

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration Office of Commercial Space Transportation

Finding of No Significant Impact and Record of Decision for

Final Tiered Environmental Assessment for Updates to Airspace Closures for Additional Launch Trajectories and Starship Boca Chica Landings of the SpaceX Starship-Super Heavy Vehicle at the SpaceX Boca Chica Launch Site in Cameron County, Texas

Summary

In 2022, the Federal Aviation Administration (FAA) prepared a Final Programmatic Environmental Assessment (2022 PEA) to analyze the potential environmental impacts of issuing an experimental permit(s) and/or a vehicle operator license to SpaceX for Starship/Super Heavy launch operations at its existing Boca Chica Launch Site in Cameron County, Texas. The federal action also included the FAA's issuance of temporary airspace closures. The Mitigated Finding of No Significant Impact and Record of Decision for the SpaceX Starship/Super Heavy Launch Vehicle Program at the SpaceX Boca Chica Launch Site in Cameron County, Texas was issued in June 2022.

The FAA prepared the April 2025 Final Tiered Environmental Assessment for SpaceX Starship/Super Heavy Vehicle Increased Cadence at the SpaceX Boca Chica Launch Site in Cameron County, Texas (2025 Tiered EA) to analyze the potential environmental impacts of modifying SpaceX's vehicle operator license for Starship Super/Heavy launches from Boca Chica (VOL-23-129) that would allow for an increased launch and landing cadence of the Starship/Super Heavy launch vehicle at its existing Boca Chica Launch Site in Cameron County, Texas.

This attached Final Tiered EA is tiered from the 2022 PEA and the 2025 Tiered EA.

After reviewing and analyzing this Tiered EA, including all available data and information on existing conditions and potential impacts, the FAA has determined that modifying SpaceX's vehicle operator license to support updated operations for additional launch trajectories and Starship Return to Launch

Site mission profiles for Starship-Super Heavy operations at the Boca Chica Launch Site would not significantly impact the quality of the human environment within the meaning of NEPA. Therefore, the preparation of an Environmental Impact Statement is not required, and the FAA is independently issuing this Finding of No Significant Impact (FONSI) and Record of Decision (ROD). The FAA has made this determination in accordance with applicable environmental laws and FAA procedures. The final Tiered EA is incorporated by reference into this FONSI/ROD.

For any questions or to request a copy of the Tiered EA, contact the Environmental Program by mail or email. A copy of the Tiered EA may also be obtained from the FAA's website:

https://www.faa.gov/space/stakeholder_engagement/spacex_starship

Environmental Program
Operational Support Branch ASA 140
Office of Commercial Space Transportation
Federal Aviation Administration
201 4th St. SE
Washington DC 20003
9-AST-Environmental@faa.gov

Purpose and Need

As stated in the November 2025 final Tiered EA, the purpose of SpaceX's Proposed Action is to provide greater mission capability to NASA and the Department of Defense. SpaceX's activities would continue to fulfill the U.S. expectation that increased capabilities and reduced space transportation costs will enhance exploration (including within the Artemis and Human Landing System programs), support U.S. national security, and make space access more affordable. The Space Transportation section of the National Space Transportation Policy of 1994 addressed the commercial launch sector, stating that "assuring reliable and affordable access to space through U.S. space transportation capabilities is a fundamental goal of the U.S. space program." In addition, the 2021 Space Priorities Framework's Mission states, "The United States will bolster the health and vitality of our space sectors – civil, commercial, and national security – for the benefit of the American people and leverage that strength to lead the international community in preserving the benefits of space for future generations." Moreover, Executive Order 14335, *Enabling Competition in the Commercial Space Industry*, states, as follows: "Ensuring that United States operators can efficiently launch, conduct missions in space, and reenter United States airspace is critical to economic growth, national security, and accomplishing Federal space objectives."

