
Federal Aviation Administration

# Draft Environmental Assessment for Zipline International Inc. Proposed Drone Package Delivery Operations in Seattle, Washington

**October 2025**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**Washington, D.C.**

**Notice of Availability, Notice of Public Comment Period, and Request for Comment on the Draft Environmental Assessment for Zipline International Inc. Proposed Drone Package Delivery Operations in Seattle, Washington**

The Federal Aviation Administration (FAA) provides notice that a Draft Environmental Assessment (EA), prepared pursuant to the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] §§ 4321–4355), to assess Zipline International Inc. (Zipline), proposed commercial drone delivery service in the Seattle, Washington, metropolitan area is available for review and comment.

Zipline is seeking to amend its air carrier Operation Specifications (OpSpecs) and other FAA approvals necessary to begin commercial drone package delivery operations in Washington. The FAA's approval of the amended OpSpecs is considered a major federal action under NEPA and requires a NEPA review. This Draft EA is submitted for review pursuant to NEPA, FAA Order 1050.1G, FAA National Environmental Policy Acy Implementing Procedures, Section 4(f) of the Department of Transportation Act (49 U.S.C. § 303), and Section 106 of the National Historic Preservation Act (16 U.S.C. § 470). The Draft EA will be available for a 30-day public review beginning on Friday, October 3, 2025, and ending on Sunday, November 2, 2025.

The Draft EA is available for online review at https://www.faa.gov/uas/advanced_operations/nepa_and_drones

Comments on the Draft EA may be submitted electronically to 9-FAA-Drone-Environmental@faa.gov. Written comments may be submitted via U.S. mail to the address below. Please ensure adequate time for receipt. All comments must be received by 5:00 p.m. Central Time on Sunday, November 2, 2025.

Federal Aviation Administration, Suite 802W
C/O AVS Environmental
800 Independence Ave SW
Washington, DC 20591

All substantive comments received will be responded to in the Final EA.

**Privacy Notice:** Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

This Draft EA becomes a federal document when evaluated, signed, and dated by the Responsible FAA Official.

**Responsible FAA Official:**

_____ Date: _____

Derek Hufty
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Office of Safety Standards, Flight Standards Service

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# Acronyms and Abbreviations

| | |
|---|---|
| ACS | American Community Survey |
| AGL | above ground level |
| APE | Area of Potential Effects |
| BVLOS | beyond visual line of sight |
| CAA | Clean Air Act |
| CFR | Code of Federal Regulations |
| dB | decibel |
| dBA | A-weighted decibel |
| DNL | day-night average sound level |
| DOT | U.S. Department of Transportation |
| EA | Environmental Assessment |
| EO | Executive Order |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| FAA | Federal Aviation Administration |
| FHWA | Federal Highway Administration |
| FONSI | Finding of No Significant Impact |
| GHG | greenhouse gas |
| HHS | U.S. Department of Health and Human Services |
| IPaC | Information for Planning and Consultation |
| LWCF | Land and Water Conservation Fund Act |
| MBTA | Migratory Bird Treaty Act |
| metro | metropolitan |
| mph | miles per hour |
| MSL | mean sea level |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NMFS | National Marine Fisheries Service |
| NMHC | non-methane hydrocarbons |
| NOA | Notice of Availability |
| NRHP | National Register of Historic Places |
| NWS | National Weather Service |
| OpSpecs | Operations Specifications |

| | |
|---|---|
| PA | Programmatic Agreement |
| PM | particulate matter |
| $PM_{10}$ | particulate matter equal to or less than 10 microns |
| $PM_{2.5}$ | particulate matter equal to or less than 2.5 microns |
| RMP | risk management plan |
| ROD | Record of Decision |
| SCC | social cost of carbon |
| SEA | Supplemental Environmental Assessment |
| SEA | Supplemental Environmental Assessment |
| SGCN | Species of Greatest Conservation Need |
| SHPO | State Historic Preservation Officer |
| THPO | Tribal Historic Preservation Officer |
| U.S.C. | United States Code |
| UA | unmanned aircraft |
| UAS | Unmanned Aircraft System |
| USFWS | U.S. Fish and Wildlife Service |
| VOC | volatile organic compound |
| WR | Written Re-evaluation |

# Chapter 1
# Purpose and Need

## 1.1 Introduction

Zipline International Inc. (Zipline) holds a Federal Aviation Administration (FAA) standard air carrier certificate under 14 Code of Federal Regulations (CFR) Part 135 (Part 135),[1] which allows holders to conduct on-demand or scheduled (commuter) operations, and a 49 United States Code (U.S.C.) Section 44807 exemption,[2] which allows Zipline to carry the property of another for compensation or hire beyond visual line of sight (BVLOS) using its Platform 2 (P2) Unmanned Aircraft System (UAS). Zipline's Part 135 certificate contains a stipulation that operations must be conducted in accordance with the provisions and limitations specified in its Operations Specifications (OpSpecs).[3,4]

Zipline is seeking to amend its OpSpecs and other FAA approvals necessary to begin unmanned aircraft (UA, also referred to as a drone) commercial package delivery operations in the Seattle metropolitan (metro) area (see Figure 2.2-1).

Zipline is proposing to conduct operations 24 hours a day, seven days per week, including holidays, from up to 75 sites in the Seattle area using its 63-pound P2 "Zip" UA.[5] Each site would contain individual "docks" (i.e., ground infrastructure) with charging or loading capability depending on the purpose of the site. Zipline would construct up to 500 docks[6] to support delivery operations, with a maximum of 20 docks per site, though many sites would have far fewer. Zipline's sites would be located in commercial areas, such as shopping centers, large individual retailers, and shopping malls, as well as laboratories and warehouses. Sites can include partner sites where packages are loaded or received, charging sites, or maintenance sites. Further description of site installations is provided in Section 2.2, *Proposed Action*. Zipline projects operating a maximum of 400 delivery flights per operating day from each site (approximately a maximum of 146,000 flights per site per year), with approximately 95% of the flights occurring during the day (from 7:00 am to 10:00 pm) and 5% at night (from 10:00 pm to 7:00 am), depending on operational demand.

The FAA's approval of the OpSpecs (including amendments) is considered a major federal action under the National Environmental Policy Act (NEPA)[7] and requires NEPA review. Zipline prepared this draft

[1] https://www.faa.gov/uas/advanced_operations/package_delivery_drone.

[2] 49 U.S.C. § 44807 provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate of authorization, or a certificate under 49 U.S.C. §§ 44703 or 44704 is required for the operation of certain UAS.

[3] An Operations Specifications is a document that defines the scope of aircraft operations that the FAA has authorized.

[4] This is different than a concept of operations, or ConOps, which is generally a description of how a set of capabilities may be employed to achieve desired objectives.

[5] The P2 "Zip" UA weighs approximately 55 pounds and has a maximum payload weight of 8 pounds.

[6] Zipline docks will be constructed primarily on previously disturbed land, such as a paved parking lot. When required, Zipline may construct docks on undisturbed land adjacent to a developed area, such as an empty field next to a shopping center.

[7] See 42 U.S.C. § 4321 et seq.

environmental assessment (draft EA) under the supervision of the FAA[8] to evaluate the potential environmental impacts that might result from the proposed action. 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 environmental effects of a proposed action, the reasonable alternatives to the proposed action, and a no action alternative (assessing the potential environmental effects of not implementing the proposed action). The DOT has established policies and procedures to ensure compliance with the provisions of NEPA through DOT Order 5610.1D, *DOT's Procedures for Considering Environmental Impacts*. The FAA has established policies and procedures to ensure compliance with the provisions of NEPA through FAA Order 1050.1G, *FAA National Environmental Policy Act Implementing Procedures* (FAA 2025).

# 1.2 FAA Role for Proposed Action

In general, Congress has charged the FAA with the safety of air commerce in the United States and to encourage the development of civil aeronautics. The FAA provides multiple approvals associated with package delivery proposals, such as a waiver of 14 CFR § 91.113(b) to enable BVLOS operations, and a Certificate of Waiver or Authorization; however, the FAA's issuance of an air carrier's OpSpecs (or amended OpSpecs) to include package delivery flights in a specified operating area is the approval that ultimately enables UA operations.

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." 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." 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 the OpSpecs. 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. The regulations implementing 49 U.S.C. § 44705 specify that an air carrier's approved OpSpecs must include, among other things, "authorization and limitations for routes and areas of operations." 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." After making this determination, the FAA must take an action on the OpSpecs amendment.

# 1.3 Purpose and Need

The Federal action subject to review under the National Environmental Policy Act (NEPA) is the Federal Aviation Administration's (FAA) decision whether to approve a modification to Zipline's Operations Specifications (OpSpecs) under 14 CFR Part 135. The modification would authorize Zipline to expand its

[8] See 42 U.S.C. § 4336a(f) and §1.3 of FAA Order 1050.1G.

commercial package delivery operations using unmanned aircraft systems (UAS) in the Seattle metro area.

The purpose of the proposed FAA action is to enable the agency to carry out its statutory responsibilities to ensure the safety and efficiency of the National Airspace System (NAS), while considering potential environmental effects consistent with NEPA and FAA Order 1050.1G. Consistent with Order 1050.1G §2.2, when the FAA is acting on an application for authorization, the purpose and need for the federal action is informed both by FAA's statutory mission and the applicant's goals.

The need for the proposed action arises from Zipline's application for expanded operating authority to extend its current commercial unmanned aircraft delivery service to the Seattle metro area. Zipline, in its business judgment, has determined that the Seattle region is an appropriate market for expansion. Zipline's proposal is to begin full-scale commercial UAS delivery operations in this region utilizing its P2 "Zip" UA. Site locations would be selected based on a combination of business case considerations, operational feasibility, installation feasibility, and proximity to other sites within Zipline's existing network. Without FAA approval of the requested OpSpecs modification, Zipline would be unable to implement this expansion of its delivery service.

Accordingly, the FAA must determine whether approving the modification to Zipline's OpSpecs is consistent with applicable safety and regulatory requirements, while also fulfilling the agency's obligation under NEPA to evaluate the reasonably foreseeable environmental effects of the decision.

## 1.4 Public Involvement

The FAA created a Notice of Availability (NOA) with information about this Draft EA and provided it to local, state, and federal officials, interest groups, and federally recognized tribes. The NOA was provided in English and Spanish. The FAA also announced availability of this Draft EA for public review via the FAA's social media and an advertisement in the *Seattle Times* and *News Tribune* newspapers. The NOA provided information about the proposed action and requested public review and comments on this draft EA, which is available on the FAA's website[9] for a 30-day comment period. Interested parties are invited to submit comments on any environmental concerns related to the proposed action.

[9] See: https://www.faa.gov/uas/advanced_operations/nepa_and_drones.

# Chapter 2
# Proposed Action and Alternatives

FAA Order 1050.1G, Sect. 1.5(b)(ii) requires the EA to briefly discuss: "The proposed action and alternatives to the extent required by NEPA § 102(2)(H), 42 U.S.C. § 4332(2)(H);" which requires all Federal Government agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." The FAA has not identified any unresolved conflicts concerning alternative uses of available resources associated with Zipline's proposal. Therefore, this EA only considers the proposed action and the no action alternative.

## 2.1 No Action Alternative

DOT Order 5610.1D, Paragraph 10(b)(3) requires the FAA to consider a no action alternative in their NEPA reviews to compare the environmental effects of not taking action with the effects of the action alternative(s). The no action alternative serves as a baseline to compare the impacts of the proposed action. Under the no action alternative, Zipline would not implement commercial UA package delivery operations in Seattle and would continue to conduct package delivery operations in other locations under Part 135 in locations currently authorized by its OpSpecs. Consumers in the areas not served by UA would be expected to continue to use ground transportation to retrieve small goods, assuming that there are viable alternative transportation methods. The no action alternative does not fulfill the stated purpose and need.

## 2.2 Proposed Action

The proposed action is the expansion of Zipline's current area of operations for UA commercial delivery service to include the Seattle metro area. Zipline's proposed Seattle operating area boundaries are shown in Figure 2.2-1. Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 delivery flights over a 24-hour day in a 10-mile radius around each site. In cases where operating areas overlap, there would be a maximum of 400 delivery flights per day in the overlapping area. Approximately 95% of flights would take place during 7:00 am to 10:00 pm and 5% of flights would take place at 10:00 pm to 7:00 am. Zipline's expected operational phasing is summarized in Table 2.2-1. The exact timing and pace of dock installation is dependent on prevailing market conditions, operational feasibility, and physical installation feasibility. If, in the future, Zipline wanted to exceed their allocated site, docks, or daily flights in the operating area, additional NEPA reviews would be required. Operations, including site placement and all UA flights, would be confined to the operating area depicted in Figure 2.2-1.[10] The operating area

[10] Modification of Zipline's operations plan requires approval in accordance with 14 CFR Part 135.

would be approximately 67 miles long east and west and 51 miles long north and south, with an area of approximately 3,474 square miles.[11]

Sites would be distributed throughout the Seattle metro area following a plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers.

**Table 2.2-1. Expected Operational Phasing**

| Component | Month 1 | Month 3 | Month 12 | Month 18 |
|---|---|---|---|---|
| Sites | 5 | 30 | 50 | 75 |
| Docks | 25 | 180 | 300 | 500 |
| Average Daily Flights per Site | 20 | 40 | 60 | 400 (expected 100 average per site) |

To avoid the potential for significant noise impacts, Zipline would place its sites at least 325 feet away from a noise-sensitive area[12] when the site is located within the controlled surface area of Class B and Class D airspace[13] (refer to Figure 3.6-1) and at least 150 feet away from a noise-sensitive area in all other areas within the study area, which is defined as Zipline's proposed operating area (see Figure 2.2-1). Flight operations would not occur in Zipline-identified keep-out zones, including zones around airports, military facilities, and open-air assemblies of people.

Each site would consist of 1 to 20 docks. On average, each site will contain approximately 7 docks; however, the exact number of docks established at each site will be determined based on market demand in the service area and logistical feasibility and efficiency. Docks are housed on vertical docking towers. Each docking tower would initially serve a single partner but may eventually serve multiple partners. Each individual dock provides the structural interface to house stationary P2 "Zip" UAs, charge P2 "Zip" UAs and provide thermal management, transfer data from P2 "Zip" UAs to and from the cloud, provide visual fiducials for P2 "Zip" UA docking maneuvers, and provide weather protection. P2 "Zip" UAs are stored at a dock between flights.

[11] The operating area boundary latitude/longitude would be bounded by the following four corner geocoordinates: 46.955788/-122.916682; 46.949789/-121.824072; 47.925453/-121.802314; 47.931662/-122.914959.

[12] Noise sensitive areas include residences, schools, hospitals, parks, and recreation areas. 14 CFR Part 150, Appendix A, Table 1, *Land Use Compatibility With Yearly Day-Night Average Sound Levels* describes compatible land uses for common noise sensitive areas as a function of noise exposure as measured using Day-Night Level.

[13] Class B airspace is generally airspace from the surface to 10,000 feet mean sea level (MSL) surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. Class D airspace is generally airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. For more information. See: https://www.faa.gov/regulationspolicies/handbooksmanuals/aviation/phak/chapter-15-airspace.

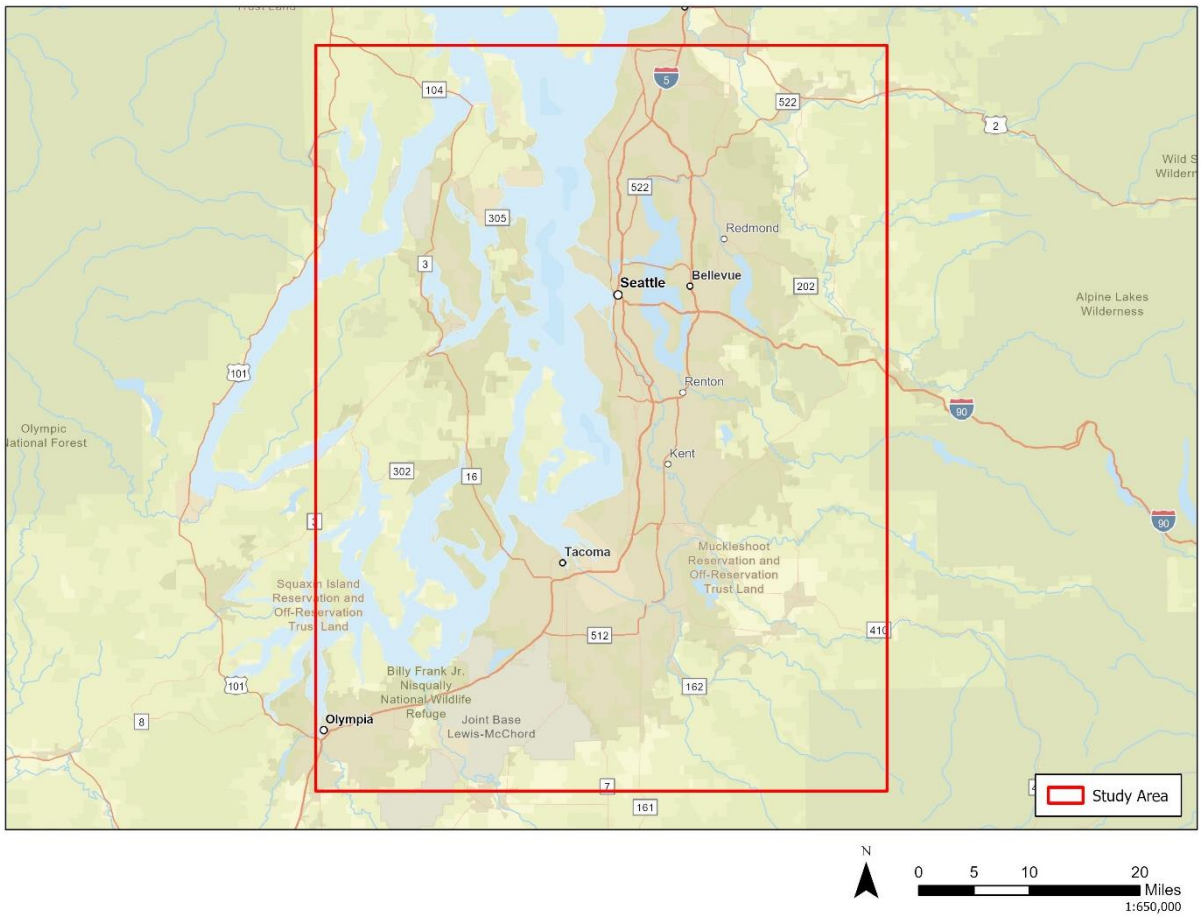



**Figure 2.2-1. Zipline's Proposed Seattle Operating Area**

Docks are either ballasted or installed. Ballasted docks are movable and do not require disturbance of the ground or structures. Installed docks would be constructed primarily as freestanding structures on previously disturbed land (e.g., paved parking lots, landscaped areas within the limits of disturbance of the property, previously disturbed vacant lots, etc.) or attached to an existing building. When required, Zipline may construct on commercially zoned undisturbed land adjacent to a developed area. Development of this type is outside the scope of this environmental assessment and may require supplemental NEPA analysis, including review by a Secretary of the Interior-qualified professional for Section 106 compliance. To comply with the Section 106 of the National Historic Preservation Act (NHPA) and in accordance with consultation with the Washington State Historic Preservation Office (SHPO), installed dock construction would occur only under the following conditions:

- Construction of Installed docks attached to buildings would occur on (a) buildings less than 45 years old or (b) buildings that are greater than 45 years old that have been determined to be ineligible for the National Register of Historic Places (NRHP) within the last 10 years;
- Freestanding Installed docks would be sited to avoid disturbance of documented archaeological resources and would comply with all federal, state, and local laws, including the Washington State permitting stipulations of RCW 27.53.060."

The maximum impervious surface that would be installed is approximately 500 square feet. Site operations would require electricity and internet services and, where possible, Zipline would utilize existing utility connections. Construction activities would not convert farmland and would not require tree clearing. Figure 2.2-2 illustrates potential docking tower configurations and Figure 2.2-3 illustrates conceptual site installations.

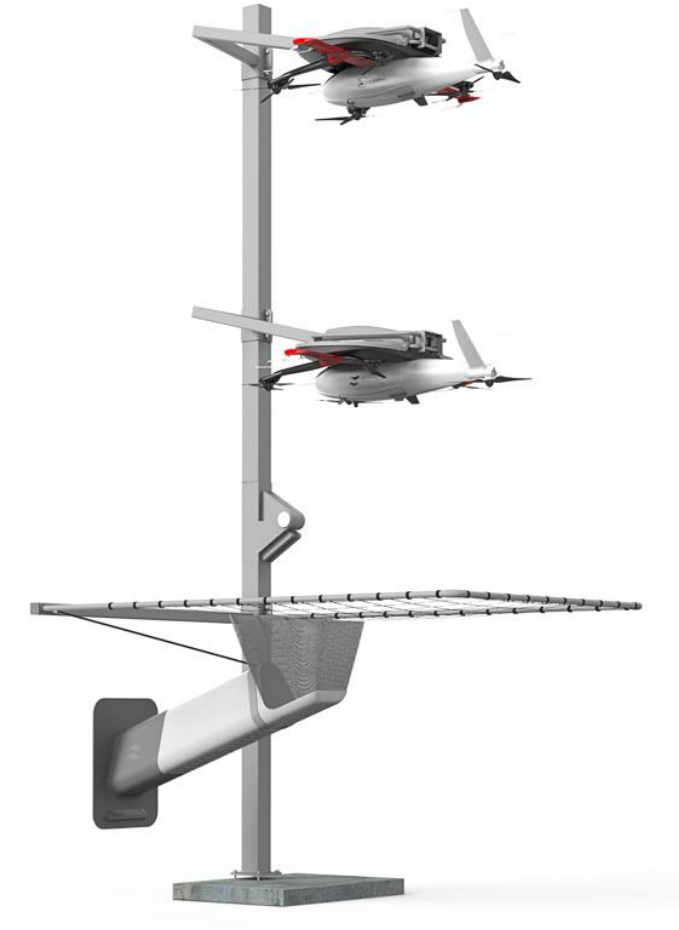


**Figure 2.2-2. Zipline Instamount (freestanding) Loading Docking Tower[14]**

[14] Illustrations are not to scale.


**Figure 2.2-3. Zipline Conceptual Site configurations at medical laboratory (top left), restaurant (bottom left), and warehouse (right)**

The estimated total distance flown for deliveries would vary depending upon the drop-off locations in the operating area. Each flight would take a package to a customer delivery address before returning to a given dock. There would be variability in the number of flights per day based on customer demand and weather conditions. Site locations are determined through partner agreements and market demand; deliveries would likely be distributed throughout the service area of an individual site. In the event that sites are installed with overlapping service areas, Zipline would not exceed 400 total deliveries or 800 overflights (en route to and from delivery locations) in the area of overlap.

P2 “Zip” UAs would primarily be transporting consumer goods, food & beverages, and pharmaceuticals in partnership with merchants (including pharmacies) in the communities they already serve and would provide an alternative to in-store pickup. Deliveries would be conducted at the time of the customer's choosing and directly to the customer's home in the operating area. P2 “Zip” UAs would also transport lab samples from healthcare facilities and hospitals to laboratories as an alternative to a courier service or other ground-based transportation service. Deliveries would also be conducted at the time of the healthcare partner’s choosing.

P2 “Zip” UAs fly pre-planned routes developed prior to flight. Routes are generated by software that takes into consideration environmental factors including weather risk, wind direction, and population density. Routes are carefully planned to avoid terrain and obstructions, known areas with high volume of other air traffic, airspace restrictions, and known venues for open-air assemblies of people, and can be regenerated, if needed. P2 “Zip” UAs automatically deconflict with each other using a combination of strategic and tactical avoidance measures including generation of predetermined flight paths following specific rules to reduce the overlap of flight paths in different modes and phases of flight. Each P2 “Zip” UA communicates directly to other P2 “Zip” UAs over radio and cellular networks to share position,

velocity, and intent information which is used for each to automatically modify flight plans to maintain separation. Deconfliction occurs even if the Remote Pilot in Command (RPIC) loses communication with P2 "Zip" UAs.

To deconflict with other aircraft, including other UAS, Zipline takes a multi-pronged approach using a third-party solution to notate Zipline areas of operation to ensure that other operators are aware of Zipline's operations; using Notice to Air Men (NOTAMs) to notify traditional and UA operators of Zipline's flight areas; participating in FAA's Unmanned Aircraft System Traffic Management (UTM) efforts; and proactively building relationships with other local commercial UA operators to identify areas of operational overlap and develop deconfliction procedures as necessary.

The software designs and carefully checks flight paths to ensure P2 "Zip" UAs stay safely within the predetermined operational area. The P2 "Zip" UA has onboard checks evaluating its position and ensuring the P2 "Zip" UA remains within the allowed operational area. If a P2 "Zip" UA departs from the pre-determined operational area, the P2 "Zip" UA would automatically take action to terminate the flight immediately and return to the most appropriate location – either docking at the closest available dock or using the hover or paraland function (safe termination of the flight using a parachute) to safely exit the airspace. Additionally, the RPIC has the ability to command flight termination if a P2 "Zip" UA flies outside of this pre-determined operational area.

### 2.2.1 Unmanned Aircraft Specifications

Zipline's P2 "Zip" UA is a highly automated, electrically powered vertical takeoff and landing aircraft capable of hover and forward flight. The P2 "Zip" UA features a multi-rotor design with 5 propellers and weighs under 63 pounds when combined with its maximum payload weight of 8 pounds. Tail propellers tilt on a 90 degree axis to toggle between lift/hover and forward flight modes.

Zipline locates P2 "Zip" UAs and their associated docks at Zipline partner sites. Once an order is placed, a package is loaded into a "droid."[15] The droid is stored in the P2 "Zip" UAs payload bay and the P2 "Zip" UA undocks and flies to the delivery site where it lowers the droid via winch line to a pre-selected delivery site. The P2 "Zip" UA has a wingspan of approximately 7.8 feet, a height of approximately 1.8 feet, and a length of approximately 8 feet. P2 "Zip" UAs are equipped with high-visibility red (left wingtip) and green (right wingtip) lights, and multi-directional strobe lights (white) on each wingtip. These lights run while P2 "Zip" UAs are in flight, and are visible for at least three statute miles. Figure 2.2-4 illustrates the P2 "Zip" UA platform.

The P2 "Zip" UA platform offers hyper-precise delivery and a larger allowable payload size and introduces the ability to take off and dock automatically. All Zipline aircraft use electric power from rechargeable lithium-ion batteries.

[15] The droid is illustrated at the bottom of Figure 2.2-5 .

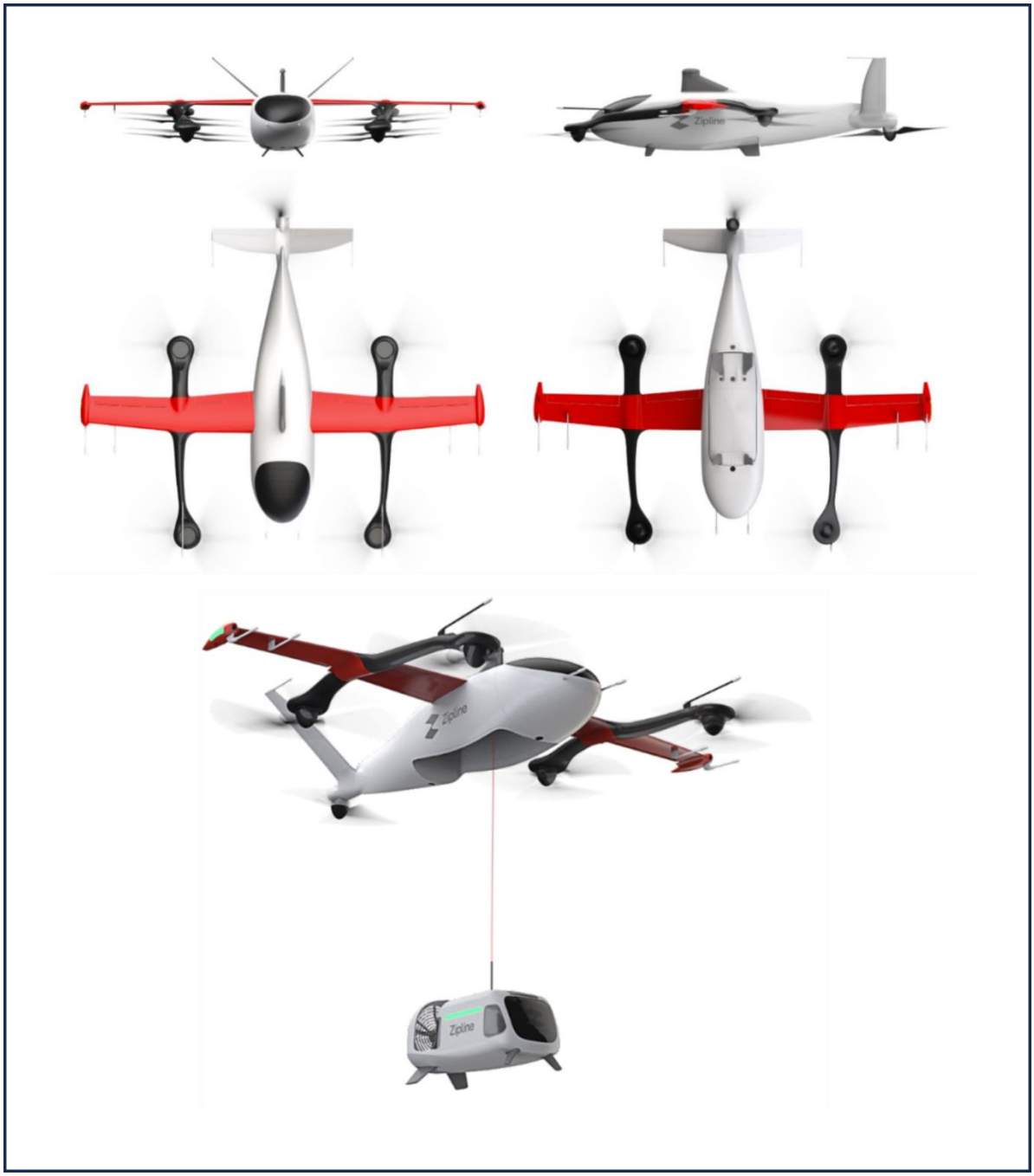



**Figure 2.2-4. Zipline P2 "Zip" UA Profile Views (above) and droid (below)**

## 2.2.2 Flight Operations

P2 "Zip" UAs would generally be operated at an altitude of 330 feet above ground level (AGL) while en route to and from delivery locations. At a delivery location, the P2 "Zip" UA would maintain stationary hover approximately 330 feet AGL and lower the droid to the ground for delivery of the payload through bay doors. Once the payload has been released, the UA would then retract the droid, ascend vertically to a cruise altitude, and depart the delivery area en route back to a site.[16]

The UA would fly a predefined flight path that is set prior to takeoff. Flight missions are automatically planned by Zipline's flight planning software. A mission originates from a dock, and Zipline's software automatically assigns, deconflicts, and routes each flight to the delivery location and back to a dock. Exclusion zones are designed to keep operations clear from nearby non-participating people and vehicles. Docks are built to separate operations from nearby non-participating people and vehicles.

As part of normal operations, the P2 "Zip" UA may be assigned one of the following missions:

- Delivery. Requires a droid to descend from a P2 "ZIP" UA to deliver a payload to a prescribed location.
- Reposition. A P2 "Zip" UA moving from one dock to another.

Zipline operations begin with order processing followed by flight phases. A typical flight profile can be broken into the following general flight phases: undocking, en route outbound, delivery, en route inbound, and docking. Figure 2.2-5 depicts these stages, each of which is explained in the following sections.

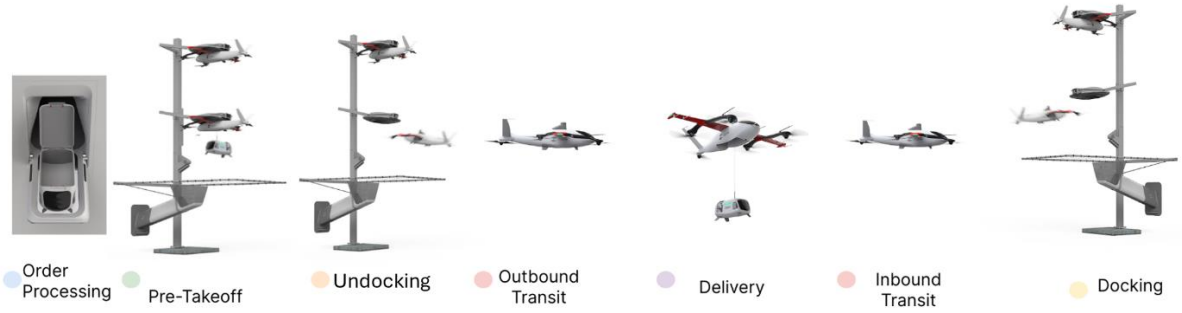



**Figure 2.2-5. Zipline P2 "Zip" UA Mission Profile**

### 2.2.2.1 Order Processing

During order processing, Zipline's partner loads the package into the droid.

### 2.2.2.2 Pre-Departure

During the pre-takeoff process, Zipline's system would complete automated preflight checks of the UAS to ensure no unsafe conditions exist. If on a delivery operation, the shipping partner would then load a package (Figure 2.2-6).

[16] See www.flyzipline.com for videos and photographs of Zipline operations.

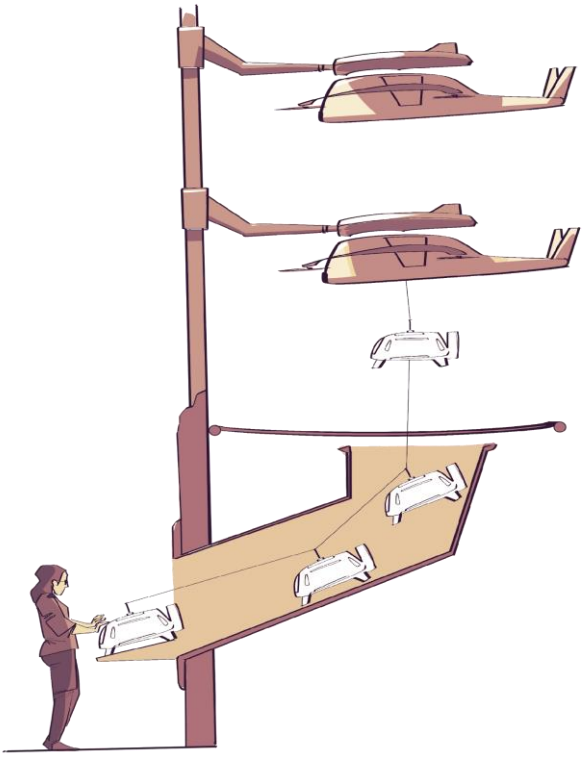


**Figure 2.2-6. Once loaded with its payload, the droid is transferred to the payload bay of the P2 "Zip" UA**

### 2.2.2.3 Undocking

Once cleared for takeoff from a dock, the P2 "Zip" UA undocks and then maneuvers away from the dock and ascends vertically to the en route altitude (330 feet AGL) on its pre-planned flight path (Figure 2.2-7).

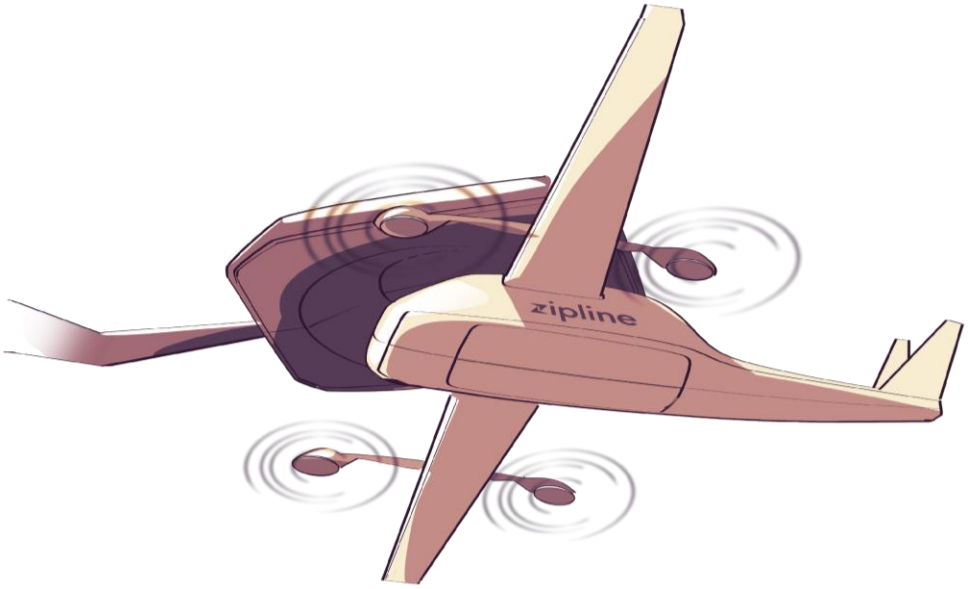



**Figure 2.2-7. P2 "Zip" UA hovers to flight position**

### 2.2.2.4 En Route Outbound

The en route outbound phase is the part of flight in which the fully loaded P2 "Zip" UA transits from the dock to a delivery point on a predefined flight path. During this flight phase, the P2 "Zip" UA would typically operate using horizontal flight at an altitude of 330 feet AGL and a typical cruise airspeed of 47 miles per hour (mph) (Figure 2.2-8).

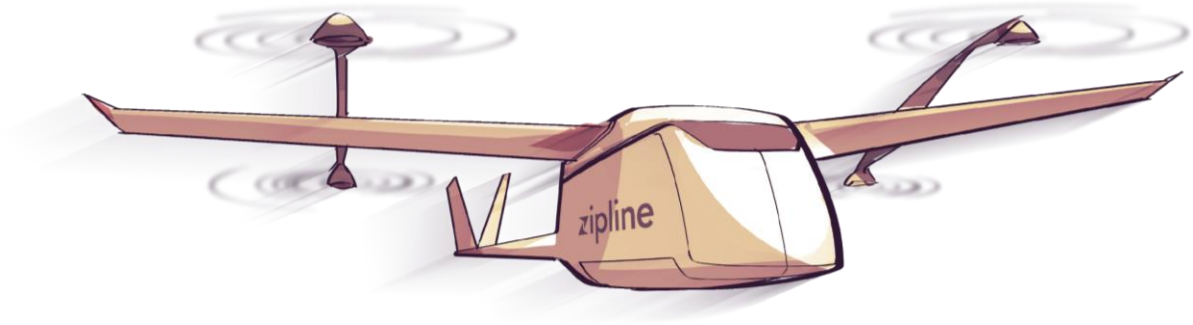



**Figure 2.2-8. P2 "Zip" UA in active, forward flight**

### 2.2.2.5 Delivery

The delivery phase consists of deceleration and hovering over a delivery point, such as a residential yard, driveway, parking lot, or common area. The P2 "Zip" UA maintains its altitude at 330 feet AGL and its position over the delivery point (Figure 2.2-9). The droid is released from the P2 "Zip" UA and lowered to the ground via the winch line (Figure 2.2-10). During droid descent, the droid automatically controls its position laterally and evaluates the delivery site. If the delivery site is clear, the droid would continue to descend and deliver the payload at the delivery target. The droid would then be retracted back into the P2 "Zip" UA. The P2 "Zip" UA would then proceed to accelerate as it exits the delivery area and begins en route transit back to the site. The total hover time for delivery operations would be approximately 75 seconds.

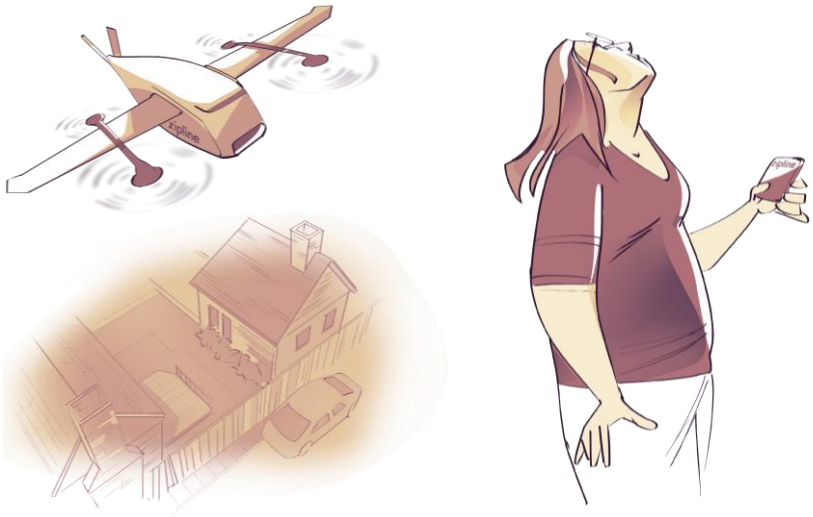


**Figure 2.2-9. Low altitude automatic flight to intended delivery location**


**Figure 2.2-10. Droid softly delivers payload on intended surface and retracts back into P2 "Zip" UA**

### 2.2.2.6 En Route Inbound

The P2 "Zip" UA continues to fly at an altitude of 330 feet AGL and a speed of 47 mph towards the dock.

### 2.2.2.7 Docking

Upon reaching the dock, the P2 "Zip" UA decelerates and descends vertically before maneuvering into the dock area. The P2 "Zip" UA then attaches to the dock from below using its docking fin. Hover motors are disengaged after the P2 "Zip" UA has registered secure connection with the dock. Figure 2.2-11 illustrates a typical docking operation.

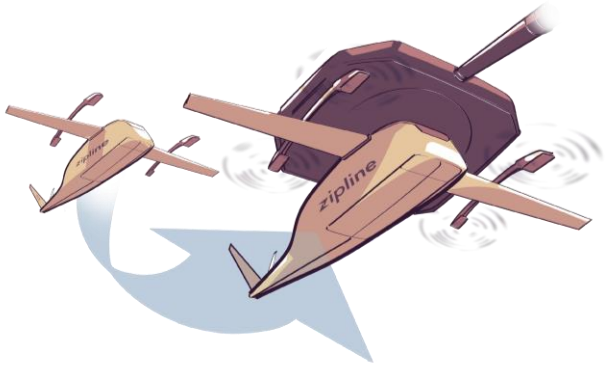



**Figure 2.2-11. P2 "Zip" UA either docks to prepare for next delivery or to recharge batteries/run diagnostics, based on aircraft needs and mission**

# Chapter 3
# Affected Environment and Environmental Consequences

## 3.1 Introduction

This chapter provides a description of the affected environment and potential environmental consequences for the environmental impact categories that have the potential to be affected by the no action alternative and proposed action, as required by FAA Order 1050.1G, *FAA National Environmental Policy Act Implementing Procedures* (FAA 2025). As required by FAA Order 1050.1G, this EA presents an evaluation of impacts for the environmental impact categories listed below.

- Aviation Emissions and Air quality
- Biological resources (including fish, wildlife, and plants)
- Coastal Resources
- Department of Transportation Act Section 303 (referred to as "Section 4(f)" and Land and Water Conservation Fund (referred to as "Section 6(f)"
- Farmlands
- Hazardous materials, solid waste, and pollution prevention
- Historical, architectural, archaeological, and cultural resources
- Land use
- Natural resources and energy supply
- Noise and noise-compatible land use
- Socioeconomics and children's environmental health and safety risks
- Visual effects (including light emissions)
- Water resources (including wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers)

The study area evaluated for potential impacts is defined as Zipline's proposed operating area shown in Figure 2.2-1. The level of detail provided in this chapter is commensurate with the importance of the potential impacts. EAs are intended to be concise documents that focus on aspects of the human environment that may be affected by the proposed action.

# 3.2 Environmental Impact Categories Not Analyzed in Detail

This EA did not analyze potential impacts on the following environmental impact categories in detail because the proposed action would not affect the resources included in the category (see FAA Order FAA Order 1050.1G, § 1.2 (b)(1).

- **Air Emissions and Air Quality:** The UA is battery powered and does not generate emissions that could result in air quality impacts or climate impacts. Electricity consumed for battery charging at the docks would be minimal. Electricity consumed for the proposed action would come from the power grid with backup generators on site in the event of an emergency. These emissions would be minimal and are not expected to contribute to any exceedance of National Ambient Air Quality Standards. Based on a 2020 study of drone delivery operations, by year 5 of operations drones were projected to replace between 11.2 percent and 18.7 percent of total delivery miles previously made by automobiles, or between 11.3 million miles and 96 million miles (Lyon-Hill et al. 2020).

- **Coastal Resources:** Although the proposed action does include activities within the designated coastal, the proposed action would not directly affect any shorelines or change the use of shoreline zones and be inconsistent with any National Oceanic and Atmospheric Administration–approved state Coastal Zone Management Plan. OpSpecs revisions are not listed activities subject to CZMA consistency review pursuant to 15 CFR § 930.51. The Department of Ecology has been notified of this EA and the final EA will detail the outcome of further waiver or review.

- **Section 6(f) of the Land and Water Conservation Fund Act:** Under Section 6(f) of the Land and Water Conservation Fund Act (LWCF; 16 U.S.C. §§ 460*l*-4 through 460*l*-11), it is prohibited to convert property acquired with or developed with LWCF grant money to non-recreational purposes without approval from the National Park Service. Site and dock installation would only occur in existing zoned commercial areas and would not occur on any lands acquired or developed with LWCF grant funds. The proposed action would not affect Section 6(f) resources.

- **Farmlands:** The proposed action would not involve the potential to convert any farmland to non-agricultural uses. Docks would be installed within existing zoned commercial areas and would primarily occur previously disturbed land. The proposed action would not affect designated prime or unique farmlands.

- **Hazardous Materials, Solid Waste, and Pollution Prevention:** The proposed action would result in limited construction or development primarily in previously disturbed areas. Therefore, the potential for impact in relation to hazardous materials, pollution prevention, and solid waste is not anticipated. Additionally, each Zipline UA is primarily made from recyclable materials and the only hazardous materials used in its manufacture and operation are lithium-ion batteries. Each Zipline UA will be properly managed at the end of its operating life in accordance with 14 CFR Part 43. Any hazardous materials would be disposed of in accordance with all federal, tribal, state, and local laws, including 40 CFR Part 273, *Standards for Universal Waste Management*.

- **Land Use:** The proposed action does not involve any changes to existing, planned, or future land uses within the area of operations. Zipline would primarily construct on existing infrastructure, such as parking lots or the sides of buildings. Land use and zoning are typically governed by local and state laws. Zipline is responsible for complying with any such applicable laws relevant to establishing its

operations (e.g., siting docks and related infrastructure). All docks would be sited in accordance with all local land use ordinances and zoning requirements. Local jurisdictions in the Seattle metro area may vary in the scope of their review and approval of commercial operations. Further, Section 2.2, *Proposed Action,* identifies the stand-off distances from noise-sensitive areas.

- **Natural Resources and Energy Supply:** The proposed action would not require the need for unusual natural resources and materials, or those in scarce supply. Zipline's aircraft would be battery powered and would not consume fossil fuel (e.g., gasoline or aviation fuel) resources. The fuel for operation of generators is expected to be in relatively low quantities that are available from the local supply. Zipline would use a charging docks to charge the batteries of the UA. In addition, Zipline's electrically powered aircraft is most often used to replace individual personal automobile trips to retrieve small goods and would therefore be expected to reduce consumption of fuel resources; a 2020 study found that by year 5 of drone operations in a single U.S. metropolitan area, drone delivery could avoid up to 294 million miles per year in road use (Lyon-Hill et al. 2020).

- **Socioeconomics** and **Children's Environmental Health and Safety Risks:** The proposed action would 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 would not affect products or substances 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. It is not anticipated that the proposed action would pose a greater health and safety risk to children than package delivery by other means (truck, mail, personal automobile trips, etc.). Additionally, Zipline's proposal includes avoiding fly less areas during operational hours, which could help avoid or reduce any potential environmental health or safety impacts on children. Zipline's electrically powered aircraft is most often used to replace individual personal automobile trips to retrieve small goods and would therefore reduce noxious emissions and improve road safety, which are both appreciable concerns for children.

- **Visual Effects (Light Emissions Only):** The proposed action would not result in significant light emission impacts because the majority of flights are expected to be conducted during the daytime. Light emissions would not noticeably affect the visual character or ambient light conditions of the study area. The small proportion of flights that do occur at night would likely be infrequent and of short duration, although flight cadence would vary depending on the location and partners served by an individual dock. Because of the overall small number of operations likely to be conducted between the beginning of morning civil twilight and the end of evening civil twilight[17], the proposed action would not result in significant light emission impacts due to nighttime operations. Night is defined by 14 CFR Section 1.1 as the time between the end of evening civil twilight and the beginning

[17] According to the National Oceanic and Atmospheric Administration National Weather Service, civil twilight begins in the morning, or ends in the evening, when the geometric center of the sun is 6 degrees below the horizon. Therefore, morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon, and ends at sunrise. Evening civil twilight begins at sunset, and ends when the geometric center of the sun is 6 degrees below the horizon (National Oceanic and Atmospheric Administration National Weather Service n.d.).

of morning civil twilight, as published in the *Air Almanac*, converted to local time (U.S. Department of the Navy 2022).

