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Agenda

1. UK approach to U6
2. Wider discussion on 6G considerations
3. Views on sharing

Ofcom objectives for the 6 GHz band

Context	Our Aims
<ul style="list-style-type: none">• Consumers want more connectivity• Both Wi-Fi and mobile articulate credible but uncertain demand• Different timescales• Different power levels• Different authorisation approaches• Incumbent users• Levels of BS densification and spectrum deployment• Fibre roll out in the UK• Concerns about outside in provision• Critical incumbent links	<ol style="list-style-type: none">1. To enable both Wi-Fi and Mobile to access the band.<ul style="list-style-type: none">• Allow the market to decide how both can evolve• Recognise there is value in a shared approach• Make that sharing as granular (smart) as possible• Balance investment certainty2. Enable innovation of new services and grow existing offerings.3. Realise benefits of use as soon as possible<ul style="list-style-type: none">• Early access for some Wi-Fi uses (available now)• Facilitate mobile in 2030+ when its standards and technologies are ready 2030+).4. Limits of outdoor in.

Our spectrum management approach is to enable spectrum access where and when it is needed to support UK consumers, businesses and innovation.

What UK has decided – Wi-Fi

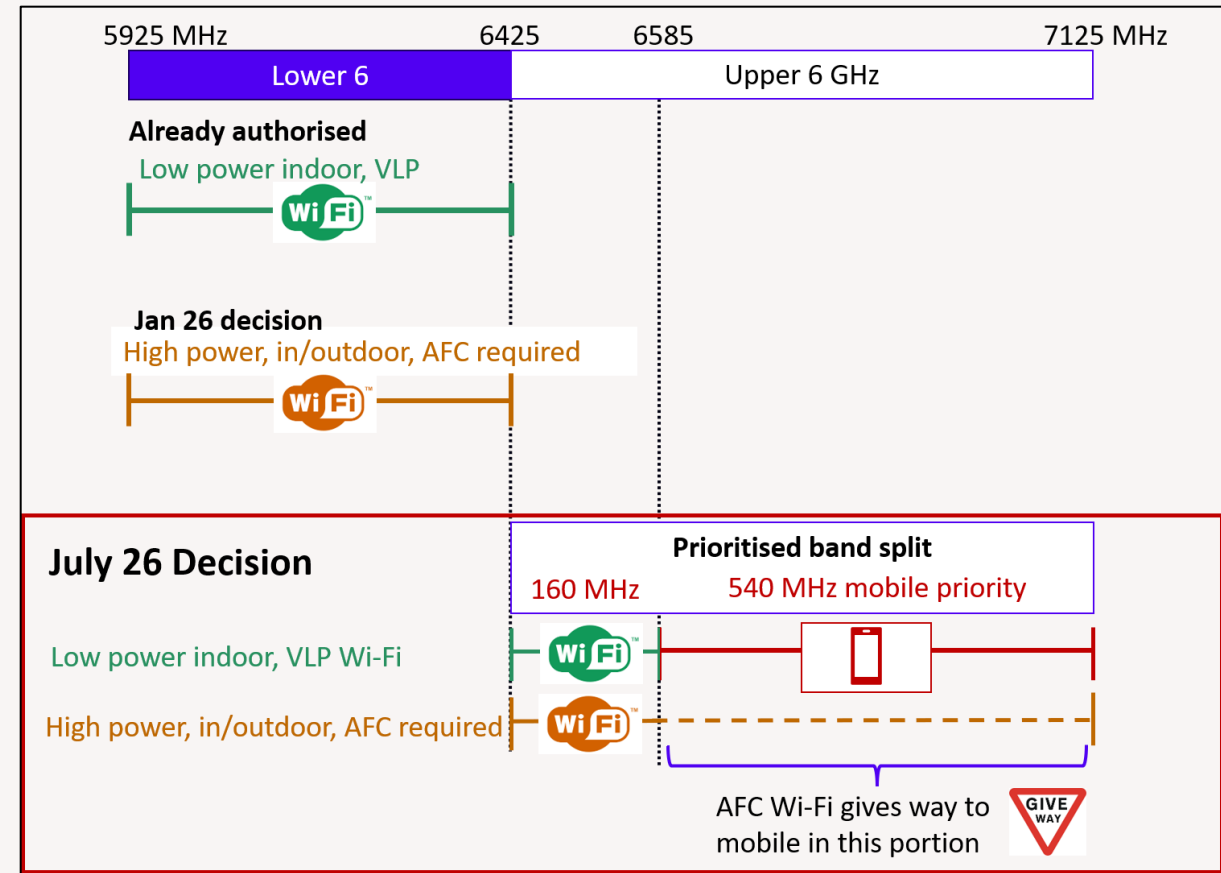
The future is Sharing –
We will enable **Mobile** and **Wi-Fi** in the band under a shared approach

