DAB+ OR MOBILE?

**Access**
Broadcast radio has always been free to access. Access to mobile data requires a mobile operator, paying either on a pay as you go or fixed monthly contract. Data costs vary depending on the subscription level.

**Battery consumption**
Research from the EBU found that the energy consumed by DAB+ on a smartphone in one hour was 6.8J. Comparatively, Spotify used up 59J in the same period of time. Power consumption of other audio apps can be found here.

**Capacity (peak listening time)**
Peak-listening time in the UK sees 15.9 million people listening to the radio at the same time. As radio networks broadcast on a one-to-many approach the number of people listening makes no difference to the service. Mobile network performance depends on proximity to the nearest cell and its capacity. At rush hour busy stations will suffer and it’s often not possible to watch video or stream music.

**Cost to broadcasters**
Research from the EBU found that DAB costs for a national broadcaster are around £1m per annum, and around £88k for a regional broadcaster. The cost to deliver audio streams over IP varies by the broadcaster and the level of traffic. Research from the EBU estimated a national broadcaster could spend up to £9.8/year to deliver its share of 1:30 per day over IP.

**Cost to listener**
Access to broadcast radio is always free to listen. Receivers are now available from £35 or less than £50 for a receiver with slideshow functionality.

**Coverage**
A DAB+ transmitter covers a much wider area compared to mobile cell sites, while also delivering the same quality of audio and image services. Coverage with DAB+ in Band III is much better compared to mobile in 800/900Mhz and therefore fewer transmitters are required. While coverage varies by network and country, radio networks traditionally have a much wider reach compared to mobile.

Based on the average listening time across the EU of 2:29 a day, this would require around 2.2GB of data per month per user. Quality mobile data services require both capacity in a cell and degrades as the user gets further away. For those in applications and mobile is therefore difficult or expensive to receive a good 4G service. While 5G is still to be defined, it will require a much more dense network to deliver the consistently higher data rates promised.

Mobile coverage will start to appear on more trains over the coming years, and a network of small cells may provide in-building coverage comparable to DAB+.

**Future-proof**
DAB+ is the newest version of the DAB standard and allows for more stations and capacity per multiplex.

WorldDAB continues to review and update the standard and work with companies delivering innovative new services over DAB+.

The next generation of mobile is 5G and, while it is still to be fully defined, it is likely to provide higher data rates at a lower latency. However this will require a much more dense network, forcing people closer to cell sites to deliver the best service.

While cellular networks were designed for mobility, some users have experienced problems when listening to audio and being handed-over into a busy cell site. Mobile coverage will have to improve to deliver existing streaming services and this could have an impact on its ability and willingness to deliver the best radio.

Third-party data connections allow listeners to link back to station or advertiser websites. This can be combined with DAB in certain devices, a dedicated app for the LG Stylo 2+ (shown) for interactivity in action.

Mobile connections are two-way, which allows for data collection from the user or combining audio with other services, for example location data.

**Infrastructure cost**
Radio hybrid uses DAB+ audio for IP, images, text and additional services. Devices with an IP connection can also link back to station or advertiser websites. Based on RadioDNS guidelines, using hybrid radio would require around 12NB of data per month, if all listening was over hybrid.

A data connection allows listeners to link back to station or advertiser websites or take part in content services. This can be combined with DAB in certain devices, a dedicated app for the LG Stylo 2+ (shown) for interactivity in action.

Mobile networks have traditionally failed to cope with the extra demand.

**Mobility**
DAB was designed as a mobile technology and is well suited to use at home and on the move.

While cellular networks were designed for mobility, some users have experienced problems when listening to audio and being handed-over into a busy cell site. Mobile coverage will have to improve to deliver existing streaming services and this could have an impact on its ability and willingness to deliver the best radio.

Some operators are looking at eMBMS (LTE broadcast) for emergency warning services. This can be combined with DAB in certain devices, a dedicated app for the LG Stylo 2+ (shown) for interactivity in action.

5G will change the network architecture and localised content and caching will aim to end device power requirements.

**Multimedia**
DAB+ can deliver images and text using slideshow. Slideshow lets broadcasters build closer relationships with listeners, providing them with extra information and bringing the station and shows to life with artwork or even photos from the studio.

3G and 4G carry a wide range of services, from music and video to messaging, social media and location-based services. Data and battery consumption vary by application.

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**Net neutrality**
All services on a multiplex are given equal priority regardless of station or audience size.

Net neutrality is the principle that ISPs should enable access to all content and applications regardless of the source, and without favouring or blocking particular services or websites. Bandwidth-intensive streaming services may put far more strain on the network than expected. Carriers may then charge for access in much the same way that they do for public networks.

Reliability
Radio networks broadcast on a one-to-many approach rather than one-to-one. This means that the number of people makes no difference to the service. Radio is also reliable in emergency situations, with redundancy and battery backups to ensure transmissions continue. It is also more cost effective to deliver this reliability, with far fewer transmission sites compared to the mobile network.

In emergencies and times of crisis, the mobile networks have traditionally failed to cope with the extra demand.

The UK’s working on using public mobile networks for emergency service use, which could improve coverage and reliability for the public. However this would not minimise the problem of overworked cell-site cells.

**Scalability**
National Coverage with DAB+ is very cost effective using GNSS transmissions, provided spectrum is available. It’s possible to deliver around 18 stations on a multiplexer. Adding a new multiplexer requires an additional spectrum and availability varies by country.

Adding capacity is often achieved through network densification with ‘small cells’ used to deliver improved data rates. Adding coverage for a larger area requires setting up a new base station or, for remote areas, small cells can be used.

Some operators are looking at mmWave (ULTRA broadcast) here only is designed for a set area such as a stadium, rather than coverage across a city or region. It would also require extensive investment in the network that mobile operators are currently unwilling to fund.

**Services**
It’s possible to deliver traffic, news and weather information on DAB+ along with other services. Mobile devices can be used to access a wide range of service and applications and mobile devices can also provide other connectivity when required.