DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Finding of No Significant Impact for Boom Technology XB-1 Supersonic Test Flights

Summary

This Environmental Assessment (EA) has been prepared to satisfy the NEPA requirements of 14 CFR § 91.817-818 (authorization to operate at supersonic speeds). The document complies with Federal Aviation Administration (FAA) Order 1050.1F Environmental Impacts: Policies and Procedures and its accompanying Desk Reference as well as U.S. Department of Transportation Order 5610.1C Procedures for Considering Environmental Impacts. This EA addresses the potential environmental impacts of proposed supersonic operations within the pre-existing supersonic corridors, as well as the potential effects of the associated landing and takeoff (LTO) operations at Mojave Air and Space Port. The proposed supersonic flight operations evaluated in this EA would consist of a limited number of test flights (10-20 supersonic tests of the XB-1 and its chase aircraft) occurring within a one-year duration. The Proposed Action would not cause a permanent change in the number of supersonic flight operations that already occur in the area.

Purpose and Need

The purpose of the project is to conduct over-land supersonic flight testing of the XB-1 experimental aircraft in a risk reduction effort for the future development of a supersonic airliner, Overture.
The need for the testing is to ensure the safe development of a new technology aircraft. The XB-1 demonstrator aircraft will test design features and operations, develop technologies and validate tools that aid in reducing later risks associated with the ultimate/final aircraft design. This testing will enable the development of a safe, airworthy design for the company's full-size supersonic airliner aircraft, Overture. The focus of testing XB-1 supersonically is to inform and ensure safety. XB-1 would serve as a flying data collector; a massive data acquisition system is integrated on the airplane. All of the data would be reviewed by flight test engineers and serve to refine and validate engineering calculations and program processes.

Proposed Action

As an experimental aircraft, XB-1 would be completing its entire test program operating to and from Mojave Air and Space Port, in Mojave CA. The proposed supersonic operations would be conducted within the Black Mountain Supersonic Corridor and portions of the High-Altitude Supersonic Corridor. The XB-1 is a three engine (GE J85 -15) aircraft. The XB-1 flight test program would consist of subsonic and supersonic flights of the experimental aircraft. A chase aircraft would accompany the XB-1 during all flight test operations, including flying supersonically. Boom plans to operate all aircraft supersonically only above 30,000ft Mean Sea Level (MSL) for these flight tests. Depending on the flight test airspeed increments dictated by flight test data from lower speeds, the supersonic portion of the test program is expected to include approximately 10 - 20 supersonic tests, with each supersonic test including up to 2

aircraft (XB-1 and chase, or two chase aircraft) flying supersonically. The safety critical chase aircraft may also conduct supersonic flight tests in advance of XB-1 flights to ensure safe overall flight operations.

The chase aircraft would be either a Northrop T-38 Talon (NH-T38) or Northrop F-5 (NH-F5) aircraft. This EA evaluates the environmental consequences of both the supersonic flight regimes of XB-1 and/or accompanying chase planes in the existing supersonic corridors, as well as the landing and takeoff portion of these flights at the Mojave Air and Space Port.

Alternatives

The following criteria were established to evaluate alternatives to the Proposed Action that meet the stated Purpose and Need:

- Population Safety: The Proposed Action must occur in a location that would minimize proximity to population centers in order to avoid safety risk to the surrounding areas.
- Flight Safety: The Proposed Action must occur in a location that would minimize safety risks to the flight test crew, ensure aircraft safety and recoverability if an immediate return to base or bailout is necessary, and maintain safety-critical communications with the ground crew at all times.
- Ability to collect flight test data: The Proposed Action must enable collection of all necessary data to refine and validate engineering calculations and design/development processes described in Chapter 1 – Purpose and Need.

The first alternative considered was conducting supersonic test flights over the ocean. This would not require any federal action as the supersonic flight tests would be conducted at such a distance away from coastlines that there would be no sonic boom impacts reaching land. To ensure safety relative to large populations on the ground and the safety of the air crew, this alternative was deemed to be infeasible per the selection criteria established herein, and therefore not carried forward for analysis.

The second alternative considered validation tests of the aircraft outside of the United States. This option was considered but is not a prudent alternative since Boom Technology is a U.S. company and testing elsewhere is not feasible as (1) XB-1 contains export-controlled technologies (which requires an export license and potential restrictions for testing abroad) and (2) some of the test data would be considered Controlled Unclassified Information in support of a U.S. Government contract which cannot be adequately protected if collected overseas. Further, Boom will ultimately seek certification from U.S. regulators for its supersonic airliner. Because this alternative does not satisfy all criteria required to accomplish the stated Purpose and Need it will not be carried forward for analysis.