Additional spectrum for Licence Exempt Wi-Fi

- 160 MHz added to L6 doubles capacity under common enterprise and stadium channel plans (6425–6585 MHz)
- Same conditions as L6 (LPI, VLP and higher power)
- AFC controlled Wi-Fi access to 540 MHz Mobile Priority part - response to consultation feedback (6585–7125 MHz) (LP)

Outdoor and higher power use in L6 with AFC – addresses demand for outdoor venues

Wi-Fi hardware aligned with US/CA models to ensure there is an ecosystem

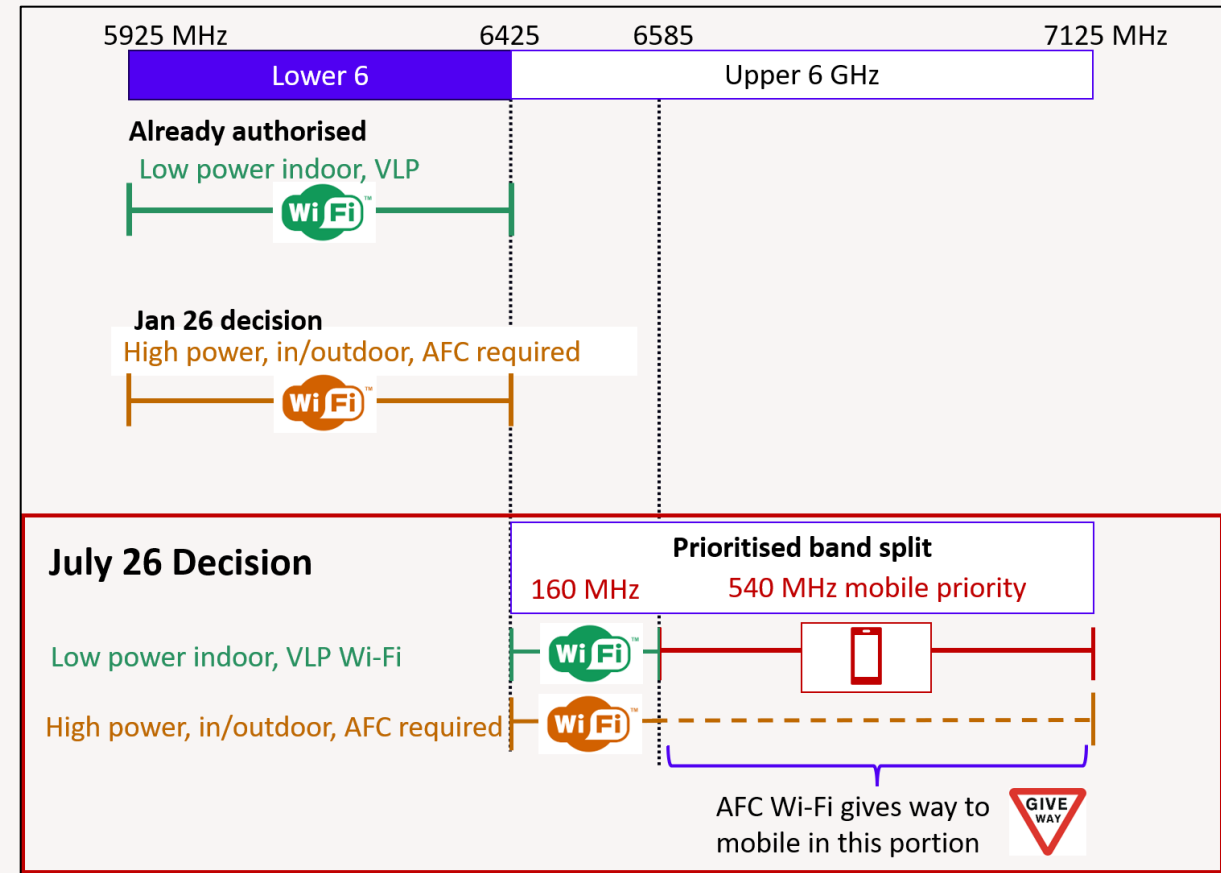


What UK has decided – Mobile

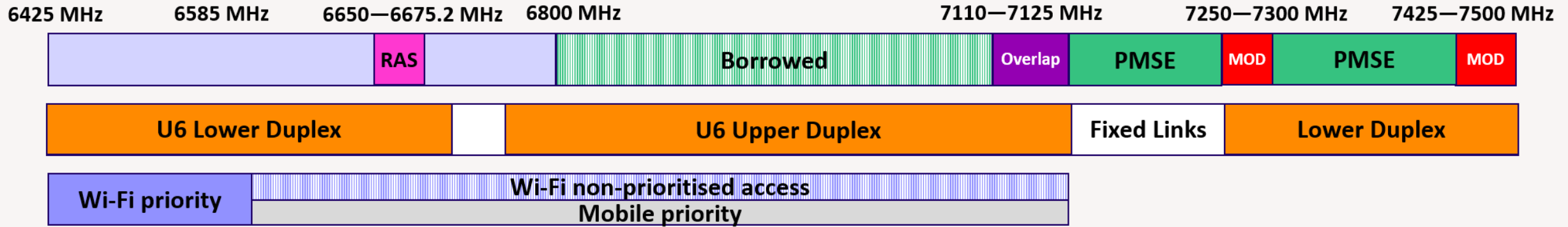
Rollout will not be uniform – driven by capacity needs and technology needs

