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Repurposing Spectrum for Mobile Broadband Is Great, But Interference Issues Must Be Resolved First

BY DR. GEORGE S. FORD

As consumers and businesses demand more and more from their wireless devices, the companies that provide wireless services and the associated equipment will require increasing amounts of radio spectrum to meet those needs. As nearly all usable radio spectrum has been allocated to particular uses and assigned to particular users, shifting spectrum toward modern uses almost certainly requires taking from one use or user to give to other uses and users.

Such spectrum repurposing need not be contentious and is often successful. The recent \$41 billion AWS-3 spectrum auction, the largest-grossing auction in history, involved spectrum repurposed from Federal government incumbents to mobile wireless providers. Similarly, Dish Network bet on 40 MHz of satellite spectrum acquired from a bankruptcy court, and subsequently received FCC permission to repurpose this spectrum for terrestrial wireless broadband use.

Yet, success is not guaranteed. Spectrum, like land, is typically “zoned” to particular uses that play nice together. For instance, a relatively low-powered satellite signal might be drowned in a sea of high-powered, land-based cellular signals. Like small and big dogs being kept separate at a dog park, different types of radio signals are managed to mitigate conflict using technical means such as power limitations and boundaries between interfering frequencies or assigning users and uses varying degrees of priority. Before one can reassign satellite spectrum to terrestrial wireless broadband use, therefore, one must seek permission from the FCC: terrestrial services are prone to interfering with satellite signals, so an approval requires a demonstration that interference with others is not a problem.

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No one needs to look further than the case of Ligado Networks to see the importance of resolving interference disputes to the task of spectrum repurposing.

Since 2010, Ligado (formerly LightSquared) has sought to repurpose 40 MHz of Mobile Satellite Service (MSS) spectrum for terrestrial mobile broadband use by exploiting a wrinkle in the FCC rules. Specifically, Ligado is seeking permission to add an “Ancillary Terrestrial Component” (ATC) to its satellite licenses, thereby permitting it to operate a terrestrial service to supplement and support its primary satellite service.

In Ligado’s case, however, its proposed spectrum repurposing is far from “ancillary”; it affects almost its entire MSS spectrum holding, and Ligado wants the right to use the spectrum only for terrestrial use (removing any notion at all that the spectrum is ancillary to the primary satellite service). While such a reclassification would bring much-needed spectrum to mobile wireless carriers in the secondary market (as well as provide a generous windfall for Ligado’s investors), under the Commission’s existing ATC rules, if harmful interference is caused to other services by an ATC operation, then Ligado must resolve any such interference.

Unfortunately for Ligado, interference is its nemesis.

Portions of Ligado’s spectrum sits next to spectrum used for GPS systems. Private and publicly-funded studies demonstrated significant interference problems, resulting in a 2011 FCC decision to block the earlier plans of Ligado, sending its predecessor into bankruptcy. Subsequently, Ligado has granted some concessions to several larger GPS players, but numerous objections from the GPS and aviation communities, among others, remain. Interference studies continue to show significant interference problems resulting from Ligado’s current proposal.

Ligado’s interference problems do not end with GPS. Another portion of Ligado’s spectrum abuts spectrum licensed by Iridium Communications, one of very few successful and growing satellite service providers. Iridium, offering both commercial services and mission-critical military services, is a significant player in satellite communications, recently spending \$3 billion to upgrade its satellite network. Iridium has offered studies demonstrating significant out-of-band interference to its services and, unsurprisingly, opposes Ligado’s current plan.

To add to the misery, Ligado wants to share spectrum with the National Oceanic and Atmospheric Administration, but those who depend on critical data from NOAA satellites want no part of it.

The incumbents in and around Ligado's spectrum, which reach far beyond the GPS industry, are critical to Ligado's success or failure. While there is much finger pointing at the FCC for Ligado's woes, this is mostly blame shifting.

For instance, a recent op-ed by economist Tom Hazlett suggested that the Ligado dispute "emanate[s] from overprotecting old services at the expense of the new" and that Ligado will "deliver vastly improved mobile broadband at little risk to existing radios." Providing more broadband for consumers is great, and thankfully others have bid billions in recent auctions for spectrum allocated to mobile broadband to do just that. And if Ligado can repurpose its spectrum while holding incumbents harmless, then good for them. They will have served both the American consumer and their investors well. But Ligado's neighbors—many of whom have invested billions in infrastructure to provide service to their customers—have the right to continue operating free from harmful interference, no matter how much Ligado's investors stand to gain from the FCC reclassifying this spectrum with a stroke of a pen. The "public interest" is not defined by Ligado's investors alone.

The issue is really quite simple. Under existing rules, Ligado is required to deal with incumbents to settle interference disputes. And, Ligado must deal with all of them, not a select few. Ligado knows how to strike deals when the economics and engineering effectively align. See, for example, its deal with Inmarsat, resulting in Ligado paying hundreds of millions to Inmarsat in exchange for the company rearranging its use of L-band spectrum over North America to facilitate Ligado's terrestrial network plans.

Economics tells us that if there is an overall value to be created, then there is some way, generally speaking, that the relevant parties can come to terms so that that additional value can be realized. Agreements may include long-term contracts, security bonds, financing of network redesign, and so forth. Ligado has struck some of these deals, but the company can and must come to terms with all the incumbents affected by its business plan, as the FCC's rules require.

Rather than reaching consensus, it appears that Ligado sees its business model as viable only if the FCC grants it permission to do something that causes greater harm to others than Ligado can afford. It's not difficult to say "no" to such a plan.

Boom or bust, Ligado is the master of its own destiny.