



SMALLSAT 
SYMPOSIUM
SILICON VALLEY 2020

Market Brief: Satellite-based EO

February 5, 2020

BRIEF BACKGROUND

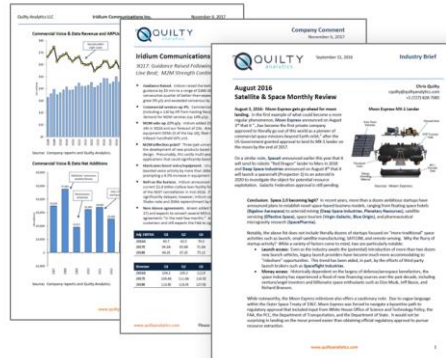
We are a boutique focused exclusively on financially oriented services for Satellite & Space



Investment Banking



Financial Research



Corporate Strategy

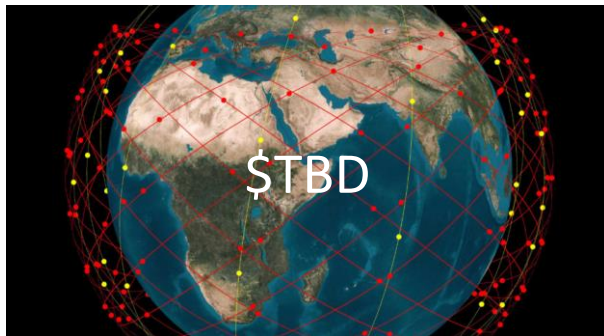


Justin Cadman, Partner
Justin@QuiltyAnalytics.com

THE PROMISE OF LEO BROADBAND

Will LEO Broadband foster major demand uplift? Or simply flood GEO with new BW supply?

LEO Broadband

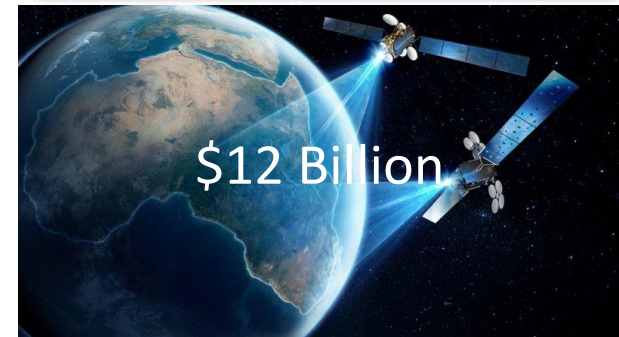


- Drive SATCOM demand?
- Weave into Terrestrial?

