Final Environmental Assessment, Finding of No Significant Impact, and Record of Decision

Wing Aviation
Drone Package Delivery Operations
Frisco and Little Elm, TX

February 2022

United States Department of Transportation
Federal Aviation Administration

Washington, D.C.

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Cover Image: Wing Aviation, LLC

DEPARTMENT of TRANSPORTATION
Federal Aviation Administration
Washington, D.C.
Notice of Availability of the Final Environmental Assessment, Finding of No Significant Impact, and Record of Decision for Wing Aviation in Frisco and Little Elm, Texas

The Federal Aviation Administration (FAA) hereby gives Notice of Availability (NOA) for the Finding of No Significant Impact (FONSI), Record of Decision (ROD), and Final Environmental Assessment (EA) evaluating the potential effects of the FAA decision to authorize Wing Aviation, LLC (Wing) to conduct unmanned aircraft (UA) commercial package delivery operations from two locations in Frisco and Little Elm, Texas.

Wing is seeking to amend its Part 135 air carrier Operations Specifications (OpSpecs) to expand its package delivery operations to a part of the Dallas Metropolitan Area. The federal action subject to this EA is the requested FAA amendment to Wing's OpSpecs to include a new paragraph with descriptive language about the Frisco and Little Elm operating area boundaries, including the specific locations and operational profile in Wing's request.

The Final EA has been prepared in accordance with the requirements set forth in the Council on Environmental Quality (CEQ) regulations at Title 40, Code of Federal Regulations (CFR), parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. The Final EA reflects consideration of comments received during the public comment period for this EA, which was open from December 7, 2021 through December 21, 2021.

The Final EA, FONSI, and ROD are available to view and download electronically at https://www.faa.gov/uas/advanced_operations/nepa_and_drones/

CONTACT INFORMATION: For any questions or to request a copy of the EA, please email 9-FAA-Drone-Environmental@faa.gov.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Finding of No Significant Impact and Record of Decision for Environmental Assessment for Wing Aviation Drone Package Delivery Operations Frisco and Little Elm, TX

Introduction

The Federal Aviation Administration (FAA) prepared the attached Environmental Assessment (EA) to analyze the potential environmental impacts that may result from FAA's approval of a Wing Aviation, LLC (Wing)[1] requested amendment to its Part 135 air carrier Operations Specifications (OpSpecs). The requested amendment would add a new paragraph to Wing's OpSpecs with language about specific locations for the Frisco and Little Elm, Texas operating area boundaries. This approval would enable Wing to begin unmanned aircraft (UA)[2] commercial package delivery operations in Frisco and Little Elm, Texas (operating boundaries are depicted in Figures 1 and 2 of the EA). The approval of the amendment to Wing's OpSpecs to include this new operating area and the other FAA approvals that are necessary for these operations are considered a major federal action subject to National Environmental Policy Act (NEPA) review requirements.

The FAA prepared the EA in accordance with the National Environmental Policy Act of 1969, as amended (42 United States Code [U.S.C.] § 4321 et seq.); Council on Environmental Quality's NEPA implementing regulations (40 Code of Federal Regulations [CFR] parts 1500 to 1508); FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*; and FAA Order 1050.1F Desk Reference.

After completing the EA and reviewing and analyzing available data and information on existing conditions and potential impacts, the FAA has determined the proposed action will not significantly affect the quality of the human environment. Therefore, the preparation of an Environmental Impact Statement is not required, and the FAA is issuing this Finding of No Significant Impact (FONSI) and Record of Decision (ROD). The FAA has made this determination in accordance with applicable

[1] A subsidiary of Alphabet Inc.
[2] Drone and UA may be used interchangeably.

environmental laws and regulations. The EA is incorporated by reference into and supports this FONSI/ROD.

Purpose and Need

The FAA has multiple approvals associated with Wing's proposed expansion of operations to Frisco and Little Elm, Texas in the Dallas metropolitan area. The FAA issuance of the amendment to the OpSpecs to add new areas of operations in Frisco and Little Elm, Texas is the approval that will ultimately enable UA commercial delivery operations in this area. Wing's request to amend its OpSpecs to add a new area of operations requires FAA review and approval. The FAA has a statutory obligation to review Wing's request to amend the OpSpecs and determine whether the amendment would affect safety in air transportation or air commerce and whether the public interest requires the amendment. After making this determination, the FAA must take an action on the OpSpecs amendment.

The purpose of Wing's request is to expand its area of operations for UA commercial delivery service to Frisco and Little Elm, TX which, in its business judgment, Wing has determined is an appropriate market for expansion. Wing's requested amendment is needed so Wing can begin limited UA commercial delivery operations in Frisco and Little Elm, Texas.

See Section 1.3 of the EA for further information.

Proposed Action

In order for Wing to amend the OpSpecs in its Part 135 air carrier certificate it must receive a number of approvals from the FAA, such as a waiver of 14 CFR 91.113(b) to enable BVLOS operations and a Certificate of Waiver or Authorization (COA). Wing has requested that the FAA amend the OpSpecs in its Part 135 air carrier certificate; this is the FAA approval that ultimately would enable operations in Frisco and Little Elm, Texas. The proposed action is the FAA approval of an amendment to Wing's B050 OpSpec, *Authorized Areas of En Route Operations, Limitations, and Provisions*, specifically to a reference section titled Limitation, Provisions, and Special Requirements. The amendment would add a new paragraph with descriptive language about the Frisco and Little Elm operating area boundaries (depicted in Figures 1 and 2 of the attached EA), including the specific location and operational profile proposed in Wing's request.

Wing projects operating a maximum of approximately 100 flights per operating day from each of the two locations in the first year of operations. The operations would occur during daytime hours only,

typically on five days of the week, and generally excluding holidays unless related to a community event or holiday-related promotion. Night operations would not be conducted under the proposed action.

See Section 2.1 of the EA for further information.

Alternatives

Alternatives analyzed in detail in the EA include the proposed action and the no action alternative. Under the no action alterative, the FAA would not issue the approvals necessary, including the OpSpec amendment, to enable Wing to begin its UA package delivery operations to Frisco and Little Elm, TX. This alternative does not support the stated purpose and need.

See Section 2.2 of the EA for further information.

Environmental Impacts

The potential environmental impacts from the proposed action and no action alternative were evaluated in the attached EA for each of the environmental impact categories identified in FAA Order 1050.1.F. Section 3 of the attached EA describes the physical, natural, and human environment within the project study area, and identifies those environmental impact categories that are not analyzed in detail, explaining why the proposed action would have no potential effects on those environmental impact categories. Those categories are Air Quality; Climate; Coastal Resources; Farmlands; Hazardous Materials, Solid Waste, and Pollution Prevention; Land Use; Natural Resources and Energy Supply; Socioeconomic Impacts and Children's Environmental Health and Safety Risks; Visual Effects (Light Emissions Only); Water Resources (Wetlands, Floodplains, Groundwater, and Wild and Scenic Rivers).

Section 3 also provides detailed evaluations of the potential environmental consequences for each of the remaining 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 category, including requisite findings with respect to relevant special purpose laws, regulations, and executive orders, is presented below:

- **Biological Resources (including Fish, Wildlife, and Plants)**, EA Section 3.2. There is no significant impact to biological resources. There will be no ground construction or habitat modification associated with the proposed action, as the landing and take off locations are in lots that are already developed.The operations will be taking place within airspace, and typically well above the tree line and away from sensitive habitats. The typical number of daily operations and

altitude of the flights (generally between 150 to 250 feet above ground level) are not expected to significantly influence wildlife in the area.

Bird species are expected to be most sensitive to disturbance from drones during the breeding season when they are protecting young in nests. Of the special status bird species that could be present, only the Bald Eagle and the Red-headed Woodpecker have the potential to nest in the operating area (see the IPaC report in Appendix A of the Final EA). Wing has agreed to a monitoring plan for Bald Eagle nests that integrates multiple strategies and resources. If Wing identifies a Bald Eagle nest or is notified of the presence of a nest, Wing will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between a vehicle's flight path and the nest. This avoidance area will be maintained until the end of the breeding season or until a qualified biologist indicates the nest has been vacated. If Wing identifies or learns of any active Red-headed Woodpecker nests within the operating area, it has indicated that it would avoid identified nest sites during the breading season or until a qualified biologist indicates the nest has been vacated.

Federally endangered Whooping Cranes could pass through the area, and suitable habitat has been identified for the species at Lewisville Lake. Whooping Cranes have not been identified in the operating area since 2014; however, if they are identified using habitat in the operating area, Wing will coordinate with the Arlington Ecological Services Field Office of the U.S. Fish and Wildlife Service, as well as the Texas Parks & Wildlife Department to determine if any avoidance zones or other best management practices are needed.

Several bat species that are considered state Species of Greatest Conservation Need could be present in the operating area; however, the FAA determined the proposed action will have no significant impacts to bats. Bat species are unlikely to encounter the vehicles as Wing's proposed operations will be limited to daylight hours. Even if flights do overlap with dawn or dusk bat emergance, the FAA has determined that the proposed action will not cause significant impacts to bats.

The American Bumblebee is also considered a state Species of Greatest Conservation Need and could be present in the operating area; however, FAA determined the proposed action is not expected to have significant impacts on insects since no widespread negative impacts regarding drone impacts on insects have been identified in scientific literature.

The proposed action will not involve ground construction or habitat modification and no impacts to fish, reptiles, or terrestrial mammal species are expected. The proposed action would not result in: extirpation of a species from the project area; adverse impacts to special status species or their habitats; substantial impacts to native species' habitats or their populations; or adverse impacts on any species' reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels required.

- **Department of Transportation Act, Section 4(f) Resources**, EA Section 3.3. Section 4(f) of the DOT Act protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) states that, subject to exceptions for de minimis impacts[3]: "The Secretary may approve a transportation program or project requiring the use of [4(f) resources]…only if—(1) there is no prudent and feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use." The term "use" includes both direct or physical and indirect or "constructive" impacts to Section 4(f) resources. The FAA has determined that infrequent UAS overflights as described in the proposed action would not cause substantial impairment to Section 4(f) resources, and therefore would not be considered a constructive use of any Section 4(f) resource. There will be no physical use of Section 4(f) resources. Noise and visual effects from Wing's occasional overflights are not expected to diminish the activities, features, or attributes of any resources in the study area. Additionally, Wing has identified public outdoor recreation areas, schools, playgrounds, public parks, and other potential open-air assemblies of non-participating persons in its flight planning system, and has confirmed to the FAA that it will generally not conduct operations over these "fly less" properties during the scope of operations covered by this proposed action. There will be no significant impacts to Section 4(f) resources as a result of the proposed action.

- **Historical, Architectural, Archaeological, and Cultural Resources**, EA Section 3.4. Section 106 of the National Historic Preservation Act (NHPA) of 1966 [54 U.S.C. § 306108] requires federal agencies to consider the effects of their undertakings on properties listed or eligible for listing in

[3] The FAA may make a de minimis impact determination with respect to a physical use of Section 4(f) property if, after taking into account any measures to minimize harm, the result is either: (1) a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or (2) a Section 106 finding of no adverse effect or no historic properties affected. See 1050.1F Desk Reference, Paragraph 5.3.3

the National Register of Historic Places (NRHP). This includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meets the NRHP criteria. Compliance with Section 106 requires consultation with the State Historic Preservation Officer (SHPO) and applicable other parties, including Indian tribes. The FAA has identified five historic sites within the study area, although the nature of the sites are such that they are not likely to be affected by infrequent UA operations. Based on a review of the information available, including the noise analysis and the operational information and the FAA's knowledge with respect to the level of environmental impacts from UAS operations, the FAA has determined that the proposed action would not affect historic resources. The FAA notified the SHPO of its determination and the SHPO concurred.

On February 2, 2021, the FAA sent consultation letters to seven Tribal Historic Preservation Offices for tribes that may potentially attach religious or cultural significance to resources in the area the APE. The seven tribes are, respectively: (1) Apache Tribe of Oklahoma; (2) Coushatta Tribe of Louisiana; (3) Muscogee (Creek) Nation; (4) Tonkawa Tribe of Indians of Oklahoma; (5) Wichita and Affiliated Tribes (Wichita, Keechi, Waco & Tawakonie), Oklahoma; (6) Comanche Nation, Oklahoma; and (7) Delaware Nation, Oklahoma. The FAA did not receive any responses or objections. No traditional cultural resources were identified by the FAA during the analysis for this project. In response to FAA's letter, the SHPO indicated that no cultural resources are present or affected by the proposed action.

Based on the information available, the FAA has determined that this undertaking will not affect historic properties. Additionally, there would be no known effect on known cultural resources from this action. Therefore, the action will not have a significant impact to historic, architectural, archaeological, or cultural resources.

- **Noise and Noise-Compatible Land Use**, EA Section 3.5 and Appendix C. The FAA has issued requirements for assessing aircraft noise in FAA Order 1050.1F, Appendix B. The FAA's required noise metric for aviation noise analysis is the yearly Day-Night Average Sound Level (DNL) metric. A significant noise impact is defined in Order 1050.1F as an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB DNL noise exposure or a noise exposure at or above the 65 dB level due to a DNL 1.5 dB or greater increase. The compatibility of existing and planned land uses with an aviation proposal is usually associated with noise impacts

The proposed action is not anticipated to result in any significant changes in the overall noise environment within the affected area. There is no construction and therefore no construction noise that will result from the proposed action. Considering the noise impacts from the proposed flight operations, the FAA noise exposure analysis concluded that even in areas with the highest noise exposure, levels would still be well below FAA's DNL 65 dB threshold for noise compatible land use as well as below FAA's significance threshold for noise. The resulting DNL at both the Frisco and Little Elm nests was estimated to only reach a potential DNL of 53.0 dB. These levels would occur just at the nest locations.

FAA also conducted a supplemental analysis to analyze the number of times over a 24-hour period the UA operations would exceed LAmax 60 dB. Similar to the results of the required DNL metric noise analysis, this supplemental metric analysis illustrated that the highest number of events occurred at or in close proximity to the nest, with some limited events occurring farther away from the nest.

Based in FAA's noise analysis, the proposed action will not have a significant noise impact.

- **Environmental Justice**, EA Section 3.6. Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, Section 1-101 requires all federal agencies to the greatest extent practicable and permitted by law, to make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The proposed action will not result in adverse impacts in any environmental resource category. In particular, as noted in Section 3.5, *Noise and Noise-Compatible Land Use*, and the Noise Analysis Report in Appendix C, the UA's noise emissions could be perceptible in areas within the operating area, but will stay well below the level determined to constitute a significant impact. Based on the information in Section 3.6, the FAA did not identify any environmental justice populations in the operating area, including any environmental justice populations that would be uniquely affected by the proposed action. For these reasons, the proposed action would not result in a disproportionately high or adverse effect on a low-income or a minority population, nor would the action result in a significant environmental justice impact.

- **Visual Effects (Visual Resources and Visual Character)**, EA Section 3.7. Visual resources and visual character impacts deal with the extent to which the proposed action would result in visual impacts to resources in the Frisco and Little Elm operating area. Visual impacts can be difficult to define and evaluate because the analysis is generally subjective, but are normally related to the extent that the proposed action would contrast with, or detract from, the visual resources and/or the visual character of the existing environment. Impacts to visual resources are not expected to be significant. The proposed action makes no changes to any landforms, or land uses, thus there would be no effect to the visual character of the area. The proposed action involves airspace operations that could result in visual impacts to sensitive areas where the visual setting is an important resource of the property. However, Wing has confirmed to the FAA that it will generally not conduct operations over certain "fly less" properties during the scope of operations covered by this proposed action. Some of these properties are certain types of resources that could be valued for aesthetic, including visual, attributes, such as schools, sports arenas, outdoor recreation areas, and playgrounds. Further, the short duration that each UA flight could be seen from any particular resource in the operating area combined with the low number of proposed flights per day minimizes any potential for significant impacts. Accordingly, any potential impacts of the proposed action on visual resources and visual character will not be significant.

- **Water Resources (Surface Waters)**, EA Section 3.8. The proposed action would not be expected to result in significant impacts to surface water resources. There are no construction activities occurring under the proposed action that could impact surface waters. The potential likely source of surface water contamination on the UA, the aircraft's Lithium-ion battery packs, are not expected to detach from the aircraft. Further, the UA is not expected to become lost in the event of a water landing as Wing is required to locate and secure any downed aircraft. For these reasons, the proposed action would not have the potential to exceed water quality standards established by federal, state, local, and tribal regulatory agencies; or contaminate public drinking water supply such that public health may be adversely affected.

Public Involvement and Coordination

The draft EA was made available for public review. The public Notice of Availability (NOA) was distributed on December 7, 2021 to local interest groups, including local government officials, Section

4(f) resource authorities,[4] Homeowners Associations' points of contact as provided by Wing, and the State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) (see section 5.0 of the EA). The NOA was also provided in Spanish. The Draft EA was available on the FAA's website and was open for comment from December 7, 2021 through December 21, 2021. Copies of the document were available upon request by emailing the FAA. The FAA received several comments during the comment period for this EA. Appendix G in the EA contains the FAA's summary and response to timely comments.

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 FAA's review and analysis and consideration of comments, it has determined that there would be no significant impacts to 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.

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.

[4] See Section 3.3.

Decision and Order

The FAA recognizes its responsibilities under NEPA, CEQ regulations, and its own directives. Recognizing these responsibilities, I have carefully considered the FAA's goals and objectives in reviewing the environmental aspects of the proposed action to approve Wing's OpSpec amendment request to begin its UA commercial package delivery operations in the Frisco and Little Elm operating area. Based upon the above analysis, the FAA has determined that the proposed action meets the purpose and need.

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 attached Final 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 general public have been addressed in the Final 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.

Having carefully considered and being properly advised as to the anticipated environmental impacts of the proposal as described in the EA and the FONSI, under the authority delegated by the Administrator of the FAA, I find the OpSpec amendment, and other approvals necessary to enable Wing's requested operations in Frisco and Little Elm, Texas 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 to Section 102(2)(C) of NEPA. I further find that the action is the type of action that does not require an Environmental Impact Statement under NEPA.

Issued on: February 9, 2022

KEVIN A. RAYMOND

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Date: 2022.02.09 14:41:14 -06'00'

Kevin Raymond
Acting Manager, General Aviation Operations Section
General Aviation and Commercial Division
Office of Safety Standards, Flight Standards Service

Right of Appeal

This FONSI/ROD constitutes a final agency action and a final order taken pursuant to 49 U.S.C. §§ 40101 et seq., and constitutes a final order of the FAA Administrator which is subject to exclusive judicial review by the Courts of Appeals of the United States in accordance with the provisions of 49 U.S.C. § 46110. Any party having substantial interest in this order may apply for a review of the decision by filing a petition for review in the appropriate U.S. Court of Appeals no later than 60 days after the order is issued in accordance with the provisions of 49 U.S.C. § 46110.

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1.0 PURPOSE AND NEED

1.1 Introduction

Wing Aviation, LLC (Wing), a subsidiary of Alphabet Inc., is seeking to amend its air carrier Operations Specifications (OpSpecs) and other Federal Aviation Administration (FAA) approvals to conduct unmanned aircraft (UA) commercial package delivery operations from two Texas locations, Frisco and Little Elm, using its 15-pound Hummingbird 7000W-A UA. It will operate one "nest" in each location.[1] Wing projects it would operate a maximum of approximately 100 flights per operating day from its Frisco nest and a maximum of approximately 100 flights per operating day from its Little Elm nest in the first year of operations. The operations would occur during daytime hours only, typically on five days of the week, and generally excluding holidays unless related to a community event or holiday-related promotion. The approval of the amendment to Wing's OpSpecs to include this new operating area and the other FAA approvals that are necessary for these operations are considered a major federal action subject to National Environmental Policy Act (NEPA) review requirements.

This Final Environmental Assessment (EA) is being prepared by the FAA to evaluate the potential environmental impacts that may result from FAA's approval of the proposed action, which would enable UA commercial delivery operations in Frisco and Little Elm, Texas. The FAA has prepared this EA pursuant to the National Environmental Policy Act of 1969 [42 United States Code (U.S.C.) § 4321 et seq.] and its implementing regulations (40 Code of Federal Regulations (CFR) §§1500-1508)). Under NEPA, federal agencies are required to consider the environmental effects of proposed federal actions and to disclose to decision-makers and the interested public a clear and accurate description of the potential environmental impacts of proposed major federal actions. Additionally, under NEPA, federal agencies are required to consider the reasonable alternatives to the proposed action, and a no action alternative (assessing the potential environmental effects of not implementing the proposed action). The FAA has established a process to ensure compliance with the provisions of NEPA through FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and the FAA Order 1050.1F Desk Reference.

