

Comment on HHS-OASH-2026-0397: Satellite-to-Gateway-to-Fiber Architecture

Submitted October 9, 2026

Submission details

Docket: [HHS-OASH-2026-0397](#), Request for Information on EMFs, RF Radiation, and Wireless Radiation Exposure

Federal Register notice: [FR Doc. 2026-19252](#), published September 21, 2026

Respondent: Sam Galiatsatos, Austin, Texas

Perspective (Q2): Individual consumer and family member

Questions addressed: 2, 5(n), 5(p), 9, 13(a), 13(d), 15(a)–(d), 16, 17, 18

Basis of evidence: Government notices and reports (HHS, FCC, NTIA program data), operator and integrator public material (SpaceX, Speedcast), and trade and news reporting. Sources are linked in each section and listed at the end.

Personal information: None. This comment contains no personal health information.

Summary

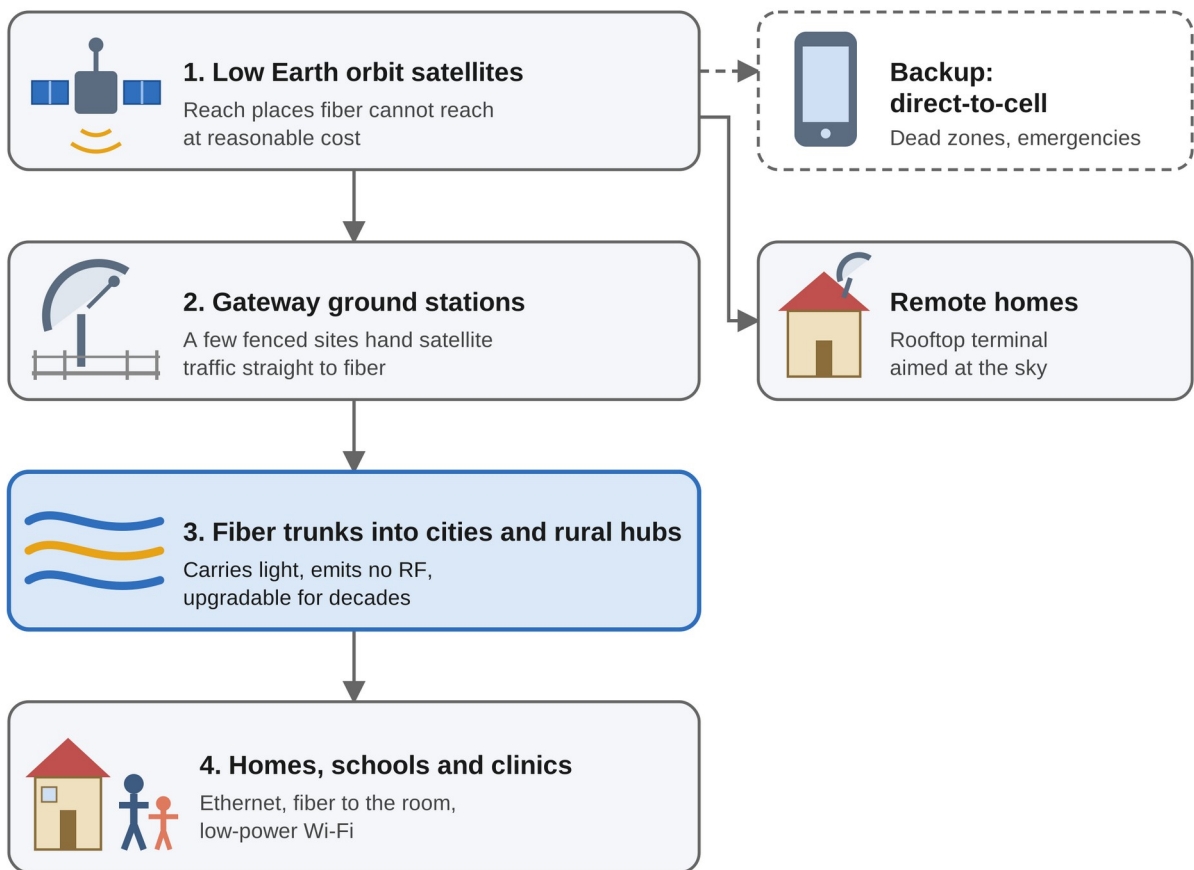
HHS should treat network architecture as a lever for reducing exposure, and should favor a satellite-to-gateway-to-fiber build in federal health and broadband policy.