or

- Pure GEO Substitute

GEO Satcom



Terrestrial Telecom

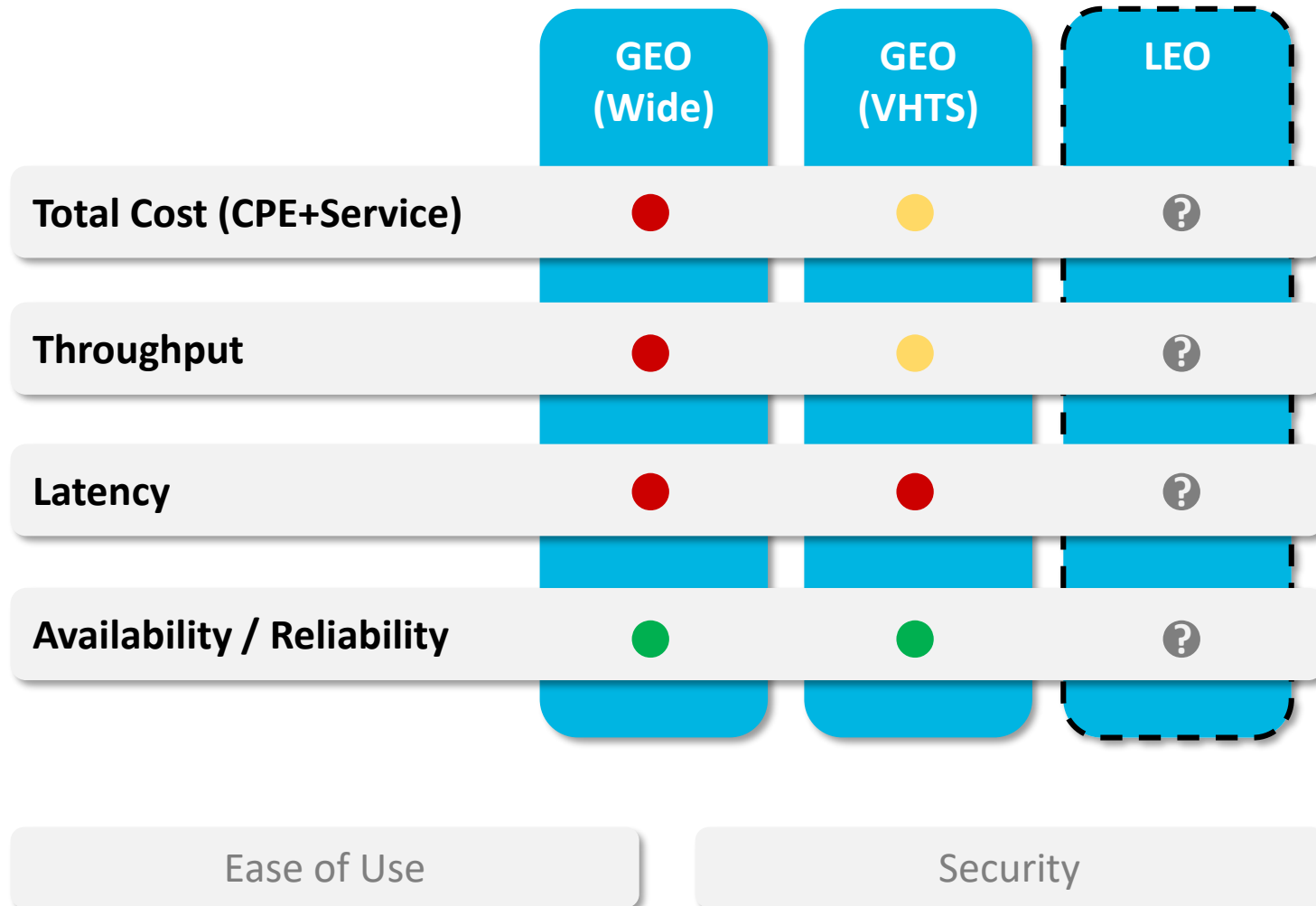


?

?