1.2 Background and Location

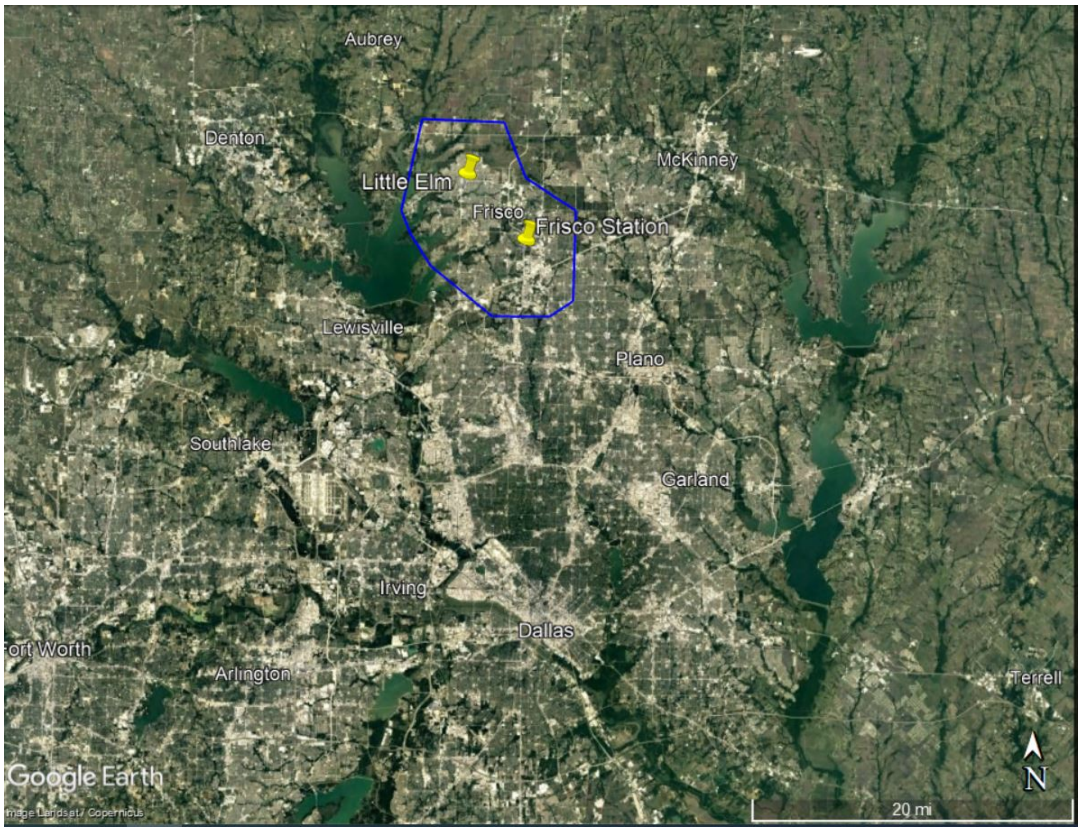
In 2012, Congress first charged the FAA with integrating unmanned aircraft systems (UAS) into the National Airspace System (NAS).[2] The FAA has engaged in a phased, incremental approach to integrating UAS into the NAS and continues to work toward full integration of UAS into the NAS. Part of that approach involves providing safety review and oversight of proposed operations to begin commercial UA delivery in the NAS.

Over the past five years Wing has been working under various FAA programs, including the UAS Integration Pilot Program (IPP),[3] the Partnership for Safety Plan Program (PSP),[4] and the BEYOND program,[5] as well as FAA's established processes to bring certificated commercial UA delivery into practice. Participants in these programs are among the first to prove their concepts, including package

[1] A nest is a ground based service area where UA are assigned and where flights originate and return.
[2] 49 U.S.C. 44802; FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, Sec. 332. 126 Stat. 11, 73 (2012).
[3] The UAS IPP was announced on October 25, 2017 via a Presidential Memorandum, which has the force and effect of law on executive agencies. https://www.faa.gov/uas/programs_partnerships/completed/integration_pilot_program/
[4] https://www.faa.gov/uas/programs_partnerships/psp/
[5] https://www.faa.gov/uas/programs_partnerships/beyond/

delivery by UA, through the use of current regulations and exemptions and waivers from some of these regulatory requirements.

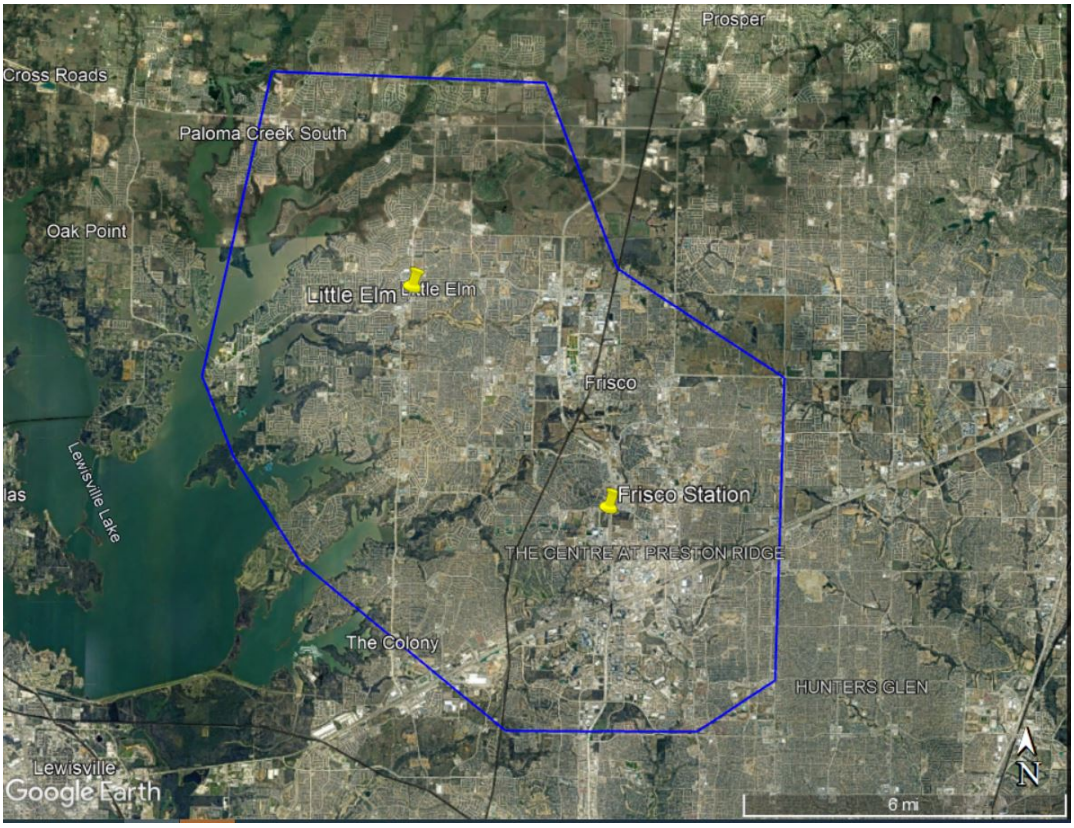
Wing was one of the first to obtain an FAA Part 135 certificate, which allows it to carry the property of another for compensation or hire Beyond Visual Line of Sight (BVLOS). Wing has a standard Part 135 air carrier certificate and that certificate contains a stipulation that operations must be conducted in accordance with the provisions and limitations specified in its OpSpecs. Wing's current request for an amended OpSpecs to specify an area of operations, in conjunction with other related FAA approvals, such as a waiver of 14 CFR 91.113(b) to enable BVLOS operations and a Certificate of Waiver or Authorization (COA), would enable commercial delivery operations in the communities of Frisco and Little Elm, TX, on the northern side of the Dallas Metropolitan Area. In Figures 1 and 2 below, the operating area is outlined in blue, with the nest locations identified using the yellow pins. The operational area, shaped like a polygon, is – at its widest – approximately 15 miles north to south and 11 miles east to west. The approximate land area is 91 square miles, and the approximate water area is 6.3 square miles. At its widest, on the western side the operational area is bounded by Lewisville Lake and on the eastern side by Coit Road. The northernmost boundary is roughly parallel to Fishtrap Road and the southernmost boundary is along the Windhaven Parkway.



[6]

Figure 1 Study Area Shown Within the Dallas Metropolitan Area

[6] Image: Google Earth, as modified by the FAA



[7]

Figure 2 Closer View of the Study Area

1.2.1 Frisco Station

The nest location at Frisco Station is on private property, and is zoned for commercial use. The location is just to the north of a commercial district where restaurants and other businesses are located, near the intersection of the Gaylord Parkway and Station Boulevard. See Figure 3, where North is at the top of the image. Wing is planning to establish partnerships with multiple businesses in this commercial area. Wing's partners would be able to deliver products to customers using Wing's UA as long as the customer was located within the blue-lined study area and within flight range of the Frisco Station nest.

[7] Image: Google Earth, as modified by the FAA

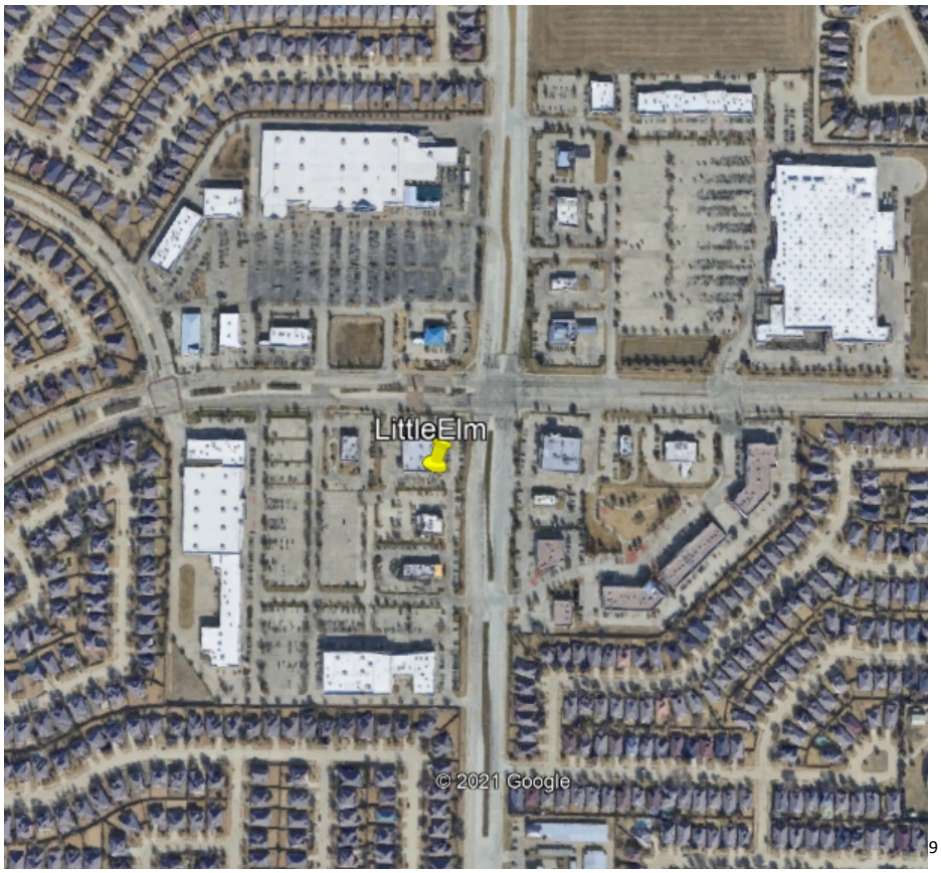
[8]

Figure 3 Wing's Nest Location at Frisco Station

1.2.2 Little Elm

The nest location at Little Elm is within the parking lot of a Walgreens pharmacy and shopping center, near the intersection of the East Eldorado Parkway and Farm to Market Road 423 (FM 423). The property is zoned for commercial use and is privately owned. See Figure 4, where North is at the top of the image. Under the proposed action reviewed in this EA, Wing will be delivering packages only from Walgreens to their customers within the blue-lined area and within the aircraft flight range of the Little Elm nest.

[8] Image: Google Earth, as modified by the FAA



[9]

Figure 4 Wing's Nest Location at Little Elm

1.3 Purpose and Need

As described in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, the Purpose and Need section of an EA briefly describes the underlying purpose and need for the proposed federal action. It presents the problem being addressed and describes what the FAA is trying to achieve with the proposed action.

1.3.1 FAA Purpose and Need

The FAA has multiple approvals, such as a waiver of 14 CFR 91.113(b) to enable BVLOS operations and a COA, associated with the expansion of operations to the Dallas metropolitan area; the FAA issuance of the amendment to the OpSpecs is the approval that will ultimately enable UA commercial delivery operations in this area. Wing's request to amend its OpSpecs to add a new area of operations requires FAA review and approval.

The FAA has a statutory obligation to review Wing's request to amend the OpSpecs and determine whether the amendment would affect safety in air transportation or air commerce and whether the public interest requires the amendment. In general, Congress has charged the FAA to encourage the development of civil aeronautics and the safety of air commerce in the United States. 49 U.S.C. §40104.

[9] Image: Google Earth, as modified by the FAA

In addition, the FAA has specific statutory and regulatory obligations related to its issuance of a Part 135 certificate and the related OpSpecs. The FAA is required to issue an operating certificate to an air carrier when it "finds, after investigation, that the person properly and adequately is equipped and able to operate safely under this part and regulations and standards prescribed under this part." 49 U.S.C. §44705. An operating certificate also specifies "terms necessary to ensure safety in air transportation; and (2)…the places to and from which, and the airways of the United States over which, a person may operate as an air carrier." *Id*. Also included in air carrier certificates is a stipulation that the air carrier's operations must be conducted in accordance with the provisions and limitations specified in OpSpecs. 14 CFR §119.5 (g), (l). The regulations also specify that a Part 135 certificate holder may not operate in a geographical area unless its OpSpecs specifically authorize the certificate holder to operate in that area. 14 CFR 119.5(j). The regulations implementing Section 44705 specify that an air carrier's approved OpSpecs must include, among other things, "authorization and limitations for routes and areas of operations." 14 CFR §119.49(a)(6). An air carrier's OpSpecs may be amended at the request of an operator if the FAA "determines that safety in air commerce and the public interest allows the amendment." 14 CFR §119.51(a); see also 49 U.S.C. §44709. After making this determination, the FAA must take an action on the OpSpec amendment.

1.3.2 Wing's Purpose and Need

The purpose of Wing's request is to expand its area of operations for UA commercial delivery service to the Dallas metropolitan area, which, in its business judgment, Wing has determined is an appropriate market for expansion. Wing's requested amendment is needed so Wing can begin limited UA commercial delivery operations in Frisco and Little Elm, Texas. This expansion could help Wing gauge public demand for UA delivery services and evaluate whether scalable and cost-effective UA delivery expansion is possible in the area. In addition, the expansion could provide an opportunity to assess community response to commercial delivery operations in the area.

1.4 Public Involvement

The Draft EA was made available for public review. The FAA created a Notice of Availability (NOA) with information about the EA and provided it on December 7, 2021 to local interest groups, including local government officials, Section 4(f) resource authorities,[10] Homeowners Associations' points of contact as provided by Wing, and the State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) discussed later in this EA. The NOA provided information about the proposed action and requested review and comments on the EA, which was published on the FAA website in early December 2021 for a 14-day comment period. The FAA also provided the NOA in Spanish. Interested parties were invited to submit comments on any environmental concerns relating to the proposed action to a specifically assigned email address. The FAA received several comments during the comment period for this EA, which was open from December 7, 2021 through December 21, 2021. Appendix G contains the FAA's summary and response to timely comments.

[10] See Section 3.3.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

In order for Wing to conduct UA package deliveries in a new location, it must receive a number of approvals from the FAA, such as a waiver of 14 CFR 91.113(b) to enable BVLOS operations, and a COA. Further, Wing has requested that FAA amend the OpSpecs in its Part 135 air carrier certificate. The OpSpec amendment is the FAA approval that ultimately would enable operations in Frisco and Little Elm, Texas.

The B050 OpSpec, *Authorized Areas of En Route Operations, Limitations, and Provisions*, includes a reference section titled Limitations, Provisions, and Special Requirements. The amendment to this reference section – to add a new paragraph with descriptive language about the Frisco and Little Elm operating area boundaries, including the specific location and operational profile proposed in Wing's request – is the proposed federal action for this EA. The OpSpecs amendment will restrict Wing to this particular location; any future expansion beyond the authorization and limitations for routes and areas of operations described in the amended OpSpecs will require additional OpSpec amendments from the FAA and will receive appropriate NEPA review at that time.[15]

The proposed UA commercial delivery operations would take place in the communities of Frisco and Little Elm, TX, on the northern side of the Dallas Metropolitan Area. In Figures 1 and 2 above, the study area is outlined in blue, with the nest locations identified using the yellow pins.

Wing projects operating a maximum of approximately 100 flights per operating day from the Frisco Station nest in the first year of operations. The operations would occur during daytime hours only, typically on five days of the week, and generally excluding holidays unless related to a community event or holiday-related promotion. Night operations would not be conducted under the proposed action.

In addition, Wing projects operating a maximum of approximately 100 flights per operating day from the Little Elm nest in the first year of operations. The operations would occur during daytime hours only, typically on five days of the week, and generally excluding holidays unless related to a community event or holiday-related promotion. Night operations would not be conducted under the proposed action.

2.2 No Action Alternative

The alternative to the proposed action is the no action alterative, where FAA would not issue the approvals necessary, including the amendment to the OpSpecs, to enable Wing to conduct UA commercial package delivery operations in the Frisco and Little Elm operating area. This alternative does not support the stated purpose and need. However, it was retained as required by CEQ regulations (40 CFR 1502.14(c)).

[15] The FAA's guidance for OpSpecs is in Volume 3, Chapter 18 of The Flight Standards Information Management System (FSIMS) Order 8900.1. Available at: https://fsims.faa.gov/PICResults.aspx?mode=EBookContents&restricttocategory=all~menu.

3.0 AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES

This section provides a description of the environmental resources that would be affected by the proposed action, as required by the CEQ regulations and FAA Order 1050.1F. The level of detail provided in this section is commensurate with the importance of the impact on these resources (40 CFR § 1502.15). The general study area for each resource is the entire area within the blue-lined boundaries of Figure 2 in this report. As required by FAA Order 1050.1F, this EA presents an evaluation of impacts for the environmental impact categories listed below.

- Air Quality
- Biological Resources (including Fish, Wildlife, and Plants)
- Climate
- Coastal Resources
- Department of Transportation Act, Section 4(f) Resources
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Compatible Land Use
- Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects (Light Emissions)
- Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

For each of the resources covered in this section, the following information is provided:

- Regulatory Setting
- Affected Environment
- Environmental Consequences

3.1 Resources Not Analyzed in Detail

This EA does not analyze potential impacts on the following environmental impact categories in detail, for the reasons explained below:

- **Air Quality and Climate** – The UA is battery-powered will not generate emissions that could result in air quality impacts or climate impacts. Electricity consumed for battery charging at the nests will be minimal, especially for the limited scope of these operations. Electricity consumed for the proposed action is not expected to cause a significant impact to the electrical grid.

- **Coastal Resources** –The proposed operation would not directly affect any shorelines or change the use of shoreline zones and be inconsistent with any NOAA-approved state Coastal Zone Management Plan (CZMP) since there are no shorelines in the area of operations.
- **Farmlands** –The proposed action will not involve the development or disturbance of any land regardless of use, nor would it have the potential to convert any farmland to non-agricultural uses.
- **Hazardous Materials, Solid Waste, and Pollution Prevention** –The proposed action will not result in any construction or development or any physical disturbances of the ground. Therefore, the potential for impact in relation to hazardous materials, pollution prevention, and solid waste is not anticipated. Additionally, each Wing UA is made from recyclable and biodegradable materials and will be properly managed at the end of its operating life in accordance with 14 CFR Part 43.
- **Land Use** – The proposed action will not involve any changes to existing, planned, or future land uses within the area of operations.
- **Natural Resources and Energy Supply –** The proposed action will not require the need for unusual natural resources and materials, or those in short supply. Wing's aircraft will be battery powered and will not consume fuel resources.
- **Socioeconomic Impacts and Children's Environmental Health and Safety Risks** – The proposed action will not involve acquisition of real estate, relocation of residents or community businesses, disruption of local traffic patterns, loss in community tax base, or changes to the fabric of the community. Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to ensure that children do not suffer disproportionately from environmental or safety risks. The proposed action will not affect products or substances that a child would be likely to come into contact with, ingest, use, or be exposed to, and would not result in environmental health and safety risks that could disproportionately affect children. Additionally, Wing's proposal includes avoiding operations near schools and playgrounds during operational hours, which could help reduce any potential environmental health or safety impacts to children.
- **Visual Effects (Light Emissions Only)** – The proposed action will not result in significant light emission impacts because flights will be limited to daytime flights only.
- **Water Resources (Wetlands, Floodplains, Groundwater, and Wild and Scenic Rivers)** –The proposed operation will not result in the construction of facilities and would therefore not encroach upon areas designated as navigable waters or directly impact wetlands. The proposed operation will not encroach upon areas designated as a 100-year flood event area as described by the Federal Emergency Management Agency (FEMA). The proposed action will not result in any changes to existing discharges to water bodies, create a new discharge that would result in impacts to surface waters, or modify a water body. The proposed action does not involve land acquisition or ground disturbing activities that would withdraw groundwater from underground aquifers or reduce infiltration or recharge to ground water resources through the introduction of new impervious surfaces. The proposed action would not foreclose or downgrade the Wild, Scenic, or Recreational river status of a river or river segment included in the Wild and Scenic River System. There are no river segments within the operational area.

3.2 Biological Resources (Including Fish, Wildlife and Plants)

3.2.1 Regulatory Setting

Biological resources include plant and animal species and their habitats, including special status species (federally listed or state-listed threatened or endangered species, species proposed for listing, species that are candidates for federal listing, marine mammals, and migratory birds) and environmentally sensitive or critical habitat. Biological resources provide aesthetic, recreational, and economic benefits to society.

Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 [16 U.S.C. § 1531 et seq.] requires the evaluation of all federal actions to determine whether a proposed action is likely to jeopardize any proposed, threatened, or endangered species or proposed or designated critical habitat. Critical habitat includes areas that will contribute to the recovery or survival of a listed species. Federal agencies are responsible for determining if an action "may affect" listed species, which determines whether formal or informal consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) is needed. If the FAA determines that the action will have no effect on listed species, consultation is not required. If the FAA determines that the action may affect listed species, consultation with the USFWS must be initiated.

A significant impact to federally-listed threatened and endangered species would occur when the USFWS or NMFS determines that the proposed action would be likely to jeopardize the continued existence of a federally-listed threatened or endangered species, or would be likely to result in the destruction or adverse modification of federally-designated critical habitat. An action need not involve a threat of extinction to federally listed species to meet the NEPA standard of significance. Lesser impacts including impacts on non-listed or special status species could also constitute a significant impact.

Migratory Birds

The Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) protects migratory birds, including their nests, eggs, and parts, from possession, sale, purchase, barter, transport, import, export, and take. The USFWS is the federal agency responsible for the management of migratory birds as they spend time in habitats of the U.S. For purposes of the Migratory Bird Treaty Act, "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR § 10.12). The Migratory Bird Treaty Act applies to migratory birds identified in 50 CFR § 10.13 (defined hereafter as "migratory birds").

Bald and Golden Eagles

The Bald and Golden Eagle Protection Act prohibits anyone from "taking" a bald or golden eagle, including their parts, nests, or eggs, without a permit issued by the USFWS. Implementing regulations (50 CFR Part 22), and USFWS guidelines as published in the National Bald Eagle Management Guidelines, provide for additional protections against "disturbances." Similar to take, "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, injury to an eagle or causes either a decrease in its productivity or nest abandonment due to a substantial interference with breeding, feeding, or sheltering. A permitting process provides limited exceptions to the Bald and Golden Eagle Protection Act's prohibitions. The USFWS has issued regulations for the permitting process in 50 CFR Part 22, which include permits for the incidental take of Bald Eagles. Such permits are only needed when avoidance of incidental take is not possible. According to federal and state guidelines, if

conservation measures can be implemented such that no aircraft are flown within 1000 feet of a nest, incidental take of Bald Eagles is unlikely to occur and no permit is needed.[16]

3.2.2 Affected Environment

This section describes the existing biological environment of the Frisco and Little Elm operating area. The Dallas metropolitan area is located in the Blackland Prairies ecoregion of Texas, characterized by gently rolling hills, cropland, and livestock grazing. Few remnant native prairie sites remain as a result of urban expansion.[17]

The proposed action would take place over mostly suburban and commercially-developed properties. These areas provide habitat for the smaller, more common and ubiquitous bird and mammal species of the southern U.S., including mammals such as white tailed deer, raccoons, opossums, and squirrels. Volant species include bats such as the Evening Bat (*Nycticeius humeralis*)[18], songbirds, waterfowl and insects. Wing's nests would be close to roads and human activity centers and would not be located in a place where "quiet" is a unique attribute of the habitat.

Special Status Species

Federally Listed Species

The potential for impacts to federally-listed species was assessed using the USFWS Information for Planning and Consultation (IPaC) map tool and reports. The study area covered the entire Frisco and Little Elm operating area, shown as the blue-lined area in earlier Figures of this EA. The IPaC report is included as Appendix A.

Based on the IPaC report, there are three ESA-listed bird species that could be present in the study area. The Piping Plover (*Charadrius melodus*), a Threatened species, the Red Knot (*Calidris canutus rufa*), a Threatened Species, and the Whooping Crane (*Grus americana*), an Endangered Species, are identified in the IPaC report. As noted in the IPaC report, both the Piping Plover and the Red Knot only need to be considered for wind energy projects, so no further analysis was conducted for those two species.

The Whooping Crane nests much further north in Canada, so there is no threat of disturbing that critical part of their lifecycle. It is possible that Whooping Cranes could use parts of Lewisville Lake within the operating area as stopover habitat on their way to wintering grounds along the Gulf Coast. Lewisville Lake has been evaluated as potential stopover habitat for the Aransas-Wood Buffalo Whooping Crane population that winters along the Gulf Coast and summers in Northern Alberta. This evaluation determined that the Lake appears to have suitable stopover habitat, although migrating cranes from this population have not been documented using the Lake. In 2013, seven wandering Whooping Cranes from the non-migratory Louisiana population spent a few months living at Lewisville Lake, as documented by Chris Jacksons from DFW Urban Wildlife. One of these cranes returned in 2014, but has not returned

[16] U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management guidelines. Available: https://fws.gov/migratorybirds/pdf/management/nationalbaldeaglenanagementguidelines.pdf. Accessed: February 4, 2022. See also, Texas Parks and Wildlife. 2003. Habitat Management Guidelines for Bald Eagles in Texas. Available: https://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_w7000_0013_bald_eagle_mgmt.pdf. Accessed: February 4, 2022.

[17] Texas Parks and Wildlife. 2021. Blackland Prairie Ecological Region. https://tpwd.texas.gov/landwater/land/habitats/cross_timbers/ecoregions/blackland.phtml. Accessed: November 23, 2021

[18] Lewisville Lake Environmental Learning Area Mammal Checklist. 2021. https://www.llela.org/about-llela/checklists/mammals. Accessed: November 23, 2021.

since.[19] Whooping Cranes have not been observed at Lewisville Lake since 2014 and are considered rare in this area.[20]

There is no critical habitat within the operating area for any species identified in the IPaC report.

State Protected Species

The Texas Parks and Wildlife Department's database of Rare, Threatened, and Endangered Species of Texas lists 50 species of amphibians, birds, mammals, reptiles, crustacea, insects, mollusks, and plants in Denton and Collin counties considered as Species of Greatest Conservation Need as defined in the 2012 Texas Conservation Action Plan.[21] This list includes the volant species presented in Figure 5.

Common name	Scientific Name
Birds	
White-faced Ibis	*Plegadis chihi*
Wood Stork	*Mycteria americana*
Bald Eagle	*Haliaeetus leucocephalus*
Black Rail	*Laterallus jamaicensis*
Whooping Crane	*Grus americana*
Piping Plover	*Charadrius melodus*
Mountain Plover	*Charadrius montanus*
Rufa Red Knot	*Calidris canutus rufa*
Franklin's Gull	*Leucophaeus pipixcan*
Western Burrowing Owl	*Athene cunicularia hypugaea*
Chestnut-collared Longspur	*Calcarius ornatus*
Mammals	
Tricolored Bat	*Perimyotis subflavus*
Big Brown Bat	*Eptesicus fuscus*
Eastern Red Bat	*Lasiurus borealis*
Hoary Bat	*Lasiurus cinereus*
Big Free-tailed Bat	*Nyctinomops macrotis*
Insects	
American Bumblebee	*Bombus pensylvanicus*

Figure 5 State-Protected Volant Species

[19] Louisiana Whooping Crane Annual Reports (2013 and 2014). Louisiana Wildlife and Fisheries. Available: https://www.wlf.louisiana.gov/resources/category/whooping-crane/annual-reports. Accessed: January 5, 2022.
[20] US Army Corps of Engineers (USACE) Lewisville Lake Master Plan, Appendix B (2020). Available: https://www.swf.usace.army.mil/Portals/47/docs/Lakes/Lewisville/MasterPlan/Appendix_B-Environmental_Assessment_and_Attachment_A.pdf?ver=2020-04-29-100221-473 Accessed: January 5, 2022
[21] Texas Parks and Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs. TPWD County Lists of Protected Species and Species of Greatest Conservation Need. Denton and Collin counties, last updated October 1 2021. Accessed 12/22/2021.

Migratory Birds

Migratory bird species found within the operating area will vary throughout the year. Many dozens of resident bird species – also protected under the Migratory Bird Treaty Act – will inhabit the fragmented woodlands and neighborhoods in the operating area all year long. During certain weeks in the spring and fall, hundreds of species of songbirds, raptors, and waterfowl from the northern U.S. and Canada may potentially pass through the operating area, mostly traveling at night. Some of these migratory birds could have winter territories in the operating area.

The IPaC report identifies Birds of Conservation Concern (BCC) that could occur in the operating area, along with information on the likelihood that they may be nesting in the area. Of the seven special status species identified in the IPaC report, only two of these species may potentially nest in the operating area. The Bald Eagle (*Haliaeetus leucocephalus*) is not a BCC in the operating area, but it could establish nests in forested areas near Lewisville Lake along the western side of the operating area. As stated in the National Bald Eagle Management Guidelines,[22] aircraft should stay at least 1,000 feet from Bald Eagle nests during its breeding season from September 1 through July 31, unless the aircraft is operated by a trained wildlife biologist.

The Red-headed Woodpecker (*Melanerpes erythrocephalus*) is a BCC that could nest within the operating area. Red-headed Woodpeckers typically nest in tall, dead trees near marshes and open bodies of water between May 10 and September 10. It is possible that Red-headed Woodpeckers may be nesting within the operating area.

3.2.3 Environmental Consequences

There will be no ground construction or habitat modification associated with the proposed action, as the aircraft nests are in lots that are already developed. Wing's aircraft will not touch the ground in any other place than the nest (except during emergency landings), since it remains aerial while conducting deliveries. Wing's deliveries will initiate from the nest, approach an en route altitude less than 400 feet above ground level (AGL), and will generally occur between 150 and 250 feet AGL. The UA will lower to around 22 feet AGL and hover for a brief time to make a delivery. Then, the UA will transition back to en route flight mode for a return to the nest.

The operations will be taking place within airspace, and typically well above the tree line and away from sensitive habitats. The low number of daily operations and altitude of the flights are not expected to significantly influence wildlife in the area.

Special Status Species

The federally endangered Whooping Cranes could pass through the operating area during their annual migration to wintering grounds along the Gulf Coast, and suitable habitat has been identified for Whooping Cranes at Lewisville Lake. However, Whooping Cranes have not been identified in this area since 2014 and migration flights are usually between 1,000 and 6,000 feet; therefore, it is not expected that occasional drone flights at 150-250 feet AGL will impact transitory Whooping Cranes at these altitudes. Additionally, the USFWS has used drones to survey Sandhill Cranes, a surrogate species for whooping crane behavior, and reported "no consistent adverse crane reaction" to the drones.[23]

[22] U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines. Available: https://www.fws.gov/northeast/ecologicalservices/pdf/NationalBaldEagleManagementGuidelines.pdf. Accessed: October 19, 2021.

[23] U.S. Fish and Wildlife Service.2011. Refuge Update, Monte Vista Refuge's Pilot-less Project to Survey Cranes. Available: https://www.fws.gov/refuges/RefugeUpdate/pdfs/refUp_NovDec_2011.pdf. Accessed: November 9, 2021

Therefore, it is expected that Whooping Cranes would react similarly if a drone was encountered at lower altitudes.

If Whooping Cranes are identified using habitat in the operating area in future, Wing will coordinate with the Arlington Ecological Services Field Office of the U.S. Fish and Wildlife Service, as well as the Texas Parks & Wildlife Department, to determine if any avoidance zones or other best management practices are needed.

Due to the limited operating area and proposed number of daily operations, the FAA determined there would be *no effect* to ESA-listed species.

Several bat species that could be present in the operating area are considered state Species of Greatest Conservation Need. Although bat species may occur within the operating area, they are unlikely to encounter the vehicles as Wing's proposed operations will be limited to daylight hours. In the event that flights do overlap with dawn or dusk bat emergence, bats may exhibit disturbance behaviors and change their flight paths to avoid drones.[24] However, research also suggests that drones have "minimal impact on bat behavior"[25] and do not appear to be disturbed by drones.[26] As a result, the FAA has determined that the proposed action will cause no significant impact to bats.

The American bumblebee is also considered a state Species of Greatest Conservation Need and could be present in the operating area. Insects, such as the bumblebee, could be struck by drones en route to or during delivery. Information regarding drone impacts on insects is limited and there have been no widespread negative impacts identified in the scientific literature. Therefore, based on the information available, the action is not expected to have significant impacts to insect populations.

Migratory Birds

Many species of migratory birds and state Species of Conservation Concern could be present in the operating area. As operations will be taking place well above the tree line, and due to the low number of daily operations, bird species are not expected to be impacted by en route flights. Bird species may be more sensitive to disturbance from drones during the breeding season when they are protecting young in nests. Only two bird species on the BCC list have the potential to nest in the operating area, the Bald Eagle and the Red-headed Woodpecker (see IPaC report in Appendix A).

To avoid impacts to nesting Bald Eagles, Wing has agreed to a monitoring plan for Bald Eagle nests that integrates multiple strategies and resources. This includes periodically checking online tools such as iNaturalist[27] to identify eagle nests that may occur in the operating area, as well as communication with the bird watching community to identify nests. Wing personnel will also be educated in the visual identification of Bald Eagle nests, which are typically very conspicuous. If Wing identifies a Bald Eagle nest or is notified of the presence of a nest, Wing will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between the vehicle's flight path and the nest. This avoidance area will be maintained until the end of the breeding season or until a qualified biologist indicates the nest has been vacated.

[24] Fewer bat passes are detected during small, commercial drone flights. Available: https://www.nature.com/articles/s41598-021-90905-0. Accessed: October 21, 2021

[25] The Chirocopter: A UAV for recording sound and video of bats at altitude. Methods in Ecology and Evolution. Available: https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/2041-210X.12992. Accessed: October 21, 2021

[26] Autonomous drones are a viable tool for acoustic bat surveys. Available: https://www.biorxiv.org/content/10.1101/673772v1.full.pdf Accessed: October 21, 2021

[27] iNaturalist. Available: https://www.inaturalist.org/. Accessed: January 5, 2022.

Red-headed Woodpecker nest locations should not be disturbed during the breeding period (May 10 to September 10[28]) in order to avoid any potential impacts to the nest activity, such as nest abandonment. If Wing identifies or learns of any active Red-headed Woodpecker nests within the operating area, it has indicated it would avoid identified nest sites during the breeding season or until a qualified biologist indicates the nest has been vacated.

Our analysis finds that the proposed action is not expected to cause any of the following impacts:

- A long-term or permanent loss of unlisted plant or wildlife species, i.e., extirpation of the species from a large project area;
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats;
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or
- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), or ability to sustain the minimum population levels required.

3.3 Department of Transportation Act, Section 4(f) Resources

3.3.1 Regulatory Setting

Section 4(f) of the DOT Act [codified at 49 U.S.C. § 303(c)] protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) states that, subject to exceptions for de minimis impacts[29]: "The Secretary may approve a transportation program or project requiring the use of [4(f) resources]…only if—(1) there is no prudent and feasible alternative to using that land; and (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use."

The term "use" includes both direct or physical and indirect or "constructive" impacts to Section 4(f) resources. Direct use is the physical occupation or alteration of a Section 4(f) property or any portion of a Section 4(f) property. A constructive use does not require direct physical impacts or occupation of a Section 4(f) resource. A constructive use would occur when a proposed action would result in substantial impairment of a resource to the degree that the protected activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished. The determination of use must consider the entire property and not simply the portion of the property used for a proposed project.[30]

Section 4(f) resources where a quiet setting is a generally recognized feature or attribute receive special consideration. In assessing constructive use, FAA Order 1050.1F, Appendix B, page B-11, requires that

[28] See IPaC Report in Appendix A of this EA.

[29] The FAA may make a de minimis impact determination with respect to a physical use of Section 4(f) property if, after taking into account any measures to minimize harm, the result is either: (1) a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or (2) a Section 106 finding of no adverse effect or no historic properties affected. See 1050.1F Desk Reference, Paragraph 5.3.3

[30] Federal Highway Administration (FHWA) Section 4(f) Policy Paper. (Note: FHWA regulations are not binding on the FAA; however, the FAA may use them as guidance to the extent relevant to aviation projects.) Available: https://www.environment.fhwa.dot.gov/legislation/section4f/4fpolicy.pdf. Accessed: February 2, 2021

the FAA "…must consult all appropriate federal, state, and local officials having jurisdiction over the affected Section 4(f) properties when determining whether project-related impacts would substantially impair the resources." Parks, recreation areas, and wildlife refuges that are privately owned are not subject to Section 4(f) provisions.

A significant impact would occur pursuant to NEPA when a proposed action either involves more than a minimal physical use of a section 4(f) property or is deemed a "constructive use" based on an FAA determination that the proposed action would substantially impair the 4(f) property, and mitigation measures do not eliminate or reduce the effects of the use below the threshold of significance.

3.3.2 Affected Environment

The FAA used data from federal, state, and other public-access sources to identify Section 4(f) resources within the operating area. The FAA identified many properties that meet the definition of a Section 4(f) resource, including public parks, recreation areas, and several historic sites identified on the Texas SHPO website. By count, most of the Section 4(f) resources are local parks, trails, and ballfields. There are no wildlife refuges within the operating area.

As discussed more in Section 3.4 – Historical, Architectural, Archaeological, and Cultural Resources, there are several historic sites within the operating area as listed on the Texas SHPO website, although most of these are considered for architectural or other purposes that will not typically be affected by UA operations. Also, as discussed in the next section devoted to Historical, Architectural, Archaeological, and Cultural Resources, the FAA consulted with the Texas SHPO to determine whether historic and traditional cultural properties would be affected by the proposed action.

In addition to FAA's analysis, Wing identifies properties such as parks, recreation areas, and schools in its flight planning system. Wing calls these "fly less" areas, which can be automatically avoided in Wing's flight planning software based on the type of the resource, time of day, and other factors. Wing has committed in its operational proposal to the FAA that it will generally avoid overflights of these "fly less" resources in the Frisco and Little Elm study area during the scope of operations covered by the proposed action, unless there is a specific purpose for Wing to enter one of these areas in coordination with the respective resource authority.

3.3.3 Environmental Consequences

The FAA has determined that infrequent UA overflights as described in the proposed action will not cause substantial impairment to any of the Section 4(f) resources in the operating area, and are not considered a constructive use of any Section 4(f) resource. There will be no physical use of Section 4(f) resources. Noise and visual effects from Wing's occasional overflights are not expected to diminish the activities, features, or attributes of the resources that contribute to their significance or enjoyment. Additionally, Wing has identified Section 4(f) resources in its flight planning procedures, and has confirmed to the FAA that it will generally not conduct operations over these "fly less" properties during the scope of operations covered by this proposed action. There will be no significant impacts to Section 4(f) resources as a result of the proposed action.

3.4 Historical, Architectural, Archaeological, and Cultural Resources

3.4.1 Regulatory Setting

Section 106 of the National Historic Preservation Act (NHPA) of 1966 [54 U.S.C. § 306108] requires federal agencies to consider the effects of their undertakings on properties listed or eligible for listing in

the National Register of Historic Places (NRHP). This includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meets the NRHP criteria. Regulations related to this process are contained in 36 CFR Part 800, Protection of Historic Properties. Compliance with Section 106 requires consultation with the State Historic Preservation Officer (SHPO) and applicable other parties, including Indian tribes.

Major steps in the Section 106 process include identifying the Area of Potential Effects (APE), identifying historic and cultural resources within the APE, consulting with the SHPO and THPOs that are identified as potentially having traditional cultural interests in the area, and determining the potential impacts to historic properties as a result of the action.

The FAA has not established a significance threshold for this impact category; however, the FAA has identified a factor to consider when evaluating the context and intensity of potential environmental impacts for historical, architectural, archeological, and cultural resources. A factor to consider in assessing significant impact is when an action would result in a finding of adverse effect through the Section 106 process. However, under 36 CFR § 800.8(a), a finding of adverse effect on a historic property does not necessarily result in a significance finding under NEPA.

3.4.2 Affected Environment

The APE for the proposed action is the entire operating area where Wing is planning to conduct UA package deliveries, as shown in Figures 1 and 2 in this EA. The FAA identified five historic sites in the APE as listed on the Texas SHPO website. These sites are: (1) Little Elm Cemetery; (2) Smith Cemetery; (3) Landrum Cemetery; (4) Bethel Cemetery; and (5) Sonntag Cemetery. The nature of these sites is such that they typically would not be affected by infrequent UA overflights.

In accordance with 36 CFR § 800.4(a)(1), the FAA consulted with the Texas SHPO and with seven THPOs for tribes that may potentially attach religious or cultural significance to resources in the APE.[31] The seven tribes are, respectively: (1) Apache Tribe of Oklahoma; (2) Coushatta Tribe of Louisiana; (3) Muscogee (Creek) Nation; (4) Tonkawa Tribe of Indians of Oklahoma; (5) Wichita and Affiliated Tribes (Wichita, Keechi, Waco & Tawakonie), Oklahoma; (6) Comanche Nation, Oklahoma; and (7) Delaware Nation, Oklahoma.

The FAA sent consultation letters to the seven tribes on February 2, 2021 regarding the entire APE, and did not receive any responses or objections. No traditional cultural resources were identified by the FAA during the analysis for this project.

The FAA sent an initial consultation letter to the Texas SHPO on January 28, 2021, and received a response from the SHPO on February 3, 2021 concurring with FAA's determination that no historic properties would be affected by the proposed project. The FAA conducted additional consultation with the Texas SHPO on March 9, 2021 regarding the entire APE, when the geographic scope of the proposed action was amended by Wing. The SHPO sent a response letter to the FAA on April 8, 2021, concurring with the FAA that no historic resources would be affected by the proposed action covered within this EA. The SHPO also stated that no historic properties, archaeological sites, or other cultural resources are present or affected. The FAA's tribal and historic outreach letters are included as Appendix B.