The No Action Alternative assumes that Boom does not conduct their vehicle testing program. This would negate the entire purpose of the XB-1 demonstrator program, which is to provide data on the flight performance capabilities of several novel technologies that have not been previously flight tested or certified and demonstrate that these technologies would not adversely impact flight safety. If Boom does not conduct supersonic testing of XB-1, it could introduce increased safety risk into the design and development of the supersonic airliner program, Overture. The No Action Alternative does not meet the criteria established to serve the “purpose and need”. However, Council on Environmental Quality (CEQ) Regulations and the Federal Aviation Administration’s (FAA) Order 1050.1F, prescribe the need to analyze and compare the No Action Alternative to the Proposed Action. Therefore, this No Action Alternative is carried forward in the analyses.

Environmental Impacts

Pursuant to the FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, the potential impacts of the activities associated with the Proposed Action are described in this chapter. The combined Affected Environment and Environmental Consequences Chapter includes a description of the existing conditions and potential impacts. An initial evaluation of the entire list of resources found in FAA Order 1050.1F identified those resources with the potential to be impacted and those unlikely to be impacted by the proposed action. The environmental resource areas below were identified as having the potential to be impacted by the proposed action and are carried forward for detailed analysis:

- Air Quality
- Biological Resources
- Climate
- Department of Transportation Section 4(f) Lands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Natural Resources and Energy Supply
- Noise and Noise Compatible Land Use
- Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks
- Cumulative Impacts

The following resource areas have been identified as not having the potential to be impacted by the Proposed Action and therefore are not carried forward for further analysis:

- Coastal Resources: The Black Mountain and High-Altitude Supersonic Corridors (where the Proposed Action would occur), or the Mohave Air and Space Port where associated LTO operations would occur, do not overlay any coastal resources.
- Farmlands: Farmland exists in the area. However, since no construction would occur with the Proposed Action, the Proposed Action would not convert any farmland into other land uses.
- Land Use: No construction would occur with the Proposed Action; therefore, no land use changes would be expected (such as disruption of communities, relocation of residences or businesses, or impact natural resource areas, apart from noise and noise compatible land use impacts that are discussed in this chapter), nor would a wildlife hazard be created.
- Visual Effects: The Proposed Action would not result in construction/new facilities. Therefore, the Proposed Action would not block or obstruct views of visual resources beyond existing conditions. Boom does not propose to conduct flight testing at night, and therefore the Proposed Action would not create light emissions that would cause annoyance or interfere with normal activities of nearby residents.
- Water Resources: The Proposed Action is not located over any USEPA-designated Sole Source Aquifers (USEPA, 2023a) or near any wild and scenic rivers (USFWS, 2023). The only surface water occurs on a small portion of Harper Dry Lake just outside the southeast border of the Black Mountain Supersonic Corridor semi-circular maneuver area, but within the High-Altitude Supersonic Corridor and the Proposed Action area. According to U.S. Air Force evaluations conducted for the existing supersonic corridors, this area is being maintained as a wetland using well water pumping by the BLM to reestablish habitat that has disappeared since the 1900s. The Proposed Action would not result in construction/new facilities that would disturb or add to

pollution of wetlands, floodplains, groundwater, surface waters or wild and scenic rivers. The Proposed Action would not affect BLM activities to reestablish habitat.

Chapter 3 evaluates the potential environmental consequences of the Proposed Action for each of analyzed resource areas listed above and documents the finding that no significant environmental impact 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.

Air Quality

An air quality assessment requires consideration under both the Clean Air Act of 1970, as Amended (CAA), and the National Environmental Policy Act of 1969, as Amended (NEPA). These two federal laws require distinct analyses and may be separately applicable to any project.

Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles and the decline in production of leaded automobile gasoline. Lead continues to be used in 100LL aviation fuel for general aviation aircraft. The Proposed Action would not include the use of 100LL fuels and thus, no Proposed Action-related lead emissions are expected. Therefore, lead is not discussed further.

Emissions above the mixing height of 3,000 feet above ground level do not affect the ability of states and regions to meet their Clean Air Act requirements. Additionally, if the emissions of the Proposed Action (operation of the XB-1 aircraft in the supersonic mode and its chase aircraft) were added to that of the LTO noted above, the emissions would remain well below de minimis and not be significant. A federal action is exempt from General Conformity requirements if the total emissions resulting from the action are equal to or less than the de minimis thresholds. Thus, the action's calculated emissions are compared against established de minimis emission levels based on the nonattainment status for each applicable criteria pollutant in the area of concern to determine the relevant compliance requirements.

As the Proposed Action would involve maximum 20 supersonic test events that would occur above 30,000 feet, it is important to note that the supersonic-related emissions would not affect local air quality, due to the mixing height being at approximately 3,000 feet above ground. Even though emissions above the mixing height do not affect local air quality, the emissions occurring in the Supersonic mode were estimated for disclosure purposes.

