

STINT 2026
Leuven, BE

Anyone, Anywhere but not Everyone, Everywhere

Starlink doesn't close the digital
divide

Wesley Woo, Juan A. Fraire, Sylvia Ratnasamy, Scott Shenker,
Shaddi Hasan



Elon Musk reposted



Starlink is a positive force in the world, bridging the digital divide across the globe. Starlink will boost education, healthcare, and economic opportunities for communities that have limited or no internet access. Everyone at SpaceX is working crazy hard to achieve this.

Gwynne Shotwell ✓
@Gwynne_Shotwell · 5 Sep 2024

This was one of my favorite days at work, bringing @Starlink's high-speed internet to a school in the Amazon and meeting (and getting hugs from) these extraordinary students.

This picture shows just a few of the hundreds of thousands of amazing ...
[Show more](#)



4:28 pm · 5 Sep 2024 · 2.5M Views

Starlink envisions itself as *the* solution to the digital divide.

NEWS EVENTS ABOUT US


THE COLORADO SUN

NEWSLETTERS

DONATE

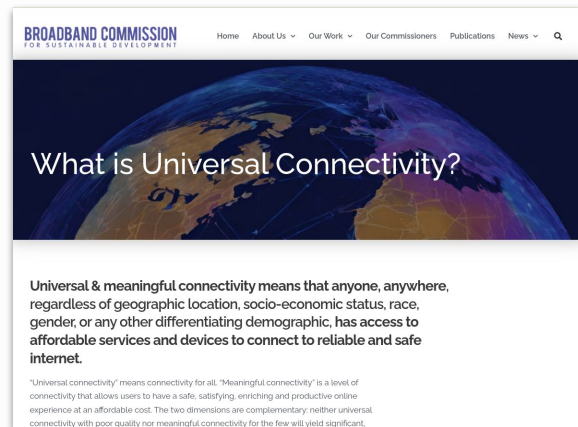
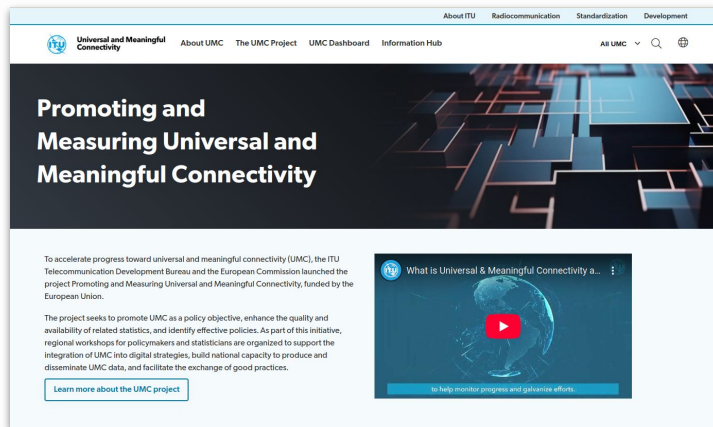
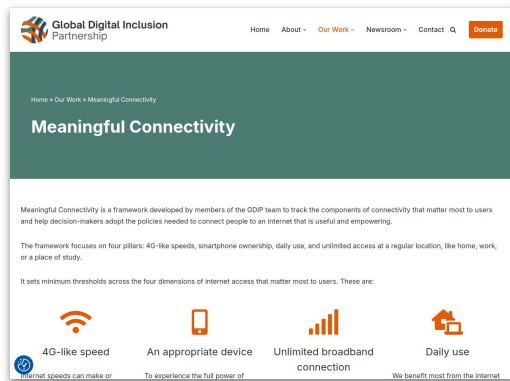


NEWS: TECHNOLOGY

Starlink, Amazon asking for \$300M of Colorado's broadband money after federal rule changes

After the Trump administration changed the rules last month to prioritize the cheapest proposals, the state's effort to award \$826.5 million to ISPs to build infrastructure had to start over. Fiber took a back seat.

Starlink can provide Internet connectivity in hard to reach places.



However, closing the digital divide requires universal, meaningful connectivity.

UNIVERSAL*



Does Starlink have enough
capacity to cover
"everyone, everywhere"?

