

An aerial photograph of the London skyline at sunset, featuring prominent skyscrapers like The Shard and The Gherkin. A large red graphic overlay is positioned in the top-left corner, containing the Arqiva logo and event information. The background shows a dense urban landscape with various buildings and a river in the distance.

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DAB v FM v IP

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Introduction 2

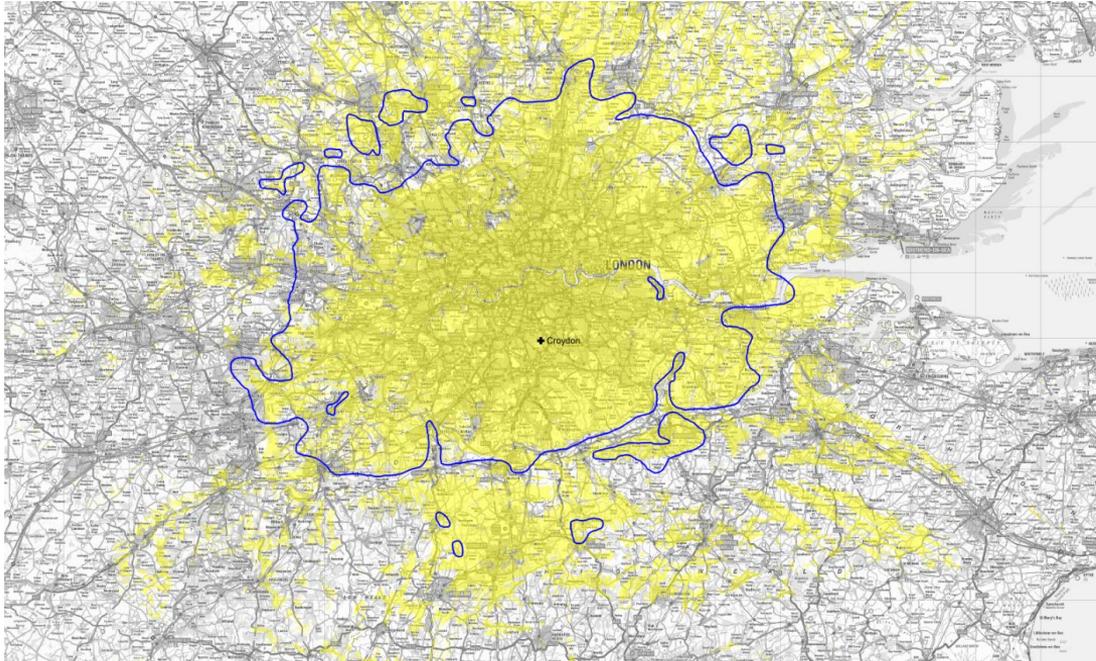
- ▶ For the Operating Costs for DAB, a Network Operator has built the network and is leasing the infrastructure to a Multiplex Operator at a per annum price on a multi year contract, who is then sub leasing the capacity to Broadcasters, the costs in the model are an estimate of the sub lease costs
- ▶ Assume that 5% of the population, of the service area, listen to this service
- ▶ People listen to 2.2 radio station typically and to 21 hours per week
- ▶ Each of the 5% of listeners, listen to 10 hours per week of the service
- ▶ Assume that all listeners over IP have wide area coverage on 4G and perfect Wi-Fi at home
- ▶ For comparison assume £1 = 1 Euro

Introduction 1

- ▶ Look at the operating costs of three technologies for delivering of a live radio service to a multi million listener audience
- ▶ The three technologies – FM, DAB and IP streaming to devices
- ▶ The target service area is London
- ▶ Assume all listeners are on IP, DAB or FM
- ▶ IP steaming is anyone listening at home over broadband/WiFi or on their mobile phone over a 3G/4G mobile phone network
- ▶ For the Operating Costs for FM, a Network Operator has built the network and is leasing the infrastructure to the Broadcaster at a per annum price on a multi year contract