Given that the potential emissions of criteria air pollutants from the Proposed Action (the supersonic portion of flight) as well as due to LTO activity are de minimis, a General Conformity Determination is not required and the resultant emissions from the Proposed Action would not be significant. Detailed analysis can be found in the EA, Chapter 3.

Biological Resources

The term biological resources in this EA, refers to various types of flora and fauna, as well as habitat types that would support these species. This section also addresses federally listed and state-listed threatened or endangered species and their habitats.

The term "endangered species" means any member of the animal kingdom (mammal, fish or bird) or plant kingdom (seeds, roots, etc.) that is in danger of extinction throughout all or a significant portion of

its range. “Threatened species” refers to those members of the animal kingdom or plant kingdom, which are likely to become endangered within the foreseeable future. Section 7 of the Endangered Species Act of 1973 requires each federal agency that carries out, permits, licenses, funds, or otherwise authorizes activities that may affect a listed species must consult with the United States Fish and Wildlife Service (USFWS) to ensure that its actions are not likely to jeopardize the continued existence of any listed species. The full list of species considered in this analysis can be found in chapter 3 of the EA.

Per FAA Order 1050.1F, a significant impact on biological resources would occur if the USFWS or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species or would result in the destruction or adverse modification of federally designated critical habitat. The FAA has not established a significance threshold for unlisted species. However, FAA Order 1050.1F includes “factors to consider” when evaluating the context and intensity of potential environmental impacts to unlisted species.

No long-term, permanent loss of plants or wildlife is expected to result from the Proposed Action. The Proposed Action would not affect species protected under the Migratory Bird Act. The Proposed Action is not expected to have an adverse impact on species’ reproduction rates, mortality rates, or ability to sustain population levels. Consideration was given to the potential effects of aircraft noise and the sonic boom impact on biological species. As there would be no physical alteration to the ground with the Proposed Action, the assessment focused on indirect effects due to noise.

Based on the above analysis, no significant impacts to biological resources are expected. Boom proposes to implement the following best practices currently in place at the Mojave Air and Spaceport and Edwards Air Force Base to minimize any potential effects to biological resources:

- Boom will comply with AFI 91-202, The U.S. Air Force Mishap Prevention Program;
- Boom will follow The U.S. Air Force Base Bird/Wildlife Aircraft Strike Hazard (BASH) plan, which outline actions designed to reduce BASH through bird avoidance and control to allow for safe operational flight missions; and
- Boom will comply with The Desert Tortoise Handout (DT Handout 412 TWPA Release #18150 20180316) distributed by Edwards Air Force Base.

Climate

The most prevalent Greenhouse Gases (GHGs) from aviation are CO2, and very small amounts of methane (CH4), and nitrous oxide (N2O). GHG emissions are typically reported in units of metric tons of carbon dioxide equivalents (CO2e). Worldwide emissions of GHG in 2021 were 54.6 billion metric tons of CO2e per year. In 2016, the United States emitted about 6,340 million metric tons of CO2e. Total U.S. emissions have decreased by 2.3 percent from 1990 to 2021, and emissions increased from 2020 to 2021 by 5.2 percent (314.3 million metric tons of CO2e). Between 2020 and 2021, the increase in total greenhouse gas emissions was driven largely by an increase in CO2 emissions from fossil fuel combustion due to economic activity rebounding after the height of the COVID-19 pandemic.

Of the five major sectors nationwide - residential and commercial, industrial, agriculture, transportation and electricity – transportation accounts for the highest fraction of GHG emissions (approximately 29 percent), closely followed by electricity (approximately 25 percent) and by industry (approximately 24

percent). The most recent USEPA data indicate that in 2021, aircraft accounted for 8.6 percent of U.S. transportation GHG emissions.

The Council on Environmental Quality (CEQ) has issued interim guidance directing agencies to quantify, disclose and contextualize climate impacts, as well as address the potential climate change effects of the major federal actions. The Proposed Action would result in increased emission of GHGs, chiefly CO2, through the consumption of jet fuel. The XB-1 aircraft contains a maximum of 6,000 lbs. of fuel in its tanks, and the T-38 chase aircraft contains a maximum of 3,900 lbs. of fuel. Therefore, each test flight event would potentially consume up to 9,900 lbs. of jet fuel, for a total fuel consumption of 198,100 lbs. assuming 20 test flights.

Assuming all the 20 test flights operate using fossil Jet A fuel, the Proposed Action would result in up to 284 metric tons of CO2. These results represent a conservative estimate of emissions, since a certain number of the supersonic test flights are expected to occur with one or two chase aircraft ahead of XB-1 flight testing. In 2021, the USEPA estimates that all sources in the U.S. emitted 6,347.7 million metric tons of CO2e. In the context of global and U.S. Greenhouse Gas emissions, the Proposed Action emissions would not be significant.

