

## **Submission to Innovation, Science and Economic Development Canada (ISED)**

### **Consultation on 5030–5091 MHz for RPAS CNPC and Related Frameworks**

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#### **1. Executive Summary**

This submission supports a structured, aviation-aligned modernization pathway for terrestrial RPAS command and control (CNP) use within 5030–5091 MHz.

We recommend:

1. Adoption of a **Temporary National Trial Licensing Window (24–36 months)** for coordinated terrestrial CNPC deployment.
2. Maintenance of **licensed, safety-of-life spectrum discipline** (no immediate licence-exempt framework).
3. Implementation of a **Dynamic Frequency Management System (DFMS)** during the trial phase.
4. Post-trial transition to a **tier-based area licensing model**, informed by Canadian empirical data.
5. Strict limitation of band use to **CNP-only (no payload data)**.

This approach preserves aviation-safety integrity while enabling evidence-based regulatory modernization.

#### **2. Responses to Consultation Questions**

##### **Q1 – CDFA Amendment / Footnote Suppression**

We support the proposed amendment to the Canadian Table of Frequency Allocations to include the CXX designation and suppress the referenced microwave landing system footnote.

This amendment aligns domestic allocation language with contemporary RPAS CNPC intent and international aeronautical alignment.

- MLS is unused in Canada.
- Dedicated CNPC allocation improves deterministic performance for safety-critical BVLOS.

- Regulatory clarity enables infrastructure investment

## **Q2 – Other RPAS Applications Beyond CNPC**

We do **not** recommend expanding band scope beyond CNPC.

### **Rationale:**

- Channel width constraints limit long-term scalability.
- Uplink performance limitations constrain non-CNPC applications.
- Payload traffic (video, detect-and-avoid data, broadband telemetry) would create congestion and undermine safety posture.
- FCC precedent reinforces strict CNPC-only interpretation.

We recommend maintaining **CNPC-exclusive usage**.

Regarding RPAS dock or autonomous RPAS ground system heartbeat signaling, we recommend no explicit expansion at this stage. Future interpretive flexibility should be preserved.

## **Q3 & Q4 – ICAO BAN Plan vs FCC BAN Model**

We support alignment with the **U.S. FCC BAN segmentation model**.

### **Rationale:**

- Cross-border harmonization
- Clearer segmentation
- Structured CNPC definition
- Improved interoperability potential
- Corridor-based licensing.
- Allows MNO and WISPs to participate in Network Supported Services (NSS).
- Aligns with BVLOS redundancy models (terrestrial + satellite).
- Rural density modeling.
- Database-managed coordination.
- Guard bands near 5010 MHz RNSS.

ICAO alignment remains important; however, FCC segmentation provides stronger operational clarity.

## **Q5 – Licensing Model for Terrestrial Aeronautical Stations**

We support a **licensed framework** (not licence-exempt and not lightly licensed).

Safety-of-life allocation demands regulatory protection.

We do **not** support:

- First-come site-specific geographic monopolization
- Unrestricted area capture
- De facto spectrum incumbency without performance evidence
- Encourage regional licensing for rural operators

### **Long-Term Preferred Model:**

## **Tier-Based Area Licensing**

This model:

- Encourages scalable infrastructure deployment
- Enables corridor development
- Supports capital certainty
- Avoids patchwork coordination burdens
- Maintains competitive access

## **Q9 – Standards Requirements**

We support requiring recognized aviation standards for CNPC systems.

At minimum:

- RTCA guidance
- Transport Canada Standard 922 alignment
- Equipment certification compliance
- Align with 3GPP Release 18 aerial UE standards.
- Promote interoperability.

Transport Canada must retain safety authority over CNPC reliability thresholds.

## **Q10 – Regulatory Incorporation Mechanism**

We recommend incorporation into a **new Radio Standards Specification (RSS)** rather than conditions of licence alone.

Equipment-level compliance is essential for safety-of-life bands.

- Equipment certification improves interoperability.
- Ensures predictable coexistence with WISP 5 GHz systems.

