



Response to Issues Paper

for

Competition in Evolving Communications Markets Issue Paper

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Introduction

Rivada Networks is proud to present this response to the issues paper released by the Australian Competition and Consumer Commission in September of 2016.

Rivada Networks is a leading designer, integrator and operator of wireless, interoperable Public Safety communications networks. We provide advanced communications solutions to the Public Safety community. The Rivada offering is focused on delivering 4G voice, video and data through the latest in LTE infrastructure, delivering state of the art capabilities whilst meeting rapidly increasing demand for wireless broadband capacity.

In August of 2016, Rivada Networks was awarded by the State of New Hampshire the first ever contract to build out a dedicated public safety broadband network in the United States. Rivada has been deeply engaged in the US “FirstNet” project from day one, which is intended to produce the world’s first fully dedicated public safety LTE network, and is considered amongst the frontrunners to be awarded the nationwide contract to build that Network when the contract is awarded in November.

Rivada is also currently bidding to build out Mexico’s “Red Compartida” (Red Shared) network, which will be the world’s first dedicated wholesale network, and is designed to facilitate increased competition and innovation in the mobile sector in Mexico.

Rivada Networks is a market leader in the provision of interoperable communications networks. It currently provides advanced communications solutions to the Public Safety community, as well as communications solutions to first responders in the aftermath of natural and man-made disasters, and terrorist threats.

Rivada Networks' customers include a diverse range of federal, state, and local agencies in the United States, including U.S. Northern Command, the Department of Homeland Security, the Federal Emergency Management Agency, and the National Guard Bureau. Rivada Networks has provided communications solutions to almost every major disaster and civil emergency in the United States of America since 9/11. The expertise gathered during these experiences led to the development of the technology and solutions that are presented in our response to this consultation.

Issues arising in the paper

In this response, Rivada does not intend to address all the issues raised in the issues paper. Instead, we propose to offer a “big picture” response that, we hope, encompasses fully the vision which we believe the Australian Government should embrace.

The core proposal that Rivada advocates is the allocation of dedicated spectrum for Australian Public Safety, with the spectrum also being made available (while not in use by public safety) on a wholesale marketplace. Our solution provides Australia with a reliable, fully interoperable, and cost-effective alternative to building expensive dedicated infrastructure for Public Safety without compromising the goal of increasing the commercial availability of spectrum for commercial 4G networks.

The solutions and approach that we present provides Australia's Public Safety services and organisations with a state of the art, fully interoperable Long Term Evolution (LTE) broadband network, and also provides a recurring revenue stream that subsidises the ongoing cost of maintaining a Public Safety network. These core goals – the highest quality Public Safety network, flexibility, and a positive revenue outcome, are unlikely to be achieved in a more efficient way.

Rivada's unique technology addresses an expanding market need in the face of a looming spectrum crisis and the stated goals of multiple governmental organisations internationally to increase spectrum

access. Whilst Rivada has focused our marketing and efforts on the potential users of Public Safety spectrum allocations, this represents a small percentage of Government controlled spectrum. Rural telecommunication providers, Public Safety agencies, industrial and enterprise users, and those who use unlicensed spectrum can use our products and services to create wireless networks without the significant capital outlays and delays required to licence spectrum.

Scarcity of Spectrum

Radio spectrum is a finite natural resource. The telecoms industry faces soaring demand for, yet a finite supply of, spectrum. The popularity of smart phones, tablets, and other mobile devices has caused demand for wireless connectivity to grow exponentially. Consumer and business demand for mobile data continues to increase rapidly and providers are struggling to deliver enough bandwidth.

Today, as more users embrace more devices and high-bandwidth services — such as video streaming — wireless network operators are running out of capacity, particularly during peak hours. In addition to demand driven by the proliferation of smartphones and tablets, further technological advancements could increase data usage beyond current forecasts. Connected cars, wearable devices and mobile healthcare are just three of the areas that may greatly accelerate the penetration of connected devices, thus further increasing spectrum demand.

