

COMMENTS OF FREE STREAM TECHNOLOGIES**Consultation Paper on Formulating a Digital Radio Broadcast Policy for Private Radio Broadcasters (TRAI CP No. 14/2024)**

Incubated at the prestigious Indian Institute of Technology, Kanpur (IITK), Free Stream Technologies (www.freestream.ai) is India's first and only 'Chips to Platform' DeepTech start-up that is focused on enabling Next-Generation Broadcasting for a Viksit Bharat. We are developing, deploying, and managing nationwide network infrastructure for cutting-edge Direct-to-Mobile (D2M) broadcast technology and related platform services.

Q34. Stakeholders may also provide their comments/suggestions along with detailed justification on any other issue that may be relevant to the present consultation.

We would like to bring up a very important distribution method that has multiple advantages, i.e., digital radio over Digital Terrestrial Transmission (DTT) based Direct-to-Mobile (D2M). The advantages are:

- i) Radio and audio programming can easily be multiplexed into the D2M digital transmission as bit streams, and demodulated and decoded using the existing audio codec in the mobile device. This would enable mobiles to receive both TV as well as radio broadcast with separate EPG.
- ii) There is no need for a separate digital radio receiver and antenna for radio over D2M.
- iii) D2M is one-to-many broadcast, so a single program stream can support an unlimited number of receivers in a D2M cell.
- iv) D2M already supports Single Frequency Networking and can provide indoor coverage and robust mobility reception at broadcast UHF frequencies without being affected by noise from electric motors.
- v) The simul broadcast of digital radio over D2M network with coverage as well as FM broadcast would dispense with the need of putting up separate digital radio transmitters set up including towers and would lessen the burden of CAPEX and OPEX on radio broadcasters. The radio broadcasters have to simply invest in content production with only little cost on slot fee on D2M platform. This would also do away with the requirements of importing FM transmitters and save significantly on import bills.
- vi) As D2M chips are home grown, the entire eco system for digital radio could be home grown. A special chip can also be developed for receiving D2M digital radio in portable digital radios of form factors as small as FM Radio Receiver or even smaller. Such chips can also be integrated with many other devices like infotainment systems installed in vehicles and similar other devices.
- vii) The above would also spare the FM spectrum after complete switch over from analogue FM to D2M enabled digital radio and the vacated spectrum could potentially be utilized for other important applications.

Private radio broadcasters should be allowed to simulcast their live terrestrial radio channels on Direct-to-Mobile (D2M) services. Bringing the rich experience of digital radio to the D2M platform is a perfect win-win situation for citizens, broadcasters and Government alike. A large number of voice and high-quality stereo audio services could occupy just a fraction of the bandwidth that's available in D2M transmission. This is, therefore, clearly in the public interest and will be highly revolutionary.

Our partners have demonstrated proofs-of-concept of radio over D2M with ATSC 3.0 enabled mobile phones, set top boxes and other types of user devices. Using the highly efficient xHE-AAC audio codec that is an integral part of DRM and widely available in cell phones, high-quality voice at 7kbps for talk radio, and high-quality stereo music audio at 24 kbps are possible.

The DRM framework is being integrated into the ATSC 3.0 standard and digital TV platform, thus D2M based on ATSC 3.0 can help leverage existing investments in DRM as well.