[31] FAA utilized the Housing and Urban Development (HUD) Tribal Directory Assessment Tool (TDAT) to identify tribes with ancestral ties or other interests within the Frisco and Little Elm APE.

3.4.3 Environmental Consequences

The nature of UA effects on historic properties is limited to non-physical, reversible impacts (i.e., the introduction of audible and/or visual elements). The number of daily flights that Wing is projecting from either of the two nests – up to approximately 100 operations spreading in all directions from a nest – means that any historic or cultural resource would be subject to only a small number of overflights per day, if any.

The FAA conducted a noise exposure analysis for the proposed action – as described in the next section – which concluded that noise levels would be well below the FAA's threshold for significance, even in areas with the highest noise exposure. Based on the information available, we have determined that this undertaking will not affect historic properties. Additionally, there would be no known effect on known cultural resources from this action. The SHPO concurred that the proposed action would not affect historic resources and indicated that no cultural resources are present or affected by the proposed action.

3.5 Noise and Noise-Compatible Land Use

3.5.1 Regulatory Setting

Aircraft noise is often the most noticeable environmental effect associated with any aviation project. Several federal laws, including the Aviation Safety and Noise Abatement Act of 1979, as amended (49 U.S.C. §§ 47501-47507) regulate aircraft noise. Through 14 CFR Part 36, the FAA regulates noise from aircraft.

FAA Order 1050.1F, Appendix B, Paragraph B-1.3 requires the FAA to identify the location and number of noise sensitive areas that could be significantly impacted by noise. As defined in Paragraph 11-5b of Order 1050.1F, page 11-3, a noise sensitive area is "[a]n area where noise interferes with normal activities associated with its use. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites."

Sound is measured in terms of the decibel (dB), which is the ratio between the sound pressure of the sound source and 20 micropascals, which is nominally the threshold of human hearing. Various weighting schemes have been developed to collapse a frequency spectrum into a single dB value. The A-weighted decibel, or dBA, corresponds to human hearing accounting for the higher sensitivity in the mid-range frequencies.

To comply with NEPA requirements, the FAA has issued requirements for assessing aircraft noise in FAA Order 1050.1F, Appendix B. The FAA's required noise metric for aviation noise analysis is the yearly Day-Night Average Sound Level (DNL) metric. The DNL metric is a single value representing the logarithmically average aircraft sound level at a location over a 24-hour period, with a 10 dB adjustment added to those noise events occuring from 10:00 p.m. and up to 7:00 a.m. the following morning. A significant noise impact is defined in Order 1050.1F as an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure or a noise exposure at or above the 65 dB level due to a DNL 1.5 dB or greater increase. The compatibility of existing and planned land uses with an aviation proposal is usually associated with noise impacts.

3.5.2 Affected Environment

The approximate land area within the study area is 91 square miles, the approximate water area is 6.3 miles, and the estimated population within the area is 278,000 per 2018 estimates. The population density of the area is approximately 3,053 persons per square mile.[32]

Existing aviation noise levels in the Frisco and Little Elm operating area are expected to be well below the FAA's threshold for significant noise exposure to residential land use (DNL 65 dB). Due to the expected operational avoidance between the proposed UA activity and other aviation activity, existing aircraft noise within the study area is not expected to be a contributing factor to the assessment of UA noise.

3.5.3 Environmental Consequences

To ensure that noise would not cause a significant impact to any noise sensitive resource within the operating area, the FAA initiated an analysis of the potential noise exposure in the area that could result from implementation of the proposed action. The noise analysis of the proposed activity was conducted based upon computer simulations of projected delivery operations from the Frisco Station and Little Elm Nests produced by Wing, along with available noise measurement data collected for the Wing UA in various operating states. Results of the noise analysis are presented in terms of the required DNL as well as a supplemental Number of Events Above 60 dB LAmax (NA60) for Average Annual Daily Operations (AAD).

Three data sets formed the basis of the noise assessment for the proposed Wing UA delivery operations. The data sets included a full year's worth of computer-simulated flight/delivery operations from the Frisco and Little Elm Nests; noise measurement data collected for aircraft certification; and noise measurement data collected during field simulations of package deliveries.

The DNL noise exposure analysis concluded that even in areas with the highest noise exposure, levels would still be well below FAA's DNL 65 dB threshold for noise compatible land use. Additionally, when operational uncertainty had to be considered in the analysis, conservative assumptions which would overpredict the noise levels produced by the UA activity were used. The resulting DNL at both the Frisco and Little Elm nests was estimated to only reach a potential DNL of 53 dB. These levels would occur at the nest locations.

The FAA also conducted a supplemental analysis to analyze the number of times over a 24-hour period the UA operations would exceed LAmax 60 dB. Similar to the results of the required DNL metric noise analysis, this supplemental metric analysis illustrated that the highest number of events occurred at or in close proximity to the nest, with some limited events occurring farther away from the nest.

The comprehensive noise analysis can be found in Appendix C.

Based on the FAA's noise analysis, the proposed action will not have a significant impact.

[32] Environmental Protection Agency's (EPA) Environmental Justice Screening Tool (EJSCREEN). Available: https://www.epa.gov/ejscreen. Accessed: September 12, 2021

3.6 Environmental Justice

3.6.1 Regulatory Setting

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, Section 1-101 requires all federal agencies to the greatest extent practicable and permitted by law, to make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

The DOT Order 5610.2(a) defines minority as "individuals who are Black; Hispanic or Latino; Asian American; American Indian and Alaskan Native; Native Hawaiian and other Pacific Islander".

The FAA Order 1050.1F provides guidance for the preparation of environmental justice analysis in support of an EA. Section 4-3.3, Exhibit 4-1 of the Order indicates that FAA should consider whether the action would have the potential to lead to a disproportionately high and adverse impact, i.e., a low-income or minority population, due to: significant impacts in other environmental impact categories; or impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population. If a significant impact would affect low income or minority populations at a disproportionately higher level than it would other population segments, an environmental justice issue is likely.

The FAA has not established a significance threshold for environmental justice. In assessing significance, FAA considers the following factors: (1) significant impacts in other environmental impact categories; or (2) impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population.

3.6.2 Affected Environment

Based on the EJSCREEN report prepared for the proposed action (Appendix E), approximately 13 percent of the population within the operating area would be considered low-income, and approximately 43 percent of the population would be considered a person of color. Both of these metrics are considerably lower than the low-income and people-of-color percentages overall in Texas. The EJSCREEN report states that approximately 278,000 people reside within the operating area. The estimated population in the 2020 Census shows slightly more than 300,000 people, as the population in this suburban environment is rapidly increasing.

3.6.3 Environmental Consequences

The proposed action would not result in adverse impacts in any environmental resource category. In particular, as noted in Section 3.5, *Noise and Noise-Compatible Land Use*, and the Noise Analysis Report in Appendix C, the UA's noise emissions could be perceptible in areas within the operating area, but will stay well below the level determined to constitute a significant impact. Since the proposed action would not result in a disproportionately high and adverse effect on any population, it would not result in an adverse effect on a low-income or a minority population.

3.7 Visual Effects (Visual Resources and Visual Character)

3.7.1 Regulatory Setting

Visual resources and visual character impacts deal with the extent to which the proposed action would result in visual impacts to resources in the Frisco and Little Elm operating area. Visual impacts can be difficult to define and evaluate because the analysis is generally subjective, but are normally related to the extent that the proposed action would contrast with, or detract from, the visual resources and/or the visual character of the existing environment. In this case, visual effects would be limited to the introduction of a visual intrusion – a UA in flight – which could be out of character with the suburban or natural landscapes.

The FAA has not developed a visual effects threshold of significance similar to noise impacts. Factors FAA considers in assessing significant impacts include the degree to which the action would have the potential to: (1) affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources; (2) contrast with the visual resources and/or visual character in the study area; or (3) block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

3.7.2 Affected Environment

The proposed action would take place over mostly suburban and commercially-developed properties. As noted in Section 3.3, *DOT Act Section 4(f) Resources*, there are some publicly-owned resources that could be valued for aesthetic attributes within the study area. However, Wing's proposal is to generally avoid overflights of schools, sports arenas, outdoor recreation areas, playgrounds, and other open-air assemblies of non-participating persons during the scope of the proposed action.

When making a delivery, the UA will depart from a nest and travel en route at an altitude less than 400 feet AGL (en route travel will generally occur between 150 – 250 feet AGL). Deliveries will mostly take place at residences. A two-square meter clear space is required for delivery; however, this space can include clear spaces surrounding multi-family dwellings. The duration of delivery from the time the customer approves the delivery to the transition back to en route flight mode is expected to last approximately 15 seconds. The FAA estimates that at typical operating altitude and speeds the UA enroute would be observable for approximately six seconds by an observer on the ground.

3.7.3 Environmental Consequences

The proposed action makes no changes to any landforms, or land uses, thus there would be no effect to the visual character of the area. The proposed action involves airspace operations that could result in visual impacts on sensitive areas such as Section 4(f) properties where the visual setting is an important resource of the property. However, the short duration that each UA flight could be seen from any particular resource in the operating area and the low number of proposed flights per day would minimize any potential for significant visual impacts. Any visual effects are expected to be similar to effects from existing air traffic in the vicinity of the operating area.

3.8 Water Resources (Surface Waters)

3.8.1 Regulatory Setting

Surface water resources generally consist of oceans, wetlands, lakes, rivers, and streams. Surface water is important for its contribution to the economic, ecological, recreational, and human health of a

community. The Clean Water Act established the National Pollutant Discharge Elimination System (NPDES) program, which regulates the discharge of point sources of water pollution into waters of the United States and requires a permit under Section 402 of the Clean Water Act. Waters of the United States are defined by the Clean Water Act and are protected by various regulations and permitting programs administered by the EPA and the U.S. Army Corps of Engineers. An action would be considered significant to surface waters when it would: (1) exceed water quality standards established by Federal, state, local, and tribal regulatory agencies; or (2) contaminate public drinking water supply such that public health may be adversely affected.

3.8.2 Affected Environment

Approximately 6.3 square miles of surface waters occur within the Frisco and Little Elm operating area, based on the EJSCREEN report for this proposed action (Appendix E). The only large surface water is Lewisville Lake, a large man-made reservoir on the west side of the operating area. The lake and its tributary streams are protected by the Clean Water Act.

3.8.3 Environmental Consequences

While it is highly unlikely for one of Wing's aircraft to crash, and even less likely for a crash to happen within Lewisville Lake or one of its tributary streams, this EA considers the potential effects of a UA crashing into surface waters covered by the Clean Water Act.

Wing is a certificated air carrier and complies with all applicable regulatory requirements. This includes compliance with regulatory requirements to notify the FAA and/or National Transportation Safety Board (NTSB) in the event of an aircraft accident. Wing's FAA-accepted checklists include procedures to notify local emergency services in the event of an accident or incident. In accordance with 14 CFR Part 135.23(d), Wing is required to locate and secure any downed aircraft pending guidance from the FAA or NTSB. The Lithium-ion battery packs are well-secured within the aircraft, and are not expected to detach from the aircraft or become lost in the event of an incident.

There will be no construction activities associated with the proposed action that could impact surface waters. For this reason, and for the reasons described above relating to potential accidents, the proposed action would not have the potential to exceed water quality standards established by federal, state, local, and tribal regulatory agencies; or contaminate public drinking water supply such that public health may be adversely affected. Therefore, the potential for impacts to surface waters is not significant.

4.0 LIST OF PREPARERS and CONTRIBUTORS

Table 4-1 lists the principal preparers, reviewers, and contributors to this EA.

Table 4-1. List of Preparers and Contributors

Name and Affiliation	Years of Industry Experience	EA Responsibility
Mike Millard, Flight Standards, FAA Aviation Safety	40	Flight Standards Environmental Specialist and Document Review
Christopher Couture, FAA Aviation Safety	15	Program Management, Environmental Science, and Document Review
Shawna Barry, FAA Office of Environment and Energy	15	NEPA SME, Biological Resources, and Document Review
Sean Doyle, FAA Office of Environment and Energy	16	Noise Analysis and Document Review
Contractor Contributors		
Jodi Jones, FAA Aviation Safety, Marton Technologies, Inc.	12	NEPA SME, Research, and Document Review
Brad Thompson, FAA Aviation Safety, Science Applications International Corporation (SAIC)	7	NEPA SME, Research, and Document Review

5.0 LIST of AGENCIES CONSULTED

State Agencies

Texas Historical Commission

Tribes

Apache Tribe of Oklahoma

Coushatta Tribe of Louisiana

Comanche Nation, Oklahoma

Delaware Nation, Oklahoma

Muscogee (Creek) Nation

Tonkawa Tribe of Indians of Oklahoma

Wichita and Affiliated Tribes (Wichita, Keechi, Waco & Tawakonie), Oklahoma

Appendix A

Frisco and Little Elm IPaC Report

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Collin and Denton counties, Texas

Local office

Arlington Ecological Services Field Office

(817) 277-1100
(817) 277-1129

2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247

http://www.fws.gov/southwest/es/arlingtontexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS

Piping Plover Charadrius melodus — Threatened

This species only needs to be considered if the following condition applies:

- Wind Energy Projects

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/6039

Red Knot Calidris canutus rufa — Threatened

Wherever found

This species only needs to be considered if the following condition applies:

- Wind Energy Projects

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/1864

Whooping Crane Grus americana — Endangered

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/758

Clams

NAME	STATUS
Texas Fawnsfoot Truncilla macrodon Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8965	Candidate

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.

2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

Buff-breasted Sandpiper Calidris subruficollis — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9488

Harris's Sparrow Zonotrichia querula — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Marbled Godwit Limosa fedoa — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Semipalmated Sandpiper Calidris pusilla — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence

across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that

overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix B

Tribal and Historic Outreach Letters

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

Mr. Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Via electronic submission to https://xapps.thc.state.tx.us/106Review/

To whom it may concern:

The purpose of this letter is to inform you of a proposal under consideration by the Federal Aviation Administration (FAA) for an approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. The FAA has determined that this proposed action is a Federal undertaking as defined in 36 CFR § 800.16 (y). Therefore, the FAA is initializing consultation with the State Historic Preservation Officer (SHPO) pursuant to § 800.11 (d).

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to approve a waiver and/or exemption to aeronautical regulations, thereby approving UAS operations in the area depicted below. FAA approval of the UAS operation in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

The UAS operation will be transporting pharmaceutical and consumer good in partnership with neighborhood Walgreens stores in the communities they already serve, and will provide a safe and convenient alternative to in-store prescription pickup at the time of the customer's choosing and to the customer's homes. Deliveries will be flown by a Hummingbird aircraft that will takeoff and quickly rise from a nest to a cruising altitude of 65-300 feet above ground level (AGL). Once at the delivery site, the Hummingbird will hover in place while a retractable cord lowers the package to the ground. The cord then retracts back to the aircraft, which flies off to return to one of the three Wing nests. The estimated total travel distances vary depending upon the pickup and dropoff locations in the operating area. The purpose is for package delivery, consisting of approximately 100 flights per day from each nest, with each flight taking a package to a customer delivery address before returning to the nest. There is variability in the number of flights per day based on customer demand and weather conditions. The dimension of the UAS area defines the Area of Potential Effect (APE). According to the

National Park Service online database of the National Register of Historic Places, one historic property was identified in the review of the operating area: the Allen Water Station located in Allen Station Park is north of Exchange Parkway on the Cottonwood Creek in Allen, TX. The FAA determined that the undertaking does not have the potential to affect historic properties; however, since this UAS technology is new to most people, consultation with the SHPO is initiated. The UAS operation will have no affects to the ground.

Consultation
The FAA seeks concurrence from the SHPO of its no historic properties affected [§ 800.11 (d)] determination for the proposed UAS operating area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the UAS operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

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Date: 2021.01.28 07:07:59 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

Chairman Bobby Komardley
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005

Dear Chairman Komardley:

The purpose of this letter is to initiate formal government-to-government consultation regarding issuance by the Federal Aviation Administration (FAA) for the approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. We wish to solicit your views regarding potential effects on tribal interests in the area.

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to approve waivers and/or exemptions to aeronautical regulations, thereby approving the UAS operation in the area depicted below. FAA approval of the UAS operations in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

The UAS operation will be transporting pharmaceutical and consumer goods in partnership with neighborhood Walgreens stores in the communities they already serve, and will provide a safe and convenient alternative to in-store prescription pickup at the time of the customer's choosing and to the customer's homes. Deliveries will be flown by a Hummingbird aircraft that will takeoff and quickly rise from multiple nests to a cruising altitude of 65-300 feet above ground level (AGL). Once at the delivery site, the Hummingbird will hover in place while a retractable cord lowers the package to the ground. The cord then retracts back to the aircraft, which flies off to return to one of the multiple Wing nests in the area. The estimated total travel distances vary depending upon the pickup and dropoff locations in the operating area. The purpose is for package delivery, consisting of approximately 100 flights per day from each nest, with each flight taking a package to a customer delivery address before returning to the nest. There is variability in the number of flights per day based on customer demand and weather conditions. The dimension of the UAS area defines the Area of Potential Effect (APE). The FAA determined that the undertaking does not have the potential to affect historic properties; however, since this UAS technology is new to most people, consultation with the Tribe is initiated. The UAS operation will have no affects to the ground.

Consultation
The FAA is soliciting the opinion of the tribe(s) concerning any tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the proposed operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

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Date: 2021.02.01 09:48:36 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

Chairman William Nelson
Comanche Nation, Oklahoma
P.O. Box 908
Lawton, OK 73502

Dear Chairman Nelson:

The purpose of this letter is to initiate formal government-to-government consultation regarding issuance by the Federal Aviation Administration (FAA) for the approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. We wish to solicit your views regarding potential effects on tribal interests in the area.

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to approve waivers and/or exemptions to aeronautical regulations, thereby approving the UAS operation in the area depicted below. FAA approval of the UAS operations in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

The UAS operation will be transporting pharmaceutical and consumer goods in partnership with neighborhood Walgreens stores in the communities they already serve, and will provide a safe and convenient alternative to in-store prescription pickup at the time of the customer's choosing and to the customer's homes. Deliveries will be flown by a Hummingbird aircraft that will takeoff and quickly rise from multiple nests to a cruising altitude of 65-300 feet above ground level (AGL). Once at the delivery site, the Hummingbird will hover in place while a retractable cord lowers the package to the ground. The cord then retracts back to the aircraft, which flies off to return to one of the multiple Wing nests in the area. The estimated total travel distances vary depending upon the pickup and dropoff locations in the operating area. The purpose is for package delivery, consisting of approximately 100 flights per day from each nest, with each flight taking a package to a customer delivery address before returning to the nest. There is variability in the number of flights per day based on customer demand and weather conditions. The dimension of the UAS area defines the Area of Potential Effect (APE). The FAA determined that the undertaking does not have the potential to affect historic properties; however, since this UAS technology is new to most people, consultation with the Tribe is initiated. The UAS operation will have no affects to the ground.

Consultation
The FAA is soliciting the opinion of the tribe(s) concerning any tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the proposed operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

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Date: 2021.02.01 09:49:38 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

Chairman David Sickey
Coushatta Tribe of Louisiana
P.O. Box 10
Elton, LA 70532

Dear Chairman Sickey:

The purpose of this letter is to initiate formal government-to-government consultation regarding issuance by the Federal Aviation Administration (FAA) for the approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. We wish to solicit your views regarding potential effects on tribal interests in the area.

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to approve waivers and/or exemptions to aeronautical regulations, thereby approving the UAS operation in the area depicted below. FAA approval of the UAS operations in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

The UAS operation will be transporting pharmaceutical and consumer goods in partnership with neighborhood Walgreens stores in the communities they already serve, and will provide a safe and convenient alternative to in-store prescription pickup at the time of the customer's choosing and to the customer's homes. Deliveries will be flown by a Hummingbird aircraft that will takeoff and quickly rise from multiple nests to a cruising altitude of 65-300 feet above ground level (AGL). Once at the delivery site, the Hummingbird will hover in place while a retractable cord lowers the package to the ground. The cord then retracts back to the aircraft, which flies off to return to one of the multiple Wing nests in the area. The estimated total travel distances vary depending upon the pickup and dropoff locations in the operating area. The purpose is for package delivery, consisting of approximately 100 flights per day from each nest, with each flight taking a package to a customer delivery address before returning to the nest. There is variability in the number of flights per day based on customer demand and weather conditions. The dimension of the UAS area defines the Area of Potential Effect (APE). The FAA determined that the undertaking does not have the potential to affect historic properties; however, since this UAS technology is new to most people, consultation with the Tribe is initiated. The UAS operation will have no affects to the ground.

Consultation
The FAA is soliciting the opinion of the tribe(s) concerning any tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the proposed operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

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Date: 2021.02.01 09:53:0 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

President Deborah Dotson
Delaware Nation, Oklahoma
P.O. Box 825
Anadarko, OK 73005

Dear President Dotson:

The purpose of this letter is to initiate formal government-to-government consultation regarding issuance by the Federal Aviation Administration (FAA) for the approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. We wish to solicit your views regarding potential effects on tribal interests in the area.