SpaceX's proposed action is needed to facilitate frequent launch and landing operations to allow iterative development of Starship-Super Heavy vehicles to achieve rapid launch capability and increase operational efficiency, capabilities, and cost effectiveness of the Starship-Super Heavy program. Satisfaction of these needs benefits government and public interests and reduces operational costs. Demand for launch services has continued to increase over the past 20 years, and the space industry's growth projections indicate this will continue into the foreseeable future. By providing a reusable launch vehicle that returns to its launch site, the proposed action would reduce the cost of launch and increase efficiency, delivering greater access to space and enabling cost-effective delivery of cargo and people to the Moon and Mars. SpaceX's proposed action would satisfy requirements for more efficient and effective space transportation methods and continue the U.S. goal of encouraging activities by the private sector to strengthen and expand U.S. space transportation infrastructure.

Proposed Action

SpaceX's Proposed Action is to conduct operations for a range of different mission profiles for orbital Starship-Super Heavy vehicle operations at the Boca Chica Launch Site. Updated operations include additional launch trajectories and Starship Return to Launch Site mission profiles. Additional launch trajectories are needed to support orbital trajectories for Starship Return to Launch Site mission profiles.

The southernmost Starship-Super Heavy launches and Super Heavy booster landings could impact the airspace of Mexico, Cuba, Jamaica, and the Cayman Islands. Mexico, Cuba, Jamaica, and the Cayman Islands would be expected to close their respective airspace. Starship-Super Heavy launches and Super Heavy booster landings with a Florida overflight would impact air routes extending eastward from the launch site over portions of the Gulf of America, northern Florida, and Atlantic Ocean.

Starship Return to Launch Site operations and Starship landings in the Gulf of America would impact air routes extending westward from the Boca Chica launch site through Mexico and portions of Texas, Arizona, New Mexico, and California, covering approximately 3,700 nautical miles.

Integrating the proposed new mission profiles for Starship-Super Heavy launch operations and Super Heavy booster landings, and Starship Return to Launch Site operations and Starship landings in the Gulf of America, from Boca Chica into the NAS would require the FAA to conduct ground stops commensurate with the timing of the Aircraft Hazard Areas (AHA) and the miles in trail (distance between aircraft) for spacing and volume control as well as rerouting aircraft around the AHA. Due to the length AHAs, certain flights, especially international, may elect to delay the departure time due to

the inability to accept a reroute caused by fuel constraints or the flight time of the reroute. According to the FAA National Airspace System assessment, the average expected flight delay for launches⁶ would last approximately 40 minutes and could last up to two hours, and could be from 40 minutes to two hours for Starship Return to Launch Site operations and Starship landings in the Gulf of America. General aviation operations would be similarly impacted; however, general aviation operations typically have more flexibility for flight planning than commercial flights, due to the nature of connecting commercial flights. The Proposed Action is described in detail in Chapter 2 of the final Tiered EA.

Federal Action

The FAA's federal action is to modify SpaceX's existing vehicle operator license to authorize SpaceX to update operations for additional launch trajectories and Starship Return to Launch Site mission profiles for Starship-Super Heavy operations at the Boca Chica Launch Site, along with potential renewals and modifications to licenses within the scope of operations analyzed in the final Tiered EA. In addition, the FAA's federal action includes issuance of temporary airspace closures (i.e. AHAs).

Alternatives

Alternatives analyzed in the Tiered EA include: (1) the Proposed Action; and (2) the No Action Alternative. The No Action Alternative provides the basis for comparing the environmental consequences of the Proposed Action and is consistent with that contained in the April 2025 Tiered EA. Under the No Action Alternative, the FAA would not modify SpaceX's license for Starship Return to Launch Site mission profiles or additional Starship-Super Heavy launch trajectories with updates to the airspace closure areas. Without these updates, SpaceX would not be able to continue the iterative development of Starship-Super Heavy and strive towards its goal of providing greater mission capability for the government and commercial space sectors.

Environmental Impacts

The potential environmental impacts of the Proposed Action and No Action Alternative were evaluated in the attached final Tiered EA for each environmental impact category identified in FAA Order 1050.1G. Chapter 3 of the final Tiered EA describes the affected environment and regulatory setting and identifies the environmental impact categories that are not analyzed in detail: biological resources (terrestrial and marine wildlife); cultural resources; Department of Transportation Act, Section 4(f) resources; natural resources and energy supply; visual resources; children's health and safety risks; farmlands; and wild

and scenic rivers. Chapter 3 of the final Tiered EA also provides evaluations of the potential environmental consequences of the Proposed Action for each of the environmental impact categories and documents the finding that no significant environmental impacts would result from the Proposed Action.