In considering the impact of climate change on the Proposed Action, the foreseeable state of the environment is not expected to change significantly over the limited duration of the Proposed Action, which spans one year, since effects are typically felt on decadal time scales. Therefore, no significant impacts from the Proposed Action are anticipated as a result of climate change effects occurring during the span of the Proposed Action.

Section 4(F)

Section 4(f) of the Department of Transportation Act of 1966 (DOT Act) currently codified as 49 USC Section 303(c), [hereinafter referred to as Section 4(f)], provides for the protection of certain publicly owned lands. These lands include public parks, recreation areas, or wildlife and waterfowl refuges of national, state, or local significance. In addition, Section 4(f) applies to all historic sites of national, state, or local significance, regardless of whether these sites are publicly owned or open to the public. Typically, Section 4(f) protects only historic or archeological properties that are on, or eligible for inclusion on, the National Register of Historic Places (NRHP).

A search of the National Park Service's online NRHP noted the presence of four sites within the Proposed Action area. A review of Bureau of Land Management data also indicates the presence of the National Scenic and Historic Trails/Old Spanish Trail and the Mojave trails. In addition to the sites noted in the NRHP, an internet search noted the presence of the Husky Monument (a site dedicated to past motor cross track users) in the area of the Black Mountain Supersonic Corridor portion of the Proposed Action area. In addition to historic sites noted above, a search was conducted to identify parks, recreational areas, and wildlife/waterfowl refuges in the project area. A complete listing of the resources identified can be found in chapter 3 of the EA.

The Proposed Action would not involve the acquisition or displacement of any lands, including lands considered DOT 4(f). Thus, the evaluation focused on indirect effects of noise and emissions on potential DOT 4(f) lands.

With regards to operational impacts, the Proposed Action would not result in a significant change in aircraft noise or emissions. As disclosed in the Noise and Noise Compatible Land Use section, the Proposed Action is expected to result in additional sonic booms in the area. As shown in the Noise and Noise Compatible Land Use section below, the individual events associated with the Proposed Action are expected to result in the output of significantly lower levels of noise than existing supersonic operations in the corridors. The Proposed Action would add less than 5 percent more operations (between 10-20 supersonic tests) to an area already receiving 345-414 annual supersonic tests, and existing operations involve larger aircraft flying supersonically at lower altitudes which would produce a stronger sonic boom overpressure than the XB-1 or the chase aircraft. Similar to the supersonic tests that currently occur, the sonic boom carpet could exceed the boundaries of the Proposed Action area, depending on where in the corridor the aircraft flies. However, the magnitude of sonic boom overpressures decreases with distance away from the centerline of the flight path, and therefore any sonic boom impacts that exceed the boundaries of the Proposed Action area would also be of a lower magnitude than existing operations that also occur within the Proposed Action area. The Proposed Action is not expected to result in noise that would impair the use of the parks, recreational uses, wilderness areas, or historic sites in the area. Therefore, no significant impacts to DOT 4(f) lands are expected and a DOT 4(f) statement is not warranted.

Hazardous Materials, Solid Waste, and Pollution Prevention

Hazardous materials and wastes are defined and identified by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (42 U.S.C. 9601–9675); the Toxic Substances Control Act (15 U.S.C. 2601-2671); the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA; 42 U.S.C. 6901-6992); and the corresponding State of California laws and regulations. Both federal and state OSHA regulations govern protection of personnel in the workplace. In general, these hazardous materials and wastes may present substantial danger to public health and welfare, to workers, or to the environment due to their quantity, concentration, or physical, chemical, or infectious characteristics. Solid waste management includes the waste streams that would be generated by a project and evaluates how these wastes would impact environmental resources. Solid waste management also evaluates the impacts on waste handling and disposal facilities that would likely receive the wastes.

Numerous types of hazardous materials are currently used at Mojave Air and Space Port, which in turn generate hazardous wastes. The hazardous materials at Mojave Air and Space Port mostly consist of airplane fuels and rocket propellants (i.e., oxidizers and fuels). Other hazardous materials used, generated, and/or stored onsite include acetylene, paints, used motor and hydraulic oil, gear lubricant, and hydraulic fluid.

Management of hazardous waste would comply with the RCRA Subtitle C (40 CFR Part 240-299) and with California Hazardous Waste Control Laws as administered by the California EPA, Department of Toxic Substances Control (DTSC), under Title 22, Division 4.5 of the CCR. These regulations require that hazardous wastes be handled, stored, transported, disposed of, or recycled according to defined procedures. Boom would be required to follow all federal, state, and local laws and regulations, which regulate hazardous waste, including its generation, storage, transportation, and disposal.