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to approve waivers and/or exemptions to aeronautical regulations, thereby approving the UAS operation in the area depicted below. FAA approval of the UAS operations in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

The UAS operation will be transporting pharmaceutical and consumer goods in partnership with neighborhood Walgreens stores in the communities they already serve, and will provide a safe and convenient alternative to in-store prescription pickup at the time of the customer's choosing and to the customer's homes. Deliveries will be flown by a Hummingbird aircraft that will takeoff and quickly rise from multiple nests to a cruising altitude of 65-300 feet above ground level (AGL). Once at the delivery site, the Hummingbird will hover in place while a retractable cord lowers the package to the ground. The cord then retracts back to the aircraft, which flies off to return to one of the multiple Wing nests in the area. The estimated total travel distances vary depending upon the pickup and dropoff locations in the operating area. The purpose is for package delivery, consisting of approximately 100 flights per day from each nest, with each flight taking a package to a customer delivery address before returning to the nest. There is variability in the number of flights per day based on customer demand and weather conditions. The dimension of the UAS area defines the Area of Potential Effect (APE). The FAA determined that the undertaking does not have the potential to affect historic properties; however, since this UAS technology is new to most people, consultation with the Tribe is initiated. The UAS operation will have no affects to the ground.

Consultation
The FAA is soliciting the opinion of the tribe(s) concerning any tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the proposed operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

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Date: 2021.02.01 09:54:1 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

Principal Chief David Hill
Muscogee Nation
P.O. Box 580
Okmulgee, OK 74447

Dear Chief Hill:

The purpose of this letter is to initiate formal government-to-government consultation regarding issuance by the Federal Aviation Administration (FAA) for the approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. We wish to solicit your views regarding potential effects on tribal interests in the area.

Proposed Activity Description
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Consultation
The FAA is soliciting the opinion of the tribe(s) concerning any tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the proposed operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

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Date: 2021.02.01 09:55:2 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

President Russell Martin
Tonkawa Tribe of Indians of Oklahoma
1 Rush Buffalo Road
Tonkawa, OK 74653

Dear President Martin:

The purpose of this letter is to initiate formal government-to-government consultation regarding issuance by the Federal Aviation Administration (FAA) for the approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. We wish to solicit your views regarding potential effects on tribal interests in the area.

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to approve waivers and/or exemptions to aeronautical regulations, thereby approving the UAS operation in the area depicted below. FAA approval of the UAS operations in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

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Consultation
The FAA is soliciting the opinion of the tribe(s) concerning any tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the proposed operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

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Date: 2021.02.01 09:56:3 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

President Terri Parton
Wichita and Affiliated Tribes, Oklahoma
P.O. Box 729
Anadarko, OK 73005

Dear President Parton:

The purpose of this letter is to initiate formal government-to-government consultation regarding issuance by the Federal Aviation Administration (FAA) for the approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX. We wish to solicit your views regarding potential effects on tribal interests in the area.

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to approve waivers and/or exemptions to aeronautical regulations, thereby approving the UAS operation in the area depicted below. FAA approval of the UAS operations in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

The UAS operation will be transporting pharmaceutical and consumer goods in partnership with neighborhood Walgreens stores in the communities they already serve, and will provide a safe and convenient alternative to in-store prescription pickup at the time of the customer's choosing and to the customer's homes. Deliveries will be flown by a Hummingbird aircraft that will takeoff and quickly rise from multiple nests to a cruising altitude of 65-300 feet above ground level (AGL). Once at the delivery site, the Hummingbird will hover in place while a retractable cord lowers the package to the ground. The cord then retracts back to the aircraft, which flies off to return to one of the multiple Wing nests in the area. The estimated total travel distances vary depending upon the pickup and dropoff locations in the operating area. The purpose is for package delivery, consisting of approximately 100 flights per day from each nest, with each flight taking a package to a customer delivery address before returning to the nest. There is variability in the number of flights per day based on customer demand and weather conditions. The dimension of the UAS area defines the Area of Potential Effect (APE). The FAA determined that the undertaking does not have the potential to affect historic properties; however, since this UAS technology is new to most people, consultation with the Tribe is initiated. The UAS operation will have no affects to the ground.

Consultation
The FAA is soliciting the opinion of the tribe(s) concerning any tribal lands, or sites of religious or cultural significance that may be affected by the proposed operation area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the proposed operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

Digitally signed by DAVID M MENZIMER
Date: 2021.02.01 09:57:4 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

From: noreply@thc.state.tx.us
To: 9-AWA-AVS-AFS-ENVIRONMENTAL (FAA); reviews@thc.state.tx.us
Subject: Section 106 Submission
Date: Tuesday, February 02, 2021 10:56:14 AM

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
THC Tracking #202105336
Wing Aviation UAS Routes in Dallas Area
Area Coverage
Dallas,TX

Description: Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Dallas metropolitan area, specifically the communities of Little Elm, Frisco and Allen, TX.

Dear Mike Millard:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Justin Kockritz, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- THC/SHPO concurs with information provided.
- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

We have the following comments: THC concurs that no historic properties will be affected by the project as proposed. Because no ground disturbance is proposed, no review by the THC Archeology Division is required.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have

any questions concerning our review or if we can be of further assistance, please email the following reviewers: justin.kockritz@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., S.W.
Washington, DC 20591

Mr. Mark Wolfe
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Via electronic submission to https://xapps.thc.state.tx.us/106Review/

Dear Mr. Wolfe:

The purpose of this letter is to inform you of a proposal under consideration by the Federal Aviation Administration (FAA) for a future operating area extension of an existing approval of a Certificate of Waiver and/or Exemption for a Hummingbird 7000 V2 Unmanned Aircraft System (UAS) operation conducted by Wing Aviation LLC in the Frisco and Allen, TX area. The FAA has determined that this proposed action is a Federal undertaking as defined in 36 CFR § 800.16 (y). Therefore, the FAA is initializing consultation with the State Historic Preservation Officer (SHPO) pursuant to § 800.11 (d). Previous coordination with the TX SHPO regarding the current operation occurred, and a THC Tracking number of 202105336 had been assigned. The SHPO responded on February 2, 2021 and stated that it concurs with information provided, and that no historic properties are present or affected by the project as proposed in the three circled area with a diamond in the center shown in the attached maps. The future expanded area of operation in approximately a year will included the existing areas and extend out to the yellow areas identified in the attached maps.

Proposed Activity Description
The Federal Aviation Administration (FAA) has been asked to consider an extension of waivers and/or exemptions to aeronautical regulations for the future expansion, thereby approving the continued existing UAS operation in the area depicted below, and extending to the future operating area identified in yellow. FAA approval of the UAS operation in the area is an undertaking subject to regulations pursuant to the National Historic Preservation Act.

The UAS operation will be transporting pharmaceutical and consumer goods in partnership with neighborhood Walgreens stores in the communities they already serve, and will provide a safe and convenient alternative to in-store prescription pickup at the time of the customer's choosing and to the customer's homes in the proposed new area. It will be flown by a Hummingbird aircraft that will takeoff and quickly rise to a cruising altitude of 65-300 feet

above ground level (AGL). Once at the delivery site, the Hummingbird will hover in place while a retractable cord lowers the package to the ground. The cord then retracts back to the aircraft, which flies off to return to one of the Wing "nests" that are located in Frisco and Allen areas. The estimated total travel distances vary depending upon the pickup and dropoff locations in the operating area. The purpose is for package delivery, consisting of approximately 100 flights per day from each nest, with each flight taking a package to a customer delivery address before returning to the nest. There is variability in the number of flights per day based on customer demand and weather conditions. The dimension of the UAS area defines the Area of Potential Effect (APE). The current operation that was coordinated with the TX SHPO showed the APE would be limited to areas near Frisco and Allen, TX. The new projected operations are going to be expanded to two larger areas on either side of Lewisville Lake and thereby increasing the APE in approximately a year. An enclosed map shows the larger area of operation in greater detail shown in yellow highlight and boarder. According to the National Park Service online database of the National Register of Historic Places, one historic property was identified in the review of the operating area: the Allen Water Station located in Allen Station Park is north of Exchange Parkway on the Cottonwood Creek in Allen, TX. The FAA determined that the undertaking does not have the potential to affect historic properties; however, since this UAS technology is new to most people, consultation with the SHPO is initiated. The UAS operation will have no affects to the ground.

Consultation

The FAA seeks concurrence from the SHPO of its no historic properties affected [§ 800.11 (d)] determination for the proposed UAS operating area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation.

If you have any comments or questions or need additional information regarding the UAS operation, please do not hesitate to contact Mr. Mike Millard, in writing at: FAA, AFS-800, 800 Independence Ave., S.W., Washington, D.C. 20591; by telephone: (202) 267-7906; or by email: 9-AWA-AVS-AFS-ENVIRONMENTAL@faa.gov.

Sincerely,

DAVID M MENZIMER

Digitally signed by DAVID M MENZIMER
Date: 2021.03.09 08:28:15 -08'00'

David Menzimer
Aviation Safety
Manager, General Aviation Operations Branch,
Flight Standards Service

Enclosure

From: noreply@thc.state.tx.us
To: 9-AWA-AVS-AFS-ENVIRONMENTAL (FAA); reviews@thc.state.tx.us
Subject: Section 106 Submission
Date: Thursday, April 08, 2021 6:37:52 PM

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
THC Tracking #202106628
Date: 04/08/2021
Dallas Unmanned Aircraft System Delivery Operations
NA
Frisco,TX

Description: The UAS Operation will be transporting pharmaceutical and consumer goods in partnership with neighborhood Walgreens stores in the communities they already serve. Please see attached letter.

Dear Mike Millard:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Justin Kockritz, Arlo McKee, has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- THC/SHPO concurs with information provided.
- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

Archeology Comments

- No identified historic properties, archeological sites, or other cultural resources are present or affected. However, if cultural materials are encountered during project activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC’s Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: justin.kockritz@thc.texas.gov, Arlo.McKee@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

Appendix C

Noise Analysis Report

Noise Assessment for Wing Aviation Proposed Package Delivery Operations in Frisco and Little Elm, Texas

In support of U.S. Code of Federal Regulations Title 14, Part 135

Final

HMMH Report No. 309990.003-2

November 19, 2021

Prepared for:

JD RoVolus, LLC
121 Pearl Street
Ypsilanti, MI 48197

Federal Aviation Administration
Aviation Safety, Flight Standards Service
Office of Environment and Energy
Policy, Engineering, Analysis, and Research (PEARS II)
693KA9-18-D-00005

Noise Assessment for Wing Aviation Proposed Package Delivery Operations in Frisco and Little Elm, Texas

In support of U.S. Code of Federal Regulations Title 14, Part 135

Final

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November 19, 2021

Prepared for:

JD RoVolus, LLC
121 Pearl Street
Ypsilanti, MI 48197

Federal Aviation Administration
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Office of Environment and Energy
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693KA9-18-D-00005

Prepared by:

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1 Introduction and Background

This document presents the methodology and results for estimation of noise exposure related to proposed small Unmanned Aircraft Systems (sUAS) package delivery operations conducted in the Dallas, Texas metropolitan area. The proposed operations would be conducted by Wing Aviation LLC (Wing), a subsidiary of Alphabet Inc. that develops and operates technology for sUAS package delivery.

In order for Wing to conduct Unmanned Aircraft (UA) package deliveries in a new location, it must receive a number of approvals from FAA, such as a waiver of 14 CFR 91.113(b) to enable Beyond Visual Line of Sight (BVLOS) operations and a Certificate of Waiver or Authorization (COA). Further, Wing has requested that FAA amend the OpSpecs in its Part 135 air carrier certificate. The OpSpec amendment is the FAA approval that ultimately would enable operations in Frisco and Little Elm, Texas.

The B050 OpSpec, Authorized Areas of En Route Operations, Limitations, and Provisions, includes a reference section titled Limitations, Provisions, and Special Requirements. The amendment to this reference section – to add a new paragraph with descriptive language about the Frisco and Little Elm operating area boundaries, including the specific location and operational profile proposed in Wing's request – is the proposed federal action evaluated by this noise analysis. The OpSpecs amendment will restrict Wing to this particular location; any future expansion beyond the authorization and limitations for routes and areas of operations described in the amended OpSpecs will require additional OpSpec amendments from the FAA and will receive appropriate NEPA review at that time.

The proposed action will take place in the communities of Frisco and Little Elm, TX, on the northern side of the Dallas-Fort Worth Metropolitan Area. The proposed operations assessed in this document include UA delivery flights using a 15-pound Hummingbird 7000W UA; originating from two bases of operations, referred to as Nests, located in the Frisco and Little Elm communities, as shown on Figure 2.

Wing has partnered with the Walgreens pharmacy store chain to offer pharmaceutical deliveries to customers within the communities surrounding each Nest location. Each Nest would be located on premises controlled by the partnering Walgreens locations and would consist of facilities for aircraft storage, pads for takeoff, landing, and charging, as well as any required power and network communications equipment.

The Wing UA is a multi-rotor vehicle weighing under 15 pounds when combined with its max payload weight of 1.2kg (2.65 pounds). It would generally be operated at an altitude of 300 feet Above Ground Level (AGL) and always below an altitude of 400 feet AGL while enroute to and from delivery locations. At a delivery location, the UA would vertically descend from its enroute cruise altitude to a stationary hover at 23 feet AGL and an externally carried package would be lowered to the ground by cable for delivery. Once a package has been lowered to the ground, the UA would then retract the cable, ascend vertically to a cruise altitude, and depart the delivery area enroute back to a Nest. Figure 1 depicts the Wing Hummingbird UA.

Figure 1. Wing Small Unmanned Aircraft with Package Attached
Source: Wing Delivery Concept of Operations, November 16, 2020

Noise analysis of the proposed activity was conducted based upon computer simulations of projected delivery operations from the Frisco Station and Little Elm Nests produced by Wing, along with available noise measurement data collected for the Wing UA in various operating states. Results of the noise analysis are presented in terms of the Day-Night Average Sound Level (DNL) and Numbers of Events Above 60 dB LAmax (NA60) for Average Annual Daily Operations (AAD).

Section 2 of this document provides further description of the data sources utilized as the basis of the noise analysis, Section 3 describes the approach undertaken to develop noise exposure estimates for the study area from the available data, and Section 4 presents the resulting required DNL and supplemental NA60 noise exposure estimates.

2 Unmanned Aircraft Delivery Operations and Noise Measurement Data Set Descriptions

Three data sets formed the basis of the noise assessment for the proposed Wing UA delivery operations. The data sets included a full year's worth of computer-simulated flight/delivery operations from the Frisco and Little Elm Nests; noise measurement data collected for aircraft certification; and noise measurement data collected during field simulations of package deliveries. The following three subsections provide additional detail on each data source.

2.1 Computer Simulated Delivery Data

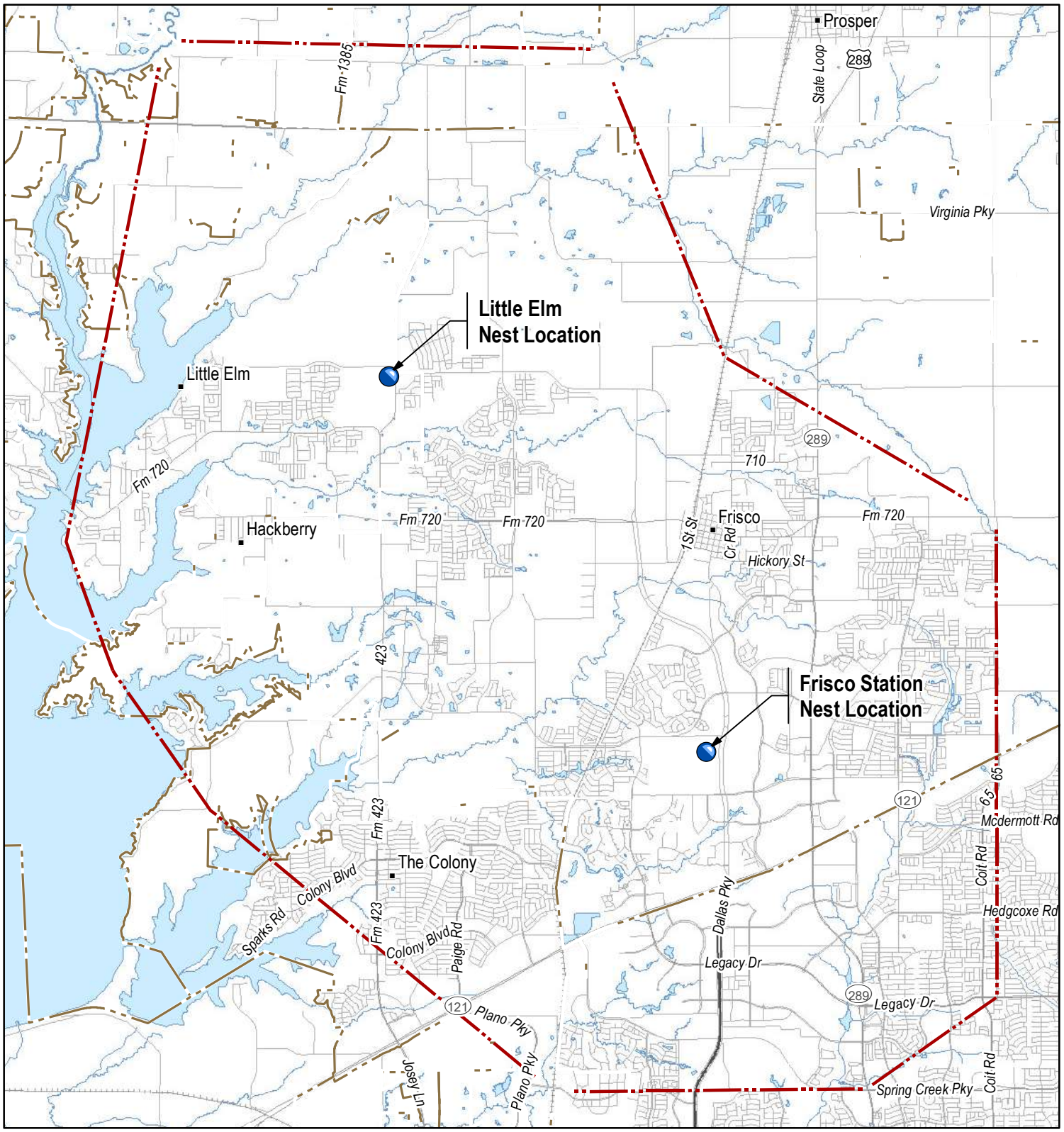
Wing developed delivery simulation data consisting of one full year of notional projected package deliveries averaging approximately 100 deliveries per day from each Nest location over an expected 250 annual operating days. This data was developed to provide FAA with information on which to base the analysis, since no operational data for this area exists. The output of the delivery simulations consisted of point-to-point flight path data consisting of latitude, longitude, altitude, and time stamp at numerous points along each delivery route provided in Google Earth Keyhole Markup Language (KML) file format. Single KML files were provided for each flight day from each Nest. In total, the simulation data set consisted of 500 individual KML files containing flight paths for 49,963 delivery operations. All deliveries would occur during the DNL metric environmental daytime period of 7:00 a.m. to 10:00 p.m. local time. Table 1 presents a summary of the contents of the simulation data.

Table 1. Wing Delivery Simulation Data for Frisco Station and Little Elm Nest Locations

Source: Wing, 2021

Nest	Daily KML Files	Total Simulated Deliveries	Unique Delivery Locations
Little Elm	250	24,996	18,867
Frisco Station	250	24,967	14,242
Total	500	49,963	30,446

The delivery areas serviced by each Nest partially overlap. As such, areas located approximately equidistant between each Nest received package deliveries from both. Out of the 49,963 total simulated deliveries, there were 30,446 unique delivery locations, meaning 39% were to locations using the service more than once during the year. The locations of each Nest and the study area boundary within which simulated deliveries were distributed is presented in Figure 2.



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Study Area
City Limits
Major / Minor Roads
Railroad
Water / Stream
Nest locations

0 1 2 Miles

Frisco Station and Little Elm Nest Locations Operations

Figure: 2

Nest Locations and Study Area

2.2 Aircraft Certification Noise Measurement Data

Aircraft certification noise measurements were collected for Wing's UA by JR Engineering in April of 2021[1]. These noise measurements were taken in accordance with an issue paper developed by FAA and Wing to create a noise certification basis for this aircraft. Further rulemaking action on the paper is expected in the future. This data set included measurements of multiple passes of level straight line overflights at 100 feet and 200 feet AGL. Overflight measurements were taken with the UA operating at Maximum Takeoff Weight (MTOW) with payload at a target cruise airspeed of 56 knots (29 m/s) and without payload at a target max airspeed of 70 knots (36 meters/second). Supplementary measurements were also collected for multiple instances of stationary hovers at 20 feet AGL. Table 2 presents a summary of the average measured Maximum A-weighted Sound Levels (LAmax) and Sound Exposure Levels (SEL) for overflights and stationary hovers.

Table 2. Aircraft Certification Noise Measurement Data Summary

Source: JR Engineering, 2021

Type	Altitude (AGL)	Package	Average LAmax (dB)	Average SEL (dB)
Overflight	100 ft	No	63	66
		Yes	64	67
	200 ft	No	59	63
		Yes	60	64
Hover*	20 ft	Yes	73	-

**UA at 20 ft AGL and 20 ft laterally from the microphone position*

2.3 Aircraft Survey Noise Measurement Data

Aircraft noise measurements for Wing's UA were also collected by WSP[2] in Australia in June of 2019. These measurements consisted of delivery simulations conducted at a Wing test site and additional supplemental simulated deliveries conducted at a single residential site. This data set included measurements of multiple instances of full delivery procedures at both locations. An excerpt from the WSP report describing the measured simulated delivery procedure is included below:

1. *UA flies into the testing area in a stable position laterally at a cruise height of 40m above ground.*
2. *The UA then descends vertically to a position directly above the origin point of the measurement surface (40m above ground) and maintains a 'hover' position at a fixed delivery height of 6.8m above ground.*
3. *The payload is then delivered from hovering at the fixed delivery height, in accordance with Wing's standard operating procedure.*
4. *Once the payload is delivered, the UA ascends vertically to cruise height (40m) and departs the testing area.*

[1] Engineering Coordination Memo and Data Files, Subject: "Data Submittal for AEE", JR Engineering 2021.
[2] Report: "Wing Aviation Unmanned Aircraft Noise Survey", WSP 2019.