A summary of the documented findings for each impact category, including requisite findings with respect to relevant special purpose laws, regulations, and executive orders, is presented below.

- **Noise and Noise-Compatible Land Use**, final Tiered EA section 3.1. Airspace closures associated with the Proposed Action could result in temporarily grounded aircraft at affected airports and re-routing of en route flights on established alternate flight paths, which themselves are assessed by the FAA under NEPA. Aircraft could be temporarily grounded if airspace above or around the airport is closed. Ground delays are also used under some circumstances to avoid airborne reroutes. If aircraft were grounded, noise levels at the airport could temporarily increase if the planes sit idle; some aircraft would likely shut down engines altogether until the closure has lifted. Also, depending on the altitude at which aircraft approach an airport, there could be temporary increases in noise levels in communities around the airports. Aircraft would travel on existing routes and flight paths that are used on a daily basis to account for weather and other temporary restrictions. Any incremental increases in noise levels at individual airports would only last the duration of the airspace closure and are not expected to meaningfully change existing day-night average sound levels at the affected airports and surrounding areas. Therefore, airspace closures due the Proposed Action are not expected to result in significant noise impacts.

FAA Order 1050.1G, Exhibit A-1 provides the FAA's significance threshold for Noise and Noise-Compatible Land Use: "[t]he action would result in noise exposure from impulsive noise sources (e.g., sonic booms) that meet or exceed 60 CDNL – equivalent to DNL 65 dBA. The action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB."

FAA Order 1050.1G, Exhibit A-1 also provides factors to consider: "[s]pecial consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within

Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question. For example, the DNL 65 dB threshold does not adequately address the impacts of noise on visitors to areas within a national park or national wildlife and waterfowl refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute, and due to the nature of the resource has limited options for mitigation.”

Based on the above findings, the data and analyses are consistent with those discussed in the 2022 PEA and April 2025 Tiered EA, and the Proposed Action would not result in significant impacts to noise and noise compatible land use.

- **Aviation Emissions and Air Quality**, final Tiered EA section 3.2. Airspace closures associated with the Proposed Action would lead to increased emissions from aircraft. This is mainly because aircraft would need to take pre-established alternative flight routes, which themselves are assessed by the FAA under NEPA. This would result in the usage of more fuel. Increases in emissions would result from the additional fuel usage. While rerouting would be a short-lived scenario for affected aircraft and commensurate with the timing of the airspace closures, the emissions from the effects of the launches and vehicle returns, considering the number of aircraft impacted, would not be significant.

FAA Order 1050.1G, Exhibit A-1, provides the FAA’s significance threshold for Air Quality: “[t]he action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the Environmental Protection Agency under the Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.”

Based on the above findings, the data and analyses are consistent with those discussed in the 2022 PEA and April 2025 Tiered EA, and the Proposed Action would not result in significant impacts to air quality.

- **Hazardous Materials, Solid Waste, and Pollution Prevention**, final Tiered EA section 3.3. A launch could result in debris and hazardous materials being distributed below the AHAs. The size of AHAs can grow or shrink as reliability is either decreased or increased with results and

analysis from each launch. If any anomalies occurred during the operation, SpaceX would respond to all accidental releases of polluting substances quickly and implement appropriate cleanup measures in accordance with applicable laws to minimize impacts to the environment. A near-surface ship explosion or a high-altitude breakup of the ship would create a debris field comprised of mostly heavy-weight metals and some composite (e.g., carbon fiber) materials. Debris would consist predominantly of stainless steel and silica, which are both inert and non-toxic. If deposited in the water, most of these materials would sink rapidly through the water column, while some items may stay buoyant on the surface or suspended in the water column before sinking towards the seafloor. Any residual propellants present would be non-toxic and are anticipated to evaporate or be diluted quickly due to surface currents and ocean. Anomalies may also result in the release or ignition of up to 34 gallons of hydraulic fluid, which is a hazardous material. Any remaining hazardous materials such as ordnance, or chemicals would be transported back to SpaceX in accordance with regulations for transport of hazardous substances.