MEANINGFUL*

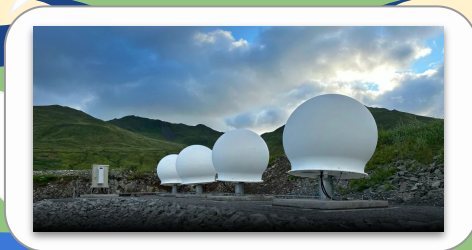
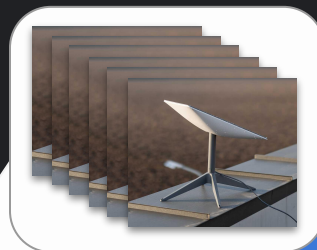
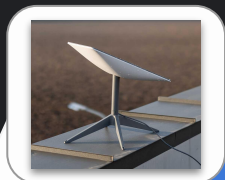


Are Starlink's Internet
service plans affordable?

(In the United States)

**LEO
SATELLITE**

**USER
TERMINAL**



**GROUND
STATION**

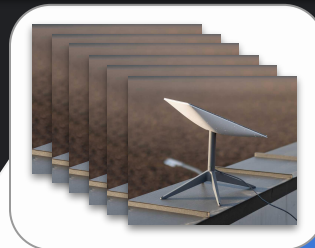
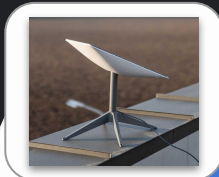
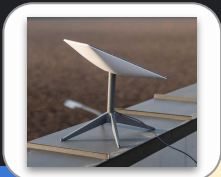
LEO
SATELLITE

USER
TERMINAL

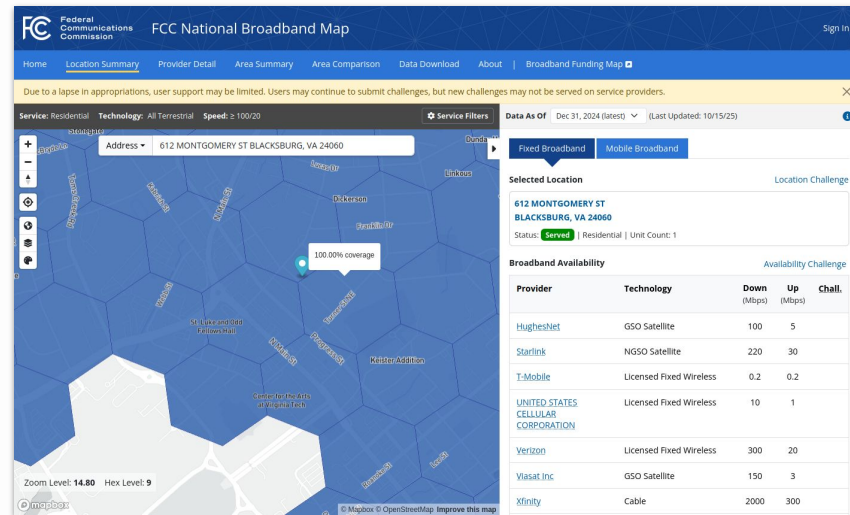
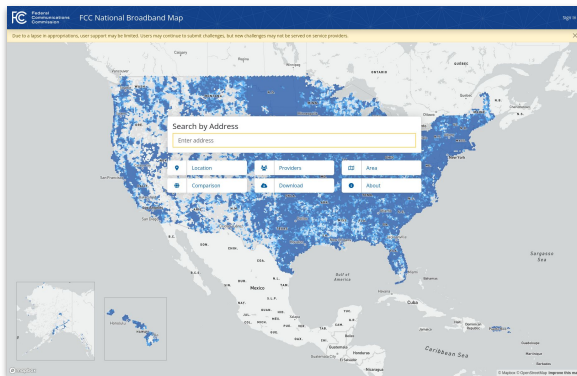
Q1: Do the satellite beams have enough capacity to serve service areas of greatest demand?

Q2: Are there enough beams to serve every user terminal?