Table 3 presents a summary of the average measured noise levels for simulated deliveries.

Table 3. Aircraft Survey Noise Measurement Data Summary

Source: WSP, 2019

Type	Altitude (AGL)	Package	Location	Average LAmax (dB)	Average SEL (dB)
Delivery*	Variable	Yes	Test Site	73	83
			Residential Site	73	84

**UA delivery hover at 7.5 meters (25 ft) laterally from the microphone position*

3 Data Reduction and Noise Analysis Methodology

The previously described data sets were used to estimate community noise exposure that could result from Wing UA delivery operations originating from the Frisco Station and Little Elm Nests, with each operating 250 days out of the year and conducting an average of 100 deliveries operations per day. There are currently no standardized tools or processes in place to conduct a noise assessment for the proposed operational scenario and UA. HMMH, with detailed technical guidance from the FAA Office of Environment and Energy, developed a customized noise exposure prediction processes based on the available data to conduct this analysis. The following subsections describe that noise analysis methodology.

3.1 Computer Simulation Data Reduction

As described in Section 2.1, the Wing UA delivery computer simulation data was provided as 250 separate KML files for each Nest location representing each potential day of operation. Each KML file contained flight path data for approximately 100 simulated deliveries. The point-to-point flight path data for each delivery route was segmented into approximately 10 sets of points consisting of around 100 points each, meaning each delivery route consisted of roughly 1,000 data points. With close to 50,000 deliveries in the dataset, this yielded a dataset of roughly 50,000,000 total datapoints.

Data Reformatting and Organization

HMMH first developed a Python script to parse the segmented delivery route data into continuous flight paths covering the entirety of each delivery operation. That modified data was then compiled into single Comma Separated Values (CSV) files for each Nest containing all data from the 250 associated KML files. Further processing was then conducted on the CSV files for each Nest to separate the data into three flight phase groups. The phase of flight was determined by the coordinates (XYZ) and elements of the segmentation from the original KML files. The three resulting flight phase datasets included:

1. Enroute flight from the Nest out to the delivery location
2. Enroute flight from the delivery location back to the Nest
3. Vertical ascent and descent to and from enroute flight altitude at both the Nest and delivery locations

Due to the high density of points for each track, HMMH also applied the Ramer-Douglas-Peucker data reduction algorithm[3,4] with a very small tolerance of five feet. This maintained a high level of detail but removed the many duplicate and unnecessary points, reducing the overall size of the data set and making subsequent data processing less computationally intensive.

[3] Douglas, D. H., & Peucker, T. K. (1973). *Algorithms for the reduction of the number of points required to represent a digitized line or its caricature.* The Canadian Cartographer, Volume 10, No 2.
[4] Ramer, U. (1972). *An iterative procedure for the polygonal approximation of plane curves.* Computer Graphics and Image Processing, Volume 1, Issue 3.

Spatial Distribution Analysis

The next step in the data reduction process required the development of a means to quantify the three-dimensional spatial distribution of the data into a format conducive to making noise exposure calculations. This was accomplished by developing a customized Python script to evaluate flight events within a two-dimensional grid of 1/16 acre-sized cells covering the study area.

For the enroute phases of flight, the script iterated over the grid and counted the flights that intersected with each cell boundary. In addition to counts of flight events per cell, the average altitude of traversal across the cell for each flight path was computed and recorded. Altitudes in the source KML files were indicated in feet above Mean Sea Level (MSL). MSL altitudes were converted to AGL altitudes to determine noise propagation path distances by obtaining terrain elevation data for the study area from U.S. Geological Survey (USGS) Nation Map website[5]. A script read in the terrain data to determine the ground elevation of each grid cell, and the ground elevation was then subtracted from the MSL altitudes of the flight paths intersecting each cell. The final dataset for enroute flights consisted of flight counts crossing each grid cell segregated into feet AGL altitude range bins based on the acoustic criteria discussed below in Section 3.2. The resulting feet AGL range for each altitude bin is illustrated in Figure 3.

For the vertical ascent and descent flight phases, the script iterated over the grid and counted the vertical flight paths contained with each cell. Altitude distribution information was not recorded for the Nest and delivery events, as flight procedures dictate a common lower bound altitude for all. The final resulting Nest and delivery locations dataset consisted of counts of deliveries or Nest launch and recovery events within each grid cell.

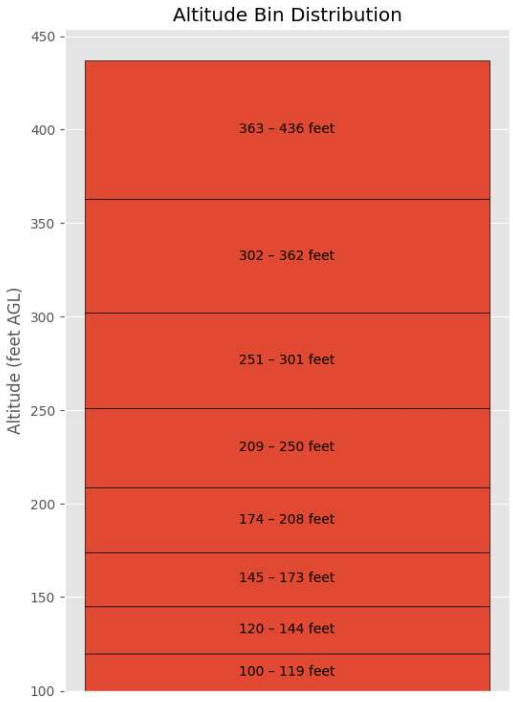

Figure 3. Grid Cell Enroute Flight Altitude Bin Ranges

[5] https://apps.nationalmap.gov/viewer/

3.2 Noise Analysis Methodology

The fully reduced data set provided counts of UA enroute flight, delivery, and Nest events laterally across an XY grid of cells and enroute flight vertically within the altitude bins shown in Figure 3. Based upon this data and available noise measurements, the associated noise contribution from all activity occurring within a cell was computed and summed to give a resulting total noise exposure level on the ground. This section describes the noise calculation processes used to determine the noise contribution for each phase of a delivery flight.

DNL for Enroute Flight

DNL noise exposure calculations for enroute flight were based on the measured aircraft SEL presented in Section 2.2. The SEL value was adjusted for flight at altitudes other than the measured altitude by applying the "delta J1" adjustment from *14 CFR Part 36 Appendix J, Section J36.205(b) Detailed Data Correction Procedures* as follows in Equation 1:

$$\Delta J_1 = 12.5 \times log_{10}\left(\frac{H_A}{H_T}\right), \text{dB} \quad (1)$$

Where ΔJ_1 is the quantity in decibels that must be algebraically added to the measured SEL to adjust for a level flight path at an altitude differing from the measured altitude; H_T is the height, in feet, of the test vehicle when directly over the noise measurement point; H_A is the new adjusted height (or reference height), and the constant (12.5) accounts for the effects on spherical spreading and duration from the off-reference altitude.
Additionally, the altitude bin ranges shown in Figure 3 were developed based on the SEL-distance-duration relationship of Equation 1 to determine the AGL altitudes from 100 feet to 400 feet AGL that would result in a 1 dB change in SEL between each bin floor. This allowed for a consistent resolution in noise level across the range of possible enroute flight altitudes. The altitude bin floor is given by Equation 2:

$$AGL_{Bin\ Floor} = 100 \times 10^{\left(\frac{\Delta SEL}{12.5}\right)}, \text{ft} \quad (2)$$

SEL noise calculations utilized the bin floor altitude as the applicable AGL altitude for all enroute flight events within a given bin range. For example, all flights occurring within the 120 feet – 144 feet AGL bin were considered to be at 120 feet AGL when applying Equation 1 to determine the associated SEL at ground level for that flight. While this yields a somewhat conservative estimate of aircraft noise level on the ground directly below an aircraft flight path, any potential overestimation that would result would be limited to less than 1 dB SEL.

An analysis of enroute ground speed was also conducted based on the flight path point time stamps contained in the simulation data. The results of this analysis showed that the UA was generally moving at a speed of 50 knots or greater during enroute flight. Figure 4 presents a histogram of average UA ground speed by grid cell.

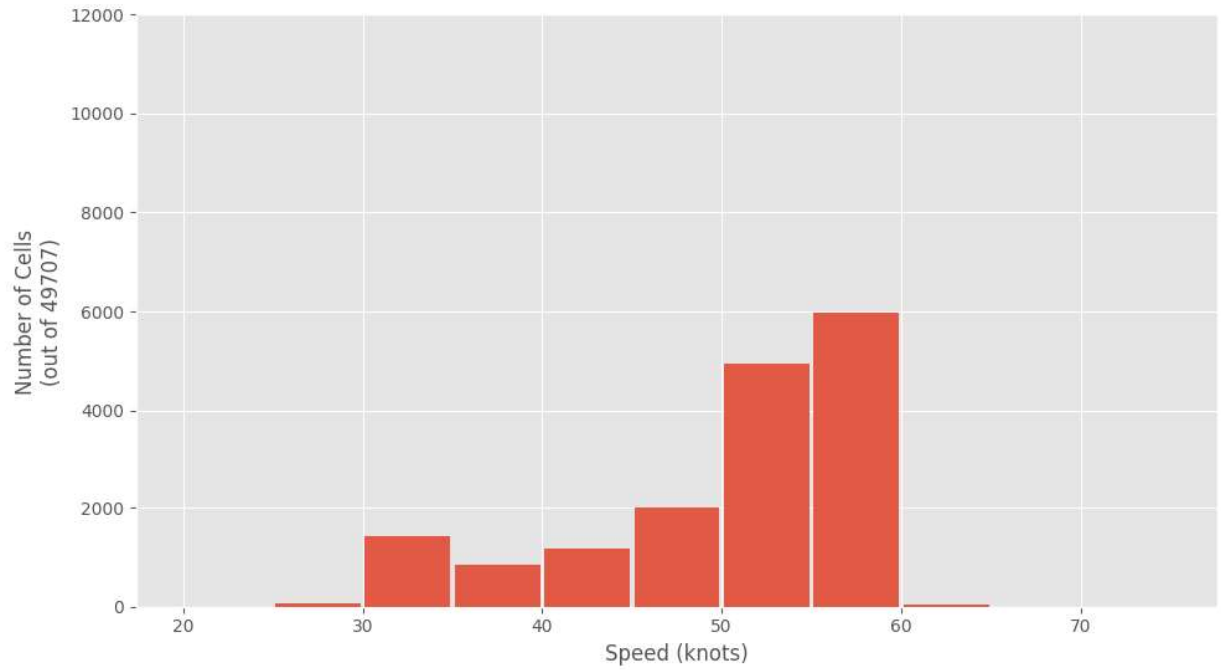

Figure 4. Histogram of UA Enroute Average Ground Speed by Grid Cell

Based on this analysis, a ground speed of 50 knots was used for all phases of enroute flight. To accommodate this in the noise calculation, SEL measurements from the data set discussed in Section 2.2 were adjusted from their actual measured ground to speed to 50 knots by applying the "delta J3" adjustment from *14 CFR Part 36 Appendix J, Section J36.205(b) Detailed Data Correction Procedures* as follows in Equation 3:

$$\Delta J_3 = 10 \times log_{10}\left(\frac{V_{RA}}{V_R}\right), \text{dB} \quad (3)$$

Where ΔJ_3 is the quantity in decibels that must be algebraically added to the measured SEL noise level to correct for the influence of the adjustment of the reference speed on the duration of the measured flyover event as perceived at the noise measurement station, V_R is the reference speed and V_{RA} is the adjusted reference speed.

After adjusting the measured SELs to a speed of 50 knots, average SEL values were computed for each measured altitude and weight configuration. Equation 1 was then applied to the average SELs to compute the resulting SELs for flight at the altitude bin floors from Figure 3. From this assessment it was determined that the measured SEL associated with overflight at 200 feet AGL with a package yielded the highest SEL values across the range of enroute flight altitudes. This data point was selected for use in all enroute flight noise calculations. Table 4 presents the resulting enroute overflight SELs for each altitude bin floor.

Table 4. Speed and Altitude Adjusted SELs Used for Enroute Flight Noise Calculations

AGL Altitude (ft)	100	120	145	174	209	251	302	363
SEL (dB)	69	68	67	66	65	64	63	62

Note: Based on JR Engineering measurement data for level flight at 200 feet AGL at MTOW

Enroute DNL for each cell was then calculated by energy summation of all individual enroute flight SELs for all eight altitude bins as follows in Equation 4:

$$DNL_{Cell\ Enroute} = 10\,log_{10}\left[\frac{Bin_{100}\sum_i^n 10^{\left(\frac{SEL_i}{10}\right)} + Bin_{120}\sum_i^n 10^{\left(\frac{SEL_i}{10}\right)} + Bin_{n\ldots}}{365}\right] - 49.4,\ \text{dB} \quad (4)$$

DNL at Delivery and Nest Locations

DNL calculations at the delivery and Nest locations were based on the measured aircraft SEL presented in Section 2.3. The measured SEL used for noise calculation of all simulated delivery and Nest events was 84 dB at 7.5 meters (25 feet). Noise measurements for the flight procedures conducted at a Nest were not available; as such, it was assumed that total noise produced at the Nest for each delivery was equivalent to the noise produced at a delivery location. With that assumption, both Nest and delivery location DNLs could be computed by energy summation of the SEL for single delivery multiplied by number of deliveries or associated Nest events occurring in any grid cell, as shown in Equation 5:

$$DNL_{Cell\ delivery/Nest} = 10\,log_{10}\left[\frac{N_{events} \times 10^{\left(\frac{84}{10}\right)}}{365}\right] - 49.4,\ \text{dB} \quad (5)$$

Grid Cell Total DNL

With the DNL computed separately for enroute flight and delivery/Nest events, energy summation was applied once more to calculate the combined DNL resulting from all activity occurring within the lateral bounds of each grid cell as follows in Equation 6:

$$Combined\ DNL_{Cell} = 10log_{10}\left[10^{\left(\frac{DNL_{cell\ enroute}}{10}\right)} + 10^{\left(\frac{DNL_{cell\ delivery/Nest}}{10}\right)}\right],\ \text{dB} \quad (6)$$

As previously stated, the dimensions used for the grid cells was 1/16 acre (52 feet x 52 feet). Additionally, this analysis approach assumed that the noise contribution of a flight within any portion of the cell was constant throughout the cell. For this assumption to be valid, the lateral cell dimensions had to be small enough that the range of possible noise source to ground receiver distances would not result in an appreciable difference in noise propagation distance over the range of applicable altitudes. An allowable source to receiver distance variance equivalent to 1 dB LAmax via spherical spreading was chosen as the constraint for determining the grid cell dimensions. A geometric analysis was conducted to determine the relationship between cell size and the possible range of noise source to ground receiver propagation distances. The results of the analysis, depicted in Figure 5, showed that a cell dimension of 50 feet x 50 feet would achieve the target limit of approximately 1 dB of variance in propagation distance for enroute flight at the lower altitude range present in the simulation data set.

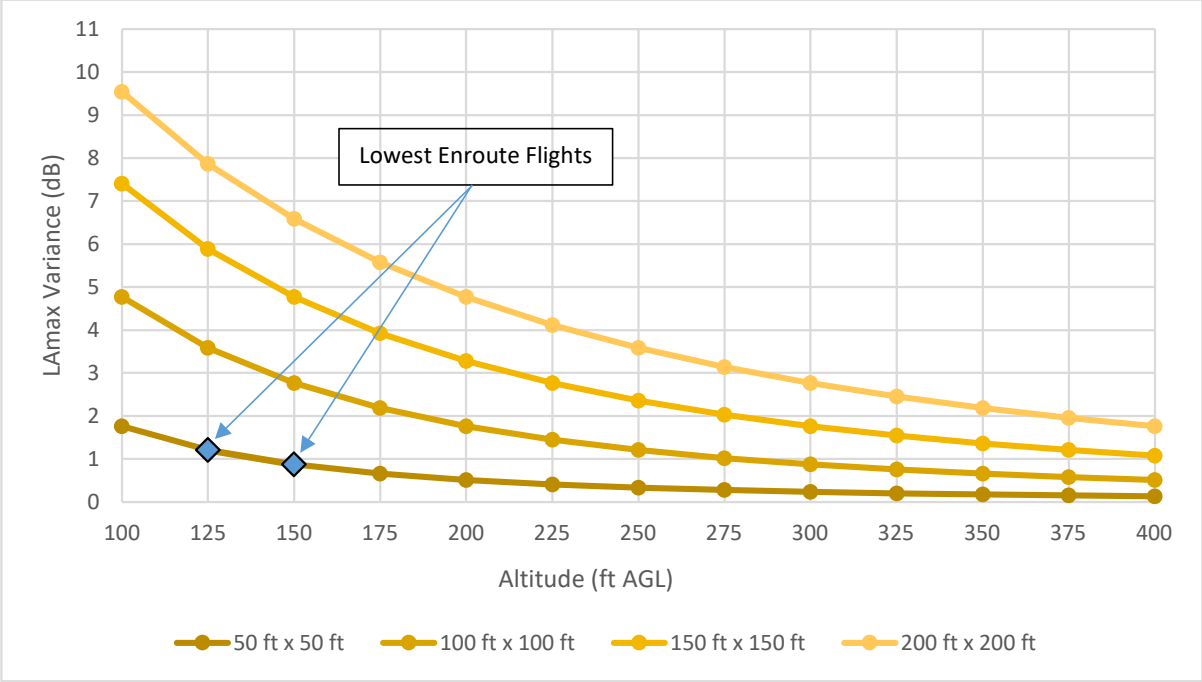

Figure 5. Possible LAmax dB Variance by Altitude for Various Cell Dimensions

Utilizing a cell size of 1/16 acre (52 feet x 52 feet) helps minimize uncertainty in the noise exposure throughout the cell resulting from those events occurring within the cell. However, noise from activity occurring in adjacent cells would also contribute to the total noise level on the ground and must be accounted for in calculating the total noise level for each grid cell. The noise contribution resulting from the nearest neighboring cells is accounted for by summing the energy average level of the eight surrounding cells to the $Combined\ DNL_{Cell}$ value from Equation 6. This nearest neighbor noise contribution addition is carried out iteratively over the entire grid cell set as a final step to produce the total DNL estimate for each grid cell.

Number of Events Above 60 dB LA_{max} (NA60)

In addition to DNL, a supplemental NA60 noise metric was also calculated for the study area. NA60 noise calculations utilize the measured LA_{max} values from the overflight measurements in Section 2.2 and the simulated delivery measurements in Section 2.3. As with the DNL calculations, the enroute NA60 calculation also uses the measured level for UA overflight at 200 feet AGL with a package. A simple spherical spreading relationship is applied to the 60 dB LAmax value at 200 feet AGL to determine the LAmax of enroute flight events at other altitudes as follows in Equation 7:

$$\mathrm{LA}_{max} = 20 \times log_{10}\left(\frac{200}{Bin_{alt}}\right) + 60, \text{ dB} \qquad (7)$$

Table 5 presents LA_{max} for enroute flight at the bin altitudes from Figure 3. NA60 for enroute flight is determined for each grid cell by a count of the number of flight events at or below 209 feet AGL.

Table 5. LAmax Used for Enroute Flight Noise Calculations

AGL Altitude (ft)	100	120	145	174	209	251	302	363
LAmax (dB)	66	65	63	62	60	58	57	55

The measured LA_{max} used for noise calculation of all simulated delivery and Nest events was 73 dB at 7.5 meters (25 feet). Since all delivery and Nest events would generate an LAmax above 60 dB within the cells that they occur, NA60 for each cell is simply the total of the delivery and Nest events occurring within the cell. Total NA60 for each grid cell is determined by the addition of total enroute flights occurring at or below 209 feet AGL and total delivery and Nest events occurring within each grid cell.

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4 Noise Exposure Estimate Results

This section presents the estimated noise exposure for Wing's proposed UA package delivery operations from the Frisco Station and Little Elm Nests. The Nest locations and their immediately surrounding areas would have the highest noise exposure levels since they serve as the hub of Wing's UA activity; however, those levels would still be well below the FAA's DNL 65 dB threshold for noise compatible land use. Areas of DNL 45 dB or greater only occur at the Nest locations. Grid cells at the Frisco Station Nest ranged from DNL 46 to DNL 51 dB, and grid cells at the Little Elm Nest ranged from DNL 47 to DNL 50 dB.

Since the Nests consist of multiple UA launch and recovery pads, the flight activity at a Nest is distributed across multiple of the grid cells used for this analysis. To provide a conservative view of possible outcomes, it is useful to consider the potential DNL that could result if all pads fell within a single grid cell, i.e., worst case. In that case, for the level of activity assessed in this document, the resulting DNL at both Nests would be 53 dB. Table 6 presents the estimated DNL range and potential DNL at the Frisco Station and Little Elm Nests.