The FAA has not established a significance threshold for Hazardous Materials, Solid Waste, and Pollution Prevention. Instead, FAA Order 1050.1G, Exhibit A-1 provides the following factors to consider: “[t]he action would have the potential to violate applicable Federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management; involve a contaminated site (including but not limited to a site listed on the National Priorities List). Contaminated sites may encompass relatively large areas. However, not all of the grounds within the boundaries of a contaminated site are contaminated, which leaves space for siting a facility on non-contaminated land within the boundaries of a contaminated site. Further, construction that does not impact existing caps or ongoing monitoring within contaminated areas may not also result in releases of contaminated material. An EIS may not be required in these instances. See the Desk Reference for mitigating impacts below significant levels (e.g., modifying an action to site it on non-contaminated grounds within a contaminated site). Therefore, if appropriately mitigated, actions within the boundaries of a contaminated site would not have significant impacts; produce appreciably larger quantities or increased or more types of hazardous waste; generate appreciably larger quantities or types of solid waste; use a different method of waste collection, treatment, storage, or disposal that, as an action, would adversely impact the site, surroundings, or affected community, and/or would exceed extant state, Tribal, or local capacity; or adversely affect human health and the environment (through

activities described in the action and their fidelity with federal, state, Tribal, or local laws or regulations regarding hazardous materials and/or solid waste management).”

There are no changes from the Proposed Action that would affect solid waste or pollution prevention. Based on the above findings, the data and analyses are consistent with those discussed in the 2022 PEA and April 2025 Tiered EA, and the Proposed Action would not result in significant impacts to hazardous materials, solid waste and pollution prevention.

- **Socioeconomics**, final Tiered EA section 3.4. The Proposed Action would restrict the use of portions of airspace and initiate ground stops at multiple airports for approximately 40 minutes and up to two hours for Starship-Super Heavy Launches and Super Heavy returns, and approximately 40 minutes and up to 60 minutes for Starship reentries. Under the Proposed Action, the mission profiles would have potential effects to airspace in the form of delays, reroutes, and cancellations. Depending on the timing and duration of the launch and reentry windows, commercial and general aviation flights could be delayed, cancelled or diverted.

Estimating the economic impact that the proposed action may have on airspace and maritime activities is challenging and is unlikely to produce reasonable and defensible estimates. Any estimate of the economic impact to airspace and maritime users resulting from space launch or re-entry activity is sensitive to the timing of prelaunch notification as well as the timing and duration of the closure, which itself may be further impacted by any off-nominal launch-related events.

The economic impacts would vary significantly based on aircraft/vessel type, operational flexibility, alternative routing options, scheduling constraints, and any buffers within these operational scenarios.

Furthermore, as Starship-Super Heavy operations become more reliable at the Boca Chica launch site, the effect on airspace and maritime activities with each launch/reentry operation may decline due to the implementation of numerous protocols and procedures, compliance with necessary notification requirements (i.e., NOTAMS and NOTMARS), and airspace coordination activities between SpaceX, the FAA, and USCG. Economic theory also recognizes that self-interested entities whose decisions are primarily driven by gain, logical analysis and preferences may adjust their behavior to recurring, predictable constraints. As such, airlines and other users of the airspace may incorporate

known operational constraints from repeated launch and reentry operations as they become more reliable and predictable into their routing, scheduling, and pricing decisions.

Given these factors and the high sensitivity of impacts to unpredictable operational variables, the lack of stable causal relationships, and the potential adaptation of affected users over time, any present attempt to estimate the long-term economic impact of airspace and maritime closures for the proposed action may be overstated and unreliable, and as such, too speculative, to reasonably inform the decision-maker's choice among potential alternatives.