The RFI states that HHS wants practical strategies "to reduce unnecessary exposure where appropriate." How a network is built decides how many transmitters sit near homes, schools and clinics. The build I recommend has four layers:

1. **Orbit.** Low Earth orbit satellites, such as SpaceX Starlink, reach locations where fiber cannot be built at reasonable cost.
2. **Gateways.** Ground stations receive satellite traffic and hand it directly to fiber. A small number of fenced sites serves a wide region.
3. **Fiber trunks and hubs.** Fiber carries traffic into cities and rural towns. Fiber carries light and emits no RF.
4. **The last meter.** Inside homes, schools and clinics, wired connections and low-power Wi-Fi that people can switch off.

Figure 1. Satellite capacity lands on fiber before it reaches people

Satellite capacity lands on fiber before it reaches people



Main beams from terminals and gateways point up. Below the gateway, the path is wired to the building.

Below the gateway, the chain stays wired until low-power Wi-Fi inside the building. Satellite terminals and gateways aim their main beams at the sky.

This recommendation does not depend on a finding that current federal limits are unsafe. It reduces exposure that a network does not need, while HHS reviews the evidence. Fiber also gives communities capacity that can be raised for decades by upgrading the equipment at each end, without new trenching.

Q13(a) and 13(d): 5G and satellite communications

The main difference between 5G and satellite broadband, for cumulative exposure, is where the transmitters sit relative to people.

- **5G (13a)**. Higher-frequency 5G bands, especially millimeter-wave, travel short distances. Coverage needs more sites, mounted closer to streets, homes and schools. Cumulative neighborhood exposure therefore depends on how many sites are built and how close they are.

- **Fixed satellite broadband (13d).** The transmitter serving the user is in orbit. The terminal at a home transmits upward, toward the satellite. Gateways also transmit upward, from a limited number of fenced sites.
- **Satellite direct-to-cell (13d).** This is a separate pattern. SpaceX has [deployed more than 600 direct-to-cell satellites since 2024, serving over six million users](#). The [FCC approved SpaceX's purchase of EchoStar spectrum on May 12, 2026](#), and [faster service is targeted for testing in late 2027](#). Here the phone itself is the transmitter near the body.

Recommendation. HHS should classify fixed satellite broadband and satellite direct-to-cell separately. It should also describe every technology by where its transmitters sit relative to people, alongside frequency and power.

Q15(a)–(d): Evidence on wireless infrastructure

Infrastructure evidence should record how far each transmitter is from people and how many transmitters a given network design requires.

- **(a) Proximity.** Record the distance from each transmitter to homes, schools, childcare facilities, healthcare facilities and workplaces.
- **(b) Cumulative neighborhood exposure.** Measure the combined exposure from all sources in a neighborhood, including phones and home Wi-Fi.
- **(c) Antenna density.** Track transmitters per square kilometer as a standard metric. Network design drives this number. A town served by fiber, fed from a regional gateway, needs no transmitter on the street to deliver home broadband.
- **(d) Small-cell deployment.** Small cells near schools and bedrooms should be disclosed to residents (see Q9).

Why gateways matter here. [Starlink gateways connect satellites to existing fiber](#), and a user needs a gateway within roughly 500 miles. In Rwanda, the country's [first Starlink gateway connects directly to the national fiber backbone](#). A few gateway sites can therefore feed fiber across a large region.

Q5(n) and 5(p): Regulatory changes and classification

HHS should add network architecture to how it assesses and reports exposure, and should work with the agencies that fund and license networks.

5(n): Changes that would improve assessment and regulation

- **Report architecture with exposure.** When HHS evaluates exposure from wireless infrastructure, report transmitter density and the type of backhaul (fiber, wireless or satellite) alongside device limits.
- **Coordinate with NTIA and the FCC.** Federal broadband funding should count lower neighborhood transmitter density as a public health benefit when fiber or gateway-fed hubs are chosen. The FCC has a [parallel RF exposure proceeding with comments due October 22](#).
- **Lead with HHS-funded facilities.** For rural clinics and research sites that HHS funds, prefer fiber connections, fed through gateways where terrain requires.

5(p): Classification

The RFI's list already includes distance from the source, proximity to the body, beamforming and cumulative exposure. I recommend that a classification system also record:

- **Beam direction.** Whether the main beam points toward the sky (satellite terminals and gateways) or toward occupied buildings and streets.
- **Site density.** Transmitters per square kilometer in the area served.
- **Service role.** Whether a transmitter provides primary everyday service or backup coverage for dead zones and emergencies.

Q9: Disclosure

Residents and local officials should be able to see where transmitters are and how their own service reaches them.

Audience	What should be disclosed
Local governments and residents	A public map of transmitter sites with operator, frequency band and mounting height
Schools and childcare facilities	Notice when a transmitter is installed within a distance HHS sets based on the evidence
Broadband subscribers	Whether service reaches the home by fiber, cable, fixed wireless or satellite
Consumers	Plain guidance on using wired connections and device settings to lower exposure at home, if they choose

Q16 and Q17: Research priorities and coordination

The first research need is measurement: real-world exposure in neighborhoods built with different network designs.

