Federated Wireless
Unlocking a spectrum of possibilities

Iyad Tarazi, CEO
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Insufficient Spectrum Supply

“Demand for mobile broadband service is likely to outstrip spectrum capacity in the near-term. Without action to address this spectrum crunch, service quality is likely to suffer and prices are likely to rise.”

Growth in spectrum-intensive applications
Shared Spectrum is the Path Forward

**Licensed**

- Exclusive Use ☒
- High cost ☒
- Inefficient ☒

**Unlicensed**

- Congested ☒
- Unpredictable ☒
- Can’t keep up ☒

**Shared Spectrum**

- Low fixed cost ✓
- High quality ✓
- Efficiency and scale ✓

Federated Wireless is leading the development of Shared Spectrum technology and solutions
Federated Wireless Partners

MNO
- Network Densification
- Capacity expansion
- verizon

MSO
- Wireless MVNO Offload
- Smart Home
- Charter

Neutral Host
- DAS alternative
- Venues, MDUs
- Telrad

Wireless Broadband
- Incumbent band users
- Rural Broadband
- American Tower

Enterprise
- Private LTE Networks
- Industrial IoT
- Arris

Federated Wireless is leading the industry
Leading Partners are Strategic Investors

<table>
<thead>
<tr>
<th>Description</th>
<th>M.V.(1)</th>
<th>Rationale / Benefit to Federated</th>
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</table>
| Charter                                                                    | $102bn | ✓ 3.5G underpins wireless strategy  
✓ 16.6m cable customers who could benefit from spectrum sharing |
| Leader of end-to-end Enterprise and Residential Wi-Fi System Solutions     | $5bn    | ✓ High leverage channel to market via millions of installed broadband systems |
| Largest US owner / operator of wireless / broadcast infrastructure RE      | $58bn  | ✓ 140k global assets: towers, fiber, venue access and DAS systems  
✓ High leverage channel to market |

(1) As at close 11 January 2018
Massive LTE Global Ecosystem

Federated Wireless is a Founding Board Member of the CBRS Alliance
Federated Wireless Technology

- Detects Incumbent usage and securely protects priority access
- Dynamically allocates surplus (~97%) for commercial use
- Cloud-based for scale, extensibility, and efficiency
- Predicts RF propagation in real time
- Provides interference protection based on aggregate effects
- Employs sensing for closed loop management

**Federated Wireless’ Spectrum Controller** is the only commercially available product
Profitable SaaS Business Model

- Subscription-based service charge per Access Point
- Recurring payments that grow with installed base
- High gross margin software-based service
- Highly leveraged through partnerships

**Federated Wireless** is pioneering the development of Private LTE solutions

- Significant cost advantage over traditional DAS
- Secondary spectrum markets automation
- Neutral Host and carrier integration technology
- Cloud edge computing and IoT
- Indoor 4G/5G is a significant growth market

Indoor Connectivity Solutions

- 50-80% Cost to Deploy

- 200k
- DAS (2-Carrier)
- Wi-Fi
- 3.5 GHz (Multi Carrier)
Large US Market for Shared Spectrum

Forecast represents a small fraction of total addressable market

- Cable and broadband: 100m homes
- Enterprise Wi-Fi: 30m APs
- Last mile: 5m homes lack broadband
- Carrier 5G densification
- IoT, underserved commercial & transportation hubs
- International adoption

US 3.5 GHz Access Points

(1) Source: ARRIS, March 2017 Investor Day Presentation
(2) Source: IDC Worldwide Enterprise WLAN Forecast 2014-2018 and multiple press releases
(3) Source: Economists Incorporated/CMA Strategy Consulting
Shared Spectrum Expansion

Federated Wireless is working to expand Shared Spectrum opportunities in US and globally.

- **Licensed**
  - 20 MHz
- **Unlicensed**
  - 40 MHz
  - 5 GHz LAA
  - CBRS 150 MHz

**Future Potential (US)**
- 800 MHz (3.4-4.2 GHz)
- 1100 MHz (5.9 GHz+)

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(1) Source: The Potential market Value and Consumer Surplus Value of CBRS at 3550-3700 MHz in the US, Harold Furchgott-Roth
Federated Wireless Leads & Collaborates

Our Competitive Advantages

- **Neutral party** – commitment to support all industry partners
- **Industry leadership** – leading rule setting standard setting with FCC
- **First mover** – already in field trials with industry leaders
- **Leading Sensor network** – developed with DoD: Able to operate by US coasts (60% US pop)
- **Differentiated software - services** to deliver greater spectrum efficiencies
- **Powerful investor syndicate - covering key use case verticals**

We Collaborate with Industry

- **Interoperability** – commitment to open interoperable systems
- **Standards and regulatory** – jointly developing industry standards
- **Solutions development** – promoting most efficient spectrum use
Commercialization Milestones

- FCC certification
- 3 – 5 commercial agreements
- First commercial revenue

Potential cash flow break-even (2020)

Commercialization of 3.5 GHz

Commercialization of Private LTE

Additional Spectrum

Commercialization begins in 2018 and accelerates with new opportunities starting in 2019
Unlocking a Premium Exit Valuation

<table>
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<tr>
<th>Disruptive innovation solving important problem</th>
<th>New technology pioneered by Federated Wireless to unlock surplus spectrum</th>
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<td>Favorable market dynamics</td>
<td>Large unmet needs for spectrum and scalable indoor solutions</td>
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<tr>
<td>Sustainable competitive advantage</td>
<td>First mover with key relationships pioneering differentiated technology and backed by powerful investors</td>
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<td>Route to widespread adoption</td>
<td>Leading industry movers are investors with large distribution reach</td>
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<td>Capable management with aligned interests</td>
<td>Senior leaders and technical experts with proven experience in running larger operations</td>
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<td>Establish potential for competitive tension</td>
<td>Value to multiple partners across segments and a powerful IPO candidate given growth potential and neutral model</td>
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Thank You