As demand grows exponentially, regulators are recognizing the need to address the scarcity and inefficient use of wireless spectrum. The idea of spectrum sharing is developing rapidly, with the US regulator, the FCC, in particular voicing strong support for the concept. Inserting DSATPA into the spectrum ecosystem enables the market to better meet the demand challenges of the future. Enabling the dynamic expansion of spectrum with DSATPA significantly enhances supply of capacity for mobile broadband.

The consumption of bandwidth is projected to grow exponentially over the coming decade. As the world becomes ever more connected, and more and more devices that consume bandwidth are brought to market, competition for bandwidth will inexorably and inevitably increase. In turn, the value of that bandwidth will increase over time far in advance of where it is valued today.

In these circumstances, a traditional model of allocating bandwidth to a single user on a lengthy licence agreement is a mistake for any government, for it places limits on the potential revenue generated from a valuable natural resource (radio spectrum).

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The opportunity

Rivada Networks' solution addresses the very significant gap in the wireless telecoms market for the provision of additional capacity. Carriers and other service providers are struggling to counter the looming spectrum crisis. Rivada's DSATPA technology alleviates capacity constraints and improves spectrum efficiency and utilisation. DSATPA enables spectrum sharing between networks via the buying and selling of network bandwidth in near-real-time. Allowing capacity requirements to be addressed on an as-needed basis is a key differentiator.

The Sharing Economy is widely regarded as one of the key emerging consumer trends of the early part of the 21st Century. The sharing economy — sometimes referred to as the peer-to-peer (P2P) economy, mesh, collaborative economy, or collaborative consumption — is a socioeconomic system built around the sharing of resources. It includes the shared creation, production, distribution, trade and consumption of goods and services. These systems take a variety of forms, often leveraging information technology to empower individuals, corporations, non-profits and government with information that enables distribution, sharing and reuse of excess capacity in goods and services.

Highly disruptive and successful sharing economy business models have emerged across a range of industries and in a range of different formats, from P2P marketplaces such as Airbnb, to crowdfunding platforms such as Kickstarter. Ridesharing service Uber's business strategy is adaptable and such a strategy could lead to lower prices in other areas such as the wireless industry. Forbes magazine has described the 'unstoppable rise' of the sharing economy and have defined it as one 'where asset owners use digital clearinghouses to capitalize the unused capacity of things they already have.' Spectrum Sharing is an inevitable next step in this movement, where a limited and perishable resource, for which there is exploding demand, becomes commoditised and much more efficiently utilised.

Rivada's signature DSATPA technology provides an optimum solution to feed the growth in demand for wireless spectrum: Airbnb has increased the effective supply of short-term housing through the creation of an online marketplace, and Uber maintains a supply-demand balance through dynamic pricing enabled by wireless technology. Similarly, Rivada's technology will leverage the efficiency of an online marketplace and the benefits of dynamic pricing to improve the mobile communications experience for all involved.

Rivada Technology

Rivada's core technology offering, DSATPA, enables spectrum leasing or capacity leasing on a short-term basis. This will increase competition in the wireless market and improve spectrum efficiency without negatively impacting the primary carriers' ability to deliver service.

DSATPA is unique in that it enables spectrum or radio resources to be leased for an entire license area or for a defined sub-license area. DSATPA is a policy driven governance and bidding process that enables spectrum and capacity to be geographically targeted for use and resale, providing a continuous source of revenue.

By employing DSATPA, both existing licensed and virtual wireless operators can enhance their service offerings by securing wireless resources in a dynamic fashion. Therefore, existing wireless networks and virtual network operators utilising fixed spectrum bands can be enhanced with capacity on-demand services in a given geographic area, and/or region through assignment of short term spectrum leases, de facto leases, or dynamic roaming for complementary or competing wireless service

providers and/or end users. DSATPA can enable spectrum and resources leases that are for small regions (e.g. per user, per sector, per base station, per cell cluster, per license county, per license area or any sub multiple or multiple thereof).

