



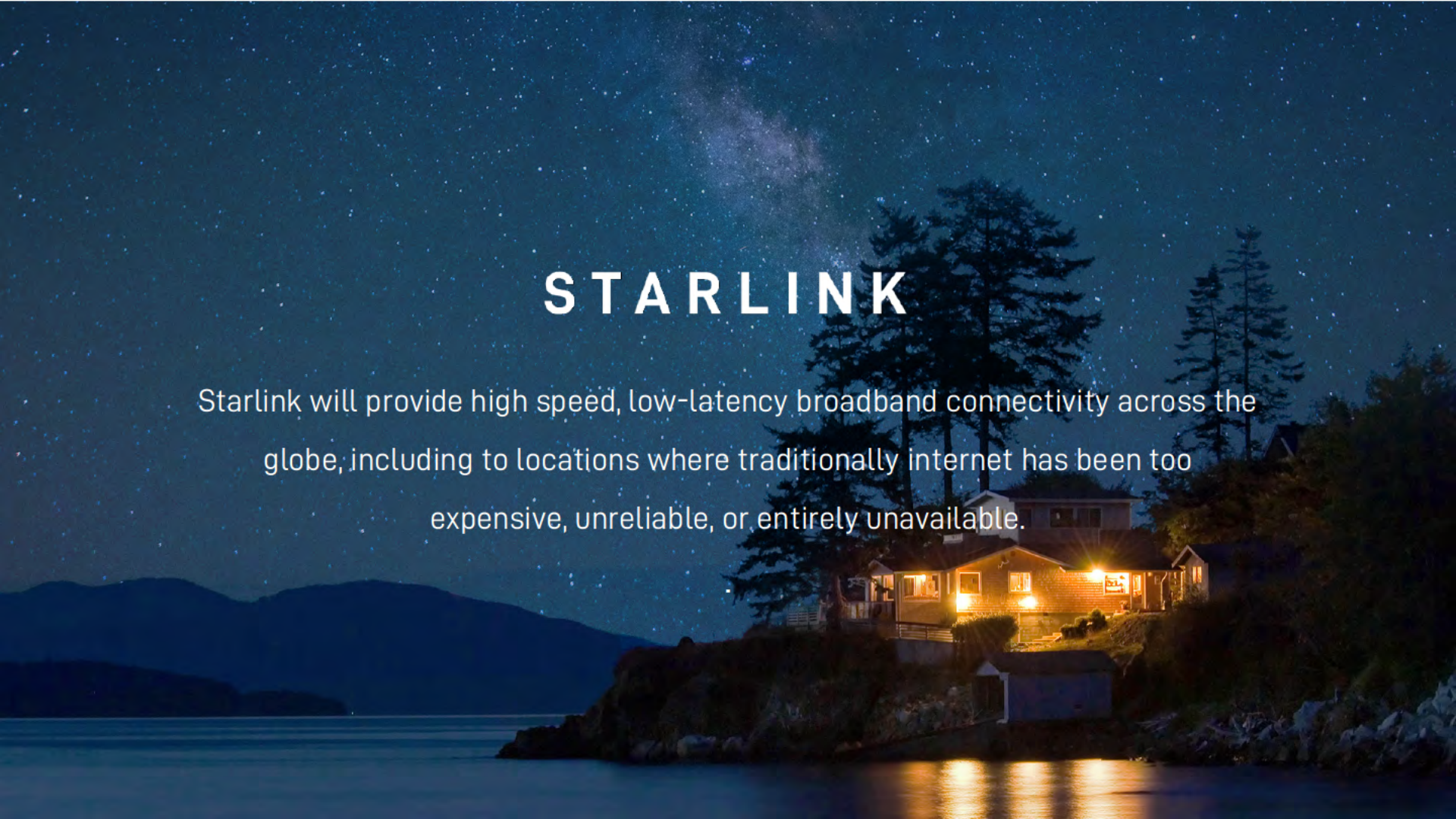


SpaceX is leveraging its experience in building rockets and spacecraft to
deploy the world's most advanced broadband internet system.



