NTIA Consultation of Development of a National Strategy

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Radio spectrum is a scarce and valuable resource that contributes substantially to a nation's wealth. It has long been understood that to maximise its value, spectrum needs to "flow" from less economically efficient uses to more efficient uses. Over time, this has frequently happened, for example with broadcasting spectrum moving to cellular usage.

While spectrum flow has generally occurred tolerably well between commercial users, a flow of spectrum between commercial and government users has proven much more problematic. Such a flow is generally assumed to be from government to commercial use, but could equally be in the opposite direction, and may involve spectrum access through techniques such as sharing as much as it involves outright transfer of exclusive usage. The key underlying difficulty is that incentives in commercial and government uses are different. Commercial users can generally be incentivised by market mechanisms allowing the profit motive to drive behaviours. But government users are relatively price insensitive and tend to focus on delivering outcomes and avoiding risks. A single incentive is unlikely to work for both, but separate incentives tend to exacerbate the division between the two user groups rather than encourage flow between them. A further challenge is the confidential nature of much government use, making outside assessment difficult.

Many approaches to delivering spectrum flow have been tried. Pricing of government users generally fails since it creates a money-go-round where the department pays the Treasury for the spectrum then requests a bigger budget from the Treasury in compensation. Requiring government users to release specific amounts, such as 500MHz by 2027 tends to result in low-quality spectrum being released which is often of little commercial use. MoUs between departments, as recently concluded between the FCC and NTIA, appear to herald a new dawn but in practice are unlikely to change behaviours which are deep seated, and the MoU is soon forgotten as old habits re-emerge. Oversight boards, or single managers across all spectrum often fails because government departments learn to obfuscate their usage to retain access. To date there are no clear examples around the world of successful arrangements that optimise the flow of spectrum between commercial and government users.

Technically this is not a difficult problem. It is relatively easy to assess the value of spectrum in different uses, the likely future demand and to model the best outcome. Behaviourally it is a very difficult problem. Understandably, those in government departments prefer to retain spectrum even if there is no immediate need and understand that they are more likely to get promoted through vigorously defending usage than through donating spectrum which might subsequently be needed. The route to successful flow is to change the behaviours rather than the modes of operation. How could this be done?

Both sides have got to want to do the right thing – optimise spectrum use for the benefit of the country - otherwise it will not happen. This means that the individuals involved must have their primary incentive focused towards spectrum efficiency, and not to the goals of their department. This could be achieved by:

- Rotating key staff across the commercial (FCC) and governmental (NTIA) as well as other stakeholders so they do not go native.

- Providing appropriate training and a career structure predicated on good spectrum management decisions, not promotion within governmental departments.
- Forming a strong collegiate bond across those involved in aiding spectrum flow.
- Establishing a common framework for assessing a spectrum band that all stakeholders can agree to.

A fair and independent arbitration is probably needed to help in those areas where agreement is challenging, staffed by a rotating panel of experts selected on the basis of their independence and sound decision making.

While the past has focused on extracting spectrum from government users, the future may be different. Data growth rates in fixed and mobile networks are slowing as are the returns delivered by mobile operators, such that it may not be more spectrum that is needed so much as the right spectrum in bands where rates of return are highest. Conversely, military operations are requiring ever-more high-tech weaponry that typically has needs for more radio spectrum although needs that can often be met with commercial solutions and may only required in rural areas. The ability to share between commercial and government use is growing, as evidenced by CBRS, and is likely to become the primary mechanism of flow. Future interactions between government and commercial users are likely to be different than the past and may work better when both parties perceive that they can gain more of what they need.

Previous approaches to optimising the use of spectrum across all users have been far from optimal. It is time to try something new.