KEY CUSTOMER TELECOM “BUY” FACTORS

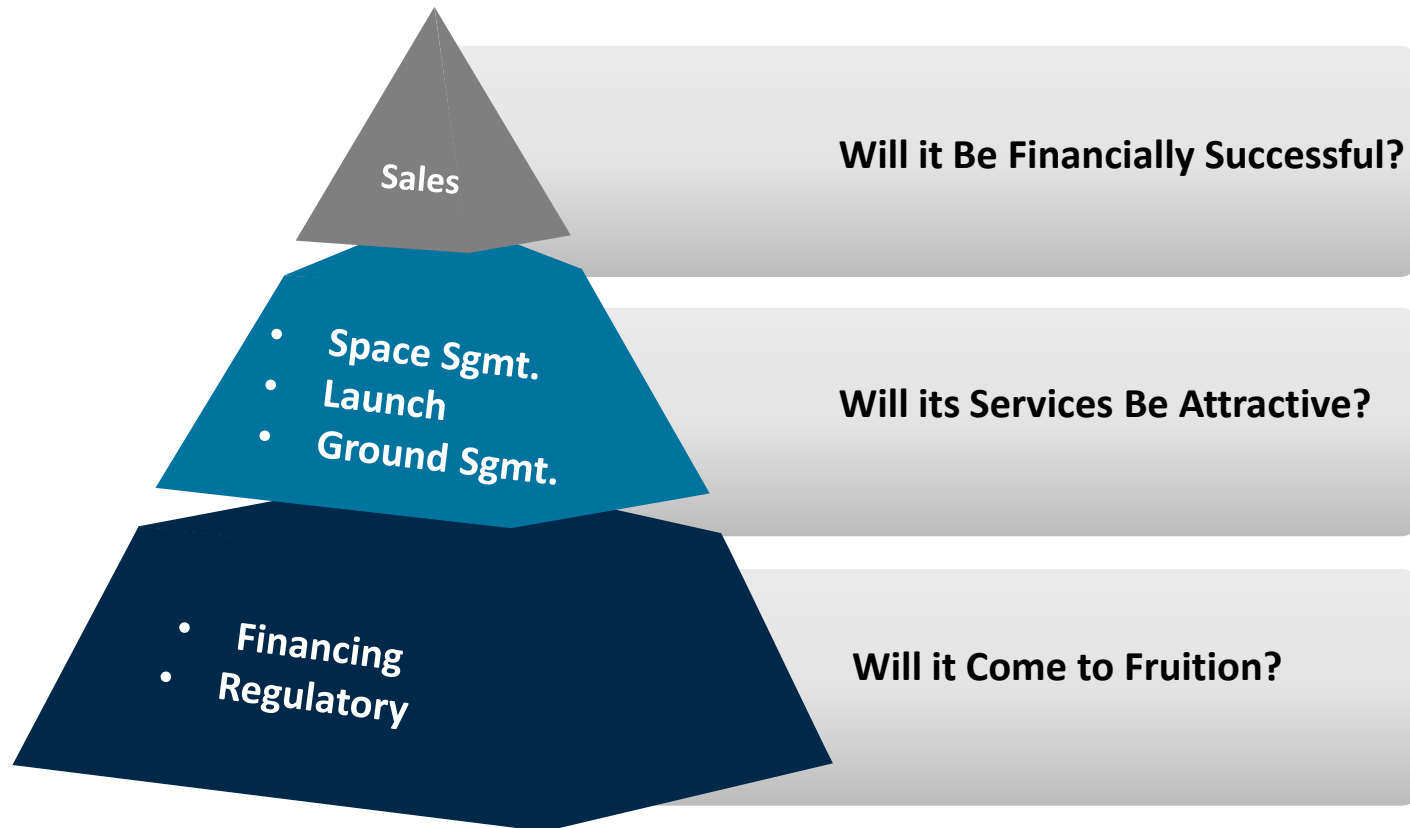
Historically, Widebeam GEO was a last resort. Will LEO make Satellite more appealing?