Though the Proposed Action would include these economic impacts from airspace closures, there would be no change in the number of operational personnel or taxes to commercial airlines. There would be changes in expenditures due to the delays and associated airline income, but there would be no change expected to economic activity, personal income, employment, population, sustenance, public services, and/or social conditions.

The FAA has not established significance threshold for Socioeconomics and Children's Environmental Health and Safety Risks. FAA Order 1050.1G, Exhibit A-1 instead provides the following factors to consider: "[t]he action would have the potential to disrupt or divide the physical arrangement of an established community; cause extensive relocation when sufficient replacement housing is unavailable; cause extensive relocation of community businesses that would cause severe economic hardship for affected communities; disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; produce a substantial change in the community tax base; or lead to a disproportionate health or safety risk to children."

Accordingly, consistent with the data and analyses contained in the 2022 PEA and the April 2025 Tiered EA, the Proposed Action would not result in significant socioeconomic impacts.

Please refer to Chapter 3 of the final Tiered EA for a full discussion of the determination for each environmental impact category.

Public Involvement

On September 19, 2025, the FAA published the draft Tiered EA on the FAA's website at https://www.faa.gov/space/stakeholder_engagement/spacex_starship, beginning the public comment

period. The FAA provided a public notice of availability of the draft Tiered EA for public review and comment through local newspaper advertisements. The public comment period ended on October 20, 2025. The FAA received 27 comments and considered all public comments when preparing the final Tiered EA. All public comments submitted on the Draft Tiered EA are available at www.regulations.gov under Docket No. FAA-2025-3124. The FAA's responses to public comments are available in Appendix A of the final Tiered EA. The FAA initially planned to hold a virtual public meeting about the draft Tiered EA on October 7, 2025, but cancelled the virtual public meeting on October 3, 2025 due to lapse of government funding.

Conditions and Mitigation

As prescribed by FAA Order 1050.1G § 1.6(a)(3), the FAA shall take steps as appropriate to the action, through mechanisms such as the enforcement of licensing conditions, and shall monitor these as necessary to ensure that SpaceX implements avoidance, minimization, and mitigation measures. No new licensing conditions or mitigations would be established as a result of the final Tiered EA. However, the 2022 PEA and Mitigated FONSI/ROD and April 2025 Tiered EA and Mitigated FONSI/ROD included mitigation measures to ensure that the potential impacts of SpaceX's launch program would not have significant impacts to the environment. SpaceX maintains ongoing compliance with all mitigation measures.

Agency Finding and Statement

The FAA has determined that no significant impacts would occur as a result of the Proposed Action and, therefore, that preparation of an EIS is not warranted and no mitigation measures beyond the ones identified by AST discussed in the Tiered EA are required as a condition of approval, and a FONSI/ROD in accordance with FAA Order 1050.1G § 4.2(b) is appropriate. After careful and thorough consideration of the attached final Tiered EA and the facts contained herein, the undersigned finds that the FAA's federal action is consistent with existing national environmental policies and objectives as set forth in Section 101(a) of NEPA and other applicable environmental requirements and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(C) of NEPA. Therefore, the FAA will not prepare an EIS for this action.

The undersigned has carefully considered the FAA's statutory mandate under 49 U.S.C. § 40103 to ensure the safe and efficient use of the National Airspace System as well as the other aeronautical goals

and objectives discussed in this Tiered EA. The undersigned finds that the FAA's federal action provides the best approach for meeting the purpose and need of that action.

Accordingly, under the authority delegated to the undersigned by the Administrator of the FAA, the undersigned approves and authorizes all necessary agency action to implement the FAA's federal action.

This decision signifies that applicable federal environmental requirements relating to the FAA's federal action have been met. The decision enables the FAA to implement that action.

APPROVED: _____

DATE: 02/12/2026

Katie L. Cranor
Executive Director, Office of Operational Safety, ASA-1

Right of Appeal

This FONSI/ROD constitutes a final order of the FAA Administrator, which orders are, in most cases, subject to exclusive judicial review under 49 U.S.C § 46110 by the U.S. Circuit Court of Appeals for the District of Columbia or the U.S. Circuit Court of Appeals for the circuit in which the person contesting the decision resides or has its principal place of business.