Ogden - Hinckley Airport
Master Plan Update (DRAFT)

Ogden City, Utah

February, 2020



ADG

Final Draft

Ogden-Hinckley Airport Master Plan

March 2020

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in association with
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The preparation of this document was supported in part with financial assistance through the Airport Improvement Program from the Federal Aviation Administration (AIP Grant Number 3-42-0024-047-2017) as provided under Title 49 USC § 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein, nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

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INTRODUCTION

In August 2018, Ogden City accepted a grant from the Federal Aviation Administration (FAA) to conduct an airport master plan study[1] for the Ogden-Hinckley Airport (OGD or Airport). The grant covered 90.63% of the project with the balance funded by Ogden City as the airport sponsor/owner.

With a growing airport community, the City recognized the importance of planning to guide the near- to long-term development process. Further, a number of other factors prompted the need for a planning study: the aviation industry has changed, emerging trends continue to reshape the role of airports, new FAA design standards have been published, the characteristics of activity have changed and new opportunities for continued economic growth in the community and region have arisen.

The Airport is a vital community asset and an important facility in the national, state and regional air transportation systems. The Airport's facilities are accommodating a multitude of users such as small/private aircraft owners, corporate/business aviation, non-scheduled air cargo operators, military, air taxi, and commercial passenger service. The City envisions that OGD will continue serving this broad range of aviation users which have some common as well as some varying needs.

To ensure the master plan and future development at OGD complies with FAA standards, this study follows FAA guidance outlined in FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans,* and FAA AC 150/5300-13A, *Airport Design*. FAA design standards have changed since OGD's last master planning study, so proposed future development incorporates the new standards.

PURPOSE OF MASTER PLAN

The Ogden-Hinckley Airport Master Plan represents the City's strategy for future development at OGD that accommodates aviation demand in a safe and effective manner, maximizes use of property in the best interest of users in the community and air transportation system, and complies with FAA design standards.

The last comprehensive master planning study for OGD was completed 26 years ago in 1994. An abbreviated planning study was completed in 2008 to update near-term to long-term development plans. However, OGD has seen changes in general aviation[2] activity, increased jet traffic, passenger air service development, growing fixed base operator (FBO) services, a recent business aviation focus on large

[1] In addition to the study documented in this report, the grant-funded project included an Airports Geographic Information System (AGIS) survey and mapping.

[2] General aviation (GA) activity is all aviation other than scheduled commercial airline and military aviation

aircraft maintenance, repair and overhaul (MRO) operations, new FAA design standards and other guidance, and economic and community changes—all signifying the need for a comprehensive master planning update study.

STUDY GOALS

During the study design process, several goals for the Airport Master Plan were identified and integrated into the study elements:

- *Accommodate aviation demand*
- *Enhance safety and security of operations*
- *Preserve/protect facility investment and long-term development opportunities*
- *Identify future development priorities and funding needs*
- *Support economic growth*
- *Foster public education and participation through community outreach*

The 2017 Ogden City General Plan also lists goals for OGD, which were derived from the 1994 Airport Master Plan:

a. *Accommodate both General Aviation and Commercial Service;*
b. *Improve, promote and expand use of the facility;*
c. *Protect the integrity and safety of the airport and surrounding land uses;*
d. *Maintain and expand airport funding sources; and*
e. *Retain ownership of the airport site, allowing for the development of those types of uses associated with the maintenance, repair, storage and use of aircraft.*

AIRPORT ISSUES

The early identification of airport issues is essential to building the framework for a successful airport master planning study. A survey questionnaire is one tool used to help identify airport issues. Early in the study an online user survey was published for OGD users with a weblink to the survey distributed via email to OGD tenants. Postcards with the survey web address were also mailed to a select number of area aircraft owners[3] inviting them to participate in the online survey. To increase the response rate, paper copies were made available at OGD and mailed to area airports and the survey web address was posted in the project newsletter on the City's webpage for airport documents. By early 2019, a total of 115

[3] Aircraft owner information pulled from FAA aircraft registry

surveys were collected from pilots/airport users of which 87% base one or more aircraft at OGD. Reasons for basing at OGD included:

- Convenient location (81 respondents)
- Airfield/Navigational Aids (27 respondents)
- Availability of Hangar or Tiedown (41 respondents)
- Other (29 respondents) including reference to fuel prices, good training environment (weather, tower, airspace, broad user and aircraft fleet mix), hangar cost, great growth opportunity, winter airfield maintenance, FBOs and aircraft maintenance capability, active pilot community.

Some survey respondents' aircraft are based at other Utah airports such as Salt Lake City International, Logan-Cache, Skypark in Bountiful, Heber City, and Brigham City. Pilots with aircraft based outside of Utah indicated locations including Northern California, New Mexico, Texas, and Michigan. The survey also asked pilots about their aircraft type based at or flown into OGD with responses including single- and multi-engine piston, turboprops, helicopters, jets, and others.

Frequency of operations conducted at OGD by survey respondents varied with responses of daily, weekly, monthly or less. When questioned about whether their primary use of OGD is for business or personal, 27% indicated business and 73% noted personal.

The survey also inquired about OGD facilities with a broad range of improvements recommended by pilots. Compiled responses include:

- **Hangars** - remove old unsafe hangars and redevelop, build additional GA hangars, add large (professional) aircraft hangars, shade hangars,
- **Aircraft Parking** - additional tiedowns, ramp space for medium to large business aircraft
- **Land Use/Function** - use of undeveloped areas, separate airline (and stricter security requirements) from general aviation users by placing terminal on other side of airfield
- **Airfield** - crosswind runway grass landing strip/dirt strip
- **Pavement** - repair/maintain ramp and taxiway pavement to minimize FOD[4]
- **Airport access** - repair/maintain roadway pavement, improve gate access system to reduce waiting during peak periods
- **Other facilities and services** - wash rack, compass rose, more amenities (car rental, restaurants, other services), enhanced access to aircraft maintenance/ avionics for more aircraft types (turbine, jet), high-speed internet access, make trash bins more accessible, raise the drains, 24/7 restroom, improvements with general aviation customer service in mind

[4] FOD, or Foreign Object Debris, is any object, live or not, located in an inappropriate location in the airport environment that has the capacity to injure airport or air carrier personnel and damage aircraft, according to the FAA's definition.

- **Activity** - attract other general aviation users including business jets, service centers, firefighting activity and target business aviation users who want to leave SLC or are being pushed out

A total of 15 users stated that facility improvements at OGD are needed in order to grow their business. This is consistent with the findings of the 2004 Utah Economic Impact Study,[5] which surveyed 3,000 businesses and revealed the presence of an airport as an important factor in choosing a business location. A commercial service airport ranked as #8 in importance and a general aviation airport ranked as #14.

In addition to user survey issues compiled, coordination with Ogden City, Utah DOT Aeronautics, FAA, and other stakeholders produced a list of other issues including:

- Placement for pressing development needs for new or growing business activity (large tenants), particularly maintenance, repair and overhaul (MRO) services
- Verification of Design Aircraft - most demanding aircraft operating regularly at OGD
- Runway length for longer commercial passenger routes in the future
- Obstructions identified by AGIS survey
- Expiring modification of standards for runway object free area (ROFA) off Runway 21
- Potential for improved instrument approach procedure (visibility minimums)
- Existing roadways and other development in approaches to runway, namely the Runway Protection Zone, which are no longer permitted according to FAA guidance
- Airport entry and ancillary roadway improvements needed
- Outdated passenger terminal building and limited ramp parking for commercial airlines
- Small GA and Corporate GA needs
- Air Traffic Control Tower age, condition and line of sight
- New FAA Design Standards for taxiway routing, fillets
- Long-term Fuel Farm for growth and expansion
- Property needs for ultimate buildout of OGD
- Compliance, Rule and Regulations, and Minimum Standards

While most issues identified here are addressed in the master planning study, some issues are more appropriately addressed through policy, management and operations.

PLANNING PROCESS

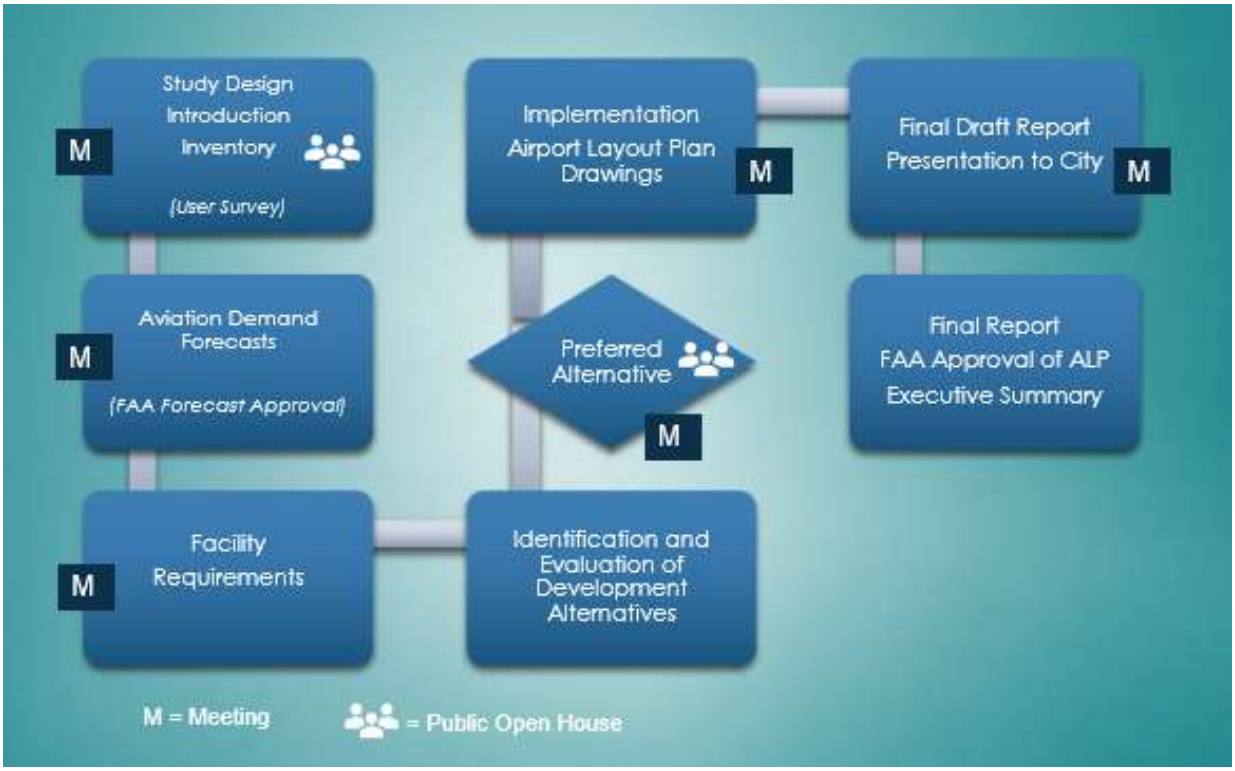
The master planning process involved several tasks completed in about 18 months. The process followed guidance in FAA Advisory Circular 150/5070 6B, Airport Master Plans. Study findings are documented in a

[5] The Utah Department of Transportation Division of Aeronautics is currently conducting an updated Economic Impact Study with a report on findings anticipated in 2020. The 2004 Economic Impact Study is the latest available.

series of chapters with supplemental information included in the appendices. Report chapters for OGD, which follow this Introduction section, include:

1. **Inventory** – existing conditions
2. **Forecasts** – projected aviation activity
3. **Facility Requirements** – facility improvement needs based on projected activity, FAA design standards and user-identified needs
4. **Development Alternatives** – physical layout options for the ultimate development of the airport including the City-selected preferred alternative
5. **Implementation** – capital improvement plan, funding sources and financial plan
6. **Airport Layout Plan Drawings** – set of technical drawings prepared in accordance with FAA design standard guidance that depict existing facilities and future development

The following flowchart illustrates the planning process established for the Ogden-Hinckley Airport Master Plan. Meetings of the Planning Advisory Committee coincided with important milestones in the planning process.



COMMUNITY OUTREACH

Community outreach is an integral part of a master planning study to ensure the public is provided ample opportunity to learn about and participate in the planning process. A public involvement program was established to assist with the community outreach effort.

To start, the City established a Planning Advisory Committee (PAC) with members representing a cross-section of the community to provide input and varying perspectives throughout the study process.

PAC representation included:

- Airport Manager
- Former Airport Manager, City Consultant
- AAC Member
- FAA
- Utah DOT Aeronautics
- Small GA
- Corporate GA
- Commercial Passenger Service
- Large Airport Tenant
- Local Business
- Ogden City Planning
- Weber County Planning
- City of Roy
- Chamber of Commerce

The PAC was one of several components comprising the community outreach program for the study; a user survey, meetings, newsletters and a webpage were also part of the program.

- **Airport User Survey**: As mentioned previously, a survey questionnaire was prepared and distributed to invite input regarding OGD activity, issues and facility needs. The survey was available online as well as in a paper version.
- **Planning Advisory Committee Meetings**: Several PAC members regularly attended meetings and/or communicated via email while others were unavailable to participate. Five PAC meetings were held to discuss airport issues, study progress and key findings as each element progressed. Various development alternatives were discussed and comparatively reviewed, so recommendations to the City could be considered before a long-term development plan was selected. The PAC members served as community liaisons and were invited to share their knowledge of the study findings with the public. The first PAC meeting/work session was held in October 2018, and the final one was held in January 2020.

- **Public Information Workshop/Open House**: The City held two public information workshops in an open house format to invite the community out to learn about the study, ask questions and provide input. The first open house was held in October 2018 to kick off the master planning study. The second was held in August 2019 during the evaluation of OGD development alternatives, which preceded the City's official selection of a preferred development alternative.
- **Project newsletters**: The master planning study included three project newsletters for publication during the study—at the beginning, middle and end.
- **City Webpage**: To keep the public informed, the City posted copies of the meeting presentations, project newsletters and various report materials for public review. Public comment sheets were available for individuals to provide their comments.

VISION

Ogden City's vision for the Airport served as the framework for identifying an ultimate development plan presented in the report and graphically depicted on the Airport Layout Plan (ALP). This vision evolved during the planning process and is generally represented by the following statement:

"Expand OGD's role as an economic engine in the region through a commitment to serve and cultivate general aviation and commercial service growth and aeronautical business opportunities."

Chapter 1

Inventory



CHAPTER 1 – INVENTORY

INTRODUCTION

The Inventory Chapter documents the existing conditions at the Ogden-Hinckley Airport. Data collected is derived from a site visit, previous OGD planning studies, the latest Airport Layout Plan (ALP) drawings set, City and airport management records, online research, and aerial mapping.

Airport facilities and environs are addressed, which will serve as the foundation from which facility deficiencies and associated improvement needs can be determined in later master plan elements.

REGIONAL SETTING

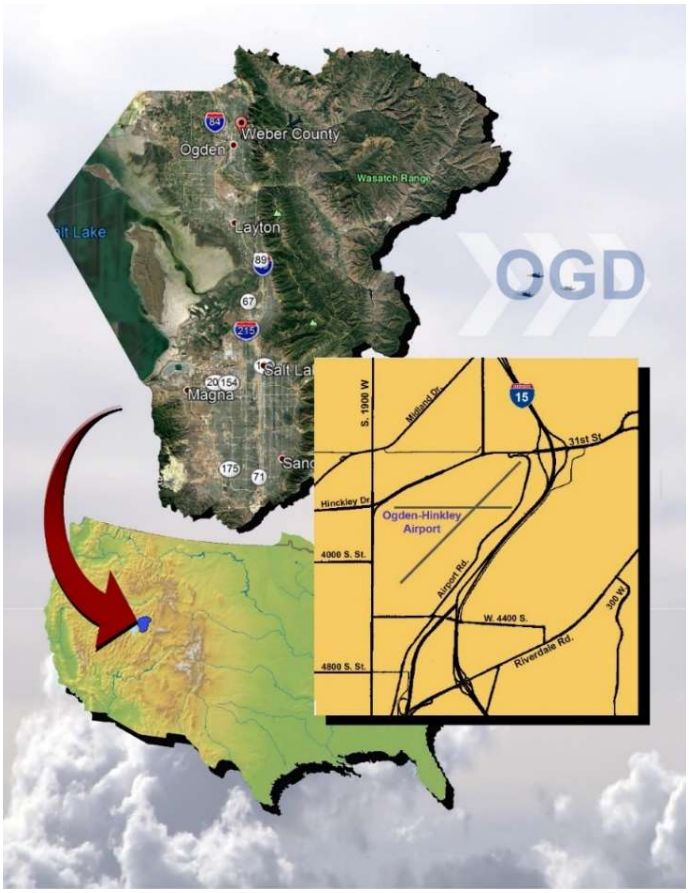
The Ogden-Hinckley Airport (OGD or the "Airport") is located in Ogden City, Utah. Ogden City is the county seat of Weber County. With an estimated population of over 87,000, Ogden City is the seventh largest city in Utah. It contains approximately one-third of Weber County's population and produces two-thirds of its Gross Domestic Product. Further, at 26.6 square miles, Ogden represents four percent of Weber County's 659 square-mile area. Located in the central portion of Weber County, Ogden is 40 miles north of Salt Lake City and an estimated 10 miles east of the Great Salt Lake.

In July, Ogden's average high temperature is around 91 degrees, while January's average low is 19 degrees. Ogden has an average of 223 days of sunshine—18 more days than the U.S. average. The area experiences higher precipitation levels than other parts of Utah due to its proximity to the Wasatch mountains, which capture more moisture. Annually, Ogden sees an estimated 21 inches of rain and 41 inches of snow.

The Airport sits at an elevation of 4,472.5 feet mean sea level (MSL) but some areas of the property drop to an estimated 4,400 feet. Ogden City elevations range from 4,300 to 5,200 feet MSL. The Wasatch mountain range represents the highest elevations in the region, reaching nearly 12,000 feet.

The Airport is three miles southwest of downtown, west of Interstate 15, and accessed via Airport Road (**Figure 1-1**).

Figure 1-1: Location Map



COMMUNITY AND AIRPORT HISTORY

In Ogden's early days, it was named Fort Buenaventura and known to be the first permanent settlement in Utah by people of European descent. It was renamed Ogden in 1850, after Peter Skene Ogden, and incorporated as a city in 1851. Ogden became a major railway hub and earned the nickname "Junction City" once Union Pacific and Central Pacific rail lines were connected. Today, Ogden is a convenient location for manufacturing and commerce with its high freight rail activity. Other key industries have emerged over the years with the City calling special attention to four: aerospace & advanced manufacturing, outdoor products, life sciences (e.g. specialization in biopharmaceuticals and medical device manufacturing), and information technology and software.

The Airport's history goes back nearly 80 years according to a past planning study. An ALP update with an accompanying narrative, completed in 2008, is the most recent planning study completed for OGD. An overview of the Airport's beginnings was included in the ALP report, explaining that the initial airport construction was completed in December 1941 on land purchased by Ogden City. Initially, there were

two asphalt-paved runways: Runway 7-25 (5,600 feet by 150 feet), and Runway 16-34 (5,352 feet by 200 feet). A lease between the City and U.S. Government established the airport as a joint use military and civilian facility in September 1942, and the airport became the Robert H. Hinckley Field. As military activity shifted to Hill Air Force Base, the airport was renamed the Ogden Municipal Airport. It wasn't until June 30, 1988, that the Ogden City Council passed a resolution to rename the airport Ogden-Hinckley Airport.

Airport development records from the FAA go back to 1982 for OGD, which include a brief project description, the Federal funding amount, and the grant number. A copy of the grant history obtained from the FAA is included in the appendices.

According to FAA records, OGD has received Federal airport improvement funding totaling more than $37 million since 1982.

AIRPORT OWNERSHIP AND MANAGEMENT

The City of Ogden owns and operates the Ogden-Hinckley Airport. Since 1992, the City has been governed by a mayor-council form of government comprised of a full-time mayor and seven part-time city council members. There are more than 600 employees on City staff.

City Council members in place during the 2019 airport master planning study include:

- Angela Choberka – District 1 (OGD is within District 1)
- Richard A. Hyer – District 2
- Doug Stephens – District 3
- Ben Nadolski – District 4
- Marcia L. White – At Large Seat A
- Bart E. Blair – At Large Seat B
- Luis Lopez – At Large Seat C

The Airport falls under Ogden City's Community & Economic Development Department. Six full-time and two part-time employees are assigned to the Airport to support management, administration, operations and maintenance needs.

In addition, a seven-member Airport Advisory Committee (AAC), which meets regularly, oversees and makes recommendations to the City regarding policy and development decisions for OGD. The seven members include:

- Les Briggs, Corporate Pilot
- John Malmberg, Pilot & President of Hill Flying Club
- Dwight Baldwin, Pilot & Local Businessman

- Mike Nichols, Pilot & Executive with Kemp Jet Services
- Steve Lindquist, Pilot, Hangar Owner, and previous FBO operator
- Dr. Justin B. Jackson, Professor of Engineering – Weber State University
- Frank Elsholz, ATC Tower Manager (non-voting alternate member)

Under the direction of the mayor, the airport manager has full power to carry out the policies adopted by the council in managing the airport.

An enterprise fund is set up for OGD to account for administration, operation and maintenance of the Airport. According to airport management records, airport operating revenues in 2018[1] totaled $564,688, comprised of ground leases, hangar rentals, tiedown fees, and fuel flowage fees—the primary revenue sources. Airport operating expenses for 2018 totaled $1,520,261, for a net operating loss of $955,573. Capital outlays for the same period totaled over $581,000. Additional airport financial information is presented in Chapter 5, Implementation.

ECONOMIC IMPACT

Airports contribute substantially to regional economies and often well beyond dollars spent on the maintenance and operation of the airport facilities. It's not uncommon for the public to be unaware of such economic benefits derived from its airport, so educating the community is essential. Towards this effort, the Utah Department of Transportation, Division of Aeronautics (UDOT Aeronautics) conducted an economic impact study to measure the impact of individual airports and the entire state. The latest available Utah Economic Impact Study is from 2004. **Table 1A** summarizes the findings of that study. The study reveals that OGD had an economic impact[2] of more than $59 million. Statewide, the economic benefit from airports reached $5.68 billion. UDOT Aeronautics has initiated an update to the study as part of the Utah state airport system planning effort; the anticipated publication date is in 2020.

[1] In 2019, airport operating revenues totaled $622,786, operating expenses totaled $987,382, and capital outlays reached nearly $5.4 million (with FAA grant funding support).

[2] While the economic impact of OGD may far exceed the operating cost of OGD, there is no direct monetary contribution to the City or OGD as a result of the economic impact dollars flowing into the community.

Table 1A: Summary of Airport Economic Impact Economic Study Findings 2004

	Employment	Payroll	Economic Output
Ogden-Hinckley (OGD)	272.5	$8,158,700	$59,327,200
Utah General Aviation Airports	3,673	$96.67 million	$274.28 million
Utah Commercial Service Airports (excl. SLC)	1,425	$36.59 million	$64.88 million
Salt Lake City International (SLC)	101,257	$2.70 billion	$5.34 billion
Total Economic Impact of Aviation in Utah	106,355	$2.83 billion	$5.68 billion

Source: 2004 Economic Impact of Utah's Airports (Executive Summary). During the 2004 Study, OGD was one of 41 general aviation airports. Commercial service airports in 2004 included SLC plus five other airports. OGD was not a commercial service airport at that time.

CURRENT AIRPORT FACILITIES

The Airport consists of 720 acres with existing facilities discussed in the following sections on airside, landside and support facilities. These facilities are further discussed in Chapter 3, Requirements. **Figure 1-2** provides an overview of the Airport's property boundary, existing airfield configuration, and key facilities. As a 14 CFR Part 139-certified[3] airport, OGD's facilities are well maintained and inspected annually by the FAA.

Airside

Airside facilities include aircraft movement areas such as the runways, taxiways, and apron areas.

Runways

The OGD airfield consists of two intersecting runways, Runways 3-21 and 17-35, both with asphalt pavement. Up until its decommissioning in 2016, OGD had a third runway, which remains partially visible on aerial photographs.

[3] This Code of Federal Regulation (CFR) certification relates to airports with airline passenger service.

Hinckley Drive
State Highway 79
Railroad
Monte Vista Mobile Home Park
State Highway 126
South 700 West Street
Iomega
Water Tanks
PAPI-2
Taxiway D
Sam Williams Drive
Williams Research Corporation
State Highway 79
ASOS
ILS Glidesplope Antenna
Runway 17-35 5,194' x 100'
Segmented Circle (OL) With Lighted Windcone
Glide Slope Critical Area
PAPI-4
MALS Equip Building
MALS
Runway 3-21 8,103' x 150'
Localizer Critical Area
ILS Localizer
PAPI-4
To Ogden Two Miles
Taxiway A
Deicing Pads
Taxiway A
Taxiway A
Apron
PAPI-2
Taxiway E
Taxiway B
Taxiway G
Taxiway F
Taxiway F
Twy B
Apron
Autoliv
Residential
4400 South Street
Sprint Tower
Auto Parking
Auto Parking
Auto Parking
Union Pacific Railroad
Control Tower and Rotating Beacon, Floor Elevtaion 4504'
US Interstate 15-84
US Interstate 15-84
Weber River
To Salt Lake City
To Ogden
0
400
800
Feet

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Figure 1-2

Existing Airport

Ogden-Hinckley Airport

Ogden, Utah

Runway 3-21 serves as the primary runway with dimensions of 150 feet by 8,103 feet. Runway 21 has a displaced threshold of 851 feet, reducing the landing length, but maintaining takeoff length. Secondary Runway 17-35 is 100 feet by 5,195 feet.

Taxiways

A system of 50-foot wide taxiways provides aircraft access between the runways, apron and building areas. Taxiway A is the full-length parallel taxiway, with four connecting taxiways, serving Runway 3-21, at a separation distance of 525 feet between centerlines. Runway 17-35 is served by a partial parallel taxiway (Taxiway B) at the Runway 35 end, 425 feet between centerlines. In addition, taxilanes provide apron circulation and access to hangars.

A taxiway project under way during the master plan study was completed as of December 1, 2019. This project included taxiway rehabilitation, and relocation of Taxiway C and a portion of Taxiway D.

Apron

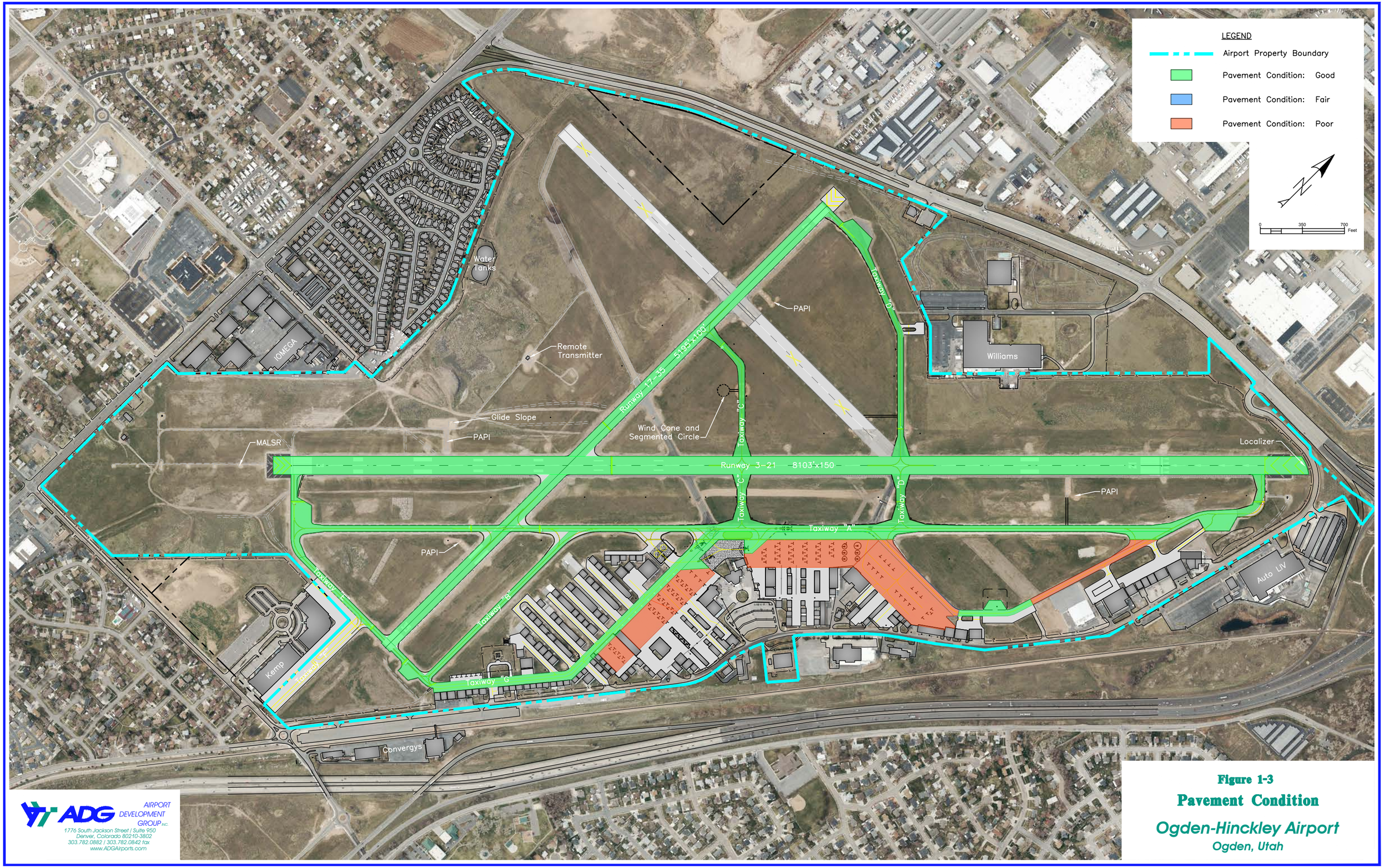
The existing apron area provides approximately 100,400 square yards of contiguous pavement for parking and circulation; more than 120 tiedowns are on the apron. The apron serves both transient and based aircraft with a current high level of usage for flight training aircraft. Many tiedowns are leased to Fixed Base Operators.

Air passenger boarding and deplaning also takes place on the apron. The single air passenger gate at the terminal building uses only one airplane parking position on the apron, which is a power-in, power-out position. The apron also has one deicing pad that is located to the south between Taxiways A and E.

Helicopters use the public apron or their lease lot apron area for operations. The U.S. Forest Service typically parks their helicopters at the north end adjacent to their facilities.

Pavement Condition

As part of a Utah statewide airport pavement evaluation project, OGD runway, taxiway, and apron pavements were evaluated in 2012. These inspections were conducted using the FAA's pavement condition index (PCI) survey procedures. The PCI procedure is the standard used by the aviation industry to visually assess pavement condition, providing engineers with a consistent, objective, and repeatable tool to represent the overall pavement condition. During the pavement survey, visible signs of deterioration within a selected sample unit were recorded and analyzed, which helped identify the structural integrity and function of the pavement. As a result, maintenance and repair needs were determined. Currently, most airfield pavements are in good condition (**Figure 1-3**) as a result of OGD's ongoing pavement rehabilitation and maintenance efforts, but aprons and one taxiway are in poor condition. Runway 3-21 pavement strength is currently estimated at 85,000 pounds single wheel loading (SWL) and 150,000 pounds dual wheel loading (DWL) An estimated pavement strength rating for dual tandem weight (DTW) aircraft has not been identified. Runway 17-35 has a pavement strength of 75,000



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Figure 1-3

Pavement Condition

Ogden-Hinckley Airport

Ogden, Utah

pounds dual wheel loading (DWL). Ogden recently initiated a new pavement management program and review, funded by the FAA, to re-evaluate pavement condition and strengths. This program is expected to move forward sometime in 2020.

Airfield Lighting, Marking and Signage

Both runways are equipped with runway edge lighting, which is essential for nighttime operations and periods of low visibility. A High Intensity Runway Lighting (HIRL) system is on Runway 3-21; while older than some airfield facilities, the system remains in good operating condition. Runway 17-35 has a Medium Intensity Runway Lighting (MIRL) system, which was installed in 2012. When the airport traffic control tower is closed, pilots may activate the lighting systems on the common traffic advisory frequency.

Runway 3 has an approach lighting system that supports the precision instrument approach; this aids the pilot in the transition from instrument flight to visual flight for landing on Runway 3. Runways 17 and 35 are each equipped with a Runway End Identifier Lights (REIL) system, installed in 2012. A REIL system consists of two high-intensity strobe lights that mark the approach end of the runway, which is important in reduced visibility conditions.

The airfield taxiway system is equipped with Medium Intensity Taxiway Lighting (MITL), which is in good operating condition.

Runway 3 has precision instrument approach markings and Runway 21 is marked non-precision. Runway 17-35 has basic visual markings. Airfield markings are regularly repainted with seal coat pavement preservation projects.

Taxiway markings include standard yellow centerline striping. Hold lines for runways are marked on appropriate taxiway connectors.

Airfield signage, which is in good condition, is also consistent with current FAA requirements. Signage provides pilots with important information including their location on the airfield.

Navigational Aids

Navigational aids include both visual and instrument approach aids. The Airport's visual aids include a four-light Precision Approach Path Indicator (PAPI) system on all four runways. The PAPI system on Runway 3 is FAA-owned while the other three are OGD-owned and maintained. A PAPI system projects light along a standard runway approach glide path. Red and white lights help the pilot determine whether the aircraft is above, below or on the standard glide path. The Airport's PAPI systems are in good operating condition. Runway 17-35's PAPIs were installed in 2012, while Runway 21 has an older system.

The Airport has a rotating beacon located on the airport traffic control tower. A rotating beacon consists of sequenced flashing green and white lights rotating 360 degrees to allow pilots to identify the facility from any direction.

To provide pilots with ground level wind conditions, a segmented circle and lighted wind cone are located on the west side of the airfield within the triangular area formed by the intersection of the active runways and decommissioned Runway 7-25.

The Airport has instrument approach procedures published for Runway 3, as well as a circling approach to the Airport. Copies of the FAA instrument approach procedures are included in the appendices. Instrument approach aids are typically used for airports that permit Instrument Flight Rules (IFR) operations, which means that operations are permitted when the visibility and cloud ceiling are below minimums for Visual Flight Rules (VFR). There are two types of instrument approaches--the traditional ground-based or satellite-based; OGD has both. The traditional ground-based includes the Instrument Landing System (ILS) on Runway 3. The ILS instrument approach procedure has visibility minimums as low as ¾ mile; the Area Navigation Global Positioning System (RNAV GPS) approach to Runway 3 has the same visibility minimums. Approach minimums are based upon factors such as navigation equipment, approach lighting, weather reporting equipment and area airspace obstructions.

Airport Traffic Control Tower (ATCT)

The Airport Traffic Control Tower (ATCT) at OGD is approximately 90 feet tall and located adjacent to and just east of the terminal building. The tower, constructed in 1973, is one of the nation's oldest towers, so it is outdated and deteriorating. For the safe and efficient flow of traffic, the ATCT directs aircraft on the ground and through controlled airspace and may provide advisory services to aircraft in non-controlled airspace. It's important to note that some landside facilities are partially obstructing the tower's line of sight on aircraft ground movement.

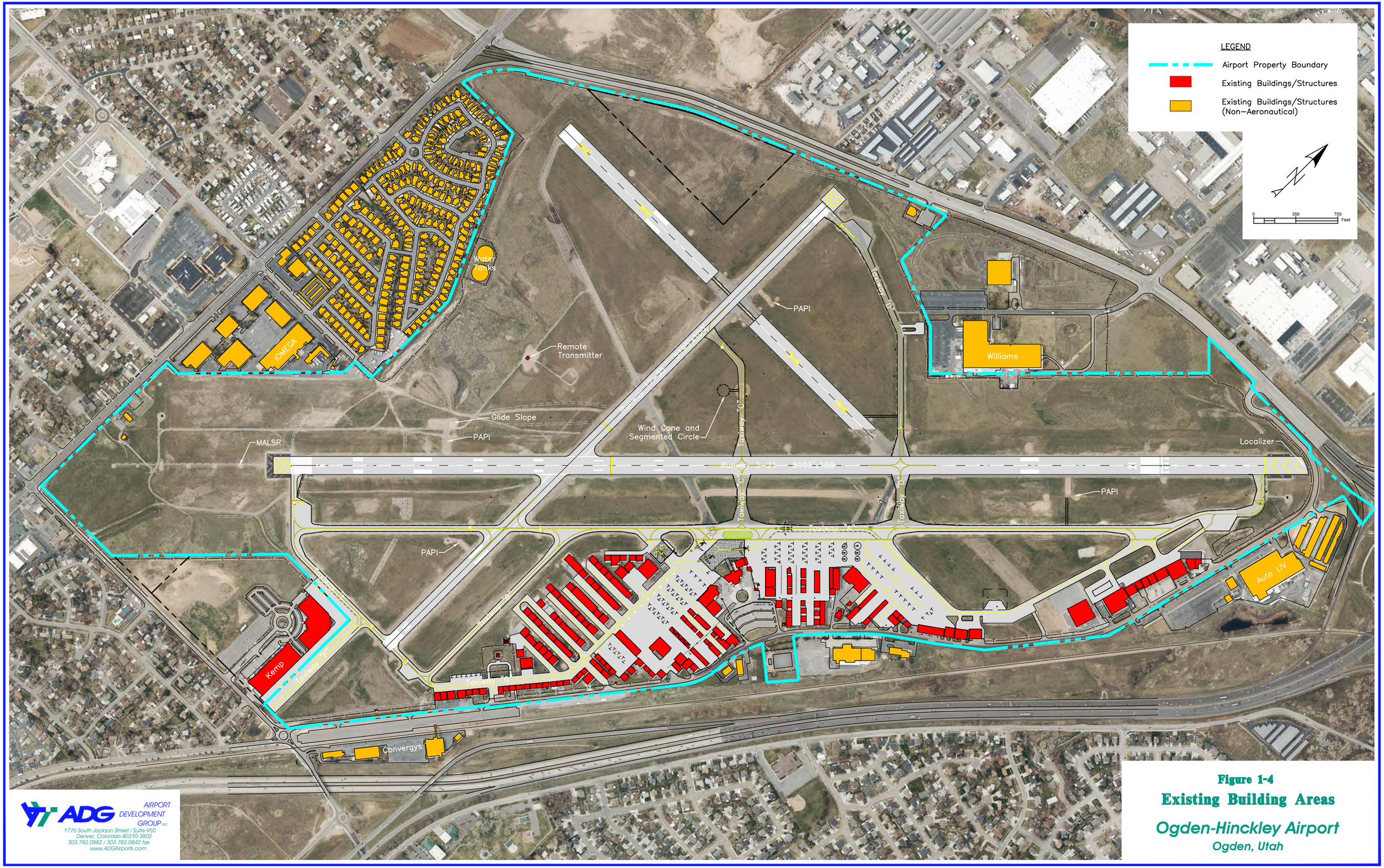
Ogden's ATCT operates from 7 AM to 8 PM daily. It is one of 254 towers in the nation that is a federally contracted tower, and one of two in the state of Utah; the other is Provo.

Automated Surface Observing System (ASOS)

Located on the west side of the airfield, OGD has an Automated Surface Observing System (ASOS), shown earlier on Figure 1-2. The ASOS provides automated weather observations 24 hours a day. The system updates weather observations every hour, or when significant changes in weather conditions occur. The ASOS is operated and controlled by the National Weather Service, in cooperation with the FAA and Department of Defense (DOD). The ASOS system reports cloud ceiling, visibility, temperature, dew point, wind direction, wind speed, altimeter setting (barometric pressure), and density altitude (airfield elevation corrected for temperature).

Landside and Support

This section includes buildings and other facilities that are not airside-related. **Figure 1-4** illustrates the layout of existing buildings at OGD.



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Figure 1-4

Existing Building Areas

Ogden-Hinckley Airport

Ogden, Utah

Terminal Building

The Airport Terminal Building, originally constructed in the 1940s, is centrally located along the apron near the Taxiway C entrance. In 2012, in order to accommodate Allegiant Airlines' service, a new building was constructed and connected to the original terminal building to accommodate a sterile passenger holding room. Passengers enter the old terminal and then access ticketing and security screening areas where the old and new buildings connect. The new building houses a single holdroom with seating for about 200 (estimated 2,100 sq. ft.), restrooms, and a bay for the firefighting truck that is required for the Allegiant service.

The main floor of the old terminal building has the passenger terminal lobby, public restrooms, space for rental car and food service concessions (now vacant), and the Airport offices for management, operations, and administrative personnel. The lack of an elevator means the basement of the old terminal is not accessible to the handicapped, but it has restrooms that can be used by passengers and visitors. The basement also houses the airfield electrical vault, airport office storage, and building services. A small control tower upstairs is not used. The terminal building consists of more than 10,000 square feet.

Passengers enplane and deplane outdoors via mobile stairs because there is no loading bridge. (A mobile ramp is available for disabled passengers.) Deplaning passengers walk back through the terminal lobby to reclaim baggage outside the front door and leave the airport. The Service Animal Relief Area (SARA) is a grassy area within the Security Identification Display Area (SIDA) and is available on request with an escort.

Hangars

Most buildings at OGD are hangars, which consist of T-hangars and conventional "box-shaped" hangars, also referred to as corporate hangars. In T-hangar buildings, the floor plan of each single airplane's hangar is shaped like the letter "T"; several T-shaped hangars are strung together and nested back-to-back with another string of hangars, providing efficient storage for small aircraft.

Most aircraft based at the Airport are stored in hangars. Numerous hangars are in poor condition and require replacement. Not all hangars are used for aircraft storage. A few, such as Borsight's hangar, are used for the maintenance/repair/overhaul (MRO) of airplanes. Borsight's existing hangar is 35,400 sq. ft. in area, and the company has imminent plans to build two more hangars of comparable size, capable of handling airplanes as large as the KC-135.

The Airport has nearly 800,000 sq. ft. of leased building area, of which 95% is aeronautical use. This aeronautical use includes 46,075 sq. ft. of hangar space at Kemp's FBO that is not on Airport property, but subject to access fees. Kemp and the other FBOs have hangars for storing both based and transient aircraft.

Several hangars are in poor condition now and others will deteriorate from fair to poor in a few years. About one-third of existing hangar buildings were built before 1970; some hangars date to the 1940s. Several hangars no longer meet current codes and their owners have been notified that upon lease renewal, the building must be brought up to current codes.

A detailed structures table updated for the OGD Airport Layout Plan was recently completed using historical data from the previous ALP, the City's latest hangar/ground lease data, AGIS survey data[4], and the City and consultant engineer's knowledge. A summary is presented in **Table 1B**.

Table 1B: Summary of OGD Hangars

	Type	Buildings	Area (SF)	Poor Condition		Fair Condition	
				Bldgs	Area	Bldgs	Area (SF)
ON-AIPORT							
	Commercial	9	113,550	1	8,000	3	37,950
	Conventional	145	549,325	42	117,125	22	89,875
	T-Hangars	9	81,435	4	27,310	2	11,000
	Subtotal	163	744,310	47	152,435	27	138,825
OFF-AIPORT (Kemp Jet Center)							
	Hangar	1	72,800				
	FBO/Hangar	1	65,000				
	Subtotal	2	137,800				
	TOTAL	165	882,110				

Source: City, AGIS survey data, and consultant information

Airport Maintenance and Snow Removal Equipment Storage

The OGD maintenance staff handle regular maintenance as well as snow removal with their airport-owned equipment; supplemental assistance from the City is requested, when needed. Currently, OGD has more equipment than airport staff to operate the equipment. A former airport maintenance shop that is no

[4] Airports Geographic Information Systems (AGIS) survey was completed in Summer 2019 as part of the airport master planning study to provide aerial mapping and other data for aeronautical purposes

longer usable requires replacement. Presently, some airport equipment must be stored outside since there is inadequate space in the current storage facilities.

FBO Services

A Fixed Based Operator (FBO) is a business that provides aviation support services to pilots, passengers and aircraft at an airport. Services may vary significantly among FBOs and airports. Examples of services include: fueling, ground servicing, deicing, oxygen, aircraft rental, aircraft storage (hangars, tiedowns), flight training, aircraft repair and maintenance, crew cars, courtesy transportation, rental cars, restaurant, in-flight catering, terminal facilities (restrooms, pilot lounge, and flight planning rooms), and sale of pilot supplies. At OGD, all or some of these services are offered by each of the local FBOs. There are three FBOs serving OGD: Kemp Jet Services, Mountain Valley Aviation (owned by Kemp), and CB Aviation. All three FBOs offer Jet A and Avgas fueling. Full-service and self-serve (Avgas) fueling are available. Kemp also has a restaurant and other airport user facilities at their south facility near Runways 3 and 35.