GROUND
STATION



FCC National Broadband Map



Starlink Schedule S filings

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20544

Application of
SPACE EXPLORATION ROBOTICS, LLC
For Approval of Orbital Deployment
And Operating Authority for the
SpaceX G22 NGSO Satellite System

Call Sign: _____
File No. _____

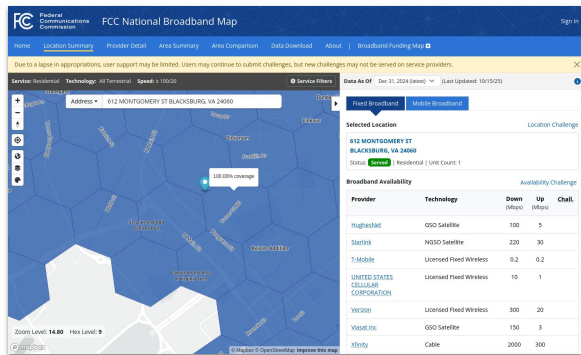
**APPLICATION FOR APPROVAL FOR ORBITAL DEPLOYMENT AND
OPERATING AUTHORITY FOR THE SPACEX G22 NGSO SATELLITE SYSTEM**

William M. Whitely
Paul Carty
HARRIS, WEISBERG & GRONDS LLP
1919 M Street, N.W.
Suite 400
Washington, DC 20036
202-778-1300 x1
202-778-1301 fax
Consent to SpaceX
May 26, 2020

David Goldson
Director of Satellite Policy
SPACE EXPLORATION TECHNOLOGIES CORP.
1135 F Street, N.W.
Suite 475
Washington, DC 20004
202-469-2700 x1
202-469-2700 fax

Evaluating Capacity

Q1: Is there enough wireless channel capacity?



Band (GHz)	# Beams	Usage
10.7–12.75 (2050 MHz)	4	Downlink to UTs
19.7–20.2 (500 MHz)	8	DL to UTs
17.8–18.6 (800 MHz)	8	DL to UTs / GWs
18.8–19.3 (500 MHz)	4	DL to UTs / GWs
71–76 (5000 MHz)	4	DL to GWs
Total to UTs / Cells	24 / 28	3850 / 8850 MHz

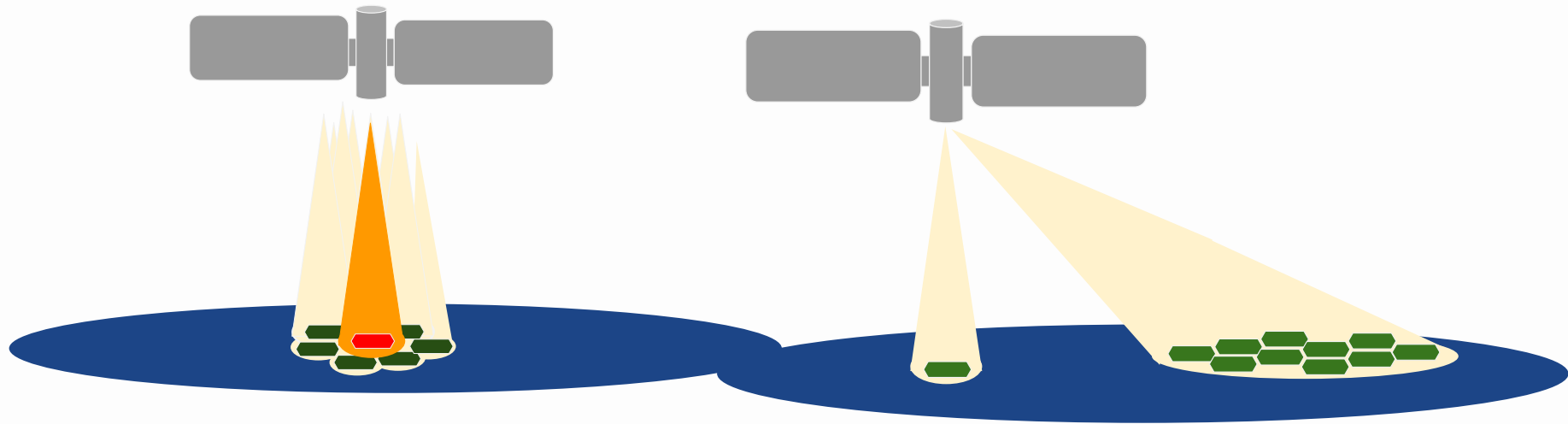
Highest demand in a single service area: **599.8 Gbps**

Maximum bandwidth served to single service area: **17.3 Gbps**

A: Starlink can serve these areas of greatest demand, but performance degrades during periods of high utilization

Evaluating Capacity

Q2: How many satellites to meet the required # of beams?



