Oregon Department of Aviation

AURORA STATE AIRPORT

DRAFT AIRPORT MASTER PLAN

APPENDIX 1-10

CENTURY WEST ENGINEERING

Appendix 1

Glossary and List Of Acronyms

GLOSSARY OF AVIATION TERMS

The following glossary of aviation terms was compiled from a variety of aviation industry sources.

Above Ground Level (AGL) – As measured above the ground; used to identify heights of built items (towers, etc.) on aeronautical charts in terms of absolute height above the ground.

Accelerate Stop Distance Available (ASDA) – The length of the takeoff run available plus the length of a stopway, when available.

Agricultural Aviation – The use of fixed-wing or rotor-wing aircraft in the aerial application of agricultural products (i.e., fertilizers, pesticides, etc.).

Air Cargo – All commercial air express and air freight with the exception of airmail and parcel post.

Air Carrier/Airline – All regularly scheduled airline activity performed by airlines certificated in accordance with Federal Aviation Regulations (FAR Part 121).

Air Taxi – Operations of aircraft "for hire" for specific trips, commonly referred to an aircraft available for charter (FAR Part 135).

Aircraft Approach Category – Grouping of aircraft based on the speed they are traveling when configured for landing (typically 1.3 times the aircraft stall speed in landing configuration). As a rule of thumb, slower approach speeds mean smaller airport dimensions and faster approach speeds require larger dimensions. The aircraft approach categories are:

Category A - Speed less than 91 knots;

Category B - Speed 91 knots or more but less than 121 knots

Category C - Speed 121 knots or more but less than 141 knots

Category D - Speed 141 knots or more but less than 166 knots

Category E - Speed 166 knots or more

Aircraft Holding Area – An area typically located adjacent to a taxiway and runway end designed to accommodate aircraft prior to departure (for pre–takeoff engine checks, instrument flight plan clearances, etc.). Per FAA design standards, aircraft holding areas should be located outside the runway safety area (RSA) and obstacle free zone (OFZ) and aircraft located in the holding area should not interfere with normal taxiway use (taxiway object free area). Sometimes referred to as holding bays or "elephant ear." Smaller areas (aircraft turnarounds) are used to facilitate aircraft movement on runways without exit taxiways or where back-taxiing is required.

Aircraft Operation – A landing or takeoff is one operation. An aircraft that takes off and then lands creates two aircraft operations.

Aircraft Owners and Pilots Association (AOPA) – A general aviation organization.

Aircraft Parking Line (APL) – A setback depicted on an ALP or other drawings that defines the minimum separation between aircraft parking areas and an adjacent runway or taxiway. The APL dimension reflects runway and taxiway clearances (object free area, etc.) and FAR Part 77 airspace surface clearance (transitional surface penetrations) for parked aircraft. Typically the tail height of the parked aircraft is used to determine adequate clearance for the transitional surface.

Airplane Design Group – A grouping of airplanes based on wingspan and tail height. As with Approach Category, the wider the wingspan, the bigger the aircraft is, the more room it takes up for operating on an airport. The Airplane Design Groups are:

Group I:	Up to but not including 49 feet or tail height up to but not including 20 feet.
Group II:	49 feet up to but not including 79 feet or tail height from 20 up to but not including 30 feet.
Group III:	79 feet up to but not including 118 feet or tail height from 30 up to but not including 45 feet.
Group IV:	118 feet up to but not including 171 feet or tail height from 45 up to but not including 60 feet.
Group V:	171 feet up to but not including 214 feet or tail height from 60 up to but not including 66 feet.
Group VI:	214 feet up to but not including 262 feet or tail height from 66 up to but not including 80 feet.

Airport - A landing area regularly used by aircraft for receiving or discharging passengers or cargo, including heliports and seaplane bases.

Airport Beacon (also Rotating Beacon) – A visual navigational aid that displays alternating green and white flashes for a lighted land airport and white for an unlighted land airport.

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Airports District Office (ADO) – The local" office of the FAA that coordinates planning and construction projects. The Seattle ADO is responsible for airports located in Washington, Oregon, and Idaho.

Airport Improvement Program (AIP) – The funding program administered by the Federal Aviation Administration (FAA) with user fees which are dedicated to improvement of the national airport system. This program currently provides 95% of funding for eligible airport improvement projects. The local sponsor of the project (i.e., airport owner) provides the remaining 5% known as the "match."

Airport Layout Plan (ALP) – The FAA approved drawing which shows the existing and anticipated layout of an airport for the next 20 years. An ALP is prepared using FAA design standards. Future development projects must be consistent with the ALP to be eligible for FAA funding. ALP drawings are typically updated every 7 to 10 years to reflect significant changes, or as needed.

Airport Reference Code (ARC) – An FAA airport coding system that is defined based on the critical or design aircraft for an airport or individual runway. The ARC is an alpha-numeric code based on aircraft approach speed and airplane wingspan (see definitions in glossary). The ARC is used to determine the appropriate design standards for runways, taxiways, and other associated facilities. An airport designed to accommodate a Piper Cub (an A-I aircraft) requires less room than an airport designed to accommodate a Boeing 747 (a D-V aircraft).

Airport Reference Point (ARP) – The approximate mid-point of an airfield that is designated as the official airport location.

Aircraft Rescue and Fire Fighting (ARFF) – On airport emergency response required for certificated commercial service airports (see FAR Part 139).

Airside – The portion of an airport that includes aircraft movement areas (runways, taxiways, etc.)

Airspace – The area above the ground in which aircraft travel. It is divided into enroute and terminal airspace, with corridors, routes, and restricted zones established for the control and safety of air traffic.

Alternate Airport – An airport that is available for landing when the intended airport becomes unavailable. Required for instrument flight planning in the event that weather conditions at destination airport fall below approach minimums (cloud ceiling or visibility).

Annual Service Volume (ASV) – An estimate of how many aircraft operations an airport can handle based upon the number, type and configuration of runways, aircraft mix (large vs. small, etc.), instrumentation, and weather conditions with a "reasonable" amount of delay. ASV is a primary planning standard used to determine when a runway (or an airport) is nearing its capacity, and may require new runways or taxiways. As operations levels approach ASV, the amount of delay per operation increases; once ASV is exceeded, "excessive" delay generally exists.

Approach End of Runway - The end of the runway used for landing. Pilots generally land into the wind and choose a runway end that best aligns with the wind.

Approach Light System (ALS) – Configurations of lights positioned symmetrically beyond the runway threshold and the extended runway centerline. The ALS visually augments the electronic navigational aids for the runway.

Approach Reference Code (APRC) – The APRC is composed of three components: AAC, ADG, and visibility minimums. Visibility minimums are expressed as Runway Visual Range (RVR) values in feet of 1600, 2400, 4000, and 5000 (nominally corresponding to lower than 1/2 mile, lower than 3/4 mile but not lower than 1/2 mile, not lower than 3/4 mile, and not lower than one mile, respectively).

Approach Surface (Also FAR Part 77 Approach) – An imaginary (invisible) surface that rises and extends from the ends of a runway to provide an unobstructed path for aircraft to land or take off. The size and slope of the approach surface vary depending upon the size of aircraft that are accommodated and the approach capabilities (visual or instrument).

Apron - An area on an airport designated for the parking, loading, fueling, or servicing of aircraft (also referred to as tarmac and ramp).

Aqueous Film Forming Foam (AFFF) – A primary fire- fighting agent that is used to create a blanket that smothers flame or prevents ignition (fuel spills, etc.). AFFF is also used to foam runways during emergency landings.

Asphalt or Asphaltic Concrete (AC) – Flexible oil-based pavement used for airfield facilities (runways, taxiways, aircraft parking apron, etc.); also commonly used for road construction.

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Automated Surface Observation System (ASOS) and Automated Weather Observation System (AWOS) – Automated observation systems providing continuous on-site weather data, designed to support aviation activities and weather forecasting.

AVGAS – Highly refined gasoline used in airplanes with piston engines. The current grade of AVGAS available is 100 Octane Low Lead (100LL).

Avigation Easement – A grant of property interest (airspace) over land to ensure unobstructed flight. Typically acquired by airport owners to protect the integrity of runway approaches. Restrictions typically include maximum height limitations for natural (trees, etc.) or built items, but may also address permitted land uses by the owner of the underlying land that are compatible with airport operations.

Back-Taxiing – The practice of aircraft taxiing on a runway before takeoff or after landing, normally, in the opposite direction of the runway's traffic pattern. Back-taxiing is generally required on runways without taxiway access to both runway ends.

Based Aircraft – Aircraft permanently stationed at an airport usually through some form of agreement with the airport owner. Used as a measure of activity at an airport.

Capacity – A measure of the maximum number of aircraft operations that can be accommodated on the runways of an airport in an hour.

Ceiling – The height above the ground or water to base of the lowest cloud layers covering more than 50 percent of the sky.

Charter – Operations of aircraft "for hire" for specific trips, commonly referred to an aircraft available for charter.

Circle to Land or Circling Approach – An instrument approach procedure that allows pilots to "circle" the airfield to land on any authorized runway once visual contact with the runway environment is established and maintained throughout the procedure.

Commercial Service Airport – An airport designed and constructed to serve scheduled or unscheduled commercial airlines. Commercial service airports are certified under FAR Part 139.

Common Traffic Advisory Frequency (CTAF) – A frequency used by pilots to communicate and obtain airport advisories at an uncontrolled airport.

Complimentary Fire Extinguishing Agent – Fire extinguishing agents that provide rapid fire suppression, which may be used in conjunction with principal agents (e.g., foam). Examples include sodium-based and potassium-based dry chemicals, Halocarbons, and Carbon dioxide. Also recommended for electrical and metal fires where water-based foams are not used. Complimentary agents are paired with principal agents based on their compatibility of use.

Conical Surface – One of the FAR Part 77 "Imaginary" Surfaces. The conical surface extends outward and upward from the edge of the horizontal surface at a slope of 20:1 to a horizontal distance of 4,000 feet.

Controlling Obstruction – The highest obstruction relative to a defined plane of airspace (i.e., approach surface, etc.).

Critical Aircraft – Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated take-off weight. The same aircraft may not be critical to all design items (i.e., runway length, pavement strength, etc.). Also referred to as "design aircraft."

Crosswind – Wind direction that is not parallel to the runway or the path of an aircraft.

Crosswind Runway – An additional runway (secondary, tertiary, etc.) that provides wind coverage not adequately provided by the primary runway. Crosswind runways are generally eligible for FAA funding when a primary runway accommodates less than 95 percent of documented wind conditions (see wind rose).

Decision Height (DH) – For precision instrument approaches, the height (typically in feet or meters above runway end touchdown zone elevation) at which a decision to land or execute a missed approach must be made by the pilot.

Declared Distances – The distances the airport owner declares available for airplane operations (e.g., takeoff run, takeoff distance, accelerate-stop distance, and landing distance). In cases where runways meet all FAA design criteria without modification, declared distances equal the total runway length. In cases where any declared distances are less than full runway length, the dimension should be published in the FAA Airport/Facility Directory (A/FD).

Departure Reference Code (DPRC) – The DPRC represents aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operational procedures necessary.

Departure Surface – A surface that extends upward from the departure end of an instrument runway that should be free of any obstacle penetrations. For instrument runways other than air carrier, the slope is 40:1, extending 10,200 feet from the runway end. Air carrier runways have a similar surface designed for one-engine inoperative conditions with a slope of 62.5: 1.

Design Aircraft – Aircraft which controls one or more design items based on wingspan, approach speed and/or maximum certificated takeoff weight. The same aircraft may not represent the design aircraft for all design items (i.e., runway length, pavement strength, etc.). Also referred to as "critical aircraft."

Displaced Threshold – A landing threshold located at a point other than on the runway end, usually provided to mitigate close-in obstructions to runway approaches for landing aircraft. The area between the runway end and the displaced threshold accommodates aircraft taxi and takeoff, but not landing.

Distance Measuring Equipment (DME) – Equipment that provides electronic distance information to enroute or approaching aircraft from a land-based transponder that sends and receives pulses of fixed duration and separation. The ground stations are typically co-located with VORs, but they can also be co-located with an ILS.

Distance Remaining Signs – Airfield signs that indicate to pilots the amount of useable runway remaining in 1,000-foot increments. The signs are located along the side of the runway, visible for each direction of runway operation.

DNL – Day-night sound levels, a mathematical method of measuring noise exposure based on cumulative, rather than single event impacts. Night time operations (10pm to 7AM) are assessed a noise penalty to reflect the increased noise sensitivity that exists during normal hours of rest. Previously referred to as Ldn.

Easement – An agreement that provides use or access of land or airspace (see avigation easement) in exchange for compensation.

Enplanements – Domestic, territorial, and international revenue passengers who board an aircraft in the states in scheduled and non-scheduled service of aircraft in intrastate, interstate, and foreign commerce and includes intransit passengers (passengers on board international flights that transit an airport in the US for non-traffic purposes).

Entitlements – Distribution of Airport Improvement Plan (AIP) funds by FAA from the Airport & Airways Trust Fund to commercial service airport sponsors based on passenger enplanements or cargo volumes and smaller fixed amounts for general aviation airports (Non-Primary Entitlements).

Experimental Aircraft – See homebuilt aircraft.

Federal Aviation Administration (FAA) – The FAA is the branch of the U.S. Department of Transportation that is responsible for the development of airports and air navigation systems.

FAR Part 77 – Federal Air Regulations (FAR) which establish standards for determining obstructions in navigable airspace and defines imaginary (airspace) surfaces for airports and heliports that are designed to prevent hazards to air navigation. FAR Part 77 surfaces include approach, primary, transitional, horizontal, and conical surfaces. The dimensions of surfaces can vary with the runway classification (large or small airplanes) and approach type of each runway end (visual, non-precision instrument, precision instrument). The slope of an approach surface also varies by approach type and runway classification. FAR Part 77 also applies to helicopter landing areas.

FAR Part 139 – Federal Aviation Regulations which establish standards for airports with scheduled passenger commercial air service. Airports accommodating scheduled passenger service with aircraft more than 9 passenger seats must be certified as a "Part 139" airport. Airports that are not certified under Part 139 may accommodate scheduled commercial passenger service with aircraft having 9 passenger seats or less.

Final Approach Fix (FAF) – The fix (location) from which the final instrument approach to an airport is executed; also identifies beginning of final approach segment.

Final Approach Point (FAP) – For non-precision instrument approaches, the point at which an aircraft is established inbound for the approach and where the final descent may begin.

Fixed Base Operator (FBO) – An individual or company located at an airport providing aviation services. Sometimes further defined as a "full service" FBO or a limited service. Full service FBOs typically provide a broad range of services (flight instruction, aircraft rental, charter, fueling, repair, etc.) where a limited service FBO provides only one or two services (such as fueling, flight instruction or repair).

Fixed Wing – A plane with one or more "fixed wings," as opposed to a helicopter that utilizes a rotary wing.

Flexible Pavement – Typically constructed with an asphalt surface course and one or more layers of base and subbase courses that rest on a subgrade layer.

Flight Service Station (**FSS**) – FAA or contracted service for pilots to contact (on the ground or in the air) to get weather and airport information. Flight plans are also filed with the FSS.

General Aviation (GA) – All civil (non-military) aviation operations other than scheduled air services and non-scheduled air transport operations for hire.

Glide Slope (GS) – For precision instrument approaches, such as an instrument landing system (ILS), the component that provides electronic vertical guidance to aircraft.

Global Positioning System (GPS) – GPS is a system of navigating which uses multiple satellites to establish the location and altitude of an aircraft with a high degree of accuracy. GPS supports both enroute flight and instrument approach procedures.

Helicopter Landing Pad (Helipad) – A designated landing area for rotor wing aircraft. Requires protected FAR Part 77 imaginary surfaces, as defined for heliports (FAR Part 77.29).

Helicopter Parking Area – A designated area for rotor wing aircraft parking that is typically accessed via hover-taxi or ground taxiing from a designated landing area (e.g., helipad or runway-taxiway system). If not used as a designated landing area, helicopter parking pads do not require dedicated FAR Part 77 imaginary surfaces.

Heliport – A designated helicopter landing facility (as defined by FAR Part 77).

Height Above Airport (HAA) – The height of the published minimum descent altitude (MDA) above the published airport elevation. This is normally published in conjunction with circling minimums.

High Intensity Runway Lights (HIRL) – High intensity (i.e., very bright) lights are used on instrument runways to help pilots to see the runway when visibility is poor.

High Speed (Taxiway) Exit – An acute-angled exit taxiway extending from a runway to an adjacent parallel taxiway which allows landing aircraft to exit the runway at a higher rate of speed than is possible with standard (90-degree) exit taxiways.

Hold Line (Aircraft Hold Line) – Pavement markings located on taxiways that connect to runways, indicating where aircraft should stop before entering runway environment. At controlled airports, air traffic control clearance is required to proceed beyond a hold line. At uncontrolled airports, pilots are responsible for ensuring that a runway is clear prior to accessing for takeoff.

Hold/Holding Procedure – A defined maneuver in controlled airspace that allows aircraft to circle above a fixed point (often over a navigational aid or GPS waypoint) and altitude while awaiting further clearance from air traffic control.

Home Built Aircraft - An aircraft built by an amateur from a kit or specific design (not an FAA certified factory built aircraft). The aircraft built under the supervision of an FAA-licensed mechanic and are certified by FAA as "Experimental."

Horizontal Surface - One of the FAR Part 77 Imaginary (invisible) Surfaces. The horizontal surface is an imaginary flat surface 150 feet above the established airport elevation (typically the highest point on the airfield). Its perimeter is constructed by swinging arcs (circles) from each runway end and connecting the arcs with straight lines. The oval-shaped horizontal surface connects to other Part 77 surfaces extending upward from the runway and also beyond its perimeter.

Initial Approach Point/Fix (IAP/IAF) – For instrument approaches, a designated point where an aircraft may begin the approach procedure.

Instrument Approach Procedure (IAP) – A series of defined maneuvers designed to enable the safe transition between enroute instrument flight and landing under instrument flight conditions at a particular airport or heliport. IAPs define specific requirements for aircraft altitude, course, and missed approach procedures. See precision or non-precision instrument approach.

Instrument Flight Rules (IFR) – IFR refers to the set of rules pilots must follow when they are flying in bad weather. Pilots are required to follow these rules when operating in controlled airspace with visibility (ability to see in front of themselves) of less than three miles and/or ceiling (a layer of clouds) lower than 1,000 feet.

Instrument Landing System (ILS) – An ILS is an electronic navigational aid system that guides aircraft for a landing in bad weather. Classified as a precision instrument approach, it is designed to provide a precise approach path for course alignment and vertical descent of aircraft. Generally consists of a localizer, glide slope, outer marker, and middle marker. ILS runways are generally equipped with an approach lighting system (ALS) to maximize approach capabilities. A Category I ILS allows aircraft to descend as low as 200 feet above runway elevation with ½ mile visibility.

Instrument Meteorological Conditions (IMC) – Meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling less than minima specified for visual meteorological conditions.

Instrument Runway – A runway equipped with electronic navigational aids that accommodate straight-in precision or non-precision instrument approaches.

Itinerant Operation – All aircraft operations at an airport other than local, i.e., flights that come in from another airport.

Jet Fuel – Highly refined grade of kerosene used by turbine engine aircraft. Jet-A is currently the common commercial grade of jet fuel.

Knot (Nautical Mile) – one nautical mile = 1.152 statute miles.

Landing Area – That part of the movement area intended for the landing and takeoff of aircraft.

Landing Distance Available (LDA) – The length of runway which is available and suitable for the ground run of an airplane landing.

Landside – The portion of an airport that includes aircraft parking areas, fueling, hangars, airport terminal area facilities, vehicle parking and other associated facilities.

Larger than Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve large planes (aircraft with maximum takeoff weights greater than 12,500 pounds).

Ldn – Noise measurement metric (see DNL)

Left Traffic – A term used to describe which side of a runway the airport traffic pattern is located. Left traffic indicates that the runway will be to the pilot's left when in the traffic pattern. Left traffic is standard unless otherwise noted in facility directories at a particular airport.

Large Aircraft – An aircraft with a maximum takeoff weight more than 12,500 lbs.

Light Sport Aircraft (LSA) – A basic aircraft certified by FAA that can be flown by pilots with limited flight training (Sport Pilot certificates), but also provide lower cost access to basic aircraft for all pilot levels. LSA design limits include maximum a gross takeoff weight of 1,320 pounds (land planes) and a maximum of two seats.

Local Area Augmentation System (LAAS) – GPS-based instrument approach that utilizes ground-based systems to augment satellite coverage to provide vertical (glideslope) and horizontal (course) guidance.

Local Operation – Aircraft operation in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

Localizer – The component of an instrument landing system (ILS) that provides electronic lateral (course) guidance to aircraft. Also used to support non-precision localizer approaches.

LORAN C – A navigation system using land based radio signals, which indicates position and ground speed, but not elevation. (See GPS)

Localizer Performance with Vertical Guidance (LPV) – Satellite navigation (SATNAV) based GPS approaches providing "near category I" precision approach capabilities with course and vertical guidance. LPV approaches are expected to eventually replace traditional step- down, VOR and NDB procedures by providing a constant, ILS glideslope-like descent path. LPV approaches use high-accuracy WAAS signals, which allow narrower glideslope and approach centerline obstacle clearance areas.

Magnetic Declination – Also called magnetic variation, is the angle between magnetic north and true north. Declination is considered positive east of true north and negative when west. Magnetic declination changes over time and with location. Runway end numbers, which reflect the magnetic heading/alignment (within 5 degrees +/-) occasionally require change due to declination.

MALSR – **M**edium-intensity **A**pproach **L**ighting **S**ystem with **R**unway alignment indicator lights. An approach lighting system (ALS) which provides visual guidance to landing aircraft.

Medevac – Fixed wing or rotor-wing aircraft used to transport critical medical patients. These aircraft are equipped to provide life support during transport.

Medium Intensity Runway Lights (MIRL) – Runway edge lights which are not as intense as HIRLs (high intensity runway lights). Typical at medium and smaller airports which do not have sophisticated instrument landing systems.

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Microwave Landing System (MLS) – An instrument landing system operating in the microwave spectrum, which provides lateral and vertical guidance to aircraft with compatible equipment. Originally developed as the "next-generation" replacement for the ILS, the FAA discontinued the MLS program in favor of GPS-based systems.

Minimum Descent Altitude (MDA) – The lowest altitude in a non-precision instrument approach that an aircraft may descend without establishing visual contact with the runway or airport environment.

Minimums – Weather condition requirements established for a particular operation or type of operation.

Missed Approach Procedure – A prescribed maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. Usually requires aircraft to climb from the airport environment to a specific holding location where another approach can be executed or the aircraft can divert to another airport.

Missed Approach Point (MAP) – The defined location in a non-precision instrument approach where the procedure must be terminated if the pilot has not visually established the runway or airport environment.

Movement Area – The runways, taxiways and other areas of the airport used for taxiing, takeoff and landing of aircraft, i.e., for aircraft movement.

MSL - Elevation above Mean Sea Level.

National Plan of Integrated Airport Systems (NPIAS) – The NPIAS is the federal airport classification system that includes public use airports that meet specific eligibility and activity criteria. A "NPIAS designation" is required for an airport to be eligible to receive FAA funding for airport projects.

Navigational Aid (Navaid) – Any visual or electronic device that helps a pilot navigate. Can be for use to land at an airport or for traveling from point A to point B.

Noise Contours – Continuous lines of equal noise level usually drawn around a noise source, such as runway, highway or railway. The lines are generally plotted in 5-decibel increments, with higher noise levels located nearer the noise source, and lesser exposure levels extending away from the source.

Non-Directional Beacon (NDB) – Non-Directional Beacon which transmits a signal on which a pilot may "home" using equipment installed in the aircraft.

Non-Precision Instrument (NPI) Approach - A non-precision instrument approach provides horizontal (course) guidance to pilots for landing. NPI approaches often involve a series of "step down" sequences where aircraft descend in increments (based on terrain clearance), rather than following a continuous glide path. The pilot is responsible for maintaining altitude control between approach segments since no "vertical" guidance is provided.

Obstacle Clearance Surface (OCS) – As defined by FAA, an approach surface that is used in conjunction with alternative threshold siting/clearing criteria to mitigate obstructions within runway approach surfaces. Dimensions, slope and placement depend on runway type and approach capabilities. Also known as Obstacle Clearance Approach (OCA).

Obstruction – An object (tree, house, road, phone pole, etc.) that penetrates an imaginary surface described in FAR Part 77.

Obstruction Chart (OC) – A chart that depicts surveyed obstructions that penetrate a FAR Part 77 imaginary surface surrounding an airport. OC charts are developed by the National Ocean Service (NOS) based on a comprehensive survey that provides detailed location (latitude/longitude coordinates) and elevation data in addition to critical airfield data.

Parallel Taxiway – A taxiway that is aligned parallel to a runway, with connecting taxiways to allow efficient movement of aircraft between the runway and taxiway. The parallel taxiway effectively separates taxiing aircraft from arriving and departing aircraft located on the runway. Used to increase runway capacity and improve safety.

Passenger Facility Charge (PFC) – A user fee charged by commercial service airports for enplaning passengers. Airports must apply to the FAA and meet certain requirements in order to impose a PFC.

Pavement Condition Index (PCI) – A scale of 0-100 that is used to rate airfield pavements ranging from failed to excellent based on visual inspection. Future PCIs can be predicted based on pavement type, age, condition and use as part of a pavement maintenance program.

Pavement Strength or Weight Bearing Capacity – The design limits of airfield pavement expressed in maximum aircraft weight for specific and landing gear configurations (i.e., single wheel, dual wheel, etc.) Small general aviation airport pavements are typically designed to accommodate aircraft weighing up to 12,500 pounds with a single-wheel landing gear.

Portland Cement Concrete (PCC) – Rigid pavement used for airfield facilities (runways, taxiways, aircraft parking, helipads, etc.).

Precision Approach Path Indicator (PAPI) – A system of lights located by the approach end of a runway that provides visual approach slope guidance to aircraft during approach to landing. The lights typically show green if a pilot is on the correct flight path, and turn red of a pilot is too low.

Precision Instrument Runway (PIR) – A runway equipped with a "precision" instrument approach (descent and course guidance), which allows aircraft to land in bad weather.

Precision Instrument Approach – An instrument approach that provides electronic lateral (course) and vertical (descent) guidance to a runway end. A non-precision instrument approach typically provides only course guidance and the pilot is responsible for managing defined altitude assignments at designated points within the approach.

Primary Runway – That runway which provides the best wind coverage, etc., and receives the most usage at the airport.

Primary Surface – One of the FAR Part 77 Imaginary Surfaces, the primary surface is centered on top of the runway and extends 200 feet beyond each end. The width is from 250' to 1,000' wide depending upon the type of airplanes using the runway.

Principal Fire Extinguishing Agent – Fire extinguishing agents that provide permanent control of fire through a fire-smothering foam blanket. Examples include protein foam, aqueous film forming foam and fluoroprotein foam.

Procedure Turn (PT) – A maneuver in which a turn is made away from a designated track followed by a turn in an opposite direction to permit an aircraft to intercept the track in the opposite direction (usually inbound).

Area Navigation (RNAV) – is a method of instrument flight navigation that allows an aircraft to choose a course within a network of navigation beacons rather than navigating directly to and from the beacons. Originally developed in the 1960, RNAV elements are now being integrated into GPS-based navigation.

Relocated Threshold – A runway threshold (takeoff and landing point) that is located at a point other than the (original) runway end. Usually provided to mitigate nonstandard runway safety area (RSA) dimensions beyond a runway end. When a runway threshold is relocated, the published length of the runway is reduced and the pavement between the relocated threshold and to the original end of the runway is not available for aircraft takeoff or landing. This pavement is typically marked as taxiway, marked as unusable, or is removed.

Required Navigation Performance (RNP) – A type of performance-based navigation system that that allows an aircraft to fly a specific path between two 3-dimensionally defined points in space. RNP approaches require on-board performance monitoring and alerting. RNP also refers to the level of performance required for a specific procedure or a specific block of airspace. For example, an RNP of .3 means the aircraft navigation system must be able to calculate its position to within a circle with a radius of 3 tenths of a nautical mile. RNP approaches have been designed with RNP values down to .1, which allow aircraft to follow precise 3 dimensional curved flight paths through congested airspace, around noise sensitive areas, or through difficult terrain.

Rigid Pavement – Typically constructed of Portland cement concrete (PCC), consisting of a slab placed on a prepared layer of imported materials.

Rotorcraft – A helicopter.

Runway – A defined area intended to accommodate aircraft takeoff and landing. Runways may be paved (asphalt or concrete) or unpaved (gravel, turf, dirt, etc.), depending on use. Water runways are defined takeoff and landing areas for use by seaplanes.

Runway Bearing – The angle of a runway centerline expressed in degrees (east or west) relative to true north.

Runway Design Code (RDC) – The RDC is comprised of the AAC, ADG, and approach visibility minimums of a particular runway. The RDC provides the information needed to determine applicable design standards. The AAC is based on aircraft approach speed. The ADG is based on either the aircraft wingspan or tail height; (whichever is most restrictive) of the largest aircraft expected to operate on the runway and taxiways adjacent to the runway. The approach visibility minimums represent RVR values in feet of 1,200, 1,600, 2,400, 4,000, and 5,000 (corresponding to lower than 1/4 mile, lower than 1/2 mile but not lower than 1/4 mile, lower than 3/4 mile but not lower than 1/2 mile, lower than 1 mile but not lower than 3/4 mile, and not lower than 1 mile, respectively).

Runway Designation Numbers – Numbers painted on the ends of a runway indicating runway orientation (in degrees) relative to magnetic north. "20" = 200 degrees magnetic, which means that the final approach for Runway 20 is approximately 200 degrees (+/- 5 degrees).

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Runway End Identifier Lights (REILs) – Two high-intensity sequenced strobe lights that help pilots identify a runway end during landing in darkness or poor visibility.

Runway Object Free Area (OFA) – A defined area surrounding a runway that should be free of any obstructions that could in interfere with aircraft operations. The dimensions for the OFA increase for runways accommodating larger or faster aircraft.

Runway Protection Zone (RPZ) – A trapezoid-shaped area located beyond the end of a runway that is intended to be clear of people or built items. The geometry of the RPZ often coincides with the inner portion of the runway approach surface. However, unlike the approach surface, the RPZ is a defined area on the ground that does not have a vertical slope component for obstruction clearance. The size of the RPZ increases as runway approach capabilities or aircraft approach speeds increase. Previously defined as "clear zone."

Runway Safety Area (RSA) – A symmetrical ground area extending along the sides and beyond the ends of a runway that is intended to accommodate inadvertent aircraft passage without causing damage. The dimensions for the RSA increase for runways accommodating larger or faster aircraft. FAA standards include surface condition (compaction, etc.) and absence of obstructions. Any items that must be located within an RSA because of their function (runway lights, airfield signage, wind cones, etc.) must be frangible (breakable) to avoid significant aircraft damage.

Segmented Circle – A system of visual indicators designed to show a pilot in the air the direction of the traffic pattern at that airport.

Small Aircraft – An aircraft that weighs 12,500 lbs. or less.

Straight-In Approach – An instrument approach that directs aircraft to a specific runway end.

Statute Mile – 5,280 feet (a nautical mile = 6,080 feet)

Stop and Go – An aircraft operation where the aircraft lands and comes to a full stop on the runway before takeoff is initiated.

T-Hangar – A rectangular aircraft storage hangar with several interlocking "T" units that minimizes -building per storage unit. Usually two-sided with either bi-fold or sliding doors.

Takeoff Distance Available (TODA) – the length of the takeoff run available plus the length of clearway, if available.

Takeoff Run Available (TORA) – the length of runway available and suitable for the ground run of aircraft when taking off.

Taxilane – A defined path used by aircraft to move within aircraft parking apron, hangar areas and other landside facilities.

Taxiway – A defined path used by aircraft to move from one point to another on an airport.

Threshold – The beginning of that portion of a runway that is useable for landing.

Taxiway Design Group (TDG) – The TDG is based on the undercarriage dimensions of the aircraft. TDG is used to determine taxiway/taxilane width and fillet standards, and in some instances, runway to taxiway and taxiway/taxilane separation requirements.

Threshold Lights – Components of runway edge lighting system located at the ends of runways and at displaced thresholds. Threshold lights typically have split lenses (green/red) that identify the beginning and ends of usable runway.

Through-the-Fence – Term used to describe how off-airport aviation users (private airparks, hangars, etc.) access an airport "through-the-fence," rather than having facilities located on airport property.

Tiedown – A place where an aircraft is parked and "tied down." Surface can be grass, gravel or paved. Tiedown anchors may be permanently installed or temporary.

Touch and Go – An aircraft operation involving a landing followed by a takeoff without the aircraft coming to a full stop or exiting the runway.

Traffic Pattern – The flow of traffic that is prescribed for aircraft landing and taking off from an airport. Traffic patterns are typically rectangular in shape, with upwind, crosswind, base and downwind legs and a final approach surrounding a runway.

Traffic Pattern Altitude – The established altitude for a runway traffic pattern, typically 800 to 1,000 feet above ground level (AGL).

Transitional Surfaces – One of the FAR Part 77 Imaginary Surfaces, the transitional surface extend outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces.

Universal Communications (UNICOM) – Is an air-ground communication facility operated by a private agency to provide advisory service at uncontrolled airports.

Utility Runway – As defined under FAR Part 77, a runway designed and constructed to serve small planes (aircraft with maximum takeoff weights of 12,500 pounds or less).

Vertical Navigation (VNAV) – Vertical navigation descent data or descent path, typically associated with published GPS instrument approaches. The use of any VNAV approach technique requires operator approval, certified VNAV-capable avionics, and flight crew training.

VOR - Very High Frequency Omnidirectional Range – A ground based electronic navigational aid that transmits radials in all directions in the VHF frequency spectrum. The VOR provides azimuth guidance to aircraft by reception of radio signals.

VORTAC – VOR collocated with ultra high frequency tactical air navigation (TACAN)

Visual Approach Slope Indicator (VASI) – A system of lights located by the approach end of a runway which provides visual approach slope guidance to aircraft during approach to landing. The lights typically show some combination of green and white if a pilot is on the correct flight path, and turn red of a pilot is too low.

Visual Flight Rules (VFR) – Rules that govern the procedures to conducting flight under visual conditions. The term is also used in the US to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

Visual Guidance Indicator (VGI) – Equipment designed to provide visual guidance for pilots for landing through the use of different color light beams. Visual Approach Slope Indicators (VASI) and Precision Approach Path Indicators (PAPI) defined above are examples.

Waypoint – A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation.

Wide Area Augmentation System (WAAS) – GPS-based instrument approach that can provide both vertical (glideslope) and horizontal (course) guidance. WAAS-GPS approaches are able to provide approach minimums nearly comparable to a Category I Instrument Landing System (ILS).

Wind Rose – A diagram that depicts observed wind data direction and speed on a 360-degree compass rose. Existing or planned proposed runway alignments are overlain to determine wind coverage levels based on the crosswind limits of the design aircraft.

Wind Cone – A device located near landing areas used by pilots to verify wind direction and velocity. Usually manufactured with brightly colored fabric and may be lighted for nighttime visibility. Also referred to as “wind sock.”

LIST OF ACRONYMS

AC – Advisory Circular

AC – Asphaltic Concrete

ACM – Airport Certification Manual

ADG – Airplane Design Group

ADIP – Airport Data and Information Portal

ADO – Airport District Office

AGIS – Airport Geographic Information Systems

AGL – Above Ground Level

AIP – Airport Improvement Program

ALP – Airport Layout Plan

ALS – Approach Lighting System

AOA – Airport Operations Area

APL – Aircraft Parking Line

APRC – Approach Reference Code

ARC – Airport Reference Code

ARFF – Aircraft Rescue and Fire Fighting

ARP - Airport Reference Point

ASDA – Accelerate-Stop Distance Available

ASV – Annual Service Volume

ATC –Air Traffic Control

ATCT – Airport Traffic Control Tower

ASOS – Automated Surface Observation System

AWOS – Automated Weather Observation System

BRL – Building Restriction Line

CFR – Code of Federal Regulations

CTAF – Common Traffic Advisory Frequency

DPRC – Departure Reference Code

DME – Distance Measuring Equipment

FAA – Federal Aviation Administration

FAR – Federal Air Regulation

FBO – Fixed Base Operator

GIS – Geographic Information System

GS – Glide Slope

GPS – Global Positioning System

HIRL – High Intensity Runway Lighting

HITL – High Intensity Taxiway Lighting

IFR – Instrument Flight Rules

ILS – Instrument Landing System

IMC – Instrument Meteorological Conditions

LDA – Landing Distance Available

LDA - Localizer Directional Aid

LIRL – Low Intensity Runway Lighting

LITL – Low Intensity Taxiway Lighting

LNAV - Lateral Navigation

LOC – Localizer

LPV – Localizer Performance with Vertical Guidance

MALSR – Medium Intensity Approach Lighting System (MALS) with Runway Alignment Indicator Lights (RAIL)

MIRL – Medium Intensity Runway Lighting

MITL – Medium Intensity Taxiway Lighting

MSL – Mean Sea Level

MTOW – Maximum Takeoff Weight

NAVAID – Navigation Aid

NDB – Non-Directional Beacon

NEPA – National Environmental Policy Act

NGS – National Geodetic Survey

NPIAS – National Plan of Integrated Airport Systems

OCS – Obstacle Clearance Surface

ODALS – Omnidirectional Airport Lighting System

OFA – Object Free Area

OFZ – Obstacle Free Zone

PAPI – Precision Approach Path Indicator

PCC – Portland Cement Concrete

PCI – Pavement Condition Index

PCN – Pavement Condition Number

POFZ – Precision Obstacle Free Zone

RAIL – Runway Alignment Indicator Lights

RDC – Runway Design Code

LIST OF ACRONYMS

REIL – Runway End Identifier Lights

RNAV – Area Navigation

ROFA – Runway Object Free Area

ROFZ – Runway Obstacle Free Zone

RPZ – Runway Protection Zone

RSA – Runway Safety Area

RVR – Runway Visual Range

RVZ – Runway Visibility Zone

TDG – Taxiway Design Group

TSA- Taxiway Safety Area

TSA – Transportation Security Administration

TODA – Takeoff Distance Available

TOFA – Taxiway/Taxilane Object Free Area

TORA – Takeoff Run Available

TSS – Threshold Siting Surface

TVOR – Terminal Very High Frequency Omni-directional Range

UAS – Unmanned Aircraft Systems

UGA – Urban Growth Area

UGB – Urban Growth Boundary

UHF – Ultra-High Frequency

USDA – United States Department of Agriculture

USGS – U.S. Geological Survey

UNICOM – Universal Communications

VASI – Visual Approach Slope Indicator

VFR – Visual Flight Rules

VGI - Visual Guidance Indicators

VNAV – Vertical Navigation

VOR – Very High Frequency Omni-Directional Range

Appendix 2

Environmental Screening Report

Draft

AURORA STATE AIRPORT MASTER PLAN UPDATE

Environmental Overview

Prepared for

Century West Engineering

December 2021

Draft

AURORA STATE AIRPORT MASTER PLAN UPDATE

Environmental Overview

Prepared for **December 2021**

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Acronyms and Abbreviations

Airport	Aurora State Airport
CO	Carbon Monoxide
DEQ	State of Oregon Department of Environmental Quality
DOT	Department of Transportation
EFH	Essential Fish Habitat
EJSCREEN	Environmental Justice Screening and Mapping Tool
EPA	U.S. Environmental Protection Agency
ESA	Environmental Science Associates
ESU	Evolutionarily Significant Unit
F	degrees Fahrenheit
FAA	Federal Aviation Administration
FBO	Fixed Based Operator
FEMA	Federal Emergency Management Agency
HUC	Hydrologic Unit Code
IPaC	Information for Planning and Consulting
LiDAR	Light Detection and Ranging
MBTA	Migratory Bird Treaty Act
MIRL	medium intensity runway light
MOW	More Oregon Wetlands
MSA	Magnuson-Stevens Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NWI	National Wetlands Inventory
O3	Ozone
ODAL	omni-directional approach light
ODFW	Oregon Department of Fish and Wildlife
ORBIC	Oregon Biodiversity Information Center
PAHs	polycyclic aromatic hydrocarbons
Pb	Lead
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PM10 and PM2.5	particulate matter
RCRA	Resource Conservation and Recovery Act
SO2	Sulfur Dioxide
TCE	trichloroethene
TMDL	Total Maximum Daily Load
TSDF	treatment, storage, and disposal facility
USFWS	U.S. Fish and Wildlife Service
VASI	visual approach slope indicator

AURORA STATE AIRPORT MASTER PLAN UPDATE

Environmental Overview

Building off of previous environmental work completed for the Aurora State Airport (Airport), Environmental Science Associates (ESA) has prepared this Environmental Overview for the Master Plan Update. The purpose of this Environmental Overview is to describe the environmental conditions of the Airport and identify any known or potential environmental conditions or issues that could be affected by proposed development at the Airport.

Utilizing available data and information, the contents and organization of this Environmental Overview are based on the National Environmental Policy Act (NEPA) Environmental Impact Categories outlined in Federal Aviation Administration (FAA) Order 1050.1F Environmental Impacts: Policies and Procedures. ESA performed a desktop analysis for the following environmental impact categories described in the FAA Order 1050.1F:

- Air Quality.
- Biological Resources (including fish, wildlife, and plants).
- Department of Transportation Act, Section 4(f).
- Hazardous Materials, Solid Waste, and Pollution Prevention.
- Natural Resources and Energy Supply.
- Visual Effects.
- Water Resources (including wetlands, floodplains, surface waters, water quality, stormwater, groundwater, and wild and scenic rivers).

In addition to completing a desktop analysis of these environmental impact categories, ESA conducted a reconnaissance-level field visit of the Airport on November 12, 2021, with Oregon Department of Aviation staff to assess existing conditions.

AIR QUALITY

Local air quality is generally described by the concentration of various pollutants in the atmosphere. The significance of a pollution concentration is determined by comparing it to state and federal air quality standards. In 1971, the U.S. Environmental Protection Agency (EPA) established standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SO2), Nitrogen Oxide (NOx), Particulate matter (PM10 and PM2.5), and Lead (Pb).

Based on both federal and state air quality standards, a specific geographic area can be classified as either an "attainment," "maintenance," or "non-attainment" area for each pollutant. The threshold for non-attainment designation varies by pollutant. The Aurora State Airport is in a portion of Marion County, Oregon, that attains all NAAQS (EPA 2021c, 2021d). Marion County currently complies with federal NAAQS.

According to the EPA's Environmental Justice Screening and Mapping Tool (EJSCREEN), a tool created to highlight locations that may be candidates for further environmental review, the Aurora State Airport property falls within a census block where all air quality-related environmental hazard indexes are between the 24th and 73rd percentile nationwide. The Airport property scores within the 51st percentile for diesel particulate matter, the 73rd percentile for PM2.5 levels, the 24th percentile for ozone summer seasonal average of daily maximum 8-hour concentrations in the air, the 51st percentile for cancer risk from the inhalation of air toxics, and the 69th percentile nationwide for other respiratory hazards exposure (EPA 2020).

The climate in Marion County includes warm, dry, short summers with mostly clear skies and cold, wet, overcast winters. National Oceanic and Atmospheric Administration (NOAA) data from 1981 to 2010 indicates that the annual average temperatures at the Aurora State Airport have a high of 68.3 degrees Fahrenheit (F) and a low of 40.3 degrees F. The lowest temperatures are in December when the average daily low is 34.6 degrees F and the average daily high is 46.0 degrees F (NOAA 2021). The highest temperatures are in August when the average daily high is 81.8 degrees F and the average daily low is 54.7 degrees F (NOAA 2021). The average annual precipitation is 41.87 inches, with the wettest month typically being November with an average of 6.63 inches and the driest month being August with an average of 0.66 inch (NOAA 2021).

BIOLOGICAL RESOURCES

Biological resources are valued for their intrinsic aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Categories of biological resources evaluated in this document include:

- General terrestrial and aquatic plant and animal species (non-listed)
- State or federally listed threatened or endangered species
- Species proposed for listing and candidates for listing
- Migratory birds
- Environmentally sensitive and critical habitats

General Biological Resources

Groundcover types on the Airport property include: mowed infields, vegetated stormwater swales, cleared soil surfaces, gravel, landscaped areas around buildings, pavement, and Airport structures. These groundcover types are described in more detail as follows:

- The infields consist of mowed grass and weedy herbs including tall fescue (*Schedonorus arundinaceus*), white clover (*Trifolium repens*), English plantain (*Plantago lanceolata*), annual bluegrass (*Poa annua*), English daisy (*Bellis perennis*), oxeye daisy (*Leucanthemum vulgare*), Queen Anne's lace (*Daucus carota*), American vetch (*Vicia americana*), dove's foot geranium (*Geranium mole*), curly dock (*Rumex crispus*), and hairy cat's ear (*Hypochaeris radicata*) (ESA 2019b). These areas provide burrowing and foraging habitat for small rodents as well as foraging habitat for raptors, songbirds, other avian species, and other small to medium sized wildlife including raccoons (*Procyon lotor*) and coyotes (*Canis latrans*).

- Vegetated stormwater swales consist of grasses, rushes, and forbs including: annual bluegrass, reed canarygrass (*Phalaris arundinacea*), common rush (*Juncus effusus*), common velvetgrass (*Holcus lanatus*), and meadow foxtail (*Alopecurus pratensis*) (ESA 2019b). Flowing water through these swales during the winter months could attract small to medium size mammals that are able to make their way through the perimeter fence.

- Landscaped areas around buildings included non-native manicured shrubs, forbs, and trees. These areas may provide limited habitat for avian nesting and foraging.

- Gravel, paved, and cleared areas of the Airport do not support vegetation and do not provide quality habitat.

- Airport structures include hangars, the air traffic control tower, maintenance buildings, and the pilot's lounge. These areas may provide nesting habitat for birds or roosting habitat for bats.

In 1999, a new security fence was installed around the entire perimeter of the Airport property with automatic, sliding security gates (Oregon.gov 2021). This system improved safety at the Aurora State Airport by reducing wildlife on Airport property as well as reducing the illegal operations of motor vehicles on Airport property (Oregon.gov 2021). Since the new fence has been installed, not many issues related to animals on Airport property have been reported, but coyotes occasionally go through the security fence to hunt rodents on Airport property; however, no coyotes or large animals have collided with aircraft at the Airport. This is supported by the FAA Wildlife Strike Database, which only has historical records of avian strikes at the Aurora State Airport (FAA 2021).

Endangered Species Act

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) are charged with overseeing the requirements of the *Endangered Species Act*, specifically Section 7, which sets forth requirements for consultation to determine if a proposed action "may affect" a federally endangered or threatened species. If an agency determines that an action "may affect" a federally protected species, then Section 7(a)(2) requires the agency to consult with the agneices to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species, or result in the destruction or adverse modification of critical habitat. If a species has been listed as a candidate species, Section 7(a)(4) states that each agency must confer with USFWS or NMFS. However, airports partake in measures to discourage wildlife on airport property for safety reasons. Therefore, when threatened or endangered species are identified at an airport, airport operations must collaborate with environmental regulatory agencies to balance the need to protect these species with the needs for maintaining airport safety as well as meeting the region's long-term aviation needs (TRB 2014). **Table 1** lists the fish and wildlife species protected under the Endangered Species Act that potentially occur in the vicinity of the Airport, while **Table 2** lists the protected plants with potential to occur. **Appendix A** includes the official federal species list from the USFWS, provided by the Information for Planning and Consultation (IPaC) system.

No records of state, federally listed, or candidates for listing occur for the Airport (PSU 2021). The Molalla River (3 miles northeast of the Airport), the Pudding River (0.85 mile east of the Airport), and Mill Creek (0.75 mile southeast of the Airport) are designated as habitat for Chinook salmon (*Oncorhynchus tshawytscha*) (federally threatened; state classified sensitive critical), Pacific lamprey (*Entosphenus tridentatus)* (federal species of concern; state classified sensitive vulnerable), and steelhead (*Oncorhynchus mykiss*) (federally threatened; state classified sensitive vulnerable) based on records of historic sightings (PSU 2021).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS (USFWS 2020a). Protected MBTA resources generally include native birds and their active nests and young. Under the requirements of the MBTA, all project proponents are responsible for complying with the appropriate regulations protecting birds when planning and developing a project.

Bald and Golden Eagle Protection Act

Bald eagles and golden eagles are protected under the Bald and Golden Eagle Protection Act of 1940. The act's primary purpose is the protection of nesting sites. Bald eagles generally construct nests in large trees, and golden eagles nest in cliff habitats. Neither of these habitats occur at the Airport.

TABLE 1
FEDERAL OR STATE PROTECTED FISH AND WILDLIFE SPECIES THAT MAY OCCUR IN THE VICINITY OF THE AIRPORT

Species	**Status**[2]	**Habitat Requirements**	**Occurrence in Vicinity of Airport**
Birds			
Northern spotted owl (*Strix occidentalis caurina*)	FT, ST	Mid and late seral coniferous forests with high canopy closure, complex canopy structure, large snags, and high volumes of downed wood. (55 Federal Register 26114)	**Not present due to lack of suitable habitat** (ESA 2019a).
Streaked horned lark (*Eremophila alpestris strigata)*	FT	Airports (flat, sparsely vegetated areas with few to no shrubs and trees), grasslands, remnant prairies, and beaches on the coasts of Oregon and Washington. (78 Federal Register 61451)	**Unlikely to occur on Airport property due to lack of suitable habitat.** No streaked horned larks were detected at the Airport during 2018 protocol surveys (ESA 2018b). Based on the survey results, FAA and the USFWS have determined that the Airport is unoccupied, and surveys are not needed again until 2022 (USFWS 2020b).
Fish[1]			
Chinook salmon (Upper Willamette River ESU) (*Oncorhynchus tshawytscha*)	FT	Chinook salmon are anadromous and typically spawn in the mainstems of large rivers where water flow is high. Fry remain in streams for approximately three months to one year before swimming to the ocean. (70 Federal Register 37160)	**Not present due to lack of suitable habitat.** Fall Chinook use part of the Pudding River near the confluence with the Molalla River for rearing and migration and the Molalla River for spawning and rearing (StreamNet 2021). Spring Chinook use Mill Creek, the Pudding River, and the Molalla River for rearing and migration (StreamNet 2021).
Steelhead (Upper Willamette River ESU) (*Oncorhynchus mykiss*)	FT	Steelhead are anadromous and have a summer and winter run, which is determined by the travel distance to their spawning grounds from the ocean. They prefer fast-flowing water in small to large mainstem rivers and medium to large tributaries. (71 Federal Register 834)	**Not present due to lack of suitable habitat**. Winter steelhead use the Willamette River, Mill Creek, the Pudding River, and the Molalla River for rearing and migration. Summer steelhead use the Willamette River and the Molalla River for migration only (StreamNet 2021).
Insects			
Fender's blue butterfly (*Icaricia icariodes fenderi)*	FE	Found only in upland prairies of the Willamette Valley where the most frequently used larval host species, Kincaid's lupine, is also present. (65 Federal Register 3875)	**Not present due to lack of suitable habitat** (ESA 2019a).
Monarch butterfly (*Danaus plexippus)*	FC	Migratory species with a summer range along the west coast of the U.S. and Canada. Typical habitat includes herbaceous and scrub-shrub wetlands, woodlands, savannas, forests, and dunes where milkweed plants occur. (85 Federal Register 81813)	**Unlikely to occur on Airport property due to lack of suitable habitat.** No milkweed was observed during the field reconnaissance.

SOURCE: USFWS (n.d., 2021c); StreamNet (2021); ODFW (2021a, 2021b, 2021c); NOAA Fisheries (2019).
[1] ESU = Evolutionarily Significant Unit.
[2] Endangered Species Act listing status: FC = Federal Candidate; FT = Federally Threatened; FE= Federally Endangered; ST= State Threatened.

Table 2
Federal or State Protected Plant Species that May Occur in the Vicinity of the Airport

Species	Status[1]	Habitat Requirements	Occurrence in Vicinity of Airport
Plants			
Bradshaw's desert parsley (*Lomatium bradshawii*)	SE	Occurs on seasonally saturated or flooded prairies adjacent to creeks and small rivers in the southern Willamette Valley with dense, heavy clay soils.	**Unlikely to occur on Airport property** as soils on the site are not heavy in clay, and the property is not directly adjacent to any creeks or small rivers.
Golden paintbrush (*Castilleja levisecta*)	FT, SE	Occurs in upland prairies on flat to mounded grasslands. Thickets of low deciduous shrubs are commonly present; in areas where there has been an absence of fire, sites may be colonized by trees and shrubs. (62 Federal Register 31740)	**Not present due to lack of suitable habitat** (ESA 2019a). The species is presumed extirpated in the Willamette Valley, and quality habitat is not present on Airport property.
Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*)	FT, ST	Typically found within the Willamette Valley in native grassland and native upland prairie habitats. (65 Federal Register 3875)	**Not present due to lack of suitable habitat** (ESA 2019a). No native upland prairie is present as quality habitat.
Nelson's checker-mallow (*Sidalcea nelsoniana)*	FT, ST	Within the Willamette Valley, this species is most commonly associated with Oregon ash (*Fraxinus latifolia*) swales and meadows with wet depressions. This species also occurs along streams, sloughs, ditches, fence rows, drainage swales, fallow fields, and along roadsides at stream crossings, and within remnant prairie grasslands. (58 Federal Register 8235)	**Possible to occur on Airport property**. Although there are no recorded occurrences of this species in the nearby vicinity of the Airport, drainage swales and wet depressions on Airport property may provide potential habitat for this species.
Peacock larkspur (*Delphinium parvonaceum*)	SE	Grows in low, flat areas in moist, silty soils of the Willamette River floodplain at elevations ranging from 150–400 feet above sea level. Occurs in native, wet prairies on the edges of ash and oak woodlands and along roadsides and fence rows.	**Unlikely to occur on Airport property due to lack of suitable habitat**. The Airport property is above the 500-year floodplain and native wet prairie habitat conditions are not present.
Water howellia (*Howellia aquatilis*)	ST	Habitat is restricted to small, vernal, freshwater wetlands, glacial pothole ponds, former river oxbows that have an annual cycle of filling with water seasonally, ponds in woods, and stagnant ponds in timber.	**Unlikely to occur on Airport property due to lack of suitable habitat**. Quality habitat is not present at the Airport, with the only potential habitat restricted to the drainage swales on site.
White rock larkspur (*Delphinium leuciphaeum*)	SE	Found on the edges of oak woodlands, in dry roadside ditches, on basalt cliffs, on riverbanks and bluffs, on moist rocky slopes, and in moist lowland meadows in shallow, loose soils with high organic matter and sand relative to the soils in which other delphiniums occur.	**Unlikely to occur on Airport property**. Could have the potential to grow in existing swales at the Airport but unlikely to occur due to lack of quality habitat.
White-topped aster (*Sericocarpus rigidus*)	ST	Habitat includes open, grassy, seasonally moist prairie and savannah habitats at elevations ranging from about 90 to 1,250 feet above sea level. In Oregon, this species prefers deep, poorly drained, clayey soils. Occasionally found in partially shaded areas under Oregon oak (*Quercus garryana*) and Pacific madrone (*Arbutus menziesii*).	**Unlikely to occur on Airport property due to lack of suitable habitat**. Soils mapped at the Airport are silt loam in texture, and the development of the land has degraded any prairie or savannah habitat that may have once been present.
Willamette daisy (*Erigeron decumbens* var. *decumbens)*	FE, SE	Species is endemic to the Willamette Valley and occurs on alluvial soils. Typically grows in seasonally flooded bottomlands, but one population is found in a well-drained upland prairie remnant. (65 Federal Register 3875)	**Not present due to lack of suitable habitat** (ESA 2019a). The Airport property is above the 500-year floodplain, and no quality upland prairie remnant habitat is present.

SOURCE: USFWS (n.d., 2021c); ODA (2018); ODFW (2021a, 2021b, 2021c); Oregon.gov (2014).
[1] Endangered Species Act listing status: FE= Federally Endangered; ST= State Threatened; SE= State Endangered.

Environmentally Sensitive and Critical Habitats

There is no designated critical habitat on the Airport property (USFWS 2021, NOAA Fisheries 2019). The nearest designated critical habitats are as follows:

- Upper Willamette River Chinook salmon critical habitat in the Pudding River, the Molalla River, and the Willamette River, starting less than 1 mile east of the Airport property (NOAA Fisheries 2019).
- Upper Willamette River steelhead critical habitat in the Pudding River, the Molalla River, and the Willamette River, starting less than 1 mile east of the Airport property (NOAA Fisheries 2019).
- Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*) critical habitat, approximately 27 miles west of the Airport near Yamhill, Oregon (USFWS 2021).
- Fender's blue butterfly (*Icaricia icariodes fenderi*) critical habitat, approximately 28 miles southwest of the Airport near Salem, Oregon (USFWS 2021).
- Northern spotted owl (*Strix occidentalis caurina*) critical habitat, approximately 27 miles northeast of the Airport near Mount Hood (USFWS 2021).

In addition to the critical habitat for the fish listed above, the sub-watersheds surrounding the Airport are considered Essential Fish Habitat (EFH) for Chinook and coho salmon (NOAA Fisheries 2021). EFH areas are identified under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) by NOAA Fisheries and the Pacific Fishery Management Council. Federal agencies are required to consult with NOAA Fisheries regarding any action authorized, funded, or undertaken that may adversely affect EFH.

Stormwater runoff from the Airport property flows into the Chinook and steelhead critical habitat areas as well as the Chinook and coho EFH areas. From the Airport property, overflow culverts direct stormwater to unnamed tributaries to Deer Creek. From Deer Creek, stormwater runoff flows to Senecal Creek, to Mill Creek, to the Pudding River, the Molalla River, and the Willamette River, where critical habitat is designated.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

Section 4(f) of the Department of Transportation (DOT) Act provides that the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a historic site, public park, recreation area, or waterfowl and wildlife refuge of national, state, regional, or local importance unless there is no feasible and prudent alternative to the use of such land, and the project includes all possible planning to minimize harm resulting from the use. The following list summarizes the nearest properties of each type that may be protected under Section 4(f) of the DOT Act.

- Properties Listed on the National Register of Historic Places:
  - The Aurora Colony Historic District is located approximately 0.30 mile east of the southeastern-most portion of the Airport property (NPS 2021).

  - The Frederick Bents House is located approximately 1.8 miles west of the Airport property (NPS 2021).
  - The William Barlow House is located approximately 2.5 miles east of the Airport property (NPS 2021).
- Recreation Areas:
  - Wilsonville Pond is the nearest publicly owned recreation area. It is owned by the Oregon Department of Fish and Wildlife (ODFW) and located approximately 0.75 mile to the northwest of the Airport property.
  - Molalla River State Park is located 2 miles northeast of the Airport property.
- Wildlife Refuge:
  - The Tualatin River National Wildlife Refuge is approximately 8.5 miles north of the Airport.
- Locally Owned Park:
  - Aurora City Park is located approximately 1.1 miles southeast of the Airport.

No Section 4(f) resources are located within the immediate vicinity of the Airport. The closest Section 4(f) resource is the Aurora Colony Historic District.

HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

Federal, state, and local laws regulate the use, storage, transport, and disposal of hazardous materials. According to the EPA's EJSCREEN, the closest Superfund site is located approximately 15 miles northeast of the Aurora State Airport property. The site is located at Northwest Pipe and Casing/Hall Process Company in Clackamas, Oregon (EPA 2020). The closest brownfield site is located at the former Canby landfill, approximately 3 miles east of the Airport (EPA 2020).

According to the EPA's TRI Search Plus Tool, between the years of 2009-2020, there were five facilities within a 3-mile radius of the Airport reporting releases of toxic chemicals into the air, water, or land. These five facilities included Milwaukee Electronics, Cemex, Sr. Smith LLC, Potters Industries LLC, and Clarios LLC (EPA 2021b). These companies span the sectors of plastics and rubber, electrical equipment, nonmetallic mineral products, and computers and electronic products (EPA 2021b). Over the course of the 12-year reporting period, in total, these facilities accounted for 102,066 lbs. of releases of eight kinds of chemicals into the surrounding air, land, and off-site waters (EPA 2021b). The eight chemicals released into the environment include: styrene, lead, lead compounds, antimony, antimony compounds, chromium, nickel, and manganese (EPA 2021b).

EJSCREEN also reports one EPA hazardous waste treatment, storage, and disposal facility (TSDF) at Columbia Helicopters Inc., adjacent to the Airport property boundary. This TSDF is recorded as addressing the handling and prevention of releases of hazardous materials into the environment from wastes generated on site at the property, as well as wastes received from off-site facilities. In addition to this TSDF, Columbia Helicopters Inc. also holds a National Pollutant Discharge Elimination System (NPDES) permit for water discharges (EPA 2020) and is identified by the EPA Cleanups in My Community Map as having been a Resource Conservation and Recovery Act (RCRA) corrective action site (EPA 2021a). Aurora State Airport also holds an NPDES permit (also referred to in Oregon as a 1200-Z Stormwater Discharge General Permit), as do an additional 12 other properties within a 3-mile radius of the Airport (EPA 2020).

There is one aboveground storage tank fueling facility and one recently decommissioned fueling facility with underground storage tanks that are planned to be removed. There are also other privately owned Fixed Based Operator (FBO) facilities surrounding the Airport property that have their own fueling facilities.

NATURAL RESOURCES AND ENERGY SUPPLY

Utilities at the Aurora State Airport include water, sewer, telephone, and electric. Water services on the Airport property and surrounded business areas are provided by on-site well systems. The Airport and surrounding area are not connected to City of Aurora water and sanitary sewer services. Sewer is addressed through septic tank systems or holding tanks. Electricity is provided by Portland General Electric, and the telephone service is provided by a local franchise company.

In 2001, the Marion County Board of Commissioners formed a Water Control District at the Airport to provide water for fire protection for properties at the Airport (Marion County Public Works 2014). Two wells are located on Airport property, in addition to a pumphouse and underground water storage tanks that provide water to fire hydrants across the Airport property.

Testing has revealed the presence of arsenic above the maximum contamination level set by the EPA in wells located on and surrounding the Airport property (Aron Faegre and Associates 2014). At the time of testing, pump and filtration systems were recommended to be implemented to provide adequate flow and water quality. The region of Oregon that the Aurora State Airport is located on is known for having arsenic in the water, and the nearby City of Aurora also has water decontamination infrastructure to remove arsenic from their well water (Aron Faegre and Associates 2014).

VISUAL EFFECTS

Aurora State Airport is located approximately 0.31 mile northeast of the city limits of Aurora and approximately one mile east of Interstate 5. Surrounding the Aurora State Airport are other privately owned aviation-focused businesses and aviation hangars. Zoning around the Airport is zoned by Marion and Clackamas counties mostly as exclusive farm use, with small areas of acreage residential, public, and public-limited use (Marion County 2021, Clackamas County n.d.).

Current operations that add to light emissions and visual presence of the Airport include flight activity relating to business jets, training activities, and air ambulance activity (WHPacific 2012).

Currently, the Aurora State Airport is equipped with the following safety lighting, equipment, and services that contribute to light emissions and visual presence in the immediate vicinity of the Airport property:

- Medium intensity runway lights (MIRL)
- Visual approach slope indicators (VASI)
- Omni-directional approach lights (ODAL)
- An air traffic control tower
- A rotating beacon
- A lighted wind indicator

WATER RESOURCES

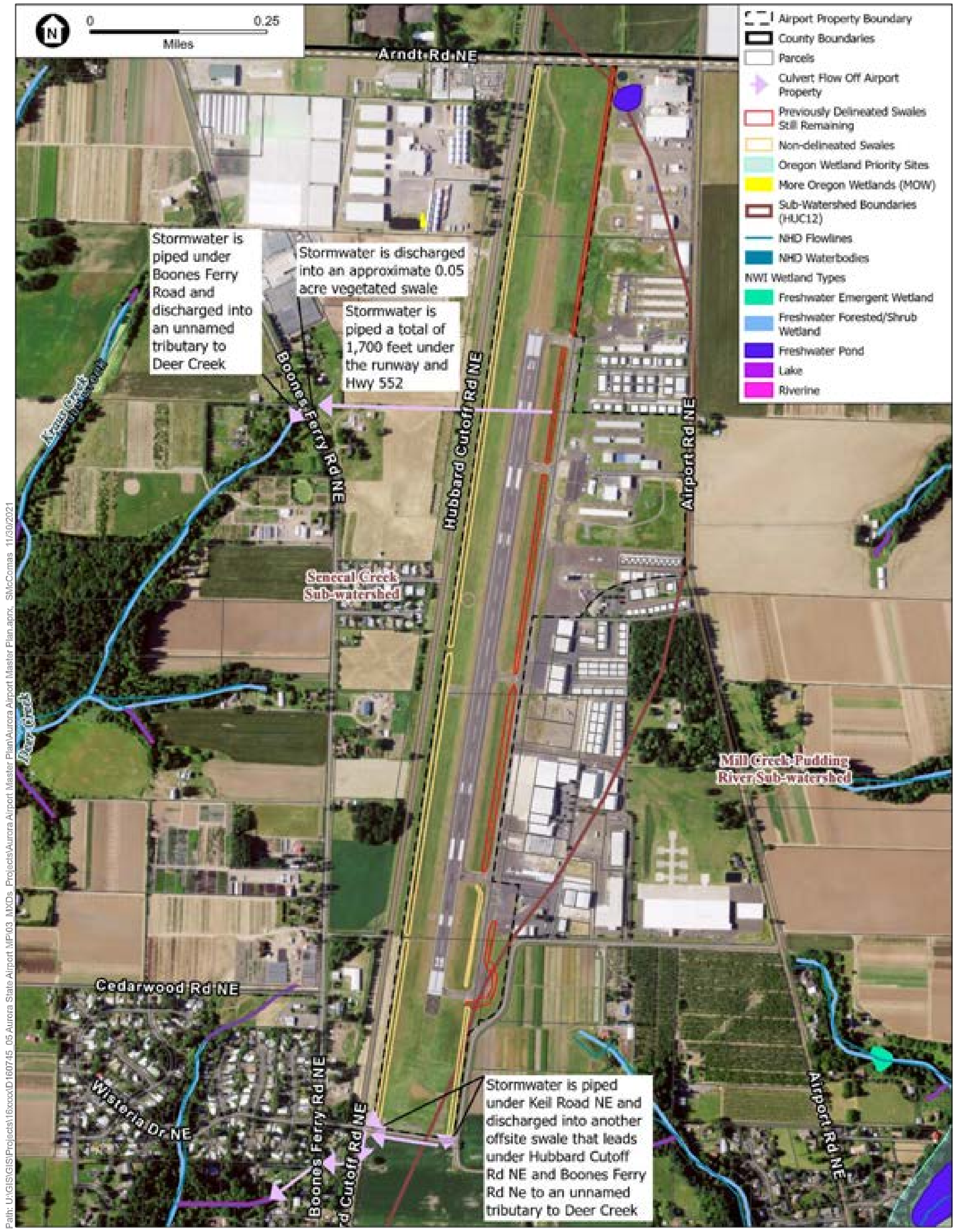
Wetlands

The U.S. Army Corps of Engineers regulates the discharge of dredged and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the Clean Water Act. Wetlands are defined in Executive Order 11990, Protection of Wetlands, as "*those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonably saturated soil conditions for growth and reproduction.*"

National Wetlands Inventory (NWI) mapping within the vicinity of the Airport is shown on **Figure 1**. The only NWI-identified wetland directly adjacent to Airport property is a freshwater pond bounding the northeastern corner of the Airport on property owned by Columbia Helicopters Inc. This mapped wetland is actuallya concrete water retention pool maintained by Columbia Helicopters Inc. for fire suppression safety requirements. Riverine, freshwater forested/shrub wetlands, and freshwater emergent wetlands are mapped in many drainages and around streams and rivers outside of the immediate vicinity of the Airport (USFWS 2021d).

No Local Wetland Inventory (LWI) is available for the immediate vicinity of the Airport; however, wetland data are available from Oregon Wetlands Explorer. Oregon Wetlands Explorer provides data for wetland priority sites for the Willamette Valley Basin and identifies areas with concentrations of important wetland habitats and opportunities for successful wetland restoration (Oregon Spatial Data Library 2019). A wetland priority site is located approximately 0.5 mile east and 1-mile south of the Airport property along the Pudding River as well as following Mill and Senecal creeks (**Figure 1**) (Oregon Spatial Data Library 2019). ORBIC provides wetland data referred to as More Oregon Wetlands (MOW). MOW contains wetland location data derived from federal, state, academic, and non-profit sources other than those used to create LWI or NWI data (Oregon Spatial Data Library 2019). The nearest MOW identified wetland is located 0.1 mile west of the northern portion of the Airport property boundary (**Figure 1**) (Oregon Spatial Data Library 2019).

Two wetland delineations have been completed on portions of the Aurora State Airport Property. In 2003, WHPacific delineated several non-jurisdictional wetlands on the Airport property



SOURCE: Basemap: (ESRI 2018); NWI: (USFWS 2021d); NHD: (USGS 2021); Oregon Wetland Priority Sites: (Oregon Spatial Data Library 2019); MOW: (Oregon Spatial Data Library 2019); Swales: Environmental Science Associates

D201600745.05

Figure 1 Water Resources

(WHPacific 2003)(**Appendix B**). In addition, ESA completed a delineation of non-jurisdictional wetlands in 2018 (ESA 2018a)(**Appendix C**).

