# 5GAA's response to TRAI Public Consultation 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.

**5GAA:**

The V2I authorization framework could be based on ECC/DEC/(08)01[1], particularly the following:

> *DECIDES*
> *1. that the purpose of this ECC Decision is to harmonise the use of safety-related Intelligent Transport Systems (ITS) in the 5875-5935 MHz frequency band;*
> *2. that, for the purpose of this ECC Decision, the following definitions apply:*
> *a) safety-related Road ITS are those applications whose aim is to reduce the number of traffic fatalities or accidents using communications between ITS stations;*
> *3. that CEPT administrations shall:*
> *a) designate the frequency band 5875-5925 MHz on a non-exclusive basis for all safety-related ITS;*
> *c) allow free circulation and use of ITS equipment subject to the provisions of this Decision;*
> *d) exempt all vehicle-installed and mobile ITS equipment subject to the provisions of this Decision from individual licensing;*
> *e) exempt Road ITS road-side equipment subject to the provisions of this Decision from individual licensing in 5875-5915 MHz;*

The nature of transmissions to/from RSU for V2I/I2V are broadcast in nature and not targeted unicast messages in the traditional communication network sense. The On-Board Units (OBUs) in the ITS/V2X system are not connected to an RSU in the same manner that a client may connect to the base-station in a telecom network. Hence, section 3(1)(a) of the Telecommunications Act 2023 that deals with "provide telecommunications service" is not a technically correct classification for direct communication (short range) of a V2X system. Section 3(3) that deals with providing exemption from authorization in public interest considering the safety-related nature of application may be better suited for this frequency range. Further, as per Section 4(6)(a) in public interest, the RSU may further be exempt from individual assignment and as per Section 4(6)b) in public interest, for the specific usage of V2I/I2V, within the range of frequencies notified, only technical parameter compliance may be sought.

[1] ECC/DEC/(08)01 of 14 March 2008 on the "Harmonised use of Safety-Related Intelligent Transport Systems (ITS) in the 5875-5935 MHz frequency band" latest amended on 7 March 2025 (ECC#66) https://docdb.cept.org/document/412

**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.

**5GAA:**
The regulatory framework should require compliance with technical standards and emission characteristics. Further, if required, the governing body may maintain a database of RSU installations depending on the kind of road (city road, state highway, national highway, private road).

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

**5GAA:**
5GAA recommends a phased and hybrid deployment strategy:

- Combine:
  - C-V2X network-based communication (V2N/Uu) for early scalability (including apps) for latency-tolerant informational use-cases and direct C-V2X (PC5) for local safety and low-latency use cases
- Finalise publications:
  - 5.9GHz spectrum regulation for direct C-V2X Direct (PC5)
  - C-V2X reference standards
  - C-V2X deployment plan
- Digitalise road infrastructure:
  - collect road traffic information at strategic traffic management centres
  - create information interfaces (APIs) to disseminate road traffic information

- Prioritise:
  - fleet deployment (emergency vehicles, taxis, public transport)
  - after-market devices to accelerate penetration
  - deploy RSUs selectively at critical locations (e.g. intersections, high-risk areas)
- Plan with OEMs on introduction of C-V2X Direct and Network in all new vehicles:
  - Regulate collection of selected safety relevant traffic information (SRTI)
  - Work with New Car Assessment (e.g. Bharat-NCAP) to incentivise V2X deployment in vehicles, ensuring that both direct C-V2X and mobile network- based (V2N) safety services are recognised and rewarded
  - Identify the need for allocating more bandwidth to support advanced driving with 5G-V2X Direct (i.e. NR-V2X PC5).

This approach allows early benefits while supporting gradual rollout of full V2X capabilities

**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.

**5GAA:**
Yes. India could prescribe a harmonized C-V2X technology framework for direct communication to ensure interoperability, ecosystem alignment, and efficient deployment of cooperative safety services.

A phased approach based on LTE-V2X Direct ("LTE-based C-V2X") for initial deployment and Day-0 / Day-1 use cases, with a defined evolution path toward 5G-V2X Direct ("NR-based C-V2X") for future advanced applications, would provide the most practical and scalable approach for India.

LTE-V2X Direct should be adopted as the baseline technology for initial direct communication deployments, considering its higher ecosystem maturity, broader deployment experience, and suitability for currently identified use cases.

5G-V2X Direct should be treated as a future evolution path for advanced cooperative and automated driving applications that may require lower latency, higher throughput, or more advanced cooperative behaviour. 5G-V2X Direct can be considered as ecosystem maturity, device availability, spectrum allocation, and deployment requirements evolve.

