



Spectrum below 1 GHz: Some Use Cases

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Use Cases

- Spectrum for supporting utilities networks^[1]
- Ham radio ^[2]
- Spectrum for programme making and special events (PMSE)^[3]
- License Exempt^[4]

[1] *How do utilities decide which spectrum to use?* -<https://www.ericsson.com/en/reports-and-papers/further-insights/utilities-spectrum-simplified> (Ericsson)

[2] *List of amateur radio frequency bands in India*-
https://en.wikipedia.org/wiki/List_of_amateur_radio_frequency_bands_in_India (Wikipedia)

[3] *New spectrum for Programme Making and Special Events* <https://www.caa.co.uk/commercial-industry/airspace/communication-navigation-and-surveillance/spectrum/new-spectrum-for-programme-making-and-special-events/> (CAA and OFCOM)

[4] *Rules for Use of Low Power Radio Frequency Devices in the frequency band 433.05-434.79 MHz, Exemption from Licence, Rules, 2022, DoT, Government of India*

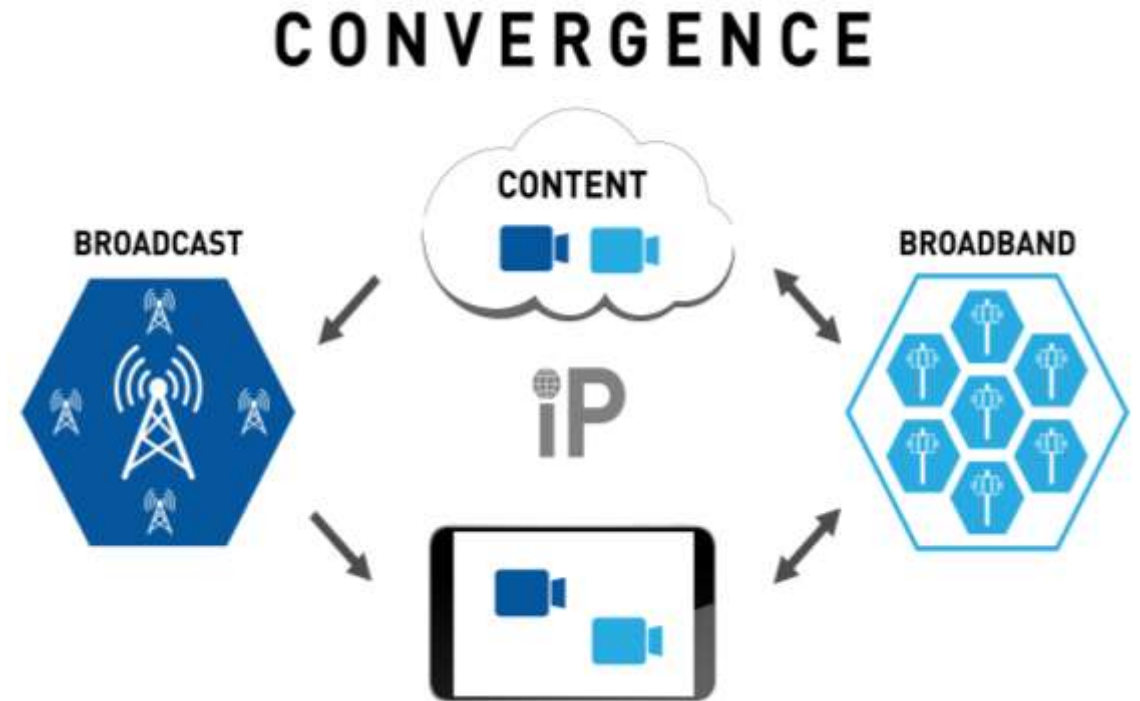


Use Cases

- Spectrum for wireless broadband in rural areas
- Mobile phone networks
- Railway radio communications^[1]
- Terrestrial broadcasting includes TV and Radio
- Direct-to-Mobile (D2M)
- *Radio Communication (VHF)*
https://indianrailways.gov.in/railwayboard/uploads/codesmanual/telecom/TelecomManual/Chapter_XI.pdf (Indian Railways)

What is D2M (Direct-to-Mobile)?