- **Water Resources (Wetlands, Floodplains, Surface Water, Groundwater, and Wild and Scenic Rivers):** The proposed action would not result in substantial new ground disturbance and would therefore not encroach upon areas designated as navigable waters, wetlands, or floodplains. Dock construction would at most involve the installation of 500 square feet of impermeable surface and site-specific standoff measures would be initiated to avoid potential affects to navigable waters, wetlands, and floodplains. The proposed action would not affect any waters of the U.S. The proposed action would not result in any substantial changes to existing discharges to water bodies, or modify a water body. The proposed action would not degrade water quality or contaminate public drinking water supplies. The proposed action does not involve activities that would withdraw groundwater from underground aquifers or reduce infiltration or recharge to groundwater resources. The closest wild and scenic river to the study area is the MiddleFork Snoqualmie, approximately 10 miles east of the study area (National Park Service 2024b). The closest Nationwide Rivers Inventory river segment is the Skykomish River, South Fork which intersects the eastern portion of the study area(National Park Service 2024c). Dock construction does not have the potential to disrupt the free-flowing character of any designated wild and scenic river and operations would not affect a wild and scenic river or river on the Nationwide Rivers Inventory. *Therefore, the proposed action would not affect wetlands, floodplains, surface water, groundwater, or wild and scenic rivers.*

# 3.3 Biological Resources (Including Fish, Wildlife, and Plants)

## 3.3.1 Definition of Resource and 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.

### 3.3.1.1 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 (16 U.S.C. § 1531 et seq.) requires all federal agencies to seek to conserve threatened and endangered species. Section 7(a)(2) of the ESA requires that each federal agency—in consultation with the U.S. Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS)—ensures that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. The FAA is required to consult the USFWS or NMFS if an action may affect a federally listed species or critical habitat. If the FAA determines the action would have *no effect* on listed species or critical habitat, consultation is not required.

#### 3.3.1.2 Migratory Birds

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703–712) protects migratory birds by prohibiting the taking, killing, or possessing of migratory birds (including their eggs, nests, and feathers). The MBTA applies to migratory birds identified in 50 CFR Section 10.13 (defined hereafter as "migratory birds"). The USFWS is the federal agency responsible for the management of migratory birds when they occupy habitat in the United States. Zipline is responsible for compliance with the MBTA.

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. Permits are only needed when avoidance of incidental take is not possible. According to the National Bald Eagle Management Guidelines, if conservation measures can be implemented such that no aircraft are flown within 1,000 feet of an eagle nest, incidental take of Bald Eagles is unlikely to occur, and no permit is needed. Zipline is responsible for compliance with the Bald and Golden Eagle Protection Act.

### 3.3.2 Affected Environment

According to the U.S. Environmental Protection Agency, the action area is almost entirely (>95%) within the Puget Lowlands level III ecoregion with a small area within the Cascades level III ecoregion (Griffith et al. 1999). The following is a general description of each of these two ecoregions based on Griffith (2010) and Wiken et al. (2011); however, note that much of the land surface in the action area is developed or disturbed, as it contains urban and suburban development in and around the Seattle-Tacoma-Bellevue metropolitan area.

- The Strait of Georgia/Puget Lowland ecoregion: This ecoregion has a mild mid-latitude maritime climate. marked by warm dry summers and mild wet winters. The mean annual temperature is approximately 9°C; the mean summer temperature is 15°C; and the mean winter temperature is 4°C. The mean annual precipitation is 1223 mm, and ranges from 300 mm to over 2500 mm. Vegetation consists of mostly coniferous forests with Douglas-fir, western hemlock, western red cedar, grand fir, red alder, bigleaf maple. Understories contain salal, Oregon grape, and moss. Some small areas of oak woodlands. Terrain consists of mostly broad rolling lowlands, with some plains with low mountains. The ecoregion occupies a continental glacial trough and is composed of many islands, peninsulas, and bays along the Strait of Georgia and in the Puget Sound area. Common wildlife includes black-tailed deer, elk, red fox, beaver, otter, bald eagle, turkey vulture, wood duck, mallard, western sandpiper and other shorebirds, chinook salmon, steelhead. Land uses are intensive; residential, industrial, recreational, transportation (corridors) and agricultural uses all compete for land.
- The Cascades ecoregion: This ecoregion has a mild to severe mid-latitude climate, varying by elevation, with mostly dry warm summers and relatively mild to cool very wet winters. The mean annual temperature ranges from approximately -1°C to 11°C. The mean annual precipitation is 1824 mm, ranging from 1150 mm to 3600 mm. Vegetation consists of extensive and highly productive

coniferous forests. At lower elevations, Douglas fir, western hemlock, western red cedar, big leaf maple, red alder are common. At higher elevations, Pacific silver fir, mountain hemlock, subalpine fir, noble fir, lodgepole pine are common. Terrain is characterized by steep ridges and river valleys in the west, a high plateau in the east, and both active and dormant volcanoes. Elevations range from about 250 meters upwards to 4,390 meters. Common wildlife includes Roosevelt elk, black-tailed deer, black bear, mountain goats in the north, cougar, coyote, beaver, river otter, mountain quail, pileated woodpecker, northern goshawk, mountain chickadee, northern spotted owl, chinook salmon, steelhead trout, and bull trout. Principal land uses involve forestry, recreation, water supply for urban and agricultural areas in adjacent lowland ecoregions, and a few areas of ranching and livestock grazing.

The study area is in rapid flux due to both historical timber harvest and forest regeneration and the ecoregion experienced the most overall land cover change from 1973 – 2000 of any western ecoregion (Sorensen 2012). Development is encroaching upon existing vacant lands both within and surrounding the project. The urban environment in the Seattle metro area includes agricultural areas; commercial areas (i.e., business parks, airports, landfills); communities; downtown areas; a military base; recreational areas (i.e., public parks, golf courses); residential areas; thoroughfare (i.e., highways, railroads, public roads); undeveloped areas (i.e., open fields, vacant lots, wooded areas); and waterbodies, wetlands, and floodplains . These areas provide habitat for the smaller, more common and/or introduced bird and mammal species of the pacific northwestern United States, including mammals such as eastern cottontail (*Sylvilagus floridanus*), raccoons (*Procyon lotor*), opossums (*Didelphis virginiana*), and eastern gray squirrels (*Scirius carlinensis*).

### 3.3.2.1 Special-Status Species

#### Federally Listed Species

The potential for impacts on federally listed species was assessed using the USFWS Information for Planning and Consultation (IPaC) online system May 9, 2025). The official species list for the study area is included within Appendix E, *Biological Resources*. Table 3.3-1 lists the federally threatened and endangered species that could be present in the study area. The study area also contains designated critical habitat for one species, the bull trout (*Salvenlinus confluentus*).

**Table 3.3-1. ESA-Listed, Proposed, and Candidate Species Potentially Present Within the Study Area**

| Species | Common Name | Scientific Name | ESA Status | Critical Habitat |
|---|---|---|---|---|
| Mammals | North American Wolverine | *Gulo gulo luscus* | Threatened | No |
| | Gray Wolf | *Canis lupus* | Endangered | No |
| | Roy prairie pocket gopher | *Thomomys mazama glacialis* | Threatened | No |
| | Yelm Pocket Gopher | *Thomomys mazama yelmensis* | Threatened | No |
| Birds | Marbled murrelet | *Brachyramphus marmoratus* | Threatened | No |
| | Mt. Rainier white-tailed Ptarmigan | *Lagopus leucura rainierensis* | Threatened | No |
| | Northern spotted owl | *Strix occidentalis caurina* | Threatened | No |
| | Streaked horned lark | *Eremophila alpestris strigata* | Threatened | No |
| | Yellow-billed cuckoo | *Coccyzus americanus* | Threatened | No |

| Species | Common Name | Scientific Name | ESA Status | Critical Habitat |
|---|---|---|---|---|
| Reptiles and Amphibians | Northwestern Pond Turtle | *Actinemys marmorata* | Proposed Threatened | No |
| | Oregon spotted frog | *Rana pretiosa* | Threatened | No |
| Fishes | Bull trout | *Salvenlinus confluentus* | Threatened | Yes |
| | Dolly varden | *Salvelinus malma* | PSAT | No |
| Insects | Monarch butterfly | *Danaus plexippus* | Proposed Threatened | No |
| | Suckley's cuckoo bumble bee | *Bombus suckleyi* | Proposed Endangered | No |
| | Taylor's (=whulge) checkerspot | *Euphydryas Editha taylori* | Endangered | No |

ESA = Endangered Species Act.

Given that the action does not include any habitat modification and the UA would not touch the ground, there are no possible mechanism of effect to ESA-listed fishes. Therefore, these species are not discussed further in this document. This analysis summarizes effects to those species which are most likely to be affected by the proposed action; all species-specific impacts have been communicated to USFWS and the outcomes of the consultation process will be provided in the Final EA.

**Mammals**

There are four ESA-listed mammal species that could be present in the study area: North American wolverine, gray wolf, roy prairie pocket gopher, and yelm pocket gopher.

The wolverine is the largest terrestrial member of the weasel family, with females weighing 18 to 27 pounds and males weighing 26 to 44 pounds (WDFW 2025a and USFWS 2023). Wolverines are stocky with short, rounded ears, small eyes, a bushy tail, and large feet that are useful for travelling through snow. Their fur is dark brown, but has tawny colored bands that run down both sides of its body to its tail. Wolverines occur in the remote mountainous areas of the Cascades and in northeastern Washington. In the Cascade Range, wolverines occupy high-elevation landscapes from North Cascades National Park and Okanogan-Wenatchee National Forest south to Mount Adams on the Gifford Pinchot National Forest. Wolverines were extirpated from Washington in the mid-1900s, however they became reestablished in the North Cascades beginning in the 1990s and in the South Cascades by 2008. The population in the Cascades is probably less than 25 individuals. Wolverine core habitat areas and documented observations and dens in Washington State are outside of the action area and this species is not analyzed further in this document.

Gray wolves are the largest wild members of Canidae, or dog family, with adults ranging in weight from 18 to 80 kilograms (40 to 175 pounds), depending on sex and geographic locale (WDFW 2025b, 2025c, 2025d, and USFWS No Date-a). They measure up to 6 feet in length, including tail, and about 30 inches in height at the shoulder. Female wolves weigh around 70 to 80 pounds, while males weigh around 95 to 100 pounds. The wide range of habitats in which wolves can thrive reflects their adaptability as a species and includes temperate forests, mountains, tundra, taiga, grasslands and deserts. In the northwestern states and western Canada, wolves are most common in relatively flat forested areas, rolling hills, or open spaces such as river valleys and basins, where prey animals are easier to chase and catch. Washington's wolf population was virtually eliminated in the 1930s but has rebounded since 2008, when

a resident pack was documented in Okanogan County. Since then, the number of wolves has increased to a minimum of 230 wolves in 43 packs reported in 2024. Packs range across public and private land in Ferry, Stevens, and Pend Oreille counties in the northeast corner of the state and Asotin, Garfield, Columbia, and Walla Walla counties in southeast Washington, and increasing numbers are present in Okanogan, Chelan, and Kittitas counties in the Northern Cascades Recovery area. All packs in Washington State, including breeding pairs, single wolf territory, and nonbreeding pack are well outside of the action area and this species is not analyzed further in this document.

The Roy Prairie and Yelm pocket gophers are two of four federally-listed subspecies of Mazama pocket gopher in the state of Washington (USFWS No Date-b, No Date-c, and No Date-d). The Roy Prairie pocket gopher is found only in Pierce County and Yelm pocket gopher found only in Thurston County. These species are small, burrowing, prairie-dependent rodents that rely on open prairies and grassland habitats. They are small mammals ranging in length from 6 to 9 inches when measured from nose to tail, and are fossorial, which means they live almost entirely underground. They prefer to eat roots, shoots, bulbs, and tubers underground, but may occasionally leave their dens for seeds and stems before running back below ground. Threats facing these species include habitat fragmentation, degradation and loss due to development, military training and certain restoration actions. Additional threats include predation by domestic and feral dogs and cats, pest species control, such as trapping and poisoning, and small population effects.

**Birds**

There are five ESA-listed bird species that could be present in the study area: marbled murrelet, Mt. Ranier white-tailed ptarmigan, northern spotted owl, streaked horn lark, and yellow-billed cuckoo.

Marbled murrelets are small (10 inches long), robin-sized diving seabirds that forage in marine waters, but nest in forests. They spend the vast majority of the non-breeding season on the ocean, resting and feeding in near-shore marine waters, and then come inland to nest (egg incubation lasts about 30 days). Marine foraging areas are usually within 1.2 to 3 miles of shore, typically in waters less than 100 feet deep. They have also been detected on rivers and inland lakes, but this is rare. Marbled murrelets generally nest in old-growth forests characterized by large trees, multiple canopy layers and moderate to high canopy closure.

The Mount Rainier white-tailed ptarmigan is found only in the Cascade Mountains of Washington State and British Columbia, and one of five subspecies of white-tailed ptarmigan in North America. The bird is one of the few animals that lives on mountaintops throughout its entire life. Well-adapted to life above the treeline, Mount Rainier white-tailed ptarmigan are equipped with feathered, snowshoe-like feet and seasonally changing plumage. It is estimated that the range of the subspecies extends from the Fraser Valley in British Columbia, south along the Cascade Range to Mount Adams. With its habitat being limited to mountaintops in the Cascade Range that effectively act as islands, climate change poses a significant threat to the ptarmigan. Population units and documented observations in Washington State are outside of the study area (see Figure 3 in USFWS [2023b]).

The northern spotted owl is the largest of three subspecies of spotted owls, and inhabits structurally complex forests from southwestern British Columbia through Washington and Oregon, and into northern California. The northern spotted owl is relatively long-lived, has a long reproductive life span, invests significantly in parental care, and exhibits high adult survivorship relative to other North American owls. The historical range of the northern spotted owl included most mature forests or stands throughout the Pacific Northwest. The current range of the northern spotted owl is smaller than the historical range, as

the northern spotted owl is extirpated or very uncommon in certain areas such as southwestern Washington and British Columbia.

The streaked horned lark is a small songbird endemic to the Pacific Northwest (Beason 1995, p. 4); it was historically found in British Columbia, Washington, and Oregon (Altman 2011, p. 196). All horned larks are small, ground-dwelling birds, approximately 6–8 inches (in) (16–20 centimeters [cm]) in length (Beason 1995, p. 2). Horned larks forage on the ground in low vegetation or on bare ground (Beason 1995, p. 6); adults feed mainly on the seeds of grasses and forbs, but feed insects to their young (Beason 1995, p. 6). At coastal sites, streaked horned larks forage in the wrack line and in intertidal habitats (Pearson and Altman 2005, p. 8). Currently, streaked horned larks nest in a broad range of habitats, including prairies, coastal dunes, fallow and active agricultural fields, wetland mudflats, sparsely vegetated edges of grass fields, recently planted Christmas tree farms with extensive bare ground, fields denuded by overwintering Canada geese (Branta canadensis), gravel roads or gravel shoulders of lightly traveled roads, airports, and dredge material placement sites along the Columbia River (Altman 1999, p. 18; Pearson and Altman 2005, p. 5; Moore 2008a, pp. 9-10, 12-14, 16).

Yellow-billed cuckoos are fairly large, long and slim birds. They display a strong preference for large, continuous riparian zones with cottonwoods and willows. In Washington, nesting also took place in fir woodlands and open brushy hillsides. A migratory species, yellow-billed cuckoos begin arriving in western North America in mid to late May. Most western birds arrive at their breeding range from early to mid-June and depart from late August to mid-September. The yellow-billed cuckoo diet consists mainly of large insects such as caterpillars, grasshoppers, katydids, beetles, and crickets, with small vertebrate prey also taken. Threats to the species include loss and degradation of riparian forests caused by dam construction, flood control practices, commercial and residential development, changes in farming and ranching practices, and nonnative plant invasions. The species formerly bred uncommonly in parts of western Washington, but is now a very rare migrant statewide, with single records in four years between 2000 and 2014. Breeding probably ended in the state by about 1940. Just 20 sightings of yellow-billed cuckoos have been documented in Washington since the 1950s, with 19 occurring from 1974 to 2016 at an average rate of one sighting every 2.3 years. Sixteen of the 20 records occurred in eastern Washington. All or nearly all of the birds recorded since the 1950s were very likely non-breeding vagrants or migrants, indicating that cuckoos are now functionally extirpated in the state.

**Reptiles and Amphibians**

There is one ESA-listed reptile, the northwestern pond turtle, and one ESA-listed amphibian, the Oregon spotted frog, potentially present within the study area.

The northwestern pond turtle is a medium-size (up to 2.2 pounds or more), plain, aquatic turtle (WDFW 2025e). Adults range in size from 3.5 to 7.5 inches carapace (top shell) length. In Washington, northwestern pond turtles occur in open upland habitats that receive extensive sun exposure such as prairies in the Puget Sound region, oak-pine savanna and other more open forest types in the Columbia Gorge, and pasture. The turtles utilize a variety of flowing and still water habitats in other parts of their range, but in Washington they are only known to inhabit ponds and lakes. This species is primarily aquatic, but strays from water to lay eggs, to disperse to new water bodies, to overwinter and to aestivate during periods of drought. They nest in grasslands and open woodland around ponds. Northwestern pond turtles are omnivorous, eating aquatic animals, including insects and amphibians, as well as aquatic plants. Threats to the species includes invasive and problematic species (American

bullfrog, invasive tall grass), habitat loss, degradation and fragmentation, and lack of suitable habitat for reintroduction sites.

The Oregon spotted frog is a medium to large aquatic frog (adults are 2 to 4 inches in length from snout to vent) (WDFW 2025f). The dorsal color is olive brown to brick red, with black spots that have ragged edges and light centers. The undersides of the legs and margin of the abdomen are orange-red to red (absent in newly metamorphosed frogs and small juveniles). The legs are relatively short, and the toes are nearly fully webbed. Breeding males develop large forelimbs and thumb bases and have a dark nuptial pad on each thumb. This species is highly aquatic and rarely found away from water. Extant populations occur in large shallow wetland systems associated with a stream or stream network. Breeding habitat is in seasonally flooded margins of wetlands and areas of extensive shallows (approximately 6 to 8 inches deep). Oregon spotted frogs eat mostly insects. Tadpoles eat algae and detritus (organic material) in the aquatic environment. Current occurrences in Washington State are in the following watersheds: Sumas River, South Fork Nooksack River, Samish River, upper Black River, lower Trout Lake Creek and at Conboy Lake and Camas Prairie in the Outlet Creek drainage. Threats include invasive reed canarygrass, disturbed habitats, and nonnative predatory fish and the American bullfrog.

**Insects**

There are three ESA-listed insect species potentially present in the study area: the monarch butterfly, Suckley's cuckoo bumble bee, and taylors checkerspot.

The monarch butterfly occurs throughout most of the United States and can be found in Washington east of the Cascades where milkweed occurs (Washington Department of Fish and Wildlife n.d.) While numbers of monarchs, in Washington is relatively low, monarchs can be found in milkweeds patchily distributed in the Columbia Basin migrating south through Washington, collecting along the Columbia and Snake Rivers. The monarch geographic range does not intersect with the operating area and is not analyzed further.

Suckley's cuckoo bumble bee is a type of bumble bee classified within the Psithyrus subgenus (one of eight subgenera of bumble bees). This subgenus differs morphologically from other bumble bee subgenera because its members do not a have pollen-carrying baskets on their hind legs. Suckley's cuckoo bumble bee females are 1.8 to 2.3 centimeters (cm) (0.7 to 0.9 inches (in)) in length, and males are 13 to 16 mm (0.5 to 0.6 in) in length. In general, habitats consist of rich floral resources throughout the nesting season, and many select specific suites of plants for obtaining nectar and pollen. They also select flowers based on their structure and the bee's tongue length. Bumble bees require above and below-ground micro-sites for overwintering and nesting, including logs, stumps, and abandoned rodent and ground-nesting bird nests. Climate influences and land use and management are the key factors driving a multitude of stressors for Suckley's cuckoo bumble bee. Occurrence records between 1893-2022 indicate the species as occurring throughout the western United States and Canada. In Washington State, occurrence records are identified in the western and far eastern parts of the state. However, there are no records of the species in Washington State after 2000, and the probability of occupancy in and around the action area is very low; in some parts of the action area the species is likely extirpated (see Figures 9 and 10 in USFWS 2024a).

Taylor's checkerspot is a medium-sized butterfly with a checkered pattern of orange to brick red, black, and cream. It is a subspecies of Edith's checkerspot and is a Pacific Northwest endemic butterfly. They require patches of early seral, short-structured, perennial bunchgrass plant communities in diverse

topographic landscapes with little or no overstory and access to areas of bare ground; larval host plants; adult nectar sources; and access to aquatic features. The current range of the butterfly is restricted to mostly small and disjunct areas west of the Cascade Mountains from Willamette Valley, Oregon, through western Washington, and into British Columbia; in Washington, the species is currently restricted to a small scattering of eight populations. In addition, they may occur in small numbers at additional sites, but they have not been detected for several years. Taylor's checkerspot butterfly is primarily threatened by habitat loss, degradation, and fragmentation, which has resulted in most of the remaining populations being small and isolated. The total abundance and number of sites occupied by Taylor's checkerspot butterfly have declined substantially over the past several decades, with extirpations at multiple sites documented from the mid-1990s through the mid-2000s.The action area is near the butterfly's South Puget Recovery Region, which is one of the three recovery areas in the subspecies' range. The South Puget Recovery Region includes five population complexes: 91st Division Prairie, TA7S, 13th Division Prairie, Scatter Creek Wildlife Area, and Tenalquot Prairie. All of these population complexes are outside of the action area, with four of these population complexes occur within Joint Base Lewis McChord.

## State Species of Greatest Conservation Need

In Washington, native animals or plants designated as a Species of Greatest Conservation Need (SGCN) are generally those that are declining or rare and in need of attention to recover, or to prevent the need to list under state federal regulation (Washington Department of Fish and Wildlife 2015). The counties identified in the study area that have been evaluated for SGCN include Kitsap, Mason, Thurston, Pierce, Island, Jefferson King, and Snohomish. The Washington Department of Fish and Wildlife database of Rare, Threatened, and Endangered Species of Washington lists species of amphibians, birds, fish, mammals, reptiles, insects, crustaceans, mollusks, and plants in these counties considered as SGCN as defined in the 2015 Washington Wildlife Action Plan. Table E-1 in Appendix E provides information on the SGCN in these counties.

## Migratory Birds

Migratory bird species found within the study area vary throughout the year. The study area is a part of the Pacific Migratory Flyway where millions of birds, including songbirds, grassland birds, waterfowl, shorebirds, and raptors migrate north and south during spring and fall migration (American Bird Conservancy 2022).

Bird behavior, in particular mobbing and territorial defense behaviors, on flying and hovering UA is the most important risk consideration for analysis, as these behaviors are the most pertinent to the proposed action. Mobbing behavior includes birds emitting alarm calls, flying at the predator, diverting its attention, and harassing it. Mobbing and aerial attack behaviors typically occur when a raptor, crow, or other aerial predator enters the airspace of breeding habitat or territorial males (Royal Society for the Protection of Birds 2023). Certain species of birds harass, mob, and attack aerial predators that fly into or near their territory, especially during the breeding season when birds are actively nesting. The defending birds will chase, dive bomb, attack the backside, and vocalize to harass the aerial predator until the offender is far enough from the territory that the defending birds cease attacking and return to their nests and foraging activities (Kalb and Randler 2019). Not all bird species exhibit mobbing and territorial defensive behaviors. Some bird species are more aggressive, defensive, and cued on aerial predators, while other species may show no aggression or interest towards an overflying hawk in its territory. Species of birds that exhibit mobbing and territorial defense behaviors that are known to occur in the Seattle area are shown in Table 3.3-2.

**Table 3.3-2. Seattle Metro Songbird Species with Mobbing and Territorial Behaviors**

| Common Name (scientific name) | Habitat Preferences | Notes |
|---|---|---|
| Red-winged Blackbird (*Agelaius phoeniceus*) and Common Grackle (*Cyanocitta cristata*) | Both species have a strong affinity for wetland habitats and lake shorelines for breeding and nesting. | Relatively aggressive territorial defender known to mob a wide variety of animals who fly over or perch within a male blackbird or grackle's harem territory. Both males and females exhibit mob behaviors during the breeding season but do not mob during the non-breeding season during the fall and winter months when blackbirds and grackles tend to form in flocks. |
| American Crow (*Corvus brachyrhynchos*) | The American crow is less of a nest defending bird and is more prone to territorial defense and inquisitive behaviors as the bird species with the highest intelligence in the Seattle metro area. | Little to no concern over mobbing UA vehicles; greater concern over territorial defense and curiosity behaviors. Crows can also attack larger prey items cooperatively. |
| Small Songbirds | Include several species that exhibit breeding habitat and nest defense behaviors. Typically tree-nesting species. | Smaller bird species like the diminutive blue-grey gnatcatcher (*Polioptila caerulea*) do not defend territories as large as the above-mentioned species, making them unlikely mobbing birds for conflicts with UAs. |

Source: eBird.
UA = unmanned aircraft.

The bald eagle (*Haliaeetus leucocephalus*) is not a Bird of Conservation Concern in the study area but warrants attention under the Eagle Act. Bald eagles may be present year-round throughout Washington as spring and fall migrants, breeders, or winter residents (Cornell Lab of Ornithology n.d.). Bald Eagles typically nest in forested areas adjacent to large bodies of water (Cornell Lab of Ornithology n.d.) and nests have been previously documented throughout the study area (iNaturalist 2025). Bald eagles and other raptors may exhibit territorial behavior when nesting (USFWS n.d.-c).

## 3.3.3 Environmental Consequences

Potential impacts on biological resources associated with the proposed action were considered in the area where drones may operate (launch, fly, and drop packages). Zipline's docks and sites would primarily be located in previously disturbed areas such as building sides and parking lots; any disturbance associated with the program would be minimal and would not affect high quality habitat availability for any species. Drones fly at lower speeds and elevations and are smaller than conventional aircraft. Zipline's deliveries would initiate from the dock, maintain an average speed of 47 mph, approach at an en route altitude less of 400 feet AGL and would generally occur at 330 feet AGL. The UA would maintain its altitude at 330 feet AGL and hover for approximately 75 seconds to make a delivery. Then, the UA would ascend and transition back to en route flight mode for a return to the dock. At a potential maximum of 30,000 flights per day across the entire Seattle metro area, the distribution and altitude of the flights are not expected to significantly affect wildlife in the study area. Furthermore, the P2 "Zip" UA would only briefly hover in fixed positions at the dock, site, and delivery locations, leaving them only temporarily exposed to a mobbing and attacking bird defending its breeding territory.

A significant impact on federally listed threatened and endangered species would occur when the USFWS or NMFS determines 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.[18]

### 3.3.3.1 No Action Alternative

Under the no action alternative, Zipline would not implement commercial UA package delivery operations in the Seattle metro area and would continue to conduct UA package delivery operations under Part 135 in locations currently authorized by its OpSpecs. The no action alternative is not expected to result in significant impacts on biological resources

### 3.3.3.2 Proposed Action

There would be limited ground construction or habitat modification associated with the proposed action, as the docks would primarily be located in lots that are already developed with commercial uses. Zipline's aircraft would not touch the ground in any place because it remains aerial while conducting deliveries and docks are stationed above ground. Zipline's deliveries would initiate from the dock, approach an en route altitude of 330 feet AGL, and would always occur below 400 feet AGL. The UA would maintain altitude at 330 feet AGL and hover for a brief time to make a delivery. Then, the UA would transition back to an en route flight mode for a return to a dock.

Because operations would occur mostly in an urban environment, typically well above the tree line and away from sensitive habitats and given the short duration of increased ambient sound levels, flights are not expected to significantly influence wildlife in the area. Zipline plans to coordinate with the managing entities of state parks and natural areas within the Seattle area on the thoughtful placement and use of delivery sites within these areas as necessary.

#### Special-Status Species

##### Federally Listed, Proposed, and Candidate Species

The proposed action does not involve ground-disturbing activity outside of existing commercial areas. Flights would primarily occur in developed areas with low quality wildlife habitat. Minimal indirect or direct effects would occur to aquatic environments or high quality terrestrial habitats as a result of the proposed action. As there is no plausible route of effects to aquatic environments, the FAA has determined that the proposed action would have *"no effect"* to dolly varden, bull trout and to the designated bull trout critical habitat within the study area. Similarly, FAA has determined that the proposed action would have "*no effect"* to North American wolverine, gray wolf, Mt. Rainier white-tailed ptarmigan, and monarch butterfly as there is not requisite habitat for these taxa within the study area and there is little to no likelihood of direct or indirect effects.

The proposed action could affect ESA-listed species through the emission of light, noise, and risk of collision. This analysis broadly summarizes potential affects to taxa groups most affected by these

[18] See FAA Order 1050.1G, Exhibit A-1, Biological Resources, Factors to Consider, p. A-1.

factors. Species-specific impacts have been communicated to USFWS and the outcomes of the consultation process will be provided in the Final EA.

The Roy Prairie and Yelm pocket gophers could potentially be affected by noise and light associated with the proposed action while present in the action area during operations. Given the estimated sound levels of the UA, the UA's linear flight profile to and from docks, the low probability of encountering an individual gopher during operations, and the short period of time the UA would be in any particular location, UA noise is not expected to adversely affect either species. Further, the chances of any one individual experiencing multiple overflights of a UA are low given the low population numbers of the two species and their limited distribution to the southern part of the action area (Thurston and Pierce counties). The FAA has determined that the action may affect, but is not likely to adversely affect, the Roy Prairie and Yelm pocket gophers because of the following: operations would occur mostly in an urban environment; the species are expected to experience low sound levels; any increase in ambient sound levels would be short in duration, and; there is a low probability of these species occurring above ground when a UA may be present. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

The marbled murrelet, northern spotted owl, streaked horn lark, and yellow-billed cuckoo species could potentially be affected by noise, light, and collision risk associated with the proposed action. However, the action involves only minimal ground disturbance, no native vegetation removal and would not occur over open marine areas. Therefore, the proposed action would not physically impact any suitable habitat for these ESA-listed bird species. If present in the action area, these ESA-listed birds could experience UA noise during the en route and delivery flight phases. Birds resting or foraging at or near the tree line at the time a UA flies by would experience the greatest sound levels. Birds near the ground at the time a UA flies by would experience lower sound levels. Given the estimated sound levels of the UA, the UA's linear flight profile to and from nests and delivery locations, the low probability of encountering an individual ESA-listed bird in the action area based on the limited occurrence of suitable mature or old growth forest and willow-cottonwood riparian corridor habitats, the generally low and fragmented population structure of these species, and the short period of time the UA would be in any particular location, UA noise is not expected to adversely affect ESA-listed birds. Further, the chances of any one individual experiencing multiple overflights of a UA are low given the mobility of the birds. One study found that, in most instances, drones within 4 meters of birds did not cause a *behavioral* response (Vas et al. 2015). The FAA has determined that the action *may affect, but is not likely to adversely affect,* marbled murrelet, northern spotted owl, streaked horn lark, and yellow-billed cuckoo because of the following: the operations would occur mostly in an urban environment; the altitude at which the UA flies in the en route phase (330 feet AGL); the expected low sound levels; any increase in ambient sound levels would be short in duration; the probability of these ESA-listed birds occurring in the action area, and; the low likelihood of the UA striking an individual. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

The northwestern pond turtle and Oregon spotted frog could potentially be affected by noise and light associated with the proposed action. The action does not include ground disturbance and therefore would not physically impact the aquatic habitat of either of these species. However, if the UA is present in the action area during operations during an instance when these species are not submerged in the aquatic environment, they could experience en route noise. Given the estimated sound levels of the UA, the UA's linear flight profile to and from docks, the low probability of encountering an individual frog during operations, and the short period of time the UA would be in any particular location, UA noise is

not expected to adversely affect either species. Further, the chances of any one individual experiencing multiple overflights of a UA are low given the low given the mobility of both species and their highly aquatic nature. The FAA has determined that if the species is listed as threatened or endangered in the future, the action *may affect, but is not likely to adversely affect*, the northwestern pond turtle and Oregon spotted frog due to the following operations would occur mostly in an urban environment; the expected low sound levels experienced by these species; any increase in ambient sound levels would be short in duration, and the low probability of a frog or turtle present and in a flight path when a UA may be present. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

Suckley's cuckoo bumble bee and Taylor's checkerspot could potentially be affected by noise, light, and collision risk associated with the proposed action. However, the risk of a strike is low given the species flight elevations would be low and their ability to fly and avoid the UA, as well as the low probability of encountering these species drone deliveries due to their very limited occurrence in the action area. The FAA has determined that the action may affect, but is not likely to adversely affect Suckley's cuckoo bumble bee and Taylor's checkerspot due to the following: operations would occur mostly in an urban environment; the altitude at which the UA flies in the en route phase (330 feet AGL); the expected low sound levels experienced by these species; any increase in ambient sound levels would be short in duration; the low probability of encountering these species due to low probability of presence, and; the low likelihood of the UA striking these species,. Any effects would be discountable (extremely unlikely to occur) or insignificant (not able to be meaningfully measured, detected, or evaluated).

On September 9, 2025 the FAA submitted an informal consultation request to the USFWS in accordance with Section 7 of the ESA and requested concurrence with the FAA's effect determination for the proposed project. Consultation is ongoing and will be completed prior to the issuance of the Final EA.

### Species of Greatest Conservation Need[19]

The hoary bat, Kenn's myotis, silver-haired bat, and Townsends's big-eared bat are SGCN that could be present in the study area. Although these bat species may occur within the study area, they are unlikely to encounter operating UA as Zipline's proposed operations occur predominantly in the urban environment where bat densities are lower. Bat activity increases as night approaches, and they are most active between dusk and dawn. Drone flights that occur between civil dawn and dusk would overlap with peak periods of activities.

Bats may exhibit disturbance behaviors and change their flight paths to avoid drones in the event that flights overlap with bat activity areas (Ednie et al. 2021). Research suggests that drones have "minimal impact on bat behavior" (Fu et al. 2018) primarily from noise emissions. However, drone disturbance is temporary and bats are expected to return to normal foraging and flight activities shortly after the exposure to drone noise ends (Kuhlmann et al. 2022; Ednie et al. 2021). These temporary disturbance events would not reduce habitat suitability or increase energy expenditure of bats outside the range of natural variability. ***As a result, the FAA has determined that the proposed action is not expected to have significant impacts on bats.***

[19] Species of Greatest Conservation Need are lists of species designated in the 56 State Wildlife Action Plans, which identify the species most in need of conservation action in that state or U.S. territory. See https://www.usgs.gov/tools/species-greatest-conservation-need-analysis-tool.

### Migratory Birds

While there is a well-established repository of literature on bird mobbing and attack behaviors, and on bird strikes with large aircraft, information on drone interactions with birds is not as well documented. Without a baseline of data or pre-existing research on drone interactions with birds, creation of an effective and sensible predictive model is not possible. Therefore, this analysis focused on bird behavior and identified the northern mockingbird, red-winged blackbird, and common grackle as potential species that could mob or attack a drone while defending territory, especially during the early spring to mid-summer breeding period.

Only two instances of birds making contact with drones have been recorded in the United States by hobbyists (Connecticut Audubon Society n.d.). In these cases, ravens made a brief touch to the backside of the drone in flight as a curiosity behavior before flying away from the moving object.

To avoid impacts on nesting bald eagles, Zipline would implement a monitoring plan for bald eagle nests that integrates multiple strategies and resources. This includes periodically checking online tools such as iNaturalist[20] to identify eagle nests that may occur in the operating area, as well as communication with the bird watching community to identify nests. If Zipline identifies a bald eagle nest or is notified of the presence of a nest, Zipline would 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. Zipline would maintain this avoidance area until the end of the breeding season or until a qualified biologist indicates the nest has been vacated. Zipline would report monitoring and avoidance measures to Washington Department of Fish and Wildlife and the USFWS Region 1 Migratory Bird Permit Office.

Based on the information available regarding the interaction between drones and birds, the FAA concludes that mobbing and attacking behaviors would be the most relevant interaction to occur. As detailed in Table 3.3-2, some bird species are more likely to exhibit this type of behavior, and these are the species that would potentially interact with the drones, if any.

***The proposed action would not be expected to result in significant impacts on migratory birds*** because it would not result in long-term or permanent loss of wildlife species, would not result in substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or populations, *and would not have adverse impacts* on reproductive success rates, natural mortality rates, non-natural mortality, or ability to sustain the minimum population levels.

# 3.4 Department of Transportation Act, Section 4(f) Resources

## 3.4.1 Definition of Resource and Regulatory Setting

Section 4(f) of the U.S. Department of Transportation (DOT) Act (codified at 49 U.S.C. § 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and

[20] See https://www.inaturalist.org.

private historic sites. Section 4(f) states that, subject to exceptions for de minimis impacts[21] "[t]he 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 on 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. *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.[22]

Another type of physical use, known as *temporary occupancy,* results when a transportation project results in activities that require a temporary easement, right-of-entry, project construction, or another short-term arrangement involving a Section 4(f) property. A temporary occupancy is considered a Section 4(f) use unless all the conditions listed the Section 4(f) regulations at 23 CFR 774.13(d) are satisfied.

A physical *use* may be considered de minimis if, after considering avoidance, minimization, mitigation, and enhancement measures, 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*. Before the FAA may finalize a determination that a physical use is de minimis, the official(s) with jurisdiction must concur in writing that the project will not adversely affect the activities, features, or attributes that make the property eligible for Section 4(f) protection.

The concept of *constructive use* is that a project that involves no actual physical use of a Section 4(f) property via permanent incorporation or *temporary occupancy*, but may still, by means of noise, air pollution, water pollution, or other proximity-related impacts, substantially impair important features, activities, or attributes associated with the Section 4(f) property. Substantial impairment occurs only when the protected activities, features, or attributes of the Section 4(f) property that contribute to its purpose and significance are substantially diminished. This means that the value of the Section 4(f) property, in terms of its prior purpose and significance, is substantially reduced or lost.

Procedural requirements for complying with Section 4(f) are set forth in DOT Order 5610.1D, *Procedures for Considering Environmental Impacts* and 49 U.S.C. § 303. The NOA process was used to notify Section 4(f) jurisdictional agencies of potential impacts to public parks, recreation areas, wildlife refuges, and historic properties. The FAA also uses Federal Highway Administration (FHWA) regulations (23 CFR Part 774) and FHWA guidance (e.g., Section 4(f) Policy Paper) when assessing potential impacts on Section 4(f)

[21] 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 1050.1G, Appendix A Exhibit A-1. Significance Determination for FAA Actions and Section 4(f) regulations at 23 CFR 774.17 *De minimis impact*.

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

properties. These requirements are not binding on the FAA; however, the FAA may use them as guidance to the extent relevant to FAA projects. More information about DOT Act, Section 4(f) can be found in Appendix C of the FAA Order 1050.1G (FAA 2025).

## 3.4.2 Affected Environment

The FAA used data from federal, state, and other public-access sources to identify potential Section 4(f) resources within the study area (Appendix B, *Section 4(f)*). The FAA identified many properties that meet the definition of a Section 4(f) resource, including public parks administered by state, city, and county authorities, and historic properties identified in the National Register of Historic Places online database (NPS 2025). By count, most of the Section 4(f) resources are local public parks, trails, and ballfields. Appendix B provides an inventory list of local parks in the study area (WA DNR 2025). There is one wildlife refuge within the study area, Nisqually National Wildlife Refuge. Wildlife refuges and parks are not currently included in Zipline's fly less restrictions.

There may be instances where the delivery would be to a customer located within a Section 4(f) resource. For example, public delivery zones could be set up for events and community engagement in collaboration with the city parks and recreation department.

As discussed in Section 3.6, *Historical, Architectural, Archaeological, and Cultural Resources*, there are numerous historic properties within the study area as listed on the National Park Service website, although most of these are considered for architectural or other purposes that would not typically be affected by UA operations. The FAA is currently consulting with the Washington SHPO to determine whether historic and traditional cultural properties would be affected by the proposed action (see Section 3.6.2, *Affected Environment*).

## 3.4.3 Environmental Consequences

### 3.4.3.1 No Action Alternative

Under the no action alternative, Zipline would not implement commercial UA package delivery operations in the Seattle metro area and would continue to conduct UA package delivery operations under Part 135 in locations currently authorized by its OpSpecs and at other locations under 14 CFR Part 107,[23] which limits operations to UA weighing less than 55 pounds and within visual line of sight. Market demand would not be met, and consumers would continue to use personal ground transportation to retrieve small goods. This alternative does not support the stated purpose and need.

### 3.4.3.2 Proposed Action

Under the proposed action, there would be no physical or constructive use of Section 4(f) resources because docks and sites would not be installed on Section 4(f) properties and occasional flyovers during temporary occupancy of UAs in the study area would not result in substantial impairment of Section 4(f) properties. As discussed in Section 3.7, *Noise and Noise-Compatible Land Use*, and Appendix D, *Noise*, the proposed action would not result in significant noise levels at any location within the study area. As further described in Section 3.9, *Visual Effects*, the short duration of en route flights (approximately 15

[23] The *Operation of Small Unmanned Aircraft Systems Over People* rule (codified in 14 CFR Part 107) permits routine operation of small UAS (UAs weighing less than 55 pounds) within visual line of sight at night and over people without a waiver or exemption under certain conditions.

seconds) would minimize any potential for significant visual impacts. In addition, Zipline's flight planning software is designed to increase variability in flight paths to minimize overflights of any given location; with the diversification of flight paths, the frequency of overflights would inversely scale as the distance from a site increases. Zipline will communicate directly with Washington Parks to discuss any concerns regarding parkland noise and will carefully coordinate any parkland delivery operations with managing entities as necessary.

The FAA has determined that UA overflights as described in the proposed action would not cause substantial impairment to any of the Section 4(f) resources in the study area and are therefore not considered a constructive use of any Section 4(f) resource.

Therefore, the proposed action is not expected to cause significant impacts to Section 4(f) resources.

# 3.5 Historical, Architectural, Archaeological, and Cultural Resources

## 3.5.1 Definition of Resource and Regulatory Setting

Cultural resources encompass a range of sites, properties, and physical resources relating to human activities, society, and cultural institutions. Such resources include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic archaeological sites, structures, objects, and districts that are considered important to a culture or community. Cultural resources also include aspects of the physical environment, namely natural features and biota that are a part of traditional ways of life and practices and are associated with community values and institutions.

The major law that protects cultural resources is the National Historic Preservation Act (NHPA). Section 106 of the 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 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 Tribal Historic Preservation Officers (THPOs) for tribes that are identified as potentially having traditional cultural interests in the area, and determining the potential effects on 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, archaeological, and cultural resources. A factor to consider in assessing a significant impact is when an action would result in a finding of adverse effect through the Section 106 process. However, an adverse effect finding does not automatically trigger preparation of an Environmental Impact Statement (i.e., a significant impact). If an adverse effect is determined, the Section 106 process will be resolved through a Memorandum of Agreement (MOU) or Programmatic Agreement (PA) to record resolution measures to mitigate or minimize adverse effects.

## 3.5.2 Affected Environment

The area of potential effect for the proposed action is the entire study area where Zipline is planning to conduct UA package deliveries, as shown in Figure 2.2-1. According to the National Park Service's online database of the NRHP, there are 516 NRHP-listed historic properties within the APE, including 394 buildings (including residences, businesses, schools, churches, social and recreational buildings), 58 historic districts, 55 structures (primarily bridges and marine vessels), eight sites (three cemeteries, two designed landscapes, two archaeological sites, and a traditional cultural place), and one object (a statue of Chief Seattle). Thirteen historic properties are National Historic Landmarks (NHLs) and are denoted in the "Name" field of the table with an (NHL) after the resource name. Seven of these NHLs are maritime vessels, three are historic districts, and three are buildings. These historic properties and districts are listed in Appendix G, *SHPO Consultation Attachment B*.

### 3.5.2.1 No Action Alternative

Under the no action alternative, Zipline would not implement commercial UA package delivery operations in the Seattle metro area and would continue to conduct package delivery operations under Part 135 in locations currently authorized by its OpSpecs. Consumers in the areas not served by UA would be expected to continue to use personal ground transportation to retrieve small goods. The no action alternative does not fulfill the stated purpose and need. Therefore, the no action alternative is not expected to result in significant impacts related to historical, architectural, archaeological, and cultural resources.

### 3.5.2.2 Proposed Action

Sites and docks would be located in commercially zoned areas primarily pre-disturbed areas. Infrastructure for this project would consist almost entirely of pre-existing hardstand and would involve limited ground disturbance. Therefore, the nature of UA effects on historic properties would be limited to non-physical, reversible impacts (i.e., the introduction of audible and/or visual elements). Aboveground dock structures could incur a minor visual effect on historic properties if those properties are within the viewshed of the autoloaders. However, required standoff distances of 150 to 325 feet, depending on airspace classification as described in Appendix G, would minimize these impacts.

Zipline projects up to 400 delivery flights per operating day per site, meaning any historic or cultural resource would experience few overflights per day, if any. All takeoff and loading operations would occur at least 150 feet away from any historic properties, adhering to standoff requirements for noise-sensitive areas. Deliveries at or near historic properties would involve the UA hovering at 330 feet AGL for about 70 seconds. In flight, the UA would appear as a small object moving at twice the speed of bird flight. These rapid and intermittent flight operations would result in minimal visual effects. Additionally, Ziplines's flight planning software minimizes overflights of any specific location by varying flight paths (Section 2.2, Proposed Action).

Noise levels for docking, undocking, and delivery would remain below 89 dB SEL for 30 seconds. In-flight noise for the P2 "Zip" UAS at 330 feet AGL is 69.1 dBA SEL, comparable to the sound inside an urban office or car. The FAA's noise exposure analysis (Section 3.6, Noise and Noise-Compatible Land Use, and Appendix G) confirms that noise levels would be below significance thresholds, even in areas of highest exposure. The small size of the UA ensures no vibrations that could affect historic structures or contents within the APE.

Based on the information available, the FAA made a preliminary finding of *no adverse effect* to historic properties. In accordance with 36 CFR Section 800.4(a)(1), the FAA is consulting with the Washington SHPO to determine on historic properties by the proposed action (Appendix G). The Final EA will detail the outcome of this consultation.

The FAA consulted with twenty one tribes that may potentially attach religious or cultural significance to resources in the APE: (1) Confederated Tribes and Bands of the Yakama Nation; (2) Confederated Tribes of the Chehalis Reservation; (3) Cowlitz Indian Tribe; (4) Jamestown S'Klallam Tribe; (5) Nisqually Indian Tribe; (6) Port Gamble S'Klallam Tribe; (7) Quinault Indian Nation; (8) Samish Indian Nation; (9) Sauk-Suiattle Indian Tribe; (10) Skokomish Indian Tribe; (11) Squaxin Island Tribe of the Squaxin Island Reservation; (12) Stillaguamish Tribe of Indians of Washington; (13) Suquamish Indian Tribe of the Port Madison Reservation; (14) Swinomish Indian Tribal Community; (15) Tulalip Tribes of Washington; (16) Lummi Tribe of the Lummi Reservation; (17) Lower Elwha Tribal Community; (18) Muckleshoot Indian Tribe; (19) Puyallup Tribe of the Puyallup Reservation; (20) Snoqualmie Indian Tribe; and (21) Upper Skagit Indian Tribe.[24] The FAA sent consultation letters to the twenty one tribes listed above in June 2024, regarding the entire APE. As of September 12, 2025 only the Squaxin Island Tribe of the Squaxin Island Reservation responded, stating in an email dating August 5, 2024, that the project was outside of the tribe's traditional area and did not need to consult further.

The FAA also previously provided the Washington Department of Archaeology and Historic Preservation (DAHP) with a project summary and requested concurrence on the area of potential effects (APE) in a letter sent on August 5, 2024. FAA received the DAHP response dated August 13, 2024, concurring with the proposed APE, and requesting to review comments from concerned tribes and other interested/affected parties. FAA will provide any comments received to DAHP as requested.

In addition to the FAA's August 2024 correspondence with the DAHP, the FAA hosted one virtual meeting on October 17, 2024, with the DAHP regarding potential project effects and consulting party consultation. As a follow-up to this meeting on October 23, 2024, the DAHP submitted a list of 51 suggested consulting party organizations for the FAA to consult with, including local government agencies and non-profit museums and historical societies (see Appendix G, *SHPO Consultation Attachment C*). The FAA will complete its Section 106 responsibilities under 36 CFR § 800.3 towards consulting parties through its National Environmental Policy Act (NEPA) public outreach requirement, and will invite comment from the public, local governments, and the other consulting parties identified in Appendix G, *SHPO Consultation Attachment C* within the APE regarding the FAA's Section 106 finding of no adverse effect for this project.

Based on the information available, the FAA made a finding of *no adverse effect* in accordance with 36 36 CFR § 800 and is currently conducting consultation with the Washington SHPO. Therefore, the proposed action would not result in significant impacts on historical, architectural, archaeological, or cultural resources. The FAA's tribal and historic outreach letters are included as Appendices F and G, respectively.