Small quantities of waste may be generated at Mojave Air and Space Port associated with the conduct of the supersonic flight tests in the Proposed Action. This could contain aircraft fluids, aircraft parts, and paper associated with documentation. However, all quantities can be handled through the existing

disposal infrastructure and practices at Mojave Air & Space Port, in Kern County. Therefore, the operation of the Proposed Action would not generate significant amounts of solid waste. Furthermore, the Proposed Action would not involve construction (use of land), and therefore would not disturb any existing land containing hazardous material or cause further contamination of the land or generate hazardous material that would adversely affect human health. Therefore, no significant impacts to this resource category are expected from the Proposed Action.

Historical, Architectural, Archaeological, and Cultural Resources

The National Park Service's NRHP was consulted to identify historic, architectural, archaeological, and Cultural Resources that are in the area where the Proposed Action would occur. The sites identified are noted earlier in relation to DOT Section 4(f) Lands. As described in the DOT 4(f) Lands Section, six (6) historic/architectural/archaeological/cultural resources are in the Proposed Action area. Additionally, five Native American tribes are located in or near the corridors: the Kawaiisu, the Chemehuevi, the Vayume, the Serrano, and the Mojave.

The Proposed Action would not require acquisition of tribal lands nor a physical disturbance to them. As no construction would occur with the Proposed Action, no cultural or archaeological sites would be physically affected. As noted in the section on Noise and Compatible Land Use, the Proposed Action would generate sonic booms of approximately 1 psf. However, the sonic booms are not expected to physically affect the sites nor alter their use. Thus, no significant impacts to historic/architectural/archaeological/cultural resources would be expected as a result of the Proposed Action.

A consultation letter was sent by email to Julianne Polanco, the State Historic Preservation Officer (SHPO), in Sacramento CA on October 27, 2020. The correspondence requested the SHPO review the proposed undertaking by the FAA involving authorization of Supersonic Test Flights in the High-Altitude Supersonic corridor associated with Edwards AFB in Kern, San Bernadino, and Los Angeles Counties. No response was received, and FAA sent a follow-up email on January 4, 2021, requesting a response by January 11, 2021. As such, the FAA is proceeding with a determination of no potential to affect historic properties.

Natural Resources and Energy Supply

Sources of energy originate from fossil fuels (coal, oil, gas, etc.), nuclear power (uranium) and renewable elements (wood, sun, wind, water, etc.). Natural resources refer to the various forms of wealth supplied by nature including the sources of energy listed above.

Staff supporting the flight testing at Mojave Air and Space Port would likely consume energy, water, and other small quantities of natural resources. The additional consumption associated with the Proposed Action would not be expected to affect supply. The Proposed Action would not have any measurable impact on any natural resource and energy supply except for jet fuel.

The Proposed Action would consume as much as 198,100 lbs. of Jet A fuel for the entirety of the supersonic flight testing (including the landing and takeoff operations from Mojave Air and Space Port, subsonic and supersonic flight activity). This is approximately 2.8% of the total annual jet fuel consumption at Mojave Air and Space Port. Since this is a relatively small fraction of total annual jet fuel usage, the Proposed Action is not expected to significantly affect supply of jet fuel. It is expected that

the Boom Technology flight testing will consume minor quantities of other resources, such as water and oil. However, these quantities are not expected to significantly affect the available supply.

Noise and Noise Compatible Land Use

Noise impacts from the Proposed Action are evaluated in this EA for both the LTO cycle at Mojave Air and Space Port as well as sonic boom impacts from supersonic overflight operations within the supersonic corridors.

Landing and Takeoff Mojave Air and Space Port Noise Assessment
Landing and takeoff noise impacts from the Proposed Action at Mojave Air and Space Port were assessed using the FAA's Area Equivalent Method (AEM) model. The AEM is a screening level process that estimates changes in the area of the existing DNL 65 dB contour. This information is then used to determine if further analysis using the more detailed noise modeling (e.g., AEDT) is needed. As the Proposed Action would comply with existing flight and operating procedures in place at Mojave Air and Space Port, they would use existing air traffic flight tracks/profiles and therefore not affect the shape of the noise contours; therefore, use of AEM as a screening tool is determined to be valid for this EA.

The baseline fleet mix at Mojave Air and Space Port was determined based on the FAA's Terminal Area Forecast for civil and military aircraft operations at Mojave Air and Space Port in 2024. These activity counts were applied to fleet mix data developed for Mojave Air and Space Port's recent Runway 12-30 rehabilitation study. A 90%-10% split for daytime vs. night-time operations was assumed based on the Kern County Airport Land Use Compatibility Plan (Kern County, 2012). Details on the baseline aircraft inventory development are provided in Appendix A of the EA.

Activity from 20 chase aircraft LTO activities from the Proposed Action were modeled in AEM using the T-38 aircraft type. Activity from 20 LTO operations from the experimental XB-1 aircraft are modeled using the A-7E aircraft as a surrogate, based on guidance from the FAA AEE on the basis of producing a conservative evaluation. All operations related to the Proposed Action would occur during the daytime hours.

