Highly likely that sharing will become the primary way of accessing additional spectrum

- Upper 6GHz – sharing with existing services and potentially between competing new services

- mmWave 5G auctions – sharing enables use by non-MNOs

- Useful new spectrum for mobile (below 24GHz) will need to be shared with incumbents

- Indoors – sharing with other indoors users

- Verticals – sharing with other verticals and more broadly

- Governmental users unlikely to give spectrum back so will want to share

- (More LEOs require more sharing)

Databases are always a better way to implement sharing

- Can refine rules over time
- Can use feedback to overcome excessive caution
- Provides important spectrum management information
- Facilitates varying levels of certainty/protection
- AI??

Can deliver the "perfect" sharing solution where the interference caused is just below the threshold at which it is problematic

One database fits all

- Common across all bands/solutions

  o Devices send a request to a known location

  o Database sends response based on **rules**

  o Links to existing regulatory systems the same for all bands

- Rules vary across bands

- Avoid sensing solutions – these are rarely efficient or economic

A simple cost-benefit analysis

- Implementation costs borne by regulator

  o Generic database - £1m-£5m

  o Specific instances - £1m

- Costs borne by users

  o £5/user for 1m-10m users = £5m-50m

- Spectrum is worth about 3-4% of GDP

  o In UK this is about £100bn

  o If sharing leads to a 1% improvement this is £1bn

- Almost all costs incurred as benefits are realised

Moving to a world of sharing

- It's simple - implement a generic database then develop specific instances
- Why is it proving so hard?
  - Stakeholders push back
  - Some barriers – integration to existing systems such as CRM
  - Regulators often risk-averse
  - ITU structure/nomenclature not set up for this form of sharing
  - CBRS seen as an exemplar rather than an outlier
  - Evidence of need cannot emerge until there is a good solution
- Way ahead
  - A pioneering regulator leads the way, or
  - Joint regulators' working group to specify common approach and solution across multiple countries and to the ITU