[24] Seventeen of these 21 tribes have THPOs: Confederated Tribes and Bands of the Yakama Nation; Confederated Tribes of the Chehalis Reservation; Cowlitz Indian Tribe; Jamestown S'Klallam Tribe; Nisqually Indian Tribe; Port Gamble S'Klallam Tribe; Quinault Indian Nation; Samish Indian Nation; Sauk-Suiattle Indian Tribe; Skokomish Indian Tribe; Squaxin Island Tribe of the Squaxin Island Reservation; Stillaguamish Tribe of Indians of Washington; Suquamish Indian Tribe of the Port Madison Reservation; Swinomish Indian Tribal Community; Tulalip Tribes of Washington; Lummi Tribe of the Lummi Reservation.

# 3.6 Noise and Noise-Compatible Land Use

## 3.6.1 Definition of Resource and Regulatory Setting

Noise is considered any unwanted sound that interferes with normal activities (such as sleep, conversation, student learning) and can cause annoyance. 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 and noise-compatible land use. Through 14 CFR Part 36, the FAA regulates noise from aircraft. FAA Order 1050.1G, Appendix C, Section 1.3 requires the FAA to identify the location and number of noise-sensitive areas that could be significantly impacted by noise.

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 1050.1G, Appendix C. 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 averaged aircraft sound level at a location over a 24-hour period, with a 10 dB adjustment added to those noise events occurring from 10:00 p.m. to 7:00 a.m. the following morning. A significant noise impact is defined in FAA Order 1050.1G 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 DNL 65 dB due to a DNL 1.5 dB or greater increase.

## 3.6.2 Affected Environment

The approximate land area within the study area is 14,200 square miles, the approximate water area is 237 square miles, and the estimated population within the counties included in the study area is 7,688,549 per 2022 American Community Survey (ACS) estimates (U.S. Census Bureau 2022).

The ambient (or background) sound level in the operations area varies and depends on the uses in the immediate vicinity. For example, the ambient sound level along a major highway is higher than the ambient sound level within a residential neighborhood. Existing sound sources in the operating area are primarily those from anthropogenic sources associated with commercial, industrial, transportation (e.g., highways, rail, and air travel), and residential land uses in an urban and city environment (e.g., vehicles, construction equipment, aircraft). Except for areas proximate to airports, existing aviation noise levels in the Seattle study area are expected to be well below the FAA's threshold for significant noise exposure to residential land use (DNL 65 dB).

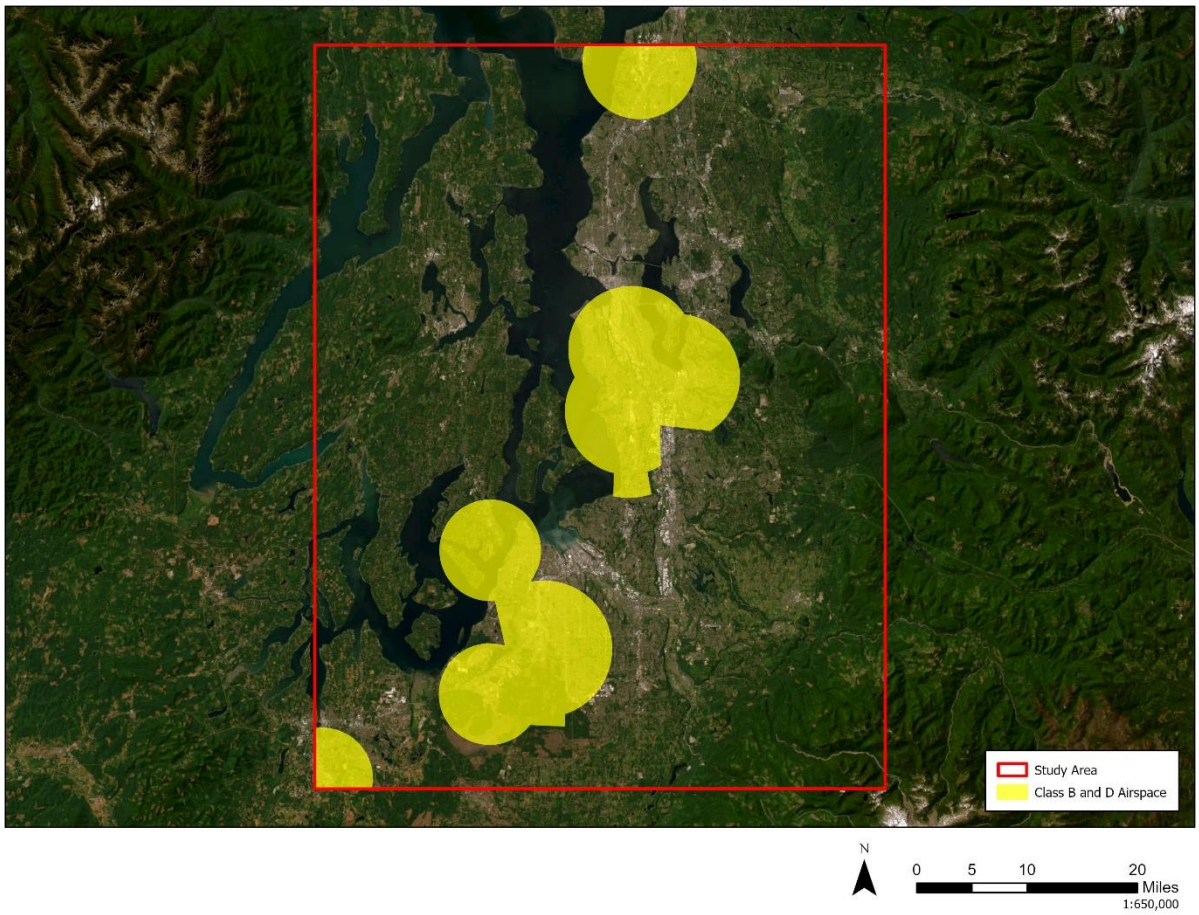



**Figure 3.6-1. Class B and Class D Surface Areas**

# 3.6.3 Environmental Consequences

## 3.6.3.1 No Action Alternative

Under the no action alternative, Zipline would not implement commercial UA package delivery operations in the Seattle metro area. Zipline would continue to conduct UA package delivery operations under Part 135 in locations currently authorized by its OpSpecs and at other locations under 14 CFR Part 107. Therefore, the no action alternative is not expected to cause a significant impact on any noise-sensitive resources within the study area.

## 3.6.3.2 Proposed Action

Operations would include up to 400 deliveries from each dock and would occur up to 365 days per year. The FAA developed a methodology to evaluate the potential noise exposure in the proposed study area that could result from implementation of the proposed action (Appendix D). The noise assessment evaluated noise emissions data for the P2 “Zip” UA.

Due to the operational profile(s) that would be this analysis assumes the most conservative scenario with the farthest setback distances presented in Tables 10 to 12 of Appendix D. This analysis was used to

define the potential significant impacts due to the proposed action. Noise assessments were performed for each of the flight phases as discussed in detail in the following sections.

## Noise Exposure for Dock Operations

Based on a daily total maximum of 400 delivery operations per site, including 20 total nighttime delivery operations, and 365 operating days per year, Table 3.6-1 provides the most conservative extent of daily noise exposure for dock operations.

**Table 3.6-1. Estimated Extent of Daily Noise Exposure from Dock**

| DNL Equivalent Day Delivery Cycles | DNL Equivalent Night Delivery Cycles | DNL 65 dB | DNL 60 dB | DNL 55 dB | DNL 50 dB |
|---|---|---|---|---|---|
| 380 | 200 | 70 feet | 150 feet | 325 feet | En Route |

Source: ICF 2025.
Note: Distances are the worst-case noise scenario (longest set back distances) based on Tables 10 through 12 of Appendix D.
dB = decibel; DNL = day-night average sound level.

As described in Section 2.2, *Proposed Action*, docks would be placed at least 325 feet away from noise-sensitive areas within the controlled surface areas of Class B and Class D airspace. In addition, docks would be placed at least 150 feet away from noise-sensitive areas when they are outside of the controlled surface areas of Class B and Class D airspace. Based on the above distances, the increase in noise would not be expected to exceed DNL 1.5 dB within areas with an existing noise exposure of DNL 65 dB or result in a noise exposure of DNL 65 dB because DNL 60 and 65dB contours would not exceed the controlled surface areas of Class B and Class D airspace. Therefore, there would be no significant impact due to the dock operations.

## Noise Exposure for En Route Operations

Based on the information provided by Zipline, it is expected that UA would generally cruise at or above an altitude of 330 feet AGL and travel at a ground speed of 47 mph during en route flight. The en route noise exposure for a single point exposed to 400 delivery and return flights (800 flights total) would not exceed 50.3 dBA DNL. Considering that en route UA noise would not be expected to exceed DNL 1.5 dB at any locations under any delivery scenarios, this was not quantified further.

## Noise Exposure for Delivery Operations

The noise exposure for delivery operations includes the noise exposure for the delivery point itself, based on maximum daily deliveries to any one location. The DNL delivery exposures assume an arrival and departure flight path restricted to a single trajectory over a receiver array with distances of 25 to 2,000 feet. The noise exposure for any one delivery point is provided in Table 11 of Appendix D and summarized in Table 3.6-2 for various DNL levels. At the level of 400 average daily deliveries, significant noise effects would not be expected anywhere beyond the immediate point of delivery.

**Table 3.6-2. DNL for Delivery Locations Based on Maximum Deliveries per Location**

| Average Daily DNL Equivalent Deliveries | 65 DNL Distance (feet) | 60 DNL Distance (feet) | 55 DNL Distance (feet) | 50 DNL Distance (feet) | 45 DNL Distance (feet) |
|---|---|---|---|---|---|
| 1 | <50 | <50 | <50 | <50 | <50 |
| 5 | <50 | <50 | <50 | <50 | <50 |
| 10 | <50 | <50 | <50 | <50 | <50 |
| 15 | <50 | <50 | <50 | <50 | <50 |
| 20 | <50 | <50 | <50 | <50 | <50 |
| 25 | <50 | <50 | <50 | <50 | 65 |
| 50 | <50 | <50 | <50 | <50 | 160 |
| 75 | <50 | <50 | <50 | 55 | 310 |
| 100 | <50 | <50 | <50 | 70 | 600 |
| 150 | <50 | <50 | <50 | 120 | En Route |
| 200 | <50 | <50 | <50 | 235 | En Route |
| 300 | <50 | <50 | 65 | 500 | En Route |
| 400 | <50 | <50 | 90 | En Route | En Route |

Source: ICF 2025.
Note: Noise exposure would exceed DNL 50 dB along the flight path for a location with 400 or more deliveries per day and DNL 45 dB for an operation with 150 or more deliveries per day. Distances are the worst case noise scenario (longest set back distances) based on Table 11 of Appendix D.
DNL = day-night average sound level.

### Overall Noise Exposure Results

The maximum noise exposure levels are associated with dock operations, where DNL 65 dB occurs within 70 feet of a dock perimeter and DNL 60 dB occurs within 150 feet. As described in Section 2.2, docks would be located at least 150 feet away from noise-sensitive areas. In addition, when docks are planned to be within the controlled surface areas of Class B and Class D airspaces, dock would be placed 325 feet away from noise-sensitive areas.

Based on the noise analysis, and the above project restrictions, the proposed action would not have a significant noise impact.

# 3.7 Visual Effects (Visual Resources and Visual Character)

## 3.7.1 Definition of Resource and Regulatory Setting

Visual resources and visual character impacts deal broadly with the extent to which the project would either (1) produce light emissions that create annoyance or interfere with activities; or (2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment. Visual effects can be difficult to define and assess because they involve subjectivity. 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 significance threshold. Factors the 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 3.5, *Department of Transportation Act, Section 4(f) Resources*, there are some publicly owned resources that could be valued for aesthetic attributes within the study area. However, P2 "Zip" UAs automatically deconflict with each other using a combination of strategic and tactical avoidance measures including generation of predetermined flight paths following specific rules to reduce the overlap of flight paths in different modes and phases of flight. During takeoff, en route outbound, delivery, en route inbound, and landing, the UA would depart from a dock and travel en route at an altitude less than 400 feet AGL (en route travel would generally occur at 330 feet AGL). Deliveries would mostly take place at residences, and, in some cases, there may be instances where the delivery would be to a customer located within a Section 4(f) resource (see Section 3.5.2, *Affected Environment*, for more information on 4(f) properties). The delivery phase consists of descent from the en route altitude to a delivery point, such as a residential yard, driveway, parking lot, or common area. If the droid is unable to automatically identify the delivery target and evaluate its suitability, an image is sent to an operator for real-time evaluation. If the delivery site does not meet Zipline's evaluation criteria[25], delivery would not continue, and the droid is retracted back into the P2 "Zip" UA. If the delivery site is identified and clear, the droid would continue to descend and deliver the payload at the delivery target. The total hover time for delivery operations would be approximately 1 minute. 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 60 seconds. The FAA estimates at typical operating altitude and speeds the UA en route would be observable for approximately 6 seconds by an observer on the ground.

## 3.7.3 Environmental Consequences

### 3.7.3.1 No Action Alternative

Under the no action alternative, Zipline would not implement commercial UA package delivery operations in the Seattle metro area and would continue to conduct package delivery operations under Part 135 in locations currently authorized by its OpSpecs. Consumers in the areas not served by UA would be expected to continue to use personal ground transportation to retrieve small goods. The no action alternative does not fulfill the stated purpose and need. Therefore, the no action alternative is not expected to result in significant visual effects.

[25] Zipline's evaluation criteria includes visual clearance for obstacles. It may also include additional checks such as droid position tracking errors.

### 3.7.3.2 Proposed Action

The proposed action would make no changes to any landforms or land uses; thus, there would be no effect on the visual character of the area, as the docks would be located in established commercial areas as further described in Section 2.2, *Proposed Action*. 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. The short duration when each UA flight could be seen from any resource in the study area and the low number of overflights within any given location would minimize any potential for significant visual impacts.

The proposed action does not have the potential to do the following:

- Create annoyance or interfere with normal activities from light emissions;
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and/or visual character in the study area; and
- Block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

***Therefore, the proposed action is not expected to cause significant impacts to visual resources.***

# Chapter 4
# Reasonably Foreseeable Effects

As most of the impacts discussed in Chapter 3, Affected Environment and Environmental Consequences, were found to be minimal and given that the drone flight is limited in its ability to interact with other outside actions due to its short duration, the proposed action's contribution to reasonably foreseeable impacts in conjunction with past, present and future actions under the FAA's jurisdiction within the study area would largely be from noise. Thus, this section will focus on the proposed action's potential impact on the noise environment.

Because UA operations would occur in areas subject to other aviation noise sources, it is necessary to evaluate the noise exposure that would result from the proposed action and the other aviation noise sources present. Examples of such scenarios are Zipline operations occurring in the vicinity of an airport where Zipline flight activity may overlap with traditional aircraft. Aviation noise sources are most likely to be the dominant contribution to noise impacts near airports. By comparison, other sources of noise would not appreciably contribute to overall noise levels at these locations.

There are 114 airports within the study area (see Appendix H). The potential for noise and compatible land use effects would result from UA and manned aircraft operating within DNL 60 dB noise exposure areas of existing airports. As such, the potential for significant noise effects would be minimized because Wing has elected to require that all nests be placed at least 325 feet away from noise-sensitive areas within the controlled surface areas of Class B, Class C, and Class D airspace. In addition, docks would be placed at least 150 feet away from noise-sensitive areas when they are outside of the controlled surface areas of Class B, Class C, and Class D airspace. No other Part 135 UA operations currently occur in the Seattle metro area. Ziplines' flight planning software is designed to increase variability in flight paths to minimize overflights of any given location, thereby reducing the potential for significant noise effects when combined with other operations subject to FAA jurisdiction in the study area. Additionally, Part 135 operators would be required to complete an environmental review before beginning operations, ensuring that any potential additional effects are properly analyzed and disclosed.

Ziplines' docks and sites would be in areas zoned for commercial activities and away from noise-sensitive areas. Ziplines' docks would be powered using available electric outlets for recharging batteries. No reasonably foreseeable significant noise effects are expected from Ziplines' charging infrastructure. .

Zipline acknowledges that future operators may propose locating operations within this proposed action's study area. Should that occur, Zipline understands the potential for impacts may increase due to a future operator's project and would work with that operator and the FAA to mitigate potential impacts. Zipline also understands that any future operators would be required to perform their own NEPA analysis to identify the potential for any noise impacts due to their operations. The degree to which different operators would operate within areas of shared airspace is dependent on the operators, their specific business use cases, and their ability to deconflict with one another in those overlapping areas. Each operator is responsible for coordinating with other operators in the same geographic area to avoid reasonably foreseeable significant noise impacts. Zipline will communicate and coordinate with other operators to limit operations occurring concurrently in the same area to avoid any significant impacts.

As discussed in Chapter 3, the proposed action is not expected to significantly impact the aforementioned environmental impact categories (see Section 3.2). Areas of existing aviation noise

sources within the study area would be avoided; thus, the proposed action would not contribute to significant noise impacts. No other actions are anticipated to interact with the proposed action to result in reasonably foreseeable effects; ***therefore, the proposed action is not expected to result in significant effects.***

# Appendix A
# References and Citations


Allmand. n.d. Allmand Maxi-Power 25 Mobile Generator. Available: https://www.allmand.com/na/en_us/product-catalog/generators/maxipower-25.html. Accessed: November 22, 2024.

Altman, B. 1999. Status and conservation of grassland birds in the Willamette Valley. Unpublished report submitted to Oregon Department of Fish and Wildlife, Corvallis.

Altman, B. 2011. Historical and Current Distribution and Populations of Bird Species in Prairie-Oak Habitats in the Pacific Northwest. *Northwest Science*, 85(2):194-222. Available: https://bioone.org/journals/northwest-science/volume-85/issue-2/046.085.0210/Historical-and-Current-Distribution-and-Populations-of-Bird-Species-in/10.3955/046.085.0210.full. Accessed: May 9, 2025.

American Bird Conservancy (ABC). 2022. Avian Superhighways: The Four Flyways of North America. Available: https://abcbirds.org/blog/north-american-bird-flyways/. Accessed: August 5, 2025.

Beason, R. 1995. Horned Lark (*Eremophila alpestris*). In *The Birds of North America*, No. 195. The Academy of Natural Sciences, Philadelphia, and The American Ornithologists Union, Washington, D.C.

Council on Environmental Quality (CEQ). 2023. National Environmental Policy Act guidance on consideration of greenhouse gas emissions and climate change. *Federal Register* 88(5), 1196–1211. Available: https://www.federalregister.gov/documents/2023/01/09/2023-00158/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions-and-climate. Accessed: November 11, 2024.

Connecticut Audubon Society. n.d. *Flying Drones Pose Danger to Threatened Birds*. Available: https://ct.audubon.org/news/flying-drones-pose-danger-threatened-birds. Accessed: November 22, 2024.

Cornell Lab of Ornithology. n.d. *All About Birds: Bald Eagle*. Available: https://www.allaboutbirds.org/guide/Bald_Eagle/overview. Accessed: November 22, 2024.

Cross Timbers Urban Forestry Council. 2019. *Cross Timbers Ecosystem*. Available: http://ctufc.org/cross-timbers-ecosystem. Accessed: November 22, 2024.

Ednie, G., D. M. Bird, and K. H. Elliott. 2021. Fewer Bat Passes Are Detected During Small, Commercial Drone Flights. *Scientific Reports* 11, 11529. Available: https://doi.org/10.1038/s41598-021-90905-0.

Federal Aviation Administration (FAA). 2025. *Order 1050.1G, FAA National Environmental Policy Act Implementing Procedures*. Available: https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1043997. Accessed: July 31, 2025.

Fu, Y., M. Kinniry, and L. N. Kloepper. 2018. The Chirocopter: A UAV for Recording Sound and Video of Bats at Altitude. *Methods in Ecology and Evolution* 9(6):1531–1535. Available: https://doi.org/10.1111/2041-210x.12992.

Griffith, G.E. Omernik, J.M, and Pierson, S.M. 1999. Level III and IV Ecoregions of Florida. Corvallis, Oregon, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory. Available: https://www.epa.gov/eco-research/ecoregion-download-files-state-region-10#pane-45. Accessed: May 9, 2025.

Griffin, Glenn. 2010. Level III North American Terrestrial Ecoregions: United States Descriptions. Prepared for North American Commission for Environmental Cooperation (CEC). May 11. Available: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fdmap-prod-oms-edc.s3.us-east-1.amazonaws.com%2FORD%2FEcoregions%2Fpubs%2FCEC_LEVEL_III_Descriptions_US_May2010.doc&wdOrigin=BROWSELINK. Accessed: May 9, 2025.

iNaturalist. 2025. iNaturalist. Available: https://www.inaturalist.org/. Accessed: August 5, 2025.

Intergovernmental Panel on Climate Change. n.d. 4.2.3.2 Volatile organic compounds (VOC). Available: https://archive.ipcc.ch/ipccreports/tar/wg1/140.htm. Accessed November 22, 2024.

Kalb, N., and C. Randler. 2019. Behavioral Responses to Conspecific Mobbing Calls Are Predator-Specific in Great Tits ( *Parus major*). *Ecology and Evolution* 9(16):9207–9213. Available: https://doi.org/10.1002/ece3.5467. Accessed: November 22, 2024.

Kuhlmann, K., Fontaine, A., Brisson-Curadeau, E.B., Bird, D.M., and Elliott, K.H. 2022. Miniaturization eliminates detectable impacts of drones on bat activity. *Methods in Ecology and Evolution*. 13(4): 842-851. Available: https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/2041-210X.13807. Accessed: November 22, 2024.

Lyon-Hill, Sarah, Tilashalski, Melissa, Ellis, Kimberly, and Travis Elli. 2020. *Measuring the Effects of Drone Delivery in the United States.* Virginia Tech Office of Economic Development and the Grado Department of Industrial & Systems Engineering.

McConnell, C. 2021. Identifying, Protecting and Managing Stopover Habitats for Wild Whooping Cranes on U.S. Army Corps of Engineers Lakes. *bioRxiv (Cold Spring Harbor Laboratory)*. Available: https://doi.org/10.1101/2020.12.30.424870. Accessed: November 29, 2024.

Moore, R. 2008. Winter diet of streaked horned larks in oregon. Unpublished report submitted to U.S. Fish and Wildlife Service. Available: https://cascadiaprairieoak.org/wp-content/uploads/2013/08/MooreWinterDietReport_2007.pdf. Accessed: May 9, 2025.

NASA Earth Observatory. 2023. 2022 tied for fifth warmest year on record. Available: https://earthobservatory.nasa.gov/images/150828/2022-tied-for-fifth-warmest-year-on-record. Accessed: November 11, 2024.

National Oceanic and Atmospheric Administration (NOAA) National Weather Service. No Date. Twilight Types. Available: https://www.weather.gov/lmk/twilight-types. Accessed: November 22, 2024.

National Park Service. 2024b. *National Wild and Scenic Rivers System*. Available: https://nps.maps.arcgis.com/apps/MapJournal/index.html?appid=ba6debd907c7431ea765071e9502d5ac#. Accessed: November 22, 2024.

National Park Service. 2024c. *Nationwide Rivers Inventory.* Available: https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm. Accessed: November 22, 2024.

Pearson, S. and Altman, B. 2005. Range-wide Streaked Horned Lark (*Eremophila alpestris strigata*) Assessment and Preliminary Conservation Strategy. Washington Department of Fish and Wildlife, Olympia, WA. Available: http://w.southsoundprairies.org/documents/streaked_horned_lark_assessment_strategy.pdf. Accessed: May 9, 2025.

Rodrigues, T. A., Patrikar, J., Oliveira, N. L., Matthews, H. S., Scherer, S., and Samaras, C. 2022. Drone flight data reveal energy and greenhouse gas emissions savings for very small package delivery. *Patterns* 3(8): 100569, ISSN 2666-3899. Available: https://doi.org/10.1016/j.patter.2022.100569. Accessed: November 11, 2024.

Royal Society for the Protection of Birds. 2023. *What Is Mobbing?* Available: https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/birdwatching/bird-behaviour/what-is-mobbing/. Accessed: November 22, 2024.

Sorenson, D. 2012. Puget Lowland Ecoregion. In: Sleeter, B.M., Wilson, T.S., and Acevedo, W., eds. *USGS Professional Paper 1794–A, Chapter 2*. Available: https://pubs.usgs.gov/pp/1794/a/chapters/pp1794a_chapter02.pdf. Accessed: August 5, 2025.

U.S. Census Bureau (USCB). 2022. ACS 1-Year Survey Estimates Tables. Available: https://data.census.gov/. Accessed: November 22, 2024.

U.S. Department of Health and Human Services (HHS). 2023. *Federal Poverty Income Guidelines.* Available: https://www.dhs.pa.gov/Services/Assistance/Documents/2023-Federal-Poverty-Income-Guidelines.pdf. Accessed: November 22, 2024.

U.S. Department of the Navy. 2022. *The Air Almanac 2023.* The Nautical Almanac Office United States Naval Observatory. Available: https://aa.usno.navy.mil/publications/aira. Accessed: November 22, 2024.

U.S. Environmental Protection Agency (EPA). 1995. Calculating Potential to Emit (PTE) for Emergency Generators. Available: https://www.epa.gov/sites/default/files/2015-08/documents/emgen.pdf. Accessed: November 11, 2024.

U.S. Environmental Protection Agency (EPA). 2023. Tailpipe Greenhouse Gas Emissions from a Typical Passenger Vehicle. Available: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1017FP5.pdf. Accessed: November 11, 2024.

U.S. Environmental Protection Agency (EPA). 2024a. Design Value Interactive Tool. Available: https://www.epa.gov/air-trends/design-value-interactive-tool. Accessed: November 25, 2024.

U.S. Environmental Protection Agency (EPA). 2024b. NAAQS Table. Available: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed: November 11, 2024.

U.S. Environmental Protection Agency (EPA). 2024d. De Minimis Tables. Available: https://www.epa.gov/general-conformity/de-minimis-tables. Accessed: November 11, 2024.

U.S. Fish and Wildlife Service (USFWS). n.a.-a. Gray Wolf. Available: https://www.fws.gov/species/gray-wolf-canis-lupus. Accessed: May 9, 2025.

U.S. Fish and Wildlife Service (USFWS). n.d.-b. *Perimyotis subflavus | U.S. Fish & Wildlife Service*. Available: https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus. Accessed: November 22, 2024.

U.S. Fish and Wildlife Service (USFWS). n.d.-c. *Keeping Wildlife Safe from Drones: Keeping Bald Eagles and Other Wildlife Safe from Drones.* Available: https://www.fws.gov/story/keeping-wildlife-safe-drones. Accessed: November 22, 2024.

U.S. Fish and Wildlife Service (USFWS). n.d.-d. Introducing. The Mazama Pocket Gopher. Available: https://fws.maps.arcgis.com/apps/Cascade/index.html?appid=a99553093e5a45b183c18e8cf0762176. Accessed: May 9, 2025.

U.S. Fish and Wildlife Service (USFWS). 2023. Recovery Outline for the Contiguous United States Distinct Population Segment of the North American Wolverine (*Gulo gulo luscus*). Available: https://ecos.fws.gov/docs/recovery_plan/NA_Wolverine_Recovery_Outline_Wolverine_20231221_signed.pdf. Accessed: May 9, 2025.

U.S. Fish and Wildlife Service (USFWS). 2023b. Mount Ranier White-tailed Ptarmigan. Species Status Assessment, Version 2. Available: https://iris.fws.gov/APPS/ServCat/DownloadFile/252595. Accessed: May 9, 2025

U.S. Fish and Wildlife Service (USFWS). 2024. Official Species List. Information for Planning and Conservation (IPaC). Available: https://ipac.ecosphere.fws.gov/. Accessed: November 22, 2024.

U.S. Fish and Wildlife Service (USFWS). 2024a. Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*) Species Status Assessment, Version 1.0. Available: https://iris.fws.gov/APPS/ServCat/DownloadFile/263505. Accessed: May 9, 2025.

Washington Department of Fish & Wildlife (WDFW). 2015. Chapter 3: Species of Greatest Conservation Need. In: Washington State Wildlife Action Plan. Available: https://wdfw.wa.gov/sites/default/files/publications/01742/5_Chapter3.pdf. Accessed: August 5, 2025.

WDFW . 2025a. Wolverine (*Gulo gulo luscus*). Available: https://wdfw.wa.gov/species-habitats/species/gulo-gulo-luscus#conservation. Accessed: May 9, 2025.

WDFW. 2025b. Gray Wolf (*Canis lupus*). Available: https://wdfw.wa.gov/species-habitats/species/canis-lupus#living. Accessed: May 5, 2025.

WDFW. 2025c. Wolf Packs in Washington. Available: https://wdfw.wa.gov/species-habitats/at-risk/species-recovery/gray-wolf/packs. Accessed: May 5, 2025.

WDFW. 2025d. Washington Gray Wolf Conservation and Management 2023 Annual Report. Available: https://wdfw.wa.gov/publications/02501. Accessed: May 5, 2025.

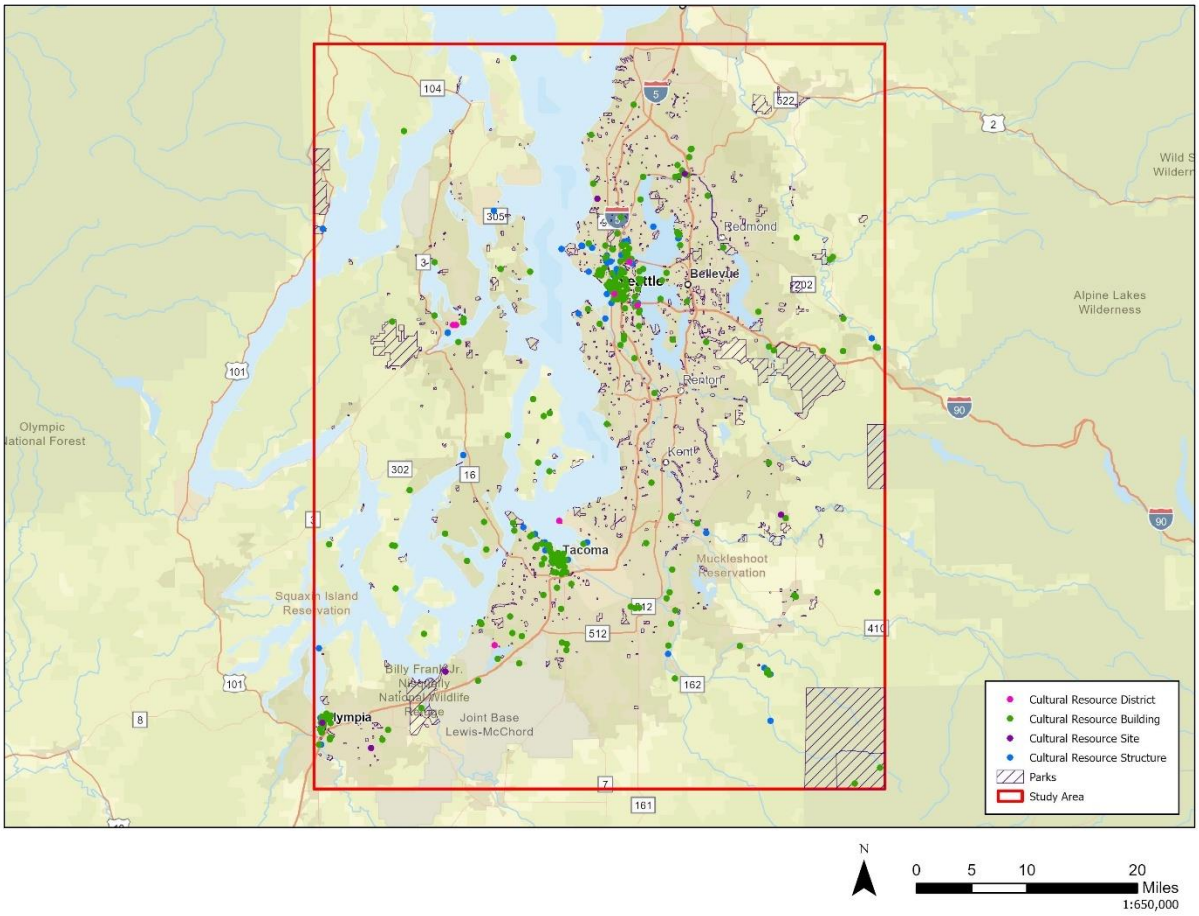
WDFW. 2025e. Northwestern pond turtle (*Actinemys marmorata*). Available: https://wdfw.wa.gov/species-habitats/species/actinemys-marmorata. Accessed: May 9, 2025.

WDFW. 2025f. Oregon spotted frog (*Rana pretiosa*). Available: https://wdfw.wa.gov/species-habitats/species/rana-pretiosa#conservation. Accessed: May 9, 2025.

WDFW. Undated. Monarch Butterfly (Danaus plexippus). Available: https://wdfw.wa.gov/species-habitats/species/danaus-plexippus#desc-range. Accessed: August 5, 2025.

Wiken, E., F. Jimenez Nava, and G. Griffith. 2011. North American Terrestrial Ecoregions – Level III. Commission for Environmental Cooperation (CEC). Available: https://dmap-prod-oms-edc.s3.us-east-1.amazonaws.com/ORD/Ecoregions/pubs/NA_TerrestrialEcoregionsLevel3_Final-2june11_CEC.pdf. Accessed: May 5, 2025.

# Appendix B
# **Section 4(f)**



# Appendix C
# List of Agencies Consulted, Preparers, and Reviewers

| Consulting Agency / Tribal Government | Representative |
|---|---|
| U.S. Fish and Wildlife Service | XX, Field Supervisor |
| Washington Department of Archeology and Historic Preservation | Maureen Elenga, Architectural Historian |
| Chairman Gerald Lewis | Confederated Tribes and Bands of the Yakama Nation |
| Chairman Dustin Klatush | Confederated Tribes of the Chehalis Reservation |
| Chairwoman Patty Kinswa-Gaiser | Cowlitz Indian Tribe |
| Chairman Ron Allen | Jamestown S'Klallam Tribe |
| Chairman William (Willie) Frank | Nisqually Indian Tribe |
| Chairwoman Amber Caldera | Port Gamble S'Klallam Tribe |
| President Guy Capoeman | Quinault Indian Nation |
| Chairman Tom Wooten | Samish Indian Nation |
| Chairman Nino Maltos | Sauk-Suiattle Indian Tribe |
| Chairman Charles "Guy" Miller | Skokomish Indian Tribe |
| Chairman Kristopher Peters | Squaxin Island Tribe of the Squaxin Island Reservation |
| Chairman Eric White | Stillaguamish Tribe of Indians of Washington |
| Chairman Leonard Forsman | Suquamish Indian Tribe of the Port Madison Reservation |
| Chairman Steve Edwards | Swinomish Indian Tribal Community |
| Chairperson Teri Gobin | Tulalip Tribes of Washington |
| Chairman Anthony Hillaire | Lummi Tribe of the Lummi Reservation |
| Chairwoman Frances Charles | Lower Elwha Tribal Community |
| Chairperson Jaison Elkins | Muckleshoot Indian Tribe |
| Chairman Bill Sterud | Puyallup Tribe of the Puyallup Reservation |
| Chairman Robert de los Angeles | Snoqualmie Indian Tribe |
| Chairwomen Marilyn Scott | Upper Skagit Indian Tribe |

| Name and Affiliation | Years of Industry Experience | EA Responsibility |
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| Jimmy Zaccagnino, ICF | 5 | Research and Document Preparation |
| Elisabeth Mahoney, ICF | 6 | Research and Document Preparation |

# Appendix D
# **Noise**

# TECHNICAL NOISE STUDY REPORT: ZIPLINE PLATFORM 2 UNMANNED AIRCRAFT PACKAGE DELIVERY OPERATIONS

# REPORT NO. 021925

**PREPARED FOR:**

Federal Aviation Administration
Unmanned Aircraft Systems Integration Office (AUS)
950 L'Enfant Plaza SW, Suite 500
Washington, D.C. 20024

**PREPARED BY:**

ICF

**May 2025**

ICF. 2025. *Technical Noise Study Report: Zipline P2 Zip Unmanned Aircraft Package Delivery Operations.* Report No. 021925. May. Seatle, WA. Prepared for the Federal Aviation Administration. Washington, DC.

# Contents

# List of Tables

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# Acronyms and Abbreviations

# Acronyms and Abbreviations

| | |
|---|---|
| AGL | above ground level |
| CONOPS | Concept of Operations |
| dB | decibel |
| dBA | A-weighted decibel |
| DNL | day night average sound level |
| FAA | Federal Aviation Administration |
| Lmax | maximum sound level |
| MTOW | maximum takeoff weight |
| SEL | sound exposure level |
| UA | unmanned aircraft |

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# Chapter 1
# Introduction

## 1.1 Purpose

The purpose of this report is to provide calculations of noise exposure for package delivery operations by unmanned aircraft (UA) developed by Zipline International, Inc. Noise exposure estimates are provided for the Platform 2 UA (P2 Zip) based on sound level testing data collected by Zipline (2025).

The analysis in this report provides a methodology of estimating noise levels from UA operation that is specific to the Zipline P2 Zip. Because the methods used in this report are based on collected measurements, they should not be applied to other UA models. The analysis accounts for source levels only and does not include a site-specific geographic component, nor does it account for the presence of structures in urban areas.

The sound level measurements presented in this report are based closely on the concept of operations (CONOPS) for all modes of UA package delivery and associated operations. Passby exposure levels at different distances from an origination or delivery point are based on as-tested conditions, which were intended to simulate all operation types in the P2 Zip. Testing simulations consisted of the following operations:

- Undocking and departure from an origination point (dock)
- Package offloading via Droid at a delivery point using the P2 Zip and departure back to dock
- Returning and landing at a dock
- Hovering in place
- En route (with a package)

Total DNL noise exposures are calculated based on various scales of package delivery and associated activities using passby exposure levels for the types of operation applicable to docks, delivery points and en route locations.

## 1.2 Fundamental Concepts

Various noise descriptors or metrics have been developed to describe time-varying noise levels. The following metrics are used in this evaluation.

- Sound Exposure Level (SEL): SEL represents the total sound energy occurring over a specified period compressed into a one-second time interval. The SEL metric has broad utility in noise prediction and is a primary metric calculated from Leq values collected from sound level testing of UAs.
- Day Night Average Sound Level (DNL): DNL is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10 decibel (dB) penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m. The DNL is used in this

analysis to describe noise exposure for daily operations from a dock, en route, or a delivery point.

- Maximum Sound Level (Lmax): Lmax is the highest sound level measured during a specified period.
- Community Noise Equivalent Level (CNEL): Similar to DNL, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m. and a 5 dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

## 1.3 Regulatory Context

The noise exposure estimates in this document are intended to be used for environmental assessments of operations involving the Zipline P2 Zip, for compliance with the National Environmental Policy Act, and operational requirements for a commercial carrier under 14 Code of Federal Regulations Part 135. The analysis method used in this report does not apply standard models such as the Aviation Environmental Design Tool but instead applies an estimation method based on collected noise measurements. As such the application of this method is only applicable to the Zipline P2 Zip. The nonstandard methodology, equivalent to Federal Aviation Administration (FAA) Order 1050.1F, was approved by the FAA to inform the environmental decision-making regarding drone noise exposure from the proposed Zipline P2 Zip package delivery operations.

Chapter 2
# Methods

## 2.1 Sound Level Testing of the P2 Zip

The analysis in this report used sound level testing data described in the *P2 Zip Noise Assessment Test Plan and Report Revision D* prepared by Zipline (2025).

Sound level testing was conducted at the Zipline test facility in Esparto, California in November 2024. The testing protocol followed FAA direction given in the document, *Measuring Drone Noise for Environmental Review Process*, dated October 2023 (FAA 2023).

The typical operational profile of the UA can be broken into Undocking, En route (outbound), Delivery, En route (inbound) and Docking. The following subsections provide a narrative description of these flight phases.

### 2.1.1 Undocking

Typical sequence of undocking operation from the dock:

1. Load package into the Droid and stow the Droid into the P2 Zip prior to undocking.
2. Complete Automated and visual pre-flight checks.
3. Conduct pre-flight motor start (approximately 25 seconds).
4. Conduct an undocking maneuver and ascend vertically from dock until reaching approximately 330 feet above ground level (AGL) (approximately 75 seconds).
5. Begin horizontal flight at constant acceleration until a speed of 41 knots is reached (approximately 10 seconds).
6. Maintain horizontal flight at constant velocity of 41 knots.

### 2.1.2 En route (Outbound)

Typical sequence of en route operation:

1. Cruise at a typical speed of approximately 41 knots towards the delivery location, at approximately 330 ft AGL.

### 2.1.3 Delivery

Typical sequence of delivery operation:

1. P2 Zip with package approaches at 330 feet AGL.
2. Decelerate from 41 knots to zero speed (approximately 20 seconds).
3. Maintain hover at 330 feet AGL as Droid is un-stowed from the P2 Zip, Droid is winched down to the ground at the delivery point, and Droid is re-stowed once delivery is complete (approximately 75 seconds).

4. Begin return horizontal flight at constant acceleration until a speed of 41 knots is reached. (approximately 10 seconds).

### 2.1.4 Enroute (Inbound)

Typical sequence of en route operation:

1. Cruise at a typical speed of approximately 41 knots to the dock, at approximately 330 ft AGL.

### 2.1.5 Docking

Sequence of docking operation:

1. P2 Zip approaches at approximately 330 feet AGL.
2. Decelerate from approximately 41 knots to zero (approximately 20 seconds).
3. Descend to the dock and complete the docking maneuver (approximately 75 seconds).
4. Shutdown propellers and aircraft systems.

## 2.2 Sound Exposure Levels from Sound Level Measurements

A brief summary of sound exposure levels from test results is shown in Table 1. The test results that include en route operation assume a nominal cruise speed of 41 knots (Zipline 2025). All tests were conducted with payload at maximum takeoff weight (MTOW). The total weight of the P2 Zip with payload was 63 pounds (55 pounds of aircraft weight and 8 pounds of payload). No flights without payload were conducted. The test flights were conducted at altitude and speed of planned takeoff and delivery operations. As such, no adjustments for speed or altitude were added to SEL values. Durations of test flights used for calculating SEL are shown in Table 2.

**Table 1. Summary of Sound Exposure Levels, P2 Zip**

| Test Series | Altitude | Microphone Position | Average SEL at the 50-foot undertrack microphone (dBA) |
|---|---|---|---|
| Leaving dock with payload at MTOW and takeoff | Ascend to 330 feet AGL, then forward flight at 330 feet AGL | Under flight path, 50 feet away from dock | 85.0 |
| Arrival with payload at MTOW and landing at dock | Arrive at 330 feet AGL and descend to dock | Under flight path, 50 feet away from dock | 86.2 |
| Delivery hover with payload at MTOW | Hover at 330 feet AGL | Under flight path, 50 feet away from delivery point | 74.1 |
| En Route with Payload at MTOW | 330 feet AGL at a forward flight speed of 41 knots | 50 feet perpendicular distance from undertrack line of flight[1] | 69.1 |

Source: Zipline 2025.

AGL = above ground level

MTOW = maximum takeoff weight

dBA = A-weighted decibel

[1] The maximum SEL was measured at a 50-foot offset position during the en route tests. This should be used to represent the undertrack SEL value for en route overflights.

**Table 2. Durations from Sound Level Testing used to Derive Sound Exposure Levels, P2 Zip**

| Operation | Test series | Test # | Start time (seconds) | End time (seconds) | Duration (seconds) |
|---|---|---|---|---|---|
| Depart from dock | Docking/Docking A | 1 | 46 | 180 | 134 |
| Depart from dock | Docking/Docking A | 2 | 44 | 168 | 124 |
| Depart from dock | Docking/Docking A | 3 | 45 | 171 | 126 |
| Depart from dock | Docking/Docking A | 4 | 44 | 170 | 126 |
| Depart from dock | Docking/Docking A | 5 | 47 | 174 | 127 |
| Depart from dock | Docking/Docking A | 6 | 45 | 171 | 126 |
| Depart from dock | Docking/Docking B | 1 | 47 | 171 | 124 |
| Depart from dock | Docking/Docking B | 2 | 43 | 167 | 124 |
| Depart from dock | Docking/Docking B | 3 | 48 | 172 | 124 |
| Depart from dock | Docking/Docking B | 4 | 47 | 171 | 124 |
| Depart from dock | Docking/Docking B | 5 | 51 | 175 | 124 |
| Depart from dock | Docking/Docking B | 6 | 49 | 172 | 123 |
| Depart from dock | Docking/Docking C | 1 | 48 | 171 | 123 |
| Depart from dock | Docking/Docking C | 2 | 44 | 169 | 125 |
| Depart from dock | Docking/Docking C | 3 | 45 | 168 | 123 |
| Depart from dock | Docking/Docking C | 4 | 48 | 172 | 124 |
| Depart from dock | Docking/Docking C | 5 | 44 | 168 | 124 |
| Depart from dock | Docking/Docking C | 6 | 43 | 169 | 126 |

| Operation | Test series | Test # | Start time (seconds) | End time (seconds) | Duration (seconds) |
|---|---|---|---|---|---|
| Arrive at dock | Docking/Docking A | 1 | 238 | 359 | 121 |
| Arrive at dock | Docking/Docking A | 2 | 230 | 350 | 120 |
| Arrive at dock | Docking/Docking A | 3 | 229 | 351 | 122 |
| Arrive at dock | Docking/Docking A | 4 | 228 | 350 | 122 |
| Arrive at dock | Docking/Docking A | 5 | 232 | 354 | 122 |
| Arrive at dock | Docking/Docking A | 6 | 230 | 350 | 120 |
| Arrive at dock | Docking/Docking B | 1 | 236 | 352 | 116 |
| Arrive at dock | Docking/Docking B | 2 | 228 | 349 | 121 |
| Arrive at dock | Docking/Docking B | 3 | 232 | 355 | 123 |
| Arrive at dock | Docking/Docking B | 4 | 232 | 355 | 123 |
| Arrive at dock | Docking/Docking B | 5 | 235 | 358 | 123 |
| Arrive at dock | Docking/Docking B | 6 | 233 | 353 | 120 |
| Arrive at dock | Docking/Docking C | 1 | 234 | 353 | 119 |
| Arrive at dock | Docking/Docking C | 2 | 230 | 351 | 121 |
| Arrive at dock | Docking/Docking C | 3 | 231 | 350 | 119 |
| Arrive at dock | Docking/Docking C | 4 | 234 | 354 | 120 |
| Arrive at dock | Docking/Docking C | 5 | 230 | 351 | 121 |
| Arrive at dock | Docking/Docking C | 6 | 231 | 350 | 119 |
| Transition/Deceleration | Docking/Docking A | 1 | 253 | 274 | 21 |
| Transition/Deceleration | Docking/Docking A | 2 | 246 | 266 | 20 |
| Transition/Deceleration | Docking/Docking A | 3 | 245 | 266 | 21 |
| Transition/Deceleration | Docking/Docking A | 4 | 235 | 265 | 30 |
| Transition/Deceleration | Docking/Docking A | 5 | 249 | 269 | 20 |
| Transition/Deceleration | Docking/Docking A | 6 | 245 | 266 | 21 |
| Transition/Deceleration | Docking/Docking B | 1 | 246 | 267 | 21 |
| Transition/Deceleration | Docking/Docking B | 2 | 245 | 265 | 20 |
| Transition/Deceleration | Docking/Docking B | 3 | 251 | 270 | 19 |
| Transition/Deceleration | Docking/Docking B | 4 | 254 | 271 | 17 |
| Transition/Deceleration | Docking/Docking B | 5 | 254 | 273 | 19 |
| Transition/Deceleration | Docking/Docking B | 6 | 249 | 268 | 19 |
| Transition/Deceleration | Docking/Docking C | 1 | 248 | 268 | 20 |
| Transition/Deceleration | Docking/Docking C | 2 | 244 | 265 | 21 |
| Transition/Deceleration | Docking/Docking C | 3 | 244 | 265 | 21 |
| Transition/Deceleration | Docking/Docking C | 4 | 248 | 268 | 20 |
| Transition/Deceleration | Docking/Docking C | 5 | 245 | 266 | 21 |
| Transition/Deceleration | Docking/Docking C | 6 | 246 | 266 | 20 |
| Transition/Acceleration | Docking/Docking A | 1 | 152 | 162 | 10 |
| Transition/Acceleration | Docking/Docking A | 2 | 143 | 153 | 10 |
| Transition/Acceleration | Docking/Docking A | 3 | 141 | 154 | 13 |
| Transition/Acceleration | Docking/Docking A | 4 | 139 | 153 | 14 |

| Operation | Test series | Test # | Start time (seconds) | End time (seconds) | Duration (seconds) |
|---|---|---|---|---|---|
| Transition/Acceleration | Docking/Docking A | 5 | 144 | 158 | 14 |
| Transition/Acceleration | Docking/Docking A | 6 | 141 | 154 | 13 |
| Transition/Acceleration | Docking/Docking B | 1 | 143 | 156 | 13 |
| Transition/Acceleration | Docking/Docking B | 2 | 138 | 151 | 13 |
| Transition/Acceleration | Docking/Docking B | 3 | 143 | 157 | 14 |
| Transition/Acceleration | Docking/Docking B | 4 | 143 | 156 | 13 |
| Transition/Acceleration | Docking/Docking B | 5 | 146 | 159 | 13 |
| Transition/Acceleration | Docking/Docking B | 6 | 142 | 156 | 14 |
| Transition/Acceleration | Docking/Docking C | 1 | 143 | 156 | 13 |
| Transition/Acceleration | Docking/Docking C | 2 | 140 | 153 | 13 |
| Transition/Acceleration | Docking/Docking C | 3 | 141 | 154 | 13 |
| Transition/Acceleration | Docking/Docking C | 4 | 143 | 157 | 14 |
| Transition/Acceleration | Docking/Docking C | 5 | 140 | 154 | 14 |
| Transition/Acceleration | Docking/Docking C | 6 | 139 | 153 | 14 |
| Transit southbound | En Route | 1 | 259 | 351 | 92 |
| Transit southbound | En Route | 2 | 245 | 329 | 84 |
| Transit southbound | En Route | 3 | 243 | 326 | 83 |
| Transit northbound | En Route | 1 | 420 | 473 | 53 |
| Transit northbound | En Route | 2 | 397 | 451 | 54 |
| Transit northbound | En Route | 3 | 393 | 449 | 56 |
| Delivery Fading away | Delivery | 1 | 185 | 215 | 30 |
| Delivery Fading away | Delivery | 2 | 185 | 215 | 30 |
| Delivery Fading away | Delivery | 3 | 185 | 215 | 30 |
| Delivery Fading away | Delivery | 4 | 180 | 210 | 30 |
| Delivery Fading away | Delivery | 5 | 180 | 210 | 30 |
| Delivery Fading away | Delivery | 6 | 185 | 215 | 30 |
| Delivery Starboard side | Delivery | 1 | 230 | 260 | 30 |
| Delivery Starboard side | Delivery | 2 | 230 | 260 | 30 |
| Delivery Starboard side | Delivery | 3 | 235 | 265 | 30 |
| Delivery Starboard side | Delivery | 4 | 225 | 255 | 30 |
| Delivery Starboard side | Delivery | 5 | 225 | 255 | 30 |
| Delivery Starboard side | Delivery | 6 | 235 | 265 | 30 |
| Delivery Fading toward | Delivery | 1 | 280 | 310 | 30 |
| Delivery Fading toward | Delivery | 2 | 280 | 310 | 30 |
| Delivery Fading toward | Delivery | 3 | 280 | 310 | 30 |
| Delivery Fading toward | Delivery | 4 | 275 | 305 | 30 |
| Delivery Fading toward | Delivery | 5 | 275 | 305 | 30 |
| Delivery Fading toward | Delivery | 6 | 280 | 310 | 30 |
| Delivery Port side | Delivery | 1 | 325 | 355 | 30 |
| Delivery Port side | Delivery | 2 | 325 | 355 | 30 |

| Operation | Test series | Test # | Start time (seconds) | End time (seconds) | Duration (seconds) |
|---|---|---|---|---|---|
| Delivery Port side | Delivery | 3 | 325 | 355 | 30 |
| Delivery Port side | Delivery | 4 | 315 | 345 | 30 |
| Delivery Port side | Delivery | 5 | 315 | 345 | 30 |
| Delivery Port side | Delivery | 6 | 325 | 355 | 30 |
| Depart from dock | Docking/Docking A | 1 | 46 | 180 | 134 |
| Depart from dock | Docking/Docking A | 2 | 44 | 168 | 124 |
| Depart from dock | Docking/Docking A | 3 | 45 | 171 | 126 |
| Depart from dock | Docking/Docking A | 4 | 44 | 170 | 126 |
| Depart from dock | Docking/Docking A | 5 | 47 | 174 | 127 |
| Depart from dock | Docking/Docking A | 6 | 45 | 171 | 126 |

Source: Zipline 2025, ICF 2025.
Note: Time stamp values are rounded to whole numbers.

