

Commercial space-based optical communications system

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Problem statement

RF satellite comms technology insufficient to meet growth in data capacity demand



• Number of satellites in orbit to triple by 2022 (driven largely by LEO)

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- Complexity of data intensive applications also expanding rapidly
 - Driving 125% CAGR in LEO data downlink capacity demand (c. 1m terabytes by 2024)
 - LEO data downlink market \$1.5bn
 - Current RF technology insufficient to service this demand (too slow)
- RF challenge exacerbated by increased competition for RF spectrum due to growth in spectrum hungry terrestrial wireless applications (AI / machine learning, IoT etc) under 5G

Satellite communications





BridgeSat's optical communications solution BRIDGE SAT. INC.

Addressing speed and spectrum shortfall of RF

High performance (10 Gbps) Compact LEO terminal dev'd GEO terminal in dev't **Optical ground** stations (10+) **Global** coverage SPACE LFO + GFO**BridgeSat Network** support **Operations** Compatible with Network management all space Tailored services for terminals customers Manage QoS levels Support RF/optical NETWORK GROU hybrid networks

Space qualified hardware

Why optical?

Greater data transmission capacity and security at much lower cost 🗫

Criteria	Incumbent RF technology	BridgeSat optical comms
Spectrum $(((\bullet)))$	 Limited availability Difficult process for obtaining Exploratory Q/V/W-band not commercialised spectrum 	 ✓ No limitations in spectrum ✓ No spectrum filing required
Interference	 Lack of spectrum minimizes guard bands to limit interference Inadvertent interference common 	 ✓ No spectrum interference issues ✓ Cloud attenuation overcome via use of multiple ground stations
Capacity	 Typically less than 200 Mbps – due to limited spectrum 	✓ Delivering 10 Gbps (10,000 Mbps) or more
Security	 RF signal broadly detectable 	 ✓ Narrow optical beam difficult to detect, intercept and jam
Cost \$	 For >1Gbps, RF is 10x optical communications (\$/byte) 	 ✓ Optical supports greater than 10 Gbps, which is not economically viable with RF

Upcoming milestones

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Key short term objective to demonstrate full end-to-end downlink (satellite to ground station to customer)

2018 2019 2020 Jan '18: BridgeSat Network Operations Center operational '18: First Operational Optical Ground Station Launch of first customer satellite with BridgeSat space terminal Space to ground testing of BridgeSat network Second customer satellite launch Complete construction at first 3 ground stations **GEO product to Japan ETS-IX** program delivered FOC across all 10 ground stations

Unlocking a premium exit valuation

BridgeSat vs. conditions for high growth potential



Disruptive innovation solving an important problem	 RF inadequate to meet exponential growth in data capacity demand BridgeSat's optical communications system solves this bottleneck
Favourable market dynamics	 Small satellites continue to increase in volume and sensor and application complexity ~125% CAGR in LEO data downlink Requirement for greater GEO data capacity
Sustainable competitive advantage	 Other optical comms providers offer non-commercial solutions suitable for government entities Only company building an optical ground network
Route to widespread adoption	 Initial sales channel to "new space" LEO satellite operators Traction with established GEO satellite operators / governments
Capable management with aligned interests	 >70 years of commercial satellite and teleco experience Managing qualified suppliers to meet milestone schedules
Potential for competitive tension	 Expressions of interest from multiple potential aerospace, defense and telecommunications companies, recognizing potential of optical comms and need to diversify Trade exit to a larger defense/aerospace or Silicon Valley firm currently more likely exit route vs IPO



Thank you