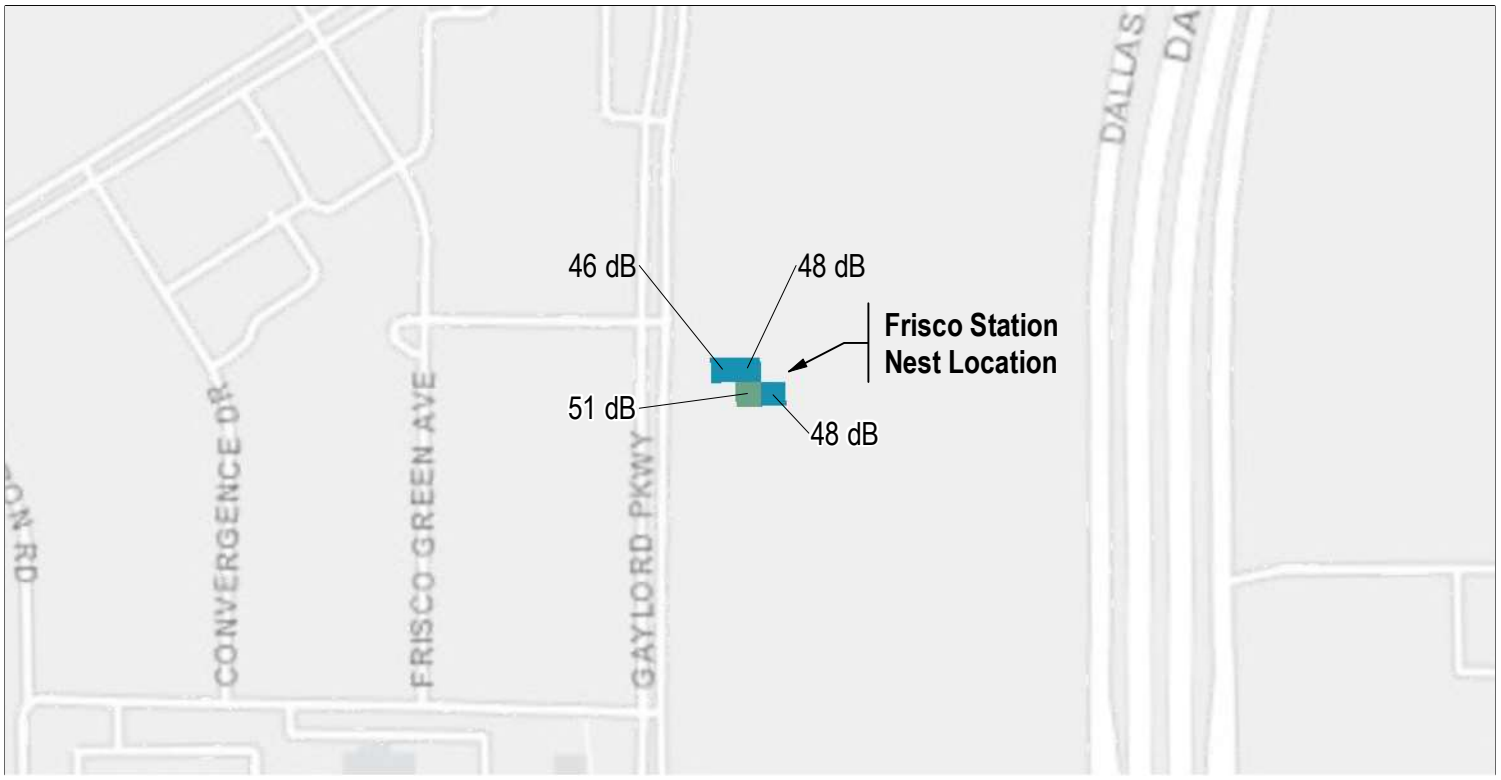
Table 6. AAD DNL at Frisco Station and Little Elm Nest Locations

Nest	Total Simulated Deliveries	DNL Range (dB)	Potential DNL (dB)
Frisco Station	24,967	46 – 51	53
Little Elm	24,996	47 – 50	53

NA60 would range up to 106 average daily events at the Nest locations. Because the NA60 calculation considers four events for every delivery, it is possible for the NA60 results of a cell to be higher than average daily number of deliveries. For the NA60 calculation an event has been defined as the following:

- Departure/Arrival at a Nest
- Enroute flight out to a delivery location
- The package drop-off at a delivery location
- Enroute flight back to a Nest

Figure 6 presents the DNL for any grid cells with an AAD DNL of 45 dB or greater. Figure 7 presents the AAD NA60 for any grid cells with one event or greater.



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City Limits
Major / Minor Roads
Railroad
Water / Stream

45 - 50 dB DNL
50 - 55 dB DNL

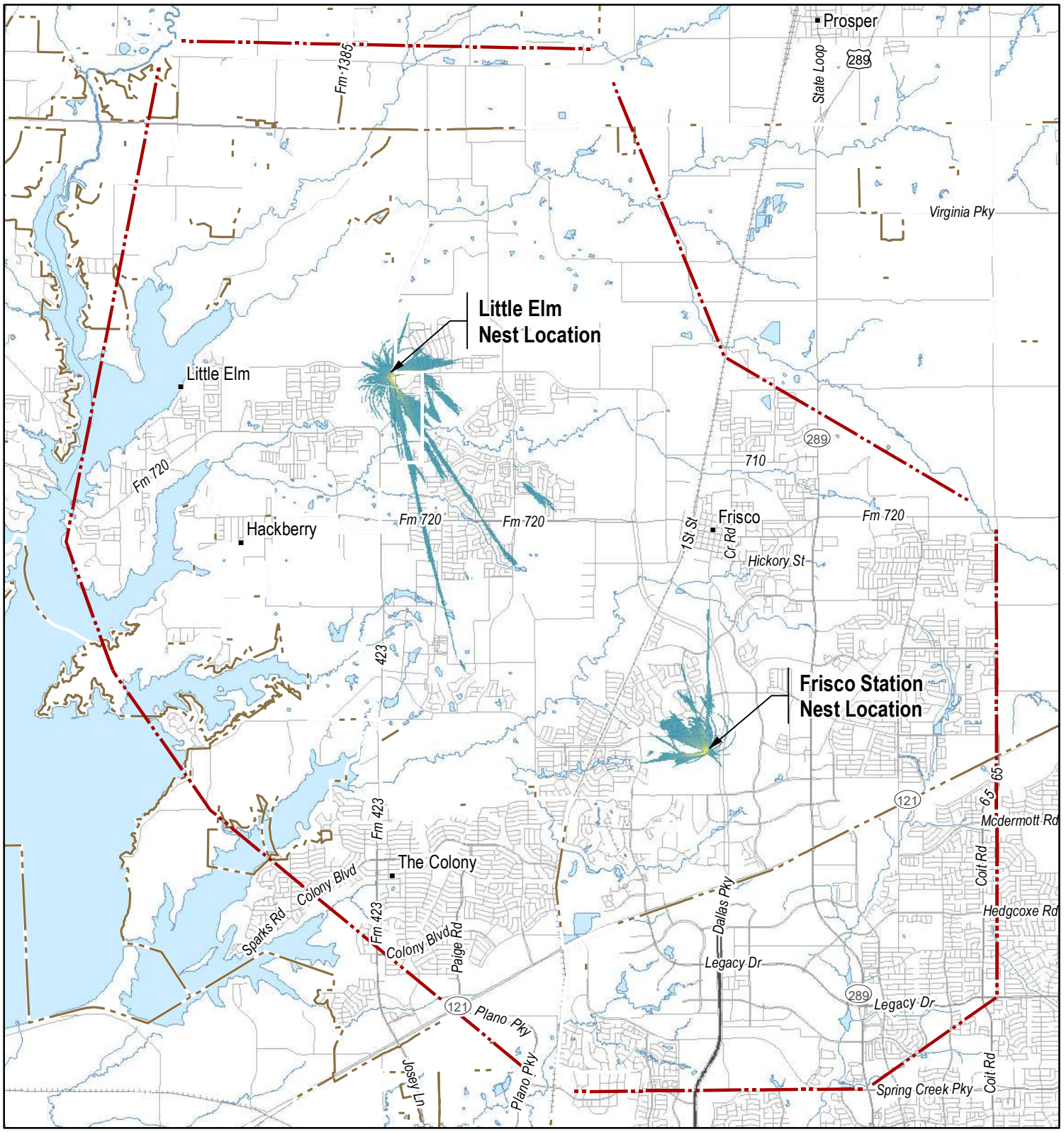
Analysis Grid Cell Size =
1/16 Acre (52 ft x 52 ft)

Frisco Station and Little Elm Nest Locations Operations

Figure: 6

Areas with 45 dB DNL or Greater

0 400 800 Feet



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Study Area
City Limits
Major / Minor Roads
Railroad
Water / Stream

106 Events (NA60)

Analysis Grid Cell Size = 1/16 Acre (52 ft x 52 ft)

1 Event (NA60)

0 1 2 Miles

Frisco Station and Little Elm Nest Locations Operations

Figure: 7

Average Annual Daily Number of Events Above 60 dB LA_{max} (NA60)

Appendix D

Noise Methodology Memos

Federal Aviation Administration

Memorandum

Date: December 1, 2021

To: Don Scata, Office of Environment and Energy (AEE)

From: Mike Millard, Flight Standards (AFS), General Aviation Operations Branch, AFS-830

Subject: Environmental Assessment (EA) Noise Methodology Approval Request for Hummingbird 7000W-A UA Operations in Frisco Station and Little Elm, TX

AFS requests AEE approval of the noise methodology to be used for the Environmental Assessment (EA) for Wing Aviation LLC (Wing) operations using the Hummingbird 7000W unmanned aircraft (UA) in Frisco Station and Little Elm, TX to provide package delivery services as a 14 CFR Part 135 operator as described below.

As the FAA does not currently have a standard approved noise model for UA, this letter serves as a request for written approval from AEE to use the methodology proposed in the following sections to support the noise analysis for the EA.

Description of Aircraft and Proposed Operations

AFS is evaluating Wing operations using the Hummingbird 7000W-A UA in Frisco Station and Little Elm, TX to deliver packages, including prescription medication from two launch and recovery locations referred to as "Nests". The Hummingbird 7000W-A aircraft weighs 15 pounds, including the maximum package weight of 3.3 pounds. Typical operations of the aircraft will consist of a departure from the Nest where the aircraft will quickly rise to an approximate cruising altitude between 150-250 feet above ground level (AGL), fly to the delivery location, then transition to hover mode and lower its altitude to approximately 23 feet AGL, where it will lower the package on its retractable cord to the ground. Following delivery, the aircraft will rise back to cruise altitude, and return back to the Nest for landing.

Noise Analysis Methodology

AFS is proposing to use the noise analysis methodology developed in HMMH Report No. 309990.003-2 on the "Noise Assessment for Wing Aviation Proposed Package Delivery Operations in Little Elm and Frisco, Texas" dated November 19, 2021. Key elements of the methodology developed in the report include:

Operations Data Analysis:

Flight paths will be parsed into flight phases representing:

- En-route flight from Nest to delivery location
- En-route flight from delivery location back to Nest
- Vertical ascent and descent from en-route altitudes to Nest and delivery locations

Flight track operations distributions will then be determined based on representative simulations of UA activity provided by Wing. The operational and flight track data will then be spatially analyzed over 1/16 acre sized grid cells over the extent of Wing's proposed operating areas from each nest location to determine counts of operations and altitude distributions within each cell for en-route, delivery, and nest activities for use in noise calculations

Acoustic Data Analysis

UA source noise will be derived from a combination of:

- Overflight and hover measured Maximum A-weighted Sound Levels (LAmax) and Sound Exposure Levels (SEL) from aircraft noise certification measurements collected for Wing's UA by JR Engineering in April of 2021[1]
- Delivery measurements from Wing noise survey data collected in Australia in June 2019[2]

Noise Exposure Calculations

Day Night Average (DNL) Sound Levels will be calculated for each flight phase based on a combination of the SEL values from the acoustic data and operations data analysis. The resulting DNL for all flight phases will then be calculated based on the energy summation of DNL values for all en-route, delivery, and Nest operations occurring within each grid cell

As a final step, the noise contributions from surrounding cells will be considered to generate the total DNL estimate for each grid cell based on summing the energy average level of the eight surrounding grid cells to the DNL levels calculated from all flight phases and iterating over each grid cell within Wing's proposed operating area.

To provide additional supplemental noise results, Number of Events Above 60 dB LAmax (NA60) will also be calculated for each flight phase based on a combination of the LAmax values from the acoustic data and operations data analysis. The resulting NA60 for all flight phases will then be calculated based on the summation of the count of NA60 for all en-route, delivery, and Nest operations occurring within each grid cell.

[1] Engineering Coordination Memo and Data Files, Subject: "Data Submittal for AEE", JR Engineering 2021.
[2] Report: "Wing Aviation Unmanned Aircraft Noise Survey", WSP 2019.

Federal Aviation Administration

Memorandum

Date: December 2, 2021

To: Mike Millard, Flight Standards (AFS), General Aviation Operations Branch, AFS-830

From: Don Scata, Manager, Noise Division, Office of Environment and Energy (AEE-100)

Subject: Environmental Assessment (EA) Noise Methodology Approval Request for Hummingbird 7000W-A Operations at Frisco Station and Little Elm, Texas

The Office of Environment and Energy (AEE) has reviewed the proposed non-standard noise modeling methodology to be used for Wing Aviation LLC (Wing) operations using the Hummingbird 7000W-A unmanned aircraft (UA) in Frisco Station and Little Elm, Texas. This request is in support of an Environmental Assessment (EA) for Wing to provide package delivery services as a 14 CFR Part 135 operator in these two areas.

The Proposed Action is to use the Hummingbird 7000W-A to deliver packages from two launch and recovery locations referred to as "Nests". Typical operations of the UA will consist of a departure from the Nest where the aircraft will quickly rise to an approximate cruising altitude between 150-250 feet above ground level (AGL), fly to the delivery location, then transition to hover mode and lower its altitude to approximately 23 feet AGL, where it will lower the package on its retractable cord to the ground. Following delivery, the aircraft will rise back to cruise altitude, and return back to the Nest for landing.

As the FAA's approved noise models and methodologies are not currently suitable for analysis of the Proposed Action, in accordance with FAA Order 1050.1F, all non-standard noise analysis in support of the noise impact analysis for the National Environmental Policy Act (NEPA) must be approved by AEE. This letter serves as AEE's response to the method developed in HMMH Report No. 309990.003-2 on the "Noise Assessment for Wing Aviation Proposed Package Delivery Operations in Little Elm and Frisco, Texas" dated November 19, 2021.

The proposed methodology appears to be adequate for this analysis; therefore, AEE concurs with the methodology proposed for this project. Please understand that this approval is limited to this particular Environmental Review, location, vehicle, and circumstances. Any additional projects using this or other methodologies or variations in the vehicle will require separate approval.

Appendix E

EJSCREEN Report

EJSCREEN Report (Version 2020)

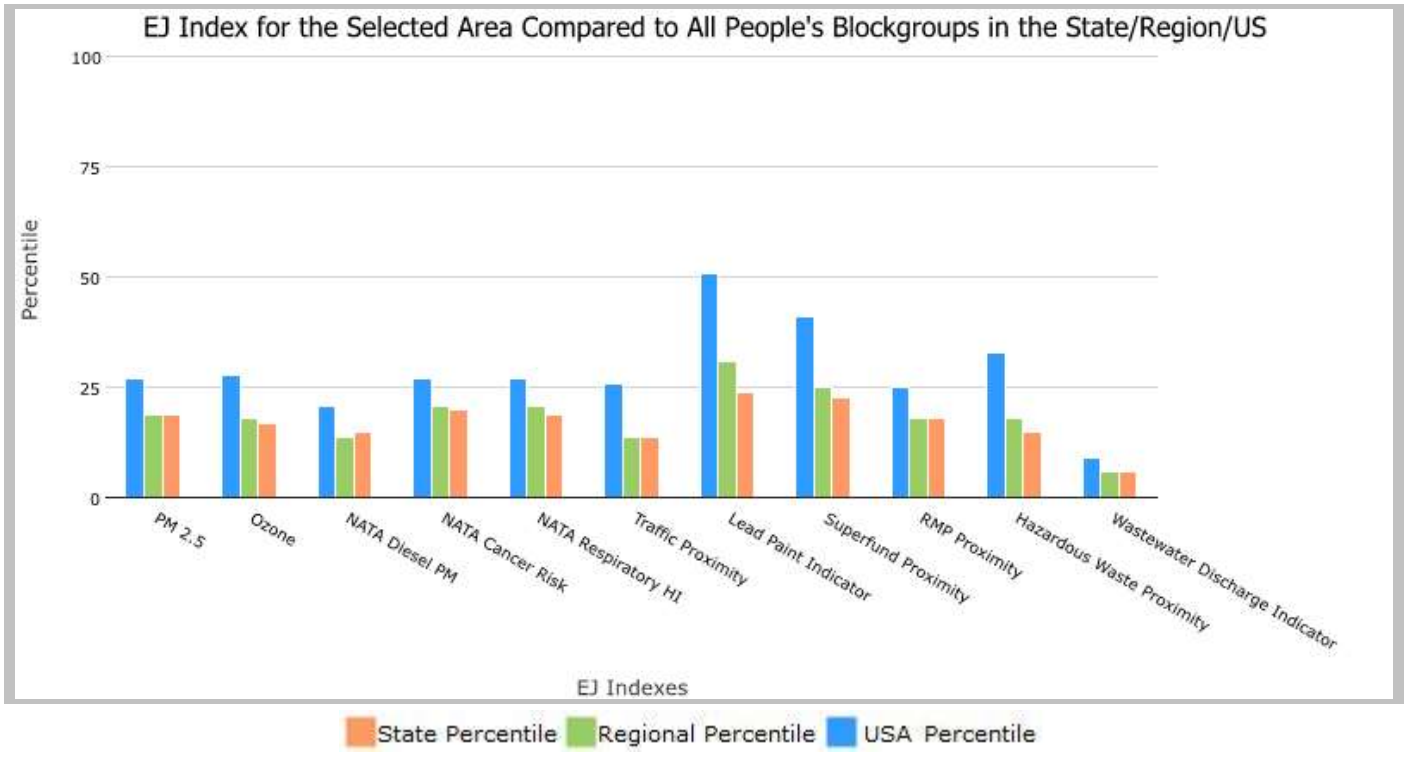
the User Specified Area, TEXAS, EPA Region 6

Approximate Population: 278,401

Input Area (sq. miles): 100.71

Frisco Little Elm

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	19	19	27
EJ Index for Ozone	17	18	28
EJ Index for NATA* Diesel PM	15	14	21
EJ Index for NATA* Air Toxics Cancer Risk	20	21	27
EJ Index for NATA* Respiratory Hazard Index	19	21	27
EJ Index for Traffic Proximity and Volume	14	14	26
EJ Index for Lead Paint Indicator	24	31	51
EJ Index for Superfund Proximity	23	25	41
EJ Index for RMP Proximity	18	18	25
EJ Index for Hazardous Waste Proximity	15	18	33
EJ Index for Wastewater Discharge Indicator	6	6	9