### 2.2.1 Dock Sound Exposure Levels

During testing, sound levels were measured continuously for a simulated delivery cycle from the dock. The tests were conducted for three microphone array orientations, each using five microphones on a linear track. The microphones were set at distances of zero, 50, 100, 200 and 400 feet from the dock. The zero-foot position was located under the docking cradle. Microphone array A was oriented directly below the flight track for departure and arrival. Microphone array B was oriented perpendicularly from the dock at a 90-degree angle from the flight track, and Microphone array C was oriented opposite the direction of flight (Zipline 2025). Six (6) tests were conducted for each of the microphone orientations. Sound exposure level (SEL) values were then calculated from measured time history data for each of the arrays.

Undocking SEL calculations include all phases of departure from a dock, including undocking, ascent to cruising altitude, acceleration and transition to cruising speed. All SEL values include payload at MTOW. The results of SEL calculations for each test are shown in Table 3. A plot of SEL values for the three microphone arrays is shown in Figure 1. The adjusted undocking SEL is based on the maximum sound exposure level among the three tested microphone arrays at each distance. The aircraft had to start decelerating almost immediately after reaching its cruise speed over the Microphone Array A 400-foot microphone due to testing site limitations. To account for this test limitation and transition noise to cruising speed at en route altitude, the deceleration noise data was included in the SEL, and additionally one half of en route noise emission was added to the SEL. This method represents the SEL value of the full undocking operation.

**Table 3. Sound Exposure Levels for Undocking at MTOW, P2 Zip**

| Microphone Position, Distance from Dock (feet) | Test 1 SEL (dBA) | Test 2 SEL (dBA) | Test 3 SEL (dBA) | Test 4 SEL (dBA) | Test 5 SEL (dBA) | Test 6 SEL (dBA) | Average SEL (dBA) |
|---|---|---|---|---|---|---|---|
| **Microphone Array A – Under flight track** | | | | | | | |
| 0 | 97.1 | 96.6 | 95.8 | 95.2 | 97.6 | 95.1 | 96.2 |
| 50 | 86.3 | 85.2 | 85.0 | 83.7 | 85.5 | 84.4 | 85.0 |
| 100 | 79.7 | 78.7 | 78.7 | 77.6 | 79.6 | 78.2 | 78.8 |
| 200 | 74.0 | 73.9 | 73.7 | 73.0 | 73.9 | 74.1 | 73.8 |
| 400 | 71.9 | 71.2 | 71.4 | 70.5 | 71.4 | 70.8 | 71.2 |
| **Microphone Array B – Perpendicular to flight track** | | | | | | | |
| 0 | 99.0 | 98.2 | 97.4 | 98.6 | 98.7 | 97.7 | 98.3 |
| 50 | 83.4 | 83.2 | 81.9 | 84.2 | 83.7 | 83.2 | 83.3 |
| 100 | 80.8 | 80.9 | 79.1 | 81.5 | 80.9 | 80.5 | 80.6 |
| 200 | 73.8 | 74.3 | 73.3 | 74.9 | 74.1 | 74.1 | 74.1 |
| 400 | 68.8 | 69.1 | 69.3 | 71.0 | 69.7 | 68.7 | 69.4 |
| **Microphone Array C – Behind dock relative to flight track** | | | | | | | |
| 0 | 94.4 | 95.4 | 96.1 | 96.4 | 95.9 | 95.8 | 95.7 |
| 50 | 83.7 | 84.0 | 84.6 | 84.6 | 84.7 | 84.9 | 84.4 |
| 100 | 80.0 | 80.7 | 81.0 | 81.0 | 81.2 | 81.5 | 80.9 |
| 200 | 75.7 | 76.0 | 76.0 | 76.0 | 75.6 | 75.8 | 75.8 |
| 400 | 71.4 | 71.5 | 71.6 | 71.9 | 71.3 | 71.6 | 71.5 |
| **Maximum Adjusted SEL from Microphone Arrays A, B, and C (dBA)[1]** | | | | | | | |
| 0 | 98.3 | | | | | | |
| 50 | 85.1 | | | | | | |
| 100 | 81.0 | | | | | | |
| 200 | 76.3 | | | | | | |
| 400 | 72.6 | | | | | | |

Source: Zipline 2025, ICF 2025.

dBA = A-weighted decibel

[1] The undocking SEL is adjusted to include one half of the en route SEL (i.e. 66.1 dBA) to include sound energy for transition from acceleration away from the dock to cruise speed.

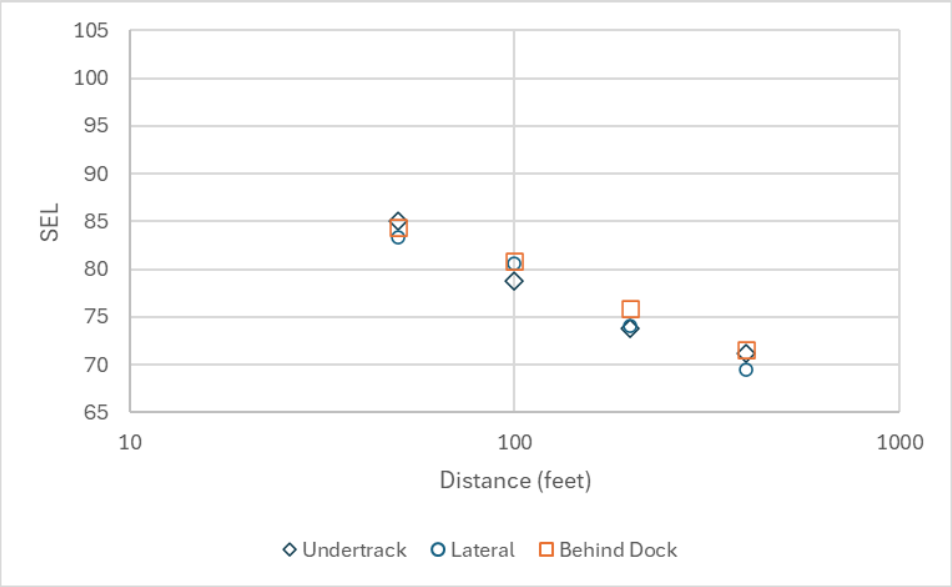


**Figure 1. Plot of Average Measured SEL Values at the Three Microphone Arrays for UA Undocking**

Docking SEL calculations include all phases of arrival including approach at cruise speed, deceleration, descent, and docking. The results of SEL calculations for each test are shown in Table 4. A plot of SEL values for the three microphone arrays is shown in Figure 2. Similar to the undocking SEL, the adjusted docking SEL is based on the maximum sound exposure level among the three tested microphone arrays. To account for transition noise from cruising speed at altitude to stationary flight, one half of en route noise emission was added to the SEL. This was added due to testing site constraints that only allowed a limited amount of time for the UA to travel at cruise speed when returning to the dock and the aircraft beginning to decelerate shortly after passing over the Microphone Array A 400-foot microphone.

**Table 4. Sound Exposure Levels for Docking at MTOW, P2 Zip**

| Microphone Position, Distance from Dock (feet) | Test 1 SEL (dBA) | Test 2 SEL (dBA) | Test 3 SEL (dBA) | Test 4 SEL (dBA) | Test 5 SEL (dBA) | Test 6 SEL (dBA) | Average SEL (dBA) |
|---|---|---|---|---|---|---|---|
| **Microphone Array A – Under flight track** | | | | | | | |
| 0 | 97.3 | 95.3 | 95.5 | 96.9 | 96.9 | 95.3 | 96.2 |
| 50 | 87.3 | 84.6 | 86.1 | 86.7 | 86.8 | 85.9 | 86.2 |
| 100 | 80.9 | 79.1 | 80.3 | 81.1 | 81.3 | 80.2 | 80.5 |
| 200 | 76.0 | 73.8 | 74.6 | 75.2 | 76.3 | 74.5 | 75.1 |
| 400 | 72.7 | 70.9 | 71.8 | 71.9 | 73.0 | 71.4 | 71.9 |
| **Microphone Array B – Perpendicular to flight track** | | | | | | | |
| 0 | 97.4 | 98.3 | 98.7 | 99.7 | 99.0 | 98.8 | 98.6 |
| 50 | 83.6 | 85.8 | 85.8 | 86.1 | 86.3 | 85.4 | 85.5 |
| 100 | 81.0 | 82.8 | 82.8 | 83.3 | 83.5 | 81.8 | 82.5 |
| 200 | 74.3 | 75.4 | 75.9 | 76.1 | 76.0 | 74.5 | 75.4 |
| 400 | 71.3 | 70.4 | 70.7 | 70.8 | 70.5 | 69.3 | 70.5 |

| Microphone Position, Distance from Dock (feet) | Test 1 SEL (dBA) | Test 2 SEL (dBA) | Test 3 SEL (dBA) | Test 4 SEL (dBA) | Test 5 SEL (dBA) | Test 6 SEL (dBA) | Average SEL (dBA) |
|---|---|---|---|---|---|---|---|
| **Microphone Array C – Behind dock relative to flight track** | | | | | | | |
| 0 | 94.8 | 95.5 | 95.4 | 95.7 | 95.4 | 96.6 | 95.6 |
| 50 | 84.9 | 84.9 | 86.0 | 86.6 | 85.3 | 85.8 | 85.6 |
| 100 | 81.6 | 81.0 | 83.1 | 83.1 | 82.0 | 82.1 | 82.1 |
| 200 | 76.4 | 76.2 | 77.2 | 77.1 | 76.2 | 75.9 | 76.5 |
| 400 | 71.1 | 71.1 | 71.8 | 71.7 | 71.3 | 71.1 | 71.3 |
| **Maximum Adjusted SEL from Microphone Arrays A, B, and C (dBA)[1]** | | | | | | | |
| 0 | 98.7 | | | | | | |
| 50 | 86.3 | | | | | | |
| 100 | 82.7 | | | | | | |
| 200 | 76.9 | | | | | | |
| 400 | 73.0 | | | | | | |

Source: Zipline 2025, ICF 2025.
dBA = A-weighted decibel
[1] The docking SEL is adjusted to include one half of the en route SEL (i.e. 66.1 dBA) to include sound energy for transition from cruise speed to deceleration toward the dock.

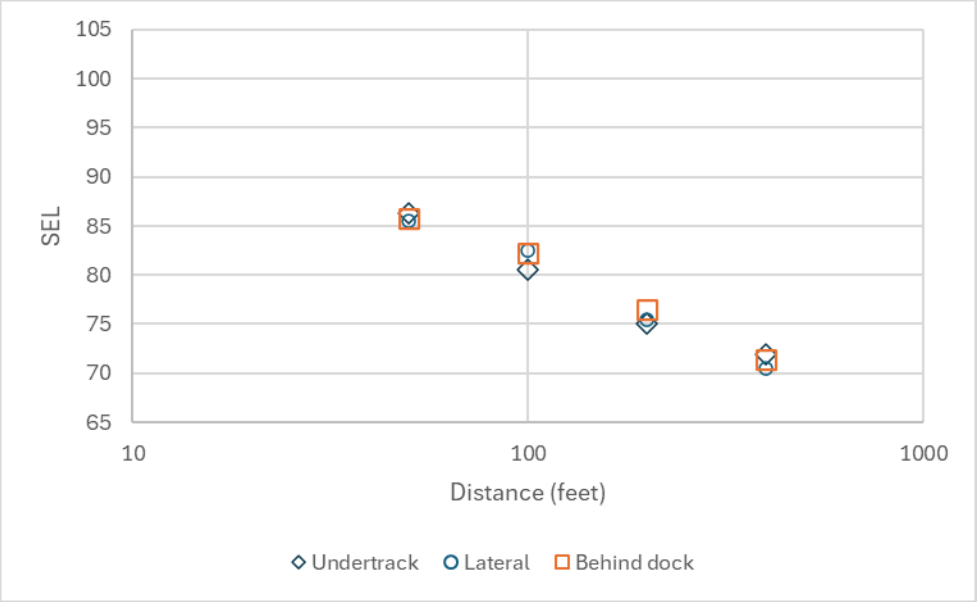


**Figure 2. Plot of Average Measured SEL Values at the Three Microphone Arrays for UA docking**

## 2.2.2 Delivery Sound Exposure Levels

During testing, sound levels were measured during hover at a simulated delivery point. The tests were conducted for one microphone array using five microphones on a linear track. The microphones were set at distances of zero, 50, 100, 200 and 400 feet from the delivery point (Zipline 2025). Six (6) tests were conducted for four (4) different hover orientations to measure different acoustic directivities from the UA during delivery hover. Hover was tested at 330 feet AGL. Sound

exposure level (SEL) values were then calculated from measured time history data for each of the UA orientations. The results of SEL calculations for each hover test are shown in Table 5. According to the data, the loudest average SEL occurs at the 50-foot microphone position for all hover orientations. Among the hover orientations, the port side of the P2 yielded the highest SEL values. A plot of SEL values from measurements for port side hover is shown in Figure 3.

The adjusted delivery SEL shown in Table 4 accounts for hover time during delivery operations, which would occur for a longer time than as-tested conditions. A time correction factor is added to scale up the sound energy to time required for delivery. The correction factor is given by:

$$K_{hover} = 10 * \text{Log}\ (75\ \text{seconds}/30\ \text{seconds}) \quad (1)$$

Sound energy for deceleration upon arrival to the delivery site and acceleration away upon completion of a delivery is included from docking and undocking time history test data. This is discussed further in Section 3.2.

**Table 5. Sound Exposure Levels from Sound Level Testing for Delivery Hover at MTOW, P2 Zip**

| Microphone Position, Distance from Delivery Point (feet) | Test 1 SEL (dBA) | Test 2 SEL (dBA) | Test 3 SEL (dBA) | Test 4 SEL (dBA) | Test 5 SEL (dBA) | Test 6 SEL (dBA) | Average SEL (dBA) |
|---|---|---|---|---|---|---|---|
| **Delivery Hover Oriented Toward Microphone Array** | | | | | | | |
| 0 | 72.0 | 72.4 | 71.4 | 71.1 | 72.0 | 71.7 | 71.8 |
| 50 | 74.2 | 74.6 | 73.4 | 73.2 | 73.8 | 73.4 | 73.8 |
| 100 | 70.5 | 70.1 | 69.4 | 68.8 | 69.2 | 69.0 | 69.5 |
| 200 | 68.6 | 68.2 | 68.0 | 67.4 | 67.2 | 67.8 | 67.9 |
| 400 | 61.1 | 62.1 | 62.4 | 62.1 | 62.2 | 62.2 | 62.0 |
| **Delivery Hover Oriented Away from Microphone Array** | | | | | | | |
| 0 | 71.5 | 71.3 | 72.2 | 71.0 | 69.2 | 69.8 | 70.8 |
| 50 | 74.0 | 72.2 | 72.5 | 71.2 | 68.9 | 70.5 | 71.5 |
| 100 | 68.3 | 68.3 | 69.3 | 68.1 | 65.2 | 67.0 | 67.7 |
| 200 | 66.9 | 66.7 | 67.7 | 67.0 | 64.7 | 66.1 | 66.5 |
| 400 | 61.4 | 61.3 | 62.4 | 61.8 | 61.3 | 61.7 | 61.7 |
| **Delivery Hover Oriented Starboard Toward Microphone Array** | | | | | | | |
| 0 | 72.0 | 69.4 | 69.7 | 69.1 | 68.8 | 70.5 | 69.9 |
| 50 | 74.6 | 71.4 | 72.3 | 70.8 | 70.7 | 71.8 | 71.9 |
| 100 | 70.1 | 67.4 | 68.1 | 66.9 | 66.8 | 67.2 | 67.7 |
| 200 | 68.5 | 66.6 | 67.0 | 66.2 | 66.0 | 65.6 | 66.7 |
| 400 | 62.8 | 61.0 | 62.2 | 61.6 | 62.0 | 63.5 | 62.2 |
| **Delivery Hover Oriented Port Toward Microphone Array** | | | | | | | |
| 0 | 73.3 | 72.6 | 72.3 | 71.2 | 72.1 | 72.1 | 72.3 |
| 50 | 75.5 | 74.5 | 74.5 | 72.5 | 73.4 | 74.3 | 74.1 |
| 100 | 70.8 | 70.7 | 70.1 | 68.6 | 69.0 | 70.3 | 69.9 |
| 200 | 69.0 | 69.5 | 68.7 | 67.0 | 67.9 | 68.6 | 68.4 |
| 400 | 62.8 | 62.8 | 63.6 | 63.8 | 63.1 | 64.1 | 63.4 |

| Microphone Position, Distance from Delivery Point (feet) | Test 1 SEL (dBA) | Test 2 SEL (dBA) | Test 3 SEL (dBA) | Test 4 SEL (dBA) | Test 5 SEL (dBA) | Test 6 SEL (dBA) | Average SEL (dBA) |
|---|---|---|---|---|---|---|---|
| **Maximum Adjusted SEL from Microphone Array (dBA)[1]** | | | | | | | |
| 0 | 77.3 | | | | | | |
| 50 | 79.0 | | | | | | |
| 100 | 76.3 | | | | | | |
| 200 | 75.3 | | | | | | |
| 400 | 73.4 | | | | | | |

Source: Zipline 2025, ICF 2025.

dBA = A-weighted decibel

[1] The delivery hover is adjusted to include deceleration from en route to a delivery site, a time correction for delivery operations (75 seconds) to scale sound energy from as-tested conditions (30 seconds), and acceleration away from a delivery site. Acceleration and deceleration sound energy is from portions of docking and undocking tests at cruising altitude. This is shown in Section 3.2, Table 7.

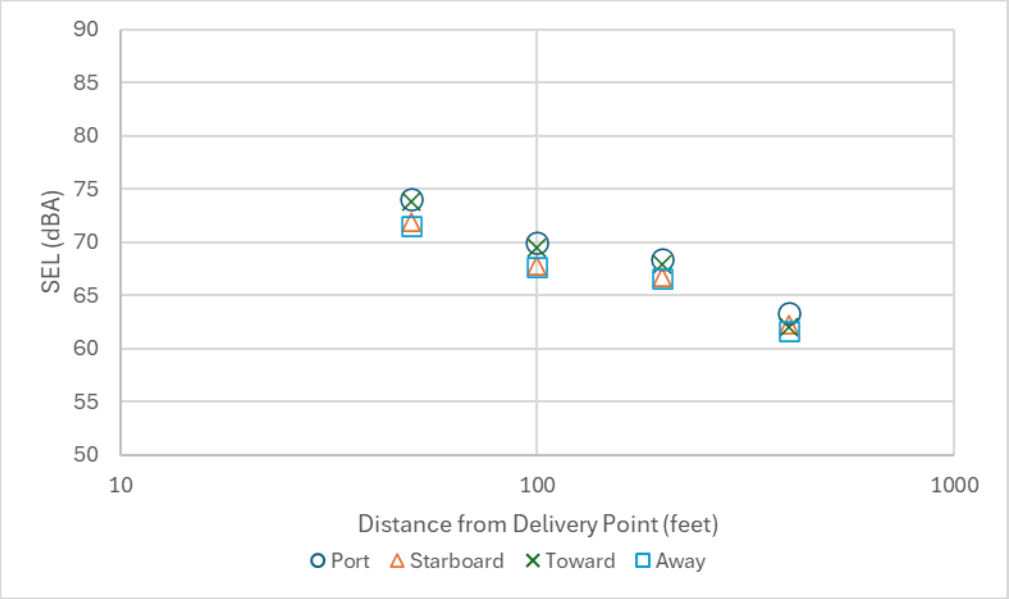


**Figure 3. Plot of Average Measured SEL Values for Delivery Hover**

## 2.2.3 En Route Sound Exposure Levels

During testing, sound levels were measured to simulate noise exposure at undertrack locations between dock and delivery points while the UA is at cruising speed. The tests were conducted for one microphone array using five microphones perpendicular to the flight track. The microphones were set at distances of zero, 50, 100, 200 and 400 feet perpendicular to the flight trajectory (Zipline 2025). Six (6) tests were conducted for en route operations, three downwind (Tests 1, 2 and 3) and three upwind (Test 4, 5, and 6). Sound exposure level (SEL) values were then calculated from measured time history data for each en route event. The results of SEL calculations for each test are shown in Table 6. According to the data, the loudest average SEL of 69.1 dBA during en route occurs at the 50-foot microphone position perpendicular to the flight track.

**Table 6. Sound Exposure Levels from Sound Level Testing for En Route Test Series, P2 Zip**

| Microphone Position, Perpendicular Distance from flight track (feet) | Test 1 SEL (dBA) | Test 2 SEL (dBA) | Test 3 SEL (dBA) | Test 4 SEL (dBA) | Test 5 SEL (dBA) | Test 6 SEL (dBA) | Average SEL (dBA) |
|---|---|---|---|---|---|---|---|
| **Microphone Array A – Under flight track** | | | | | | | |
| 0 | 68.5 | 68.4 | 68.1 | 66.4 | 66.3 | 66.9 | 67.4 |
| 50 | 70.4 | 70.1 | 69.7 | 67.9 | 68.2 | 68.2 | 69.1 |
| 100 | 68.3 | 68.7 | 67.9 | 65.8 | 67.3 | 66.3 | 67.4 |
| 200 | 68.0 | 67.7 | 67.2 | 64.7 | 65.4 | 65.8 | 66.5 |
| 400 | 66.3 | 65.0 | 64.9 | 63.3 | 62.6 | 62.4 | 64.1 |

Source: Zipline 2025, ICF 2025.
dBA = A-weighted decibel

# 2.3 Analysis Procedure Methodology

To calculate SEL for receptors located near a dock or delivery point, a combination of actions are evaluated to define different types of operations as a UA transitions between different operating modes. The types of operations evaluated are the following:

- Docking
- Undocking
- Package delivery at a delivery point
- En Route inbound and outbound from delivery point

The SEL calculation for each of these operation types involves the use of sound level data as measured by an array of microphones during simulation testing of each operation, as described in the noise measurement test report (Zipline 2025). Microphones placed on a linear path relative to the dock collected sound level data at distances of 0 feet, 50 feet, 100 feet, 200 feet, and 400 feet. The incident SEL values were used to determine attenuation rates between microphone positions, which were influenced by different degrees of en route and vertical or hover portions of the flight profile depending on the type of operation tested. For distances greater than 400 feet from the dock, the falloff rate from the 200-foot to 400-foot microphone position is used to determine the distance at which UA sound emission values are equal to en route conditions. This is described further in the data presentation in the next chapter.

DNL values are calculated for three categories of locations: 1) a dock, 2) a delivery point, and 3) the en route inbound and outbound path. The DNL values at a dock are calculated by summing the sound energy for undocking and departure from the dock with a return to the dock. The DNL value for a single delivery cycle at each of the three types of locations is scaled for multiple UA operations using a logarithmic multiplier (i.e., log of the number of events multiplied by 10) adjusted by a factor of 49.4 to convert from SEL to DNL. The equation to calculate DNL from SEL is:

$$DNL = 10*\log(10^{(SEL/10)} * [\text{deliveries per day}]) - 49.4 \quad (2)$$

Chapter 3
# Sound Levels of UA Operations

## 3.1 Undocking and Docking Sound Levels

Calculated sound levels for P2 Zip undocking and docking at the dock are shown in Table 6. Undocking and docking SEL values also include the portions of the en route cycle as the UA departs from and arrives back at the dock. Once the UA has traveled far enough away from the dock, the undertrack sound level is equal to en route conditions as measured during testing. The SEL values are based on the maximum value measured among the undertrack, lateral and behind-dock microphone arrays. As shown in Table 1, the average measured level for en route conditions is 69.1 dBA SEL. This occurs at different distances for departure and arrival. For undocking, the SEL is equal to the en route sound level of 69.1 dBA SEL at 1,600 feet from the dock, while for docking this occurs at 1,425 feet, as shown in Table 7. The flights include the maximum payload on board. The docking and undocking SEL values are given by Equation 3, which includes one-half en route SEL in each direction, i.e. equivalent to one full en route SEL:

$$SEL_{dock} = 10 * Log\ (10^{(SEL_{departure}/10)} + 10^{(SEL_{en\ route}/10)} + 10^{(SEL_{arrival}/10)}) \quad (3)$$

which is the logarithmic sum of departure and arrival sound energy, and sound energy from inbound/outbound portions of the flight profile equivalent to one half of en route SEL in each direction. Note that Equation 3 includes one-half en route SEL in each direction to adjust for testing site limitations, as described in Section 2.2.1. Since this is included for a roundtrip from the dock for one delivery cycle, this is equivalent to one full en route SEL.

**Table 7. Calculated SEL values for Undocking and Docking at Dock**

| Distance between Dock and Receiver | Undocking and Departure, dBA SEL | Arrival and Docking, dBA SEL | Docking and Undocking Cycle, dBA SEL |
|---|---|---|---|
| 0 | 98.3 | 98.7 | 101.5 |
| 50 | 85.1 | 86.3 | 88.7 |
| 75 | 82.4 | 83.9 | 86.2 |
| 100 | 81.0 | 82.7 | 84.9 |
| 125 | 79.5 | 80.6 | 83.1 |
| 150 | 78.2 | 79.1 | 81.7 |
| 175 | 77.2 | 77.9 | 80.6 |
| 200 | 76.3 | 76.9 | 79.6 |
| 225 | 75.6 | 76.1 | 78.9 |
| 250 | 75.1 | 75.4 | 78.3 |
| 275 | 74.5 | 74.8 | 77.7 |
| 300 | 74.1 | 74.2 | 77.2 |
| 325 | 73.7 | 73.7 | 76.7 |
| 350 | 73.3 | 73.4 | 76.4 |
| 375 | 72.9 | 73.2 | 76.1 |
| 400 | 72.6 | 73.0 | 75.8 |

| Distance between Dock and Receiver | Undocking and Departure, dBA SEL | Arrival and Docking, dBA SEL | Docking and Undocking Cycle, dBA SEL |
|---|---|---|---|
| 425 | 72.3 | 72.7 | 75.5 |
| 450 | 72.1 | 72.5 | 75.3 |
| 475 | 71.9 | 72.3 | 75.1 |
| 500 | 71.8 | 72.2 | 75.0 |
| 525 | 71.6 | 72.0 | 74.8 |
| 550 | 71.5 | 71.8 | 74.7 |
| 575 | 71.4 | 71.7 | 74.6 |
| 600 | 71.3 | 71.6 | 74.4 |
| 625 | 71.2 | 71.4 | 74.3 |
| 650 | 71.1 | 71.3 | 74.2 |
| 675 | 71.0 | 71.2 | 74.1 |
| 700 | 70.9 | 71.1 | 74.0 |
| 725 | 70.8 | 71.0 | 73.9 |
| 750 | 70.7 | 70.8 | 73.8 |
| 775 | 70.7 | 70.7 | 73.7 |
| 800 | 70.6 | 70.7 | 73.6 |
| 825 | 70.5 | 70.6 | 73.6 |
| 850 | 70.4 | 70.5 | 73.5 |
| 875 | 70.4 | 70.4 | 73.4 |
| 900 | 70.3 | 70.3 | 73.3 |
| 925 | 70.3 | 70.2 | 73.3 |
| 950 | 70.2 | 70.2 | 73.2 |
| 975 | 70.1 | 70.1 | 73.1 |
| 1,000 | 70.1 | 70.0 | 73.1 |
| 1,025 | 70.0 | 70.0 | 73.0 |
| 1,050 | 70.0 | 69.9 | 72.9 |
| 1,075 | 69.9 | 69.8 | 72.9 |
| 1,100 | 69.9 | 69.8 | 72.8 |
| 1,125 | 69.8 | 69.7 | 72.8 |
| 1,150 | 69.8 | 69.7 | 72.7 |
| 1,175 | 69.7 | 69.6 | 72.7 |
| 1,200 | 69.7 | 69.5 | 72.6 |
| 1,225 | 69.6 | 69.5 | 72.6 |
| 1,250 | 69.6 | 69.4 | 72.5 |
| 1,275 | 69.6 | 69.4 | 72.5 |
| 1,300 | 69.5 | 69.4 | 72.5 |
| 1,325 | 69.5 | 69.3 | 72.4 |
| 1,350 | 69.5 | 69.3 | 72.4 |
| 1,375 | 69.4 | 69.2 | 72.3 |
| 1,400 | 69.4 | 69.2 | 72.3 |
| 1,425 | 69.3 | 69.1 | 72.3 |
| 1,450 | 69.3 | 69.1 | 72.2 |

| Distance between Dock and Receiver | Undocking and Departure, dBA SEL | Arrival and Docking, dBA SEL | Docking and Undocking Cycle, dBA SEL |
|---|---|---|---|
| 1,475 | 69.3 | 69.1 | 72.2 |
| 1,500 | 69.2 | 69.1 | 72.2 |
| 1,525 | 69.2 | 69.1 | 72.2 |
| 1,550 | 69.2 | 69.1 | 72.1 |
| 1,575 | 69.2 | 69.1 | 72.1 |
| 1,600 | 69.1 | 69.1 | 72.1 |
| Greater than 1,600 | 69.1 | 69.1 | 72.1 |

Source: Zipline 2025, ICF 2025.
dBA = A-weighted decibel; SEL = sound exposure level

# 3.2 Delivery

During a delivery, the P2 Zip hovers in place above the delivery point at its cruising altitude. The onboard delivery service, referred to as a Droid carrying a payload is lowered to the delivery point via a winch line (Zipline 2025). The noise exposure at a delivery point consists of deceleration on arrival, hover in place, and departure acceleration. As discussed in Chapter 2, a time correction was added to hover sound levels to account for hover time during a delivery (75 seconds) vs. the as-tested condition (30 seconds). The hover SEL levels are based on measurements from hover orientation to the port side, which yielded the highest SEL values from the four orientations tested. SEL values for each of these segments of a delivery cycle are shown in Table 8, with a total SEL exposure for a delivery point cycle in the rightmost column of values. The arrival deceleration and departure acceleration have a minimum value equivalent to the en route SEL value of 69.1 dBA. This occurs at distances of 50 feet and greater from the delivery point for deceleration toward the delivery point, and at distances of 125 feet or greater for acceleration away from the delivery point.

The delivery SEL values are given by Equation 4:

$$SEL_{delivery} = 10 * Log\ (10\text{^}(SEL_{deceleration}/10) + 10\text{^}(SEL_{hover,port}/10) + K_{hover} + 10\text{^}(SEL_{acceleration}/10)) \quad (4)$$

which is the logarithmic sum of sound energy from deceleration to the delivery point, hover above the delivery point, hover time correction given by $K_{hover}$ in Equation 1, and acceleration away from the delivery point.

**Table 8. Calculated SEL Values for Delivery Operations**

| Distance between Delivery Point and Receiver | Arrival Deceleration, dBA SEL | Hover, dBA SEL[1] | Departure Acceleration, dBA SEL | Delivery Cycle, dBA SEL |
|---|---|---|---|---|
| 0 | 67.0 | 76.3 | 67.8 | 77.3 |
| 50 | 69.1 | 78.1 | 68.4 | 79.0 |
| 75 | 69.1 | 75.6 | 69.3 | 77.3 |
| 100 | 69.1 | 73.9 | 69.9 | 76.3 |
| 125 | 69.1 | 73.4 | 69.1 | 75.8 |
| 150 | 69.1 | 73.0 | 69.1 | 75.6 |

| Distance between Delivery Point and Receiver | Arrival Deceleration, dBA SEL | Hover, dBA SEL[1] | Departure Acceleration, dBA SEL | Delivery Cycle, dBA SEL |
|---|---|---|---|---|
| 175 | 69.1 | 72.7 | 69.1 | 75.4 |
| 200 | 69.1 | 72.4 | 69.1 | 75.3 |
| 225 | 69.1 | 71.6 | 69.1 | 74.8 |
| 250 | 69.1 | 70.8 | 69.1 | 74.5 |
| 275 | 69.1 | 70.1 | 69.1 | 74.2 |
| 300 | 69.1 | 69.5 | 69.1 | 74.0 |
| 325 | 69.1 | 68.9 | 69.1 | 73.8 |
| 350 | 69.1 | 68.3 | 69.1 | 73.6 |
| 375 | 69.1 | 67.8 | 69.1 | 73.5 |
| 400 | 69.1 | 67.4 | 69.1 | 73.4 |
| 425 | 69.1 | 66.9 | 69.1 | 73.2 |
| 450 | 69.1 | 66.5 | 69.1 | 73.2 |
| 475 | 69.1 | 66.1 | 69.1 | 73.1 |
| 500 | 69.1 | 65.7 | 69.1 | 73.0 |
| 525 | 69.1 | 65.4 | 69.1 | 72.9 |
| 550 | 69.1 | 65.0 | 69.1 | 72.9 |
| 575 | 69.1 | 64.7 | 69.1 | 72.8 |
| 600 | 69.1 | 64.4 | 69.1 | 72.8 |
| 625 | 69.1 | 64.1 | 69.1 | 72.7 |
| 650 | 69.1 | 63.8 | 69.1 | 72.7 |
| 675 | 69.1 | 63.5 | 69.1 | 72.7 |
| 700 | 69.1 | 63.3 | 69.1 | 72.6 |
| 725 | 69.1 | 63.0 | 69.1 | 72.6 |
| 750 | 69.1 | 62.8 | 69.1 | 72.6 |
| 775 | 69.1 | 62.5 | 69.1 | 72.6 |
| 800 | 69.1 | 62.3 | 69.1 | 72.5 |
| 825 | 69.1 | 62.1 | 69.1 | 72.5 |
| 850 | 69.1 | 61.9 | 69.1 | 72.5 |
| 875 | 69.1 | 61.6 | 69.1 | 72.5 |
| 900 | 69.1 | 61.4 | 69.1 | 72.5 |
| 925 | 69.1 | 61.2 | 69.1 | 72.4 |
| 950 | 69.1 | 61.0 | 69.1 | 72.4 |
| 975 | 69.1 | 60.9 | 69.1 | 72.4 |
| 1,000 | 69.1 | 60.7 | 69.1 | 72.4 |
| 1,025 | 69.1 | 60.5 | 69.1 | 72.4 |
| 1,050 | 69.1 | 60.3 | 69.1 | 72.4 |
| 1,075 | 69.1 | 60.1 | 69.1 | 72.4 |
| 1,100 | 69.1 | 60.0 | 69.1 | 72.4 |
| 1,125 | 69.1 | 59.8 | 69.1 | 72.3 |
| 1,150 | 69.1 | 59.7 | 69.1 | 72.3 |
| 1,175 | 69.1 | 59.5 | 69.1 | 72.3 |
| 1,200 | 69.1 | 59.3 | 69.1 | 72.3 |

| Distance between Delivery Point and Receiver | Arrival Deceleration, dBA SEL | Hover, dBA SEL[1] | Departure Acceleration, dBA SEL | Delivery Cycle, dBA SEL |
|---|---|---|---|---|
| 1,225 | 69.1 | 59.2 | 69.1 | 72.3 |
| 1,250 | 69.1 | 59.0 | 69.1 | 72.3 |
| 1,275 | 69.1 | 58.9 | 69.1 | 72.3 |
| 1,300 | 69.1 | 58.8 | 69.1 | 72.3 |
| 1,325 | 69.1 | 58.6 | 69.1 | 72.3 |
| 1,350 | 69.1 | 58.5 | 69.1 | 72.3 |
| 1,375 | 69.1 | 58.3 | 69.1 | 72.3 |
| 1,400 | 69.1 | 58.2 | 69.1 | 72.3 |
| 1,425 | 69.1 | 58.1 | 69.1 | 72.3 |
| 1,450 | 69.1 | 58.0 | 69.1 | 72.3 |
| 1,475 | 69.1 | 57.8 | 69.1 | 72.3 |
| 1,500 | 69.1 | 57.7 | 69.1 | 72.3 |
| 1,525 | 69.1 | 57.6 | 69.1 | 72.3 |
| 1,550 | 69.1 | 57.5 | 69.1 | 72.2 |
| 1,575 | 69.1 | 57.4 | 69.1 | 72.2 |
| 1,600 | 69.1 | 57.2 | 69.1 | 72.2 |
| 1,625 | 69.1 | 57.1 | 69.1 | 72.2 |
| 1,650 | 69.1 | 57.0 | 69.1 | 72.2 |
| 1,675 | 69.1 | 56.9 | 69.1 | 72.2 |
| 1,700 | 69.1 | 56.8 | 69.1 | 72.2 |
| 1,725 | 69.1 | 56.7 | 69.1 | 72.2 |
| 1,750 | 69.1 | 56.6 | 69.1 | 72.2 |
| 1,775 | 69.1 | 56.5 | 69.1 | 72.2 |
| 1,800 | 69.1 | 56.4 | 69.1 | 72.2 |
| 1,825 | 69.1 | 56.3 | 69.1 | 72.2 |
| 1,850 | 69.1 | 56.3 | 69.1 | 72.2 |
| 1,875 | 69.1 | 56.2 | 69.1 | 72.2 |
| 1,900 | 69.1 | 56.1 | 69.1 | 72.2 |
| 1,925 | 69.1 | 56.0 | 69.1 | 72.2 |
| 1,950 | 69.1 | 55.9 | 69.1 | 72.2 |
| 1,975 | 69.1 | 55.8 | 69.1 | 72.2 |
| 2,000 | 69.1 | 55.8 | 69.1 | 72.2 |

Source: Zipline 2025, ICF 2025.

dBA = A-weighted decibel; SEL = sound exposure level

[1] Hover sound levels are corrected to a 75 second duration from the as-tested duration of 30 seconds. The 75 second duration is the estimated time required for the droid to deliver a package. Noise from the droid is negligible and as such is not included in the delivery cycle SEL (see Section 5.3 of *P2 Zip Noise Assessment Test Plan and Report* (Zipline 2025).

## 3.3 En Route

As shown in Table 1, the average en route sound level was calculated to be 69.1 dBA SEL. For inbound and outbound flights occurring along the same trajectory, a single round trip en route SEL would be 72.1 dBA SEL. For a single flight, this level represents the loudest case for areas within 50 feet of an undertrack location relative to a P2 Zip in flight between a dock and a delivery point.

# Chapter 4
# Noise Exposure from UA Operations

This chapter presents estimated DNL values for package delivery operations for various daily rates of delivery for a P2 Zip operation. This analysis assumes 95% of package deliveries would occur during daytime hours only (7:00 a.m. to 10:00 p.m.), and 5% would be done during night hours (10:00 p.m. to 7:00 a.m.) Night operations include a 10 dB penalty for the purpose of calculating DNL. The analysis assumes there would be at least one night delivery for all scenarios. The number of daytime and nighttime deliveries for different delivery scenarios is shown in Table 9.

**Table 9. Number of Daytime and Nighttime Deliveries for Different Delivery Scenarios**

| Average Daily Deliveries per Dock | Number of Daytime Deliveries | Number of Nighttime Deliveries | Number of Daytime Equivalent Deliveries |
|---|---|---|---|
| 1 | 0 | 1 | 10 |
| 5 | 4 | 1 | 14 |
| 10 | 9 | 1 | 19 |
| 15 | 14 | 1 | 24 |
| 20 | 19 | 1 | 29 |
| 25 | 23 | 2 | 43 |
| 50 | 47 | 3 | 77 |
| 75 | 71 | 4 | 111 |
| 100 | 95 | 5 | 145 |
| 150 | 142 | 8 | 222 |
| 200 | 190 | 10 | 290 |
| 300 | 285 | 15 | 435 |
| 400 | 380 | 20 | 580 |

## 4.1 Noise Exposure from a Dock Location

A single delivery operation consists of undocking, departure, return to dock and landing phases, and the full cycle of these actions are accounted for in noise exposure at a dock location, as discussed in Section 3.1.

Estimated DNL noise exposure distances at a dock operating P2 Zip UAs are shown in Table 10. Noise exposure DNL values are shown at different operational scales: from 1 delivery per day up to 400 deliveries per day. The noise exposure values assume a departure and return flight path restricted to a single trajectory over a receiver array with distances of 50 to 2,000 feet from the dock. According to the calculations, undocking and docking operations would equal or exceed 65 DNL at less than 50 feet from a dock location up to a rate of 200 package loading operations per day. At a rate of 400 deliveries per day including up to 20 nighttime deliveries, package loading operations would equal or exceed 65 DNL up to 70 feet from a dock location.

**Table 10. DNL Noise Exposure Distances at a Dock for P2 Zip for Different Scales of Operation**

| Average Daily Deliveries per Dock[1] | 65 DNL Distance, feet | 60 DNL Distance, feet | 55 DNL Distance, feet | 50 DNL Distance, feet | 45 DNL Distance, feet |
|---|---|---|---|---|---|
| 1 | <50 | <50 | <50 | <50 | 110 |
| 5 | <50 | <50 | <50 | 60 | 130 |
| 10 | <50 | <50 | <50 | 75 | 155 |
| 15 | <50 | <50 | <50 | 90 | 175 |
| 20 | <50 | <50 | <50 | 105 | 200 |
| 25 | <50 | <50 | 60 | 125 | 260 |
| 50 | <50 | <50 | 90 | 180 | 430 |
| 75 | <50 | <50 | 115 | 225 | 715 |
| 100 | <50 | 60 | 135 | 275 | 1,125 |
| 150 | <50 | 85 | 170 | 390 | En Route[2] |
| 200 | <50 | 105 | 200 | 535 | En Route |
| 300 | 60 | 130 | 265 | 1,020 | En Route |
| 400 | 70 | 150 | 325 | En Route[2] | En Route |

Note: [1] The CONOPS assumes 95% of UA operations would be done between the hours of 7:00 a.m. and 10:00 p.m. and 5% would be done between 10:00 p.m. and 7:00 a.m. The number of average daily deliveries per dock in this table include 5% of deliveries occurring between 10:00 p.m. and 7:00 a.m. consistent with the CONOPS and Table 9.
[2] Noise exposure would exceed 50 DNL along the flight path for an operation with 400 or more deliveries per day, and 45 DNL along the flight path for an operation with 150 or more deliveries per day.
DNL = day/night average sound level

# 4.2 Noise Exposure from a Delivery Site

Estimated DNL noise exposure distances at a delivery point for the P2 Zip are shown in Table 11. The DNL exposures assume an arrival and departure flight path restricted to a single trajectory over a receiver array with distances of 25 to 2,000 feet. A single delivery operation consists of arrival, package delivery, and departure phases, as described in Section 3.2. According to the calculations, package loading operations would equal or exceed 65 DNL at less than 50 feet from a dock location up to a rate of 400 package loading operations per day.

**Table 11. DNL Noise Exposure Distances at a Delivery Point for P2 Zip for Different Scales of Operation**

| Average Daily Deliveries at Delivery Point[1] | 65 DNL Distance, feet | 60 DNL Distance, feet | 55 DNL Distance, feet | 50 DNL Distance, feet | 45 DNL Distance, feet |
|---|---|---|---|---|---|
| 1 | <50 | <50 | <50 | <50 | <50 |
| 5 | <50 | <50 | <50 | <50 | <50 |
| 10 | <50 | <50 | <50 | <50 | <50 |
| 15 | <50 | <50 | <50 | <50 | <50 |
| 20 | <50 | <50 | <50 | <50 | <50 |
| 25 | <50 | <50 | <50 | <50 | 65 |
| 50 | <50 | <50 | <50 | <50 | 160 |

| Average Daily Deliveries at Delivery Point[1] | 65 DNL Distance, feet | 60 DNL Distance, feet | 55 DNL Distance, feet | 50 DNL Distance, feet | 45 DNL Distance, feet |
|---|---|---|---|---|---|
| 75 | <50 | <50 | <50 | 55 | 310 |
| 100 | <50 | <50 | <50 | 70 | 600 |
| 150 | <50 | <50 | <50 | 120 | En Route[2] |
| 200 | <50 | <50 | <50 | 235 | En Route |
| 300 | <50 | <50 | 65 | 500 | En Route |
| 400 | <50 | <50 | 90 | En Route[2] | En Route |

Note: [1] The CONOPS assumes 95% of UA operations would be done between the hours of 7:00 a.m. and 10:00 p.m. and 5% would be done between 10:00 p.m. and 7:00 a.m. The number of average daily deliveries per dock in this table include 5% of deliveries occurring between 10:00 p.m. and 7:00 a.m. consistent with the CONOPS and Table 9.
[2] Noise exposure would exceed 50 DNL along the flight path for an operation with 400 or more deliveries per day, and 45 DNL along the flight path for an operation with 150 or more deliveries per day.
DNL = day/night average sound level

# 4.3 En Route Noise Exposure

Noise exposure from UA en route trajectories would be loudest within 50 feet of the flight path, as described in Chapter 2. In practice, UAs would serve many delivery points from a point of origin, however in areas where there is a high demand for deliveries, en route UA noise may be intermittently noticeable depending on the level of existing ambient noise. In addition, an undertrack location would receive noise exposure from two en route events representing both outbound and inbound portions of a round trip for a delivery cycle. Along a single flight trajectory, en route noise levels would exceed 45 DNL at 150 or more deliveries per day, as shown in Table 12. Since test flights were conducted at the operating altitude of 330 feet AGL with MTOW, no altitude correction factors were used.