STARLINK

Starlink will provide high speed, low-latency broadband connectivity across the globe, including to locations where traditionally internet has been too expensive, unreliable, or entirely unavailable.



Starlink Deployment Plan

Starlink is targeting service in the Northern U.S. and Canada by the end of 2020, rapidly expanding to near global coverage of the populated world by 2021.

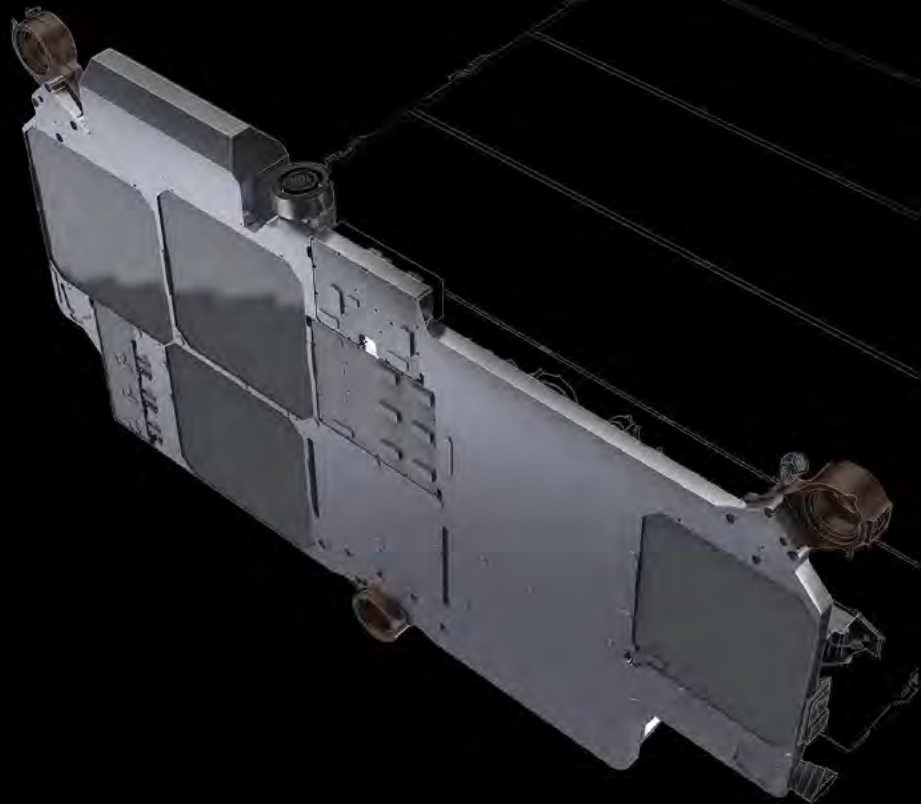
Total of 538 satellites launched as of June 18, 2020.

- **February 2018:** Two demonstration satellites launched
- **May 2019:** Initial 60 Starlink satellites launched (v0.9)
- **Nov 2019:** 60 more satellites launched – first v1.0 model
- **Q1-Q2 2020:** Launched additional 418 v1.0 satellites; one more launch scheduled 6/23.
- **Q3 2020:** Start Starlink beta testing for broadband service started in Northern US, Canada, ongoing launches
- **Q4 2020:** Target ~1400 satellites launched
- **2021-2022:** Currently planned polar deployment schedule



Global Broadband Connectivity

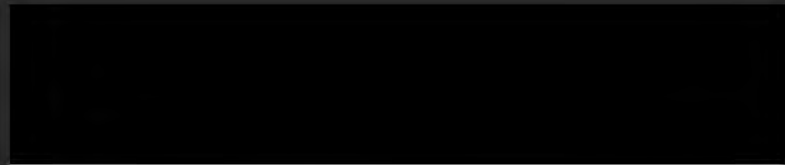
- High-speed, low latency broadband to any location on Earth
- Consumer service not yet published (speed/subscription price/user terminal offering)
 - First US beta tests starting early Q3 2020
 - [REDACTED]
 - [REDACTED]
- Rapid build-out of constellation – targeting 120 satellites launched per month with SpaceX's reusable Falcon 9 launch system
- Resiliency through path diversity: phased-array antennas for satellites and user terminals
- Responsible space operation with low altitude system and autonomous collision avoidance