D2M is a Broadcast Delivery capability in a mobile device that provides direct reception of content via a broadcast tower overlay

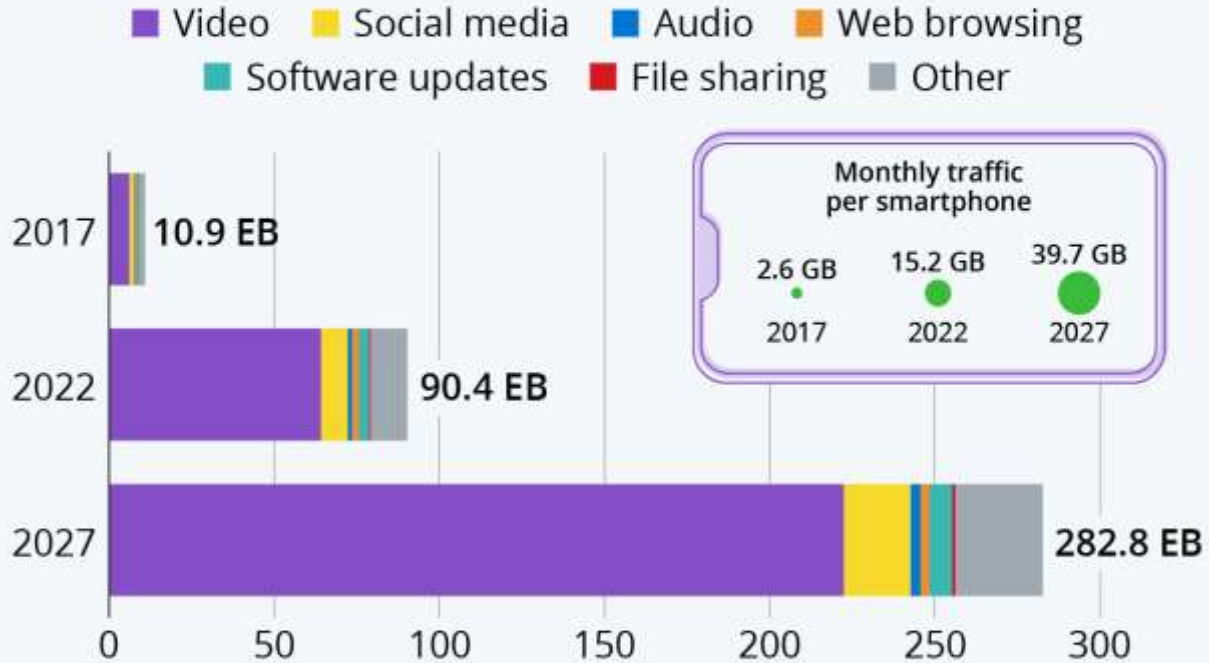


Why D2M ?



Video Drives Surge in Mobile Data Traffic

Estimated global mobile data traffic by application category (in exabytes per month)*



* one exabyte equals one million terabytes

Source: Ericsson Mobility Report

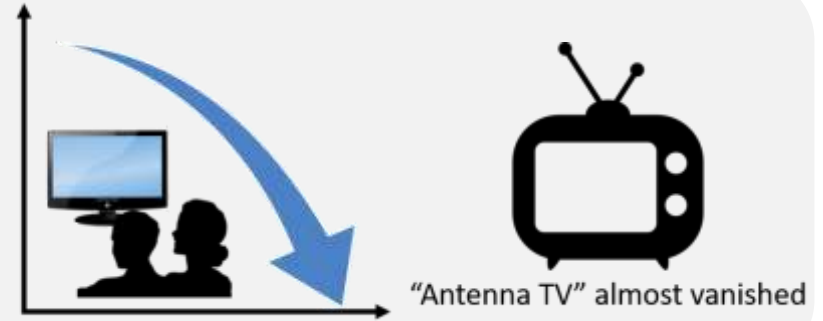


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Linear Broadcast TV Consumption In India on Decline

- Primarily through Cable/Satellite Television
- “Antenna TV” almost vanished



Why D2M?