**Table 12. En Route DNL Exposure for P2 Zip for Different Scales of Operation**

| Average Daily Deliveries per Dock[1] | En Route DNL |
|---|---|
| 1 | 32.7 |
| 5 | 34.2 |
| 10 | 35.5 |
| 15 | 36.5 |
| 20 | 37.3 |
| 25 | 39.0 |
| 50 | 41.6 |
| 75 | 43.2 |
| 100 | 44.3 |
| 150 | 46.2 |
| 200 | 47.3 |
| 300 | 49.1 |
| 400 | 50.3 |

Note: [1] The CONOPS assumes 95% of UA operations would be done between the hours of 7:00 a.m. and 10:00 p.m. and 5% would be done between 10:00 p.m. and 7:00 a.m. The number of average daily deliveries per dock in this table include 5% of deliveries occurring between 10:00 p.m. and 7:00 a.m. consistent with the CONOPS and Table 9.
DNL = day/night average sound level

# 4.4 Cumulative Noise Exposure

Criteria for significance of impacts and changes in noise exposure are defined in FAA Order 1050.1F *Environmental Impacts: Policies and Procedures* (FAA 2015). Order 1050.1F Exhibit 4-1 states the following with respect to threshold of significance for a proposed action:

> *The action would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB.*

A cumulative increase in noise from a proposed action can be calculated using the difference between the additional noise exposure introduced by a proposed action and the no action alternative. The cumulative DNL increase associated with different values of the proposed action is shown in Table 13.

**Table 13. Cumulative Increase in DNL due to a Proposed Action**

| Proposed Action minus No Action (x) | Cumulative Increase in DNL (Δ) |
|---|---|
| x < -3.8 dB | Δ < 1.5 dB |
| -3.8 dB < x < 0.0 dB | 1.5 dB < Δ < 3 dB |
| 0.0 dB < x < 3.3 dB | 3 dB < Δ < 5 dB |
| 3.3 dB < x | 5 dB < Δ |

For air traffic airspace and procedure actions where the study area is larger than the immediate vicinity of an airport, Order 1050.1F specifies the following change-of-exposure criteria to identify locations where noise exposure levels will increase by a magnitude considered reportable. An action that would increase noise exposure by 3 dB where no action is between 60 and 65 DNL, or by 5 dB where no action is between 45 and 60 DNL would be considered reportable.

# Chapter 5
# References


Code of Federal Regulations (CFR). *Noise Standards: Aircraft Type and Airworthiness Certification.* Available: https://www.ecfr.gov/current/title-14/chapter-I/subchapter-C/part-36. Accessed: July 23, 2024.

Federal Aviation Administration (FAA). 2015. Order 1050.1F. *Environmental Impacts: Policies and Procedures*. Appendix B. Available: https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf#page=113 Accessed: July 23, 2024.

Federal Aviation Administration (FAA) Office of Environment and Energy. 2023. Drone Team, AEE-100. *Measuring Drone Noise for Environmental Review Process*. Draft Measurement Protocol for Applications for EA Noise Analysis V05, PowerPoint Presentation, October 2023.

ICF International. 2025. Noise Modeling for *Technical Noise Study Report: Zipline Model P2 Zip Unmanned Aircraft Package Delivery Operations.* Pea Ridge, Arkansas*.* Prepared for the Federal Aviation Administration.

Zipline. 2025. *P2 Zip Noise Assessment Test Plan and Report*. Document Number 00003956, Revision D.

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# Appendix E
# Biological Resources

**Table E-1. State Species of Greatest Conservation Need in Kitsap, Mason, Thurston, Island, Jefferson, Pierce, King, and Snohomish Counties.**

| Taxon | Scientific Name | Common Name | ESA Status | State Status |
|---|---|---|---|---|
| **Amphibians and Reptiles** | | | | |
| | *Rhyacotriton cascadae* | Cascade Torrent Salamander | - | C |
| | *Plethodon larselli* | Larch Mountain Salamander | - | S |
| | *Plethodon vandykei* | Van Dyke's Salamander | - | C |
| | *Rana luteiventris* | Oregon Spotted Frog | - | C |
| | *Anaxyrus boreas* | Western Toad | - | C |
| | *Actinemys marmorata* | Northwestern Pond Turtle | - | E |
| **Birds** | | | | |
| | *Pelecanus occidentalis* | Brown Pelican | - | - |
| | *Gavia immer* | Common Loon | - | S |
| | *Brachyramphus marmoratus* | Marbled Murrelet | T | E |
| | *Phoebastria albatrus* | Short-tailed Albatross | E | C |
| | *Fratercula cirrhata* | Tufted Puffin | - | E |
| | *Aechmophorus occidentalis* | Western grebe | - | C |
| | *Branta bernicla* | Western High Arctic Brant | - | - |
| | *Histronicus histronicus* | Harlequin Duck | - | - |
| | *Aquila chrysaeotos* | Golden Eagle | - | C |
| | *Oreotyx pictus* | Mountain Quail | - | - |
| | *Columba fasciata* | Band-tailed Pigeon | - | - |
| | *Coccyzus americanus* | Yellow-billed Cuckoo | T | E |
| | *Strix occidentalis* | Northern Spotted Owl | T | E |
| | *Pooecetes gramineus affinis* | Oregon Vesper Sparrow | - | E |
| | *Sitta carlinensis aculeata* | Slender-billed White-breasted Nuthatch | - | C |
| | *Eremophila alpestris strigata* | Streaked Horned Lark | T | E |
| **Fish** | | | | |
| | *Lampetra tridentata* | Pacific Lamprey | - | - |
| | *Lampetra ayresi* | River Lamprey | - | C |
| | *Acipenser medirostris* | Green Sturgeon | T | - |
| | *Acipenser transmontanus* | White Sturgeon | - | - |
| | *Novumbra hubbsi* | Olympic Mudminnow | - | S |
| | *Clupea pallasi* | Pacific Herring | - | - |
| | *Hypomesus pretiosus* | Surfsmelt | - | - |
| | *Salvelinus confluentus* | Bull Trout | T | C |

| Taxon | Scientific Name | Common Name | ESA Status | State Status |
|---|---|---|---|---|
| | *Salvelinus malma* | Dolly Varden | - | - |
| | *Oncorhynchus tshawtscha* | Chinook Salmon | T | - |
| | *Oncorhynchus keta* | Chum Salmon | - | - |
| | *Oncorhynchus kisutch* | Coho Salmon | T | - |
| | *Prospium coulteri* | Pygmy Whitefish | - | S |
| | *Oncorhynchus mykiss* | Steelhead | T | C |
| | *Oncorhynchus nerka* | Sockeye Salmon | - | - |
| | *Gadus macrocephalus* | Pacific Cod | - | - |
| | *Merccluccius productus* | Pacific Hake | - | - |
| | *Gadus chalcogrammus* | Walleye Pollock | - | - |
| | *Sebastes paucispinis* | Bocaccio Rockfish | E | - |
| | *Sebastes auriculatus* | Brown Rockfish | - | - |
| | *Sebastes pinniger* | Canary Rockfish | - | - |
| | *Sebastes nebulosus* | China Rockfish | - | - |
| | *Sebastes caurinus* | Copper Rockfish | - | - |
| | *Sebastes elongatus* | Greenstriped Rockfish | - | - |
| | *Sebastes maliger* | Quillback Rockfish | - | - |
| | *Sebastes proriger* | Redstripe Rockfish | - | - |
| | *Sebastes nigrocinctus* | Tiger Rockfish | - | - |
| | *Sebastes ruberrimus* | Yelloweye Rockfish | T | - |
| | *Ammodytes hexapterus* | Pacific Sand Lance | - | - |
| **Mammals** | | | | |
| | *Orcinus orca* | Orca (Killer Whale) | E | E |
| | *Phocoena phocoena* | Harbor Porpoise | - | C |
| | *Enhydra lutris* | Northern Sea Otter | - | T |
| | *Corynorhinus townsendii* | Townsend’s Big-eared Bat | - | C |
| | *Myotis keenii* | Keen's Myotis | - | C |
| | *Marmota olympus* | Olympic Marmot | - | C |
| | *Sciurus griseus* | Western Gray Squirrel | - | E |
| | *Thomomys mazama* | Mazama (Western) Pocket Gopher | T | T |
| | *Vulpes vulpes cascadens* | Cascade Red Fox | - | E |
| | *Pekania pennanti* | Fisher | - | E |
| | *Ursus arctos* | Grizzly Bear | T | E |
| | *Lynx canadensis* | Lynx | T | E |
| | *Martes caurina* | Pacific Marten | - | - |
| | *Gulo gulo* | Wolverine | T | C |

| Taxon | Scientific Name | Common Name | ESA Status | State Status |
|---|---|---|---|---|
| **Insects** | | | | |
| | *Agonum belleri* | Beller's Ground Beetle | - | C |
| | *Eanus hatchi* | Hatch's Click Beetle | - | C |
| | *Phanogomphus kurilis* | Pacific Clubtail | - | C |
| | *Bombus occidentalis* | Western Bumble Bee | C | C |
| | *Callophyrys johnsoni* | Johnson's Hairstreak | - | C |
| | *Polites mardon* | Mardon Skipper | - | E |
| | *Tharsalea mariposa makah* | Makah Copper | - | C |
| | *Icaricia icarioides blackmorei* | Puget Blue | - | C |
| | *Copablepharon fuscum* | Sand-verbena Moth | - | C |
| | *Speyeria zerene bremnerii* | Valley Silverspot | - | C |
| **Mollusks** | | | | |
| | *Prophysaon coeruleum* | Blue-gray Taildropper | - | C |
| | *Haliotis kamtschatkana* | Pinto (Northern) Abalone | - | E |
| | *Ostrea lurida* | Olympia Oyster | - | - |

Source: Washington Department of Fish and Wildlife 2016.
C: Candidate; E: Endangered; S: Sensitive; T: Threatened.

Appendix F

# Government-to-Government Consultation with Federally Recognized Tribes

Chairman Gerald Lewis
401 Fort Road
Toppenish, Washington 98948

*Transmitted via mail and email to gerald_lewis@yakama.com*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Lewis:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Rose Ferri, THPO
Attachment A – NHPA Section 106 Consultation Letter

Rose Ferri, THPO
P.O. Box 151
Toppenish, Washington 98948

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Confederated Tribes and Bands of the Yakama Nation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

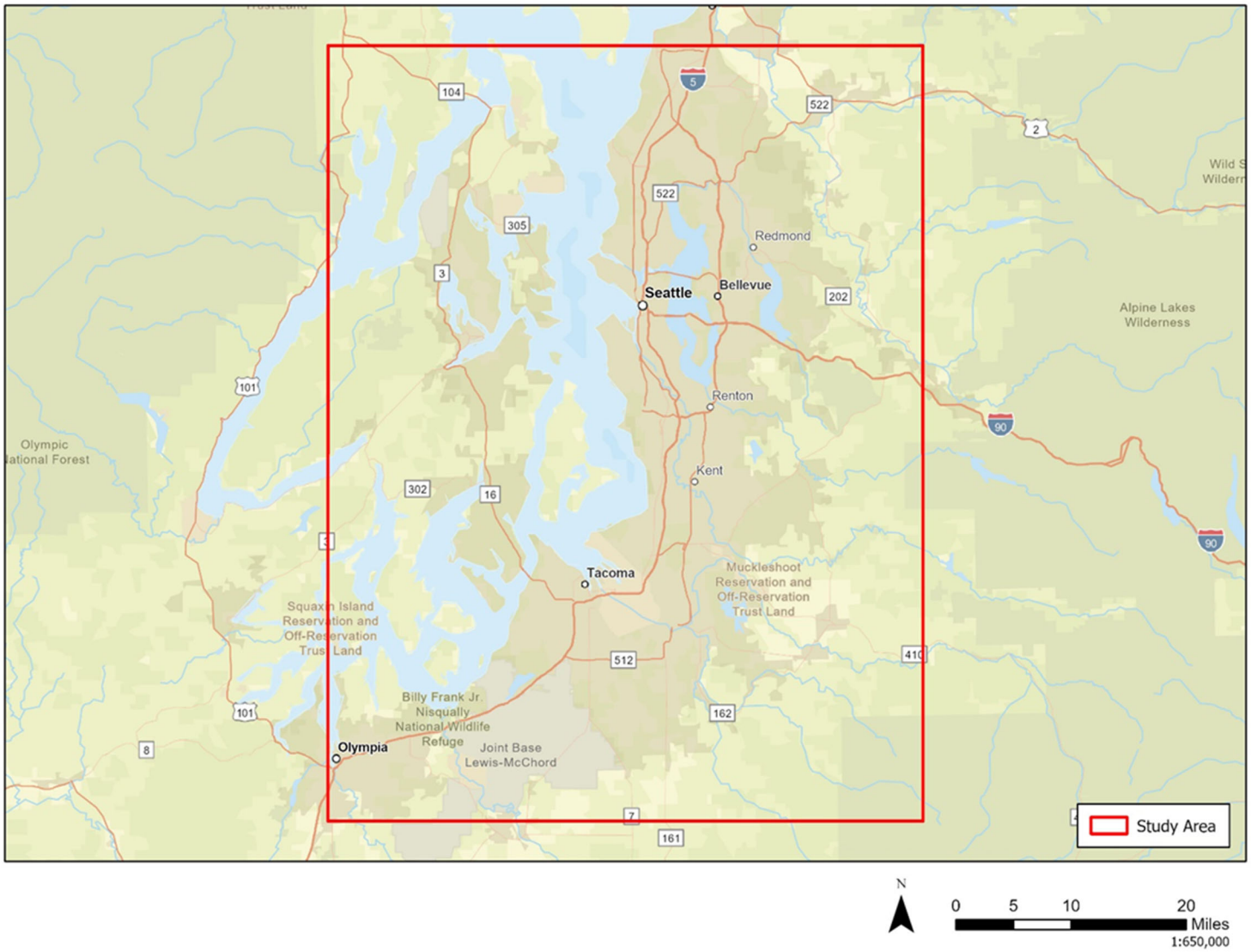
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Dustin Klatush
420 Howanut Road
Oakville, Washington 98568

*Transmitted via mail and email to chairman@chehalistribe.org*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Klatush:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Dan Penn, THPO
Attachment A – NHPA Section 106 Consultation Letter

Dan Penn, THPO
420 Howanut Road
Oakville, Washington 98568

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Confederated Tribes of the Chehalis Reservation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

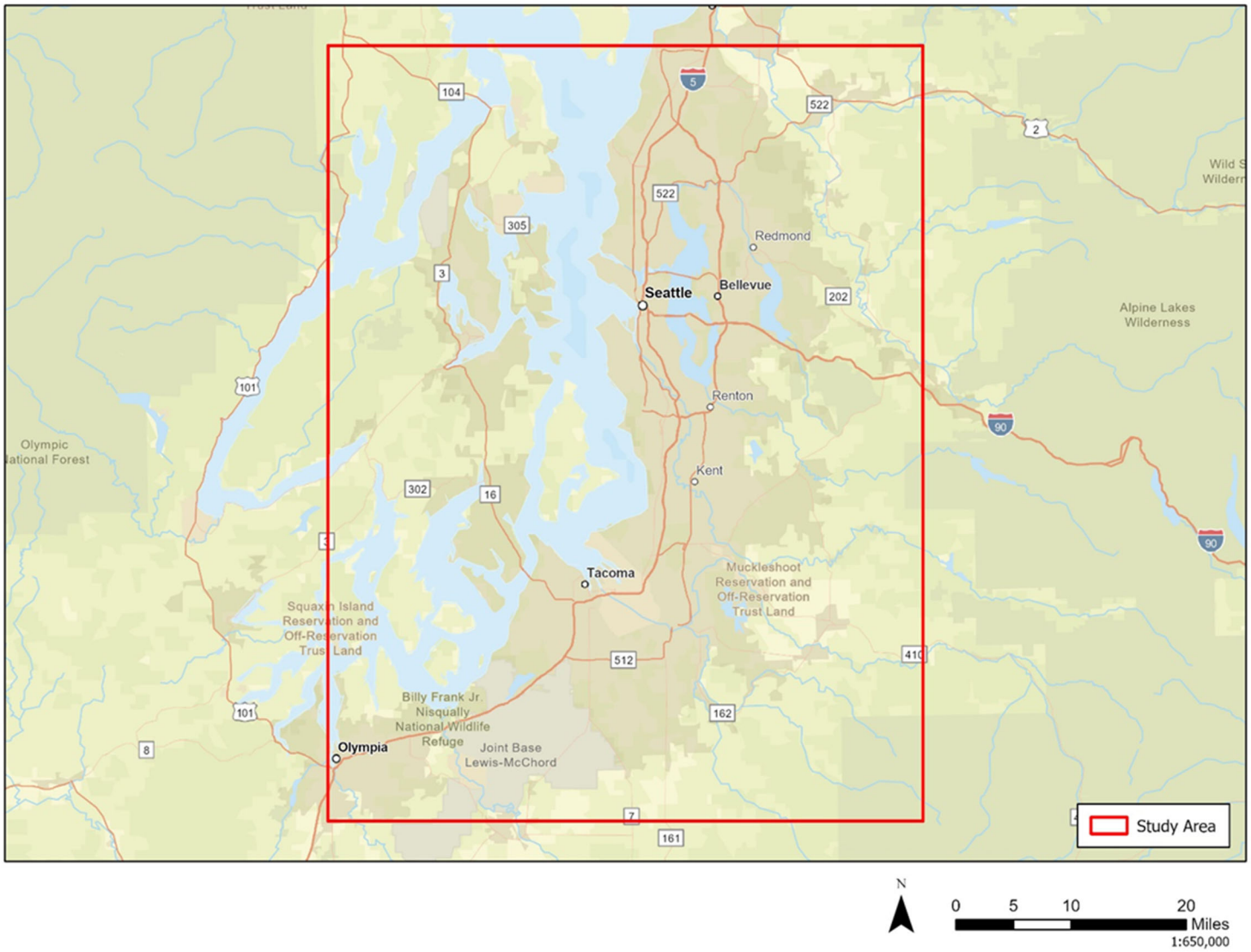
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman William Lyall
1055-9th Avenue Suite B
Longview, Washington 98632

*Transmitted via mail and email to biyall@tc.cowlitz.org*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Lyall:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: James Gordon, THPO
Attachment A – NHPA Section 106 Consultation Letter

James Gordon, THPO
P.O. Box 2547
Longview, Washington 98632

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Cowlitz Indian Tribe and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

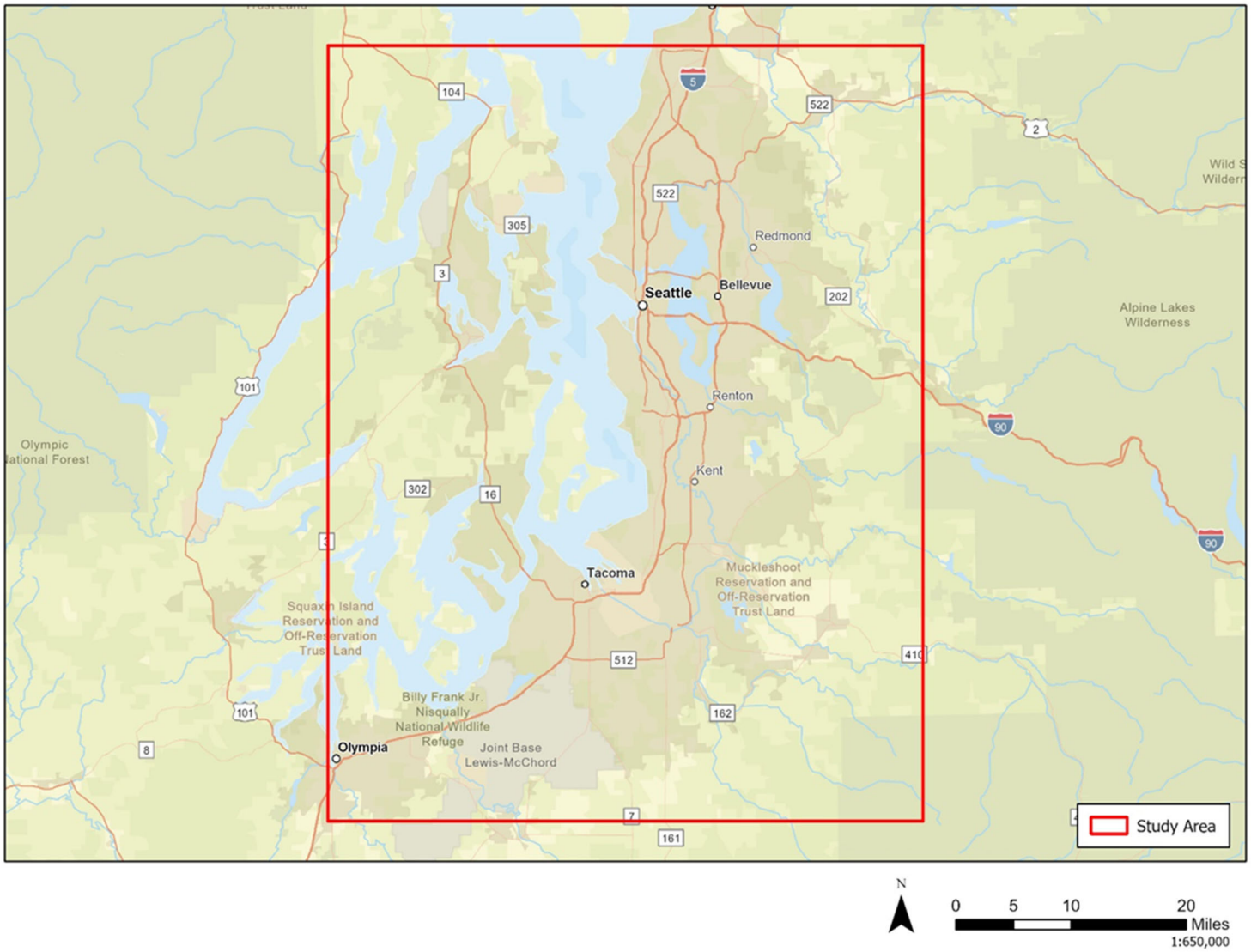
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Ron Allen
1033 Old Blyn Highway
Sequim, Washington 98382-7670

*Transmitted via mail and email to rallen@jamestowntribe.org*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Allen:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Allie Taylor, THPO
Attachment A – NHPA Section 106 Consultation Letter

Allie Taylor, THPO
1033 Old Blyn Hwy, Sequim
Sequim, Washington 98382

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Jamestown S'Klallam Tribe and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

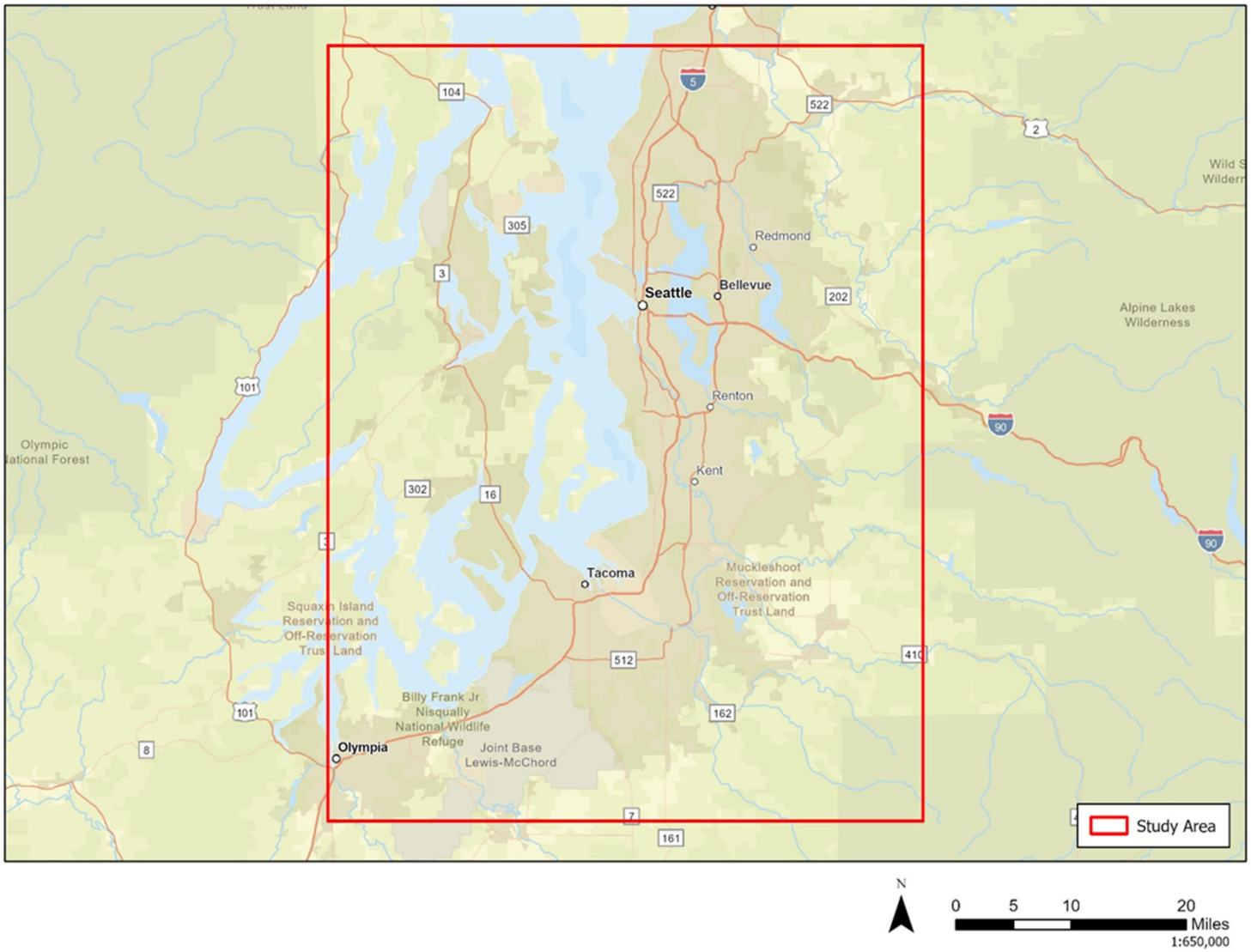
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Ken Choke
4820 She-Nah-Num Drive Se
Olympia, Washington 98513-9199

*Transmitted via mail and email to choke.ken@nisqually-nsn.gov*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Choke:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Brad Beach, THPO
Attachment A – NHPA Section 106 Consultation Letter

Brad Beach, THPO
4820 She-Nah-Num Drive SE
Olympia, Washington 98513

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Nisqually Indian Tribe and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

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**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

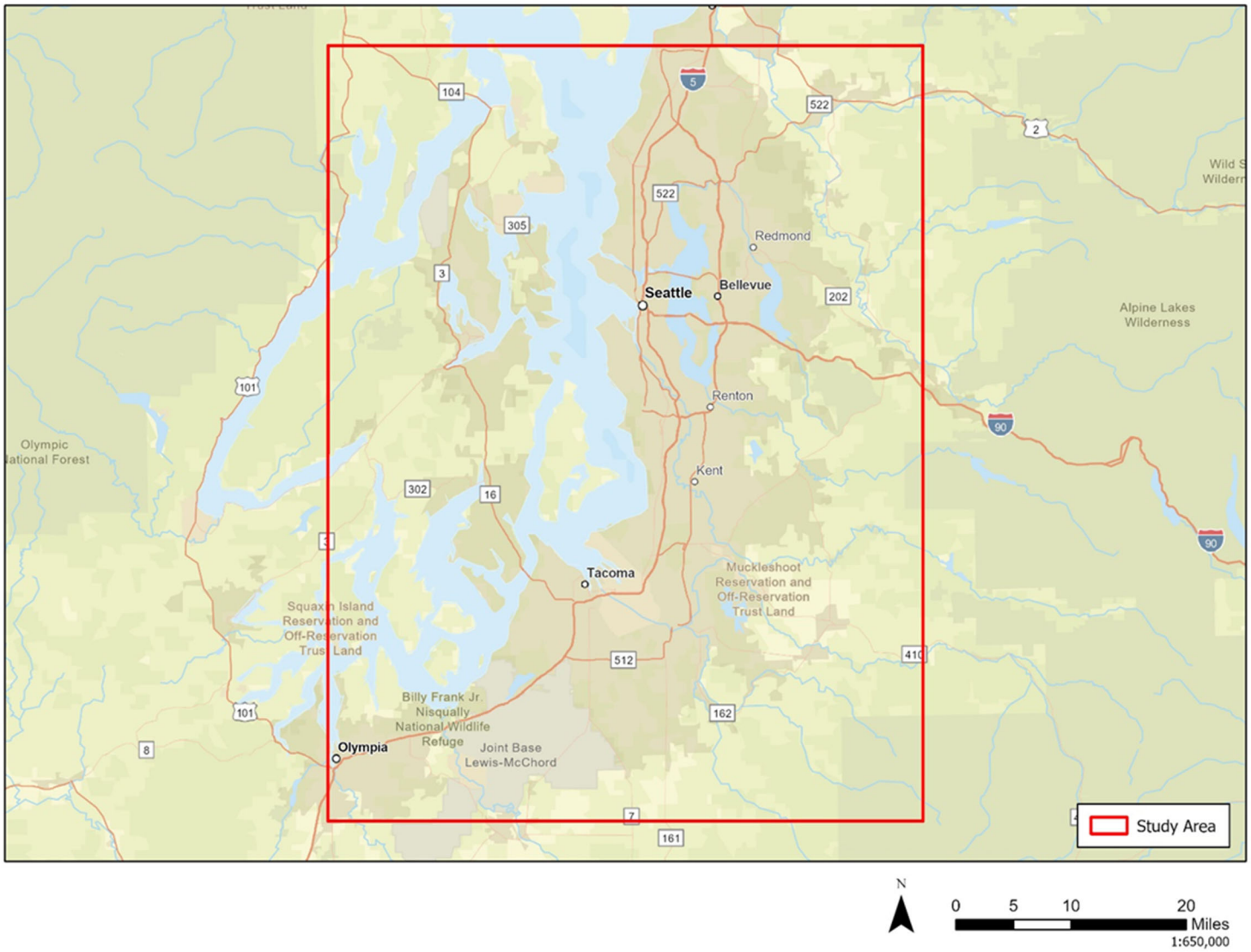
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairwoman Amber Caldera
31912 Little Boston Road NE
NE, Kingston, Washington 98346-0155

*Transmitted via mail and email to chairperson@pgst.nsn.us*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairwoman Caldera:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Misty Ives, THPO
Attachment A – NHPA Section 106 Consultation Letter

Misty Ives, THPO
31912 Little Boston Rd. NE
NE, Kingston, Washington 98346

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Port Gamble S'Klallam Tribe and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

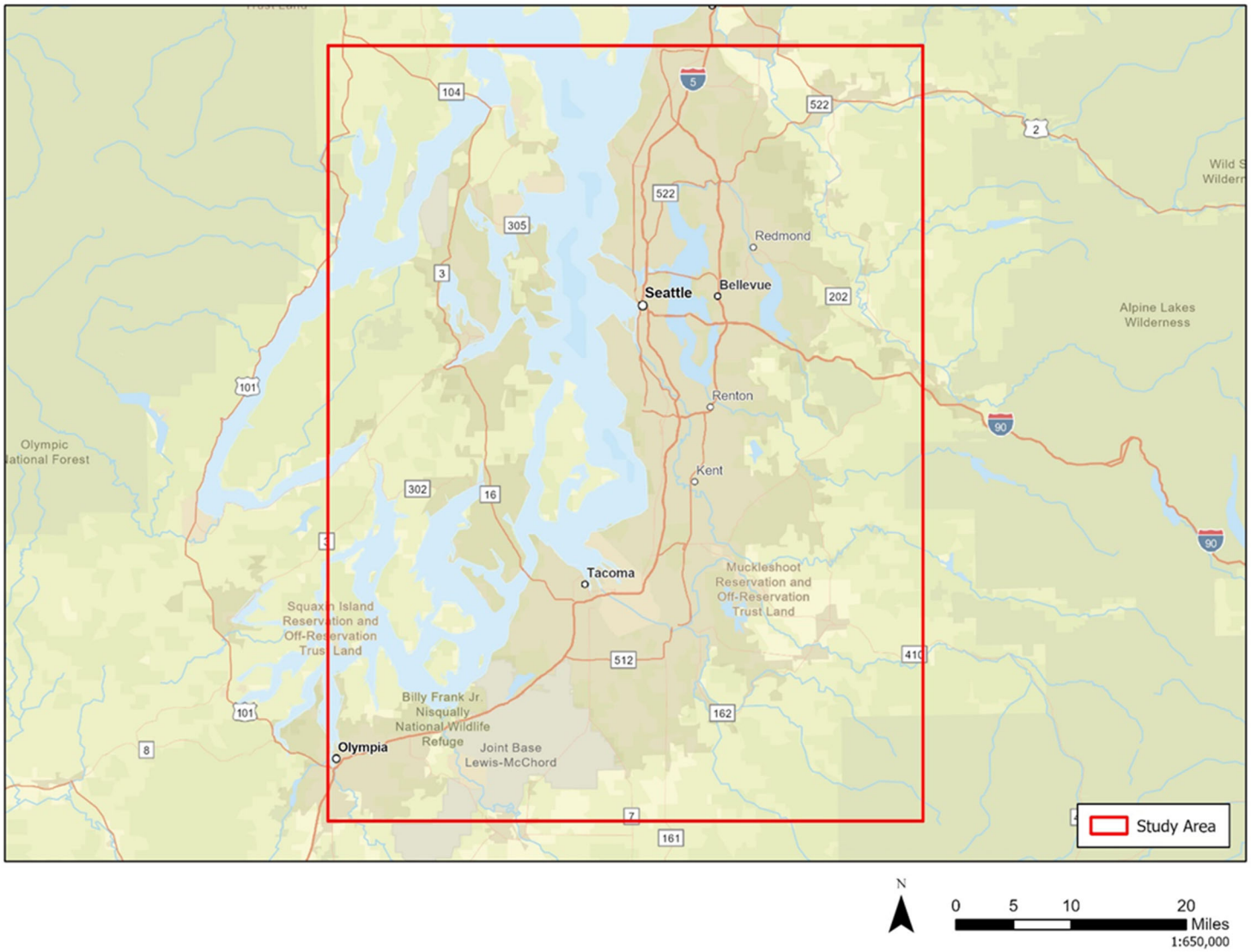
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



President Guy Capoeman
1214 Aalis Drive, Taholah
Taholah, Washington `

*Transmitted via mail and email to guy.capoeman@quinault.org*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear President Capoeman:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Lia Frenchman, THPO
Attachment A – NHPA Section 106 Consultation Letter

Lia Frenchman, THPO
Po Box 189
Taholah, Washington 98587

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Quinault Indian Nation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

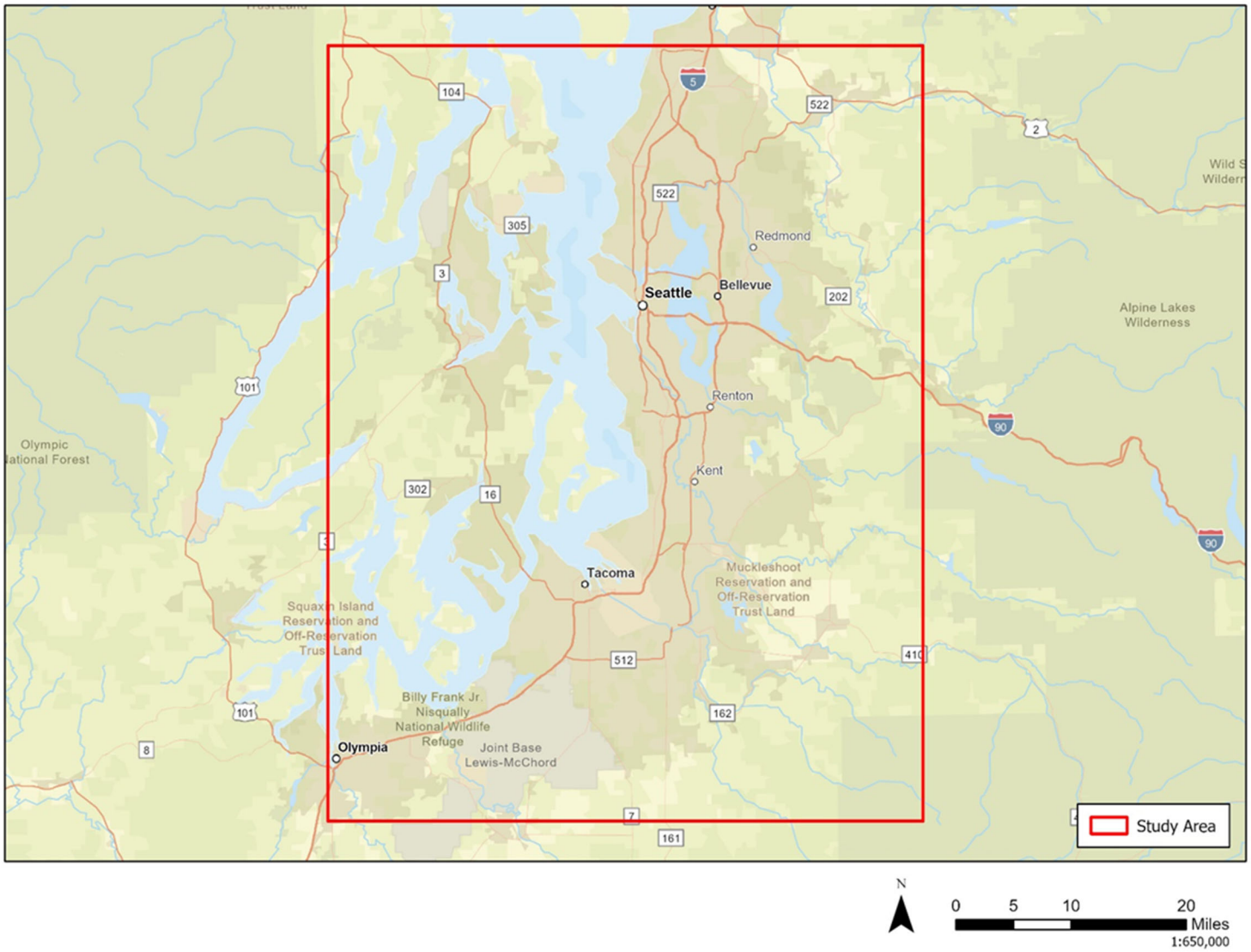
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Tom Wooten
2918 Commercial Avenue
Anacortes, Washington 98221

*Transmitted via mail and email to tomwooten@samishtribe.nsn.us*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Wooten:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Jackie Ferry, THPO
Attachment A – NHPA Section 106 Consultation Letter

Jackie Ferry, THPO
2918 Commercial Avenue
Anacortes, Washington 98221

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Samish Indian Nation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

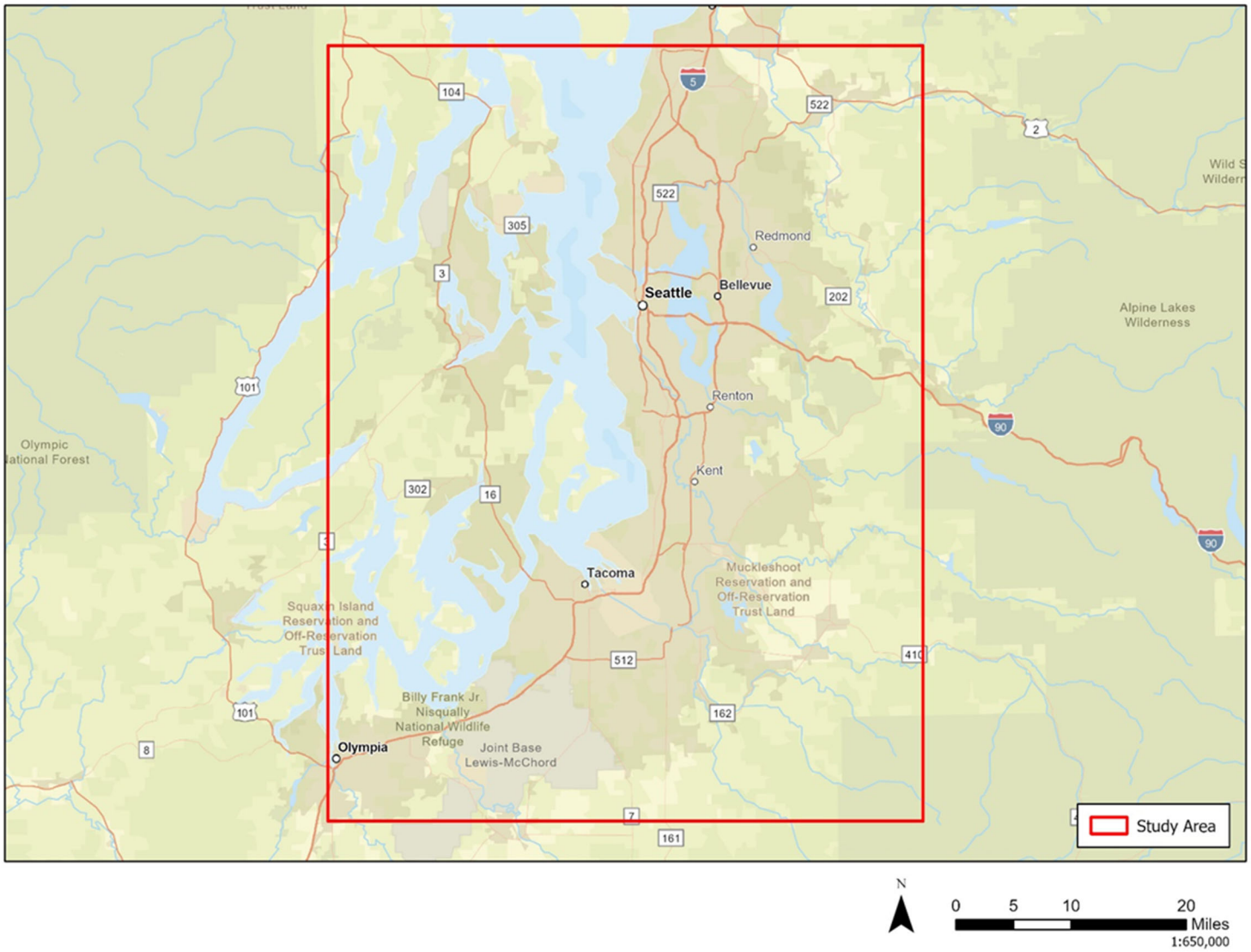
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Nino Maltos
5318 Chief Brown Lane, Darrington
Darrington, Washington 98241-9421

*Transmitted via mail and email to chairman@sauk-suiattle.com*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Maltos:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Kevin Joseph, THPO
Attachment A – NHPA Section 106 Consultation Letter

Kevin Joseph, THPO
5318 Chief Brown Lane
Darrington, Washington 98241

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Sauk-Suiattle Indian Tribe and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

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**Area of Potential Effects**

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**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

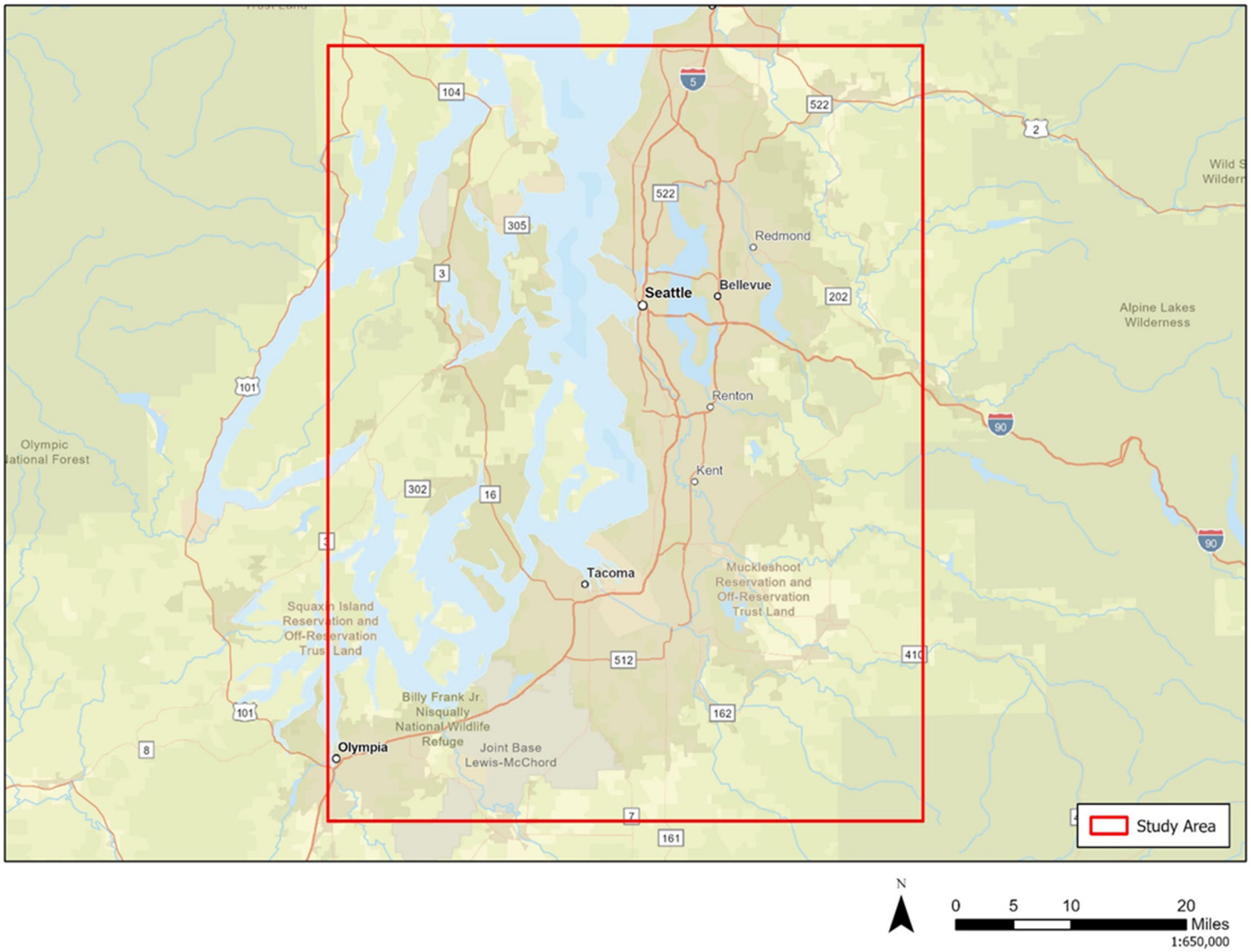
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Charles "Guy" Miller
80 North Tribal Center Road, Shelton
Shelton, Washington 98584-9748

*Transmitted via mail and email to gmiller@skokomish.org*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Miller:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Kris Miller, THPO
Attachment A – NHPA Section 106 Consultation Letter

Kris Miller, THPO
80 North Tribal Center Road
Shelton, Washington 98584

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Skokomish Indian Tribe and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

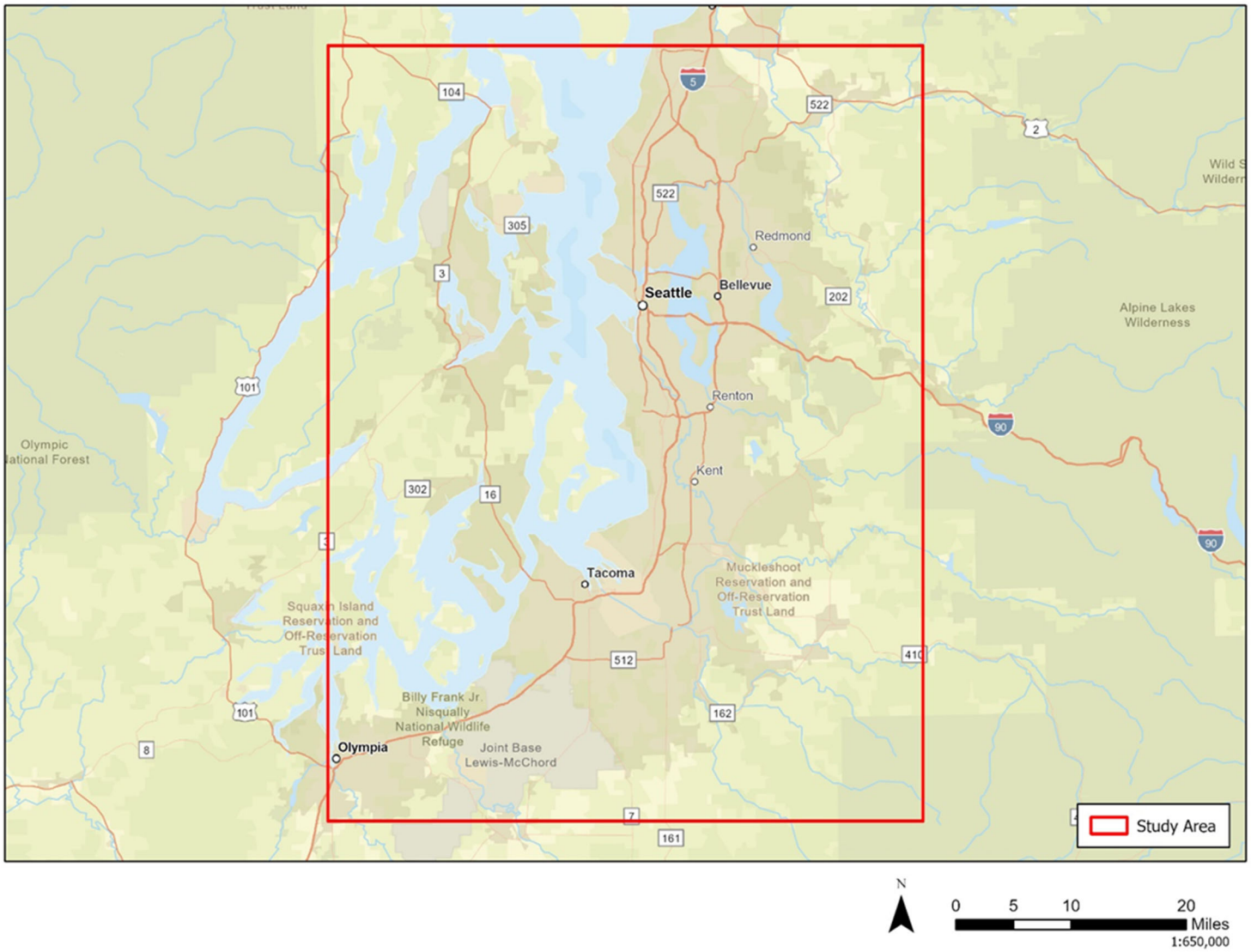
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Kristopher Peters
10 Se Squaxin Lane, Shelton
Shelton, Washington 98584-9200

