

Re: Comments of the Secure World Foundation on the Application for Orbital Data Centers by Space Exploration Holdings LLC (ICFS File No. SAT-LOA-20260108-00016)

March 6, 2026

**Federal Communications Commission
45 L Street NE
Washington, D.C. 20554**

Executive Summary

The Secure World Foundation (“SWF”) appreciates the consultative approach by the Federal Communications Commission (“FCC” or “Commission”) in seeking public comment on an application by Space Exploration Holdings, LLC (“SpaceX” or “the Applicant”) for a new non-geostationary orbit (NGSO) system of up to one million satellites.

SWF recognizes the important role that U.S. commercial innovation has played in advancing space capabilities. In particular, SpaceX has demonstrated leadership in operational safety, transparency, and responsible debris mitigation practices. At the same time, the application before the Commission is unprecedented in scale and ambition. It raises novel technical, environmental, and governance considerations that extend beyond the Commission’s routine licensing practice and expertise, and warrants commensurate regulatory scrutiny and system-level evaluation.

From an orbital stewardship perspective, SWF respectfully offers the following recommendations to assist the FCC in ensuring that its decision process both supports innovation and safeguards the long-term sustainability of the space environment.

- a) The Commission should evaluate the application as a **precedent-setting, non-routine** request. Consequently, **all waivers should be denied or deferred**, until the Applicant provides a sufficiently detailed technical record to enable assessment of risks at full scale.
- b) The Commission should require **system-level analysis and disclosure** from the Applicant, including for cumulative collision risks, post-mission disposal (PMD) performance, and aggregate interference effects.
- c) The Commission should consider a **phased, demonstration-based authorization approach**, with strict reporting, transparency commitments, and clear performance benchmarks prior to any expansion.

- d) Given the expansive nature of the considerations associated with a constellation of this magnitude, the Commission should **initiate a parallel Notice of Inquiry** to address externalities and cumulative metrics of very large constellations, drawing upon relevant interagency expertise to ensure that future applications of similar scale are evaluated under clear, updated standards.

We believe these steps are consistent with the FCC's public interest mandate and will support the continued growth of the U.S. space sector while promoting long-term stability and sustainability in space operations. They will also ensure that U.S. leadership in commercial space continues to be defined by safety, responsible governance, and transparency.

A. Responsibility in Precedent Setting

1. U.S. leadership in commercial innovation has catalyzed the modern space economy, empowering the private sector to play a central role in shaping the global norms by which space is accessed and used today. SpaceX has demonstrated leadership in operational safety and sustainability through its Starlink constellation, with conservative maneuver thresholds, strong PMD performance, and proactive information sharing. These practices set a positive example globally.

2. However, this is not a routine NGSO satellite system application. Its scale is qualitatively different from prior filings. At the time of writing, there are slightly under 15,000 active satellites in LEO; this application is for up to one million. Even constellations at a fraction of this application (e.g., 100,000) represent a material increase in the orbital population.

3. Licensing decisions for this application will set an international precedent. This is especially pertinent as other nations and commercial entities are also looking to deploy constellations that are orders of magnitude larger than existing authorizations and operations. Hence, the FCC must evaluate this application as such – **precedent-setting and non-routine** – and apply a proportionate level of attention and evaluation.

4. We thus urge the Commission **to deny or defer all waivers** requested by the Applicant – including processing round bypass, milestones and deployment obligations, surety bond requirements, and any completeness relief with regard to Schedule S information submission – until the Applicant provides a sufficiently detailed technical record to enable assessment of risks at full scale.

B. Safety and System-Level Integrity

5. Authorization requirements should, as a matter of principle, uphold system-level safety beyond individual satellite performance, and ensure that cumulative risks across the constellation remain demonstrably controlled. At the scale of this application, the distinction between per-satellite compliance and aggregate outcomes becomes critical. At full deployment, a 99% PMD success rate implies up to 10,000 PMD failures; a 1-in-1,000 per satellite collision risk compounds quickly over a million spacecraft; similarly, a 1-in-10,000 risk of human casualty from each surviving debris may become non-trivial. Existing compliance metrics are not designed for million-satellite constellations; simply meeting these per-satellite requirements does not entail that the Application fulfills the safety objectives these requirements are meant to achieve.

6. In addition, the current application lacks sufficient information and detail for an adequate technical and public interest assessment. Certain elements appear conceptual or evolving in nature (e.g., the wide range of operational altitudes), which could suggest that the proposed constellation is early in development and may contain speculative aspects. It would be prudent to ensure that authorization does not precede technical clarity if key operational assumptions and parameters remain to be worked out.

7. We have separately expressed support for FCC's regulatory streamlining efforts to bolster U.S. competitiveness, on the premise that streamlining should not diminish the integrity of technical and public interest scrutiny. Similar considerations apply here. We thus recommend that the Commission require a **system-level analysis and disclosure** from the Applicant, including for cumulative collision risks, PMD performance, and aggregate interference effects.