At least 540 MHz for Mobile

- 540 MHz+ works in our 3-player market
- 7125-7250 MHz is emerging in CEPT
 - still need to consider UK PMSE video
- Block licences for high density areas – yet to decide what happens outside those
- Proposed 88 high density areas in April covering UK towns and cities – not yet concluded analysis of responses



Managing Incumbents



Wi-Fi – Europe is also clear that protecting Wi-Fi below 6425 MHz is essential.

Fixed Links – proposed in April to clear ~200 fixed links in and around high density areas in favour of mobile

- Only where we expect mobile deployments – non-use by mobile would lead to inefficient use
- 5 years notice needed
- Some links support critical national infrastructure and may need to be protected

Radio Astronomy – will protect 6 UK sites for Wi-Fi and proposed same for mobile

- Some restrictions in UK across ~25 MHz

PMSE – proposed to lose access to 15 MHz for wireless cameras

- Demand at most events easily met – a few peak ones may need to “borrow” spectrum
- Sector currently under review in UK

Alignment with Other Countries

Aligned Wi-Fi hardware and AFC as closely as possible with US and Canada to minimise rework & maximise ecosystem in UK

Topic	Ofcom decisions	Europe (RSPG)
Upper 540 MHz 6585–7125	Prioritise for mobile and allow Wi-Fi access under AFC-controlled.	Prioritise for mobile. Enable Wi-Fi only on a non-prioritised basis once sharing mechanisms are identified. Aligned
Lower 160 MHz 6425–6585	Added to Lower 6 GHz for Wi-Fi	No use for now; future RLAN use depends on the WRC-27 outcome. Different
Upper extension 7125–7250	UK PMSE video impacts still under consideration.	Emerging as possible in CEPT Open
Mobile deployment	Demand-led rollout: block licences in high-density areas. Outside those areas to be finalised.	Member States may withhold mobile authorisation where national demand is insufficient. Aligned