The delineated non-jurisdictional wetlands on Airport property were man-made drainage swales that are located in historic uplands with non-hydric soils. According to Oregon Department of State Lands Rule 141-085-0515 Removal-Fill Jurisdiction by Type of Water, these swales with wetland hydrology, vegetation, and soils are not considered waters of the state because they are artificially created for the purposes of stormwater detention and/or treatment. These delineated non-jurisdictional wetlands all occurred within drainage swales on the eastern side of the runway. Since the wetland delineation conducted by WHPacific, the location of the paved taxiways has changed, and swales that were delineated in that report have since changed locations.

The remaining existing swales identified by the two previous delineations were observed during the field reconnaissance and were functioning as water retention facilities, with three culverts leading off of Airport property to drain excess water during high water events. In addition to the swales delineated on the east side of the runway, swales on the west side of the runway were also observed functioning as water retention facilities and have the possibility to be non-jurisdictional wetlands as well. **Figure 1** shows the areas of delineated swales that still remain after the movement of the paved taxiway.

Floodplains

Executive Order 11988, Floodplain Management, directs federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by the floodplains. Based on a review of Federal Emergency Management Agency (FEMA) maps, there are no areas of 100-year floodplains on Airport property.

The Airport property lies in a FEMA Zone X, which is considered an area of minimal flood hazard (FEMA 2019). The Zone X area in which the Airport is located is considered to be outside of the 500-year floodplain (FEMA 2019). The closest 100-year floodplain is located approximately 0.55 mile east of the Airport and is associated with the Pudding River.

Surface Waters

The Airport property is in the Willamette drainage basin defined by the 6-digit Hydrologic Unit Code (HUC6) 170900, and the Airport property is almost entirely located within the Senecal Creek sub-watershed (HUC12 170900090501), except for the northeastern and southeastern corners of the property, which are located within the Mill Creek-Pudding River sub-watershed (HUC12 170900090502). There are currently no National Hydrography Dataset (NHD) surface waters mapped on Airport property (see **Figure 1**). However, multiple surface waters are mapped in the vicinity surrounding the Airport:

- West of the Airport property, Deer Creek and its tributaries flow south to merge with Senecal Creek.
- South of the Airport, Senecal Creek and its related tributaries flow into Mill Creek, which flows northward to the east of the Airport property into the Mill Creek-Pudding River sub-watershed.

- East of the Airport, Mill Creek merges into the Pudding River and flows north until it merges into the Molalla River.
- North of the Airport, the Molalla River flows into the Willamette River, which flows west to east, approximately 2.2 miles north of the northern boundary of the Airport property.

All surface waters within the vicinity of the Airport eventually flow into the Willamette River, which confluences with the Columbia River north of Portland, Oregon. From this confluence, the Columbia River flows west to the Pacific Ocean.

Water Quality

Many of the surface waters in the vicinity of the Aurora State Airport property are contaminated and listed on the 303(d) list (DEQ 2021). Contaminated surface waters in the vicinity of the Airport include:

- The segment of the Pudding River east of the Airport is on the 303(d) list of impaired waterways for guthion, water temperatures, and dieldrin. It is impaired for fish and aquatic life, fishing, and public and private domestic water supplies.
- The entire Mill Creek-Pudding River sub-watershed (1^{st}–4^{th} order streams) is listed on the 303(d) list for benthic macroinvertebrates bioassessments and inorganic arsenic. It is considered impaired habitat for fish and aquatic life, fishing, public and private domestic water supplies, and recreational contact with the water.
- The segment of the Molalla River that intersects the Pudding River east of the Airport is not a 303(d)-listed waterway but is listed by the EPA's "How's My Waterway" tool as impaired for fishing due to flow regime modification.
- The segment of the Willamette River that the Molalla River flows into north of the Airport is also a 303(d)-listed waterway. It is listed for the following factors: noxious aquatic plants, aldrin, benthic macroinvertebrates bioassessments, temperatures, 4,4'-DDE, 4,4'DDT, dieldrin, and PCBs. It is considered impaired for aesthetic quality, boating, fish and aquatic life, fishing, and public and private domestic water supply.

A Total Maximum Daily Load (TMDL) describes the maximum amount of a pollutant allowed in a water body and serves as the starting point or planning tool for restoring water quality. Several TMDLs actively apply to the 303(d) impaired waters listed above:

- There is a TMDL for water temperatures for all 303(d) temperature-impaired listed waters of the mainstem Willamette River (DEQ 2006).
- For the Molalla-Pudding Subbasin, TMDLs for temperature also apply to all 303(d) temperature listings within the subbasin (DEQ 2008).

Additional TMDLs that apply to other types of impaired water resources in the area can be referenced in the following State of Oregon Department of Environmental Quality (DEQ) reports: the "Pudding River Water Quality Report Total Maximum Daily Load Program" document (DEQ 1993), the "Willamette Basin Total Maximum Daily Load" document (DEQ 2006), and the "Molalla-Pudding Subbasin TMDL and WQMP" document (DEQ 2008).

The compromised waters in the vicinity of the Airport property include critical habitat for federally threatened Upper Willamette River Chinook and steelhead populations. These waters also flow downstream to additional critical habitat areas for other species of federally listed fish species in the Columbia River.

Stormwater

The Airport currently holds an NPDES permit (1200-Z Stormwater Discharge General Permit) that regulates the stormwater discharge from the Airport property. Stormwater from the Airport is directed away from the runway and surrounding infrastructure via a system of constructed swales that wrap around both sides of the runway. The locations of these swales are show in **Figure 1** and were mapped using a combination of Light Detection and Ranging (LiDAR) elevation mapping and satellite imagery (DOGAMI n.d.).

The swales on Airport property function as stormwater retention devices that have shallow, vegetated sloped sides designed to capture, treat, and infiltrate stormwater runoff as it moves downstream. Stormwater flows in these swales from north to south, and the swales continue south past the Airport boundary. Where the swales meet a taxiway entrance to the runway or other drivable maintenance access area, they are connected by culverts.

Three culverts on Airport property conduct water off of Aurora State Airport boundaries. One culvert is near the northern extent of the runway, and two culverts are located at the southern boundary of the Airport property.

- The northern culvert connects the swales on both sides of the runway and is piped approximately 1,700 feet under the runway and Hwy 551 (also called Hubbard Cutoff Road NE) (see **Figure 1**). From there, water is discharged into an approximate 0.05-acre vegetated swale from which it then is piped under Boones Ferry Road and discharges into an unnamed tributary to Deer Creek. Deer Creek flows into Senecal Creek, which confluences with Mill Creek, which flows into the Pudding River that then confluences with the Molalla River before it is discharged into the Willamette River.

- The two southern culverts connect the southernmost swale on Airport property to a swale that continues south and west of Airport property. Satellite imagery and LiDAR data indicate that the off-site swale wraps around the northern and eastern edges of the agricultural field south of the Airport until it reaches a culvert that passes under Hubbard Cutoff Road NE and Boones Ferry Road NE, and through a residential area until it is discharged into an unnamed tributary to Deer Creek approximately one-mile south of where the northern culvert discharges to.

Groundwater

The general aquifer type in the vicinity of the Airport is Willamette Lowland basin-fill aquifers composed of unconsolidated sand and gravel aquifers (USGS n.d.). These types of aquifers are used extensively for groundwater supplies (USGS n.d.). There are no sole source aquifers in the vicinity of Marion County (EPA n.d.). Well water derived from on-site wells is the source of all water services provided at the Aurora State Airport and surrounding properties.

National Wild and Scenic Rivers

The closest designated segment of a Wild and Scenic River is a portion of the Molalla River, approximately 18 miles southeast of the Airport (USFWS 2016).

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Appendix A
USFWS Official Species List

ESA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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In Reply Refer To: October 27, 2021
Consultation Code: 01EOFW00-2022-SLI-0051
Event Code: 01EOFW00-2022-E-00145
Project Name: Aurora Airport

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to investigate opportunities for incorporating conservation of threatened and endangered species into project planning processes as a means of complying with the Act. If you have questions regarding your responsibilities under the Act, please contact the Endangered Species Division at the Service's Oregon Fish and Wildlife Office at (503) 231-6179. For information regarding listed marine and anadromous species under the jurisdiction of NOAA Fisheries Service, please see their website (http://www.nwr.noaa.gov/habitat/habitat_conservation_in_the_nw/habitat_conservation_in_the_nw.html).

Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Oregon Fish And Wildlife Office
2600 Southeast 98th Avenue, Suite 100
Portland, OR 97266-1398
(503) 231-6179

Project Summary

Consultation Code: 01EOFW00-2022-SLI-0051
Event Code: Some(01EOFW00-2022-E-00145)
Project Name: Aurora Airport
Project Type: ** OTHER **
Project Description: Environmental Overview of Aurora Airport
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@45.248400000000004,-122.76904610155853,14z

Counties: Marion County, Oregon

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Streaked Horned Lark *Eremophila alpestris strigata* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/7268	Threatened

Insects

NAME	STATUS
Fender's Blue Butterfly *Icaricia icarioides fenderi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6659	Endangered
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

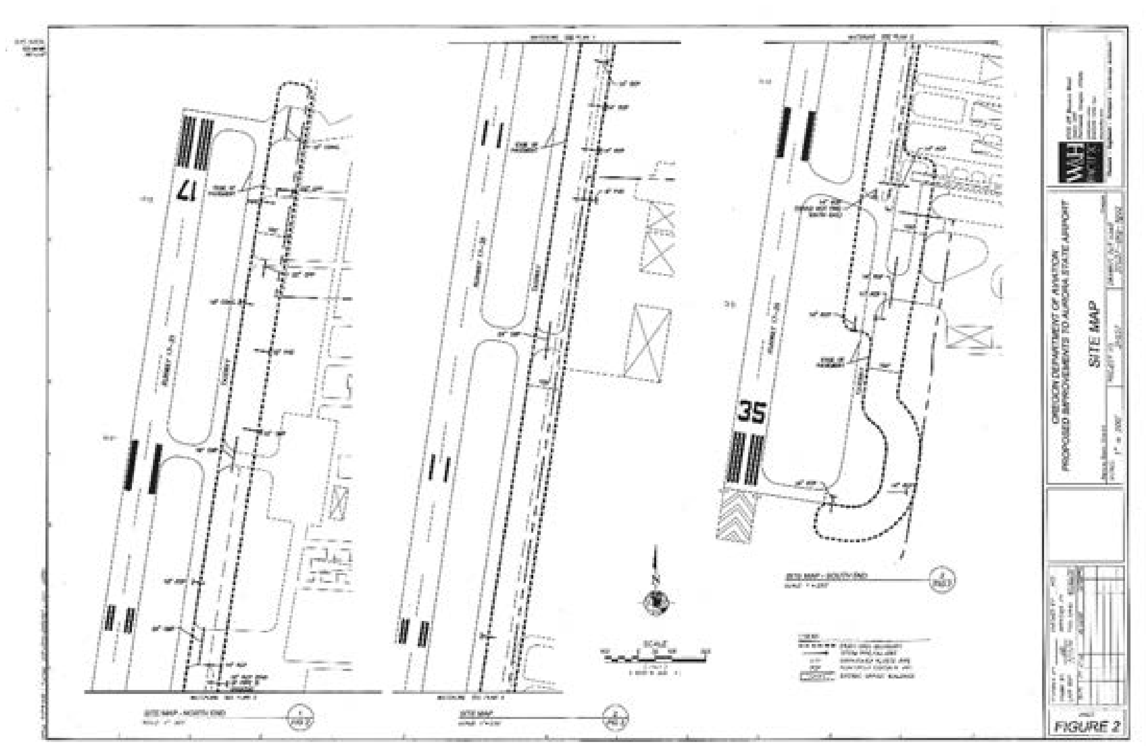
NAME	STATUS
Kincaid's Lupine *Lupinus sulphureus ssp. kincaidii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3747	Threatened
Nelson's Checker-mallow *Sidalcea nelsoniana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7340	Threatened
Willamette Daisy *Erigeron decumbens* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6270	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix B
Non-Jurisdictional Wetlands Delineated by WHPacific (2003)

ESA


17
35
OREGON DEPARTMENT OF AVIATION
PROPOSED IMPROVEMENTS TO AURORA STATE AIRPORT
SITE MAP
FIGURE 2

Appendix C

Non-Jurisdictional Wetlands Delineated by ESA (2018)

ESA

SOURCE: ESA 2018; DigitalGlobe, 2017; Open Street Map, 2016; Marion Co, 2017

D160745. Aurora State Airport Wetland Delineation

Figure 5
Wetland Delineation Map
Aurora, OR

ESA

Appendix 3

Cultural Resource Review

CULTURAL RESOURCE REVIEW AND ARCHAEOLOGY SURVEY

FOR THE

AURORA STATE AIRPORT MASTER PLAN PROJECT,

MARION COUNTY, OREGON

Prepared For
Century West Engineering Corporation
Lake Oswego, Oregon

January 27, 2022

REPORT NO. 4754

Archaeological Investigations Northwest, Inc.

3510 NE 122nd Ave. • Portland, OR • 97230 Phone 503 761-6605 • Fax 503 761-6620

PROJECT SUMMARY

PROJECT:	Development of a Master Plan for the Aurora State Airport
SURVEY TYPE:	Cultural resource review, including background research and pedestrian archaeological survey
LOCATION:	Sections 2 and 11, Township 4 South, Range 1 West, Willamette Meridian
USGS QUADS:	*Sherwood, OR,* 7.5-minute, 2017 *Woodburn, OR,* 7.5-minute, 2017
COUNTY:	Marion
STUDY AREA:	148.4 acres
AREA SURVEYED:	148.4 acres
RESULTS:	• The pedestrian archaeology survey identified no high-probability areas and no archaeological resources within the study area. • Four historic resources have been previously identified within the study area: Runway 17-35, a drainage ditch, and two wind cones. The historic resources were recommended to be not eligible for listing in the National Register of Historic Places (NRHP) in 2019.
RECOMMENDATION:	If individual projects are proposed in association with the Master Plan, compliance-level cultural resource investigations are recommended. This includes documenting historic resources within the study area on one or more Section 106 Documentation Forms and determining their eligibility for listing in the NRHP in consultation with the Federal Aviation Administration and the Oregon State Historic Preservation Office (SHPO). Consultation with SHPO regarding the potential for a historic district at Aurora State Airport should be resumed.
PREPARERS:	Kelley Prince Martinez, M.S., R.P.A., Tara Seaver, M.S., and Andrea Blaser, M.S.

INTRODUCTION

The Oregon Department of Aviation (ODA) is developing a Master Plan for the Aurora State Airport. The Master Plan will provide guidance in making necessary improvements to maintain a safe and efficient airport, ensuring airport operations are economically, environmentally, and socially sustainable. The Master Plan will also define short and long-term airport needs by evaluating current conditions that may impact future plans, development, and operation of the airport.

The project is being completed with funds provided by the Federal Aviation Administration (FAA) and administered by ODA. As such, the project is subject to review under Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations (36 CFR 800).

An Area of Potential Effects has not yet been defined. In consultation with ODA, a study area was delineated for cultural resources that is limited to 148.4 acres state-owned airport lands (Figure 1). The study area is in Sections 2 and 11 of Township 4 South, Range 1 West, Willamette Meridian, north of the city of Aurora in Marion County, Oregon (Figure 1).

In support of the Aurora State Airport Master Plan project, Archaeological Investigations Northwest, Inc., (AINW), has completed a cultural resource review of the study area. The cultural resource review included background research and a pedestrian archaeological survey of the study area. One goal of the study was to identify archaeological resources and areas with a high probability to contain buried archaeological resources within the study area. A second goal of the study was to identify previously documented historic resources within the study area and to provide recommendations for further work that would be needed for historic resources to support implementation of the Master Plan. The cultural resource study was completed and supervised by AINW staff who meet the Secretary of the Interior's Professional Qualifications Standards in the fields of Archaeology, Architectural History, and History.

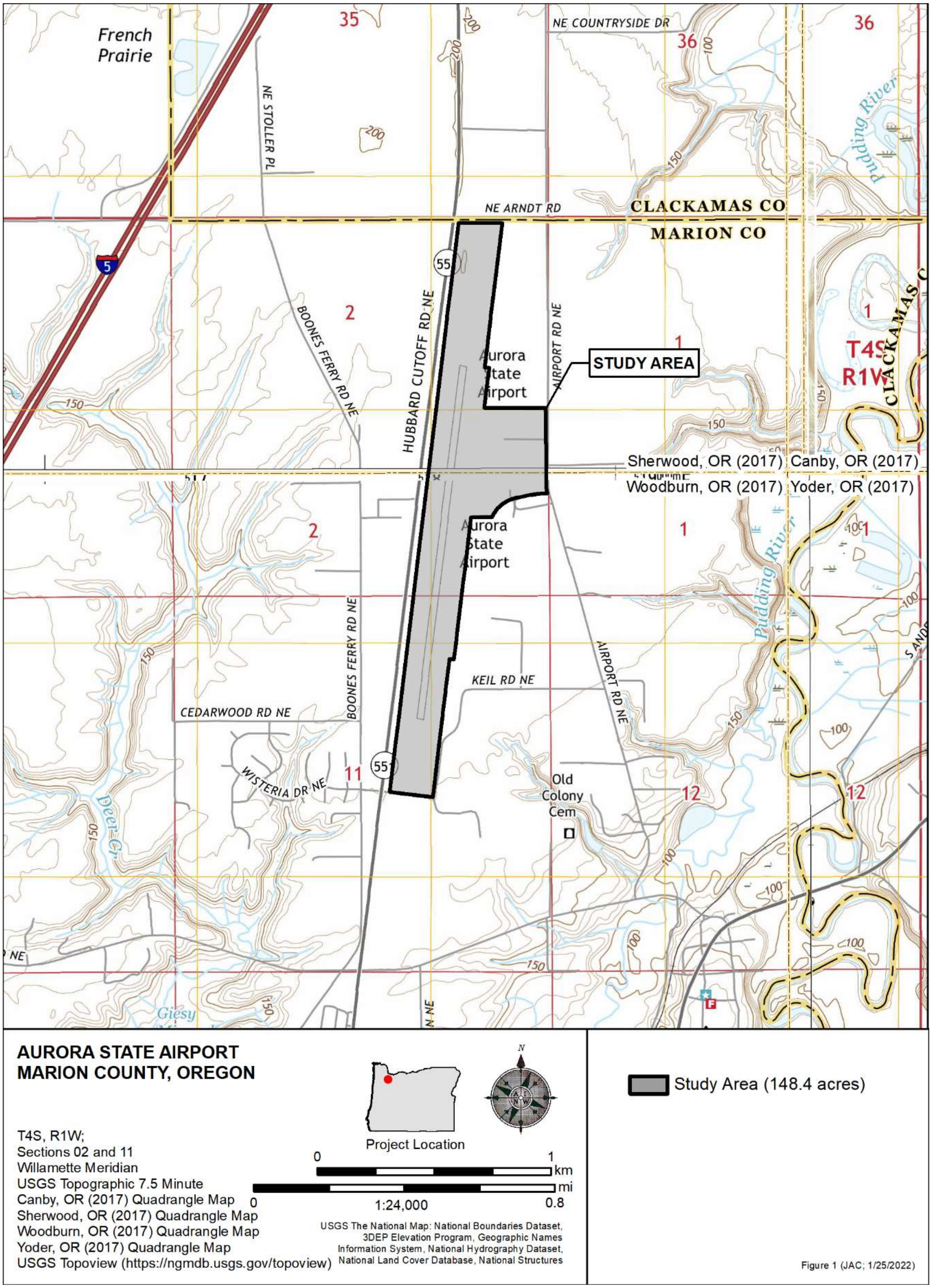


Figure 1. The study area encompasses the entirety of state-owned land at Aurora State Airport.

LOCATION AND ENVIRONMENTAL SETTING

The study area is in Sections 2 and 11 Township 4 South, Range 1 West, Willamette Meridian (Figure 1). It is 1.4 kilometers (km) (0.9 mile [mi]) west of the Pudding River, 3.7 km (2.3 mi) south of the Willamette River, and 1.6 km (1 mi) north of the City of Aurora.

The study area is in the northeastern corner of Marion County and the northeastern portion of the Willamette Valley physiographic province. The Willamette Valley extends from Cottage Grove in the south to the Columbia River in the north and is characterized by broad alluvial flats (Franklin and Dyrness 1988). The physiographic province is bordered by the Oregon Coast Range to the west and the Cascade Range to the east (Baldwin 1964), and it is part of a continental shelf that is overlain with layers of alluvium on top of pre-Tertiary bedrock (Orr et al. 1992). During the Missoula floods, massive amounts of water and debris repeatedly inundated the valley, causing large amounts of silts, sand, clay, and boulders to be deposited throughout the valley (Orr and Orr 1996). The flood-derived deposits within the Willamette Valley are known as the Willamette formation and make up the top 100 meters (m) (330 feet [ft]) of sediments (McDowell 1991).

The Willamette Valley is bound on either side by the *Tsuga heterophylla* vegetation zone (Franklin and Dyrness 1988). The interior valley contains *Quercus* woodland zones and conifer forest areas. The *Quercus* woodland is known for its forest stands, groves, and savannas that contain deciduous oaks and evergreens. The conifer forests are known for their Douglas-firs, grand firs, and ponderosa pines (Franklin and Dyrness 1988:111-116). Within the general vicinity of the study area, native Douglas-fir, bigleaf maple, and western redcedar are present. The surrounding landscape is used for modern agricultural activity with cultivated crops and non-native invasive grass-species.

The soils in the study area are mapped as the Amity silt loam and Woodburn silt loam series. The Amity series consists of very deep, somewhat poorly drained soils formed in stratified silty glaciolacustrine deposits on broad terraces (United States Department of Agriculture, Natural Resources [USDA, NRCS] 2009a). The Woodburn series consists of very deep, moderately well drained soils formed in stratified silty glaciolacustrine deposits on broad valley terraces (USDA, NRCS 2009b).

CULTURAL SETTING

NATIVE PEOPLES – CONTACT PERIOD

The northern portion of the Willamette Valley was divided into multiple small, independent groups who spoke a language shared with the Kalapuyan family (Aikens 1993). The study area lies within the area traditionally inhabited by the Ahantchuyuk, or Pudding River people (Zenk 1990:547), and it is bordered closely to the east by an area inhabited the Northern Molala people (Zenk and Rigsby 1998). The Ahantchuyuk were located between the Willamette River and the Pudding River, northeast of Salem, Oregon.

The Kalapuyans traditionally occupied permanent villages during the harsh winter months, and more transitory camps during the summer (Zenk 1990). Their permanent villages consisted of multi-family households in semi-subterranean rectangular plank houses. Their summer shelters were less permanent, consisting of tree groves and brush windbreaks.

A large portion of Kalapuyan subsistence consisted of vegetable resources. Camas was considered the most valuable resource and was abundant in the Willamette Valley. Camas was often roasted, dried, and pressed into cakes, which could then be used as a trade item (Zenk 1990:547). Other subsistence resources included wapato, tarweed seeds, hazelnuts, various berries, and occasionally, acorns. Animal resources varied throughout the valley, but included birds, small mammals, black-tailed and white-tailed deer, elk, and black bear (Zenk 1990:547, 548).

Differing views exist regarding Kalapuyan social organization. Aikens (1993:187) states that neither major chiefs nor any well-defined elite class is present in the Willamette Valley, whereas Zenk (1990:550) states that chiefs and their immediate families were on one end of the social spectrum, and slaves were on the other. Overall, the Kalapuyans did not place a strong emphasis on rank like the neighboring Chinookan people, and they did not differentiate between "commoners" (Zenk 1990:550). In addition, while uncommon, it was not unknown for a free person to marry a slave (Zenk 1990:550).

HISTORICAL CONTEXT

An 1852 General Land Office (GLO) map of Township 4 South, Range 1 West, indicates that the study area overlaps the former location of Jesse G. Hoffman's farm in the northwest quarter of Section 11 (GLO 1852). The Hoffman farm was on a Donation Land Claim that overlapped the study area in the southeast quarter of Section 2 and the northeast quarter of Section 11 of Township 4 South, Range 1 West, Willamette Meridian (Bureau of Land Management 2022). The land is described as "land gently rolling with first rate clay loam," with fir, white oak, cedar, white ash, willow, and maple trees (GLO 1852). Two roads forked south of the Hoffman farm in Section 11, after which one road continued east to a sawmill on Mill Creek in Section 12 (GLO 1852). A ferry northwest of the sawmill provided service across the Pudding River (GLO 1852). Land within the study area that was north of the Hoffman farm, in Section 2, was undeveloped in the mid-nineteenth century (GLO 1852).

In 1856, Dr. Wilhelm (William) Keil established the Aurora Colony, also referred to as Aurora Mills, just north of the Pudding River ferry (Kopp 2017). Keil was a Methodist preacher who eventually turned away from established churches and embraced utopian communities of like-minded Christians (Kopp 2017). The Aurora Colony was known throughout the Pacific Northwest for its hospitality, particularly the food and the Aurora Colony Band (Kopp 2017; Will 1955). The hospitality business was such an important economic driver for the colony that Keil advocated for and succeeded in bringing the Oregon & California Railroad through Aurora in 1870 (Kopp 2017). When Keil passed away in 1877, a board of trustees assembled to manage the colony's interest decided to dissolve the settlement and sell the land that Keil had purchased on behalf of the colony (Kopp 2017). An 1878 map shows the Aurora Colony as still owning the townsite of Aurora, which was platted in 1872 (Edgar Williams & Co. 1878).

Major twentieth century developments in and near the study area include the construction of the West Portland-Hubbard Highway (now OR 551) in 1937 and the establishment of an emergency airfield at Aurora in 1943 that would eventually become the Aurora State Airport (Oregon Department of Transportation 2017:51-1). The emergency airfield, which was originally referred to as the Aurora Flight Strip, was constructed by the State Highway Department during World War II for use by air carrier craft and as an airline alternate to the Portland International Airport (CH2M Hill 1976; Fortin et al. 2019). However, the airstrip was used so infrequently that drag races were often held there; the races were eventually permitted by state authorities, but the drivers were asked to pause and allow circling planes to land as needed (*The Oregonian* 1948, 1955).

During its early years of operation, this airstrip was administered by the Bureau of Public Roads. The Board of Aeronautics began to lease the airport from the Bureau of Public Roads in 1953, and in 1973 the State Highway Commission officially transferred the title for the airfield to the Board of Aeronautics (CH2M Hill 1976). Shortly after the Board of Aeronautics acquired the property, a master plan study was completed for the airport to improve the existing airport facilities. The 1976 master plan reported that there was no parallel taxiway to the runway, no public aircraft parking apron, and no traffic control tower at the airport (CH2M Hill 1976). Although several buildings and structures had been constructed by fixed-base operators (FBOs) on private lands east of the airport runway, the only facilities located on state land at that time were the airport runway and three taxiway exits, which had been privately constructed (CH2M Hill 1976).

Since the completion of this master plan in 1976, the Aurora State Airport has been extensively upgraded and modernized. Between 1977 and 1978, using a portion of a FAA grant, the runway was reconstructed, a parallel taxiway was constructed, drainage was improved, runway lighting and a rotating beacon were installed, and tiedown aprons were constructed (The Capital Journal 1978; WHPacific 2012:2-2). In 1979, a 22-acre parcel near the center of the airport was purchased and has since been developed by private FBOs through the construction of airplane hangars and other facilities (WHPacific 2012:2-2). The runway was extended in 1995 and reconstructed in 2004, and the parallel taxiway was relocated in 2009 (WHPacific 2012:2-2). In 2015, the Aurora Airport Air Tower was completed using funds from the ConnectOregon bond initiative, which finances transportation projects using revenue generated by the state lottery (Bartman 2015).

PREVIOUS CULTURAL RESOURCE STUDIES

Prior to conducting fieldwork, AINW staff reviewed records online using the Oregon Archaeological Records Remote Access (OARRA) database and Oregon Historic Sites database, both of which are administered by the Oregon State Historic Preservation Office (SHPO). This records search was done to determine if cultural resources have been recorded or cultural resource surveys have been completed within or near the study area. In addition to this research, historical maps and other documents on file at AINW or available online were examined to determine the potential for encountering archaeological resources.

PREVIOUS STUDIES AT AURORA STATE AIRPORT

Three cultural resource studies overlap or partially overlap with the current study area (Connolly 2003; Fortin et al. 2019; O'Neill and Ruiz 2015). A cultural resource study that partially overlaps with the northernmost portion of the study area was done for the widening of Arndt Road. No cultural resources were identified within the study area during a pedestrian survey (Connolly 2003).

A cultural resource study conducted in 2015 for the proposed widening of OR 551 overlapped the western portion of the study area. Although no archaeological resources were identified within the study area, site 35MA355 was identified approximately 44 m (145 ft) to the west. Site 35MA355 is a historic-period refuse scatter consisting of a rotary saw blade, galvanized wires, various nails, brick fragments, a metal strap, and a porcelain light socket. The site, which is located on the east side of OR 551, likely represents remnants of a barn that was moved prior to the construction of OR 551 in 1937. Site 35MA355 was determined to be not eligible for listing in the National Register of Historic Places (NRHP) (O'Neill and Ruiz 2015).

In 2017 and 2019, AINW performed a cultural resource survey for proposed airport improvements (Fortin et al. 2019). Within the study area, pedestrian archaeological survey was limited to 4.7 acres east of the airport runway, where construction of a run-up apron was proposed. No archaeological resources or high probability areas were identified (Fortin et al. 2019). Four historic resources were identified: Runway 17/35, two wind cones, and a drainage ditch (Fortin et al. 2019). AINW recommended that the four historic resources are not eligible for listing in the NRHP, and that there is limited potential for a NRHP-eligible Aurora State Airport Historic District to be present that would encompass the historic resources (Fortin et al. 2019). In 2019, SHPO declined to concur with FAA's determination regarding the NRHP eligibility of the four historic resources and the potential Aurora State Airport Historic District, citing the need for documentation of buildings and structures that operate in association with the airport on privately-owned property outside of the study area (Fortin et al. 2019).

PREVIOUS STUDIES WITHIN THE STUDY AREA VICINITY

Six other cultural resource studies have been conducted within 1.6 km (1 mi) of the study area. The studies were done for road widening and improvement projects, bridge replacement, residential development, fiber optic line installation, and solar panel construction projects.

Eleven archaeological resources have been identified within 3.2 km (2 mi) of the current study area. Most historic-period archaeological sites are southeast of the study area, corresponding with the location of the Aurora Colony. Pre-contact sites of the area are generally located to the east on terraces along the Pudding and Molalla Rivers.

As previously noted, the nearest recorded archaeological resource, site 35MA355, is located approximately 44 m (145 ft) west of the study area. The site is a historic-period artifact scatter that is likely associated with a barn that was moved prior to the construction of OR 551 in 1937 (O'Neill and Ruiz 2015).

Other nearby sites include site 35CL273, located approximately 2.3 km (1.4 mi) east of the current study area. The site is a pre-contact lithic scatter that may represent a permanent habitation site (Brown 2000). Pre-contact site 35CL200 contains multiple burials, lithic material, and fire-cracked rock, and is approximately 2.6 km (1.6 mi) east of the study area (Roulette and Reese 1995).

Historic-period sites in the area include historic-period refuse scatters at sites 35MA416, and 35MA417, located approximately (2.9 km) 1.8 mi southwest of the study area (Bialis et al. 2020). Three other historic-period resources are located approximately 1.3 km (0.8 mi) southeast of the current study area: site 35MA258, a historic-period refuse scatter (Mills et al. 1998); site 35MA226, which represents remnants of the Aurora Colony Hotel (Minor and Chappel 1997); and site 35MA227, which is a cabin site associated with Amable Arcouet (Brauner 1987).

ARCHAEOLOGICAL FIELD SURVEY OF THE STUDY AREA

SURVEY METHODS

A pedestrian survey of the study area was conducted on January 18 and 19, 2022, by AINW archaeologists Kelley Prince Martinez, M.S., R.P.A., and Tara Seaver, M.S. Don Richcreek, Operations Specialist for ODA, escorted Martinez and Seaver in portions of the study area near the runway and taxiways.

The study area was examined by walking transects spaced no more than 15 m (50 ft) apart. All exposed ground surfaces were carefully examined for evidence of artifacts. Mineral soil visibility was limited by vegetation cover and graveled and paved surfaces, and less than 10% of the mineral soil surface was visible throughout the study area (Figure 1; Photos 1, 2, and 3). The entire 148.4-acre study area was surveyed.

SURVEY RESULTS

No archaeological resources were identified as a result of the survey. In addition, no areas were identified as having a high probability to contain buried archaeological resources. Construction, operation, and improvement of the airport from the 1940s to present have led to extensive ground disturbance within the study area.

Much of the non-paved ground surface throughout the study area appeared to be filled and leveled. The runway and taxiway pass northeast-southwest through the study area (Photo 4). Drainage ditches were present east and west of the existing runway and several buried utilities were identified throughout the study area (Photo 5). A gravel access road passes through the northern portion of the study area. What appeared to be drain fields were identified in grass-covered areas in the north, south, and eastern portions of the study area. These areas featured visible ground disturbance with buried PVC pipes and gravel to facilitate water drainage in the area (Photo 6).

A large, paved area is located in the eastern portion of the study area that features a weather monitoring station, and a gravel pad with guide lighting is located within the southern portion of the study area (Photo 7). The easternmost portion of the study area featured large fill piles and areas that appeared to have been leveled and mechanically excavated (Photo 8).

Most native vegetation within the study area has been removed and replaced with non-native grasses and ornamental plants. Vegetation within the study area includes various grasses, juncus, horse tail, Himalayan blackberry, Scotch broom, and snowberry. Vegetation in adjacent parcels includes various cultivated crops, various non-native grasses, and Douglas-fir, bigleaf maple, and western redcedar trees.

Photo 1. Overview of the northern portion of the study area, which represents the ground visibility in the non-paved and gravel-covered portions of the study area. The view is towards the south.

Photo 2. Overview of a paved and gravel-covered area in the eastern portion of the study area. The view is towards the east.

Photo 3. Overview of the grass-covered and paved area surrounding the control tower in the eastern portion of the study area. The view is towards the southwest.

Photo 4. Overview of the central portion of the study area. The runway is visible at right and the taxi lanes are visible at left. The view is towards the south.

Photo 5. Example of buried utilities throughout the airport property. This light fixture is located in the northern portion of the study area. The view is towards the south.

Photo 6. Overview of drain field located in the northeastern portion of the study area. The view is towards the west.

Photo 7. Overview of the light and signaling fixture located in the southern portion of the study area. The view is towards the west.

Photo 8. Overview of ground disturbance in the eastern portion of the study area. The control tower can be seen in the background. The view is towards the west-southwest.

REVIEW OF HISTORIC RESOURCES IN THE STUDY AREA

In 2017 and 2019, AINW completed a cultural resources survey within the study area and recorded four historic resources at Aurora State Airport property: Runway 17-35, a drainage ditch, and two wind cones (Figure 2; Photos 9 and 10) (Fortin et al. 2019). The runway was constructed in 1943 as the Aurora Flight Strip. The two wind cones and the drainage ditch appear to have been constructed in 1953 when the Board of Aeronautics began to lease the airport from the Bureau of Public records. The historic-period drainage ditch parallels Runway 17/35 on the west side of the study area. The two historic-period wind cones are located east of the ditch on the north and south ends of the runway. A second drainage ditch on the east side of the runway, several storage buildings or hangars, the Aurora Aviation building, a commercial business, and the Aurora Air Tower are within the study area but are less than 50 years old (Historic Aerials 2022; Google Earth 1994).

At the recommendation of AINW, the FAA determined that the four historic resources at Aurora State Airport are not individually eligible for listing in the NRHP, and that they are unlikely to contribute to a potential historic district at the airport. Runway 17/35 has been significantly modified since it was constructed in 1943 for emergency use, and changes to the Aurora State Airport property during the late twentieth century have diminished the runway's historical integrity of design, setting, materials, workmanship, feeling, and association. Similarly, the expansion of the Aurora State Airport property and FBO facilities and improvements made during the modern period detract from the historical appearance and integrity of the two wind cones and drainage ditch that were constructed circa 1953. AINW's summary report (Fortin et al. 2019) documented historic resources in a baseline table, which is no longer an acceptable form of historic resources documentation for most projects that are reviewed by the Oregon SHPO.

At least six other historic-period buildings that operate in association with the state airport but are located on private property were identified during the 2019 survey, including four T-hangers, an office building, and a shop. These historic resources were not included in AINW's survey as they were not within the project's Area of Potential Effects or the boundary of the state-owned airport property. Approximately 78 buildings and at least one structure constructed after 1981 are also located on private land outside of the state-owned airport; AINW cited the prevalence of modern-period buildings and structures as a justification for why there is unlikely to be a NRHP-eligible historic district at the Aurora State Airport (Fortin et al. 2019). In 2019, SHPO declined to concur with FAA's determination regarding the potential Aurora State Airport Historic District, citing the need for documentation of buildings and structures that operate in association with the airport on privately owned property.

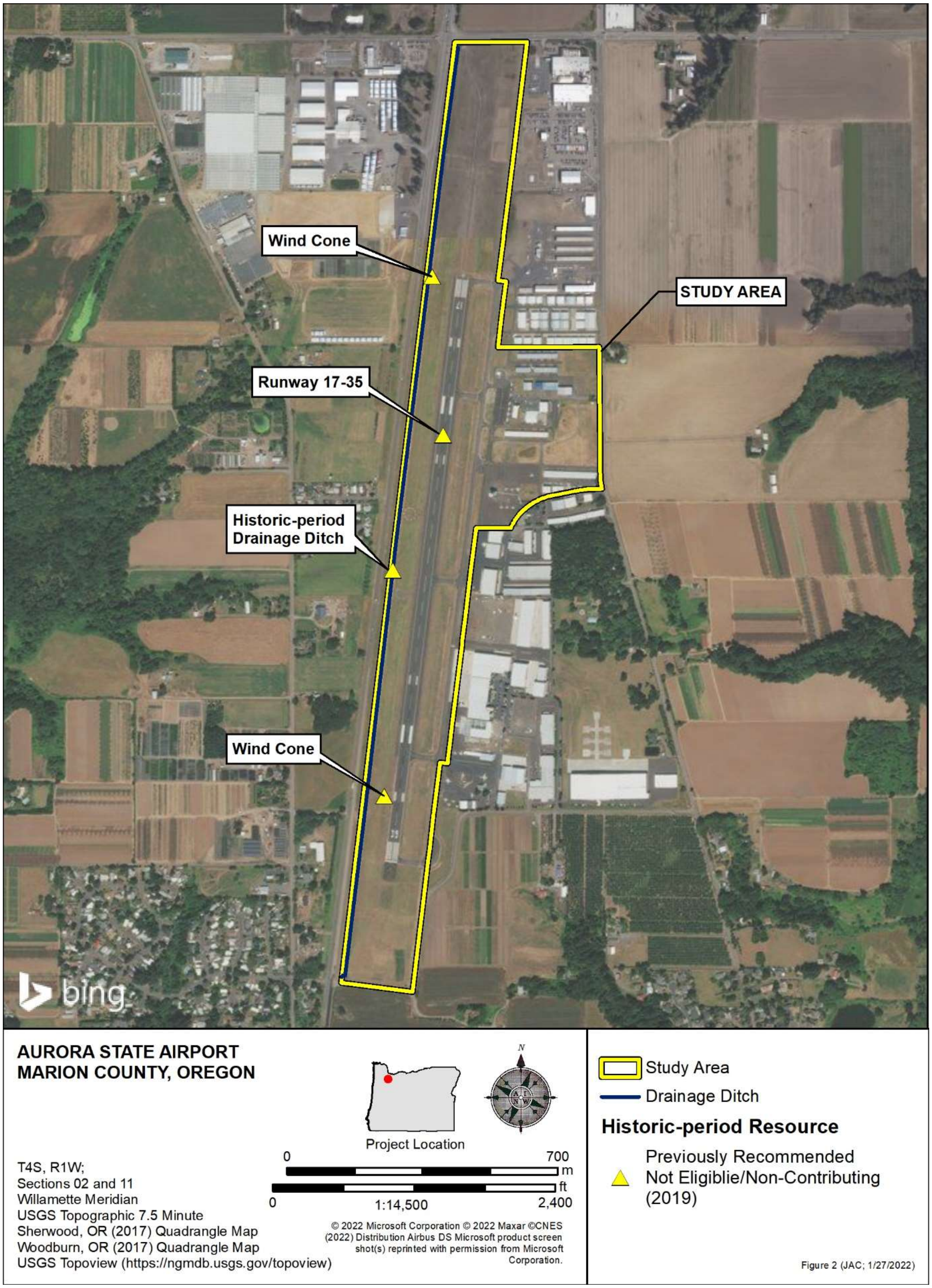


Figure 2. Four historic resources have been documented at the airport (Fortin et al. 2019). The resources were recommended to be Not Eligible/Non-Contributing.

Photo 9. Overview from the north end of Runway 17/35, which was constructed in 1943. The view is towards the south.

Photo 10. Circa 1953 wind cone and drainage ditch near the north end of Runway 17/35. The view is towards the east.

SUMMARY AND RECOMMENDATIONS

AINW has completed a cultural resource review for the Aurora State Airport Master Plan project. A background review and pedestrian survey of the entire 148.4-acre study area was conducted.

ARCHAEOLOGICAL RESOURCES

No archaeological resources were identified within the study area as a result of the background research and pedestrian survey. Due to airport upgrading and modernization over time, in addition to disturbance associated with buried utilities and drainage features, no high probability areas for buried archaeological resources were identified within the study area. AINW recommends that the pedestrian survey results be submitted to FAA and SHPO for review and concurrence in the event that individual projects involving ground disturbance are proposed in association with master planning efforts. No further archaeological investigation is recommended within the study area.

HISTORIC RESOURCES

Historic resources at the Aurora State Airport were identified and documented for a prior cultural resource study (Fortin et al. 2019). However, SHPO declined to concur with the determination of FAA that the four historic resources of the study area are not eligible for listing in the NRHP, requesting that additional survey of adjacent private lands be done to support an evaluation of the airport's potential NRHP eligibility as a historic district.

If projects are proposed in association with the master plan that have potential to remove or modify identified historic resources, AINW recommends that consultation with the Oregon SHPO should be reinitiated to determine the NRHP eligibility of individual historic resources at the Aurora State Airport. Historic resources should be documented on one or more Section 106 Documentation Forms for the review and concurrence by FAA and the Oregon SHPO. If historic resources at the airport are found to be eligible for listing in the NRHP, either as individual properties or as contributing features of a historic district, assessment of project effects will be required under Section 106 of the National Historic Preservation Act.

REFERENCES

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Appendix 4

Area Zoning Districts

Aurora, Oregon, Code of Ordinances

Clackamas County Zoning and Development Ordinance

Marion County Code

Chapter 16.24 A AIRPORT OVERLAY

16.24.010 Purpose.

The purpose of the airport overlay zone (A) is to prevent the creation of potential air traffic hazards in the form of projections above a specified height within the flight path of planes using the Aurora State Airport. On the date the ordinance codified in this title was adopted, all land within the city was and is, subject to the provisions of the airport overlay zone. All of the city is under the horizontal surface and as such, no new structures are allowed to project into this imaginary surface. The present height limitations of this title insure that this will not occur. None of the city is presently within the Airport approach surface.

(Ord. 415 § 7.76.010, 2002)

16.24.020 Definitions.

As used in this chapter:

Airport approach surface means a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. The inner edge of the approach surface is the same width as the primary surface and extends to a width of: one thousand two hundred fifty (1,250) feet for a utility runway having only visual approaches; one thousand five hundred (1,500) feet for a runway other than a utility runway having only visual approaches; two thousand (2,000) feet for a utility runway having a non-precision instrument approach; and three thousand five hundred (3,500) feet for a non-precision instrument runway other than utility, having visibility minimums greater than three-fourths of a statute mile. An Airport approach surface extends for a horizontal distance of five thousand (5,000) feet at a slope of twenty (20) feet for each one foot upward (20:1) for all utility and visual runways, and ten thousand (10,000) feet at a slope of thirty-four (34) feet for each one foot upward (34:1) for all non-precision instrument runways other than utility.

Airport hazard means any structure, tree or use of land which exceeds height limits established by the airport imaginary surfaces.

Airport imaginary surfaces means those imaginary areas in space which are defined by the airport surface, transitional zones, horizontal zone, runway protection zone, conical surface, and in which any object extending above these imaginary surfaces is an obstruction.

Conical surface extends one foot upward for each twenty (20) feet outward (20:1) for four thousand (4,000) feet, beginning at the edge of the horizontal surface (five thousand (5,000) feet from the center of each end of the primary surface of each visual and utility runway, or ten thousand (10,000) feet for all non-precision instrument runways other than utility at one hundred fifty (150) feet above the airport elevation), and upward extending to a height of three hundred fifty (350) feet above the airport elevation.

Horizontal surface means a horizontal plane one hundred fifty (150) feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of five thousand (5,000) feet from the center of each end of the primary surface of all other runways and connecting the adjacent arcs by lines tangent to those arcs.

Impact means noise levels exceeding fifty-five (55) Ldn.

Place of public assembly means a structure which the public may enter for such purposes as deliberation, worship, education, shopping, entertainment, amusement or awaiting transportation.

Primary surface means a surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends two hundred (200) feet beyond each end of that runway. The width of the primary surface is two hundred fifty (250) feet for utility runways having only visual approaches, five hundred (500) feet for utility runways having non-precision instrument approaches, and five hundred (500) feet for other than utility runways.

Runway protection zone extends from the primary surface to a point where the approach surface is fifty (50) feet above the runway end elevation.

Transitional zones extend one foot upward for each seven feet outward (7:1) beginning on each side of the primary surface which point is the same elevation as the runway surface, and from the sides of each approach surfaces, thence extending upward to a height of one hundred fifty (150) feet above the airport elevation (horizontal surface).

Utility runway means a runway that is constructed and intended to be used by propeller driven aircraft of twelve thousand five hundred (12,500) pounds maximum gross weight or less.

(Ord. 415 § 7.76.020, 2002)

16.24.030 Application of airport overlay.

In any zoning district where airport overlay designation is combined with a primary district, the following regulations shall apply. If any conflict in regulation or procedure occurs with the primary zoning district, the provisions of the airport overlay shall govern.

A. Notice shall be provided to the Department of Aviation when the property or a portion thereof that is being developed is located within five thousand (5,000) feet of the sides or the ends of a runway except where the following criteria are satisfied:

  1. All proposed structures are thirty-five (35) feet or less in height;

  2. The proposal does not involve industrial uses, mining or similar uses that emit smoke, dust or steam;

  3. The proposal does not involve sanitary landfills or water impoundments individually or cumulatively one quarter acre or greater in size; and

  4. The proposal does not involve radio, radio telephone, television or similar transmission facilities or above ground electrical transmission lines.

B. For limited land use decisions, notice shall be provided in accordance with Chapter 16.78.

C. For quasi-judicial decisions, notice shall be provided in accordance with Chapter 16.76.

D. For legislative decisions, notice shall be provided in accordance with Chapter 16.74.

(Ord. 415 § 7.76.030, 2002)

16.24.040 Permitted uses within the airport approach surface.

The following uses are permitted. Variances from listed permitted uses are prohibited.

A. Agriculture, excluding the commercial raising of animals that would be adversely impacted by aircraft passing overhead;

B. Landscape nursery, cemetery, or recreation areas, which do not include buildings or structures;

C. Roadways, parking areas, and storage yards located in such a manner that vehicle lights will not make it difficult for pilots to distinguish between landing lights and vehicle lights, or result in glare, or in any way impair visibility in the vicinity of the landing approach;

D. Pipeline;

E. Underground utility wires.

(Ord. 488, § 2(Exh. A), 2019; Ord. 415 § 7.76.040, 2002)

16.24.050 Conditional uses within the airport approach surface.

The following uses are conditional:

A. A structure that is an accessory to a permitted use;

B. A single-family dwelling, mobile home, duplexes, multiple-family dwellings, when authorized in the primary zoning district, provided the landowner signs and records in the deed and mortgage records of Marion County a hold harmless agreement and an aviation and hazard easement, and submits them to the airport sponsor and to the city;

C. Buildings and uses of a public works, public service or public utility nature;

D. Commercial and industrial uses when authorized in the primary zoning district, provided the use does not:

1. Create electrical interference with navigational signals or radio communication between the airport and the aircraft;
2. Make it difficult for pilots to distinguish between airport lights and all others;
3. Impair visibility;
4. Create bird strike hazards;
5. Endanger or interfere with the landing, taking off or maneuvering of aircraft intending to use the airport;
6. Attract large numbers of people.

(Ord. 415 § 7.76.050, 2002)

16.24.060 Procedures for approval.

A. The approval of a new conditional use in the airport approach surface shall follow the conditional use procedures set forth in Chapter 16.60.

B. The application for a conditional use shall contain all the information listed in Chapter 16.60 plus the following special information:

1. Property lines as they relate to the airport approach and the end of the runway;
2. Location and height of all existing and proposed buildings, structures, utility lines and roads;
3. A statement from the Federal Aviation Administration indicating that the proposed use will not interfere with the operation of the landing facility.

(Ord. 415 § 7.76.060, 2002)

16.24.070 Special limitations.

To meet the standards and reporting requirements established in FAA Regulations, Part 77, the following limitations shall apply:

A. No structure shall penetrate into the airport imaginary surfaces as defined by Section 16.24.020.

B. No place of public assembly shall be permitted in an airport approach surface.

C. The height of any structure shall be limited to the requirements prescribed by the commission or by any other local ordinance or regulation.

D. Whenever there is a conflict in height limitations prescribed by this code or another pertinent ordinance, the lowest height limitation fixed shall govern, provided the height or other limitations and restrictions here imposed shall not apply to such structures or uses customarily employed for aeronautical purposes.

E. No glare-producing materials shall be used on the exterior of any structure located within the airport approach surface.

F. No structure or building shall be allowed within the runway protection zone.

(Ord. 415 § 7.76.070, 2002)

713 PUBLIC USE AIRPORT AND SAFETY OVERLAY ZONES

713.01 PURPOSE

Section 713 is adopted to implement Oregon Revised Statutes 836.600 through 836.630 and policies of the Comprehensive Plan as they relate to public use airports. When applied, it provides for their continued operation and vitality consistent with state law by allowing certain compatible airport related commercial and recreational uses. It also provides for safety standards to promote air navigational safety at such public use airports and to reduce the potential for safety hazards for property and for persons living, working, or recreating on lands near such airports.

713.02 APPLICATION

This special use zoning district may be applied to publicly owned airports that are shown in the records of the Oregon Department of Aviation (ODA) on December 31, 1994. It also may be applied to those privately owned, public use airports identified pursuant to Oregon Revised Statutes (ORS) 836.610(3) by the ODA as providing important links in air traffic in Oregon, providing essential safety or emergency services, or are of economic importance to the County.

The boundaries of this special use district are coterminous with airport boundaries as described in Oregon Administrative Rules (OAR) 660-013-0040. The boundaries of safety overlay zones radiate from points at the ends of the airport's primary surface as described in OAR 660-013-0070(1)(a) and Exhibits 1 and 4 that accompany that rule. The definitions in Subsection 713.03 are consistent with ORS Chapter 836, OAR 660-013, and Exhibits 1 and 4 of that rule.

If an airport that had this special use zoning district applied is removed from the State's list of airports in a manner described in ORS 836.610, the application of this special use zoning district is automatically terminated.

713.03 DEFINITIONS

A. <u>Aircraft</u>. Means airplanes and helicopters, but not hot air balloons or ultralights.

B. <u>Airport</u>. The strip of land used for taking off and landing aircraft, together with all adjacent land used in connection with the aircraft landing or taking off from the strip of land, including but not limited to land used for existing airport uses.

C. <u>Airport Elevation</u>. The highest point of an airport's usable runway, measured in feet above mean sea level.

D. <u>Airport Imaginary Surfaces</u>. Imaginary areas in space and on the ground that are established in relation to the airport and its runways. Imaginary surfaces are defined by the primary surface, runway protection zone, approach surface, horizontal surface, conical surface and transitional surface.

E. Airport Noise Impact Boundary. Areas located within 1,500 feet of an airport runway or within established noise contour boundaries exceeding 55 Ldn.

F. Airport Sponsor. The owner, manager, or other person or entity designated to represent the interests of an airport.

G. Approach Surface. A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface.

1. The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:

    a. 1,250 feet for a utility runway having only visual approaches;

    b. 1,500 feet for a runway other than a utility runway with only visual approaches;

    c. 2,000 feet for a runway with a non-precision instrument approach;

    d. 3,500 feet for a non-precision instrument runway other than utility, having visibility minimums greater than three-fourths statute mile;

    e. 4,000 feet for a non-precision instrument runway, other than utility, having a non-precision approach with visibility minimums as low as three-fourths statute mile; and

    f. 16,000 feet for precision instrument runways.

2. The approach surface extends for a horizontal distance of:

    a. 5,000 feet at a slope of 20 feet outward for each foot upward for all utility and visual runways;

    b. 10,000 feet at a slope of 34 feet outward for each foot upward for all non-precision instrument runways, other than utility; and

    c. 10,000 feet at a slope of 50 feet outward for each one foot upward, with an additional 40,000 feet at a slope of 40 feet outward for each one foot upward, for precision instrument runways.

3. The outer width of an approach surface will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

H. Conical Surface. A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to one for a horizontal distance of 4,000 feet.

I. Hazard. All hazards within and around airports shall be as determined by the Oregon Department of Aviation or Federal Aviation Administration (FAA).

J. Heliports. A heliport is an area of land, water, or structure designated for the landing and take-off of helicopters or other rotorcraft. The heliport overlay zone applies the following imaginary surfaces. The heliport approach surfaces begin at each end of the heliport primary surface and have the same width as the primary surface. They extend outward and upward for a horizontal distance of 4,000 feet where their width is 500 feet. The slope of the approach surfaces is eight to one for civilian heliports and 10 to one for military heliports. The heliport primary surface coincides in size and shape with the designated takeoff and landing area of a heliport. The heliport primary surface is a horizontal plane at the established heliport elevation. The heliport transitional surfaces extend outward and upward from the lateral boundaries of the heliport primary surface and from the approach surfaces at a slope of two to one for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

K. Horizontal Surface. A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

1. 5,000 feet for all runways designated as utility or visual.

2. 10,000 feet for all other runways.

3. The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000 foot arc is encompassed by tangents connecting two adjacent 10,000 foot arcs, the 5,000 foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

L. Non-Precision Instrument Runway. A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in non-precision instrument approach has been approved, or planned, and for which no precision approach facilities are planned or indicated on an FAA-approved airport layout plan or other FAA planning document.

M. Other than Utility Runway. A runway that is constructed for and intended to be used by turbine-driven aircraft or by propeller-driven aircraft exceeding 12,500 pounds gross weight.

N. Precision Instrument Runway. A runway having an existing instrument approach procedure utilizing air navigation facilities that provide both horizontal and vertical guidance, such as an Instrument Landing System (ILS) or Precision Approach Radar (PAR). It also means a runway for which a precision approach system is planned and is so indicated by an FAA-approved airport layout plan or other FAA planning document.

O. Primary Surface. A surface longitudinally centered on a runway. When a runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway. When a runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is:

1. 250 feet for utility runways having only visual approaches;

2. 500 feet for utility runways having non-precision instrument approaches;

3. For other than utility runways the width is:

    a. 500 feet for visual runways having only visual approaches;

    b. 500 feet for non-precision instrument runways having visibility minimums greater than three-fourths statute mile;

    c. 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with a visibility minimum as low as three-fourths statute mile, and for precision instrument runways.

P. Public Assembly Facility. A permanent or temporary structure or facility, place or activity where concentrations of people gather in reasonably close quarters for purposes such as deliberation, education, worship, shopping, employment, entertainment, recreation, sporting events, or similar activities. Public assembly facilities include, but are not limited to, schools, places of worship, conference or convention facilities, employment and shopping centers, arenas, athletic fields, stadiums, clubhouses, museums, and similar facilities and places, but do not include parks, golf courses or similar facilities unless used in a manner where people are concentrated in reasonably close quarters. Public assembly facilities also do not include air shows, structures or uses approved by the FAA in an adopted airport master plan, or places where people congregate for short periods of time such as parking lots or bus stops.

Q. Runway. A defined area on an airport prepared for landing and takeoff of aircraft along its length.

R. Runway Protection Zone (RPZ). An area off the runway end used to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The inner width of the RPZ is the same as the width of the primary surface. The outer width of the RPZ is a function of the type of aircraft and specified approach visibility minimum associated with the runway end. The RPZ extends from each end of the primary surface for a horizontal distance of:

1. 1,000 feet for utility runways.

2. 1,700 feet for other than utility runways having non-precision instrument approaches.

3. 2,500 feet for precision instrument runways.

S. Structure. Any constructed or erected object which requires location on the ground or is attached to something located on the ground. Structures include but are not limited to buildings, decks, fences, signs, towers, cranes, flagpoles, antennas, smokestacks, earthen formations and overhead transmission lines. Structures do not include paved areas.

T. Transitional Surface. Those surfaces that extend upward and outward at 90 degree angles to the runway centerline and the runway centerline extended at a slope of seven feet horizontally for each foot vertically from the sides of the primary and approach surfaces to the point of intersection with the horizontal and conical surfaces. Transitional surfaces for those portions of the precision approach surfaces which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at a 90 degree angle to the extended runway centerline.

U. Utility Runway. A runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight or less.

V. Visual Runway. A runway intended solely for the operation of aircraft using visual approach procedures, where no straight-in instrument approach procedures or instrument designations have been approved or planned, or are indicated on an FAA-approved airport layout plan or any other FAA planning document.

W. Water Impoundment. Includes wastewater treatment settling ponds, surface mining ponds, detention and retention ponds, artificial lakes and ponds, and similar water features. A new water impoundment includes an expansion of an existing water impoundment except where such expansion was previously authorized by land use action approved prior to the effective date of Section 713.

713.04 USES PERMITTED OUTRIGHT

The following uses and activities are permitted outright in the Public Use Airport special use zoning district:

A. Customary and usual aviation-related activities, including but not limited to takeoffs and landings; aircraft hangars and tie-downs; construction and maintenance of airport facilities; fixed-base operator facilities; one single-family dwelling in conjunction with an airport (if there is not one there already) for an airport manager, caretaker, or security officer; and other activities incidental to the normal operation of an airport. Except as provided in this ordinance, "customary and usual aviation-related activities" do not include residential, commercial, industrial, manufacturing, and other uses.

B. Air passenger and air freight services and facilities, at levels consistent with the classification and needs identified in the Oregon Department of Aviation Airport System Plan.

C. Emergency medical flight services, including activities, aircraft, accessory structures, and other facilities necessary to support emergency transportation for medical purposes. Emergency medical flight services do not include hospitals, medical offices, medical labs, medical equipment sales, and other similar uses.

D. Law enforcement, military, and firefighting activities, including aircraft and ground-based activities, facilities and accessory structures necessary to support federal, state or local law enforcement or land management agencies engaged in law enforcement or firefighting activities. Law enforcement and firefighting activities include transport of personnel, aerial observation, and transport of equipment, water, fire retardant and supplies.

E. Search and rescue operations, including aircraft and ground based activities that support the orderly and efficient conduct of search or rescue related activities.

F. Flight instruction, including activities, facilities, and accessory structures located at airport sites that provide education and training directly related to aeronautical activities. Flight instruction includes ground training and aeronautic skills training, but does not include schools for flight attendants, ticket agents or similar personnel.

G. Aircraft service, maintenance and training, including activities, facilities and accessory structures provided to teach aircraft service and maintenance skills and to maintain, service, refuel or repair aircraft and aircraft components. "Aircraft service, maintenance and training" includes the construction and assembly of aircraft and aircraft components for personal use, but does not include activities, structures or facilities for the manufacturing of aircraft, aircraft components or other aircraft-related products for sale to the public.

H. Aircraft rental, including activities, facilities and accessory structures that support the provision of aircraft for rent or lease to the public.

I. Aircraft sales and the sale of aeronautic equipment and supplies, including activities, facilities and accessory structures for the storage, display, demonstration and sales of aircraft and aeronautic equipment and supplies to the public but not including activities, facilities or structures for the manufacturing of aircraft, aircraft components or other aircraft-related products for sale to the public.

J. Crop dusting activities, including activities, facilities and structures accessory to crop dusting operations. Crop dusting activities include, but are not limited to, aerial application of chemicals, seed, fertilizer, defoliant and other chemicals or products used in a commercial agricultural, forestry or rangeland management setting.

K. Agricultural and Forestry Activities, including activities, facilities and accessory structures that qualify as a "farm use" as defined in ORS 215.203 or "farming practice" as defined in ORS 30.930.

L. Aeronautic recreational and sporting activities, including activities, facilities and accessory structures at airports that support recreational usage of aircraft and sporting activities that require the use of aircraft or other devices used and intended for use in flight. Aeronautic recreation and sporting activities authorized under this paragraph include, but are not limited to, fly-ins; glider flights; hot air ballooning; ultralight aircraft flights; displays of aircraft; aeronautic flight skills contests; and gyrocopter flights, but do not include flights carrying parachutists or parachute drops (including all forms of skydiving).

M. Flights carrying parachutists, and parachute drops (including all forms of skydiving) onto an airport, but only upon demonstration that the parachutist business has secured approval to use a drop zone that is at least 10 contiguous acres in size. The configuration of the drop zone shall roughly approximate a square or a circle and may contain structures, trees, or other obstacles only if the remainder of the drop zone provides adequate areas for parachutists to land safely.

N. Uses not identified in Subsection 713.04, but permitted in the underlying zoning district, may be permitted if they do not conflict with permitted uses in Subsection 713.04, safety, or the continued operation and vitality of the airport.

713.05 USES PERMITTED SUBJECT TO REVIEW

Uses not identified in Subsection 713.04 and contained in an Airport Expansion Plan approved by the County as part of the Comprehensive Plan shall require review as a Type III application pursuant to Section 1307 and shall be subject to the following standards and criteria:

A. The use is, or will be, supported by adequate types and levels of public facilities, services, and transportation systems authorized by applicable statewide land use planning goals;

B. The use does not seriously interfere with existing land uses in areas surrounding the airport; and

C. For airports where the underlying zoning district is EFU, the use shall comply with the standards described in ORS 215.296.

D. The development standards in Section 1000 shall be applied appropriate to the type of use permitted.

E. An applicant may demonstrate that these standards will be satisfied through the imposition of clear and objective conditions.

713.06 IMAGINARY SURFACE AND NOISE IMPACT BOUNDARY DELINEATION

The airport elevation, the airport noise impact boundary, and the location and dimensions of the runway, primary surface, runway protection zone, approach surface, horizontal surface, conical surface and transitional surface, direct and secondary impact boundaries shall be delineated for each public use airport where this district is applied and shall be made part of the zoning maps adopted pursuant to Subsection 103.02. All lands, waters, and airspace, or portions thereof, that are located within these boundaries or surfaces shall be subject to the requirements of this zone.

713.07 LAND USE COMPATIBILITY REQUIREMENTS

Applications for land use or building permits for properties within the boundaries of these safety overlay zones shall comply with the requirements of this Section as provided herein.

713.08 WATER IMPOUNDMENTS WITHIN SAFETY OVERLAY ZONES

Any use or activity that would result in the establishment or expansion of a water impoundment shall comply with the requirements of this section.

713.09 NONCONFORMING USES

Section 713 shall not be construed to require the removal, lowering, or alteration of any existing structure or vegetation not conforming to Section 713. Section 713 shall not require any change in the construction, or alteration of the intended use of any structure, the construction or alteration of which was begun or completed prior to the effective date of this safety overlay zone.

[Amended by Ord. ZDO-248, 10/13/14; Amended by Ord. ZDO-268, 10/2/18]

Chapter 17.171
P (PUBLIC) ZONE Revised 3/19

Sections:

17.171.010 Purpose.

The purpose and intent of the P (public) zone is to provide regulations governing the development of lands appropriate for specific public and semi-public uses and to ensure their compatibility with adjacent uses. It is intended that this zone be applied to individual parcels shown to be an appropriate location for a certain public or semi-public use. If the use existing at the time the P zone is applied is discontinued or if a proposed use is not established, it is the intent that the land be rezoned to conform to surrounding zoning or be devoted to permitted uses. It is not intended that a property zoned public for one type of use be allowed to change without demonstrating that the proposed conditional use will be compatible with adjacent uses and the property is better suited to the proposed use than alternative locations. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004; Ord. 1139 § 5, 2001; Ord. 1131 § 5, 2000; Ord. 1118 § 5, 2000; Ord. 1055 § 4, 1997; Ord. 579 § 5, 1980. RZ Ord. § 171.010.]

17.171.020 Uses. Revised 3/19

Within any P (public) zone, no building, structure or premises shall be used, arranged, or designed to be used, erected, structurally altered or enlarged except for the following purposes:

A. Farm use, but not including a medical marijuana processor (see MCC 17.110.376), medical marijuana producer (see MCC 17.110.378), or a medical marijuana dispensary (see MCC 17.110.374);

B. Forest use;

C. Dwellings (including mobile homes) and other structures customarily provided in conjunction with farm or forest use subject to the criteria in MCC 17.139.030;

D. Utility facilities necessary for public service except public power generation;

E. Wireless communications facilities, including attached, subject to the following development standards:

1. Notwithstanding other height limitations in this title omni-directional (whip) antennas not exceeding 20 feet in height and directional/parabolic antennas not exceeding seven feet in diameter or width and 15 feet in height may be attached to or located on existing structures;

2. Antennas and associated equipment shall be surfaced in a nonreflective color to match the structure on which they are located. An equipment enclosure may be set back from the edge of a roof by a distance at least equal to its height in lieu of screening;

3. Equipment enclosures shall be located within the building on which they are located wherever possible; otherwise, equipment enclosures shall be fenced by a six-foot-high fence, wall or hedge;

4. Antennas shall not be illuminated except as required by the Oregon State Aeronautics Division or the Federal Aviation Administration;

5. A wireless communications facility, attached, and equipment enclosure shall be removed by the facility owner or property owner within six months of the date it ceases to be operational;

6. Notwithstanding other height limitations in this code all lattice, monopole, guyed or other freestanding support structures shall be limited to a total height, including antennas, of 150 feet above natural grade;

F. *Repealed by Ord. 1397*;

G. Fire and emergency services stations and police substations; training facilities, administrative offices and living quarters for fire, emergency, and police services are permitted in conjunction with these uses, not to exceed 20 full-time persons and 200 day-use visitors. [Ord. 1397 § 4 (Exh. B), 2019; Ord. 1372 § 4 (Exh. A), 2016; Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004; Ord. 1139 § 5, 2001; Ord. 1131 § 5, 2000; Ord. 1118 § 5, 2000; Ord. 1055 § 4, 1997; Ord. 579 § 5, 1980. RZ Ord. § 171.020.]

17.171.030 Conditional uses.
When authorized under the procedure provided for conditional uses in this title, the following uses will be permitted in a P zone:

A. Airport and airport-related commercial and industrial uses;

B. Public ball park, exposition, fairground, museum, stock show and related commercial uses subject to MCC 17.171.040;

C. Cemeteries, crematoriums and mausoleums;

D. Dwelling for the caretaker or watchman; housing for the staff required for an approved conditional use;

E. Golf courses, public parks and playgrounds, recreational resorts and retreats, related camping and related commercial uses subject to MCC 17.171.040;

F. Religious organizations and related conference and residence facilities;

G. Schools, elementary and secondary (as defined in Chapter 17.110 MCC);

H. Military training facilities and armory;

I. Public instructions for detention or correction;

J. Residential facilities, institutions and schools for the handicapped or mentally retarded;

K. Public service buildings, structures and uses (e.g., field offices, outdoor storage of equipment, reservoir, water tower, pump station, sewage treatment plant, solid waste disposal site, power generation), except fire, police and emergency service stations;

L. Fire and emergency services stations and police substations; training facilities, administrative offices and living quarters for fire, emergency, and police services exceeding 20 full-time persons and 200 day-use visitors. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004; Ord. 1139 § 5, 2001; Ord. 1131 § 5, 2000; Ord. 1118 § 5, 2000; Ord. 1055 § 4, 1997; Ord. 974 § 4, 1994; Ord. 925 § 6, 1992; Ord. 579 § 5, 1980. RZ Ord. § 171.030.]

17.171.040 Scale of commercial uses.

A. New commercial uses in conjunction with public uses may be established up to a maximum of 3,500 square feet of floor area.

B. Lawfully established commercial uses existing as of the date of adoption of the ordinance codified in this title may be expanded up to 3,500 square feet of floor area, or an additional 25 percent of the floor area that existed as of the date of adoption of the ordinance codified in this title, whichever is greater.

C. Airport-related uses located at the Aurora Airport are not subject to the size limitations in subsections (A) and (B) of this section.

D. Except as established in subsection (B) of this section, for a commercial use to exceed the square foot limitations requires taking an exception to Goal 14. Such exception shall be processed as an amendment to the Marion County Comprehensive Plan. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004. RZ Ord. § 171.040.]

17.171.050 Prohibited and lawfully established existing uses.

A. The following uses are prohibited:

1. Uses of structures and land not specifically permitted in the public zone.

2. New residential dwellings, except when accessory to a primary use. However, a dwelling that legally existed at the time of adoption of the ordinance codified in this title shall not be a nonconforming use, and may be remodeled, expanded, or replaced.