THE ASSESSMENT FRAMEWORK

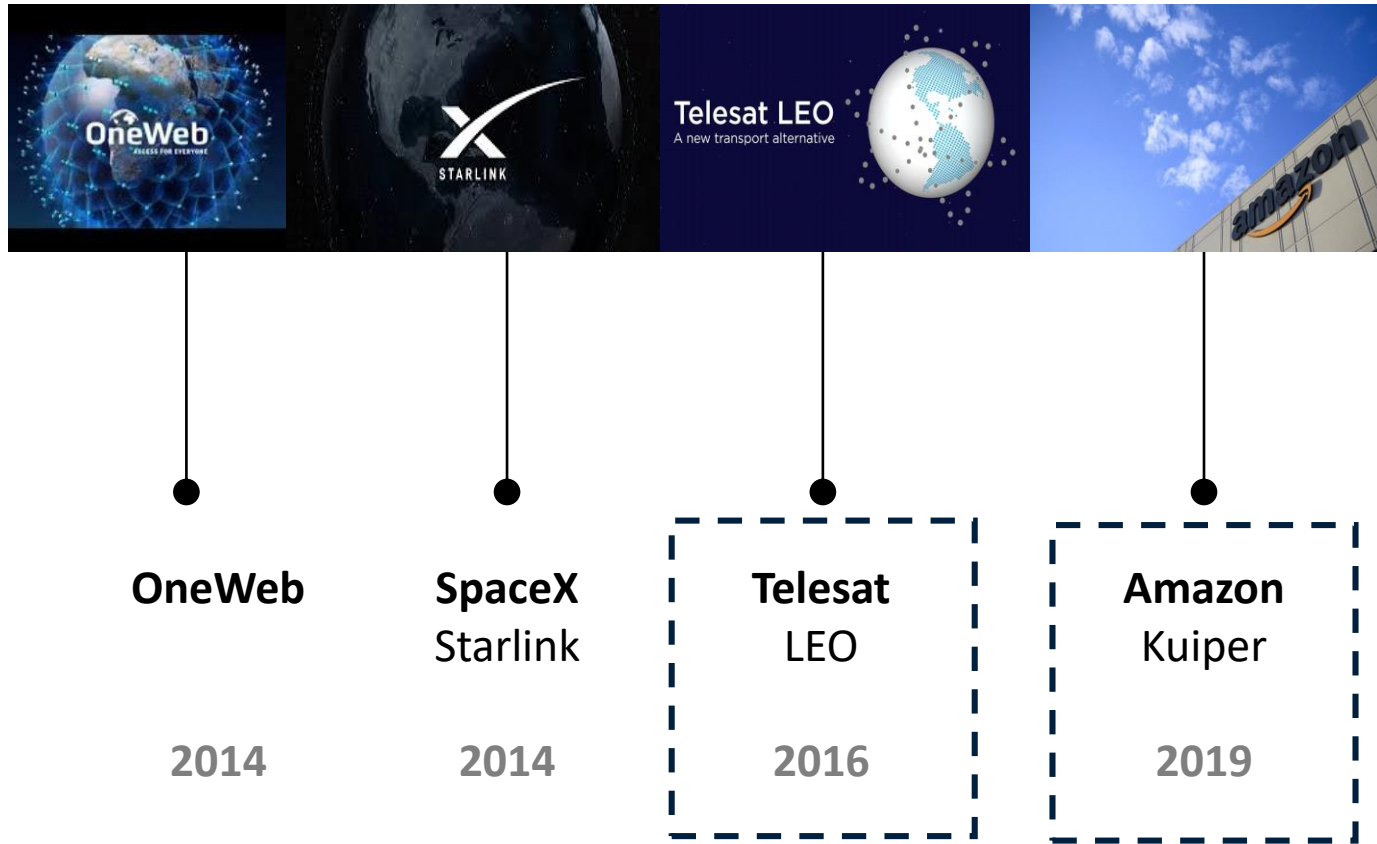
There are multiple ways to assess LEO Broadband and define “success:”