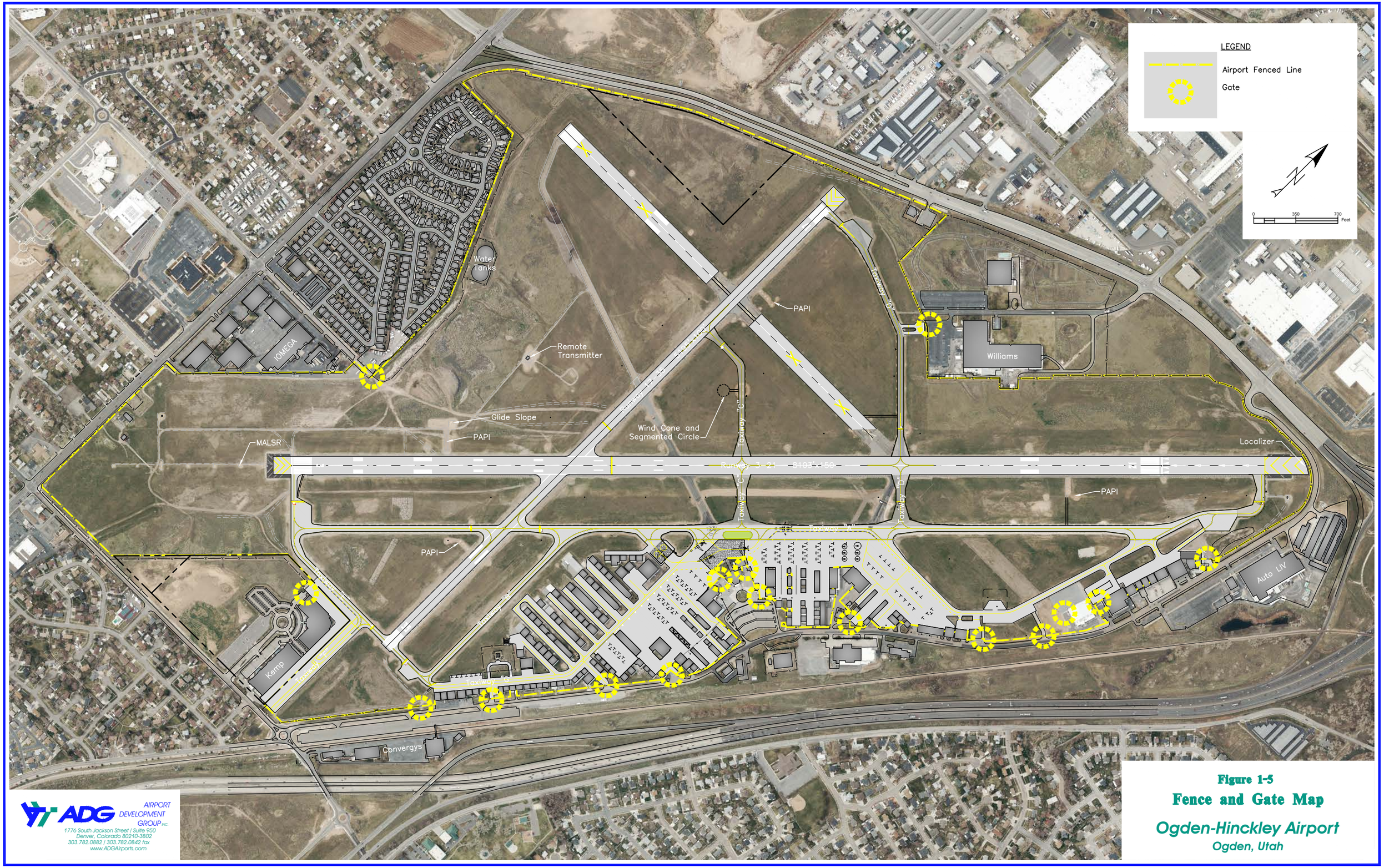
Security and Fencing

Perimeter fencing surrounds airport property. **Figure 1-5** depicts the airport boundary and the 16 access gates around the Airport. A portion of the airport fencing adjacent to Roy is in disrepair. Of the 16 gates, 14 are along the east side of the airfield where the primary landside facility development is located; the other two gates are on the west side. Most gates have keypads that require coded electronic access.

To comply with Transportation Security Administration (TSA) requirements, OGD has a designated Security Identification Display Area (SIDA), which is inside the fenced area including the ramp where there are aircraft ground operations. SIDA badges are provided on an as-needed basis to airport users and staff after background checks and training are completed. The entire airfield meets TSA's airport operating area requirements.

One important purpose of airport fencing is to keep wildlife away from the airfield. To further promote a secure and safe operating environment, OGD prepared a Wildlife Hazard Management Plan (WHMP). The draft WHMP, completed in February 2019 and finalized thereafter, states the following with respect to maintaining a secure airfield:

> *OGD will manage the habitat on and around the airfield in a manner that will discourage hazardous wildlife. OGD will take active measures to disperse hazardous wildlife when they occur, provide advisories to pilots and air traffic control, and make operational changes as necessary to address hazardous wildlife issues. The WHMP outlines priorities for habitat and hazardous wildlife control and management, including target dates for completion. Wildlife attractants within 5-miles of the air operations area (AOA) are also addressed because they could potentially attract wildlife and thereby threaten air traffic operations into and out of OGD.*



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Figure 1-5

Fence and Gate Map

Ogden-Hinckley Airport

Ogden, Utah

Wildlife strikes for OGD totaled 13 over a 28-year period according to the WHMP. These strikes occurred from 1990 thru December 31, 2018.

The WHMP further stated the following about inspections.

> *As part of the daily protocol, operations maintenance personnel will be responsible for conducting all physical inspections of movement areas, the security perimeter fence, and other areas critical to wildlife hazard management.*

Aircraft Rescue and Fire Fighting (ARFF)

When the Airport began receiving passenger service from Allegiant Airlines, the required Part 139 certificate was acquired. Part 139 of the Code of Federal Regulations contains the safety and other requirements for airports with passenger service. One of the requirements is Index B ARFF capability (equipment and trained personnel) during the air carrier operations at the Airport. The required ARFF vehicle, placed into service in February 2013, is contained in the single bay that's part of the terminal building and includes a modern 2011 Rosenbauer Panther 4 x 4 model (1,500 gallons).

Utilities

Airport utilities and associated providers include the following:

- Water: Ogden City
- Wastewater: Ogden City
- Electricity: Pacificorp (Rocky Mountain Power)
- Natural Gas: Questar Gas Company
- Telecommunications: CenturyLink and Xfinity

Figure 1-6 depicts the City's available information on utility mains for OGD—sewer and water are shown. Collection of additional utility information from the City is addressed in a future chapter.

Drainage

Storm water at the Airport generally flows to the north. The property is very flat, with an approximate slope of 0.7%. Appropriate pavement and infield slopes and a system of pipes direct storm water from the airfield, building and pavement areas to collecting drainage structures. These discharge to a storm water detention area on the east and north side of Runway 3-21. The system detains storm water, allowing it to infiltrate into the ground. If a storm event exceeds the system's capacity, water overflows to Airport Road at the northeast edge of the property.

Detention basins are an effective method of storm water control at the Airport. Most or all the storm water infiltrates to the ground or evaporates. During intense storms or wetter seasons, water infiltrates, evaporates and/or is discharged to the detention area.

LEGEND

Airport Property Boundary

Storm Sewer

Water Line

0 350 700 Feet

Water Tanks

IOMEGA

Remote Transmitter

PAPI

Taxiway "D"

Williams

Glide Slope

PAPI

MALSR

Wind Cone and Segmented Circle

Taxiway "C"

Runway 3-21 8103 x 150

Localizer

PAPI

PAPI

Taxiway "A"

Taxiway "B"

Taxiway "E"

Taxiway "F"

Taxiway "G"

Taxiway "H"

Auto LIV

Kemp

Convergys

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Figure 1-6

Utility Mains

Ogden-Hinckley Airport

Ogden, Utah

CURRENT AVIATION ACTIVITY

OGD serves many based aircraft and operations as well as a diverse group of users for personal, business and government purposes. A based aircraft is one that spends most of its time at the airport. An operation is a takeoff or a landing; a flight training "touch-and-go" counts as two operations. Local operations stay within 20 nautical miles of the airport; all other aircraft operations are categorized as itinerant. According to 2018 data[5], OGD has an estimated 241 based aircraft and 89,222 annual operations (244 daily on average). For comparison, OGD's aviation activity and facilities are compared to other area (GA) airports within a 30-minute driving distance (**Table 1C**). This includes three airports: Morgan County, Brigham City Regional, and Skypark.

Table 1C: Area Airports

Airport and Elevation	Distance from OGD	Runway(s)	Lighting / Approach Aids	Published Approaches	Based Aircraft	Est Ops	Airport Services
Ogden-Hinckley (OGD) 4472.5' MSL	--	RW 3-21 8,103' x 150' Grooved Asphalt RW 17-35 5,195' x 100' Grooved Asphalt	RW 3-21 HIRL, PAPI-4, MALS (RW 3) RW 17-35 MIRL PAPI-4 REIL	ILS/LOC RW3 RNAV(GPS) RW3 VOR-A	SE: 191 ME: 25 Jet: 8 Heli: 12 Glider: 2 UL: 3 TOTAL: 241	AC: 324 AT: 3,943 GA Loc: 37,804 GA Itin: 46,801 Mil: 350 TOTAL: 89,222	100LL, Jet-A Maint., Bulk Oxygen, Hangar, Tiedowns, Charter, Instruction, Rentals, Sales
Morgan County (42U) 5020.0' MSL	12 nm E Drive: 18 mi/21 mins	R3-21 3,904' x 50' Asphalt	n/a	n/a	SE: 54 ME: 2 Jet: 0 Heli: 1 Gliders: 19 UL: 2 TOTAL 78	AC: 0 AT: 20 GA Loc:3,230 GA Itin: 1,068 Mil: 0 TOTAL 4,318	Tiedowns
Brigham City Regional (BMC) 4229.9' MSL	21.6 nm N Drive: 26 mi/28 min.	R17-35 8,900' x 100' Grooved Asphalt	MIRL PAPI-2	RNAV (GPS)RW 35	SE: 61 ME: 4 JET: 0 HELI: 3 TOTAL: 68	AC: 0 AT: 340 GA Loc: 9,900 GA Itin: 9,560 MIL: 0 TOTAL: 19,800	100LL, Jet-A, Maint., Hangars, Tiedowns, Inst. Rental
Skypark (BTF) 4234.0' MSL	20 nm S Drive: 27 mi/28 min.	R17-35 4,700' x 70' Asphalt	LIRL PAPI-2	N/A	SE: 195 ME: 10 Jet: 0 Heli: 12 TOTAL: 217	AC: 0 AT: 150 GA Loc:14,866 GA Itin: 22,152 Mil: 0 TOTAL: 37,168	100LL, Jet-A Maint., Hangars, Tiedowns, Instruction, Rentals

Source: FAA Airport Master Record (Form 5010), MapQuest, AirNav. OGD ops adjusted to 2018 data. Note: Distance limited to 30-minute drive. AC=Air Carrier, AT=Air Taxi, ME=Multi-Engine, SE=Single Engine, UL=Ultralight.

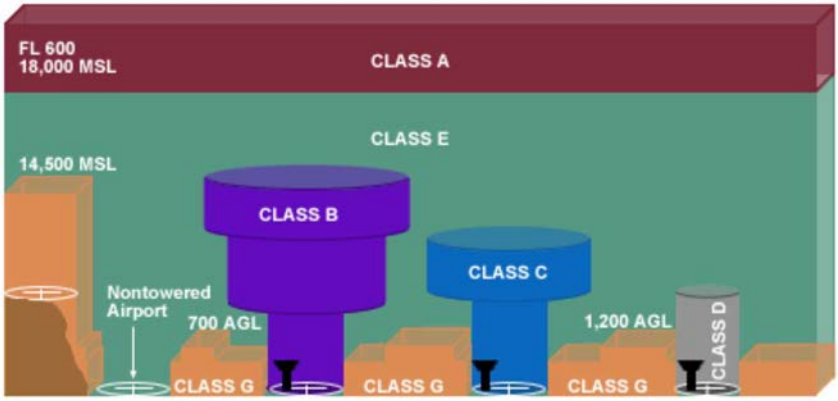
[5] OGD operations data available during the study included 2018. According to more recent data after the Inventory and subsequent study elements were completed, OGD operations reached 113,663 in 2019.

AIRSPACE

To ensure the safety of aviation activity, the protection of airspace and the proper operation and communication within airspace is essential. Airspace is defined as the portion of the atmosphere above a particular land area, usually above a country. There are six classes of airspace defined to support the proper management of air traffic **(Figure 1-7)**. These classes are divided into the categories of controlled and uncontrolled airspace:

- Controlled Airspace includes Class A, Class B, Class C, Class D, and Class E. While operating in controlled airspace, the pilot is subject to certain operating rules, as well as pilot qualifications and aircraft equipment requirements.
- Uncontrolled Airspace includes Class G airspace. FAA Air Traffic Control (ATC) does not exercise control of air traffic in Class G airspace.

Figure 1-7. Airspace Classifications



Airspace Features	Class A	Class B	Class C	Class D	Class E	Class G
ATC Facility	ARTCC	TRACON	TRACON or ATCT	ATCT	ARTCC	None
Operations Permitted	IFR	IFR & VFR	IFR & VFR	IFR & VFR	IFR & VFR	IFR & VFR
Entry Requirements	ATC Clearance	ATC Clearance	ATC Clearance for IFR. All require radio contact	ATC Clearance for IFR. All require radio contact	ATC Clearance for IFR. All require radio contact	None
VFR Minimum Distance from Clouds	N/A	Clear of clouds	500' below, 1,000' above, and 2000' horizontal	500' below, 1,000' above, and 2000' horizontal	500' below, 1,000' above, and 2000' horizontal	Clear of clouds
Aircraft Separation	All	All	IFR, SVFR, and runway operations	IFR, SVFR, and runway operations	IFR and SVFR	None

Courtesy of FAA

A summary of the controlled airspace category follows.

- Class A airspace includes all airspace from 18,000 feet MSL to Flight Level 600 (approximately 60,000 feet MSL).
- Class B airspace surrounds high activity commercial service airports.
- Class C airspace surrounds commercial service airports with moderate traffic and some military airports.
- Class D airspace surrounds smaller airports with an air traffic control tower.
- Class E airspace is defined as controlled airspace that is neither A, B, C nor D.

Uncontrolled Airspace, Class G, is primarily used for a small layer of airspace near the ground, but remote regions have larger areas of Class G airspace. In general, within the U.S., Class G Airspace extends up to 14,500 feet MSL. At and above this altitude, all airspace is within Class E Airspace.

The U.S. also has areas designated as Special Use Airspace (SUA), which includes Alert Areas, Warning Areas, Restricted Airspace, Prohibited Airspace, Military Operation Areas (MOA), Controlled Firing Areas (CFA), and National Security Areas (NSA). Each segment of SUA is contained within at least one of the airspace classifications shown in Figure 1-7; SUA is not its own class of airspace.

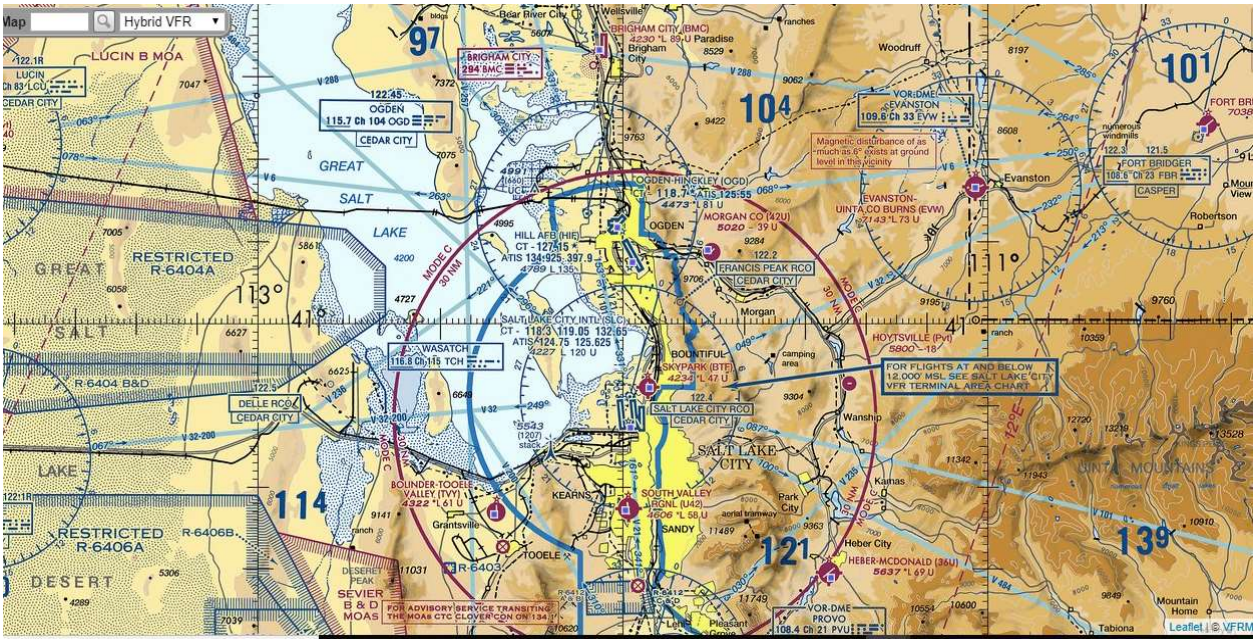
Local Airspace

There are several restricted airspace and military operations areas around the Airport, as illustrated in **Figure 1-8**. Hill Air Force Base and other area airports are also illustrated.

A broad range of civilian and military aircraft use the local area airspace. Further, area activity is growing and so is its complexity as emerging trends change the area fleet mix—new unmanned aerial systems, more business jets, growing activity by sport aircraft, and new Hill AFB F-35 operations, for example. Another local airspace consideration is parachute jumping, which occurs on the northeast portion of the Airport.

With the proximity of Hill Air Force Base, there is a heavy volume of military aircraft flying over OGD at approximately 5,700 to 6,400 feet MSL. Consequently, the required traffic pattern altitude at OGD is 5,200 feet MSL. The traffic pattern at OGD consists of a standard left turn for Runways 3 and 35, and a non-standard right traffic pattern for Runway 21 and 17.

Figure 1-8: Area Airspace



Source: FAA

Area obstructions are also important considerations. The Airports Geographic Information System (AGIS) survey, recently completed as part of this master plan study, provides a detailed analysis of area obstructions important to runway approach procedures. Obstruction tables included with runway approach plan and profile drawings in the ALP drawings set provide specifics. A preliminary review of the AGIS survey findings for Runway 3 (precision approach runway) indicates that a number of houses, commercial buildings, parking lot lights, power line poles, a flagpole, many trees, and two roads are approach surface penetrations. In addition, the Runway 3 departure surface (at the north end of the runway) includes at least three trees at a height that are obstructions within the departure surface. These trees are on the adjacent Autoliv property. Further, the AGIS survey shows that the Autoliv and US Foods buildings are surface penetrations.

The AGIS survey offers specifics to update OGD's FAA Airport Master Record (Form 5010), which presently documents only a small number of obstructions:

- Runway 3 – trees (54 feet above runway end)
- Runway 21 – pole (24 feet above runway end)
- Runway 17 – Road (3 feet above runway end)
- Runway 35 – sign (50 feet above runway end)

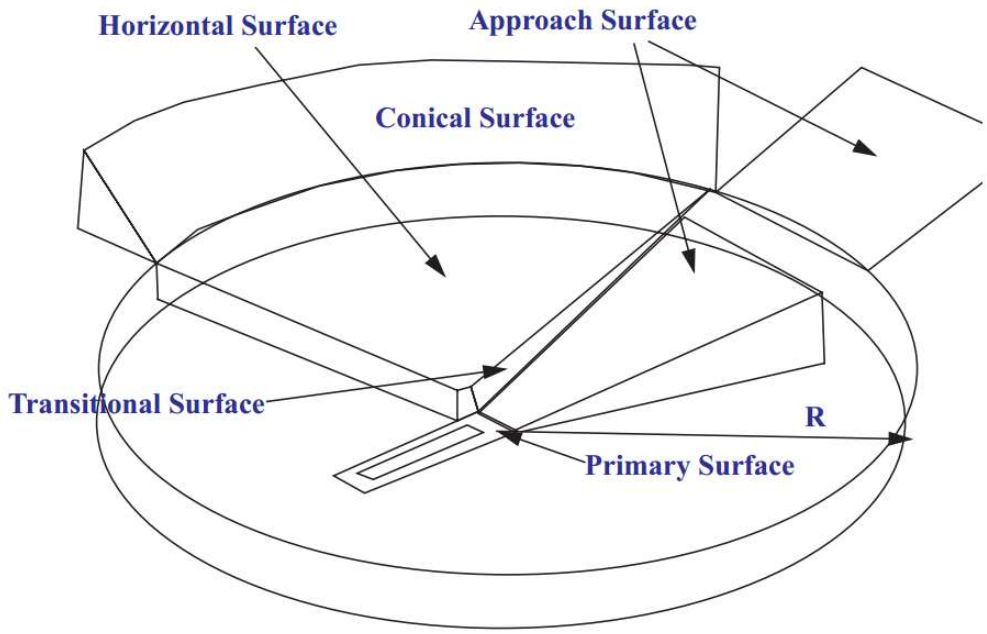
Part 77 Imaginary Surfaces

Guidance in 14 Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace* (Part 77) establishes standards for determining which structures pose potential obstructions to air navigation. This is accomplished through defining specific airspace areas around an airport that should not contain any protruding objects. These airspace areas are referred to as "Imaginary Surfaces." Trees, terrain, and permanent or temporary construction are examples of possible obstructions to these imaginary surfaces, such as those identified by the AGIS survey.

The imaginary surfaces outlined in Part 77, and illustrated in **Figure 1-9**, include the following:

- Primary Surface
- Approach Surface
- Transitional Surface
- Horizontal Surface
- Conical Surface

Figure 1-9. Part 77 Imaginary Surfaces



Source: FAA

Part 77 surface dimensions vary with the type of runway approach. Although the FAA can determine which structures are obstructions to air navigation, the FAA is not authorized to regulate tall structures. However, the FAA can undertake an aeronautical study to determine whether the structure in question

would be a hazard to air navigation. Despite the study results, there is no specific authorization in any statute that permits the FAA to limit structure heights or determine which structures should be lighted or marked. Instead, the FAA encourages local government to enact ordinances to protect imaginary surfaces. In every aeronautical study determination, the FAA acknowledges that state or local authorities have control over the appropriate use of property beneath an airport's airspace.

Part 77 surface definitions are as follows:

Primary Surface: The primary surface is longitudinally centered on a runway. When the runway has a hard surface, the primary surface extends 200 feet beyond each end of the runway. The width of a primary surface ranges from 250 feet to 1,000 feet, depending on the existing or planned approach and runway type (e.g., visual, non-precision, or precision).

Approach Surface: Longitudinally centered on the extended runway centerline, the approach surface extends outward and upward from the end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach. The approach slope of a runway is 20:1, 34:1, or 50:1, depending on the sophistication of the approach. FAA approach surfaces are 20:1 for visual approaches, 34:1 for non-precision approaches, and 50:1[6] for precision approaches.

Transitional Surface: Transitional surfaces extend outward and upward at right angles to the runway centerline, with the runway centerline extended at a slope of seven feet horizontally for each foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to where they intercept the horizontal surface at a height of 150 feet above the runway elevation. Transitional surfaces for those portions of the precision approach surface, which project through and beyond the limits of the conical surface, extend 5,000 feet horizontally from the edge of the approach surface and at right angles to the runway centerline.

Horizontal Surface: The horizontal surface is a horizontal plane located 150 feet above the established airport elevation, covering an area from the transitional surface to the conical surface. The perimeter is constructed by swinging arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those areas. For all approaches to runways supporting large aircraft, the radius of each arc used to construct the horizontal surface is 10,000 feet.

Conical Surface: The conical surface extends upward and outward from the periphery of the horizontal surface at a slope of one foot for every 20 feet (20:1) for a horizontal distance of 4,000 feet.

Subsequent chapters examine Part 77 surfaces for OGD and provide airspace drawings and AGIS information.

[6] Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet.

LAND USE AND ZONING

This section briefly reviews land use in the airport environs. While the majority of OGD is within the Ogden City limits, a portion of OGD's property within the perimeter fence is in Roy City limits. The Airport is bounded by Ogden City, Roy and Riverdale (**Figure 1-10**).

To protect the Airport environs from future development that is incompatible with airport operations, the City established an Airport Overlay Zone (AOZ). The AOZ, adopted in 2002, is based on FAA-defined airspace surfaces that surround OGD. While Ogden City adopted the AOZ, a multi-jurisdictional adoption is not complete. However, a recent meeting among the city mayors has revitalized an effort to complete the full AOZ adoption.

Figure 1-10: City Limits for Communities Adjacent to OGD



Source: http://www.mappery.com/maps/Lower-Weber-County-Street-Map.jpg

The City of Ogden requires all proposed construction and development within the AOZ be reviewed in accordance with Part 77 airspace surfaces, which is accomplished by submitting FAA Form 7460-1. The previous OGD planning study recommended to the City that the form be included as a building permit requirement for all land uses that fall under the AOZ for the cities of Ogden, Roy, and Riverdale.

In addition to the AOZ, the City established two primary Airport Zoning Districts for the airport property. **Figure 1-11** is the City's current zoning map which includes OGD and its Airport Commercial Zones (A-C) land use in light gray and Airport Industrial Zones (A-I) land use in dark gray. Definitions follow:

15-24-1: AIRPORT DISTRICT:

The "airport district" is defined as those properties that are within the area bordered by Hinckley Dr., 4400 South (south city boundary), the west city boundary adjacent to Roy City, and the east city boundary adjacent to Riverdale City. The area is centered about the Ogden-Hinckley airport and contains both public and private lands.

(Ord. 2002-24, 6-4-2002, eff. 6-16-2002)

15-24-2: AIRPORT DISTRICTS PURPOSE:

The purpose of each zoning category within the airport district is described below:

A. Airport Commercial Zone (A-C):

1. District Characteristics: This airport commercial zone is intended to protect and preserve prime lands within the airport district for high quality aeronautically related commercial development.

2. Purpose of District: The airport commercial zone provides for sales and services with access to the Ogden-Hinckley airport. It is intended that such sales and services be aeronautically related in nature, or support other aeronautical activities.

B. Airport Industrial Zone (A-I):

1. District Characteristics: The airport industrial zone is intended to protect and preserve lands within the airport district for limited aeronautically related industrial, research or manufacturing uses. The airport industrial zone is also intended to protect and preserve land for aeronautical uses such as airplane hangars, taxi lanes, fixed base operators, etc. The airport industrial zone may be established on airport district properties that are appropriate for limited aeronautically related industrial, research, or manufacturing uses, as well as properties that are appropriate for aeronautical uses in support of airport operations.

2. Purpose of District: The purpose is to accommodate a range of aeronautically related industrial uses that are of limited intensity, e.g., aeronautically related parts manufacturing and research

Figure 1-11: Ogden City Zoning

Ogden City Zoning Map

- O-1, Open Space
- R-1-10, Single-Family Residential
- R-1-8, Single-Family Residential
- R-1-6, Single-Family Residential
- R-1-5, Single-Family Residential
- R-2, Two-Family Residential
- R-2EC, Two-Family Residential East Central
- R-3, Multiple-Family Residential
- R-3/CO, Multiple-Family Residential Conditional Overlay
- R-3EC, Multiple-Family Residential East Central
- R-4, Multiple-Family Residential
- R-4/CO, Multiple-Family Residential Conditional Overlay
- R-5, Multiple-Family Residential
- RMH-1, Residential Manufactured Home Park
- PI, Professional/Institutional
- PI/CO, Professional/Institutional Conditional Overlay
- NC-1, Limited Scale Neighborhood Commercial
- NC-2, Expanded Scale Neighborhood Commercial
- C-1/CP-1, Neighborhood Commercial
- C-2/CP-2, Community Commercial
- C-2/CO, Community Commercial Conditional Overlay
- C-3/CP-3, Regional Commercial
- C-3/CO, Regional Commercial Conditional Overlay
- CBD, Central Business District
- CBD/CO CBD Conditional Overlay
- CBDI, CBD Intensive District
- MU, Mixed-Use
- CRC-1, Commercial Recreation
- BEH, Business Exchange Historical
- BEI, Business Exchange Industrial
- M-1, Limited Manufacturing
- M-2, Manufacturing and Industrial
- MRD, Manufacturing, Research and Development
- DDR, Defense Depot Reuse
- OCIP, Ogden Commercial and Industrial Park
- A-C, Airport Commercial
- A-I, Airport Industrial
- Accessory Dwelling Unit
- 12th Street Corridor
- Sensitive Area
- Airport Overlay
- Ogden City Boundary

0 1,000 2,000 4,000 6,000 8,000 Feet

N

Prepared by
Ogden City Planning
Updated February 2018

and development, and other aeronautical uses in support of airport operations, e.g., hangars, tie down areas, fixed base operators, etc. The uses should be aeronautical in nature, or support aeronautical activities, should not create hazards or emissions of noxious odors, smoke or noise, nor have exterior storage of materials or parts.

Most off-airport land uses are non-aeronautical, but two airport users are located off-airport with through-the-fence (TTF) access. Kemp Jet Services, one of the FBOs, has TTF aircraft access at the southern airport property boundary from their facilities to the airfield. Williams International, which develops and manufactures a range of turbine engines, has TTF pedestrian-only access at the northern airport boundary.

With the proximity of OGD to the Cities of Riverdale and Roy, zoning maps for both adjacent communities are reviewed as part of the planning study (**Figures 1-12 and 1-13**). Residential land use to the east and south of OGD are of particular interest since residential development may be sensitive to airport noise, which is further discussed in the environmental inventory. Also notable is the presence of schools near Runway 3 within the City of Roy. Presumably, this development occurred as the result of Utah State Law, which permits school districts and charter schools to violate any local jurisdiction's zoning. Once a multi-jurisdictional approval of the AOZ is achieved, future incompatible and noise-sensitive development may be avoided.

Figure 1-12: Riverdale Zoning Map

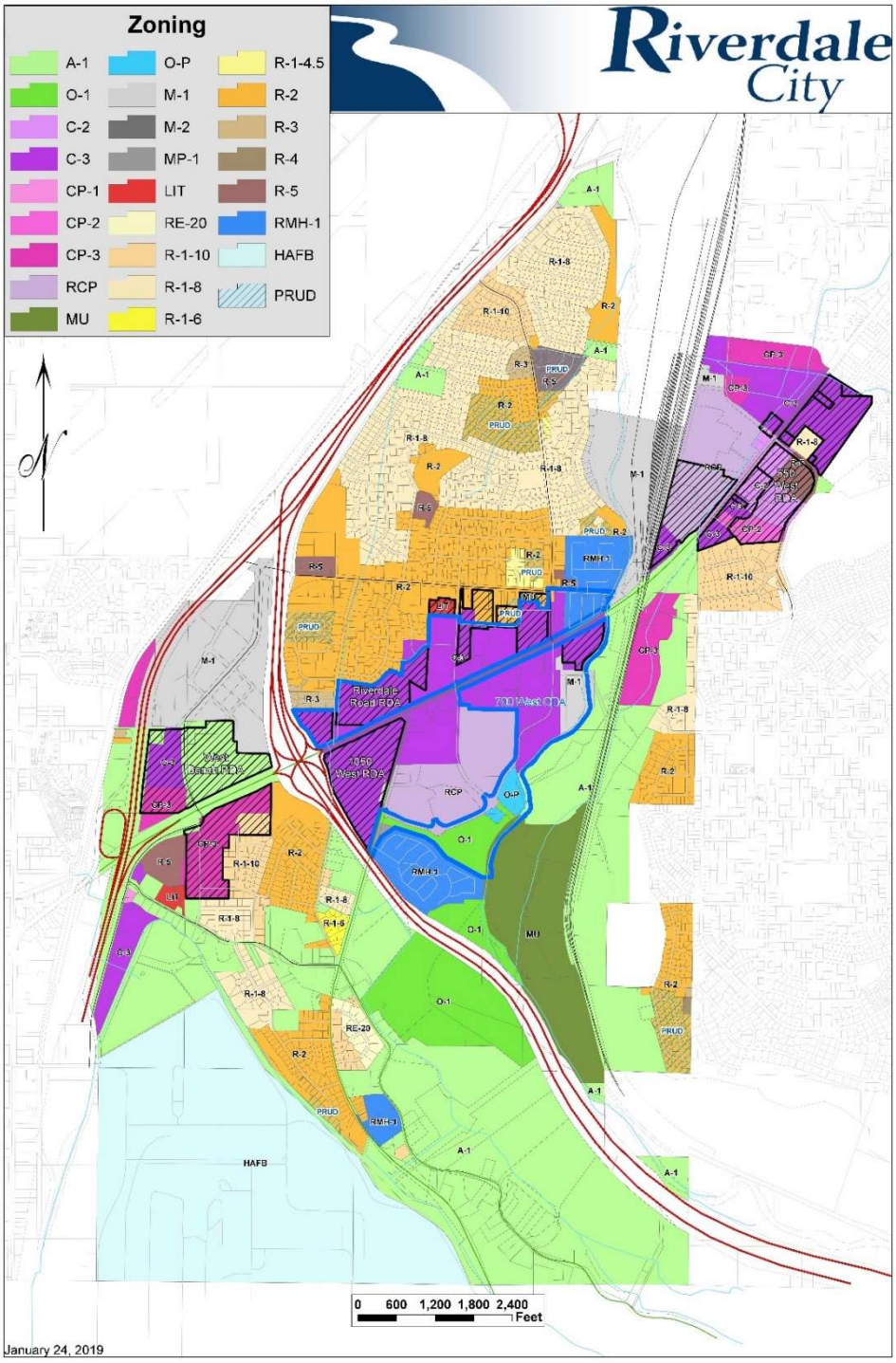
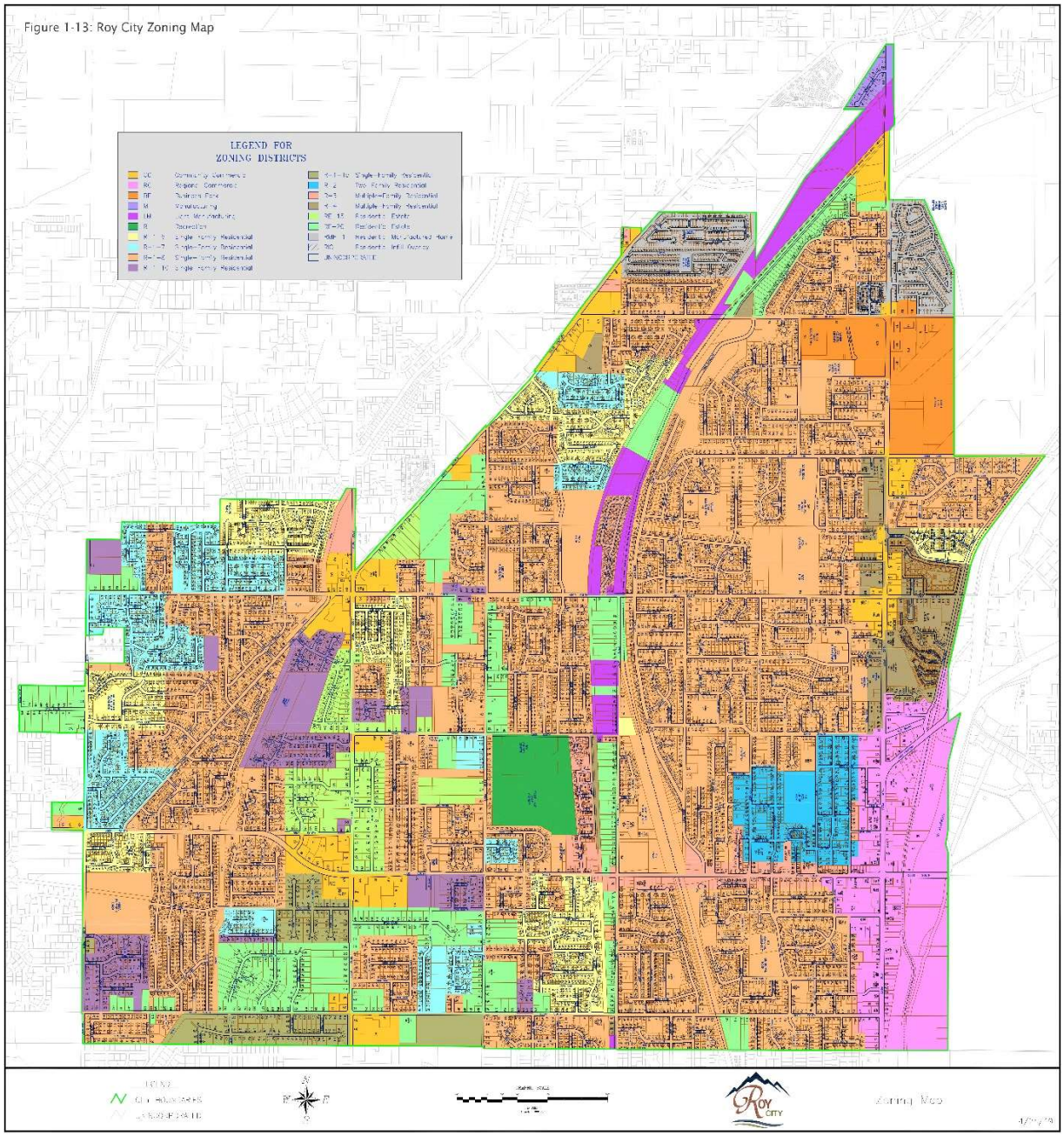


Figure 1-13: Roy City Zoning Map



ENVIRONMENTAL INVENTORY

As part of the master plan, a basic review of existing environmental conditions is completed. Environmental categories addressed are derived from two key FAA resources: *FAA Order 1050.1F, Environmental Impacts: Policies and Procedures,* and *FAA Order 5050.4B, National Environmental Policy Act: Implementing Instructions for Airport Actions.* Categories excluded from the environmental inventory are not applicable or not relevant at this point in the planning process. While this review of known environmental conditions is not intended to follow the NEPA process, the information serves as the first step in considering potential environmental concerns in future airport development.

A comprehensive environmental assessment (EA) was completed for OGD in 2012 to address potential environmental impacts associated with Allegiant Air beginning scheduled commercial air service using turbojets. Information contained in this section includes both newly gathered data as well as relevant data from the previous EA.

Air Quality

Six common air pollutants are considered harmful to the environment and to public health according to the Environmental Protection Agency (EPA):

- Carbon Monoxide
- Lead
- Nitrogen Dioxide
- Ozone
- Particulate Matter (PM 10) and (PM2.5)
- Sulfur Dioxide

The EPA has established National Ambient Air Quality Standards (NAAQS) for each of these pollutants, so geographic areas can be assessed to determine whether they meet the standards.

According to the Utah Department of Environmental Quality (DEQ), Ogden City has been designated a nonattainment area for one pollutant, PM10, because it does not meet NAAQS. The City has been classified as a maintenance area for Carbon Monoxide, which means they currently meet the NAAQS, but have a history of not meeting the standard.

Particulate matter (PM 10) is a mixture of materials that can include soot, metals, salt, and dust. Major sources include:

- Vehicles
- Wood-burning
- Wildfires or open burns

- Industry
- Dust from construction sites, landfills, gravels pits, agriculture, and open lands

Biological Resources

Protected species of concern in the project area are briefly reviewed as part of the data collection and inventory effort. A biological resources survey was not conducted as part of the master planning study. However, the U.S. Fish and Wildlife Service online database provides a list of endangered and threatened species by county. **Table 1D** lists four species and their status in Weber County to include two threatened species, one proposed threatened species, and one species in recovery, which was previously listed as endangered during the preparation of the 2012 Environmental Assessment for OGD.

Table 1D: Federal List of Endangered and Threatened Species in Weber County

	Common Name	Scientific Name	Status
Birds	Yellow-billed Cuckoo	Coccyzus americanus	Threatened
Mammals	Gray wolf	Canis lupus	Recovery
Mammals	Canada Lynx	Lynx canadensis	Threatened
Mammals	North American wolverine	Gulo gulo luscus	Proposed Threatened

Note: No plant species identified for Weber County, and no wildlife were identified as endangered.
Source: U.S. Fish and Wildlife Service

Although the above-listed species are known to occur in the county, further study is needed to assess the potential occurrence within the immediate airport environs.

In addition to the federal species listed above for Weber County, Utah also maintains its own list. The latest data available online is from 2017 (**Table 1E**).

As noted earlier in the chapter under *Security and Fencing*, OGD completed a Wildlife Hazard Management Plan (WHMP) in February 2019. Major wildlife attractants/habitats found on and within five miles of OGD were identified. Further, the most hazardous wildlife expected at OGD were listed, but the list did not include any endangered or threatened species.

Table 1E: Utah Species of Concern List for Weber County

Common Name	Scientific Name	State Status
American White Pelican	Pelecanus erythrorhynchos	SPC
Bald Eagle	Haliaeetus leucocephalus	SPC
Bluehead Sucker	Catostomus discobolus	CS
Bobolink	Dolichonyx oryzivorus	SPC
Bonneville Cutthroat Trout	Oncorhynchus clarkii utah	CS
Burrowing Owl	Athene cunicularia	SPC
Columbia Spotted Frog	Rana luteiventris	CS
Desert Mountainsnail	Oreohelix peripherica	SPC
Grasshopper Sparrow	Ammodramus savannarum	SPC
Gray Wolf	Canis lupus	S-ESA
Greater Sage-grouse	Centrocercus urophasianus	SPC
June Sucker – Introduced	Chasmistes liorus	S-ESA
Kit Fox	Vulpes macrotis	SPC
Lewis's Woodpecker	Melanerpes lewis	SPC
Long-billed Curlew	Numenius americanus	SPC
Lyrate Mountainsnail	Oreohelix haydeni	SPC
Northern Goshawk	Accipiter gentilis	CS
Columbian Sharp-tailed Grouse	Tympanuchus phasianellus columbianus	SPC
Short-eared Owl	Asio flammeus	SPC
Smooth Greensnake	Opheodrys vernalis	SPC
Townsend's Big-eared Bat	Corynorhinus townsendii	SPC
Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis	S-ESA

Website Data Disclaimer: This list was compiled using known species occurrences and species observations from the Utah Natural Heritage Program's Biodiversity Tracking and Conservation System (BIOTICS); other species of special concern likely occur in Utah Counties. This list includes both current and historic records. (Last updated on November 1, 2017).
Notes: S-ESA = Federally listed or candidate species under the Endangered Species Act. SPC = Wildlife species of concern.
CS = Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing.

Department of Transportation Act Section 4(f)

The Department of Transportation Act, Section 4(f) deals with the protection of parks, recreation areas, wildlife and waterfowl refuges, and historic sites. Use of such land is prohibited "…unless there is no feasible and prudent alternative to that use and the action includes all possible planning to minimize harm to the property."

The City has over 40 parks, but none are adjacent to the Airport. Also, the 2012 EA for OGD found no potential impacts to Section 4(f) resources.

Farmlands

The Farmland Protection Policy Act (FPPA) defines farmland as "prime or unique land as determined by the participating state or unit of local government and considered to be of statewide or local importance." As indicated in the 2012 EA for OGD, there are no areas designated as prime, unique or statewide and locally important farmland at or immediately adjacent to OGD.

Hazardous Materials, Pollution Prevention, and Solid Waste

There are many statutes and regulations that govern hazardous material, solid waste, and pollution prevention. The two most significant, as they relate to airports, are the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Resource Conservation and Recovery Act (RCRA).

CERCLA establishes liability for cleanup costs associated with hazardous substance releases. RCRA created guidelines for hazardous waste and non-hazardous solid waste management.

When evaluating hazardous waste impacts, there should be a review of existing contaminated sites at or in the vicinity of the airport. Existing National Priority List (NPL) sites and cleanup sites are shown in Table 1F.

Table 1F: NPL Sites

Site Name	NPL Status	Distance and direction from OGD	Notes
Ogden Defense Depot	Final NPL	6.3 NE	Contaminated Groundwater Migration Under Control
Hill Air Force Base	Final NPL	7.8 SE	Contaminated Groundwater Migration under Control

Source: epa.gov

In addition to the above-mentioned NPL sites, EPA's website lists two EPA cleanup sites in the vicinity of the airport:

- Ogden Swift Building – This building is owned by the City of Ogden. It has gone through many uses, but most recently was leased to a chemical manufacturer. The EPA is currently conducting a removal of the hazardous materials. This site is located four miles northeast of the airport.
- Roy Abandoned Chemicals – This site contained numerous abandoned chemical containers. The EPA is coordinating the cleanup of this site. This site is located directly west of the airport.

There are three solid waste or recycling facilities in Weber County. The Weber County Transfer Station serves as a transfer station, household hazardous waste facility, green waste facility, construction and demolition (C&D) landfill, and landfill gas to energy project. The Recycled Earth facility converts commercial, residential construction and demolition waste into reusable products. The Green Waste Disposal site accepts natural waste such as brush, leaves, grass, and small tree branches.