B. Lawfully established commercial and industrial uses that existed prior to zoning or established through the applicable land use process on or before the date of the ordinance codified in this title, not otherwise listed in the zone, are allowed outright and shall not be classified as nonconforming uses.

C. All other lawfully established, existing uses and structures not specifically permitted in the public zone shall be considered nonconforming uses subject to the provisions of Chapter 17.114 MCC. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004. RZ Ord. § 171.050.]

17.171.060 Property development standards.

A. Height. No building or structure in a P zone shall exceed six stories or 70 feet; provided, that buildings or structures shall be set back from every street and lot line one foot for each foot of height of the building in excess of 35 feet in addition to all other yard and setback requirements herein specified.

B. Front Yard. Front yard shall be a minimum of 20 feet. No parking shall be permitted within the minimum front yard area.

C. Side Yards. Where the side of a lot in a P zone abuts upon the side of a lot in any R zone, there shall be a minimum side yard of 10 feet. Otherwise there shall be no minimum side yard setback. Where the side of a lot abuts upon a street there shall be a minimum side yard of 20 feet wherein no parking shall be permitted.

D. Rear Yard. In a P zone there shall be a rear yard that shall have a minimum depth of 30 feet.

E. Lot Area and Coverage. The minimum requirements in P zones for dwellings shall be one acre except 6,000 square feet inside an unincorporated community boundary where public sewer and water service is provided. No main building, including dwellings, shall occupy more than 30 percent of the lot area.

F. Open Storage.

1. All yard areas, exclusive of those required to be landscaped as provided in subsection (G) of this section, may be used for materials and equipment storage areas related to a use permitted in the P zone, provided such area is screened so it cannot be seen from public

roads, or from dwellings on property in other zones.

2. The surface of open storage areas, including automobile and truck parking areas shall be paved or graveled and maintained at all times in a dust-free condition.

G. Landscaping. The area within 20 feet of a street shall be landscaped. As a condition of approval for a conditional use, additional landscaping may be required if necessary to make the use compatible with the area.

H. Performance Standards. No land or structure shall be used or occupied unless maintained and operated in continuing compliance with all applicable standards adopted by the Oregon Department of Environmental Quality.

I. Sewage Disposal. Demonstrate that the development will not exceed the existing carrying capacity of the local sewage disposal system or has an on-site sewage disposal site approved by Marion County or the Department of Environmental Quality.

J. Traffic Analysis. Demonstrate that the development will be consistent with the identified function, capacity, and level of service of transportation facilities serving the site. A transportation impact analysis, approved by the Marion County department of public works, may be required prior to building permit approval. [Ord. 1271 § 5, 2008; Ord. 1227 § 4, 2006; Ord. 1191 § 4, 2004. RZ Ord. § 171.060.]

Chapter 17.177
AIRPORT OVERLAY ZONE

Sections:

17.177.010 Purpose.

The airport overlay zone is intended to minimize potential dangers from, and conflicts with, the use of aircraft at public airports based on the adopted master plans for each airport. It is to be used in conjunction with the underlying zone. If any conflict in regulation or procedure occurs with the underlying zoning districts, the more restrictive provisions shall govern. This section is intended to comply with Federal Aviation Agency Regulation FAR-77 and all other applicable federal and state laws regulating hazards to air navigation. [Ord. 602 § 5, 1981. RZ Ord. § 177.010.]

17.177.020 Definitions.

A. “Airport” means a public airport as defined in MCC 17.110.040.

B. “Airport elevation” means the highest point of an airport’s usable landing area measured in feet from mean sea level. This elevation above mean sea level shall be shown on the official zoning map.

C. “Airport surfaces” means the specific dimensions, slopes and elevations of the airport surfaces shall be delineated on the official zoning map.

1. “Primary surface” means the surface of the runway and adjacent land on each side of the runway centerline and 200 feet beyond the ends of the runway. The length of this surface is determined by using the existing runway length or the runway length identified in an adopted state airport master plan, if longer. The width is the same as the end of the approach surface that is closest to the runway.

2. Approach Surface. This surface begins at the end of the primary surface. From its initial width, that is the same as the width of the primary surface, it extends upward and outward on both sides of the projected centerline of the runway with a specified slope and terminates

where it intersects the horizontal surface.

3. “Horizontal surface” is a horizontal plane which surrounds the airport 150 feet above the airport elevation. The interior portion of this surface terminates where it intersects with the transitional and approach surfaces. Its outer edge terminates where it intersects with the conical surface.

4. “Transitional surface” means an imaginary plane that extends upward and outward from the sides of the primary surface and approach surface to the horizontal surface.

5. “Conical surface” means a surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to one for a horizontal distance of 4,000 feet.

D. “Hazard to air navigation” means an obstruction determined to have a substantial adverse effect on the safe and efficient utilization of the navigable airspace.

E. “Height” is the highest point of any structure as further defined in MCC 17.110.260. The official zone map identifies the maximum height permitted for any obstruction calculated from the airport elevation as defined in subsection (B) of this section and from mean sea level.

F. “Obstruction” is any structure, tree or other object, including a mobile object, which extends above airport surfaces as defined in subsection (C) of this section.

G. “Runway” is a defined area on the airport prepared for landing and takeoff of aircraft along its length.

H. “Tree” means any natural vegetation. [Ord. 602 § 5, 1981. RZ Ord. § 177.020.]

17.177.030 Airport districts.

In order to carry out the provisions of this airport overlay zone, three airport development districts are provided within the airport overlay zone. These three districts are shown on the official zoning map showing the height limits adopted at the time the airport overlay zone is applied.

A. Airport Development District. This district consists of those lands, waters and airspace area at or below the primary, transitional and approach surfaces described in MCC 17.177.020(C).

1. Use Limitations. Any use, accessory use, buildings and structures otherwise allowed in the underlying zone shall be permitted provided the following requirements are satisfied:

a. No obstruction or object shall be permitted if it extends above the transitional and approach surfaces as defined in MCC 17.177.020(C).

b. Roadways, parking areas and storage yards shall be located in such a manner that vehicle lights will not result in glare in the eyes of the pilots, or in any other way impair visibility in the vicinity of the runway approach.

c. Sanitary landfills, sewage lagoons or sewage sludge disposal shall not be permitted closer than 10,000 feet to the airport runway.

d. No game preserve or game reservation shall be permitted if the animals or birds have the potential to become a hazard to air navigation.

e. No structure or use intended for public assembly shall be allowed except by a conditional use permit.

B. Horizontal Surface District. This district consists of the land, water and airspace underneath the horizontal surface as described in MCC 17.177.020(C).

1. Use Limitations. Any use, accessory use, building and structure allowed in the underlying zone shall be permitted provided the following requirements are satisfied:

a. No obstruction shall penetrate the horizontal surface as defined in MCC 17.177.020(C).

b. Sanitary landfills, sewage lagoons or sewage sludge disposal shall not be permitted closer than 10,000 feet to the airport runway.

C. Conical Surface District. This district consists of the land, water and airspace underneath the conical surface as described in MCC 17.177.020(C).

1. Use Limitations. Any use and accessory uses, buildings and structures allowed in the underlying zone shall be permitted; provided, that no obstruction penetrates the conical surface as defined in MCC 17.177.020(C). [Ord. 602 § 5, 1981. RZ Ord. § 177.030.]

17.177.040 Procedure.

A. An applicant seeking a building permit involving any use or structure regulated by the airport overlay zone shall provide the following information in addition to any other information required in the permit application:

1. Property boundary lines as they relate to the airport approach and the end of the runway;

2. Location and height of all existing and proposed buildings, structures, utility lines and roads.

B. Proposed buildings or structures shall be approved by the building inspector if it is determined that they will not extend above the airport surfaces as defined in MCC 17.177.020(C).

C. An applicant seeking rezoning, a conditional use permit or a variance involving any use, building or structure regulated by the underlying zone or the airport overlay zone shall be reviewed in accordance with the applicable procedure in this title. During this review process, the State Aeronautics Division shall be notified of the proposal and any public hearing, be given an opportunity to comment and be notified of the decision. [Ord. 602 § 5, 1981. RZ Ord. § 177.040.]

17.177.050 Nonconforming uses.

The regulations prescribed by the airport overlay zone shall not be construed to require the removal, lowering or other change or alteration of any structure or tree not conforming to the regulations as of the effective date of the ordinance codified in this title, or otherwise interfere with the continuance of the nonconforming use except as provided in MCC 17.110.405. Nothing contained herein shall require any change in the construction, alteration or intended use of any structure, otherwise permitted, the construction or alteration of which was begun prior to the effective date of the ordinance codified in this title. [Ord. 602 § 5, 1981. RZ Ord. § 177.050.]

17.177.060 Marking and lighting.

The owner of any existing nonconforming structure or tree shall permit the installation, operation and maintenance thereon of such markers and lights as shall be deemed necessary by the Oregon Department of Transportation to indicate to the operators of aircraft the presence of such airport obstruction. Such markers and lights shall be installed, operated and maintained at the expense of the airport owner. [Ord. 602 § 5, 1981. RZ Ord. § 177.060.]

17.177.070 Variances.

The provisions of this overlay zone may be varied subject to the procedures and criteria for considering variances set forth in Chapter 17.122 MCC. Variances may be allowed where it is found that the proposal will not create a hazard to air navigation, and will be in accordance with the spirit and intent of this overlay zone. [Ord. 602 § 5, 1981. RZ Ord. § 177.070.]

Appendix 5

Instrument Approach and Departure Procedures

LOC RWY 17
AURORA STATE (UAO)

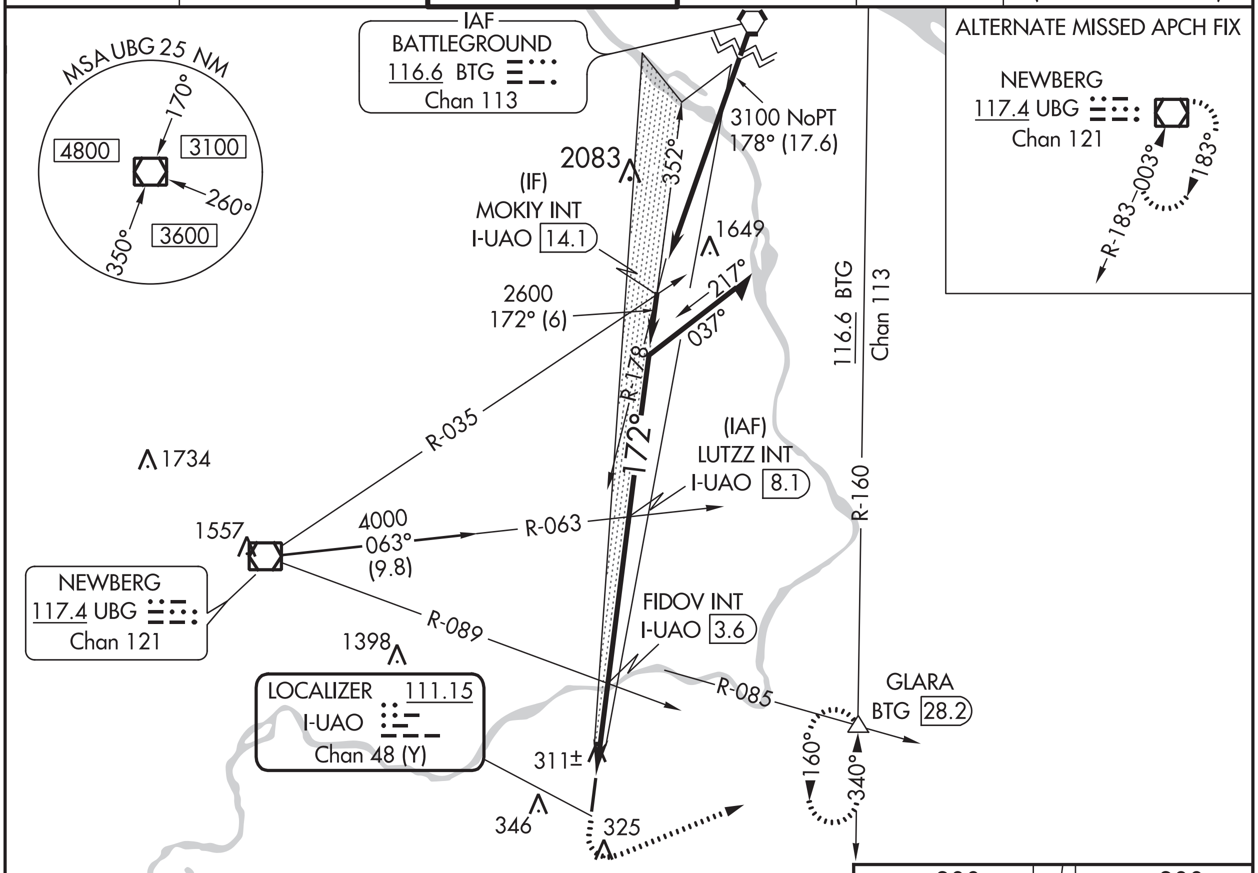
LOC/DME I-UAO	APP CRS	Rwy Idg	5003
111.15 Chan 48(Y)	172°	TDZE	200
		Apt Elev	200

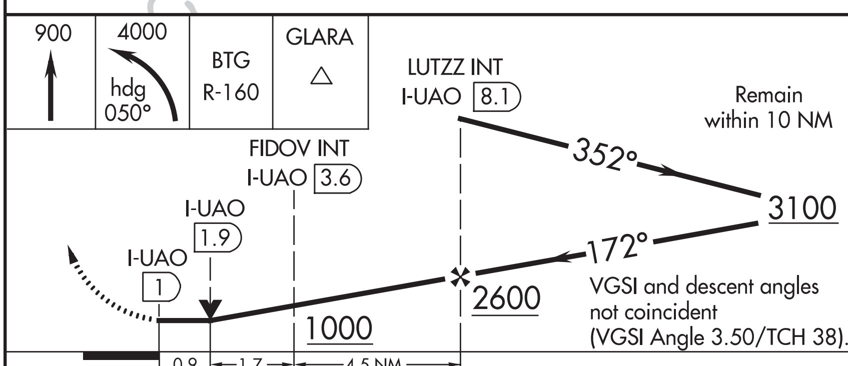
T Rwy 17 helicopter visibility reduction below ¾ SM NA.
A FIDOV fix minimums: Inop table does not apply to Cats C/D. For inop ALS, increase S-17 Cats C/D visibility to 2½ SM.

ODALS

MISSED APPROACH: Climb to 900 then climbing left turn to 4000 on heading 050° and BTG R-160 to GLARA INT/ BTG 28.2 DME and hold, continue climb-in-hold to 4000.

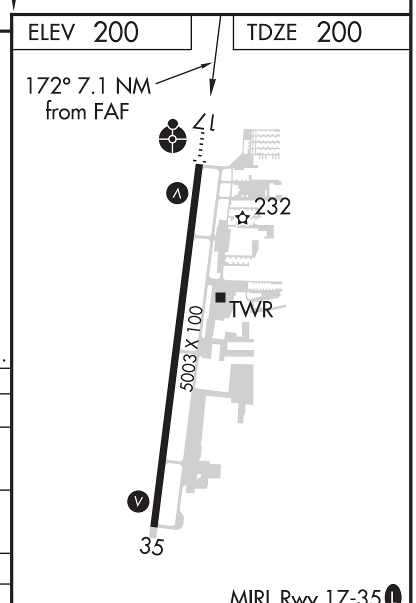
ATIS ★	PORTLAND APP CON	AURORA TOWER ★	GND CON	CLNC DEL	PORTLAND CLNC DEL
118.525	126.0 269.175	120.35 (CTAF) L	119.15	119.15	119.95 (When tower closed)





CATEGORY	A	B	C	D
S-17	1000-¾ 800 (800-¾)	1000-1 800 (800-1)	1000-2 800 (800-2)	
C CIRCLING	1000-1 800 (800-1)	1000-1¼ 800 (800-1¼)	1000-2½ 800 (800-2½)	

FIDOV FIX MINIMUMS				
S-17	580-¾ 380 (400-¾)		580-1 380 (400-1)	
C CIRCLING	700-1 500 (500-1)		700-1½ 500 (500-1½)	940-2¼ 740 (800-2¼)



FAF to MAP 7.1 NM					
Knots	60	90	120	150	180
Min:Sec	7:06	4:44	3:33	2:50	2:22

NW-1, 04 NOV 2021 to 02 DEC 2021

NW-1, 04 NOV 2021 to 02 DEC 2021

WAAS CH 70308 W17A	APP CRS 172°	Rwy ldg 5003 TDZE 200 Apt Elev 200

RNAV (GPS) RWY 17
AURORA STATE (UAO)

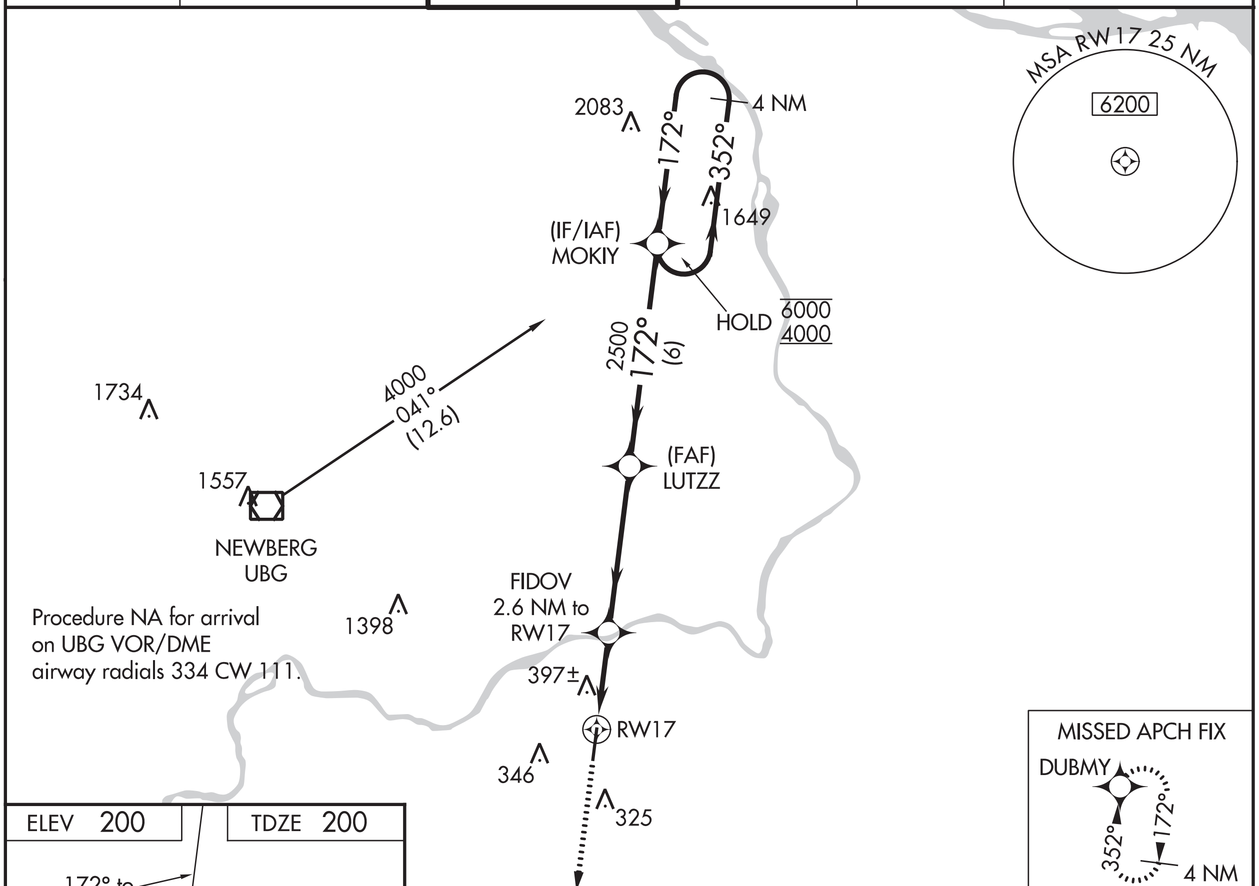
RNP APCH.

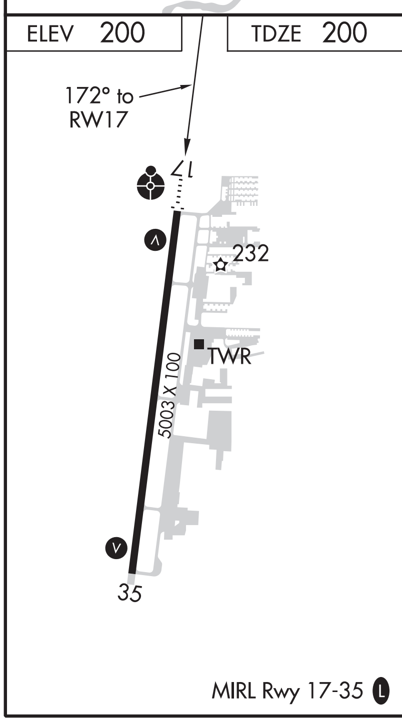
T A Rwy 17 helicopter visibility reduction below ¾ SM NA. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -6°C or above 54°C. For inop ALS, increase LNAV/VNAV Cat A/B and LNAV Cat C/D visibility to 1⅜ SM. Inop table does not apply to LPV and LNAV Cat A/B.

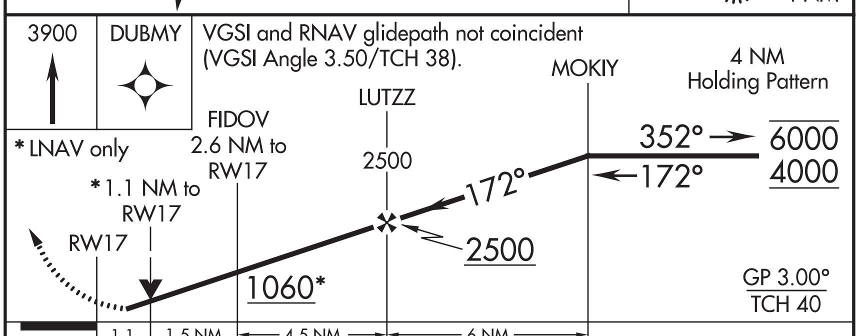
ODALS

MISSED APPROACH: Climb to 3900 direct DUBMY and hold, continue climb-in-hold to 3900.

ATIS ★	PORTLAND APP CON	AURORA TOWER ★	GND CON	CLNC DEL	PORTLAND CLNC DEL
118.525	126.0 269.175	120.35 (CTAF) L	119.15	119.15	119.95 (When tower closed)







CATEGORY	A	B	C	D
LPV DA	511-⅞ 311 (400-⅞)			
LNAV/ VNAV DA	661-1¼ 461 (500-1¼)			
LNAV MDA	660-1 460 (500-1)		660-1⅛ 460 (500-1⅛)	
C CIRCLING	700-1 500 (500-1)		700-1½ 500 (500-1½)	940-2¼ 740 (800-2¼)

NW-1, 04 NOV 2021 to 02 DEC 2021

NW-1, 04 NOV 2021 to 02 DEC 2021

RNAV (GPS) RWY 35
AURORA STATE (UAO)

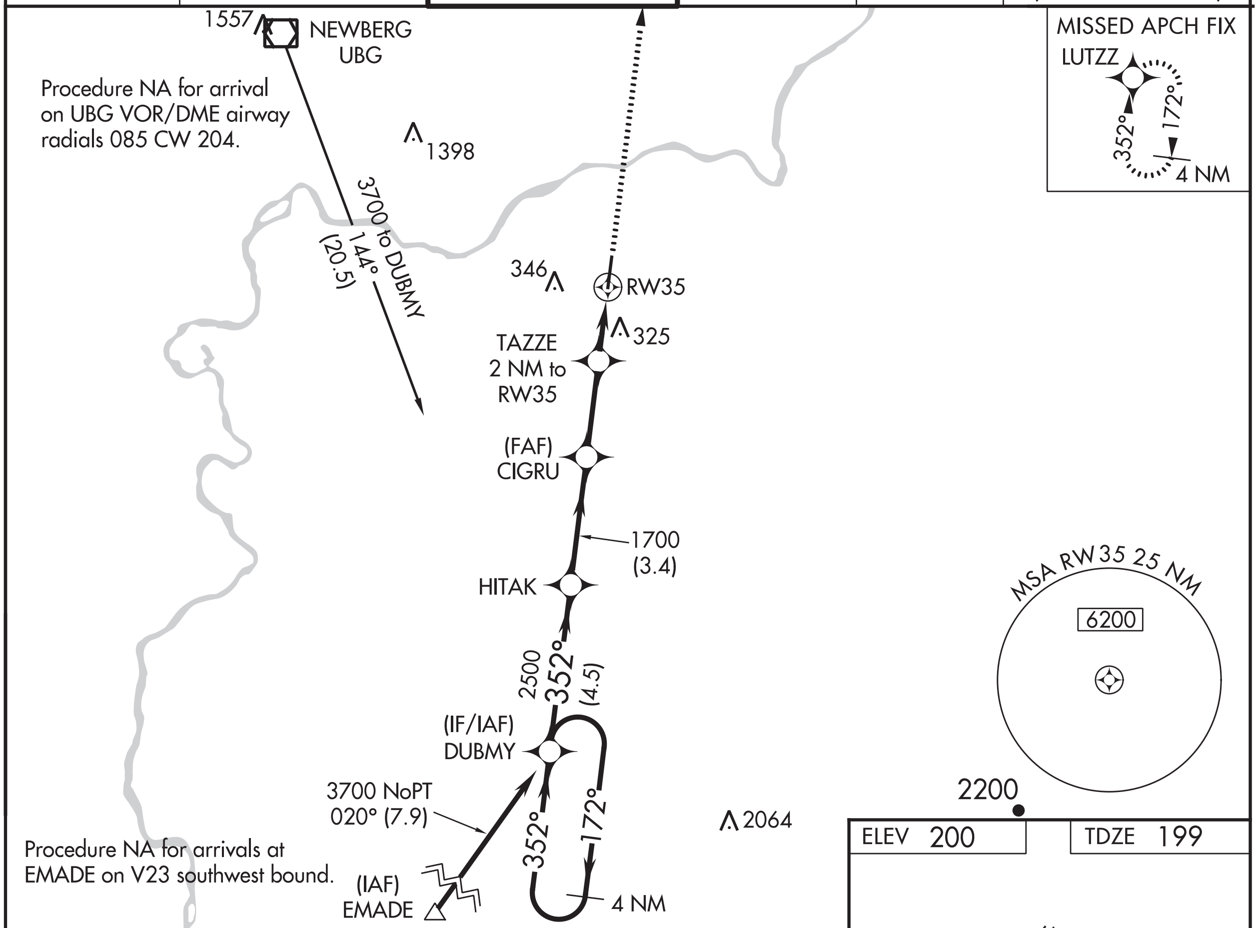
WAAS CH 77508 W35A	APP CRS 352°	Rwy Idg 5003 TDZE 199 Apt Elev 200

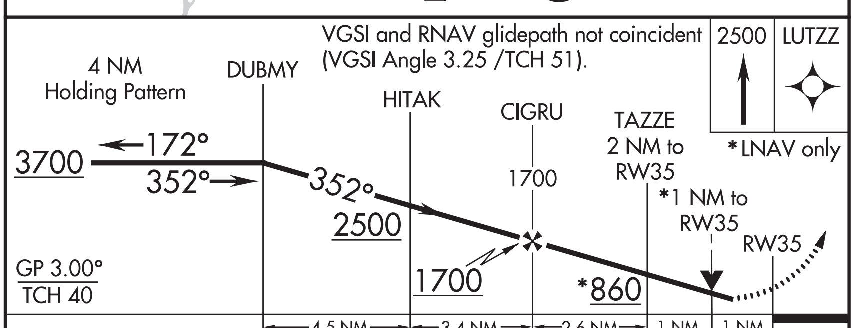
RNP APCH.

For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -6°C or above 54°C. Rwy 35 helicopter visibility reduction below ¾ SM NA.

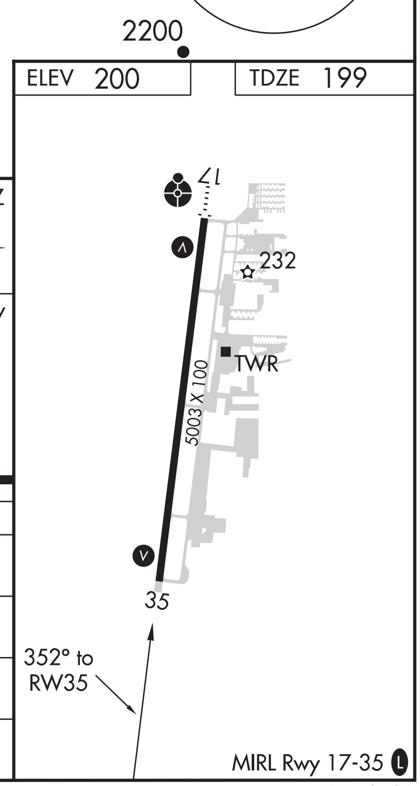
MISSED APPROACH: Climb to 2500 direct LUTZZ and hold.

ATIS ★	PORTLAND APP CON	AURORA TOWER ★	GND CON	CLNC DEL	PORTLAND CLNC DEL
118.525	126.0 269.175	120.35 (CTAF) L	119.15	119.15	119.95 (When tower closed)





CATEGORY	A	B	C	D
LPV DA	453-⅞ 254 (300-⅞)			
LNAV/VNAV DA	515-1 316 (400-1)			
LNAV MDA	620-1 421 (500-1)		620-1¼ 421 (500-1¼)	
C CIRCLING	700-1 500 (500-1)		700-1½ 500 (500-1½)	940-2¼ 740 (800-2¼)



NW-1, 04 NOV 2021 to 02 DEC 2021

NW-1, 04 NOV 2021 to 02 DEC 2021

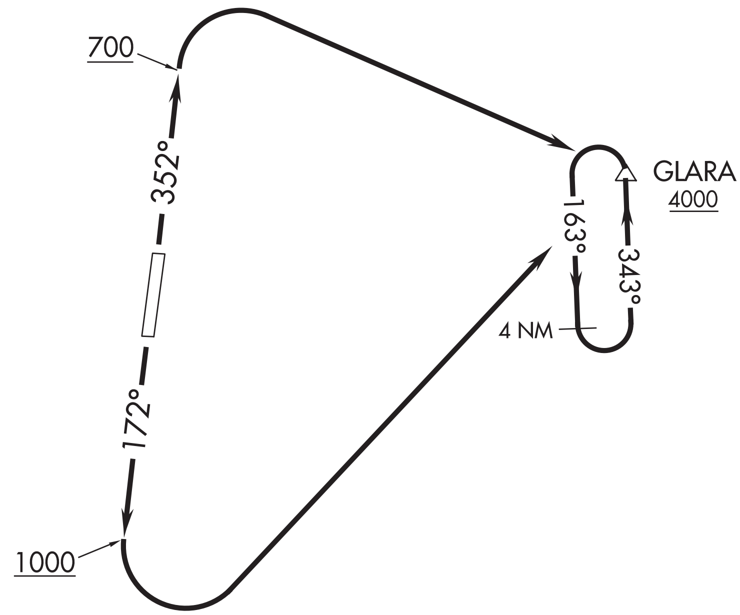
GLARA TWO DEPARTURE (RNAV)

AL-5722 (FAA)

AURORA STATE (UAO)
AURORA, OREGON

TOP ALTITUDE: ASSIGNED BY ATC

ATIS ★
118.525
CLNC DEL
119.15
PORTLAND CLNC DEL
119.95 (when tower closed)
GND CON
119.15
AURORA TOWER ★
120.35
PORTLAND DEP CON
126.0 284.6



NOTE: RNAV 1.
NOTE: GPS required.

TAKEOFF MINIMUMS
Rwy 17: Standard with minimum climb of 375′ per NM to 1000.
Rwy 35: Standard with minimum climb of 350′ per NM to 700.

NOTE: Chart not to scale.

NW-1, 04 NOV 2021 to 02 DEC 2021

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 17: Climb heading 172° to 1000, then climbing left turn direct GLARA. Thence . . . .

TAKEOFF RUNWAY 35: Climb heading 352° to 700, then climbing right turn direct GLARA. Thence . . . .

. . . . continue climb in GLARA holding pattern to cross GLARA at or above 4000 before proceeding on course.

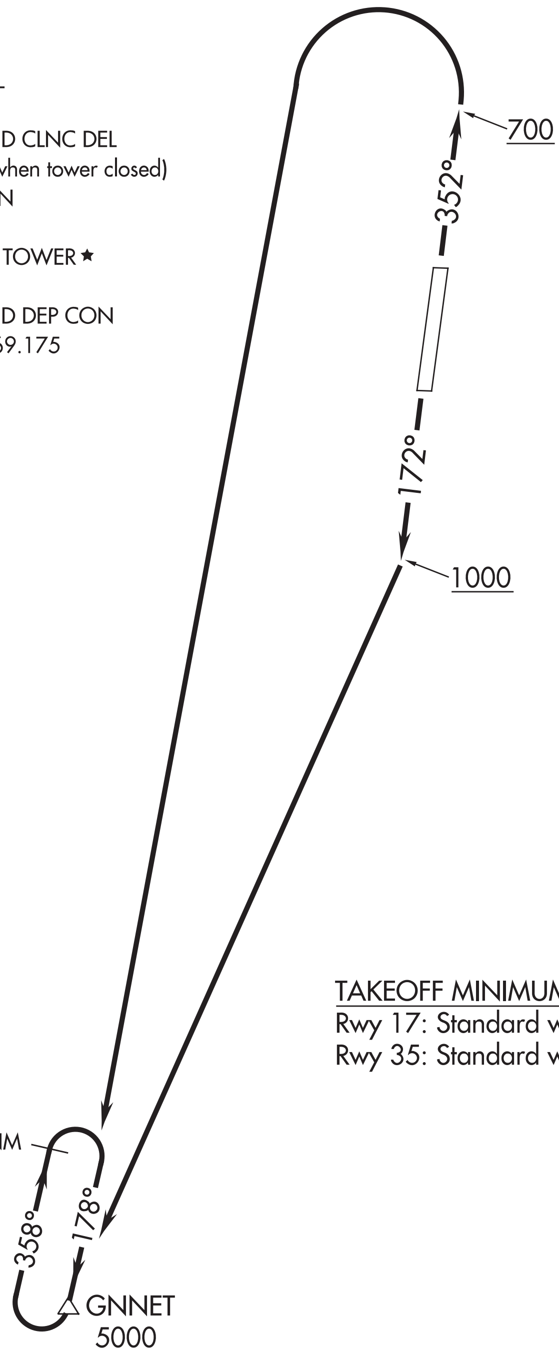
GNNET TWO DEPARTURE (RNAV)

AL-5722 (FAA)

AURORA STATE (UAO)
AURORA, OREGON

TOP ALTITUDE: ASSIGNED BY ATC

ATIS ★
118.525
CLNC DEL
119.15
PORTLAND CLNC DEL
119.95 (when tower closed)
GND CON
119.15
AURORA TOWER ★
120.35
PORTLAND DEP CON
126.0 269.175



NOTE: RNAV 1
NOTE: GPS required.

TAKEOFF MINIMUMS
Rwy 17: Standard with minimum climb of 375′ per NM to 1000.
Rwy 35: Standard with minimum climb of 350′ per NM to 2100.

NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 17: Climb heading 172° to 1000, then climbing right turn direct GNNET. Thence . . . .

TAKEOFF RUNWAY 35: Climb heading 352° to 700, then climbing left turn direct GNNET. Thence . . . .

. . . . continue climb in GNNET holding pattern to cross GNNET at or above 5000 before proceeding on course.

(UBG2.UBG) 17285

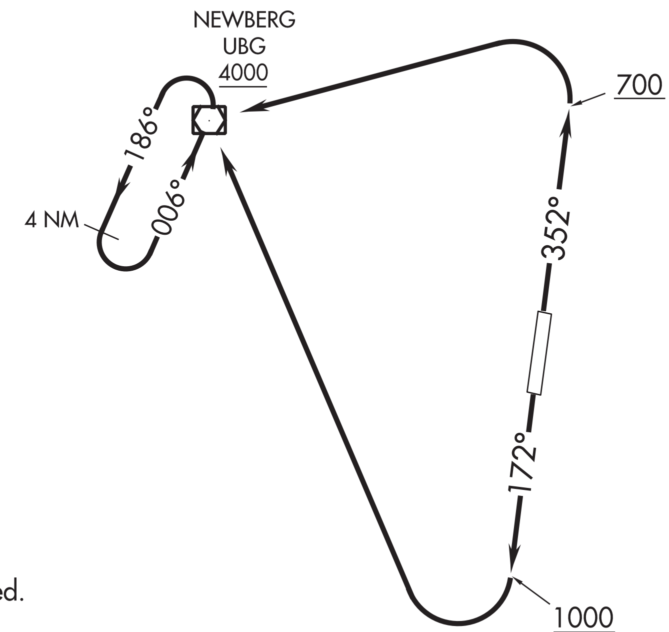
NEWBERG TWO DEPARTURE (RNAV)

AL-5722 (FAA)

AURORA STATE (UAO)
AURORA, OREGON

TOP ALTITUDE: ASSIGNED BY ATC

ATIS ★
118.525
CLNC DEL
119.15
PORTLAND CLNC DEL
119.95 (when tower closed)
GND CON
119.15
AURORA TOWER ★
120.35
PORTLAND DEP CON
126.0 269.175



NOTE: RNAV 1.
NOTE: GPS required.

TAKEOFF MINIMUMS
Rwy 17: Standard with minimum climb of 375′ per NM to 2100.
Rwy 35: Standard with minimum climb of 350′ per NM to 2100.

NOTE: Chart not to scale.

DEPARTURE ROUTE DESCRIPTION

TAKEOFF RUNWAY 17: Climb heading 172° to 1000, then climbing right turn direct UBG VOR/DME. Thence . . . .

TAKEOFF RUNWAY 35: Climb heading 352° to 700, then climbing left turn direct UBG VOR/DME. Thence . . . .

. . . . continue climb in hold UBG VOR/DME holding pattern to cross UBG VOR/DME at or above 4000 before proceeding on course.

NEWBERG TWO DEPARTURE (RNAV)
(UBG2.UBG) 27APR17

AURORA, OREGON
AURORA STATE (UAO)

Appendix 6

Airport Pavement Assessments

Oregon

DEPARTMENT OF AVIATION

Pavement Evaluation/ Maintenance Management Program 2018

Aurora State Airport

Pavement Consultants Inc.

Pavement Evaluation/Maintenance Management Program 2018

Aurora State Airport

Oregon Department of Aviation

2018 Pavement Evaluation / Maintenance Management Program

Final Report – Individual Airports
Functional Category 2, Central Climatic Zone

Prepared for:

State of Oregon
Department of Aviation
3040 25th Street SE
Salem, Oregon 97303-1125

Prepared by:

Pavement Consultants Inc.
7714 58th Avenue N.E.
Seattle, Washington 98115-6339

September 2018

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Introduction

The Oregon Department of Aviation has been collecting pavement condition information at eligible airports since the mid-1980s. In January 1995 the Federal Aviation Administration (FAA) mandated that any airport sponsor receiving and/or requesting federal funds for pavement improvement projects must have implemented a pavement maintenance management program. Through the Department's system planning efforts, the airports included in the Department's Pavement Evaluation / Maintenance Management Program have been complying with the intent of the law since the mid-1980s, well ahead of the FAA mandate. The information collected during this study ensures that your airport continues to comply with the Federal mandate. The developed pavement maintenance management program, as it relates to an individual airport, is described in this report.

The Oregon Department of Aviation routinely provides information to airport owners and operators throughout the State that assists them in maintaining and operating their airports. The State addresses many issues as part of their planning process, one of which is to provide to each individual airport, on a three-year cycle, a report on pavement condition. Through the statewide study, pavement maintenance management programs for all eligible airports in the state are efficiently and economically completed through the Department of Aviation's Pavement Evaluation / Maintenance Management Program.

Each airport owner or operator makes frequent decisions about the timing and type of maintenance and repair activities that should be completed on their pavements to maintain acceptable surface condition and adequate load-carrying capacity. The pavement maintenance management program described in this document, and supplemented by the information contained in the attached report prepared specifically for your airport, will assist you in making necessary decisions about pavement maintenance and rehabilitation projects at your airport, and will ensure compliance with the Federal mandate.

To develop a pavement maintenance management program for each eligible airport, the Department of Aviation elected to conduct pavement evaluations (visual inspections), and to implement the PAVER pavement maintenance management software. These activities were completed as part of the Department's Continuous Aviation System Plan efforts. PAVER uses the evaluation results to efficiently identify pavements requiring maintenance and rehabilitation, and to establish project priorities. The software can also be used to assess overall pavement network condition, prepare and forecast the budgets required to maintain the network at an acceptable condition level, and identify required maintenance and rehabilitation activities.

The federally mandated pavement maintenance management program identifies five major requirements:

- **Pavement inventory**
- **Inspection schedule (detailed and monthly)**
- **Record keeping**
- **Information retrieval**
- **Program funding**

The approach taken to meet these program requirements for your airport is described in this report.

Pavement Inventory

The FAA-mandated Pavement Inventory requirement specifies that information about each piece of pavement at an airport be compiled. This information is to include, at a minimum: pavement location, pavement dimensions, pavement surface type, and last construction date. The process used to develop this information is discussed under “Records Review”.

Additionally, information is collected about the pavements at an airport so its pavement network can be defined. After the pavement network is defined, pavement inspections can be completed and a pavement maintenance management program can be developed. The methodology for defining the pavement network follows the Records Review discussion.

Records Review

The first step in meeting FAA’s pavement maintenance management program requirement is to develop a maintenance and construction history for all pavements at an airport. For more than 30 years the Oregon Department of Aviation has, for its eligible airports, been conducting pavement evaluations to determine existing condition. In 1991 Pavement Consultants Inc. began assisting the Department in their efforts to compile and update that information. The information collected was used to develop a pavement maintenance management program for each eligible airport as described in this report, and your attached individual airport report.

Previous State-sponsored projects identified pavement layout, pavement construction history and pavement condition at each eligible airport. During this inspection cycle these documents were reviewed, and follow-up inquiries on pavement construction history were directed to the Oregon Department of Aviation, the FAA, consultants and airport sponsors. Based on this review, pavement boundaries were identified at your airport and were placed on an AutoCAD-generated base map (see Figure 1 in your attached airport report). ***The established base map fulfills the FAA "Pavement Inventory" requirement for locating pavements, identifying their dimensions, and identifying pavement type and age.***

Network Definition

Once the pavement history at an airport has been compiled, individual pavement features can be identified, a process called network definition. These pavement features are defined on the basis of: primary use, construction history, and traffic pattern. Each airport is divided into features according to the guidelines contained in the current edition of ASTM International-Standard D5340, *Standard Test Method for Airport Condition Index Surveys*. The pavement features used in this project are defined as follows.

Network: Each eligible airport constitutes a separate pavement network.

Branch: A branch is any identifiable part of a pavement network that has a distinct function. Airfield pavements such as individual runways, taxiways and aprons are each considered to be a separate branch.

Section: A section is a subdivision of a branch and has consistent characteristics throughout its length or area. These characteristics include: pavement layer material type and thickness, construction history, traffic, and pavement condition. A section is the basic management unit of a pavement network, and is that portion of a branch over which a maintenance and rehabilitation project is likely to be completed.

Sample Unit: A sample unit is an arbitrarily defined portion of a pavement section that is used when performing detailed pavement inspections. It is the smallest subdivision in a pavement network. For flexible airport pavements such as asphalt concrete or surface treatment, sample units are about 5,000 square feet in area. For rigid (portland cement concrete) airport pavements, sample units typically include approximately 20 contiguous pavement slabs.

Beginning approximately 30 years ago, branches, sections and sample units were established for each eligible airport in the Oregon system. During this project, these divisions were reviewed and modified as required, based on changed conditions (new pavements, demolished pavements), or completion of any pavement-related maintenance and rehabilitation projects.

Branch and Section Names

Each pavement feature is assigned a name that allows it to be uniquely identified in the statewide airport system. Each branch name consists of a series of characters. The first character indicates the branch type: “R” for Runway, “T” for Taxiway, “A” for Apron or Helipad. The last two characters in the branch name identify the airport to which the branch belongs and were taken from the airport name. All branches for your airport carry this airport-specific two-letter identifier. The individual runway, taxiway, apron or helipad referenced is identified by characters located between the branch type (“R”, “T” or “A”) and your two-letter airport identifier. To the extent possible, these identifying characters were chosen to reflect the facility names you use. If the facility does not have a name it was assigned a number. In the case of runways, numbers are used that are the lower of the two runway numbers corresponding to compass bearing.

Located after a hyphen following the branch name are two- or three alpha-numeric characters. These characters identify the section within the branch. An example illustrating the naming convention is:

R17AU-01

which is the name for Runway 17/35, Aurora State Airport, Section 01.

The branches, sections and sample units identified for your airport are shown on Figure 2 in your attached individual airport report.

Network Identifiers

Several designators are used to describe information about a particular airport included in the State System Plan. These designators include: network identification, zone, functional category, funding group, ownership and climatic region.

Network Identification

Each airport in the statewide system is assigned a unique network identifier (name). This name is typically the name of the city in which the airport is located. The network identification name for your airport can be found in the appendices attached to your airport report. This network identification name is assigned so that an individual airport or a group of airports contained in the statewide database can be selected for evaluation. The statewide database contains information for all eligible airports in the State.

Zone

Zones are used to allow individual airports within the statewide database to be separately selected for analysis. The FAA airport designator is used as the zone designator.

Functional Category

Each airport is assigned a functional category based on its classification within the State System Plan. Each airport is assigned a functional category of either 1, 2, 3, 4 or 5 in accordance with the criteria set forth in the System Plan. These categories correspond to the following airport types: commercial service, business or high activity general aviation, regional general aviation, community general aviation, and low activity general aviation, respectively. The category assigned to your airport is listed in the appendices attached to your airport report. This category assignment allows groups of airports in different functional categories to be separately evaluated.

Funding Group

Airports in the State are categorized as either NPIAS or non-NPIAS. NPIAS designated airports are eligible for project funding under the FAA's Airport Improvement Program (AIP). Being designated as NPIAS or non-NPIAS in the database allows the Department to evaluate funding alternatives for the State airport system.

Ownership

Airport ownership is designated as Public, State or Private. This designation allows the Department to evaluate funding allocations based on eligibility for State and/or Federal funding.

Climatic Region
Each airport in the statewide system is assigned to one of three climatic regions - eastern, central or coastal. Because climatic conditions can impact pavement performance, assigning airports to a climatic region allows pavement performance to be more accurately modeled, resulting in more accurate pavement condition forecasts.

Branch or Section Identifiers
Several designators are used to describe a branch or section's function, importance or construction. These characteristics are: branch use, pavement rank, and surface type.

Branch Use
Branch use identifies the primary use of each distinct pavement area. For each airport pavement included in this study, a branch use of "Runway", "Taxiway", "Apron" or "Helipad" is assigned, as appropriate.

Pavement Rank
Pavement rank refers to the relative importance assigned to multiple facilities having the same branch use. Each pavement section is assigned a rank of primary ("P"), secondary ("S") or tertiary ("T") as appropriate. As an example, an airport with two runways might rank the more heavily used runway as primary and the lesser-used runway as secondary. The pavement rank assigned to each pavement section at your airport can be found in the appendices attached to your individual airport report.

Surface Type
Each pavement section is assigned a surface type designator based on the type of surface material present. Throughout the State six (6) surface types were encountered: asphalt overlay over asphalt concrete (AAC), asphalt concrete (AC), asphalt overlay over portland cement concrete (APC), portland cement concrete (PCC), surface treatment (ST), and chip seal (X). The surface type assigned to each pavement section at your airport is provided in the report appended to this document. ***Surface type identification fulfills one of FAA's "Pavement Inventory" requirements.***

Structural and Construction History Data
Available construction records for each airport were obtained from the Oregon Department of Aviation, Federal Aviation Administration, consultants, or airport sponsors. These records were reviewed to establish a last construction date for each pavement section. Additional information was requested from individual airport sponsors to update or clarify this information, as necessary. The last construction date and known construction history for each pavement section can be found on Figure 1 in your individual airport report. The last construction date is also identified in the reports found in the attached appendixes. For those pavement sections where information

was not available, a last construction date was assigned based on pavement condition. ***Last construction date identification fulfills the final FAA "Pavement Inventory" requirement.***

Field Verification

Information obtained through the records review and discussions with airport sponsors, Department of Aviation staff, FAA personnel and consultant staff was field-verified to ensure that each facility is accurately mapped and properly subdivided into branches and sections. Modifications to the maps, and/or branch and section divisions, were made as necessary wherever discrepancies in airport geometry, paving materials, or construction history were found during the visual inspections.

Inspection Schedule

The FAA's Pavement Maintenance Management Program guidelines require all airports seeking or receiving federal funds for pavement-related projects to complete both detailed and drive-by inspections. The guidelines require that detailed inspections be performed yearly, unless the inspections are conducted in accordance with the Pavement Condition Index methodology set forth in ASTM D5340, at which point detailed inspections are required once every three years. ***The Pavement Condition Index methodology is used to inspect Oregon's airports. Each airport is inspected on a three-year cycle thus complying with the FAA detailed inspection requirement.***

The drive-by inspections required by the FAA are to be completed monthly. These inspections are cursory inspections that are performed to detect any unexpected changes in pavement condition.

A description of the detailed inspection methodology, as well as an approach to completing the monthly drive-by inspections, is provided below.

Detailed Inspection

Methodology

Pavement Condition Index (PCI) surveys were performed in May and July 2018 for all airports included in this year's project. The surveys were performed using the Pavement Condition Index (PCI) methodology developed by the U.S. Army Corps of Engineers, and outlined in the current edition of ASTM D-5340, *Standard Test Method for Airport Condition Index Surveys*. This document defines distress types, severity levels, and methods for measuring and recording distresses.

The PCI procedure was developed to collect data that would provide engineers and managers with a numerical value indicating overall pavement condition, and that would reflect both pavement structural integrity and surface operational condition. The procedure was designed to be highly repeatable and was found to be well-correlated with the judgment of experienced pavement engineers.

A PCI survey is performed by measuring the amount and severity of certain defined distresses (defects) observed in a sample unit. Table 1 lists both the asphalt concrete and portland cement concrete pavement distress types considered in the PCI method, and also identifies their most common cause (load, climate/durability, other) as assigned by the PAVER software. Load-related distresses are apparent where the pavement has been over-stressed by traffic loads applied to its surface. Climate/durability-related distresses arise due to exposure to the environment. Other-related distresses are caused by actions not related to load or climate such as fuel spills or construction deficiencies.

Table 1. Pavement Condition Index Distress Types and Related Causes.

Asphalt Concrete		Portland Cement Concrete	
Pavement Distress	**Related Cause**	**Pavement Distress**	**Related Cause**
Alligator Cracking	Load	Blow-Up	Climate/Durability
Bleeding	Other	Corner Break	Load
Block Cracking	Climate/Durability	Cracks: Longitudinal, Transverse, and Diagonal	Load
Corrugation	Other	Durability ("D") Crack	Climate/Durability
Depression	Other	Joint Seal Damage	Climate/Durability
Jet Blast Erosion	Other	Patching, Small	Other
Joint Reflection Cracking	Climate/Durability	Patching, Large and Utility Cuts	Other
Longitudinal and Transverse Cracking	Climate/Durability	Popouts	Other
Oil Spillage	Other	Pumping	Other
Patching and Utility Cut Patching	Climate/Durability	Scaling, Map Cracking, Crazing	Other
Polished Aggregate	Other	Settlement or Faulting	Other
Raveling	Climate/Durability	Shattered Slab / Intersecting Cracks	Load
Rutting	Load	Shrinkage Cracks	Other
Shoving	Other	Spalling (Longitudinal and Transverse Joint)	Other
Slippage Cracking	Other	Spalling (Corner)	Other
Swell	Other	Alkali Silica Reaction (ASR)	Other
Weathering	Climate/Durability		

To obtain a statistically reliable PCI for a given pavement section it is not necessary to inspect all sample units in that section. A pre-determined number of randomly chosen sample units are selected for inspection based on the total number of sample units in the section. The sampling rates used during this study are shown in Table 2. The sampling rates contained in Table 2 result in data that are reliable at a 92 percent confidence level.

Table 2. Selection of Number of Sample Units to Inspect.

Flexible Pavement		Rigid Pavement	
N	n	N	n
1	1	1	1
2 - 3	2	2	2
4 - 6	3	3 - 4	3
7 - 13	4	5 - 6	4
14 - 38	5	7 - 8	5
39 +	6	9 - 11	6
		12 - 14	7
		15 - 19	8
		20 - 27	9
		28 - 38	10
		39 - 58	11
		59 - 104	12
		105 - 313	13
		314 +	14

Where: N = Total number of sample units in a pavement section
n = Number of sample units to be surveyed

Pavement Condition Index Calculation

To calculate a PCI for a given sample unit, each distress type observed is assigned a deduct value based on its density (frequency of occurrence) in that sample area, and its severity. All deducts are summed and subsequently adjusted (corrected) for the number of different distresses found. This corrected deduct value is subtracted from 100, the PCI for a "perfect" pavement, to arrive at a PCI for that particular sample unit. The PCI for a pavement section is the area-weighted average PCI value of all sample units evaluated in that section. Pavement Condition Ratings (PCRs) are associated with ranges of PCI values.

The color-coded Figure 3 in your attached individual airport report shows the PCRs and their associated PCI ranges, as well as the pavement condition at your airport in May or July 2018.

Monthly Drive-By Inspection

As part of the FAA-mandated pavement maintenance management program, a monthly drive-by inspection is required. This inspection is intended to identify abrupt changes in condition occurring since the last monthly inspection, and to record any maintenance activities completed during the previous month. This inspection can easily be accomplished by driving your airport and noting any changes or maintenance performed on the form provided in Figure 1. Each drive-by inspection must note the date the inspection was completed, and record any maintenance performed since the last inspection. These records must be kept on-file for five years.

Figure 1. Monthly Drive-By Inspection Form.

Airport: ____

Date: ____

Inspector: ______________________________________

Branch*	Section*	Distresses Observed	Maintenance Performed Since Last Inspection

* Refer to the "Airport Layout, Dimensions and Pavement Cross-Sections" or "Pavement Branch, Section and Sample Unit Layout" figures in your airport report.

Record Keeping and Data Retrieval

The FAA pavement maintenance management program requires that compiled records be kept for five years. To facilitate record keeping and data retrieval at the State level, the PAVER pavement maintenance management software was implemented. PAVER provides the Oregon Department of Aviation with a method for storing data and generating reports.

PAVER was developed by the U.S. Army Construction Engineering Research Laboratory (USA-CERL). The program uses the guidelines contained in the current edition of ASTM D5340 as its basis. The current version, Version 7.0.6, is a Windows-based program that can store pavement condition information, as well as construction and maintenance history information. Using the data stored in the PAVER database the user has many capabilities, including: evaluating current condition, predicting future condition, determining maintenance and rehabilitation needs, scheduling future inspections, and preparing budget estimates.

The statewide database containing the information for all evaluated airports was updated during this project. Information for each individual airport can easily be extracted from the statewide database. The database allows required records to be stored indefinitely, thus meeting the FAA requirement that records be maintained for a five-year period. Additionally, the software allows data to be retrieved quickly and efficiently.

After data were entered into the State's PAVER database for each inspected airport, the software was used to analyze the stored data and to generate useful reports. The reports described in Table 3 were generated for your airport and are provided as appendices to your individual airport report.

Table 3. PAVER Reports.

Report Name	Report Description
Branch Condition	Lists information about each branch, including: network identification, branch identification, name, use, number of sections, total branch area and the average and area-weighted average PCI for the entire branch.
Section Condition	Provides information about each section, including: branch identification and section number, last construction date, surface type, use, rank, section area, last inspection date, age of pavement at last inspection and the PCI at the last inspection.
Network Maintenance	Applies the stored distress maintenance policy to the pavement network and identifies the type and cost of routine maintenance required across the entire network. Information in this report is listed by section.
Re-Inspection	Summarizes the distress data collected during the most recent inspection and provides the PCI for each sample unit inspected, as well as summary information about the section.

Pavement Condition Prediction

To allow future pavement condition to be predicted, data collected throughout the State were used to generate "performance curves". The curves were developed based on surface type, use, airport functional category and climatic region. These curves (models) are used to predict future pavement condition by assuming the behavior of an individual pavement section is similar to the behavior of the pavement sections used to generate the "performance curve". Figures 2 through 10 show the “performance curves” used to model pavements in your airport’s functional category and climatic region.

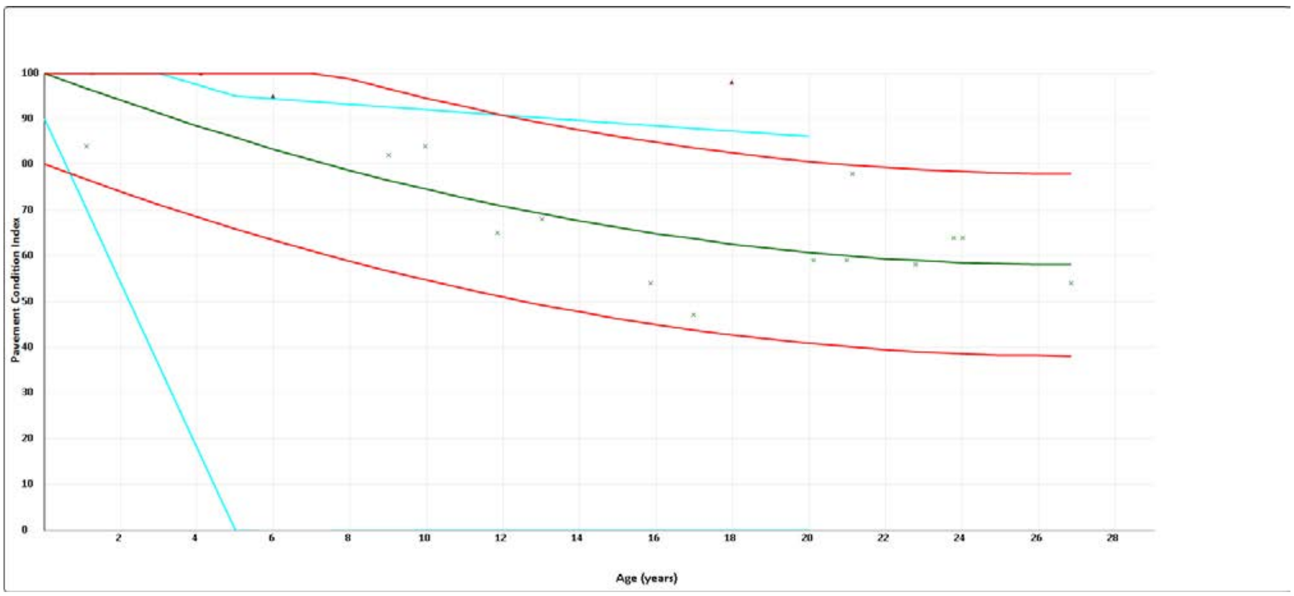


Figure 2. Performance Curve for Category 2 AAC Aprons – Central Oregon.

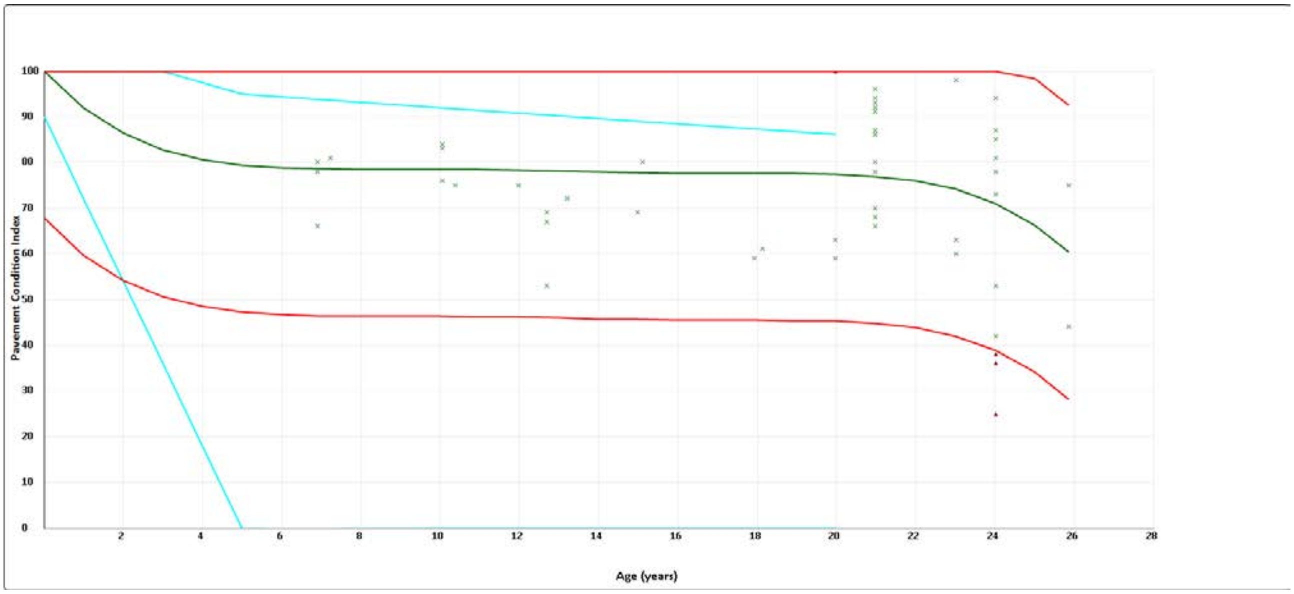


Figure 3. Performance Curve for Category 2 AAC Runways – Central Oregon.

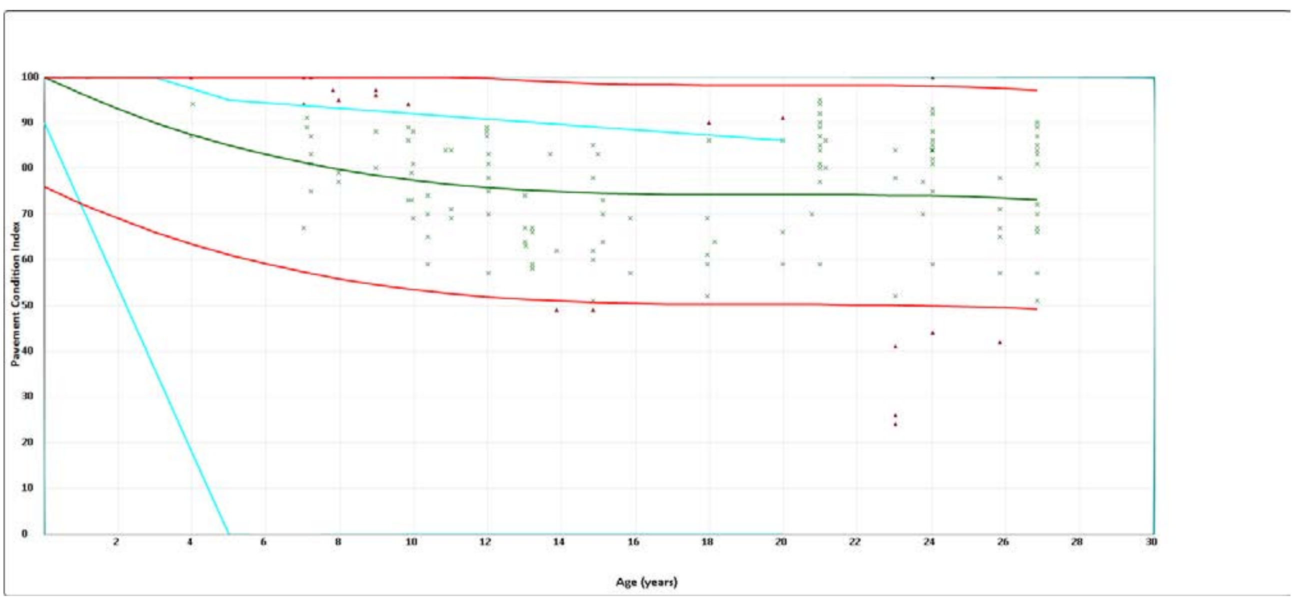


Figure 4. Performance Curve for Category 2 AAC Taxiways – Central Oregon.

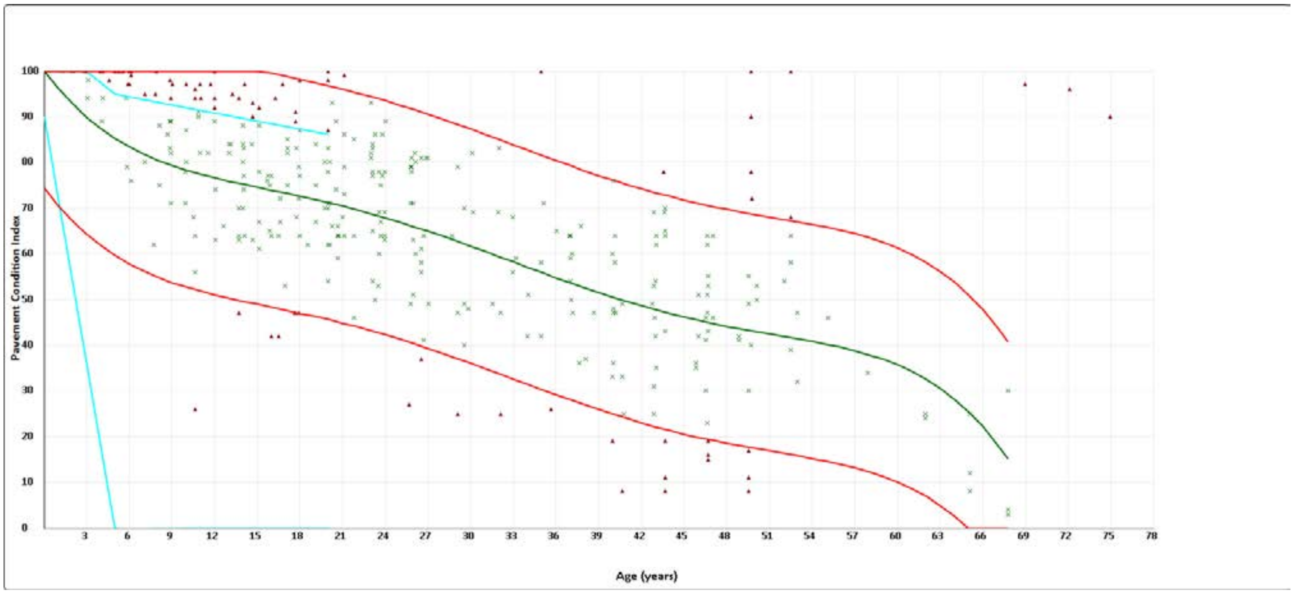


Figure 5. Performance Curve for Category 2 AC Aprons – Central Oregon.

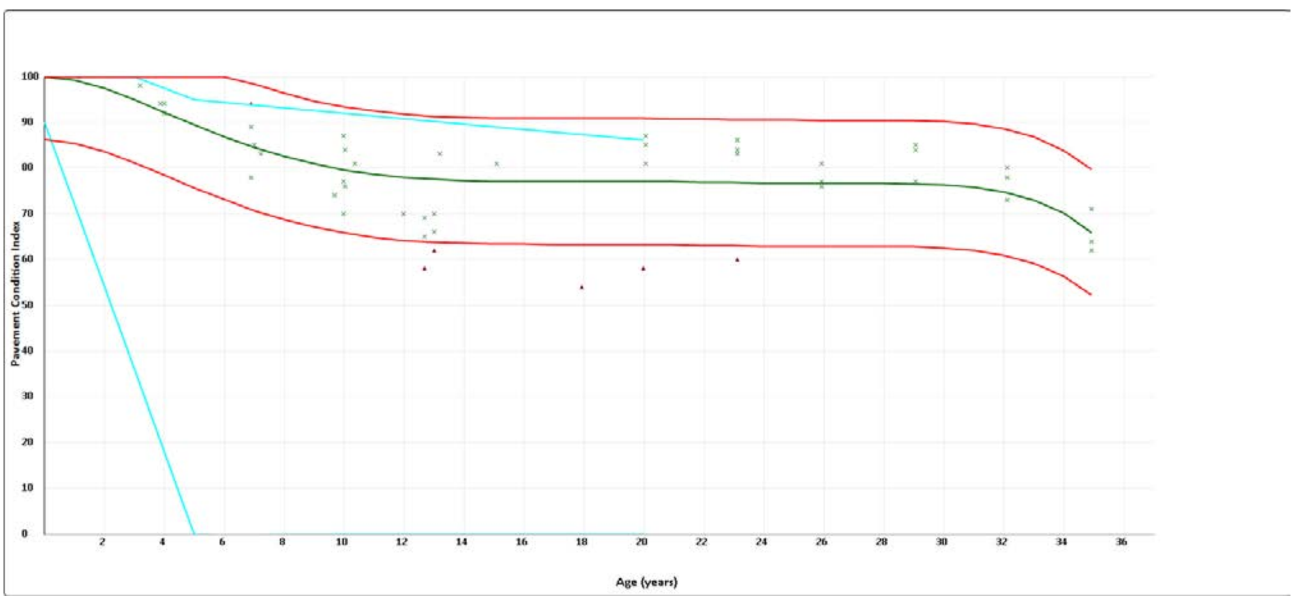


Figure 6. Performance Curve for Category 2 AC Runways – Central Oregon.