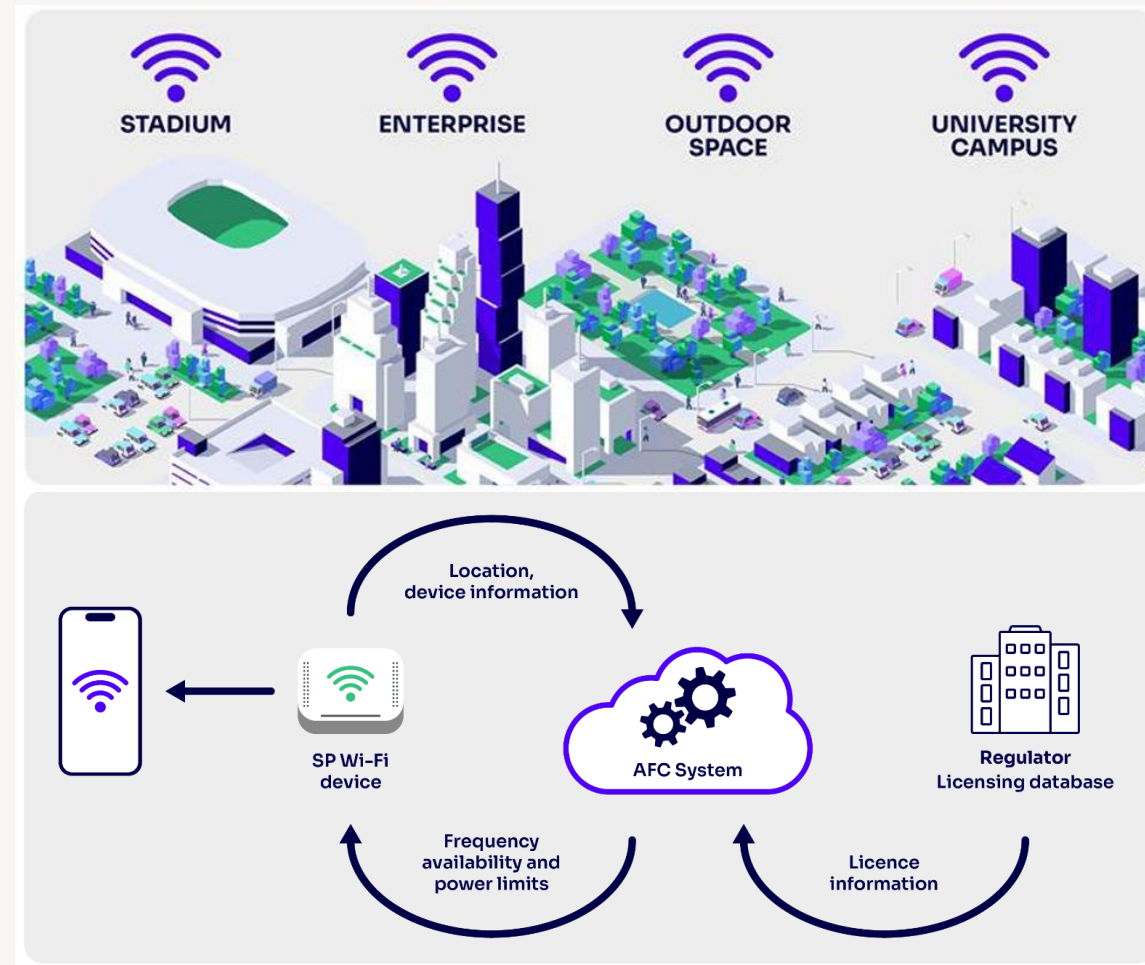
Moving ahead of Europe

1. Some risk as European harmonisation is important for both Wi-Fi and mobile - We aim to line up if possible.
2. Good opportunity to influence the European debate and avoid deadlock.
3. Certainty about spectrum access enables manufacturers and operators to invest in new devices.
4. Realises benefits of Wi-Fi use sooner and avoids inefficient use of the spectrum before European harmonisation.

AFC enables smarter sharing of 6 GHz band

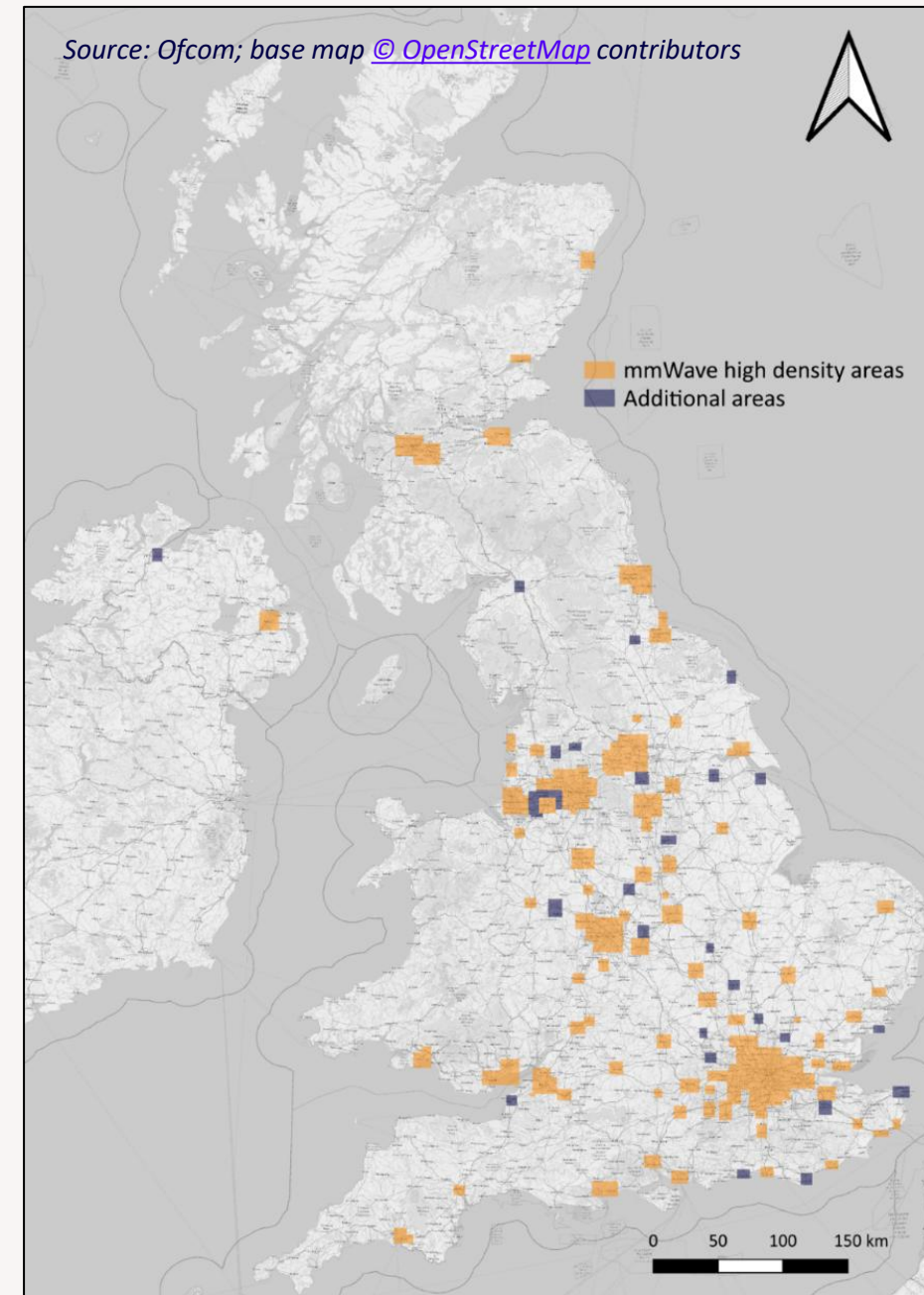
AFC is an automated coordination system that calculates spectrum availability for a device based on its reported location and nearby protected users

