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Intelligent Transport Systems

6 GHz band spectrum sharing for Automatic Frequency Coordination

ITS Australia Submission

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OFFICIAL

Spectrum sharing using Automatic Frequency Coordination in the 6 GHz band

ITS Australia sincerely appreciates the opportunity the Commonwealth Government and the ACMA has provided to make a submission on this important topic. ITS Australia is the peak body for the transport technology sector and many of our 150+ member organisations play a role at the leading edge of new and emerging technologies to improve safety and efficiency on our transport networks.

ITS Australia supports the development of an Automated Frequency Coordination (AFC) assisted spectrum sharing framework in the 6 GHz band, provided that implementation includes robust safeguards to protect safety-critical Cooperative ITS (C-ITS) and other Intelligent Transport Systems (ITS) , which is allocated to the adjacent 5855 MHz to 5925 MHz band as per the Radiocommunications (Intelligent Transport Systems) Class Licence 2017.

Introduction

ITS Australia welcomes the opportunity to respond to the ACMA discussion paper on Automatic Frequency Coordination-assisted spectrum sharing in the 6 GHz band (5925–6585 MHz). The transport technology sector is both a beneficiary of improved broadband connectivity and an incumbent user of the adjacent ITS band 5855 - 5925 MH with safety-critical spectrum needs, particularly for C-ITS and related roadside systems. The proposed use of AFC to enable standard-power RLAN operations in the 6 GHz band has the potential to enhance connectivity and support new applications. However, it must not compromise the safety, reliability, or functional performance of established and planned ITS deployments in the adjacent 5855 - 5925 MHz range.

This submission focuses on:

- Ensuring that any AFC regime preserves the integrity of existing C-ITS and tolling operations in adjacent bands.
- Identifying technical and operational measures needed to avoid harmful adjacent-band interference.

- Highlighting the need for empirical testing in realistic transport environments before large-scale deployment of standard-power RLAN.

Importance of protecting adjacent ITS bands

The lower 6 GHz RLAN band sits immediately above the harmonised ITS spectrum used for C-ITS (around 5.9 GHz). These bands support safety-critical vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) applications, including collision avoidance, hazard warnings, and speed and lane control functions, which depend on low-latency, highly reliable, interference-free communications.

Key points:

- Existing and planned ITS services in 5.8–5.9 GHz underpin the National Road Transport Technology Strategy and the 2024–27 National Connected and Automated Vehicle (CAV) Action Plan, endorsed by all Australian jurisdictions at the Infrastructure and Transport Ministers' Meeting (ITMM).
- Any degradation of C-ITS performance, even if intermittent, could materially affect collision-prevention and safety-of-life applications, and therefore poses an unacceptable risk to road users and operators.
- While safety and control channels currently have some frequency separation from the lower edge of the 6 GHz band (for example a 10 MHz buffer), this buffer should not be treated as an allowance for increased out-of-band (OOB) emissions; it is a design margin to enhance robustness, not a substitute for strict emission limits.

ITS Australia therefore considers that protection of the 5.8–5.9 GHz ITS bands must be treated as a primary design constraint in any AFC framework for 6 GHz RLAN.

Limitations of AFC for adjacent-band protection

The discussion paper correctly identifies AFC as a dynamic, database-driven coordination mechanism aimed at protecting *in-band* primary services, particularly fixed point-to-point links and other licensed users within 5925–6585 MHz. AFC allocates frequencies and power on the basis of device geolocation, propagation modelling, and a database of incumbent assignments, and is not designed to control or mitigate adjacent-band OOB emissions.

From an ITS perspective, this has several implications:

- AFC can reduce co-channel and in-band interference to 6 GHz incumbents but does not by itself address interference from the skirts of RLAN emissions into the 5.8–5.9 GHz ITS bands.
- Even when AFC accurately constrains transmit power and channel use, adjacent-band interference is governed primarily by device emission masks, hardware design and regulatory emission limits, not by the AFC database.
- As a result, the introduction of standard-power 6 GHz RLANs coordinated by AFC may increase the risk of harmful interference to C-ITS and DSRC tolling systems unless conservative OOB limits, minimum frequency offsets, and deployment constraints are maintained.

ITS Australia therefore urges ACMA to explicitly distinguish between:

- Use of AFC for coordination *within* the 6 GHz RLAN band; and
- Separate, stringent regulatory measures to protect *adjacent* safety-critical ITS bands, including emission limits, minimum operating frequencies, and usage restrictions.

Lessons from the previous 6 GHz RLAN consultation

In the earlier consultation on "Proposed updates to the LIPD Class Licence for 6 GHz RLANs", ACMA recognised the need to protect the 5.9 GHz C-ITS band by:

- Restricting 6 GHz RLAN to low-power indoor (LPI) and very-low-power (VLP) outdoor operation.
- Introducing OOB emission limits designed to ensure that ITS services in 5.9 GHz are not subject to harmful interference.

That consultation was informed by European work, including ECC Report 355 (2024), which found that very low power applications operating at 5945 MHz with OOB emission levels of −37 dBm/MHz and −45 dBm/MHz can reduce the performance of a single Communications-Based Train Control (CBTC) radio link operating below 5935 MHz. Although CBTC is a rail application, the principle is directly relevant to C-ITS and road-side radio systems: modest OOB emissions from dense deployments of low-power devices can still degrade the performance of safety-critical links.