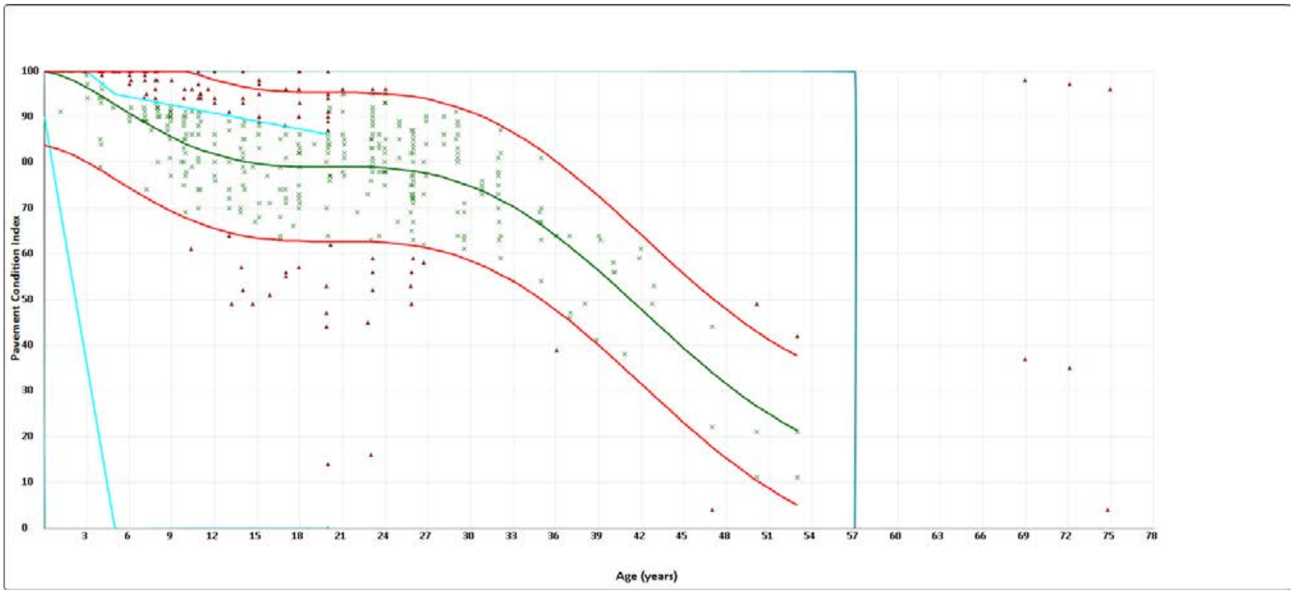


Figure 7. Performance Curve for Category 2 AC Taxiways – Central Oregon.

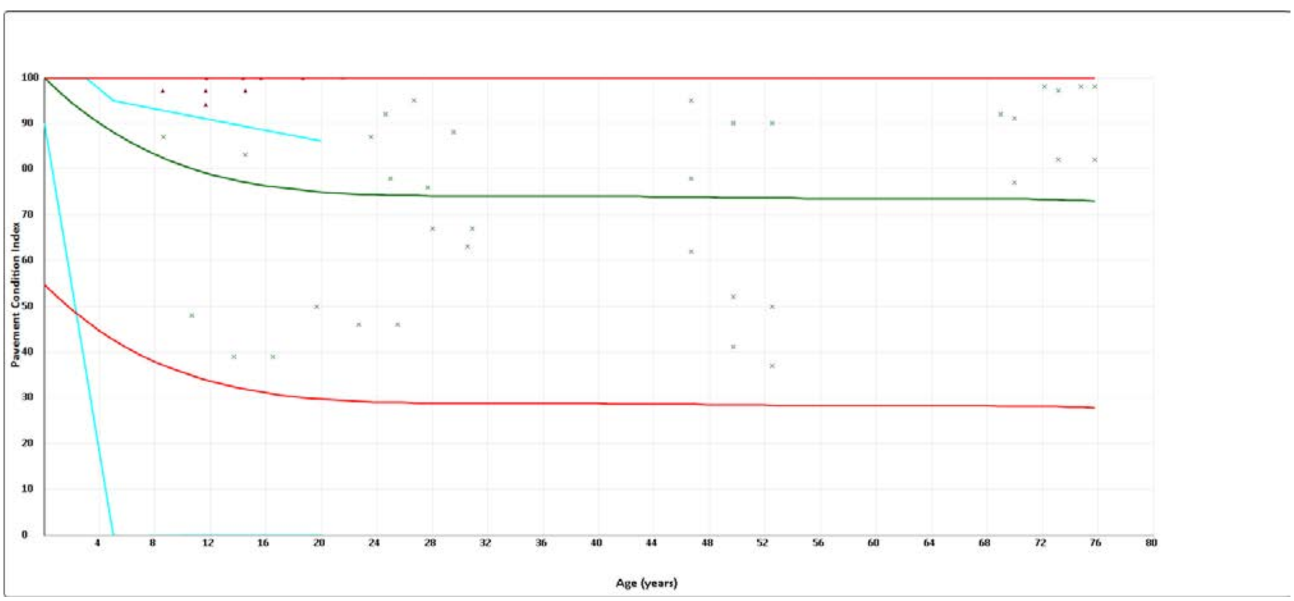


Figure 8. Performance Curve for Category 2 PCC Aprons – Central Oregon.

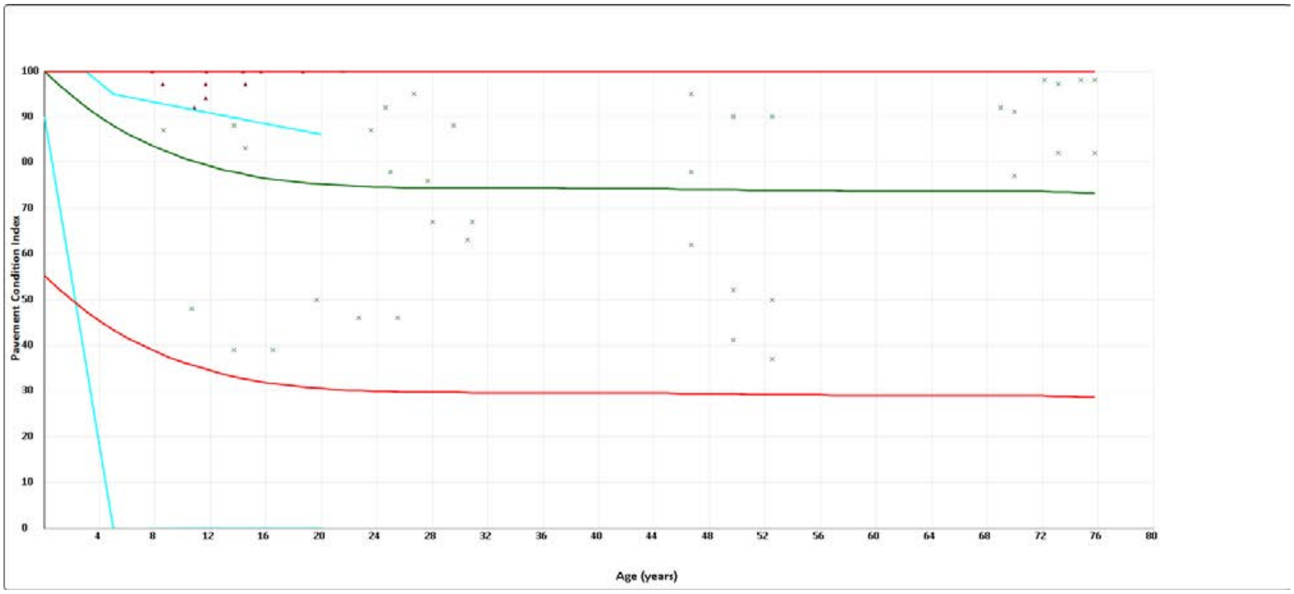


Figure 9. Performance Curve for Category 2 PCC Taxiways – Central Oregon.

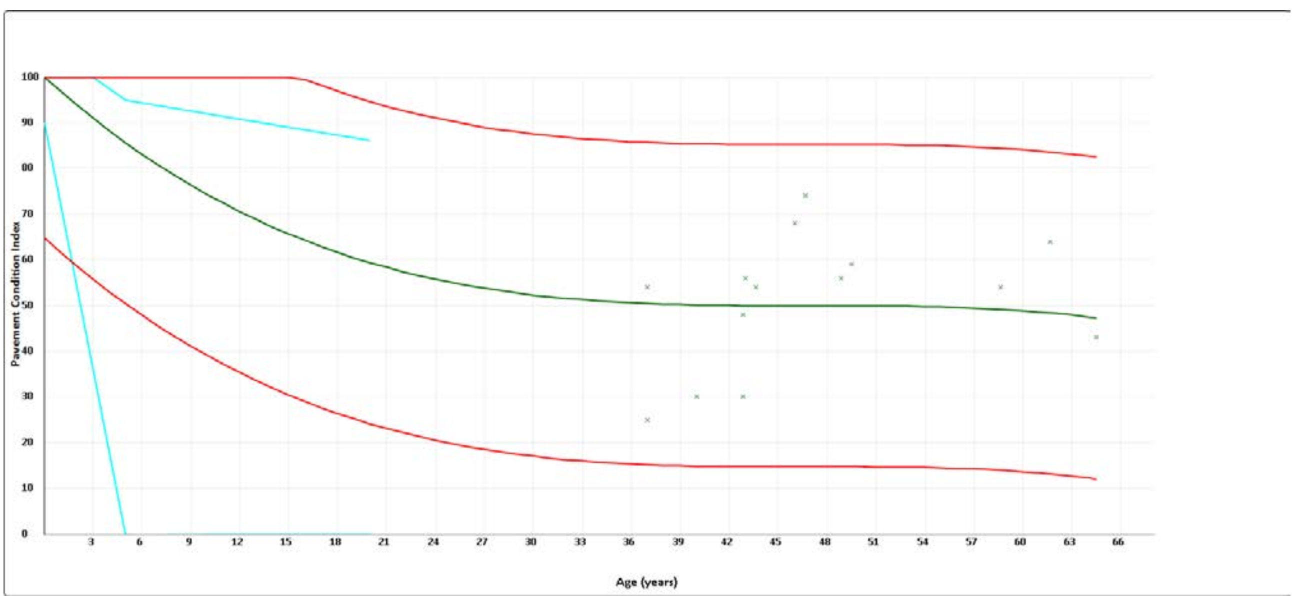


Figure 10. Performance Curve for Category 2 ST Aprons – Central Oregon.

Typical Maintenance Requirements

The PAVER-generated M&R Plan Report was used to identify when pavement maintenance and rehabilitation projects are required for a given pavement section, and what repair type is most appropriate. The repair strategies evaluated were:

- Reconstruction (pavements with Pavement Condition Indices less than 40).
- Overlay flexible pavements (runways with Pavement Condition Indices between 40 and 65, taxiways between 40 and 60, aprons between 40 and 55, and pavements exhibiting significant load-related distress with PCIs above the critical PCI).
- Global maintenance (fog seal, slurry seal or thin (2 inch) overlay) applied on a user-specified interval of 6 years for a fog seal, 6 years for a slurry seal, and 10 years for an overlay, unless the Pavement Condition Index (PCI) is above 90, at which point the global maintenance will be scheduled when the PCI falls to 90 or below. The global maintenance type recommended is based on the distress types observed in the section during the visual inspections.
- Routine maintenance, such as crack sealing and patching.

The M&R Plan Report was generated for a 5-year period beginning in June 2019. Included in the work plan are estimated costs for each recommended project. The costs are estimated by applying a unit cost for the recommended activity to the square foot area of the pavement section. The unit costs include adjustments for engineering and administration, mobilization, restriping and contingency. The unit costs used to develop the work plan activity cost are shown in Table 4. The recommended work plan for your airport is provided in your attached individual airport report.

Table 4. Unit Costs for the Various Work Plan Activities.

Activity	Unit	Unit Cost
Fog Seal	SF	$0.19
Slurry Seal	SF	$0.31
2” Asphalt Concrete Overlay	SF	$2.50
2” – 3” AC Mill and Replace	SF	$3.00 - $4.50
Reconstruction	SF	$7.95 – 13.6

Your Airport Report

AURORA STATE AIRPORT

This report describes how your Pavement Maintenance Management Program (PMMP) was developed. Your Program was developed as part of the Oregon Continuous Aviation System Plan sponsored in part by the Oregon Department of Aviation and the Federal Aviation Administration (FAA). The information and data contained in this report ensures you comply with the requirements of FAA Grant Assurance Number 11 which states that any airport requesting federal funds for pavement improvement projects must have implemented a pavement maintenance management program.

DATA COLLECTION

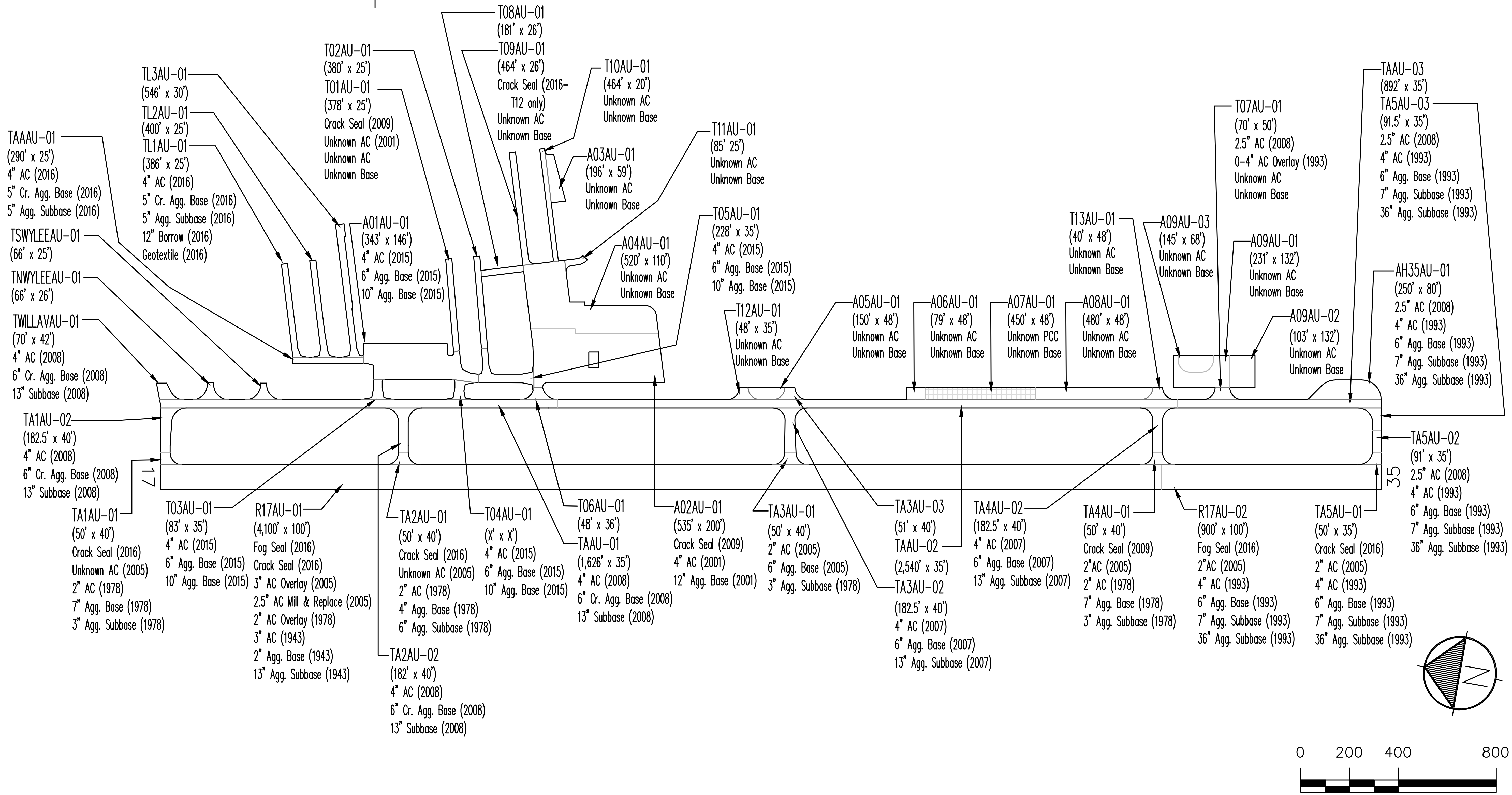
To determine how your pavements were constructed and their age, a records review was conducted. Figure AU-1 shows the records review results. This figure identifies pavement boundaries, dimensions, pavement layer types, thicknesses and dates of construction. The most recent construction date for each pavement can also be found in the Section Condition Report in Appendix 2. Figure AU-1 and the information contained in Appendices 1, 2 and 4 ensure that your airport complies with the “pavement inventory” requirement of FAA’s PMMP guidelines.

The pavements at your airport were divided into branches, sections and sample units in accordance with the methodology outlined in the current edition of ASTM D5430, *Standard Test Method for Airport Condition Index Surveys*. The branches, sections and sample units established at your airport are shown in Figure AU-2. A Branch Condition Report showing all branches, their associated areas, and their area-weighted average condition is provided in Appendix 1. Additionally, the Appendix 2 Section Condition Report provides information used to define each branch and section in the PAVER database.

Using the branch, section and sample unit divisions established, a visual condition survey was conducted at Aurora State Airport in July 2018. During the inspection, pavement defects were identified and measured in accordance with the methodology outlined in ASTM D5430. This inspection ensures your airport complies with the “detailed inspection” requirement of FAA’s PMMP guidelines. After collection, the data were entered into the PAVER software for analysis. These data are reproduced in the Re-Inspection Report attached as Appendix 4.

The PAVER database updated during this project ensures your airport complies with the “record keeping and information retrieval” requirements of FAA’s PMMP guidelines.

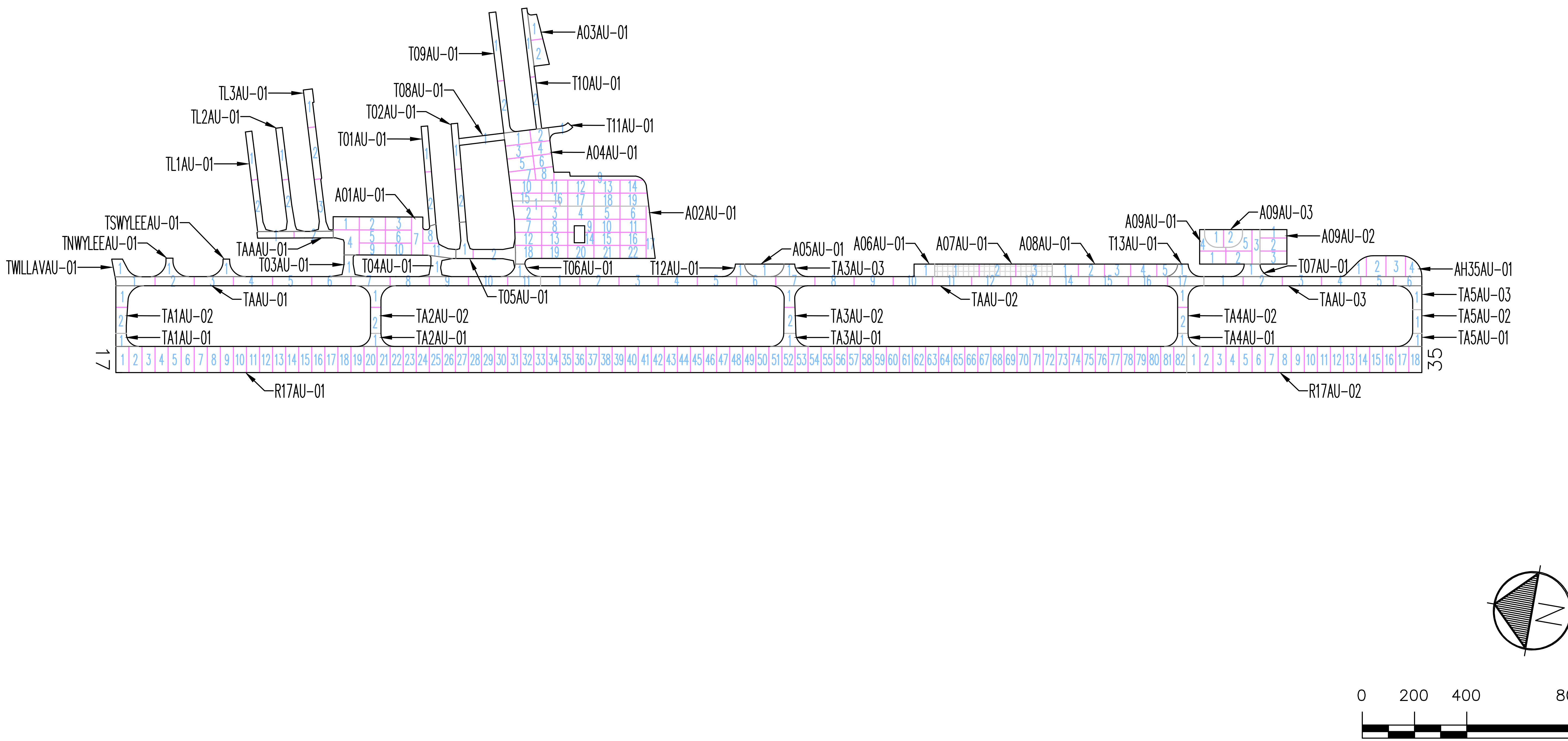
Figure AU-1. Airport Layout, Dimensions and Pavement Cross-Sections.
Aurora State Airport



Drawing Date: September 2018

PAVEMENT CONSULTANTS INC.

Figure AU-2. Pavement Branch, Section and Sample Unit Layout.
Aurora State Airport



PAVEMENT CONSULTANTS INC.

Drawing Date: September 2018

RESULTS

Using the data collected during the visual inspection, the PAVER software was used to calculate an area-weighted average Pavement Condition Index (PCI) for each pavement section inspected using the sample units evaluated. Using each section's PCI, a Pavement Condition Rating (PCR) was assigned. The PCIs measured during this inspection are shown in Table 1. The table also contains PCIs from past inspections as well as projected PCIs for 2023 and 2028. The projections were based on pavement deterioration models developed by PAVER using the inspection data from other pavements in the same airport category as your airport, located in the same climatic region, and with the same surface type and use.

The Branch Condition Report in Appendix 1 summarizes current pavement condition by branch while the Section Condition Report in Appendix 2 lists pavement condition by section. The current Pavement Condition Rating (PCR) is shown graphically in Figure AU-3.

Table 1. Past, Present and Future Pavement Condition Indices.

Branch	Section	Inspections			Forecast	
		2012	2015	2018	2023	2028
A01AU	01	---	100	100	85	78
A02AU	01	82	64	53	48	44
A03AU	01	78	53	49	45	42
A04AU	01	98	62	68	63	57
A05AU	01	69	41	40	35	25
A06AU	01	100	86	82	77	73
A07AU	01	87	95	88	81	77
A08AU	01	78	64	70	66	60
A09AU	01	60	64	49	45	42
A09AU	02	---	100	75	72	68
A09AU	03	---	100	88	80	75
AH35AU	01	100	80	71	67	62
R17AU	01	83	81	83	78	77
R17AU	02	81	75	72	47	24
T01AU	01	95	89	88	81	79
T02AU	01	91	85	74	65	52
T03AU	01	---	100	100	93	84
T04AU	01	---	100	100	93	84
T05AU	01	---	100	100	93	84
T06AU	01	100	89	80	79	79
T07AU	01	100	91	79	75	74
T08AU	01	83	80	64	51	37
T09AU	01	86	73	71	60	46
T10AU	01	78	58	61	48	34

Table 1. Past, Present and Future Pavement Condition Indices.

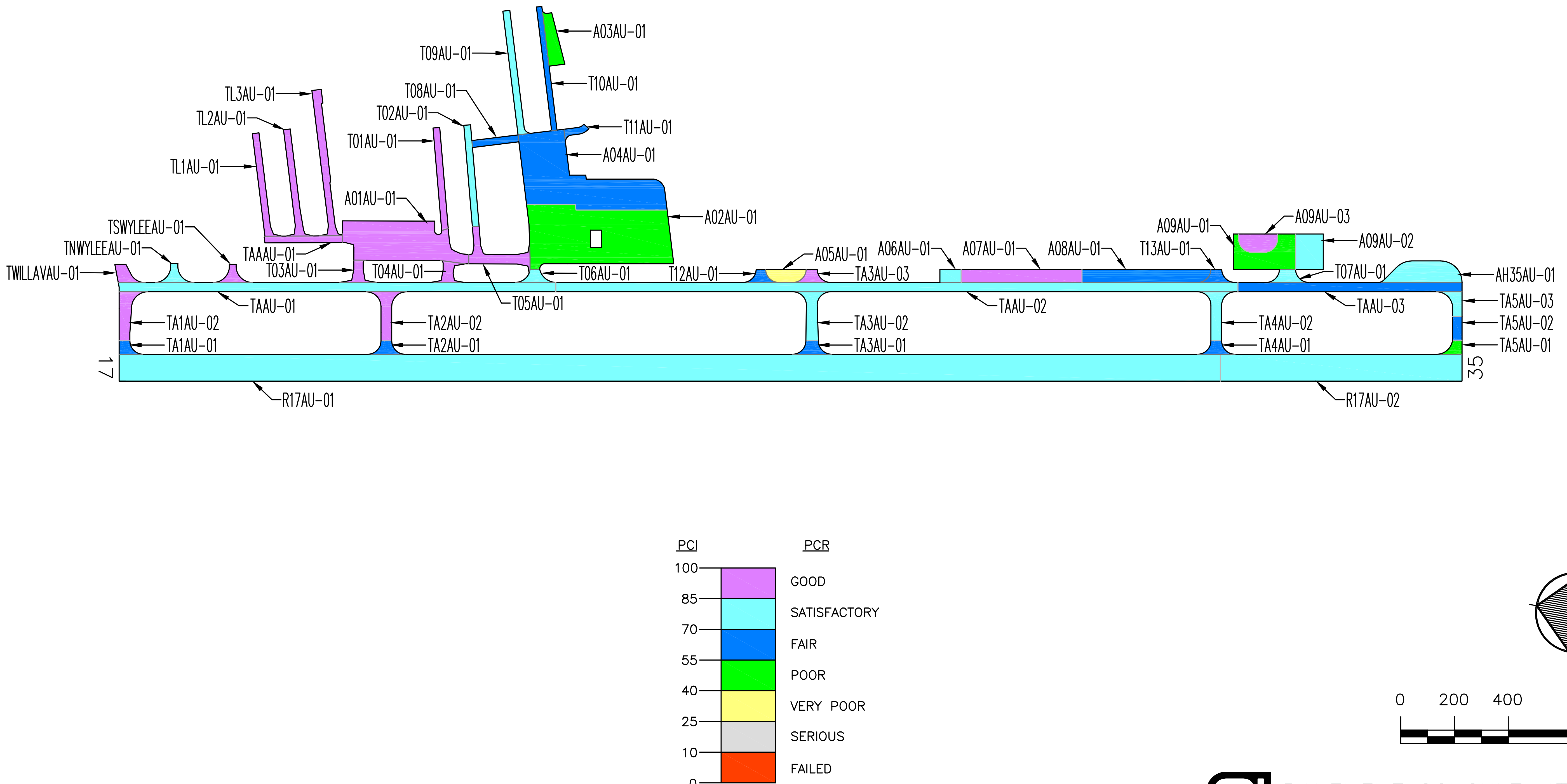
Branch	Section	Inspections			Forecast	
		2012	2015	2018	2023	2028
T11AU	01	64	62	69	58	43
T12AU	01	96	79	66	54	39
T13AU	01	84	80	63	50	36
TA1AU	01	100	70	59	58	56
TA1AU	02	94	89	88	81	79
TA2AU	01	81	74	67	66	64
TA2AU	02	100	92	89	82	79
TA3AU	01	75	65	66	65	63
TA3AU	02	100	92	80	79	79
TA3AU	03	100	90	88	81	79
TA4AU	01	83	59	58	57	55
TA4AU	02	92	80	74	65	52
TA5AU	01	74	81	49	35	24
TA5AU	02	100	90	69	58	43
TA5AU	03	---	89	73	72	70
TAAAU	01	---	---	100	93	84
TAAU	01	100	92	83	79	79
TAAU	02	100	91	73	63	50
TAAU	03	100	89	69	58	43
TL1AU	01	---	---	100	93	84
TL2AU	01	---	---	100	93	84
TL3AU	01	---	---	100	93	84
TNWYLEEAU	01	100	94	75	67	54
TSWYLEEAU	01	100	94	94	85	80
TWILLAVAU	01	100	94	89	82	79

Section PCIs at Aurora State Airport range from a low of 40 (a PCR of “Very Poor”) to a high of 100 (a PCR of “Good”). The area-weighted average PCI for all airport pavements is 77, corresponding to an overall PCR of “Satisfactory”. Figure AU-4 shows how much pavement area is associated with each Pavement Condition Rating category and also shows pavement condition distribution from the inspections conducted in 2012 and 2015.

The primary distresses observed during the inspection were: longitudinal and transverse cracking, weathering, patching, block cracking, alligator cracking, raveling and depressions. The primary distress observed in the concrete pavement was joint spalls, with isolated occurrences of linear cracking.

A graphical representation of the projected PCIs listed in Table 1 is shown in Figure AU-5.

Figure AU-3. Pavement Condition in July 2018.
Aurora State Airport



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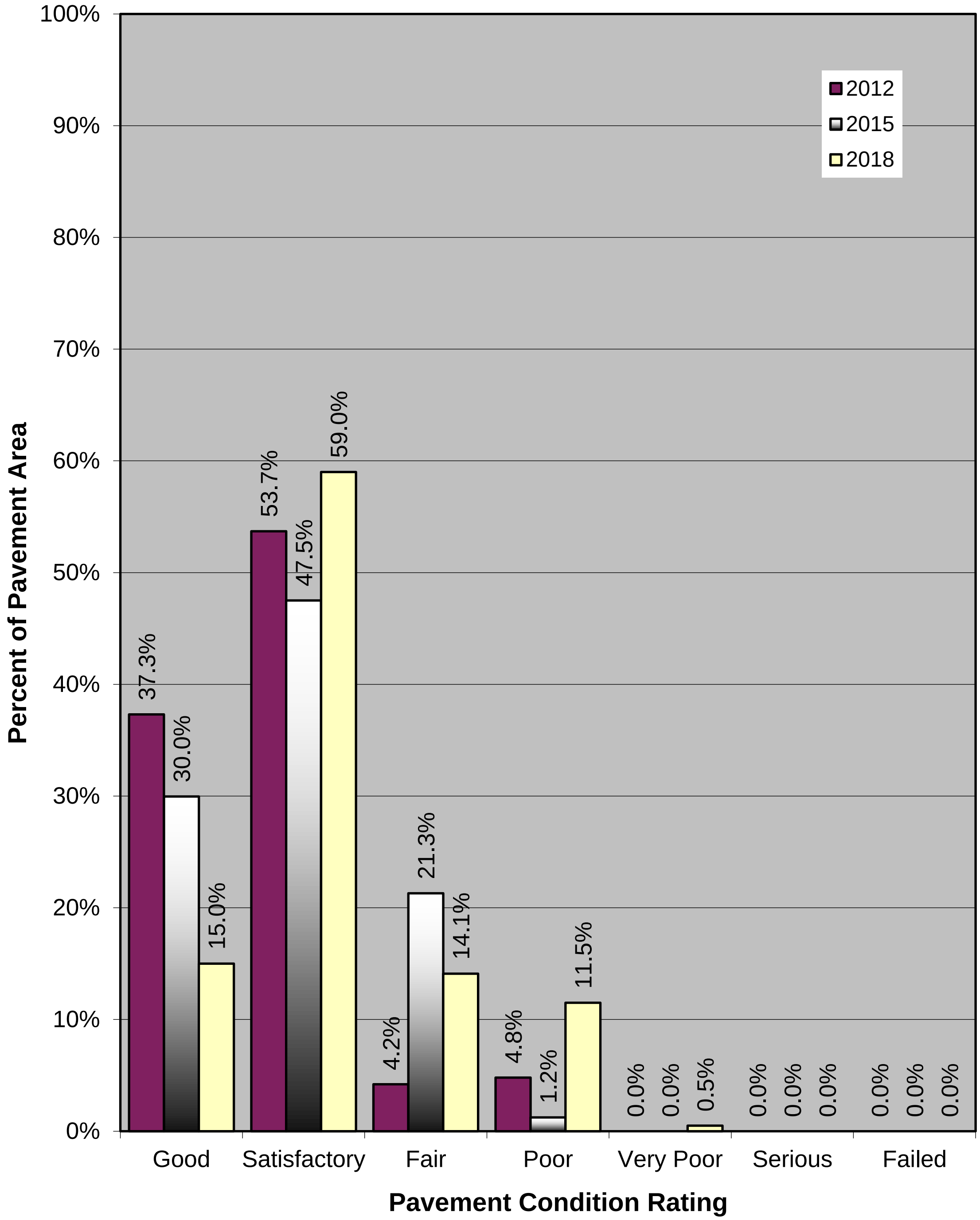
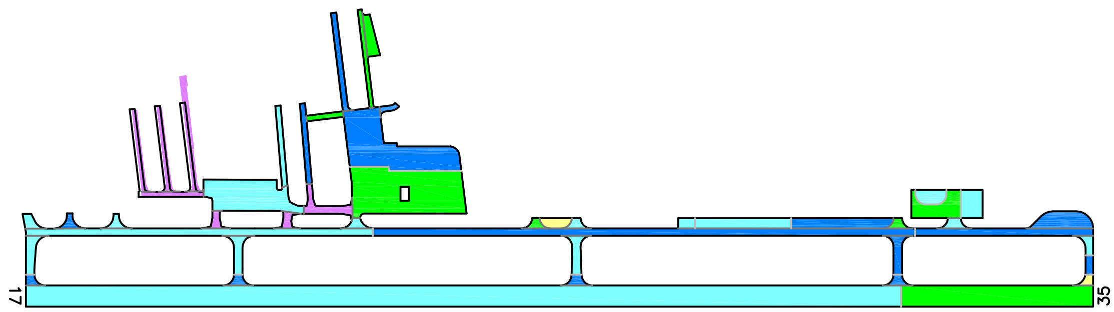
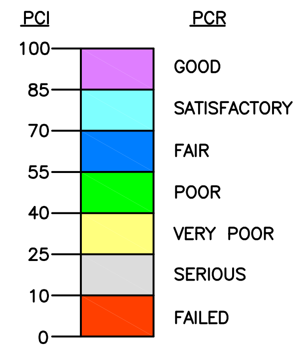
Drawing Date: September 2018

Figure AU-4. Pavement Condition Distribution
Aurora State Airport

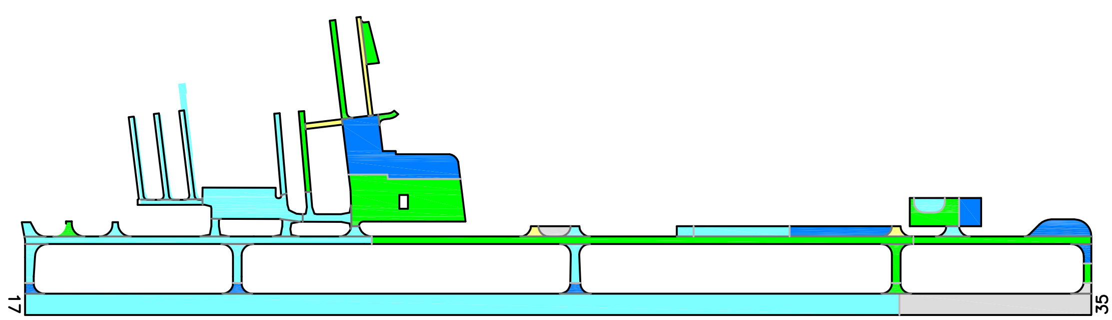


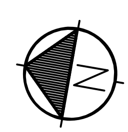
Predicted Condition in 2023.





Predicted Condition in 2028.





Drawing Date: September 2018

PAVEMENT CONSULTANTS INC.

Figure AU-5. Future Pavement Condition.

RECOMMENDATIONS

Data collected during the visual condition survey were used by the PAVER software to generate the Network Maintenance Report contained in Appendix 3. This report identifies, for each pavement section, the recommended localized maintenance activities (i.e.-crack sealing, patching) that should be completed to repair the defects observed during the visual inspection. The repair quantities identified in the report were extrapolated to cover the entire pavement section, based on the distresses measured in the inspected sample units. If the repair activities identified are completed, the pavement deterioration rate will be slowed.

The recommended localized maintenance activities to be applied are selected by the PAVER software based on a Distress Maintenance Policy established for the Oregon airport system. The report results indicate that, over your entire airport, the following quantities of localized maintenance are needed:

- 20,295 linear feet of asphalt concrete crack sealing
- 4 linear feet of asphalt concrete wide crack sealing/repair.

The PAVER software can also identify and schedule recommended global (applied over an entire section) maintenance activities such as fog seals, slurry seals and other surface treatments, as well as major rehabilitation activities such as asphalt concrete overlays and complete reconstruction. PAVER schedules global maintenance on a user-defined interval. To schedule major rehabilitation PAVER uses pavement deterioration models developed during this project. These models are used to estimate future pavement condition and to schedule rehabilitation based on a trigger PCI.

During this project a 5-year program outlining recommended global maintenance and rehabilitation was developed. The program begins in the year 2019 to allow time for project development. These recommendations are presented in Table 2, which identifies the pavement section requiring rehabilitation, the year the action should be completed, the type of action, and an associated cost. This information is also presented graphically in Figure AU-6.

Table 2. Five-Year Global Maintenance and Rehabilitation Plan.

Year	Branch	Section	Action	Area (sf)	Unit Cost ($/sf)	Total Cost ($)
2019	A02AU	01	Slurry Seal	109,649	$0.31	$33,991
2019	A03AU	01	2" AC Overlay	9,162	$2.50	$22,905
2019	A04AU	01	Slurry Seal	87,212	$0.31	$27,036
2019	A05AU	01	4" AC over 6" Crushed Aggregate Base over 13" Aggregate Subbase	6,184	$11.45	$70,807

Table 2. Five-Year Global Maintenance and Rehabilitation Plan.

Year	Branch	Section	Action	Area (sf)	Unit Cost ($/sf)	Total Cost ($)
2019	A06AU	01	Slurry Seal	3,790	$0.31	$1,175
2019	A08AU	01	Slurry Seal	22,503	$0.31	$6,976
2019	A09AU	01	2" AC Overlay	21,705	$2.50	$54,263
2019	A09AU	02	Slurry Seal	13,596	$0.31	$4,215
2019	A09AU	03	Slurry Seal	8,786	$0.31	$2,724
2019	AH35AU	01	Slurry Seal	19,308	$0.31	$5,985
2019	T01AU	01	Slurry Seal	9,478	$0.31	$2,938
2019	T02AU	01	Slurry Seal	9,468	$0.31	$2,935
2019	T06AU	01	Slurry Seal	3,128	$0.31	$970
2019	T07AU	01	Slurry Seal	3,953	$0.31	$1,225
2019	T08AU	01	Slurry Seal	4,516	$0.31	$1,400
2019	T09AU	01	Slurry Seal	12,198	$0.31	$3,781
2019	T10AU	01	2" AC Overlay	9,280	$2.50	$23,200
2019	T11AU	01	Slurry Seal	2,325	$0.31	$721
2019	T12AU	01	Slurry Seal	2,749	$0.31	$852
2019	T13AU	01	Slurry Seal	2,992	$0.31	$928
2019	TA1AU	01	2" AC Overlay	2,537	$2.50	$6,343
2019	TA1AU	02	Slurry Seal	8,740	$0.31	$2,709
2019	TA2AU	01	Slurry Seal	3,073	$0.31	$953
2019	TA2AU	02	Slurry Seal	8,595	$0.31	$2,664
2019	TA3AU	01	Slurry Seal	3,403	$0.31	$1,055
2019	TA3AU	02	Slurry Seal	8,813	$0.31	$2,732
2019	TA3AU	03	Slurry Seal	3,190	$0.31	$989
2019	TA4AU	01	2" AC Overlay	3,324	$2.50	$8,310
2019	TA4AU	02	Slurry Seal	9,028	$0.31	$2,799
2019	TA5AU	01	2" AC Overlay	2,520	$2.50	$6,300
2019	TA5AU	02	Slurry Seal	3,188	$0.31	$988
2019	TA5AU	03	Slurry Seal	3,975	$0.31	$1,232
2019	TAAU	01	Slurry Seal	56,785	$0.31	$17,603
2019	TAAU	02	Slurry Seal	88,885	$0.31	$27,554
2019	TAAU	03	Slurry Seal	29,204	$0.31	$9,053
2019	TNWYLEEAU	01	Slurry Seal	3,465	$0.31	$1,074
2019	TWILLAVAU	01	Slurry Seal	3,777	$0.31	$1,171
					2019 Total	**$362,556**
2021	R17AU	02	Slurry Seal	90,000	$0.31	$27,900
2021	TSWYLEEAU	01	Fog Seal	3,237	$0.19	$615
2021	A01AU	01	Fog Seal	56,334	$0.19	$10,703
2021	R17AU	01	Slurry Seal	410,000	$0.31	$127,100

Table 2. Five-Year Global Maintenance and Rehabilitation Plan.

Year	Branch	Section	Action	Area (sf)	Unit Cost ($/sf)	Total Cost ($)
					2021 Total	$166,318
					5-Year Total	$528,875

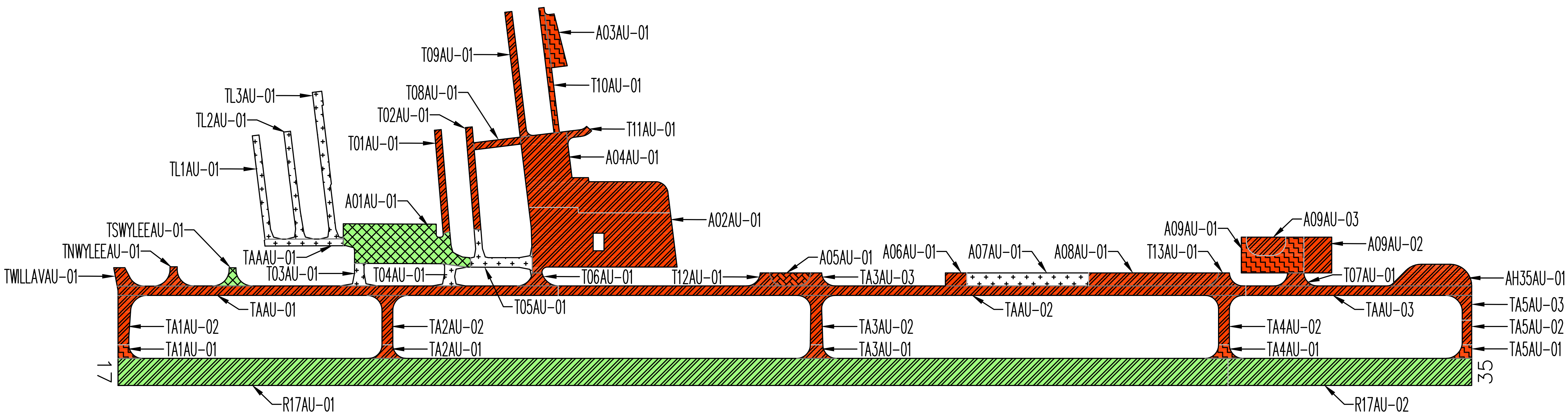
If the global maintenance and/or rehabilitation activities recommended in Table 2 are not completed, the localized maintenance activities identified in the Network Maintenance Report (Appendix 3) for that section should be done. Additionally, for those sections not listed in Table 2 as requiring global maintenance or rehabilitation, the localized maintenance activities outlined in the Network Maintenance Report should be completed. By completing the localized maintenance activities, pavement condition is improved, life is extended, deterioration is slowed and the length of time until major repair or rehabilitation is required is increased.

INSPECTION SCHEDULE

To comply with the inspection schedule requirement of FAA Grant Assurance Number 11, a detailed visual inspection should be conducted every 3 years using the methodology described in ASTM D5430. The next scheduled detailed visual inspection should take place in 2021.

In addition, the FAA requires that a drive-by inspection be conducted monthly to detect unforeseen changes in pavement condition. The results of each drive-by inspection should be recorded and kept in a file. At a minimum, the date of the inspection and an indication of any maintenance performed since the last drive-by inspection should be recorded.

Figure AU-6. Five-Year Pavement Management Plan.
Aurora State Airport

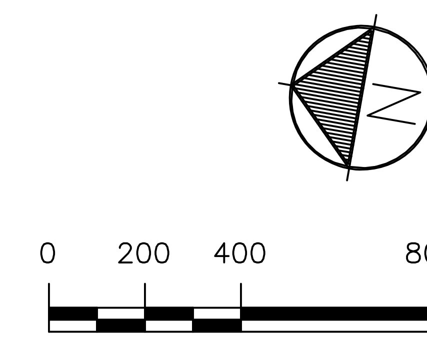


ACTION TIMING

- 2019
- 2020
- 2021
- 2022
- 2023

ACTION

- FOG SEAL
- SLURRY SEAL
- OVERLAY
- RECONSTRUCT
- ROUTINE MAINTENANCE



PAVEMENT CONSULTANTS INC.

Drawing Date: September 2018

Appendix 1
Branch Condition Report

Branch Condition Report

Pavement Database: ODA_2018 _Final

Branch ID	Number of Sections	Sum Section Length (Ft)	Avg Section Width (Ft)	True Area (SqFt)	Use	Average PCI	Standard Deviation PCI	Weighted Average PCI
A01AU	1	343.00	146.00	56,334.00	APRON	100.00	0.00	100.00
A02AU	1	523.00	200.00	109,649.00	APRON	53.00	0.00	53.00
A03AU	1	197.00	59.00	9,162.00	APRON	49.00	0.00	49.00
A04AU	1	520.00	280.00	87,212.00	APRON	68.00	0.00	68.00
A05AU	1	150.00	48.00	6,184.00	APRON	40.00	0.00	40.00
A06AU	1	79.00	48.00	3,790.00	APRON	82.00	0.00	82.00
A07AU	1	450.00	48.00	21,600.00	APRON	88.00	0.00	88.00
A08AU	1	480.00	48.00	22,503.00	APRON	70.00	0.00	70.00
A09AU	3	479.00	110.67	44,087.00	APRON	70.67	16.21	64.79
AH35AU	1	225.00	80.00	19,308.00	APRON	71.00	0.00	71.00
R17AU	2	5,000.00	100.00	500,000.00	RUNWAY	77.50	5.50	81.02
T01AU	1	380.00	25.00	9,478.00	TAXIWAY	88.00	0.00	88.00
T02AU	1	378.00	25.00	9,468.00	TAXIWAY	74.00	0.00	74.00
T03AU	1	83.00	35.00	3,684.00	TAXIWAY	100.00	0.00	100.00
T04AU	1	75.00	40.00	3,880.00	TAXIWAY	100.00	0.00	100.00
T05AU	1	228.00	35.00	11,678.00	TAXIWAY	100.00	0.00	100.00
T06AU	1	48.00	36.00	3,128.00	TAXIWAY	80.00	0.00	80.00
T07AU	1	48.00	60.00	3,953.00	TAXIWAY	79.00	0.00	79.00
T08AU	1	174.00	25.00	4,516.00	TAXIWAY	64.00	0.00	64.00
T09AU	1	464.00	26.00	12,198.00	TAXIWAY	71.00	0.00	71.00
T10AU	1	464.00	20.00	9,280.00	TAXIWAY	61.00	0.00	61.00
T11AU	1	85.00	25.00	2,325.00	TAXIWAY	69.00	0.00	69.00
T12AU	1	48.00	35.00	2,749.00	TAXIWAY	66.00	0.00	66.00
T13AU	1	40.00	48.00	2,992.00	TAXIWAY	63.00	0.00	63.00
TA1AU	2	232.50	40.00	11,277.00	TAXIWAY	73.50	14.50	81.48
TA2AU	2	232.50	40.00	11,668.00	TAXIWAY	78.00	11.00	83.21
TA3AU	3	283.50	40.00	15,406.00	TAXIWAY	78.00	9.09	78.56
TA4AU	2	232.50	40.00	12,352.00	TAXIWAY	66.00	8.00	69.69
TA5AU	3	232.50	35.00	9,683.00	TAXIWAY	63.67	10.50	65.44
TAAAU	1	290.00	25.00	7,284.00	TAXIWAY	100.00	0.00	100.00
TAAU	3	5,000.00	35.00	174,874.00	TAXIWAY	75.00	5.89	75.58
TL1AU	1	386.00	25.00	9,921.00	TAXIWAY	100.00	0.00	100.00
TL2AU	1	400.00	25.00	10,673.00	TAXIWAY	100.00	0.00	100.00
TL3AU	1	546.00	25.00	15,963.00	TAXIWAY	100.00	0.00	100.00
TNWYLEE	1	66.00	26.00	3,465.00	TAXIWAY	75.00	0.00	75.00
TSWYLEE	1	66.00	25.00	3,237.00	TAXIWAY	94.00	0.00	94.00
TWILLAVA	1	70.00	42.00	3,777.00	TAXIWAY	89.00	0.00	89.00

Branch Condition Report

Pavement Database: ODA_2018 _Final

Use Category	Number of Sections	Total Area (SqFt)	Arithmetic Average PCI	Average STD PCI	Weighted Average PCI
APRON	12	379829.000466786	69.42	17.77	68.68
RUNWAY	2	500000.002380733	77.50	5.50	81.02
TAXIWAY	35	368909.0000595	78.80	14.44	79.61
ALL	49	1248738.00290702	76.45	15.61	76.85

Appendix 2
Section Condition Report

Pavement Database: ODA_2018 _Final *NetworkId: Aurora*

Branch ID	Section ID	Last Const. Date	Surface	Use	Rank	Lanes	True Area (SqFt)	Last Inspection Date	Age At Inspection	PCI
A01AU	01	9/26/2015	AC	APRON	P	0	56,334.00	7/12/2018	3	100
A02AU	01	8/2/2001	AC	APRON	P	0	109,649.00	7/12/2018	17	53
A03AU	01	1/1/1969	AC	APRON	S	0	9,162.00	7/12/2018	49	49
A04AU	01	1/1/2008	AC	APRON	P	0	87,212.00	7/12/2018	10	68
A05AU	01	1/1/1989	AC	APRON	S	0	6,184.00	7/12/2018	29	40
A06AU	01	1/1/2007	AC	APRON	S	0	3,790.00	7/12/2018	11	82
A07AU	01	1/1/1989	PCC	APRON	S	0	21,600.00	7/12/2018	29	88
A08AU	01	1/1/1989	AC	APRON	S	0	22,503.00	7/12/2018	29	70
A09AU	01	1/1/1989	AC	APRON	S	0	21,705.00	7/12/2018	29	49
A09AU	02	6/1/2010	AC	APRON	S	0	13,596.00	7/12/2018	8	75
A09AU	03	6/1/2010	AC	APRON	S	0	8,786.00	7/12/2018	8	88
AH35AU	01	8/1/2008	AC	APRON	P	0	19,308.00	7/12/2018	10	71
R17AU	01	5/2/2005	AC	RUNWAY	P	0	410,000.00	7/12/2018	13	83
R17AU	02	5/1/2005	AAC	RUNWAY	P	0	90,000.00	7/12/2018	13	72
T01AU	01	8/1/2001	AC	TAXIWAY	S	0	9,478.00	7/12/2018	17	88
T02AU	01	8/1/2001	AC	TAXIWAY	S	0	9,468.00	7/12/2018	17	74
T03AU	01	9/26/2015	AC	TAXIWAY	S	0	3,684.00	7/12/2018	3	100
T04AU	01	9/26/2015	AC	TAXIWAY	S	0	3,880.00	7/12/2018	3	100
T05AU	01	9/26/2015	AC	TAXIWAY	S	0	11,678.00	7/12/2018	3	100
T06AU	01	9/3/2008	AC	TAXIWAY	S	0	3,128.00	7/12/2018	10	80
T07AU	01	8/1/2008	AAC	TAXIWAY	S	0	3,953.00	7/12/2018	10	79
T08AU	01	1/1/1989	AC	TAXIWAY	S	0	4,516.00	7/12/2018	29	64
T09AU	01	1/1/1989	AC	TAXIWAY	S	0	12,198.00	7/12/2018	29	71
T10AU	01	1/1/1989	AC	TAXIWAY	S	0	9,280.00	7/12/2018	29	61
T11AU	01	1/1/1989	AC	TAXIWAY	S	0	2,325.00	7/12/2018	29	69
T12AU	01	1/1/2001	AC	TAXIWAY	S	0	2,749.00	7/12/2018	17	66
T13AU	01	1/1/1989	AC	TAXIWAY	S	0	2,992.00	7/12/2018	29	63
TA1AU	01	5/2/2005	AAC	TAXIWAY	P	0	2,537.00	7/12/2018	13	59
TA1AU	02	9/3/2008	AC	TAXIWAY	P	0	8,740.00	7/12/2018	10	88
TA2AU	01	5/2/2005	AAC	TAXIWAY	P	0	3,073.00	7/12/2018	13	67
TA2AU	02	9/3/2008	AC	TAXIWAY	P	0	8,595.00	7/12/2018	10	89
TA3AU	01	5/2/2005	AAC	TAXIWAY	P	0	3,403.00	7/12/2018	13	66
TA3AU	02	9/3/2007	AC	TAXIWAY	P	0	8,813.00	7/12/2018	11	80
TA3AU	03	9/3/2007	AC	TAXIWAY	P	0	3,190.00	7/12/2018	11	88
TA4AU	01	5/2/2005	AAC	TAXIWAY	P	0	3,324.00	7/12/2018	13	58
TA4AU	02	9/3/2007	AC	TAXIWAY	P	0	9,028.00	7/12/2018	11	74
TA5AU	01	5/2/2005	AC	TAXIWAY	P	0	2,520.00	7/12/2018	13	49
TA5AU	02	8/1/2008	AC	TAXIWAY	P	0	3,188.00	7/12/2018	10	69
TA5AU	03	8/1/2008	AAC	TAXIWAY	P	0	3,975.00	7/12/2018	10	73
TAAAU	01	9/3/2016	AC	TAXIWAY	P	0	7,284.00	7/12/2018	2	100
TAAU	01	9/3/2008	AC	TAXIWAY	P	0	56,785.00	7/12/2018	10	83
TAAU	02	9/3/2007	AC	TAXIWAY	P	0	88,885.00	7/12/2018	11	73
TAAU	03	8/1/2008	AC	TAXIWAY	P	0	29,204.00	7/12/2018	10	69
TL1AU	01	9/3/2016	AC	TAXIWAY	S	0	9,921.00	7/12/2018	2	100

TL2AU	01	9/3/2016	AC	TAXIWAY	S	0	10,673.00	7/12/2018	2	100
TL3AU	01	9/3/2016	AC	TAXIWAY	S	0	15,963.00	7/12/2018	2	100
TNWYLEEAU	01	9/3/2008	AC	TAXIWAY	S	0	3,465.00	7/12/2018	10	75
TSWYLEEAU	01	9/3/2008	AC	TAXIWAY	S	0	3,237.00	7/12/2018	10	94
TWILLAVAU	01	9/3/2008	AC	TAXIWAY	P	0	3,777.00	7/12/2018	10	89

Section Condition Report (Summary)

Pavement Database: ODA_2018 _Final

Age Category	Average Age at Inspection	Total Area (SqFt)	Number of Sections	Arithmetic Average PCI	Standard Deviation PCI	Weighted Average PCI
00-02	2	43,841.00	4	100.00	0.00	100.00
03-05	3	75,576.00	4	100.00	0.00	100.00
06-10	10	256,949.00	15	79.33	8.39	75.23
11-15	12	628,563.00	12	70.92	11.13	79.32
16-20	17	131,344.00	4	70.25	12.70	57.31
26-30	29	103,303.00	9	63.89	12.90	66.38
41-50	49	9,162.00	1	49.00	0.00	49.00
ALL	14	1,248,738.00	49	76.45	15.61	76.85

Appendix 3
Network Maintenance Report

Network Maintenance Report
Aurora State Airport

Network	Branch	Section	Distress	Severity	Action	Work Quantity	Unit	Unit Cost	Work Cost	Section Total Cost
Aurora	A02AU	01	Block Cracking	Medium	Crack Sealing - AC	6,404	Ft	$1.50	$9,605	$9,605
Aurora	A05AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	90	Ft	$1.50	$135	$135
Aurora	A06AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	40	Ft	$1.50	$60	$60
Aurora	A08AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	477	Ft	$1.50	$715	$715
Aurora	A09AU	01	Block Cracking	Medium	Crack Sealing - AC	3,308	Ft	$1.50	$4,961	$4,961
Aurora	AH35AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	758	Ft	$1.50	$1,136	$1,136
Aurora	R17AU	02	Long. & Trans. Cracking	Medium	Crack Sealing - AC	3,960	Ft	$1.50	$5,940	$5,940
Aurora	T01AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	20	Ft	$1.50	$30	$30
Aurora	T02AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	190	Ft	$1.50	$285	$285
Aurora	T07AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	40	Ft	$1.50	$60	$60
Aurora	T08AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	120	Ft	$1.50	$180	$180
Aurora	T09AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	260	Ft	$1.50	$390	$390
Aurora	T11AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	50	Ft	$1.50	$75	$75
Aurora	T12AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	120	Ft	$1.50	$180	$180
Aurora	T13AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	110	Ft	$1.50	$165	$165
Aurora	TA1AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	240	Ft	$1.50	$360	$360
Aurora	TA2AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	130	Ft	$1.50	$195	$195
Aurora	TA3AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	154	Ft	$1.50	$230	$230
Aurora	TA3AU	02	Long. & Trans. Cracking	High	Crack Seal - Wide Cracks	1	Ft	$30.00	$30	$30
Aurora	TA4AU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	250	Ft	$1.50	$375	$375
Aurora	TA4AU	02	Long. & Trans. Cracking	Medium	Crack Sealing - AC	100	Ft	$1.50	$150	$150
Aurora	TA5AU	01	Block Cracking	Medium	Crack Sealing - AC	384	Ft	$1.50	$576	$576
Aurora	TA5AU	02	Long. & Trans. Cracking	Medium	Crack Sealing - AC	110	Ft	$1.50	$165	$165
Aurora	TA5AU	03	Long. & Trans. Cracking	Medium	Crack Sealing - AC	90	Ft	$1.50	$135	$135
Aurora	TAAU	01	Long. & Trans. Cracking	High	Crack Seal - Wide Cracks	3	Ft	$30.00	$81	$81
Aurora	TAAU	02	Long. & Trans. Cracking	Medium	Crack Sealing - AC	1,795	Ft	$1.50	$2,692	$2,692
Aurora	TAAU	03	Long. & Trans. Cracking	Medium	Crack Sealing - AC	1,038	Ft	$1.50	$1,558	$1,558
Aurora	TNWYLEEAU	01	Long. & Trans. Cracking	Medium	Crack Sealing - AC	60	Ft	$1.50	$90	$90
									Total	$30,555

Appendix 4
Re-Inspection Report

Re-Inspection Report

ODA_2018 _Final
Generated Date 7/26/2018

Network: Aurora **Name:** Aurora State

Branch: A01AU **Name:** Apron 01 Aurora **Use:** APRON **Area:** 56,334 SqFt

Section: 01 of 1 **From:** Taxiway 06 **To:** Tie Down Apron New **Last Const.:** 9/26/2015
Surface: AC **Family:** OR-Cat2-AC-Central-AP-2015 **Zone:** KUAO **Category:** F **Rank:** P
Area: 56,334 SqFt **Length:** 343 Ft **Width:** 146 Ft
Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft
Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0
Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 11 **Surveyed:** 4
Conditions: **PCI:** 100
Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5000.00 SqFt **PCI:** 100
Sample Comments:

<No Distress>

Sample Number: 02 **Type:** R **Area:** 5000.00 SqFt **PCI:** 100
Sample Comments:

<No Distress>

Sample Number: 06 **Type:** R **Area:** 5000.00 SqFt **PCI:** 100
Sample Comments:

<No Distress>

Sample Number: 10 **Type:** R **Area:** 4600.00 SqFt **PCI:** 100
Sample Comments:

<No Distress>

Network: Aurora		**Name:** Aurora State	

Branch: A02AU	**Name:** Apron 02 Aurora	**Use:** APRON	**Area:** 109,649 SqFt

Section: 01	of 1	**From:** Taxiway 09		**To:** Private Apron	**Last Const.:** 8/2/2001
Surface: AC	**Family:** OR-Cat2-AC-Central-AP-2015	**Zone:** KSPB		**Category:** E	**Rank:** P
Area: 109,649 SqFt	**Length:** 523 Ft		**Width:** 200 Ft		
Slabs:	**Slab Length:** Ft		**Slab Width:** Ft		**Joint Length:** Ft
Shoulder:	**Street Type:**		**Grade:** 0		**Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 22 **Surveyed:** 5

Conditions: **PCI:** 53

Inspection Comments:

Sample Number: 03 **Type:** R **Area:** 5000.00 SqFt **PCI:** 54

Sample Comments:

43	BLOCK CR	L	4000.00 SqFt
43	BLOCK CR	M	1000.00 SqFt
57	WEATHERING	L	5000.00 SqFt

Sample Number: 05 **Type:** R **Area:** 5000.00 SqFt **PCI:** 47

Sample Comments:

50	PATCHING	L	1050.00 SqFt
43	BLOCK CR	L	3160.00 SqFt
43	BLOCK CR	M	790.00 SqFt
57	WEATHERING	L	5000.00 SqFt

Sample Number: 11 **Type:** R **Area:** 5000.00 SqFt **PCI:** 54

Sample Comments:

43	BLOCK CR	L	4000.00 SqFt
43	BLOCK CR	M	1000.00 SqFt
57	WEATHERING	L	5000.00 SqFt

Sample Number: 15 **Type:** R **Area:** 5000.00 SqFt **PCI:** 54

Sample Comments:

43	BLOCK CR	L	4000.00 SqFt
43	BLOCK CR	M	1000.00 SqFt
57	WEATHERING	L	5000.00 SqFt

Sample Number: 20 **Type:** R **Area:** 5000.00 SqFt **PCI:** 54

Sample Comments:

43	BLOCK CR	L	4000.00 SqFt
43	BLOCK CR	M	1000.00 SqFt
57	WEATHERING	L	5000.00 SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	A03AU	**Name:**	Tie Down Apron 03 Aurora	**Use:**	APRON	**Area:**	9,162 SqFt

Section: 01 of 1 **From:** T13AU **To:** End **Last Const.:** 1/1/1969

Surface: AC **Family:** OR-Cat2-AC-Central-AP-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 9,162 SqFt **Length:** 197 Ft **Width:** 59 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 49

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3900.00 SqFt **PCI:** 35

Sample Comments:

50	PATCHING	L	1360.00	SqFt
43	BLOCK CR	L	2540.00	SqFt
52	RAVELING	M	2540.00	SqFt

Sample Number: 02 **Type:** R **Area:** 5262.00 SqFt **PCI:** 59

Sample Comments:

52	RAVELING	L	5262.00	SqFt
43	BLOCK CR	L	5262.00	SqFt

Network: Aurora		**Name:** Aurora State	

Branch: A04AU	**Name:** Tie Down Apron 04 Aurora	**Use:** APRON	**Area:** 87,212 SqFt

Section: 01 of 1	**From:** A02AU		**To:** T12AU	**Last Const.:** 1/1/2008
Surface: AC	**Family:** OR-Cat2-AC-Central-AP-2015	**Zone:** KUAO	**Category:** F	**Rank:** P
Area: 87,212 SqFt	**Length:** 520 Ft	**Width:** 280 Ft		
Slabs:	**Slab Length:** Ft	**Slab Width:** Ft		**Joint Length:** Ft
Shoulder:	**Street Type:**	**Grade:** 0		**Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 19 **Surveyed:** 5

Conditions: **PCI:** 68

Inspection Comments:

Sample Number: 02 **Type:** R **Area:** 3600.00 SqFt **PCI:** 62

Sample Comments:

43	BLOCK CR	L	2880.00	SqFt
57	WEATHERING	L	3600.00	SqFt

Sample Number: 03 **Type:** R **Area:** 5000.00 SqFt **PCI:** 62

Sample Comments:

43	BLOCK CR	L	4000.00	SqFt
57	WEATHERING	L	5000.00	SqFt

Sample Number: 10 **Type:** R **Area:** 5982.00 SqFt **PCI:** 67

Sample Comments:

57	WEATHERING	L	5982.00	SqFt
43	BLOCK CR	L	2991.00	SqFt

Sample Number: 12 **Type:** R **Area:** 5000.00 SqFt **PCI:** 76

Sample Comments:

48	L & T CR	L	370.00	Ft
57	WEATHERING	L	5000.00	SqFt

Sample Number: 18 **Type:** R **Area:** 5000.00 SqFt **PCI:** 74

Sample Comments:

48	L & T CR	L	420.00	Ft
57	WEATHERING	L	5000.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	A05AU	**Name:**	Apron 05 Aurora	**Use:**	APRON	**Area:**	6,184 SqFt

Section:	01	of 1	**From:**	Taxiway 15		**To:**	Taxiway A3	**Last Const.:**	1/1/1989
Surface:	AC	**Family:**	OR-Cat2-AC-Central-AP-2015	**Zone:**	KUAO	**Category:**	F	**Rank:**	S
Area:	6,184 SqFt	**Length:**	150 Ft	**Width:**	48 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 40

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 6184.00 SqFt **PCI:** 40

Sample Comments:

52	RAVELING	M	5256.00	SqFt
48	L & T CR	M	90.00	Ft
57	WEATHERING	L	927.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	A06AU	**Name:**	Apron 06 Aurora	**Use:**	APRON	**Area:**	3,790 SqFt

Section:	01	of 1	**From:**	Taxiway A		**To:**	East	**Last Const.:**	1/1/2007
Surface:	AC	**Family:**	OR-Cat2-AC-Central-AP-2015	**Zone:**	KUAO	**Category:**	K	**Rank:**	S
Area:	3,790 SqFt	**Length:**	79 Ft	**Width:**	48 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 82

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3790.00 SqFt **PCI:** 82

Sample Comments:

48	L & T CR	L	10.00	Ft
48	L & T CR	M	40.00	Ft
57	WEATHERING	L	3790.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: A07AU **Name:** Apron 07 Aurora **Use:** APRON **Area:** 21,600 SqFt

Section: 01 of 1 **From:** Taxiway A **To:** East **Last Const.:** 1/1/1989

Surface: PCC **Family:** OR-Cat2-PCC-Central-AP-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 21,600 SqFt **Length:** 450 Ft **Width:** 48 Ft

Slabs: 78 **Slab Length:** 20 Ft **Slab Width:** 20 Ft **Joint Length:** 1,662 Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 3 **Surveyed:** 3

Conditions: **PCI:** 88

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 27.00 Slabs **PCI:** 84

Sample Comments:

63	LINEAR CR	L	1.00	Slabs
63	LINEAR CR	L	4.00	Slabs
74	JOINT SPALL	M	1.00	Slabs

Sample Number: 02 **Type:** R **Area:** 21.00 Slabs **PCI:** 84

Sample Comments:

63	LINEAR CR	L	2.00	Slabs
63	LINEAR CR	L	1.00	Slabs
74	JOINT SPALL	M	2.00	Slabs

Sample Number: 03 **Type:** R **Area:** 24.00 Slabs **PCI:** 96

Sample Comments:

63	LINEAR CR	L	1.00	Slabs

Network:	Aurora	**Name:**	Aurora State

Branch:	A08AU	**Name:**	Apron 08 Aurora	**Use:**	APRON	**Area:**	22,503 SqFt

Section:	01	of 1		**From:**	Taxiway A	**To:**	East			**Last Const.:**	1/1/1989
Surface:	AC	**Family:**	OR-Cat2-AC-Central-AP-2015	**Zone:**	KUAO	**Category:**	F			**Rank:**	S
Area:	22,503 SqFt	**Length:**	480 Ft	**Width:**	48 Ft						
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft				
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0				

Section Comments:

Last Insp. Date:	7/12/2018	**TotalSamples:**	5	**Surveyed:**	3

Conditions: **PCI:** 70

Inspection Comments:

Sample Number:	02	**Type:**	R	**Area:**	4800.00 SqFt	**PCI:**	74

Sample Comments:

48	L & T CR	L	130.00	Ft
48	L & T CR	M	100.00	Ft
57	WEATHERING	L	4800.00	SqFt

Sample Number:	03	**Type:**	R	**Area:**	4800.00 SqFt	**PCI:**	75

Sample Comments:

48	L & T CR	L	75.00	Ft
48	L & T CR	M	75.00	Ft
45	DEPRESSION	L	10.00	SqFt
57	WEATHERING	L	4800.00	SqFt

Sample Number:	04	**Type:**	R	**Area:**	4800.00 SqFt	**PCI:**	60

Sample Comments:

48	L & T CR	L	200.00	Ft
48	L & T CR	M	130.00	Ft
45	DEPRESSION	L	45.00	SqFt
57	WEATHERING	L	4800.00	SqFt
41	ALLIGATOR CR	L	45.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: A09AU **Name:** Apron 09 Aurora **Use:** APRON **Area:** 44,087 SqFt

Section: 01 of 3 **From:** Taxiway 10 **To:** East **Last Const.:** 1/1/1989

Surface: AC **Family:** OR-Cat2-AC-Central-AP-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 21,705 SqFt **Length:** 231 Ft **Width:** 132 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 5 **Surveyed:** 3

Conditions: **PCI:** 49

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5000.00 SqFt **PCI:** 49

Sample Comments:

43	BLOCK CR	L	2500.00	SqFt
43	BLOCK CR	M	2500.00	SqFt
57	WEATHERING	L	5000.00	SqFt

Sample Number: 02 **Type:** R **Area:** 5000.00 SqFt **PCI:** 49

Sample Comments:

43	BLOCK CR	L	2500.00	SqFt
43	BLOCK CR	M	2500.00	SqFt
57	WEATHERING	L	5000.00	SqFt

Sample Number: 05 **Type:** R **Area:** 4385.00 SqFt **PCI:** 49

Sample Comments:

43	BLOCK CR	L	2193.00	SqFt
43	BLOCK CR	M	2192.00	SqFt
57	WEATHERING	L	4385.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: A09AU **Name:** Apron 09 Aurora **Use:** APRON **Area:** 44,087 SqFt

Section: 02 of 3 **From:** Taxiway 10 **To:** South **Last Const.:** 6/1/2010

Surface: AC **Family:** OR-Cat2-AC-Central-AP-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 13,596 SqFt **Length:** 103 Ft **Width:** 132 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 3 **Surveyed:** 2

Conditions: **PCI:** 75

Inspection Comments:

Sample Number: 02 **Type:** R **Area:** 5150.00 SqFt **PCI:** 90

Sample Comments:

48	L & T CR	L	40.00	Ft
57	WEATHERING	L	5150.00	SqFt

Sample Number: 03 **Type:** R **Area:** 5150.00 SqFt **PCI:** 61

Sample Comments:

41	ALLIGATOR CR	L	200.00	SqFt
57	WEATHERING	L	5150.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: A09AU **Name:** Apron 09 Aurora **Use:** APRON **Area:** 44,087 SqFt

Section: 03 of 3 **From:** Paved Infill **To:** - **Last Const.:** 6/1/2010

Surface: AC **Family:** OR-Cat2-AC-Central-AP-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 8,786 SqFt **Length:** 145 Ft **Width:** 68 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 88

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4393.00 SqFt **PCI:** 90

Sample Comments:

48	L & T CR	L	25.00	Ft
57	WEATHERING	L	4393.00	SqFt

Sample Number: 02 **Type:** R **Area:** 4393.00 SqFt **PCI:** 85

Sample Comments:

41	ALLIGATOR CR	L	6.00	SqFt
48	L & T CR	L	3.00	Ft
57	WEATHERING	L	4393.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	AH35AU	**Name:**	Hold Apron 35 Aurora	**Use:**	APRON	**Area:**	19,308 SqFt

Section:	01	of 1		**From:**	Taxiway A	**To:**	END	**Last Const.:**	8/1/2008
Surface:	AC	**Family:**	OR-Cat2-AC-Central-AP-2015	**Zone:**	KUAO	**Category:**	F	**Rank:**	P
Area:	19,308 SqFt	**Length:**	225 Ft	**Width:**	80 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 4 **Surveyed:** 3

Conditions: **PCI:** 71

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3723.00 SqFt **PCI:** 78

Sample Comments:

48	L & T CR	L	100.00	Ft
48	L & T CR	M	90.00	Ft

Sample Number: 02 **Type:** R **Area:** 5964.00 SqFt **PCI:** 73

Sample Comments:

48	L & T CR	L	300.00	Ft
48	L & T CR	M	225.00	Ft

Sample Number: 03 **Type:** R **Area:** 5989.00 SqFt **PCI:** 64

Sample Comments:

48	L & T CR	L	375.00	Ft
48	L & T CR	M	300.00	Ft
57	WEATHERING	L	5989.00	SqFt

Network: Aurora		**Name:** Aurora State	

Branch: R17AU **Name:** Runway 17/35 Aurora **Use:** RUNWAY **Area:** 500,000 SqFt

Section: 01 of 2 **From:** Runway 17 End **To:** Section 02 **Last Const.:** 5/2/2005

Surface: AC **Family:** OR-Cat2-AC-Central-RW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 410,000 SqFt **Length:** 4,100 Ft **Width:** 100 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 82 **Surveyed:** 6

Conditions: **PCI:** 83

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5000.00 SqFt **PCI:** 81

Sample Comments:

48 L & T CR L 350.00 Ft

Sample Number: 21 **Type:** R **Area:** 5000.00 SqFt **PCI:** 81

Sample Comments:

48 L & T CR L 350.00 Ft

Sample Number: 38 **Type:** R **Area:** 5000.00 SqFt **PCI:** 82

Sample Comments:

48 L & T CR L 330.00 Ft

Sample Number: 51 **Type:** R **Area:** 5000.00 SqFt **PCI:** 85

Sample Comments:

48 L & T CR L 260.00 Ft

Sample Number: 68 **Type:** R **Area:** 5000.00 SqFt **PCI:** 82

Sample Comments:

48 L & T CR L 320.00 Ft

Sample Number: 81 **Type:** R **Area:** 5000.00 SqFt **PCI:** 84

Sample Comments:

48 L & T CR L 280.00 Ft

Network: Aurora **Name:** Aurora State

Branch: R17AU **Name:** Runway 17/35 Aurora **Use:** RUNWAY **Area:** 500,000 SqFt

Section: 02 of 2 **From:** Section 01 **To:** Runway 35 End **Last Const.:** 5/1/2005

Surface: AAC **Family:** OR-Cat2-AAC-Central-RW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 90,000 SqFt **Length:** 900 Ft **Width:** 100 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 18 **Surveyed:** 5

Conditions: **PCI:** 72

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5000.00 SqFt **PCI:** 78

Sample Comments:

48	L & T CR	L	300.00 Ft
48	L & T CR	M	50.00 Ft

Sample Number: 06 **Type:** R **Area:** 5000.00 SqFt **PCI:** 65

Sample Comments:

48	L & T CR	M	450.00 Ft

Sample Number: 10 **Type:** R **Area:** 5000.00 SqFt **PCI:** 72

Sample Comments:

48	L & T CR	L	200.00 Ft
48	L & T CR	M	200.00 Ft

Sample Number: 14 **Type:** R **Area:** 5000.00 SqFt **PCI:** 69

Sample Comments:

48	L & T CR	L	200.00 Ft
48	L & T CR	M	250.00 Ft

Sample Number: 17 **Type:** R **Area:** 5000.00 SqFt **PCI:** 76

Sample Comments:

48	L & T CR	L	200.00 Ft
48	L & T CR	M	150.00 Ft

Network: Aurora **Name:** Aurora State

Branch: T01AU **Name:** Taxiway 01 Aurora **Use:** TAXIWAY **Area:** 9,478 SqFt

Section: 01 of 1 **From:** Tie Down Apron New **To:** Hangars **Last Const.:** 8/1/2001

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 9,478 SqFt **Length:** 380 Ft **Width:** 25 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 88

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4362.00 SqFt **PCI:** 89

Sample Comments:

48	L & T CR	L	40.00	Ft
57	WEATHERING	L	4362.00	SqFt

Sample Number: 02 **Type:** R **Area:** 5116.00 SqFt **PCI:** 88

Sample Comments:

48	L & T CR	M	20.00	Ft
57	WEATHERING	L	5116.00	SqFt

Network: Aurora		**Name:** Aurora State	

Branch: T02AU	**Name:** Taxiway 02 Aurora	**Use:** TAXIWAY	**Area:** 9,468 SqFt

Section: 01 of 1	**From:** Tie Down Apron New		**To:** Hangars	**Last Const.:** 8/1/2001
Surface: AC	**Family:** OR-Cat2-AC-Central-TW-2015	**Zone:** KUAO	**Category:** F	**Rank:** S
Area: 9,468 SqFt	**Length:** 378 Ft	**Width:** 25 Ft		
Slabs:	**Slab Length:** Ft	**Slab Width:** Ft		**Joint Length:** Ft
Shoulder:	**Street Type:**	**Grade:** 0		**Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 74

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4378.00 SqFt **PCI:** 71

Sample Comments:

48	L & T CR	L	40.00	Ft
48	L & T CR	M	120.00	Ft
57	WEATHERING	L	4378.00	SqFt
50	PATCHING	L	25.00	SqFt

Sample Number: 02 **Type:** R **Area:** 5090.00 SqFt **PCI:** 77

Sample Comments:

48	L & T CR	L	70.00	Ft
48	L & T CR	M	70.00	Ft
57	WEATHERING	L	5090.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: T03AU **Name:** Taxiway 03 Aurora **Use:** TAXIWAY **Area:** 3,684 SqFt

Section: 01 of 1 **From:** Taxiway A **To:** Apron 01 **Last Const.:** 9/26/2015

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 3,684 SqFt **Length:** 83 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3684.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Aurora **Name:** Aurora State

Branch: T04AU **Name:** Taxiway 04 Aurora **Use:** TAXIWAY **Area:** 3,880 SqFt

Section: 01 of 1 **From:** Taxiway A **To:** Apron 01 **Last Const.:** 9/26/2015

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 3,880 SqFt **Length:** 75 Ft **Width:** 40 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3880.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Aurora **Name:** Aurora State

Branch: T05AU **Name:** Taxiway 05 Aurora **Use:** TAXIWAY **Area:** 11,678 SqFt

Section: 01 of 1 **From:** Apron 01 **To:** Apron 02 **Last Const.:** 9/26/2015

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 11,678 SqFt **Length:** 228 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5236.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 02 **Type:** R **Area:** 6441.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Aurora **Name:** Aurora State

Branch: T06AU **Name:** Taxiway 06 Aurora **Use:** TAXIWAY **Area:** 3,128 SqFt

Section: 01 of 1 **From:** TAAU-01 **To:** A02AU-01 **Last Const.:** 9/3/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 3,128 SqFt **Length:** 48 Ft **Width:** 36 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 80

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3128.00 SqFt **PCI:** 80

Sample Comments:

48	L & T CR	L	160.00	Ft
57	WEATHERING	L	3128.00	SqFt

Network: Aurora		**Name:** Aurora State	

Branch: T07AU	**Name:** Taxiway 07 Aurora	**Use:** TAXIWAY	**Area:** 3,953 SqFt

Section: 01 of 1 **From:** TAAU **To:** Private Apron **Last Const.:** 8/1/2008

Surface: AAC **Family:** OR-Cat2-AAC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 3,953 SqFt **Length:** 48 Ft **Width:** 60 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 79

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3953.00 SqFt **PCI:** 79

Sample Comments:

48	L & T CR	L	40.00	Ft
48	L & T CR	M	40.00	Ft
57	WEATHERING	L	3953.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: T08AU **Name:** Taxiway 08 Aurora **Use:** TAXIWAY **Area:** 4,516 SqFt

Section: 01 of 1 **From:** Taxiway 05 **To:** Apron 05 **Last Const.:** 1/1/1989

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 4,516 SqFt **Length:** 174 Ft **Width:** 25 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 64

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4516.00 SqFt **PCI:** 64

Sample Comments:

41	ALLIGATOR CR	L	80.00	SqFt
48	L & T CR	M	120.00	Ft
48	L & T CR	L	200.00	Ft

Network: Aurora **Name:** Aurora State

Branch: T09AU **Name:** Taxiway 09 Aurora **Use:** TAXIWAY **Area:** 12,198 SqFt

Section: 01 of 1 **From:** Apron 05 **To:** End **Last Const.:** 1/1/1989

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 12,198 SqFt **Length:** 464 Ft **Width:** 26 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 71

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 6864.00 SqFt **PCI:** 68

Sample Comments:

48	L & T CR	L	240.00	Ft
48	L & T CR	M	260.00	Ft
57	WEATHERING	L	6864.00	SqFt

Sample Number: 02 **Type:** R **Area:** 5334.00 SqFt **PCI:** 74

Sample Comments:

48	L & T CR	L	440.00	Ft
57	WEATHERING	L	5334.00	SqFt

Network: Aurora		**Name:** Aurora State	
Branch: T10AU	**Name:** Taxiway 10 Aurora	**Use:** TAXIWAY	**Area:** 9,280 SqFt

Section: 01 of 1 **From:** Apron 05 **To:** End **Last Const.:** 1/1/1989

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 9,280 SqFt **Length:** 464 Ft **Width:** 20 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 61

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5280.00 SqFt **PCI:** 64

Sample Comments:

52	RAVELING	L	5280.00	SqFt
48	L & T CR	L	440.00	Ft
57	WEATHERING	L	5280.00	SqFt

Sample Number: 02 **Type:** R **Area:** 4000.00 SqFt **PCI:** 59

Sample Comments:

57	WEATHERING	L	4000.00	SqFt
48	L & T CR	L	270.00	Ft
50	PATCHING	L	90.00	SqFt
52	RAVELING	L	4000.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	T11AU	**Name:**	Taxiway 11 Aurora	**Use:**	TAXIWAY	**Area:**	2,325 SqFt

Section:	01	of 1		**From:**	Apron 05	**To:**	End	**Last Const.:**	1/1/1989
Surface:	AC	**Family:**	OR-Cat2-AC-Central-TW-2015	**Zone:**	KUAO	**Category:**	F	**Rank:**	S
Area:	2,325 SqFt	**Length:**	85 Ft	**Width:**	25 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 69

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 2325.00 SqFt **PCI:** 69

Sample Comments:

48	L & T CR	L	60.00	Ft
48	L & T CR	M	50.00	Ft
50	PATCHING	L	80.00	SqFt
57	WEATHERING	L	2325.00	SqFt

Network: Aurora		**Name:** Aurora State	
Branch: T12AU	**Name:** Taxiway 12 Aurora	**Use:** TAXIWAY	**Area:** 2,749 SqFt

Section: 01 of 1 **From:** Taxiway A **To:** End **Last Const.:** 1/1/2001

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 2,749 SqFt **Length:** 48 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 66

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 2749.00 SqFt **PCI:** 66

Sample Comments:

48	L & T CR	L	250.00	Ft
48	L & T CR	M	120.00	Ft
57	WEATHERING	L	2749.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: T13AU **Name:** Taxiway 13 Aurora **Use:** TAXIWAY **Area:** 2,992 SqFt

Section: 01 of 1 **From:** Taxiway A **To:** End **Last Const.:** 1/1/1989

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 2,992 SqFt **Length:** 40 Ft **Width:** 48 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 63

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 2992.00 SqFt **PCI:** 63

Sample Comments:

48	L & T CR	L	120.00	Ft
48	L & T CR	M	110.00	Ft
57	WEATHERING	L	2543.00	SqFt
57	WEATHERING	M	449.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	TA1AU	**Name:**	Taxiway A1 Aurora	**Use:**	TAXIWAY	**Area:**	11,277 SqFt

Section:	01	of 2		**From:**	Runway 17 End	**To:**	TA1AU-01	**Last Const.:**	5/2/2005
Surface:	AAC	**Family:**	OR-Cat2-AAC-Central-TW-2015	**Zone:**	KUAO	**Category:**	F	**Rank:**	P
Area:	2,537 SqFt	**Length:**	50 Ft	**Width:**	40 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 59

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 2537.00 SqFt **PCI:** 59

Sample Comments:

48	L & T CR	M	240.00	Ft
57	WEATHERING	L	2537.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TA1AU **Name:** Taxiway A1 Aurora **Use:** TAXIWAY **Area:** 11,277 SqFt

Section: 02 of 2 **From:** TA1AU-01 **To:** TAAU-01 **Last Const.:** 9/3/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 8,740 SqFt **Length:** 183 Ft **Width:** 40 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 88

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4574.00 SqFt **PCI:** 89

Sample Comments:

48	L & T CR	L	60.00	Ft
57	WEATHERING	L	4574.00	SqFt

Sample Number: 02 **Type:** R **Area:** 4166.00 SqFt **PCI:** 86

Sample Comments:

48	L & T CR	L	110.00	Ft
57	WEATHERING	L	4166.00	SqFt

Network:	Aurora			**Name:**	Aurora State		

Branch:	TA2AU	**Name:**	Taxiway A2 Aurora	**Use:**	TAXIWAY	**Area:**	11,668 SqFt

Section: 01 of 2 **From:** Runway 17/35 **To:** TA2AU-02 **Last Const.:** 5/2/2005

Surface: AAC **Family:** OR-Cat2-AAC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 3,073 SqFt **Length:** 50 Ft **Width:** 40 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 67

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3073.00 SqFt **PCI:** 67

Sample Comments:

48	L & T CR	L	130.00	Ft
48	L & T CR	M	130.00	Ft
57	WEATHERING	L	3073.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TA2AU **Name:** Taxiway A2 Aurora **Use:** TAXIWAY **Area:** 11,668 SqFt

Section: 02 of 2 **From:** TA2AU-01 **To:** TAAU-01 **Last Const.:** 9/3/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 8,595 SqFt **Length:** 183 Ft **Width:** 40 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 89

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4595.00 SqFt **PCI:** 90

Sample Comments:

48	L & T CR	L	30.00	Ft
57	WEATHERING	L	4595.00	SqFt

Sample Number: 02 **Type:** R **Area:** 4000.00 SqFt **PCI:** 88

Sample Comments:

48	L & T CR	L	80.00	Ft
57	WEATHERING	L	4000.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TA3AU **Name:** Taxiway A3 Aurora **Use:** TAXIWAY **Area:** 15,406 SqFt

Section: 01 of 3 **From:** Runway 17/35 **To:** TA3AU-02 **Last Const.:** 5/2/2005

Surface: AAC **Family:** OR-Cat2-AAC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 3,403 SqFt **Length:** 50 Ft **Width:** 40 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 66

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3324.00 SqFt **PCI:** 66

Sample Comments:

48	L & T CR	L	110.00	Ft
48	L & T CR	M	150.00	Ft
57	WEATHERING	L	3324.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	TA3AU	**Name:**	Taxiway A3 Aurora	**Use:**	TAXIWAY	**Area:**	15,406 SqFt

Section:	02	of 3	**From:**	TA3AU-01		**To:**	TAAU-02	**Last Const.:**	9/3/2007
Surface:	AC	**Family:**	OR-Cat2-AC-Central-TW-2015	**Zone:**	KUAO	**Category:**	F	**Rank:**	P
Area:	8,813 SqFt	**Length:**	183 Ft	**Width:**	40 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 80

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4403.00 SqFt **PCI:** 82

Sample Comments:

48	L & T CR	L	190.00	Ft
57	WEATHERING	L	4403.00	SqFt

Sample Number: 02 **Type:** R **Area:** 4410.00 SqFt **PCI:** 78

Sample Comments:

48	L & T CR	L	160.00	Ft
48	L & T CR	H	1.00	Ft
57	WEATHERING	L	4410.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	TA3AU	**Name:**	Taxiway A3 Aurora	**Use:**	TAXIWAY	**Area:**	15,406 SqFt

Section:	03	of 3	**From:**	TAAU-02		**To:**	End	**Last Const.:**	9/3/2007
Surface:	AC	**Family:**	OR-Cat2-AC-Central-TW-2015	**Zone:**	KUAO	**Category:**	F	**Rank:**	P
Area:	3,190 SqFt	**Length:**	51 Ft	**Width:**	40 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 88

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3190.00 SqFt **PCI:** 88

Sample Comments:

48	L & T CR	L	60.00	Ft
57	WEATHERING	L	3190.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TA4AU **Name:** Taxiway A4 Aurora **Use:** TAXIWAY **Area:** 12,352 SqFt

Section: 01 of 2 **From:** Runway 17/35 **To:** TA4AU-02 **Last Const.:** 5/2/2005

Surface: AAC **Family:** OR-Cat2-AAC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 3,324 SqFt **Length:** 50 Ft **Width:** 40 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 58

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3324.00 SqFt **PCI:** 58

Sample Comments:

48	L & T CR	L	150.00	Ft
48	L & T CR	M	250.00	Ft
57	WEATHERING	L	3324.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TA4AU **Name:** Taxiway A4 Aurora **Use:** TAXIWAY **Area:** 12,352 SqFt

Section: 02 of 2 **From:** TA4AU-01 **To:** TAAU-02 **Last Const.:** 9/3/2007

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 9,028 SqFt **Length:** 183 Ft **Width:** 40 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 74

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4685.00 SqFt **PCI:** 83

Sample Comments:

48	L & T CR	L	180.00	Ft
57	WEATHERING	L	4685.00	SqFt

Sample Number: 02 **Type:** R **Area:** 4343.00 SqFt **PCI:** 64

Sample Comments:

50	PATCHING	L	880.00	SqFt
48	L & T CR	L	120.00	Ft
48	L & T CR	M	100.00	Ft
57	WEATHERING	L	4343.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TA5AU **Name:** Taxiway A5 Aurora **Use:** TAXIWAY **Area:** 9,683 SqFt

Section: 01 of 3 **From:** TA5AU-02 **To:** Runway 35 End **Last Const.:** 5/2/2005

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 2,520 SqFt **Length:** 50 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 49

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 2520.00 SqFt **PCI:** 49

Sample Comments:

43	BLOCK CR	L	1260.00	SqFt
43	BLOCK CR	M	1260.00	SqFt
57	WEATHERING	L	2520.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	TA5AU	**Name:**	Taxiway A5 Aurora	**Use:**	TAXIWAY	**Area:**	9,683 SqFt

Section: 02 of 3 **From:** TA5AU-01 **To:** TA5AU-03 **Last Const.:** 8/1/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 3,188 SqFt **Length:** 91 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 69

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3188.00 SqFt **PCI:** 69

Sample Comments:

48	L & T CR	L	110.00	Ft
48	L & T CR	M	110.00	Ft
57	WEATHERING	L	3188.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TA5AU **Name:** Taxiway A5 Aurora **Use:** TAXIWAY **Area:** 9,683 SqFt

Section: 03 of 3 **From:** Taxiway A **To:** TA5-02 **Last Const.:** 8/1/2008

Surface: AAC **Family:** OR-Cat2-AAC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 3,975 SqFt **Length:** 92 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 73

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3975.00 SqFt **PCI:** 73

Sample Comments:

48	L & T CR	L	90.00	Ft
48	L & T CR	M	90.00	Ft
57	WEATHERING	L	3975.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TAAAU **Name:** Taxiway AA Aurora **Use:** TAXIWAY **Area:** 7,284 SqFt

Section: 01 of 1 **From:** TL01 **To:** TL03 **Last Const.:** 9/3/2016

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 7,284 SqFt **Length:** 290 Ft **Width:** 25 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3512.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 02 **Type:** R **Area:** 3772.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Aurora **Name:** Aurora State

Branch: TAAU **Name:** Taxiway A Aurora **Use:** TAXIWAY **Area:** 174,874 SqFt

Section: 01 of 3 **From:** TA1AU-02 **To:** T12AU-01 **Last Const.:** 9/3/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 56,785 SqFt **Length:** 1,626 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 11 **Surveyed:** 4

Conditions: **PCI:** 83

Inspection Comments:

Sample Number: 02 **Type:** R **Area:** 5250.00 SqFt **PCI:** 80

Sample Comments:

48	L & T CR	L	260.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 04 **Type:** R **Area:** 5250.00 SqFt **PCI:** 87

Sample Comments:

48	L & T CR	L	120.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 06 **Type:** R **Area:** 5250.00 SqFt **PCI:** 90

Sample Comments:

48	L & T CR	L	40.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 09 **Type:** R **Area:** 5250.00 SqFt **PCI:** 76

Sample Comments:

48	L & T CR	L	250.00	Ft
48	L & T CR	H	1.00	Ft
57	WEATHERING	L	5250.00	SqFt

Network:	Aurora			**Name:**	Aurora State		

Branch:	TAAU	**Name:**	Taxiway A Aurora	**Use:**	TAXIWAY	**Area:**	174,874 SqFt

Section: 02 of 3 **From:** TAAU-01 **To:** TA4AU-02 **Last Const.:** 9/3/2007

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 88,885 SqFt **Length:** 2,540 Ft **Width:** 35 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 17 **Surveyed:** 5

Conditions: **PCI:** 73

Inspection Comments:

Sample Number: 03 **Type:** R **Area:** 5250.00 SqFt **PCI:** 71

Sample Comments:

48	L & T CR	L	150.00	Ft
48	L & T CR	M	150.00	Ft
45	DEPRESSION	L	6.00	SqFt
57	WEATHERING	L	5250.00	SqFt

Sample Number: 07 **Type:** R **Area:** 5250.00 SqFt **PCI:** 74

Sample Comments:

48	L & T CR	L	110.00	Ft
48	L & T CR	M	110.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 11 **Type:** R **Area:** 5250.00 SqFt **PCI:** 74

Sample Comments:

48	L & T CR	L	450.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 14 **Type:** R **Area:** 5250.00 SqFt **PCI:** 70

Sample Comments:

48	L & T CR	L	210.00	Ft
48	L & T CR	M	160.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 16 **Type:** R **Area:** 5250.00 SqFt **PCI:** 74

Sample Comments:

57	WEATHERING	L	5250.00	SqFt
48	L & T CR	L	100.00	Ft
48	L & T CR	M	110.00	Ft

Network:	Aurora			**Name:**	Aurora State		
Branch:	TAAU	**Name:**	Taxiway A Aurora	**Use:**	TAXIWAY	**Area:**	174,874 SqFt

Section:	03	of 3	**From:**	TA4AU-01		**To:**	TAAU-04	**Last Const.:**	8/1/2008
Surface:	AC	**Family:**	OR-Cat2-AC-Central-TW-2015	**Zone:**	KUAO	**Category:**	F	**Rank:**	P
Area:	29,204 SqFt	**Length:**	834 Ft	**Width:**	35 Ft				
Slabs:		**Slab Length:**	Ft	**Slab Width:**	Ft	**Joint Length:**	Ft		
Shoulder:		**Street Type:**		**Grade:**	0	**Lanes:**	0		

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 6 **Surveyed:** 3

Conditions: **PCI:** 69

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 5250.00 SqFt **PCI:** 67

Sample Comments:

48	L & T CR	L	250.00	Ft
48	L & T CR	M	220.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 02 **Type:** R **Area:** 5250.00 SqFt **PCI:** 68

Sample Comments:

48	L & T CR	L	280.00	Ft
48	L & T CR	M	200.00	Ft
57	WEATHERING	L	5250.00	SqFt

Sample Number: 04 **Type:** R **Area:** 5250.00 SqFt **PCI:** 72

Sample Comments:

48	L & T CR	L	150.00	Ft
48	L & T CR	M	140.00	Ft
57	WEATHERING	L	5250.00	SqFt

Network:	Aurora			**Name:**	Aurora State		
Branch:	TL1AU	**Name:**	Taxilane 01 Aurora	**Use:**	TAXIWAY	**Area:**	9,921 SqFt

Section: 01 of 1 **From:** TAA **To:** Hangars **Last Const.:** 9/3/2016

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 9,921 SqFt **Length:** 386 Ft **Width:** 25 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4648.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 02 **Type:** R **Area:** 5273.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Aurora **Name:** Aurora State

Branch: TL2AU **Name:** Taxilane 02 Aurora **Use:** TAXIWAY **Area:** 10,673 SqFt

Section: 01 of 1 **From:** TAA **To:** Hangars **Last Const.:** 9/3/2016

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 10,673 SqFt **Length:** 400 Ft **Width:** 25 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 2 **Surveyed:** 2

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 4990.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 02 **Type:** R **Area:** 5682.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network:	Aurora			**Name:**	Aurora State		
Branch:	TL3AU	**Name:**	Taxilane 03 Aurora	**Use:**	TAXIWAY	**Area:**	15,963 SqFt

Section: 01 of 1 **From:** TAA **To:** Hangars **Last Const.:** 9/3/2016

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 15,963 SqFt **Length:** 546 Ft **Width:** 25 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 3 **Surveyed:** 2

Conditions: **PCI:** 100

Inspection Comments:

Sample Number: 02 **Type:** R **Area:** 5823.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Sample Number: 03 **Type:** R **Area:** 5561.00 SqFt **PCI:** 100

Sample Comments:

<No Distress>

Network: Aurora **Name:** Aurora State

Branch: TNWYLEEAU **Name:** North Wylee Taxiway Aurora **Use:** TAXIWAY **Area:** 3,465 SqFt

Section: 01 of 1 **From:** TAAU-01 **To:** Hangars **Last Const.:** 9/3/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 3,465 SqFt **Length:** 66 Ft **Width:** 26 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 75

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3465.00 SqFt **PCI:** 75

Sample Comments:

48	L & T CR	L	50.00	Ft
48	L & T CR	M	60.00	Ft
57	WEATHERING	L	3465.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TSWYLEEAU **Name:** South Wylee Taxiway Aurora **Use:** TAXIWAY **Area:** 3,237 SqFt

Section: 01 of 1 **From:** TAAU-01 **To:** Hangars **Last Const.:** 9/3/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** S

Area: 3,237 SqFt **Length:** 66 Ft **Width:** 25 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 94

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3237.00 SqFt **PCI:** 94

Sample Comments:

57	WEATHERING	L	3237.00	SqFt

Network: Aurora **Name:** Aurora State

Branch: TWILLAVAU **Name:** Willamette Aviation Taxiway Aurora **Use:** TAXIWAY **Area:** 3,777 SqFt

Section: 01 of 1 **From:** TAAU-01 **To:** Hangars **Last Const.:** 9/3/2008

Surface: AC **Family:** OR-Cat2-AC-Central-TW-2015 **Zone:** KUAO **Category:** F **Rank:** P

Area: 3,777 SqFt **Length:** 70 Ft **Width:** 42 Ft

Slabs: **Slab Length:** Ft **Slab Width:** Ft **Joint Length:** Ft

Shoulder: **Street Type:** **Grade:** 0 **Lanes:** 0

Section Comments:

Last Insp. Date: 7/12/2018 **TotalSamples:** 1 **Surveyed:** 1

Conditions: **PCI:** 89

Inspection Comments:

Sample Number: 01 **Type:** R **Area:** 3777.00 SqFt **PCI:** 89

Sample Comments:

48	L & T CR	L	30.00	Ft
57	WEATHERING	L	3777.00	SqFt

GRI
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Beaverton, OR 97008-7172
p | 503-641-3478 f | 503-644-8034

September 16, 2019

Century West Engineering Corporation
5331 SW Macadam Avenue, Suite 287
Portland, OR 97239

Attention: James Kirby, PE
Senior Project Manager

SUBJECT: Pavement Classification Number (PCN) Evaluation of Runway 17-35
Aurora State Airport (UAO)
Aurora, Oregon

As requested, GRI conducted a pavement evaluation at Aurora State Airport (UAO) in support of the Oregon Department of Aviation (ODA) to develop a pavement classification number (PCN) for Runway 17-35.

PROJECT DESCRIPTION

Our work included review of relevant ODA records for Runway 17-35, falling weight deflectometer (FWD) testing, core explorations, and engineering analyses in accordance with Federal Aviation Administration (FAA) Advisory Circular 150/5335-5C, *Standardized Method of Reporting Airport Pavement Strength – PCN*. According to the FAA, the PCN is a number that expresses the load-carrying capacity of a pavement for unrestricted operations. We determined the PCN using the Technical Evaluation Method specified in Advisory Circular 150/5335-5C.

BACKGROUND

Based on information provided in the ODA pavement evaluation/maintenance management program report prepared by Pavement Consultant Inc. in 2018, a 4,100-ft-long segment on the north end of the runway was first constructed in 1943 and in 1993, a 900-ft-long extension was built to the south. The last major rehabilitation on the runway was conducted in 2005 and generally consisted of a 2- to 3-in. overlay.

The current Airport Master Record, FAA Form 5010, lists the gross weight limit for a single-wheel, main-gear aircraft and a dual-wheel, main-gear aircraft at 30,000 and 45,000 lbs, respectively. UAO currently does not have an established PCN.

FIELD WORK

Site Reconnaissance

A visual pavement reconnaissance was performed by GRI engineers on August 12, 2019, to assess the general surface condition of the pavements within the project and to identify core exploration locations.

Falling Weight Deflectometer Tests

GRI conducted FWD testing on August 20, 2019, along the full length of the runway. The testing was conducted in accordance with FAA Advisory Circular 150/5370-11b, *Use of Nondestructive Testing in the Evaluation of Airport Pavements,* using our KUAB 2m Model 150 FWD device.

FWD testing was completed along test lines located at 7 ft west and 12 ft east of the runway centerline. The tests were spaced at approximately 200-ft intervals within the runway keel section. The approximate locations of the test lines are shown on Figure 1.

The FWD test procedures are described in Appendix A. The data were normalized to a 30,000-lb load basis and the FWD deflection data are shown in Table 1A.

We also reviewed the load-response data measured by the FWD to provide a preliminary understanding of the overall stiffness of the pavement structure. Although this information does not provide information about the stiffness of individual soil and pavement layers, it does provide a quick assessment of the overall stiffness of the pavement system to gauge the variability of pavement stiffness within a particular pavement facility. Impact stiffness modulus (ISM) is inversely proportional to deflection and is therefore a direct measurement of the combined stiffness, or resistance to deflection induced by FWD loading, of the pavement and subgrade soils. As such, it is usually a relative measure of the pavement's ability to support loads, i.e., high ISM modulus values usually correspond to high pavement strength and vice versa. The profile of relative pavement strength along the two FWD test lines, as measured by resistance to deflection under FWD loading, is plotted for each FWD test location on Figure 4A. Additional discussion regarding ISM is provided in Appendix A.

Coring Explorations

General. On August 20, 2019, GRI conducted three core explorations, all of which were located over cracks. The approximate locations of the explorations are shown on the Site Plan, Figure 1. Details of our field investigations are further discussed in Appendix A of this report and the core explorations are summarized in Table 1.

Table 1: SUMMARY OF CORING EXPLORATION RESULTS

Core No.	FWD Test No.	Test Line	Station	Asphalt Concrete Thickness, in.	Aggregate Base Thickness, in.	Drilled Over a Crack?	Depth of Crack, in.
B-1	26	7 ft west	56+81	8.75	15.00	Yes	2.50
B-2	16	7 ft west	39+51	9.00	15.00	Yes	3.25
B-3	32	12 ft east	19+41	9.00	15.00	Yes	2.50

Existing Pavement Conditions

Overall, the pavement surface of Runway 17-35 appears to be in good condition. The primary distresses observed on the runway are low- to medium-severity longitudinal cracking, primarily at paving-panel joints or along the centerline; low-severity weathering; and isolated low-severity alligator cracking within the gear paths.

Since the alligator cracking within the gear paths (noted above) is a load-associated distress, in our opinion, it warranted further investigation and we therefore conducted the three core explorations in areas of alligator cracking on the runway. As shown in Table 1 and the photo logs on Figures 1A through 3A in Appendix A, the cracking is top down and extends to a depth of 2.5 in. in cores B-1 and B-3 and to a depth of 3.25 in. in B-2. These types of cracks may be induced by excessive shear stresses imposed by aircraft wheel loads at the runway surface and can typically be repaired by milling to the depth of cracking and overlaying. In our opinion, pavement exhibiting this type of distress should be rehabilitated when the cracking progresses to the point that spalling begins to occur and therefore represents a significant Foreign Object Damage (FOD) potential. The core samples also exhibit delamination (separation of asphalt concrete [AC] layers) at a depth of 2.5 and 3.25 in. in cores B-2 and B-3, respectively. The depth of delamination generally agrees with the thickness of the 2005 overlay.

DESIGN PROCEDURES AND ANALYSIS

Traffic Loading

Century West Engineering Corporation (CWE) provided an estimate of the aircraft traffic-volume data consisting of the number of operations (i.e., either an arrival or departure) for Runway 17-35 in 2018 from the FAA Traffic Flow Management System Counts (TFMSC). Our traffic-loading estimate is based on an annual growth rate of 1.58% per year, which is based on the aviation forecasts provided in the current master plan for UAO (WHPacific, 2012).

The COMFAA 3.0 software used to compute the PCN has inputs for each aircraft type (in the mix), which include the type of aircraft, gross weight, and number of annual departures over a 20-year period. The program does not take into account the annual growth rate, so we calculated the total departures from 2020 to 2040 to determine the equivalent annual number of departures for the analysis. The aircraft mix and annual number of departures we input into COMFAA are provided in Table 2.

Table 2: RUNWAY 17-35: AIRCRAFT TYPES AND DEPARTURE VOLUMES

Aircraft Type	Maximum Takeoff Weight, lbs	Design Aircraft for COMFAA	2018 Annual Operations	2040 Annual Operations	Values Entered into COMFAA	
					Equivalent Airplane	Annual # of Departures
Bombardier Global Express	92,500	Gulfstream G-V	50	61	Gulfstream G-V	64
Gulfstream G600	91,600	Gulfstream G-V	2	3		
Gulfstream V	76,850	Gulfstream G-IV	2	3	Gulfstream G-IV	7
Gulfstream IV	73,200	Gulfstream G-IV	2	3		
Dassault Falcon 900	45,503	Falcon-900	68	83	Falcon-900	83
Bombardier Challenger 600	45,100	Challenger CL-604	58	70	Challenger CL-604	176
Bombardier Challenger 300	38,850	Challenger CL-604	88	106		
Dassault Falcon 2000	41,000	Falcon-2000	34	42	Falcon-2000	42
Dassault Falcon 50	37,480	Falcon-50	276	332	Falcon-50	424
Dassault Falcon 20	28,650	Falcon-50	76	92		
Cessna Citation 750	36,600	Citation X	104	126	Citation X	292

Aircraft Type	Maximum Takeoff Weight, lbs	Design Aircraft for COMFAA	2018 Annual Operations	2040 Annual Operations	Values Entered into COMFAA	
					Equivalent Airplane	Annual # of Departures
Cessna Citation 680	30,775	Citation X	138	167		
Hawker 800	28,000	Hawker-800	34	42	Hawker-800	42
Gulfstream G150	26,100	D-35	80	97	D-35	97
Astra 1125	24,650	D-30	96	117	D-30	117
Cessna Citation 650	22,000	Citation VI/VII	98	119	Citation VI/VII	119
Learjet 60	23,500	Learjet-55	30	36		
Learjet 55	21,500	Learjet-55	4	6	Learjet-55	57
Learjet 75	21,500	Learjet-55	12	15		
Learjet 45	20,500	Learjet-35A/65A	110	133		
Learjet 35	18,000	Learjet-35A/65A	8	10	Learjet-35A/65A	254
Learjet 31	15,500	Learjet-35A/65A	92	111		
Cessna Citation 560	20,000	Citation 550B	704	847	Citation 550B	1,102
Cessna Citation 550	13,300	Citation 550B	212	255		
Phenom 300/ Embraer 300	17,968	D-25	56	68	D-25	68
		Total Operations:	**2,434**			**2,944**

Backcalculation Analysis of FWD Test Data

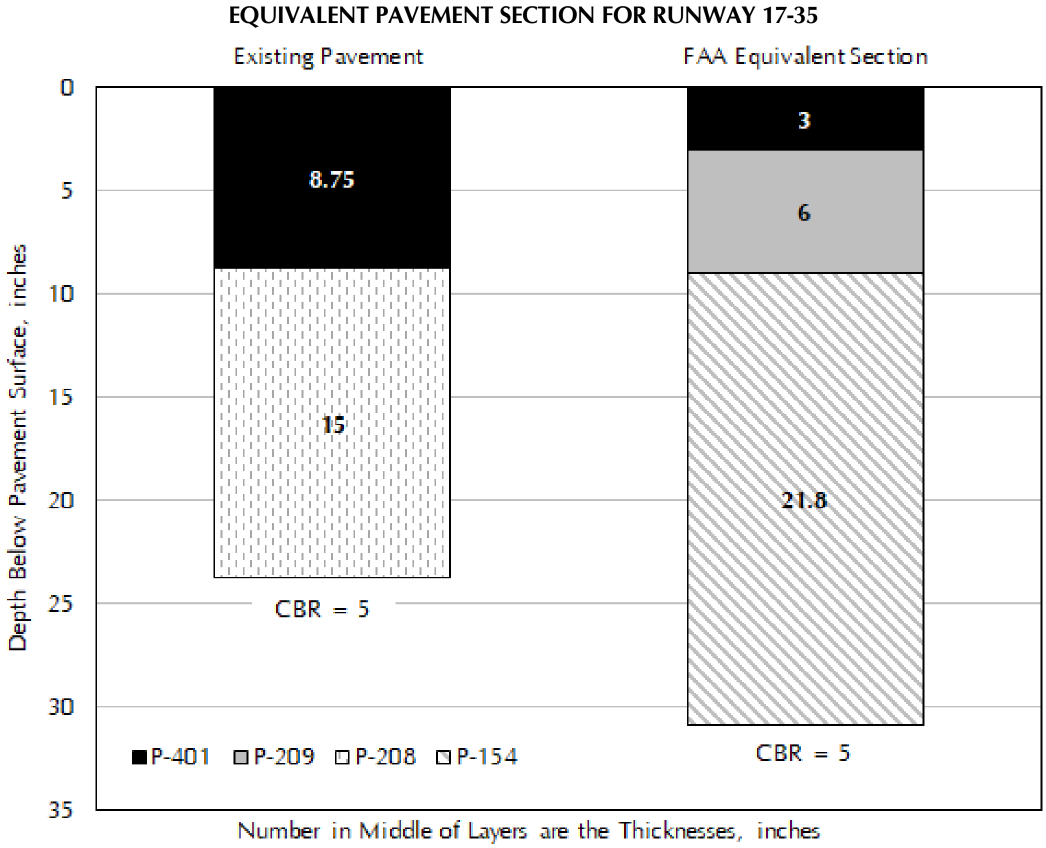
The elastic moduli of the subgrade soil at the boring locations were backcalculated from the FWD test data. The average minus-one standard deviation subgrade moduli for each analysis unit (design modulus) are shown at the bottom of the backcalculation analysis results in Table 2A in Appendix A.

PAVEMENT CLASSIFICATION NUMBER (PCN) CALCULATIONS

As requested by the ODA, we calculated the PCN for Runway 17-35 for each aircraft in the fleet mix based on the critical pavement-layer thickness and subgrade-support characteristics developed herein. The California bearing ratio (CBR) used in the PCN analysis is based on the backcalculated design modulus from Analysis Unit 2 in Table 2A in Appendix A and was calculated using the typical correlation between CBR and Resilient Modulus (M_r) and the correlation adopted by the FAA in Advisory Circular 150/5320-6F, *Airport Pavement Design and Evaluation*, which is represented by the following:

$$CBR = M_r / 1{,}500$$

The analysis was conducted using the FAA's Support Spreadsheet, COMFAA 3.0. The pavement-layer thicknesses were converted into an equivalent pavement section using the appropriate subgrade-support code and the default values for the conversion factors given in Advisory Circular 150/5335-5C. Based on our analysis, the equivalent pavement section is also shown on the following figure.



Results of the PCN computations summarized in Table 3 are based on the departure traffic provided by CWE. For Runway 17-35, we recommend publishing the PCN value shown in Table 3. The corresponding PCN elements of the runway are summarized in Form 5010 (Table 1B) in Appendix B.

Table 3: RECOMMENDED UPDATES TO FAA FORM 5010 FOR UAO RUNWAY 17-35

Runway	PCN	Aircraft Gross Weight, thousands lbs	
		Single Wheel Main Gear	Dual Wheel Main Gear
17-35	40/F/C/X/T	102	145

Our recommended single-wheel, main-gear and dual-wheel, main-gear aircraft gross weights are 102,000 and 143,000 lbs, respectively. The increase in wheel-load capacity (as compared to the current Airport Master Record, FAA Form 5010) is likely due to the increased structural capacity related to the 2005 overlay. Additional discussion regarding the PCN methodology and reporting is provided in Appendix B.

LIMITATIONS

This pavement report has been prepared for use by the Oregon Department of Aviation and Century West Engineering Corporation and should not be relied upon by any other entity without the written permission of an authorized representative. The scope is limited to the specific project and location described herein, and our description of the project represents our understanding of the significant aspects of the project relevant to the analysis of the pavements at the time of publication.

PCN system is only intended as a method that airport operators can use to evaluate acceptable operations of aircraft. It is not intended as a pavement design or pavement evaluation procedure, nor does it restrict or replace the methodology used to design or evaluate a pavement structure.

Our work has been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the locale. The results and conclusions submitted in this report are based on the data obtained from our sources of information discussed in this report. No other warranty, expressed or implied, is made.

Please contact the undersigned if you have any questions regarding this report or any other pavement considerations associated with this project.

Submitted for GRI,

Renews 12/2020

Michael J. Maloney, PE
Principal

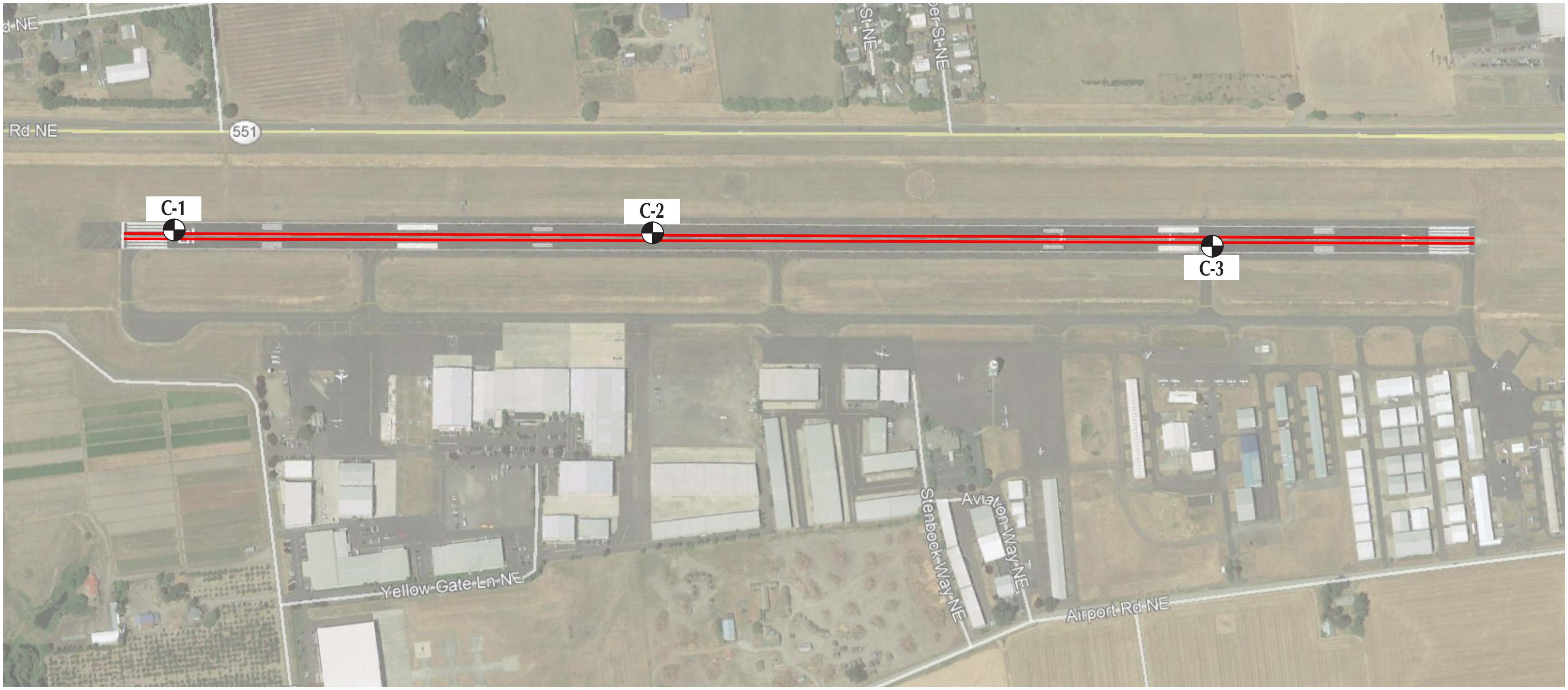
Lindsi A. Hammond, PE
Associate

This document has been submitted electronically.

References

WHPacific, Inc., 2012, Aurora State Airport, Airport Master Plan Update.

Pavement Consultants Inc., 2018, 2018 Pavement Evaluation / Maintenance Management Program: Aurora State Airport.



PAVEMENT CORE COMPLETED BY GRI
(AUGUST 20, 2019)

FWD TESTING COMPLETED BY GRI
(AUGUST 20, 2019)

SITE PLAN FROM GOOGLE EARTH (IMAGE DATE JULY 2018)

North

0 600 1,200 FT

GRI

CENTURY WEST ENGINEERING CORPORATION
AURORA STATE AIRPORT – RUNWAY 17-35 PCN EVALUATION

SITE PLAN

SEP. 2019 JOB NO. 6289 FIG. 1

APPENDIX A

Field Explorations and FWD Data

APPENDIX A

FIELD EXPLORATIONS AND FWD DATA

FIELD EXPLORATIONS

Existing pavement and subsurface conditions on Runway 17-35 were investigated by GRI on August 20, 2019, with three core explorations, designated B-1 through B-3. The approximate locations of the explorations are shown on the Site Plan, Figure 1. The field exploration and laboratory programs completed for this project are described below.

Pavement Core Explorations

The pavement was cored at each exploration location to assist in evaluation of the type of cracking and/or the thickness and condition of the asphalt concrete (AC). The pavement was cored using an electric drill owned and operated by GRI. Photographs of the core locations and core samples are shown on Figures 1A through 3A. Below the AC, we excavated to a maximum total depth of 24 in. below ground surface to observe the condition of the aggregate base (AB) and subgrade, if encountered. The subgrade was not encountered during our explorations and the AB was classified as silty sandy gravel ranging from angular to rounded and up to 1 to 1.5 in. in diameter.

FWD DATA

Falling weight deflectometer (FWD) tests were conducted by GRI on August 20, 2019, using our KUAB Model 150 FWD. The annual reference calibration for the FWD was accomplished in October 2019 at the KUAB manufacturing facility in Savoy, Illinois.

The FWD testing on Runway 17-35 was accomplished along test lines located at 7 ft west and 12 ft east of the runway centerline. The tests were completed at approximately 200-ft intervals within the keel section of the runway.

General

Geodetic coordinates of all test locations were measured from GPS signal using a submeter-capable Trimble™ GPS receiver with the antenna mounted on the FWD above the load plate.

The FWD load is generated by a two-mass/two-buffer, falling-weight system that produces a nearly haversine-shaped load-pulse waveform. The buffer and weight combination used for these tests produces a load rise time of approximately 14 milliseconds with an equivalent haversine frequency of approximately 32 Hz. The load pulse was applied to the pavement surface through a 450-mm-diameter (8.86-in.-radius), four-part, segmented plate designed to apply uniform surface pressure distribution despite irregularities in the pavement surface. Air temperature and pavement surface temperature (the latter measured by infrared thermometer) were recorded for each test.

Test Data

The average deflections from the two nominal 32,000-lb impact loads were linearly normalized to a 30-kip (30,000-lb) load basis and are tabulated in Table 1A of this appendix. The measurement units for the test data are distance in feet, deflections in mil units (1 mil = 0.001 in.), load in pounds, sensor distance in inches, load plate radius in inches, and temperature in degrees Fahrenheit.

Impact Stiffness Modulus (ISM)

The Impact Stiffness Modulus (ISM) shown in units of kips per square inch (ksi) is the composite stiffness, or dynamic plate bearing modulus, of all the materials beneath the pavement/roadway surface. It is computed using the Boussinesq formula for surface deflection beneath the center of a uniformly loaded circular area on a linear-elastic half space, with a Poisson's ratio of 0.50. The surface deflection measured at the center of the FWD load plate (D0) was used to compute the surface modulus. The magnitude of the ISM is inversely proportional to deflection and comparable to the elastic modulus. The difference between the pavement ISM and elastic modulus is that the elastic modulus represents the elastic load-deformation response of an individual pavement layer or the subgrade soil, whereas the pavement ISM represents the composite elastic load-deformation response of all materials (pavement layers and subgrade soil) below the pavement surface. Therefore, the ISM (as computed from the deflection measured beneath the FWD load plate) cannot be taken as representative of the elastic modulus of any single pavement layer or the subgrade soil. However, since it is a measurement of the combined stiffness of the pavement structure and subgrade soil, it is often useful for evaluation of variation in pavement stiffness and for assessment of relative pavement strength. Plots of the ISMs are shown on Figure 4A.

Table 1A - FWD NORMALIZED DEFLECTION TEST DATA
RUNWAY 17-35: AURORA STATE AIRPORT (UAO)

Test Section:	RW 17-35							
Start Point:	North edge of runway, 10+00							
Test Date:	8/20/2019							
Test File:	6289-Aurora Airport.fwd							
Load Plate Radius, in:	8.86							
Sensor Distance, in:	0	12	18	24	36	48	60	72

Deflections Normalized to 30000 lbf Basis

Test No.	Test Station	Test Line	Core	D 1, mils	D 2, mils	D 3, mils	D 4, mils	D 5, mils	D 6, mils	D 7, mils	D 8, mils	Surface Temp., °F	Time	Surface Modulus, Ksi	ISM, kips/in	Comments
1	10+50	7' w		28.54	24.85	21.17	18.56	13.73	10.05	7.37	5.54	68	1:24:59	57	1,051	7' west
2	12+50	7' w		25.28	20.28	16.82	14.62	10.56	7.81	5.80	4.50	71	1:26:36	64	1,187	
3	14+49	7' w		30.42	25.52	21.55	18.73	13.50	9.84	7.24	5.55	71	1:27:52	53	986	
4	16+51	7' w		29.35	24.82	20.94	18.25	13.29	9.74	7.15	5.47	71	1:29:09	55	1,022	
5	18+50	7' w		24.65	20.46	17.12	14.81	10.62	7.71	5.71	4.47	71	1:30:14	66	1,217	
6	20+56	7' w		27.93	22.60	18.54	15.81	11.05	7.98	5.87	4.66	71	1:31:20	58	1,074	
7	22+50	7' w		25.72	21.22	17.71	15.34	11.10	8.13	6.06	4.70	71	1:32:26	63	1,166	
8	24+51	7' w		26.54	21.58	17.98	15.18	10.67	7.71	5.71	4.47	71	1:33:33	61	1,130	
9	26+53	7' w		26.28	20.74	17.15	14.64	10.47	7.67	5.83	4.64	70	1:34:39	62	1,142	
10	28+55	7' w		26.82	22.10	18.49	15.98	11.58	8.49	6.34	4.95	71	1:35:42	60	1,119	
11	30+54	7' w		26.27	21.60	18.22	15.84	11.70	8.66	6.45	4.96	71	1:37:01	62	1,142	
12	32+54	7' w		30.95	25.88	21.81	19.07	13.97	10.26	7.67	5.78	71	1:38:07	52	969	
13	34+52	7' w		36.96	27.64	22.18	18.81	13.26	9.67	7.12	5.56	71	1:39:22	44	812	
14	36+57	7' w		32.41	26.67	22.42	19.26	13.87	10.02	7.26	5.44	70	1:40:28	50	926	
15	38+52	7' w		28.76	23.55	19.60	16.84	12.06	8.67	6.34	4.88	70	1:41:38	56	1,043	
16	39+51	7' w	B-2	34.09	27.13	22.55	19.48	14.13	10.46	7.65	5.72	70	1:43:21	47	880	B-2
17	40+51	7' w		27.27	22.43	18.67	16.13	11.60	8.44	6.11	4.75	70	1:44:29	59	1,100	
18	42+51	7' w		31.58	25.74	21.56	18.44	13.11	9.35	6.80	5.10	70	1:45:38	51	950	
19	44+51	7' w		29.21	23.02	18.77	15.98	11.24	7.90	5.76	4.52	70	1:46:46	55	1,027	
20	46+50	7' w		29.41	23.54	19.35	16.44	11.40	7.92	5.78	4.50	70	1:47:53	55	1,020	
21	48+52	7' w		28.25	23.01	19.08	16.26	11.38	8.17	6.06	4.66	70	1:49:02	57	1,062	
22	50+52	7' w		39.77	29.04	22.94	19.04	12.53	8.69	6.21	4.86	70	1:50:10	41	754	
23	52+50	7' w		34.37	27.28	22.48	18.86	12.83	8.94	6.47	5.08	70	1:51:20	47	873	
24	54+51	7' w		44.23	34.59	27.53	22.75	14.74	9.70	6.77	5.20	69	1:52:33	37	678	
25	56+40	7' w		37.32	28.83	22.75	18.62	11.88	7.81	5.61	4.42	67	1:53:49	43	804	
26	56+81	7' w	B-1	35.88	28.79	23.20	19.31	12.57	8.38	5.79	4.55	70	1:55:03	45	836	B-1
27	58+50	7' w		35.45	27.78	22.05	18.05	11.74	7.82	5.60	4.34	65	1:56:22	46	846	5875=s end end 7' west
28	11+50	12' e		25.22	21.35	18.22	15.93	11.88	8.90	6.66	5.09	68	2:05:27	64	1,190	12' east
29	13+50	12' e		30.01	25.29	21.29	18.67	13.66	10.11	7.43	5.70	70	2:07:03	54	1,000	
30	15+51	12' e		30.03	25.22	21.26	18.42	13.46	9.89	7.28	5.64	70	2:08:15	54	999	
31	17+53	12' e		28.42	22.94	19.00	16.27	11.53	8.38	6.20	4.83	70	2:09:28	57	1,056	
32	19+41	12' e	B-3	34.02	25.85	20.87	17.26	11.79	8.33	6.13	4.74	70	2:13:56	48	882	B-3
33	21+50	12' e		21.06	17.31	14.42	12.49	9.07	6.79	5.19	4.17	70	2:16:05	77	1,425	
34	23+52	12' e		25.55	21.01	17.53	15.14	11.13	8.27	6.23	4.95	70	2:17:18	63	1,174	
35	25+52	12' e		21.98	17.91	15.02	13.04	9.69	7.31	5.60	4.43	69	2:18:26	74	1,365	
36	27+51	12' e		26.27	20.79	16.87	14.33	10.21	7.48	5.62	4.44	69	2:19:33	62	1,142	
37	29+50	12' e		34.66	28.16	23.24	19.76	13.95	10.10	7.48	5.79	69	2:20:42	47	866	

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Table 1A - FWD NORMALIZED DEFLECTION TEST DATA
RUNWAY 17-35: AURORA STATE AIRPORT (UAO)

Deflections Normalized to 30000 lbf Basis

Test No.	Test Station	Test Line	Core	D 1, mils	D 2, mils	D 3, mils	D 4, mils	D 5, mils	D 6, mils	D 7, mils	D 8, mils	Surface Temp., °F	Time	Surface Modulus, Ksi	ISM, kips/in	Comments
38	31+52	12' e		27.24	22.35	18.84	16.39	12.19	9.20	6.99	5.47	69	2:21:52	59	1,101	
39	33+49	12' e		26.34	21.87	18.38	15.90	11.64	8.78	6.71	5.25	69	2:23:00	61	1,139	
40	35+53	12' e		24.64	20.22	16.91	14.67	10.73	8.01	6.08	4.83	69	2:24:09	66	1,218	
41	37+51	12' e		29.65	24.86	20.96	18.32	13.45	9.99	7.38	5.60	69	2:25:16	55	1,012	
42	39+50	12' e		25.27	21.38	17.99	15.86	11.68	8.77	6.56	5.13	69	2:26:26	64	1,187	
43	41+51	12' e		25.80	21.67	18.35	15.90	11.67	8.62	6.43	4.94	69	2:27:34	63	1,163	
44	43+50	12' e		27.58	23.19	19.57	17.18	12.51	9.22	6.76	5.14	69	2:28:38	59	1,088	
45	45+51	12' e		26.22	21.41	17.71	15.13	10.72	7.77	5.72	4.51	69	2:29:48	62	1,144	
46	47+54	12' e		28.02	22.49	18.48	15.60	10.83	7.75	5.68	4.46	69	2:30:56	58	1,071	
47	49+51	12' e		27.34	22.44	18.36	15.67	11.04	7.94	5.90	4.62	69	2:32:04	59	1,097	
48	51+53	12' e		30.35	24.69	20.12	17.00	11.60	8.11	5.96	4.66	69	2:33:11	53	988	
49	53+55	12' e		31.95	26.02	21.17	17.69	11.99	8.46	6.17	4.85	69	2:34:18	51	939	
50	55+50	12' e		36.26	28.03	22.28	18.48	12.16	8.34	6.04	4.75	69	2:35:31	45	827	
51	57+51	12' e		32.67	26.40	21.38	17.62	11.50	7.75	5.50	4.31	67	2:36:47	49	918	5878=s end end 12' east

Table 2A - BACKCALCULATION ANALYSIS SUMMARY
RUNWAY 17-35: AURORA STATE AIRPORT (UAO)

Runway 17-35: Aurora State Airport (UAO)
Based on FWD Testing Conducted: 8/20/2019
Start Station: North edge of runway, 10+00

FWD Test #	Test Station	Test Line	Core Exploration	Analysis Unit	D0, mils	AC Thickness, inches	AB Thickness, inches	Subgrade Modulus, psi
1	10+50	7' w		1	28.54	9.00	15.00	10,402
2	12+50	7' w		1	25.28	9.00	15.00	15,441
3	14+49	7' w		1	30.42	9.00	15.00	11,553
4	16+51	7' w		1	29.35	9.00	15.00	11,570
5	18+50	7' w		1	24.65	9.00	15.00	12,902
6	20+56	7' w		1	27.93	9.00	15.00	11,768
7	22+50	7' w		1	25.72	9.00	15.00	14,630
8	24+51	7' w		1	26.54	9.00	15.00	12,567
9	26+53	7' w		1	26.28	9.00	15.00	15,004
10	28+55	7' w		1	26.82	9.00	15.00	14,486
11	30+54	7' w		1	26.27	9.00	15.00	13,228
12	32+54	7' w		1	30.95	9.00	15.00	10,155
13	34+52	7' w		1	36.96	9.00	15.00	9,847
14	36+57	7' w		1	32.41	9.00	15.00	10,365
15	38+52	7' w		1	28.76	9.00	15.00	10,556
16	39+51	7' w	B-2	1	34.09	9.00	15.00	9,726
17	40+51	7' w		1	27.27	9.00	15.00	10,489
18	42+51	7' w		1	31.58	9.00	15.00	11,108
19	44+51	7' w		1	29.21	9.00	15.00	11,314
20	46+50	7' w		1	29.41	9.00	15.00	11,087
21	48+52	7' w		1	28.25	9.00	15.00	14,129
22	50+52	7' w		2	39.77	8.75	15.00	8,814
23	52+50	7' w		2	34.37	8.75	15.00	9,367
24	54+51	7' w		2	44.23	8.75	15.00	6,713
25	56+40	7' w		2	37.32	8.75	15.00	9,796
26	56+81	7' w	B-1	2	35.88	8.75	15.00	7,615
27	58+50	7' w		2	35.45	8.75	15.00	9,512
28	11+50	12' e		1	25.22	9.00	15.00	12,541
29	13+50	12' e		1	30.01	9.00	15.00	11,399
30	15+51	12' e		1	30.03	9.00	15.00	9,781
31	17+53	12' e		1	28.42	9.00	15.00	11,645
32	19+41	12' e	B-3	1	34.02	9.00	15.00	10,977
33	21+50	12' e		1	21.06	9.00	15.00	17,720
34	23+52	12' e		1	25.55	9.00	15.00	13,364
35	25+52	12' e		1	21.98	9.00	15.00	14,811
36	27+51	12' e		1	26.27	9.00	15.00	14,236
37	29+50	12' e		1	34.66	9.00	15.00	11,837
38	31+52	12' e		1	27.24	9.00	15.00	10,942
39	33+49	12' e		1	26.34	9.00	15.00	11,421
40	35+53	12' e		1	24.64	9.00	15.00	14,477
41	37+51	12' e		1	29.65	9.00	15.00	10,835
42	39+50	12' e		1	25.27	9.00	15.00	11,501
43	41+51	12' e		1	25.80	9.00	15.00	13,236
44	43+50	12' e		1	27.58	9.00	15.00	11,913

Table 2A - BACKCALCULATION ANALYSIS SUMMARY
RUNWAY 17-35: AURORA STATE AIRPORT (UAO)

FWD Test #	Test Station	Test Line	Core Exploration	Analysis Unit	D0, mils	AC Thickness, inches	AB Thickness, inches	Subgrade Modulus, psi
45	45+51	12' e		1	26.22	9.00	15.00	12,250
46	47+54	12' e		1	28.02	9.00	15.00	11,825
47	49+51	12' e		1	27.34	9.00	15.00	12,606
48	51+53	12' e		2	30.35	8.75	15.00	11,238
49	53+55	12' e		2	31.95	8.75	15.00	10,326
50	55+50	12' e		2	36.26	8.75	15.00	9,761
51	57+51	12' e		2	32.67	8.75	15.00	9,341

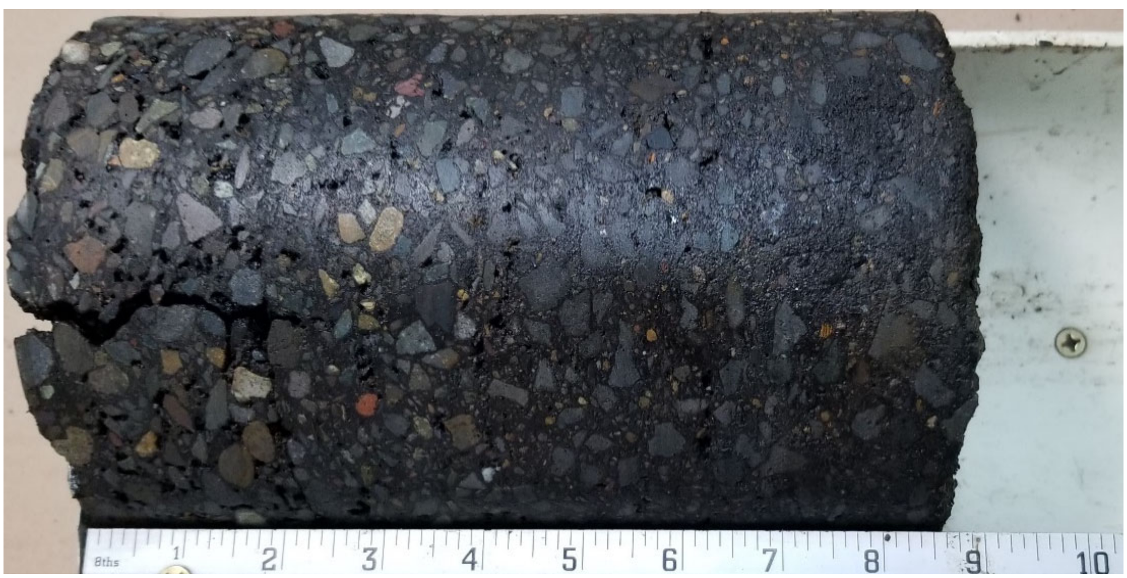
Statistical Summary

Structural Unit#	From Sta	To Sta	PAVER PMP Unit	Average D0, mils	Average AC Thickness, in.	Average AB Thickness, in.	Average Subgrade Modulus, psi
1	0+00	49+51	R17AU-01	28.10	9.00	15.00	12,235
2	0+00	58+50	R17AU-02	35.83	8.75	15.00	9,248

Design Subgrade Resilient Modulus

Structural Unit #	From	To	PAVER PMP Unit	Average Subgrade Modulus, psi	Standard Deviation, psi	Average Subgrade – Standard Deviation, psi	CBR, Mr (psi)/1500
1	10+50	49+51	R17AU-01	12,235	1,800	10,435	7
2	50+52	58+50	R17AU-02	9,248	1,294	7,955	5

Core B-1 (RW 17-35 8′ West of Centerline, Station 56+81, FWD 26)



B-1 (Pavement Core Sample, 8.75 in.)

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PAVEMENT CORE PHOTOGRAPHS

Core B-2 (RW 17-35 8′ West of Centerline, Station 39+51, FWD 16)

B-2 (Pavement Core Sample, 9.0 in.)

