

News Release

Federated Wireless Makes Shared Spectrum a Reality with Availability of Industry's First Spectrum Controller; Closes \$42M Series B with Wireless Industry Backing

Company to Leverage Investments from Wireless Ecosystem to Make LTE-Ready Spectrum Immediately Available Eliminating Challenge of Supporting Explosive Wireless Demand on Finite Spectrum

Arlington, Va. — September 14, 2017 – Federated Wireless, a leading technology provider enabling the shared spectrum revolution, today announced the availability of its Spectrum Controller and the closing of a \$42M Series B round of funding, including strategic investments from key wireless industry ecosystem partners Charter Communications (NASDAQ: CHTR), American Tower Corporation (NYSE: AMT), ARRIS International plc (NASDAQ: ARRS) and GIC, Singapore's sovereign wealth fund. Enabling the efficient access, management and optimization of the FCC-approved Citizens Broadband Radio Service (CBRS) 3.5GHz shared spectrum band, Federated Wireless is unlocking a spectrum of possibilities for businesses across industries. This makes LTE-ready spectrum immediately accessible, eliminating the growing challenge of supporting explosive growth and demand for wireless communications with a finite amount of available spectrum.

“Shared spectrum isn't just a promising approach of the future – Federated Wireless' Spectrum Controller is now available for use by customers of all sizes conducting live, integrated field trials and commercial deployments in readiness for FCC certification. Spectrum sharing will dramatically reduce the cost of delivering wireless services, with our technology serving as the onramp,” said Iyad Tarazi, CEO of Federated Wireless. “The commercial availability of our Spectrum Controller and the investment of the wireless industry in the company will enable us to cement our leadership position and capitalize on the rapid industry shift to shared spectrum set to begin this year.”

The Federated Wireless Spectrum Controller allows Mobile Operators, Cable Operators, Broadband Wireless Access Providers, Managed Service Providers and Enterprises across industries, to leverage CBRS when and where they need it. As a result, spectrum efficiency and utilization is not only increased, but the economics for delivering spectrum-based services and applications are dramatically improved for operators and enterprises. The technology allows for the bolstering of existing carrier and LTE networks, and for commercial and industrial properties to launch robust LTE networks for advanced applications.

The Spectrum Controller is an end-to-end solution for shared spectrum access, management and optimization, helping businesses to quickly and efficiently plan, optimize and monetize CBRS services. The Spectrum Controller's key components, include:

- **Spectrum Access System (SAS)** – A standards-based cloud-service that delivers access to interference-free bandwidth within the CBRS band, enhancing wireless coverage options.
- **Environmental Sensing Capability Network** – Nationwide redundant network of sensors that identify and protect the Federal agencies already using the 3.5 GHz band to ensure defense and government communications aren't impacted by commercial users.
- **Spectrum Management Tools** – A robust set of tools and analytics providing a real-time view into shared spectrum utilization and availability to maximize use of CBRS and enable greater optimization.
- **Open Partner Ecosystem** – An API-centric architecture and large ecosystem of pre-integrated technology partners enables ease of integration with existing networks, while reducing operating costs and improving time to market.



“Charter is proud to partner with Federated Wireless to bring CBRS 3.5 GHz technology to market,” said Craig Cowden, SVP Wireless Technology at Charter Communications. “Federated Wireless is a market leader in enabling and optimizing the allocation of shared spectrum, and we are excited to partner with them on this innovative new technology. When combined with Charter’s advanced and powered high speed infrastructure, it will enable innovative service offerings that enhance the customer experience.”

“With the explosive growth of wireless data it is imperative that the industry finds new and innovative ways to meet this demand cost effectively,” said Steven Marshall, President US Tower, a division of American Tower Corporation. “Federated Wireless has built a strong capability to facilitate access to the CBRS spectrum expected to be made available by the FCC shortly. We are delighted to be able to work with Federated to develop in-building proprietary and shared wireless access networks that can enhance functionality and potentially develop new revenue streams for property owners.”

