WORLD DAB
Digital Audio Broadcasting

DAB+ OR MOBILE?

	DAB+	Mobile streaming
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 59.9J in the same period of time. Power consumption of other audio apps can be found here.
Capacity (peak time listening etc)	Peak-time listening 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 around busy stations the service will be slower 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 $86k 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 that a national broadcaster could spend up to $9.8m/year to deliver its share of daily listening of 1:30 per day over IP.
Cost to listener	Access to broadcast radio is always free to the listener. Receivers are now available from €15 or less than €50 for a receiver with slideshow functionality.	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.
Coverage	A DAB+ transmitter covers a much wider area compared to mobile cell sites, while also delivering the same quality of service out to the edge of coverage. 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.	Quality mobile data service requires both capacity in a cell and degrades as the user gets further away. For those in remote areas it 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, putting people closer to cell sites to deliver the best service.
Gatekeepers	There are no gatekeepers standing between a listener and their favourite radio stations – this is one of the fundamental strengths of radio.	Access to radio over IP requires a subscription or fee to a service provider, who may choose to list stations based on commercial agreements or prioritise traffic for certain services. If 5G becomes a mode/alternative platform for audio streaming the business case may be able move towards a more direct link to the listener with no gatekeeper. The KPIs from the service provider in future may be no different to those offered from a DAB operator today.
Infrastructure cost	Research from the EBU modelled the 'average' costs for a national broadcaster. On DAB this would be around $2m capex plus $1m opex per year - $12milion over ten years. The work also showed that DAB is at least 6 times cheaper than FM.	The same research calculated the cost of data for a broadcaster if they used IP instead of broadcast radio. The costs were $9.8m per year - $98m over ten years.
Interactivity	Hybrid radio uses DAB+ for audio and IP for images, text and additional services. Devices with an IP connection can then also link back to station or advertiser websites. Based on RadioDNS guidelines, using hybrid radio would require around 112MB 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 competitions. This can be combined with DAB in certain devices, a dedicated app for the LG Stylus 2 shows this 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.
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 radio.
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. 5G will change the network architecture and localised content and caching will aim to reduce end device power requirements.
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 products or websites. This varies by country and there is no guarantee it won't change in the future.
Reliability	Radio networks broadcast on a one-to-many approach rather than one-to-one. This means that the number of people listening 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 is 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 overcrowded cell sites.
Scalability	National Coverage with DAB+ is very cost effective using SFN transmissions, provided spectrum is available. It's possible to deliver around 18 stations on a multiplex. Adding a new multiplex requires additional spectrum and availability varies by country. Expanding requires new transmitter sites, which can be shared with existing towers or set up as new.	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 basestation or, for remote areas, small cells can be used. Some operators are looking at eMBMS (LTE broadcast) however this is only 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 over DAB+ to listeners or drivers. In tunnels, emergency warnings can be delivered to all cars.	Mobile data can be used to access a wide range of service and applications and mobile devices can also use GPS and other connectivity when required.