## **Q13 – Other adjacent band considerations?**

- 5 GHz WISP backhaul protection.
- RNSS protection at 5010-5030 MHz.
- Future NTN downlink expansion.

## **Q 14 – Interim Framework**

### **Option 3 – Temporary National Trial Licensing Window (24–36 Months)**

We formally recommend adoption of a structured National Trial Licensing Framework.

#### **3.1 Policy Rationale**

##### **A. Preserve Aviation-Safety Intent**

5030–5091 MHz is internationally aligned with aeronautical safety allocations.

A coordinated trial:

- Maintains safety-of-life posture
- Avoids premature commoditization
- Protects Canada's ICAO alignment

## **B. Evidence-Based Regulation**

The trial window allows collection of:

- Interference measurements
- Propagation validation
- Aggregate density thresholds
- Reliability statistics
- Adjacent-band coexistence performance

Future regulatory liberalization must be data-driven.

## **C. Support Transport Canada BVLOS Enablement**

A coordinated RF environment:

- Enables deterministic C2 performance
- Reduces interference variability
- Strengthens safety cases
- De-risks early corridor deployment

Spectrum and aviation policy must align.

## **D. Avoid Premature Congestion**

Immediate licence-exempt access risks:

- RF density hotspots
- Spectrum squatting
- De facto incumbency
- Regulatory rollback complications

A trial window prevents destabilization.

## **3.2 Trial Framework Structure**

**Duration:** 24–36 months

**Eligibility:**

- Aviation safety-case operators
- Certified CNPC equipment only

**Conditions:**

- $\leq 10$  W EIRP (or tiered structure)
- Geographic coordination
- Registered station coordinates
- Interference reporting

- Revocation authority

### **3.3 Post-Trial Pathways**

Following empirical analysis:

1. Licence-exempt model
2. Class licence model
3. Tiered hybrid
4. Continued coordination

Policy decision informed by Canadian operational evidence.

## **Q15-17 DFMS**

We support implementation of a **Dynamic Frequency Management System (DFMS)**.

### **Position:**

- Third-party private administrators acceptable.
- Interoperability mandatory.
- Multiple providers acceptable if sustainable.
- Estimated implementation timeline: ~5 years (conservative).

DFMS enables:

- Real-time coordination
- Deployment density management
- Interference avoidance
- Transparent accountability
- Proven in 3.65 GHz and AFC models.
- Enables scalable coexistence

## **Q19 Non-Networked RPAS Users**

The distinction between networked and non-networked users has limited applicability to CNPC in this band.

Most serious BVLOS C2 architectures are inherently coordinated.

We support:

- Power limits
- Coordination thresholds
- Density monitoring

## **Q21-24 Commercial Spectrum Bands**

Commercial MNO bands (e.g., 700 MHz, AWS) should remain subject to carrier negotiation frameworks.

We recommend:

- Maximizing flexibility across available mobile allocations
- Recognizing hardware constraints for aircraft transceivers
- Avoiding over-prescription within this consultation
- Harmonization benefits equipment costs.
- 3.5 GHz possible future candidate.
- 850 MHz considered but evaluate legacy constraints.

## **Q26 Direct-to-Cell / Satellite**

SMCS and emerging NTN architecture represents a long-term structural shift.

We support:

- Explicit allowance for RPAS aerial UEs under SMCS framework.
- Continued development of IoT-grade direct-to-cell modems suitable for aviation use.
- Recognition that terrestrial + NTN hybrid models will emerge.
- Enables hybrid redundancy model

## **Q27 – Apply future bilateral agreements?**

**Position:** Support transparent transition periods.

- Limited to CNPC + payload.
- No radionavigation use.

**Rationale:** Manufacturers benefit from long lead times required for RAN and schema changes. Operators require stability for fleet planning.