*Transmitted via mail and email to kpeters@squaxin.us*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Peters:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Rhonda Foster, THPO
Attachment A – NHPA Section 106 Consultation Letter

Rhonda Foster, THPO
Se 70 Squaxin Lane
Shelton, Washington 98584

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Squaxin Island Tribe of the Squaxin Island Reservation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

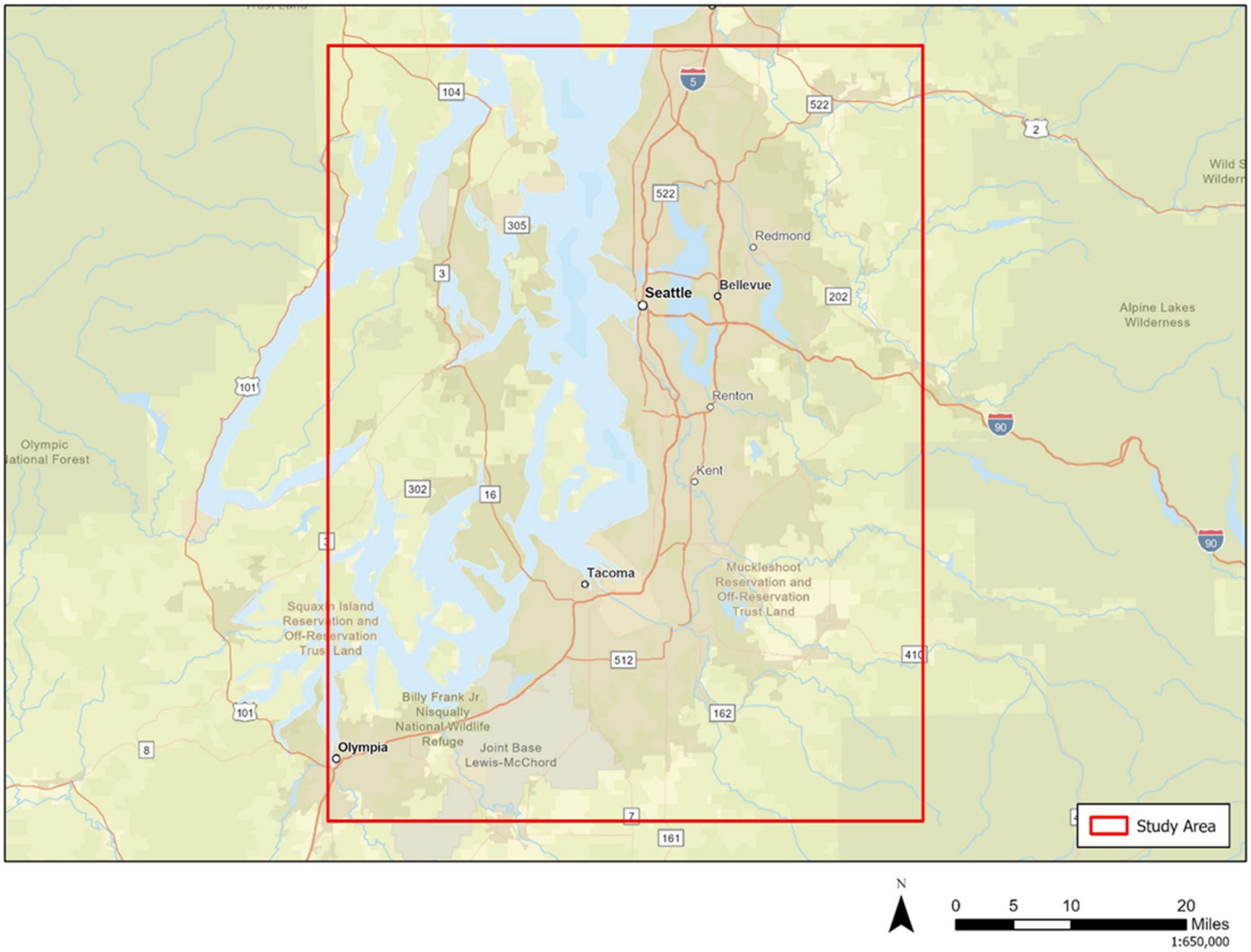
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Eric White
3322 236th Street Ne, Arlington
Arlington, Washington 98223

*Transmitted via mail and email to ewhite@stillaguamish.com*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman White:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Kerry Lyste, THPO
Attachment A – NHPA Section 106 Consultation Letter

Kerry Lyste, THPO
P.O. Box 277
Arlington, Washington 98223

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Stillaguamish Tribe of Indians of Washington and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

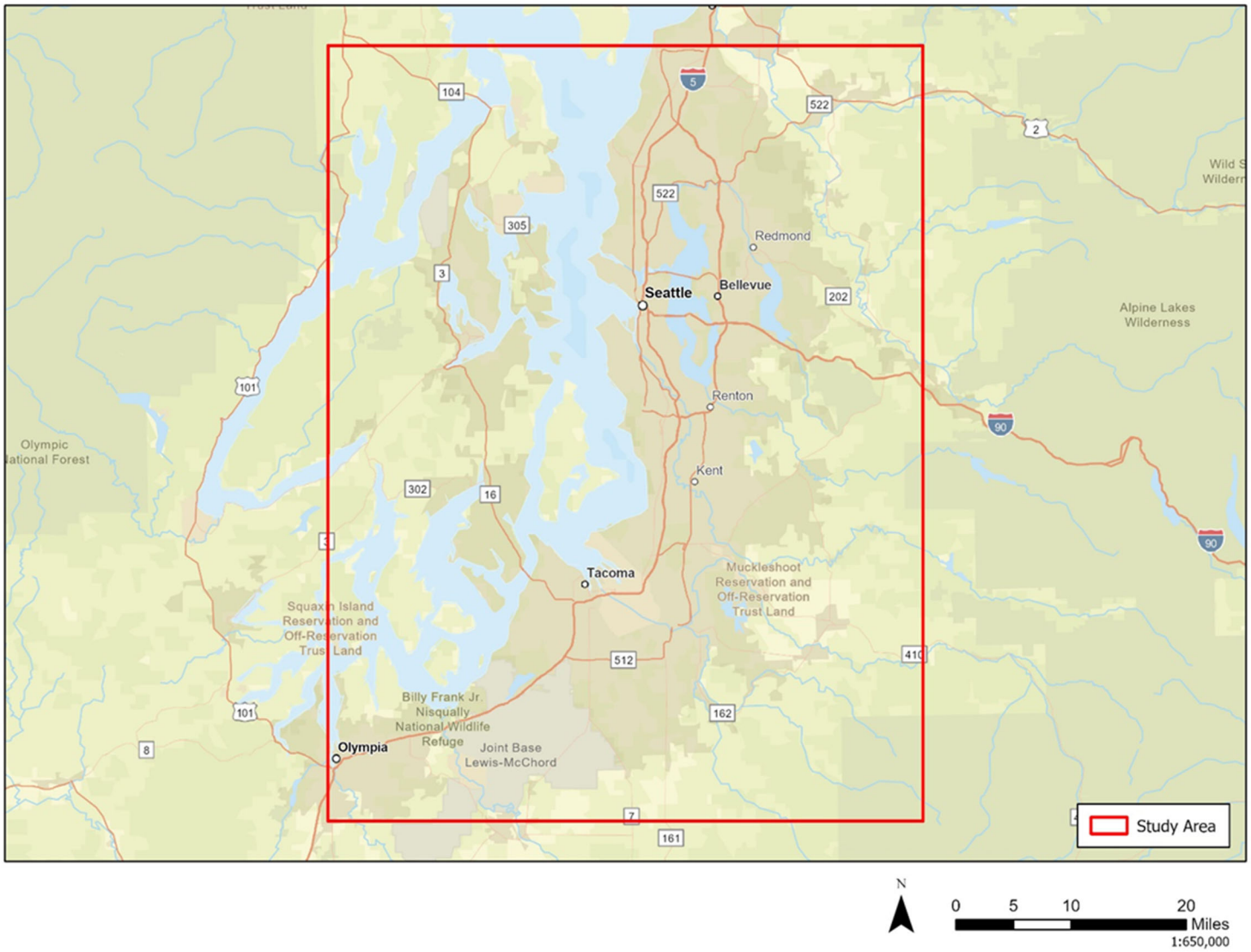
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Leonard Forsman
18490 Suquamish Way
Suquamish, Washington 98392

*Transmitted via mail and email to lforsman@suquamish.nsn.us*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Forsman:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Stephanie Trudel, THPO
Attachment A – NHPA Section 106 Consultation Letter

Stephanie Trudel, THPO
PO Box 498
Suquamish, Washington 98392

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Suquamish Indian Tribe of the Port Madison Reservation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

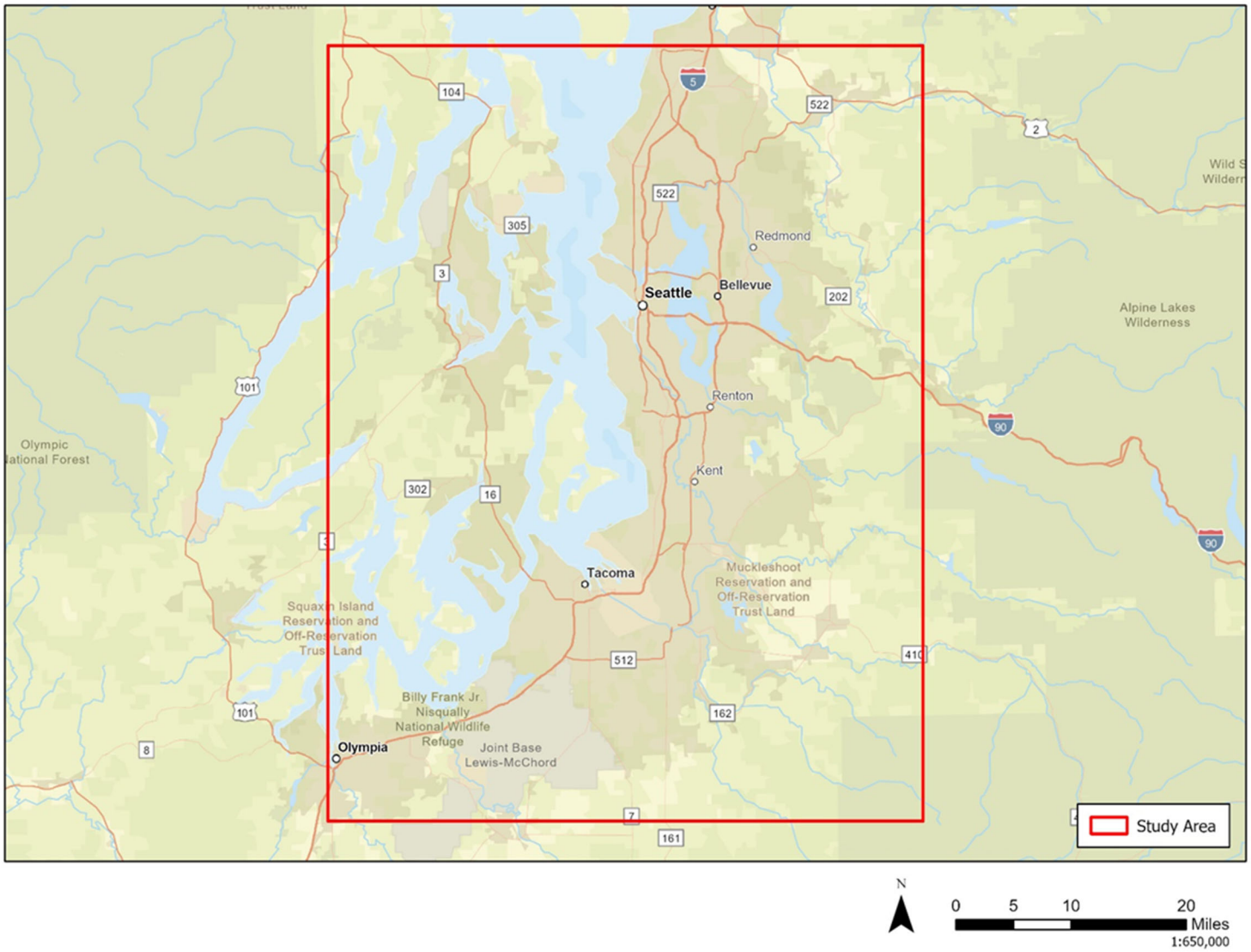
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Steve Edwards
11404 Moorage Way
La Conner, Washington 98257-9450

*Transmitted via mail and email to sedwards@swinomish.nsn.us*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Edwards:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Josephine Jefferson, THPO
Attachment A – NHPA Section 106 Consultation Letter

Josephine Jefferson, THPO
11404 Moorage Way
La Conner, Washington 98257

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Swinomish Indian Tribal Community and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

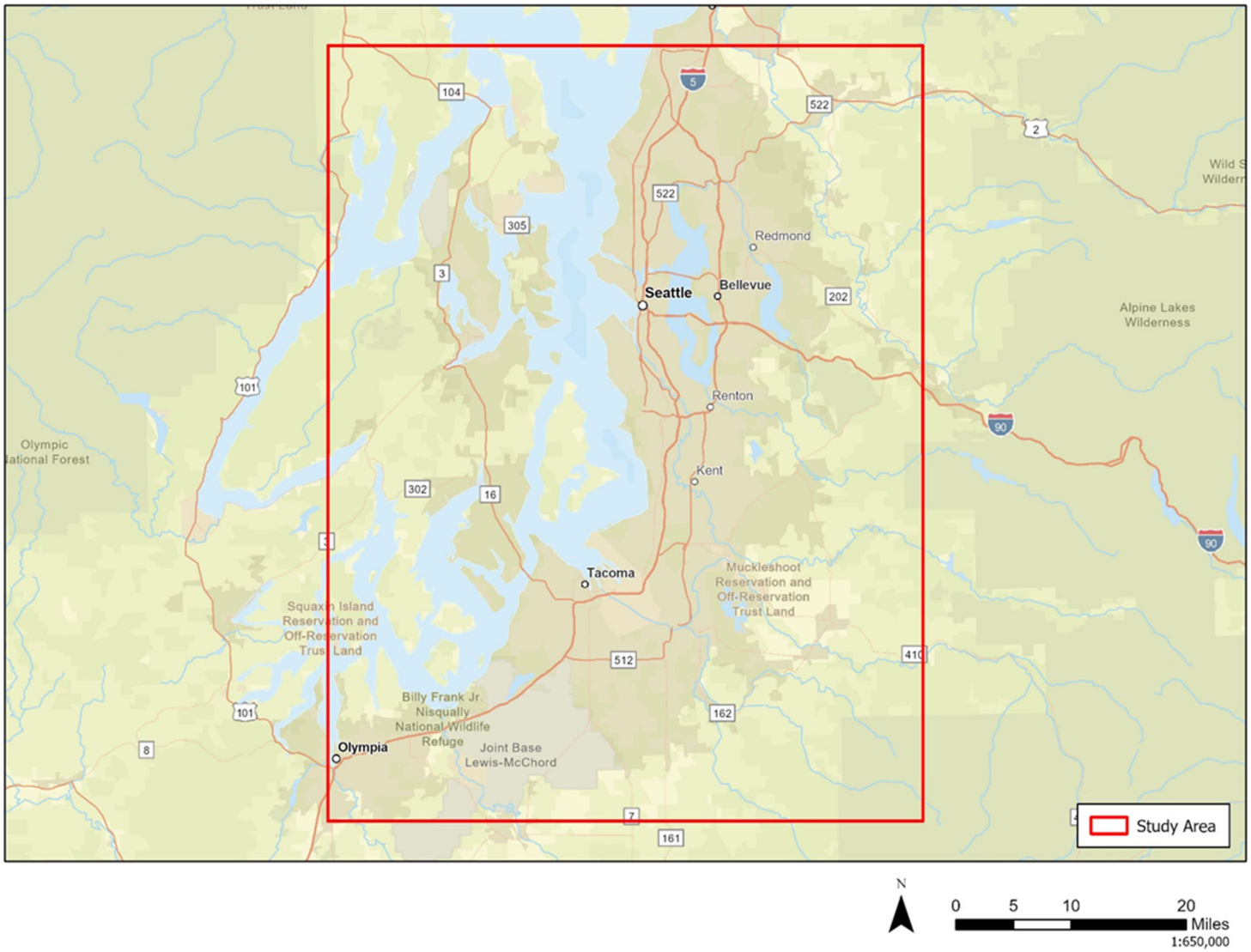
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairman Anthony Hillaire
2665 Kwina Road
Bellingham, Washington 98226-9221

*Transmitted via mail and email to anthonyh@lummi-nsn.gov*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Hillaire:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

cc: Lena Tso, THPO
Attachment A – NHPA Section 106 Consultation Letter

Lena Tso, THPO
2665 Kwina Road
Bellingham, Washington 98226

The Federal Aviation Administration (FAA) is currently evaluating Zipline International Inc.'s (Zipline) proposal to conduct expanded delivery drone operations in the Seattle, Washington area. Zipline must obtain approval from the FAA prior to expanding its operations by operating the P2 Zip drone in Seattle, Washington. The FAA has determined that its proposed action, which would encompass all FAA approvals necessary to enable expanded operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The purpose of this letter is to initiate Section 106 consultation with the Lummi Tribe of the Lummi Reservation and to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

**Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The proposed operation APE would be an approximately 3,474 square mile area around Seattle. The enclosed map (see **Attachment 1**) shows the proposed APE in detail.

**Identification of Historic Properties**

The proposed undertaking does not have the potential to affect below ground or archeological resources because the undertaking will only result in disturbance to previously disturbed land but could result in auditory or visual effects. Therefore, the FAA focused its identification efforts on above-ground historic properties.

**Consultation**

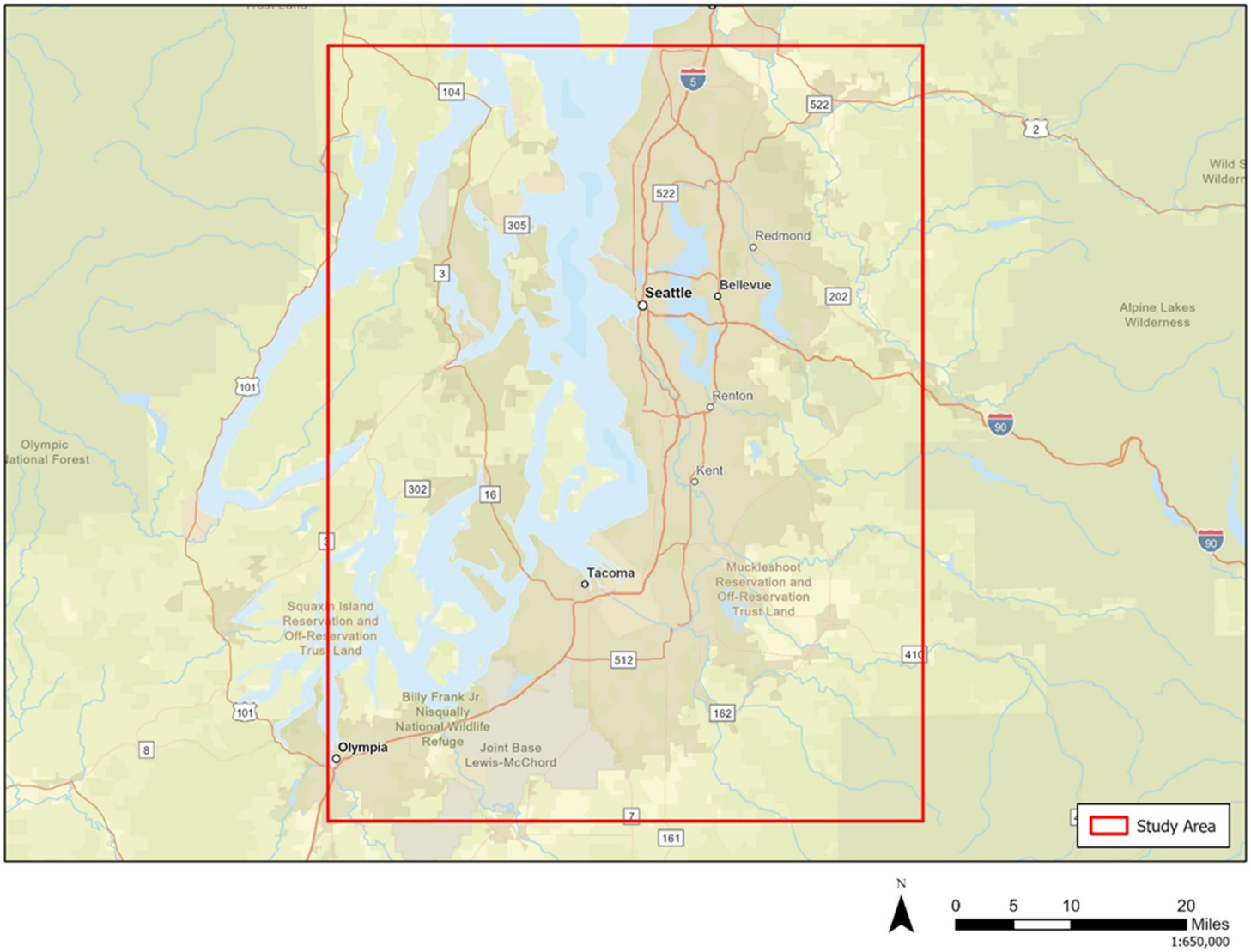
The FAA is now soliciting the opinion of the Tribes concerning any Tribal lands, or sites of religious or cultural significance that may be affected by the proposed operations area. Your response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. If you have any questions or need additional information, please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of receipt of this letter.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachments:
Attachment 1 - Proposed Area of Potential Effects

**Attachment 1. Area of Potential Effects**



Chairwoman Frances Charles
2851 Lower Elwha Road
Port Angeles, Washington 98363

*Transmitted via mail and email to fgcharles@elwha.org*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairwoman Charles:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachment 1 – Project Description
Attachment 2 – Area of Potential Effects

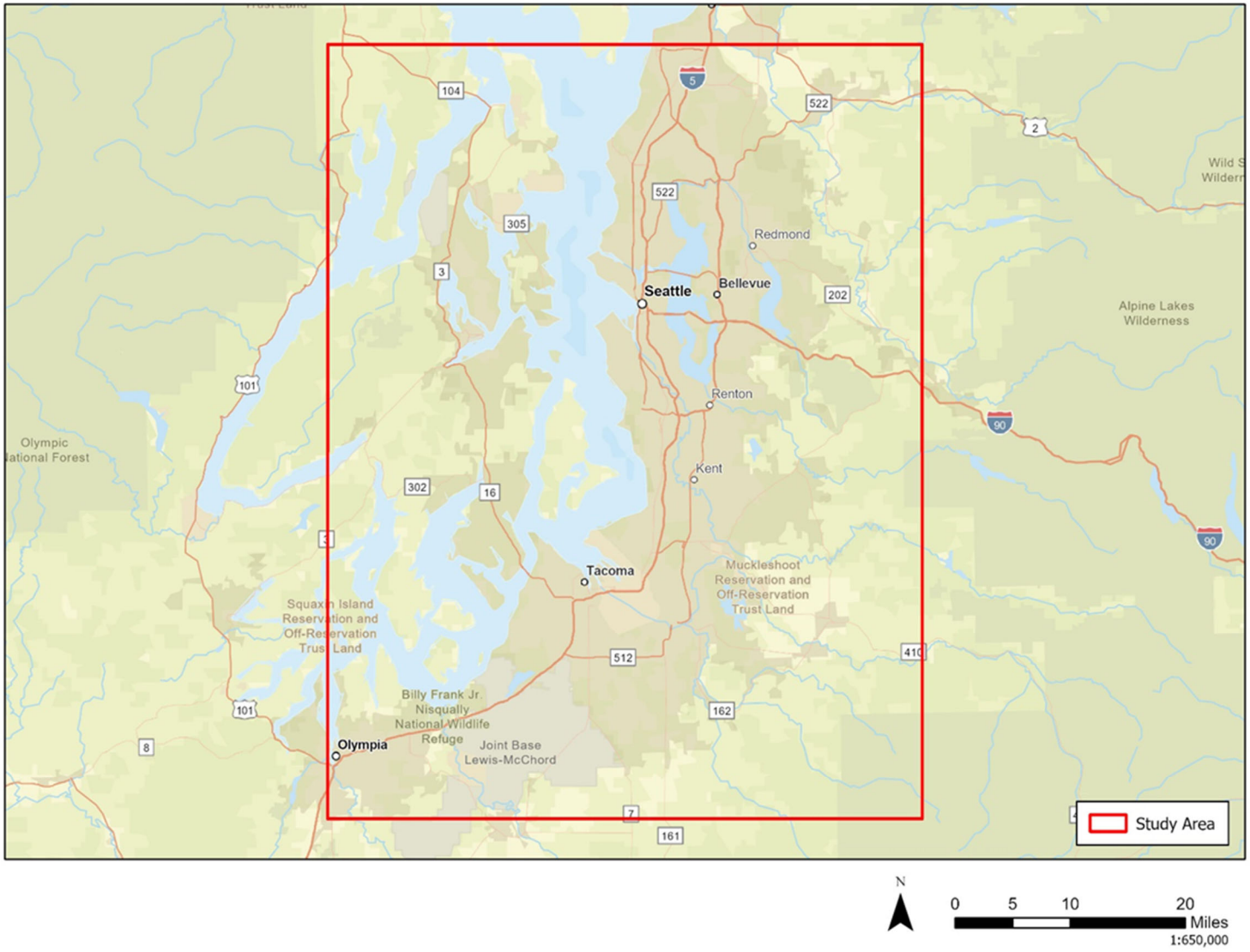
**Attachment 1. Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Attachment 2. Area of Potential Effects**



Chairman Jaison Elkins
39015 172nd Avenue SE
Auburn, Washington 98092-9763

*Transmitted via mail and email to jaison.elkins@muckleshoot.nsn.us*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Elkins:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachment 1 – Project Description
Attachment 2 – Area of Potential Effects

**Attachment 1. Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

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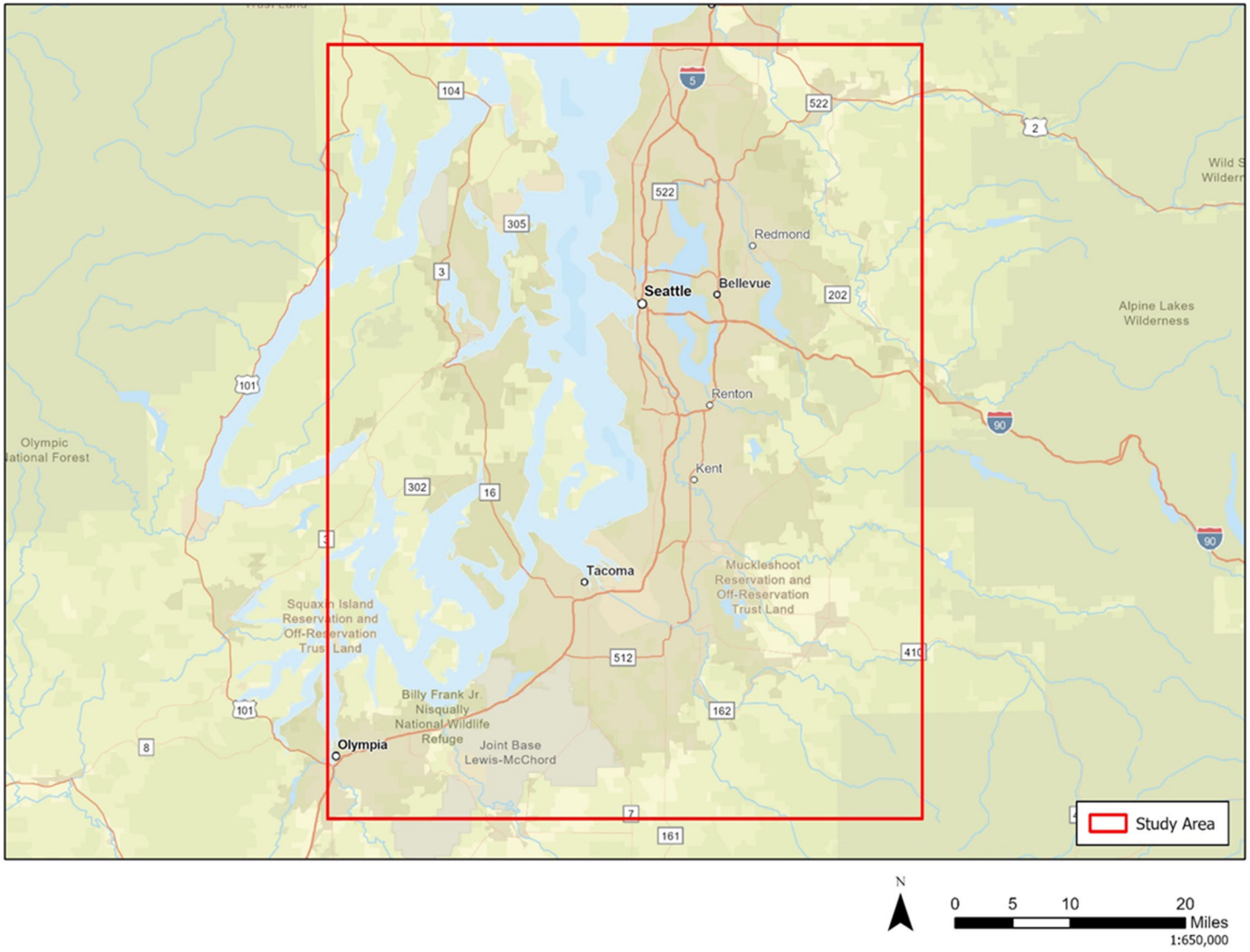

Chairman Bill Sterud
3009 East Portland Avenue
Tacoma, Washington 98404-4926

*Transmitted via mail and email to angel.robertiello@puyalluptribe-nsn.gov*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Sterud:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

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approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

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**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachment 1 – Project Description
Attachment 2 – Area of Potential Effects

**Attachment 1. Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

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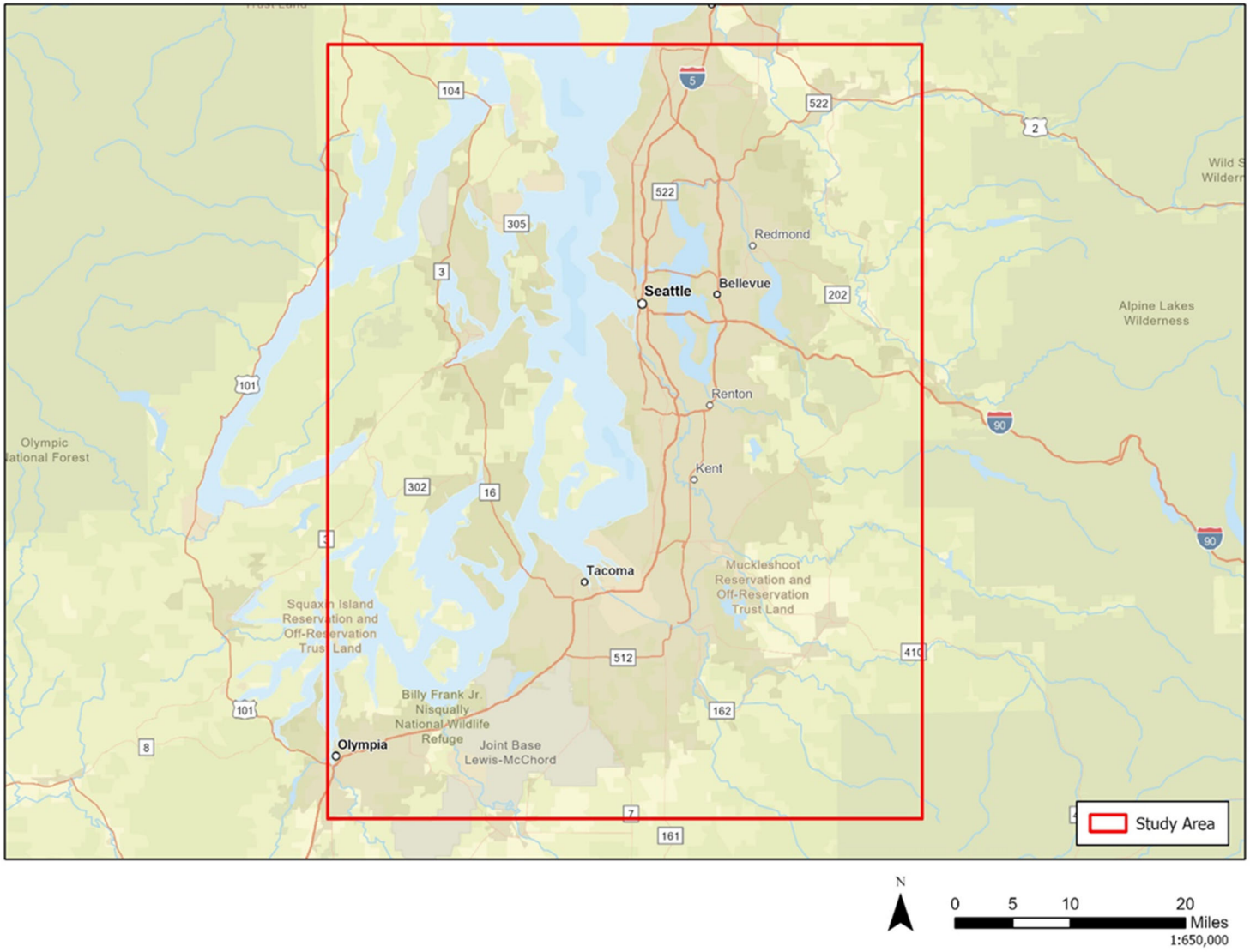
**Attachment 2. Area of Potential Effects**



Chairman Robert de los  Angeles
9571 Ethan Wade Way SE
Snoqualmie, Washington 98065

*Transmitted via mail and email to bobde@snoqualmietribe.us*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairman Angeles:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project.  Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

**Proposed Activity Description**

The FAA is preparing an Environmental Assessment to assess the potential environmental impacts of the FAA's actions of authorizing commercial package delivery operations using drones in Seattle under Part 135. Since 2019, the FAA has been issuing air carrier certificates to UAS operators in accordance with Part 135 so that operators can conduct package delivery flights. Generally, these approvals are associated with issuing a new or amended Part 135 air carrier Operations Specifications as the operative

approval. For your reference, the project description used for consultation under Section 106 is enclosed with this letter.

**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

**Confidentiality**

We understand that you may have concerns about the confidentiality of information on areas or resources of traditional, religious, and cultural importance to your Tribe. We are available to discuss these concerns and develop procedures to ensure the confidentiality of such information is maintained.

**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachment 1 – Project Description
Attachment 2 – Area of Potential Effects

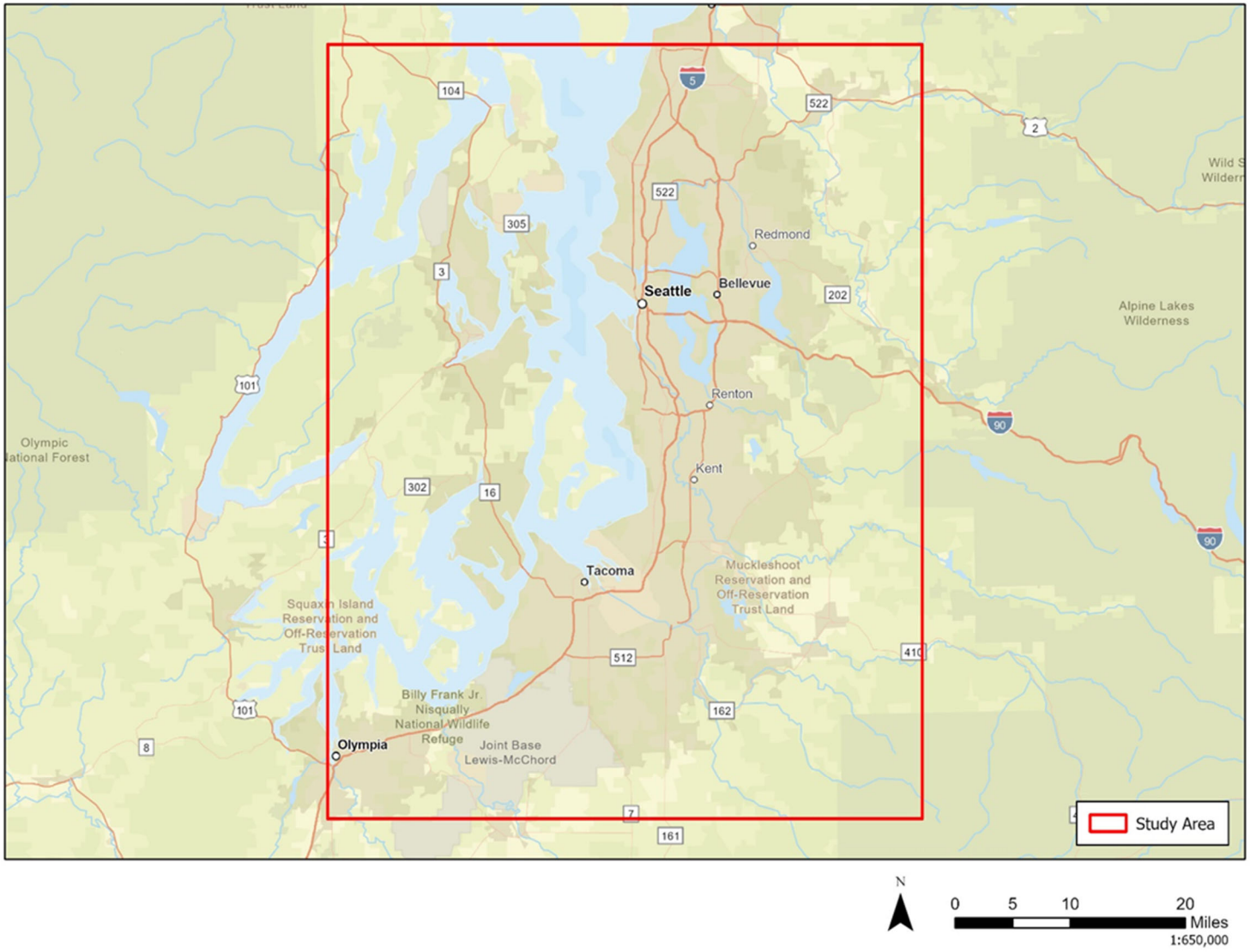
**Attachment 1. Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

Under the proposed action, Zipline would establish up to 75 site locations and construct up to a total of 500 docks with a maximum of twenty docks at a single site. Operations would occur 24 hours a day, seven days per week, including holidays. Zipline would conduct up to 400 flights over a 24-hour day in a 10-mile radius around each site. Initially, Zipline expects to fly much less than 400 flights per day from the launch/landing site and gradually ramp up to the proposed level as consumer demand increases. Approximately 95 percent of flights would take place during acoustic daytime (7:00 AM to 10:00 PM) and 5 percent of flights would take place at acoustic nighttime (10:00 PM to 7:00 AM).

Sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers. Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population.

**Attachment 2. Area of Potential Effects**



Chairwoman Marilyn Scott
25944 Community Plaza Way
Sedro Woolley, Washington 98284-9739

*Transmitted via mail and email to marilyns@upperskagit.com*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairwoman Scott:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

The primary purpose of government-to-government consultation is to ensure that Federally Recognized Tribes are given the opportunity to provide meaningful and timely input regarding proposed FAA actions that uniquely or significantly affect the Tribes. This policy is provided in Federal Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; Presidential Memorandum, *Uniform Standards for Tribal Consultation*; DOT Order 5301.1A, *Department of Transportation Tribal Consultation Policy and Procedures*; and FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*.

**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

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**Area of Potential Effects**

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**Confidentiality**

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**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachment 1 – Project Description
Attachment 2 – Area of Potential Effects

**Attachment 1. Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

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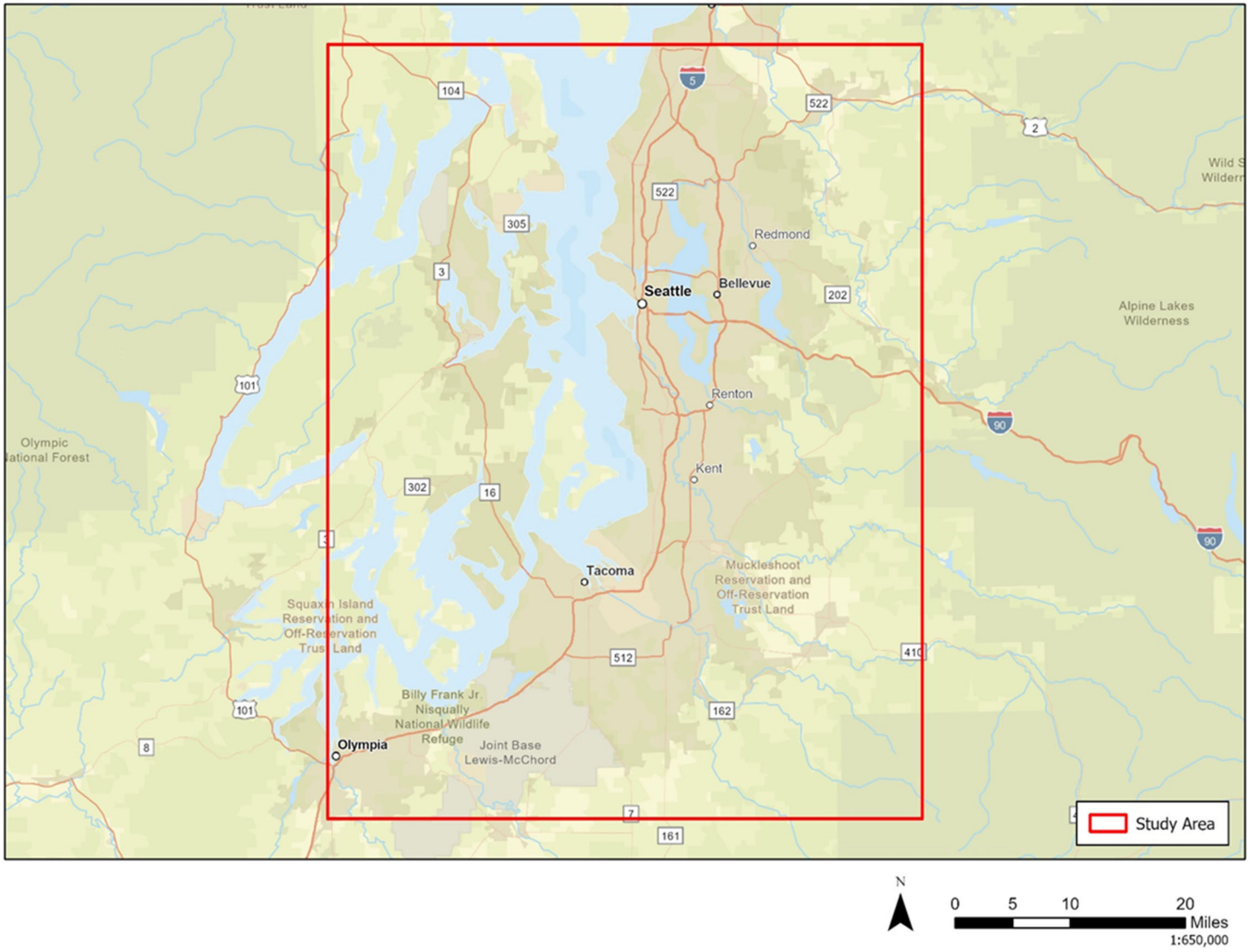

Chairwoman Teri Gobin
6406 Marine Drive
Tulalip, Washington 98271-9775

*Transmitted via mail and email to trgobin@tulaliptribes-nsn.gov*

**RE: Invitation for Government-to-Government Tribal Consultation for Drone Package Delivery Operations in Washington**

Dear Chairwoman Gobin:

The purpose of this letter is to initiate formal government-to-government consultation regarding a proposal under consideration by the Federal Aviation Administration (FAA) to authorize commercial Unmanned Aircraft Systems (UAS) operators to deliver goods to customers (referred to as package delivery) using unmanned aircraft (also referred to as drones) in accordance with 14 Code of Federal Regulations Part 135 (Part 135) in the state of Washington. The FAA is the lead federal agency for government-to-government consultation for the proposed project. Zipline International Inc. (Zipline) is the proponent of the project. We wish to solicit your views regarding potential effects on tribal interests in the area. The FAA has begun an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to analyze the proposed action. FAA intends to complete consultation for Section 106 of the NHPA concurrently with the NEPA process.

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**Consultation Initiation**

With this letter, FAA is seeking input concerning any Tribal lands or sites of religious or cultural significance that may be affected by the proposed operation. Early identification of Tribal concerns, or known properties of traditional, religious, and cultural importance, will allow the FAA to consider ways to avoid or minimize potential impacts to Tribal resources. We are available to discuss the details of the proposed project with you.

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**Area of Potential Effects**

In accordance with 36 CFR 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects. The APE would be approximately 3,474 square miles and is shown in greater detail in the enclosure.

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**FAA Contact Information**

Your timely response over the next 30 days will greatly assist us in incorporating your concerns into our environmental review of the operation. In addition, we respectfully request your response in the event that your Tribe would like to consult with the FAA in a government-to-government relationship about this proposal. Please contact Chris Hurst via email at 9-faa-drone-environmental@faa.gov within 30 days of the receipt of this letter to confirm your intent to participate in this government-to-government consultation.

Sincerely,

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Attachment 1 – Project Description
Attachment 2 – Area of Potential Effects

**Attachment 1. Project Description**

Zipline is proposing the expansion of their existing commercial drone package delivery operations to include the Seattle metro area. The P2 Zip drone weighs approximately 55 pounds and can transport a small package up to about 8 pounds. The P2 Zip drone would take off from Zipline's site locations and quickly rise to a cruising altitude of 150 to 400 feet above ground level (AGL). Once at the delivery site, the P2 Zip drone hovers in place at about 100 to 400 feet AGL and drops the package to the ground. Once the package has been delivered, the drone flies back to the launch/landing site at roughly the same altitude.