In its response to that consultation, industry submissions strongly recommended that:

- ACMA thoroughly assess the implications of permitting standard-power applications in the lower 6 GHz band for safety-critical ITS operations.

- Standard-power RLAN applications using AFC be allowed only above 5945 MHz, providing a minimum separation between high-power RLAN and the upper edge of the ITS bands.
- Existing OOB limits for outdoor applications (for example−37 dBm/MHz) be retained, so that any shift to standard-power is not accompanied by looser emissions constraints.

ITS Australia supports these positions and considers they remain highly relevant to the current AFC consultation.

Spectrum planning and emission limits

ITS Australia recommends that ACMA adopt a conservative spectrum planning approach to AFC-enabled standard-power RLAN in the lower 6 GHz band, in line with the discussion paper's recognition of the need to protect incumbents and manage segmentation.

Recommended planning principles

1. **Standard-power floor at or above 5945 MHz**
    - Standard-power AFC-coordinated RLAN devices should not be authorised below 5945 MHz.
    - The 20 MHz of spectrum immediately above the ITS allocations should be reserved for LPI/VLP only, or left unused by AFC-enabled standard-power devices, creating an effective guard region in practice.
2. **Maintain existing OOB limits for outdoor use**
    - For any outdoor applications (including standard-power AFC-coordinated RLAN), OOB emissions in the direction of the ITS bands should remain at least as strict as the −37 dBm/MHz limit currently applied to protect rail and ITS-type systems in related studies.
    - Consideration should be given to adopting even more stringent limits for outdoor deployments in high-density urban environments or near major road corridors and railways, given the concentration of safety-critical radio systems.

AFC operational constraints in transport environments

The discussion paper emphasises that AFC relies on real-time or near-real-time geolocation (typically GPS), database integrity and propagation modelling to manage in-band coexistence. Road transport environments present several specific challenges for this model:

- **Tunnels and GPS-denied environments**: AFC-enabled devices located in tunnels or cut-and-cover road sections may have degraded or unavailable GPS reception, undermining the ability of devices to obtain or maintain valid AFC grants.
- **Roadside infrastructure density**: Tolling gantries, C-ITS road-side units (RSUs), and other infrastructure often cluster along motorways, creating complex multipath and clutter conditions that may not be adequately captured by generalised propagation models.
- **Continuity of operations**: Both C-ITS and DSRC tolling systems require continuous coverage and deterministic behaviour; sporadic interference or loss of communications in short road sections can have disproportionate safety and operational impacts.

ITS Australia therefore recommends that:

- AFC operational rules require devices to cease or significantly reduce transmissions when they cannot maintain valid geolocation or AFC authorisation, particularly near identified ITS corridors.
- Geofencing rules be considered so that standard-power AFC-coordinated RLAN devices are either prohibited or subject to stricter power and OOB limits within defined distances of key road and rail corridors, tunnels, and complex interchanges.

International developments and timing

The discussion paper notes that the United Kingdom and other European jurisdictions are actively consulting on the expansion of 6 GHz access, including the potential use of AFC and associated interference studies. ITS Australia considers these processes highly relevant because many C-ITS and RLAN equipment ecosystems are global, and European studies have already demonstrated vulnerabilities of safety-critical systems such as CBTC to 6 GHz OOB emissions.

ITS Australia therefore recommends that ACMA:

- Closely monitor the outcomes of the UK and EU consultations on AFC and 6 GHz RLAN, including any new interference studies addressing transport and C-ITS systems.
- Consider deferring final decisions on the introduction of standard-power AFC-enabled RLAN below 5945 MHz until the current UK/EU work and related compatibility assessments are sufficiently advanced.
- Where appropriate, leverage international technical criteria and test methodologies, rather than developing completely bespoke Australian parameters in isolation.

This sequencing would help ensure that the Australian framework benefits from the latest evidence and international best practice, while avoiding premature commitments that could later be difficult or costly to revise.

The discussion paper notes an ongoing AFC trial in the 6 GHz band under a scientific licence, coordinated by industry partners and WISPs to test real-world behaviour and AFC–RRL integration. ITS Australia strongly supports the use of trials and recommends that future stages explicitly include transport-sector scenarios.

Conclusion

ITS Australia recognises the significant opportunity presented by AFC-assisted spectrum sharing in the 6 GHz band to enhance connectivity and support innovation across Australia, including in regional and remote areas. At the same time, we stress that any framework must be designed so that safety-critical C-ITS and DSRC tolling operations in the adjacent 5.8–5.9 GHz bands remain fully protected, both now and as deployments scale under national strategies and action plans.

Accordingly, ITS Australia recommends that ACMA:

- Limit AFC-enabled standard-power RLAN operations to frequencies at or above 5945 MHz.
- Maintain at least current OOB emission limits for outdoor applications, with consideration of stricter constraints near key transport corridors.
- Address AFC's inherent limitations for adjacent-band interference through explicit regulatory emission masks, frequency planning and geofencing.
- Undertake targeted trials in real transport environments and take account of pending UK/EU consultation outcomes before finalising the Australian AFC framework.

ITS Australia and its members remain available to work with ACMA to further develop technical studies, test programs and practical coexistence arrangements that both enable wireless innovation and uphold the safety and reliability of Australia's transport systems.

To facilitate any future engagement, ITS Australia Policy Manager Stacey Ryan can be contacted at Stacey.ryan@its-australia.com.au.

Yours sincerely,

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