## **Q28 – Establish performance reporting?**

**Position:** Support performance-based compliance.

**Rationale:** Focus on measurable continuity and latency.

### **Q29 – Define outage tolerances?**

**Position:** Encourage MSO-based framework.

**Rationale:** Maximum Service Outage is directly tied to aviation safety.

### **Q30 – Handover interruption thresholds?**

**Position:** Support corridor-class differentiation.

**Rationale:** Urban vs rural mobility differs materially.

### **Q31 – Anticipated Use Cases and Deployment Considerations**

**Position:** RPAS UEs will be operating throughout the allowable airspace (up to 122m) and will have increased visibility to adjacent cells with the potential for interference with terrestrial UEs. It is felt that this risk can be managed.

**Rationale:** Both network and UE side controls (measurable) can be implemented to manage risk.

### **Q32 – Effectiveness of ISED's proposed licensing approach in facilitating intra-network coexistence with RPAS?**

**Position:** Support ISED position.

**Rationale:** Rather than creating a new RPAS spectrum class, it leverages the existing licensed mobile broadband framework, where interference management, power control, and QoS enforcement already exist.

### **Q33 – Apply existing technical rules and coexistence measures?**

**Position:** Phase-in period recommended.

**Rationale:** Maintains Regulatory Consistency and Spectrum Integrity

Applying the existing Standard Radio System Plans (SRSPs) to RPAS aerial UEs:

- Preserves technology neutrality
- Maintains band-specific emission discipline
- Avoids creating a parallel airborne regime that fragments spectrum governance

SRSPs already define:

- Maximum e.i.r.p. / field strength limits
- pfd constraints at geographic or service boundaries
- Out-of-band emission (OOBE) limits

- Coordination requirements

Extending these to aerial UEs ensures that aerial mobility does not bypass terrestrial coexistence safeguards.

**Q34 – Develop new technical requirements such as specific power limits and transmit power control provisions, in the relevant Radio Standards Specifications (RSS) for aerial UEs?**

**Position:** Development of aerial UE-specific RSS requirements is appropriate to manage interference and ensure predictable network behaviour.

**Rationale:** Requirements must avoid over-constraining uplink C2 reliability in Canadian rural corridors and must explicitly differentiate TN and NTN operational domains.

**Q35 – Proposal to not require any additional interference mitigation measures, beyond the existing out-of-block emission limits, to address adjacent block inter-network interference?**

**Position:** Agreed

**Rationale:** The current Out-of-Band Emission (OOBE) limits embedded within ISSED's spectrum technical standards are:

- Derived from 3GPP emission masks
- Harmonized with international band plans (FCC, CEPT/ECC)
- Validated through large-scale commercial deployment experience

These limits already account for:

- Transmitter spectral regrowth under maximum EIRP
- Aggregate interference from multi-carrier deployments
- Worst-case edge-of-band loading scenarios

**Q36 – Proposal to not require any additional interference mitigation measures, beyond the existing OOBE limits, to address adjacent public safety services and fixed point-to-point services interference?**

**Position:** Agreed

**Rationale:** As above.

**Q37 – Exclusion zones around DRAO?**



**Position:** Agreed.

**Rationale:** Minimal impact on RPAS activity.

### **Q38 – MetSat appropriate interference mitigation measure?**

**Position:** No position

**Rationale:**

### **Q39 – Additional comments?**

**Position:** Canada can lead globally in integrated aviation-grade connectivity if it:

1. Enables architecture-neutral compliance
2. Encourages multi-bearer redundancy
3. Avoids operational fragility in coordination models
4. Aligns spectrum policy with measurable C2 safety performance

### **BVCI Core Position Summary**

- Support CNPC allocation in 5030–5091 MHz
- Enable TN/NTN multi-bearer architectures
- Require performance-based compliance
- Ensure coordination does not introduce systemic risk
- Promote QoS transparency in commercial mobile frameworks
- Recognize NTN as essential for Canadian geography

### **3. Conclusion**

The recommended pathway:

Phase 1: Coordinated Trial Licensing (Option 3)

Phase 2: Empirical evaluation

Phase 3: Tier-based commercialization

This is the lowest-risk modernization pathway available.

### **Final Position**

This submission advocates for:

- Aviation-safety alignment
- Evidence-based modernization
- Structured transitional control
- Innovation enablement
- Controlled commercialization