LEO Broadband Assessment Framework



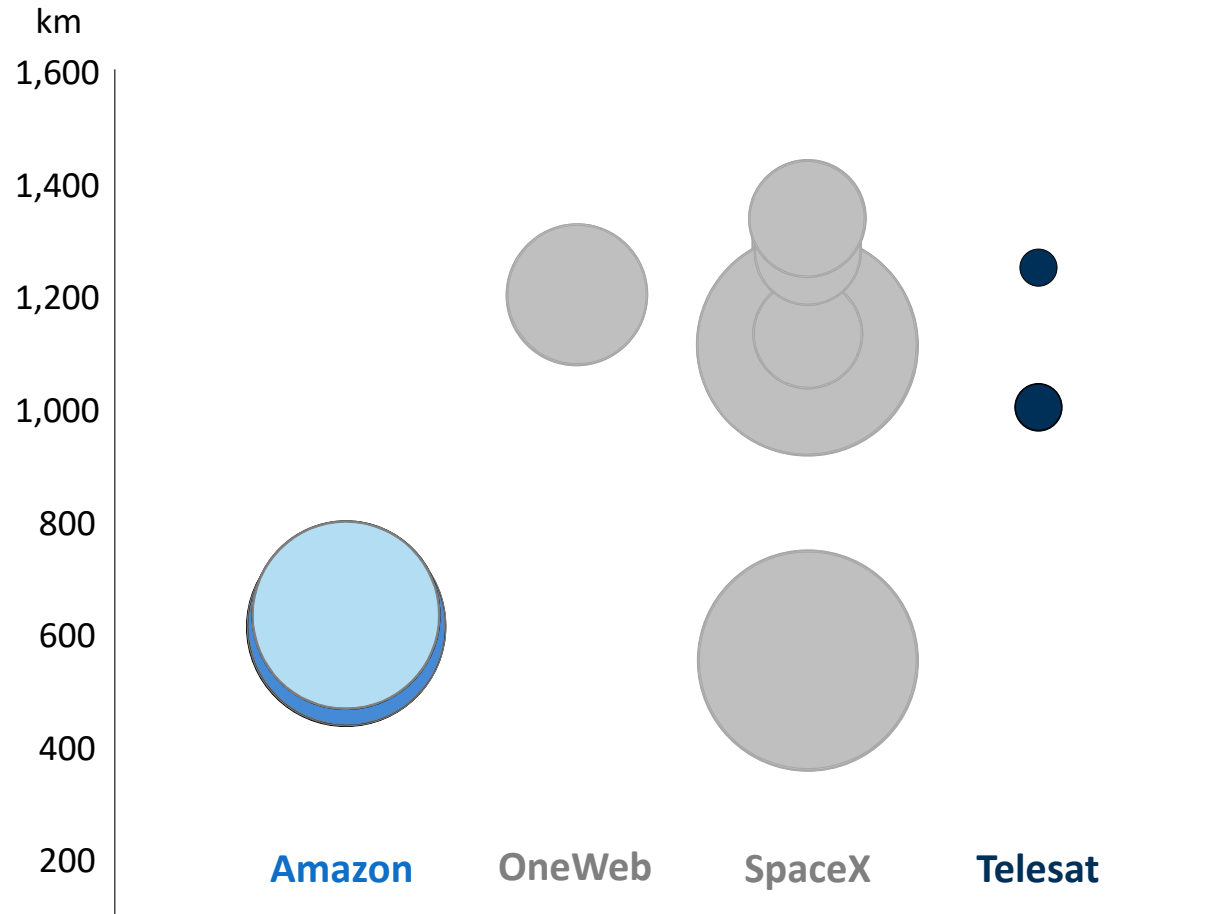
OUR FOCUS TODAY: AMAZON & TELESAT

Today, we are focused on the two newest systems in the LEO Broadband race:



"PHASE ONE" SYSTEMS: VERY DISTINCT

Number of Phase I Satellites by Orbital Altitude



Bubble size = # of Ph. I Satellites

Amazon

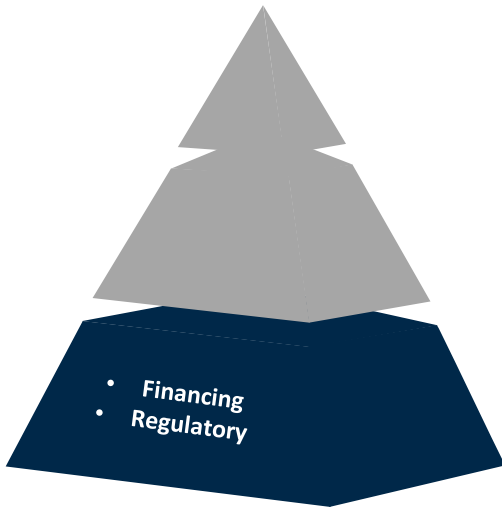
- **Big:** 3,236 satellites
- **Low:** ~600km
- **Solid S/C design**
- **Vertically integrated development model**

Telesat LEO

- **Small:** 117, increasing to 292-512 satellites
- **Higher:** 1,000+ km
- **Most powerful S/C**
- **Outsourced development model**

REGULATORY & FINANCING FOUNDATION

Regulatory & Financing success are necessary foundations to bring a LEO system online.