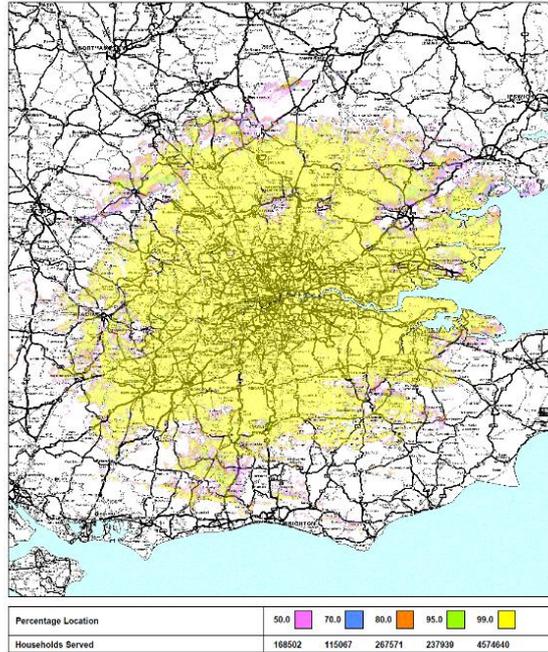
FM Service

- ▶ Single transmitter serving the London area
- ▶ Serves 2.5m people 15+



DAB Service

- ▶ Network of 8 Transmitters in a single frequency DAB network (SFN)
- ▶ There are 25 DAB+ services carried on the DAB multiplex
- ▶ Serving 4.6m people 15+



FM cost per hour listened

FM	
Rental of FM transmitter PA	£60,000
Studio to transmitter circuit costs PA	£8,000
Total costs	£68,000
People Served	2.5m
5% people reached	125,000
10 hours per week per person, total hours per week	1,250,000
Total hours per year	65,000,000
Cost per hour	£0.00105

DAB cost per hour

DAB	
Mux and Transmission costs for an 8 site DAB network (Mux Operator charge to Broadcasters)	£800,000
Transmitter network rental for single service PA, 25 DAB+ sites	£32,000
Studio to multiplexer circuit costs PA	£8,000
Total costs	£40,000
People Served	4.6m
5% people reached	230,000
10 hours per week per person, total hours per week	2,300,000
Total hours per year	119,600,000
Cost per hour	£0.00033

IP streaming

IP delivered audio	
Streaming server in studio (origin server) PA	£5,000
Studio to CDN connectivity PA	£8,000
Audio bit rate	32 k bits/s
With IP packetization	40 kbits/s
Bytes for 1 hour of audio	18,000,000
Converted to Gbytes shifted	0.01800
CDN cost to deliver one hour of radio @ £0.02 per Gbyte shifted	£0.00036
Connection and Origin per hour shared across total hours listened (DAB)	£0.00011
Cost per hour	£0.00047

In the CDN market depending on volumes £0.02 to £0.08 are typical GB shifted pricing

Comparison Scenario 1, £0.02 per Gbyte shifted, 5% reach

	FM	DAB	IP	
FM		313%	223%	DAB 1/3 of the price of FM
DAB	32%		71%	
IP	45%	140%		IP 1.4 x greater cost than DAB at £0.02 per GB shifted

Comparison Scenario 2, £0.04 Gbyte shifted, 5% reach

	FM	DAB	IP	
FM		313%	126%	DAB 1/3 of the price of FM
DAB	32%		40%	
IP	79%	248%		IP 2.5 x greater cost than DAB at £0.04 per GB shifted

Comparison Scenario 3, £0.04 Gbyte shifted, 7% reach

	FM	DAB	IP	
FM		313%	94%	DAB 1/3 of the price of FM
DAB	32%		30%	FM and IP equal in cost
IP	107%	334%		IP 3.3 x greater cost than DAB at £0.04 per GB shifted

An aerial photograph of the London skyline at sunset, featuring prominent skyscrapers like The Shard and The Gherkin. A large red triangular overlay is positioned in the upper left, containing the 'arqiva' logo and the text 'Any Questions?'. To the left of the red overlay, there are vibrant, multi-colored light trails in shades of blue, purple, orange, and red, suggesting motion or data flow.

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Any Questions?