Where future coexistence between LTE-V2X and 5G-V2X Direct becomes necessary, interoperability can be managed through phased migration strategies and interoperability considerations. In addition, the full benefits of 5G-V2X Direct may require availability of additional spectrum resources for advanced cooperative applications.

If multiple direct communication technologies are allowed without harmonization, interoperability risks may arise between vehicles, RSUs, OEMs, and infrastructure vendors, potentially increasing deployment complexity and certification burden.

At the same time, India should recognize that C-V2X includes both direct communication (PC5) and network-based communication (Uu/V2N). V2N-based services to support infrastructure communication (i.e. V2N2I/I2N2V) can be deployed immediately using existing cellular infrastructure and can complement direct communication use cases during the early deployment phases. This complementary deployment approach is also reflected in multiple 5GAA reports and whitepapers at 5GAA White Paper: Road Traffic Operation in a Digital Age.

**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.

**5GAA:**
RSUs and OBUs could be brought under interoperability and conformance frameworks. 5GAA recommends ETA for wireless emission testing and voluntary-based industry certification for protocol conformance and interoperability.

These devices perform wireless transmission and reception of safety-related information between vehicles, infrastructure, and communication networks. Their malfunction, non-compliance, or compromise may adversely impact road safety, spectrum integrity, interoperability, and trust in the V2X ecosystem.

The ETA for wireless emission:

1. RF performance and spectrum compliance
2. EMI/EMC and electrical safety

For industry certification on voluntary basis:

1. Communication protocol conformance
2. Interoperability validation
3. Cybersecurity and privacy requirements
4. Compliance with Indian regulatory requirements

India might establish or adopt a V2X-specific voluntary conformance and interoperability certification framework to ensure interoperability across OEMs, RSUs, OBUs, chipset vendors, and infrastructure providers.

International certification ecosystems such as OmniAir (https://omniair.org/) and GCF (https://www.globalcertificationforum.org/services/automotive.html) may be used as useful references for defining interoperability and conformance testing methodologies. Certification and interoperability validation could extend beyond the radio layer to message-level behaviour, including

aspects such as congestion control, positioning quality, message prioritization, and interpretation of safety message semantics.

As V2N-based services operate on existing certified devices (e.g. telematics control units, cellular modems) no additional C-V2X-specific radio equipment certification should be required. Such services can therefore be deployed more quickly while continuing to comply with applicable telecom, cybersecurity, privacy, and vehicle-level requirements. This can help build early user confidence, ecosystem learning, and momentum for broader V2X deployment.

**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.

**5GAA:**
Yes, for C-V2X Direct (PC5) communication there is a need to standardise additional layers (beyond the access layer) in the ITS stack to ensure interoperability among different RSUs/OBUs from multiple vendors.

Interoperability cannot be guaranteed solely through harmonization of the radio access layer. Standardization is also required at higher layers to ensure consistent interpretation of messages, congestion management behaviour, positioning quality handling, prioritization mechanisms and security services across different implementations.

Guidelines can be provided for application layer behaviour to enable a consistent user experience across implementations.

Considering the Task Force recommendations, global maturity, and ecosystem alignment, ETSI TC ITS standards may be adopted as the baseline higher-layer ITS framework for India.

At the same time, India may define an India-specific deployment profile for Day-0 and Day-1 deployments to ensure:

- reduced implementation complexity,
- practical certification requirements,
- lower deployment cost,
- and alignment with India-specific traffic and infrastructure conditions.

The ETSI stack provides a mature and feature-rich framework, including geo-networking capabilities, facilities-layer services, congestion control, and integrated security mechanisms. However,

deployment and certification complexity for early-stage use cases should be carefully managed through phased implementation and profiling.

A common higher-layer standard adopted across the direct C-V2X ecosystem would accelerate ITS rollout and avoid fragmentation. The ecosystem should not be fragmented by having multiple V2V application layer standards. In this respect, existing or ongoing work could be leveraged as a basis to develop India's Direct Communication Profile, e.g. ETSI TS 103 723 (LTE-V2X Direct Communication Profile) and ongoing work on the Profile for 5G NR-V2X Sidelink Direct Communication - Release 2 (draft TS 103 939).

For security on direct communication, the adopted stack should rely on globally recognized C-V2X security mechanisms, including IEEE 1609.2-based certificate and message security frameworks as profiled by ETSI.

Testing standards from ETSI and international interoperability and certification frameworks such as OmniAir may serve as useful references for certification methodology and interoperability validation.

For V2N-based services using cellular networks and information sharing using backend systems, standard IT security methods can be applied, this is further elaborated in the 5GAA position paper V2N2X security, privacy, and data quality. Interoperability should be addressed through standardized data exchange formats, i.e. harmonised profile for the application layer information in a message (AKA the facility layer), this would allow interoperability between various transport technologies (e.g. direct and network). Quality requirements for safety-related traffic information needs to be specified.