Increasing Media Consumption over Mobile Devices

- Fueled by Spiraling Downward Cost of Data plans
- Shift to OTT/On-demand Consumption over Devices
- 44% of OTT viewing in India on Smartphones*

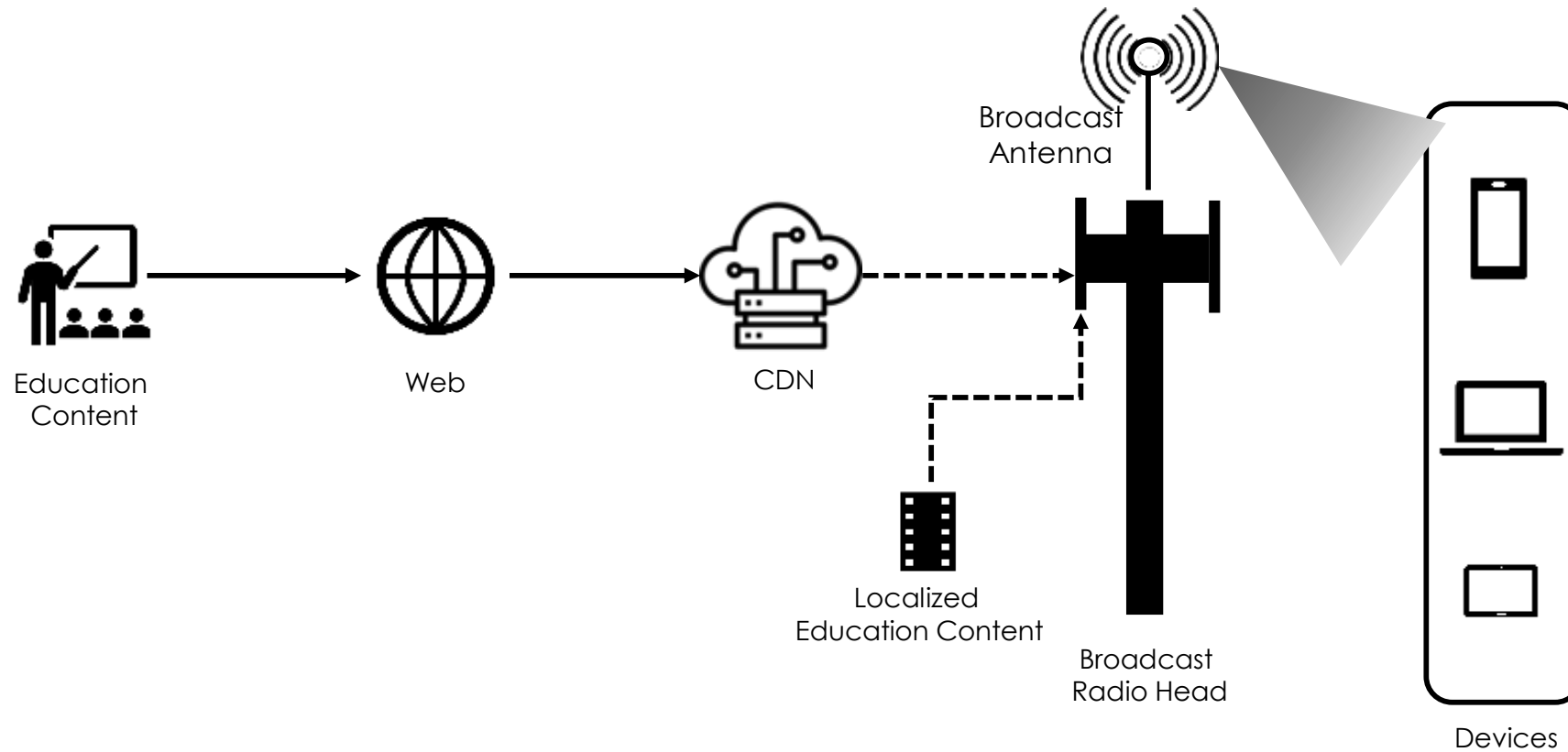
Convergence of Broadcasting and Broadband