Sonic Boom Assessment in the Existing Supersonic Corridors

Current modeling methods such as FAA's Aviation Environmental Design Tool (AEDT) and NASA's PCBOOM, are not practical or feasible options for XB-1 sonic boom analyses, given that the XB-1 is a one-of-a-kind experimental aircraft and therefore not included in any of those models. Surrogate aircraft were identified for XB-1 and the chase aircraft based on aircraft dimensions and other parameters that affect the strength of sonic booms, and the sonic boom impacts were assessed using the results of several NASA measurement studies, as shown in Figure 4 and Figure 5 in the EA. The surrogate aircraft and proposed noise methodology are described in detail in Appendix B of the EA**.**

Results from the AEM screening analysis show that the Proposed Action would contribute to landing and takeoff noise to the Mojave Air and Space Port environs but increases in the noise contours are expected to be less than 1% for all noise contours, which is well below the FAA's AEM significance criteria of 17%. This indicates that the noise levels would increase by much less than 1.5 dB, and therefore the Proposed Action would not cause a significant impact with respect to Mojave Air and Space Port environs noise.

In the context of sonic boom noise exposure, a significant increase in aircraft noise is not anticipated with the Proposed Action. Although the Boom Technology test events would be expected to generate additional sonic boom noise, the noise increase would not be significant given the DoD's long history of supersonic test flights occurring in this area. The peak overpressure resulting from the proposed supersonic test events would only be 1 psf which is typically not associated with public reaction or structural damage. Therefore, the Proposed Action would not cause a significant impact with respect to sonic boom noise exposure.

Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomic resources include the population, income, employment, and housing conditions of a community or affected environment. This section evaluates potential socioeconomic impacts that would result from the proposed Action, including an assessment of impacts to environmental justice communities.

Land underlying the Proposed Action area is sparsely populated. Much of the area is unincorporated, and the only city or town is California City. Other areas, such as Mojave, Boron, Aerial Acres, etc. are considered unincorporated communities or census-designated places (which are statistical geographies representing closely settled, unincorporated communities that are locally recognized and identified by name). Based upon the 2016-2020 US American Community Survey (ACS), the project area has a small population per square mile, but within that area there is a large concentration of minorities or low-income populations. Under Executive Order 12898 minority populations are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Low income is defined as the population whose household income is equal or less than the poverty level.

Calculations using the USEPA's EJ Screen provided information on the demographics of the population within the project area. The project area overlays the census tracts and the percentage of population that are minority, low income, and under the age of 5, as listed in Table 11 in the EA. As is noted in the EA, the percentage of minority populations ranges from 0% to 82%, with an average across the project area of 54%. The percentage of population meeting the low-income designation ranges from 5% to 87%, with an average across the project area of 40%. In comparison, the minority population of the state is 64% and low income is 29%.

The FAA has not established a significance threshold for socioeconomics, environmental justice, or children's environmental health and safety risks. However, FAA Order 1050.1F identifies factors to consider when evaluating impacts, which include the following:

- Whether the Proposed Action would cause an alteration in surface traffic patterns, or cause a noticeable increase in surface traffic congestion or decrease in Level of Service;
- Whether the Proposed Action would cause induced, or secondary, socioeconomic impacts to surrounding communities, such as changes to business and economic activity in a community; impact public service demands; induce shifts in population movement and growth, etc.;
- Whether the Proposed Action would have a disproportionate impact on minority and/or low-income communities (considering human health, social, economic, and environmental issues, as outlined in DOT Order 5610.2(a)); and,

- Whether the Proposed Action would have the potential to lead to a disproportionate health or safety risk to children.

The Proposed Action would not alter any surface condition, and the only changes in surface traffic would be the addition of the staff supporting the Flight Tests that would use area roadways in the vicinity of Mojave Air and Space Port for the duration of flight testing. Any change in economic activity would be positive with project participants supporting local businesses for daily necessities. Because the Proposed Action would not result in construction, the only changes in business activity associated with the Action is the temporary movement of Boom representatives to the areas during the test. Therefore, the Proposed Action would not cause material induced, or secondary, socioeconomic impacts to surrounding communities.

With regards to minority and low-income populations, as noted in the Affected Environment section of the EA, the percentage of minority and low-income population in the census tracts is high; of the census tracts in the Proposed Action area, on average 54% of the population are minority and 40% are low income in comparison, the minority population of the State of California is 64% and low income is 29%. There are large minority and low-income populations within the region where the High-Altitude Supersonic Corridor and Black Mountain Supersonic Corridor are located. Further, many of the census tracts are so large that part of the tract is within the Proposed Action area and part is outside.