Regulatory: Spectrum is King

Amazon

- Ka Band User Links
- No license (yet)

Telesat

- Ka Band User Links
- License w/ priority

Financing: Access to Capital & Cost of Capital

Amazon

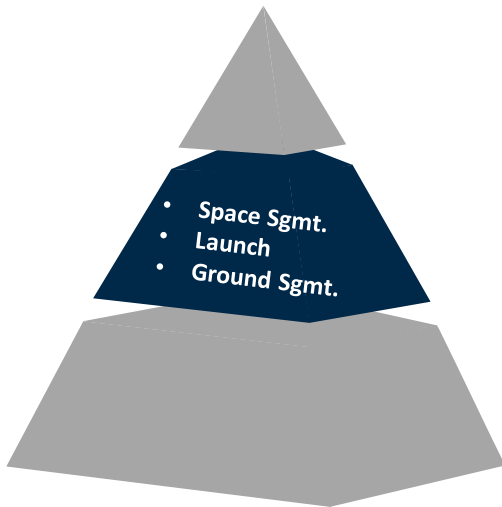
- \$43 billion EBITDA
- Net cash position
- Ready access to \$
- Low cost of capital

Telesat

- \$0.6 billion EBITDA
- ~3.5x Net leverage
- Path: Debt + Canadian gov't support + 3rd Party Invest.

SYSTEM DESIGN & LAUNCH: COMPETITIVE DRIVERS

System Design & Launch drive Cost and QoS: i.e., LEO's competitiveness.



System Design Highlights*

Amazon

- **Large** constellation (>3K)
- **Capable, low cost** satellites
- System design not static
- Considering **ISLs**

Telesat

- **Small** constellation (117/292)
- **Powerful** satellites:
35 Gbps potential
- Inter-satellite links (**ISLs**)

Manufacturing & Launch Highlights

Amazon

- Vertical integration
- New 219K SF facility

- Blue Origin: Sister launch company, but arms length

Telesat

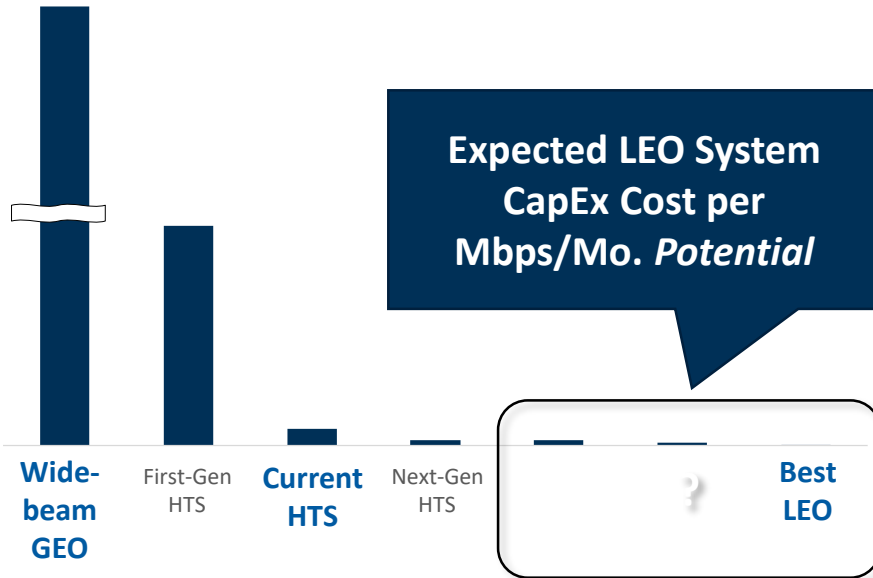
- Prime contractor selection process (still) underway

