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To: Shri Akhilesh Kumar Trivedi,
Advisor (Networks, Spectrum and Licensing),
Telecom Regulatory Authority of India (TRAI)
World Trade Center, Nauroji Nagar, New Delhi - 110029

Subject: Response on Spectrum Allocation vs. Auction for Satellite-Based Commercial Communication Services

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Dear Shri Trivedi and Members of the Consultation Committee,

As a prospective CEO for a Global Digital Business, I would like to take this opportunity to contribute to the critical dialogue surrounding spectrum allocation for satellite-based commercial communication services. TRAI's focus on establishing an equitable and forward-looking policy is both timely and necessary to align India's technological ambitions with its socio-economic needs. This submission proposes a **transformative hybrid model for spectrum assignment** that ensures equitable access for emerging satellite communications without compromising the rights of terrestrial service providers—a decision with profound implications for India's digital future.

1. Advocating a Hybrid Model for Balanced Spectrum Access

In a landscape where satellite communication holds the potential to redefine connectivity, a **hybrid spectrum assignment model** is paramount. This approach balances allocation and auction by providing:

1. **Direct Allocation for Critical Connectivity Services**: Direct allocation of specific frequency bands for satellite services addressing rural and remote areas would enable rapid deployment. Satellite connectivity can deliver essential services to regions traditionally underserved by terrestrial networks—a mission consistent with India's Digital India and Atmanirbhar Bharat initiatives. For instance, L-band and S-band, which penetrate remote geographies effectively, could be allocated directly to prioritize immediate public benefit.
2. **Selective Auctions for High-Demand Commercial Bands**: High-value bands such as Ka-band (17–31 GHz) and Ku-band (10–15 GHz), ideal for commercial and enterprise applications, should be auctioned to ensure competitive pricing. This model aligns with international practices that emphasize commercial spectrum pricing transparency, as seen in U.S. and European markets. Auctioning commercial bands assures that satellite operators uphold the same market

standards as terrestrial providers, while avoiding monopolistic spectrum concentration.

Industry Impact: **This hybrid approach opens up the satellite market for Indian corporations like Vedanta and Adani Group**, enabling them to invest confidently without the financial burden imposed by full-spectrum auctions, thereby creating a viable pathway to develop high-growth services in satellite broadband and IoT.

2. Ensuring Equity with Terrestrial Communication Providers

The Indian telecom industry, backed by billions in spectrum investments, has built a successful model around auction-based allocations. Satellite services should uphold the same principles for high-demand bands to ensure **market parity** with terrestrial communication providers. Implementing competitive auctions for certain bands also avoids an imbalanced market scenario, where satellite operators could have unrestricted access at lower costs. This suggestion guarantees that new entrants in the satellite market meet the same competitive standards as established telecom players, thus securing fairness for all.

3. Addressing Technical Challenges for Seamless Coexistence

This hybrid model brings forward several technical challenges—particularly in terms of interference and shared frequency management between satellite and terrestrial networks. I recommend the following measures, which build on both national and international standards:

- **Interference Management with Equivalent Power Flux Density (EPFD) Limits**: EPFD regulations, such as those enforced by the FCC [1], help balance high-density satellite signals without disrupting terrestrial communications. India could adopt similar interference thresholds, especially in commercial bands like 13 GHz and 18 GHz, to safeguard against inter-service disruptions.
- **NGSO and GSO Coexistence**: Non-Geostationary Satellite Orbit (NGSO) constellations present a dynamic challenge due to their relative motion compared to Geostationary Satellites (GSO). My recommendation is to enforce the coordination protocols under ITU-R Article 22.2 for managing interference [2], specifically for satellite Earth station gateways sharing spectrum with terrestrial networks. This practice mirrors standards adopted by the UK's Ofcom, which promotes coexistence through cooperation and mitigates interference via default spectrum-splitting if operators cannot reach an agreement.

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1. https://docs.fcc.gov/public/attachments/fcc-17-122a1.pdf
2. https://life.itu.int/radioclub/rr/art22.pdf

4. Opportunities for Indian Enterprises to Lead in Satellite Communication

By fostering this hybrid approach, India can unlock significant economic opportunities in satellite-based communication—an industry projected to reach USD 10 billion in India by 2030. This model supports an investment-friendly environment, drawing in Indian companies like **Adani, Vedanta** to establish advanced satellite services and expand broadband access to underserved populations.

- **Boosting India's Infrastructure in Line with Digital India**: Satellite investments, particularly in bands allocated for rural outreach, allow Indian companies to rapidly deploy digital services in underserved regions at a lower upfront cost, making the infrastructure rollout affordable and scalable. This model supports India's vision of universal digital inclusion, reinforcing the country's standing as a leader in next-generation communication technologies.
- **Revenue Potential in High-Demand Commercial Bands**: Auctions for Ka and Ku bands open high-margin revenue streams in corporate broadband and IoT markets. This structure will allow Indian corporations to gain substantial returns on investment while contributing to the digital transformation of key sectors, such as logistics, agriculture, and telemedicine.

5. Conclusion: A Future-Ready Framework for Satellite Spectrum

A hybrid model for spectrum assignment that combines direct allocation with selective auctions provides an equitable, economically viable solution for India's satellite and terrestrial communication ecosystems. This approach enables rapid connectivity expansion in remote areas while promoting fair competition for commercial satellite and terrestrial service providers. By embracing this model, TRAI can set a precedent for market parity, technological advancement, and economic growth in satellite communications.

With a hybrid approach, India can position itself as a global leader in satellite communications, paving the way for Indian enterprises to expand and innovate in this critical sector. Thank you for considering this submission. I look forward to TRAI's decision in shaping India's strategic roadmap for satellite communication.

Warm regards,

Jeetendra Pratap aka **Jeet**
Mob. : +91 8826000434
E-Mail : Jeetendra.Pratap.ITExec@gmail.com
Res. : #973, HRBR Layout, Bangalore, Karnataka - 560043
LinkedIn : https://www.linkedin.com/in/jeetendra-pratap-6445a25