Cohere Technologies

Founded in 2009

Headquartered in Santa Clara, CA

Completed A, B and C Rounds of Financing

Industry Leading Investors

OTFS™ – An innovative form of modulation. OTFS simultaneously extracts time, frequency & spatial channel behavior resulting in greater coverage, higher capacity, and cost savings.
Three Challenges in Wireless

**CAPACITY:**
Demand for 1000x increase in capacity

- Mobile Networks require a 1000x increase in RAN capacity to meet the growing demands for data
- Existing wireless systems are inadequate and unprepared to address this challenge

**COVERAGE:**
New points of presence

- Networks are being re-architected with high density and re-use with small cells
- High capacity systems aren’t available everywhere these networks need to be deployed

**COST:**
Complexity of deployment

- Point to point link cost ($$/Mbps/Hz)
- Physical deployment costs – Simple planning and rapid deployment (time, scale)
- NLOS/LOS issues;
- Spectrum costs/availability
Cohere’s OTFS™ Addresses The Problems

1000x

- 100X capacity at the sector
- 1000X capacity at the network
- Increased coverage
- <50% of the cost
- Across RAN/Mobility, Backhaul and FWA

100x increase in spectral efficiency – 1000x increase in network capacity
The Secret Sauce: 2D Channel State Information

1D Channel
- Is non-stationary
- Fades
- Looks random
- Time or frequency resolution
- Inefficient, inaccurate, non-timely CSI

2D Channel
- Is stationary
- Does not fade
- Deterministic
- Time and frequency resolution
- Efficient, accurate, timely CSI acquisition

The 2D CSI enables interference mitigation for greater coverage, capacity, and frequency re-use
Cohere’s Business Roadmap

**Backhaul**
Phase 1
- ANT
- Ntwk Mgt. Tools
- Ops Bands

OTFS™ fundamentals of capacity and bandwidth; system building
“Prove the thesis”

**Fixed Wireless**
Phase 2
- Massive MIMO
- SUB Mgt.

Scale, integration, commercialization
“Broaden technology”

**Mobility**
Phase 3
- 5G / WiFi Standards

Specifications, simulations, characterization
“Leverage learning”
## Roadmap Markets Profile

<table>
<thead>
<tr>
<th>Backhaul (Macro/SC)</th>
<th>Fixed Wireless</th>
<th>Mobile (5G)</th>
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</thead>
<tbody>
<tr>
<td><strong>Market Problem(s)</strong></td>
<td>Backhaul capacity not tracking with 4G LTE; Fiber PoP access not adjacent to cell site</td>
<td>Performance of wireline providers (Mbps); large coverage area to leverage investment</td>
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<tr>
<td><strong>Customers</strong></td>
<td>Mobile Network Operators (Sprint, Telstra, AT&amp;T, Vodafone)</td>
<td>Video &amp; Voice providers (DISH, DirecTV, NBN)</td>
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<tr>
<td><strong>Market Size</strong></td>
<td>Macro: &gt;$4B annual Small Cell: early cycle</td>
<td>+$5B annually</td>
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<td><strong>Competitors</strong></td>
<td>Microwave OEMs (Ericsson, ALU, Huawei, Dragonwave, Fastback)</td>
<td>LTE OEMs (Ericsson, ALU, Huawei)</td>
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<tr>
<td><strong>End Product(s)</strong></td>
<td>Hub &amp; Remote Systems</td>
<td>BTS &amp; CPE Systems</td>
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<tr>
<td><strong>Market Entry Hurdles</strong></td>
<td>Formal approval processes</td>
<td>Proof of concept</td>
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OTFS™ Value-add shown via TCO

**Macro Cell**  
Ring and Corridor
- 40%-60% Cost Savings
- Lower Deployment Costs (less equipment)
- Lower Spectrum Costs - 18GHz
- Flexibility of Deployment with NLOS
  - PTP/PTMP

**Small Cell**  
Urban/Suburban
- 50%+ Cost Savings
- Lower Deployment Costs (less equipment)
- 60GHz Deployment restrictions – LOS
- Flexibility of Deployment with NLOS
  - PTP/PTMP

**FWA**  
Biz and Residential
- 80%+ Savings
- Greater Coverage
  - Cell Edge increase
- Greater Throughput
  - >50Mbps/CPE
- Lower Spectrum Costs
- Flexibility of Deployment with NLOS
  - PTMP
Integrated Radio Unit (IRU) Physical Specs

- Integrated Unit
- 2x2 Antenna
  - Includes Radio
  - Includes Extension Capability to add’l 2x2 Antenna
  - Beam widths
    30 degree azimuth
    15 degree elevation
- Dimensions:
  15x8x5.5in (HxWxD)
  38.1x120.32x13.9 cm
  ~12lbs/5.44kg
- Power: ~70watts
- Passively cooled (no fans)
- Single gland based connector
THANK YOU