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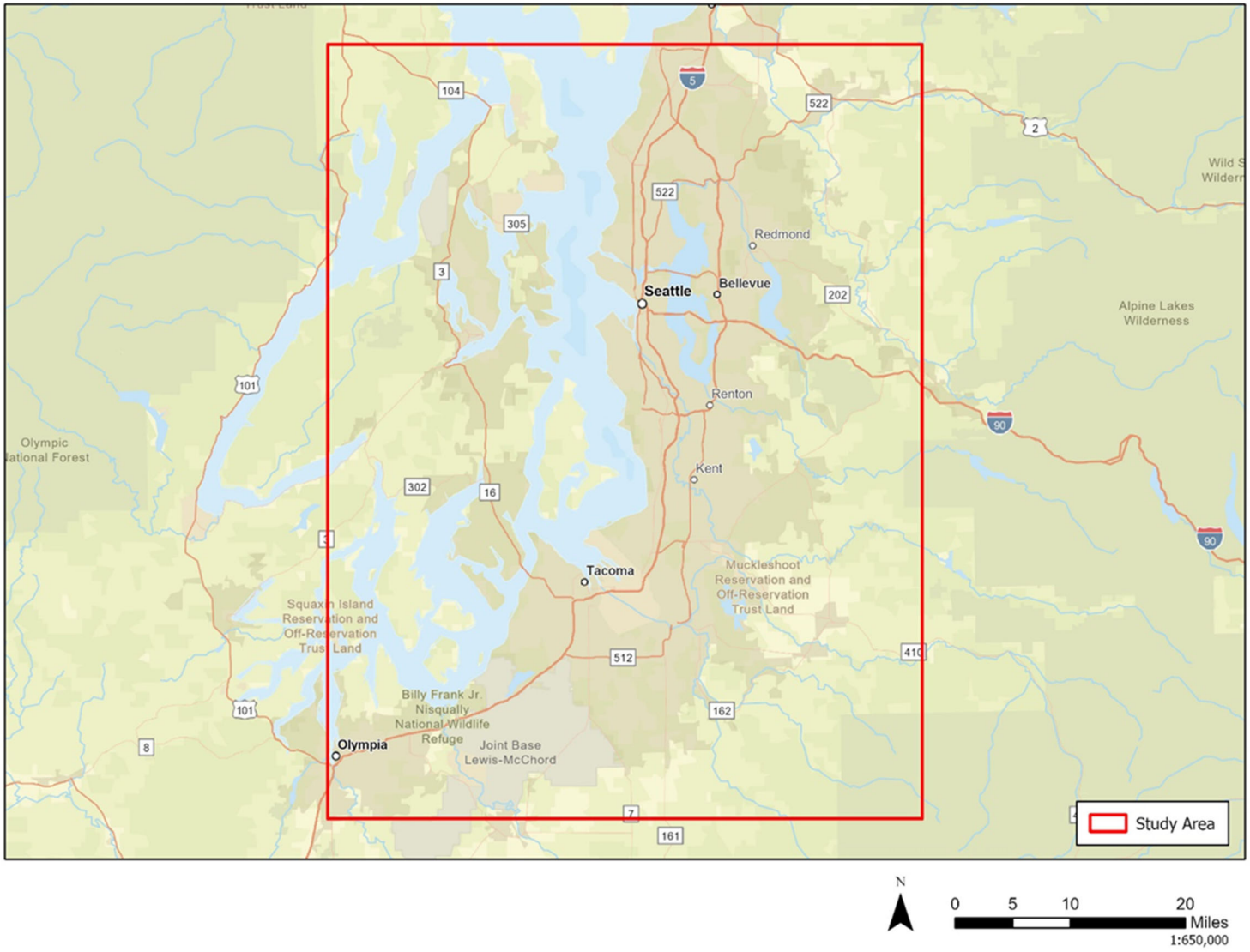


# Appendix G
# **SHPO Consultation**

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

Aviation Safety

800 Independence Ave., SW.
Washington, DC 20591

State Historic Preservation Office
Department of Archaeology and Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

Via electronic submission to 106@dahp.wa.gov.

**Re: Concurrence with Proposed Area of Potential Effects for Drone Delivery Operations in Seattle, Washington**

State Historic Preservation Officer:

The Federal Aviation Administration (FAA) is currently evaluating a proposal from Zipline International Incorporated doing business as Zipline, to introduce drone package delivery operations in the **Seattle, Washington,** area. The FAA has determined the proposed action, which requires FAA approvals to enable operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)). The FAA participated in two pre-consultation meetings with your office on April 17, 2024, and May 17, 2024, to discuss the proposed action. As a result of these meetings, your office provided a Tribal contact list that FAA referenced as part of consultation invitation outreach efforts. The purpose of this letter is to coordinate with the State Historic Preservation Officer (SHPO) and request concurrence on the definition of the Area of Potential Effects (APE).

**Proposed Undertaking**

Unmanned Aircraft

Zipline's P2 Zip platform is a highly automated, electrically powered vertical takeoff and landing aircraft capable of hover and forward flight. The Zip features a multi-rotor design with 5 propellers and weighs under 63 pounds when combined with its maximum payload weight of 8 pounds. The P2 Zip is shown in **Attachment A**.

Zipline locates Zips and their associated docks at Zipline partner sites. Once an order is placed, a package is loaded into a "Droid." The Droid is stored in the Zips' payload bay and the Zip undocks and flies to the delivery site where it lowers the Droid via winch line to a pre-selected delivery site. The Zip has a wingspan of approximately 7.8 feet, a height of approximately 1.8 feet, and a length of approximately 8 feet. Zips are equipped with high-visibility red (left wingtip) and green (right wingtip) LED lights, and aft-directed strobe lights (white) on each wingtip. These lights run continuously during Zip operation, day or night, and are visible for at least 3 statute miles.

Flight Operations

Zips would generally be operated at an altitude of 150–400 feet above ground level (AGL) while en route to and from delivery locations. At a delivery location, the Zip would descend vertically to a stationary hover approximately 100-400 feet AGL (depending on terrain/airspace) and lower the Droid to the ground for delivery of the payload through bay doors. Once the payload has been released, the UA would then retract the Droid, ascend vertically to a cruise altitude, and depart the delivery area en route back to a site.

The UA would fly a predefined flight path that is set prior to takeoff. Flight missions are automatically planned by Zipline's flight planning software. A mission originates from a dock, and Zipline's software automatically assigns, deconflicts, and routes each flight to the delivery location and back to a dock. Exclusion zones are designed to keep operations clear from nearby non-participating people and vehicles. Pedestrians or vehicles are not permitted in these areas when Zips are docking or undocking.

*Takeoff*

Once cleared for takeoff from a dock, the Zip undocks and then maneuvers away from the dock and climbs to the en route altitude (150-400 feet AGL) on its pre-planned flight path.

*En Route Outbound*

The en route outbound phase is the part of flight in which the fully loaded Zip transits from the dock to a delivery point on a predefined flight path. During this flight phase, the Zip would typically operate at an altitude of 150–400 feet AGL and a typical cruise airspeed of 47 miles per hour (mph). The Zip would not exceed 76 mph at any point during the flight.

*Delivery*

The delivery phase consists of descent from the en route altitude to a delivery point, such as a residential yard, driveway, parking lot, or common area. The Zip descends vertically to 100-400 feet AGL while maintaining position over the delivery point. The Droid is released from the Zip and lowered to the ground via the winch line. During Droid descent, the Droid automatically controls its position laterally and evaluates the delivery site. If the Droid is unable to automatically identify the delivery target and evaluate its suitability, an image is sent to an operator for real-time evaluation. If the delivery site does not meet Zipline's evaluation criteria, delivery would not continue, and the Droid is retracted back into the Zip. If the delivery site is identified and clear, the Droid would continue to descend and deliver the payload at the delivery target. The Droid would then be retracted back into the Zip. The Zip would then proceed to climb vertically back to en route altitude. The total hover time for delivery operations would be approximately one minute.

*En Route Inbound*

The P2 Zip continues to fly at an altitude of 150—400 feet AGL and a speed of 47 mph towards the dock.

*Landing*

Upon reaching the dock, the Zip slowly descends and maneuvers into the dock area. The Zip then attaches to the dock from below using its docking fin. Hover motors are disengaged after the Zip has registered a secure connection with the dock.

**Area of Potential Effects**
In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the APE in consideration of the undertaking's potential direct and indirect effects. The proposed APE is the drone operating area outlined in red in **Attachment B**. The operating area would be rectangular, approximately 67 miles long east and west and 51 miles long north and south, with an area of approximately 3,474 square miles.

**Conclusion**
The FAA requests your concurrence on the definition of the proposed APE and any recommendations of other consulting parties who should be invited to consult on the proposed action. Your response within the next 30 days will greatly assist us in our environmental review process. In the event that you would like to consult with the FAA about the proposed APE, please contact Christopher Hurst via email at 9-faa-drone-environmental@faa.gov.

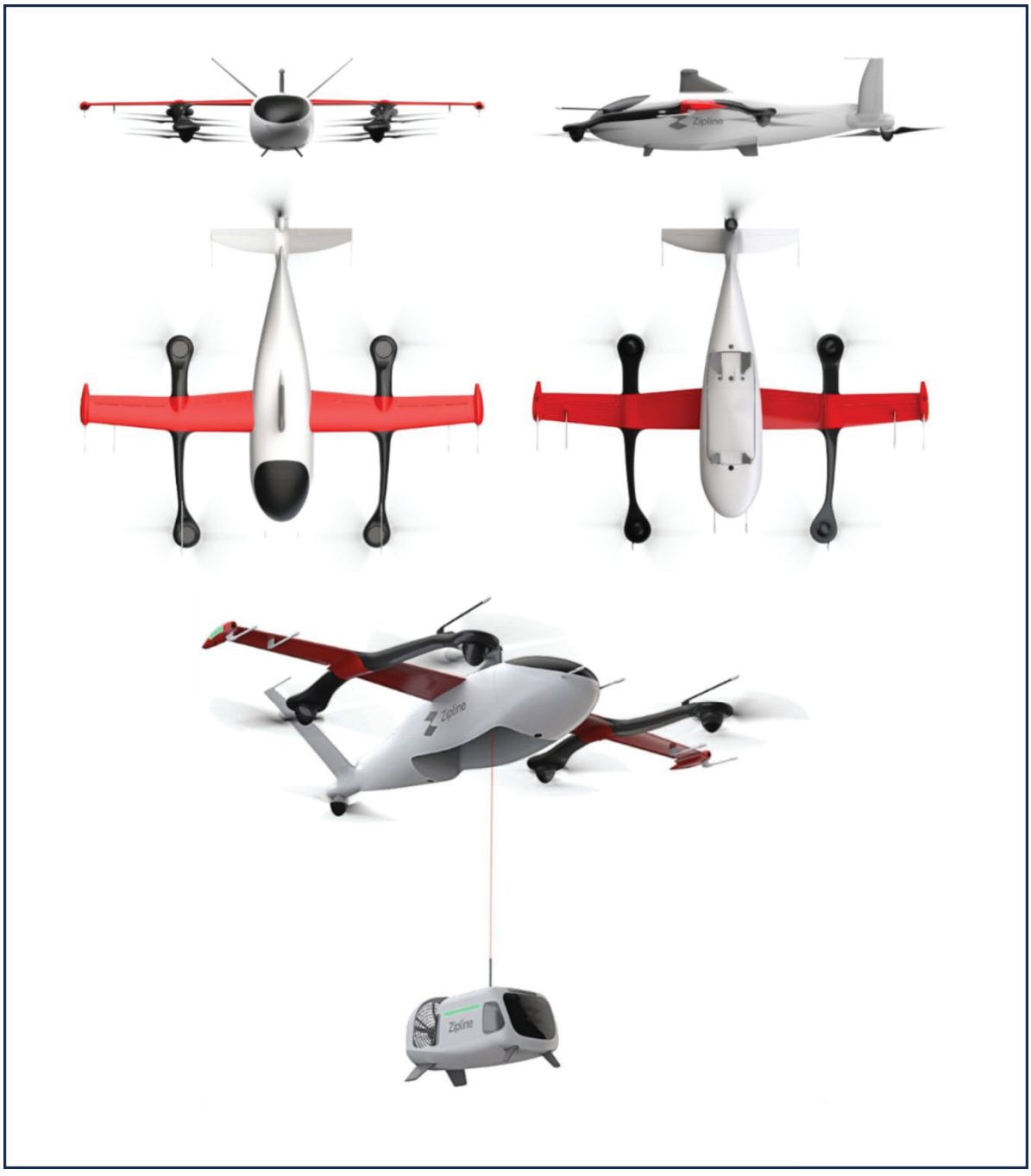
Sincerely,

DEREK W HUFTY Digitally signed by DEREK W HUFTY
Date: 2024.08.01 12:00:43 -04'00'

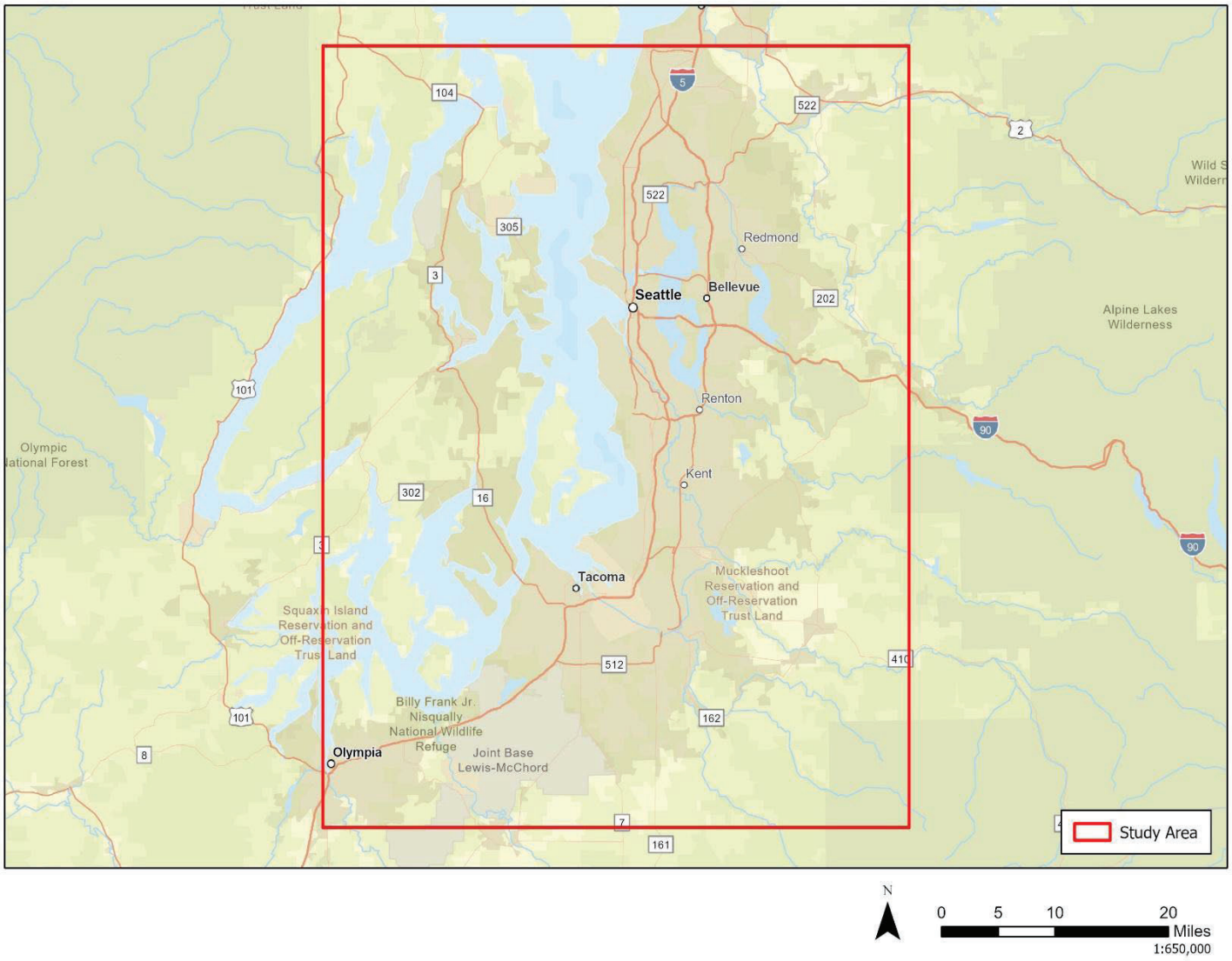
Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:
Attachment A – UAS Image
Attachment B – Proposed Area of Potential Effects

**Attachment A**
**Zipline P2 Zip Drone**



**Attachment B**
**Proposed Area of Potential Effects**



Allyson Brooks Ph.D., Director
State Historic Preservation Officer

August 13, 2024

Mr. Christopher Hurst
Environmental Protection Specialist
Federal Aviation Administration

In future correspondence please refer to:
Project Tracking Code: 2024-08-05523
Property: FAA: Zipline Inc. Application for Package Delivery utilizing Drones in Seattle, WA-NHPA Section 106 Coordination
Re: APE Concur

Dear Mr. Hurst:

Thank you for contacting the State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) regarding the above referenced project. In response, we have reviewed your description and map of the area of potential effect (APE).

We concur with your definition of the APE. Please provide us with your survey methodology before proceeding with any inventories. Along with the results of the inventory we will need to review your consultation with the concerned tribes, and other interested/affected parties. Please provide any correspondence or comments from concerned tribes and/or other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4).

These comments are based on the information available at the time of this review and on behalf of the SHPO in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800. Should additional information about the project become available, our assessment may be revised.

Thank you for the opportunity to review and comment. Please ensure that the DAHP Project Number (a.k.a. Project Tracking Code) is shared with any hired cultural resource consultants and is attached to any communications or submitted reports. If you have any questions, please feel free to contact me.

Sincerely,

Dennis Wardlaw
Transportation Archaeologist
(360) 485-5014
dennis.wardlaw@dahp.wa.gov

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

Aviation Safety
800 Independence Ave., SW.
Washington, DC 20591

Allyson Brooks
State Historic Preservation Officer
Department of Archaeology and Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

*Via electronic submission to 106@dahp.wa.gov.*

RE: Zipline Drone Delivery Operations in the Seattle metro area (DAHP Project Tracking Code: 2024-3435)

Dear Ms. Brooks:

The Federal Aviation Administration (FAA) is currently evaluating a proposal from Zipline International Inc. (Zipline) to conduct unmanned aircraft (UA; also referred to as a drone) retail package delivery operations in the Puget Sound region of Washington State, which includes the Seattle metro area and portions of Jefferson, King, Kitsnap, Mason, Pierce, Snohomish, and Thurston Counties. For the purpose of this letter, this entire region will be referred to as the "Seattle metro area". Zipline must obtain approval from the FAA prior to conducting operations in the Seattle metro area using its Platform 2 (P2) "Zip" UA (Zip). The FAA has determined the proposed action, which would encompass all FAA approvals necessary to enable operations, is an undertaking as defined under the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR § 800.16(y)).

FAA previously provided the Washington Department of Archaeology and Historic Preservation (DAHP) with a project summary and requested concurrence on the area of potential effects (APE) in a letter sent on August 5, 2024. FAA received the DAHP response dated August 13, 2024, concurring with the proposed APE, and requesting to review FAA consultation with concerned tribes and other interested/affected parties.

The purpose of this letter is to continue Section 106 consultation with the DAHP, including providing the results of the preliminary identification of historic properties and finding of effect for this undertaking.

**Project Description**

Zipline is proposing to conduct UA commercial delivery services in the Seattle metro area. Zipline International Inc. (Zipline) holds a Federal Aviation Administration (FAA) standard air carrier certificate

under 14 Code of Federal Regulations (CFR) Part 135 (Part 135),[1] which allows holders to conduct on-demand or scheduled (commuter) operations, and a 49 United States Code (U.S.C.) Section 44807 exemption,[2] which allows Zipline to carry the property of another for compensation or hire beyond visual line of sight (BVLOS) using its P2 Zip UA. Zipline's Part 135 certificate contains a stipulation that operations must be conducted in accordance with the provisions and limitations specified in its Operations Specifications (OpSpecs).[3,4] Zipline is seeking to amend its OpSpecs and other FAA approvals necessary to begin UA commercial package delivery operations in the Puget Sound region (see **Attachment A**, **Figure 1**).

Under the proposed action, Zipline would establish 75 site locations with up to 500 docks and conduct up to 400 flights 24 hours per day in a 10-mile radius around each site (although the expected average number of flights for each site would be 100 flights). The estimated total distance flown for deliveries would vary depending upon the pickup and drop-off locations in the operating area. Each flight would take a package to a customer delivery address before returning to a given dock. There would be variability in the number of flights per day based on customer demand and weather conditions.

Zips would primarily be transporting consumer goods, food & beverage, and pharmaceuticals in partnership with merchants (including pharmacies) in the communities they already serve and would provide an alternative to in-store pickup. Deliveries would be conducted at the time of the customer's choosing and directly to the customer's home in the operating area. Zips would also transport lab samples from health care facilities and hospitals to laboratories as an alternative to a courier service or other ground-based transportation service, at the time of the healthcare partner's choosing. Initially, Zipline expects to fly less than 400 flights per day from each site and then gradually increase to 400 deliveries per day as consumer demand rises. Even in the locations where the service areas of nests overlap, deliveries would not exceed 400 per day. There would be variability in the number of flights per day based on customer demand and weather conditions.

For this consultation the project is divided into two components: installation of Zipline Infrastructure, consisting of dock locations; and Flight Operations, which details Zip pre-departure, undocking (takeoff), en route outbound flight, delivery, en route inbound flight, and docking. The effects of infrastructure and flight operations are significantly different in degree and scale, with the effects of installation of Zipline Infrastructure being more permanent but impacting a much smaller area, with Flight Operations having only very brief, temporary effects but impacting a much larger area.

Project Component: Zipline Infrastructure

Zipline sites would be distributed throughout the Seattle metro area following a measured rollout plan to be developed with Zipline's partners and through outreach to local communities (including local officials and wildlife groups, schools, and community groups) and airspace users. Zipline's sites would be located in established commercial areas whose use is consistent with local zoning and land use

[1] https://www.faa.gov/uas/advanced_operations/package_delivery_drone.

[2] 49 U.S.C. § 44807 provides the Secretary of Transportation with authority to determine whether a certificate of waiver, certificate of authorization, or a certificate under 49 U.S.C. §§ 44703 or 44704 is required for the operation of certain UAS.

[3] An Operations Specifications is a document that defines the scope of aircraft operations that the FAA has authorized.

[4] This is different than a concept of operations, or ConOps, which is generally a description of how a set of capabilities may be employed to achieve desired objectives.

requirements, such as retail stores, warehouses, laboratories, and other locations operated by customers.

Each site would serve an area within a 10-mile radius, with the exclusion of areas with high densities of air traffic or population (see **Attachment A, Figure 2**). Zipline's expected operational phasing is summarized in **Table 1**.

**Table 1. Expected Operational Phasing**

| Component | Month 1 | Month 3 | Month 12 | Month 18 |
|---|---|---|---|---|
| **Sites** | 5 | 30 | 50 | 75 |
| Docks | 25 | 180 | 300 | 500 |
| Average Daily Flights per Site | 20 | 40 | 60 | 100 (expected average per site) |
| Operating hours | 24 hours | | | |
| Operating Radius | 10 miles | | | |

Each site would consist of 1 to 20 docks. On average, each site will contain approximately 7 docks; however, the exact number of docks established at each site will be determined based on market demand in the service area and logistical feasibility and efficiency. Docks would be housed on vertical docking towers, with single-dock towers measuring 21.25 feet in height and double-dock towers measuring 28.75 feet in height. Each docking tower would initially serve a single partner but may eventually serve multiple partners. Each individual dock provides the structural interface to house stationary Zips, charge Zips and provide thermal management, transfer data from Zips to and from the cloud, provide visual fiducials for Zip docking maneuvers, and provide weather protection. Zips would be stored at docks between flights.

Docks are either *ballasted* or *installed*. Ballasted docks are movable and do not require disturbance of the ground or structures. Installed docks would be constructed primarily as freestanding structures on previously disturbed land (e.g., paved parking lots, landscaped areas within the limits of disturbance of the property, previously disturbed vacant lots, etc.) or attached to an existing building. To comply with Section 106 of the National Historic Preservation Act (NHPA) and in accordance with consultation with the DAHP, installed dock construction would occur only under the following conditions:

- Freestanding Installed docks would be sited to avoid disturbance of documented archaeological resources and would comply with all federal, state, and local laws, including the Washington State permitting stipulations of RCW 27.53.060.
- Construction of Installed docks attached to buildings would occur on (a) buildings less than 45 years old or (b) buildings that are greater than 45 years old that have been determined to be ineligible for the National Register of Historic Places (NRHP) within the last 10 years;

The maximum impervious surface that would be installed is approximately 500 square feet. Site operations would require electricity and internet services and, where possible, Zipline would utilize existing utility connections. Construction activities would not convert farmland and would not require tree clearing (see **Attachment A, Figure 3** for potential docking tower configurations and **Attachment A, Figure 4** for conceptual site installations).

When required, Zipline may construct its infrastructure on commercially zoned undisturbed land adjacent to a developed area. It is understood that development of this type will be outside the scope of this Section 106 consultation and may require supplemental Section 106 consultation by Secretary of the Interior-qualified professionals.

Flight Operations

Zipline will use for flight operations its P2 Zip platform (Zip) (see **Attachment A, Figure 5**), an electrically powered vertical takeoff and landing aircraft capable of hover and forward flight. The Zip features a multi-rotor design with 5 propellers and weighs under 63 pounds when combined with its maximum payload weight of 8 pounds. Delivery packages are loaded into a Zip component called a "droid", which is stored into the Zip's payload bay. The Zip lowers the droid via winchline to execute delivery.

The Zip has a wingspan of approximately 7.8 feet, a height of approximately 1.8 feet, and a length of approximately 8 feet. Zips are equipped with high-visibility red (left wingtip) and green (right wingtip) lights, and multi-directional strobe lights (white) on each wingtip. These lights run while Zips are in flight and are visible for at least three statute miles.

Zips would fly a predefined flight path that is set prior to takeoff. Flight missions are automatically planned by Zipline's flight planning software. A mission originates from a dock, and Zipline's software automatically assigns, deconflicts, and routes each flight to the delivery location and back to a dock. Exclusion zones are designed to keep operations clear from nearby non-participating people and vehicles. Docks are built to separate operations from nearby non-participating people and vehicles.

As part of normal operations, Zips may be assigned one of two missions, delivery and reposition (moving from one dock to another). For delivery missions, Zipline operations begin with order processing followed by flight phases. A typical flight profile can be broken into the following general flight phases: *pre-departure*, *undocking*, *en route outbound*, *delivery*, *en route inbound*, and *docking*:

- *Pre-Departure.* During the pre-departure process, Zipline's system would complete automated preflight checks of the Zip system to ensure no unsafe conditions exist. If on a delivery operation, the shipping partner would then load a package (see **Attachment A, Figure 6**).
- *Undocking.* Once cleared for takeoff from a dock, the Zip would undock, maneuver away from the dock, and ascend vertically to the en route altitude (330 feet AGL) on its pre-planned flight path.
- *En route Outbound.* The en route outbound phase is the part of flight in which the fully loaded Zip transits from the dock to a delivery point on a predefined flight path. During this flight phase, the Zip would typically operate at an altitude of 330 feet AGL and a typical cruise airspeed of 47 miles per hour (mph).
- *Delivery.* At a delivery location, the Zip would descend vertically to a stationary hover at approximately 330 feet AGL (depending on terrain/airspace) over a delivery point such as a residential yard, driveway, parking lot, or common area (see **Attachment A, Figure 7**). The Zip would lower its droid to the ground for delivery of the payload through bay doors. During droid descent, the droid automatically controls its position laterally and evaluates the delivery site prior during payload delivery. Once the payload has been released, the Zip would then retract the droid, ascend vertically to a cruise altitude, and depart the delivery area en route back to a

dock site (see **Attachment A, Figure 8**). The total hover time for delivery operations would be approximately 75 seconds.[5]

- *En Route Inbound.* The Zip would fly at an altitude of 330 feet AGL and a speed of 47 mph towards the dock.
- *Docking.* Upon reaching the dock, the Zip would decelerate and descend vertically before maneuvering into the dock area. The Zip would then attach to the dock from below using its docking fin. Hover motors are disengaged after the Zip has registered a secure connection with the dock (see **Attachment A, Figure 9** for an illustration of a typical docking operation).

**Project Effects**

Zipline Infrastructure

Installation of Zipline infrastructure would involve potential physical effects (ground disturbance and modification of existing buildings) and visual effects to historic properties. Regarding physical effects, Zipline infrastructure would consist of dock installed as standalone structures or physically attached to existing buildings. Zipline installations would consist of between 1 to 20 docks located in commercially-zoned areas. Some docks would be ballasted (which would not involve ground disturbance) but others would be installed in previously disturbed land and almost entirely within pre-existing hardstand. Sites in previously disturbed areas *without* pre-existing hardstand (such as landscaped areas within the limits of disturbance of the property or previously disturbed vacant lots) would require installation of a maximum of 500 square feet of impervious surface within these previously disturbed areas. Docks would also require installation of utilities if no pre-existing utilities were on-site. ***Any work involving ground disturbance or building modification covered under this consultation will:***

- be conducted within previously disturbed soils,
- adhere to the permitting stipulations of RCW 27.53.060 to avoid known archaeological sites; and
- if involving attachment of docks to buildings, only be affixed to buildings either less than 45 years old or that have been determined ineligible for the National Register of Historic Places (NRHP) within the last 10 years.

Regarding potential visual effects of Zipline infrastructure, the height of docking towers would vary depending on whether a tower holds a single dock (21.25 feet height) or two docks (28.75 feet in height), and it is possible that installation of dock towers would incur some visual effect on nearby historic properties. Historic properties, however, would be considered noise-sensitive areas requiring a standoff distance of 150 feet between Zip sites and historic properties, or up to 325 feet if the historic property is located within the controlled surface area of Class B and Class D airspace. [6] This standoff distance should serve to avoid or minimize potential visual effects.

Flight Operations

Zips would fly generally at 330 feet above ground level (AGL) at a speed of 47 miles per hour; for comparison, the usual cruising speed for most birds ranges from 20 to 30 miles per hour. UA flights

[5] See www.flyzipline.com for videos and photographs of Zipline operations.

[6] Class B airspace is generally airspace from the surface to 10,000 feet mean sea level (MSL) surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. Class D airspace is generally airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower.

would be visible as small airborne objects flying at about fifty percent faster than the speed of bird flight. Therefore, visual effects of flight operations would be rapid, intermittent, and barely noticeable.

Undocking would involve 25 seconds of pre-flight motor start and a 75-second ascent from the dock. Zip undocking would occur at least 150 feet from historic properties and other noise-sensitive locations (or up to 325 feet if the historic property is located within the controlled surface area of Class B and Class D airspace). However, deliveries may occur at or adjacent to historic properties and would involve the Zip hovering at 330 feet AGL for approximately 75 seconds. Docking a Zip after delivery would take 75 seconds.

FAA conducted a noise analysis using sound level measurement data for the P2 Zip to determine potential audible effects from dock, flight operations, and delivery. See **Table 2.**

**Table 2**. Sound Level Test Results, P2 Zip (ICF 2025)[a]

| **UAS** | **Average SEL (dBA) Undocking[1]** | **Average SEL (dBA) En route Outbound (with package)[2]** | **Average SEL (dBA) Delivery[3]** | **Nominal cruise speed (mph)** | **Altitude (AGL)** |
|---|---|---|---|---|---|
| P2 Zip | 85.0 dBA | 69.1 dBA | 74.1 dBA | 47 mph | 330 ft |

[a] Undocking, en route, and delivery SELs measured 50 ft from operational location. AGL = above ground level; dB = decibels; dBA = A-weighted decibels; ft = feet; SEL = Sound Exposure Level.

As an explanation of this table, dBA stands for A-weighted decibels, a unit of measurement which approximates the sensitivity of the human ear. This is a logarithmic scale, meaning that a 10-dBA increase is the equivalent of doubling loudness of a noise. Noise for undocking and docking for the P2 Zip is less than 86 dB SEL, approximating the noise level of a freight train at a 100-foot distance from an observer, for 75 seconds. Noise for en route flight for the P2 Zip measures 69.1 dBA, approximating the noise of a dishwasher. Noise for delivery operations for the P2 Zip is 74.1 dBA, approximating the noise inside of an airplane, for 75 seconds. Predicted sound levels decrease as distances from the Zip increase. Overall, audible effects of flight operations would be intermittent. Most operational noise levels would be non-intrusive except for docking and undocking (which could be 150 feet or 325 feet away from historic properties) and deliveries, which may occur at historic properties intermittently for 75 seconds per operation.

In conclusion, Zip flight operations would only incur intermittent visual and audible effects on historic properties.

**Area of Potential Effects**

In accordance with 36 CFR § 800.4(a)(1), the FAA has defined the Area of Potential Effects (APE) in consideration of the undertaking's potential direct and indirect effects (the APE is the operating area outlined in red in **Attachment A**, **Figure 1**). The operating area is 14,200 square miles and consists of portions of portions of Jefferson, King, Kitsnap, Mason, Pierce, Snohomish, and Thurston Counties in northwest Washington.

**Identification of Historic Properties**

FAA has taken into account the magnitude and nature of the undertaking and the nature and extent of potential effects on historic properties in this identification effort pursuant to 36 CFR § 800.4(b)(1).

Given the massive geographic area of the project (portions of seven counties in Washington state), its infrastructure footprint, and intermittent, short-term, minor visual and audible effects, FAA has determined that a reasonable and good faith effort for identification will consist of a review of existing information on historic properties (both archaeological sites and aboveground properties) within the APE utilizing the National Park Service (NPS) National Register of Historic Places (NRHP) online database. A review of this database identified 516 NRHP-listed historic properties within the APE, including 394 buildings (including residences, businesses, schools, churches, social and recreational buildings), 58 historic districts, 55 structures (primarily bridges and marine vessels), eight sites (three cemeteries, two designed landscapes, two archaeological sites, and a traditional cultural place), and one object (a statue of Chief Seattle) (see **Attachment B**).

Thirteen historic properties are National Historic Landmarks (NHLs) and are denoted in the "Name" field of the table in **Attachment B** with an (NHL) after the resource name. Seven of these NHLs are maritime vessels, three are historic districts, and three are buildings.

In addition to the NRHP-listed historic properties under **Attachment B**, the FAA is cognizant of additional buildings, sites, structures, and objects within the APE, that while not listed in the NRHP, have been evaluated as eligible for the NRHP and are therefore also historic properties. Information on these sites is available in the Washington Information System for Architectural and Archaeological Records Data (WISAARD).

**Assessment of Effects**

Pursuant to 36 CFR § 800.5(a), FAA applied the criteria of adverse effects to historic properties in the APE. Emplacement of ballasted dock towers would involve no ground disturbance and would have no effect on subsurface historic properties, however, construction of installed dock towers would involve subsurface disturbance to include anchoring the dock, and potential installation of hardstand and utilities if none are onsite. Docks may also be attached to buildings.

However, emplacement of installed docks, either freestanding or attached to buildings, would be conducted within specific and restricted conditions. Construction of installed freestanding docks would occur on previously disturbed land and would adhere to the permitting stipulations of RCW 27.53.060 to avoid known archaeological sites. Docks will only be attached to buildings that are either less than 45 years old or have been determined ineligible for the NRHP within the last 10 years. Any installation of docks in undisturbed areas or on buildings 45 years old or older that have not been evaluated for NRHP eligibility within the past 10 years ***would not fall within the scope of this letter and would require additional Section 106 consultation.***

Zip docking towers range in height from 21.25 to 28.75 feet, which may incur some visual effects to aboveground historic properties. Historic properties, however, would be considered noise-sensitive areas and there would be a standoff distance of 150 feet from Zip sites, or up to 325 feet if the historic property is located within the controlled surface area of Class B and Class D airspace, minimizing visual effects to historic properties.

Given the small size of the Zip and predicted sound levels, Zip operations would not produce vibrations that could affect the architectural structure or contents of any structure in the APE. While Zip operations are not expected to generate significant noise levels at or within any historic property for significant

lengths of time, the FAA considered Zip delivery noise and potential visual effects on historic properties where a quiet setting or visually unimpaired sky might be a key attribute of the property's significance. However, any visual or audible effects that may occur within a flight path would be negligible and temporary.

Taking into account the restrictions placed on infrastructure construction for this consultation, consideration of historic properties in the OpSpecs as noise-sensitive areas, and the temporary nature of potential audible and visual effects, the FAA determined that the undertaking's effects do not meet the criteria in 36 CFR § 800.5(a)(1). Therefore, FAA has made a finding of ***no adverse effect*** to historic properties pending consultation with the SHPO and other consulting parties.

**Consultation**

In June 2024, FAA initiated government-to-government consultation regarding the proposed undertaking with the following 21 tribes: Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Chehalis Reservation, Cowlitz Indian Tribe, Jamestown S'Klallam Tribe, Lower Elwha Tribal Community, Lummi Tribe of the Lummi Reservation, Muckelshoot Indian Tribe, Nisqually Indian Tribe, Port Gamble S'Klallam Tribe, Puyallup Tribe of the Pullyallup Reservation, Quinalt Indian Nation, Samish Indian Nation, Sauk-Suiattle Indian Tribe, Skokomish Indian Tribe, Snoqualmie Indian Tribe, Squaxin Island Tribe of the Squaxin Island Reservation, Stillaguamish Tribe of Indians of Washington, Suquamish Indian Tribe of the Port Madison Reservation, Swinomish Indian Tribal Community, Tulalip Tribes of Washington, and the Upper Skagit Indian Tribe. As of this date only the Squaxin Island Tribe of the Squaxin Island Reservation responded, stating in an email dating August 5, 2024 that the project was outside of the tribe's traditional area and did not need to consult further.

In addition to the FAA's August 2024 correspondence with the DAHP previously mentioned in this letter, the FAA hosted one virtual meeting on October 17, 2024, with the DAHP regarding potential project effects and consulting party consultation. As a follow-up to this meeting on October 23, 2024, the DAHP submitted a list of 51 suggested consulting party organizations for the FAA to consult with, including local government agencies and non-profit museums and historical societies (see **Attachment C**). The FAA will complete its Section 106 responsibilities under 36 CFR § 800.3 towards consulting parties through its National Environmental Policy Act (NEPA) public outreach requirement, and will invite comment from the public, local governments, and the other consulting parties identified in **Attachment C** within the APE regarding the FAA's Section 106 finding of *no adverse effect* for this project.

In accordance with 36 CFR § 800.10, should an undertaking incur direct and adverse effects on an NHL, the FAA must notify the National Park Service (NPS) of any consultation regarding an NHL, and request Advisory Council on Historic Preservation (Council) participation in consultation to resolve adverse effects. However, because the FAA has determined that this project will result in no adverse effect to any NHLs, the FAA is not extending consultation invitations to either the NPS or the Council at this time.

**Conclusion**

The FAA requests your concurrence on the finding of ***no adverse effect*** to historic properties. Your response within the next 30 days will greatly assist us in our environmental review process.

If you have any questions or need additional information, please contact Jonathan Zack DeLaune via email at 9-FAA-Drone-Environmental@faa.gov

Sincerely,

DEREK W HUFTY

Digitally signed by DEREK W HUFTY
Date: 2025.09.10 07:41:10 -04'00'

Derek Hufty
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division
Office of Safety Standards, Flight Standards Service

Enclosures:

Attachment A. Figures

Attachment B. Historic Properties

Attachment C. Other Consulting Parties Suggested by DAHP

## Attachment A. Figures

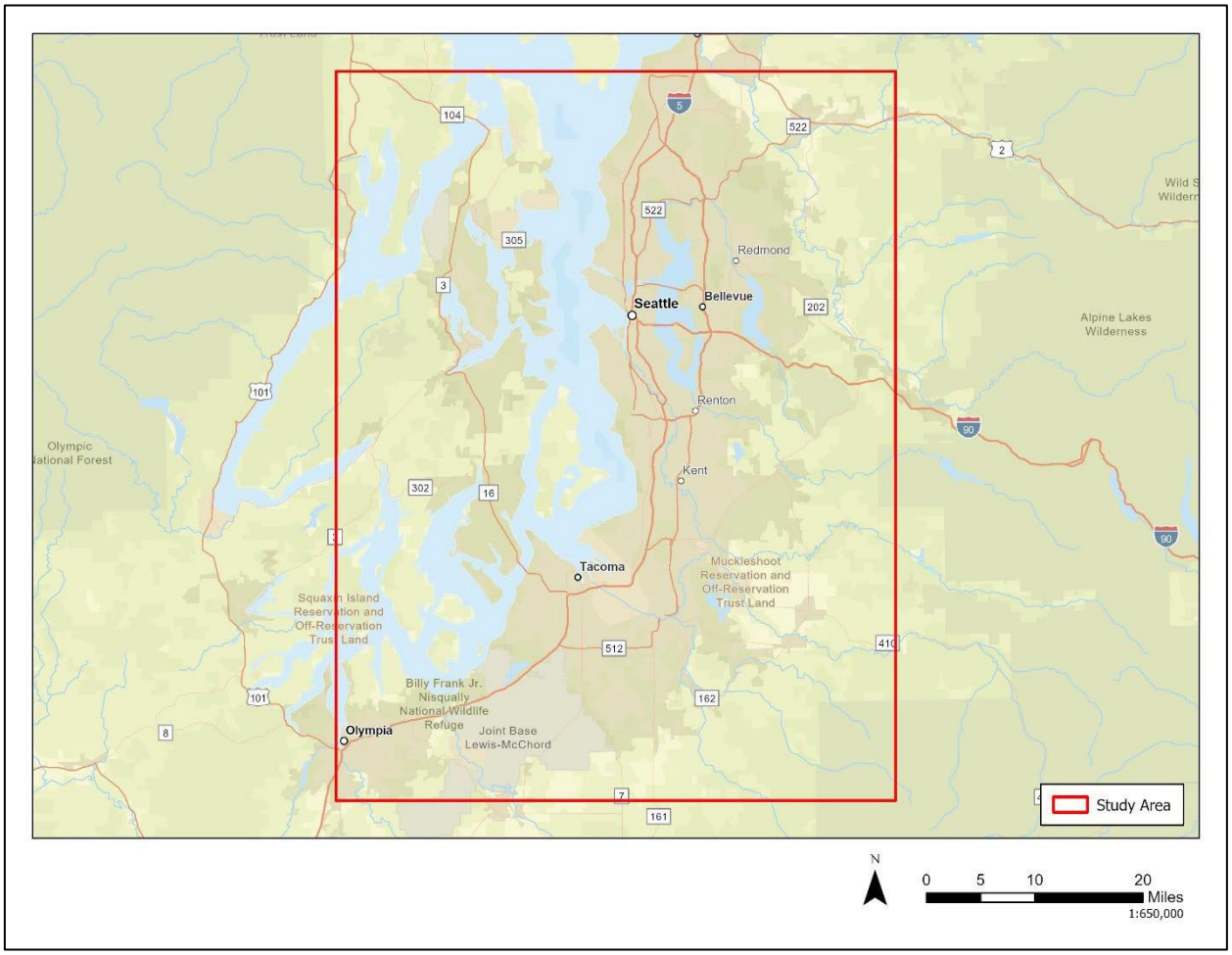



**Figure 1. Area of Potential Effects**

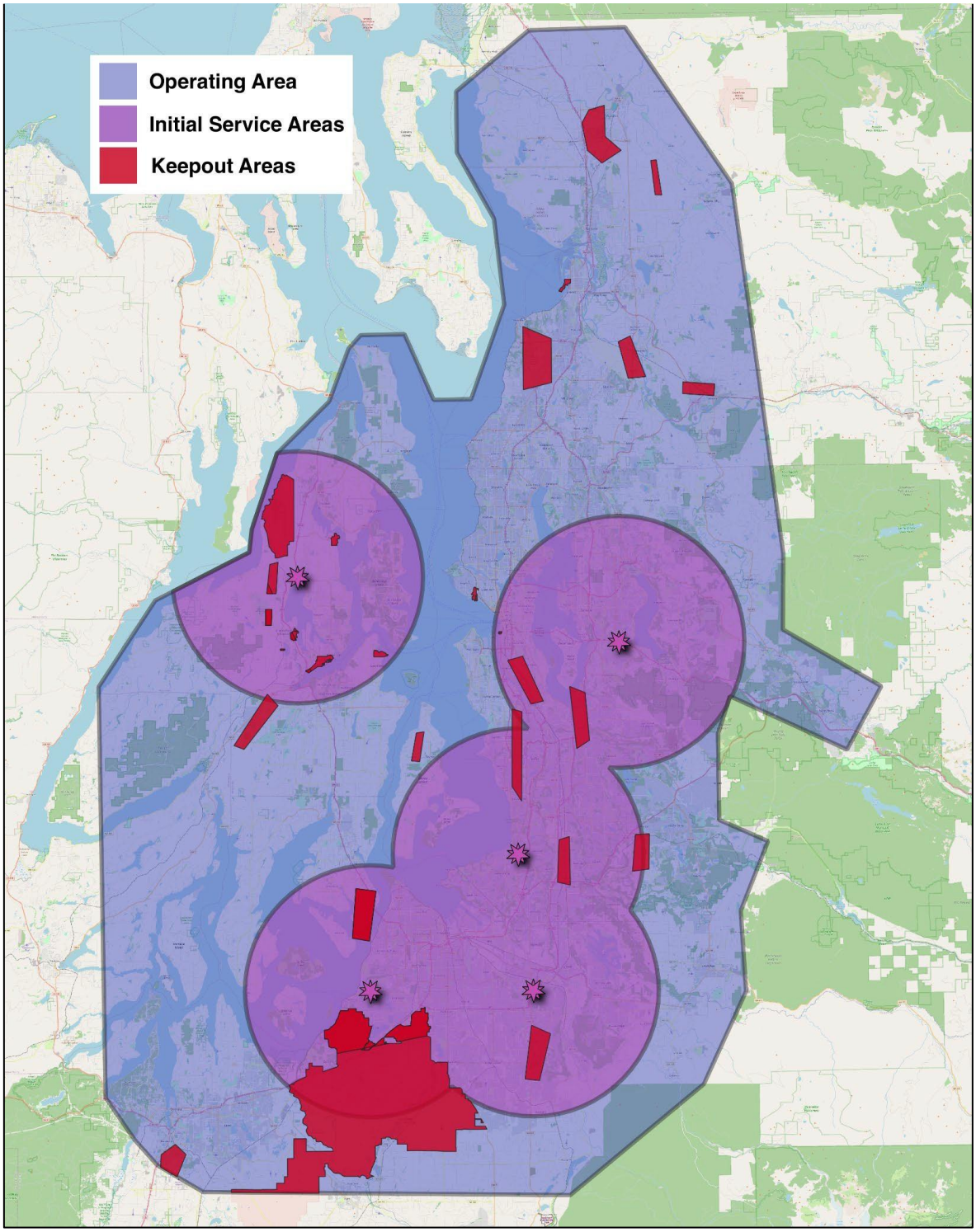



**Figure 2. Approximate Initial Site Locations and Service Areas with Keep-Out Zones (Purple Stars indicate Dock locations)[7]**

[7] Gaps in coverage, or keep out zones, are due to nearby airports, military installations, and other areas that Zipline would avoid due to air traffic density or population density.

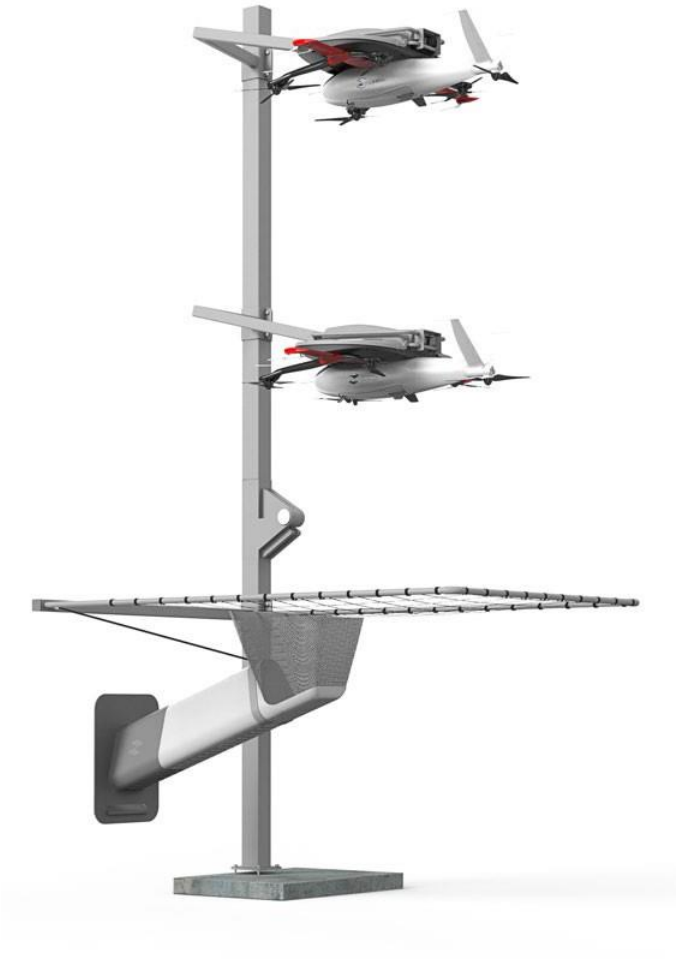


**Figure 3. Zipline Instamount (freestanding) Loading Docking Tower[8]**

[8] Illustrations are not to scale.