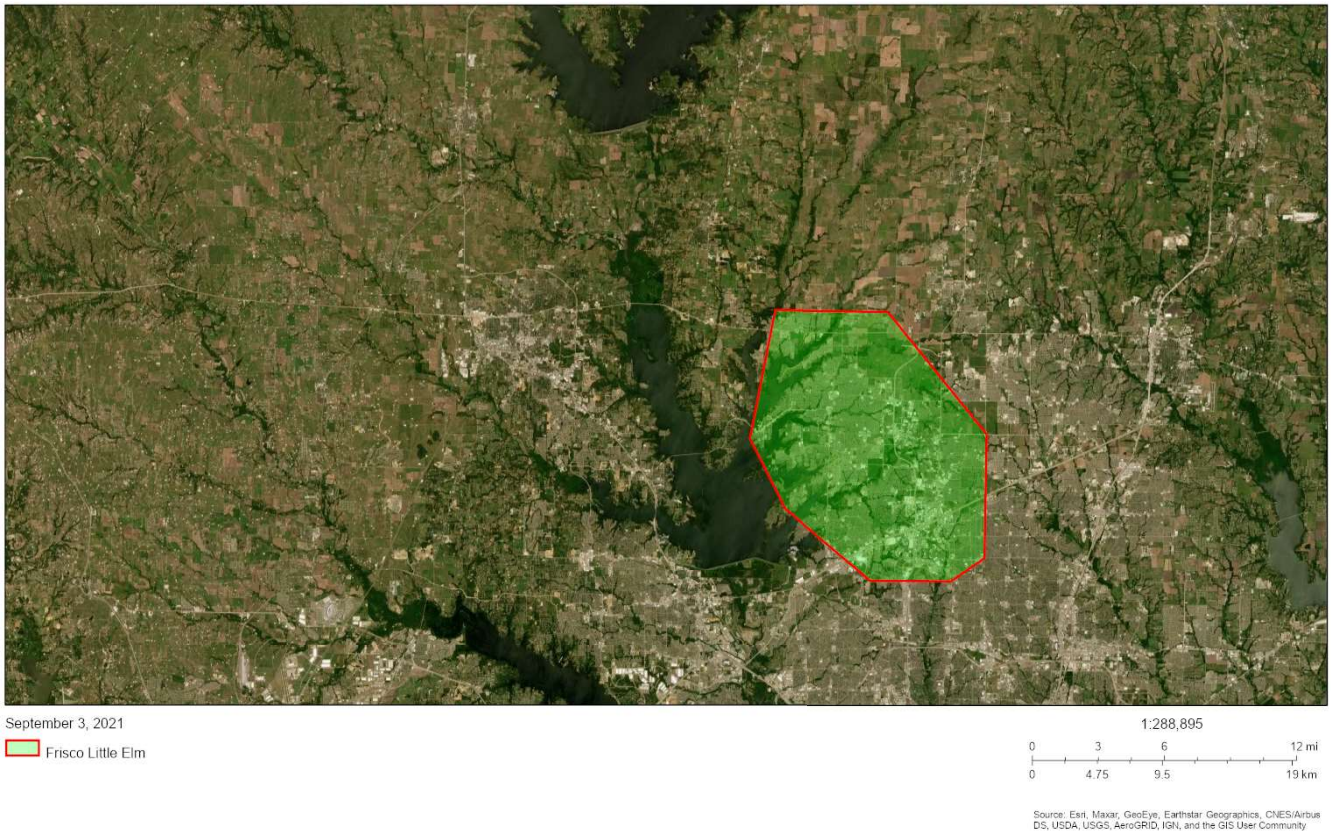


This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

the User Specified Area, TEXAS, EPA Region 6

Approximate Population: 278,401
Input Area (sq. miles): 100.71
Frisco Little Elm



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	5

EJSCREEN Report (Version 2020)

the User Specified Area, TEXAS, EPA Region 6

Approximate Population: 278,401

Input Area (sq. miles): 100.71

Frisco Little Elm

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	9.6	9.18	76	8.95	79	8.55	84
Ozone (ppb)	48.3	41.3	94	41.8	88	42.9	86
NATA* Diesel PM (µg/m^3)	0.529	0.428	69	0.401	70-80th	0.478	60-70th
NATA* Cancer Risk (lifetime risk per million)	33	35	51	36	<50th	32	50-60th
NATA* Respiratory Hazard Index	0.45	0.43	56	0.45	<50th	0.44	50-60th
Traffic Proximity and Volume (daily traffic count/distance to road)	280	470	62	400	66	750	55
Lead Paint Indicator (% Pre-1960 Housing)	0.012	0.15	32	0.17	26	0.28	14
Superfund Proximity (site count/km distance)	0.025	0.084	32	0.081	35	0.13	23
RMP Proximity (facility count/km distance)	0.36	0.91	43	0.82	49	0.74	53
Hazardous Waste Proximity (facility count/km distance)	0.57	0.88	58	0.99	56	5	40
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.022	0.41	83	9.5	84	9.4	83
Demographic Indicators							
Demographic Index	28%	47%	26	44%	29	36%	46
People of Color Population	43%	58%	35	52%	44	39%	61
Low Income Population	13%	35%	18	37%	15	33%	19
Linguistically Isolated Population	4%	8%	50	6%	60	4%	68
Population With Less Than High School Education	4%	17%	22	16%	20	13%	26
Population Under 5 years of age	6%	7%	44	7%	47	6%	56
Population over 64 years of age	8%	12%	33	13%	27	15%	18

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

Appendix F

Acronyms and Abbreviations

Appendix F. Acronyms and Abbreviations

AAD - Average Annual Daily Operations

AGL - Above Ground Level

APE - Area of Potential Effects

AUVSI - Unmanned Vehicle Systems International

BCC - Birds of Conservation Concern

BVLOS - Beyond Visual Line of Sight

CDA - Commercial Drone Alliance

CEQ - Council on Environmental Quality

CFR - Code of Federal Regulations

COA - Certificate of Waiver or Authorization

Con Ops - Concept of Operations

CZMP - Coastal Zone Management Plan

dB - Decibel

DNL - Day-Night Average Sound Level

DOT – Department of Transportation

EA - Environmental Assessment

EJSCREEN - Environmental Justice Screening Tool

EO - Executive Order

EPA - Environmental Protection Agency

ESA - Endangered Species Act

FAA - Federal Aviation Administration

FEMA - Federal Emergency Management Agency

FHWA - Federal Highway Administration

FM 423 - Farm to Market Road 423

FONSI - Finding of No Significant Impact

FSIMS - The Flight Standards Information Management System

GA - General Aviation

HUD - Housing and Urban Development

IPaC - Information for Planning and Consultation

IPP - UAS Integration Pilot Program

NAS - National Airspace System

NEPA - National Environmental Policy Act

NHPA - National Historic Preservation Act

NMFS - National Marine Fisheries Service

NOA - Notice of Availability

NRHP - National Register of Historic Places

NTSB – National Transportation Safety Board

OpSpecs - Operations Specifications

PSP - Partnership for Safety Program

ROD – Record of Decision

RPIC - Remote Pilot in Command

SHPO - State Historic Preservation Office(r)

TDAT - Tribal Directory Assessment Tool

THPO - Tribal Historic Preservation Office

UA - Unmanned Aircraft

UAS - Unmanned Aircraft Systems

USACE - United States Army Corps of Engineers

USC - United States Code

USFWS - United States Fish and Wildlife Service

Wing – Wing Aviation, LLC.

Appendix G

Public Comments and FAA Responses

Appendix G. Public Comments and FAA Responses

The comments below include direct quotes from the comments received by the FAA.

Texas Parks and Wildlife Department

Page 4, Section 1.2.2

In relation to the Draft EA's discussion on the locations of the nests and the delivery to customers within the flight range of the nest, Texas Parks and Wildlife asked "what is the flight range? what is the size of the operational area. are there avoidance areas, if so, where are they."

FAA Response

The aircraft flight range for each nest under the proposed action would be within the blue-lined operational area depicted in Figures 1 and 2 of the Draft EA and Figures 1 and 2 of the Final EA. The operational area, shaped like a polygon, is – at its widest – approximately 15 miles north to south and 11 miles east to west. The approximate land area is 91 square miles, and the approximate water area is 6.3 square miles. At its widest, on the west the operational area is bounded by Lewisville Lake and on the east by Coit Road. The northernmost boundary is roughly parallel to Fishtrap Road and the southernmost boundary is along the Windhaven Parkway. The FAA has modified the text of the EA to clarify.

Regarding the flight range and operating area the EA now states "Under the proposed action reviewed in this EA, Wing will be delivering packages only from Walgreens to their customers within the flight range of the Little Elm nest, which is the blue-lined operating area in Figures 1 and 2 of the Draft EA and Figures 1 and 2 of the Final EA." Further, with respect to the Frisco Station nest, Wing's partners would be able to deliver to customers "as long as the customer was located within the blue-lined study area and within flight range of the Frisco Station nest." In addition, the FAA has added additional description of the operating area to Section 1.2 of the Final EA.

As stated in Section 3.3 of the EA, Wing has identified properties such as outdoor recreation areas, playgrounds, and schools in its flight planning system. Wing calls these "fly less" areas, and they are indicative of areas to be avoided based on the type of the resource, time of day, and other factors. Wing has committed in its operational proposal to the FAA that it will generally avoid overflights of these "fly less" resources in the Frisco and Little Elm study area during the scope of operations covered by the proposed action, unless there is a specific purpose for Wing to enter one of these areas in coordination with the respective resource authority. In any case, the proposed action does not result in any significant impacts.

Page 7, Section 2.1

In relation to the Draft EA's statement of the proposed action as being, in part, an amendment to the B050 OpSpec, the commenter asked "where can i read the op spec." Where the proposed action discussion references the location of the operations, the commenter stated "area has no scale, size" referring to Figures 1 and 2 of the Draft EA.

FAA Response

See response to the first comment for additional information on the scale and size of the operating area. In addition, a scale has been added to Figure 1 for reference. The FAA's guidance for OpSpecs is in Volume 3, Chapter 18 of The Flight Standards Information Management System (FSIMS) Order 8900.1, available at: https://fsims.faa.gov/PICResults.aspx?mode=EBookContents&restricttocategory=all~menu.

Page 13, Section 3.2.3
In relation to the discussion of potential impacts to the Whopping Crane, the commenter asked whether there were "any potential wc [Whooping Crane] stopover habitat at Lewisville that should be nofly zones.?"

FAA Response

The Lewisville Lake Environmental Learning Area is outside of the operating area for this action. However, there are several arms of Lewisville Lake within the operating area. Lewisville Lake has been evaluated as potential stopover habitat for the Aransas-Wood Buffalo Whooping Crane population that winters along the Gulf Coast and summers in Northern Alberta. This evaluation determined that the Lake appears to have suitable stopover habitat, although migrating cranes from this population have not been documented using the Lake. In 2013, seven wandering Whooping Cranes from the non-migratory Louisiana population spent a few months living at Lewisville Lake, as documented by Chris Jacksons from DFW Urban Wildlife. One Whooping Crane returned in 2014, but there have been no Whooping Cranes observed at Lewisville Lake since that time.

While there is suitable habitat for Whooping Cranes at Lewisville Lake, there is currently not a need for avoidance zones to be established due to the lack of occupancy. If Whooping Cranes are identified using habitat in the operating area in future, Wing will coordinate with the Arlington Ecological Services Field Office of the U.S. Fish and Wildlife Service, as well as the Texas Parks & Wildlife Department, to determine if any avoidance zones or other best management practices are needed. Edits to Section 3.2 were made to reflect this response.

Page 13, Section 3.2.3

In relation to the discussion of potential impacts to Bald Eagles, the commenter asked "what is their [Wing's] nest monitoring plan and design? how often, when, [would Wing report] to USFWS?" The commenter also asked whether Wing's UA record video indicating that the Texas Parks and Wildlife Department "has laws regarding permits needed to assess wildlife using aerial methods, including drones."

FAA Response

Wing has agreed to a monitoring plan for Bald Eagle nests that integrates multiple strategies and resources. This includes periodically checking online tools such as iNaturalist to identify eagle nests that may occur in the operating area, as well as potential communication with the bird watching community to identify nests. Wing personnel will also be educated in the visual identification of Bald Eagle nests which are typically very conspicuous. If Wing identifies a Bald Eagle nest or is notified of the presence of a nest, Wing will establish an avoidance area such that there is a 1,000 feet vertical and horizontal separation distance between the vehicle's flight path and the nest. This avoidance area will be

maintained until the end of the breeding season or a qualified biologist indicates the nest has been vacated.

Wing's aircraft will not be used to assess wildlife or monitor nests. Wing has stated that its aircraft are equipped with low-resolution, black-and-white cameras used primarily to assist with navigation and to help ensure the safety and reliability of operations. Wing's aircraft do not carry high-resolution cameras. At no time is there a live feed of images from the cameras to anyone — including the pilots supervising flights. Wing has indicated that the cameras cannot be pointed or zoomed to view objects on the ground, and in practice, people and wildlife are not recognizable while the drone flies to its delivery destination.

Page 13, Section 3.2.3

In relation to the EA's discussion of potential adverse impacts to state species of concern, the commenter asked whether FAA had reviewed RTEST [the Rare, Threatened, and Endangered Species of Texas] for the SGCN [Species of Greatest Conservation Need] of the state.

FAA Response

A discussion of state listed volant species, including species of greatest conservation need (SGCN) has been added to Chapter 3 and 4 of the Final EA.

Page 14, Section 3.3.2

In the EA's discussion of the Department of Transportation Act, Section 4(f) Resources and referring to Wing's identification of "fly less" areas in its flight planning system, the commenter stated "where are the flyless areas in Wing's flight planning system. EA should identify these."

FAA Response

As stated in Section 3.3 of the EA, Wing has identified properties such as outdoor recreation areas, playgrounds, and schools in its flight planning system. Wing calls these "fly less" areas, and they are indicative of areas to be avoided based on the type of the resource, time of day, and other factors. Wing has committed in its operational proposal to the FAA that it will generally avoid overflights of these "fly less" resources in the Frisco and Little Elm study area during the scope of operations covered by the proposed action, unless there is a specific purpose for Wing to enter one of these areas in coordination with the respective resource authority. In any case, the proposed action does not result in any significant impacts to Section 4(f) resources.

Hillwood

From Robert Folzenlogen, Senior Vice President of Strategic Development at Hillwood

Frisco Station in Frisco, TX was designed with futureproofing in mind, bringing next-generation mobility options to reality today. The addition of Wing and its first-of-its-kind innovation builds upon Frisco Station's foundational pillars of Smart, Creative, Healthy and once again showcases the development nationwide as the place where pioneering visions can be put into practice today and maximized well into the future.

FAA Response

Comment noted.

From Mike Berry, President at Hillwood

We're excited to partner with Wing as a key operator at the AllianceTexas Mobility Innovation Zone and Frisco Station as they unveil the first commercial drone delivery facility in North Texas. Hillwood has a long-standing history of successful public-private partnerships and deep-rooted experience in innovation, and today, those connections push forward the future of how goods and people move.

FAA Response

Comment noted.

Commercial Drone Alliance

The Commercial Drone Alliance ("CDA")[1] appreciates the opportunity to submit comments on the Federal Aviation Administration's ("FAA") "Notice of Availability, Notice of Public Comment Period, and Request for Comment on the Draft Environmental Assessment for Wing Aviation in Frisco and Little Elm, Texas" (hereafter the "Draft EA"). For the reasons set forth below, the CDA strongly supports the FAA's efforts to authorize uncrewed aircraft systems ("UAS") commercial package delivery operations by Wing Aviation, LLC ("Wing") from Frisco and Little Elm, Texas. FAA's approval of Wing's UAS operations supports the federal government's ongoing efforts to implement its congressional mandate to fully integrate UAS into the National Airspace System ("NAS"). FAA approval of Wing's proposed operations will help normalize safe, scalable, economically viable, and environmentally advantageous commercial UAS package delivery operations in the United States.

The CDA recognizes that environmental review is a critical piece of the regulatory framework enabling UAS package delivery operations to scale commercially in the U.S. Indeed, UAS operations have significant environmental benefits. A wide variety of industries are counting on UAS to help decarbonize their operations, particularly those that currently rely on larger, louder gas-powered vehicles. Existing commercial drone deployments have already demonstrated a net positive impact on the environment—including reductions in overall noise levels and CO_2 greenhouse gas emissions. For example, a September 2020 economic report published by the Virginia Tech Office of Economic Development found that enabling drone delivery in a single metropolitan area could avoid up to 294 million miles per year in road use and up to 580 car crashes per year, equivalent to taking 25,000 cars off the road or planting 46,000 acres per year of new forest, reducing carbon emissions by up to 113,900 tons per year.[2]

[1] The CDA is an independent non-profit organization led by key leaders in the commercial drone industry. The CDA has actively participated in rulemakings and policy efforts to facilitate the safe and secure development and expansion of commercial drone operations. The CDA works with all levels of government to collaborate on policies for industry growth and seeks to educate the public on the safe and responsible use of commercial drones to achieve economic benefits and humanitarian gains. We bring together commercial drone end-users, manufacturers, service providers, advanced air mobility companies, drone security companies, and vertical markets including oil and gas, precision agriculture, construction, security, communications technology, infrastructure, newsgathering, filmmaking, and more. Learn more at www.commercialdronealliance.org.

[2] Virginia Tech Office of Economic Development, "Measuring the Effects of Drone Delivery in the United States," (September 2020), available at https://vtechworks.lib.vt.edu/bitstream/handle/10919/100104/Effects%20of%20Drone%20Delivery%20US_September%202020.pdf?sequence=1&isAllowed=y.

We support the FAA's current efforts to approve amendments to Wing's air carrier Operations Specifications (OpsSpecs) to conduct commercial drone delivery operations from two Texas locations using Wing's 15-pound Hummingbird 7000W-A aircraft. These efforts are important for the public's acceptance of commercial drone operations in the United States – operations that provide extensive benefits and essential services to the American public. For example, among other use cases commercial drone operations can deliver critical supplies, lifesaving medicines, and commercial products and more efficiently serve isolated, quarantined, and homebound people than other delivery means. Importantly, commercial drones can provide these enormous benefits in an environmentally responsible, efficient, and cost-effective manner.

The CDA appreciates the FAA's effort to work with Wing to identify reasonably foreseeable impacts of the proposed operations to the environment, disclose those environmental impacts to the public, and evaluate those impacts by examining the affected environment and the environmental consequences. The FAA has carried out a thorough evaluation and robust analysis of various environmental impacts, including those to biological resources; Department of Transportation Section 4(f) resources; historical architectural, archeological, and cultural resources; as well as noise and noise-compatible land use and environmental justice issues. In addition, we commend the FAA for leveraging Wing's participation in the UAS Integration Pilot Program (IPP), the Partnership for Safety Plan Program (PSP), and the BEYOND program, which have enabled the FAA to work with states, localities and industry to collect critical data and engage in community outreach initiatives. The results of Virginia Tech's recent public perception survey indicate nearly 90% positive sentiment toward drone delivery in Christiansburg, Virginia, where Wing currently performs drone delivery services.[3] These results demonstrate that community outreach is effective and that communities that have already experienced Wing's services overwhelmingly enjoy the benefits of commercial drone delivery.

We agree with the FAA's conclusions that Wing's proposed operations are unlikely to have negative environmental consequences in any of the environmental impact categories identified in the Draft EA. None of the environmental effects identified in the Draft EA meet the FAA's significance thresholds (where one has been established) or otherwise result in adverse impacts. Based on the Draft EA and supporting documents, we urge the FAA to expeditiously determine that Wing's operations will not significantly affect the quality of the human environment, individually or cumulatively, and issue a Finding of No Significant Impact. We also urge the FAA to use this Draft EA as a basis for programmatic (rather than site-specific) review of similar waivers and exemptions moving forward.

By enabling operations such as those proposed by Wing, the FAA is taking important steps to support the UAS industry's viability and enable safe, efficient and environmentally friendly commercial UAS operations that will benefit the American public.

FAA Response

Comment noted.

[3] Nelsen, Eleanor, Adeline Guthrie, and Lee Vinsel. "When the Drone Is in Your Backyard." Issues in Science and Technology 37, no. 3 (Spring 2021): 29–31, https://issues.org/when-the-drone-is-in-yourbackyard-nelsen-guthrie-vinsel/.

Small UAV Coalition

The Small UAV Coalition ("Coalition") is pleased to provide comments in support of the FAA's draft Environmental Assessment ("EA") of Wing's proposed drone delivery operations from two locations in the Dallas-Ft. Worth metro area to residences and commercial businesses. FAA explains that it is required to perform a review under the National Environmental Policy Act ("NEPA") in order to amend Wing's Operations Specifications ("OpSpecs") for its Part 135 drone delivery operations in particular locations.

The Coalition has reviewed the draft EA and supporting information and agrees the noise impacts are well below the threshold of significance, using standard and supplemental noise metrics. The Coalition also agrees with the draft EA's conclusion that there are no other significant impacts from these operations in the many areas required to be reviewed. Accordingly, the Coalition supports the FAA's issuance of a Finding of No Significant Impact ("FONSI").

In particular, the Coalition notes the draft EA's conclusion that Wing's battery-powered drone has no air quality, climate, or noise impact.

This draft EA addresses Wing's drone, concept of operations ("Con Ops"), and particular locations in the Dallas-Ft. Worth metro area. The Coalition recommends that the FAA move beyond individualized circumstances and apply a programmatic approach to drone noise impacts and operating parameters (e.g., weight, speed, altitude, and Con Ops) that will not materially differ from one location to another. Multiple individual EAs are unnecessary and costly and expose FAA and the industry to repetitive challenge and risk of litigation.

While the Coalition concurs with FAA's ultimate result, it questions whether the same conclusions could not have been arrived at through use of the established Categorical Exclusion ("CATEX") process. The CATEX process is commonly applied to OpSpec issuance and amendments relating to air carriers. The CATEX process affords predictability and flexibility, including through consideration of potential extraordinary circumstances, and could be supplemented and updated as necessary to address drone-specific actions.

FAA Response

In accordance with FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, the FAA considered the specific aspects of Wing's proposal in determining the appropriate level of environmental review. After thorough review of this proposal, the FAA determined that this action did not fit within the scope of one of the categorical exclusions currently listed in Paragraph 5-6 of FAA Order 1050.1F. As appropriate, the FAA may consider using this EA, as well as future environmental reviews for UAS approvals, to develop justification for a new categorical exclusion covering this category of actions.

Association for Unmanned Vehicle Systems International

The Association for Unmanned Vehicle Systems International (AUVSI) supports the amendment by Wing Aviation, LLC (Wing) to its Part 135 air carrier Operations Specific (OpSpecs) to expand its package delivery operations to the Dallas Metropolitan area. Wing, in partnership with Walgreens, seeks to bring

daytime drone pharmaceutical delivery to the Frisco and Little Elm areas using a small drone weighing less than 15 pounds. It is noteworthy that Wing's operations maximum potential Day-Night Average Sound Level (DNL) will be only 53 decibels, which is well below the FAA's DNL 65 decibel threshold for noise compatible land use.

AUVSI is the world's largest non-profit devoted exclusively to advancing the unmanned systems and robotics community. Thousands of businesses – large and small, across the country – are embracing technology, such as drones, to enhance efficiency, keep people safe, and provide new workforce opportunities. AUVSI and its members, including Wing, work closely with the U.S. government to ensure that operations remain safe and compliant with federal regulations, and we have built an enviable track record. Wing's amendment to its Part 135, and expanded operations in Texas, are a natural evolution of a proven system of drone delivery established in Christiansburg, VA.

AUVSI encourages the approval of Wing's to its Part 135 air carrier Operations Specific (OpSpecs) to expand its package delivery operations to the Dallas Metropolitan area. Thank you for the opportunity to comment.

FAA Response

Comment noted.