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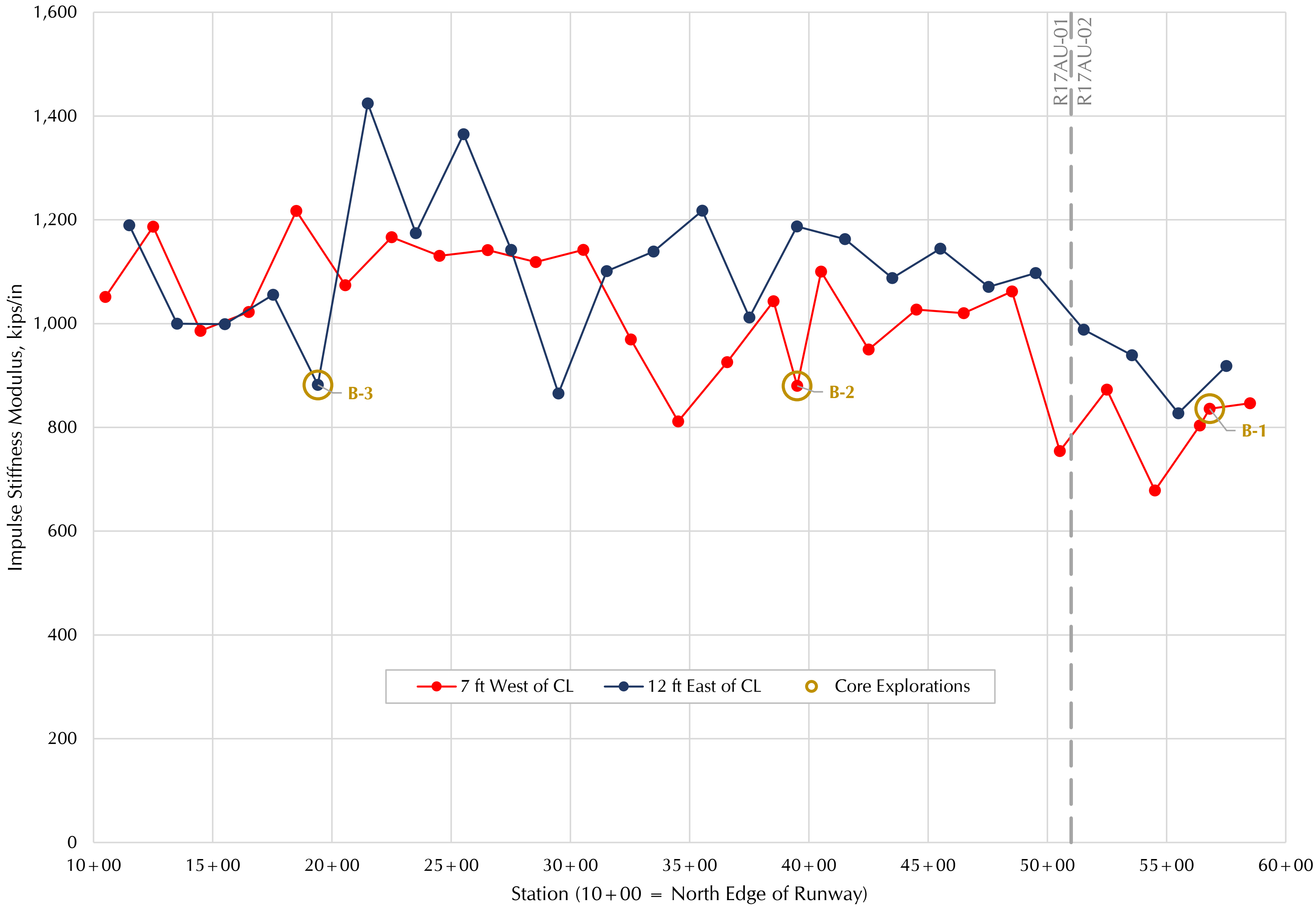
PAVEMENT CORE PHOTOGRAPHS

Core B-3 (RW 17-35 12′ East of Centerline, Station 19+41, FWD 32)

B-3 (Pavement Core Sample, 9.0 in.)

GRI

PAVEMENT CORE PHOTOGRAPHS



GRI

IMPULSE STIFFNESS MODULUS

SEP. 2019 JOB NO. 6289 FIG. 4A

APPENDIX B

Pavement Classification Number Analysis

APPENDIX B

PAVEMENT CLASSIFICATION NUMBER ANALYSIS

BACKGROUND

In 2014, the FAA instituted a requirement that Part 139-certified airports be assigned pavement classification number (PCN) data. The PCN is required because the United States is a member state of the International Civil Aviation Organization (ICAO), the international regulatory body for air traffic. ICAO adopted the Aircraft Classification Number (ACN)-Pavement Classification Number (ACN-PCN) method to allow any airport a standardized method for reporting the effect of aircraft that use the facility, as well as the load-carrying capacity of the pavement (ICAO, 1999).

The ACN is a number that expresses the relative effect of an aircraft at a given configuration on a pavement structure for a specified standard subgrade strength. Conversely, the PCN is defined as a number that expresses the load-carrying capacity of a pavement for unrestricted operations. Therefore, the ACN-PCN system is structured so that a pavement with a particular PCN value can support unlimited repetitions of an aircraft that has an ACN equal to or less than the pavement's PCN value.

In the ACN/PCN method, the PCN, pavement type, subgrade strength category, tire pressure category, and evaluation method are all reported together. A code system has been implemented to allow an abbreviated presentation of the necessary information. The pavement type is abbreviated "R" for rigid (portland cement concrete [PCC]) and "F" for flexible (AC) pavements. Four subgrade categories, A, B, C, and D, indicate high, medium, low, and ultra-low subgrade strengths, respectively. The four tire-pressure categories, W, X, Y, and Z, indicate high, medium, low, and very low tire pressures, respectively. The evaluation methods are T for a technical evaluation and U for an evaluation based on the type and weight of the aircraft that commonly use the airfield. For example, the PCN code 90/F/C/W/T indicates that the PCN number is 90, that the pavement is flexible, that there is a low-strength subgrade, that high-pressure tires are allowed, and that a technical evaluation was performed to determine the PCN rating.

METHODOLOGY

As noted above, the pavement strength evaluation was accomplished in accordance with the Technical Method described in Advisory Circular 150/5335-5C. To complete the analysis, the following information was used for Runway 17-35:

> **Aircraft Traffic Volume:** The traffic volume estimate was provided by Century West Engineering Corporation in terms of operations for Runway 17-35. The COMFAA 3.0 program includes a library of standard aircraft types, and we used the default gear weight for each aircraft in the aircraft fleet mix.
>
> **Pavement Structure:** As noted earlier herein, the pavement thickness and subgrade support characteristics were estimated based on the FWD backcalculation results and core explorations.

The results of our PCN analysis are summarized in Form 5010 – Airport Master Record (Table 1B) and presented on Figure 1B of this appendix.

Reference

ICAO, 1999, Aerodrome standards – aerodrome design and operations, Annex 14, Third Edition.

Table 1B - FORM 5010 AIRPORT MASTER RECORD

- ○ A Flexible Category (CBR 15)
- ○ B Flexible Category (CBR 10)
- ● C Flexible Category (CBR 6)
- ○ D Flexible Category (CBR 3)

TIRE PRESSURE

- ○ W Unlimited
- ● X 254 psi
- ○ Y 145 psi
- ○ Z 73 psi

METHOD USED

- ○ Using Aircraft
- ● Technical

Project info

Aurora State Airport

- ○ A Rigid Category (k 552 pci)
- ○ B Rigid Category (k 295 pci)
- ○ C Rigid Category (k 147 pci)
- ○ D Rigid Category (k 74 pci)

AIRCRAFT GEAR TYPE IN TRAFFIC MIX

- ☑ S (single wheel gear)
- ☑ D (dual wheel gear)
- ☐ 2D (dual tandem wheel gear)
- ☐ 3D (triple tandem wheel gear) e.g B-777
- ☐ DDT or W/B (tandem gear under wing AND tandem gear under body) e.g. B-747, A-340-600, A-380

Airport LOC-ID UAO

Pavement ID RW 17-35

Enter PCN 40

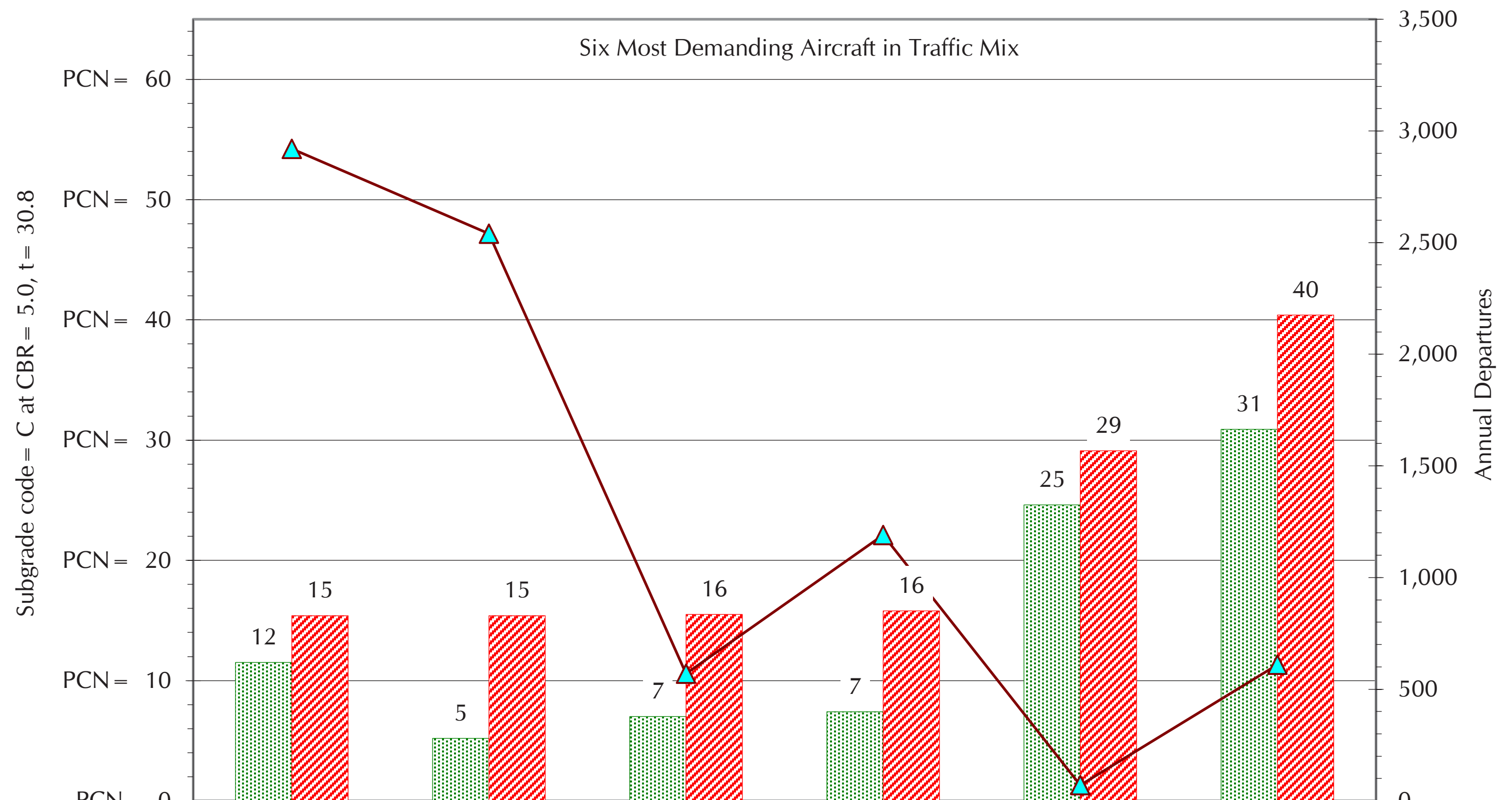
IF 3D or W/B Gear Checked, #38 = PCN
Please Add Data Element #38 Remark

Form 5010 Data Element	Gross Weight and PCN
#35 S gear	102
#36 D gear	143
#37 DT gear	
#38 DDT gear	
#39 PCN	40/F/C/X/T

3D	
2D/2D2	
2D/3D2W	
2D/3D2B	

Report Minimum Gross Weight

Airport LOC-ID	Pavement ID	#35 S GW	#36 D GW	#37 DT GW	#38 DDT GW	#39 PCN
UAO	17-35	102	143			40/F/C/X/T



	Citation-X	Learjet-35A/65A	Learjet-55	Citation-VI/VII	Gulfstream-G-IV	Gulfstream-G-V
1. Aircraft ACN at traffic mix GW	11.5	5.2	7.0	7.4	24.6	30.9
2. Calculated PCN at CDF max. GW	15.4	15.4	15.5	15.8	29.1	40.4
3. Annual Departures from traffic mix	2,920	2,540	570	1,190	70	610

GRI

PAVEMENT CLASSIFICATION CHART

SEP. 2019 JOB NO. 6289 FIG. 1B

Memo

To:	**Heather Peck, Projects and Programs Director, Oregon Department of Aviation**
From:	**James Kirby, PE, Century West Engineering**
Date:	**September 4th, 2020**
Project:	**Aurora State Airport - Runway Pavement Considerations for Overweight Landings**
Re:	**Evaluation and Recommendations**

The Oregon Department of Aviation (ODA) has requested that Century West Engineering assess the existing information concerning Runway 17-35 at Aurora State Airport (UAO) and provide recommendations on further consideration of overweight landing requests there. A review of existing conditions, recent structural evaluation work, and qualitative factors related to the surface condition follows:

Existing conditions

The most recent ODA Pavement Evaluation Program (PEP) report prepared by Pavement Consultant Inc. (dated 2018) shows the existing Runway 17-35 pavement is comprised of two major sections. The largest being the 4,100' long Northern section of the runway, first constructed in 1943. The 900' long Southern extension was constructed in 1993. During the last major project in 2005, the entire length of the runway received a 2" to 3" overlay.

The PEP reports that the pavement surface of Runway 17-35 is in "satisfactory" condition with a weighted average Pavement Condition Index of 81. The primary distresses present on the runway are low- to medium-severity longitudinal cracking, low-severity weathering, and isolated low-severity alligator cracking. The longitudinal cracking is located primarily at paving joints created during the 2005 overlay project and sealed most recently in August of 2020. The alligator cracking is located in the gear path for the larger business jet aircraft using the airport.

When design for the 2005 project was being contemplated, FAA had limited the structural capacity input used in the design to 30,000 lbs (single wheel main gear) and 45,000 lbs (dual wheel main gear). It was determined that the existing pavement met those design criteria and as that project was not intended to increase runway capacity, the overlay was limited in depth. The 2" to 3" overlay was able to address surface conditions and combined with milling, extend the overall pavement section's life considerably. No additional structural testing of the final section was conducted at that time and as a result, the current Airport Master Record (FAA Form 5010) lists the 30,000 lbs single wheel and 45,000 lbs dual wheel numbers as the gross weight limitations for the runway pavement.

Recent Structural Evaluations

In August of 2019, GRI performed a pavement evaluation of Runway 17-35 at UAO to determine the existing Pavement Classification Number (PCN). That project included review of ODA historical pavement records, falling weight deflectometer testing, pavement cores, and related analysis. The guidance provided in FAA Advisory Circular 150/5335-5C, Standardized Method of Reporting Airport Pavement Strength – PCN, was used to calculate the final PCN based on this work.

The reported PCN indicated that the existing pavement's structural capacity was greater than the 30,000 lbs single wheel and 45,000 lbs dual wheel numbers published in the Airport Master Record. GRI recommended that the single-wheel, main-gear and dual-wheel, main-gear aircraft gross weights be increased to 102,000 and 143,000 lbs, respectively based on the new PCN calculation. They hypothesized in their report that the 2005 overlay resulted in additional pavement section depth that likely increased the structural capacity. As design thicknesses for various portions of the pavement section are rounded up and factors of safety are built into the design process, these likely factored into the existing structure having increased capacity over the design numbers as well.

Overweight Landings

For aircraft exceeding the published pavement strength ratings, ODA requires submission of a Weight Limit Waiver Request and Liability Release Form prior to use of the airport. This anticipates that individual landings and takeoffs will be considered in light of the Runway strength rating and may be allowed on an individual basis. There have been a number of such requests approved in the last five years from operators of Gulfstream aircraft such as the GIV, GV, and GVI as well as Global Express aircraft.

The PCN calculation which yielded the GRI recommendation to increase the gross weight limits for the Runway does have some caveats that need to be considered. It should be noted that the PCN system is used as a method for airport operators to determine whether or not individual aircraft operations may be acceptable on their pavements. As such, it does not provide a mechanism to evaluate the cumulative damage from repeated aircraft operations of a specific type, size or configuration. In short, it does not provide a substitute for a pavement design or evaluation of changes in fleet mix, each which must be considered separately.

We looked at a representative fleet mix to see if an additional large aircraft might significantly reduce pavement life. Taking into account GRI's pavement strength assessment, it is unlikely that isolated operations of the aircraft that have made requests for overweight landings previously would significantly reduce the pavement life. Those aircraft gross takeoff weights are under the calculated pavement strengths so the effect of individual operations would be minimal.

However, large shifts in fleet mix to heavier aircraft should be considered carefully in light of the cumulative effect that major fleet changes have on pavement life. To evaluate the effect, a fleet mix could be created for the airport that included all operations broken out by specific aircraft type and configuration. Then that fleet mix could have one or more aircraft of interest added to the mix with their proposed operational counts and the cumulative effects on the pavement section could be quantified. The concerns noted by GRI in their report about the condition of the existing overlay however, preclude the use of that approach in any meaningful way.

Other Considerations

GRI noted low severity alligator cracking within the gear paths that warranted further examination. Pavement cores were drilled in those areas and the cracking was found to be top-down. GRI also noted delamination of the top course of asphalt (from the 2005 overlay). This type of cracking and delamination is indicative of shear stresses at the pavement surface from aircraft wheel loading during landing and hard braking.

These observations make looking at an individual aircraft's cumulative effect on pavement life problematic as those effects may not result in the most likely failure mode for the runway pavement. The FAA does not have an accepted approach for modelling shear stresses or delamination of overlays in a quantifiable way. Variability in the degree of delamination over the runway surface also presents a unique problem. We can examine what operations may make those situations worse however. Surface shear stresses result when aircraft tires contact the pavement surface and significant friction forces are generated. Examples are initial contact with the pavement surface at the touchdown point and hard wheel braking during rollout. Aircraft with large tire contact areas and heavier weights would be worse in this regard. Even lighter aircraft such a DC-3 when fitted with larger tires put the runway overlay at greater risk for shear failure due to their larger tire contact area.

Recommendations

Evaluation of waiver requests for aircraft exceeding the existing published pavement strength ratings provides ODA with a valuable tool to control further runway degradation. However, a qualitative approach is likely the best way to maintain overall pavement condition as long as possible when overweight operations are being considered. Individual or limited operations of aircraft with gross weights over the published maximums and under those weights indicated by the PCN calculations are likely negligible. Significant additional operations of aircraft in that weight range may warrant additional and specific study. We would also recommend that any overweight landing request be considered in light of the potential for shear stress failures in the form of overlay delamination and FOD generation from low-severity alligator cracking worsening on the runway.

In general, we would recommend that the runway be inspected more frequently to monitor pavement conditions at those locations where alligator cracking was noted. This would include the wheel paths along the length of the runway as well as the width of the runway in the landing areas at both ends. If worsening alligator cracking, significant new transverse cracking, random cracking, or FOD generation is noted, further pavement inspection and assessment would be recommended as well.

Finally, we would also recommend ODA consider putting together a formal action plan for what steps would be taken should a surface failure occur. Should a failure happen, at best, significant FOD would be generated requiring shutdown and cleanup. At worst, a catastrophic failure along the weakened delamination plane may displace part of the runway surface and require a lengthier shutdown and significant repair. Coordinating with potential repair contractors or other local agency resources (ODOT, Marion county road crews, etc.) that might be brought in to address an immediate pavement need is an important consideration in reducing runway closure length.

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MEMORANDUM

To: James Kirby, PE / Century West Engineering

Date: June 8, 2021

GRI Project No.: 6488-A

From: Lindsi Hammond, PE

Re: Pavement Evaluation
Aurora Airport Runway 17/35 Remaining Structural Life Evaluation
Aurora, Oregon

As requested, GRI performed engineering analyses to determine the remaining structural life of Runway 17/35 at Aurora State Airport (UAO) in support of the Oregon Department of Aviation (ODA). This work was completed as a follow-up to the report titled "Pavement Classification Number (PCN) Evaluation of Runway 17-35," issued on November 12, 2019 (2019 PCN Report). As discussed in Federal Aviation Administration (FAA) Advisory Circular 150/5335-5C titled *Standardized Method of Reporting Airport Pavement Strength – PCN*, the PCN system has significant limitations such that the analysis consolidates the entire fleet mix into one representative aircraft and that the PCN should not be used to replace a structural evaluation or pavement design due to the complex nature and engineering judgment required beyond the outputs of the FAA software programs.

Our work included reviewing relevant ODA records for Runway 17/35, performing a multilayered backcalculation analysis using the falling weight deflectometer (FWD) data that were used to assist us in delivering our 2019 PCN Report, and evaluating the structural remaining life in general accordance with the FAA Advisory Circular 150/5320-6F, *Airport Pavement Design and Evaluation*, and the FAA pavement evaluation software, FAARFIELD (FAA Rigid and Flexible Iterative Elastic Layered Design) v1.42. Additional background data and analysis results are provided in Appendices A and B, respectively.

STRUCTURAL LIFE OF EXISTING PAVEMENT

The structural life of the existing pavement is calculated by the FAA design procedure based on traffic loading (i.e., aircraft fleet mix), structural properties of the existing pavement (thickness and modulus), and subgrade strength, as determined from investigation and testing of the pavement materials and subgrade soils. The structural life calculated in this manner only applies to the amount of time the existing pavement could support the forecasted traffic loading until its structural capacity decreases to the extent strengthening or reconstruction is required. Structural life does *not* account for deterioration in surface conditions or factors that can affect the integrity or functional life of the pavement system.

PAVEMENT FUNCTIONAL LIFE/PAVEMENT INTEGRITY

Pavement functional life is the period before the surface condition deteriorates to the state where there is significant potential for foreign object debris (FOD), which is the primary factor controlling the need for rehabilitation.

The functional life and integrity of asphalt concrete (AC) pavements are primarily controlled by 1) surface cracking that originates at the pavement surface and is typically confined to the upper pavement layers of the pavement system, 2) joint cracking, or 3) delamination of AC layers that can influence accelerated deterioration. Surface cracking may occur due to thermally induced movement, moisture exposure, and/or hardening of asphalt cement due to oxidation. Traffic loading, particularly with high tire pressures and heavily weighted aircraft, can initiate surface cracking and be an exacerbating factor in propagation and deterioration, especially when the upper AC layers exhibit delamination. In addition to the above factors, joint cracking is often caused by reduced compaction near the joint or mechanical and temperature segregation during asphalt construction.

ANALYSIS

We evaluated the remaining structural life of Runway 17/35 based on four traffic-loading scenarios, which included 1) current aircraft fleet mix; 2) current aircraft fleet mix plus 64 monthly operations of a Gulfstream G650ER (G650ER) at 103,600 pounds; 3) current aircraft fleet mix plus 64 monthly operations of a G650ER at 83,500 pounds; and 4) current aircraft fleet mix plus 64 monthly operations of a G650ER at 75,000 pounds. The aircraft fleet mix is provided in Tables 1A and 2A of Appendix A.

RESULTS

Based on the current aircraft fleet mix, the existing runway should be scheduled for rehabilitation within the next 10 years (e.g., sooner than the estimated remaining structural life). Table 1 shows our recommended timeframe for rehabilitation or reconstruction based on the results of the analysis in combination with the current integrity/functional life of the pavement system. Runway 17/35 exhibits delamination of the upper 2 inches to 3 inches of AC. In our opinion, the delamination in combination with the presence of fatigue cracking contributes to recommending a reduced remaining structural life. Additional details are provided in Appendix B.

Table 1: RECOMMENDED TIME UNTIL REHABILITATION/RECONSTRUCTION

Current Fleet Mix	Additional G650ER Operations @ 103,600 pounds	Additional G650ER Operations @ 83,500 pounds	Additional G650ER Operations @ 75,000 pounds
10 years	0 years	Within 5 years	Within 10 years

LIMITATIONS

This memorandum has been prepared for use by the Oregon Department of Aviation and Century West Engineering Corporation and should not be relied upon by any other entity without the written permission of an authorized representative. The scope is limited to the specific project and location described herein, and our description of the project represents our understanding of the significant aspects of the project relevant to the analysis of the pavements at the time of publication. In the event any changes in the parameters as outlined in this memorandum are planned, we should be given the opportunity to review the changes and modify or reaffirm the conclusions and recommendations of this memorandum in writing.

The conclusions and recommendations submitted in this memorandum are based on the data obtained from the subsurface explorations referenced in this memorandum and other sources of information discussed herein. In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. However, it is acknowledged variations in soil conditions may exist between exploration locations. This memorandum does not reflect any variations that may occur between these explorations. The nature and extent of variation may not become evident until construction and/or after additional field explorations. Additionally, our work has been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the locale. No other warranty, expressed or implied, is made.

Please contact the undersigned if you have any questions.

Submitted for GRI,

REGISTERED PROFESSIONAL ENGINEER
88693PE
OREGON
MAY 21, 2014
LINDSI ALEYCE HAMMOND
Expires 06-2021

Lindsi Hammond, PE
Principal

Todd Scholz, PE
Principal

This document has been submitted electronically.

6488-A UAO REMAINING STRUCTURAL LIFE MEMO

APPENDIX A

Pavement Evaluation Background Data

APPENDIX A

PAVEMENT EVALUATION BACKGROUND DATA

A.1 BACKGROUND

Based on the information provided in the ODA pavement evaluation/maintenance management program report prepared by Pavement Consultants Inc. in 2018, the runway was constructed in two phases. The 4,100 foot-long segment on the north end of the runway was first constructed in 1943, which is referred to herein as Analysis Unit 1. In 1993, a 900-foot-long extension was built to the south, which is referred to herein as Analysis Unit 2. The locations of Analysis Units 1 and 2 are shown on Figure 1A. The last major rehabilitation on the runway was conducted in 2005 and generally consisted of a 2- to 3-inch-thick overlay. Based on the construction history provided in the 2018 ODA report, the runway was constructed with 6 inches to 8 inches of asphalt concrete (AC), whereas the results from the 2019 core explorations found 8¾ inches to 9 inches of AC. The aggregate base and subbase ranges from 15 inches to 49 inches, which was not field-verified during the 2019 project.

As discussed in the 2019 PCN Report, GRI observed isolated areas of low-severity fatigue cracking (i.e., alligator cracking) within the aircraft landing gear paths on Runway 17/35. Also, the extracted core specimens exhibited delamination (separation of asphalt concrete [AC] layers) at a depth that generally agrees with the thickness of the 2005 overlay. The cores also showed top-down cracking to the same depth as the delamination. The presence of these distresses indicates material degradation, which can impact the integrity of the pavement system and structural performance.

A.2 TRAFFIC LOADING

The 2019 PCN Report listed aircraft traffic-volume data consisting of the number of operations (i.e., either an arrival or departure) for Runway 17/35 in 2018 from the FAA Traffic Flow Management System Counts (TFMSC). Our traffic-loading estimate is based on escalating the traffic volumes to the year 2041 for a 20-year period using an annual growth rate of 1.58% per year, which is based on the aviation forecasts provided in the current master plan for UAO (WHPacific, 2012). The aircraft fleet mix is provided in Table 1A. Based on the existing aircraft fleet mix, over 99%, based on the number of annual departures, operate at a gross takeoff weight of less than 50,000 pounds.

Table 1A: CURRENT AIRCRAFT TYPES AND DEPARTURE VOLUMES

Aircraft Type	Gross Takeoff Weight, pounds	Design Aircraft for FAARFIELD	2021 Annual Operations	2041 Annual Operations	Values Entered into FAARFIELD	
					Equivalent Airplane	2021 Annual # of Departures
Gulfstream G600	91,600	Gulfstream G-V	3	3	Gulfstream G-V	2
Gulfstream V	76,850	Gulfstream G-IV	3	3	Gulfstream G-IV	4
Gulfstream IV	73,200	Gulfstream G-IV	3	3		
Dassault Falcon 900	45,500	Falcon-900	72	84	Falcon-900	42
Bombardier Challenger 600	45,100	Challenger CL-604	61	71	Challenger CL-604	91
Bombardier Challenger 300	38,850	Challenger CL-604	93	110		
Dassault Falcon 2000	41,000	Falcon-2000	36	42	Falcon-2000	21
Dassault Falcon 50	37,480	Falcon-50	290	338	Falcon-50	216
Dassault Falcon 20	28,650	Falcon-50	80	98		
Cessna Citation 750	36,600	Citation X	110	128	Citation X	150
Cessna Citation 680	30,775	Citation X	145	169		
Hawker 800	28,000	Hawker-800	36	42	Hawker-800	21
Gulfstream G150	26,100	D-35	84	98	D-35	49
Astra 1125	24,650	D-30	101	118	D-30	59
Cessna Citation 650	22,000	Citation VI/VII	103	120	Citation VI/VII	61
Learjet 60	23,500	Learjet-55	32	37	Learjet-55	30
Learjet 55	21,500	Learjet-55	5	6		
Learjet 75	21,500	Learjet-55	13	15		
Learjet 45	20,500	Learjet-35A/65A	116	135	Learjet-35A/65A	131
Learjet 35	18,000	Learjet-35A/65A	9	10		
Learjet 31	15,500	Learjet-35A/65A	97	113		
Cessna Citation 560	20,000	Citation 550B	738	860	Citation 550B	561
Cessna Citation 550	13,300	Citation 550B	223	260		
Phenom 300/ Embraer 300	17,968	D-25	59	69	D-25	35

In addition to the current aircraft fleet mix we also evaluated the impact of adding a G650ER at three different weights as shown in Table 2A.

Table 2A: ADDITIONAL AIRCRAFT TYPES AND DEPARTURE VOLUMES

Aircraft Type	Gross takeoff Weight, pounds	Design Aircraft for FAARFIELD	2021 Annual Operations	2041 Annual Operations	Values Entered into FAARFIELD	
					Equivalent Airplane	2021 Annual # of Departures
Gulfstream G650ER	103,600	Gulfstream G-V	768	895	Gulfstream G-V	448
Gulfstream G650ER	83,500	Gulfstream G-V	768	895	Gulfstream G-V	448
Gulfstream G650ER	75,000	Gulfstream G-V	768	895	Gulfstream G-V	448

A.3 BACKCALCULATION

A.3.1 FWD Data

Falling weight deflectometer (FWD) tests were conducted by GRI on August 20, 2019, using our KUAB Model 150 FWD. The annual reference calibration for the FWD was accomplished in October 2019 at the KUAB manufacturing facility in Savoy, Illinois.

The FWD testing on Runway 17/35 was accomplished along test lines located at 7 feet west and 12 feet east of the runway centerline. The tests were completed at approximately 200-foot intervals within the keel section of the runway. This work was performed as a part of the "Pavement Classification Number (PCN) Evaluation of Runway 17-35" project, which the report was issued on November 12, 2019 (2019 PCN Report).

A.3.2 Overview of Backcalculation Analysis Procedure

The FWD deflection data were analyzed to backcalculate the in-situ equivalent elastic moduli of the pavement layers and subgrade soil following the guidelines of ASTM D5858 and Federal Aviation Administration (FAA) Advisory Circular 150/5370-11B. This analysis was accomplished using our PAVBACK iterative, elastic, layered backcalculation analysis software. The software calculates deflections using the Boussinesq-Odemark method of an equivalent thickness (Ullidtz, 1998). Pavement layer moduli are determined through an iterative search process using the MINPACK-1 (More et al., 1980) version of the Levenberg-Marquardt non-linear least-squares minimization algorithm with the objective of minimizing the root mean squared deflection error (RMSE), as computed by:

$$RMSE = \sqrt{\frac{1}{n}\sum_{j=1}^{n}\left(d_j - w_j\right)^2} \qquad (1)$$

where:

dj = Measured deflection at sensor j; ($j = 1, \ldots, n$ = number of sensors)

wj = Calculated deflection at sensor j

PAVBACK solutions were validated by comparing the calculated and measured values of asphalt tensile strain and subgrade compressive strain/stress. The deflection test data and corresponding measured values of strain and stress used for the validation were obtained from data published in a report about backcalculation analysis of deflection tests conducted on an instrumented pavement test section (Ullidtz, ASTM STP 1375, 2000). The reported deflection measurements were inputted into PAVBACK to backcalculate the moduli of the pavement layers and subgrade in the test section. The moduli backcalculated by PAVBACK were then used to calculate asphalt tensile strain and subgrade compressive strain/stress for the FWD load corresponding to the reported measured stress and strain values. The calculated strains and stress were found to agree nearly exactly with the reported measured strain and stress values (within ±10% of the measured values).

A.3.3 Backcalculation Models

We modeled the pavement as a multilayered elastic three-layered system to backcalculate the equivalent elastic moduli (as applicable) of the AC, aggregate base (AB) and/or aggregate subbase (ASB), and subgrade soil. We used the pavement layer thicknesses reported in our 2019 PCN Report from the shallow core explorations in the backcalculation analysis. Furthermore, the data was separated into two analysis units based on the differing construction as discussed previously.

The multilayered backcalculation analysis uses mathematical optimization techniques to calculate the equivalent elastic modulus values of the pavement layers and subgrade soil to minimize the difference between deflections calculated according to the analysis model and the deflections measured in the field. This analysis is conducted by an iterative approach beginning with an assumed set of layer moduli. Pavement surface deflections are calculated according to elastic layer theory using these initial layer moduli. The computed deflections are compared with the measured deflections, and the initial layer moduli are adjusted to reduce the differences between the calculated and measured deflections. The adjusted moduli are then used to start the next analysis iteration. The iteration process continues until the computed, and measured deflections match within a specified tolerance or until the adjustment to the solution values is less than a specified tolerance. The "goodness of fit" between the measured and computed deflections is measured by the RMSE, which is calculated using the percent difference between the measured and calculated deflections relative to the measured deflection and is roughly a measure of the relative percent error per deflection sensor.

For the analysis, we used the average subgrade modulus less one standard deviation from the backcalculation results to estimate the design subgrade moduli for each analysis unit.

A.3.4 Backcalculation Analysis Results

The backcalculation analysis results are tabulated in Table 3A for Runway 17/35. These results include the layer thicknesses, backcalculated moduli with the AC moduli normalized to a pavement temperature of 82 °F and loading frequency of 2 Hertz (discussed below), equivalent P-401 AC thicknesses (discussed below), and the RMSE values of the backcalculation solutions.

The backcalculated AC moduli were normalized using the Asphalt Institute's predictive equation (Finn et al., 1982) to correspond to a pavement temperature of 82 °F and loading frequency of 2 Hertz. These normalization conditions are based on the design pavement temperature for UAO and the equivalent loading frequency of taxiing aircraft as determined by the U.S. Army Corps of Engineers (COE) airfield design procedure, which is the basis for the Advisory Circular 150/5320-6F design procedures. The modulus of new AC for the same normalizing conditions is 200 kips per square inch (ksi), as predicted by the COE airfield design procedure. This is the same value as the modulus assigned to P-401 AC surface course in the FAARFIELD software. Therefore, backcalculated normalized AC moduli of less than 200 ksi indicate the structural value of the existing AC is lower than the new P-401 AC surface course.

Since the FAARFIELD software does not allow for changing the modulus of AC surface course or base course except by entering the AC as an undefined material, the backcalculated normalized moduli for existing AC cannot be directly used in structural analysis by the FAARFIELD software. In order to overcome this limitation, the thickness of existing AC with a normalized backcalculated modulus of less than 200 ksi was adjusted (reduced from the actual thickness) so the flexural stiffness of the adjusted AC section at a modulus of 200 ksi is the same as the flexural stiffness of the actual AC section at the normalized backcalculated moduli. The adjusted thickness is calculated by the following equation derived from the method of equivalent thickness:

$$T_{eq} = T_{ac}\left(E_{ac}/200\right)^{1/3} \qquad (2)$$

where:

T_{eq}	=	Equivalent P-401 AC (at 200-ksi modulus) thickness, inches
T_{ac}	=	Actual thickness of AC, inches
E_{ac}	=	Backcalculated AC modulus normalized to 82 °F and 2 Hertz, ksi ≤ 200 ksi
$\left(E_{ac}/200\right)^{1/3}$	=	AC thickness to P-401 thickness conversion factor

This adjustment ensures the computed stresses and strains for layers below the AC layer reflect the reduced structural capacity of the existing AC, corresponding to its normalized backcalculated modulus being lower than the 200-ksi modulus assigned by FAARFIELD for AC surface course. Note that the thickness adjustment is only applied downward and not upward; therefore, the structural analysis becomes more conservative when the normalized backcalculated modulus of

AC is greater than 200 ksi. The calculated AC thickness conversion factors and equivalent P-401 AC thicknesses are included with the tabulated backcalculation analysis results.

References

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Ullidtz, P., 2000, Will Nonlinear Backcalculation Help? Nondestructive Testing of Pavements and Backcalculation of Moduli: Third Volume, ASTM STP 1375, D. Tayabji and E. O. Lukanen, Eds, American Society for Testing and Materials, pp. 14-22.

Table 3A - MULTILAYER BACKCALCULATION ANALYSIS SUMMARY
RUNWAY 17/35: AURORA STATE AIRPORT (UAO)

Runway 17/35: Aurora State Airport (UAO)
Based on FWD Testing Conducted: 8/20/2019 [Report Titled "*Pavement Classification Number (PCN) Evaluation of Runway 17-35* " issued on November 12, 2019]
Start Station: North edge of runway, 10+00

FWD Test #	Test Station	Test Line	Core Exploration	Analysis Unit	Center Deflection (D_0), mils	AC Thickness, inches	AB/ASB Thickness, inches	AC Modulus @ 82°F & 2 Hz, psi	AB Modulus, psi	Subgrade M_R at 6 psi Deviator Stress, psi	Existing AC Thickness to P-401 Thickness Conversion Factor	Equivalent P-401 AC (@ 200 ksi) Thickness, inches
1	10+50	7 feet w		1	28.54	9.00	15.00	199,573	34,592	10,402	1.00	8.99
2	12+50	7 feet w		1	25.28	9.00	15.00	129,400	64,221	15,441	0.86	7.78
3	14+49	7 feet w		1	30.42	9.00	15.00	159,107	36,513	11,553	0.93	8.34
4	16+51	7 feet w		1	29.35	9.00	15.00	166,815	39,633	11,570	0.94	8.47
5	18+50	7 feet w		1	24.65	9.00	15.00	182,973	44,396	12,902	0.97	8.74
6	20+56	7 feet w		1	27.93	9.00	15.00	136,993	39,213	11,768	0.88	7.93
7	22+50	7 feet w		1	25.72	9.00	15.00	158,978	49,948	14,630	0.93	8.34
8	24+51	7 feet w		1	26.54	9.00	15.00	155,524	37,967	12,567	0.92	8.28
9	26+53	7 feet w		1	26.28	9.00	15.00	122,045	50,461	15,004	0.85	7.63
10	28+55	7 feet w		1	26.82	9.00	15.00	152,341	47,589	14,486	0.91	8.22
11	30+54	7 feet w		1	26.27	9.00	15.00	144,662	60,171	13,228	0.90	8.08
12	32+54	7 feet w		1	30.95	9.00	15.00	140,076	44,596	10,155	0.89	7.99
13	34+52	7 feet w		1	36.96	9.00	15.00	61,910	45,388	9,847	0.68	6.09
14	36+57	7 feet w		1	32.41	9.00	15.00	121,697	41,002	10,365	0.85	7.63
15	38+52	7 feet w		1	28.76	9.00	15.00	135,420	42,673	10,556	0.88	7.90
16	39+51	7 feet w	B-2	1	34.09	9.00	15.00	82,735	56,700	9,726	0.75	6.71
17	40+51	7 feet w		1	27.27	9.00	15.00	141,083	48,581	10,489	0.89	8.01
18	42+51	7 feet w		1	31.58	9.00	15.00	121,645	39,640	11,108	0.85	7.63
19	44+51	7 feet w		1	29.21	9.00	15.00	105,805	45,644	11,314	0.81	7.28
20	46+50	7 feet w		1	29.41	9.00	15.00	124,285	36,411	11,087	0.85	7.68
21	48+52	7 feet w		1	28.25	9.00	15.00	138,708	37,945	14,129	0.89	7.97
22	50+52	7 feet w		2	39.77	8.75	15.00	60,512	33,025	8,814	0.67	5.87
23	52+50	7 feet w		2	34.37	8.75	15.00	113,342	28,356	9,367	0.83	7.24
24	54+51	7 feet w		2	44.23	8.75	15.00	80,066	18,997	6,713	0.74	6.45
25	56+40	7 feet w		2	37.32	8.75	15.00	87,111	21,059	9,796	0.76	6.63
26	56+81	7 feet w	B-1	2	35.88	8.75	15.00	117,034	20,889	7,615	0.84	7.32
27	58+50	7 feet w		2	35.45	8.75	15.00	91,355	22,326	9,512	0.77	6.74
28	11+50	12 feet e		1	25.22	9.00	15.00	172,552	54,943	12,541	0.95	8.57
29	13+50	12 feet e		1	30.01	9.00	15.00	147,564	43,263	11,399	0.90	8.13
30	15+51	12 feet e		1	30.03	9.00	15.00	148,549	39,794	9,781	0.91	8.15
31	17+53	12 feet e		1	28.42	9.00	15.00	125,716	42,941	11,645	0.86	7.71
32	19+41	12 feet e	B-3	1	34.02	9.00	15.00	80,430	34,690	10,977	0.74	6.64
33	21+50	12 feet e		1	21.06	9.00	15.00	185,230	57,106	17,720	0.97	8.77
34	23+52	12 feet e		1	25.55	9.00	15.00	145,745	53,157	13,364	0.90	8.10
35	25+52	12 feet e		1	21.98	9.00	15.00	149,035	74,897	14,811	0.91	8.16
36	27+51	12 feet e		1	26.27	9.00	15.00	112,695	49,426	14,236	0.83	7.43
37	29+50	12 feet e		1	34.66	9.00	15.00	102,930	33,377	11,837	0.80	7.21
38	31+52	12 feet e		1	27.24	9.00	15.00	124,820	61,287	10,942	0.85	7.69
39	33+49	12 feet e		1	26.34	9.00	15.00	145,949	51,343	11,421	0.90	8.10
40	35+53	12 feet e		1	24.64	9.00	15.00	149,184	53,878	14,477	0.91	8.16
41	37+51	12 feet e		1	29.65	9.00	15.00	136,435	47,933	10,835	0.88	7.92
42	39+50	12 feet e		1	25.27	9.00	15.00	171,828	51,898	11,501	0.95	8.56
43	41+51	12 feet e		1	25.80	9.00	15.00	166,029	48,784	13,236	0.94	8.46
44	43+50	12 feet e		1	27.58	9.00	15.00	156,236	46,762	11,913	0.92	8.29
45	45+51	12 feet e		1	26.22	9.00	15.00	141,024	43,126	12,250	0.89	8.01

Table 3A - MULTILAYER BACKCALCULATION ANALYSIS SUMMARY
RUNWAY 17/35: AURORA STATE AIRPORT (UAO)

FWD Test #	Test Station	Test Line	Core Exploration	Analysis Unit	Center Deflection (D_0), mils	AC Thickness, inches	AB/ASB Thickness, inches	AC Modulus @ 82°F & 2 Hz, psi	AB Modulus, psi	Subgrade M_R at 6 psi Deviator Stress, psi	Existing AC Thickness to P-401 Thickness Conversion Factor	Equivalent P-401 AC (@ 200 ksi) Thickness, inches
46	47+54	12 feet e		1	28.02	9.00	15.00	124,960	37,437	11,825	0.85	7.69
47	49+51	12 feet e		1	27.34	9.00	15.00	139,375	36,694	12,606	0.89	7.98
48	51+53	12 feet e		2	30.35	8.75	15.00	137,690	27,259	11,238	0.88	7.73
49	53+55	12 feet e		2	31.95	8.75	15.00	131,769	24,002	10,326	0.87	7.61
50	55+50	12 feet e		2	36.26	8.75	15.00	88,169	25,673	9,761	0.76	6.66
51	57+51	12 feet e		2	32.67	8.75	15.00	125,325	19,556	9,341	0.86	7.49

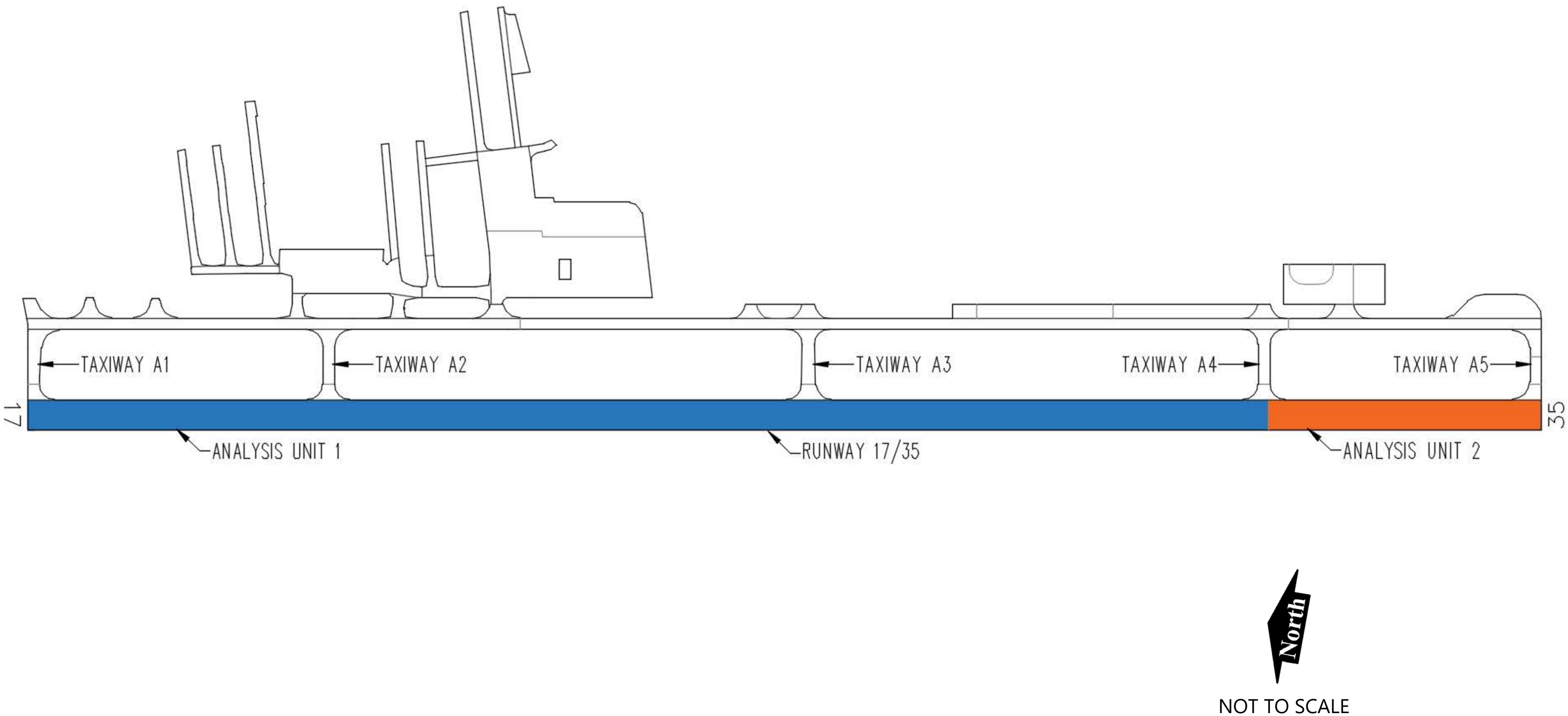
Abbreviations: M_R = Resilient Modulus; psi = Pounds per Square Inch; ksi = Kips per Square Inch; AC = Asphalt Concrete; AB = Aggregate Base; ASB = Aggregate Subbase; e = east of centerline; w = west of centerline; Hz = Hertz; °F = Degree Fahrenheit; PMP = Pavement Management Program

Statistical Summary

Structural Unit#	From Sta	To Sta	PAVER PMP Unit	Average D0, mils	Average AC Thickness, inches	Average AB/ASB Thickness, inches	Average AC Modulus @ 82°F & 2 Hz, psi	Average AB Modulus, psi	Average Subgrade M_R at 6 psi Deviator Stress, psi	Average Equivalent P-401 AC (@ 200 ksi) Thickness, inches
1	0+00	49+51	R17AU-01	28.10	9.00	15.00	139,221	46,488	12,235	7.9
2	0+00	58+50	R17AU-02	35.83	8.75	15.00	103,237	24,114	9,248	7.0
All	0+00	58+50	ALL	29.61	8.95	15.00	132,165	42,101	11,650	7.7

Design Subgrade Resilient Modulus

Structural Unit #	From	To	PAVER PMP Unit	Average Subgrade M_R at 6 psi Deviator Stress, psi	Standard Deviation, psi	Average Subgrade Less One Standard Deviation, psi	CBR, M_R (psi)/1500
1	10+50	49+51	R17AU-01	12,235	1,800	10,435	7.0
2	50+52	58+50	R17AU-01	9,248	1,294	7,955	5.3
All	0+00	58+50	ALL	11,650	2,081	9,569	6.4



GRI

CENTURY WEST ENGINEERING
UAO RUNWAY 17/35 EVALUATION

SITE PLAN

JUN. 2021 JOB NO. 6488 FIG. 1A

APPENDIX B

Remaining Structural Life Analysis

APPENDIX B

REMAINING STRUCTURAL LIFE ANALYSIS

B.1 REMAINING STRUCTURAL LIFE

We estimated the remaining pavement life of Runway 17/35, also referred to as "remaining structural life," using the FAA evaluation procedure and Version 1.42 of the FAARFIELD pavement-design software program. The results are based on the current traffic loading, growth rates, structural properties of the existing pavement (thickness and modulus), and subgrade stiffness determined from the previous pavement-core explorations and FWD deflection test data from the 2019 PCN Report, pavement and subgrade soils laboratory testing, and backcalculation analysis.

Remaining structural life of AC pavements is based on an analysis of the cumulative damage factor (CDF) for two modes of pavement failure: rutting due to excessive vertical compressive strain at the top of the subgrade, and fatigue cracking due to excessive horizontal strain in the bottom of the AC layer. Structural life calculated in this manner only applies to how long the existing pavement would support the forecast aircraft fleet mix until its structural capacity decreases to the extent that strengthening, or reconstruction is required to avoid significant risk of structural damage by heavily loaded aircraft. Since structural life does not account for deterioration in the bound-pavement layer, pavement structures can have calculated structural lives well in excess of a typical design period. Furthermore, the results, even though they meet the desired remaining life, may not be realistic from a material-degradation standpoint due to the presence of delamination, stripping, and/or cracking distress.

We have presented the FAARFIELD outputs showing the calculated remaining structural life of Runway 17/35 on Figures 1B to 2B for Analysis Unit 1 and on Figures 3B to 4B for Analysis Unit 2 in this appendix. The results are also summarized in Table 1B below. We found that Analysis Unit 2, which encompasses the runway extension between Taxiways A4 to A5 has a significantly lower remaining structural life as compared to Analysis Unit 1. The shorter life is likely due to the thinner AC section and lower subgrade moduli. If a G650ER is added to the fleet mix, we calculated the remaining structural life to range from 1 year to 14 years, depending on the operational weight. We assume that the G650ER will require the full length of the runway to operate, and therefore Analysis Unit 2 controls the remaining structural life.

Additionally, due to the presence of delamination in the upper 2 inches to 3 inches of AC and cracking distress located in the landing gear path, it is our opinion, that the calculated remaining structural life results provided in Table 1B may be reduced due to the deteriorated condition of the AC. The addition of larger aircraft generally heavier than 50,000 pounds may further accelerate the pavement deterioration resulting in the development of foreign object debris (FOD) and ultimately requiring rehabilitation sooner. In our opinion, under the current traffic loading without the operation of a G650ER the runway will require rehabilitation in approximately 10 years even though the remaining structural life is approximately 20 years. If the G650ER plans to operate on a regular basis at maximum gross weight (i.e., 103,600 pounds), we recommend rehabilitating the runway prior to operation because the runway will likely require structural strengthening. If the G650ER operates at a lower weight, we recommend planning a rehabilitation project within the next five years due to the condition of the AC. Table 1 presented above shows our recommended timeframe until rehabilitation/reconstruction, which is based on the results structural analysis results from FAARFIELD analysis and the functional condition of the runway materials.

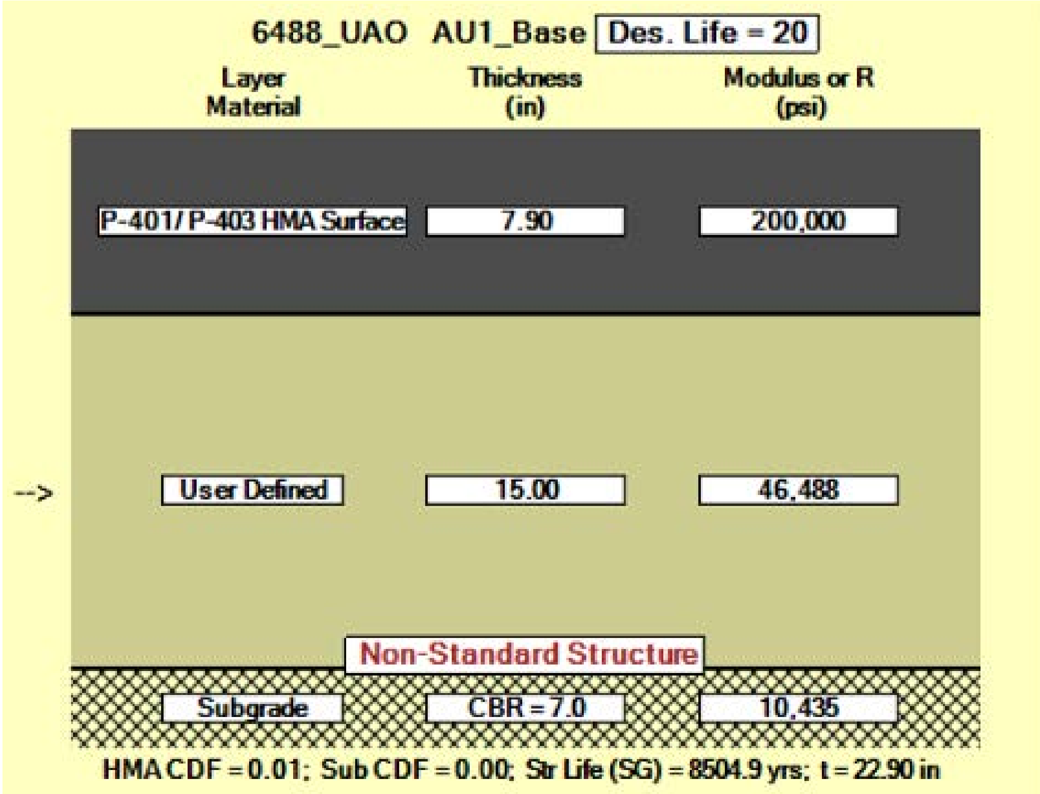
Table 1B: SUMMARY OF REMAINING STRUCTURAL LIFE RESULTS

		Remaining Life, years[(a)]			
	Analysis Unit	Current Fleet Mix	Additional G650ER Operations @ 103,600 pounds	Additional G650ER Operations @ 83,500 pounds	Additional G650ER Operations @ 75,000 pounds
(1)	Runway 17/35 Taxiway A1 to A4	>20	>20	>20	>20
(2)	Runway 17/35 Taxiway A4 to A5	>20	1	6	14

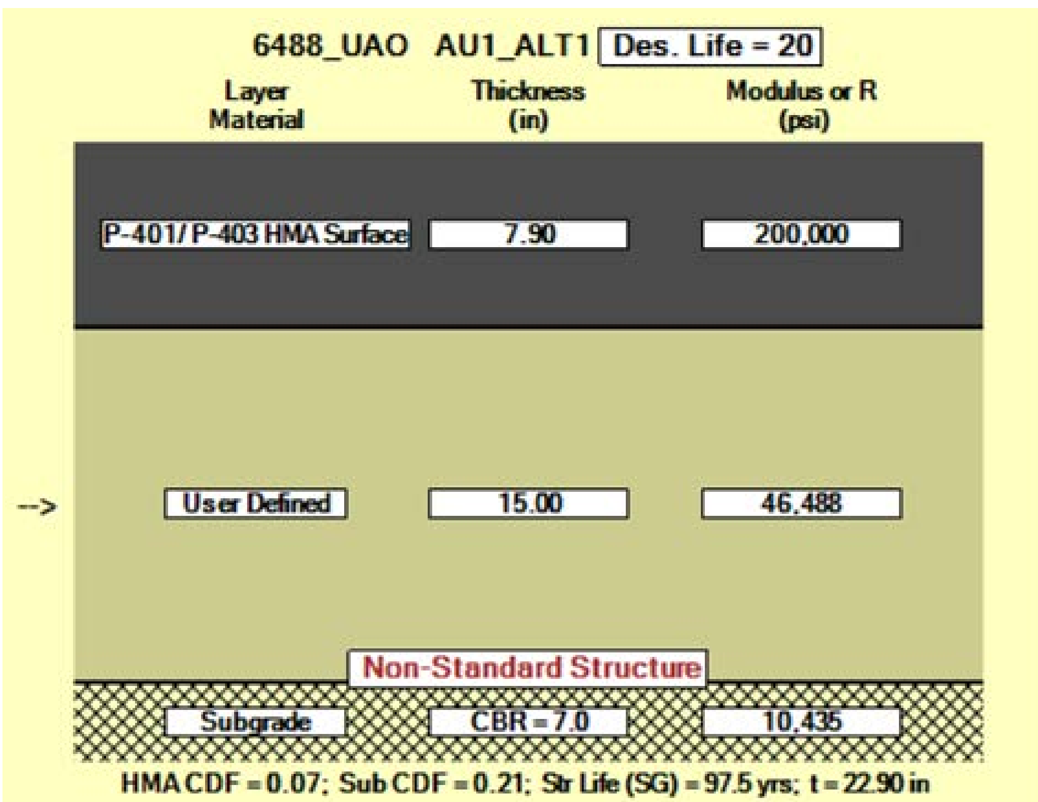
Note:

a) The remaining structural life may be well in excess of the reasonable timeframe that the runway may warrant rehabilitation or reconstruction from a material-degradation standpoint (i.e., delamination, stripping, or cracking distress).

We developed our results using limited subsurface condition data collected to assist us in developing the abovementioned 2019 PCN Report. The 2019 fieldwork only included three shallow core explorations, which were terminated at 24 inches below the ground surface. At each core exploration, we did not encounter subgrade. In order to refine the remaining life evaluation or to develop rehabilitation or reconstruction design recommendations, we recommend performing deeper borings in order to quantify the total aggregate base thickness and to classify the subgrade. The results from additional boring explorations may change the results of the remaining life results presented above.



ANALYSIS UNIT 1 – CURRENT FLEET MIX



ANALYSIS UNIT 1 – CURRENT FLEET MIX + 64 MONTHLY OPERATIONS OF A G650ER @ 103,600 POUNDS

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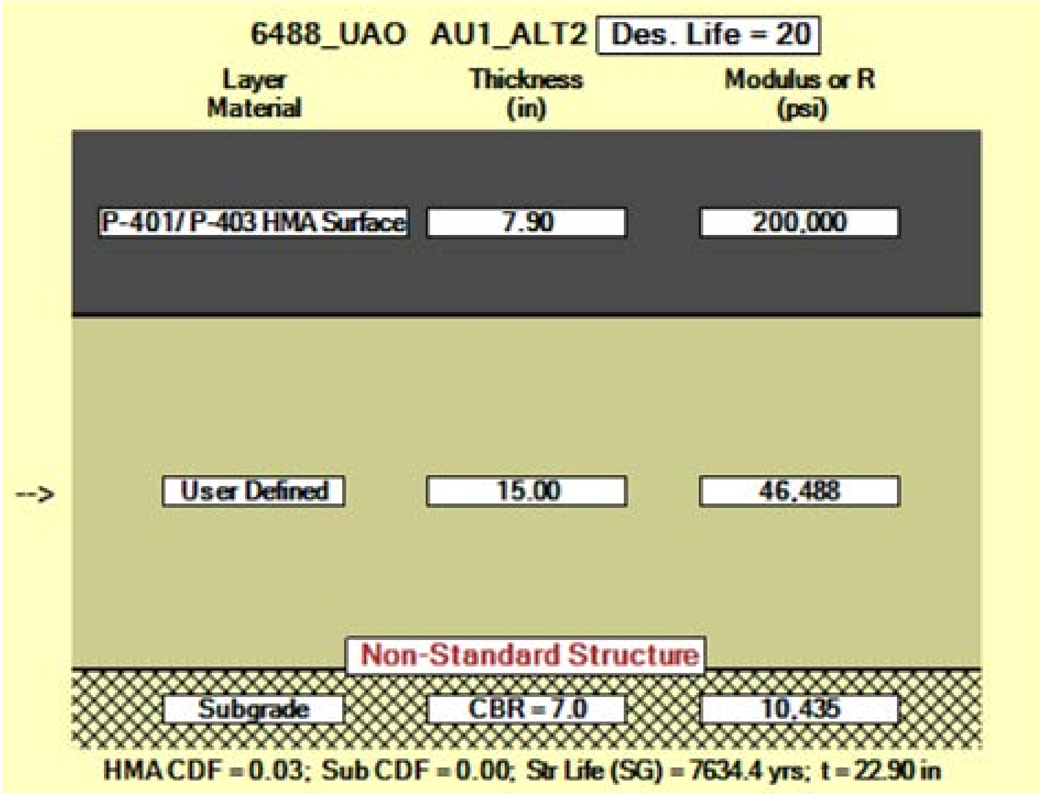
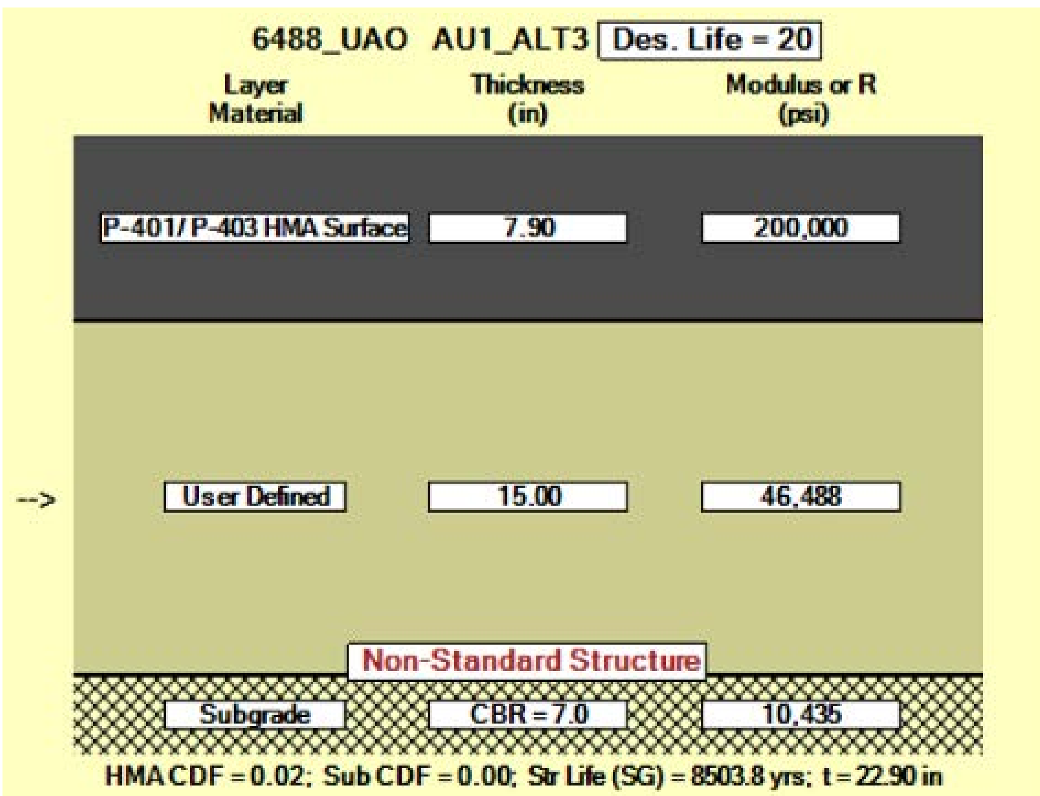
CENTURY WEST ENGINEERING
UAO RUNWAY 17/35 EVALUATION

FAARFIELD REMAINING STRUCTURAL LIFE RESULTS

JUN. 2021 JOB NO. 6488 FIG. 1B



ANALYSIS UNIT 1 – CURRENT FLEET MIX + 64 MONTHLY OPERATIONS OF A G650ER @ 83,500 POUNDS



ANALYSIS UNIT 1 – CURRENT FLEET MIX + 64 MONTHLY OPERATIONS OF A G650ER @ 75,000 POUNDS

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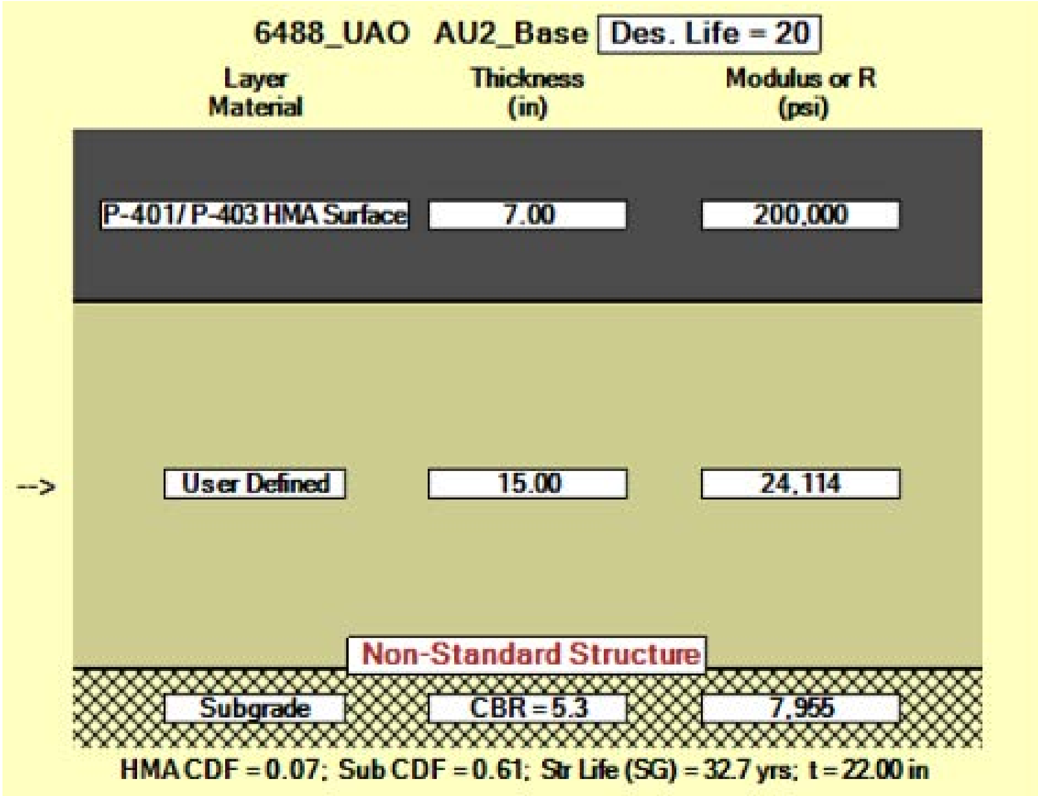
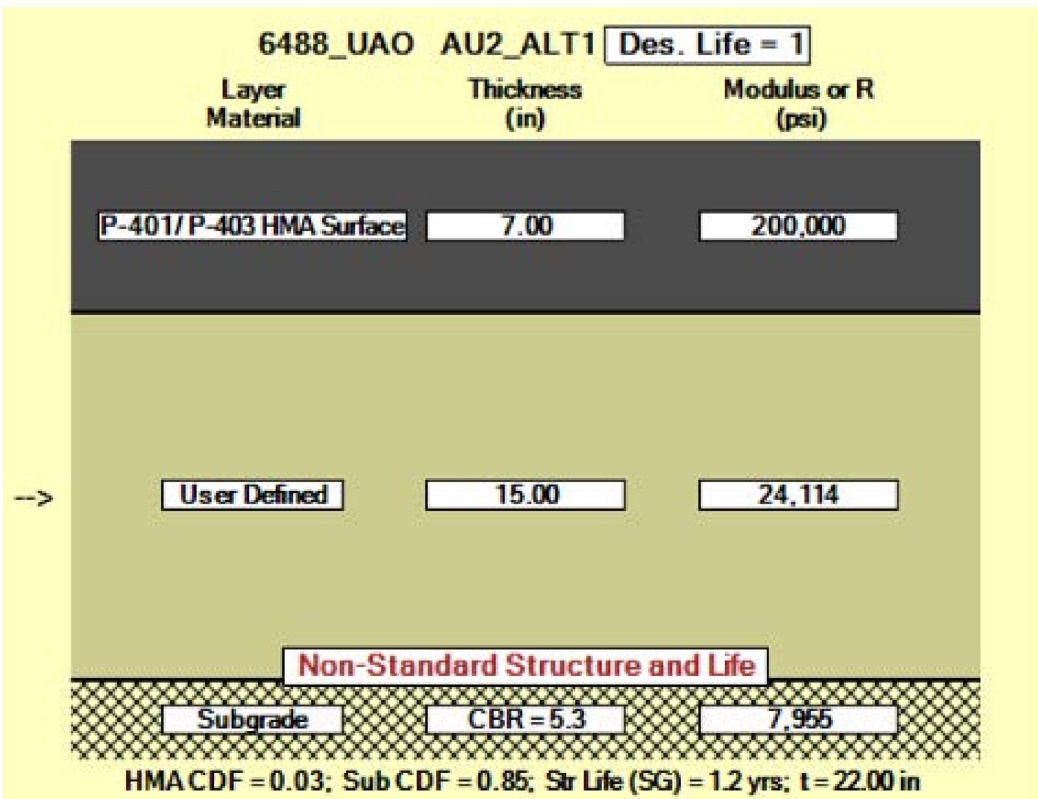
CENTURY WEST ENGINEERING
UAO RUNWAY 17/35 EVALUATION

FAARFIELD REMAINING STRUCTURAL LIFE RESULTS

JUN. 2021 JOB NO. 6488 FIG. 2B



ANALYSIS UNIT 2 – CURRENT FLEET MIX



ANALYSIS UNIT 2 – CURRENT FLEET MIX + 64 MONTHLY OPERATIONS OF A G650ER @ 103,600 POUNDS

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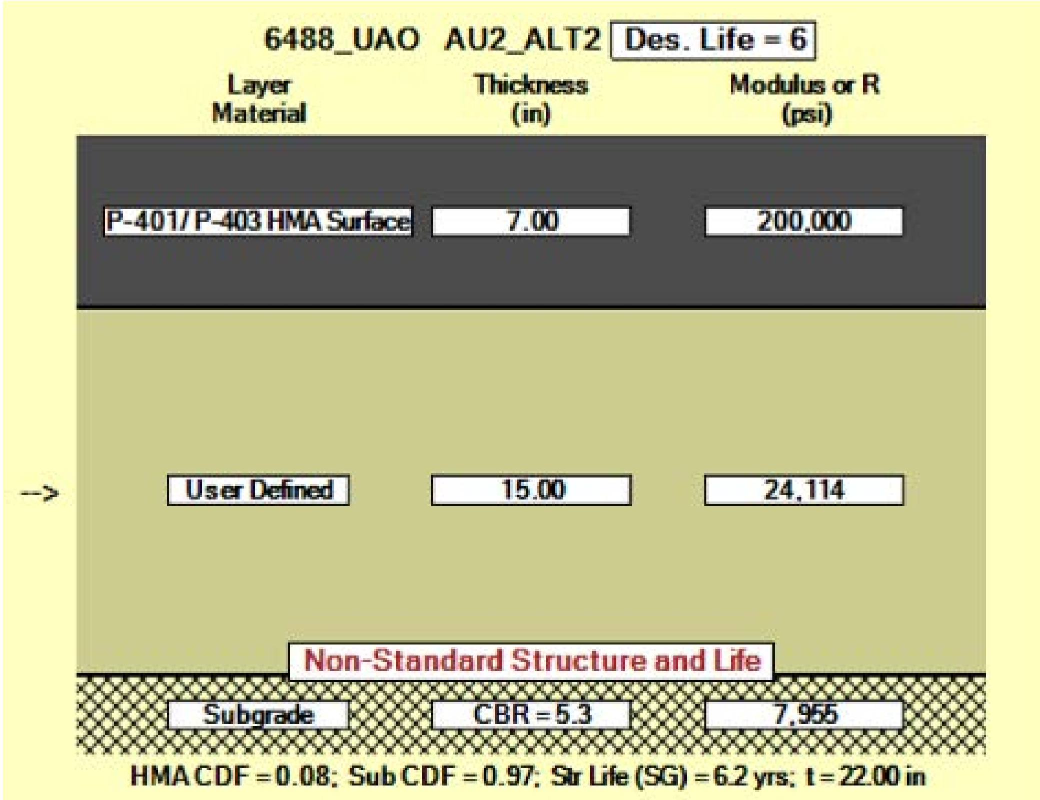
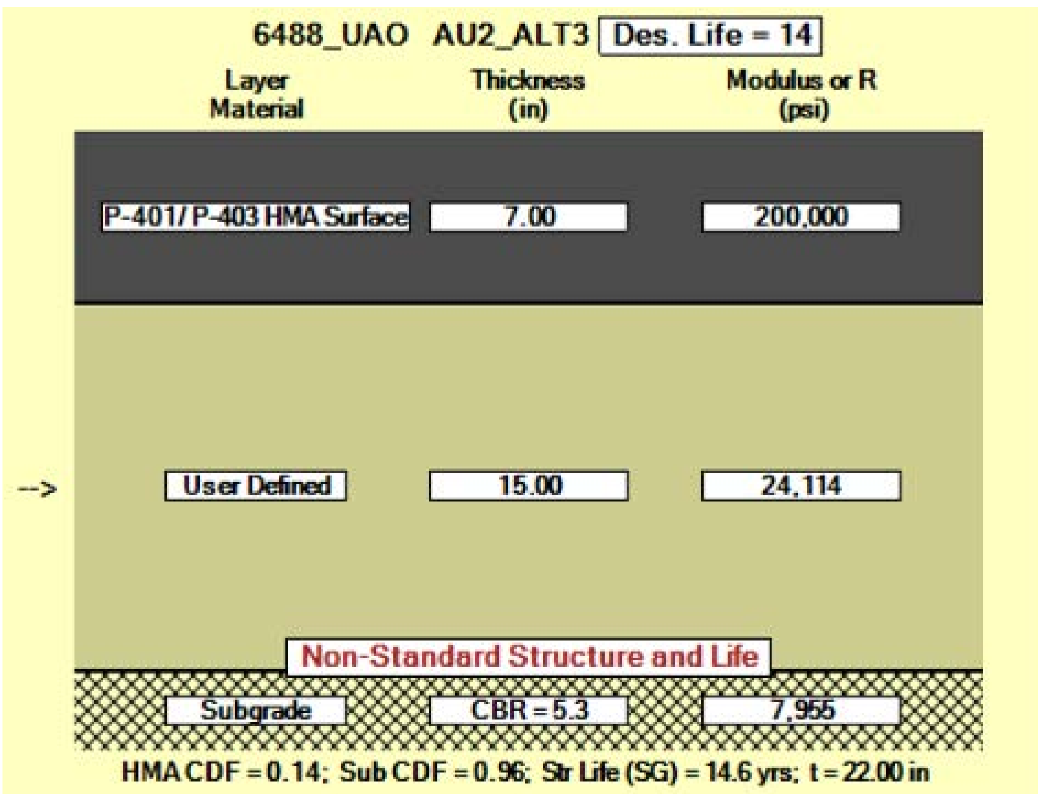
CENTURY WEST ENGINEERING
UAO RUNWAY 17/35 EVALUATION

FAARFIELD REMAINING STRUCTURAL LIFE RESULTS

JUN. 2021 | JOB NO. 6488 | FIG. 3B



ANALYSIS UNIT 2 – CURRENT FLEET MIX + 64 MONTHLY OPERATIONS OF A G650ER @ 83,500 POUNDS



ANALYSIS UNIT 2 – CURRENT FLEET MIX + 64 MONTHLY OPERATIONS OF A G650ER @ 75,000 POUNDS

GRI

CENTURY WEST ENGINEERING
UAO RUNWAY 17/35 EVALUATION

FAARFIELD REMAINING STRUCTURAL LIFE RESULTS

JUN. 2021 | JOB NO. 6488 | FIG. 4B

Appendix 7

Aircraft Activity Data

☐ Condensed Header

Aircraft List: ☐ Only Commented Tail Numbers ☐ Only Duplicates ☐ All Others

Federal Aviation Administration

Personal information has been redacted for privacy

ventory Program

link for User Support.