Relevant international references include the EU SRTI/RTTI framework, DATEX II harmonized profiles, Data for Road Safety-type data sharing models, and evolving vehicle safety assessment frameworks such as Euro NCAP. These references show that network-based safety information exchange can coexist with direct V2X standards and support interoperable awareness services (see https://transport.ec.europa.eu/transport-themes/smart-mobility/road/its-directive-and-action-plan/safety-related-traffic-information-srti-real-time-traffic-information-rtti_en, https://www.dataforroadsafety.eu/ and to https://www.euroncap.com/press-media/euro-ncap-dfrs-join-forces-for-safer-roads-in-europe for more information).

**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.

**5GAA:**

Yes. India could prescribe a harmonized security framework for ITS/C-V2X to ensure trust, interoperability, privacy protection, message integrity, and resilience of the cooperative transportation ecosystem.

**(a).** The security framework should align with globally adopted V2X security principles and standards associated with the selected ITS stack. The ETSI security framework and IEEE 1609.2-based mechanisms are both mature and well-established approaches and provide strong foundations for secure V2X communication.

**(b).** CCA/MeitY could play a central role in governance, policy management, and trust anchoring for the national ITS/C-V2X security ecosystem.

The operational V2X PKI / SCMS infrastructure may be implemented by designated national entities or licensed operators under approved certificate policies and governance frameworks. Existing global SCMS implementations and providers may be referenced or leveraged, subject to Indian policy, sovereignty, and governance requirements.

**(c).** Conventional X.509 PKI mechanisms cannot directly replace V2X-specific credential management, since V2X communication requires additional privacy-preserving mechanisms such as pseudonym certificates and unlinkability. However, coexistence with the existing RCAI/X.509 framework can be achieved through trust anchoring, countersigning, or coexistence architectures, similar to those discussed in the Task Force recommendations. In this model, India's existing X.509 trust infrastructure can support national trust anchoring and governance, while V2X-specific certificate mechanisms continue to address pseudonymity, message signing, and privacy requirements.

India could adopt a coexistence framework that:

- maintains compatibility with India's national trust infrastructure,
- preserves V2X-specific privacy requirements,
- supports interoperability with global V2X ecosystems,
- and minimizes implementation complexity for OEMs and infrastructure providers.

The V2X ecosystem should operate as a controlled trust domain where only authenticated and authorized devices and infrastructure entities can participate while still supporting multi-vendor and multi-OEM interoperability.

At the same time, security implementation for direct C-V2X should not delay deployment of V2N-based infrastructure related services. V2N-based services can leverage that communicating parties are known (I.e. IP point to point connections), mature internet security, cloud security, and connected-vehicle security mechanisms already used by OEMs, while continuing to comply with applicable cybersecurity, privacy, and data protection requirements, e.g. based on consent by users.

**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.

**5GAA:**

**(a).** No rigid regulatory partitioning between safety and non-safety applications should be mandated. A separation would lead to increased receiver complexity, and reduced spectral efficiency. 5GAA explicitly recommends not separating safety and non-safety at spectrum level as congestion management solutions already exist for LTE-V2X PC5 in the 3GPP specifications. Therefore, differentiation between safety vs non-safety messaging should be handled via message prioritization called ProSe Per-Packet Priority (PPPP). The congestion control mechanism of a C-V2X Basic System shall be compliant to [ETSI TS 103 574].

However, LTE-V2X 3GPP standards support flexible channel widths (10 MHz and 20 MHz natively for LTE Sidelink) and subsequent 5G-V2X direct sidelink supports 10 MHz, 20 MHz, 30 MHz, and 40 MHz channel bandwidths.

For example, the current LTE-V2X channel in China and Korea utilizes 20MHz, and the expected 5G-V2X channel to be used in the future can be as wide as 40MHz (allocated for future use in Korea).

**(b).** Direct LTE-V2X (PC5) operates via distributed resource allocation, not operator-controlled spectrum segmentation. There is no need to pre-allocate spectrum to specific RSU operators. Coexistence is ensured by the radio technology using a semi-persistent scheduling, where each C-V2X radio autonomously selects and reserves radio resources over time. Devices monitor channel usage and dynamically reselect resources when congestion or interference is detected, enabling decentralized coordination and efficient sharing of the spectrum without central control.