While it is not possible to avoid overlying areas of minority or low-income populations, due to the frequent nature of these types of activities (300-400 per year) already occurring in the project area, the addition of a limited number of test flights over a short period of time will not produce any discernible changes to the current environment. The minority and low-income populations identified will not be disproportionally impacted by the proposed action.

Mitigation Measures: Based on the analysis in this EA, no mitigation measures were identified as necessary to reduce or avoid potentially significant adverse effects.

Cumulative Impacts

NEPA requires that cumulative effects be evaluated along with the direct and indirect effects of the actions across the various environmental disciplines. Cumulative impacts are defined in the CEQ regulations (40 CFR §1508.7) as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.”

Past Actions

Limited public information exists about past activity in the existing supersonic corridors given their nature is military testing. In preparing the cumulative impact evaluation for this EA, prior military reports and any other public actions were reviewed. During the 1980s and early 1990s, the F-4 and F-111 were the primary users of the Supersonic Corridors. From the late 1990s through 2000 the primary aircraft became the B-1, F-15, F-16, and T-38. From 2001 to 2009, the primary usage transitioned to the F-16, F-18, and T-38 with a temporary increase in F-22 supersonic flight during its initial test period of 2007 to 2008. In 2009, F-22 annual flights stabilized in the range of 20 to 25. Most aircraft anticipated to use the Black Mountain Supersonic Corridor during the period of the text would be the F-35, F-16, F-18, and T-38 with some continued use by the F-22.

Present Actions
In recent years, the number of supersonic tests has ranged from 345 to 414 per year (with the peak occurring in 2022), although there were prior years when higher numbers of supersonic tests were conducted. Many of these tests are conducted with aircraft flying in formation, with a test aircraft and a chase aircraft. In recent years, approximately 20-25% of supersonic operations in the Black Mountain Supersonic Corridor occurred below 30,000 ft in altitude, and the majority (>80%) of these operations were conducted by aircraft which are all larger and significantly heavier than XB-1 and the T-38 or F-5 chase aircraft and would produce larger sonic booms than would occur with the XB-1 and chase aircraft.

Reasonably Foreseeable Future Actions
Consideration was given to actions that would occur in the next 5 years at the same time as the Proposed Action. In their 2021 EA, the U.S. Air Force identified the following additional activities that are expected to occur within the Edwards restricted airspace within 5 years:

- On-going and/or increased testing of the B-21
- On-going and/or increased testing of the KC-46A
- A one-for-one replacement of T-38 permanently assigned aircraft (PAA) for the new T-7

Given that the Proposed Action would not involve any new construction projects or earthmoving activity, there will be no direct impacts to Biological Resources, DOT Section 4(f) Lands, Historical, Architectural, Archaeological and Cultural Resources and Socioeconomic, Environmental Justice and Children's Environmental Health and Safety Risks. Indirect effects due to noise impacts from supersonic overflights are discussed in the Noise section below.

Environmental resources that could have potential cumulative impacts associated with past, present, and foreseeable future projects include air quality, noise, climate, and hazardous materials. Following is the finding of these potential cumulative impacts in these areas.

Air Quality and Climate
The increase in emissions due to the Proposed Action (both within the landing and takeoff from Mojave Air and Space Port as well as emissions associated with supersonic portion of flight testing, from both the XB-1 and chase aircraft) would not exceed the federal de minimis thresholds and are therefore not significant. While the Proposed Action would contribute to the cumulative emissions of air pollutants in Kern County, no projects or proposals have been identified that, when combined with the emissions from the Proposed Action, would result in a cumulative effect of the net air emissions that would cause or contribute to any new violation of the NAAQS, increase the frequency or severity of an existing violation, or delay timely attainment of any standard. Further, the SIP includes plans to achieve attainment in the future recognizing regional actions expected in the area. Therefore, the cumulative impact on air quality is not expected to be significant.

With regards to climate impacts, while the Proposed Action would result in GHG emissions, the emissions were deemed to be not significant in the context of U.S. wide and global GHG emissions. Further, Boom plans to minimize its potential climate effects of the Proposed Action, as discussed in the Climate section above. CEQ Interim Guidance on assessment of GHG impacts in NEPA documents indicates that "climate effects analysis is inherently cumulative in nature". While the Proposed Action would authorize 10-20 test flights during a one-year period that would result in GHG emissions, the emissions would cease once testing is complete. At this time there is no threshold of significance for greenhouse gas emissions and thus, the incremental increase in GHG emissions from the Proposed

Action would be small and would not be expected to be significant in the context of US or world emissions.