User Terminals

Consumer user terminal is a flat phased array design

- 0.5 m diameter (19 inches)



Installation and activation

- Designed for self-installation by owner
- Once powered on, will automatically connect to satellite network

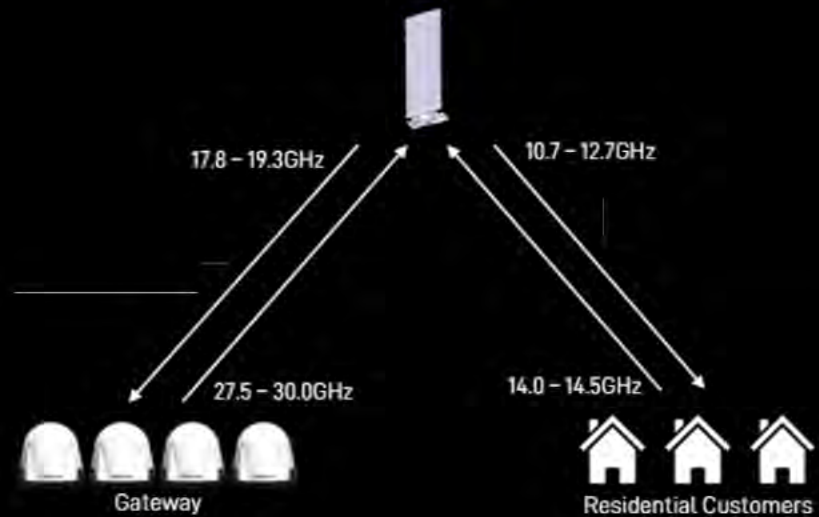


Operating Spectrum

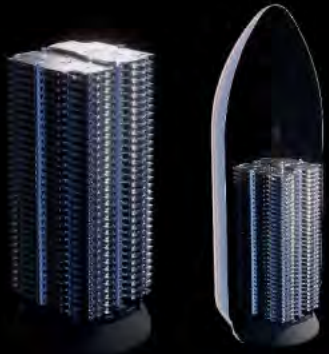
- Downlink: 10.7 – 12.7 GHz
- Uplink: 14.0 – 14.5 GHz



Starlink Network Overview



Starlink Technology



AN EFFICIENT, COMPACT DESIGN

allows for approximately 60 satellites to launch on each Falcon 9 rocket, enabling rapid constellation deployment



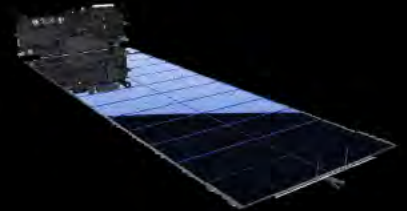
POWERFUL PHASED ARRAY ANTENNAS

and electronically steerable beams on each satellite enable precision placement of large data throughput



KRYPTON ION THRUSTERS & ON-BOARD GPS

provide efficient maneuvering capability on orbit, and autonomous collision avoidance with space debris and other satellites



FULLY DEMISEABLE MATERIALS

and a low 500km orbital altitude enable rapid disposal at end of life, more than 5x faster than industry standards



SATELLITES 1000km +

KEEPING SPACE CLEAN

At end of life, the satellites will utilize their on-board propulsion system to deorbit over the course of a few months. In the unlikely event the propulsion system becomes inoperable, the satellites will burn up in Earth's atmosphere within 1-5 years, significantly less than the hundreds or thousands of years required at higher altitudes.



STARLINK 550km

1000 km

550 km