Q16: Priority gaps

- **Exposure by architecture.** Compare measured exposure in neighborhoods served by dense small cells, by fiber to the home, and by satellite in rural areas. Health studies can then be designed on known exposure.
- **Satellite direct-to-cell.** Measure handset exposure from satellite links as that service grows, since the phone is the nearest transmitter.
- **Children at school.** Measure exposure in classrooms, a population the RFI names as a priority.

Q17: Coordination

Agency	Proposed role
FDA	Device emission data, under its authority over radiation-emitting electronic products (21 CFR subpart J, cited in the RFI)

NIH	Fund exposure-to-health studies with pre-registered protocols and published methods
CDC	Environmental monitoring and surveillance design
FCC and NTIA (outside HHS)	Joint exposure mapping, and alignment of broadband funding with the findings

Q18: Additional information

Federal broadband spending and HHS's own research programs already point toward this build.

Federal broadband money favors fiber. Under the revised BEAD program, about [67.1% of eligible locations will get fiber and 20.5% low Earth orbit satellite](#). States are now being asked to [remove up to half of their satellite locations](#), because the program pays satellite providers for reserved capacity instead of a physical build. Fiber as the backbone, with satellite where fiber cannot reach, matches where federal dollars are going.

A rural hub model already exists. Starlink Community Gateways [sell internet transit to local internet providers](#), and customers [pay a one-time cost plus a monthly rate in 1 Gbps increments](#). A rural town can take that capacity and run fiber or copper to each home.

HHS's clinical trial program needs this connectivity. ARPA-H [launched STACK on September 30, 2026](#) to help research-naïve sites run clinical trials. STACK aims to [bring trials to patients where they live, including rural areas](#). A rural clinic producing regulatory-grade data needs a stable, high-capacity connection. Fiber, fed through a gateway where needed, provides it without adding transmitters near patients.

Satellite direct-to-cell has a place as backup. It has [carried communications for more than 1.5 million people during recent U.S. disasters](#). I recommend it as coverage for dead zones and emergencies, with everyday service carried by fixed connections.

Limits of this comment

This comment recommends an infrastructure approach. It does not claim that exposure below current federal limits causes harm.

- **Current scientific assessments.** Reviews by the WHO and ICNIRP have [concluded that RF exposure below recommended limits is unlikely to cause adverse health effects](#). The FCC has stated that no scientific evidence establishes a causal link between wireless device use and cancer or other illness.
- **Trade-offs.** Fiber is costly and slow to build in remote terrain. Satellite capacity is limited, which is one reason BEAD satellite awards are being reduced. Gateways and home terminals are transmitters too, though their main beams point at the sky.

- **Vendor neutrality.** I use SpaceX as the leading working example. The recommendation applies to any operator that builds on the same satellite, gateway and fiber layers.

References

1. HHS, [Request for Information on EMFs, RF Radiation, and Wireless Radiation Exposure](#), FR Doc. 2026-19252, September 21, 2026.
2. HHS, [HHS Seeks Public Input on Electromagnetic Fields and Wireless Radiation](#), press release.
3. HHS, [HHS Launches SURPASS and New Efforts to Accelerate Faster, Smarter Clinical Trials](#), September 30, 2026.
4. Speedcast, [Starlink Community Gateway brochure](#).
5. Converge Digest, [SpaceX EchoStar spectrum and Direct to Cell milestones](#), July 14, 2026.
6. Satnews, [SpaceX Unveils 150Mbps Performance Target for Upgraded Direct-to-Cell Starlink](#), February 25, 2026.
7. Basenor, [FCC Approves SpaceX Starlink Direct-to-Phone 5G Spectrum Deal](#), May 12, 2026.
8. ARRL, [FCC and HHS Initiate New Proceedings on RF Exposure](#), September 25, 2026.
9. AIP FYI, [HHS Seeks Public Input on Wireless Technology Safety](#), September 24, 2026.
10. Broadband Breakfast, [Satellite BEAD Awards to be Reduced](#), July 14, 2026.
11. Blandin on Broadband, citing Fierce Network, [BEAD technology mix](#).
12. KUT, [RFK Jr. announces partnership with Dell Medical School to boost clinical trials](#), October 1, 2026.
13. DatacenterDynamics, [Starlink expands ground infrastructure in Chile, deploys community gateway in Galapagos](#).
14. Space in Africa, [Rwanda and SpaceX Advance Starlink Rollout with First Gateway Installation Planned](#), October 2, 2025.
15. Raupach, [Groundstations](#) (gateway range of roughly 500 miles).