- Enables outdoor and higher power use in the 6 GHz band whilst protecting Fixed Links and Radio Astronomy
- Fully automated coordination
 - P.452 + UK terrain/clutter/Building Loss to calculate Wi-Fi channel / power combos
 - Or exclusion zones by location and time
- Similar approach to SAS in CBRS
- Extend to control Wi-Fi pullback as mobile deploys in U6 mobile priority areas



Proposed High Density Areas

- Focus mobile deployment into 88 high density areas (towns and cities)
 - Proposed based on capacity need
 - Respondents flagged technology needs too
- We are still considering approaches outside of high-density areas

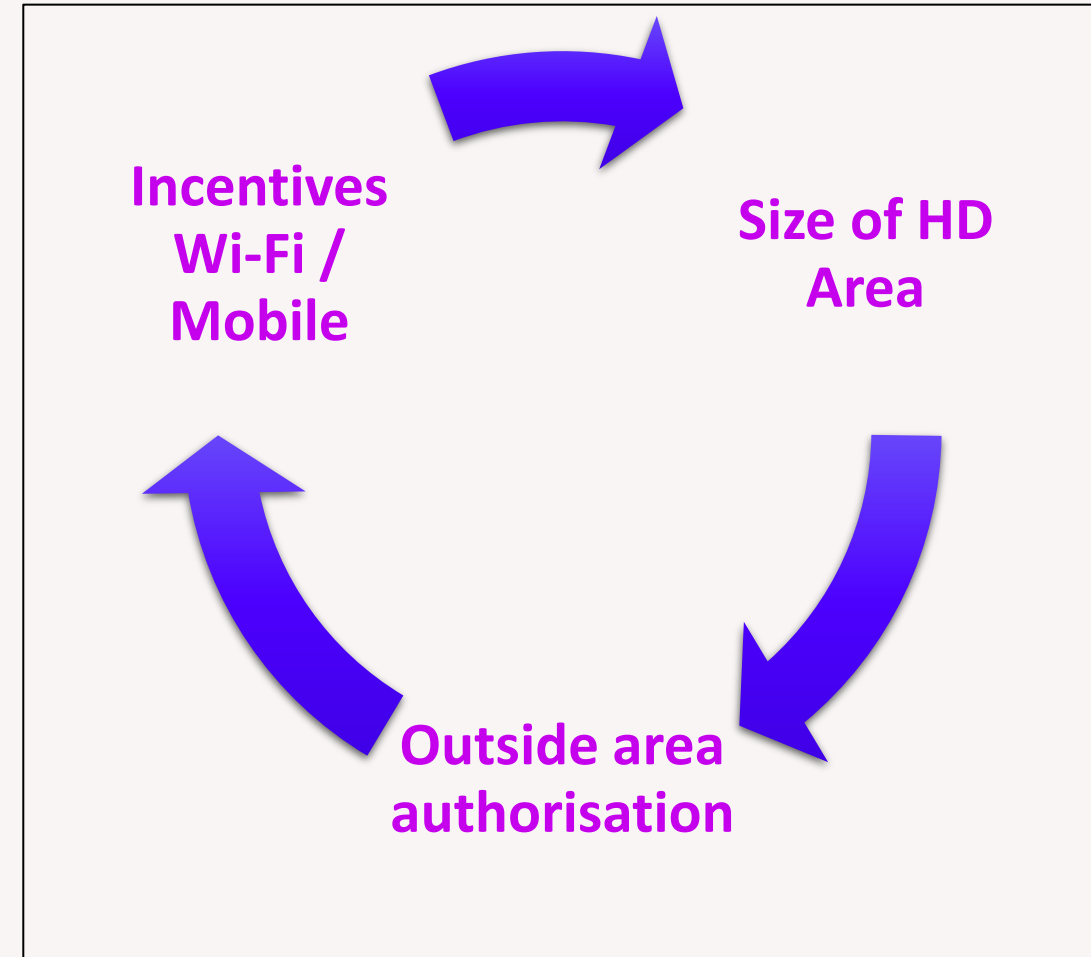


High Density Areas

Stakeholders responded on HD areas saying

- Deployments greater than areas proposed
- Request we re-evaluated if mobile deployments don't happen