- Support for Broadcast (TV) Reception on Mobile Devices
- Availability of all types of Media on a Single Device
- Identical Broadcast Mechanism for TV/Digital Radio/Mobile Devices

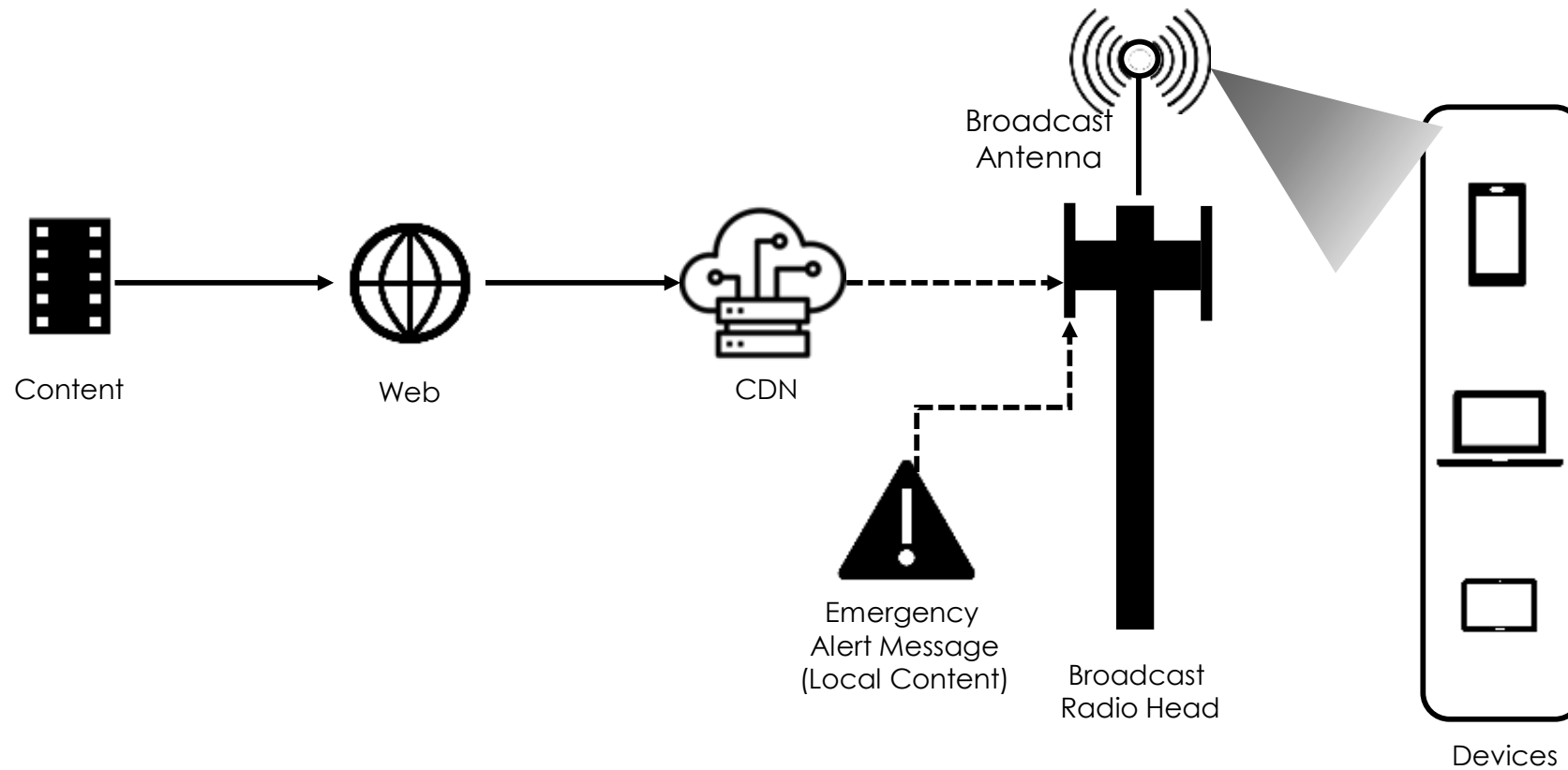
Improved Monetization of Broadcast Pipe



Use Cases: Education Content over Broadcast



Use Cases: Emergency Alert and Public Safety

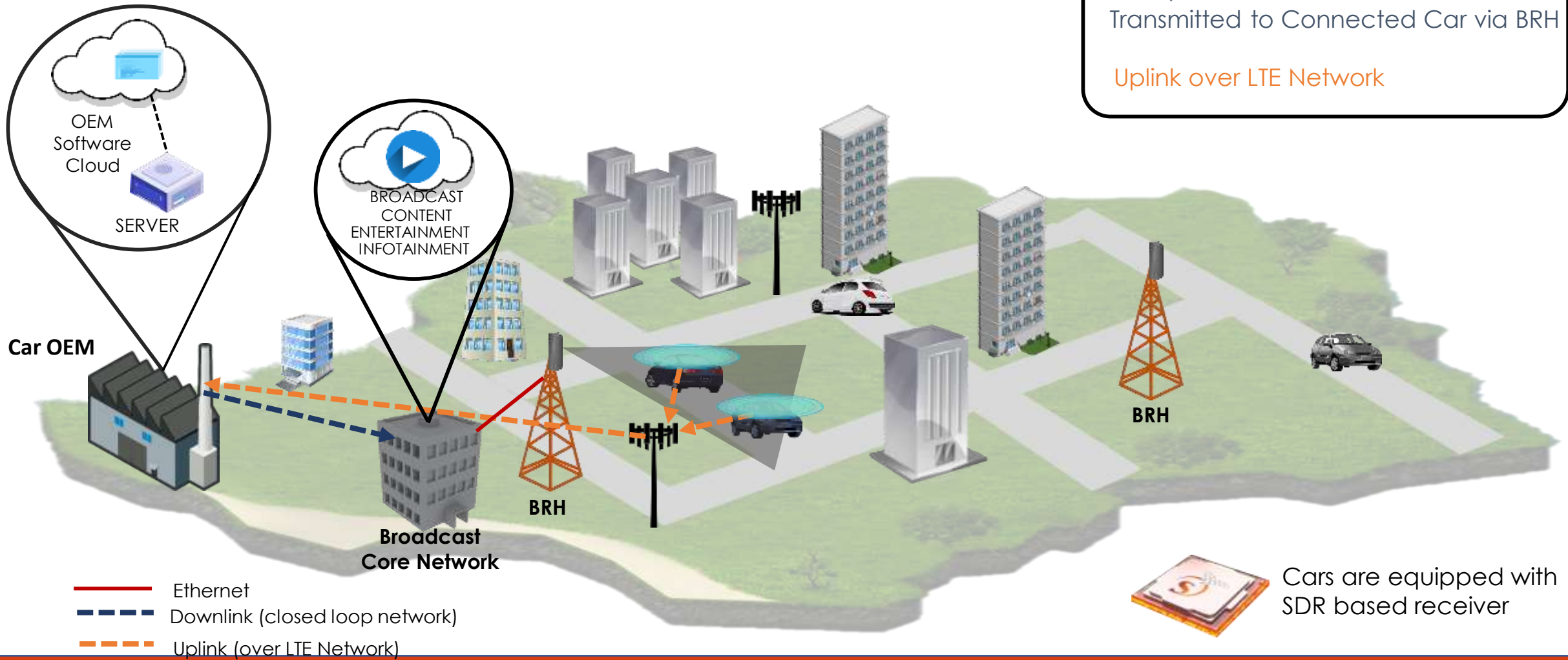




Use Cases: FOTA/SOTA over Broadcast

SOTA/FOTA + Infotainment Content Transmitted to Connected Car via BRH

Uplink over LTE Network





One Way Forward

- Reserving spectrum for D2M
- Retaining spectrum for broadcast – pressure to use for broadband or unlicensed
- Public Broadcaster mission relevance
- Creating a large device ecosystem with a broadcast feature