We build a model to estimate constellation size from the bandwidth demand of unserved US locs.

Evaluating Capacity

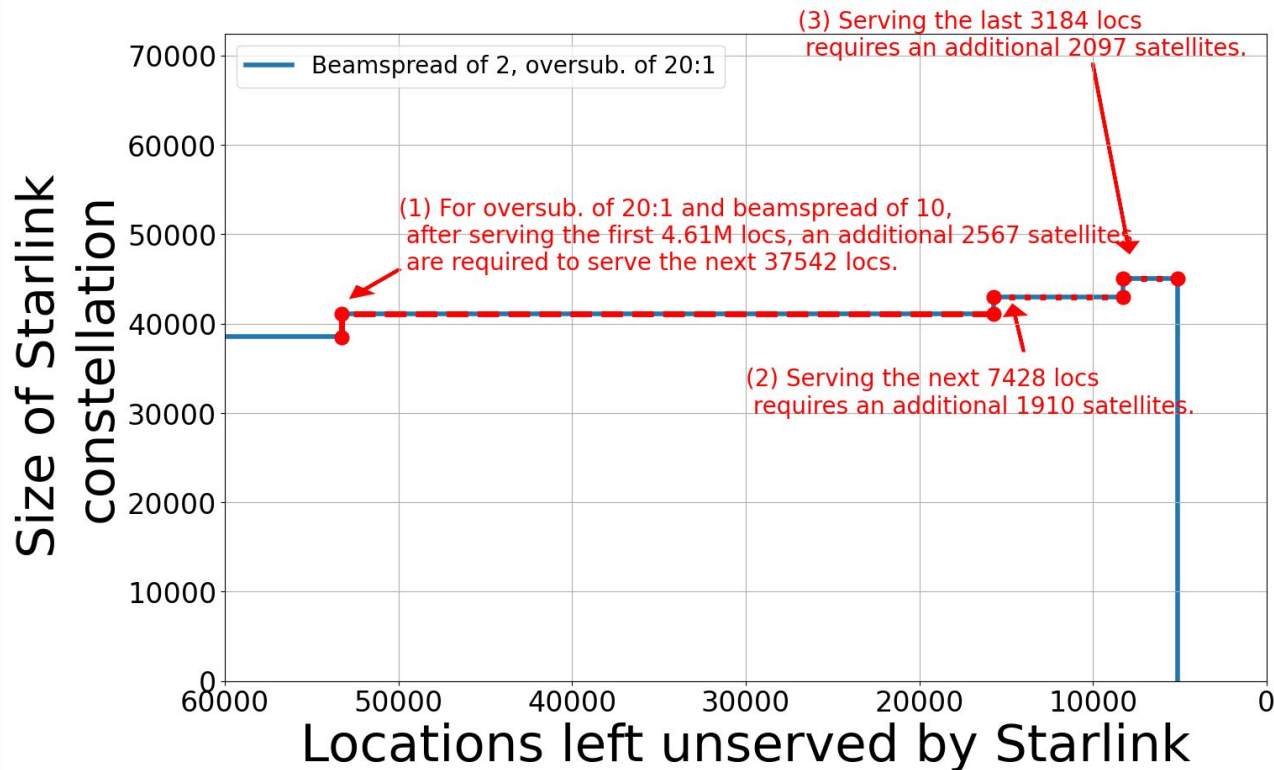
Q2: How many satellites to meet the required # of beams?

Beamspread Degree	Constellation size (full service)
1	79287 satellites
2	40611
5	16486
10	8284
15	5532

Starlink requires
~40,000 *additional*
satellites.