Historical, Architectural, Archeological, and Cultural Resources

A cultural resources survey (CRS) at OGD was conducted concurrently with the master planning study. The FAA completed their review of the CRS scope in early July 2019, the archaeological survey was conducted between 09/12/2019 and 09/24/2019, and the draft report[7] was published in October 2019.

According to the technical report, two archaeological sites and seven isolated occurrences (IOs) were identified during the pedestrian cultural resources inventory. The first archaeological site includes previously unrecorded features of the Ogden-Hinckley Airport, which includes one cinder block storage facility, several frontage roads of unknown age, a decommissioned taxiway, and seven isolated artifacts. The second site includes two newly recorded segments of the Davis-Weber Canal.

Additionally, the environmental consultant is completing a review of various eastside properties with potential historical significance: Terminal Building, Hangar S-755 and other hangars proposed for redevelopment.

Natural Resources and Energy Supply

As part of the airport planning and development process, the potential impact on energy and natural resources are considered. The analysis is primarily associated with aircraft, motor and ground support vehicles, and airfield lighting. There are no current issues with the natural resource and energy supply needs of OGD. While no significant impacts are anticipated with future development, any issues or concerns with the proposed development alternatives presented later in the study are identified in the master plan or future environmental studies.

[7] Cultural Resource Survey (CRS) was completed by Desert West Environmental. Except for sensitive information that should not be distributed, the final report is included in the master plan appendices.

Noise and Compatible Land Use

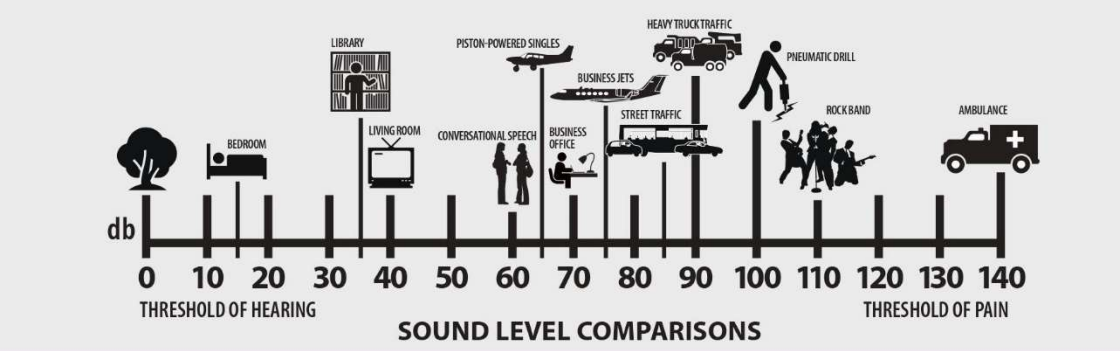
Noise caused by aircraft operations is typically the primary airport-related environmental issue for the public. Even moderate noise exposure can raise concerns, particularly in more quiet rural areas that don't have the ambient noise that cities do. Consequently, compatible land use development in the airport environs is important to minimize noise impacts.

For purposes of noise analysis, the yearly Day-Night Level (DNL) is used as the measure of an individual's exposure to noise. Sound is averaged over a 24- hour period with nighttime operations weighted more.

Noise-sensitive areas are areas where noise disrupts normal activities. Residential, educational, health and religious uses are all considered noise sensitive uses. Parks, recreation areas, wild areas, wildlife refuges, and cultural and historic areas are also noise sensitive. The Aviation Environmental Design Tool (AEDT) provides noise exposure contours at varying levels, usually including at least DNL 65, 70 and 75 dB levels. These results can then be compared to the values in 14 CFR Part 150, *Airport Noise Compatibility Planning,* which shows land use types ranging from the most sensitive, such as residential, to less sensitive uses such as manufacturing, and the compatibility of those land uses in each dB level of noise.

In **Figure 1-13**, sound levels for a variety of noise sources at varying decibel (dB) levels, from 0 to 140, is compared.

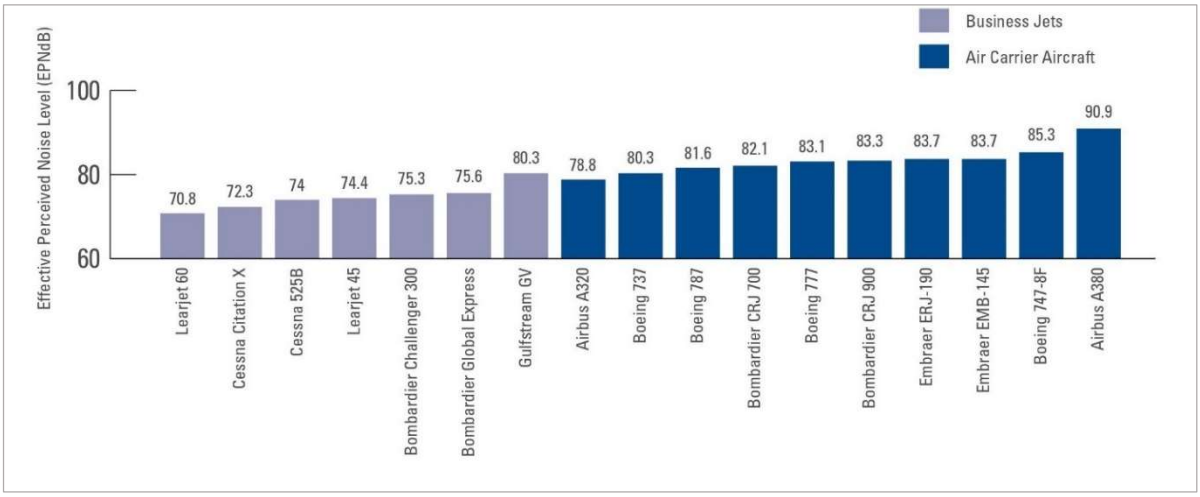
Figure 1-13: Sound Level Comparisons



Source: AOPA's Guide to Airport Noise and Compatible Land Use

Used for aircraft certification, Effective Perceived Noise Level (EPNdB) is another noise measurement and applies to an individual aircraft and not the noise exposure from an airport. It measures the relative noise from an aircraft's pass-by event. **Figure 1-14** depicts the EPNdB from various types of aircraft ranging from small business jets to large commercial jets. Generally, commercial jet operations have a higher EPNdB than non-commercial aircraft.

Figure 1-14: Aircraft Noise Comparison Chart



Source: NBAA Airports Handbook and FAA AC 36-1H

To lessen impacts from noise, there are measures the sponsor can do to help mitigate the problems, including:

- acquire land, easements, or development rights in noise sensitive areas
- develop aircraft traffic patterns and runway use which will avoid areas of impact
- provide sound installation for residences in impacted areas
- install noise barriers or use landscaping to shield areas from ground level noise

To date, a Part 150 study has not been prepared for OGD, which would include the preparation of noise exposure maps with a set of recommended measures in a noise compatibility program to reduce noise and incompatible land uses. However, noise contours prepared for OGD as part of the master plan study are included in the ALP drawings. Also notable is that preliminary information suggests that Hill Air Force Base aircraft noise, which is more significant than OGD, may be impacting the south end of OGD.

Coordination with appropriate jurisdictions to develop good land use plans is the most important step airport sponsors can take to be proactive. Airports receiving federal funding have an obligation to take action whenever possible to adopt zoning and planning regulations that will ensure compatible uses around the airport.

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

These three impact categories are not applicable to the OGD environmental inventory but may be relevant to future airport development.

Socioeconomics

As the name suggests, socioeconomic impacts include those impacts that are either social or economic in nature and may include factors such as changes in population, impacts to housing, the need to relocate or displace people, changes in employment and transportation patterns, and impacts to the community such as a change in the local tax base.

A baseline analysis of current socioeconomic conditions should first be completed to allow for a comparison with the impacts associated with the proposed action. An example of baseline data to collect includes current economic activity and income, employment, population and housing, existing public services, and current social conditions.

One of the primary impacts related to socioeconomics is relocation and displacement of people and businesses. The Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970 contains provisions that must be followed if relocation occurs due to a proposed action that involves Federal funding.

Environmental Justice

Environmental justice, as it relates to development and implementation of environmental laws, regulations and policies, is defined as giving fair treatment and providing for meaningful involvement of all people regardless of race, color, national origin, or income.

Fair treatment means that no group of people should experience a larger share of the negative impacts from those policies. Meaningful involvement allows all people to have an opportunity to have a part in the decision-making and given the chance to influence the decision regarding such policies. Decision makers should insure this by seeking out and promoting the involvement of those groups of people potentially affected.

There are several laws and other guidance that pertain to environmental justice, including Title VI of the Civil Rights Act of 1964, and DOT Order 5610.2(a), Environmental Justice in Minority and Low-Income.

Factors to consider when examining impacts for environmental justice are those that would cause a higher relative proportion of impacts to an environmental justice population. This may include impacts in other environmental categories that may not, in themselves, be significant, but may be significant when considered specifically for environmental justice issues. Other impacts may be those impacts to the physical or natural environment that may be unique to the environmental population.

Children's Environmental Health and Safety Risks

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, directs Federal agencies to examine actions for risks that may specifically affect children.

The following areas of impact have been identified by the Task Force on Environmental Health Risks and Safety Risks to Children, as needing analysis: 1) asthma, 2) unintentional injuries, 3) developmental disorder, including lead poisoning, and 4) cancer.

It is important to treat the impacts to children separately since children may be more susceptible to environmental hazards and experience higher levels of adverse effects compared to adults with the same exposure.

Visual Effects

OGD airfield lighting systems, which are necessary for safe and efficient operations, include HIRL and MIRL systems, runway approach lighting, REIL systems, PAPI systems, and a rotating beacon. Other airport area lighting includes aircraft ramp areas and auto parking areas for security. Airport lighting may disturb sensitive land uses such as residential areas.

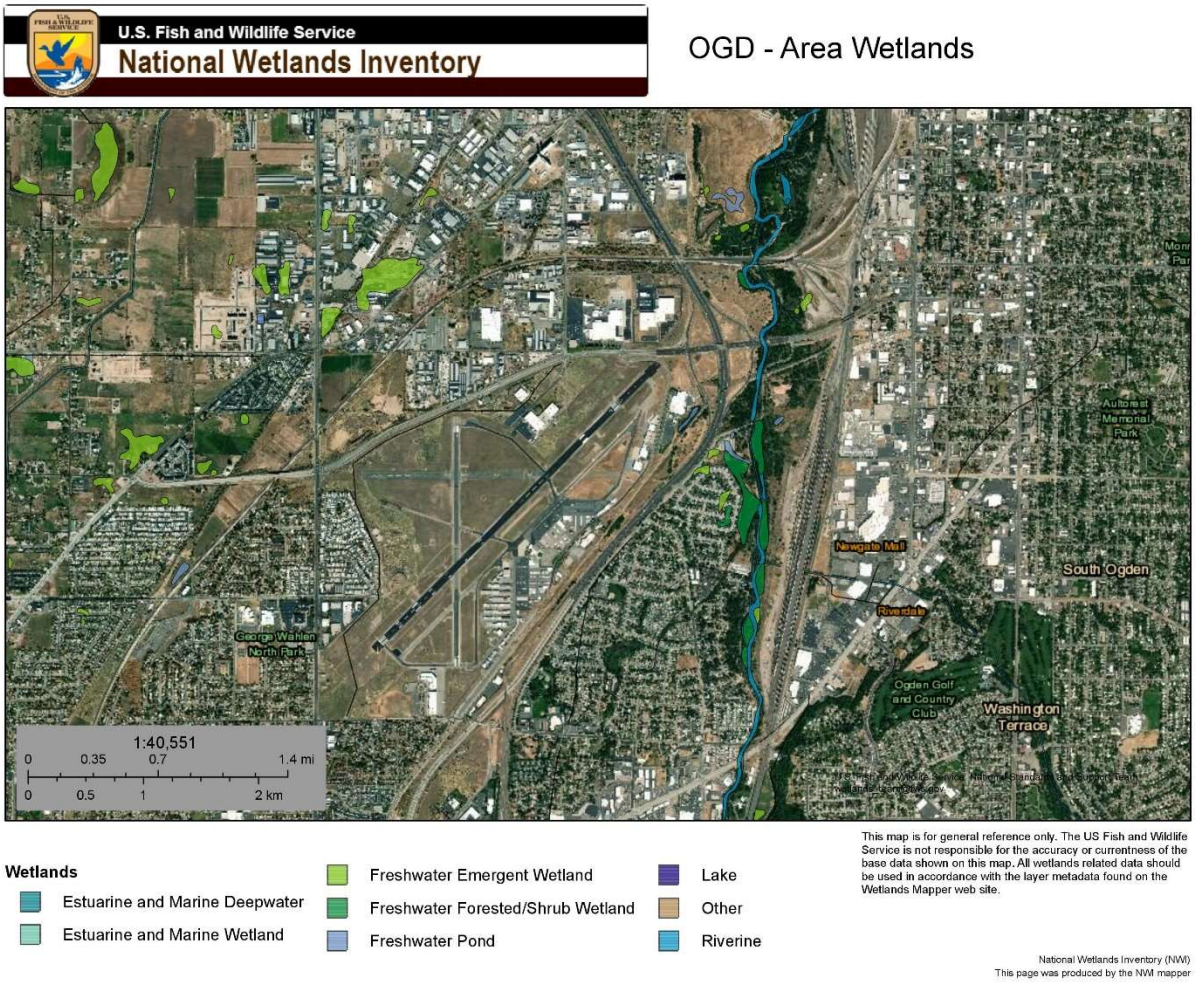
While OGD lighting is not presently an issue for neighboring land uses, future development that includes additional light emissions will consider impacts on sensitive land uses.

Water Resources

Wetlands

The 2012 EA pointed out that there are no wetlands on or in the immediate vicinity of OGD. A national wetland inventory map derived from the USFWS depicts wetlands in the region (**Figure 1-15**). Executive Order 11990, *Protection of Wetlands*, defines 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 vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction." Federal agencies are required to avoid, minimize, and/or mitigate the destruction, loss, or degradation of wetlands.

Figure 1-15: OGD Area Wetlands



Floodplains

Floodplains are the lowlands and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, at a minimum, that are prone to the 100-year flood. All airport development should avoid floodplains if another development option is available. This is required by Executive Order 11988, Floodplains, and the U.S. Department of Transportation (DOT) Order 5650.2, Floodplain Management and Protection. If a practicable alternative to development is unavailable, floodplain impacts should be minimized including potential risks to property loss and impacts on human safety, health, and welfare.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), there are no special flood hazard areas on the Airport.

Surface Waters

Surface waters include streams, rivers, lakes, ponds, estuaries, and oceans. There are several statutes and regulations that are important in the protection of surface water. The Clean Water Act (CWA) is one of the most significant, as it regulates the discharge of pollutants into waters of the U.S. Specific sections of the CWA that apply are Section 303(d), Section 404, Section 401, and Section 402, which established the National Pollutant Discharge Elimination System (NPDES).

Coordination with the U.S. Fish and Wildlife Service (USFWS) and other agencies may be necessary when proposed projects result in the modification of a water body. In addition to Federal regulations there may be State and local regulations regarding surface waters.

Examples of potential impacts to surface waters include construction related impacts, indirect impacts such as sedimentation or oil spills, and increased runoff caused by creating more impermeable surfaces.

Groundwater

Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The geologic layers that store or transmit groundwater is called the aquifer.

The Safe Drinking Water Act (SDWA) is the primary statute governing activities that affect groundwater. This act prohibits actions that are Federally funded if they would contaminate an EPA-designated sole source aquifer (SSA) or its recharge area. An SSA is one that is the sole or main source of drinking water for an area.

Impacts that may occur to groundwater from a proposed action include oil spills from construction that could reach groundwater, withdrawal of groundwater to an extent that groundwater levels may be affected and creating new impervious surfaces that might impede infiltration by acting as a barrier.

A significance threshold for groundwater may exist if the action would exceed groundwater quality standards established by the governing agencies, or contamination of an aquifer to the extent that the public water supply and public health is affected.

Scenic Rivers

According to the National Wild and Scenic Rivers System data, Utah has nearly 82,000 miles of river, but only 169.3 miles are designated as wild and scenic. There are no wild and scenic rivers near the Ogden-Hinckley Airport.

Chapter 2

Forecasts



CHAPTER 2 - FORECASTS

INTRODUCTION

Aviation demand forecasts help develop an airport's capital improvement plan. They help by estimating future activity levels that assist in estimating the timing and size of needed improvements.

The following components of aviation demand—identified in FAA airport master planning guidance— are projected for OGD in this chapter:

- Passengers – travelers on commercial airline service
- Cargo – freight and mail carried on all-cargo aircraft and in the bellies of passenger airlines (scheduled and non-scheduled)
- General Aviation (Based Aircraft) – a based aircraft is one that spends most of its time at the airport
- Aircraft Operations – an operation is a takeoff or a landing; a "touch-and-go" counts as two operations
- Peaking Characteristics – timeframes when airport activities reach high levels and require the greatest facility capacity since seasonal and time-of-day variations in demand may occur
- Instrument Demand – level of aircraft operations conducted under instrument, rather than visual, flight rules; instrument demand typically correlates with higher performance aircraft use
- Design Aircraft and Airport Reference Code – most demanding aircraft or family of aircraft using an airport, which drives airfield dimensions and separation standards

Forecasting Process

The base year for Ogden-Hinckley Airport's forecasts is 2017 or 2018, depending on the availability of data. In some cases, the FAA tracks Fiscal Year (FY) instead of calendar year (CY). The federal fiscal year is October 1 through September 30.

Forecasts project 20 years into the future, with short-term (2023), intermediate-term (2028), and long-term (2038) forecast milestones defined. Several different models of forecasting are employed, including trend models that look at historical data and project that historical trends will continue. Correlation with socioeconomic factors are analyzed, as are forecasts prepared by the FAA and aviation industry groups.

Frankly, forecasts are "best guesses." Aviation demand fluctuates from year to year and does not grow or decline in a straight line. Consequently, activity levels need to be monitored over time, and demand forecasts should be updated periodically when actual activity deviates substantially from forecast activity. The FAA reviews forecasts and depends on studies such as master plans to provide justification for

forecasts. The FAA's Terminal Area Forecasts[1] (TAF) are annual projections of aviation demand at over 3,300 airports. Some of the TAF projections are adopted from airport master plans or similar studies, although most are based on the FAA's own analysis. If an airport master plan forecast differs from the TAF by more than 10% within the first five years, FAA Headquarters must approve the forecast before the master plan can proceed with developing facility requirements based on the forecast.[2]

The Airport's Role

An airport's role within the national system of airports is important for many reasons, including the tie between roles and funding levels within the Airport Improvement Program (AIP). The National Plan of Integrated Airport Systems (NPIAS) groups airports into two major categories: primary and nonprimary. Primary airports are "public airports receiving scheduled air service with 10,000 or more enplaned passengers per year."[3] Since Allegiant Airlines' first full year of service in 2013, Ogden-Hinckley has been a primary airport. The NPIAS further subdivides primary airports into large hub, medium hub, small hub, and nonhub categories. Ogden-Hinckley is a nonhub airport, since it enplanes less than 0.05% of all enplanements in the country.

For the Airport to graduate to the small hub primary category, it would need a more than 20-fold increase in passenger enplanements. If OGD were to lose commercial service or if the annual enplanements were to fall below 10,000, the NPIAS would consider it a nonprimary airport. Nonprimary airports are considered national, regional, or local. If passenger enplanements fell below 10,000, OGD would be considered a national or regional primary airport.

The Airport's current role within the state, as defined by the Utah Continuous Airport System Plan (2007), is General Aviation Regional Airport. A General Aviation Regional Airport primarily serves general aviation activity, including jet and multi-engine aircraft, and provides access to major population centers. Since that Plan was published in 2007, OGD has obtained commercial passenger service. However, it does not have a "high" level of commercial service activity, which would elevate it to the Utah system plan's National Airport category.

The forecasts in this chapter are consistent with Ogden-Hinckley Airport's current national and state roles.

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[1] The most recent when this chapter was written was *FAA Terminal Area Forecasts*, released January 2018. Information from the February 2019 release of the *Terminal Area Forecasts* is footnoted in this chapter.

[2] The FAA approved the forecasts on August 21, 2019, several months after the forecast was prepared. For the readers' information, this chapter notes some updated actual activity numbers that became available after the forecast was submitted for approval.

[3] *Report to Congress National Plan of Integrated Airport Systems (NPIAS) 2019 – 2023*.

INFLUENTIAL TRENDS

Important trends that influence aviation demand at OGD include aviation industry and socioeconomic trends.

National, state, regional, and local aviation trends are described in this chapter with the major forecast components (passengers, cargo, and general aviation), because different segments of aviation experience different trends. The FAA is the primary source of information about aviation trends in its annual Aerospace Forecast[4] and the TAF. Other aviation industry sources, such as the General Aviation Aircraft Manufacturers Association (GAMA), provide trend information.

Aviation demand is largely determined by socioeconomic factors within an airport's service[5] area. For a general aviation airport, the service area is typically a half-hour's drive, or about 25 miles. For scheduled commercial passenger and cargo service, the service area may be larger. For the relatively low level of passenger and cargo service the Airport has now, and for the general aviation activity that dominates Airport traffic, the service area is roughly the same as the Ogden-Clearfield Metropolitan Statistical Area (MSA). This MSA consists of Box Elder, Davis, Morgan, and Weber Counties. While most of Box Elder and Morgan Counties lie beyond a 25-mile drive from OGD, these two counties are lightly populated compared to Weber and Davis Counties, and their most densely populated areas are closest to Ogden. As of the last Census estimate, the Ogden-Clearfield MSA contains 665,357 people, or 21% of Utah's population (3,101,833). The four counties' shares of the total MSA population appear in **Table 2A**.

Table 2A: Ogden-Clearfield Metropolitan Statistical Area Population

County	Population	Share of MSA
Box Elder	54,079	8%
Davis	347,637	52%
Morgan	11,872	2%
Weber	251,769	38%
Total	665,357	100%

Source: US Census Bureau, July 1, 2017 Estimates

[4] Most recently, *FAA Aerospace Forecast Fiscal Years 2018 – 2038*, released March 2018. It projects overall national demand, not demand for individual airports.
[5] Service area might also be called a market, trade, or catchment area.

The economy in the MSA is strong and diversified. Unemployment in Utah is lower than the national average. As shown in **Table 2B**, the unemployment rate in three of the four MSA counties is lower than the state rate.

Table 2B: Unemployment Rate Comparison

	Unemployment Rate
United States	3.7%
Utah	3.2%
Box Elder County	3.0%
Davis County	3.0%
Morgan County	2.8%
Weber County	3.4%

Source: Utah Department of Workforce Services, data as of November 2018

Government is the largest industry sector in the MSA, with Hill Air Force Base and the regional Internal Revenue Service office being major government employers. As of mid-2018, Government accounted for 22% of nonfarm employment in Davis County and 19% in Weber County. Trade/ Transportation/ Utilities was the second largest sector in these two counties, accounting for 18% of nonfarm employment in both. The top two industry sectors in Box Elder County are Manufacturing and Trade/ Transportation/ Utilities, and in Morgan County they are Government and Construction.

According to Ogden's Community Profile, "the community offers all the advantages of a major metropolitan area, while maintaining a low cost of business and living, high quality of life, and unparalleled access to the outdoors...Ogden is home to a sizeable and well-educated labor force." In 2018, CNBC ranked Ogden as the country's 12th best boomtown and WalletHub ranked Ogden the 7th best small city for starting a business. In 2016, Forbes Magazine ranked the Ogden-Clearfield MSA as the 8th best place for business and careers, the 6th fastest growing city, and the 2nd best place to raise a family in the US. That same year, the Brookings Institute found Ogden had the 14th highest share of advanced industry employees.

The Ogden-Weber Economic Development Department highlights strength in four industry clusters:

- Aerospace & Advanced Manufacturing accounts for 6,831 jobs, with job concentration 2.22 times the national job concentration.
- Outdoor Products accounts for 2,933 jobs, a 34% increase in five years, compared with 9% growth nationwide.

- Information Technology/Software grew 20.1% from 2012 to 2017 and employs 5,789.
- Life Sciences, with 4,609 jobs, grew 9% in five years, compared to national growth of 6%. Fresenius USA Manufacturing, with over 1,000 jobs, is the largest employer in this sector.

Several ongoing economic development opportunities for Ogden-Hinckley Airport relate to the major government employer, Hill Air Force Base (AFB). Hill AFB, located 2 miles from OGD, employs 5,788 military personnel and 16,300 civilians.[6] The largest opportunity for the Airport now relates to the US Air Force's replacement of F-16 fighter jets with F-35A fighter jets, and the fact that Hill AFB is home to the Ogden Air Logistics Complex, the worldwide manager for a wide range of military aircraft. As Maintenance-Repair-Overhaul (MRO) activity changes to focus on the F-35A, Hill has issued a request for proposals to perform MRO for the F-16 off-base. Ogden-Hinckley has an airfield and airport facilities capable of handling this workload and is located near a workforce of experienced F-16 mechanics, supporting strong optimism that the Airport will experience a big increase in aircraft MRO soon. While no longer sold to the US Air Force, thousands of F-16s remain in the US fleet and in some 25 foreign military fleets. Based on MRO opportunities, Borsight, an advanced avionics company located at the Airport, has recently expanded and plans to build more large hangars to support new work on KC-135 and C-130 military aircraft that is expected to double its revenue.[7] Facilities capable of handling military aircraft MRO are also capable of handling commercial aircraft MRO. MRO businesses will likely want to diversify their customer base to include both civilian and military customers.

The Ogden-Clearfield MSA's economic history and outlook are positive, as shown in **Table 2C**, which presents a variety of socioeconomic indicators for the MSA. The table's source is Woods & Poole Economics, an independent firm that collects and projects demographic and economic data for US states, regions, and counties. Historical data in Table 2C goes back 20 years and is shown in five-year increments. Future milestone years match the aviation demand forecast years; 2023 is the short-term (five-year) future; 2028 is the mid-term (ten-year) future; and 2038 is the long-term (20-year) future.

Although growth was slower, or even slightly negative, in the five-year period following 2008's recession, Table 2C shows that the population and most economic factors have been growing over the last 20 years. In the next 20 years, the forecast is for continued growth.

[6] Hill Air Force Base Economic Impact Statement released January 2019. In addition to military personnel and civilian workers, Hill has 3,621 military dependents. The Statement found Hill Air Force Base had a $3.6 billion impact on the Utah economy in 2018.

[7] According to "Borsight Expands Ogden, Utah, Hangar Hub," *Area Development News*, March 13, 2018, "Borsight will invest an estimated $6.3 million to expand its…hangar facility…The company plans to add up to 95 associates during the next seven years…hangar space will be sized for large aircraft such as USAF KC-135 Aerial Refueling Aircraft and commercial Boeing 737s."

How do socioeconomic forecasts for the Ogden-Hinckley MSA compare to national socioeconomic forecasts?

The 20-year MSA population growth rate, 1.4%, is twice the 0.7% annual growth rate the US Census Bureau projects for the US population.

Table 2C: Historical and Forecast Socioeconomic Factors for Ogden-Clearfield MSA

Year	Total Population	Total Employment	Per Capita Income (2009 $)	Economics Wealth Index (U.S. = 100)	Gross Regional Product (millions of 2009 $)	Retail Sales Per Household (2009 $)
1998	470,206	248,406	28,251	89.01	13,857.53	36,399
2003	513,021	267,175	31,001	89.50	16,676.90	35,702
2008	577,040	310,632	33,619	87.79	19,352.24	37,313
2013	622,371	315,533	32,801	85.01	20,068.27	36,188
2018	673,856	362,975	37,044	86.04	23,900.18	38,572
2023	726,189	395,458	39,467	86.09	26,450.22	39,348
2028	781,810	428,240	41,708	86.08	29,126.98	40,355
2038	896,890	491,330	45,080	85.91	34,656.67	42,502
Historical Average Annual Growth						
1998-2003	1.8%	1.5%	1.9%	0.1%	3.8%	-0.4%
2003-2008	2.4%	3.1%	1.6%	-0.4%	3.0%	0.9%
2008-2013	1.5%	0.3%	-0.5%	-0.6%	0.7%	-0.6%
2013-2018	1.6%	2.8%	2.5%	0.2%	3.6%	1.3%
Projected Average Annual Growth						
2018-2023	1.5%	1.7%	1.3%	0.0%	2.0%	0.4%
2023-2028	1.5%	1.6%	1.1%	0.0%	1.9%	0.5%
2028-2038	1.4%	1.4%	0.8%	0.0%	1.8%	0.5%

Source: Woods & Poole Economics

IHS Global Insight provided the economic projections used for the FAA's Aerospace Forecast for 2038. The 20-year average annual growth rates IHS Global Insight projected follow:

- Real Gross Domestic Product 2.0%
- Real Personal Consumption Expenditure per Capita 1.5%
- Consumer Price Index 2.4%
- Refiners' Acquisition Cost Average[8] 4.2%

The gross regional product growth for Ogden-Clearfield MSA is similar to, although slightly lower than, the national projection, 1.8% compared to 2.0%. The lower growth in MSA per capita income (0.8%) compared to national per capita expenditure (1.5%) is likely due to the difference in income vs. expenditure and to larger household size (3.14 persons per household in Utah compared to 2.63 in the whole US).

PASSENGER TRENDS AND FORECASTS

The FAA uses enplaned passenger counts to determine entitlement funding for airports with commercial service. Consequently, enplaned passengers are projected in this master plan. Of course, airport facilities such as terminal buildings and vehicle parking are needed for deplaning as well as enplaning passengers.

Since the recession that ended in 2009, the U.S. airline industry has transformed itself from a highly cyclical, capital intensive industry to one that can generate sustained profits. The airlines have minimized losses by lowering operating costs, eliminating unprofitable routes, and grounding older airplanes. They initiated new services that customers were willing to pay for and started to charge separately for services that used to be included in ticket prices.

Nationwide, the airlines posted profits for the ninth consecutive year in 2018. Comparing 2017 to 2016, yields9 increased a low 0.1 percent in the U.S. market. This was due to rising energy and labor costs and to competition from ultra-low-cost carriers such as Allegiant Airlines keeping a lid on airfare increases. In 2018, system yields grew for the first time since 2014.

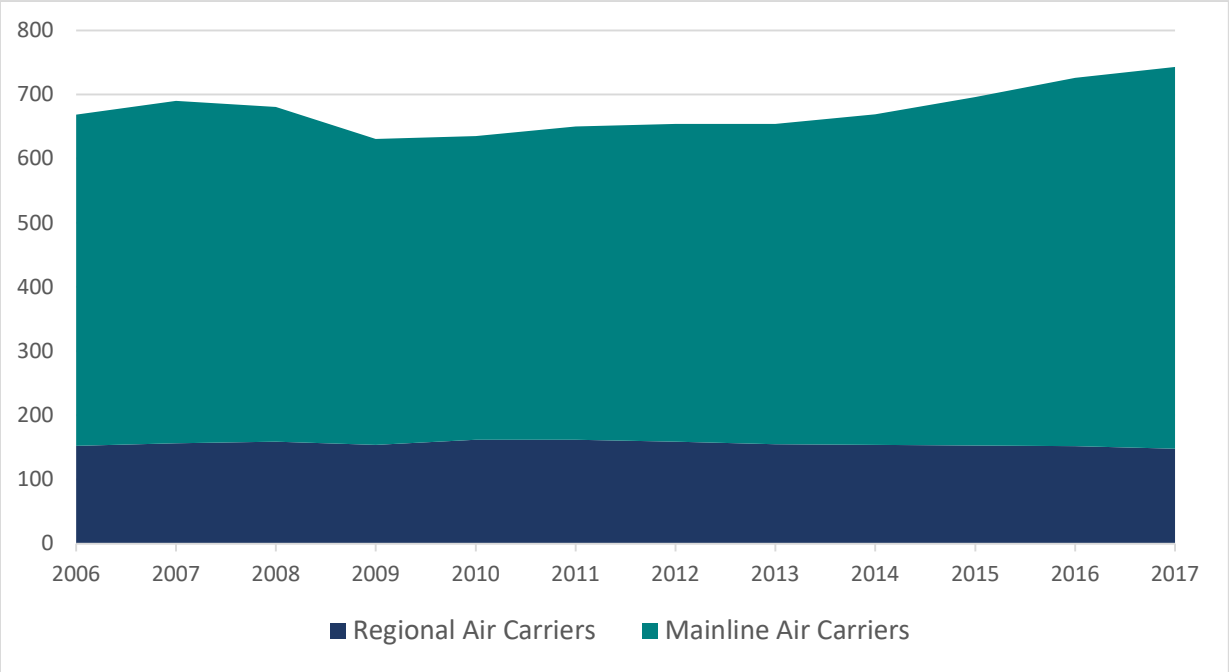
[8] The cost of oil is significant to the American economy in general, but particularly affects the level of discretionary flying. In mid-2008, market speculation caused the price of crude oil to spike above $140 per barrel. As this is written, the price of crude oil is historically low ($50 - $60 per barrel). IHS Global Insight projected little change through 2019 due to supply growth but anticipated the price would rise in subsequent years due to growing global demand and higher extraction costs. Refiners' acquisition cost was projected to surpass $100 per barrel in 2030 and reach $119 in 2038.

[9] Yield is the average fare per passenger per mile.

Figure 2-1 shows historical numbers of domestic passenger enplanements in the US since 2006. After reaching 690 million in 2007, the recession caused the number to dip to under 631 million in 2009. Passenger numbers rose to a plateau of 654 million in 2012 and 2013, before increasing to over 700 million. The proportion of passengers on regional (commuter) carriers instead of mainline carriers has declined from 34% in 2010 to 25% in 2018.

The latest FAA national forecast used when OGD's forecast was prepared expected U.S. airline passenger growth to average 1.9% per year through 2038; the more recent FAA forecast expects 1.8% annual growth through 2039. Long-term, the FAA expects "a competitive and profitable aviation industry characterized by increasing demand for air travel and airfares growing more slowly than inflation, reflecting …a growing U.S. and global economy."

Figure 2-1: US Domestic Passenger Enplanements (millions)



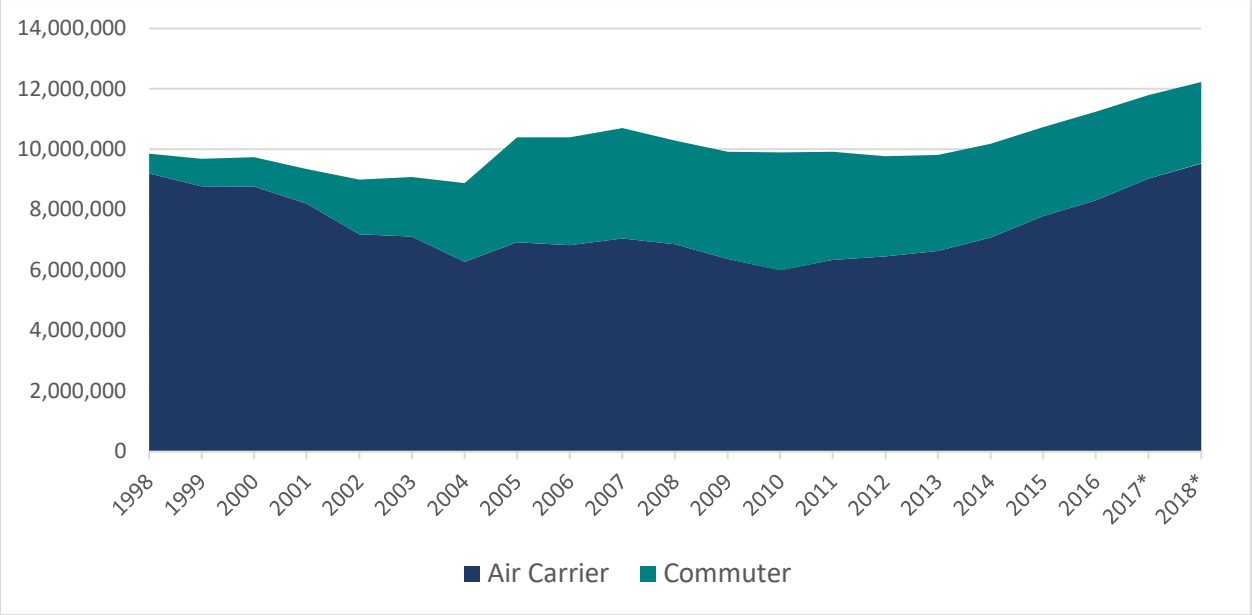
Source: FAA Aerospace Forecasts

The International Air Transport Association (IATA), the trade association for the world's airlines, announced in October of 2018 that it expects the number of passengers in North America to increase at 2.4% annually from 2017 through 2037.

Figure 2-2 looks at the passenger trends at Utah's airports over the last 20 fiscal years. The number of enplanements has grown from about 10 million to about 12 million over that period. Salt Lake City International Airport (SLC) accounts for about 98% of the passenger enplanements in Utah. Each of the

other airports with airline passengers—St. George Regional (SGU), Provo Municipal (PVU), Cedar City (CDC), Canyonlands (CNY), Vernal (VEL) and Ogden-Hinckley—each enplane less than 1%. **Table 2D** takes a regional look at OGD's market share in the greater Salt Lake City region. In the regional market, SLC accounts for 99% of the enplaned passengers; Provo Municipal and Ogden-Hinckley split the remaining 1%.

Figure 2-2: Utah Historical Passenger Enplanements



Source: FAA Terminal Area Forecasts
Note: FY 2017 and FY 2018 are estimates.

Table 2D: Airport Market Shares of Passengers in Salt Lake City Region

Airport	Enplaned Passengers (2017)	Market Share
Salt Lake City International	11,615,954	99.0%
Provo Municipal	91,581	0.8%
Ogden-Hinckley	20,324	0.2%
Regional Total	11,727,859	100.0%

Source: Source: US DOT Air Carrier Activity Information System (ACAIS)
Note: Regional enplaned passengers in 2018 grew to 12,325,163. Salt Lake City's share grew to 99.3%, while Provo's declined to 0.6% and Ogden's declined to 0.1%

The 20-year passenger history in Utah reflects national trends – decline experienced after 9/11, boom before and decline after the 2008 recession, and growth in more recent years. Utah's data shows substantial growth in commuter, or regional, passenger enplanements in the years before and shortly after the recession. The proportion of commuter/regional passengers as a share of all passengers has declined since 2010 and now accounts for about 25% of total passengers, consistent with the whole US.

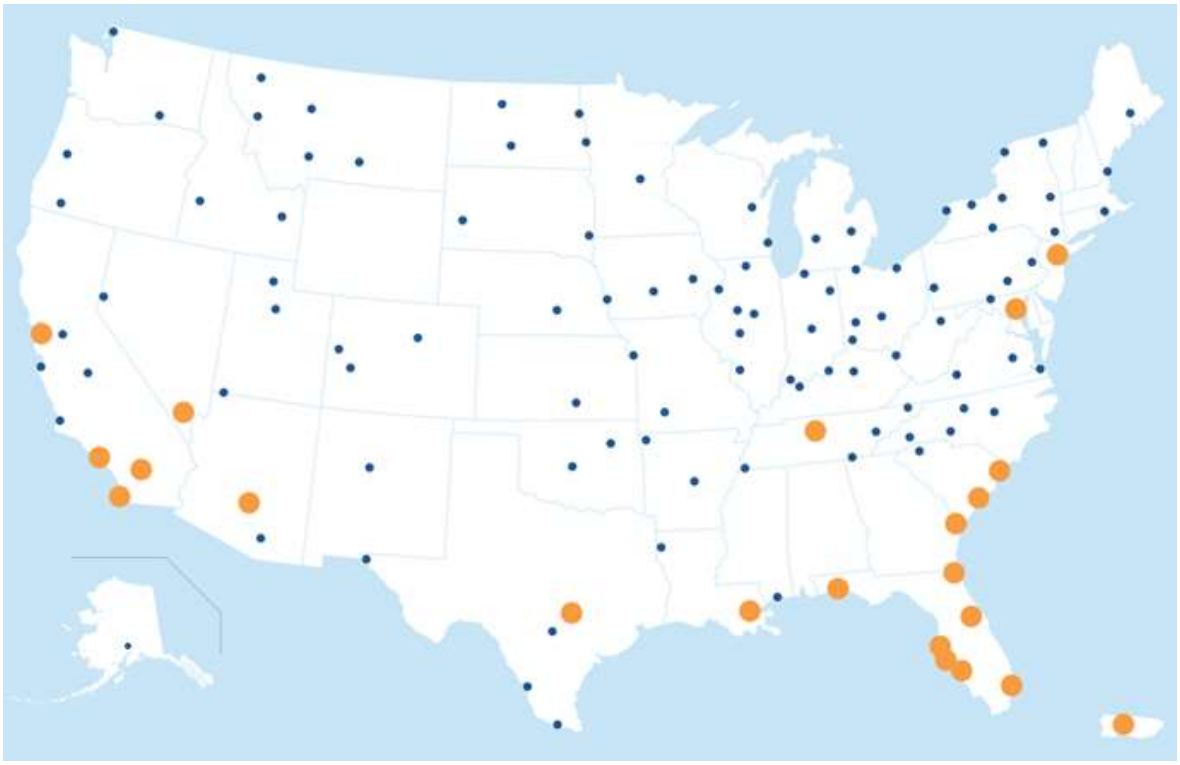
The FAA's Terminal Area Forecast for Utah projects 2.0% annual average growth in passenger enplanements, from about 12 million now to over 18 million in 2038.

Passenger service in Ogden, while influenced by national and state trends, is unique and limited. Air service in Ogden began with Allegiant Airline's twice weekly service to and from Mesa, Arizona in September 2012. During the winter season, a third weekly flight was added, and for a short time, weekly departures to Los Angeles International and Las Vegas were tried. As of mid-2019, Allegiant's service is down to two weekly Mesa flights.

Las Vegas-based Allegiant is one of the airlines that the FAA characterizes as an ultra-low-cost carrier (ULCC). In a recent article,[10] aviation consultant Michael Boyd called the ULCCs "wildcatters." Wildcatter is a term in the oil business describing "entities that set out on their own to drill for oil where mainline companies have little interest." In addition to Allegiant, Frontier, Spirit, and Sun Country are ULCCs. They represent almost 7% of all US airline departing seats, and with the airplanes they have on order, they will have 12% in 18 months. Allegiant Airlines' initial business model was to offer low-fare, high-value vacation packages from secondary airports to points in Florida and Las Vegas. **Figure 2-3** shows the cities Allegiant serves, illustrating its service between northern, usually smaller cities to major, mostly southern tourist destinations.

[10] Michael Boyd, "Ultra-Low Cost Carriers Are The New Wildcatter Airlines," *Forbes*, August 1, 2018.

Figure 2-3: Allegiant Airlines Route Map



Source: Allegiant Airlines, January 2019
Note: The large dots denote tourist destinations and the small dots are other markets served.

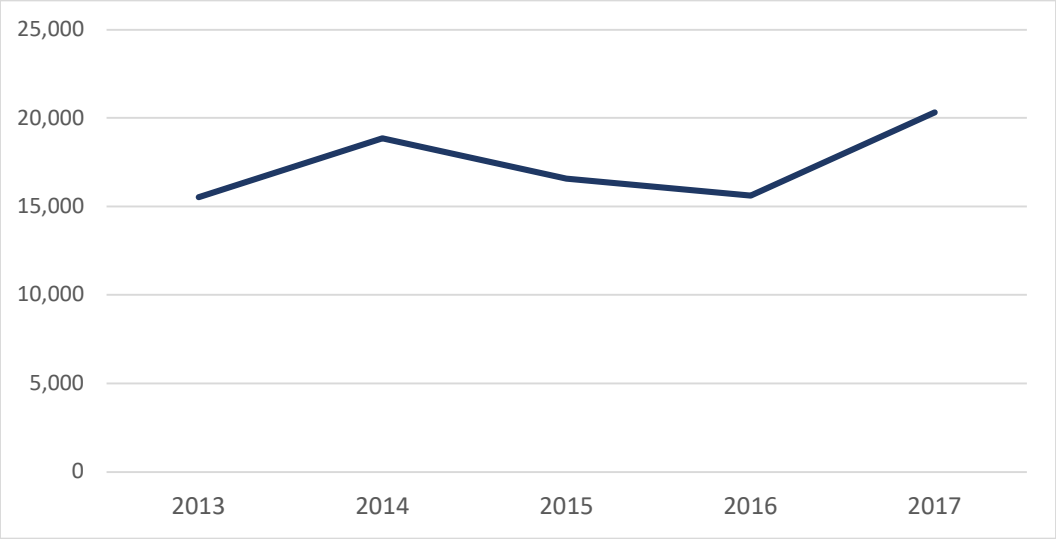
ULCCs offer non-stop service between unserved or underserved city pairs, even if the service is not daily. Unlike mainline airlines, they do not have a route structure that connects passengers to nationwide and worldwide destinations. With one exception (Frontier Airlines in Denver), ULCCs operate point-to-point rather than hub-and-spoke route systems.