C. Sustainable Space Operations and Access

8. FCC public interest considerations should include long-term access implications for future U.S. civil and commercial space operators. Approving a constellation of this scale without thorough technical analysis and reporting requirements may have unintended implications for U.S. competitiveness by limiting or restricting access for current and future operators.

9. For example, significant deployment in high-demand, sun-synchronous orbits warrants careful consideration of long-term orbital capacity and sustainability. The use of disposal orbits with long orbital lifetimes could create persistent object populations in currently less-congested regimes, and should be evaluated accordingly. In addition, for heliocentric disposal at this scale, remediation options for failed attempts are uncertain, and governance frameworks are underdeveloped. The FCC should exercise caution in setting irreversible national authorization precedents without adequate safeguards.

10. SWF recognizes the innovative thinking reflected in the application regarding in-orbit reuse, recycling, and potential circularity concepts. This presents an opportunity to demonstrate how U.S. commercial innovation can advance reliable and sustainable space operations at scale. We encourage SpaceX to provide further technical and operational clarity in this area.

11. To balance support for commercial innovation with considerations for long-term space sustainability and intergenerational equity, we recommend that FCC consider a **phased, demonstration-based authorization approach**, with strict reporting, transparency commitments, and clear performance benchmarks prior to any expansion.

D. Responsible governance and regulatory stewardship

12. Decisions of this magnitude should reinforce confidence in the integrity, transparency, and durability of the U.S. licensing regime. In addition to the safety and sustainable access considerations discussed above, this application raises broader governance issues that need to be given due consideration at the national level. The Commission should work with relevant entities to ensure that any authorization granted at this scale is grounded in a clear, technically robust record that can withstand domestic and international scrutiny.

13. Specifically, large constellations of this scale raise externalities that extend beyond spectrum interference considerations. A non-exhaustive list of such externalities includes:

- a) Governance, coexistence, and transparency considerations associated with systems that intend to “rely nearly exclusively” on optical links;
- b) The limits of typical radio frequency-based coordination mechanisms in managing shared access where physical congestion or interference, rather than spectrum interference, may become the constraining factor;
- c) The impact of increased launch cadence on airspace management, operational disruptions, and closures;
- d) The potential environmental impact of associated launch activities, including whether existing categorical exclusions from NEPA remain appropriate when considering constellations several orders of magnitude larger than those previously licensed;
- e) Aggregate atmospheric and spacecraft ablation effects associated with mass reentry at this scale, which are not yet fully understood; and

- f) Cumulative impacts on dark and quiet skies and long-term implications for optical and radio astronomy.

14. SWF acknowledges that these externalities may not fit squarely within FCC's scope of authority and areas of expertise. Nevertheless, their potential long-term impact warrants careful examination at the national level. In this regard, the FCC should take into account parallel efforts within the U.S. government that could shape the institutional framework for such applications. For example:

- a) Executive Order 14335 directs the Department of Commerce to develop a mission authorization process for space activities "not clearly or straightforwardly governed by existing regulatory frameworks" – a description that could encompass orbital data centers, operation of which involves aspects that are not clearly within the scope of existing licensing frameworks.
- b) The Office of Space Commerce ("OSC") is concurrently advancing the Traffic Coordination System for Space ("TraCSS"), which could meet the space situational awareness needs of very large constellations, but the system is still transitioning to full operation.

These efforts may produce considerations, standards, or determinations that support a more informed policy landscape for addressing these externalities. Granting full authorization for a million-satellite constellation before that landscape clarifies risks creating governance gaps and locking in irreversible outcomes. It is also important to clarify gaps in the U.S. space licensing structure in order to provide commercial space operators a clear and consistent regulatory playing field.

15. In addition, U.S. licensing decisions routinely inform international processes, including ongoing discussions at the United Nations Committee on the Peaceful Uses of Outer Space on long-term sustainability and responsible behaviors. National authorization at an extreme scale should therefore be calibrated to avoid foreclosing or constraining future multilateral outcomes that may better address aggregate safety and sustainability challenges.

16. This Application creates an opportunity for relevant agencies – including the FCC, the OSC, the Federal Aviation Authority, and drawing upon the technical expertise of the National Aeronautics and Space Administration – to convene a coordinated national approach to the authorization of very large constellations, so as to ensure that such assessments adequately address the long-term safety, sustainability, and public interest considerations across the breadth of issues at stake.

17. Hence, we recommend that the Commission **initiate a parallel Notice of Inquiry** to address very large constellation externalities and cumulative metrics, drawing upon relevant interagency expertise to ensure that future applications of similar scale are evaluated under clear, updated standards. Doing so would demonstrate that U.S. leadership in commercial space is matched by leadership in responsible governance.

Conclusion

18. History shows that bold visions can accelerate innovation and human progress. The Secure World Foundation believes that progress in space is not defined by infrastructure scale alone. The promise it holds relies on sustained access to shared spectrum and orbital resources. We must therefore prioritize the responsible stewardship of our space environment to preserve long-term operational safety and stability, and to secure an enduring foundation upon which American innovation and leadership in space can flourish for generations to come.