“ARRIS strongly believes in the shared spectrum market opportunity,” said Bruce McClelland, ARRIS CEO. “As service providers of every type develop expanded wireless product offerings, and Enterprises explore Private LTE and Industrial IoT opportunities, we see a strong market opportunity by adding CBRS capability to our portfolio. Federated Wireless is a foundational building block in the CBRS ecosystem, and we are pleased to serve these markets with Federated as a partner.”

“As a long-term investor, we believe the dynamic sharing of 150MHz of CBRS spectrum at 3.5GHz is an innovative and leading method of addressing the future need for bandwidth by data-intensive applications”, said Bryan Yeo, Chief Investment Officer for Public Equities at GIC. “We are pleased to invest in Federated Wireless with its enabling technologies to act as a neutral allocator of spectrum. We are confident in the long-term potential of dynamic sharing at 3.5GHz, and possibly other spectrum bands, leading to a more efficient utilization of scarce spectrum resources, better indoor coverage, more innovative services based on private LTE networks, as well as the provision of wireless broadband access by a greater number of players.”

The Federated Wireless Spectrum Controller comes to market following more than five years of development and nine months of industry testing by customers in the telecommunications, cable services and commercial property industries. The company’s Spectrum Controller already has conditional FCC certification with full certification anticipated in January 2018. To further support the proliferation of shared spectrum the company will continue to work closely with the FCC, Department of Defense (DoD), the Wireless Innovation Forum (WInnForum) and CBRS Alliance to identify and develop additional use cases and applications, and expand the technology ecosystem. Catapult Advisors served as financial advisor to Federated Wireless in connection with the transaction.

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About Federated Wireless

Federated Wireless is leading the wireless industry through the shared spectrum revolution, unlocking a spectrum of possibilities by eliminating the decades-old problem of spectrum scarcity. The Company offers the industry’s first FCC-certified spectrum controller, enabling government and commercial users to securely share the same spectrum band without impacting quality of service. Headquartered in Arlington, Virginia, Federated Wireless is removing the multi-billion dollar price tag associated with spectrum access, allowing for the creation of new wireless carriers and business models. For more information please visit, www.federatedwireless.com.



About Charter

Charter (NASDAQ: CHTR) is a leading broadband communications company and the second largest cable operator in the United States. Charter provides a full range of advanced broadband services, including Spectrum TV™ video entertainment programming, Spectrum Internet™ access, and Spectrum Voice™. Spectrum Business™ similarly provides scalable, tailored, and cost-effective broadband communications solutions to business organizations, such as business-to-business Internet access, data networking, business telephone, video and music entertainment services, and wireless backhaul. Charter's advertising sales and production services are sold under the Spectrum Reach™ brand. More information about Charter can be found at www.charter.com.

About American Tower

American Tower is a leading independent owner, operator and developer of wireless and broadcast communication real estate. Our global portfolio includes approximately 148,000 communications sites and is experiencing steady growth. In addition to leasing space on towers, we provide customized collocation solutions through our in-building systems, outdoor distributed antenna systems and other right-of-way options, managed rooftops and services that speed network deployment.

About ARRIS

ARRIS International plc (NASDAQ: ARRS) is a world leader in entertainment and communications technology. Our innovations combine hardware, software, and services across the cloud, network, and home to power TV and Internet for millions of people around the globe. The people of ARRIS collaborate with the world's top service providers, content providers, and retailers to advance the state of our industry and pioneer tomorrow's connected world. For more information, visit www.arris.com.

About GIC

GIC is a leading global investment firm with well over US\$100 billion in assets under management. Established in 1981 to secure the financial future of Singapore, the firm manages Singapore's foreign reserves. A disciplined long-term value investor, GIC is uniquely positioned for investments across a wide range of asset classes, including real estate, private equity, equities and fixed income. GIC has investments in over 40 countries and has been investing in emerging markets for more than two decades. Headquartered in Singapore, GIC employs over 1,400 people across 10 offices in key financial cities worldwide. For more information about GIC, please visit www.gic.com.sg.