Allegiant and the other ULCCs are becoming less dependent on vacation/leisure travel, and more dependent on stimulating travel decisions created just by offering very low fares. Airline wildcatters "drill" for latent discretionary dollars in communities, in the same way oil industry wildcatters drill for "black gold" in overlooked places. For the most part, the ULCC is not trying to capture traffic from mainline airlines. If their independent research of a market does not translate into business once they begin service, they will leave. According to Michael Boyd, "should the ULCC pull down or delete a market, it actually leaves it better off than before they arrived" because they have stimulated new traffic and consumers through the airport and made the consumer base more aware of the local airport.

Allegiant Airlines began serving Ogden with 166-seat MD-83 aircraft and 156-seat A319 aircraft. Recently, Allegiant transformed its fleet to all Airbus A319 and A320 airplanes, with new A320 airplanes on order that seat up to 186 passengers. From 2013 through 2018 (partial) the average historical load factor—the percentage of seats filled—was 86.75 at Ogden. Allegiant's load factors are higher than mainline airlines. The FAA reported the average domestic load factor nationwide was 83.5 in 2017; it projects the national average will peak at 86.6 in the near-term future.

Ogden-Hinckley's historical numbers of enplaned passengers appear in **Figure 2-4**.

Figure 2-4: Historical Enplaned Passengers at Ogden-Hinckley Airport



Source: US DOT Air Carrier Activity Information System (ACAIS)
Note: Since the forecast was prepared, ACAIS published enplaned passengers for 2018, which declined to 18,327. The estimated 2019 number declined further to 15,905.

In the first full year of service (2013), 15,523 passengers were enplaned. In the last full year of service reported (2017), 20,234 passengers were enplaned, reflecting 7.0% average annual growth rate over the four years. The first seven months of 2018, compared to the first seven months of 2017, showed a 19% increase in passengers, according to USDOT T-100 data.

In 2015, Airport Development Group, with its air service market consultant Tri-Star, prepared a long-term commercial passenger forecast for Ogden-Hinckley Airport. The purpose was to identify trends for the types and levels of aviation activity that could trigger the need for airport facility expansion or improvement. The 2015 study identified a primary air trade area of over 750,000 people in six Utah counties. It also identified a secondary market of over 270,000 people in eight southern Idaho counties,

some of whom may be using the commercial service airports in Pocatello and Idaho Falls. Based on passenger booking analysis, the Ogden catchment area was found to generate 25% of the passenger bookings for Salt Lake City International. The 2015 study considered the possibility of airline service expanding well beyond the Airport's current air service.

Three alternate forecasts were prepared in 2015:

> The first forecast, an economic analysis of the Wasatch Front, concluded that Ogden-Hinckley would have a 26.6% share of the total market. After analyzing other satellite markets for large airports, it was projected that OGD could serve 14.1% of the total SLC market area, resulting in growth to 1,774,000 enplanements by 2035. From 20,234 enplanements in 2017, this forecast results in 28.2% average annual growth to 2035.
>
> The second forecast analyzed passenger bookings for the Airport catchment area and looked at origin and destination passengers in the top 50 city pair markets for SLC. This forecast found passenger enplanement potential to exceed one million. Doubting the flight frequency to these markets could match SLC, a lower capture rate, between 20% and 80% was assumed. A 30% capture rate resulted in a forecast of 932,200 enplanements in 2035. Average annual growth over the 18-year period from 2017 would be 23.7%.
>
> The third forecast analyzed airline flights and capacity in current and new markets. "The best opportunity of new air service will be to key on Allegiant Airlines focus markets such as Las Vegas, Los Angeles International, and Oakland, and to hub airports in the region such as Dallas/Ft. Worth, Denver, Las Vegas, Los Angeles International, Phoenix-Sky Harbor, San Francisco International, and Seattle International. Later, air service to special markets like Hawaii, Mexico, and Canada should probably be considered." Based on expanding flight schedules for Allegiant and for new airlines serving OGD, this forecast projected growth to 655,520 enplanements in 2024. This forecast reflects 22.7% average annual growth from 2017 enplanements.

The type of forecasting and market analysis done in 2015 is important for the City of Ogden to understand the Airport's potential, but with a low level of airline service, a short history of airline service, and without airline commitment to expanding service, the 2015 forecast is too speculative for the FAA to approve for master planning purposes. In addition, in 2017 Salt Lake City International began a multi-year, multi-billion-dollar terminal modernization and expansion program that will accommodate growth within its service area, which includes Ogden, and will improve surface transportation access to the airport. Consequently, this master plan's passenger projections for OGD are more conservative than those prepared in 2015.

TAF Forecast for Ogden-Hinckley Passengers

In making projections for this master plan the first forecast model examined was the FAA's TAF for OGD. For airports with fewer than 100,000 annual enplanements, the TAF is based on an analysis of historic trends. With the short history of commercial service at OGD and the fact that the TAF historical records are not up-to-date, the latest TAF projects annual passenger enplanements at the Airport will not grow and will remain at 15,892 (the level in 2016) through 2045.[11] Since this number has already been surpassed, it is reasonable to consider other forecast models.

Trend Models for Ogden-Hinckley Passenger Forecast

The limited number of years with passenger data make it impossible to correlate statistically passenger traffic with socioeconomic factors. However, two trend continuation models are considered. The Linear Trend model examines historical numbers and projects future values along a straight line using the method of least squares. The Growth Trend model predicts exponential growth from existing data. The two models projected more growth than the TAF. The Linear Trend model projected passenger enplanements reaching 32,022 in 2038, reflecting 2.2% average annual growth. The Growth Trend model projected passenger enplanements reaching 38,697 in 2018, reflecting 3.1% average annual growth. While these models reflect growth rates close to the FAA's national and Utah passenger forecast (1.9% and 2.0% average annual growth), they do not reflect any increase in flights, destinations, or airlines, which are quite limited now.

Air Service Model for Ogden-Hinckley Passenger Forecast

This model looks at a reasonable scenario of future air service. It is a more conservative scenario than was considered in the 2015 study and may be surpassed with successful air service marketing efforts.

While the Ogden area accounts for 25% of passenger bookings at SLC, it is located within a reasonable driving time of SLC. All the major airlines with hubbing route systems (Delta, American, United, and Alaska) provide service at SLC. With their regional airline affiliates, these airlines provide passengers with access to thousands of destinations worldwide.

Sky West, the nation's largest regional airline, deserves special mention. Sky West flies Embraer and Bombardier CRJ regional jet aircraft with seating capacities between 50 and 90. Sky West is headquartered in Utah (St. George) and accounts for a large amount of pilot training at OGD. Sky West flies under contract to Delta, United, American, and Alaska as their affiliated regional airlines.

[11] The February 2019 update of the TAF shows an estimated 22,191 enplanements in FY2018 and projects annual enplanements through 2038 remaining at 22,191.

While the population in the OGD market area is large enough for regional airline service, the relatively close proximity to SLC is an issue. Mainline airlines, with their hub-and-spoke route structures that incorporate their affiliated regional airlines, are established at SLC. A mainline-affiliated regional airline's initiation of OGD service could be considered competition by the "parent" airline within the same market area. While opportunities for OGD may arise with Sky West and communication with that airline should be continued, regional airline service is not included in the Air Service forecast model.

In addition to mainline carriers, SLC has low-cost airline service, providing point-to-point flights to many destinations. Southwest Airlines was the pioneer low-cost airline, competing with other major airlines by starting service at secondary airports in large metropolitan area. Before starting service in a new market, Southwest looks for high passenger volume – seven daily departures, at least, in 147 to 175-passenger seat airplanes. This is a passenger level difficult to initiate at Ogden-Hinckley. Southwest Airlines traffic has been a tremendous boost to secondary airports in the Houston, Chicago, and Dallas-Fort Worth metropolitan areas, but these are urban areas with populations of 7 to 9 million, much larger than the Salt Lake City area. Jet Blue is another low-cost, point-to-point airline serving SLC. While Jet Blue's business model differs from Southwest, it might also want a high volume of passenger traffic to initiate service in a new market.

Another type of airline service, which was described previously and now exists at OGD, is ultra-low-cost carrier service. The Air Service forecast model assumes continued service by ULCC Allegiant Airlines, but an increase in flights and destinations. While the number of passengers at OGD has grown substantially since 2012 and load factors are high, the number of scheduled flights (two to three weekly) and destinations (Mesa) have not changed.

Provo has population and income characteristics[12] comparable to Ogden and a similar driving time from SLC. Allegiant Airlines began serving Provo in February 2013, after Frontier Airlines ceased operating there in January. While Provo's Allegiant service, like Ogden's, began with two weekly departures to Mesa, Allegiant quickly expanded the number of flights and destinations. Now, Allegiant Airlines serves Provo with 12 weekly departures—daily departures to Mesa, two departures per week to Tucson, and three to Los Angeles (LAX).

[12] The Ogden-Clearfield MSA population is 655,357 and real median household income is $71,629. The Provo-Orem MSA population is 617,675 and real median household income is $70,196. (July 1, 2017 estimates)

The expanding flight schedule has had a dramatic impact on Provo's passenger enplanements:

- 106% increase from 2013 to 2014
- 5% increase from 2014 to 2015
- 20% increase from 2015 to 2016
- 17% increase from 2016 to 2017

Why does Provo have more Allegiant passenger service than Ogden? The answers to that question are not permanent barriers to expanded Ogden service. Both Provo and Ogden markets have performed well for Allegiant. Provo Municipal's average load factor (2013-2018) is 86.65, compared to Ogden-Hinckley's 86.75. Some speculate that Allegiant representatives have a personal affinity to Provo or are using Provo as a test bed for its service. Add-ons to Allegiant vacation packages might be deemed more attractive at Provo, although Ogden has recently enhanced its add-ons. Ogden airport management noted that a change in terms during the last negotiations with Allegiant may have been less attractive to the airline than previous terms. The new airport manager reports the City recently decided to put up $500,000 for air service, which would be a significant incentive. The very short duration of Allegiant service to Los Angeles and Las Vegas from Ogden was discouraging; however, Allegiant assured airport management that Ogden is one of their top markets and the airline plans to expand service to other destinations from Ogden as soon as their inventory of airplanes allows. Even if Ogden's future air service expansion is not with Allegiant, other airlines have approached the City about possibly initiating service. Both Southwest and United Airlines have discussed service to Denver with Ogden. An ULLC in place of Allegiant is also a possibility for Ogden's future air service, particularly since the market has proven viable for that type of airline.

Based on market similarities, one might expect Ogden-Hinckley's Allegiant service to match Provo Municipal's Allegiant service. While OGD passenger enplanements grew from 15,523 in 2013 to 20,324 in 2017, an average annual growth rate of 7%, Provo's enplanements grew from 30,090 to 91,581, a 32% average annual growth rate over the same period. The Air Service model projects the number of Ogden passengers to grow at an average annual rate of 32% to a level comparable to Provo's current service in about five years. This would mean average weekly departures would grow from three in 2017 to ten in 2023. During the last 15 years of the forecast, growth would slow, with 5% annual growth in the mid-term and 2% annual growth in the long-term periods. By 2038, the average number of weekly departures would be 15.

Preferred Forecast

While Airport management favors the Air Service Model for future planning and land use protection in a visionary approach, a less aggressive growth forecast that aligns better with industry trends and FAA projections nationwide is selected as the preferred forecast. Consequently, the Air Service Model is designated a contingency forecast for high passenger growth.

The preferred forecast is a based on a model that blends a small, near-term increase in air service with gradual growth thereafter:

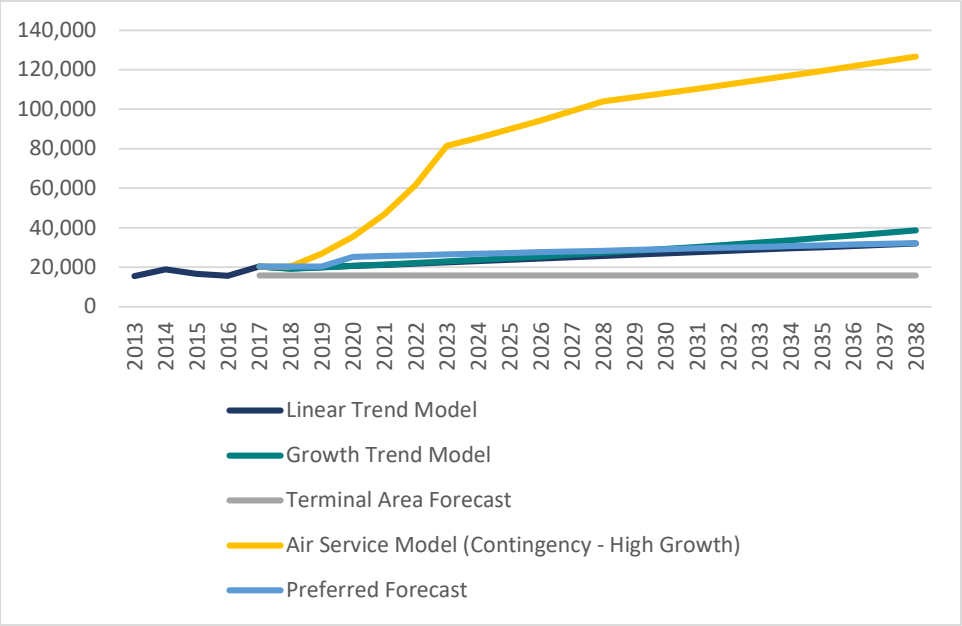
- 2018-2019: no change, flat growth
- 2020: Allegiant adds one additional flight for a total of three weekly
    - A320 with 186 seats
    - 87% passenger load factor
    - 3 flights x 52 weeks x 186 seats x 87% = 25,244 passenger enplanements
- 2021 to 2038: Population growth rate from Table 2C applied, resulting in 32,196 enplanements in 2038.

Over the forecast period, passenger enplanement growth averages 2.2% per year. **Table 2E** and **Figure 2-5** compare the Terminal Area Forecast to the three alternate models.

Table2E: Enplaned Passenger Forecast Models for Ogden-Hinckley Airport

Year	Linear Trend Model	Growth Trend Model	Terminal Area Forecast	Air Service Model (Contingency - High Growth)	Preferred Forecast
2013	15,523	15,523	15,128	15,523	15,523
2017	20,324	20,324	15,892	20,324	20,324
2023	22,470	22,868	15,892	81,448	26,007
2028	25,654	27,251	15,892	103,950	28,017
2038	32,022	38,697	15,892	126,715	32,196
Average Annual Growth					
2017-2038	2.2%	3.1%	0.0%	9.1%	2.2%

Figure 2-5: Enplaned Passenger Forecast Models for Ogden-Hinckley Airport



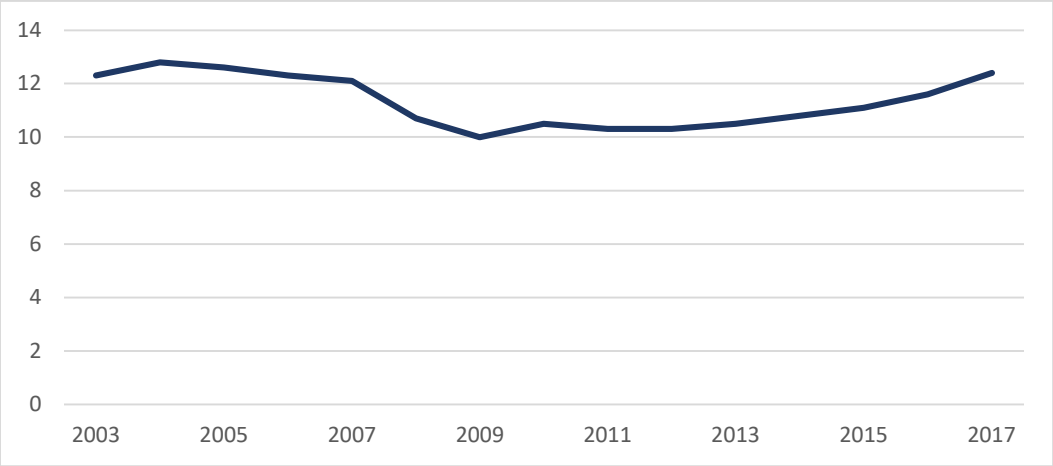
CARGO TRENDS AND FORECASTS

Air cargo activity is driven almost exclusively by economic activity. Air cargo carriers compete with trucks, container ships, and rail cars, so time and cost, particularly for fuel, are important determinants of shippers' decisions on transportation mode. Transport by air is typically appropriate for high value, time-sensitive cargo.

Air cargo is made up of two components, freight and mail. Air cargo is carried on all-cargo aircraft and in the bellies of passenger airlines, in both scheduled and non-scheduled service. At an individual airport, differences in the amount of enplaned cargo vs. deplaned cargo can be substantial.

Figure 2-6 shows historical enplaned freight and mail data within the US. Correlation with economic decline and expansion is apparent. Another factor that has affected air cargo is post-9/11 security requirements that resulted in a reduction of cargo carried on passenger airlines. Other changes in the industry since 2000 are a shift from air to other modes (especially truck), use of all-cargo carriers (e.g. FedEx) by the US Postal Service for mail, and the increased use of mail substitutes (e.g. e-mail, cloud-based services).

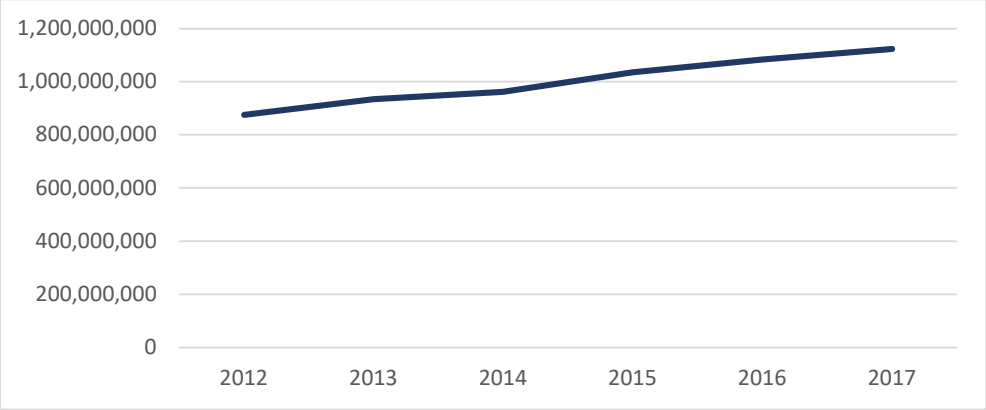
Figure 2-6: Historical US Enplaned Air Cargo Tons (millions)



Source: US DOT T-100 Data

Within the state of Utah, SLC is the only airport that receives cargo entitlement funding. It reports the all-cargo aircraft that use the airport, using standard "landed weight" for the different all-cargo aircraft types. **Figure 2-7** shows that SLC has in recent years steadily increased all-cargo traffic. Figures 2-6 and 2-7 both reflect air cargo activity trends, but they measure different aspects of air cargo.

Figure 2-7: Historical Salt Lake City International All-Cargo Landed Weight (pounds)

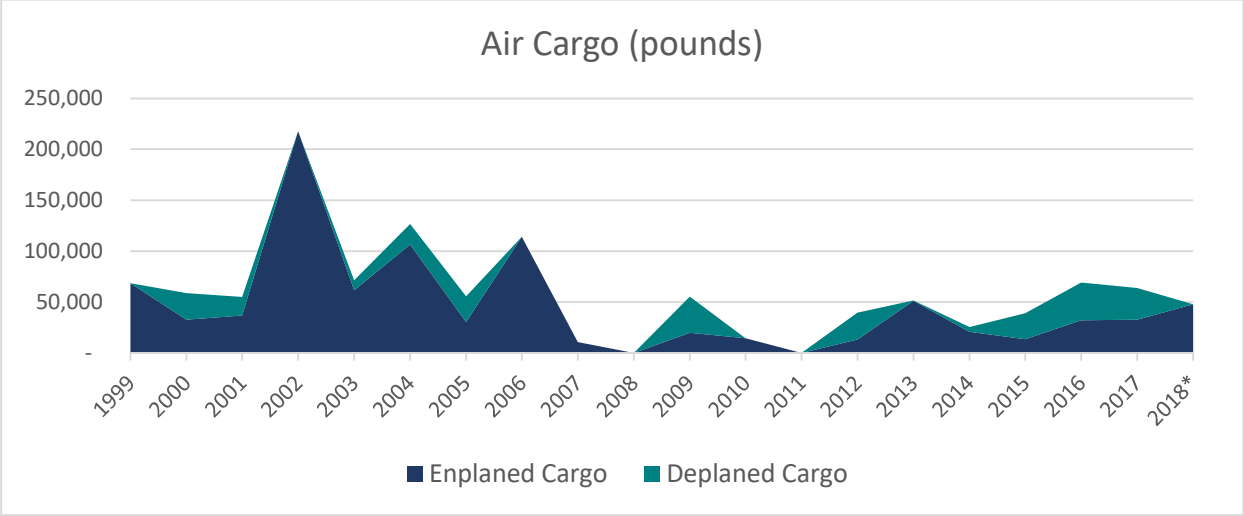


Source: US DOT Air Carrier Activity Information System (ACAIS)

Historical records of air cargo at OGD appear in **Figure 2-8**. At Ogden-Hinckley, air cargo is carried on nonscheduled flights when the need arises. Almost all the cargo at OGD is freight. Unlike some other passenger airlines, Allegiant Airlines does not carry freight or mail. In the last 20 years, only three years

included any mail, and only one year recorded a substantial amount of mail—15,586 pounds, or 28%, of 54,952 total pounds of cargo in 2001. The peak year for cargo at OGD was 217,768 pounds in 2002. Higher amounts of cargo in pre-recession years, compared to post-recession years, may reflect freight associated with enterprises such as Adam Aircraft, which closed its Ogden plant in 2008. In 2008 and 2011, no OGD cargo was reported; it is possible there was unreported air cargo activity during those years. The last full year for cargo data was 2017 (63,856 pounds), which was close to the annual average (59,216) for the 20-year period.

Figure 2-8: Historical Air Cargo at Ogden-Hinckley Airport (pounds)



Source: US DOT T-100 Data
Note: 2018 data reported through June was doubled to approximate the full year.

Unlike passengers, the amount of cargo enplaned at an airport can be very different than the amount deplaned at that airport. At Ogden-Hinckley, on average, 78% of cargo is enplaned and 22% is deplaned. Air cargo activity is generated by local industries, such as Autoliv, which periodically sends out the automotive safety equipment it manufactures on aircraft as large as the Boeing 757. Air cargo is also carried in much smaller aircraft, such as the turboprops flown by Western Air Express.

With the high variability of OGD air cargo, a trend in historical activity cannot be identified. The growth in population and jobs in the MSA and the future growth of businesses based at the Airport lead to the assumption that the amount of cargo handled at the Airport will increase, too. According to the FAA, air cargo historically tracks with the Gross Domestic Product. Consequently, the projected growth for the Ogden-Clearfield MSA's Gross Regional Product (GRP) is used to forecast air cargo at the Airport. For the first five years of the forecast period, the GRP is projected to grow 2.0% annually, for the second five years

of the forecast period, the GRP is projected to grow 1.9% annually, and for the last ten years of the forecast period, the GRP is projected to grow 1.8% annually.

The amount of air cargo would increase dramatically if an all-cargo airline began serving OGD with scheduled service. Airport Development Group's 2015 study examined cargo activity at SLC and identified air cargo handled at SLC that originated at and was destined for the Ogden area. The study produced two potential air cargo forecasts for Ogden-Hinckley. One forecast, based on economic share, indicated an outbound potential of 44,200,000 pounds. Allocating OGD cargo activity based on estimated flights for the Ogden market, produced the second potential forecast of outbound air cargo--33,153,000 pounds.

The 2015 report summarized the market potential at the Airport:

> "If Ogden-Hinckley Airport only has passenger air service then the air cargo at the Airport will be insignificant. If the Airport only has Allegiant Airlines, then there will be no air cargo. If the Airport has regional jet service to hub airports, then there will be some air cargo. The real contributor to air cargo at Ogden-Hinckley will be service by UPS. Without UPS, there may be some limited contract service."

Recently, UPS decided to establish a new regional hub at SLC, building a $275 million, 840,000 square foot new processing facility on a 160-acre site. Consequently, the potential for UPS to move to OGD is not being considered in this forecast.

Table 2F presents the forecast for air cargo pounds at OGD, using the GRP growth rates projected by Woods and Poole and shown in Table 2C. By 2038, over 90,000 pounds of enplaned and deplaned air cargo is expected. It is assumed that the proportion of deplaned and enplaned cargo will be the same as in the past--22% deplaned and 78% enplaned.

Table 2F: Air Cargo Forecast for Ogden-Hinckley Airport

Year	Air Cargo (pounds)
2017	63,856
Forecast:	
2023	70,502
2028	79,008
2038	94,439

The number of all-cargo aircraft operations is difficult to identify when service is ad-hoc and happens in a wide range of aircraft types and sizes. Air traffic controllers do not identify all-cargo aircraft operations separately; they occur among the categories of aircraft operations that controllers do track—air carrier, air taxi, and military. While the number of all-cargo aircraft operations is unknown, they are assuredly a small percentage of OGD's annual operations.

The Boeing 757 freighter has a payload capacity of over 84,000 pounds, although, for most loads, a freighter's available volume is more restrictive than its weight capacity. Theoretically, a single 757 departure could hold a whole year of enplaned cargo forecast for 2038 (78% of 94,439 pounds). Of course, shipping needs occur at different times, in different amounts, and to/from different locations. As the amount of cargo at the Airport increases, it is possible the number of all-cargo operations will not increase at all, if shippers choose larger capacity aircraft for the sake of efficiency.

GENERAL AVIATION TRENDS AND FORECASTS

GA activity is all aviation other than scheduled commercial airline and military aviation. GA aircraft include a wide range, from single-engine piston to business jets and helicopters. The FAA tracks and estimates through surveys the type of active[13] GA aircraft and the hours they are flown annually (**Table 2G**). The table illustrates that, while single-engine piston aircraft comprise nearly three-fourths of the GA fleet, they are flown less than one-third the average amount of time as the turboprops, turbojets, and rotorcrafts. Consequently, differences in fleet composition are important in forecasting aircraft operations.

In its latest annual forecast, the FAA reviewed what happened in the previous year, 2017. The general aviation industry recorded an increase of 4.2 percent in aircraft deliveries, with pistons up by 9.5 percent and turbines about the same as the previous year. Since most of the increase was in the lower priced piston segment and the more expensive business jet deliveries were down by 0.2 percent, U.S. billings decreased 8.5 percent to $10.6 billion from 2016 to 2017. General aviation activity at FAA and contract tower airports recorded a 0.1 percent increase in 2017 as local (training) activity rose 0.9 percent, more than offsetting a 0.5 percent decline in itinerant operations.

[13] An active aircraft flies at least one hour during the year.

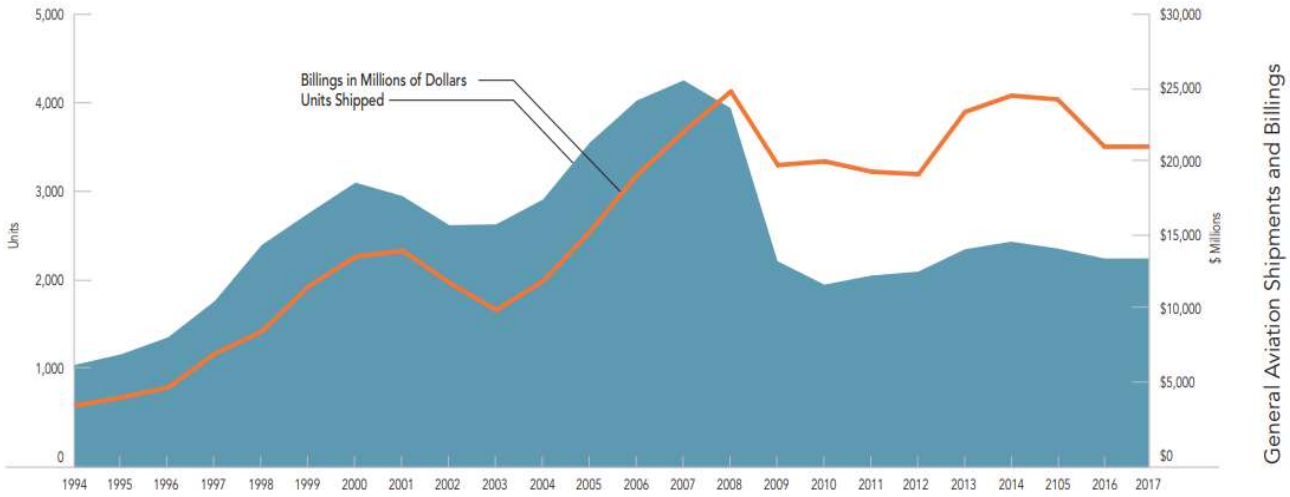
Table 2G: Nationwide GA and Air Taxi Active Fleet and Hours Flown

Aircraft Type	Active Aircraft	% Fleet	Hours Flown	% Hours Flown	Hours per Aircraft
Piston SE Fixed Wing	130,330	73.4%	11,877,735	50.1%	91.1
Piston ME Fixed Wing	12,935	7.3%	1,665,676	7.0%	128.8
Turboprop Fixed Wing	9,430	5.3%	2,674,467	11.3%	283.6
Turbojet Fixed Wing	14,075	7.9%	4,273,872	18.0%	303.6
Rotorcraft	10,805	6.1%	3,237,145	13.6%	299.6
Total	**177,575**		**23,728,894**		
Experimental	27,865	78.5%	1,248,478	76.1%	44.8
Sport Aircraft	2,585	7.3%	196,913	12.0%	76.2
Other	5,025	14.2%	194,623	11.9%	38.7
Total	**35,475**	100.0	**1,640,014**	100.0	46.2

Source: FAA Aerospace Forecast 2018-2038
Estimated for 2017 as of December 31
SE=Single Engine ME = Multi Engine

The GA industry suffered during the economic recession and has taken a long time to recover. This is illustrated in the General Aviation Manufacturer Association (GAMA) report on historical aircraft billings and shipments (**Figure 2-9**). Aircraft shipments began to recover slightly after hitting bottom in 2010. The recovery in billings was stronger, indicating a shift to manufacturing the more expensive GA aircraft.

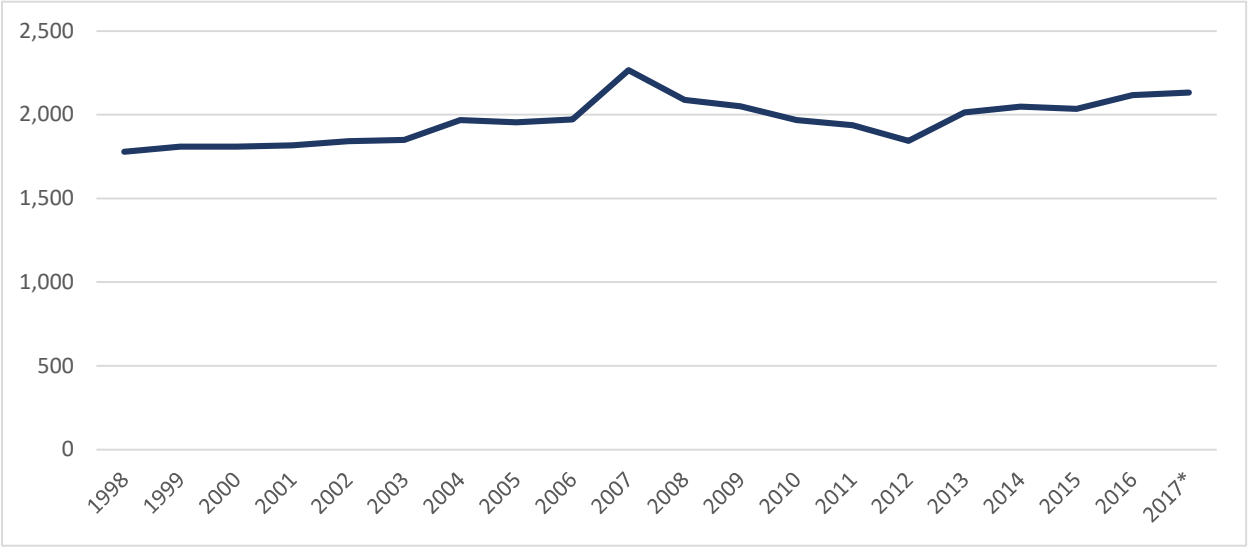
Figure 2-9. General Aviation Airplane Shipments and Billings Worldwide (1994–2017)



Source: GAMA 2017 Annual Report

Figure 2-10 shows how the number of based aircraft at Utah's 35 NPIAS airports has changed in the last 20 years. It shows strong growth right before the recession, decline for a few years afterwards, and then recovery. Despite the mid-period fluctuations, Figure 2-10 shows 1.0 percent average annual growth in Utah based aircraft over the 20-year period.

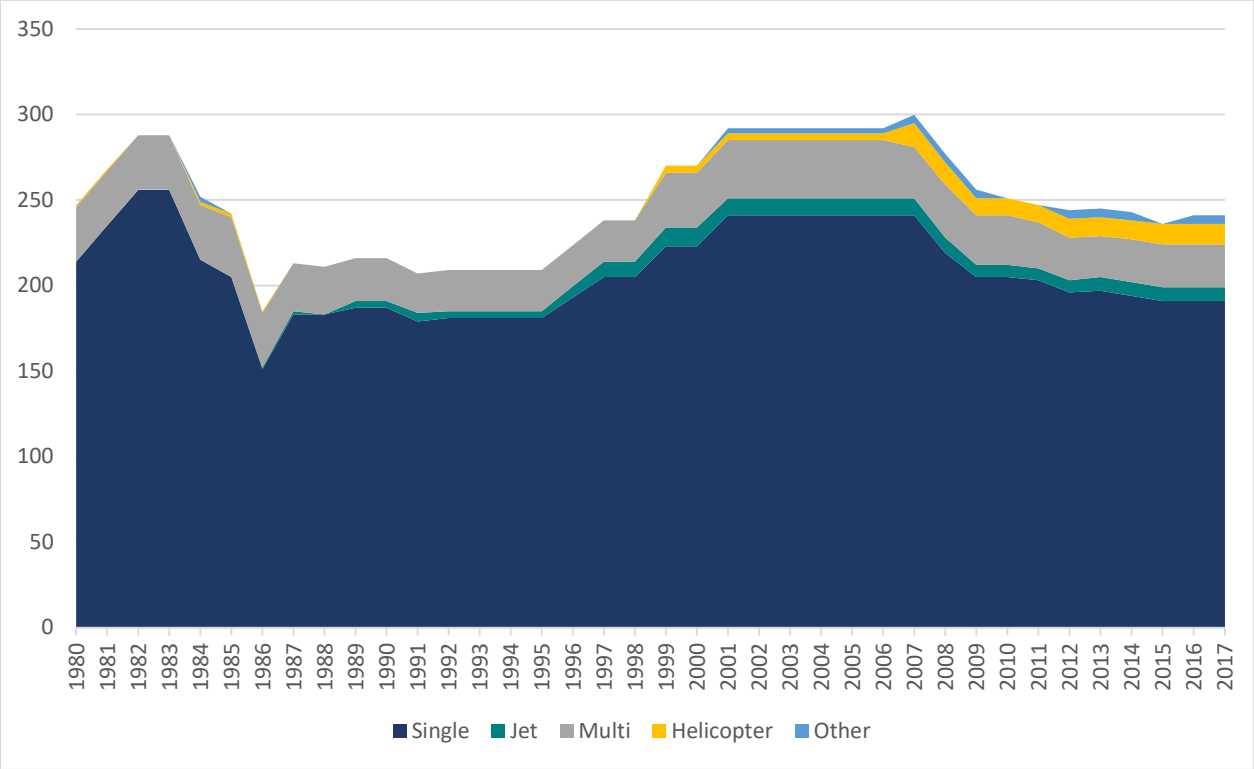
Figure 2-10: Historical Based Aircraft in Utah



Source: Terminal Area Forecasts

TAF records of Ogden-Hinckley's based aircraft go back to 1980, providing an even longer picture of general aviation and how it has changed specifically at OGD. Since 1980, the total number of aircraft based at OGD has not varied much, as **Figure 2-11** shows. In 1980, the total number of based aircraft was 247, of which 87% were single engine and 13% were multi-engine. The Figure shows that national trends affected OGD. The number of based aircraft declined in the 1980s and then grew after the 1994 revitalization act limited aircraft manufacturers' liability. Economic growth fueled based aircraft growth in the 1990s and 2000s, until the 2008 recession caused a steep decline.

Figure 2-11: Historical Based Aircraft at Ogden-Hinckley Airport



Source: FAA's Terminal Area Forecast (through 2016) and Airport Master Record (2017), with interpolation for all aircraft types in 1996 and for single engine aircraft in 2007.

To forecast the next 20 years of Ogden-Hinckley's based aircraft, analyzing the last 20 years is recommended. While the number of based aircraft averaged 264 over the last 20 years, the number in 1997 (238) was almost the same as the number in 2017 (241). From 1997 to 2007, the number increased at an average annual rate of 2.3%, and since 2007, the number has decreased at an average annual rate of 2.2%. This shows that the number has recovered to pre-recession levels.

Changes in the type of aircraft (fleet mix) can be seen in Figure 2-11. While the predominant type of aircraft based at OGD has always been single-engine, the number of jets and helicopters has risen. In 1980, no jets were based at the Airport. The number grew very slowly until about 20 years ago. Between 1997 and 2008, based jets numbered between 9 and 11. The number dropped to 7 after the recession, and has been 8 since 2013. Only one helicopter was based at the Airport in 1980; this number grew to 14 in 2007, declined to 10 for a few years after the recession, and has been 12 since 2015.

Over the last 20 years, single-engine aircraft have declined from 86% to 79% of the total. Multi-engine aircraft have consistently been 10% of the fleet. Jets are between 3% and 4% of the fleet, while helicopters' share of the total have grown from 0% to 5%.

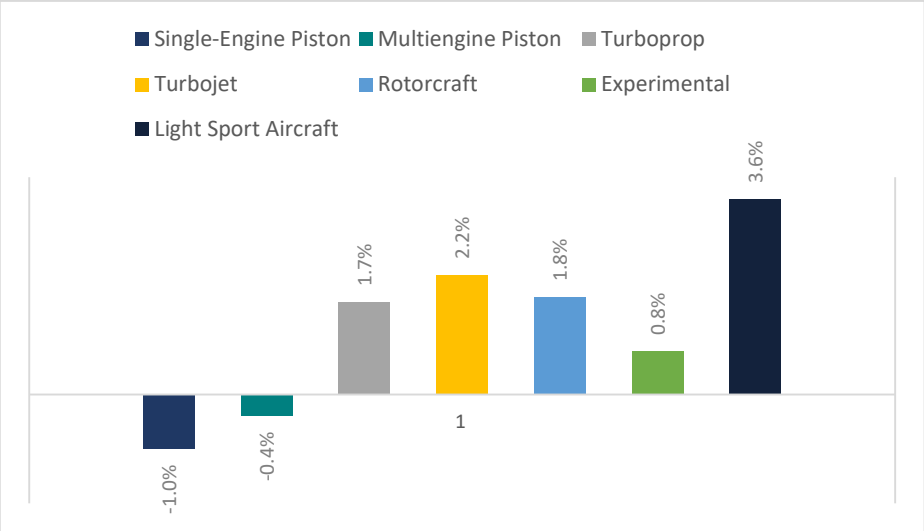
National Forecasts for General Aviation

The FAA's outlook for GA is "stable to optimistic." The FAA expects growth at the high end (turbojet aircraft) to offset continuing retirements at the low end (piston aircraft). "The active general aviation fleet is forecast to remain relatively stable between 2018 and 2038. While steady growth in both GDP and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet – fixed wing piston aircraft continues to shrink over the forecast. While the fleet remains level, the number of general aviation hours flown is projected to increase an average of 0.8 percent per year through 2038, as growth in turbine, rotorcraft, and experimental hours more than offset a decline in fixed wing piston hours."

The FAA's GA forecasts relied heavily on discussions with industry experts, along with the results of the General Aviation and Part 135 Activity Survey. The General Aviation and Part 135 Activity Survey has been conducted annually since 1977. The survey methodology has been improving since 2004, with larger samples and more categories. In 2005 the FAA added the light sport aircraft category.

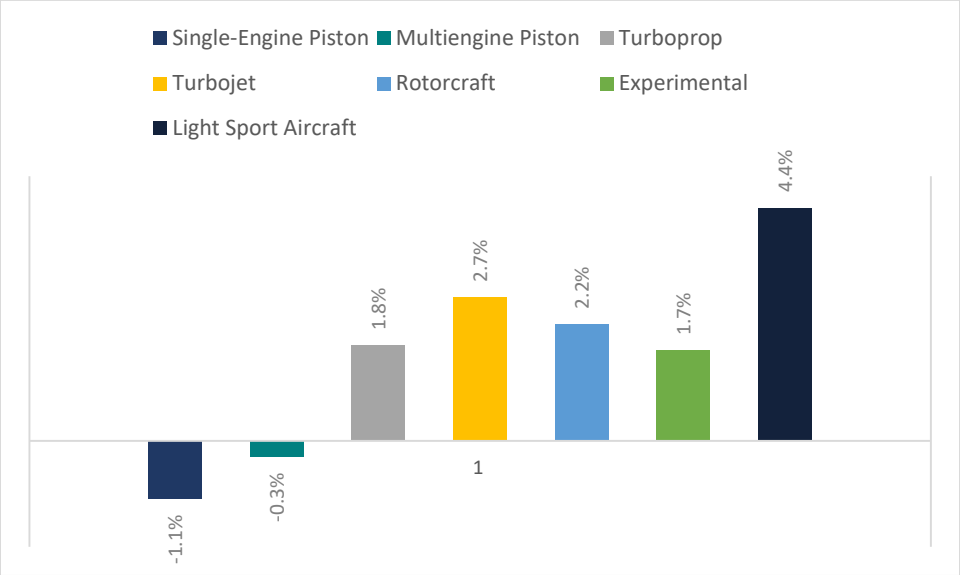
The FAA's projected annual growth rates for GA active aircraft and hours flown, from 2018 through 2038, appear in **Figures 2-12 and 2-13**. For the whole GA fleet, the FAA projects no growth over the next 20 years, combining 0.8% annual decline for piston aircraft and 2.0% annual growth for turbine aircraft. For all GA aircraft hours flown, the average annual growth rate is 0.8%, combining 0.8% annual decline for piston aircraft and 2.4% annual growth for all turbine aircraft.

Figure 2-12: Annual Growth Rate for Ga Active Aircraft, 2018-2038



Source: FAA Aerospace Forecast Fiscal Years 2018-2038

Figure 2-13: Annual Growth Rate for GA Hours Flown, 2018-2038



Source: FAA Aerospace Forecast Fiscal Years 2018-2038

The FAA's aviation demand forecasts are based on economic projections using several assumptions, so the degree to which this projected aviation activity is realized is uncertain. Oil prices and the strength of U.S. and global economies are examples of factors that could impact aviation demand. In late 2018, Honeywell projected in their Global Business Aviation Outlook that the business jet industry is expected to experience strong growth in the short to medium term, supported by a better used aircraft market and by new airplane models. Honeywell's annual survey revealed that operators plan to purchase new business jets equivalent to 20% of their current fleet, 1% more than the previous year. These jets will be replacements or additions to their current fleet. The focus on business aviation here is to call attention to the GA segment with the highest growth in recent history and continued growth potential.

Forecasts for Ogden-Hinckley General Aviation

What sort of GA growth is reasonable to expect at Ogden-Hinckley Airport? Continued population growth in the service area implies the number of based aircraft might grow. It is reasonable to expect this will include more small aircraft used primarily for recreation and personal purposes, and as business grows in the Ogden-Clearfield MSA, an increase in aircraft intended for business use might also be expected. As SLC expands to accommodate more commercial passenger and all-cargo airline business, the airspace around that airport will become busier and possibly some owners of smaller, slower GA aircraft based at SLC will choose to relocate to another airport,[14] such as OGD. In the preparation of based aircraft forecasts for OGD, an inherent assumption is that land will be available to develop additional hangars for any based aircraft growth.

Terminal Area Forecast for Ogden-Hinckley Based Aircraft

The FAA's forecast for the Airport results in the number of based aircraft growing from 241 in 2017 to 286[15] in 2038, representing average annual growth of 0.6%. This is a higher growth rate than the FAA's national forecast for GA aircraft (no growth over the next 20 years, combining 0.8 percent annual decline for piston aircraft and 2.0% annual growth for turbine aircraft). While the TAF's overall growth in based aircraft is reasonable, the detailed fleet mix forecast is questionable. The TAF projects all future growth will occur in the single-engine category and no growth is projected for the other categories, which are the ones FAA expects to grow more than single-engine pistons in its national forecast.