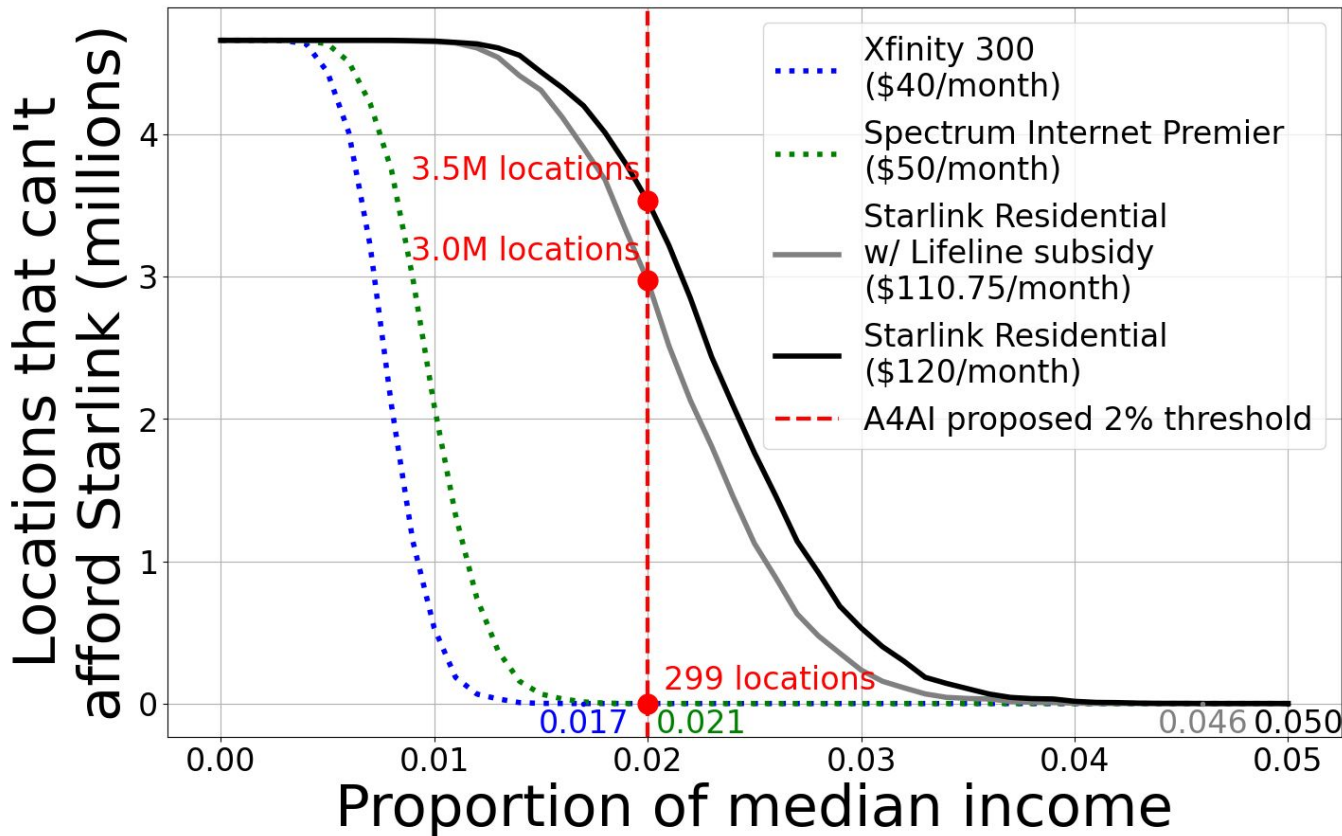
Evaluating Capacity

Q2: How many satellites to meet the required # of beams?



Increasing marginal costs disincentivizes coverage of all locations

Evaluating Affordability



As per Steve Song, Starlink is “just another rock” in filling the digital divide “jar”.

Closing the digital divide requires innovation of multiple forms, including novel technologies, new models of spectrum access and infrastructure sharing, and community or municipal-based approaches to connectivity