Hazardous Materials and Solid Waste

The Proposed Action would generate small amounts of waste at Mojave Air and Space Port associated with aircraft fluids, aircraft parts, and paper associated with documentation. These would contribute cumulatively to waste generated by other existing and planned activities at Mojave Air and Space Port. However, all quantities are expected to be handled effectively through the existing disposal infrastructure and practices at Mojave Air and Space Port, and therefore no cumulatively significant impacts would be expected**.**

Noise

Today, Mojave Air and Space Port serves over 21,000 annual aircraft operations. The additional Proposed Action takeoff and landing operations at the airport would add up to 40 additional operations in total and would be a negligible increase (less than 0.2%) over past, present, and reasonably foreseeable operations. The Proposed Action by itself was shown to be less than significant with respect to aircraft landing and takeoff noise and would not be expected to have cumulatively significant noise impact.

The US Air Force conducts regular supersonic tests in the High-Altitude Supersonic corridor and Black Mountain Supersonic Corridor and has done so since the 1960s. The local land use jurisdictions are aware of the noise and sonic boom effects that the area regularly experiences. Local jurisdictions have reflected the presence of flight testing in their local land use plans. The Air Force has and is expected to continue to conduct supersonic events in the corridors subject to a waiver and has operated within that waiver since its original issuance.

The addition of the Proposed Action, the Boom test flights, would not result in the exceedance of the Air Force waiver. The minor incremental increase in aircraft noise, as discussed in the Noise impact section, captured the change in noise associated with the addition of the Boom supersonic test flights. Further, the FAA's threshold of project-related noise change is measured in DNL, and the Proposed Action would be below the threshold of significance (0.5 DNL). To achieve a significant cumulative impact would require a 50% increase over the Air Force activity levels (from the Air Force past 345 to 414 sorties to 518 to 621 sorties) in addition to the Proposed Action. The Air Force supersonic sortie data remains relatively stable from year to year and there are no publicly announced new supersonic aircraft entering flight test at Edwards. Therefore, no significant increase in supersonic flights is expected and a significant cumulative noise impact in the Supersonic corridors is not expected.

Public Involvement and Coordination

The FAA published a Notice of Availability (NOA) with information about the draft EA and provided it to local, state, and federal officials, interest groups, and federally recognized tribes. The NOA provided information about the proposed action and requested public review and comments on the draft EA, which was published on the FAA's website https://www.faa.gov/about/office_org/headquarters_offices/apl/aee/env_policy/sfa_supersonic. The public comment period was January 12 to February 2, 2024. No comments were received. The Final EA and the Finding of No Significant Impact can be found at the website above.

Finding

The FAA finding is based on a comparative examination of environmental impacts for each of the alternatives studied during the environmental review process. The EA discloses the potential environmental impacts for each of the alternatives and provides a full and fair discussion of those impacts. Based on the FAA's review and analysis and consideration of comments, it has determined that there would be no significant impacts on the natural environment or surrounding population as a result of the Proposed Action.

The FAA believes the Proposed Action best fulfills the purpose and need identified in the EA. In contrast, the no action alternative fails to meet the purpose and need identified in the EA. An FAA decision to take the required actions and approvals is consistent with its statutory mission and policies supported by the findings and conclusions reflected in the environmental documentation and this FONSI/ROD. After careful and thorough consideration of the facts contained herein and following consideration of the environmental impacts described; the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101(a) of the National Environmental Policy Act of 1969 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.

Decision and Order

The FAA recognizes its responsibilities under NEPA, CEQ regulations, and its own directives. Recognizing these responsibilities, the undersigned has carefully considered the FAA's goals and objectives in reviewing the environmental aspects of the Proposed Action to grant Boom a Special Flight Authorization to exceed Mach 1 over land. Based upon the above analysis, the FAA has determined that there are no significant impacts that will result from this Proposed Action.

The environmental review included the purpose and need to be served by the Proposed Action, alternatives to achieving them, the environmental impacts of these alternatives, and conditions to preserve and enhance the human environment. This decision is based on a comparative examination of the environmental impacts for each of these alternatives. The EA provides a fair and full discussion of the impacts of the Proposed Action. The NEPA process included appropriate consideration for avoidance and minimization of impacts, as required by NEPA, the CEQ regulations, and other special purpose environmental laws, and appropriate FAA environmental orders and guidance.

The FAA has determined that environmental concerns presented by interested agencies and the public have been addressed in the EA. The FAA believes that, with respect to the Proposed Action, the NEPA requirements have been met. FAA approval of this environmental review document indicates that applicable Federal requirements for environmental review of the Proposed Action have been met.

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101 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 of Section 102(2)(C) of NEPA. In addition, the action is the type of action that does not require an Environmental Impact Statement under NEPA.

Issued in Washington, DC on February 29, 2024:

DONALD S SCATA JR

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Date: 2024.02.29 08:59:03 -05'00'

Donald S. Scata Jr.
Deputy Director (A), Office of Environment and Energy
Office of Policy, International Affairs and Environment