Spectrum and radio resources can be made available on the basis of time, usage, geography or any combination of the three as defined by the arbitrage process. DSATPA enables quasi just-in-time allocation of spectrum and radio resources thereby improving the overall spectrum utilization for a given market and providing a revenue source for the spectrum owner.

- The technology enables a spectrum holder to dynamically lease radio spectrum to the highest competitive bidder, while retaining complete control of the network and the ability to instantly take capacity back as and when needed.
- The spectrum holder can retain the ability to pre-empt spectrum as needed (e.g. public safety spectrum).
- The competitive nature of this approach levels the playing field and means that carriers and non-traditional players have the same opportunity to access the network. There is no “gatekeeper” since use is mediated by a transparent, open market.
- DSA technology unlocks the potential for supply and demand economics to bolster the quality, quantity and coverage of wireless broadband services.

Under a traditional spectrum licence, the carrier pays the government up front for exclusive use of a frequency band or bands for a specified period of time, subject to renewal. Using Rivada’s DSATPA technology, one possible arrangement would entail forgoing the traditional licence cost in exchange for a continuing stream of revenue from a newly created Telecoms Commodity Exchange, using Rivada’s technology. Rivada proposes to take a percentage of the commercial revenue generated in that marketplace, and to remit the remainder, after paying for network build-out costs and maintenance, to the Government in lieu of the up-front licence fee. Over time, we expect this excess to become quite substantial. And because network utilisation will almost certainly be much higher than under current arrangements, the value of the spectrum sold on the exchange, and the revenue to the Government, would likely be greater than under a traditional licence.

Conclusions

Traditional spectrum licensing regimes are rigid, exclusionary and economically inefficient. Long-term licence auctions often see spectrum going to those with the deepest pockets, rather than those who will make the best use of it. Beauty contests, on the other hand, are prone to corruption, and even when conducted cleanly, require regulators to know more about the future uses of spectrum than anyone can possibly know.

The good news is that with the advent of Dynamic Spectrum Arbitrage, these compromises are no longer necessary. Rather than making a single, long-term choice about the control and use of blocks of spectrum, Australia has the opportunity to show the way forward through the creation of a dynamic, near-real-time, permanent marketplace for network capacity.

New spectrum could be brought into this marketplace through a public-private partnership that would return a continuing stream of money back to the Government as the new network’s capacity is bought and sold. Rivada is confident that the initial funding for network build out could be raised from private investors, minimizing the up-front cost and risk to the government of adopting this approach.

In the US, Rivada is working to deploy its technology first in 20MHz of spectrum that the US federal government has made available to Public Safety nationwide, and a decision on Rivada's bid is expected imminently. While Australia would also benefit from a dedicated 4G Public Safety Broadband network, it is not necessary for the deployment of Rivada's technology, which is fully compatible with the latest 3GPP LTE specifications.

MNOs face a bandwidth crunch in prime locations at peak times, and thus would be interested in purchasing any capacity that is made available to them, especially if the incremental cost is less than their cost to supply bandwidth on their own. For areas/times of peak demand, market forces will drive the pricing up to premium levels. A large portion of the revenue from the leasing of capacity that reverts to the Government will be from this premium peak traffic. Bandwidth at prime locations during off-peak time or peak time and non-prime locations should be sold at market price, where the anticipated buyer would be MNOs, MVNOs, and other heavy bandwidth users. Lower demand, and thus lower priced, off-peak capacity is more attractive to wholesale customers looking for inexpensive alternatives to existing agreements, ways to save money, or ways to solve growing demands in areas like security monitoring, transmission of large data sets that can occur at off-peak hours, and the growth in machine-to-machine communications. Rivada's approach pays for the network's build-out and operation. It provides an ongoing revenue stream to the Government that will grow with the expansion of market demand for wireless bandwidth. The potential upside for this growth is left where it belongs, on the Government balance sheet, for the public's benefit.

By reducing the barriers to entry to the commercial market, the Rivada approach allows new market entrants to purchase bandwidth as needed without investing in a nationwide mobile network. This proposal fosters the creation of an entirely new marketplace that will result in countless innovations and thousands of jobs in broadband communications and beyond.