AURORA STATE

AURORA, OR

Loc ID: UAO **Site Number:** 19356.*A **S/L:** GA

Region: ANM **Facility Use:** PU **Ownership:** PU

Owner	Manager	Preferred Contact
OREGON DEPT OF AVIATION 3040 25TH ST SE SALEM, OR 97302-1125 503-378-4880	STATE AIRPORTS MGR 3040 25TH ST SE SALEM, OR 97302-1125 503-378-4880	Anthony Beach Airport Manager anthony.beach@aviation.state.or.us 503-378-2523

N-Number Duplicates: **0** N-Numbers Reported by Other Apts: **2**

Commented N-Numbers: **5** Acft Not in Acft Reg: **7**

	In 5010 12/30/2021 (A)	In Inventory* (B)	Currently Validated** (C)
Single Engine	287	226	220
Multi Engine	26	15	15
Jet	34	37	36
Helicopter	49	10	10
Single, Multi, Jet, Heli	**396**	**288**	**281**
Glider	3	3	***
Ultra-light	1	1	***
Military	0	***	***
		Total:	**281**

Non 5010 Aircraft Types	**5**
Total Found in FAA Acft. Reg. Data	**297**
Total Not Found in FAA Acft. Reg. Data	**7**
Total Entered in BA.com Inventory	**304**

Confirmation of Counts **Date:** 1/10/2022 10:57:23 AM **By:** Anthony Beach

Comment: made a correction to one aircraft with a typo in the N-number

*Type derived from FAA Aircraft Registration data.

**Total verified aircraft counts, excluding dups and aircraft not found in FAA Aircraft Registration data.

***Glider, ultra-light, and military counts will not be moved from the inventory to 5010.

	Data Entered by Inventory Users		Date	Reported by		FAA Data (If N Number is found)	
N Number	**Type/Make/Model**	**Owner**	**Added**	**Other Apts**	**FAA BA Type**	**Registrant**	**Make/Model**
N1005B	Single Engine Piper Malibu		3/4/2014	[redacted]	Single Engine Cert: 01/28/2014 Airw: Standard Airw: 11/9/1987	[redacted]	PIPER PA-46-310P
N1010D			5/24/2019		Single Engine Cert: 08/01/2013 Airw: Standard Airw: 6/29/1956	[redacted]	CESSNA 195A
N104WD			5/24/2019		Single Engine Cert: 09/26/2016 Airw: Standard Airw: 9/12/1979	[redacted]	CESSNA P210N
N10766	Single Engine Cessna 150L	[redacted]	5/9/2019		Single Engine Cert: 09/30/2019 Airw: Standard Airw: 8/20/1973	[redacted]	CESSNA 150L
N108RJ	Multi Engine RAYTHEON AIRCRAFT COMPANY B200		3/5/2014		Multi Engine Cert: 06/17/2010 Airw: Standard Airw: 7/29/2002	[redacted]	RAYTHEON AIRCRAFT COMPANY B200
N109HW	WOLFE HOWARD 320 FB LANCAIR		5/14/2007		Single Engine Cert: 02/25/1998 Airw: Experimental Airw: 7/15/1998	[redacted]	WOLFE H/WOLFE B 320 FB LANCAIR
N10HL	Single Engine Cessna 210L	[redacted]	5/9/2019		Single Engine Cert: 12/11/2021 Airw: Standard Airw: 1/31/1975	[redacted]	CESSNA 210L
N10QW	Multi Engine Beechcraft Kingair Super		12/8/2021		Multi Engine Cert: 01/07/2020 Airw: (Blank) Airw: (Blank Date)	[redacted]	RAYTHEON AIRCRAFT COMPANY B200
N110YD	Single Engine Cessna 210L	[redacted]	5/9/2019		Single Engine Cert: 04/16/1990 Airw: Standard Airw: 6/6/1975	[redacted]	CESSNA 210L
N111GF	Single Engine Cessna 182P	[redacted]	5/9/2019		Single Engine Cert: 08/01/2000 Airw: Standard Airw: 1/27/1975	[redacted]	CESSNA 182P
N111NS	BEECHCRAFT KING AIR 200C		5/14/2007		Multi Engine Cert: 08/02/1994 Airw: Standard Airw: 5/5/1981	[redacted]	BEECH 200C
N111PR	(Non 5010) Balony Kubicek SPOL BB70Z	[redacted]	5/9/2019		(Non 5010) Cert: 05/24/2012 Airw: Standard Airw: 5/26/2012	[redacted]	BALONY KUBICEK SPOL SRO BB70Z
N1122G	Single Engine Groelz & Meyers Vans RV-9A	[redacted]	5/9/2019		Single Engine Cert: 05/08/2017 Airw: Experimental Airw: 5/25/2017	[redacted]	GROELZ & MEYERS VANS RV-9A
N1122P	Single Engine Beechcraft BE35		12/8/2021		Single Engine Cert: 04/11/2005 Airw: Standard Airw: (Blank Date)	[redacted]	BEECH V35B

	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N112AJ			5/9/2019	Glider Cert: 05/15/2018 Airw: Standard Airw: 3/16/2001	[redacted]	BOLKOW PHOEBUS B-1 (DEREG Canceled 09/2021)
N112PR	Single Engine Pudding River Bearha Bearhawk LSA	[redacted]	5/9/2019	Single Engine Cert: 05/31/2018 Airw: Experimental Airw: 2/11/2019	[redacted]	PUDDING RIVER BEARHAWK LLC BEARHAWK LSA
N112TF	Single Engine Vans Aircraft Inc RV-12	[redacted]	12/5/2017	Single Engine Cert: 04/25/2011 Airw: Experimental Airw: 2/17/2016	[redacted]	VANS AIRCRAFT INC RV-12
N112VB	Single Engine Cessna 182F	[redacted]	5/9/2019	Single Engine Cert: 10/02/2014 Airw: Standard Airw: 7/9/1963	[redacted]	CESSNA 182F
	Aircraft possibly sold, now based at UAO					
N114KN	Multi Engine Cessna 560	[redacted]	12/5/2017	Jet Cert: 03/18/2013 Airw: Standard Airw: 3/1/2013	[redacted]	CESSNA 560
N11754	Single Engine Monocoupe 90A	[redacted]	5/9/2019	Single Engine Cert: 05/04/2016 Airw: Standard Airw: 9/22/1955	[redacted]	MONOCOUPE 90A
N117TT	CESSNA 182Q		5/14/2007	Single Engine Cert: 05/24/2001 Airw: Standard Airw: 5/19/1978	[redacted]	CESSNA 182Q
N1192Y	Single Engine American Gen Acft Co AG5B	[redacted]	5/9/2019	Single Engine Cert: 03/29/2017 Airw: Standard Airw: 5/2/1991	[redacted]	AMERICAN GENERAL ACFT CORP AG5B
N122BG	Single Engine Gush William J Monnett Moni	[redacted]	5/9/2019	Single Engine Cert: 06/23/2011 Airw: Experimental Airw: 4/13/1983	[redacted]	GUSH WILLIAM J MONNETT MONI
N124KL	Single Engine Vans Aircraft Inc RV-12	[redacted]	5/9/2019	Single Engine Cert: 07/23/2018 Airw: Experimental Airw: 12/17/2018	[redacted]	VANS AIRCRAFT INC RV-12
N124XD	Single Engine Vans Aircraft Inc RV-12	[redacted]	5/9/2019	Single Engine Cert: 11/07/2014 Airw: Experimental Airw: 6/19/2015	[redacted]	VANS AIRCRAFT INC RV-12
N126TS	Single Engine Pilatus Aircraft LTD PC-12/47E	BB&T Equipment [redacted]	12/5/2017	Single Engine Cert: 01/14/2020 Airw: Standard Airw: 3/27/2009	[redacted]	PILATUS AIRCRAFT LTD PC-12/47E
	12/5/17 AC leased to Life Fl[redacted]. Registered in the State of Oregon, based at UAO					
N128X	Single Engine Beech C35	[redacted]	5/9/2019	Single Engine Cert: 08/23/1994 Airw: Standard Airw: 5/24/1956	[redacted]	BEECH C35
N129RV	VANS RV-9A		5/14/2007	Single Engine Cert: 03/29/2000 Airw: Experimental Airw: 1/15/2021	[redacted]	VANS AIRCRAFT INC RV-9A
N1330W	MOONEY MK20E		5/14/2007	Single Engine Cert: 07/20/2000 Airw: Standard Airw: 12/6/1963	[redacted]	MOONEY M20E
N1368X	Helicopter Bell 206A	[redacted]	5/9/2019	Helicopter Cert: 03/23/2011 Airw: Standard Airw: 1/13/1967	[redacted]	BELL 206A
N1375K	Single Engine Krum Thomas C Baby Great Lakes	[redacted]	5/9/2019	Single Engine Cert: 01/25/2007 Airw: Experimental Airw: 4/30/1984	[redacted]	KRUM THOMAS C BABY GREAT LAKES
N137RV	VANS RV-7		5/14/2007	Single Engine Cert: 01/29/2001 Airw: Experimental Airw: 1/21/2021	[redacted]	VANS AIRCRAFT INC RV-7
N138WH	Helicopter HUGHES 369D		3/5/2014	Helicopter Cert: 01/13/2010 Airw: Standard Airw: 12/29/1981	[redacted]	HUGHES 369D
N139RM	Single Engine AERO VODOCHODY L39C		3/5/2014	Jet Cert: 11/23/2020 Airw: Experimental Airw: 2/10/2009	[redacted]	AERO VODOCHODY L39C
N1434Z	Single Engine Dehavilland Beaver DHC-2	[redacted]	5/9/2019	Single Engine Cert: 09/26/2011 Airw: Standard Airw: 2/16/1982	[redacted]	DEHAVILLAND BEAVER DHC-2
N143SB	Single Engine Cirrus SR-20		12/8/2021	Single Engine Cert: 05/10/2021	[redacted]	CIRRUS DESIGN CORP SR20

				Airw: Standard Airw: 12/17/2012		
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N146U	Single Engine X-Cub		12/8/2021	Single Engine Cert: 07/13/2021 Airw: Standard Airw: 8/27/2018	[redacted]	CUB CRAFTERS INC CC19-180
N148CC	Single Engine Cub Crafters PA18-150	[redacted]	5/9/2019	Single Engine Cert: 09/26/2013 Airw: Standard Airw: 5/13/2003	[redacted]	CUB CRAFTERS PA18-150
N149BA	Single Engine Littlewood Alan J Moni	[redacted]	5/9/2019	Single Engine Cert: 03/03/2005 Airw: Experimental Airw: 4/21/1987	[redacted]	LITTLEWOOD ALAN J MONI
N149WW	Multi Engine Cessna 525B	[redacted]	12/5/2017	Jet Cert: 05/06/2014 Airw: Standard Airw: 8/12/2007	[redacted]	CESSNA 525B
	*** As of 12/5/2017 aircraft is registered with the State of Oregon and is based at UAO.					
N1529B	Single Engine Luscombe 8E	[redacted]	5/9/2019	Single Engine Cert: 01/21/2020 Airw: Standard Airw: 8/15/1956	[redacted]	LUSCOMBE 8E
N15426	PIPER PA28-180		5/14/2007	Single Engine Cert: 10/25/2000 Airw: Standard Airw: 11/1/1972	[redacted]	PIPER PA-28-180
N155CC	Single Engine CubCrafters Inc CC11-160	[redacted]	12/5/2017	Single Engine Cert: 10/30/2021 Airw: Light Sport Airw: 6/6/2016	[redacted]	CUBCRAFTERS INC CC11-160
N15606	Single Engine Fairchild 24 C8C	[redacted]	5/9/2019	Single Engine Cert: 12/24/2009 Airw: tandard Airw: 8/21/1954	[redacted]	FAIRCHILD 24 C8C
N1560H	CESSNA 177		5/14/2007	Single Engine Cert: 07/16/2002 Airw: Standard Airw: 5/14/1975	[redacted]	CESSNA 177RG
N158RV	VANS RV-8		5/14/2007	Single Engine Cert: 05/03/2001 Airw: Experimental Airw: 8/15/2006	[redacted]	VANS ACFT INC RV-8
N162DH	Single Engine Aerosport LTD Ikarus C42E	[redacted]	12/18/2017	Single Engine Cert: 09/23/2008 Airw: Light Sport Airw: 2/20/2007	[redacted]	AEROSPORT LTD IKARUS C42E
N1636V	Single Engine Cessna 120	[redacted]	5/9/2019	Single Engine Cert: 02/14/1984 Airw: Standard Airw: (Blank Date)	[redacted]	CESSNA 120
N1665W	Single Engine BEECH A36	[redacted]	5/9/2019	Single Engine Cert: 05/09/1988 Airw: Standard Airw: 8/9/1972	[redacted]	BEECH A36
	POSSIBLY SOLD OR OWNER MOVED TO OREGON, AIRCRAFT BASED AT UAO					
N17078	Single Engine BEECH C17B	[redacted]	5/9/2019	Single Engine Cert: 09/15/2018 Airw: Standard Airw: 8/10/1966	[redacted]	BEECH C17B
N171LL			5/9/2019	(Non 5010) Cert: 10/16/2021 Airw: Standard Airw: 9/2/2016	[redacted]	THUNDER & COLT LTD COLT 77A
N17251	CESSNA 150L		5/14/2007	Single Engine Cert: 08/02/2000 Airw: Standard Airw: 8/22/1972	[redacted]	CESSNA 150L
N1734B	Single Engine BOEING E75	[redacted]	5/9/2019	Single Engine Cert: 04/22/1988 Airw: Standard Airw: 8/27/1973	[redacted]	BOEING E75
N1804Y	CESSNA 172C		5/14/2007	Single Engine Cert: 03/12/1992 Airw: Multiple Airw: 4/15/1963	[redacted]	CESSNA 172C
N18121	Multi Engine DOUGLAS DC3A		3/5/2014	Multi Engine Cert: 09/11/2007 Airw: Standard Airw: 6/9/1953	[redacted]	DOUGLAS DC3A
N1852M	Single Engine BOEING E75	[redacted]	5/9/2019	Single Engine Cert: 11/01/2002 Airw: Standard Airw: 7/23/1957	[redacted]	BOEING E75
N1856D	Single Engine BEECH C35	[redacted]	5/9/2019	Single Engine Cert: 04/30/2019 Airw: Standard Airw: 12/2/1955	[redacted]	BEECH C35
N1863Q	Single Engine CESSNA 177RG		3/5/2014	Single Engine Cert: 06/26/2001	[redacted]	CESSNA 177RG

			Airw: Standard Airw: 6/21/1972		
N1869	Single Engine Cessna 206H	12/8/2021	Single Engine Cert: 12/18/2020 Airw: Standard Airw: 1/23/2008	[redacted]	CESSNA T206H
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N186DL	Multi Engine CESSNA 525 [redacted]	5/9/2019	Jet Cert: 12/27/2018 Airw: Standard Airw: 12/22/2013	[redacted]	CESSNA 525
	AIRCRAFT POSSIBLY SOLD, AIRCRAFT BASED AT UAO				
N1873L	Single Engine Beechcraft BE35	12/8/2021	Single Engine Cert: 04/18/2014 Airw: Standard Airw: 5/10/1976	[redacted]	BEECH V35B
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N18HV		5/9/2019	Single Engine Cert: 03/12/2007 Airw: Experimental Airw: 9/23/1998	[redacted]	VEENKER HARLEN G VANS RV8
N19131	Single Engine DURAMOLD F46A	3/5/2014	Single Engine Cert: 12/29/2017 Airw: Standard Airw: 3/23/1956	[redacted]	DURAMOLD F46A
N195K		5/9/2019	Single Engine Cert: 10/25/2012 Airw: Standard Airw: 10/15/1955	[redacted]	CESSNA 195B
N19609		5/9/2019	Single Engine Cert: 08/12/2013 Airw: Standard Airw: 4/20/1972	[redacted]	CESSNA 172L
N1991A		5/9/2019	Single Engine Cert: 06/19/2020 Airw: Standard Airw: 7/1/1956	[redacted]	PIPER PA-18-135
N19ZM		5/9/2019	Single Engine Cert: 12/28/2017 Airw: Multiple Airw: 6/7/1983	[redacted]	DEHAVILLAND BEAVER DHC-2
N1AN		5/9/2019	Single Engine Cert: 01/22/2016 Airw: Standard Airw: 8/2/1985	[redacted]	PITTS AEROBATICS S-2B
N1CZ		5/9/2019	Single Engine Cert: 02/28/1978 Airw: Standard Airw: 10/21/1955	[redacted]	CESSNA 190
N200FJ	Multi Engine Dassault - Breguet Mystere Falcon 20-F5 [redacted]	12/18/2017	Jet Cert: 10/26/2015 Airw: Standard Airw: 12/18/2000	[redacted]	DASSAULT-BREGUET MYSTERE FALCON 20-F5
N20488	CESSNA 172M	5/14/2007	Single Engine Cert: 08/26/2019 Airw: Standard Airw: 1/22/1973	[redacted]	CESSNA 172M
N20524		5/9/2019	Single Engine Cert: 07/16/1980 Airw: Standard Airw: 11/25/1957	[redacted]	TAYLORCRAFT A
N20555	Single Engine CESSNA 172M	3/5/2014	Single Engine Cert: 08/04/1992 Airw: Standard Airw: 2/5/1973	[redacted]	CESSNA 172M
N206RC		5/9/2019	Single Engine Cert: 06/16/2003 Airw: Standard Airw: (Blank Date)	[redacted]	CESSNA TU206F
N209MT		5/9/2019	Single Engine Cert: 09/27/2011 Airw: Experimental Airw: 6/7/2010	[redacted]	TERRELL M A /CARAGOL A J RV 7
N20DF		5/9/2019	Single Engine Cert: 02/28/2007 Airw: Experimental Airw: 4/15/1980	[redacted]	SHIPLER SKYBOLT
N210DM		5/9/2019	Single Engine Cert: 01/04/1989 Airw: Standard Airw: 8/31/1978	[redacted]	CESSNA T210M
N210EF	Single Engine Cessna P210	12/8/2021	Single Engine Cert: 07/31/2019 Airw: Standard Airw: 11/12/1979	[redacted]	CESSNA P210N
N21145	CESSNA 182P	5/14/2007	Single Engine Cert: 11/09/2016 Airw: Standard Airw: 10/18/1972	[redacted]	CESSNA 182P
N21230	CESSNA 182	5/14/2007	Single Engine Cert: 11/12/2019	[redacted]	CESSNA 182P

				Airw: Standard Airw: 11/8/1972	[redacted]	
N21244			5/9/2019	Single Engine Cert: 12/14/2021 Airw: Standard Airw: 11/8/1972	[redacted]	CESSNA 182P
N2130F			5/9/2019	Single Engine Cert: 05/21/2021 Airw: Standard Airw: 6/16/2003	[redacted]	CESSNA 172S
N214VA	Single Engine VANS AIRCRAFT INC RV-14A		3/5/2014	Single Engine Cert: 03/14/2012 Airw: Experimental Airw: 6/21/2021	[redacted]	VANS AIRCRAFT INC RV-14A
N2152U	Helicopter Brantly B2A		12/8/2021	Helicopter Cert: 03/09/2006 Airw: Multiple Airw: 4/27/1967	[redacted]	BRANTLY B-2A
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N21531			5/9/2019	Single Engine Cert: 09/07/1999 Airw: Standard Airw: 8/17/1994	[redacted]	PIPER PA-18-150
N21612	Single Engine MOONEY AIRCRAFT CORP M20S	[redacted]	5/9/2019	Single Engine Cert: 12/30/2014 Airw: Standard Airw: 2/16/2000	[redacted]	MOONEY AIRCRAFT CORP. M20S
	AIRCRAFT POSSIBLY SOLD, NOW BASED AT UAO					
N2176G			5/24/2019	Single Engine Cert: 10/07/1996 Airw: Standard Airw: 8/20/1958	[redacted]	CESSNA 182A
N217RS			5/24/2019	Helicopter Cert: 12/18/1990 Airw: Experimental Airw: 8/27/1990	[redacted]	SELL RAYMOND B EXEC
N21864			5/24/2019	Single Engine Cert: 01/24/1992 Airw: Standard Airw: 6/25/1957	[redacted]	PIPER J3C-65
N22047			5/24/2019	Single Engine Cert: 06/07/2007 Airw: (Blank) Airw: (Blank Date)	[redacted]	FAIRCHILD 24W-9
N2230V			5/24/2019	Single Engine Cert: 02/10/2016 Airw: Standard Airw: 3/10/1956	[redacted]	CESSNA 140
N2268X			5/24/2019	Helicopter Cert: 08/18/1997 Airw: (Blank) Airw: (Blank Date)	[redacted]	BELL 206B
N2269N			12/8/2021	Single Engine Cert: 03/01/2021 Airw: Standard Airw: 11/22/1994	[redacted]	NORTH AMERICAN-MEDORE SNJ-4
N2274V			5/24/2019	Single Engine Cert: 11/04/1998 Airw: Standard Airw: 9/8/1955	[redacted]	PIPER J3C-65
N2284E			5/24/2019	Single Engine Cert: 07/18/2012 Airw: Standard Airw: 8/22/1994	[redacted]	CESSNA 170
N229DC			5/24/2019	Single Engine Cert: 05/02/2017 Airw: Experimental Airw: 1/29/2010	[redacted]	COOPER DAHL S-12
N231J			5/24/2019	Single Engine Cert: 02/14/2019 Airw: Standard Airw: 3/19/1981	[redacted]	MOONEY AIRCRAFT CORP. M20K
N2323N			5/24/2019	Single Engine Cert: 04/23/2019 Airw: Standard Airw: 9/6/1956	[redacted]	CESSNA 140
N23245			5/24/2019	Single Engine Cert: 03/20/2018 Airw: Standard Airw: 6/23/1983	[redacted]	PIPER J3F-60
N2376M	PIPER PA-12		5/14/2007	Single Engine Cert: 04/13/1999 Airw: Standard Airw: 7/13/1956	[redacted]	PIPER PA-12
N238AB			5/24/2019	(Non 5010) Cert: 03/16/2019 Airw: Experimental Airw: 1/25/2008	[redacted]	MAAS DOUGLAS W SIX CHUTER 2 (DEREG Canceled 02/2021)
N238MA	ALLARDYCE GLASTAR		5/14/2007	Single Engine Cert: 11/09/2018 Airw: Experimental Airw: 11/24/2003	[redacted]	ALLARDYCE MICHAEL GLASTAR

N238Y			5/24/2019	Single Engine Cert: 04/01/2010 Airw: Standard Airw: 9/21/1956	[redacted]	BEECH F17D
N23981			5/24/2019	Single Engine Cert: 11/14/2013 Airw: Standard Airw: 12/30/2008	[redacted]	AERONCA 65-C
N2411E			5/24/2019	Single Engine Cert: 10/28/2004 Airw: Standard Airw: 6/9/1971	[redacted]	AERONCA 7AC
N2457B	GLOBE SWIFT GC-1B		5/14/2007	Single Engine Cert: 08/06/1993 Airw: Standard Airw: 7/16/1956	[redacted]	TEMCO GC-1B
N24638			5/24/2019	Single Engine Cert: 09/02/1976 Airw: Experimental Airw: (Blank Date)	[redacted]	BEECH C23
N2468C			5/24/2019	Single Engine Cert: 10/04/2011 Airw: Standard Airw: 7/3/1956	[redacted]	CESSNA 180
N248EC	Multi Engine Raytheon Aircraft Company Hawker 800XP	[redacted]	12/18/2017	Jet Cert: 11/01/2019 Airw: Standard Airw: 9/25/1998	[redacted]	RAYTHEON AIRCRAFT COMPANY HAWKER 800XP
N2497S			5/24/2019	Ultralight Cert: 06/22/2007 Airw: Experimental Airw: 1/2/2007	[redacted]	NORTHWING DESIGN INC APACHE SPORT
N249GB			5/24/2019	Helicopter Cert: 07/20/1999 Airw: (Blank) Airw: (Blank Date)	[redacted]	SPITZER CRAIG A MINI-500
N24PD	Beechcraft B24R		12/8/2021	Single Engine Cert: 03/03/2020 Airw: Standard Airw: 2/10/1976	[redacted]	BEECH B24R
N24RV	VANGRUNSVEN RV-4		5/14/2007	Single Engine Cert: 09/29/2020 Airw: Experimental Airw: 7/20/1984	[redacted]	VANGRUNSVEN RICHARD E RV-4
N250RJ	Jet Gulfstream G450		12/8/2021	Jet Cert: 10/21/2020 Airw: Standard Airw: 11/10/2020	[redacted]	GULFSTREAM AEROSPACE GIV-X (G450)
N252YN	Single Engine Mooney Aircraft Corp M20K	[redacted]	2/28/2018	Single Engine Cert: 10/27/1993 Airw: Standard Airw: 11/18/1986	[redacted]	MOONEY AIRCRAFT CORP. M20K
	UAO does not have radar coverage to the surface. Aircraft will cancel IFR, when able, for expedi ing landing into Aurora.					
N2546F			5/24/2019	Single Engine Cert: 12/04/1997 Airw: Standard Airw: 11/4/1965	[redacted]	CHAMPION 7ECA
N25719			5/24/2019	Single Engine Cert: 01/21/1946 Airw: Standard Airw: 10/15/1973	[redacted]	BEECH V35B
N25LF	BOEING B75N1		5/14/2007	Single Engine Cert: 03/27/2003 Airw: Standard Airw: (Blank Date)	[redacted]	BOEING B75N1
N2614C			5/24/2019	Single Engine Cert: 03/20/2015 Airw: Experimental Airw: 1/5/2008	[redacted]	TITAN TORNADO
N269AM	Single Engine AIRCRAFT MFG & DEVELOPMENT CO CH 2000		3/5/2014	Single Engine Cert: Airw: Standard Airw: 5/28/2004	[redacted]	AIRCRAFT MFG & DEVELOPMENT CO CH 2000
	Aircraft currently registered with the State of Oregon, listing UAO as home base.					
N271CL	Single Engine Kodiak 100		12/8/2021	Not found in FAA Aircraft Registration Airw: (Blank) Airw: (Blank Date)		
N2735U			5/24/2019	Single Engine Cert: 04/02/1974 Airw: Standard Airw: 5/10/1963	[redacted]	CESSNA 172D
N2779X	Single Engine CARROLL ROBERT DOUGLAS JR KIT FOX MODEL 5		3/5/2014	Single Engine Cert: 11/19/2009 Airw: Experimental Airw: 2/22/2005	[redacted]	CARROLL ROBERT DOUGLAS JR KIT FOX MODEL 5
N2787D	RAVEN S-60A		5/14/2007	(Non 5010) Cert: 03/03/1997	[redacted]	RAVEN S-60A

			Airw: Standard Airw: 3/14/1985		
N2821L		5/24/2019	Single Engine Cert: 03/12/2009 Airw: Standard Airw: 3/31/1967	[redacted]	CESSNA 172H
N282CD	Single Engine CIRRUS DESIGN CORP SR22	3/5/2014	Single Engine Cert: 11/23/2004 Airw: Standard Airw: 10/26/2004	[redacted]	CIRRUS DESIGN CORP SR22
N282RD		5/24/2019	Single Engine Cert: 02/15/2017 Airw: Experimental Airw: 5/2/1999	[redacted]	DAVENPORT ROBERT W LONG EZ
N2850X	CESSNA CARDINAL	5/14/2007	Single Engine Cert: 02/22/2001 Airw: Standard Airw: 11/20/1967	[redacted]	CESSNA 177
N2865B	Single Engine Cirrus SR22T	12/8/2021	Single Engine Cert: 12/06/2018 Airw: Standard Airw: 9/25/2018	[redacted]	CIRRUS DESIGN CORP SR22T
N288HK	Multi Engine CESSNA 680	3/5/2014	Jet Cert: 10/18/2011 Airw: Standard Airw: 9/27/2011	[redacted]	CESSNA 680
N28930	GRUMMAN AMERICAN AA5B	5/14/2007	Single Engine Cert: 04/21/2004 Airw: Standard Airw: 8/31/1978	[redacted]	GRUMMAN AMERICAN AVN. CORP. AA-5B
N290BA		5/24/2019	Glider Cert: 01/29/2001 Airw: Standard Airw: 5/10/1996	[redacted]	LET L 33 SOLO
N29130		5/24/2019	Single Engine Cert: 10/19/2021 Airw: Standard Airw: 5/14/1968	[redacted]	CESSNA U206C
N294TW	PIPER PA-28-160	5/14/2007	Single Engine Cert: 01/07/1999 Airw: Standard Airw: 2/5/1965	[redacted]	PIPER PA-28-160
N29958		5/24/2019	Single Engine Cert: 06/23/2010 Airw: (Blank) Airw: (Blank Date)	[redacted]	WACO UPF-7
N29LJ		5/24/2019	Jet Cert: 07/09/2010 Airw: Standard Airw: 9/28/2001	[redacted]	LEARJET INC 60
N2AV		5/24/2019	Single Engine Cert: 05/02/2003 Airw: Standard Airw: 9/26/1985	[redacted]	CESSNA 208
N2FQ	Jet Falcon 50	12/8/2021	Jet Cert: 01/08/2020 Airw: Standard Airw: 11/10/1992	[redacted]	DASSAULT-BREGUET FALCON 50
N302S		5/24/2019	Glider Cert: 09/19/2017 Airw: Experimental Airw: 4/29/1981	[redacted]	GLASFLUGEL MOSQUITO
N3034V		5/24/2019	Single Engine Cert: 06/01/2017 Airw: Standard Airw: 1/26/1994	[redacted]	MAULE MX-7-160
N30419		5/24/2019	Single Engine Cert: 07/02/2018 Airw: Experimental Airw: 2/21/2008	[redacted]	S C AEROSTAR S A YAK-52
N3075M	PIPER WARRIOR	5/14/2007	Single Engine Cert: 10/25/1999 Airw: Standard Airw: 1/4/1978	[redacted]	PIPER PA-28-161
N3093X		5/24/2019	Single Engine Cert: 03/11/2004 Airw: (Blank) Airw: (Blank Date)	[redacted]	CESSNA 150F
N3097R	BALLOON WORKS FIREFLY 9	5/14/2007	(Non 5010) Cert: 06/11/2012 Airw: Standard Airw: 5/21/1996	[redacted]	BALLOON WORKS FIREFLY 9
N309HW	Single Engine Piper PA 46-350P [redacted]	12/18/2017	Single Engine Cert: 02/19/2014 Airw: Standard Airw: 12/13/2013	[redacted]	PIPER PA 46-350P
N3104D	NANCHANG CJ-6	5/14/2007	Single Engine Cert: 02/01/2021 Airw: Experimental Airw: 11/14/1991	[redacted]	NANCHANG CHINA CJ-6A
N31188	PIPER CUB J-3	5/14/2007	Single Engine Cert: 10/31/2017	[redacted]	PIPER J3C-65

			Airw: Standard Airw: (Blank Date)	[redacted]	
N3153B	CESSNA P-210N	5/14/2007	Single Engine Cert: 07/20/2017 Airw: Standard Airw: 3/14/1984	[redacted]	CESSNA P210N
N3235T	Single Engine Beech B36TC	12/8/2021	Single Engine Cert: 09/08/2014 Airw: Standard Airw: 5/9/1995	[redacted]	BEECH B36TC
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N340DV	Multi Engine Cessna 340	12/8/2021	Multi Engine Cert: 11/18/2019 Airw: Standard Airw: 5/4/1981	[redacted]	CESSNA 340A
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N3518W	Single Engine Cessna 182	12/8/2021	Single Engine Cert: 06/12/2019 Airw: (Blank) Airw: (Blank Date)	[redacted]	CESSNA T182T
N357PG	Single Engine Cirrus SR	12/8/2021	Single Engine Cert: 09/11/2021 Airw: Standard Airw: 12/22/2011	[redacted]	CIRRUS DESIGN CORP SR22T
	Aircraft owner confirmed on 11/17 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N3801R	BEECH 77 SKIPPER	5/14/2007	Single Engine Cert: 02/28/1986 Airw: Standard Airw: 10/13/1980	[redacted]	BEECH 77
N3867B	Single Engine BEECH F35	3/5/2014	Single Engine Cert: 01/31/2012 Airw: Standard Airw: 6/29/1956	[redacted]	BEECH F35
N3880C	CESSNA 180	5/14/2007	Single Engine Cert: 07/01/2013 Airw: Standard Airw: 4/2/1956	[redacted]	CESSNA 180
N398RS	Jet Cessna 560XL	12/8/2021	Jet Cert: 01/16/2020 Airw: Standard Airw: 10/2/1998	[redacted]	CESSNA 560XL
N399HO	Single Engine Cirrus	12/8/2021	Not found in FAA Aircraft Registration Airw: (Blank) Airw: (Blank Date)		
N3TM	PIPER J-3C-65	5/14/2007	Single Engine Cert: 10/20/1998 Airw: Standard Airw: 9/9/1955	[redacted]	PIPER J3C-65
N402RH	Single Engine Hickman Robert J RV-10 [redacted]	2/28/2018	Single Engine Cert: 06/02/2008 Airw: Experimental Airw: 7/11/2008	[redacted]	HICKMAN ROBERT J RV-10
N40UT	Jet Stoller Falcon	12/8/2021	Jet Cert: 08/26/2014 Airw: Standard Airw: 6/10/1993	[redacted]	CANADAIR LTD CL-600-2B16
N410RV	Single Engine VANS AIRCRAFT INC RV-10	3/5/2014	Single Engine Cert: 03/20/2003 Airw: Experimental Airw: 1/15/2020	[redacted]	VANS AIRCRAFT INC RV-10
N411CC	Multi Engine BEECH B200	3/5/2014	Multi Engine Cert: 10/31/2002 Airw: Standard Airw: 12/3/1995	[redacted]	BEECH B200
N412RV	Single Engine VANS AIRCRAFT INC RV-12	3/5/2014	Single Engine Cert: 08/21/2019 Airw: Light Sport Airw: 7/20/2009	[redacted]	VANS AIRCRAFT INC RV-12
N412WC	Multi Engine HAWKER BEECHCRAFT CORP C90GTI	3/5/2014	Multi Engine Cert: 01/08/2009 Airw: Standard Airw: 12/12/2008	[redacted]	HAWKER BEECHCRAFT CORP C90GTI
N416CD	CIRRUS SR20	5/14/2007	Single Engine Cert: 06/23/2021 Airw: Standard Airw: 2/20/2006	[redacted]	CIRRUS DESIGN CORP SR22
N419ST	Single Engine Cirrus SR22	12/8/2021	Single Engine Cert: 08/13/2019 Airw: Standard Airw: 10/25/2005	[redacted]	CIRRUS DESIGN CORP SR22
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N41KE	Single Engine SUKHOI SU-26	3/5/2014	Single Engine Cert: 05/25/2010 Airw: (Blank) Airw: (Blank Date)	[redacted]	SUKHOI SU-26
N424WC	Helicopter MCDONNELL DOUGLAS HELI CO 500-E	3/5/2014	Helicopter Cert: 02/04/2008 Airw: Standard Airw: 7/31/2020	[redacted]	MCDONNELL DOUGLAS HELI CO 369FF
N424WH	CESSNA 5182T	5/14/2007	Single Engine	[redacted]	CESSNA T182T

			Cert: 12/01/2005 Airw: Standard Airw: 8/19/2004	[redacted]	
N430WC	Jet BOMBARDIER AEROSPACE INC BD-100-1A10	3/5/2014	Jet Cert: 04/03/2013 Airw: Standard Airw: 3/29/2013	[redacted]	BOMBARDIER INC BD-100-1A10
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N4387P	Multi Engine PIPER PA-23-160	3/5/2014	Multi Engine Cert: 08/26/2011 Airw: Standard Airw: 10/19/1960	[redacted]	PIPER PA-23-160
N4544P	Single Engine GRUMMAN AMERICAN AVN. CORP. AA-5B	3/5/2014	Single Engine Cert: 09/27/2012 Airw: Standard Airw: 11/16/1979	[redacted]	GRUMMAN AMERICAN AVN. CORP. AA-5B
N4715K	Single Engine Cessna 182	12/8/2021	Single Engine Cert: 05/04/2020 Airw: Standard Airw: 3/14/1975	[redacted]	CESSNA 182P
N4719K	CESSNA 182P	5/14/2007	Single Engine Cert: 08/15/2018 Airw: Standard Airw: 3/25/1975	[redacted]	CESSNA 182P
N4720C	Single Engine Cessna T210N [redacted]	2/28/2018	Single Engine Cert: 09/12/2014 Airw: Standard Airw: 8/31/1979	[redacted]	CESSNA T210N
N474PE	Jet Cessna 560	12/8/2021	Jet Cert: 11/21/2012 Airw: Standard Airw: 12/6/2001	[redacted]	CESSNA 560
N477RV	VANS AIRCRAFT RV-7	5/14/2007	Single Engine Cert: 02/19/2004 Airw: Experimental Airw: 11/5/2020	[redacted]	VANS AIRCRAFT INC VANS RV-7
	UAO does not have radar coverage to the surface. Aircraft will cancel IFR, when able, for expedi ing landing into Aurora.				
N4793J	BEECH A23-24	5/14/2007	Single Engine Cert: 07/18/1995 Airw: Standard Airw: 4/14/1967	[redacted]	BEECH A23-24
N4807T	PIPER PA28-140	5/14/2007	Single Engine Cert: 08/16/2012 Airw: Standard Airw: 2/27/1972	[redacted]	PIPER PA-28-140
N480WC		12/8/2021	Jet Cert: 06/02/2021 Airw: Standard Airw: 3/16/2021	[redacted]	EMBRAER EXECUTIVE AIRCRAFT INC EMB-505
N4819Z*DE-REGISTERED	Piper Tripacer	12/8/2021	Single Engine Cert: Airw: Standard Airw: 5/22/1964	[redacted]	PIPER PA-22-108 (DEREG Canceled 09/2021)
	*2021-12-16 Help Desk JL: This aircraft does not have a valid FAA registration / airworthiness certificate. It does not meet the criteria required to be counted as a based aircraft because it is not legally airworthy. Aircraft owner confirmed on 11/17 th				
N4848D	Single Engine Cessna 182	12/8/2021	Single Engine Cert: 08/07/1995 Airw: Multiple Airw: 7/13/1983	[redacted]	CESSNA 182B
N4875K	CESSNA P210-N	5/14/2007	Single Engine Cert: 03/27/2017 Airw: Standard Airw: 8/22/1979	[redacted]	CESSNA P210N
N499A	Single Engine PIPER PA-28RT-201T	3/5/2014	Single Engine Cert: 02/06/2004 Airw: Standard Airw: 7/6/1995	[redacted]	PIPER PA-28RT-201T
	Aircraft currently registered with the State of Oregon, listing UAO as home base.				
N500MZ	Helicopter HUGHES 500D	3/5/2014	Helicopter Cert: 11/22/2005 Airw: Standard Airw: 9/4/2004	[redacted]	HUGHES 500D
N50NA	Multi Engine Beechcraft Kingair Super	12/8/2021	Multi Engine Cert: 04/02/2019 Airw: Standard Airw: 3/30/1999	[redacted]	BEECH B200
N520RR	VANS RV 8A	5/14/2007	Single Engine Cert: 05/13/2003 Airw: Experimental Airw: 12/4/2003	[redacted]	RAUCH RICHARD B RV-8A
N5220T	PIPER CHEROKEE 140E PA-28	5/14/2007	Single Engine Cert: 03/08/1983 Airw: Standard Airw: 5/3/1972	[redacted]	PIPER PA-28-140
N52214	Single Engine Cessna 182P [redacted]	2/28/2018	Single Engine Cert: 05/18/2017 Airw: Standard Airw: 10/9/1973	[redacted]	CESSNA 182P
	Aircraft Verified at Aurora and registered with the State of Oregon				
N526SM	Jet CESSNA 560XL	3/5/2014	Jet Cert: 08/24/2017	[redacted]	DASSAULT-BREGUET

				Airw: Standard Airw: 2/1/1990	[redacted]	FALCON 50
N5274V	Single Engine CESSNA 172S		3/5/2014	Single Engine Cert: 06/05/2013 Airw: Standard Airw: 12/15/2009	[redacted]	CESSNA 172S
	Aircraft currently registered with the State of Oregon, listing UAO as home base.					
N528ES	Single Engine Cessna 182		12/8/2021	Single Engine Cert: 09/10/2019 Airw: Standard Airw: 11/12/1979	[redacted]	CESSNA 182Q
N52MW	Single Engine PILATUS AIRCRAFT LTD PC-12/47E		3/5/2014	Jet Cert: 08/12/2016 Airw: Standard Airw: 6/29/2011	[redacted]	CESSNA 560XL
N530GM	Helicopter MD HELICOPTERS INC 369FF		3/5/2014	Helicopter Cert: 01/13/2011 Airw: Standard Airw: 7/2/2008	[redacted]	MD HELICOPTERS INC 369FF
N535BC	Jet Embraer Phenom 300		12/8/2021	Jet Cert: 11/15/2018 Airw: Standard Airw: 9/25/2018	[redacted]	EMBRAER EXECUTIVE AIRCRAFT INC EMB-505
N53PE	Jet Cessna 560		12/8/2021	Jet Cert: 02/03/2020 Airw: Standard Airw: 5/13/1998	[redacted]	CESSNA 560
N541BS	CESSNA TR182		5/14/2007	Single Engine Cert: 08/21/2021 Airw: Standard Airw: 5/6/1980	[redacted]	CESSNA TR182
N541DC	Single Engine Vans Aircraft RV-6A		3/5/2014	Single Engine Cert: 06/30/2009 Airw: Experimental Airw: 10/7/2009	[redacted]	CARLSON DAVID L VANS RV6A
N54PT	Multi Engine Beech E-90	[redacted]	2/2/2018	Multi Engine Cert: 03/12/2019 Airw: (Blank) Airw: (Blank Date)	[redacted]	BEECH E-90
N5527A	Single Engine Cessna 210R		12/8/2021	Single Engine Cert: 08/06/2018 Airw: Standard Airw: 8/13/1985	[redacted]	CESSNA P210R
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N5549A	CESSNA t210n		5/14/2007	Single Engine Cert: 07/07/2014 Airw: Standard Airw: 11/8/1993	[redacted]	CESSNA T210N
N55666	Single Engine Piper PA-28-180	[redacted]	2/2/2018	Single Engine Cert: Airw: Standard Airw: 5/24/1973	[redacted]	PIPER PA-28-180
	Registered with the State of Oregon and based at Aurora possibly part-time.					
N556DC	DIAMOND DA20		5/14/2007	Single Engine Cert: 04/03/2019 Airw: Standard Airw: 10/25/2001	[redacted]	DIAMOND AIRCRAFT IND INC DA20-C1
N558WW	Jet CESSNA 560		3/5/2014	Jet Cert: 10/03/2012 Airw: Standard Airw: 9/22/1992	[redacted]	CESSNA 560
N565TM	DE HAVILLAND DHC II		5/14/2007	Single Engine Cert: 03/07/2002 Airw: Standard Airw: 6/21/1991	[redacted]	DEHAVILLAND DHC-2 MK. I(L20A)
N566VR	Jet Cessna 560		12/8/2021	Jet Cert: 07/02/2014 Airw: Standard Airw: 9/1/1998	[redacted]	CESSNA 560
N56KG	Jet Cessna 560	[redacted]	2/2/2018	Jet Cert: 05/08/2015 Airw: Standard Airw: 5/4/2001	[redacted]	CESSNA 560
N57405	Single Engine Bellanca 7KCAB	[redacted]	2/28/2018	Single Engine Cert: 11/06/2018 Airw: Standard Airw: 4/30/1973	[redacted]	BELLANCA 7KCAB
N5814K	Single Engine Beech Debonair		12/8/2021	Single Engine Cert: 01/27/2016 Airw: Standard Airw: 12/5/1985	[redacted]	BEECH 35-C33
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N58WW	BELL JETRANGER 206B		5/14/2007	Helicopter Cert: 12/21/2018 Airw: Standard Airw: 2/6/2004	[redacted]	BELL 206B
N5908W	PIPER PA28-150		5/14/2007	Single Engine Cert: 04/01/1997 Airw: Standard Airw: 11/1/1965	[redacted]	PIPER PA-28-150
N591DK	Jet Cessna 560		12/8/2021	Jet	[redacted]	CESSNA 560

				Cert: 12/18/2001 Airw: Standard Airw: 12/5/2001	[redacted]	
	Aircraft owner confirmed on 11/17/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N5970Q	Single Engine MOONEY M20C		3/5/2014	Single Engine Cert: 07/23/2007 Airw: Standard Airw: 10/6/1965	[redacted]	MOONEY M20C
N61031	Single Engine CESSNA 150J		3/5/2014	Single Engine Cert: 02/14/2008 Airw: Standard Airw: 5/14/1969	[redacted]	CESSNA 150J
N612PS*DE-REGISTERED	Single Engine Pitts S1T		3/5/2014	Single Engine Cert: Airw: (Blank) Airw: (Blank Date)	[redacted]	DOGGETT JACK PITTS MODEL 12 (DEREG Exprtd 2014-BRAZIL)
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N6159W	Single Engine Piper PA-28-140	James Boedecker	2/2/2018	Single Engine Cert: 03/24/2017 Airw: Standard Airw: 7/10/1964	[redacted]	PIPER PA-28-140
	UAO does not have radar coverage to the surface. Aircraft will cancel IFR, when able, for expedi ing landing into Aurora.					
N623JC	Single Engine Vans Aircraft RV-7		3/5/2014	Single Engine Cert: 06/12/2012 Airw: Experimental Airw: 4/18/2011	[redacted]	CHARNO JON A RV7
N6281F	Single Engine CESSNA 182P		3/5/2014	Single Engine Cert: 07/15/2014 Airw: Standard Airw: (Blank Date)	[redacted]	CESSNA 182P
N6283V	CESSNA 172RG		5/14/2007	Single Engine Cert: 08/10/2015 Airw: Standard Airw: 7/23/1980	[redacted]	CESSNA 172RG
N6292J	Single Engine Cessna 182		12/8/2021	Single Engine Cert: 08/12/2019 Airw: Standard Airw: 7/16/2008	[redacted]	CESSNA T182T
N63TK	Jet Cessna 550		12/8/2021	Jet Cert: 08/08/2018 Airw: Standard Airw: 2/20/1997	[redacted]	CESSNA 550
N63YH	Single Engine Cirrus 22T		12/8/2021	Single Engine Cert: 07/01/2019 Airw: Standard Airw: 6/1/2016	[redacted]	CIRRUS DESIGN CORP SR22T
N64120	CESSNA 172 SKYHAWK II		5/14/2007	Single Engine Cert: 11/15/2016 Airw: Standard Airw: 3/25/1975	[redacted]	CESSNA 172M
	UAO does not have radar coverage to the surface. Aircraft will cancel IFR, when able, for expedi ing landing into Aurora.					
N64160	CESSNA 172M		5/14/2007	Single Engine Cert: 03/24/2021 Airw: Standard Airw: 4/3/1975	[redacted]	CESSNA 172M
N64604	Single Engine BOEING A75N1(PT17)		3/6/2014	Single Engine Cert: 12/15/2018 Airw: Standard Airw: 7/3/1985	[redacted]	BOEING A75N1(PT17)
N650JS	Jet RAYTHEON AIRCRAFT COMPANY HAWKER 800XP		3/6/2014	Jet Cert: 10/10/2014 Airw: Standard Airw: 1/29/1991	[redacted]	DASSAULT-BREGUET FALCON 50
N666RV	VAN'S AIRCRAFT RV-6A		5/14/2007	Single Engine Cert: 04/21/1988 Airw: Experimental Airw: 11/24/2020	[redacted]	VANGRUNSVEN R E/VANGRUNSVEN D RV 6A
N66840	Single Engine Beechcraft Bonanza		12/8/2021	Single Engine Cert: 02/26/2014 Airw: Standard Airw: 6/7/1983	[redacted]	BEECH A36
N67683	Single Engine JOHNSON DANIEL H III VANS RV-7		3/6/2014	Single Engine Cert: 09/29/2009 Airw: Experimental Airw: 5/2/2007	[redacted]	JOHNSON DANIEL H III VANS RV-7
N6780Q	Single Engine BEECH A36		3/6/2014	Single Engine Cert: 09/07/2021 Airw: Standard Airw: 1/7/1984	[redacted]	BEECH A36
N678RT	Multi Engine Cessna 525	Jim Matsies	2/2/2018	Jet Cert: 06/30/2016 Airw: Standard Airw: 7/30/2004	[redacted]	CESSNA 525
N680ME			12/8/2021	Jet Cert: 10/28/2020 Airw: Standard Airw: 11/4/2020	[redacted]	CESSNA 680
N68517	BELLANCA DECATHALON		5/14/2007	Single Engine Cert: 08/26/2014 Airw: Standard Airw: 8/16/1976	[redacted]	BELLANCA 8KCAB

N6857P	Single Engine PIPER PA-24-250	3/6/2014	Single Engine Cert: 03/23/2019 Airw: Standard Airw: 4/29/1960	[redacted]	PIPER PA-24-250
	Aircraft currently registered with the State of Oregon, listing UAO as home base.				
N6863A	CESSNA 172	5/14/2007	Single Engine Cert: 01/09/1991 Airw: Standard Airw: 7/17/1956	[redacted]	CESSNA 172
N699SU	SU-29 SUKHOI	5/14/2007	Single Engine Cert: 06/13/2000 Airw: Experimental Airw: 5/9/2018	[redacted]	SUKHOI SU-29
N700CG		12/8/2021	Not found in FAA Aircraft Registration Airw: (Blank) Airw: (Blank Date)		
N701CA	PIPER PA-28R-200	5/14/2007	Single Engine Cert: 10/26/2017 Airw: Standard Airw: 11/28/1973	[redacted]	PIPER PA-28R-200
	UAO does not have radar coverage to the surface. Aircraft will cancel IFR, when able, for expedi ing landing into Aurora.				
N705WL	Multi Engine Cessna 560XL [redacted]	2/2/2018	Jet Cert: 01/16/2019 Airw: Standard Airw: 5/13/2014	[redacted]	DASSAULT AVIATION FALCON 2000
	Aircraft owner confirmed on 11/09 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N70HA	VARIEZE	5/14/2007	Single Engine Cert: 05/27/2021 Airw: Experimental Airw: 3/25/2003	[redacted]	STRAUCH H/STRAUCH A FUNEZE
N71QT	Single Engine Cirrus 22T	12/8/2021	Not found in FAA Aircraft Registration Airw: (Blank) Airw: (Blank Date)		
N7280C	PIPER CHEROKEE PA 28 140	5/14/2007	Single Engine Cert: 08/28/2003 Airw: Standard Airw: 11/19/1975	[redacted]	PIPER PA-28-140
N731TR	Jet CESSNA 560	3/6/2014	Jet Cert: 10/25/2017 Airw: Standard Airw: 4/6/1999	[redacted]	CESSNA 560
N734NV	Single Engine Cessna 172	12/8/2021	Single Engine Cert: 07/30/2020 Airw: Standard Airw: 4/22/1977	[redacted]	CESSNA 172N
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N734RA	Single Engine CESSNA 172N	3/6/2014	Single Engine Cert: 04/25/2008 Airw: Standard Airw: 5/3/1977	[redacted]	CESSNA 172N
N7353T	CESSNA 172A	5/14/2007	Single Engine Cert: 05/10/2021 Airw: Standard Airw: 10/27/1959	[redacted]	CESSNA 172A
N735VA	Single Engine Cessna 182Q	12/8/2021	Single Engine Cert: 11/17/2018 Airw: Standard Airw: 5/16/1977	[redacted]	CESSNA 182Q
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N73BT	CESSNA 180H	5/14/2007	Single Engine Cert: 01/21/2009 Airw: Standard Airw: 5/1/1989	[redacted]	CESSNA 180H
	UAO does not have radar coverage to the surface. Aircraft will cancel IFR, when able, for expedi ing landing into Aurora.				
N742RS	Glider Pipistrel LSA SRL Sinus [redacted]	2/2/2018	Single Engine Cert: 03/19/2014 Airw: Light Sport Airw: 4/6/2014	[redacted]	PIPISTREL LSA SRL SINUS
N759RE	CESSNA 182Q	5/14/2007	Single Engine Cert: 11/27/2017 Airw: Standard Airw: 1/9/1978	[redacted]	CESSNA 182Q
N75XP	Jet Bombardier Lear 45 [redacted]	3/5/2014	Jet Cert: 08/05/2021 Airw: Standard Airw: 9/25/2000	[redacted]	LEARJET INC 45
	Aircraft owner confirmed on [redacted] is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N760ED	Jet CESSNA 560XL	3/6/2014	Jet Cert: 04/28/2011 Airw: Standard Airw: 10/6/2001	[redacted]	CESSNA 560XL
N76413	Single Engine Cessna 140	12/8/2021	Single Engine Cert: 12/06/2017 Airw: Standard Airw: (Blank Date)	[redacted]	CESSNA 140
N7776L	Single Engine CIRRUS DESIGN CORP SR22	3/6/2014	Single Engine Cert: 09/23/2005	[redacted]	CIRRUS DESIGN CORP SR22

				Airw: Standard Airw: 8/26/2005		
	Aircraft currently registered with the State of Oregon, listing UAO as home base.					
N777Q	CESSNA 310C		5/14/2007	Multi Engine Cert: 07/07/2014 Airw: Standard Airw: 4/13/1959	[redacted]	CESSNA 310C
N7813D	Single Engine Piper PA20		12/8/2021	Single Engine Cert: 04/30/2014 Airw: Standard Airw: 8/27/1957	[redacted]	PIPER PA-22-150
N7818A	CESSNA 180A		5/14/2007	Single Engine Cert: 07/07/2014 Airw: Standard Airw: 5/29/1959	[redacted]	CESSNA 180A
N781KB	Jet Cessna 560XL		12/8/2021	Jet Cert: 08/08/2020 Airw: Standard Airw: 7/1/2016	[redacted]	TEXTRON AVIATION INC 560XL
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N781TD	Single Engine Conroy Trevor RV-7	Trevor Conroy 28685 SW Crestwood Dr Wilsonville OR 97070	2/2/2018	Single Engine Cert: 08/13/2020 Airw: Experimental Airw: 4/1/2015	[redacted]	CONROY TREVOR RV-7
N7849T	Single Engine CESSNA 172A		3/6/2014	Single Engine Cert: 04/23/2009 Airw: Standard Airw: 4/9/1960	[redacted]	CESSNA 172A
N789GS	GLASAIR		5/14/2007	Single Engine Cert: 10/20/2006 Airw: Experimental Airw: 4/2/2010	[redacted]	HALEY MP/HALEY GF GLASAIR SPORTSMAN2+2
N799GQ	Socata		12/8/2021	Not found in FAA Aircraft Registration Airw: (Blank) Airw: (Blank Date)		
N79KL	Jet Embraer Phenom 300		12/8/2021	Jet Cert: 04/20/2020 Airw: Standard Airw: 12/14/2018	[redacted]	EMBRAER EXECUTIVE AIRCRAFT INC EMB-505
N800TN	Multi Engine Beechcraft B200		12/8/2021	Multi Engine Cert: 12/08/2020 Airw: Standard Airw: 9/14/2007	[redacted]	HAWKER BEECHCRAFT CORP B200
N805K	Single Engine KAUFFMAN LEONARD A VANS RV-8		3/6/2014	Single Engine Cert: 10/13/2005 Airw: Experimental Airw: 6/29/2006	[redacted]	KAUFFMAN LEONARD A VANS RV-8
N806PS	Single Engine PITTS S-1-11		12/8/2021	Single Engine Cert: 04/28/2020 Airw: Experimental Airw: 1/22/2021	[redacted]	JOSHUA W PRUZEK PITTS S-1-11 SUPER
N807SM	Multi Engine HAWKER BEECHCRAFT CORP B200		3/6/2014	Multi Engine Cert: 09/19/2007 Airw: Standard Airw: 8/10/2007	[redacted]	HAWKER BEECHCRAFT CORP B200
N808JP	Single Engine AVIAT INC PITTS S-2B		3/6/2014	Single Engine Cert: 07/17/2012 Airw: Standard Airw: 4/14/1993	[redacted]	AVIAT INC PITTS S-2B
N81933	AERONCA CHAMP 7BCM		5/14/2007	Single Engine Cert: 02/16/1990 Airw: Standard Airw: 10/19/1955	[redacted]	AERONCA 7AC
N826CH	Single Engine Lancair ES		12/8/2021	Single Engine Cert: 02/24/2020 Airw: Experimental Airw: 11/12/2008	[redacted]	HESS CHARLES A SUPER ES
N8315H	Single Engine Saratoga YA32		12/8/2021	Single Engine Cert: 03/29/2021 Airw: Standard Airw: 4/26/1982	[redacted]	PIPER PA-32-301T
	Aircraft owner confirmed on 11/26 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N8336C	Multi Engine Douglas DC3		12/8/2021	Multi Engine Cert: 06/03/2009 Airw: Standard Airw: 1/5/1956	[redacted]	DOUGLAS DC3A
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO					
N83386	PIPER PA-18-150		5/14/2007	Single Engine Cert: 03/30/2019 Airw: Standard Airw: 6/21/1976	[redacted]	PIPER PA-18-150
N8381V	Single Engine Piper Saratoga		12/8/2021	Single Engine Cert: 12/04/2018 Airw: Standard Airw: 3/31/1981	[redacted]	PIPER PA-32-301T
N8526U*DE-REGISTERED	SKYHAWK C172F		5/14/2007	Single Engine Cert: 02/14/2018	[redacted]	CESSNA 172F (DEREG Canceled 06/2021)

			Airw: Standard Airw: 1/13/1965		
	*2021-12-16 Help Desk JL: This aircraft does not have a valid FAA registration / airworthiness certificate. It does not meet the criteria required to be counted as a based aircraft because it is not legally airworthy.				
N86TU	PIPER WARRIOR II	5/14/2007	Single Engine Cert: 04/25/2019 Airw: Standard Airw: 6/18/1979	[redacted]	PIPER PA-28-161
N890MT	Jet Cessna Citation M2	12/8/2021 [redacted]	Jet Cert: 02/28/2018 Airw: Standard Airw: 11/9/2015	[redacted]	TEXTRON AVIATION INC 525
N8KD	Jet EMBRAER EXECUTIVE AIRCRAFT INC EMB-500	3/6/2014	Jet Cert: 11/04/2013 Airw: Standard Airw: 9/18/2013	[redacted]	EMBRAER EXECUTIVE AIRCRAFT INC EMB-500
N907DF	Jet Cessna Citation	3/5/2014	Jet Cert: 09/10/2010 Airw: Standard Airw: 1/13/1994	[redacted]	CESSNA 650
N91926	Single Engine Cessna 182M	12/8/2021	Single Engine Cert: 04/17/2006 Airw: Standard Airw: 9/12/1969	[redacted]	CESSNA 182M
	Aircraft owner confirmed on 11/09 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N92448	Single Engine Cessna 172	12/8/2021	Single Engine Cert: 05/21/1946 Airw: Standard Airw: 3/27/1973	[redacted]	CESSNA 172M
	Aircraft owner confirmed on 11/18 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N92761	Single Engine NORTH AMERICAN AT-6G	3/6/2014	Single Engine Cert: 03/22/2018 Airw: Standard Airw: 10/19/1983	[redacted]	NORTH AMERICAN AT-6G
N927G61	Single Engine North American T6	12/8/2021	Not found in FAA Aircraft Registration Airw: (Blank) Airw: (Blank Date)		
N927PT	Multi Engine PIPER PA-23-250	3/6/2014	Multi Engine Cert: 10/26/2004 Airw: Standard Airw: 10/1/1976	[redacted]	PIPER PA-23-250
N928MT	Single Engine MARK B COOPER RV-10	3/6/2014	Single Engine Cert: 01/07/2013 Airw: Experimental Airw: 7/1/2013	[redacted]	[redacted] RV-10
N931EM	Single Engine Cessna 182P [redacted]	2/2/2018	Single Engine Cert: 08/24/2018 Airw: Standard Airw: 3/3/1975	[redacted]	CESSNA 182P
N9320X	Single Engine Cessna 182R	12/8/2021	Single Engine Cert: 07/31/2020 Airw: Standard Airw: 8/23/1985	[redacted]	CESSNA 182R
	Aircraft owner confirmed on 11/09 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N93272	Single Engine Cessna A185F [redacted]	2/2/2018	Single Engine Cert: 12/03/2015 Airw: Standard Airw: 12/9/1976	[redacted]	CESSNA A185F
	Ownership changed, new owner lives in Lake Oswego and bases aircraft at Aurora				
N943SP	CESSNA 172S	5/14/2007	Single Engine Cert: 07/15/2002 Airw: Standard Airw: 4/12/1999	[redacted]	CESSNA 172S
N9467S	Single Engine Beechcraft Bonanza V35	12/8/2021	Single Engine Cert: 05/12/2004 Airw: Standard Airw: 1/18/1966	[redacted]	BEECH V35
N95159	Single Engine CESSNA 152	3/6/2014	Single Engine Cert: 07/26/2004 Airw: Multiple Airw: 1/11/1988	[redacted]	CESSNA 152
N9550K	Single Engine Stinson 108-2	12/8/2021	Single Engine Cert: 10/15/2018 Airw: Standard Airw: 8/12/1955	[redacted]	STINSON 108
N96968	CESSNA 182	5/14/2007	Single Engine Cert: 07/14/2005 Airw: Standard Airw: 4/13/1979	[redacted]	CESSNA 182Q
N96FP	Jet Cessna CJ2	12/8/2021	Jet Cert: 10/31/2017 Airw: Standard Airw: 3/6/2015	[redacted]	CESSNA 525A

N97127	CESSNA 180Q	5/14/2007	Single Engine Cert: 02/03/2012 Airw: Standard Airw: 6/2/1979	[redacted]	CESSNA 182Q
N9715T	Single Engine Piper PA 38	12/8/2021	Single Engine Cert: 07/05/2016 Airw: Standard Airw: 5/8/1978	[redacted]	PIPER PA-38-112
N9828E	Single Engine Cessna 182P	12/8/2021	Single Engine Cert: 08/24/2021 Airw: Standard Airw: 5/23/1975	[redacted]	CESSNA 182P
N988LE	Single Engine Vans RV14	12/8/2021	Not found in FAA Aircraft Registration Airw: (Blank) Airw: (Blank Date)		
N989LW*DE-REGISTERED	Single Engine Experimental	3/5/2014	Single Engine Cert: 10/25/2012 Airw: Experimental Airw: 2/5/2010	[redacted]	LEWIS ERIC TWIN CUB (DEREG Canceled 03/2019)
	*2021-12-16 Help Desk JL: This aircraft does not have a valid FAA registration / airworthiness certificate. It does not meet the criteria required to be counted as a based aircraft because it is not legally airworthy. Aircraft owner confirmed on 11/18 th				
N9989V	CESSNA SKYHAWK 172M	5/14/2007	Single Engine Cert: 11/19/2009 Airw: Standard Airw: 2/5/1975	[redacted]	CESSNA 172M
N998HG	Single Engine EICHER BRUCE R RV-8	3/6/2014	Single Engine Cert: 07/03/2012 Airw: Experimental Airw: 9/6/2012	[redacted]	EICHER BRUCE R RV-8
N999QA	CESSNA 172	5/14/2007	Single Engine Cert: 05/18/2006 Airw: Standard Airw: 8/14/1973	[redacted]	CESSNA 172M
N999TF*DE-REGISTERED	Single Engine CIRRUS DESIGN CORP SR22	3/6/2014	Single Engine Cert: 06/08/2007 Airw: Standard Airw: 5/15/2007	[redacted]	CIRRUS DESIGN CORP SR22 (DEREG Canceled 04/2021)
	Aircraft owner confirmed on 11/18/2021 that this aircraft is based in their leased hangar at UAO, Anthony Beach, Airport Manager UAO				
N99CR	LANCAIR 360	5/14/2007	Single Engine Cert: 04/16/2018 Airw: Experimental Airw: 12/13/1993	[redacted]	[redacted] LANCAIR 360

Total Currently Validated Aircraft Excluding Duplicates & Acft. Not Found in FAA Acft. Reg. Data: 281

SECURITY SENSITIVE INFORMATION WARNING: This data contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. Government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520.