[14] "Salt Lake City International Airport considers pushing out small planes," *Ogden Standard-Examiner*, October 30, 2018.
[15] The February 2019 release of the TAF projects based aircraft will reach 266 in 2038.

Three alternate forecast models have been developed for based aircraft, to compare with the TAF:

- Linear Trend Model
- Socioeconomic Model
- FAA Growth Rates Model

Linear Trend Model for Ogden-Hinckley Based Aircraft Forecast

The Linear Trend model projects future growth in based aircraft as a continuation of the trend of based aircraft numbers since 1998. The number of based aircraft now is virtually the same as it was 20 years ago, although it grew, declined, and then recovered to the current level. The Linear Trend model projects future decline, 1.1% annually, to reach 192 based aircraft in 2038. With a growing population and economy in the service area, and the possibility of GA aircraft moving from SLC, the results of the Linear Trend model seem too low.

Socioeconomic Model for Ogden-Hinckley Based Aircraft Forecast

The various socioeconomic indicators for the MSA (Table 2C) were examined for correlation to based aircraft at OGD, using records dating back to 1990. None of the socioeconomic factors were found to have statistical correlation with based aircraft (correlation coefficient of 0.8 or higher, where 1.0 represents complete correlation). In the absence of correlation, it was assumed that growth in based aircraft would be equivalent to the growth in the population and some economic indicators. This amounts to 1.5% annual growth in the first five years, 1.4% annual growth in the next five years, and 1.3% annual growth in the last ten years. With an overall annual growth rate of 1.4%, based aircraft would reach 321 in 2038.

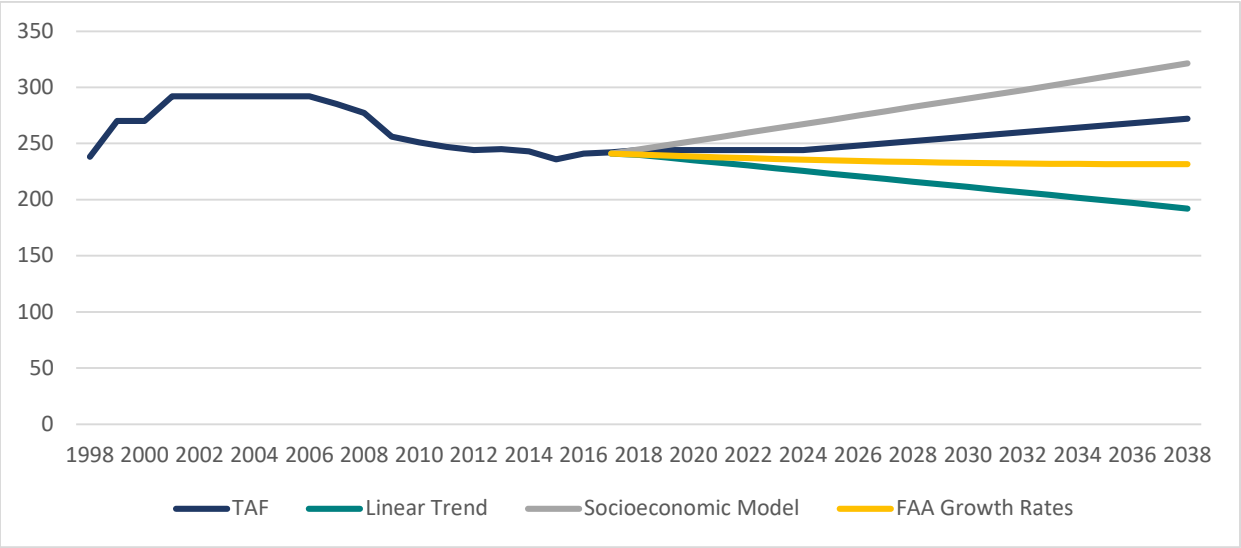
FAA Growth Rates Model for Ogden-Hinckley Based Aircraft Forecast

With this model, the FAA's national growth rates for different types of aircraft were applied to the current numbers of based aircraft at the Airport. Because some of OGD's based aircraft categorized as single-engine piston are light sport aircraft, a growing category of aircraft, slightly less decline was projected for single-engine piston. Because turboprop aircraft are based at the Airport and yet not categorized as such, the multi-engine category was assumed to have growth that combines the FAA's forecast rates for multi-engine piston and turboprop aircraft. The result was a total of 232 aircraft in 2038, representing an annual loss of 0.2%. The forecast changed the fleet mix, so that single-engine piston aircraft declined from 75% to 63% of the based aircraft, while the proportions of jets and helicopters grew. While forecast fleet mix produced by this model seems reasonable and in-line with national trends, the overall decline in based aircraft does not seem reasonable, given projected population and economic growth and the potential relocation of some aircraft from SLC.

Preferred Based Aircraft and Fleet Mix Forecast

The three alternate forecast models compared to the TAF appear in **Figure 2-14**. The Socioeconomic model produces the highest growth. The Linear Trend and FAA Growth Rates models project the number of based aircraft will decline.

Figure 2-14: Based Aircraft Forecast Models for Ogden-Hinckley Airport



The alternate models do not appear to be more reasonable than the TAF, so the TAF is accepted as the preferred based aircraft forecast. However, the fleet mix in the TAF is not consistent with national trends, as it shows the proportion of single-engine aircraft growing at the expense of other aircraft types such as jets and helicopters. To correct this, the fleet mix resulting from the FAA Growth Rates model is used and applied to the TAF total based aircraft, as shown in Table 2H.

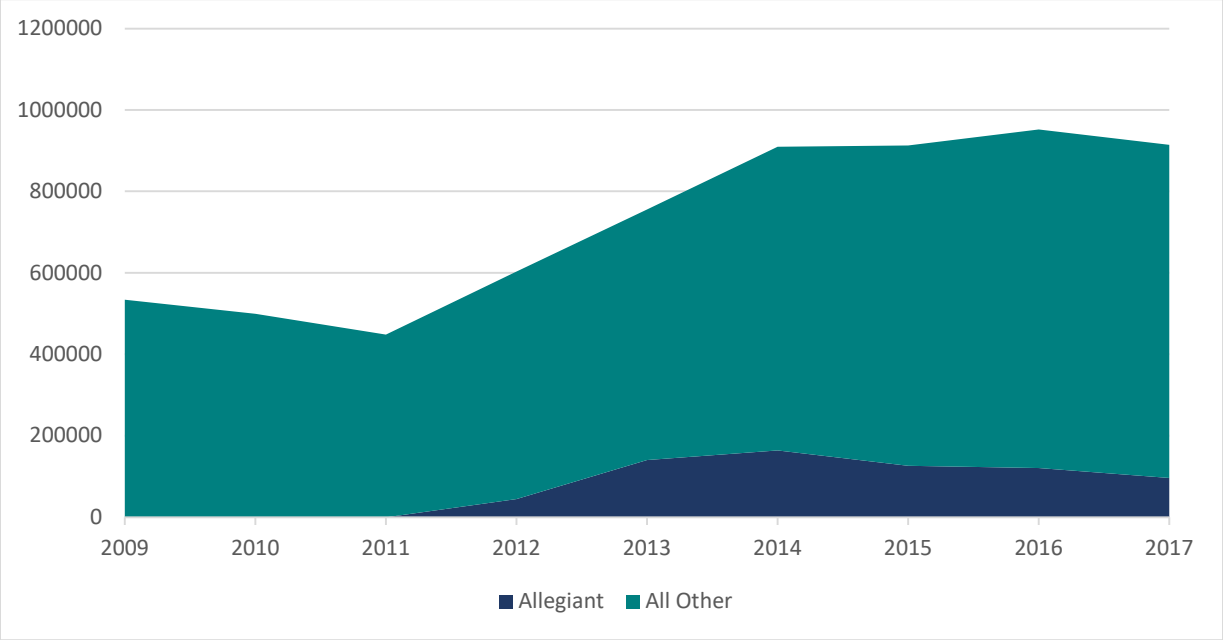
Table 2H: Ogden-Hinckley Airport Based Aircraft and Fleet Mix Forecast

	Single Engine	Multi-Engine	Jet	Heli-copter	Other	Total
2017	79%	10%	3%	5%	2%	
	191	25	8	12	5	241
2023	77%	11%	4%	6%	2%	
	188	27	10	15	5	244
2028	76%	11%	5%	6%	2%	
	192	28	13	15	5	252
2038	72%	12%	5%	8%	3%	
	197	32	14	22	7	272
Avg. Annual Growth	0.1%	1.2%	2.6%	2.8%	1.5%	0.6%

AIRCRAFT OPERATIONS TRENDS AND FORECAST

One trend indicator of aviation activity is the historical record of fuel sales. **Figure 2-15** shows the history at Ogden-Hinckley—7% average annual growth from 2009 (533,551 gallons) through 2017 (914,075 gallons). Fuel flowage in 2018 is on track to exceed 1,000,000 gallons. Fuel sales to Allegiant Airlines contributed a substantial amount, up to 23% of the total in each year they have had OGD service. The fact that Allegiant accounts for only about 3% of the aircraft operations demonstrates that an increase in the average aircraft size can result in a fuel sales growth rate that exceeds the growth rate for aircraft operations.

Figure 2-15: Historical Fuel Flowage at Ogden-Hinckley Airport (gallons)



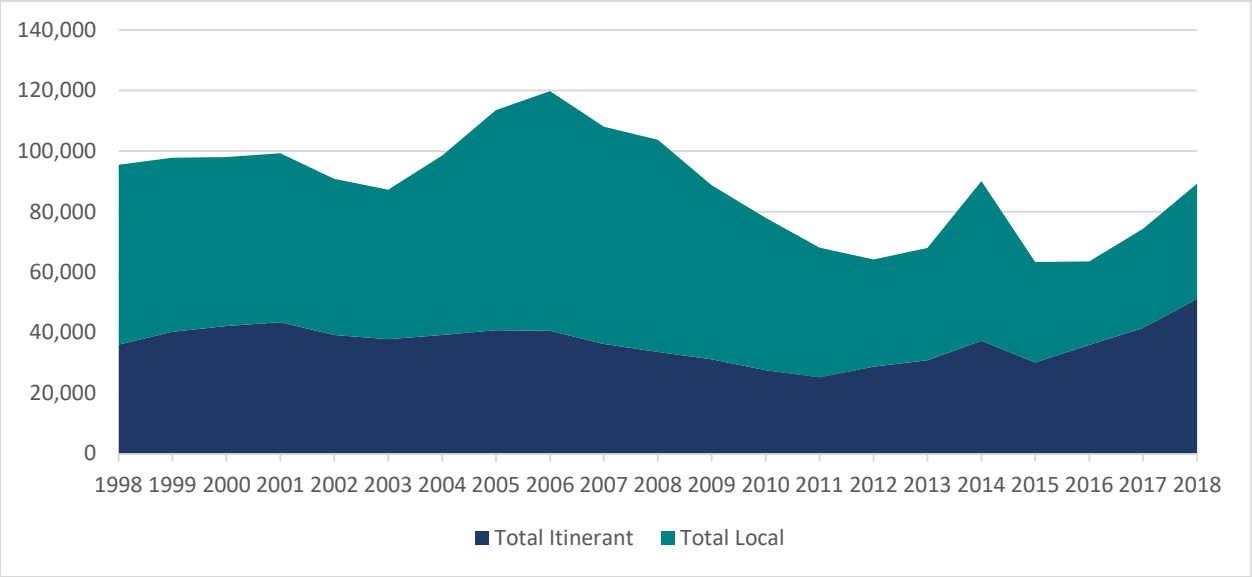
Source: Airport Records

Aircraft operations at the Airport have been tracked by the Air Traffic Control Tower (ATCT) and documented in the TAF. **Figure 2-16** shows the history of operations by fiscal year since 1998. Total operations peaked in 2006 at 119,831. The lowest year was 63,402 in 2015. The total in 2018 was 84,605. Figure 2-16 shows the subdivision of operations into local and itinerant. Local (training) operations have varied more than itinerant operations, probably reflecting changes in flight training schools and in fuel

costs. Over the last 20 years, local operations have varied from 68% of total operations (in 2008) to 43% (in 2016).

ATCT personnel further categorize aircraft operations. Local operations are by military or civil (GA) aircraft. Itinerant operations are categorized as air carrier, air taxi, military, or GA. For this forecast, each of these categories are examined separately, beginning with the largest, GA.

Figure 2-16: Historical Aircraft Operations at Ogden-Hinckley Airport

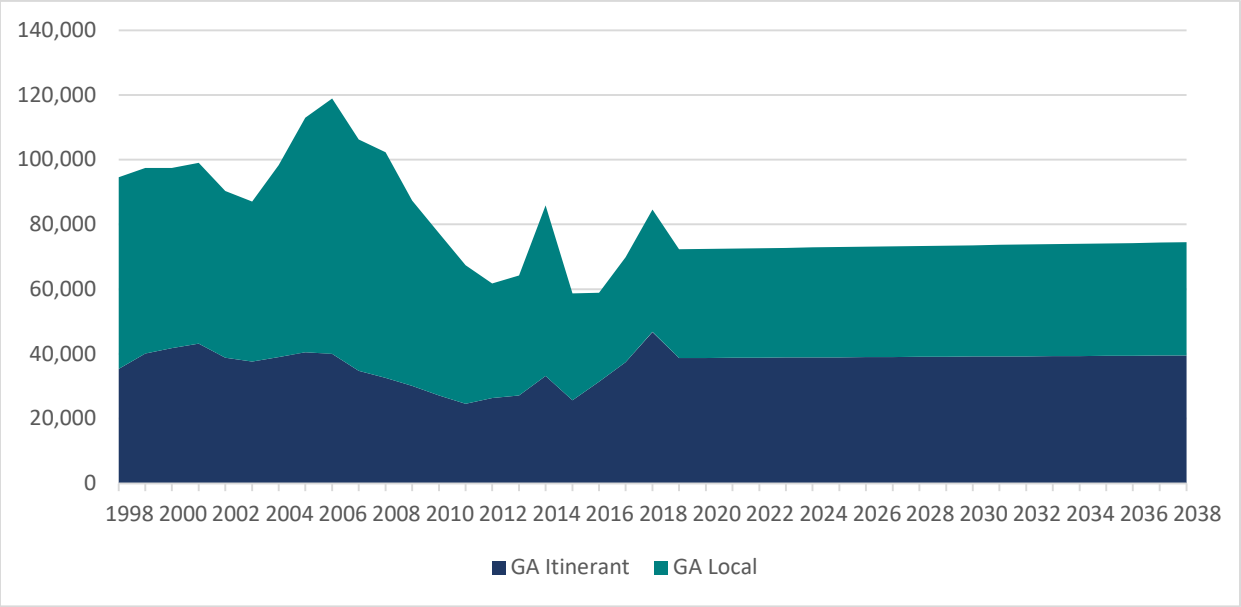


Source: TAF (through FY 2017) and Air Traffic Activity System (ATADS) (FY 2018)
Note: According to ATADS, aircraft operations in CY 2019 reached 113,663.

GA Operations Forecast for Ogden-Hinckley

GA aircraft operations have comprised 98% of all operations at OGD over the last 20 years. That percentage dipped to 93% in 2015 and 2016 but has been 99% or higher in ten different years since 1998. The proportion of GA operations that are local instead of itinerant has declined somewhat in recent years, averaging 61% from 1998-2008 and 56% from 2009-2018. In 2018, just under 45% of GA operations were local. **Figure 2-17** shows not only the past 20 years of GA operations, but also the FAA's forecast of GA operations through 2038.

Figure 2-17: GA Operations History & Terminal Area Forecast for Ogden-Hinckley Airport



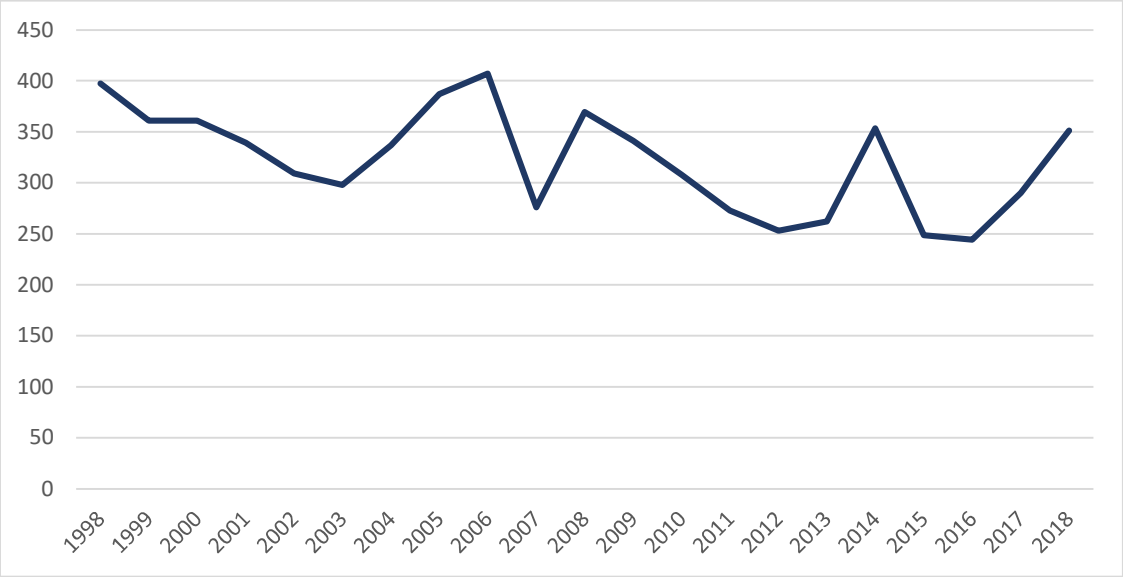
The TAF projects GA operations will reach 74,465[16] in 2038, representing an average annual decline of 0.6%. Throughout the forecast period, local operations are 47% of total operations. The TAF's 2038 forecast is more than 10,000 operations fewer than the 84,605 operations that occurred in 2018.[17] The Linear Trend model, projecting continuation of the past 20 years' trend, is even more pessimistic, projecting annual decline of 5.1% and resulting in only 29,768 operations in 2038. With 2018 GA operations 21% higher than 2017 operations and 2017 operations 19% higher than 2016 operations, one might expect strong future growth. On the other hand, 2016 and 2017 were years of unusual economic strength and unusually low fuel prices. The growth in GA operations will likely moderate as the economy cools off and fuel prices increase.

Analyzing the number of operations per based aircraft (OPBA) is useful for understanding and forecasting GA aircraft operations. **Figure 2-18** shows the historical trend in OPBA. OPBA has varied from a high of 407 in 2006 to a low of 244 in 2016. The figure illustrates large fluctuations in OPBA but shows a slight declining trend. The recent survey conducted as part of this master plan resulted in activity estimates from about 100 pilots. They reported an average of 363 OPBA. This may be a bit higher than the average

[16] The February 2019 TAF projects GA operations reaching 90,558 in 2038, with 45% local and 55% itinerant.
[17] GA operations have continued strong growth, reaching 109, 252 in calendar year 2019 according to ATADS.

for the Airport, as the survey responses included three flight instructors. However, it is not appreciably different from the 321 OPBA that is the historical average at OGD.

Figure 2-18: Historical Operations Per Based Aircraft at Ogden-Hinckley Airport

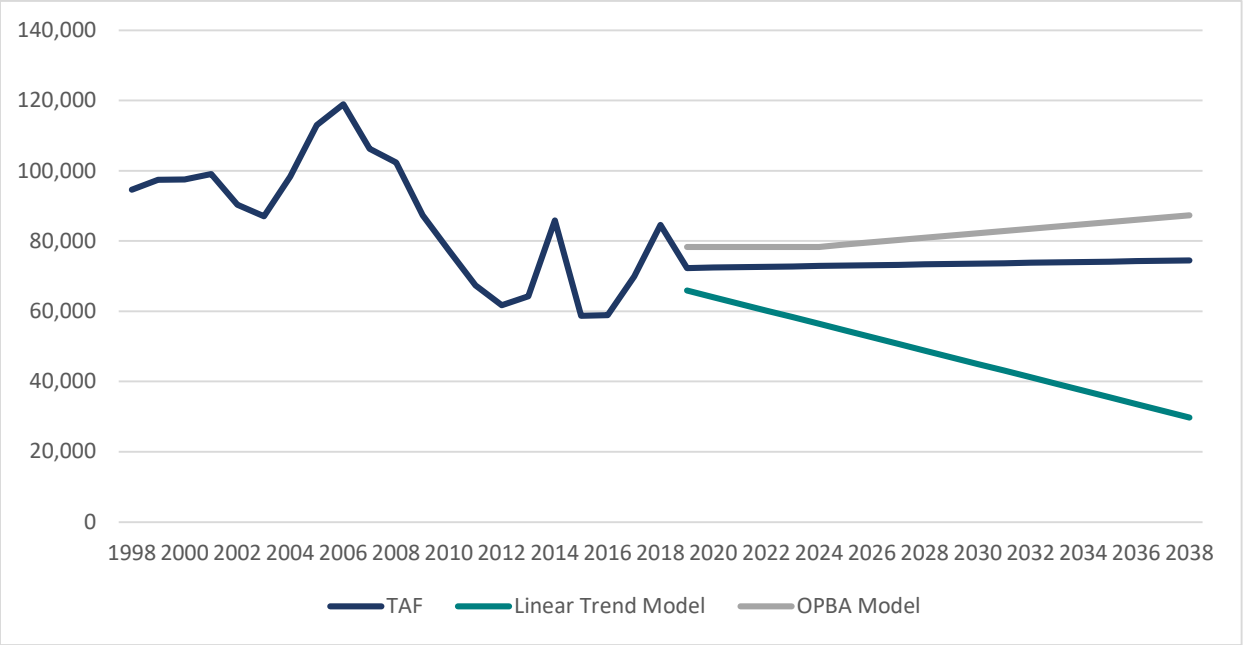


Source: Derived from Terminal Area Forecast and Air Traffic Activity System (ATADS)

The OPBA Model is recommended for forecasting GA operations at Ogden-Hinckley Airport. The OPBA model projects that the past ratio of operations per based aircraft will continue in the future. With this model, the historical average OPBA of 321 is applied to the forecast numbers of based aircraft. The result is 87,312 GA operations in 2038, representing 0.5% average annual growth. This growth rate recognizes that the majority of the OGD fleet will still be piston aircraft, which the FAA expects to be flown less over time, but other aircraft types will have a growing share of the fleet. The FAA projects future increases in hours flown by these other aircraft types, namely turboprops, turbojets, and helicopters. For the proportions of local vs. itinerant operations, this model assumes a declining trend in the percentage of local operations, starting with 51.9% in 2019, declining to 44.9% in 2038. With flight schools based at the Airport, relatively uncongested airspace, and an airfield with instrument approaches, training operations are likely to remain a significant part of OGD's operations.

Figure 2-19 compares the various forecast models used to project GA aircraft operations. The preferred forecast is the OPBA model.

Figure 2-19: General Aviation Operations Forecasts for Ogden-Hinckley Airport



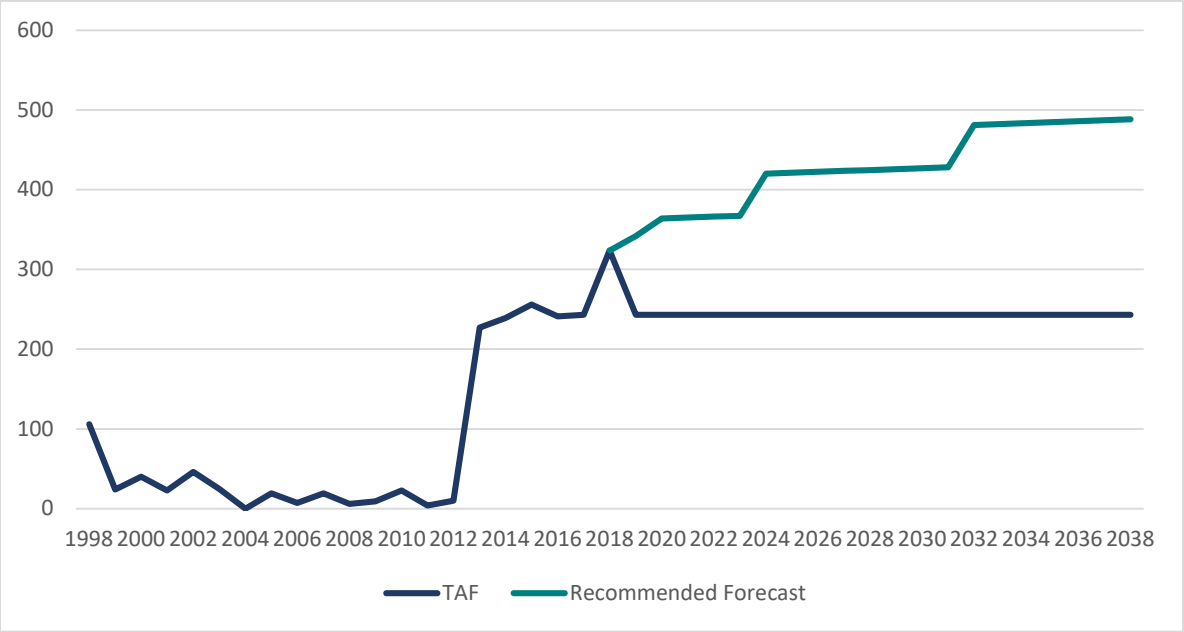
Air Carrier Operations Forecast for Ogden-Hinckley

Air carrier operations are those takeoffs and landings of commercial aircraft with seating capacity of more than 60 seats (or comparably sized all-cargo aircraft). Most of these operations at OGD are by Allegiant Airlines aircraft. Average weekly departures for Allegiant are projected to grow from two now (in 2019) to four in 2038. Consequently, by 2038, Allegiant's aircraft operations are projected to reach 416.

Before Allegiant Airlines began service to OGD, air carrier operations were few and differed greatly from year to year. None were reported in FY2004. Fewer than 50 occurred each year between FY1999 and 2012. The average number between 1999 and 2012 was 18. It is likely these were chartered passenger and all-cargo aircraft, or possibly large aircraft brought to OGD for maintenance. Lacking good information about the non-Allegiant air carrier operations, they are assumed to grow with the local economy. Consequently, the non-Allegiant air carrier operations are increased at the same rate as the Ogden-Clearfield MSA's gross regional product applied to a starting point of 18 annual operations. For the first five years of the forecast period, the GRP is projected to grow 2.0% annually, for the second five years of the forecast period, the GRP is projected to grow 1.9% annually, and for the last ten years of the forecast period, the GRP is projected to grow 1.8% annually. This growth could easily be surpassed with the establishment of more cargo and/or MRO businesses at the Airport.

The TAF projects air carrier operations to stay at the FY2017 level, 243, through the forecast period.[18] Air carrier operations in FY2018 totaled 324; as a result, the TAF projects a decline in air carrier operations (1.4% average per year) from 2018 to 2038. Such a decline is inconsistent with the growth in air carrier operations that has occurred since 2013. Figure 2-10 compares the preferred forecast for air carrier operations to the TAF. The preferred forecast uses the increases in Allegiant Airlines' flights derived from the preferred passenger forecast plus increases in other air carrier operations. For other air carrier operations, the preferred forecast uses the same growth as forecast for the MSA's gross regional product. Adding the Allegiant Airlines' operations and the other air carrier operations results in 2.1% average annual growth and 488 air carrier operations in 2038. If passenger flights grow as in the Contingency passenger forecast, the annual number of air carrier operations would total nearly 1,600 by 2038. Whether or not the high growth in passenger departures happens, air carrier operations are now and will remain a small percentage of total operations at the Airport.

Figure 2-10: Air Carrier Operations Forecast for Ogden-Hinckley



[18] In calendar year 2019, air carrier operations totaled 229 (ATADS). The February 2019 TAF projects annual air carrier operations to be 324 through 2038.

Air Taxi Operations Forecast for Ogden-Hinckley

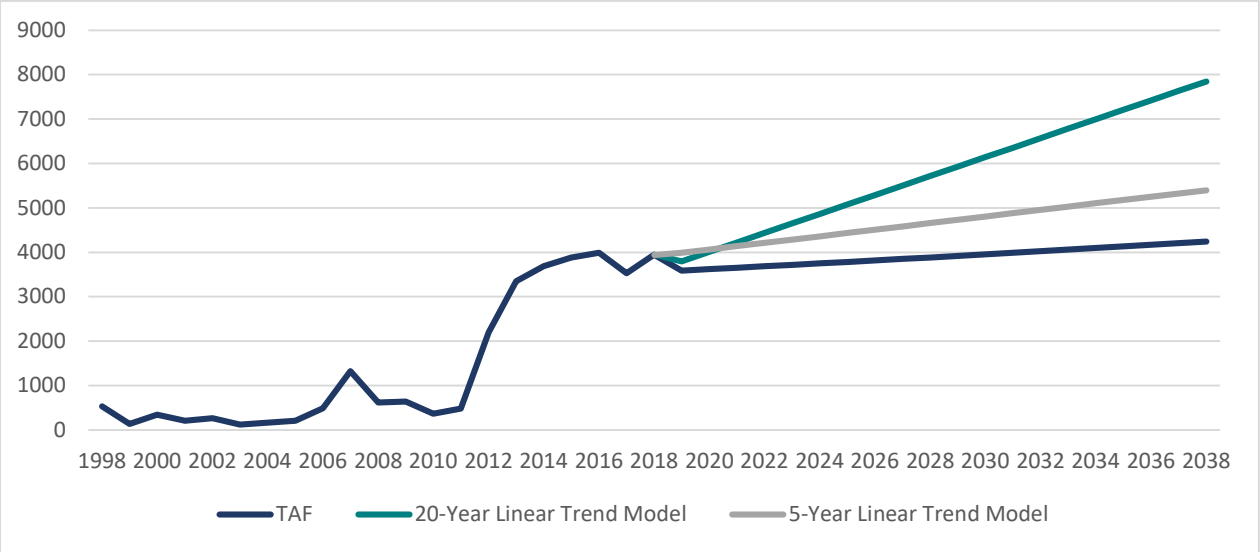
Air taxi operations at the Airport include takeoffs and landings in commercial aircraft with 60 or fewer seats (or comparably sized all-cargo aircraft). Air taxi operations can include scheduled regional airline service, but at OGD the air taxi operations are nonscheduled. The operations are primarily business jets, turboprops, and some piston aircraft on chartered passenger and all-cargo flights. They also include helicopter operations that are for hire, such as for powerline surveys. Air taxi operators include several different air ambulances, such as AirCARE1, AirMedCare, and Life Flight. Western Air Express based in Boise is an example of an air taxi that charters both passengers and cargo. Charters are primarily for business, but sometimes have recreational purposes, such as for ski trips or "flightseeing."

Since 1998, air taxi operations have grown at an average annual rate of 10.5%. From 1998 through 2011, air taxi operations averaged 420 per year. In 2012, the number jumped up. According to ATCT personnel, this jump may have reflected new air taxi business at the Airport, such as Guardian air ambulance maintenance, and/or a change in categorization of some aircraft operations. For example, Ogden Skydive operations used to be counted as GA and are now counted as air taxi. The number of air taxi operations between 2013 and 2018 grew from 3,348 to 3,943 at an average annual rate of 3.3%.

The TAF projects air taxi operations will grow to 4,247[19] in 2038, reflecting 0.4% annual growth. Considering the steady growth of air taxi operations at OGD in the last five years and considering the FAA's projected "hours flown" growth rates for jets and turboprops (2.7% and 1.8%), the TAF projection is comparatively low. Two linear trend forecast models were analyzed for comparison with the TAF. One used the whole 20 years of past data to project annual growth at 3.5% resulting in 7,847 operations in 2038. The other used only the last five years of data to project annual growth of 1.6% to reach 5,399 operations in 2038. The preferred forecast is the Five-Year Linear Trend model. **Figure 2-21** compares the TAF with the two linear trend models.

[19] According the to ATDS, calendar year 2019 had 3,890 air taxi operations. The February 2019 TAF projects air taxi operations growth to 4,713 in 2038.

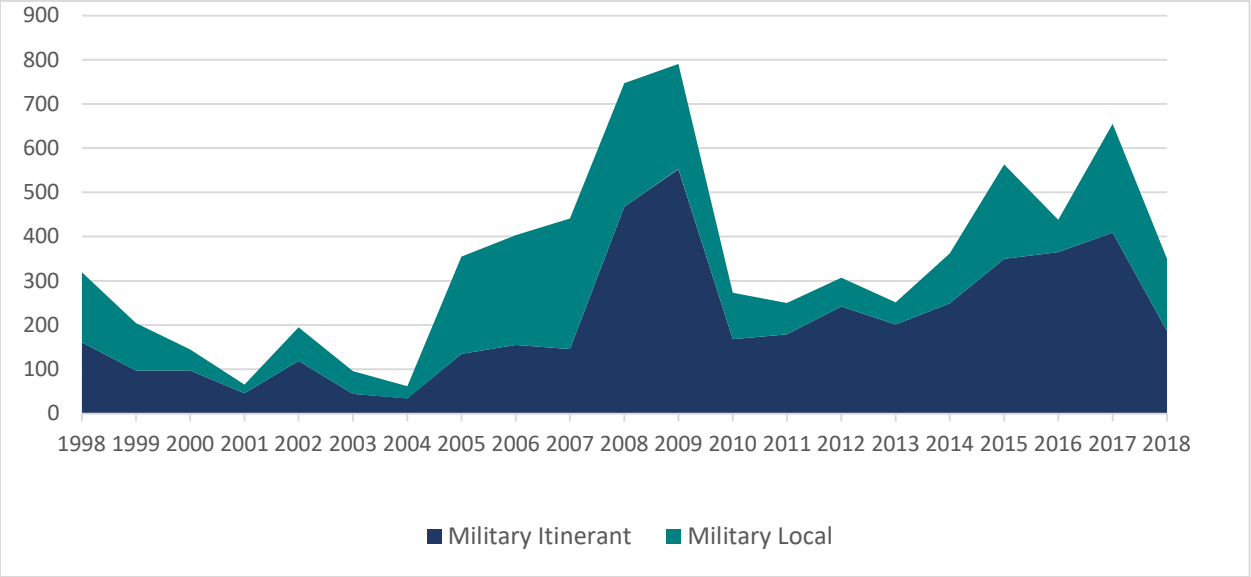
Figure 2-21: Air Taxi Operations Forecasts for Ogden-Hinckley Airport



Military Aircraft Operations Forecast for Ogden-Hinckley

Over the last 20 years (**Figure 2-22**), military aircraft operations at OGD have varied considerably, from a low of 62 in 2004 to a high of 791 in 2009. The number in FY2018 was 350. The growth between 1998 and 2018 averaged 0.5% annually. Between 17% and 67% of the military operations were local, and between 33% and 83% were itinerant.

Figure 2-22: Historical Military Aircraft Operations at Ogden-Hinckley Airport



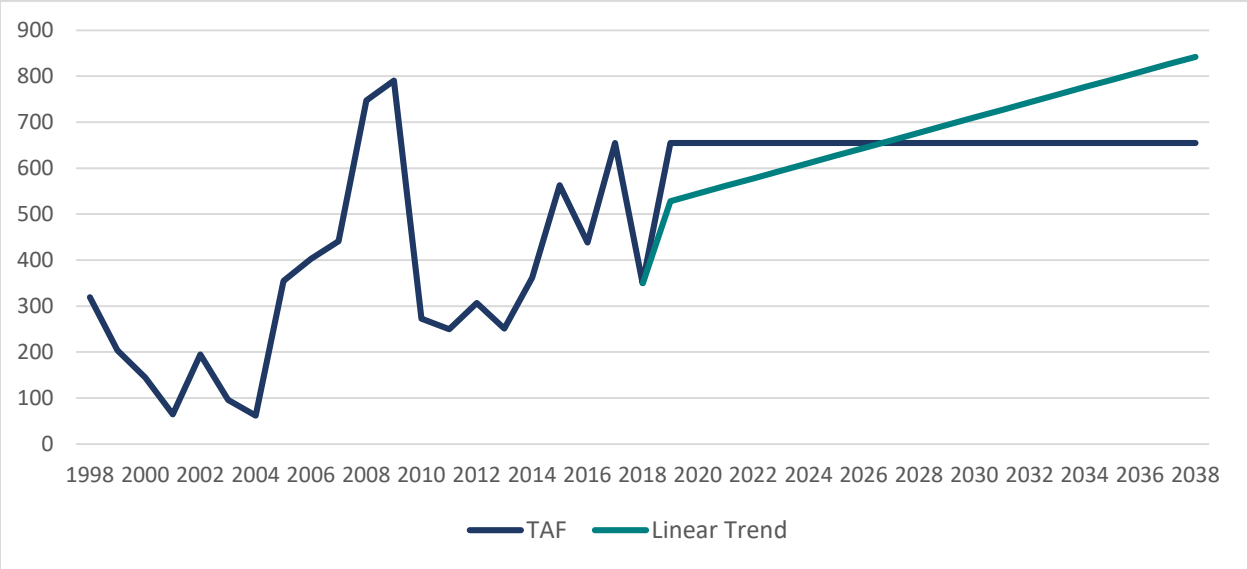
Source: Terminal Area Forecasts and Air Traffic Activity System (ATADS)

The FAA typically projects no growth or decline in future military aircraft operations at airports unless some major change, such as a nearby base's closure, is publicly known. The US military prefers not to share its plans for security reasons. For Ogden-Hinckley, the TAF projects the continuation of 2017 operations, 655 (409 itinerant and 246 local), through 2038.[20]

For comparison purposes, a Linear Trend model was developed. It resulted in 4.5% annual growth to 842 military operations in 2038. This growth rate seems unreasonably high compared to other aviation components. Consequently, the TAF is the preferred forecast. It uses a number consistent with recent activity and shows, by not changing in the future, that the military's plans for using OGD are unknown and unpredictable. Throughout the forecast period, 38% of operations are local and 62% are itinerant. Figure 2-23 compares the TAF (preferred) and the Linear Trend forecast model for military aircraft operations.

[20] In calendar year 2019, OGD had 292 military aircraft operations--236 itinerant and 56 local--according to ATADS. The February 2019 TAF projects 350 annual military operations, 186 local and 164 itinerant, through 2038.

Figure 2-23: Military Aircraft Operations Forecasts for Ogden-Hinckley



Compilation of Aircraft Operations Forecasts

Table 2I summarizes the preferred forecasts for all components of aircraft operations. From FY 2018 to FY2038, total operations are forecast to increase from 89,222 to 93,854.[21]

FY2017 operations appear in Table 2I, as well as FY2018 operations, to provide some perspective for the forecast. Nearly 15,000 more operations were recorded for 2018 than for 2017. Every category except military operations grew in one year—air carrier operations grew 33%, air taxi operations grew 12%, itinerant GA operations grew 25%, and local GA operations grew 16%. The short-term forecast for 2023 reflects the expectation of a "cooling" economy and rising oil prices, which results in approximately 5,000 fewer operations than 2018. Still, the forecast for 2038 shows nearly 10,000 more operations than occurred in 2017.

From 2018, total operations are projected to grow at an average annual rate of 0.3% to reach 93,854 in 2038. This compares to the TAF projection of 79,610 total operations in 2038,[22] reflecting an average annual decline of 0.6%.

[21] According to ATADS, actual operations in calendar year 2019 reached 113,663, 18% higher than the previous calendar year. GA operations grew 19% to account for 96% of total operations in 2019. Air carrier, air taxi and military operations declined between 2018 and 2019. Itinerant operations growth (29%) was much higher than the growth in local operations (4%).

[22] The February 2019 TAF projects annual operations will reach 95,945 in 2038.

Table 2I: Aircraft Operations Forecast for Ogden-Hinckley Airport

	Itinerant	Itinerant	Itinerant	Itinerant	Local	Local	Total
Fiscal Year	Air Carrier	Air Taxi	Military	GA	GA	Military	Oper-ations
2017	243	3,526	409	37,373	32,504	246	74,301
2018	324	3,943	186	46,801	37,804	164	89,222
2023	367	4,286	409	37,644	40,680	246	83,632
5-Year AAGR	2.5%	1.7%	17.1%	-4.3%	1.5%	8.4%	-1.3%
2028	425	4,657	409	40,789	40,103	246	86,629
5-Year AAGR	3.0%	1.7%	0.0%	1.6%	-0.3%	0.0%	0.7%
2038	488	5,399	409	48,150	39,162	246	93,854
10-Year AAGR	1.4%	1.5%	0.0%	1.7%	-0.2%	0.0%	0.8%
20-year AAGR	2.1%	1.6%	4.0%	0.1%	0.2%	2.0%	0.3%

The slow growth forecast for operations is not uniform for all categories. Air carrier and air taxi operations are projected to grow more than GA. GA operations, dominated by piston aircraft projected to be flown fewer hours per aircraft over the next 20 years, will comprise 93% of total operations in 2038, compared to 95% in 2018.

Operations Fleet Mix Forecast

The mix of aircraft types flying at OGD is not necessarily the same as the mix of based aircraft. Many aircraft using the Airport are not based there. Examples are Allegiant's jets and the military aircraft that operate at OGD. In addition, many aircraft of various types carry passengers and sometimes cargo on visits to and from Ogden for business and personal reasons. The type of operations can also account for different aircraft types--virtually all the training (local) operations are in piston aircraft. Itinerant aircraft operations include jets, turboprops and helicopters, as well as single engine piston (SEP) and multi-engine piston (MEP) aircraft.

The fleet mix forecast for OGD aircraft operations is based on an estimate of the 2018 operations fleet mix, the pilot survey performed for this master plan, FAA's forecast of hours flown for different types of air taxi and GA aircraft (Figure 2-13), and the based aircraft and aircraft operations forecasts (Tables 2H and 2I).

FAA records of specific aircraft types flying by instrument flight rules (IFR) were helpful in estimating the mix of 2018 operations. However, 89% of the operations in 2018 were under visual flight rules (VFR), so reasoning and estimating was required to distribute them by aircraft type. Still, the IFR records show the diversity of OGD's operations. The IFR records for 2018 listed nearly 800 different airplane models. The most frequent jet traffic was by various models of the Cessna Citation (over 1,000 operations); Gulfstreams, Diamond Stars, Embraer Phenoms, Bombardier Challengers, Learjets, and Dassault Falcons each accounted for between 50 and 250 operations. The Pilatus PC-12 accounted for the most turboprop operations (450); King Air and Socata TBM turboprop models also recorded large numbers.

In the pilot survey, approximately 100 pilots estimated their annual landings, which amount to one-half of their annual operations. Most of the pilots responding to the survey flew single-engine piston aircraft, but three flew business jets and one flew helicopters. Several pilots reported as few as 20 annual operations, but others reported 500 operations or more. The lower operations were reported by pilots who mostly flew for personal rather than business reasons.

Table 2J presents the fleet mix forecast for operations at Ogden-Hinckley. The table shows that over the 20-year forecast period, jets, turboprops, and helicopters will have increasing proportions of aircraft operations, consistent with recent trends and the FAA's national forecast. Piston aircraft will have declining shares of the annual total. However, by 2038, piston aircraft will still account for most operations at the Airport.

Table 2J:Fleet Mix Forecast for Operations at Ogden-Hinckley Airport

Year	SEP	MEP	Turboprop	Jet	Helicopter	Total
2018	79.5%	6.5%	4.0%	3.0%	7.0%	100.0%
	70,931	5,799	3,569	2,677	6,246	89,222
2023	75.5%	6.0%	4.5%	4.0%	10.0%	100.0%
	63,142	5,018	3,763	3,345	8,363	83,632
2028	74.5%	6.0%	5.0%	4.5%	10.0%	100.0%
	64,539	5,198	4,331	3,898	8,663	86,629
2038	69.5%	6.0%	6.0%	5.0%	13.5%	100.0%
	65,229	5,631	5,631	4,693	12,670	93,854

PEAKING CHARACTERISTICS

Aviation activity at an airport fluctuates throughout the year, the month, and the day. For a busy airport like Ogden-Hinckley, calculating peak demand is important to ensure facilities have adequate capacity.

Forecasts of peak demand for aircraft operations start by identifying the peak month. Air Traffic Control data indicates that the busiest month for operations at OGD accounts for about 10% of the annual total. Operations are fairly evenly spread over the year, and the peak month can differ from year to year. In 2018, it was October, and in 2017, it was May.

The design day is determined by dividing the activity in the peak month by the number of days in the month. The busiest hour is estimated to account for 15% of the peak day. The forecast of peak demand for aircraft operations appears in **Table 2K**.