Need to trade-off various aspects



Aspects still to propose



The authorisation
approach outside the
HD areas



The award mechanisms
and any competition
considerations



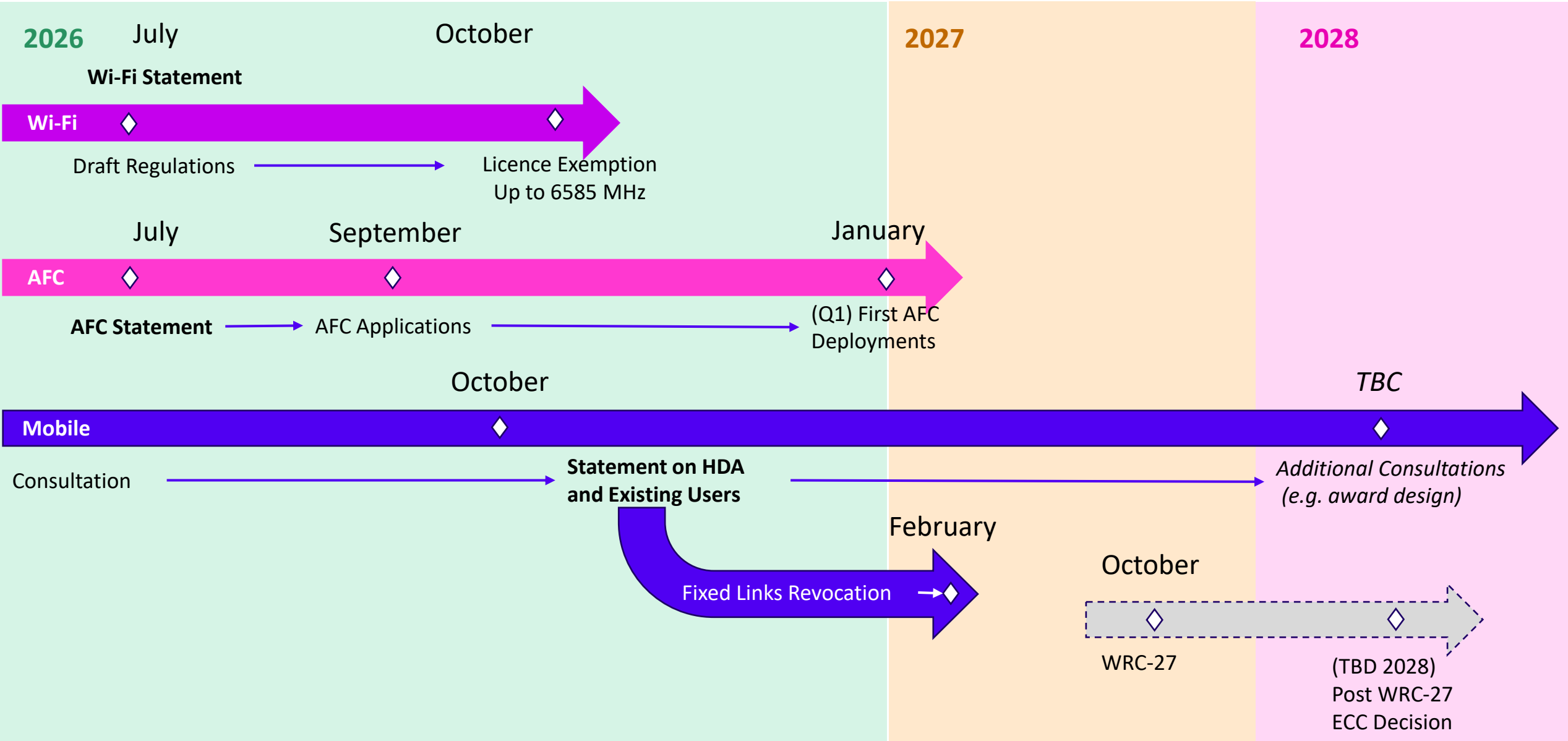
Detailed rules for AFC
to clear Wi-Fi as mobile
deploys



More granular sharing
with future sensing-
based sharing



Timeline



6G in the UK



What is currently driving mobile (6G) in the UK?

- Mobile connectivity in the UK needs to improve
 - Rural outdoor
 - Urban outdoor
 - Shared indoor spaces
 - Trains
- Need for greater resilience and reliability
- Market context – high and growing fiber penetration, strong geographic coverage, growing satellite use for coverage gaps
- Responding to demand uncertainty – people, AI, robots, sensing...
- Technology leadership?



When?

- Achieving 5G ROI
- Device refresh & adoption rates
- Use Cases and Places
- Opportunities: Better integration and offload, NTN coverage, new approaches to indoors
- Risks: AI changes, sensing changes, business case



6G in the UK

We expect 6G to be evolution not revolution

Spectrum Bands

- **Refarming** a significant part of answer
- CEPT focus on **6585 – 7250 MHz**
 - Above that significant military use
 - UK challenges around Video PMSE
- Unsure if further capacity spectrum needed in UK – beyond planned U6
- Likely option for **600 MHz** in UK (2034)
 - Gov consulting on Future of DTT
 - Sharing / accommodating PMSE