- Multiple LVs, includes role for Blue Origin & Relativity

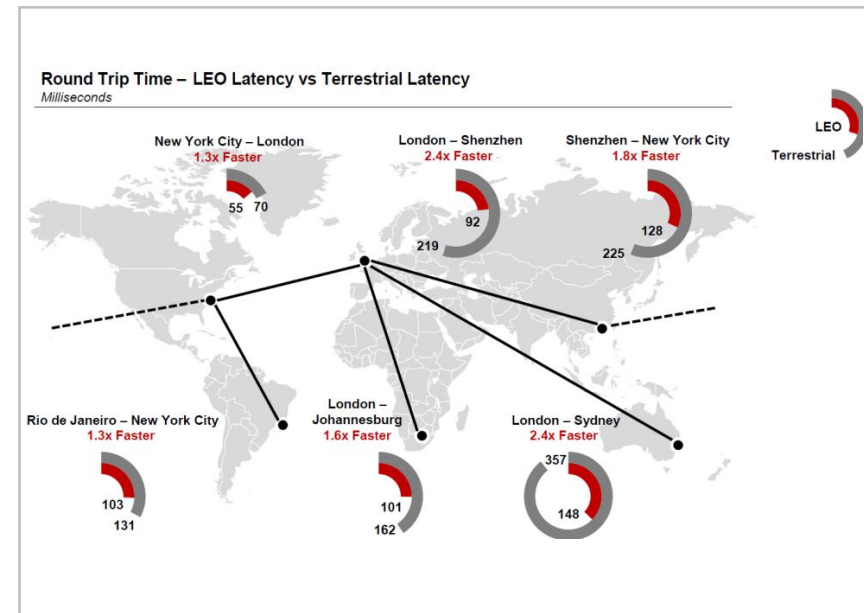
KEYS TO LEO *POTENTIAL*: LATENCY & COST

The systems bring disruptive latency potential, an increasingly important enterprise factor.

**Cost Per Bit:
Great Potential, But Not Fiber**



**Low Latency:
Potential to *Beat* Fiber!**



Key for Amazon & Telesat: Premium end-markets are less sensitive to antenna costs / FPAs

SALES & DISTRIBUTION: OFTEN OVERLOOKED

While Amazon & Telesat are the most-advantaged LEOs for Sales, their focuses diverge.

“Project Kuiper is a long-term initiative to launch a constellation of LEO satellites that will **provide low-latency, high-speed broadband connectivity to unserved and underserved communities** around the world.”

“Telesat LEO will deliver a combination of **high capacity, security, resiliency, and affordability with ultra-low latency and fiber-like speeds...**”



Key Considerations

Amazon

- **Kuiper is infrastructure**
- **Consumer is not #1**
- Internalized Use
- AWS Secret Weapon for latency-sensitive customers
- Unique sales platform

Telesat

- **Expanding & building on existing GEO markets** for satcom capacity
- Telesat is a leading GEO satcom player

SUMMARY OF THE CONTENDERS

Widebeam GEO was often a last resort. Will LEO integrate into the global telecom fabric?



LEO Broadband Part II:
LEO Systems Analysis



February 2020



© Quilty Analytics LLC. This proprietary report is not for redistribution except pursuant to a Quilty Analytics subscription agreement or license.



	Amazon Kuiper	OneWeb	SpaceX Starlink	Telesat LEO
Sales/Distribution	●	●	△ Sales	●
Space Segment	●	●	▽ • Space Sgmt. • Launch • Ground Sgmt.	●
Launch Campaign	●	●		●
Ground Network	●	●		●
Regulatory	●	●	▽ • Financing • Regulatory	●
Financing	●	●		●

Justin@QuiltyAnalytics.com