Table 2K: Peak Demand Forecast for Ogden-Hinckley Airport

	Base Year 2018	Short-Term 2023	Intermediate Term 2028	Long-Term 2038
Annual Operations	89,222	83,632	86,629	93,854
Peak Month (10% of Total)	8,922	8,363	8,663	9,385
Design Day	297	279	289	313
Design Hour (15% of Design Day)	45	42	43	47

Peak passenger demand is usually a very important element in terminal building planning. The terminal area is a concern at Ogden-Hinckley, as the ramp area is limited, and part of the terminal building is several decades old and needs improvement. The holdroom capacity is adequate for one planeload of Allegiant Airlines passengers, but not two. At busy airports with competing airlines whose schedules compete for business travelers, significant peaks occur during morning and evening "rush hours." However, based on the type of service Allegiant Airlines provides, flight schedules at OGD are likely to be spread out through the day. Even with 15 weekly departures, as in the contingency passenger forecast for 2038, the maximum number of daily departures is three or four. These would likely be spread out during the day, reducing the likelihood that more than one or two Allegiant airplanes will be at the Airport at the same time. For the short-term contingency forecast, the average number of daily departures is 1.4, indicating the need to accommodate more than one flight at a time would be unlikely.

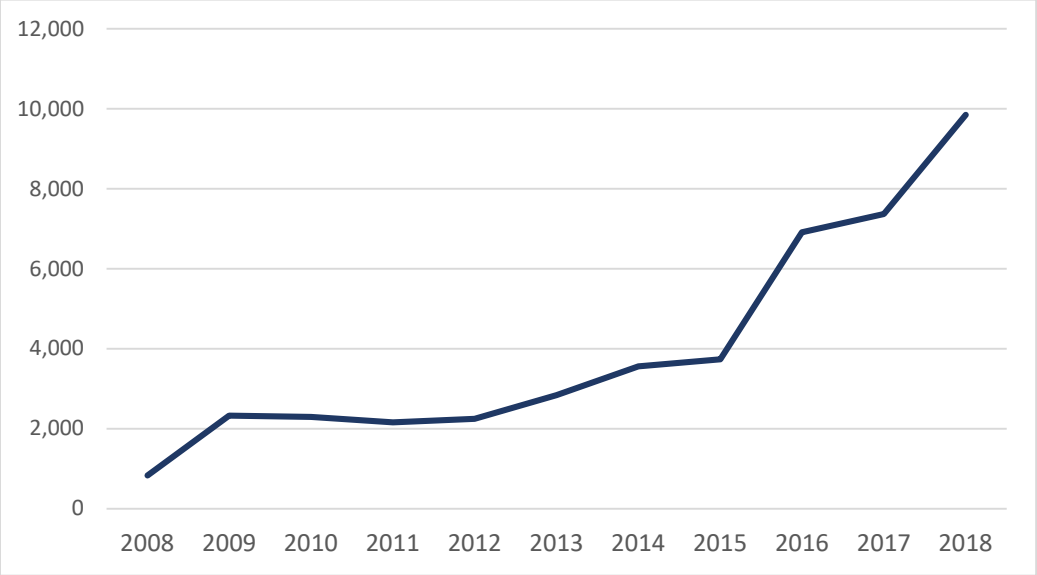
INSTRUMENT OPERATIONS

The number of instrument operations at an airport is important for forecasting ATC workload and for assessing the capacity of the airfield during instrument weather conditions. Some pilots fly under instrument flight rules regardless of how clear the weather is. One reason is that jet aircraft fly at high altitudes where the ride is smoother, and where flying is limited to IFR. Consequently, all the air carrier operations at OGD are IFR and some of the air taxi, GA, and military operations are IFR.

As shown in **Figure 2-24**, the number of IFR operations at OGD has been increasing over the last ten years, particularly in the last five years. In 2010, only 3% of all aircraft operations were IFR. The percentage

grew to 6% in 2015, and 11% in 2018.[23] The fact that Allegiant Airlines' air carrier operations began in 2012 and are 100% IFR is only part of the reason for the increase in instrument operations. The proportion of itinerant GA operations that are IFR has grown from 6% to 19% since 1998. Air taxi IFR ops have varied from 8% to 63% since 1998, averaging 23%. For military aircraft, an average of 42% of itinerant military operations have been IFR.

Figure 2-24: Historical IFR Operations at Ogden-Hinckley Airport



Source: Air Traffic Activity System (ATADS)

Over time, the proportion of itinerant traffic that is IFR is projected to increase gradually, consistent with higher growth in jet traffic. **Table 2L** presents the forecast for instrument operations. By 2038, the number of IFR operations is projected to reach 14,454, or 15% of all OGD aircraft operations.

[23] According to ATADS, instrument operations were 12% of total operations in calendar year 2019. Total 2019 instrument operations, 13,924, increased 35% from 2018.

Table 2L: Instrument Operations Forecast for Ogden-Hinckley Airport

	Air Carrier	Air Taxi	Military Itinerant	GA Itinerant	Total Ops
2018	324	654	102	8,773	9,853
	100%	17%	55%	19%	11%
2023	367	1,072	176	7,529	9,144
	100%	25%	43%	20%	11%
2028	425	1,257	184	8,974	10,850
	100%	27%	45%	22%	13%
2038	488	1,728	200	12,038	14,454
	100%	32%	49%	25%	15%

DESIGN AIRCRAFT AND AIRPORT REFERENCE CODE

FAA criteria require an airport's design to be based on the design, or critical, aircraft. The design aircraft is the most demanding aircraft that regularly uses the airport. The definition of regular use, also called substantial use, is at least 500 annual itinerant operations.

The design aircraft need not be one specific model, but a family of aircraft defined by common features that determine an Airport Reference Code (ARC). ARCs are linked to specific FAA airport design standards.

An ARC consists of a letter representing Aircraft Approach Category (based on 1.3 times stall speed) and a Roman Numeral representing the Airplane Design Group (based on wingspan, primarily). In some cases, the airplane tail height is a more demanding factor for Airplane Design Group than wingspan. **Table 2M** explains the components of the ARC and lists representative airplanes.

The easiest way to document the design aircraft for an airport is to examine the FAA's IFR records. **Table 2N** shows specific aircraft types flown IFR in 2017, with their Aircraft Approach Category and Airplane Design Group noted, along with total operations. Table 2N details 734 IFR operations, which accounted for only 10% of the total 7,368 IFR ops. FAA data show that 87% of annual IFR operations were business aviation in 2017, and 78% of the business aviation operations were in business jets. Table 2N lists the largest and fastest jets with IFR operations at OGD; they are the most demanding aircraft for the Airport's design.

Until recently, Allegiant flew both Airbus (ARC C-III) and MD-80 (ARC D-III) aircraft. In CY2017, Allegiant accounted for 310 operations, 257 in Airbus A319 and A320 aircraft and 53 in MD-83 and MD-88 aircraft. Allegiant is now transitioning to an all Airbus A319 and A320 fleet.

Table 2N is summarized below:

Aircraft Approach Category C	596 operations
Aircraft Approach Category D	130 operations
Airplane Design Group III	378 operations
Airplane Design Group IV	25 operations

Clearly, the Aircraft Approach Category part of the ARC should be C, as more than 500 operations were in C aircraft. However, aircraft with wingspans meeting Airplane Design Group III and larger accounted for 403 operations, less than the 500 operations threshold. While IFR operations can be identified by aircraft model, VFR operations cannot be. Civilian VFR traffic in airplanes with wingspans over 79 feet (Design Group III) is rare, according to ATCT personnel. However, ATCT personnel estimate that about 30% of itinerant military VFR operations are in Design Group III or IV aircraft, such as the KC-135 and C-130. Using an average of the last two years' military VFR itinerant operations, the 30% estimate amounts to 50 additional Group III/IV operations to add to the 403 previously identified. Borsight's new KC-135/C-130 MRO contract will likely increase the number of military aircraft contributing to the C-III Airport Reference Code. Just one additional weekly Allegiant Airlines flight adds 104 operations in Group III airplanes. Considering these factors, the threshold for Airplane Design Group III should be surpassed within five years.

Even if Allegiant or other large aircraft traffic for charter passengers, cargo, or MRO does not grow as expected, business jet traffic at OGD is substantial and forecast to grow. The national and local trend is not only to more business jets, but larger ones. Consequently, ARC C-III is recommended for Ogden-Hinckley Airport design.

Table 2M: Airport Reference Code (ARC) Components

Aircraft Approach Category	Approach Speed	Representative Aircraft
A	Less than 91 knots	Cessna 150, 172, Beech Bonanza
B	91 to 120 knots	King Air, Piper Navajo, Gulfstream I
C	121 to 140 knots	Learjet, Citation X, Boeing 737
D	141 to 165 knots	Boeing 747, Gulfstream V
Airplane Design Group	**Wingspan**	**Representative Aircraft**
I	Less than 49 feet	Cessna 150, 172, 206
II	40 to 78 feet	King Air, Dassault Falcon 900
III	79 to 117 feet	Boeing 737, DC-3, Gulfstream V
IV	118 to 170 feet	Boeing 757
Airplane Design Group may be determined by tail height, if more demanding than wingspan:		
Airplane Design Group	**Tail Height**	
I	Less than 20 feet	
II	20 to 29 feet	
III	30 to 44 feet	
IV	45 to 59 feet	

Source: FAA AC 150/5300-13A, Airport Design.
Note: Aircraft Approach Category E (166 knots or more) and Airplane Design Groups V and VI (171 feet or more) are not shown.

Table 2N: 2017 IFR Aircraft Operations Supporting ARC at Ogden-Hinckley Airport

Aircraft	Aircraft Approach Category	Airplane Design Group	Operations
FA7X - Dassault Falcon F7X	B	III	8
H25B - BAe HS 125/700-800/Hawker 800	C	I	40
LJ31 - Bombardier Learjet 31/A/B	C	I	70
LJ40 - Learjet 40; Gates Learjet	C	I	4
LJ45 - Bombardier Learjet 45	C	I	31
LJ60 - Bombardier Learjet 60	C	I	10
WW24 - IAI 1124 Westwind	C	I	2
CL30 - Bombardier (Canadair) Challenger 300	C	II	24
CL35 - Bombardier Challenger 300	C	II	10
E135 - Embraer ERJ 135/140/Legacy	C	II	6
G150 - Gulfstream G150	C	II	35
G280 - Gulfstream G280	C	II	6
GALX - IAI 1126 Galaxy/Gulfstream G200	C	II	34
LJ75 - Learjet 75	C	II	10
A319 - Airbus A319	C	III	256
A320 - Airbus A320 All Series	C	III	1
B462 - BAe 146 -200	C	III	3
B722 - Boeing 727-200	C	III	4
B737 - Boeing 737-700	C	III	1
DC91 - Boeing (Douglas) DC 9-10	C	III	4
GL5T - Bombardier BD-700 Global 5000	C	III	4
GLEX - Bombardier BD-700 Global Express	C	III	16
B752 - Boeing 757-200	C	IV	3
B757 - Boeing 757	C	IV	1
C130 - Lockheed 130 Hercules	C	IV	21
F18 - Boeing FA-18 Hornet	D	I	1
F18S - F18 Hornet	D	I	2
LJ35 - Bombardier Learjet 35/36	D	I	28
GLF4 - Gulfstream IV/G400	D	II	18
B738 - Boeing 737-800	D	III	6
GLF5 - Gulfstream V/G500	D	III	14
GLF6 - Gulfstream	D	III	8
MD83 - Boeing (Douglas) MD 83	D	III	49
MD88 - Boeing (Douglas) MD 88	D	III	4

Source: Traffic Flow Management System Counts (TFMSC), CY 2017

SUMMARY OF FORECASTS

- Forecasts are prepared for the short-term (2023), intermediate term (2028), and long-term future (2038). The base year for aviation activity is 2017 or 2018 (calendar year or fiscal year), depending on the availability of data. Since forecasts help determine and justify airport improvements eligible for federal funding, they are subject to FAA review. Forecasts more than 10% higher than the FAA's Terminal Area Forecast need FAA Headquarters' approval before they can be used for master planning. The FAA approved Ogden-Hinckley's forecasts on August 21, 2019.

- Ogden-Hinckley Airport's role within the national system of airports is "nonhub primary," which means it enplanes at least 10,000 passengers annually, but less than 0.05% of all US enplanements. Over the next 20 years, the Airport's role is not projected to change.

- The Airport's service area is about a half-hour's drive, or approximately 25 miles. The service area's socioeconomic profile is that of the Ogden-Clearfield Metropolitan Statistical Area (MSA), which has a population around 665,000. Expected population and economic growth in the Airport's service area compares favorably with the nation.

- The air passenger market in Utah is dominated by Salt Lake City International, which enplanes 98% of the state's total and 99% of the greater Salt Lake City area total.

- The FAA's projection of passenger growth in Utah (2.0% annual) is in line with its national passenger forecast (1.9% annual) and the International Air Transport Association (IATA) forecast of 2.4% annual passenger growth in North America.

- The national FAA forecast for passengers notes that, since the recession, the US airline industry has transformed itself from a highly cyclical, capital intensive industry to one that can generate sustained profits. The airlines have lowered operating costs, eliminated unprofitable routes, grounded older airplanes, initiated new services that customers are willing to pay for, and started charging separately for services formerly included in ticket prices. Yields (average fare per passenger per mile) increased only 0.1% from 2016 to 2017, partly due to competition from ultra-low-cost carriers (ULCC) such as Allegiant Airlines.

- ULCCs like Allegiant have been compared to "wildcatters" in the oil industry, because they "drill" for latent discretionary income available in markets overlooked by mainline airlines.

- Since Allegiant Airlines began serving OGD in September of 2012, enplaned passengers have been growing (7% average annual growth from 2013 to 2017), but the average numbers of flights and destinations have not. In comparison, Provo, with comparable population and distance from SLC, has 4-1/2 times the passengers and flights.

- In the preferred passenger forecast, an additional weekly Allegiant Airlines flight is added, bringing the number from two in 2019 to three in 2020. Consistent with recent trends, all service in 2020 will use the A320 airplane, with 186 seats that are 87% filled, on average. Beyond 2020, passenger growth is projected at the same rate as the MSA population. By 2038, the forecast is for four weekly flights and 32,196 passenger enplanements, which represents 2.2% average annual growth.

- A contingency forecast with higher growth in passengers will be used for future planning in a visionary approach for the protection of possible land use development needs. In the contingency forecast, passenger growth for Ogden-Hinckley is projected to result from Allegiant Airlines (or another ULCC) expanding flights and destinations to more closely match those at Provo Municipal Airport. Growth from 20,324 enplaned passengers (about three weekly departures) in 2017 to 126,715 enplaned passengers (about 15 weekly departures) in 2038 reflects 9.1% average annual growth. The highest growth would be in the first five years.

- Air cargo at Ogden-Hinckley is carried on nonscheduled flights and consists almost entirely of freight (little or no mail). Most (78%) of the cargo is enplaned rather than deplaned. The annual amount has varied widely over the last 20 years, as has the size of all-cargo aircraft (from small turboprops to Boeing 757 freighters). Cargo is projected to grow at the same rate as the service area's gross regional product, resulting in 94,439 pounds in 2038, compared to 63,856 pounds in 2017.

- Nationally, the general aviation (GA) industry has not recovered to pre-recession levels, although it is growing. Ogden-Hinckley's GA activity (based aircraft and aircraft operations) has trended with the nation. While most GA aircraft and aircraft operations are piston-powered, the past and future trend for piston aircraft is gradual decline. The FAA projects the active aircraft and hours flown in the turboprop, jet, and helicopter segments of GA will grow.

- Based aircraft at OGD will continue to be mostly piston-powered, but the proportion of piston-powered aircraft will decline. Based aircraft are projected to grow from 241 in 2017 to 272 in 2038. Single engine piston aircraft will grow slightly, but will comprise 72% of fleet in 2038, compared to 79% in 2017. Multi-engine (piston and turboprop) aircraft will grow from 10% to

12% of the based aircraft. Jets will grow from 3% to 5%, while helicopters will grow from 5% to 8%.

- GA will continue to dominate aircraft operations at Ogden-Hinckley Airport (95% of the total now, compared to 93% in 20 years). The preferred forecast for GA operations uses an operations per based aircraft (OPBA) model that applies the historical average 321 OPBA to the based aircraft forecast. The historical OPBA average is slightly less than the 363 OPBA estimated from this master plan's pilot survey. The pilot survey estimate is probably higher because three flight instructors responded. While flight training will continue to account for a large share of aircraft operations in 20 years, local (training) GA operations are projected to grow less than itinerant GA operations. The 2038 forecast is 39,162 local GA operations and 48,150 itinerant GA operations.[24]

- Growth in air carrier operations is expected due to increasing Allegiant Airlines' flights and more large aircraft using the Airport for passenger charter, air cargo, or MRO purposes. The number of air carrier operations are projected to increase from 324 in 2018 to 488 in 2038, reflecting 2.1% average annual growth. Air taxi operations are projected to grow from 3,943 in 2018 to 5,399 in 2038, reflecting 1.6% average annual growth. Both air carrier and air taxi operations are commercial; air taxi aircraft are 60-seat or smaller, and air carrier aircraft have more than 60 seats. OGD air taxi operations include chartered passenger and cargo flights, air ambulances, and other "for hire" flights in various fixed wing aircraft and helicopters.[25]

- Military aircraft operations are projected to remain 409 itinerant and 246 local through the forecast period, consistent with the FAA's Terminal Area Forecast.[26]

- The compiled total for aircraft operations grows 0.3% annually, on average, from 89,222 in 2018 to 93,854 in 2038. Operations in 2018 were about 15,000 higher than in 2017, and 2017's operations were considerably higher than 2016's.[27] As the economy cools and fuel prices rise, a slight, short-term decline in GA operations is projected.

- The fleet mix of aircraft operations does not match the based aircraft fleet mix, as Airport operations include visiting as well as based aircraft. About 80% of 2018 aircraft operations are

[24] Calendar year 2019 exceeded the 2038 GA forecast with 42,513 GA local and 66,795 GA itinerant operations (ATADS).
[25] According to ATADS, air carrier operations totaled 229 and air taxi operations totaled 3,890 in CY2019.
[26] ATADS military operations numbers for CY2019 were 236 itinerant and 56 local.
[27] Operations continued to grow in 2019, reaching 113,663, an 18% increase over 2018 (ATADS).

estimated to be in single engine piston aircraft, but this percentage is expected to decline to under 70%, as turboprops, jets, and helicopters hold growing shares of the operations fleet mix.

- Peak monthly demand for aircraft operations is 10% of the annual total. The design hour represents an estimated 15% of the average daily operations in the peak month. The result is a design hour in 2038 that is virtually the same as in 2018 (47 compared to 45). However, the fleet mix of the design hour will be different in 2038, based on the operations fleet mix.

- The number of operations under instrument flight rules (IFR) instead of visual flight rules (VFR) has increased a lot in the last ten years. In 2010 instrument operations were only 3% of the total; the proportion grew to 6% in 2015 and 11% in 2018. Instrument operations do not all relate to how clear the weather is. For example, pilots of jet aircraft typically fly IFR all the time. Over the last 20 years, the proportion of IFR GA itinerant operations has grown from 6% to 19%. By 2038, IFR operations are projected to comprise 15% of total OGD operations.[28]

- Based primarily on Air Traffic Control records that enumerate the number of IFR operations by specific airplane models, the recommended Airport Reference Code (ARC) for Ogden-Hinckley Airport is C-III. This means airfield features should meet FAA design standards for airplanes having minimum approach speeds of 121 knots and minimum 79-foot wingspans. Allegiant's A319 and A320 airplanes fit ARC C-III, as do several business jets.

- **Table 2O** summarizes the forecasts and compares them to the February 2019 update of the FAA's Terminal Area Forecasts.

[28] In CY2019, instrument operations comprised 12% of total aircraft operations and 20% of itinerant GA operations (ATADS).

Table 2O. Ogden-Hinckley Airport Forecasts Compared to FAA's February 2019 Terminal Area Forecasts

	Base Year 2017/2018	Short-Term 2023	Intermediate Term 2028	Long-Term 2038
Enplaned Passenger Forecast	20,324*	26,007	28,017	32,196
TAF Enplaned Passenger Forecast	22,191*	22,191	22,191	22,191
Difference	-8.4%	17.2%	26.3%	45.1%
Based Aircraft Forecast	241**	244	252	272
TAF Based Aircraft Forecast	236	238	246	266
Difference	2.1%	2.5%	2.4%	2.3%
Aircraft Operations Forecast	89,222	83,632	86,629	93,854
TAF Aircraft Operations Forecast	89,222	94,191	94,762	95,945
Difference	0%	-11.2%	-8.6%	-2.2%

*The OGD forecast used the actual CY2017 number of enplanements for the base year. The TAF uses the estimated FY2018 number.

**The OGD forecast used 241 for based aircraft in the base year; the source was the Airport Master Record dated 10/1/2017.

Chapter 3

Facility Requirements



CHAPTER 3 – FACILITY REQUIREMENTS

INTRODUCTION

Facility requirements for the Ogden-Hinckley Airport (OGD) are identified in this working paper. Requirements are based on airport user input, aviation demand forecasts and the ability of OGD facilities to accommodate demand in compliance with current FAA design standards.

Requirements span the 20-year planning period with high-priority needs identified for the near-term, through 2023. Other improvements are outlined for the intermediate-term (2024-2028) and long-term (2029-2038). However, airport improvements are demand-driven rather than time-driven, since actual activity may deviate from the forecast timeframes. Further, funding feasibility, addressed later in the Implementation Chapter, may dictate that the timing of some facility improvement projects be adjusted.

Similar to Inventory, airport facilities are categorized as airside or landside. Airside facilities include runways, taxiways, apron, navigational aids, marking and lighting, while landside facilities include the terminal area, hangars, auto access, automobile parking, and various support facilities.

PLANNING CRITERIA AND GUIDANCE

The airport planning process addresses a broad range of airport facilities, which involves criteria and guidance from several sources. Examples include:

- **Federal Aviation Administration –** There are numerous FAA resources that offer guidance in the planning and development of an airport but two are key to this study and this chapter. FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans,* provides guidance for the preparation of this master plan. FAA design guidelines found in AC 150/5300-13A, *Airport Design*, provide criteria specific to the layout of runways, taxiways and apron areas, including protective surfaces.
- **Utah Continuous Airport System Plan (UCASP) 2007 –** Prepared by the Utah Department of Transportation (UDOT) Division of Aeronautics, the UCASP[1] presents a set of minimum facility and service objectives recommendations for each airport classification.
- **Transportation Security Administration (TSA)** – Transportation Security Administration (TSA) - regulatory requirements are published for airports with scheduled passenger service and for many aspects of aviation.
- **Business Aviation Industry –** The National Business Aviation Association (NBAA) represents the business segment of the general aviation industry and provides general recommendations for airport facilities and services to accommodate business aviation needs.

[1] UDOT Aeronautics has initiated an update to the UCASP but a draft report is not anticipated until late 2020.

- **City of Ogden and Airport Users –** The City and airport users include local government officials, the Planning Advisory Committee (PAC) members, other meeting participants and user survey respondents providing local perspective and input on OGD needs.

DEVELOPMENT TRENDS AND CONSIDERATIONS

In addition to planning guidance, a few trends that influence airport development are outlined. Many of these are not specifically addressed in the master plan but are considered when project details are defined in the Airport Capital Improvement Plan (ACIP) and/or in the project application process submitted to funding agencies. It is anticipated that much of what is addressed here will become a greater part of future master plan updates as these trends continue to be integrated into the industry.

Airport Sustainability

Sustainability has become a more common term within the airport community in the last decade. The FAA generally groups sustainable actions for airports into the following categories: 1) reduce environmental impacts; 2) help maintain high levels of economic growth; and 3) help achieve "social progress" by integration with the local community and improving community relations. The FAA has purposely created broad categories of sustainability in order to allow for innovation and creativity in airport sustainability plans. Airports can create plans that address opportunities that are unique for each individual airport. In the future development of OGD, opportunities to reduce environmental impacts can be explored. Examples of reducing environmental impacts may include: reducing energy consumption by using LED lighting in buildings, installing solar panels on buildings, and establishing pilot-controlled lighting for the airfield (like OGD has now); designing buildings for optimum natural ventilation; providing bicycle-friendly buses and trains; and installing occupancy sensors to turn off lighting when rooms are unoccupied.

Revenue Generation

Airport sponsors, like the City of Ogden, often subsidize their airport's capital improvement needs (e.g. grant matching funds) as well as the maintenance and operation of facilities. With the cyclical nature of the economy, a downturn negatively impacts cash flow and reduces funding support for the airport. Consequently, airports have looked for creative ways to generate revenues. While revenue generation is not an airport master planning element, it is an inherent part of the airport sponsor's decision-making processes to promote the long-term viability and growth of the airport. For Ogden, maintenance, repair and overhaul (MRO) businesses are attracted to the area, and specifically to OGD, for its proximity to Hill Air Force Base to support their needs. While facility requirements for current and prospective MRO tenants are not addressed here, their location, acreage, and access needs should be considered in future development layout concepts in the next chapter.

Unmanned Aerial Systems (UAS)

Unmanned Aerial Systems (UAS), or drones, have become increasingly popular in recent years. These systems provide opportunities for growth in aviation. Examples of UAS use include aerial photography, land surveying, airport facilities inspection (e.g. runway and perimeter fencing condition), wildlife monitoring, disaster relief, and search and rescue. Routine transportation of people via UAS is also being explored. Facility and support service needs of UAS activity in a region may influence airport and area airspace considerations.

The FAA states "While significant UAS integration progress continues to be made, the FAA recognizes that much remains to be done to maintain existing operational capacity, security, and safety, while protecting airspace users, people, and property on the ground from excessive risk." According to FAA's July 2018 statistics, over 98,000 remote pilot certificates have been issued and over 214,400 commercial UAS registrations have been completed online (plus hobby registrations of nearly 935,000).

Urban Air Mobility (UAM)

The urban air mobility (UAM) concept centers around providing point-to-point urban transport with small, versatile electric vertical take-off and landing (eVTOL) aircraft, a type of electric air taxi. Operations would be conducted in and out of vertiports or vertipads. Like helicopters, these aircraft may use building tops and existing helipads. This is of interest to air travelers since access to big city airports to catch a flight is often cumbersome – ground transportation is sometimes slow and unpredictable. The electric taxi is not only environmentally efficient, but more adaptable. According to industry news, more than 130 designs are under review and the major aircraft manufacturers already have well-established eVTOL development programs. Use of these eVTOL aircraft could transport passengers to airport terminal buildings, parking garages, and to/from train stations. Current and progressing technology is a "game changer" for this air taxi market -- battery technology, autonomous flying technologies and ride sharing options are ultimately expected to make this new concept a cost-competitive option. Some companies offering similar air taxi support to the airport are working towards the goal of replacing their helicopters with the eVTOL aircraft. Uber is one of the early companies to jump into this market with plans to initiate testing UAM air taxi service in Dallas-Fort Worth and Los Angeles by 2020. Uber also has a network of skyports being planned for Uber UAM operations.

For OGD and similar airports, consideration may be given to the UAM concept in future development plans. This is new aviation territory, so regulations, policy and design standards are far from complete. Potential benefits are numerous but challenges to be addressed include the need for energy supply, increased security controls, safe integration into the existing airspace system, and issues with community acceptance such as privacy concerns, noise and visual disturbances, and safety risks.

According to UDOT Aeronautics, they recently started their *Aviation Development Strategy*, which will be addressing the implications of UAM, particularly for airports. They offered the following input for the OGD master plan with respect to UAM.

The Division of Aeronautics believes airports can play a critical role in UAM integration. Airports provide an environment where many challenges and risks are already mitigated. For many smaller metro areas, it makes sense to start UAM integration at the airport versus investing in new infrastructure; this makes sense, particularly where the airport is within ten minutes of the city's Central Business District (CBD) via a ground transportation choice. While not always recognized, many airports suffer from first/last mile challenges that are often associated with public transit. The time it takes to reach a common destination, such as a CBD, is often correlated with the perceived utility of an airport. Accessibility is a challenge for most of Utah's airports because access to CBDs from the airport is not typically a priority in the city transportation or transit provider's plans due to a lack of appreciation for an airport's ability to serve as an intermodal facility. These challenges make integrated land use and transportation planning very important.

Remote Air Traffic Control Towers

A remote tower pilot program is exploring the benefits and drawbacks of managing air traffic without having to construct and maintain a brick-and-mortar air traffic control tower. This cost-effective alternative may be ideal for implementing air traffic control at busy airports without a tower as well as replacing aging tower buildings that would otherwise require costly construction of a replacement building.

Two pilot projects under way will offer insight to the industry on the success of remote air traffic control facilities, often referred to as virtual towers. One is at a busy general aviation airport, Leesburg Executive Airport, in Leesburg, VA. The second is at Northern Colorado Regional Airport (FNL) in Loveland, CO (38 miles northwest of Denver). According to news reports, the remote system uses high definition video cameras, pan-tilt-zoom cameras, signal light gun and microphones to send data to multiple high-definition displays, which the controllers use to direct aircraft to and from the airport's runways. In anticipation of the planned remote tower being activated at FNL in the fall of 2019, Allegiant Airlines announced in August 2019 that new service from FNL to Las Vegas and Phoenix would begin November 21, 2019. However, remote tower project delays caused Allegiant to cancel that planned new service. The latest reports state that testing of the FNL tower is scheduled for 2020. Completion of the project is anticipated after recommendations, derived from testing, have been implemented.

NextGen

The Next Generation Air Transportation System (NextGen) has been a hot topic in the industry for about 12 years when this FAA-led initiative began improvements in support of NextGen goals and components. The FAA states that NextGen is the modernization of America's air transportation system to make flying even safer, more efficient, and more predictable. Posted on the FAA webpage is the following:

This modernization effort is one of the most ambitious infrastructure projects in U.S. history. Instead of making minor upgrades to aging infrastructure, the FAA and its partners continue to implement major new technologies and capabilities in shaping a modern, resilient, and secure National Airspace System that serves more than 2.7 million passengers and 44,000 flights per day.

> *NextGen is not one technology, product, or goal. The modernization effort encompasses innovative and transformative technologies that are being developed and implemented after thorough testing for safety.*
>
> *NextGen is about halfway through a multi-year investment and implementation plan. For several years now, it has continually introduced new technologies to improve air travel. The FAA plans to continue implementing cutting-edge technologies, procedures, and policies that benefit passengers, the aviation industry, and the environment through 2025 and beyond.*

The NextGen Weather Program, for example, results in safer, more efficient aircraft operations by reducing the impact of weather on aviation. NextGen Weather uses computing power, advances in forecasting, and better translation of information to provide tailored weather products, which supports improved decision-making and on-time performance.

There are numerous components associated with the NextGen program that the FAA continues to report as progress continues.

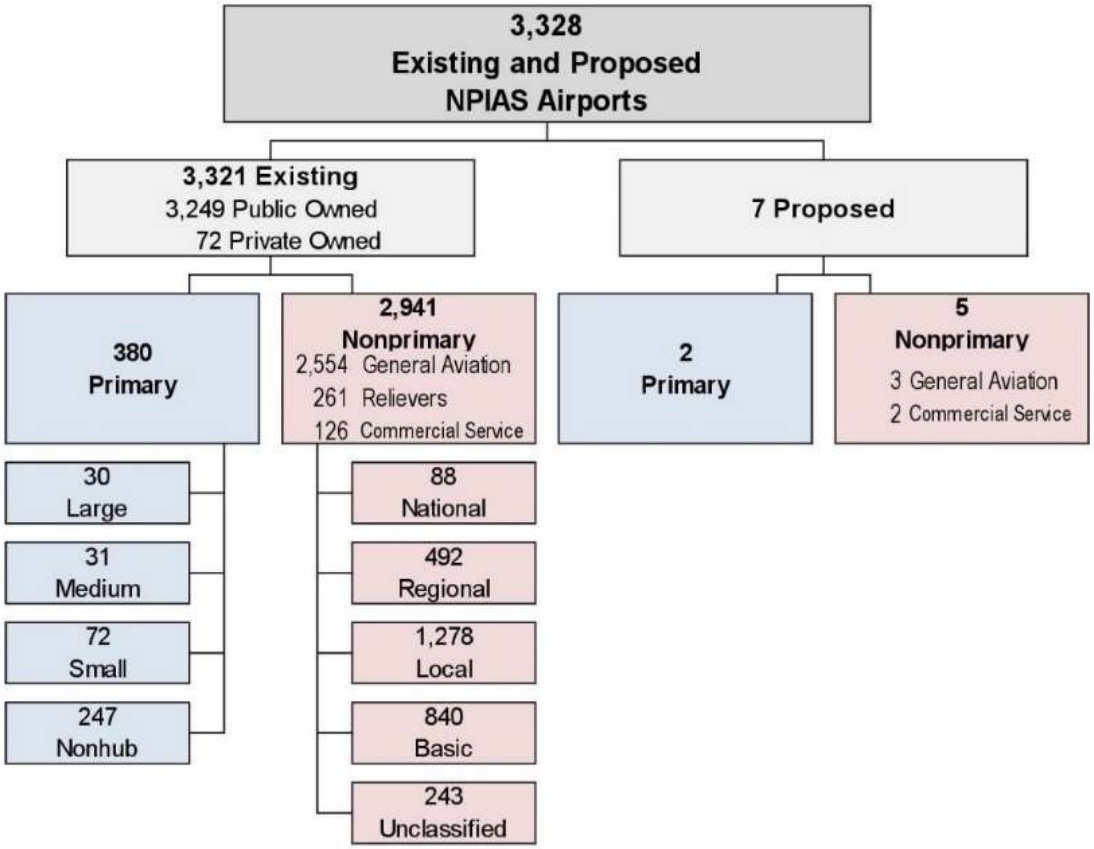
Other Technology Improvements

Beyond the advancements previously described, the aviation industry is seeing improvements in aircraft design efficiency and noise reduction, all at a lower cost. The Very Light Jet (VLJ) market, for example, is making it more affordable for businesses to afford a jet, which is shifting the aircraft fleet mix at many airports. According to industry news articles, the weight and costs of VLJs are kept lower by using lightweight composite materials, cutting edge digital avionics, and smaller, yet more efficient jet engines. While the enthusiasm about VLJs a decade ago has diminished following some cancelled or failed design and manufacturing efforts, there are still light jets in the industry being successfully used by businesses across the nation.

AIRPORT ROLE

In the National Plan of Integrated Airport Systems (NPIAS), OGD is identified as a Primary nonhub facility. Primary airports are those that have scheduled passenger service and more than 10,000 enplanements per year. These airports serve the highest levels of aviation activity in Utah, including commercial service and general aviation, and are in the largest population areas of the state. OGD is one of 247 primary nonhub airports in the nation according to **Figure 3-1** from the latest NPIAS publication. Chapter Two, Forecasts, concludes that the Airport will retain its primary nonhub role through the planning period. Consideration of an airport's role plays an important part in identifying facility and service needs to better serve its air transportation system users.

Figure 3-1. Summary of NPIAS Airports by Category and Role



Source: FAA NPIAS 2019-2023

Facility and service recommendations can also be derived for OGD based on its role in the state airport system. In the 2007 UCASP, OGD is designated a "GA Regional" Airport. However, the 2007 publication was well before OGD re-established passenger service in 2013.

With an update to the UCASP under way, it is expected that the OGD role in the state system will be modified to "National," and the Airport will remain in that role through the planning period, according to Chapter Two, Forecasts. However, the roles identified in the 2007 UCASP may also be re-examined and revised. The updated UCASP, expected in late 2020, will present OGD's new role.

Figure 3-2 is derived from the 2007 UCASP and depicts the airports in the state airport system by role. In 2007, as shown, only two airports were identified as National while the greatest number of airports in the state system were identified as GA Regional.

Figure 3-2. UCASP (2007) Airports by Role



Table 3A summarizes the UCASP 2007 minimum facilities recommended based on airport role. UCASP recommendations included Airport Reference Code (described earlier in the Forecasts Chapter), various airside facilities, airport services, terminal, hangars, apron and auto parking. Ogden-Hinckley Airport has many of the facilities and services recommended for National airports but is deficient in some areas such as a modern airline passenger terminal and adequate apron space, for example. However, Fixed Base Operators (FBOs) on the airfield provide modern facilities for GA users.

Table 3A. Minimum Facility and Service Objectives – Utah Continuous Airport System Plan (UCASP)

UCASP MINIMUM FACILITY AND SERVICE OBJECTIVES

	National Airports	General Aviation Regional Airports	General Aviation Community Airports	General Aviation Local Airports
Airport Reference Code (ARC)	C-III or Design Aircraft	C-II or Greater	B-II or Greater	A-I
Runway Length:	Accommodate 75% of large aircraft at 90% useful load	Accommodate 75% of large aircraft at 60% useful load	Accommodate 75% of small airplanes	Maintain Existing
Runway Width:	To Meet ARC	To Meet ARC	Minimum 75'	Maintain Existing
Runway Strength:	Single-wheel gear – 60,000 lbs. or equivalent for dual wheel	Single-wheel gear – 30,000 lbs. or equivalent for dual wheel	Single-wheel gear – 12,500 lbs.	Single-wheel gear – 12,500 lbs.
Taxiway:	Full Parallel	Partial Parallel	Turnarounds & Connectors	Connector and/or Turnarounds
Navigational Aids:	Precision Approach	Non-Precision Straight-In Approach	Non-Precision Approach	N\A
Visual Aids:	MALSR, GVGIs	GVGIs, REILs	GVGIs, REILs	N\A
Lighting:	MIRL, Beacon, Windsock	MIRL, Beacon, Windsock	MIRL, Beacon, Windsock	Reflectors or LIRL, Beacon, Windsock
Weather:	Automated Weather	Automated Weather	Automated Weather	N\A
Services:	• Phone • Restrooms • FBO – Full service • Maintenance facilities & hangar 5,000 sq. ft • On-site rental car • Perimeter fencing, controlled access	• Phone • Restrooms • FBO – Limited service • Maintenance facilities – Limited service • On-site courtesy car • Perimeter fencing	• Phone • Restrooms • FBO – Limited service • On-site courtesy car • Perimeter fencing	• Phone • Restrooms • Perimeter fencing
Facilities:	• Modern terminal • Hangars – 75% of based fleet & 25% of overnight aircraft • Apron – 25% of based fleet & 75% for transient • Auto Parking – Per master plan	• Terminal with appropriate facilities • Hangars – 60% of based fleet & 25% of overnight aircraft • Apron – 40% of based fleet & 50% for transient • Auto Parking – Equal to 33% of based aircraft	• Pilots lounge • Hangars – 50% of based fleet & 25% of overnight aircraft • Apron – 50% of based fleet & 25% for transient • Auto Parking – Equal to number of based aircraft	• Pilots lounge • Auto Parking – Equal to number of based aircraft
	International Airport: *UDOA will work with SLC to identify facility and service objectives that are consistent with FAA, UDOA, and SLC facility needs*			

In the 2004 Utah State Economic Impact Study, the top ten reasons that businesses use general aviation in their daily operation include the following, which further supports the State's recommended minimum facility and service objectives to serve users of the air transportation system:

- Flexibility
- Time savings
- Reliability
- Safety
- Improved marketing efficiency
- Facility/Branch office control
- Personnel development training
- Privacy and comfort
- Efficiency
- Security

Also notable is the support that Wasatch Front Regional Council (WFRC) expresses for its eight area airports, including OGD. The WFRC Regional Transportation Plan 2040 states the following:

> *Airports are essential transportation facilities similar in character to the Interstate Highway System. Like the highway system, the system of airports in the Wasatch Front region facilitates the quick and efficient movement of people and goods. Airports are a key catalyst of economic activity by facilitating rapid passenger travel between distant locations. In addition to passenger travel, the air transportation system is used to move high value, time sensitive goods such as documents and technical equipment to remote locations. Airports also often play a key role in facilitating the transportation of passengers and equipment during emergency medical and natural disaster situations. Airports play a key role in the Utah economy and must continue to be developed and protected in order for the region to preserve its quality of life and achieve maximum economic potential. Airports must be improved to take advantage of new technology and new facilities in order to continue to serve the air transportation and economic needs of the region, while minimizing impacts to surrounding communities.*

RECAP OF FORECASTS

The following (**Table 3B**) is a summary of the forecasts presented in the previous chapter. These figures support the need for many of the facility requirements outlined in this chapter.

Table 3B. Projected Activity

	Baseline 2017/**2018**	Near-Term **2023**	Mid-Term **2028**	Long-Term **2038**
Enplanements	20,324	26,007	28,017	32,196
Air Cargo (pounds)	63,586	70,502	79,008	94,439
Based Aircraft	241	244	252	272
Total operations	89,222	83,632	86,629	93,854
Air Cargo (tons)	31.8	35.3	39.5	47.2
ARC	C-III	C-III	C-III	C-III
Source: Chapter Two, Forecasts				

AIRSIDE FACILITIES

Design Standards

In determining applicable airport design standards, an understanding of airport operations and the critical design aircraft is essential. The most demanding aircraft or family of aircraft conducting at least 500 annual itinerant operations is deemed the design aircraft.

Next, the FAA's alphanumeric coding system, which is based on aircraft physical and operational characteristics, drives the design components of an airport. The Forecasts Chapter identified OGD as a C-II airport transitioning to C-III as Allegiant's A320 series (C-III) activity is projected to increase within five years. GA jet traffic is also growing and supports the ultimate C-III designation for OGD. While the Airport is assigned an Airport Reference Code (ARC) of C-III, the runways are identified by a Runway Design Code (RDC). The RDC is similar to ARC but includes a third component to represent visibility minimums for the runway. The RDC for Runway 3-21 is C-III-4000, where 4,000 represents the visibility minimums of not lower than ¾ mile. Runway 17-35 is B-II-VIS, where "VIS" represents visual or a circling approach.

Table 3C summarizes the standards applicable for Runway 3-21 as Allegiant's A320 activity increases. With Runway 3-21's visibility minimums down to ¾-mile, the third column of Table 3B applies. Lower visibility minimums (4th column) require larger dimensions for the approach runway protection zone while other dimensions remain the same as ¾-mile minimums. In **Table 3D**, FAA design standards for B-II are presented, which apply to Runway 17-35 (secondary runway).

The following helps explain the design standards outlined in Tables 3C and 3D.

Runway Width. Runway 3-21 is currently 150 feet wide, which meets the standard for its ultimate C-III designation. The RDC and visibility minimums typically drive the runway width requirements. However, the necessary runway width may also be driven by the gross takeoff weight of the design aircraft. If OGD's C-III design aircraft were below 150,000 lbs., the runway width requirement would be 100 feet. However, the Airbus A320 is well above 150,000 lbs., so the runway width requirement remains at 150 feet as depicted in Table 3C.

Secondary Runway 17-35 exceeds the minimum runway width of 75 feet for B-II, which is a benefit for the growing traffic in the approach category C class (aircraft with faster approach speeds than B); this allows C-II traffic to use the secondary runway during strong crosswinds and when conditions don't require the longer length of Runway 3-21.

Table 3C. FAA Design Standards for C-III

Aircraft Approach Category (AAC) and Airplane Design Group (ADG):		C/D/E - III			
ITEM	**DIM** [1]	VISIBILITY MINIMUMS			
		Visual	Not Lower than 1 mile	Not Lower than 3/4 mile	Lower than 3/4 mile
RUNWAY DESIGN					
Runway Length	A	*Refer to paragraphs 302 and 304*			
Runway Width [12]	B	150 ft	150 ft	150 ft	150 ft
Shoulder Width [12]		25 ft	25 ft	25 ft	25 ft
Blast Pad Width [12]		200 ft	200 ft	200 ft	200 ft
Blast Pad Length		200 ft	200 ft	200 ft	200 ft
Crosswind Component		16 knots	16 knots	16 knots	16 knots
RUNWAY PROTECTION					
Runway Safety Area (RSA)					
Length beyond departure end [9, 10]	R	1,000 ft	1,000 ft	1,000 ft	1,000 ft
Length prior to threshold [11]	P	600 ft	600 ft	600 ft	600 ft
Width	C	500 ft	500 ft	500 ft	500 ft
Runway Object Free Area (ROFA)					
Length beyond runway end	R	1,000 ft	1,000 ft	1,000 ft	1,000 ft
Length prior to threshold [11]	P	600 ft	600 ft	600 ft	600 ft
Width	Q	800 ft	800 ft	800 ft	800 ft
Runway Obstacle Free Zone (ROFZ)					
Length		*Refer to paragraph 308*			
Width		*Refer to paragraph 308*			
Precision Obstacle Free Zone (POFZ)					
Length		N/A	N/A	N/A	200 ft
Width		N/A	N/A	N/A	800 ft
Approach Runway Protection Zone (RPZ)					
Length	L	1,700 ft	1,700 ft	1,700 ft	2,500 ft
Inner Width	U	500 ft	500 ft	1,000 ft	1,000 ft
Outer Width	V	1,010 ft	1,010 ft	1,510 ft	1,750 ft
Acres		29.465	29.465	48.978	78.914
Departure Runway Protection Zone (RPZ)					
Length	L	1,700 ft	1,700 ft	1,700 ft	1,700 ft
Inner Width	U	500 ft	500 ft	500 ft	500 ft
Outer Width	V	1,010 ft	1,010 ft	1,010 ft	1,010 ft
Acres		29.465	29.465	29.465	29.465
RUNWAY SEPARATION					
Runway centerline to:					
Parallel runway centerline	H	*Refer to paragraph 316*			
Holding Position [8]		250 ft	250 ft	250 ft	250 ft
Parallel taxiway/taxilane centerline [2]	D	400 ft	400 ft	400 ft	400 ft
Aircraft parking area	G	500 ft	500 ft	500 ft	500 ft
Helicopter touchdown pad		*Refer to AC 150/5390-2*			

Note:

- Values in the table are rounded to the nearest foot. 1 foot = 0.305 meters.