Other Considerations

1. Consumers care about improved connectivity not 6G
2. Sharing by default
 - U6 with Wi-Fi and
 - 600MHz with PMSE
3. NTN seamless integration in remote areas
4. How to serve indoor users with indoor infrastructure

More thoughts on sharing



Sharing today

Challenges / Needs

- Benefits of harmonisation
- Certainty of access
- Certainty for investment vs technology risk
- Regulator and industry acceptance

Reasons for Optimism

- Licence exempt technologies
 - WiFi and its evolutions (MLO, hole punching)
 - UWB
 - Others
- IMT MIMO
- U6 and AFC
- LEO
- PMSE sharing with MoD (2300)
- Shared Access

Goal: Increase spectrum capacity through density and efficiency of use



The future of sharing / increasing spectrum capacity

- Industry and regulator toolkit
 - Interference tolerance
 - Technical optimisation vs technology neutrality
 - Segmentation of bands (trade off)
 - Coordination
 - Lower power
 - Evolve AFC – additional services, licenced access
 - Efficiency of spectrum use as a consideration
- Spectrum access considerations
 - Densification and lower powers
 - Ability to share
 - Ability to use efficiently (receivers, antennas, modulation)

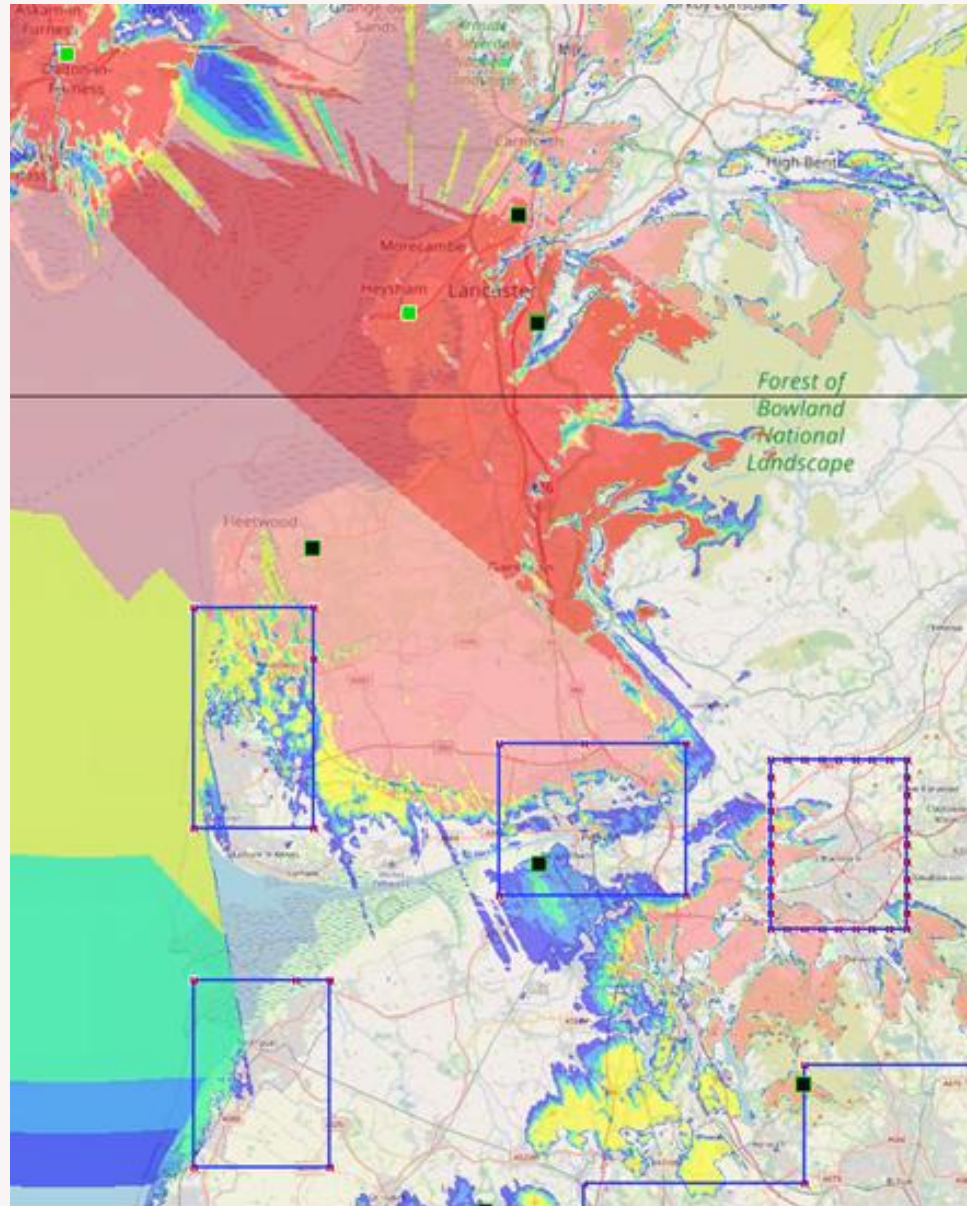
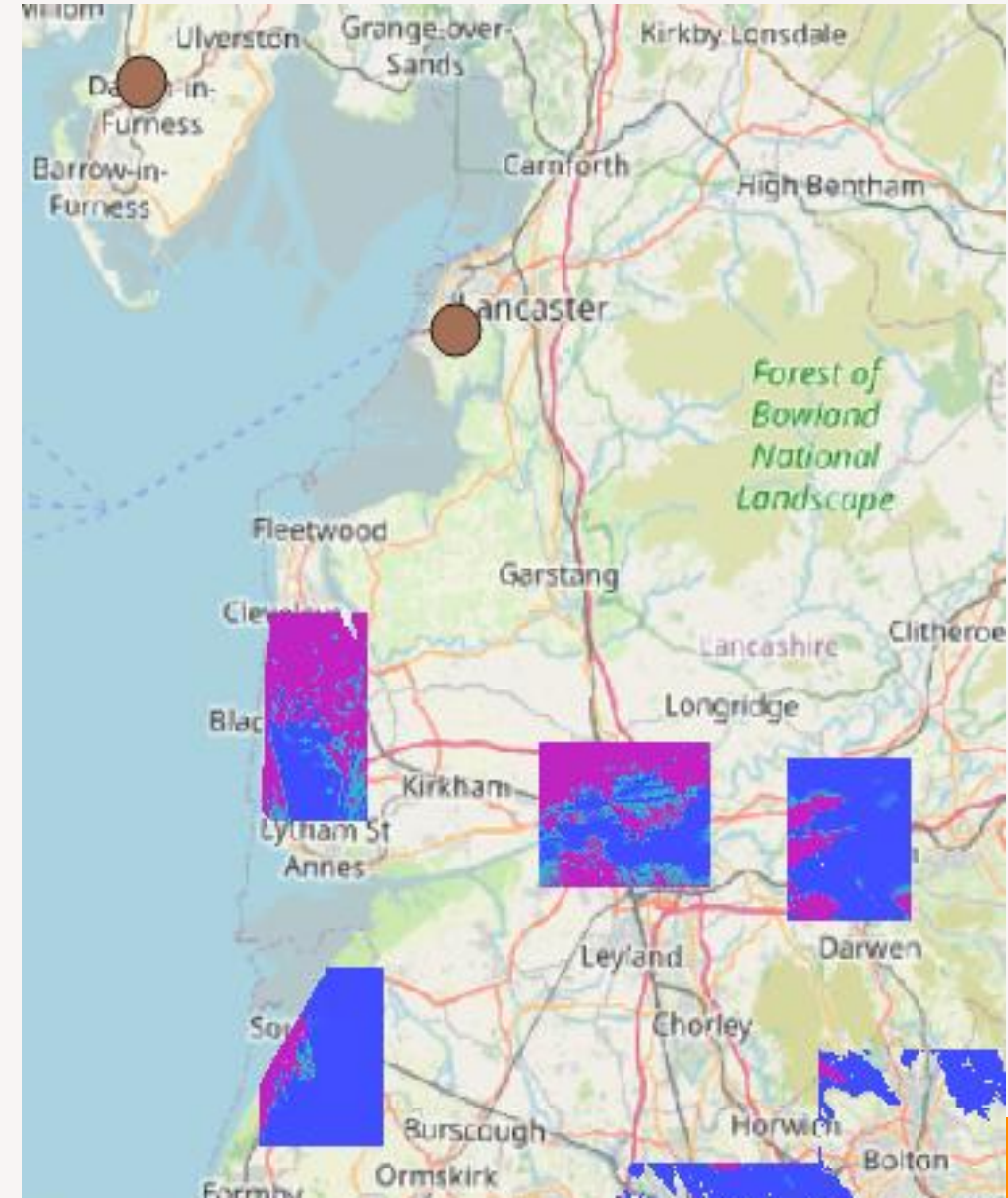


Thank You

Annex



Example fixed links



What will 6G be?

- Systems integration – TN, NTN, Wi-Fi, Fibre
- RF Resilient
- Flexible and scalable ‘toolkit’
- Spectrum sharing & spectrum efficiency
- Sustainable TCO



RSPG Opinion – outcome

1. **Recommendation to designate 6585 – 7125 MHz as prioritised for mobile**
2. **Expectation of enabling Wi-Fi on non-prioritised basis** in this spectrum once mechanisms are identified
3. **Recommendation to leave 6425 – 6585 MHz as a guard band** between IMT and RLAN – pending outcome of WRC-27
4. RSPG expects to designate **lower 160 MHz for RLAN, only if WRC-27 identifies 7125 – 7250 MHz for high power mobile** otherwise it will be for mobile (likely less any guard band to protect L6 Wi-Fi).
5. **Member States may not authorise any use** in the lower 160 MHz for now
6. **Provision for MS to not authorise mobile** if there isn't sufficient demand in their nation for mobile