## Attachment A. Figures


**Figure 4. Zipline Conceptual Site configurations at medical laboratory (top left), restaurant (bottom left), and warehouse (right)**

**Figure 5. Zipline P2 Zip Profile Views (above) and droid (below)**

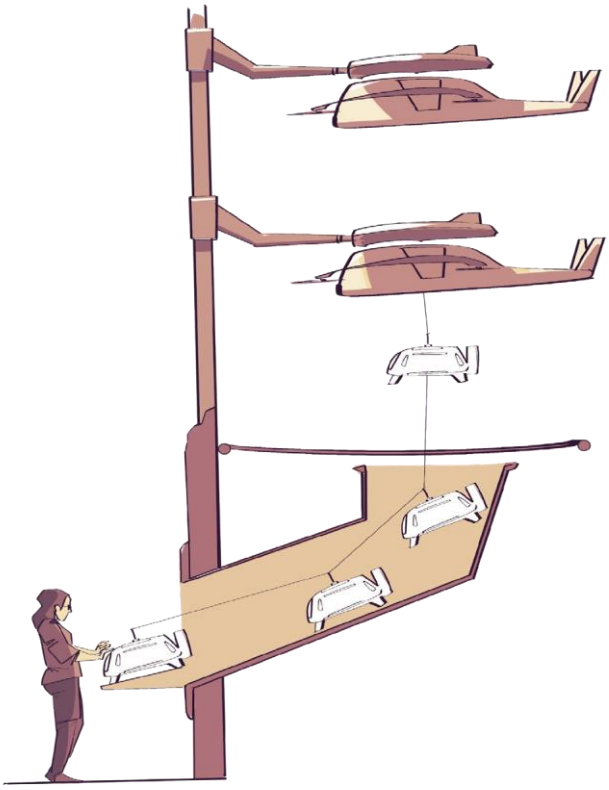


**Figure 6. Once loaded with its payload, the droid is transferred to the payload bay of the P2 Zip**

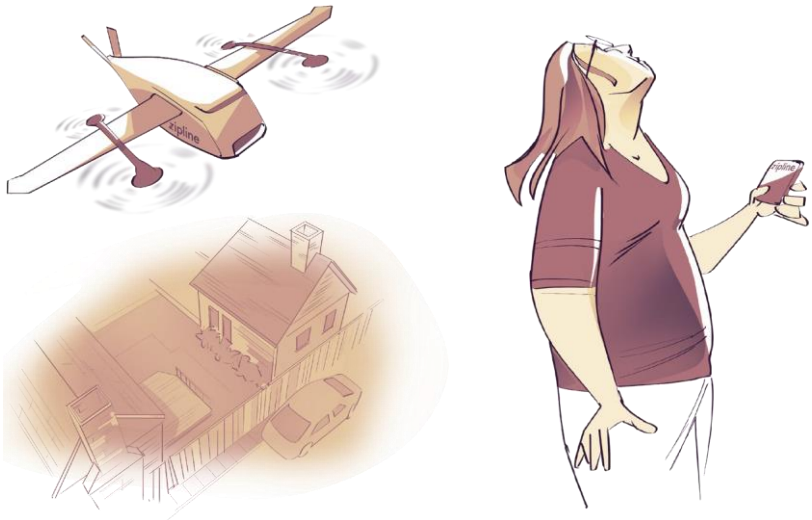



**Figure 7. Low altitude automatic flight to intended delivery location**


**Figure 8. Droid softly delivers payload on intended surface and retracts back into P2 Zip**

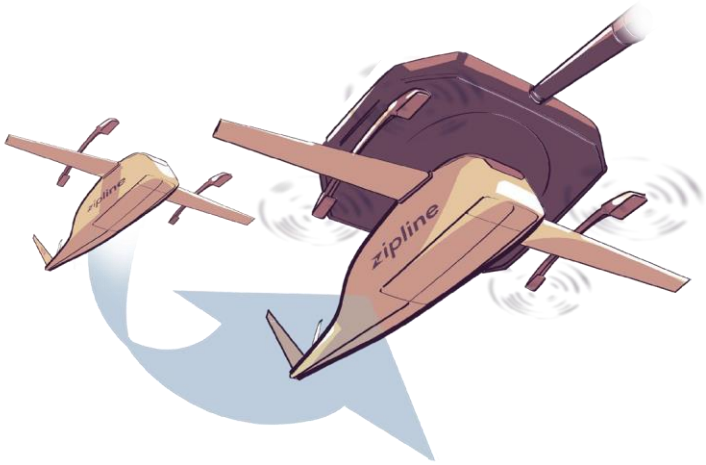



**Figure 9. P2 Zip either docks to prepare for next delivery or to recharge batteries/run diagnostics, based on aircraft needs and mission**

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 82004227 | 12th Avenue South Bridge | Structure | King | Seattle |
| 91000633 | 1411 Fourth Avenue Building | Building | King | Seattle |
| 82004228 | 14th Avenue South Bridge | Building | King | Seattle |
| 13000278 | 1600 East John Street Apartments | Building | King | Seattle |
| 16000829 | 1926 Model Brick Home | Building | King | Seattle |
| 2000249 | Adair, William and Estella, Farm | Building | King | Carnation |
| 91000537 | Adjutant General's Residence | Building | Pierce | Tacoma |
| 13000016 | Admiral's House, 13th Naval District | Building | King | Seattle |
| 89001067 | ADVENTURESS (NHL) | Structure | King | Seattle |
| 95000625 | Agate Pass Bridge | Structure | Kitsap | Suquamish |
| 97001673 | Agen Warehouse | Building | King | Seattle |
| 71000871 | Alaska Trade Building | Building | King | Seattle |
| 2000247 | Albers Brothers Mill | Building | Pierce | Tacoma |
| 87001171 | Alderton School | Building | Pierce | Alderton |
| 87000872 | Allen House Hotel | Building | Thurston | Olympia |
| 2000250 | Allen, Horatio and Laura, Farm | Building | King | Duvall |
| 11000280 | Allen, John B., School | Building | King | Seattle |
| 9000218 | American Lake Veterans Hospital | District | Pierce | Tacoma |
| 87000871 | American Legion Hall | Building | Thurston | Olympia |
| 87001165 | Anderson Island School | Building | Pierce | Anderson Island |
| 99000919 | Annobee Apartments | Building | Pierce | Tacoma |
| 82004229 | Arboretum Sewer Trestle | Structure | King | Seattle |
| 78002749 | Arctic Building | Building | King | Seattle |
| 87001163 | Arletta School | Building | Pierce | Gig Harbor |
| 100007697 | Arreguin, Alfredo & Susan Lytle, House and Studio | Building | King | Seattle |
| 89001078 | ARTHUR FOSS (tugboat) (NHL) | Structure | King | Kirkland |
| 72001271 | Assay Office | Building | King | Seattle |
| 407 | Auburn Post Office | Building | King | Auburn |
| 82004221 | Auburn Public Library | Building | King | Auburn |
| 7001458 | Auditorium Dance Hall, The | Building | Pierce | Tacoma |
| 82004230 | Aurora Avenue Bridge | Structure | King | Seattle |
| 95000193 | Bainbridge Island Filipino Community Hall | Building | Kitsap | Bainbridge Island |
| 6001214 | Balfour Dock Building | Building | Pierce | Tacoma |
| 76001885 | Ballard Avenue Historic District | District | King | Seattle |
| 82004231 | Ballard Bridge | Structure | King | Seattle |
| 79002535 | Ballard Carnegie Library | Building | King | Seattle |
| 79002536 | Ballard-Howe House | Building | King | Seattle |
| 76001886 | Ballinger, Richard A., House | Building | King | Seattle |
| 13000995 | Barksdale, Julian and Marajane, House | Building | King | Seattle |
| 75001853 | Barnes Building | Building | King | Seattle |
| 95000189 | Bates--Tanner Farm | Building | Snohomish | Bothell |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 12001221 | Bay View Brewery | Building | King | Seattle |
| 74001957 | Bell Apartments | Building | King | Seattle |
| 7001459 | Beutel, Conrad F. & Annie K., House | Building | Pierce | Tacoma |
| 79002562 | Bigelow, Daniel R., House | Building | Thurston | Olympia |
| 82004276 | Bisson, William, House | Building | Pierce | South Prairie |
| 406 | Black Diamond Cemetery | Site | King | Black Diamond |
| 91000781 | Blomeen, Oscar, House | Building | King | Auburn |
| 9001235 | Blue Mouse Theatre | Building | Pierce | Tacoma |
| 82004277 | Boatman-Ainsworth Hose | Building | Pierce | Tacoma |
| 88002743 | Boeing, William E., House | Building | King | Highlands |
| 16000830 | Bon Marche Department Store | Building | King | Seattle |
| 96000050 | Bothell Pioneer Cemetery | Site | King | Bothell |
| 79002553 | Bowes Building | Building | Pierce | Tacoma |
| 86003162 | Bowles, Jesse C., House | Building | King | Seattle |
| 94001436 | Brandes House | Building | King | Issaquah |
| 95000192 | Bremerton Elks Temple Lodge No. 1181 Building | Building | Kitsap | Bremerton |
| 89000208 | Browns Point Lighthouse and Keeper's Cottage | District | Pierce | Tacoma |
| 16000882 | Buckley's Addition Historic District | District | Pierce | Tacoma |
| 92001883 | Building 50 | Building | Kitsap | Bremerton |
| 95000222 | Building at 1602 South G Street | Building | Pierce | Tacoma |
| 95000226 | Building at 712--716 Sixth Avenue | Building | Pierce | Tacoma |
| 71000872 | Building No. 105, Boeing Airplane Company | Building | King | Seattle |
| 71000873 | Butterworth Building | Building | King | Seattle |
| 77001354 | Cabin No. 97 | Building | Pierce | Tacoma |
| 13000208 | Calhoun Hotel | Building | King | Seattle |
| 16000148 | Cambridge Apartments | Building | King | Seattle |
| 99000405 | Camlin Hotel | Building | King | Seattle |
| 5001351 | Camp Major Hopkins | Building | Kitsap | Bainbridge Island |
| 73001885 | Camp Six | District | Pierce | Tacoma |
| 82004300 | Capital Boulevard Crossing | Structure | Thurston | Tumwater |
| 100002706 | Capital Savings and Loan Association | Building | Thurston | Olympia |
| 73001887 | Carnegie, Andrew, Library | Building | Snohomish | Edmonds |
| 13000998 | Central Elementary School | Building | Tacoma | Pierce |
| 100002406 | Century 21-Washington State Coliseum | Building | King | Seattle |
| 95000803 | Chamber's Prairie--Ruddell Pioneer Cemetery | Site | Thurston | Lacey |
| 90001246 | Chase, Dr. Reuben, House | Building | King | Bothell |
| 78002750 | Chelsea Family Hotel | Building | King | Seattle |
| 13000279 | Chiarelli, James and Pat, House | Building | King | Seattle |
| 100008187 | Chief Sealth International High School | Building | King | Seattle |
| 86002094 | Chinese Baptist Church | Building | King | Seattle |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 78002751 | Chittenden Locks and Lake Washington Ship Canal | District | Seattle | King |
| 78002751 | Chittenden Locks and Lake Washington Ship Canal | District | Seattle | King |
| 94001440 | Christ Episcopal Church | Building | Puyallup | Pierce |
| 84003479 | Church of the Blessed Sacrament, Priory, and School | Building | King | Seattle |
| 82004278 | City Waterway Bridge | Structure | Pierce | Tacoma |
| 73001874 | Clise, James W., House | Building | King | Redmond |
| 78002779 | Cloverfields | Building | Thurston | Olympia |
| 84003485 | Cobb Building | Building | King | Seattle |
| 9000367 | Coder-Coleman House | Building | Kitsap | Bremerton |
| 74001976 | Coke Ovens | Structure | Pierce | Wilkeson |
| 75001854 | Coliseum Theater | Building | King | Seattle |
| 13000017 | Colman Automotive Building | Building | King | Seattle |
| 72001272 | Colman Building | Building | King | Seattle |
| 82004232 | Colonial Hotel | Building | King | Seattle |
| 100001443 | Colonnade Hotel | Building | King | Seattle |
| 80004000 | Columbia City Historic District | District | King | Seattle |
| 970 | Colvos Store | Building | King | Vashon |
| 3000161 | Cooper, Frank B., Elementary School | Building | King | Seattle |
| 77001337 | Cornish School | Building | King | Seattle |
| 5000313 | Covenant Beach Bible Camp | District | King | Des Moines |
| 82004233 | Cowen Park Bridge | Structure | King | Seattle |
| 12000088 | Curran, Charles and Mary Louise, House | Building | Pierce | University Place |
| 87001162 | Custer School | Building | Pierce | Tacoma |
| 95000305 | Dadisman, David, House | Building | Pierce | Home |
| 100003525 | Daughters of the American Revolution-Rainier Chapter House | Building | King | Seattle |
| 73001884 | Davidson House | Building | Pierce | Steilacoom |
| 80004001 | De La Mar Apartments | Building | King | Seattle |
| 97001672 | Dearborn, Henry H., House | Building | King | Seattle |
| 93000369 | DeVoe, Emma Smith, House | Building | Pierce | Tacoma |
| 97000324 | Dieringer School | Building | Pierce | Sumner |
| 83003337 | Dockton Hotel | Building | King | Dockton |
| 93001339 | Dofflemyer Point Light | Structure | Thurston | Olympia |
| 13000996 | Dose, Charles P. and Ida, House | Building | King | Seattle |
| 5001353 | Dougherty, John and Kate, Farmstead | Building | Duvall | King |
| 82004222 | Dr. Trueblood House | Building | King | Kirkland |
| 77001351 | Drum, Henry, House | Building | Pierce | Tacoma |
| 82004219 | Duckabush River Bridge | Structure | Jefferson | Duckabush |
| 94001435 | Dunn Gardens | Site | King | Seattle |
| 87001542 | DuPont Village Historic District | District | Pierce | DuPont |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 89001448 | DUWAMISH (NHL) | Structure | King | Seattle |
| 83003338 | Eagles Auditorium Building | Building | King | Seattle |
| 82004279 | East 34th Street Bridge | Structure | Pierce | Tacoma |
| 100002940 | Ebenezer Congregational Church | Building | Mason | Allyn |
| 82004226 | Eddy, James G., House and Grounds | Building | King | Medina |
| 86003139 | Eddy, James G., House and Grounds (Boundary Increase) | Structure | King | Medina |
| 99001453 | El Rio Apartment Hotel | Building | King | Seattle |
| 88000690 | Elks Building | Building | Thurston | Olympia |
| 100004460 | Eng, Jim and Betty, House | Building | King | Seattle |
| 86000965 | Engine House No. 11 | Building | Pierce | Tacoma |
| 86000964 | Engine House No. 13 | Building | Pierce | Tacoma |
| 84002425 | Engine House No. 4 | Building | Pierce | Tacoma |
| 86000968 | Engine House No. 8 | Building | Pierce | Tacoma |
| 75001866 | Engine House No. 9 | Building | Pierce | Tacoma |
| 99000918 | Entwistles, David and Martha, House | Building | King | Carnation |
| 100009631 | F/V Tordenskjold (West Coast Halibut Schooner) | Structure | King | Seattle |
| 82004273 | Fairfax Bridge | Structure | Pierce | Melmont |
| 4000922 | Falls City Masonic Hall | Building | King | Fall City |
| 94000405 | Faust--Ryan House | Building | King | Bothell |
| 79003155 | Federal Office Building | Building | King | Seattle |
| 11000985 | Federal Reserve Bank of San Francisco, Seattle Branch | Building | King | Seattle |
| 79002537 | Ferry, Pierre P., House | Building | King | Seattle |
| 100006070 | Fir Lodge | Building | King | Seattle |
| 86000980 | Fire Alarm Station | Building | Pierce | Tacoma |
| 86000974 | Fire Station No. 1 | Building | Pierce | Tacoma |
| 86000966 | Fire Station No. 10 | Building | Pierce | Tacoma |
| 86000962 | Fire Station No. 14 | Building | Pierce | Tacoma |
| 86000961 | Fire Station No. 15 | Building | Pierce | Tacoma |
| 73001876 | Fire Station No. 18 | Building | King | Seattle |
| 86000972 | Fire Station No. 2 | Building | Pierce | Tacoma |
| 71000874 | Fire Station No. 23 | Building | King | Seattle |
| 72001273 | Fire Station No. 25 | Building | King | Seattle |
| 86000971 | Fire Station No. 5 | Building | Pierce | Tacoma |
| 83004254 | FIREBOAT NO.1 (NHL) | Structure | Pierce | Tacoma |
| 86000978 | Fireboat Station | Building | Pierce | Tacoma |
| 10001105 | First Methodist Episcopal Church | Building | King | Seattle |
| 93000364 | First Methodist Protestant Church of Seattle | Building | King | Seattle |
| 13000823 | Ford Motor Company Assembly Plant | Building | King | Seattle |
| 78002752 | Fort Lawton | District | King | Seattle |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 70000647 | Fort Nisqually Granary (NHL) and Factor's House | Building | Pierce | Tacoma |
| 74001971 | Fort Nisqually Site | Site | Pierce | Dupont |
| 77001350 | Fort Steilacoom | District | Pierce | Steilacoom |
| 78002759 | Fort Ward Historic District | District | Kitsap | Winslow |
| 96000415 | Fort Ward Historic District (Boundary Increase) | District | Bainbridge Island | Kitsap |
| 12001138 | Fourth Church of Christ, Scientist | Building | King | Seattle |
| 87001167 | Fox Island School | Building | Pierce | Fox Island |
| 82004234 | Fremont Bridge | Structure | King | Seattle |
| 92001587 | Fremont Building | Building | King | Seattle |
| 87000691 | Funk House | Building | Thurston | Olympia |
| 3000163 | Gaffney's Lake Wilderness Lodge | Building | King | Maple Valley |
| 80004002 | Galland, Caroline Kline, House | Building | King | Seattle |
| 2000862 | Gas Works Park | District | King | Seattle |
| 7000134 | General Administration Building | Building | Thurston | Olympia |
| 7000135 | Georgia--Pacific Plywood Company Office | Building | Thurston | Olympia |
| 78002767 | Glencove Hotel | Building | Pierce | Gig Harbor |
| 82004235 | Globe Building, Beebe Building and Hotel Cecil | Building | King | Seattle |
| 89002094 | Graham, J. S., Store | Building | King | Seattle |
| 82004236 | Grand Pacific Hotel | Building | King | Seattle |
| 85001941 | Guiry and Schillestad Building | Building | King | Seattle |
| 83003349 | Haddaway Hall | Building | Pierce | Tacoma |
| 84003632 | Hale, Calvin and Pamela, House | Building | Thurston | Olympia |
| 14000849 | Hamilton-Worthington House | Building | Jefferson | Quilcene |
| 89000212 | Harstine Island Community Hall | Building | Mason | Hartstene Island |
| 82004237 | Harvard-Belmont District | District | King | Seattle |
| 8001301 | Hawthorne Square | Building | King | Seattle |
| 100003254 | Highland Apartments | Building | King | Seattle |
| 76001887 | Hill, Samuel, House | Building | King | Seattle |
| 2000248 | Hjertoos, Andrew and Bergette, Farm | Building | King | Carnation |
| 83003339 | Hoge Building | Building | King | Seattle |
| 78002757 | Hollywood Farm | Building | King | Woodinville |
| 89001606 | Holy Trinity Orthodox Church | Building | Pierce | Wilkeson |
| 76001888 | Holyoke Building | Building | King | Seattle |
| 78002753 | Home of the Good Shepherd | Building | King | Seattle |
| 82004272 | Home School | Building | Pierce | Home |
| 88003052 | Hospital Reservation Historic District (component of Puget Sound Naval Shipyard NHL) | District | Kitsap | Bremerton |
| 100006936 | Hotel Sorrento | Building | King | Seattle |
| 95000230 | House at 1510 Tacoma Avenue South | Building | Pierce | Tacoma |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 95000223 | House at 1610 South G Street | Building | Pierce | Tacoma |
| 95000220 | House at 2314 South Ainsworth Avenue | Building | Pierce | Tacoma |
| 95000225 | House at 2326 South L Street | Building | Pierce | Tacoma |
| 95000221 | House at 605 South G Street | Building | Pierce | Tacoma |
| 95000224 | House at 708--710 South 8th Street | Building | Pierce | Tacoma |
| 95000229 | House at 802--804 South G Street | Building | Pierce | Tacoma |
| 83003340 | Hull Building | Building | King | Seattle |
| 82004238 | Hyde, Samuel, House | Building | King | Seattle |
| 82004239 | Immanuel Lutheran Church | Building | King | Seattle |
| 99000917 | Independent Order of Odd Fellows (IOOF) Hall No. 148 | Building | King | Carnation |
| 83003341 | Interlake Public School | Building | King | Seattle |
| 91000181 | Ipsut Creek Patrol Cabin | Building | Pierce | Carbon River Entrance |
| 71000875 | Iron Pergola | Structure | King | Seattle |
| 90001461 | Issaquah Depot | Building | King | Issaquah |
| 98001419 | Issaquah Sportsmen's Club | Building | King | Issaquah |
| 95001036 | Jackson Hall Memorial Community Hall | Building | Kitsap | Silverdale |
| 87000870 | Jeffers Studio | Building | Thurston | Olympia |
| 9000047 | JOHN N. COBB (fisheries research vessel) | Structure | King | Seattle |
| 4000158 | Jovita Land Company Model Home--Corbett House | Building | King | Federal Way |
| 82004287 | Keeler's Korner | Building | Snohomish | Lynnwood |
| 5000923 | Keewaydin Clubhouse | Building | King | Mercer Island |
| 73001877 | King Street Station | Building | King | Seattle |
| 95000188 | Kirk, Lilly, House | Building | King | Bothel |
| 73001873 | Kirk, Peter, Building | Building | King | Kirkland |
| 89002321 | Kirkland Woman's Club | Building | King | Kirkland |
| 100004459 | Knights of Columbus Hall - Council No. 676 | Building | King | Seattle |
| 82004240 | Kraus, Joseph, House | Building | King | Seattle |
| 100000989 | Lake Washington Boulevard | District | King | Seattle |
| 88000742 | Lakeview School | Building | King | Mercer Island |
| 94000419 | Leamington Hotel and Apartments | Building | King | Seattle |
| 72001274 | Leary, Eliza Ferry, House | Building | King | Seattle |
| 100002392 | Lewis, Hannah, House | Building | King | Seattle |
| 11000626 | Liggett Building | Building | King | Seattle |
| 88000697 | Long Lake Recreation Hall | Building | Thurston | Lacey |
| 87001164 | Longbranch School Gymnasium | Building | Pierce | Lakebay |
| 82004223 | Loomis House | Building | King | Kirkland |
| 81000591 | Lord, C. J., Mansion | Building | Thurston | Olympia |
| 7001385 | Lord--Heuston House | Building | Pierce | Tacoma |
| 87000715 | LOTUS (motor vessel) | Structure | Thurston | Olympia |
| 80004401 | Lotz, J. H., House | Building | Pierce | Puyallup |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 5001352 | Lynn, C.O., Co. Funeral Home | Building | Pierce | Tacoma |
| 95000806 | Lyon Building | Building | King | Seattle |
| 82004241 | M. V. VASHON | Structure | King | Seattle |
| 15000453 | Magnolia Public Library | Building | King | Seattle |
| 7001386 | Manley--Thompson Ford Agency | Building | Pierce | Tacoma |
| 88003051 | Marine Reservation Historic District (component of Puget Sound Naval Shipyard NHL) | District | Kitsap | Bremerton |
| 89000500 | Marsh, Louis S., House | Building | King | Kirkland |
| 10000254 | Masonic Hall- Port Orchard | Building | Kitsap | Port Orchard |
| 82004224 | Masonic Lodge Building | Building | King | Kirkland |
| 93000357 | Masonic Temple Building--Temple Theater | Building | Pierce | Tacoma |
| 15000454 | Masonic Temple-Auburn | Building | King | Auburn |
| 100004329 | Matzen, George and Irene, House | Building | King | Seattle |
| 8001026 | McChord Field Historic District | District | Pierce | Tacoma |
| 78002780 | McCleary, Henry, House | Building | Thurston | Olympia |
| 95000227 | McIlvaine Apartments | Building | Pierce | Tacoma |
| 82004275 | McMillin Bridge | Structure | Pierce | Puyallup |
| 87001172 | McMillin School | Building | Pierce | McMillin |
| 6000371 | Medical Dental Building | Building | King | Seattle |
| 71000879 | Meeker, Ezra, Mansion | Building | Pierce | Puyallup |
| 77001339 | Merrill, R. D., House | Building | King | Seattle |
| 8000998 | Messenger of Peace Chapel Car | Structure | King | Snoqualmie |
| 85000351 | Meyer House | Building | Thurston | Olympia |
| 87001166 | Midway School | Building | Pierce | Gig Harbor |
| 82004242 | Montlake Bridge | Structure | King | Seattle |
| 74001958 | Moore Theatre and Hotel | Building | King | Seattle |
| 83003354 | Mottman Building | Building | Thurston | Olympia |
| 16000855 | Mount Baker Park Improvement Club Clubhouse | Building | King | Seattle |
| 82004243 | Mount Baker Ridge Tunnel | Structure | King | Seattle |
| 97000344 | Mount Rainier National Park (NHL) | District | Pierce | Ashford |
| 94001165 | Mukai Cold Process Fruit Barrelling Plant | Building | King | Vashon |
| 100004345 | Munson, Herbert and Barbara House | Building | Pierce | Tacoma |
| 85001810 | Murray, Frederick H., House | Building | Pierce | Tacoma |
| 6000177 | MV KALAKALA (ferry) | Structure | Pierce | Tacoma |
| 7000304 | MV WESTWARD (Wooden Motor Vessel) | Structure | King | Seattle |
| 6000671 | National Bank of Tacoma | Building | Pierce | Tacoma |
| 82004244 | National Building | Building | King | Seattle |
| 9001218 | Naval Air Station (NAS) Seattle | District | King | Seattle |
| 75001856 | Naval Military Hangar--University Shell House | Building | King | Seattle |
| 9000506 | Naval Reserve Armory | Building | King | Seattle |
| 74001955 | Neely, Aaron, Sr., Mansion | Building | King | Auburn |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 4000921 | Neighbor--Bennett House | Building | King | Fall City |
| 73001879 | Nelson, Charles F., House | Building | Kitsap | Olalla |
| 11000426 | New Richmond Hotel | Building | King | Seattle |
| 89001607 | New Washington Hotel | Building | King | Seattle |
| 84003568 | Nihon Go Gakko | Building | Pierce | Seattle |
| 82004245 | Nihon Go Gakko | Building | King | Tacoma |
| 78002754 | Nippon Kan | Building | King | Seattle |
| 1000429 | Nisqually Power Substation | Building | Pierce | Tacoma |
| 90001248 | Nisqually School | Building | Thurston | Olympia |
| 82004280 | North 21st Street Bridge | Structure | Pierce | Tacoma |
| 82004281 | North 23rd Street Bridge | Structure | Pierce | Tacoma |
| 94000406 | North Creek School | Building | Snohomish | Bothell |
| 3000160 | North Slope Historic District | District | Tacoma | Pierce |
| 3000160 | North Slope Historic District | District | Pierce | Tacoma |
| 3000165 | Northern Bank and Trust Building | Building | King | Seattle |
| 75001857 | Northern Life Tower | Building | King | Seattle |
| 76001901 | Northern Pacific Office Building | Building | Pierce | Tacoma |
| 8001158 | Nuclear Reactor Building | Building | King | Seattle |
| 83003330 | Oatman, Earl, House | Building | Jefferson | Quilcene |
| 88003054 | Officers' Row Historic District (component of Puget Sound Naval Shipyard NHL) | District | Bremerton | Kitsap |
| 75001877 | Old Capitol Building | Building | Thurston | Olympia |
| 74001973 | Old City Hall | Building | Pierce | Tacoma |
| 77001352 | Old City Hall Historic District | District | Tacoma | Pierce |
| 83003342 | Old Georgetown City Hall | Building | King | Seattle |
| 84003570 | Old Main | Building | Pierce | Tacoma |
| 73001878 | Old Public Safety Building | Building | King | Seattle |
| 84003492 | Olson, Louis and Ellen, House | Building | King | Enumclaw |
| 1001080 | Olson, Mary, Farm | Building | King | Kent |
| 4001008 | Olympia Downtown Historic District | District | Thurston | Olympia |
| 87000869 | Olympia National Bank | Building | Thurston | Olympia |
| 82004299 | Olympia Public Library | Building | Thurston | Olympia |
| 79002538 | Olympic Hotel | Building | King | Seattle |
| 72001280 | Orr, Nathaniel, House and Orchard | Building | Pierce | Steilacoom |
| 83003350 | Orton, Charles W., House | Building | Pierce | Sumner |
| 78002768 | Pacific Brewing and Malting Company | Building | Pierce | Tacoma |
| 79002534 | Pacific Coast Company House No. 75 | Building | King | Renton |
| 80004008 | Pacific National Bank Building | Building | Pierce | Tacoma |
| 2000861 | Pagani, Luigi and Aurora, House | Building | King | Black Diamond |
| 7001457 | Palmer, A.L., Building | Building | King | Seattle |
| 6000462 | Panama Hotel (NHL) | Building | King | Seattle |
| 76001902 | Pantages Theatre | Building | Pierce | Tacoma |
| 74001959 | Paramount Theatre | Building | King | Seattle |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 72001275 | Park Department, Division of Playgrounds | Building | King | Seattle |
| 96000838 | Parkland Lutheran Children's Home | Building | Pierce | Tacoma |
| 91000782 | Parsons, William, House | Building | King | Seattle |
| 78002781 | Patnude, Charles, House | Building | Thurston | Olympia |
| 95000626 | Patton Bridge | Structure | King | Auburn |
| 1444 | Perkins Building | Building | Pierce | Tacoma |
| 93000359 | Phillips House | Building | King | Seattle |
| 83003343 | Pickering Farm | Building | King | Issaquah |
| 70000644 | Pike Place Public Market Historic District | District | King | Seattle |
| 77001340 | Pioneer Building, Pergola, and Totem Pole | District | King | Seattle |
| 70000645 | Pioneer Hall | Building | King | Seattle |
| 70000086 | Pioneer Square-Skid Road District | District | King | Seattle |
| 78000341 | Pioneer Square-Skid Road District (Boundary Increase) | District | King | Seattle |
| 88000739 | Pioneer Square--Skid Road Historic District (Boundary Increase) | District | King | Seattle |
| 968 | PIRATE (R-Class Sloop) | Structure | King | Seattle |
| 100001518 | Point Defiance Lodge | Building | Pierce | Tacoma |
| 13001060 | Point Defiance Streetcar Station | Building | Tacoma | Pierce |
| 78002758 | Point No Point Light Station | Building | Kitsap | Hansville |
| 4000359 | Point Robinson Light Station | District | King | Vashon Island |
| 66000746 | Port Gamble Historic District (NHL) | District | Kitsap | Port Gamble |
| 8001186 | Preston Community Clubhouse | Building | King | Preston |
| 92001883 | Puget Sound Naval Shipyard (NHL) | District | Kitsap | Bremerton |
| 92001883 | Puget Sound Naval Shipyard Historic District (component of Puget Sound Naval Shipyard NHL) | District | Kitsap | Bremerton |
| 88003053 | Puget Sound Radio Station Historic District (component of Puget Sound Naval Shipyard NHL) | District | Kitsap | Bremerton |
| 82004274 | Purdy Bridge | Structure | Pierce | Purdy |
| 12001139 | Puyallup Fish Hatchery | Building | Puyallup | Pierce |
| 85001811 | Pythian Temple | Building | Pierce | Tacoma |
| 83003344 | Queen Anne Club | Building | King | Seattle |
| 85002916 | Queen Anne High School | Building | King | Seattle |
| 11000427 | Queen Anne Post Office and Regional Headquarters | Building | King | Seattle |
| 75001858 | Queen Anne Public School | Building | King | Seattle |
| 12000162 | Quilcene Ranger Station | District | Jefferson | Quilcene |
| 76001889 | Rainier Club | Building | King | Seattle |
| 82004246 | Ravenna Park Bridge | Structure | King | Seattle |
| 79002539 | Raymond-Ogden Mansion | Building | King | Seattle |
| 2000863 | Rector Hotel | Building | King | Seattle |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 79002552 | Red Shield Inn | Building | Pierce | Fort Lewis |
| 89002298 | Redelsheimer--Ostrander House | Building | King | Seattle |
| 8001302 | Redmond City Park | District | King | Redmond |
| 87000712 | Reinhart--Young House | Building | Thurston | Olympia |
| 75001852 | RELIEF (lightship) (NHL - currently named SWIFTSURE LV-83) | Structure | King | Kirkland |
| 78002769 | Rhodes Medical Arts Building | Building | Pierce | Tacoma |
| 6000670 | Rhodes, Henry A. and Birdella, House | Building | Pierce | Tacoma |
| 83003352 | Rhodesleigh | Building | Pierce | Tacoma |
| 92001041 | Rialto Theater | Building | Pierce | Tacoma |
| 9000578 | Roanoke Park Historic District | District | King | Seattle |
| 75001859 | Ronald, Judge James T., House | Building | King | Seattle |
| 87000713 | Rudkin, Frank, House | Building | Thurston | Olympia |
| 85001806 | Rust, William Ross, House | Building | Pierce | Tacoma |
| 76001900 | Ryan House | Building | Pierce | Sumner |
| 71000876 | S.S. SAN MATEO | Structure | King | Seattle |
| 7000137 | Saint Edward Seminary | District | King | Kenmore |
| 98001018 | SAND MAN (Tug Boat) | Structure | Thurston | Olympia |
| 99001008 | Sandberg--Schoenfeld Buildings | Building | Pierce | Tacoma |
| 86003163 | Sanders, Erick Gustave, Mansion | Building | King | Kent |
| 95000801 | Schmidt, F. W., House | Building | Thurston | Olympia |
| 15000500 | Schmidt, Trueman and Virginia, House | Building | Thurston | Olympia |
| 82004247 | Schmitz Park Bridge | Structure | King | Seattle |
| 1001205 | SCHOONER MARTHA | Structure | King | Seattle |
| 95000228 | Schultz Apartments | Building | Pierce | Tacoma |
| 82004225 | Sears, Joshua, Building | Building | King | Kirkland |
| 16000474 | Seattle Art Museum | Building | King | Seattle |
| 86003153 | Seattle Chinatown Historic District | District | King | Seattle |
| 78002755 | Seattle Electric Company Georgetown Steam Plant (NHL) | Building | King | Seattle |
| 100009645 | Seattle Naval Hospital Chapel | Building | King | Shoreline |
| 82004249 | Seattle Public Library | Building | King | Seattle |
| 82004250 | Seattle Public Library | Building | King | Seattle |
| 82004251 | Seattle Public Library | Building | King | Seattle |
| 82004252 | Seattle Public Library | Building | King | Seattle |
| 82004253 | Seattle Public Library | Building | King | Seattle |
| 82004909 | Seattle Public Library | Building | King | Seattle |
| 6000370 | Seattle Yacht Club--Main Station | Building | King | Seattle |
| 84003502 | Seattle, Chief of the Suquamish, Statue | Object | King | Seattle |
| 89000214 | Selleck Historic District | District | King | Selleck |
| 95001445 | Shafer Building | Building | King | Seattle |
| 1449 | Shawnee House | Building | King | Vashon |
| 4000160 | Shelbanks | Building | Kitsap | Bremerton |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 86000970 | Showboat Theatre | Building | King | Seattle |
| 2001487 | Shuey, Henry Owen, House | Building | King | Seattle |
| 7000305 | Sigma Kappa Mu Chapter House | Building | King | Seattle |
| 11000627 | Skansie, Andrew & Bertha, Net Shed and House | Building | Perce | Gig Harbor |
| 78002756 | Skinner Building | Building | King | Seattle |
| 76001903 | Slavonian Hall | Building | Pierce | Tacoma |
| 95000194 | Smith, Peter, Farm--Donation Land Claim | Building | Pierce | Parkland |
| 74001978 | Snohomish Historic District | District | Snohomish | Snohomish |
| 74001963 | Snoqualmie Depot | Building | King | Snoqualmie |
| 92000784 | Snoqualmie Falls | Site | King | Snoqualmie |
| 76001895 | Snoqualmie Falls Cavity Generating Station | Structure | King | Snoqualmie |
| 92001324 | Snoqualmie Falls Hydroelectric Power Plant Historic District | District | King | Snoqualmie |
| 89000209 | Snoqualmie School Campus | Building | King | Snoqualmie |
| 95000187 | Sorenson House | Building | King | Bothell |
| 91001516 | South Capitol Neighborhood Historic District | District | Thurston | Olympia |
| 86001020 | South J Street Historic District | District | Pierce | Tacoma |
| 85002920 | Sprague Building | Building | Pierce | Tacoma |
| 74001974 | St. Peter's Episcopal Church | Building | Pierce | Tacoma |
| 77001353 | Stadium-Seminary Historic District | District | Pierce | Tacoma |
| 92000783 | Steele, Alden Hatch, House | Building | Thurston | Olympia |
| 976 | Steen, Helmer and Selma, House | Building | King | Vashon |
| 74001972 | Steilacoom Catholic Church | Building | Pierce | Steilacoom |
| 75001865 | Steilacoom Historic District | District | Steilacoom | Pierce |
| 76001890 | Stimson-Green House | Building | King | Seattle |
| 15000910 | Stoecker, Richard & Lydia | Building | Thurston | Olympia |
| 76001891 | Storey, Ellsworth, Cottages Historic District | District | King | Seattle |
| 72001276 | Storey, Ellsworth, Residences | Building | King | Seattle |
| 83003345 | Stuart House and Gardens | Building | King | Seattle |
| 79002540 | Summit School | Building | King | Seattle |
| 85001809 | Sunset Telephone & Telegraph Building | Building | Pierce | Tacoma |
| 13000209 | Supply Laundry Building | Building | King | Seattle |
| 1001162 | Tacoma Building | Building | Pierce | Tacoma |
| 405 | Tacoma Mausoleum | Building | Pierce | Tacoma |
| 92001068 | Tacoma Narrows Bridge Ruins | Site | Pierce | Tacoma |
| 84003506 | Temple de Hirsch | Building | King | Seattle |
| 79002541 | Thompson, Will H., House | Building | King | Seattle |
| 82004283 | Thornewood | Building | Pierce | Tacoma |
| 97001408 | Thorton, William Harper, House | Building | King | Bothell |
| 81000592 | Thurston County Courthouse | Building | Thurston | Olympia |
| 83003346 | Times Building | Building | King | Seattle |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 91000195 | Tolmie Peak Fire Lookout | Building | Pierce | Mowich Lake Entrance |
| 97000321 | TOURIST II (auto ferry) | Structure | King | Kirkland |
| 87000868 | Town Square | Site | Thurston | Olympia |
| 95000830 | Tracy House | Building | King | Seattle |
| 76001892 | Triangle Hotel and Bar | Building | King | Seattle |
| 91001440 | Trinity Parish Church | Building | King | Seattle |
| 972 | Trommald Building | Building | King | Enumclaw |
| 79002544 | Tukwila School | Building | King | Tukwila |
| 78002782 | Tumwater Historic District | District | Thurston | Tumwater |
| 84003636 | Tumwater Methodist Church | Building | Thurston | Tumwater |
| 76001893 | Turner-Koepf House | Building | King | Seattle |
| 80004003 | U.S. Courthouse | Building | King | Seattle |
| 79002542 | U.S. Immigrant Station and Assay Office | Building | King | Seattle |
| 79002543 | U.S. Marine Hospital | Building | King | Seattle |
| 79002563 | U.S. Post Office | Building | Thurston | Olympia |
| 80004009 | Union Depot-Warehouse Historic District | District | Tacoma | Pierce |
| 88000699 | Union Mills Superintendent's House | Building | Thurston | Olympia |
| 74001975 | Union Passenger Station | Building | Pierce | Tacoma |
| 13000210 | Union Stables | Building | King | Seattle |
| 74001960 | Union Station | Building | King | Seattle |
| 80004004 | United Shopping Tower | Building | King | Seattle |
| 82004254 | University Bridge | Structure | King | Seattle |
| 10000995 | University Heights School | Building | King | Seattle |
| 100006904 | University National Bank Building | Building | King | Seattle |
| 16000464 | University of Washington Faculty Club | Building | King | Seattle |
| 87001524 | US Immigration Building | Building | King | Seattle |
| 91000638 | US Post Office--Bremerton Main | Building | Kitsap | Bremerton |
| 91000652 | US Post Office--Port Townsend Main | Building | Kitsap | Port Townsend |
| 91000657 | US Post Office--Tacoma Downtown Station--Federal Building | Building | Pierce | Tacoma |
| 100008195 | USCG-11 (united states coast guard patrol vessel) | Building | King | Seattle |
| 92001880 | USCGC FIR | Structure | King | Bremerton |
| 971 | Vashon Hardware Store | Building | King | Vashon |
| 90001864 | Victorian Apartments | Building | King | Seattle |
| 4000920 | Vincent School | Building | King | Carnation |
| 73001875 | VIRGINIA V (NHL) | Structure | King | Seattle |
| 83004236 | Volker, William, Building | Building | King | Seattle |
| 76001894 | Volunteer Park | District | Seattle | King |
| 72001270 | W. T. PRESTON (snagboat) (NHL) | Structure | King | Seattle |
| 82004255 | Wagner Houseboat | Structure | King | Seattle |
| 94000420 | Walker Apartment Hotel | Building | Pierce | Tacoma |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 78002770 | Walker Cut Stone Company | District | Pierce | Wilkeson |
| 83003347 | Wallingford Fire and Police Station | Building | King | Seattle |
| 72001277 | Ward House | Building | King | Seattle |
| 100002408 | Washington Athletic Club | Building | King | Seattle |
| 9000508 | Washington Building | Building | Pierce | Tacoma |
| 10001018 | Washington Hall | Building | King | Seattle |
| 6000729 | Washington School | Building | Pierce | Tacoma |
| 79002564 | Washington State Capitol Historic District | District | Thurston | Olympia |
| 15000501 | Washington State Library | Building | Thurston | Olympia |
| 74001961 | Washington Street Public Boat Landing Facility | Structure | King | Seattle |
| 70000643 | WAWONA (schooner) | Structure | King | Seattle |
| 77001336 | West Point Light Station | Structure | King | Fort Lawton |
| 91001441 | Weyerhaeuser South Bay Log Dump Rural Historic Landscape | District | Thurston | Olympia |
| 15000455 | White Center Fieldhouse and Caretaker Cottage | District | King | Seattle |
| 12001100 | Whitman Elementary School | Building | Pierce | Tacoma |
| 74001962 | Wilke Farmhouse | Building | King | Seattle |
| 973 | Wilkeson Arch | Structure | Pierce | Wilkeson |
| 13000507 | Wilkeson Community House | Building | Pierce | Wilkeson |
| 76001905 | Wilkeson School | Building | Pierce | Wilkeson |
| 84000172 | Williams, Herbert, House | Building | Pierce | Sumner |
| 84000179 | Williams, Sidney, House | Building | King | Sumner |
| 6000669 | Windham Apartments | Building | King | Seattle |
| 95000259 | Winnifred Street Bridge | Structure | Pierce | Ruston |
| 94000418 | Winningham Farm | Building | Snohomish | Bothell |
| 92000367 | Winters, Frederick W., House | Building | King | Bellevue |
| 87001168 | Wollochet--Point Fosdick School | Building | Pierce | Gig Harbor |
| 79002565 | Women's Club | Building | Thurston | Olympia |
| 9000507 | Women's University Club of Seattle | Building | King | Seattle |
| 97001083 | Woodbrook Hunt Club | Building | Pierce | Lakewood |
| 100001517 | Woodinville School | Building | King | Woodinville |
| 83004260 | Woolrey-Koehler Hop Kiln | Building | Pierce | Orting |
| 15000880 | Woolworth, F.W., Company Store | Building | King | Renton |
| 76001904 | Wright Park and Seymour Conservatory | District | Tacoma | Pierce |
| 76001904 | Wright Park and Seymour Conservatory | District | Tacoma | Pierce |
| 90002154 | Wurdemann, Harry Vanderbilt, House | Building | King | Lake Forest Park |
| 83003353 | Y.M.C.A. Building | Building | Pierce | Tacoma |
| 82004256 | Ye College Inn | Building | King | Seattle |
| 74001956 | Yellowstone Road, The | Structure | King | Redmond |
| 85001807 | Yuncker, John F., House | Building | Pierce | Tacoma |
| 6001215 | YWCA Building--Seattle | Building | King | Seattle |

## Attachment B. Historic Properties

| Reference Number | Name | Resource Type | County | City |
|---|---|---|---|---|
| 82004248 | ZODIAC (schooner) | Structure | King | Seattle |

**Attachment C. Other Consulting Parties Suggested by DAHP**

- Alliance for Pioneer Square - https://allianceforpioneersquare.org
- Bainbridge History Museum - https://www.bainbridgehistorymuseum.org
- Ballard Historical Society – https://www.ballardhistory.org
- Black Diamond Historical Society and Museum - https://www.blackdiamondmuseum.org
- Capitol Hill Historical Society - https://www.capitolhillpast.org
- Docomomo US/WEWA – https://www.docomomo-wewa.org
- Duvall Historical Society - https://www.duvallhistoricalsociety.org
- East Side Heritage Center (Bellevue) https://eastsideheritagecenter.org
- Edmonds-South Snohomish County Historical Society - https://historicedmonds.org
- Enumclaw History Museum - https://www.enumclawhistorymuseum.com
- Fall City Historical Society – https://www.fallcityhistorical.org
- Federal Way Historical Society - https://www.federalwayhistory.org
- Greater Bonny Lake Historical Society - https://gblhs.org
- Harbor History Museum (Gig Harbor) - https://www.gigharborhistory.org
- Heritage League of Pierce County - https://heritageleaguepiercecounty.org/index.html
- Highline Heritage Museum – https://highlinemuseum.org
- Historical Society of Federal Way – https://www.federalwayhistory.org
- Historic Seattle - https://historicseattle.org
- Historic Wallingford - https://www.historicwallingford.org
- Jefferson County Historical Society - https://jchsmuseum.org
- Kent Historical Museum – https://kenthistoricalmuseum.org
- King County Historic Preservation Program – https://kingcounty.gov/en/dept/dnrp/buildings-property/historic-preservation-program
- Kirkland Heritage Society - https://kirklandheritage.org
- Kitsap History Museum - https://kitsapmuseum.org
- Lakewood Historical Society - https://www.lakewoodhistorical.org
- Lewis Army Museum - https://lewisarmymuseum.com
- Lynnwood History & Heritage Board - https://www.lynnwoodwa.gov/Government/Boards-and-Commissions/History-Heritage-Board
- Magnolia Historical Society - https://magnoliahistoricalsociety.org
- Maple Valley Historical Society – https://www.maplevalleyhistorical.com
- Mason County Historical Society - https://www.masoncountyhistoricalsociety.org
- Mercer Island Historical Society - https://www.mercerislandhistory.org/
- Monroe Historical Society - https://www.monroehistoricalsociety.org
- Mukilteo Historical Society - https://mukilteohistorical.org
- Newcastle Historical Society – https://www.newcastlewahistory.org
- Olympia Historical Society and Bigelow House Museum - https://olympiahistory.org
- Pierce County Historic Preservation Program - https://www.piercecountywa.gov/5938/Landmarks-and-Historic-Preservation
- Poulsbo Historical Society - https://www.poulsbohistory.com
- Queen Anne Historical Society – https://www.qahistory.org
- Redmond Historical Society - https://www.redmondhistoricalsociety.org

**Attachment C. Other Consulting Parties Suggested by DAHP**

- The Sammamish Heritage Society - https://www.sammamishheritage.org
- Shoreline Historical Museum – https://shorelinehistoricalmuseum.org
- Snohomish Historical Society - https://snohomishhistoricalsociety.org
- Southwest Seattle Historical Society - https://loghousemuseum.org
- South Whidbey Historical Society - https://southwhidbeyhistory.org
- Sumner Historical Society - https://www.sumnerhistoricalsociety.com
- Tacoma Historical Society - https://www.tacomahistory.org
- Thurston County Historic Commission - https://www.thurstoncountywa.gov/historic-commission
- Vashon (Island) Heritage Museum - https://www.vashonheritagemuseum.org
- Washington State Historical Society - https://www.washingtonhistory.org
- Washington Trust for Historic Preservation - https://preservewa.org
- White River Valley Museum (Auburn) - https://www.wrvmuseum.org
- Woodinville Heritage Society - https://www.woodinvilleheritage.com

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

September 16, 2025

Derek Hufty
Federal Aviation Administration
Manager, General Aviation and Commercial Branch (AFS-750)
Emerging Technologies Division

In future correspondence please refer to:
Project Tracking Code: 2024-08-05523
Property: FAA: Zipline Inc. Application for Package Delivery utilizing Drones in Seattle, WA-NHPA Section 106 Coordination
Re: No Adverse Effect

Dear Derek Hufty:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP) regarding the above-referenced federal undertaking. We reviewed the undertaking on behalf of the State Historic Preservation Office under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. Our review is based upon documentation provided in your submittal.

We concur that the project as proposed will have no adverse effect to historic properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP), with the understanding that any installation of docks in undisturbed areas or on buildings 45 years old or older that have not been evaluated for NRHP eligibility within the past 10 years would not fall within the scope of this letter and would require additional Section 106 consultation with DAHP.

As a result of our concurrence, further consultation with DAHP on this undertaking is not necessary. However, if new information about affected properties becomes available and/or the project scope of work changes significantly, please resume consultation as our assessment may be revised. If any archaeological resources are encountered during construction, please halt work immediately and contact the appropriate Native American Tribes and DAHP for further consultation and provide all documentation from the consulting parties

Thank you for the opportunity to review and comment. If you have any questions, please feel free to contact me.

Sincerely,

Maureen Elenga, M.A.
Architectural Historian – Transportation Reviewer
(360) 972-4539
Maureen.Elenga@dahp.wa.gov

# Appendix H
# Seattle Metro Area Airports