**(c).** N/A

**(d).** There are already internationally harmonized parameters for interference management. In the US, the Second FCC Report & Order (FCC 24-123) in Docket No. 19-138 settled the rules for the LTE-V2X RSU and OBU: EIRP is typically limited to 33 dBm. RSU Antenna height up to 8 m (15 m with reduced power) and defined OOBE masks consistent with the IEEE 802.11p-2010, Table I.8. In Europe, ETSI EN 302 571 specifies EIRP limits (~23 dBm/MHz class) and spectrum masks, providing a comparable and proven baseline. This approach is consistent with 5GAA positions on European band configuration and spectrum, which support harmonized technical limits to ensure interoperability and coexistence.

**(e).** A full SACFA-type prior approval framework is not required for every RSU. RSUs are low-power, short-range devices comparable to infrastructure radios. Instead, a lightweight registration and coordination mechanism, similar to the US model, could be adopted. In the United States, entities first obtain a non-exclusive geographic license, then each RSU must be registered in a central database (FCC ULS) before operation, including location and technical parameters. Registrations are subject to validation (e.g., interference coordination) and become effective only once approved. Operators must update or delete RSU records if modified or decommissioned and ensure operation strictly matches registered parameters. This system ensures deployment traceability and deployment monitoring across a large number of road operators without heavy administrative burden.

A similar approach in India — based on mandatory registration — would enable efficient oversight while supporting scalable, rapid deployment of V2I infrastructure.

**(f).** Yes – 5GAA supports to adopt Task Force recommendations as baseline.

**(g).** 5GAA recommends that RSU operators would receive a Medium-term assignment (e.g., 10 years) with renewal. This rule would be similar to the US RSU licenses based on the above lightweight registration.

**(h).** Yes – limited roll-out obligations would be necessary to avoid spectrum hoarding and delayed deployment. 5GAA advises setting clear deployment plans with indicators to manage the expectations. While the US Deployment Plans focussed on infrastructure-based initial deployment, 5GAA would recommend India to focus on accelerating vehicle manufacturer adoption of LTE-V2X either via hard regulations or soft measures like Bharat NCAP.

**(i).** While explicit “surrender” provisions for V2X spectrum are not always formalized, analogous mechanisms exist internationally, particularly in general spectrum management frameworks. For

example, the Telecommunications Act allows termination where spectrum is "unutilised for insufficient reasons", and in the US, RSU licenses lapse automatically if not deployed within a defined timeframe (e.g. 12 months).

5GAA would recommend that a flexible surrender mechanism could be introduced at the condition a sufficient lead time of 24-36 months is set giving a fair chance for the Indian automotive industry to adopt the technology as well as a set of clear criteria on which a assessment can be made. This could become a incentive to take the opportunity in a short time window.

**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.

**5GAA:**
Timelines should be aligned with a lightweight registration framework, similar to the US model, where RSUs are deployed through registration rather than full licensing. Under this approach, processing focuses on validation rather than approval, enabling faster deployment.

For standard RSU registrations, processing could be limited to 1–2 weeks, primarily for administrative and technical validation. In cases requiring coordination (e.g. aviation or defence), timelines may extend to 4–6 weeks. A "deemed approval" mechanism could apply if no objection is raised within the defined period.

This model reflects the US framework, where RSUs are registered in a central system before operation, ensuring traceability and interference management without heavy administrative burden.

Such an approach supports rapid rollout, scalability, and regulatory efficiency, while maintaining necessary oversight through standardized technical rules and registration obligations.

**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.

**5GAA: N/A**

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

**5GAA: N/A**

**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.

**5GAA:**
Given the public safety and public welfare nature of C-V2X applications, spectrum assigned to V2I communication service authorised entities should not be subject to significant spectrum charges, particularly for safety-related use cases.

International experience shows that many jurisdictions adopt license-exempt or low-cost administrative assignment for ITS/C-V2X spectrum to enable rapid deployment and maximise societal benefits.

V2I services, especially those supporting collision avoidance, traffic management, and emergency response, typically do not generate direct commercial revenue, making traditional spectrum pricing models inappropriate.

Any sort of spectrum charges / heavy-licence fees and dependence on third-party communication providers will demotivate and create undue roadblocks in V2I deployment.

India can consider an approach like Europe and exempt safety-critical applications from spectrum charges.

Such a framework would ensure efficient spectrum use while removing financial barriers, thereby accelerating large-scale deployment and delivering measurable safety benefits.

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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.

**5GAA: N/A**

**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

**5GAA: N/A**

**About 5GAA**

The 5G Automotive Association (5GAA) is a global, cross-industry organisation of companies from the automotive, technology, and telecommunications industries (ICT), working together to develop end-to-end solutions for future mobility and transportation services. Created in September 2016, 5GAA has rapidly expanded to include key players with a global footprint in the automotive, technology and telecommunications industries. This includes automotive manufacturers, tier-1 suppliers, chipset/communication system providers, mobile operators, and infrastructure vendors.

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**Secretariat Contact:** liaison@5gaa.org