Note: Table footnotes applicable to OGD are explained in the chapter text.

Table 3D. FAA Design Standards for B-II

Aircraft Approach Category (AAC) and Airplane Design Group (ADG):		A/B - II			
ITEM	**DIM** [1]	VISIBILITY MINIMUMS			
		Visual	Not Lower than 1 mile	Not Lower than 3/4 mile	Lower than 3/4 mile
RUNWAY DESIGN					
Runway Length	A	*Refer to paragraphs 302 and 304*			
Runway Width	B	75 ft	75 ft	75 ft	100 ft
Shoulder Width		10 ft	10 ft	10 ft	10 ft
Blast Pad Width		95 ft	95 ft	95 ft	120 ft
Blast Pad Length		150 ft	150 ft	150 ft	150 ft
Crosswind Component		13 knots	13 knots	13 knots	13 knots
RUNWAY PROTECTION					
Runway Safety Area (RSA)					
Length beyond departure end [9, 10]	R	300 ft	300 ft	300 ft	600 ft
Length prior to threshold	P	300 ft	300 ft	300 ft	600 ft
Width	C	150 ft	150 ft	150 ft	300 ft
Runway Object Free Area (ROFA)					
Length beyond runway end	R	300 ft	300 ft	300 ft	600 ft
Length prior to threshold	P	300 ft	300 ft	300 ft	600 ft
Width	Q	500 ft	500 ft	500 ft	800 ft
Runway Obstacle Free Zone (ROFZ)					
Length		*Refer to paragraph 308*			
Width		*Refer to paragraph 308*			
Precision Obstacle Free Zone (POFZ)					
Length		N/A	N/A	N/A	200 ft
Width		N/A	N/A	N/A	800 ft
Approach Runway Protection Zone (RPZ)					
Length	L	1,000 ft	1,000 ft	1,700 ft	2,500 ft
Inner Width	U	500 ft	500 ft	1,000 ft	1,000 ft
Outer Width	V	700 ft	700 ft	1,510 ft	1,750 ft
Acres		13.770	13.770	48.978	78.914
Departure Runway Protection Zone (RPZ)					
Length	L	1,000 ft	1,000 ft	1,000 ft	1,000 ft
Inner Width	U	500 ft	500 ft	500 ft	500 ft
Outer Width	V	700 ft	700 ft	700 ft	700 ft
Acres		13.770	13.770	13.770	13.770
RUNWAY SEPARATION					
Runway centerline to:					
Parallel runway centerline	H	*Refer to paragraph 316*			
Holding Position		200 ft	200 ft	200 ft	250 ft
Parallel taxiway/taxilane centerline [2, 4]	D	240 ft	240 ft	240 ft	300 ft
Aircraft parking area	G	250 ft	250 ft	250 ft	400 ft
Helicopter touchdown pad		*Refer to AC 150/5390-2*			

Note:

- Values in the table are rounded to the nearest foot. 1 foot = 0.305 meters.

Note: Table footnotes applicable to OGD are explained in the chapter text.

Runway to Parallel Taxiway Separation. To ensure adequate wingtip clearance, OGD must maintain the minimum separation distance per FAA design standards between aircraft on the runway and a parallel taxiway. At 500 to 525 feet, measured between centerlines, existing parallel Taxiway A exceeds the minimum 400-foot requirement for Runway 3-21. The distance between Runway 17-35 and its partial parallel taxiway is also adequate--425 feet, measured between centerlines. Future parallel taxiways constructed to serve any west side development should be constructed to meet or exceed the minimum separation as well.

Runway Safety Area (RSA). The RSA is a critical surface that must be contained on airport property and terrain in the RSA must comply with FAA standards. RSAs are of particular importance to the FAA and receive high priority funding since they enhance the safety of aircraft that overshoot, undershoot or veer off the runway. Further, emergency vehicles may use the RSA for firefighting and rescue during such incidents. The RSA is a cleared and graded area centered about the runway centerline for the full length of the runway plus an extended distance beyond each runway end. The width and length beyond each runway end depend on type of aircraft and approach visibility minimums associated with the runway. For OGD, the B-II RSA width requirement is 150 feet and C-III requires 500 feet. Regarding length, the RSA must extend beyond the runway end 300 feet to serve B-II and 1,000 feet to serve C-III (larger/faster aircraft).

Runway Object Free Area (ROFA). The purpose of the ROFA is to maintain a clear area surrounding the runway--beyond that required by the RSA. The ROFA does not have a grading requirement like the RSA, but no object can protrude above the ROFA within its boundary. Like the RSA, the ROFA is centered about the runway centerline for the full length of the runway plus an extended distance off each runway end. The width and length off each runway end are a function of the type of aircraft and approach visibility minimums associated with the runway. The ROFA typically extends the same length beyond the runway end as the associated RSA, but the ROFA is wider than the RSA. The required ROFA width is 800 feet for Runway 3-21 and 500 feet for Runway 17-35. The north end of Runway 3-21's OFA does not meet the standard by 138 feet. The Airport has had the FAA's approval for a "modification of standard" related to this condition for several years. The FAA requires re-evaluation of the approved modification as part of this master plan and ALP update.

Runway Obstacle Free Zone (ROFZ). The ROFZ surrounds the runway and must remain clear of taxiing and parked aircraft or any fixed objects unless located by function such as runway lights. The ROFZ extends 200 feet beyond the runway end but the width varies depending on aircraft size and runway visibility minimums. For large aircraft, the ROFZ is 400 feet wide. ROFZ and related requirements are depicted in the Airport Layout Plan (ALP) drawings. *Runway Protection Zone (RPZ).* The FAA states that the function of the RPZ is to enhance the protection of people and property on the ground. The RPZ is an area (trapezoidal in shape) centered about the extended runway centerline and beginning 200 feet from the runway end. The RPZ size depends on the type of aircraft and approach visibility minimums associated with the runway end. It is desirable to clear all objects from the RPZ, but some uses are permitted if they

do not attract wildlife, are outside of the ROFA, and do not interfere with navigational aids. Prohibited land uses within RPZs are residences, places of public assembly, and fuel storage facilities.

It's important to note that more land uses were permitted within the RPZ before 2012, when the FAA published interim land use guidance with further restrictions. Most notable is the requirement to keep roadways out of RPZs. Since many airports across the nation have roads in the RPZ and bringing them all into compliance at once is infeasible, the FAA has decided to address the issue when there is a triggering event. In other words, if the airport sponsor is improving their runway and there is an existing roadway in the runway proposed for improvement, this would require FAA coordination to address the RPZ land use issue. Similarly, if the roadway traversing the RPZ is proposed for improvement, the same coordination with the FAA is required. The FAA will determine what action is required on a case-by-case basis. With existing roadways and community development within the OGD RPZs, the interim RPZ land use guidance requires consideration in the development alternatives.

Airfield Capacity

Airfield capacity can be determined using computer simulation models for detailed analyses or it can be estimated using guidance found in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. Using the latter, OGD's airfield capacity is estimated at 230,000 operations annually, which FAA refers to as annual service volume (ASV). The ASV is the number of operations that an airfield can typically accommodate before significant delays occur. As demand approaches capacity, delays can severely impact the operations efficiency. In additional to airfield configuration and aircraft fleet mix, other factors that may impact capacity include weather conditions and approach procedures. FAA guidance also identifies the estimated hourly capacity for an airfield configuration, which is 98 visual and 59 instrument operations at OGD.

Considering the 89,222 total operations presently conducted at OGD and the aircraft fleet mix, activity is approximately 38.7% of annual airfield capacity. While demand is projected to grow in the 20-year planning period to nearly 94,000 operations, this is only 41% of airfield capacity. Even at the highest level of annual operations that has occurred in the last 30 years, 119,831, only 52% of airfield capacity was used. Consequently, the OGD airfield has adequate capacity[2] for the planning period.

Runway Alignment

Ideally, runways should be constructed to align with the prevailing winds to enhance the safety of aircraft operations. FAA guidelines indicate that the orientation of a runway should provide at least 95% wind coverage. Consequently, an airport sponsor with a single-runway airfield with wind coverage less than

[2] In calendar year 2019, OGD operations reached 113,663 according to ATADS. This is 18% higher than 2018 figures and exceeds OGD's projected activity presented in Chapter Two, Forecasts. If OGD operations continue an aggressive growth pattern, activity could exceed 41% of airfield capacity. However, operations typically fluctuate over a 20-year planning period.

95% should typically plan to construct a crosswind or secondary runway to improve wind coverage by providing a combined runway coverage that is 95% or better.

A runway wind coverage analyses for OGD was conducted using the wind analysis tool in FAA's Airport GIS Airport Design Tools. **Table 3E** presents the results of analysis, which included an analysis for all-weather as well as for IFR conditions. The results indicate that the two-runway configuration provides more than adequate wind coverage. In fact, Runway 17-35 offers better wind coverage than Runway 3-21, but Runway 3-21 is the primary runway based on its length, width, strength and instrument approach capability.

Table 3E: All-Weather and IFR Wind Coverage Analysis for OGD

Runway	A-I, B-I 10.5 knots (12 mph)	A-II, B-II 13 knots (15 mph)	A-III, B-III, C-I, C-II, C-III, D-I, D-II, D-III 16 knots (18 mph)	A-IV thru D-IV 20 knots (23 mph)
All-Weather				
3-21	93.55 %	96.44 %	98.89 %	99.77%
17-35	98.11 %	99.06 %	99.72 %	99.94%
Combined	99.16 %	99.68 %	99.91 %	99.99 %
IFR				
3-21	93.41 %	95.91 %	98.55 %	99.68%
17-35	97.96 %	99.06 %	99.72 %	99.94%
Combined	99.16 %	99.68 %	99.91 %	99.99 %

Source: National Climatic Data Center. Station: OGD. Period: 2009-2018 data
Note: All-weather wind coverage is similar to previous All-weather wind coverage table with 1996-2005 data

Runway Length

Runway length requirements are driven by the most demanding airplane using and projected to use the runway on a regular basis, which is 500 or more annual itinerant operations. For OGD, Allegiant's Airbus A320 aircraft is the most demanding aircraft. However, site constraints limit OGD's ability to extend its primary runway (Runway 3-21).

The Airport currently uses declared distances for Runway 3-21, which means that users have varying lengths published for OGD as identified in **Table 3F**.

Table 3F. Declared Distances Published for OGD

Declared Distance Description	Runway 3	Runway 21
Takeoff Run Available (TORA)	8,103 feet	8,103 feet
Takeoff Distance Available (TODA)	8,103 feet	8,103 feet
Accelerate Stop Distance Available (ASDA)	7,252 feet	8,103 feet
Landing Distance Available (LDA)	7,252 feet	7,252 feet

Source: FAA

It is recommended that the development alternatives element of the master plan explore options for maximizing the takeoff length. A preliminary site analysis and communication with the FAA about options suggest that OGD may be restricted to its current runway dimensions for the long-term particularly since Runway 3-21 has a modification of standards that is expiring on the ROFA for Runway 21. This means that OGD may be required to reduce the Runway 3-21 runway length by 138 feet to mitigate the ROFA deficiency that FAA allowed for the last 20 years; this mitigation would require increasing the displaced threshold on Runway 21. The latest FAA guidance requires that requests for modifications of standards be re-evaluated every five years, and the FAA has said that continued approval will be denied.

With declared distances, OGD may continue to maximize its takeoff length on Runway 3-21 within its current site constraints. An option is to extend Runway 3-21 by 1,000 feet to the south (at the approach end of Runway 3) over the RSA. Consequently, a displaced threshold that included the additional 1,000 feet would be necessary to comply with the RSA and ROFA standards. This option is considered in the development alternatives discussed in the next chapter. However, the FAA stated in email correspondence (August 21, 2019) that they cannot support any runway extension that does not have the full RSA/ROFA dimensions to accompany it. More specifically, the FAA does not support the use of declared distances to meet RSA/ROFA standards. While there are airports in the three states under the FAA Denver Airports District Office (ADO) jurisdiction (OGD included) that currently have displaced thresholds/declared distances for various reasons, the Denver ADO will not support the introduction of new development that requires the new or continued use of declared distances and they plan to continue their efforts to remove them where possible.

Also important to the discussion of runway extensions is the FAA's interim guidance on land use within RPZs published in 2012. Many airports are theoretically "grandfathered in" if one or more of their RPZs contains incompatible land uses such as roadways and other community development. However, specific actions trigger the FAA's review of an airport's land use within an RPZ such as a proposed runway extension. Since roadways and buildings contained within the RPZ, as is the case at OGD, are deemed incompatible land uses, the FAA could require mitigation; relocation of the roadways and buildings or relocation of the runway threshold to clear the RPZ of incompatible land uses would be the options.

Currently, Runway 3-21 has a total length of 8,103 feet. While this length has adequately served Allegiant on its current service routes, this length may be restrictive on longer hauls. To date, Allegiant has not responded with specific answers regarding runway length requirements for other prospective routes. The City will continue to work with Allegiant on the possibility of expanding its service routes and on identifying any constraints that OGD runway length might impose on expanded routes.

Runway 17-35 has adequate length for the airplanes that use it, including those of Airplane Design Group I that are most affected by crosswinds on Runway 3-21.

Standards Associated with Instrument Approaches

Instrument approach visibility minimums can affect design standards for an airport. OGD currently has a precision approach (ILS) to Runway 3 with ¾-mile visibility minimums. If lower visibility minimums were sought in the future, this would change the design standards for the Airport. Visibility minimums of less than ¾-mile would increase the size of the approach runway protection zone from 49 to 79 acres (identified in the FAA design standards outlined in Table 3C).

If visibility minimums remain at ¾-mile or higher, standards would remain unchanged unless and until new FAA design standards are published. The Airport has an approach lighting system, which is required for approaches with less than ¾-mile visibility minimums. Based on area airspace, it is not anticipated that the approach will be reduced to less than ¾ mile, but the development alternatives identify an option for the improved instrument approach so stakeholders may evaluate the impacts and benefits. It's important to note that airport user survey respondents were satisfied with the current instrument approach capability at OGD.

The FAA Flight Technologies and Procedures Division office determines instrument approach visibility minimums. The minimums are based on several factors. The FAA evaluates departures, approach and missed approach, and obstacle clearance requirements. Terrain and area obstructions often dictate the minimums.

A recent change in FAA requirements for runways with circling approaches will impact Runway 17-35. The FAA recently reported that runways with a circling approach will be required to comply with instrument approach guidelines that require departure surface protection. Departure surfaces require 40:1 slope clearance, which is more restrictive than the 34:1 approach slope surface requirement now applicable to Runway 17-35. If the new policy is implemented, OGD will need to comply with the more restrictive requirement or drop the circling approach and limit the runway to visual operations.

Taxiways

As identified in the Inventory Chapter, OGD is well-served by a taxiway system that provides safe and efficient circulation. Recent FAA guidance required modifications to OGD's taxiway system that were made in 2019 and brought the taxiways into compliance. An expansion of the taxiway and taxilane system will be necessary to support the anticipated future development of OGD, particularly on the west side of the airfield. All future taxiway system development projects should follow FAA guidance based on the

applicable Taxiway Design Group (TDG) projected to use specific taxiways and taxilanes. The TDG includes seven classifications and is based on the overall Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) dimension. Access to small GA hangar areas, for example, may be built to the smaller TDG standards, which could reduce costs. With respect to Allegiant's Airbus 320, the applicable requirement is TDG 3, which requires a 50-foot wide taxiway like the existing taxiways at OGD.

Apron

Apron expansion should be an inherent part of future OGD development. Apron requirements are influenced by a number of factors such as activity levels, fleet mix, flight training, transient daytime versus overnight storage needs, hangar availability, and efficiency of apron and taxilane layouts.

While apron demand fluctuates at OGD, tiedowns often reach 95% capacity due to flight school demand. Even though most aircraft based at OGD are stored in hangars, flight training is a frequent user of the apron. In particular, GA apron expansion should provide for growth in training activity as well as transient operations. Respondents to the user survey, distributed early in the study, also pointed out the need for additional tiedowns as well as ramp space for medium to large business aircraft.

All future landside development should consider adjacent apron development and expansion needs to serve tenants and users. The UCASP recommends that airports with a National role in the state airport system include apron area to serve 25% of based and 75% of transient aircraft. At OGD, most based aircraft use hangars but there are some paying for monthly tiedowns. Ideally, the proposed development of new hangars and redevelopment of several existing hangars will increase aircraft storage capacity that will alleviate some of the peak demand issues on the apron with flight training activity and offer more transient aircraft parking. With the apron often near capacity for flight training and other GA activity, **Table 3G** provides the additional apron area required to support OGD's growing operations in the short-. intermediate- and long-term.

Table 3G. Additional Apron Area

	2023	2028	2038
Operations			
Annual Itinerant Operations	42,706	46,280	54,446
Peak Month Operations	4,271	4,628	5,445
Design Day Operations	142	154	181
Aircraft			
Aircraft on average day of peak month	71	77	91
Aircraft simultaneously parked on apron	28	31	36
Aircraft parking fleet mix			
Primarily ADG I	25	28	31
Primarily ADG II	2	2	3
Primarily ADG III	1	1	2
Apron Requirements			
Additional apron area needed (sf)	62,200	67,500	81,600

For ADG I and ADG II aircraft, which represent the majority of activity, approximately 1,000 square feet and 1,500 square feet, respectively, should be planned for apron parking. ADG III aircraft parking is also required at OGD and is based on the aircraft size or approximately double the size of the small aircraft parking spaces and should be placed for power in/power out parking. However, it's important to note that the changing fleet mix at OGD includes increased jet and helicopter traffic, both of which primarily use hangar storage rather than apron whether it's a based aircraft or transient overnight. Beyond parking space needs, apron circulation often doubles the space requirement to accommodate taxilanes and vehicle and equipment on the apron. Nested tiedowns for smaller aircraft is an option for a space-efficient layout; this requires push-in and pull-out parking with appropriate taxilane object free area on either side for safe ground movement.

Pavement

A new pavement management program, coordinated with UDOT Aeronautics, has been initiated to ensure that pavement projects are appropriately scheduled to maximize the lifespan of airfield pavements. The new program will likely re-evaluate the condition and strength of pavements at OGD in early 2020, so the

City may update its airport capital improvement plan (ACIP) with respect to pavement projects. The City should continue regular pavement evaluations and consistently work within the pavement management program.

Helicopter Facilities

For safety reasons, helicopter operations are often separated from fixed wing operation and parking areas when operations are frequent. As presented in the OGD forecasts, helicopter operations are currently estimated at 6,246 annually, which is 7.0% of total operations. Within the planning period, it is anticipated this this activity will increase to 12,670 operations and represent a greater proportion of total annual activity at 13.5%. This translates to an average of 17 daily helicopter operations now and doubling to 35 daily operations by 2038.

With the high level of helicopter and fixed wing operations, a more deliberate separation of these activities may enhance safety. While the PAC and user survey respondents have not identified this need or commented that this traffic mix has been an issue, to date, the growing fixed wing and helicopter activity projected at OGD may benefit from a plan that offers helicopters a separate area. Such separation will reduce the potential for rotor wash effects on small aircraft, which represent the majority of OGD operations.

Development alternatives presented in the next chapter will address long-term options for helicopter facilities.

Air Cargo Facilities

The Airport does not currently have regularly scheduled air cargo operations by major carriers like UPS or FedEx. As stated in the Forecasts (Chapter 2), UPS is establishing a new regional hub at SLC on a 160-acre site making it unlikely that UPS would consider OGD for cargo operations. However, there remains the potential for air cargo operators to use OGD on a scheduled basis in the future. For planning purposes, development alternatives will consider an area for future air cargo use in the long-term. Based on the forecasts, the current and projected volume of air cargo for OGD is small. Consequently, use of the apron area for loading and unloading will continue to meet the near-term needs for cargo activity.

Airfield Lighting, Marking, Signage and Navigational Aids

The High Intensity Runway Lighting (HIRL) system on Runway 3-21 is in good operating condition, but the aging equipment will require replacement during the planning period. With the required shift in the displaced threshold on Runway 21 to address the ROFA deficiency (expiring modification to standards), it would be cost effective to update the HIRL system at the same time.

Runway 17-35's Medium Intensity Runway Lighting (MIRL) system was installed in 2012 and should be adequate through the 20-year planning timeframe. Taxiways are lighted in all aircraft movement areas. The Medium Intensity Taxiway Lighting (MITL) system is in good condition. Approach lighting on Runway 3 and the runway end identifier lights (REILs) on Runway 17-35, which are also in good operating condition, should be adequate through the planning period. However, the approach lighting system is

comprised of older equipment so a replacement may be needed during the planning period. If Runway 3 is extended to the south, in-pavement lighting would be needed for a portion of the system.

Airfield markings and signage comply with FAA design standards. Markings should be regularly repainted with seal coat pavement preservation projects as they have been in the past. Signage was updated within the last two years in 2017. Navigational aids at OGD, which include a Precision Approach Path Indicator (PAPI) system on all four runways and a rotating beacon, will meet the Airport's planning needs through the long-term.

The ILS on Runway 3, which is owned and maintained by the FAA, is in good condition and adequate to serve OGD's precision instrument approach procedure. Technological advancements may ultimately eliminate the need for costly ILS equipment. In fact, FAA has generally discontinued the funding for new ILS installations.

Airport Traffic Control Tower (ATCT)

The ATCT, located adjacent to the terminal building, is adequately serving OGD's airport traffic control needs, but the aging building requires maintenance and updating. Further, the ATCT's line-of-sight is partially impacted by ground facilities. Air traffic controllers must maintain visual line-of-sight to all movement areas on the airfield. Discussions with ATCT staff suggest that other locations might improve line-of-sight for the controllers and provide an opportunity for an updated facility. Alternate locations are considered in the development alternatives in the next chapter. Another consideration is the possibility of a remote tower (virtual tower) in the long-term, as described earlier in the chapter, which could significantly reduce costs with controllers in a centralized facility, enhance safety with high-definition cameras and sensors that provide 360-degree views of airspace and runways, and potentially offer increased tower operating times.

Automated Surface Observing System (ASOS)

As noted in Chapter One, Inventory, OGD has an ASOS on the west side of the airfield that provides automated weather observations 24 hours a day. The system meets the weather reporting needs of the Airport for the planning period. All maintenance and repair of the ASOS is the responsibility of the National Weather Service, in cooperation with the FAA and Department of Defense (DOD). Development proposed on the west side of the airfield may dictate that the ASOS be avoided or that it be relocated in the long-term. An ASOS should be located 1,000 to 3,000 feet from the runway end, and 750 to 1,000 feet from the runway centerline.

LANDSIDE

Landside facility needs are more significant than airside needs at OGD, particularly with growing commercial passenger traffic, aging hangars, increased opportunities for new or expanding large tenants and increasing business aviation activity.

Terminal Analysis

In the following sections, existing airline passenger facilities and future needs are described. Terminal planning criteria is derived from FAA AC 150/5360-13A, Airport Terminal Planning; ACRP Report 25, Airport Passenger Terminal Planning and Design; and Airport Engineering, Norman Ashford/Paul H. Wright.

Terminal Building Requirements

As described in the Inventory Chapter, the original terminal building construction dates to the 1940s. A new structure was constructed and connected to the original in 2012 to accommodate the Allegiant Airlines passenger activity. An estimated 10,000 sq. ft. is currently available for passenger terminal use.

The terminal functions adequately for a one-gate, one-airline terminal with two to three flights per week. The holdroom is adequate for one planeload of passengers, as are the ticket counter and security processing areas. Baggage handling within the building is minimal. Enplaned baggage takes a short trip from the ticket counter to the airplane with little need for sorting. After unloading, deplaned baggage stays outdoors and is taken by cart to the covered entrance of the old terminal. Space needs for airline employees and their equipment is minimal; catering, lavatory, and potable water services are not required due to the short duration of the flights and no cargo or baggage over 99 pounds is allowed. The terminal contains no concessions (food service, shops, etc.). Passengers enplane and deplane outdoors via mobile stairs because there is no loading bridge. (A mobile ramp is available for disabled passengers.) Deplaning passengers walk back through the terminal lobby to reclaim baggage and leave the airport. The Service Animal Relief Area (SARA) is a grassy area within the Security Identification Display Area (SIDA) and is available on request with an escort. The terminal facility and operations meet security requirements, although the proximity of GA hangars to the terminal increases the potential for people without badges to enter the SIDA.

For the functions that are provided in the terminal, the Level of Service (LOS) is between A and B, which is high to excellent. LOS, as defined by the International Air Transport Association (IATA), refers to conditions rated between A (free flow; no delays; direct routes; excellent level of comfort) and F (system breakdown; unacceptable congestion and delays). These definitions of LOS do not address boarding, deplaning, and claiming baggage outdoors, which are substandard conditions compared to most US airport terminals. On the other hand, passengers' expectations for ultra-low-cost carriers such as Allegiant are lower than for other airlines. Additional problems with the current terminal include conditions associated with a building over 70 years old and spatial inefficiencies associated with the somewhat circuitous routing of passengers through the old and new buildings.

Terminal size planning criteria are difficult to apply to the unique conditions at Ogden-Hinckley, but they provide a range of projections. The number of design, or peak, hour passengers is an important factor. As with operations, the design hour is a typically busy time—not the busiest that ever occurs. For Ogden's current situation, the reasonable number of design hour passengers is about 150, which is the number of enplaned passengers for one departure at the average load factor. Deplaning passengers are excluded

from the design hour at Ogden because they do not pass through the holdroom as they do at most airports.

Planning guidance indicates the calculated design hour passengers for Ogden is 81, which is 0.2% of annual passengers—enplaned and deplaned—for an airport serving fewer than 100,000 passengers. (For 100,000 to 500,000 annual passengers, the design hour is 0.13% of annual passengers.) Multiplying the design hour number by 242 sq. ft. provides an estimate of gross terminal area needed. This means the current terminal should be about 20,000 sq. ft. in size. Another rule-of-thumb for terminal planning is 15,000 to 20,000 sq. ft. per gate, which would mean the current terminal should be between 15,000 and 20,000 sq. ft.

Based on the preferred passenger forecast that was accepted by the FAA, the calculated design hour passenger numbers would be 104 in 2023, 112 in 2028, and 129 in 2038. Using 242 sq. ft. per design hour passenger, the terminal would need to be 25,000 sq. ft. by 2023, 27,000 sq. ft. by 2028, and 31,000 sq. ft. by 2038. However, if outdoor passenger loading and bag handling is acceptable and a single gate suffices, the current terminal could serve throughout the planning period with relatively minor renovation and expansion. Only two more weekly flights are projected by 2038. It is unlikely these two additional flights would be scheduled to overlap with the two to three weekly flights that occur now.

For planning purposes, the higher contingency passenger forecast should be considered. The contingency forecast for 2023 includes 10 weekly departures of an ultra-low-cost carrier such as Allegiant. Some days would have two daily departures, and the departure times might be within two hours. Based on the way Allegiant operates at OGD, there would still be one gate. Ticketing and security would become busier but would not need to expand significantly to accommodate the higher workload on busier days. The biggest choke point would be the passenger holdroom. Without expansion, the holdroom LOS could decline to D (unstable flow; delays for passengers; condition acceptable for short periods of time). Expanding the holdroom about 2,000 sq. ft. would bring the LOS to A (excellent). Conversion of the ARFF truck bay to terminal functions could allow the terminal building to remain at its current location, although other existing inadequacies would remain or worsen.

It is worth noting that Provo Municipal Airport is handling about as many Allegiant passengers now as the 2023 contingency forecast for Ogden-Hinckley. Provo's 6,500 sq. ft. terminal is very inadequate. Recently, full funding for a new Provo Municipal Airport terminal was announced. The new terminal will have four gates and will at least triple the terminal size.

Beyond 2023, the contingency forecast for OGD passenger departures increases how frequently two and sometimes three daily departures occur. While the forecasts are based on continued service from a single ultra-low-cost carrier like Allegiant, competing airlines and/or regional airlines using airplanes with fewer seats might be serving Ogden in the future. With competing airlines comes the probability of scheduling flights around the same time and the demand for separate gates for different airlines.

Eventually, a new terminal building, which accommodates passenger demand with an appropriate level of customer service and provides flexibility for future airline service, will be needed for the contingency forecast. Such a terminal should have upper level gates with loading bridges as well as ground-level holdrooms/gates for regional jets. Bag claim area(s) inside the building would be needed, as well as more indoor bag sorting area. Concessions and rental car counters would be needed, and airline operating areas would need to be larger. **Table 3H** shows the range of terminal building requirements projected.

Table 3H. Terminal Building Requirements (Contingency Forecast)

	Design Hour Passengers	Minimum Terminal Size (sq. ft.)	Maximum Terminal Size (sq. ft.)	Gates*
Existing	150	10,000 (existing)		1
Short-Term (2023)	212	12,000**	50,000	1-2
Intermediate-Term (2028)	270	30,000**	80,000	2-4
Long-Term (2038)	329	40,000	90,000	2-6

*While one gate can easily handle five or more departures per day, additional gates may be needed for different airlines and for differences in airplane size (ground level vs loading bridge boarding).
**It is assumed that the existing facility with slight expansion could suffice for the short-term, but a new facility would be built for the intermediate-term.

The following is recommended for planning purposes:

- Short-term (2023) - the existing terminal is expanded slightly at its current location
- Intermediate-term (2028) - a new terminal facility is built, with 80,000 sq. ft. and four gates, adequate to serve for ten years. (80,000 is equal to 329 design hour passengers x 242 sq. ft. and to 4 gates x 20,000 sq. ft. per gate)
- Long-term (2038) - wherever the new terminal building is sited, land should be available for doubling the size, allowing expansion beyond the contingency forecast for 2038.

Terminal Apron

Currently, the single gate at the terminal requires only one airplane parking position. It is a power-in, power-out position, which means a tug is not required. There is room for a second power-in, power-out position. With power-out operation, the risk of jet blast damage to people or property is somewhat higher compared to using a tug to move the airplane away from the building. With nose-in parking and a tug to move the aircraft, three airplanes can be parked at the terminal apron at the same time.

In the future, each gate should have an aircraft parking space. At least one additional space without gate access should be provided for airplanes that are early/delayed or that remain overnight (RON).

Terminal Parking and Curb

Table 3I presents the future requirements for auto parking at the terminal and for passenger unloading/loading curb.

Table 3I. Terminal Parking and Curb Requirements (Contingency Forecast)

Function	Criteria	2023	2028	2038
Short-term and Long-term Parking	.0035 spaces per annual enplanement	285	364	443
Employee Parking	0.5 spaces per design hour passenger	106	135	165
Rental Car Parking	0.75 spaces per design hour passenger	159	203	247
Curbside	1.75 linear feet per design hour passenger	371	473	576

The existing paid parking lot, located within walking distance of the terminal building, has 225 spaces. An additional 67 parking spaces are in the terminal area, although many of the 42 spaces on the south side of the building are used by the adjacent flight school. Terminal planning criteria call for .0035 short-term and long-term parking spaces per annual enplanement, with about 25% of the parking spaces designated short-term.

The 225 existing parking spaces provide adequate short-term parking for the 2023 contingency forecast, but the total number of spaces is short 60. This shortage might be addressed by raising the parking rate to reduce the amount of long-term parking that occurs in the lot. Otherwise, establishing a long-term lot and providing shuttle service from the lot will be required. If a new terminal site is established, it may be possible to provide both short-term and long-term parking close enough to the terminal building that shuttle service is not required. Long-term parking provided by off-airport businesses is another option.

In addition to parking for passengers and visitors, additional parking is needed for employees' cars and rental cars. Currently, there are few Airport and QuickFlight Services employees, no concession employees, and few rental car parking spaces. It is possible the 67 spaces near the terminal outside the paid lot will be adequate for short-term future employee parking and a few spaces in the existing paid parking can continue to be allotted for ready/return rental cars with a remote lot for additional rental cars. If passengers grow as in the contingency forecast, in a few short years more area will be needed for auto parking than now exists.

For estimating purposes, the amount of curbside frontage needed for departing and arriving passengers is 1.75 linear feet per design hour passengers. For the existing condition, this equates to 263 feet. The existing terminal does not have this length of curb but has a covered drive about 50 feet long and enough room for cars to queue on the circular drive between the parking and the terminal. At a new terminal building, the curbside could be split between arrival and departure levels.

Hangar Requirements

Most of the 163 on-airport and two off-airport hangar buildings are used to store based aircraft. Total hangar area is 882,110 square feet comprised of 744,310 square feet on-airport and 137,800 square feet off-airport (Kemp Jet Center).

A total of 154 on-airport buildings (630,760 square feet) are used only for the storage of based and inactive aircraft. Nine on-airport buildings are commercial hangars that may store some based aircraft but also have offices, FBO functions, space for transient airplanes, and space for aircraft maintenance.

Borsight is an airport tenant with a large hangar that does not store based aircraft but is used for the maintenance/repair/overhaul (MRO) of airplanes. Borsight has imminent plans to build two more hangars of comparable size, capable of handling airplanes as large as the KC-135. Besides Borsight's expansion, the Airport has opportunities to expand MRO activity for military and large civilian aircraft. These opportunities were mentioned in the last chapter, but they are subject to nondisclosure agreements regarding detailed facility size and other requirements. The employment and economic benefits of these potential MRO activities are so valued by the City that a large portion of undeveloped Airport land on the west side of the airfield (up to 100 acres) is considered reserved for MRO purposes.

The estimated hangar area used for storing approximately 290 based and inactive aircraft on-airport is approximately 668,600 sq. ft. [3], resulting in an average of 2,300 sq. ft. per airplane. The trend seems to be towards larger hangars; in the last ten years, ten new conventional hangars were built, totaling about 34,000 sq. ft., which is an average of 3,400 sq. ft. per hangar. Another trend is for the average sized business jet to be larger. In fact, the Airport currently lacks a hangar big enough for a business jet with a wingspan over 79 feet, such as a Gulfstream V. The need for a hangar large enough for a transient B-747 was recently identified. A Gulfstream V would need a hangar at least 15,000 sq. ft. in area, while a B-747 would need about 70,000 sq. ft.

As described in the Inventory Chapter, there are two types of hangars that store aircraft at OGD including T-hangars and conventional "box-shaped" hangars. With conventional hangars, multiple airplanes can be stored together, but this is not the case in many of OGD's conventional hangars. Most airplane owners have only one airplane or a share of one airplane. To store multiple airplanes, the conventional hangar would need to be shared by different airplane owners. With multiple airplanes in one hangar, it is sometimes necessary to move an airplane to get another one in or out of the hangar. This can increase the risk of damage to airplanes. While a small, single-engine piston aircraft can be adequately housed in about 1,300 sq. ft., many conventional hangars at OGD are less than 4,000 sq. ft. in area and house only one small, single-engine piston airplane.

[3] This assumes one-third of commercial hangar space is available for based aircraft storage.

The estimated area needed per aircraft in the future is as follows:

- Single-Engine & Other: 1,200 – 1,500 sq. ft.
- Multi-engine: 2,000 sq. ft.
- Jet: 4,000 – 8,000 sq. ft.
- Helicopter: 1,500 sq. ft.

To account for the future need for more transient airplanes, the number of additional based aircraft forecast in Chapter Two was increased 10%, from 31 to 34, for **Table 3J**. The table applies the above areas per aircraft by type in order to project the need for additional hangars in the short-term, intermediate term, and long-term future.

Table 3J: Hangar Requirements

	Short-Term (2023)	Intermediate Term (2028)	Long-Term (2038)	Total Additional
Single-Engine/Other	1	4	3	8
Area (sq. ft.)	1,200	5,600	4,500	11,300
Multiengine	2	2	5	9
Area (sq. ft.)	4,000	4,000	10,000	18,000
Jet	2	3	2	7
Area (sq. ft.)	8,000	18,000	16,000	42,000
Helicopter	3	1	6	10
Area (sq. ft.)	4,500	1,500	9,000	15,000
Total	**8**	**10**	**16**	**34**
Area (sq. ft.)	**17,700**	**29,100**	**39,500**	**86,300**

Note: Table does not include future MRO (undetermined size) or hangar for transient large/heavy aircraft (15,000 - 70,000 sq. ft.).

Besides the need for additional hangar space, hangar building condition is an issue. While 60% of existing hangar space is in good condition, 20% is in poor condition now and the other 20% may deteriorate from fair to poor condition in a few years. Some hangars were built in the 1940s. Over the 20-year planning period, many hangars will need major refurbishment or replacement. As shown in the Inventory Chapter (Table 1B), 47 hangar buildings totaling 152,435 square feet are in poor condition and 27 hangar buildings totaling 138,825 square feet are in fair condition.

Redevelopment of older hangar areas would improve efficiency. Taxilane layouts could be improved to enhance safety as well as reduce the amount of land devoted to circulation. Conventional hangars might

be "right-sized" to a few different airplane sizes. In addition, conventional hangars of the same size might be grouped together and built with common side walls in order to increase the density of airplane storage.

Aircraft Rescue and Fire Fighting (ARFF) Facility Requirements

The Airport acquired its Part 139 certificate, as required, once they began receiving passenger service from Allegiant Airlines. Index B ARFF capability (equipment and trained personnel) is required during the air carrier operations at the Airport.

If passenger service consists of fewer than five daily departures in aircraft shorter than 126 feet, Index B will remain the requirement. That is the situation forecast through 2038. Index C would not be required unless the Airport received five or more daily departures in aircraft longer than 126 feet. (Allegiant's A320 is 123 feet long.) Having a second ARFF vehicle before it is required for Index C would provide redundancy that would enhance safety.

The passenger terminal now contains a bay for the single Index B ARFF vehicle required now. However, expansion of terminal functions into that bay may be necessary to accommodate the forecast growth of passengers in the short-term future. In addition, the City wants a new fire station to serve the nearby community. A new ARFF facility that serves the off-airport community will need additional equipment, personnel, and building area. Current thinking is that a new fire station would need three bays for ARFF vehicles and three bays for community fire fighting vehicles. To serve the adjacent Ogden community, a location near the existing airport entrance road from Highway 79 would be best. The location must continue to allow fire fighters to meet the Part 139 response requirement, which is for at least one ARFF vehicle to reach the midpoint of the runway within three minutes.

Roadways and Auto Parking

The main entrance to the Airport (Airport Road) is a signaled intersection with Hinckley Drive (State Highway 79). Airport Road is so near the airfield that it must curve near the intersection with Hinckley Drive, which is a condition less than ideal for traffic queuing and safety. Airport Road, running along the east perimeter of the Airport, provides access to the main vehicle parking area near the terminal building and air traffic control tower and to parking provided adjacent to business tenants. Hangar tenants often park their cars inside their hangar when taking their aircraft out.

In the subsequent development alternatives element, entrance and other roadway improvements are considered, along with the need to provide access to new development areas proposed such as the anticipated west side development. Auto parking needs and location are based on specific land uses and tenants. Terminal area parking needs are as outlined earlier.

Security and Fencing

With new development at OGD, particularly on the west side, and proposed improvements to airport roadways, modifications to security fencing and controlled access gates will be necessary. Further, user survey respondents requested that GA and commercial passenger service be better separated to alleviate some of the current GA security restrictions resulting from the proximity of commercial service

operations. Since the City has been considering for some time the option to develop a commercial service terminal on the west side, this would help address the GA user concerns. Some of the security issues considered for commercial service were addressed earlier in the terminal discussion. Future business tenants and operators such as MRO services, business jet operators, and possible long-term air cargo service may have specific security needs to address as their development plans evolve.

Utilities and Drainage

Utility infrastructure and drainage improvements should be coincident with other future development at OGD. Coordination with Ogden City is ongoing to address details of utility infrastructure capacity and anticipated needs associated with airport development, primarily on the west side, over the 20-year planning period. A technical summary of existing utility infrastructure and future needs is included in the appendices.

Fuel Storage

All three FBOs have fuel tanks at OGD. A consolidated fuel farm should be considered for enhanced safety and efficiency. With much of OGD's future facility expansion expected on the west side of the airfield, a fuel farm on the west is an option considered with the airport development alternatives. Fuel storage requirements at the Airport depend on activity levels, fleet mix, and frequency of fuel deliveries. While OGD's storage capacity is adequate to serve existing and 20-year 100LL and Jet A fueling needs, future development should consider fuel truck access (off-airport and on-airport), safety, efficiency, and environmental requirements.

Airport Maintenance and Snow Removal Equipment Storage

Airport maintenance facilities at OGD include both indoor and outdoor storage for equipment used for airside and landside maintenance. While new maintenance facilities are not a high priority, a new consolidated facility that provides storage for all equipment would be ideal. Its location could be convenient to the airfield but removed from prime land that could better serve other OGD needs. New maintenance facilities can also incorporate energy-efficient components that support sustainability efforts. Airport snow removal equipment (SRE) storage could be collocated with the airport maintenance facilities in a maintenance complex with convenient access to the airfield to maintain runway surfaces during snowfall. The development alternatives in the next chapter consider options for maintenance and SRE storage.

Wash Rack

An aircraft wash rack is recommended for OGD to address the requests of a few of the user survey respondents. A wash rack should be conveniently located for GA aircraft and would need a catch basin and proper diversion into a storm water treatment system.

CONTINGENCY SCENARIO

In Chapter Two, Forecasts, a contingency scenario was identified which assumes the Airport's commercial air passengers will exceed the aviation demand forecasts if the City's ongoing efforts and Allegiant's plans follow the City's aspirations. Consideration of this possibility is important in this chapter as well as the next when development alternatives are prepared to address new and expanded facility location and property needs. Passenger growth that far exceeds the projections could accelerate passenger terminal development needs. In addition, dramatic growth in other aviation activity segments such as MRO services and business jet traffic, for example, could also require the City be prepared to respond to facility and service needs, including infrastructure, sooner than anticipated.

SUMMARY

Ongoing maintenance and improvement of OGD is key to accommodating the needs of its broad range of aviation users. Future improvements should ensure growing aviation demand and changes in the aircraft fleet mix are addressed, the City's vision for OGD remains an integral part of planning and decision-making, and compliance with new FAA design standards is inherent in all proposed development.

In the next chapter, various development alternatives are presented for comparative evaluation with respect to near- to long-term facility needs.

Chapter 4

Development Alternatives



Chapter 4 -Development Alternatives

INTRODUCTION

The purpose of the development alternatives element of the master planning study is to identify and evaluate various options for accommodating aviation demand, addressing airport user issues and facility needs identified in the previous chapter, complying with FAA design standards, and aligning with the City's vision for the Ogden-Hinckley Airport (OGD or the Airport).

Input on the various development alternatives was solicited from the Planning Advisory Committee (PAC) during a scheduled work session in August 2019, and from the community during a public open house that followed the PAC meeting. Input from the FAA, Utah Department of Transportation (UDOT) Division of Aeronautics, Airport/City staff, and other interested parties and stakeholders is important so that varying perspectives are considered and decision-making is well-informed. Evaluation criteria was used to guide the analysis and comparative evaluation of alternatives.