Appendix 8

Discarded Forecast Models

Discarded Forecast Models

2021-2041 Aviation Activity Forecasts

BASED AIRCRAFT

Discarded Models

National Aerospace Forecast (Combined Rate) Model – This model applies the *National Aerospace Forecast FY 2021-2041* growth rate for entire fleet to the Airport's baseline based aircraft count, and projected out for the 20-year planning period. The linear projection assumes steady growth that does not change year-over-year during the 20-year forecast. The model projects fleet growth as a whole, not by individual aircraft type. The model results in an average annual growth rate of 0.1%. The model was discarded in favor of a weighted version of the National Aerospace forecast, as it does not account for aircraft fleet mix.

Northwest Mountain Region Federal Contract Tower TAF Model – This model also uses the FAA TAF Query Data subsets for federal contract air traffic control towers described earlier. The model is based on the TAF forecast for the group of airports located in the FAA's Northwest Mountain Region. As with the Oregon contract tower model, the operational similarities of this group of airports provides a broad assessment of activity. This model applies the FAA's Northwest Mountain Region Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline based aircraft counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models, but uses regional forecast rates. The model results in an average annual growth rate of 1.1%. This model was discarded in favor of the similar and more locally-based state TAF model.

National Federal Contract Tower TAF Model – This model also uses the FAA TAF Query Data subsets for federal contract air traffic control towers. The model is based on the TAF forecast for all similarly grouped airports in the federal contract tower system. As with the other FAA contract tower models, the operational similarities of this group of airports provides a broad assessment of activity. This model applies the FAA's National Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline based aircraft counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models but uses national TAF forecast rates. The model results in an average annual growth rate of 1.3%. This model was discarded in favor of the similar and more locally-based state TAF model.

Oregon Aviation Plan v6.0 Model – This model applies the OAP v.6.0 statewide growth rate for Oregon's based aircraft fleet to the Airport's baseline based aircraft count and projects out 20 years. The linear projection assumes steady growth that does not change year-over-year during the 20-year forecast. The model results in an average annual growth rate of 1.1%. This model was discarded based on its reliance on historical TAF data and pre-COVID activity assumptions in place when the forecast was created.

Historical Hangar Development Trend Model – This model was developed based on an assessment of the Airport's hangar development trend since the last airport master plan was completed. The evaluation was performed by measuring the total area of on-airport and TTF hangar building footprints in August 2012 and June 2021 as observed in Google Earth imagery. Hangars were measured as whole; non aircraft storage spaces (operations, aircraft maintenance, equipment storage, etc.) located within the structures have not been removed from the measurements. A linear rate (1.7% CAGR) of increase in hangar space was calculated for the nine-year period. Details of the net change in airport hangar area are described in Chapter 2. The rate was applied to baseline based aircraft total and projected out for the 20-year planning period. The model assumes that actual hangar development was demand driven, not speculative and that the buildings constructed as hangars are used for aircraft storage, not general storage. The model result s in an average annual growth rate of 1.7%.

AIRCRAFT OPERATIONS

Discarded Models

Historical Tower Counts Trend – This model uses the full six years (2016-2021) of adjusted ATCT airport operations data available to establish a best-fit linear trend line for the period. The model assumes steady linear growth year-over-year. Itinerant and local splits were based on 2021 operations counts. The model is limited by the short period from which to develop meaningful trend and operational events experienced during the COVID-19 pandemic (e.g., decreased business travel by corporations and increased flight training activity) may be disproportionately reflected in the resulting trend projection. The model results in an average annual growth rate of 3.6%.

The Historical Tower Counts Trend model was discarded, primarily due to the comparatively short period of ATCT data available to develop the projection. Also, as indicated by FAA at the beginning of the COVID-19 pandemic: *"Federal Aviation Administration (FAA) forecast approval will be based in reference to the data and methodologies used and the conclusions at the time the document was prepared. However, consideration must still be given to the significant impacts of COVID-19 on aviation activity. As a result, there is lower than normal confidence in future growth projections."*

Marion County Population Correlation – Socio-economic indicators (population, employment, and gross regional product) for several local defined areas were compared to the Airport's adjusted ATCT operations counts (2016-2021). Ultimately Marion County Population was chosen as the most representative model as the county showed good correlation across the three indicators (population being the highest at R-squared = 0.93) and is the most focused area in which the airport is located. Clackamas County Population was also 0.93, but the airport isn't located in the county and employment correlation was on the low end of the range, so it wasn't chosen over Marion County. PSU PRC population forecast annual growth rates were applied to baseline operation counts for the 20-year period. The model assumes that operations will continue to mirror population growth in Marion County. Itinerant and Local split based on 2021 operations counts. The model results in an average annual growth rate of 2.9%.

This model was discarded due to its reliance on the ATC tower counts to establish the correlated relationship between population and operations. As previously discussed, the short and variable history of the tower count data are not an adequate dataset from which to establish relationships or project trends.

Federal Contract Tower TAF Non-Hub Models – The FAA TAF for non-hub airports with federal contract air traffic control towers provides a reasonable model for projecting annual aircraft operations at Aurora State Airport based on the model's focus on airports with similar facilities and operational characteristics. The TAF models for general aviation operations are primarily based on time-series analysis. The FAA notes that the average decrease in 2020 general aviation operations was significantly less than commercial operations or commercial enplaned passengers. Three models were developed for varying geographic levels (national, regional, and state). Based on the review of each model, the projection for Oregon contract towers was determined to be most applicable for further consideration (see below). The national and regional federal contract tower models, although producing similar growth rates, were discarded in favor of the FAA TAF Contract Tower State (Oregon) Model.

National Aerospace Forecast (Hours Flown) Model – This model applies the "Active General Aviation and Air Taxi Hours Flown" forecast 2021-2041 single growth rate to the Airport's baseline operation counts and projects out 20 years. Aircraft categories were combined into Local and Itinerant totals based on the splits from baseline. The model assumes that the Airport operations will mirror national trends. The model results in an average annual growth rate of 1.0%. This model was discarded since the individual aircraft categories presented in the FAA forecast are not detailed in ATCT activity counts used to develop the baseline aircraft operations total.

Northwest Mountain Region Federal Contract Tower TAF Model – This model applies the FAA's NW-Mountain Region Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline operations counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models but uses Northwest Mountain Region TAF forecast rates. The model results in an average annual growth rate of 0.5%. This model was discarded in favor of the similar and more locally based state TAF model.

National Federal Contract Tower TAF Model – This model applies the FAA's National Federal Contract Tower TAF forecast annual growth rates for aircraft classifications to the Airport's baseline operations counts (using the same classifications) over the 20-year period. The model uses the same assumptions as State TAF contract tower models but uses national TAF forecast rates. The model results in an average annual growth rate of 0.7%. This model was discarded in favor of the similar and more locally-based state TAF model.

National Aerospace Forecast (Hours Flown) Model – This model applies the "Active General Aviation and Air Taxi Hours Flown" forecast 2021-2041 single growth rate to the Airport's baseline operation counts and projects out 20 years. Aircraft categories were combined into Local and Itinerant totals based on the splits from baseline. The model assumes that the Airport operations will mirror national trends. The model results in an average annual growth rate of 1.0%. This model was discarded since the individual aircraft categories presented in the FAA forecast are not detailed in ATCT activity counts used to develop the baseline aircraft operations total.

Oregon Aviation Plan v6.0 Model – This model applies OAP v.6.0 operations growth rate to the Airport's baseline operations count and projects out 20 years. The linear projection assumes steady growth that does not change year-over-year during the 20-year forecast. The model results in an average annual growth rate of 0.9%. This model was discarded based on its reliance on historical TAF data and pre-COVID-19 activity assumptions in place when the forecast was created.

Appendix 9

Noise Contours Update

Noise Contours Update

Introduction

In support of the Airport Master Plan (AMP), a noise analysis of the airport environment was conducted to evaluate noise exposure due to aircraft operations at Aurora State Airport. Noise contours were developed for the base year (2021), and future 20-year (2041) activity levels based on the FAA-approved 2021-2041 AMP forecast. The 2021 analysis is based on the existing airfield configuration, and the 2041 analysis is based on the future airfield configuration depicted on the AMP Preliminary Preferred Alternative.

For airport noise exposure analysis, the cumulative noise energy exposure of neighboring people and property resulting from airport operations is quantified in terms of yearly day/night average sound level (DNL).[1] The DNL methodology is used in conjunction with the standard A-weighted decibel scale (dB) which is measured on a logarithmic scale, by which is meant that for each increase in sound energy level by a factor of 10, there is a designated increase of 1 dB. DNL has been adopted by the U.S. Environmental Protection Agency (EPA), the Department of Housing and Urban Development (HUD), and the Federal Aviation Administration (FAA) for use in evaluating noise impacts. DNL provides an estimation of annual average aircraft related noise for a particular location such as a runway, but also includes a penalty for night operations as noise at night considered more of a disturbance than noise during the day.

Federal Noise and Land Use Compatibility Criteria

Federal regulatory agencies have adopted standards and suggested guidelines relating DNL to compatible land uses. Most of the noise and land-use compatibility guidelines strongly support the concept that significant annoyance from aircraft noise levels does not occur outside a 65 dB DNL noise contour. This concept is supported by several federal agencies including the Environmental Protection Agency, Department of Housing and Urban Development, and the Federal Aviation Administration.

Title 14 of the Code of Federal Regulations (CFR) Part 150, Airport Noise Compatibility Planning provides guidance for land-use compatibility around airports. **Table 1** summarizes the federal guidelines for compatibility or non-compatibility of various land uses and noise exposure levels. Under federal guidelines, all land uses, including residential, are considered compatible with noise exposure levels of 65 dB DNL and lower. Generally, residential and some public uses are not compatible within the 65-70 dB DNL, and above. As noted in this table, some degree of noise level reduction (NLR) from outdoor to indoor environments may be required for specific land uses located within higher-level noise contours. Land uses such as commercial, manufacturing, some recreational uses, and agriculture are compatible within 65-70 dB DNL contours.

Residential development within the 65 DNL contour and above is not recommended and should be discouraged. Care should be taken by local land use authorities to avoid creating potential long-term land use incompatibilities in the vicinity of the airport by permitting new development of incompatible land uses such as residential subdivisions in areas of moderate or higher noise exposure.

1 14 Code of Federal Regulations (CFR) Part 150, Airport Noise Compatibility Planning

TABLE 1 - LAND USE COMPATIBILITY* WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

	Yearly day-night average sound level (DNL) in decibels					
Land Use	Below 65	65–70	70–75	75–80	80–85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general						
Utilities	Y	Y	25	30	N	N
Communication	Y	Y	Y(2)	Y(3)	Y(4)	N
Manufacturing and Production	Y	Y	25	30	N	N
Manufacturing, general						
Photographic and optical	Y	Y	Y(2)	Y(3)	Y(4)	N
Agriculture (except livestock) and forestry	Y	Y	25	30	N	N
Livestock farming and breeding	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Mining and fishing, resource production and extraction	Y	Y(6)	Y(7)	N	N	N
Recreational						
Outdoor sports arenas and spectator sports	Y	Y	Y	Y	Y	Y
Outdoor music shells, amphitheaters	Y	Y(5)	Y(5)	N	N	N
Nature exhibits and zoos	Y	N	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	N	N	N	N
Golf courses, riding stables and water recreation	Y	Y	Y	N	N	N

Numbers in parentheses refer to notes.
Source: Federal Aviation Regulations, Part 150, Airport Noise Compatibility Guidelines
*The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key to Table 1
SLUCM=Standard Land Use Coding Manual.
Y (Yes)=Land Use and related structures compatible without restrictions.
N (No)=Land Use and related structures are not compatible and should be prohibited.
NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes for Table 1
(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.
(5) Land use compatible provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25.
(7) Residential buildings require an NLR of 30.
(8) Residential buildings not permitted.

ADSB Data

Automatic Dependent Surveillance-Broadcast (ADSB) is an aviation monitoring technology which broadcasts in real-time an aircraft's position (latitude, longitude, and altitude) and other related flight data such as aircraft identifier, heading, speed, and squawk code. The broadcast enables an aircraft to be identified and tracked by other aircraft and air traffic control (ATC) to improve situational awareness and aid ATC in managing traffic.

With few exceptions – such as aircraft without engine-driven electrical systems - the technology is required to be installed in aircraft flying in the following airspace:

- Class A, B, and C airspace;
- Class E airspace at or above 10,000 feet MSL (mean sea level), excluding airspace at and below 2,500 feet AGL (above ground level);
- Within 30 nautical miles of a Class B primary airport (the Mode C veil);
- Above the ceiling and within the lateral boundaries of Class B or Class C airspace up to 10,000 feet (note that ADS-B is not required below a Class B or Class C airspace shelf, if it is outside of a Mode C veil);
- Class E airspace over the Gulf of Mexico, at and above 3,000 feet MSL, within 12 nm of the U.S. coast.

Aircraft without ADSB may operate in the areas described above, but pilots must receive prior approval from the ATC facility responsible for that airspace. Since Aurora State Airport airspace is classified as Class D when the control tower is in operation, and Class E when it is not, aircraft are not required to have ADSB to operate in Aurora State Airport airspace.

ADSB data were acquired from FlightAware.com for the period of January – October of 2021. They include all recorded aircraft positions within 5 nautical miles of the Airport at or below 3000 feet AGL. The data were used to aid in determining flight paths and estimating fleet mix splits.

Noise Modeling Methodology

Noise exposure to the surrounding environment was modeled using the FAA's current noise modeling software, AEDT (Aviation Environmental Design Tool), version 3G. AEDT models aircraft performance in space and time to estimate emissions, noise, and air quality consequences of aviation activity based on user-defined inputs including airport configuration, aircraft operation counts or estimates, fleet mix, and flight tracks. Only aircraft-generated noise exposure was evaluated in this study.

AIRPORT CONFIGURATION

Aviation-related noise at airports can be primarily attributed to aircraft takeoffs, landings, touch-and-go landings, and pre-takeoff engine run-ups. A touch-and-go is when an aircraft lands and immediately takes off without coming to a full stop. This procedure is often executed as an efficient method of practicing takeoffs and landings for flight training. Takeoffs, landings, and touch and go operations occur on runways or helicopter operation areas. Run-ups are a procedure where the pilot performs a series of final checks on the aircraft prior to takeoff with the engine running at increased throttle levels (typically 60%-70%). Run-ups are performed by piston-engine aircraft prior to departure, typically near the runway end.

Aurora State Airport, in its current configuration, has a single runway, 17/35. It has a paved asphalt surface 5,003 feet long and 100 feet wide oriented north and south. Runway 17 accounts for 26% of all arrivals and departures, and runway 36 accounts for 74%. The runway end locations from the current ALP were entered into AEDT to establish the existing runway used in the 2021 scenarios. There is a dedicated run-up apron on the south end of Taxiway A to accommodate run-ups by aircraft preparing to depart on Runway 35. There is no dedicated run-up area identified for aircraft departing on Runway 17. Instead, aircraft that intend to depart on Runway 17 complete run-ups at various locations on the airfield, including on the main apron and in adjacent hangar areas.

The Preliminary Preferred Alternative depicts a future runway extension of 497 feet on the 17 end, resulting in a future runway length of 5,500 feet. A new dedicated runup apron is proposed at the north end of Taxiway A to accommodate aircraft preparing to depart on Runway 17. The future runway end and runup locations from the preferred alternative were implemented into AEDT for use in the 2041 scenario.

While helicopters operate at the Airport, there are no designated helipad or operations areas on the airport, nor is a future facility proposed. Discussions with airport personnel and pilots familiar with the airport indicated that helicopters operate across the facility, but most commonly from the runway, Taxiway A, or adjacent through-the-fence (TTF) properties. However, there was little confidence in determining how many helicopter operations should be attributed to each of these areas. So, a single representative helipad was modeled at the current midpoint of Runway 17/35. This modeled helipad location was maintained for the 2021 and 2041 conditions. Helicopter activity attributed to neighboring helicopter facilities unrelated to Aurora State Airport were not included in the analysis.

AIRCRAFT OPERATIONS

Noise levels are dependent on the type and frequency of operations over a period, and the type of aircraft responsible for those operations. Annual operations estimates for the 2021 and the 2041 periods were developed as part of the Airport Master Plan. The Forecast Summary is presented in **Table 2**.

AIRCRAFT NOISE AND PERFORMANCE (ANP) PROFILES

AEDT uses Aircraft Noise and Performance (ANP) profiles to assign noise and performance details based on engine type, speed, climb rates, and other flight characteristics to groups of similar aircraft. For example, Cessna 172, Cessna 177, and Piper PA-22 are all represented by ANP CNA172. ANP profiles representing the current airport fleet were identified based on the based aircraft inventory, ADSB data, and Traffic Flow Management System Counts (TFMSC) records. A list of the selected ANP profiles and the aircraft they represent is included in **Table 3**.

TABLE 2 - MASTER PLAN FAA-APPROVED FORECAST SUMMARY

Forecast Summary	2021	2041
Based Aircraft		
Single Engine	220	146
Multi Engine	15	4
Jet	36	46
Helicopter	10	19
Total Based Aircraft	**281**	**215**
Aircraft Operations		
Itinerant		
Itinerant Air Taxi	2,006	2,214
Itinerant GA	36,390	39,544
Itinerant Military	79	79
Itinerant Total	38,475	41,838
Local		
Local GA	37,488	48,328
Local Military	65	65
Local Total	37,553	48,393
Total Operations	**76,028**	**90,230**
Aircraft Operations Fleet Mix		
Single Engine*	65,319	62,762
Multi Engine Piston	2,299	2,165
Turbo Prop	2,628	9,796
All Jets	5,022	14,378
Jets 12,500 lbs or Less	842	1,327
Jets 12,501 lbs and up to 60,000 lbs	4,088	12,739
Jets Greater than 60,000 lbs	92	312
Helicopter	760	1,130
Total Operations	**76,028**	**90,230**
Instrument Operations	**9,443**	**16,089**

TABLE 3 - ANP AIRCRAFT GROUPS

ANP	Representative Aircraft*
GASEPF	Beechcraft 23, Cessna 140, Cessna 150, Cessna 152, GC1 Globe Swift, Grumman AA-5B, Piper J-3, Piper PA-18, Piper PA-28, Stinson 108, Stinson Voyager, Vans RV-4
GASEPV	Beechcraft Bonanza, Cessna 180, Cessna 195, Cessna 210, Larkin Pitts Special, Mooney M20, Piper PA-24, Piper PA-32, Prisel-Ralph Skybolt, Raytheon A36, Ryan ST3KR, Vans RV-6, Vans RV-7, Vans RV-8, Vans RV-9, Vans RV-10
CNA172	Aeronca 7, Cessna 170, Cessna 172, Cessna 175, Cessna 177, Champion Citabria, Christen A-1, Piper PA-20, Piper PA-22
CNA182	Cessna 180, Cessna 182, Cessna 185
COMSEP	Cirrus SR20, Cirrus, SR22
BEC58P	Beechcraft 55, Beechcraft 58, Cessna 310, Piper PA-23, Piper PA-31, Piper PA-34
PA30	Diamond DA42, Diamond DA-62, Piper PA-30, Piper PA-44
CNA208	Beechcraft T-6, Cessna 208, Pilatus PC-12, EPIC LT/Dynasty, DeHavilland DHC-2, DeHavilland DHC-3, Socata TBM 700, Piper PA-46
DHC6	Raytheon King Air 90, Raytheon Beech 99, Raytheon Super King Air 200/300, DeHavilland DHC-6
CNA560E	Cessna 560 Encore, Hawker Beechjet 400
CNA525C	Cessna CitationJet CJ1, CJ2, CJ3, CJ4
CNA55B	Cessna 550 Citation II, Embraer Phenom 300, Embraer Legacy 500, Pilatus PC-24
CNA750	Cessna 750 Citation X, Raytheon Hawker 4000 Horizon, Dassault Falcon 2000
LEAR35	Learjet 31/35/36/40/45, Dassault Falcon 10/100, Hawker HS-125/ 800/900
CL600	Bombardier Challenger 300/350/600/601, Bombardier CRJ 100/200/400,
GIV	Gulfstream G300/G350/G400/G450, Dessault Falcon 8X
R22	Robinson R22, Guimbal Cabri G2*
EC130	Eurocopter EC-130, Eurocopter EC-135
B212	Bell 214
H500D	Hughes 500D, Schweizer S269D/330
CH47D**	Boeing CH-47D

Note: Above are examples of aircraft operating at UAO. Not a complete list.
* An ANP model for the Cabri G2 is not provided in AEDT 3G. R22 ANP was selected as a substitution as the aircraft are similar in size, have similar published noise levels, and are used primarily as trainers.
** Only operations by CH47D helicopters associated with UAO facilities are included in the analysis. Operations associated with neighboring facilities were not included.

After representative ANP groups were identified, a percentage of fleet for each ANP group was estimated using ADSB data, TFMSC records (turboprops and jets) and institutional knowledge provided by airport management. A summary of the annual operations by each ANP group for each study year is presented in **Table 4**.

TABLE 4 – OPERATIONS FLEET MIX

AC Class	Percent of Group	2021 Operations	2041 Operations
Total		**76,028**	**90,230**
Total Fixed Wing		**75,268**	**89,101**
Total SEP		**65,319**	**62,762**
CNA172	35%	22,862	21,967
GASEPF	25%	16,330	15,691
GASEPV	25%	16,330	15,691
CNA182	10%	6,532	6,276
COMSEP	5%	3,266	3,138
Total MEP		**2,299**	**2,165**
BEC58P	66%	1,517	1,429
PA30	34%	782	736
Total Turboprop		**2,628**	**9,796**
CNA208	50%	1,314	4,898
DHC6	50%	1,314	4,898
Total Jet		**5,022**	**14,378**
CNA560E	23%	1,155	3,307
CNA525C	36%	1,808	5,176
CNA55B	7%	352	1,006
CNA750	14%	703	2,013
LEAR35	9%	452	1,294
CL600	8%	402	1,150
GIV	3%	151	431
Total Helicopter		**760**	**1,130**
EC130	25%	190	283
B212	20%	152	226
R22	35%	266	396
H500D	15%	114	170
CH47D	5%	38	57

The annual operations estimate for each ANP group and study year was divided by 365 to calculate the average-annual daily operations. A 94%/6% day-night split identified in the airport master plan was applied to estimate day-time and night-time operations which were then assigned to the flight tracks described in the following section.

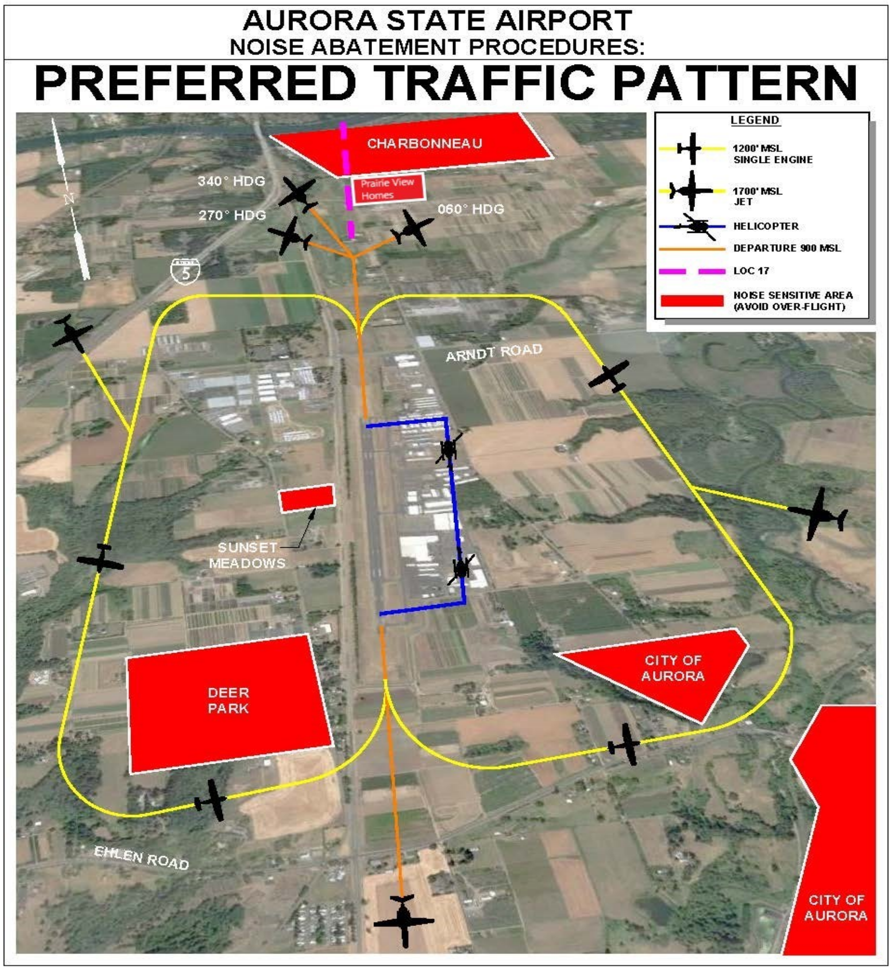
AIRCRAFT FLIGHT TRACKS

AEDT uses flight tracks to approximate the path over the ground that an aircraft flies to, from, or around an airport. The flight tracks do not account for the paths of every aircraft arrival and departure at the airport but are intended to represent the most commonly used flight paths taken to or from the airport. Flight tracks are categorized as one of three types: Arrival, Departure, or Touch and Go. Arrivals and departures are subclassified as either pattern, where the aircraft enters the airport's standard traffic pattern before landing or departing the area, or straight-in, where the aircraft fly directly to or from the runway or helipad without entering the pattern.

Noise Abatement Procedures

Aurora State Airport encourages pilots to follow flight tracks identified in published noise abatement procedures to minimize exposure of nearby noise sensitive residential areas to aircraft noise while ensuring safety of flight operations. While pilots are encouraged to follow these procedures whenever possible, they are not mandatory. Pilots are ultimately responsible for operating the aircraft in a safe manner based on the conditions at the time. They must also follow direction given by ATC. The procedures are illustrated and described in **Figure 1** below.

FIGURE 1 – AURORA STATE AIRPORT NOISE ABATEMENT PROCEDURES



Aurora State Airport
Noise Management Procedure

Pilots make the difference to an airport noise abatement program! By avoiding unnecessary residential Overflights and by flying as quietly as safety permits. Care should be taken to minimize the aircraft's noise profile whenever possible by utilizing noise abatement best practices at air-ports, especially during night-time and early-morning hours. Please help us maintain a "Good Neighbor" rela-tionship with the surrounding communities by following these recommended noise management practices.

"FLY NEIGHBORLY"

IF YOU CAN SAFELY MODIFY YOUR FLYING TO REDUCE NOISE IMPACT, PLEASE DO SO. HERE ARE SOME SUGGESTIONS:

- Fly the full pattern. Early turns and other shortcuts over nearby residential areas at low altitudes cause many of the Aurora noise complaints. If you fly the full pattern, you should avoid over flying the residential parks west of the airport.
- Use quiet power/prop settings when safely feasible
- **The calm-wind RWY 35**. Standard left hand traffic patterns are designated for both runways after UAO ATC hours (2000-0700hrs)
- **Avoid over flying Charbonneau, City of Aurora, and Deer Creek (see diagram).**

ARRIVAL:

⇒ Enter traffic pattern at 45° downwind.
⇒ Mid-Field crossing: Cross runway at 2200'MSL (2700" MSL Jets) maneuver to 45° entry

DEPARTURE:

⇒ RWY 35 **"Avoid Straight-Out Departures"**; Turn Left 270° HDG to NEWBERG2 or Turn Right 060° HDG to GLARA2; if must Straight-out 340° HDG (direct I-5)

⇒ RWY 17 Avoid turns that will fly-over City of Aurora; turn left or right three (3) miles from end of runway

NOT FOR NAVIGATION PURPOSE

Source: https://www.oregon.gov/aviation/airports/pages/airports/uao.aspx

2021 Flight Tracks

Fixed wing traffic at Aurora State Airport uses a standard left-hand traffic pattern at 1,000 feet above ground level (AGL). A review of the ADSB data suggests that the pattern differs from what is typical as well as what is described in the noise abatement procedures.

Due to regularly heavy traffic conditions, the pattern is longer than is typical and shifted toward the approach side of the pattern as pilots extend the downwind leg to allow others into the pattern and maintain safe distances from other aircraft. This occurs for both pattern approaches but is especially pronounced for the Runway 35 approach. The west side pattern (Runway 35 approach/Runway 17 departure) has shorter crosswind and base legs, resulting in a slightly compressed pattern compared to the east side pattern. This is likely due to pilots using I-5 as a visual cue to start the downwind turn. The pattern flight tracks are primarily used by aircraft operating under VFR, aircraft operating under IFR and utilizing a GPS circling approach, or aircraft doing touch-and-go landings.

Straight-in and straight-out tracks are aligned with the runway providing direct access to and from the runway while bypassing the local pattern. Each straight-in and straight-out track also includes east and west branches to account for traffic turning onto or out of the straight track.

Straight-in arrivals are primarily attributed to instrument flight rules (IFR) traffic approaching the airport using published approach procedures. Though, aircraft operating under visual flight rules (VFR) may also utilize a straight-in arrival track with clearance from ATC. Aurora State Airport has a localizer approach procedure to Runway 17, and RNAV GPS approaches to Runways 17 and 35.

Straight-out departures are not necessarily tied to IFR operations, but due to the heavy traffic conditions in the pattern, all IFR traffic and 90% of departing VRF traffic (not including touch-and-goes) are estimated to depart via a straight-out track from the runway. The Airport has three published RNAV GPS departure procedures: GLARA TWO, GNNET TWO, and NEWBERG TWO. Each of the procedures are described below.

GLARA TWO

Runway 17: Climb heading 172° to 1000, then climbing left turn direct GLARA. Thence, continue climb in GLARA holding pattern to cross GLARA at or above 4000 before proceeding on course.

Runway 35: Climb heading 352° to 700, then climbing right turn direct GLARA. Thence, continue climb in GLARA holding pattern to cross GLARA at or above 4000 before proceeding on course.

GNNET TWO

Runway 17: Climb heading 172° to 1000, then climbing right turn direct GNNET. Thence, continue climb in GNNET holding pattern to cross GNNET at or above 5000 before proceeding on course.

Runway 35: Climb heading 352° to 700, then climbing left turn direct GNNET. Thence, continue climb in GNNET holding pattern to cross GNNET at or above 5000 before proceeding on course.

NEWBERG TWO

Runway 17: Climb heading 172° to 1000, then climbing right turn direct UBG VOR/DM. Thence, continue climb in UBG VOR/DM holding pattern to cross UBG VOR/DM at or above 4000 before proceeding on course.

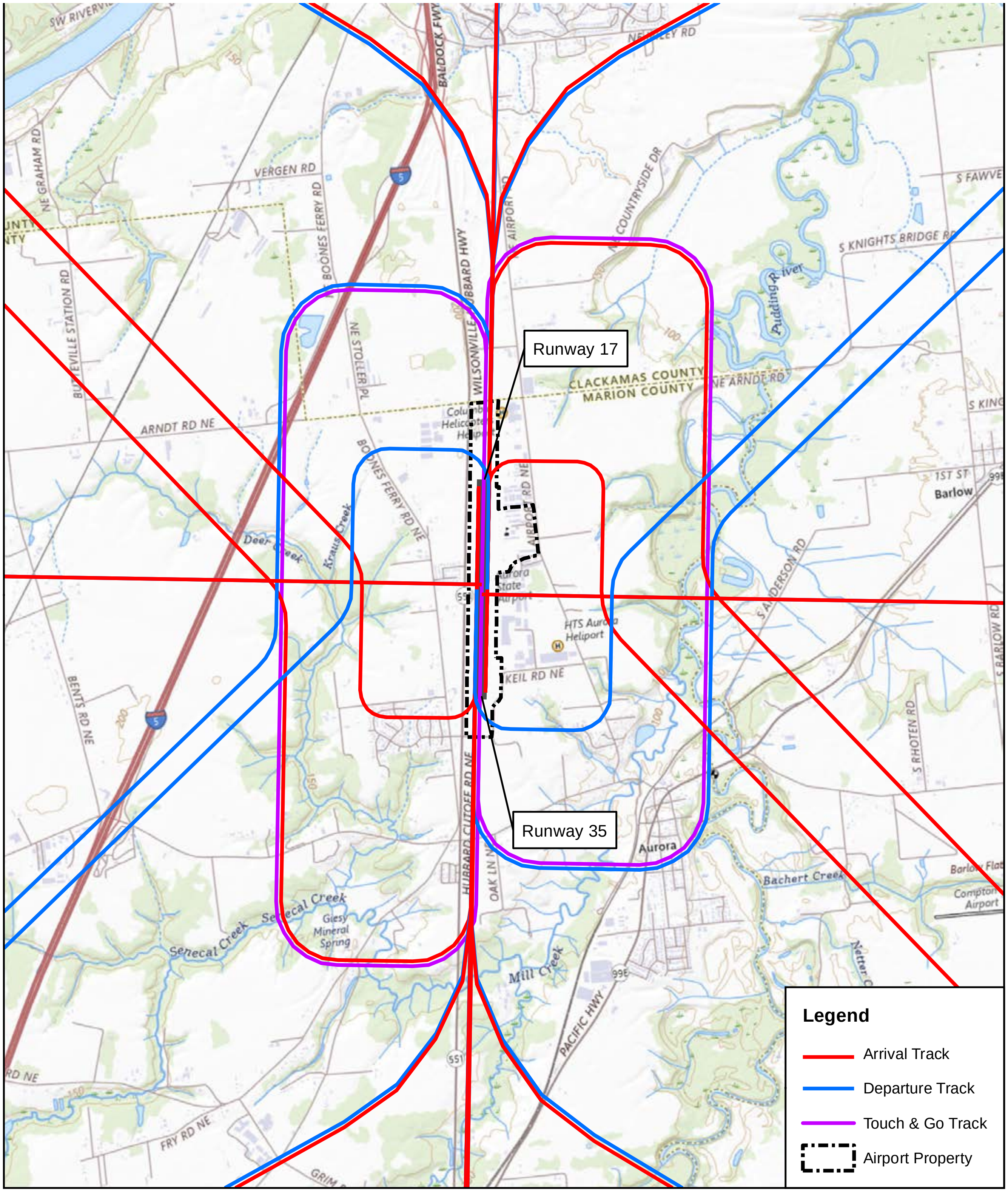
Runway 35: Climb heading 172° to 700, then climbing left turn direct UBG VOR/DM. Thence, continue climb in UBG VOR/DM holding pattern to cross UBG VOR/DM at or above 4000 before proceeding on course.

Touch and go flight tracks are used by pilots when performing touch and go landings. After the touch and go, the aircraft remains in the traffic pattern to fly the circuit and repeat the procedure. Based on the fleet mix, traffic conditions, and discussions with ATC personnel, it is assumed that nearly all touch and go operations at Aurora State Airport are attributed to single-engine piston and multi-engine piston aircraft.

Helicopters account for approximately 1% of the total airport operations and many helicopters are not equipped with ADSB equipment as they operate outside of airspace where it is required. As a result, representative helicopter flight tracks could not be derived from the ADSB data. Instead, the tracks were defined based on input from helicopter operators and airport personnel, and then compared to the available ADSB data as a check.

Based on the input received, helicopters operate using a left-hand traffic pattern at 500 feet above ground level (AGL). In order to separate helicopter activity from fixed-wing, the pattern is smaller in size with the downwind legs located 0.5 nautical miles from the runway. Many helicopters do not enter the pattern on arrival or departure, but instead fly directly to or from a location on the airport. Straight-in and straight-out arrival and departure tracks oriented in each cardinal direction are included to account for these operations.

The 2021 flight tracks described above are illustrated in **Figure 2**.



Note: Track lines are depicted as offset to improve visibility

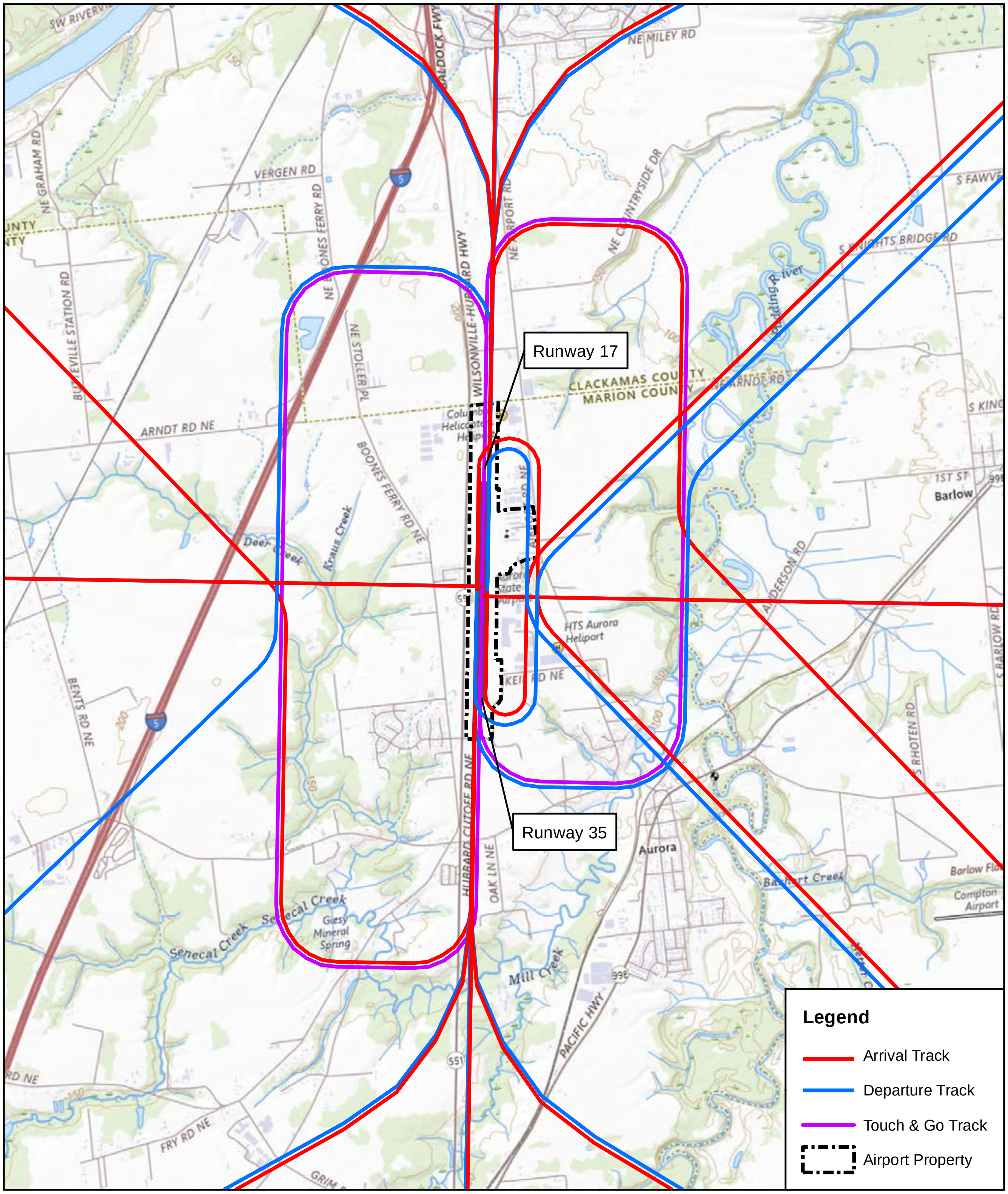
Figure 2	Aurora State Airport Flight Tracks - 2021	CENTURY WEST ENGINEERING

2041 Flight Tracks

The 2041 flight tracks are largely similar to the 2021 flight tracks, however adjustments were made to account for the proposed runway extension on Runway 17. Additionally, it is assumed that with further future coordination with ATC, operators, and neighbors regarding the published noise abatement procedures will result in a higher level of participation. As such, the 2041 tracks were adjusted to better reflect the procedures. The primary adjustments are listed below:

1. All tracks associated with Runway 17 end were shifted 497 feet north to match the proposed runway extension.
2. The crosswind leg of the Runway 17 departure track and the associated touch-and-go track were shifted approximately 0.3 nautical miles north to route departing aircraft away from the City of Aurora and through the undeveloped green space along Ehlen Road as described in the noise abatement procedures.
3. The west helicopter pattern is moved to the east side of the runway as described in the noise abatement procedures. This results in helicopters operating on Runway 35 employing a right-hand pattern while those operating on Runway 17 continue to employ a left-hand pattern.

The 2041 flight tracks are illustrated in **Figure 3**.



Note: Track lines are depicted as offset to improve visibility

Figure 3	Aurora State Airport Flight Tracks - 2041

DNL Contours

The above-described inputs were incorporated into the AEDT model for each scenario and DNL contours were generated at 5 dB intervals between 65 DB DNL and 80 DB DNL. The resulting noise exposure contours for each period were overlaid on the current Marion and Clackamas County Zoning to assess which land uses are impacted by airport-related noise and to what extent they are impacted. The DNL contours are described below and presented in **Figures 4 and 5**.

2021 DNL CONTOURS

The 2021 DNL contours are shown in **Figure 4**. The 65 dB DNL contour extends approximately 1,000 feet on either side of the of the runway. The north and south extents of the contour remain north of the south airport property line, but extends off property on the east and west sides. The contours are enlarged at each runway end due to the increase in noise generated during the initial application of power for takeoff and for the slower movement of the aircraft at the beginning of the takeoff roll. Run-up operations by piston engine aircraft on the run-up apron and the low altitude of aircraft during final approach and landing also contribute to concentrated areas of noise near the runway ends. Zoning districts impacted by the 65 DB DNL contour include P, EFU, and AR.

A continuous area of 70 DB DNL contours extend along the length of the runway and beyond the runway ends. This area is largely contained on the airport property, however it extends beyond the property boundary on either side of the runway and near the run-up apron. Zoning districts impacted by the 70 DB DNL contour include P, EFU, and AR.

A smaller continuous area of 75 DB DNL contour surrounds the runway and run-up apron in a similar manner to the 70 DB DNL. Nearly all of the 75 DB DNL contour is contained within the airport boundary with the exceptions of two small areas near runway end 17 and the associated run-up apron. Impacted zoning districts include P, and EFU.

Three small areas of 80 DB DNL contours are present near the runway ends and at the center of the runway where a helipad was (virtually) located in order to model the helicopter noise associated with the Airport. Nearly all of the 80 DB DNL contour area is contained on airport property with the exception of a small area (< 1 acre) east of the run-up apron. Impacted zoning districts include P and EFU.

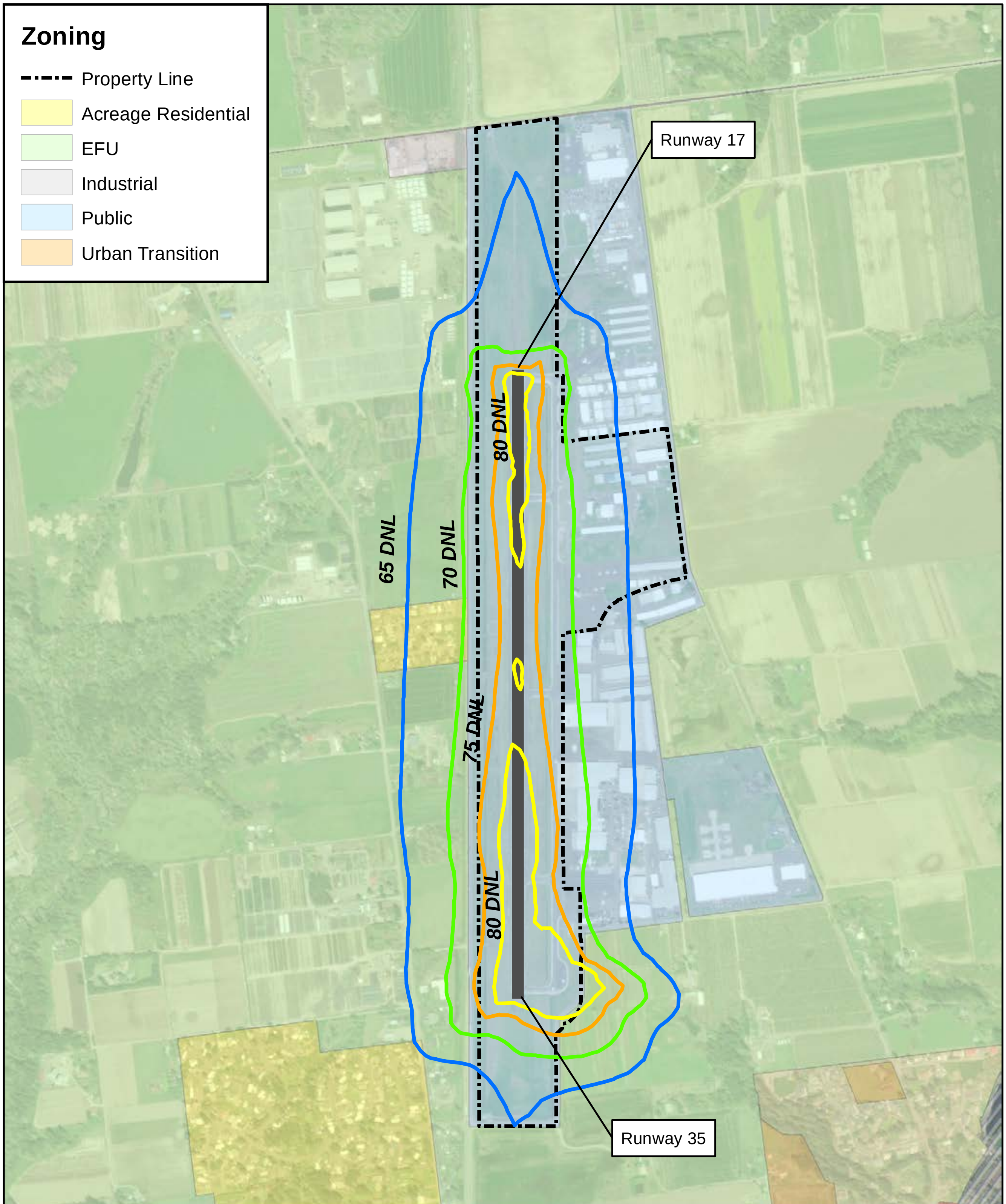


Figure 4	Aurora State Airport Noise Impacted (65+ DNL) Zoning - 2021

2041 DNL CONTOURS

The 2041 DNL contours are shown in **Figure 5**. The 2041 contours have a largely similar shape to the 2021 contours and impact the many of the same zoning districts. There is a lengthening of the southernmost tip of the contour which extends approximately 600 feet south of the existing airport property line due to the forecasted increase in operations. A similar lengthening is observed on the north end again due to the projected increase in operations as well as the proposed 497-foot extension. The addition of a run-up apron at the north end of Taxiway A results in an enlargement of the contours in that area similar to the south end.

The total increase in area contained in the 65 dB DNL contour is 52.8 acres or approximately a 20% increase over the 2021 scenario, driven primarily by the extension of the runway. Similar to the 2021 contours nearly all of the 80 and 80 dB DNL contours are located on the existing airport property, with only small areas of the 80 dB DNL contour extending off the property on the south.

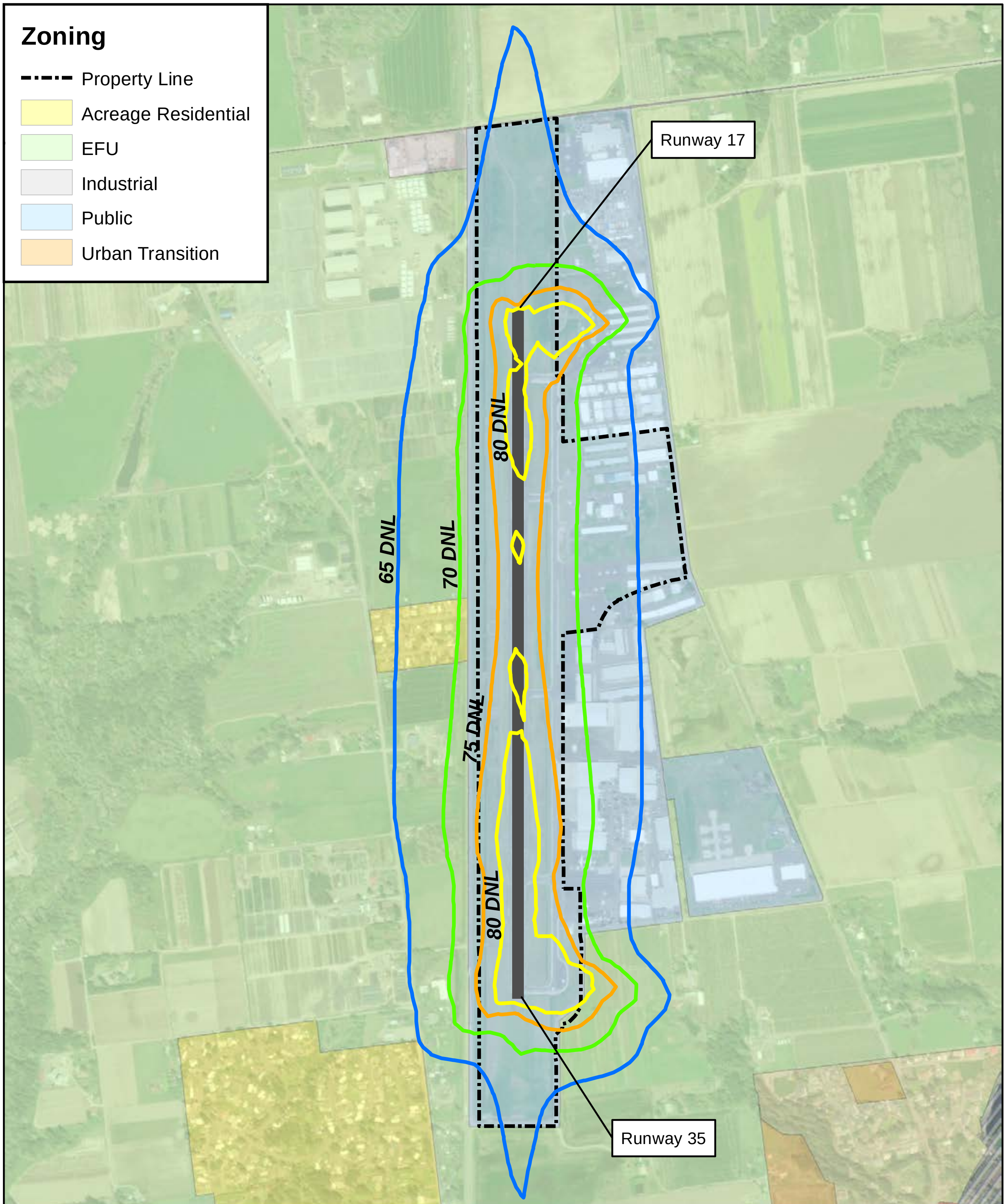


Figure 5

Aurora State Airport
Noise Impacted (65+ DNL) Zoning - 2041

CENTURY WEST ENGINEERING

Airport and Vicinity Land Use Evaluation

The existing airport property totals 140 acres and is entirely characterized by a single land use designation type, Public (P). Also in the immediate vicinity of the Airport are Acreage Residential (AR), Exclusive Farm Use (EFU), Industrial (I), and Urban Transition (UT).

Based on updated noise modeling, three of the above land use designation types were identified as impacted by the 65 dB DNL contour or greater in the two study year scenarios. Those impacted are listed and described below.

Public Designation (P)

The existing airport property is zoned as Public (P) as defined in Marion County Code 17.171. The intent of the P zone is "to provide regulations governing the development of lands appropriate for specific public and semi-public uses and to ensure their compatibility with adjacent uses." Airports are regulated by Chapter 17.171, Section 030 - Conditional Uses, which states that "Airport and airport related commercial and industrial uses" are authorized under the procedure provided for conditional uses and are permitted in the P zone. This zone includes the existing airport property, TTF properties, and adjacent helicopter facilities.

Acreage Residential Designation (AR)

The AR zone (Marion County Code 17.128) facilitates the division and development of property suitable for development of acreage homesites. Allowed uses include single-family dwellings, agricultural development, planned developments, public parks and recreation facilities, religious organization use (less than 20,000 square feet in area), or replacement of an existing lawfully established dwelling.

Exclusive Farm Use Designation (EFU)

Marion and Clackamas Counties both have EFU zoning which are impacted in the 2041 scenario. The designations are described similarly in each of the respective County Code (Marion County Code 17.136, Clackamas County Code Section 401). The intent of the EFU zone to provide and preserve the continued practice of commercial agriculture. It is intended to be applied in areas composed of tracts that are predominantly high value farm soils. EFU zone generally prohibits the construction, use, or design of buildings and structures except for facilities used in agricultural or forestry operations, replacing or restoring a lawfully established dwellings, supporting exploration of geothermal or mineral resources, or supporting agri-tourism destinations and events. EFU zone also permits the construction of public roads, establishment or enhancement of wetlands, and the operation of composting facilities.

A detailed breakdown of all land uses impacted by airport noise in each of the time periods analyzed is presented in **Table 5**.

TABLE 5 - NOISE EXPOSURE AND LAND USE SUMMARY

	DNL (dB)	Impacted Land Use (Acres) Public (P)	Acreage Residential (AR)	Exclusive Farm Use (EFU)	Total
2021	65-70	69.7	5.5	59.2	**134.4**
	70-75	54.5	0.4	14.8	**69.7**
	75-80	36.9	0	2.4	**39.3**
	>80	22.8	0	0.9	**23.7**
	Total	**183.9**	**5.9**	**77.3**	**267.1**
2041	65-70	83.4	5.9	74.3	**163.6**
	70-75	62.6	0.9	17.1	**80.6**
	75-80	45.5	0	2	**47.5**
	>80	27.9	0	0.3	**28.2**
	Total	**219.4**	**6.8**	**93.7**	**319.9**

The implementation of the preferred alternative may prompt changes in zoning districts for the properties involved. For the realignment of Hubbard Highway, the right-of-way would be relocated within an existing Residential Zone, changes to the zoning may be needed to accommodate the highway use. The proposed property acquisition to relocate Keil Road outside of the runway object free area (ROFA) may result in 7.8 acres of EFU zone being rezoned to P zone, of which 5.9 acres are within the 65 dB DNL contour.

Appendix 10

Solid Waste & Recycling Plan

Appendix 10
Solid Waste and Recycling Plan

Introduction

This memorandum discusses solid waste generation at the Aurora State Airport, and the recycling options available. The memorandum follows Federal Aviation Administration (FAA) guidance established in 2014 for preparing airport recycling and solid waste management plans as an element of airport master plan updates. The FAA guidance was in response to Section 133 of the **FAA Modernization and Reform Act of 2012[1]:**

> *"SEC. 133. RECYCLING PLANS FOR AIRPORTS. Section 47106(a) is amended— ... (6) if the project is for an airport that has an airport master plan, the master plan addresses issues relating to solid waste recycling at the airport, including—*
>
> *(A) the feasibility of solid waste recycling at the airport;*
>
> *(B) minimizing the generation of solid waste at the airport;*
>
> *(C) operation and maintenance requirements;*
>
> *(D) the review of waste management contracts; and*
>
> *(E) the potential for cost savings or the generation of revenue."*

This memorandum is organized around the following sections:

- Waste Audit;
- Local Recycling Management and Programs;
- Recycling Feasibility;
- Plan to Minimize Solid Waste Generation;
- Operational and Maintenance Requirements;
- Waste Management Contracts;
- Potential for Cost Savings or Revenue Generation; and
- Future Development and Recommendations.

Waste Audit

AIRPORT SOLID WASTE AND RECYCLING

This section provides a summary of the solid waste generated at the Aurora State Airport and recycling practices in anticipation of identifying any opportunities for reducing waste at the Airport.

No state or federal requirements apply to the waste generated at the Airport. Airport tenants are responsible for the disposal of their own waste and any hazardous materials, as agreed upon in their leases with the state of Oregon through the Oregon Department of Aviation.

Tenants and the users of the Aurora State Airport create a limited amount of waste on site. Specific sources of on-site waste include aircraft storage hangars, aircraft maintenance hangars, general terminal/FBO building, aircraft fueling area, and the aircraft parking apron. Private hangars and buildings can create a variety of waste, depending on the function of the building. Common items may include household/office types of trash, used oil, and aircraft parts.

1 112th Congress, Report 112-381, Conference Report H.R. 658 (February 1, 2012)

Republic Services provides solid waste and recycling services for both residential and business purposes, including the Aurora State Airport. Republic Services is the contracted solid waste provider for the Airport. They offer a full range of recycling and waste services, including on-site pick-up and recycling drop-off options. These services extend to all airport users, including "through-the-fence" (TTF) users.

EXISTING SOLID WASTE FACILITIES

Marion County has five solid waste sites with Oregon Department of Environmental Quality (DEQ) permits. These facilities are not located in the City of Aurora but are located in Marion County. These facilities include many different types of stations, which are summarized in **Table 1**. Brown's Island Demolition Landfill is an active landfill located in Marion County.

TABLE 1: SOLID WASTE FACILITIES – MARION COUNTY

DEQ Permit	Facility Name	Location	Distance from UAO	Type
#399	Brown's Island Demolition Landfill	2895 Faragate Street S, Salem	33 mi	Demolition
#1421	Brown's Island Compost Facility	2895 Faragate Street S, Salem	33 mi	Registration
#1731	Argi-Plas	5016 Waconda Road NE, Brooks	17 mi	Transfer
#1618	American Gypsum Recycling	12451 Duck Flat Road SE, Turner	41 mi	Transfer/Material Recovery
#1510	Annen Bros. Composting	14358 Dominic Road, Mt. Angel	16 mi	Registration
--	K B Recycling Inc	1600 4th Avenue, Canby	7 mi	Recycling
--	Republic Services - Woodburn	2215 N Front Street, Woodburn	9 mi	Transfer
--	North Marion Recycling & Transfer Station	17827 Whitney Lane NE, Woodburn	10 mi	Transfer/Recycling
--	Salem-Keizer Recycling & Transfer Station	3250 Deer Park Drive SE, Salem	31 mi	Transfer/Recycling
--	Household Hazardous Waste Facility	3250 Deer Park Drive SE, Salem	31 mi	Hazardous Waste

WASTE DISPOSAL

Republic Services provides solid waste collection, disposal services, and recycling in Aurora through an agreement with the City of Aurora. Republic Services provides scheduled solid waste collection services at the Airport through individual service agreements. The Airport contracts with Republic Services to transfer the solid waste to the Republic Services Transfer Station in Woodburn, OR, and or other local landfills or transfer stations that take specific items.

Based on the availability of local resources, airport tenants have three options available for managing their solid waste generation:

1. On-Site Collection – direct contract with Republic Services
   - » Flexible for the business's specific needs
2. Transfer Station – self-haul (solid waste)
   - » Republic Services of Woodburn accepts self-hauled recycling. The facility is 9 miles from the airport and is open Monday through Friday (8 am to 5 pm) and Saturday (8 am to 12 pm). Trash can only be transferred by a hauler at this location.

3. Transfer Station – haulers only (solid waste)
   » Republic Services of Woodburn is largely a recycling site, whereas the Republic Services station of Wilsonville accepts trash only through the organization's haulers.

Although the Airport is in Republic Services, service area, tenants are not limited to their services. Other transfer stations near the Airport are Argi-Plas (self-haul), located 17 miles from the Airport. The facility is open Monday through Sunday (7AM to 4:30PM). Argi-Plas accepts specific solid waste items such as plastics, containers, buckets, pots, etc. Another transfer station, American Gypsum Recycling (haulers only), located 41 miles from the Airport. The facility is open Monday through Friday (7AM to 4PM). Other times at this site or available by appointment.

It is important to note that Coffin Butte Landfill, located in Corvallis, OR, is owned and operated by Republic Services. Republic Services provides collection services for waste and specific hazardous materials for a hauling and delivery fee.

It is assumed that some airport tenants may combine their limited airport-generated solid waste with existing commercial or residential collection service, within the limits of their service agreements.

The local recycling collection facility is located 7 miles from the Airport on 1600 4th Avenue, in Canby.

CONSTRUCTION WASTE

Construction waste is the responsibility of the contractor for each specific project at the Airport. At the Aurora State Airport, several projects included in the 20-year capital improvement program provide potential opportunities for recycling:

- East Apron Rehabilitation (grind, overlay, reconstruction);
- Runway Rehabilitations;
- Replacement of existing electrical systems (wiring, components for runway lights, PAPI, REIL, beacon);
- Access Taxilanes Rehabilitation (grind, overlay, reconstruction.
- Parallel Taxiway & Exit Taxiways Rehabilitation (grind, overlay, reconstruction); and
- Hangar demolitions (at end of lease/useful life).

Local Recycling Management and Programs

Republic Services provides recycling services at the Aurora State Airport and throughout the community. Services include curbside pickup and the operation of a waste drop-off to its own transfer station in Woodburn. These services and the provisions for collecting hazardous waste, fuel, and paint are described listed in **Table 3**. The state of Oregon provides regulatory guidance for recycling management and solid waste programs that apply within the City of Aurora and Marion County.

State of Oregon

In 1983, the Recycling Opportunity Act was the first law in the U.S. to require that people statewide be provided with an opportunity to recycle. This statute established solid waste management policies for waste prevention, reuse and recycling. In order to conserve energy and natural resources the statute uses a solid waste management hierarchy:

- Reduce the amount of waste generated;
- Reuse materials for their original intended use;
- Recycle what can't be reused;
- Compost what can be reused or recycled;
- Recover energy from what cannot be reused, recycled, or composted;
- Dispose of residual materials safely.

The **Recycling Opportunity Act** also required that:

- Wasteshed counties, except for the City of Milton-Freewater and the greater Portland Tri-County Area known as the Metro Wasteshed, to have recycling depots; and
- Cities with populations over 4,000 to provide monthly curbside recycling collection service to all garbage service customers.

Note: The City of Aurora 2023 population was 1,118.

The 1991 **Oregon Recycling Act** (Senate Bill 66) strengthened the state's recycling requirements and created a recovery goal of 50% by the year 2000. This statute also established a household hazardous waste program; required recycled content in glass containers, directories, and newsprint publications; established requirements for recycling rigid plastic containers to promote market development; and required the Department of Environmental Quality (DEQ) to calculate annual recovery rates and develop a solid waste management plan. In 2005, House Bill 3744 established a wasteshed goal and extended Oregon's statewide recovery goals of 45% in 2005 and 50% in 2009.

The state did not meet the 50% goal by 2000, which extended into the recovery goals of 45% in 2005 and 50% in 2009. Post 2005, the state exceeded the goal by 4.1% (49.1%). The state was able to meet its goals for 2009 as well. To continue the trend, the State of Oregon DEQ has adopted a 2050 vision and framework for action to ensure locals are producing and using materials responsibly.

Recycling Feasibility

Table 2 lists the recyclable materials accepted at these facilities.[2]

TABLE 2: MARION COUNTY RECYCLABLE ITEMS

Accepted Items (Republic Services) – Contracted		
- Flattened cardboard	- Magazines	- Food and beverage cans
- Newspaper	- Office paper	- Food and liquid containers with lids on
	- Common mail	
Accepted Items (American Gypsum Recycling)		
- Cardboard	- Newspaper	- Food and beverage cans
- Paper bags	- Magazines	- Steel cans
- Tissue paper	- Phone directory	- Plastic tubes and bottles
- Non-metalized gift wrap	- Books	- Nursery packaging
- Office paper		
Accepted Items (K B Recycling Inc)		
- Empty aerosol cans	- Coated wire	- Microwave ovens
- Appliances	- Computer, monitors, electronics, television	- Drums
- Cardboard	- Glass jars and bottles	- String lights
- Cell phones	- Magazines, phonebooks, newspaper	- Tin cans

2 Recycling Guidelines Recycling Simplified: Recycle Smarter with Republic Services

TABLE 3: HOUSEHOLD HAZARDOUS WASTE FACILITY (HAZARDOUS MATERIALS)

Accepted Items		
- Antifreeze	- Solvents	- Wood preservatives
- Pesticides	- Spot remover	- Rust remover
- Weed killer	- Turpentine	- Degreasers/Solvents
- Herbicides	- Mercury	- Engine Cleaners
- Fuels	- Paint thinner	- Paint – up to 10 gallons per visit
- Pool chemicals		

Plan to Minimize Solid Waste Generation

The solid waste contractor (Republic Services) utilizes current Marion County Solid Waste programs and facilities that encourage recycling. Airport tenants are encouraged to obtain information at the Republic Services website https://www.republicservices.com/.

METHODS TO REDUCE SOLID WASTE

There are limited opportunities to reduce solid waste generation at the Airport since little waste is produced, and there are no on-site recycling services available. However, ODAV should still establish a goal to reduce the amount of solid waste generated at the Airport.

While ODAV is not responsible for waste generated by airport tenants, informational brochures on recycling opportunities could be distributed to all the airport tenants to encourage them to recycle their waste at existing county facilities. Local efforts to expand recycling opportunities by providing additional common collection bins may increase the percentage of recycled materials and reduce the county's overall waste stream.

Opportunities to reduce airport-related construction waste also exist, including the reuse of old asphalt or base materials during pavement rehabilitation or reconstruction projects and the recycling of electrical components and salvaged building materials.

Operational and Maintenance Requirements

Airfield operational and maintenance requirements are minimal. ODAV is responsible for mowing the airfield and the clippings are left in place. Airport users are responsible for activities within their leased areas.

Waste Management Contracts

The standard ODAV commercial and non-commercial site leases require tenants to maintain their facilities and control waste at their expense. The leases do not contain specific language that addresses on-site solid waste or recycling requirements. Although tenants are responsible for their own waste from the hangar, the leases do not establish tenant recycling requirements. Some leases include language requiring tenant payment for refuse collection under utilities:

Example: 5.4 UTILITIES. Tenant shall pay when due all charges for electricity, natural gas, water, sewage, telephone, refuse collection, and other services or utilities used by Lessee on or in connection with the Premises.

Potential for Cost Savings or Revenue Generation

The potential for cost savings is limited since individual tenants are responsible for costs associated with solid waste disposal and recycling. Revenue generation is also limited due to the small amount of waste generated. Any potential for additional revenue would accrue to the individual tenants since they contract with the waste disposal and recycling provider.

Future Development and Recommendations

FUTURE DEVELOPMENT

Future development projects at the Airport include tenant improvements, landside and airside facility development, and rehabilitation projects. The demolition and waste associated with each of these projects would be the responsibility of the contractor performing the work. ODAV requires all demolition waste to be removed from the Airport, unless it is recycled on-site for a future project.

Opportunities to recycle airfield construction waste (old asphalt pavement) through grinding and compaction for use on new or replacement airfield surfaces and service roads may also be considered. Recycling of obsolete electrical components during construction may also exist.

A periodic review of the Airport's solid waste policies should be considered to address future development needs.

RECOMMENDATIONS

Immediate

Monitor all applicable DEQ regulations to ensure compliance.

Short-Term

The Airport should consider adding on site recycling collection bin(s).

Ongoing

Encourage airport tenants and users to utilize the available trash collection and recycling services.

Modifications to Specifications

None recommended.