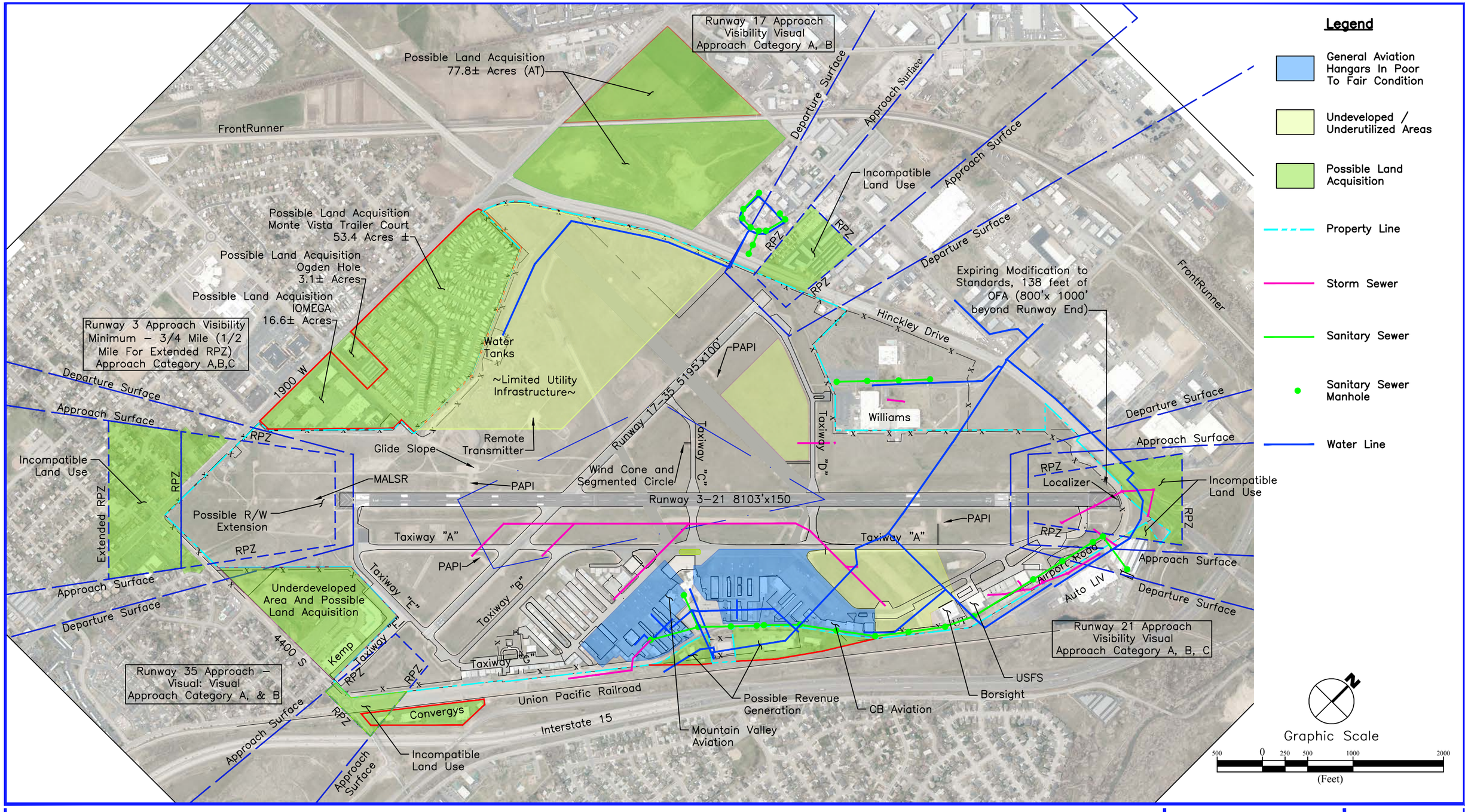


The process built into this element concluded with the selection of a "preferred alternative," which is a development plan for OGD that addresses its near- to long-term growth in a safe, efficient, and effective manner. The following sections describe the process.

PLANNING CONSIDERATIONS

Prior to identifying alternatives for OGD, development opportunities and challenges or constraints associated with future improvements are outlined. These are referred to as planning considerations.

Figure 4-1 depicts these planning considerations for OGD. As shown, there are several areas on the airport which are presently undeveloped or underutilized that are ideal for future landside improvement needs. Further, there are several tracts of land adjacent to OGD that could potentially be acquired for long-term airport development. This is of particular importance with OGD's strong growth potential that might otherwise be limited by bordering major roadways and existing community development. Additionally, some property is needed for mitigation of incompatible land uses in the runway protection zones.



Ogden – Hinckley Airport

Planning Considerations

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Project No: ODG1495
Date: February 2020

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Figure 4–1
Planning Considerations

While existing utility and roadway infrastructure will serve continued development on the east side of the airfield, the west side has limited infrastructure. Consequently, infrastructure improvements on the west side will need to be integrated with development plans on that side of the airfield.

While not specifically depicted, a recent survey of runway approaches identified various objects within the runway approaches. The survey results will be considered by the FAA when evaluating the potential for an improved instrument approach with reduced visibility minimums—a feature included in the development alternatives.

IDENTIFICATION OF ALTERNATIVES

Five alternative ways to develop the Airport in the long-term future were proposed for consideration. The alternatives are conceptual in nature. They were developed by airport management and the master plan consulting team, within the context of the planning considerations, projected airport needs, and identified issues with the current airport configuration.

The alternatives contain similar elements and accommodate the growth projected for 20 years into the future. Most of the alternatives accommodate growth that exceeds the 20-year projections.

Table 4A summarizes the main features of the five alternatives, which are named Alternatives A through E. The major differences among the alternatives concern the airfield, amount of land acquisition, and the placement of the terminal area. These differences drive other variations, such as roads, the size and shape of other land uses, and the availability of land for airport-compatible commercial development. Differences shown for specific facility locations relate to Fixed Base Operators (FBO), the Aircraft Rescue and Fire Fighting (ARFF) facility, fuel farm, air traffic control tower, airport operations and maintenance, helicopter parking, and urban air mobility.

Table 4A. Comparison of Alternative Features

	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Number of Runways	2	2	2	1	2
Runway Extension	no	yes	yes	yes	yes
Approach Improvement	no	no	yes	yes	yes
GA Hangars/Apron (acres)	81*	124	98	113	104
Terminal Area (acres)	14	21	99	72	64
MRO/Cargo Area (acres)	115	121	125	160	96
Commercial Area (acres)	0	11	44	93	106
Land Acquisition (acres)	52	114	186	215	185

*Excludes 16 off-airport acres at Kemp Jet Services. MRO = maintenance/repair/overhaul

Alternative A

The premise of the first alternative (Alternative A, **Figure 4-2**) is to accommodate the 20-year projected growth within existing development patterns as much as possible, while also allowing the possibility of major large aircraft MRO and air cargo activity.

Airfield

In Alternative A, Runways 3-21 and 17-35 do not change in terms of width, strength, and instrument approaches. A nonstandard runway object free area condition is corrected, which slightly reduces the useable length of Runway 3-21 by increasing the Runway 21 displaced threshold an additional 138 feet. A parallel taxiway system is developed on the west side of the two runways, to provide aircraft access from the currently undeveloped west side of the Airport. As in all five alternatives, the runway that was decommissioned in 2006 is removed to prevent its accidental use as a runway. The air traffic control tower remains where it is now located.

GA Hangars/Aprons

As is now the case, areas north and south of the passenger terminal are devoted to GA hangars and aprons, although some of the GA hangars and apron north of the terminal are ultimately removed to accommodate terminal growth. The existing GA areas are redeveloped for more efficiency, with larger conventional hangars to the north and T-hangars for smaller airplanes to the south. Redevelopment will begin with the oldest hangars that are in the poorest condition and will occur over several years. Undeveloped, off-airport land south of the Kemp FBO is assumed to be available for GA hangar development as well. An expansion of the apron to the north is dedicated to helicopter parking. An aircraft wash rack is added at the south end of the on-airport GA hangars.

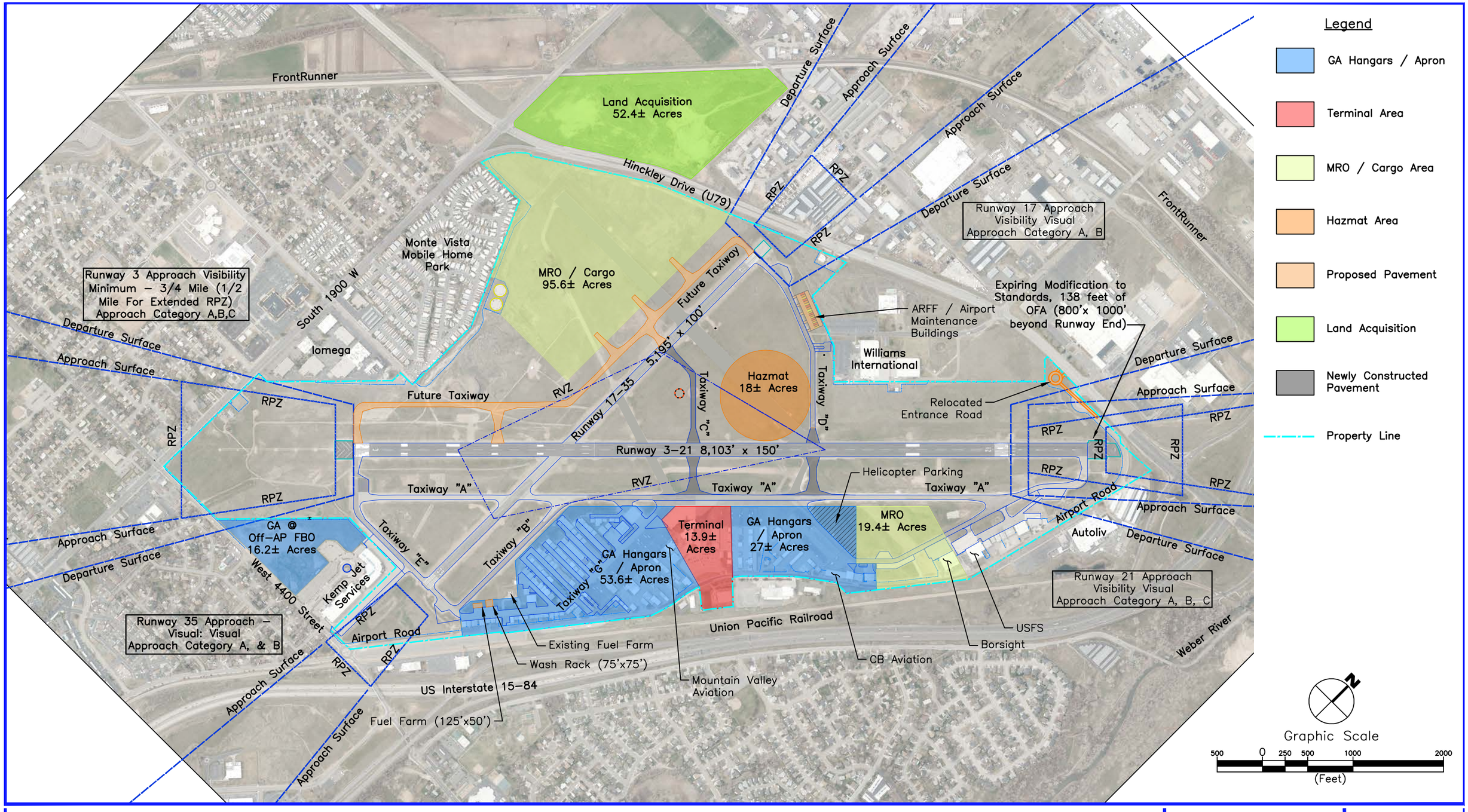
The number and location of FBOs remains unchanged with Alternative A.

Terminal Area

The existing passenger terminal, terminal apron, and auto parking are expanded northward. Expansion requires the relocation of the ARFF vehicle, as the terminal building expands into and beyond the existing ARFF bay. Presumably the old 1940s terminal building is replaced as building additions are constructed, although Alternative A does not preclude the renovation of the old building if closer study concludes renovation is preferable to replacement. The future terminal area is adequate for two to six gates, as needed for more robust passenger growth.

MRO/Cargo Area

Expansion area around Borsight on the east side of the airfield is reserved for future large aircraft MRO. Virtually all the developable west side of the airfield is reserved for future development of large aircraft



Ogden – Hinckley Airport

Development Alternative "A"

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Date: August 2019

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Figure 4–2
Development Alternative A

MRO and air cargo operators. A new entrance road from Hinckley Drive into the west side of the Airport is included. Relatively large quantities of hazardous materials may be required for future MRO. Consequently, a hazardous materials storage area with a 500-foot safety clearance around it is located between the north ends of Runways 3-21 and 17-35, but outside the runway visibility zone between the runways.

Other Features

The existing fuel farm at the south end of the GA hangar area is expanded at that location, as aircraft operations and demand for fuel grows.

A consolidated complex for ARFF and airport maintenance is developed near the northwest edge of the Airport next to Taxiway D. This location has room for expansion and is relatively central to both runways, an advantage for rescue, firefighting, and snow removal. Moving these functions from their current locations also frees up room for GA hangars and the passenger terminal to grow.

The unpaved airport perimeter road will be paved over time; paving the portion from Airport Road to the new ARFF/ Maintenance complex would be coordinated with developing that complex. The other major road improvement would be the slight relocation of the Airport entrance westward and adding a traffic circle to provide more queuing room for vehicles entering the Airport.

Land Acquisition

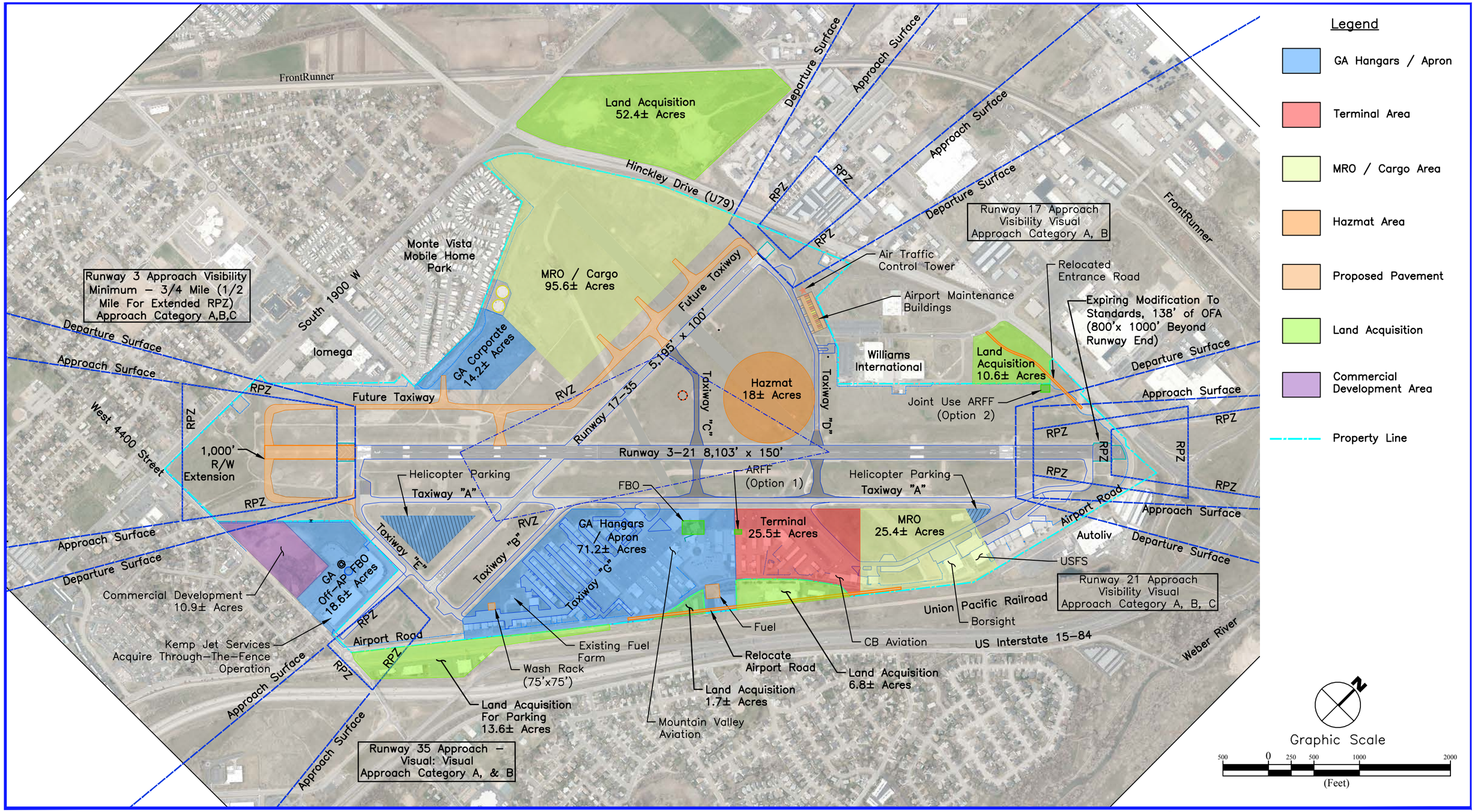
The only land acquired with Alternative A is the 52-acre parcel west of the Airport across Hinckley Drive (Highway 79). This land acquisition provides flexibility for OGD development such as remote vehicle parking and fuel storage. The land also has potential for a wide range of airport-compatible, revenue-producing development, from a FrontRunner/urban air mobility station, to commercial enterprises (e.g., offices, hotels, restaurants, gas stations) or light industry.

Alternative B

Alternative B (**Figure 4-3**), compared with Alternative A, provides more aggressive development, including a runway extension, acquisition of Kemp's FBO by the City, construction of a new passenger terminal, and land acquisition to solve some existing functional problems, as well as to expand airport growth capacity beyond the 20-year projected need.

Airfield

A nonstandard runway object free area condition is corrected, which slightly reduces the useable length of Runway 3-21 by increasing the Runway 21 displaced threshold by 138 feet. Runway 3-21 is lengthened 1,000 feet to the south, if approved by the FAA, which will increase takeoff run on Runway 3, particularly on hot days and for heavier and more fully loaded airplanes. To avoid increasing various safety clearances,



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Figure 4–3
Development
Alternative B

the lowest visibility minimum approach remains ¾ mile. Acquisition of additional buildings within the south runway protection zone is avoided with the use of declared distances on Runway 3-21. With the runway extension, northbound and southbound takeoffs will have about the same amount of useable runway. An FAA prohibition of public roads in runway protection zones must be considered. Alternative B proposes that any addition of vehicular lanes to the portion of West 4400 South Street that is within the runway protection zone will be accomplished within the existing curb-to-curb width of the street in order to retain "grandfathered" status.

Runway 17-35 does not change in Alternative B. A parallel taxiway system is developed on the west side of the two runways, to provide aircraft access from the currently undeveloped west side of the Airport.

The deactivated runway's pavement is removed to prevent accidental use as a runway.

A new air traffic control tower is in the northwest part of the Airport, near Taxiway D, where it will provide good visibility of both the east and west sides of the airfield.

GA Hangars/Aprons

The GA hangars and apron north of the existing passenger terminal are removed, to provide a site for a new passenger terminal. The GA area south of the existing passenger terminal is redeveloped for more efficiency. The area available is expanded by the acquisition and removal of existing facilities east of Airport Road and the relocation of Airport Road eastward so that it parallels the Union Pacific Railroad. An aircraft wash rack is added.

A parcel of land west of the airfield is designated for corporate GA hangar development.

The City acquires the Kemp FBO to avoid the "through-the-fence" operation and the existing passenger terminal is converted into an FBO operated by the Airport. The Kemp property includes undeveloped land that could be used for new GA hangars; a portion of the undeveloped Kemp land is designated commercial use.

Two areas are designated for helicopter parking—one is west of the US Forest Service leasehold and the other is north of the Kemp FBO, a location that will require escorting people to and from the helicopters, as the location is within the aircraft operating area.

Terminal Area

New passenger terminal, terminal apron, and auto parking facilities are built north of the existing terminal area. The relocation of Airport Road to the east, as described for GA Hangars/Aprons, also provides more room for the terminal area. This future terminal area is adequate for more robust passenger growth than the 20-year projection, if needed.

Long-term terminal auto parking and/or extra auto parking for the GA area is provided through the acquisition of a strip of existing parking spaces located between Airport Road and the Union Pacific Railroad.

MRO/Cargo Area

Expansion area around Borsight on the east side of the airfield is reserved for future large aircraft maintenance/repair/overhaul. Most of the developable west side of the airfield is reserved for future development of large aircraft MRO and air cargo operators. A new entrance road from Hinckley Drive into the west side of the Airport is included. Relatively large quantities of hazardous materials may be required for future MRO. Consequently, a hazardous materials storage area with a 500-foot safety clearance around it is located west of the intersection of Runways 3-21 and 17-35, but outside the runway visibility zone between the runways.

Other Features

A new fuel farm is built on the east side of the airfield, closer to the passenger terminal and expanding capacity beyond what is now available.

Alternative B proposes two options for the ARFF. One option is to expand northward from its current location, attached to the passenger terminal that will be converted to the FBO. The other option is to build a joint City-Airport use fire station at the north end of the airport.

A storage building for airport maintenance equipment is constructed near the northwest edge of the Airport next to Taxiway D and near the new control tower. This location has room for expansion and is relatively central to both runways, an advantage for snow removal.

The unpaved airport perimeter road will be paved over time; paving the portion from Airport Road to the new control tower and airport maintenance building would be coordinated with developing those facilities.

The other major road improvement in Alternative B is the relocation of the Airport entrance westward, on land acquired from Williams International.

An urban air mobility station might be located near the new FBO or the new passenger terminal. At this time, the space required is unknown—it might be a small as a few auto parking spaces located outside the Security Identification Display Area (SIDA) but road-accessible.

Land Acquisition

For Alternative B, land is acquired on the east side along Airport Road, including Kemp's FBO. Some undeveloped land is acquired from Williams International, for the new entrance road. The 52-acre parcel west of the Airport across Hinckley Drive (Highway 79) is also acquired. This land has potential for a wide

range of airport-compatible, revenue-producing development, from a FrontRunner/urban air mobility station, to commercial enterprises (e.g., offices, hotels, restaurants, gas stations) or light industry.

Alternative C

Alternative C (**Figure 4-4**) focuses on establishing a major multi-modal passenger role for the Airport. This alternative prepares for levels of aviation activity that far exceed the 20-year projections. Runway 3-21 is lengthened, and the instrument approach is improved, making the airfield capability more like other commercial service airports. The landside portion of the passenger terminal is relocated to acquired land west of Hinckley Drive and co-located with a future FrontRunner station. Via a tunnel under the highway, airline passengers are carried to and from airline gates on the west side of the airfield. Alternative C also expands areas for GA, MRO/cargo, and commercial businesses.

Airfield

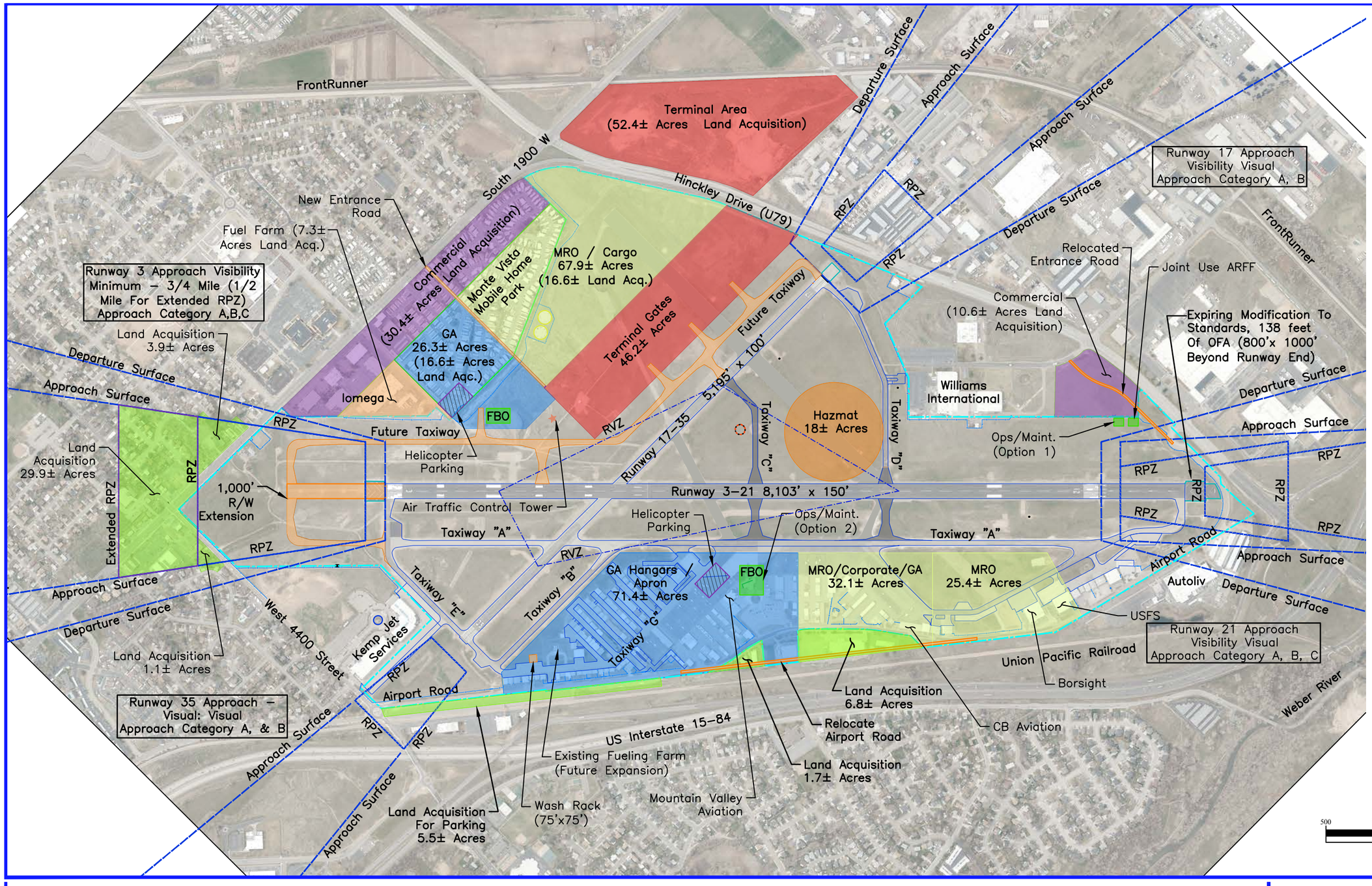
A nonstandard runway object free area condition is corrected, which slightly reduces the useable length of Runway 3-21 by increasing the Runway 21 displaced threshold an additional 138 feet. Runway 3-21 is lengthened 1,000 feet to the south, if approved by the FAA, which will increase takeoff run on Runway 3, particularly on hot days and for heavier and more fully loaded airplanes. In addition, the instrument approach to Runway 3 is improved to ½-mile visibility minimums. This instrument approach improvement increases the safety clearances required around the runway—particularly the size of the runway protection zone. The future required runway protection zone extends 800 feet farther than the existing one and must not contain incompatible land uses (most types of occupied buildings and public roads). Thus, a large amount of land acquisition, home and business relocations, and the relocation of two streets will be required. To avoid even more land and building acquisition south of the runway, declared distances must be used for Runway 3-21. With the runway extension, northbound and southbound takeoffs will have about the same amount of useable runway.

Runway 17-35 does not change in Alternative C. A parallel taxiway system is developed on the west side of the two runways, to provide aircraft access from the currently undeveloped west side of the Airport. The deactivated runway's pavement is removed to prevent accidental use as a runway.

A new air traffic control tower is located on the west side of the airfield, near the intersection of the two runways.

GA Hangars/Aprons

Over time, the existing GA area is redeveloped for more efficiency and expanded into the existing passenger terminal area when the terminal is relocated. The area available for GA is expanded by the acquisition and removal of existing facilities east of Airport Road and the relocation of Airport Road



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Figure 4–4
Development Alternative C

eastward so that it parallels the Union Pacific Railroad. The existing passenger terminal is converted to an FBO facility, which might be operated by the City or leased to a private FBO.

Helicopter parking is designated on the apron near the Mountain Valley Aviation facility, just south of the existing passenger terminal. An aircraft wash rack is built in the GA area.

As GA activity grows and west side infrastructure (roads and utilities) is built, a new GA area is established on the west side of the airfield. The west side GA area has land reserved for another FBO facility (same or different operator than on the east side) and for helicopter parking.

Alternative C does not preclude or depend on Kemp's continued activity as a "through-the-fence" FBO in the long-term future.

Terminal Area

The landside (ticketing, check-in, security, bag claim, rental car) portion of the new passenger terminal is built on land acquired west of Hinckley Drive and near the FrontRunner tracks. The airline passenger terminal, a new FrontRunner station, and an urban air mobility station will have coordinated designs to facilitate passenger transfers between air and rail travel. Auto parking for passengers, rental cars, and terminal/station employees is also located on this land. Airline passengers will be conveyed via a tunnel under Hinckley Drive to and from the waiting areas, gates, and aircraft apron, which will be centrally located on the west side of the airfield.

MRO/Cargo Area

Expansion area around Borsight on the east side of the airfield is reserved for future large aircraft maintenance/repair/overhaul. The reserved area extends farther south in Alternative C than in Alternatives A and B, and the extended area is available for both MRO and corporate GA. A large area on the west side of the airfield is reserved for future development of large aircraft MRO and air cargo operators. A new entrance road from Hinckley Drive into the west side of the Airport is included. Relatively large quantities of hazardous materials may be required for future MRO. Consequently, a hazardous materials storage area with a 500-foot safety clearance around it is located between the north ends of Runways 3-21 and 17-35, but outside the runway visibility zone between the runways.

Other Features

The existing east side fuel farm is expanded in place, and a new fuel farm is built on the west side of the airfield.

The ARFF facility is relocated. A new joint City-Airport fire station is built at the north end of the airport.

Just south of the joint-use fire station is the Option 1 location for a new airport operations and maintenance building. The Option 2 location for airport ops/maintenance is within an expansion of the east side FBO (existing passenger building).

The unpaved airport perimeter road will be paved over time; paving the portion from Airport Road to the new joint use fire station and airport ops/maintenance building would be coordinated with developing those facilities.

Another road improvement in Alternative C is the extension of Airport Road through land acquired from Williams International. The extended road intersects with the entrance road to Williams, allowing the closure of the existing airport entrance from Hinckley Drive.

A new main Airport entrance road is built from Hinckley Drive to the new landside passenger terminal. Alternative C also includes roads from South 1900 West Street to serve new development on the west side of the airfield.

A large commercial land use area is developed along South 1900 West Street. Airport-compatible uses such restaurants, hotels, offices, shops, and gas stations might be built there.

Land Acquisition

A major acquisition is the 52-acre parcel west of Hinckley Drive where the landside terminal is constructed.

Another large acquisition is on the southwest side of the Airport along South 1900 West Street; this land is now occupied by a mobile home park and the former Iomega office buildings. It is anticipated that the residential mobile home park will be exposed to incompatible levels of aircraft noise as the frequency and size of airplanes using the Airport increases, so acquisition of these homes will be necessary. Further, future development of MRO/Cargo, GA and Commercial is proposed there.

A third large land acquisition is to provide land use compatibility within the larger runway protection zone south of the primary runway. This will require the acquisition and relocation of many homes and businesses that would likely also be exposed to incompatible levels of noise.

Some undeveloped land is acquired from Williams International for the Airport Road extension. Additional land alongside the road extension is designated for commercial development.

On the east side, land is acquired to relocate Airport Road eastward, as in Alternative B. A strip of existing parking spaces located between Airport Road and the Union Pacific Railroad is also acquired. These spaces could provide overflow parking for the adjacent GA area and could serve as temporary parking spaces for construction workers or to replace spaces unusable during construction.

Alternative D

The unique feature of Alternative D (**Figure 4-5**) is the conversion of Ogden-Hinckley into a one-runway airport. Runway 17-35 is closed and removed, opening considerable land for future development. Along with major land acquisition on the west side of the airfield, this alternative prepares for levels of aviation activity that far exceed the 20-year projections. Runway 3-21 is lengthened, and the instrument approach is improved, making the airfield capability more like other commercial service airports. A new terminal area is developed on the west side, midfield. Large aircraft MRO, air cargo, and commercial development are other major uses of the west side. GA and MRO are the main uses of the east side.

Airfield

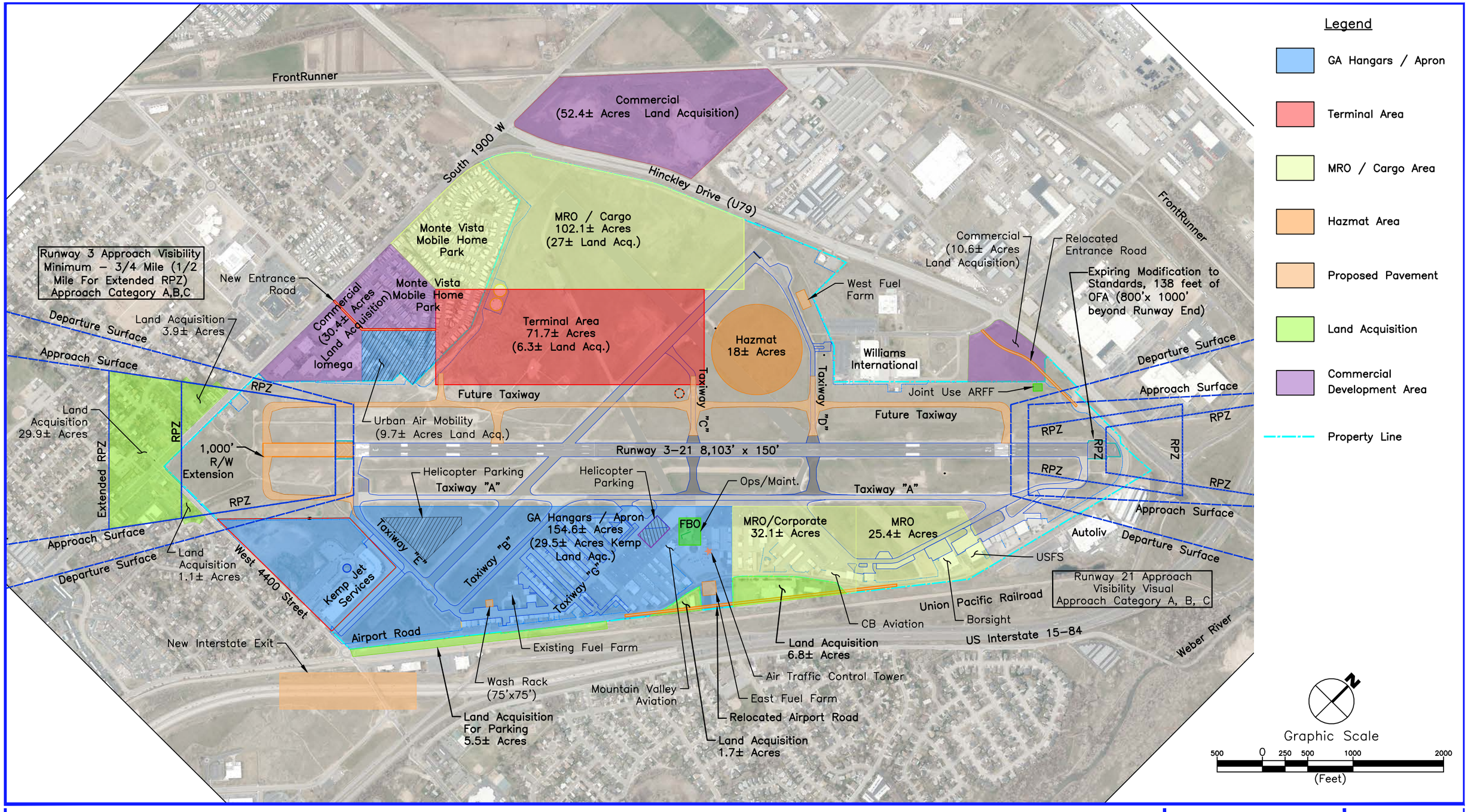
A nonstandard runway object free area condition is corrected, which slightly reduces the useable length of Runway 3-21 by increasing the Runway 21 displaced threshold an additional 138 feet. Runway 3-21 is lengthened 1,000 feet to the south, if approved by the FAA, which will increase takeoff run on Runway 3, particularly on hot days and for heavier and more fully loaded airplanes. In addition, the instrument approach to Runway 3 is improved to ½-mile visibility minimums. This instrument approach improvement increases the safety clearances required around the runway—particularly the size of the runway protection zone. The future required runway protection zone extends 800 feet farther than the existing one and must not contain incompatible land uses (most types of occupied buildings and public roads). Thus, a large amount of land acquisition, home and business relocations, and the relocation of two streets will be required. To avoid even more land and building acquisition south of the runway, declared distances must be used for Runway 3-21. With the runway extension, northbound and southbound takeoffs will have about the same amount of useable runway. A parallel taxiway system is developed on the west side of the runway.

Runway 17-35 is deactivated. The pavements for the previously deactivated runway and for Runway 17-35 are removed to prevent their accidental use as runways. (However, portions of Runway 17-35, Taxiway B, and Taxiway E pavements that are east of parallel Taxiway A might be retained if they can be incorporated into future GA aprons or taxilanes.)

The air traffic control tower remains at its current location on the east side, near the existing passenger terminal.

GA Hangars/Aprons

With the removal of Runway 17-35 and the relocation of the passenger terminal, most of the land east of Runway 3-21 is dedicated to GA hangars and apron. Over time, the existing GA area is redeveloped for more efficiency, including grouping hangars by aircraft size to minimize land loss to taxilane object free areas. The area available for GA is expanded by the acquisition and removal of existing facilities east of Airport Road and the relocation of Airport Road eastward so that it parallels the Union Pacific Railroad.



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Figure 4–5
Development Alternative D

The City acquires the Kemp FBO to avoid the "through-the-fence" operation and the existing passenger terminal is converted into an FBO operated by the Airport. Helicopter parking is designated at two locations: on the apron near the Mountain Valley Aviation facility and north of the Kemp property. An aircraft wash rack is built in the GA area.

Terminal Area

Alternative D's new terminal area is located on the west side, midfield. It is served from South 1900 Street, with a new entrance road passing by commercial and MRO/cargo area. Secondary access to the terminal is from Hinckley Drive. The 72 acres dedicated to terminal area is enough to accommodate the apron, terminal building (landside and airside), and auto parking (for passengers, rental cars, and employees) needed for many years. An adjacent 10-acre area is reserved for urban air mobility. Currently, the land and airspace requirements for urban air mobility are undefined. The site might be large enough for a helipad, bus terminal, commuter parking, charging station, or other intermodal facilities.

MRO/Cargo Area

Expansion area around Borsight on the east side of the airfield is reserved for future large aircraft maintenance/repair/overhaul. A large area on the west side of the airfield is reserved for future development of large aircraft MRO and air cargo operators. Road access is from both South 1900 West Street and Hinckley Drive. Relatively large quantities of hazardous materials may be required for future MRO. Consequently, a hazardous materials storage area with a 500-foot safety clearance around it is located west of Runway 3-21.

Other Features

A new fuel farm is built on the east side of the airfield, expanding capacity beyond what is now available. This fuel farm will eliminate fuel tankers operating on the aprons and taxiways. A new fuel farm is also built on the northwest side of the airfield.

The ARFF facility is relocated. A new joint City-Airport fire station is built at the north end of the airport.

Airport ops/maintenance is within an expansion of the east side FBO (existing passenger building).

The unpaved airport perimeter road will be paved over time; paving the portion from Airport Road to the new fuel farm would be coordinated with developing that facility. Another road improvement in Alternative D is the extension of Airport Road through land acquired from Williams International. The extended road intersects with the entrance road to Williams, allowing the closure of the existing airport entrance from Hinckley Drive.

A large commercial land use area is developed on South 1900 West Street. The 52-acre land acquisition between Hinckley Drive and the FrontRunner is also designated for commercial use, as is undeveloped

land acquired from Williams International. Airport-compatible uses such restaurants, hotels, offices, and gas stations might be built at these sites.

A major off-airport project is a new interchange on I-15 at West 4400 Street. Some of the land acquisition proposed at the south end of the airport might be used for the interchange or for a subsequent upgrading of West 4400 Street.

Land Acquisition

One major acquisition is the 52-acre parcel west of Hinckley Drive.

Another large acquisition is on the southwest side of the Airport along South 1900 West Street; this land is now occupied by a mobile home park and Iomega office buildings. It is anticipated that the residential mobile home park will be exposed to incompatible levels of aircraft noise as the frequency and size of airplanes using the Airport increases, so acquisition of these homes will be necessary and future development is proposed there.

A third large land acquisition is to provide land use compatibility within the larger runway protection zone south of the primary runway. This will require the acquisition and relocation of many homes and businesses that would likely also be exposed to incompatible levels of noise.

Some undeveloped land is acquired from Williams International for the Airport Road extension and commercial development.

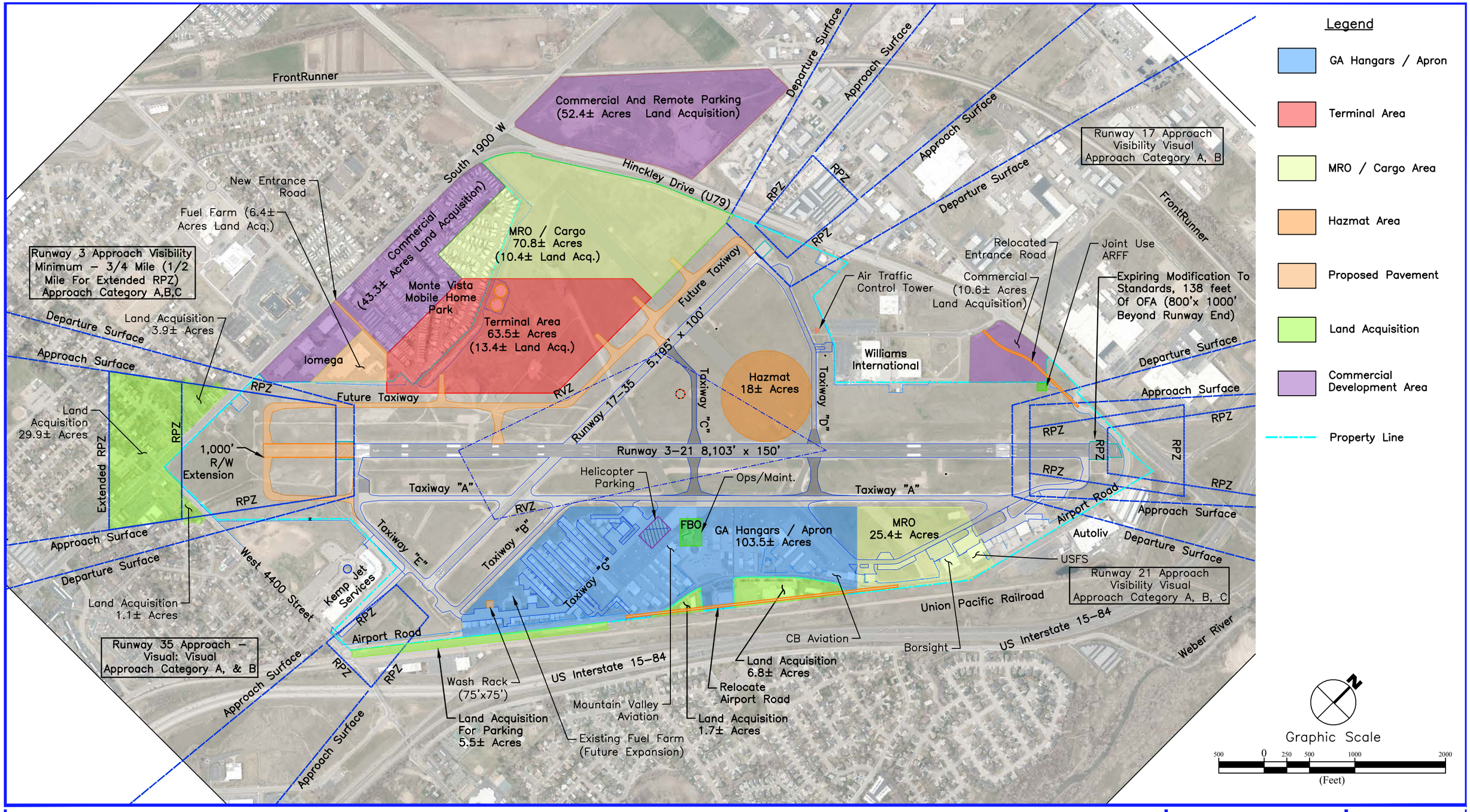
On the east side, land is acquired to relocate Airport Road eastward, as in previous alternatives. The strip of existing parking spaces located between Airport Road and the Union Pacific Railroad is also acquired. These spaces could provide overflow parking for the adjacent GA area and could serve as temporary parking spaces for construction workers or to replace spaces unusable during construction.

Alternative E

Unlike Alternative D, Alternative E (**Figure 4-6**) retains both runways. With major land acquisition on the west side of the airfield, this alternative prepares for levels of aviation activity that far exceed the 20-year projections. Runway 3-21 is lengthened, and the instrument approach is improved, making the airfield capability more like other commercial service airports. A new terminal area is developed on the west side near the mid-field. Large aircraft maintenance/repair/overhaul, air cargo, and commercial development are other major uses of the west side. GA and MRO are the main uses of the east side.

Airfield

A nonstandard runway object free area condition is corrected, which slightly reduces the useable length of Runway 3-21 by increasing the Runway 21 displaced threshold an additional 138 feet. Runway 3-21 is



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Figure 4–6
Development
Alternate E

lengthened 1,000 feet to the south, if approved by the FAA, which will increase takeoff run on Runway 3, particularly on hot days and for heavier and more fully loaded airplanes. In addition, the instrument approach to Runway 3 is improved to ½-mile visibility minimums. This instrument approach improvement increases the safety clearances required around the runway—particularly the size of the runway protection zone. The future required runway protection zone extends 800 feet farther than the existing one and must not contain incompatible land uses (most types of occupied buildings and public roads). Thus, a large amount of land acquisition, home and business relocations, and the relocation of two streets will be required. To avoid even more land and building acquisition south of the runway, declared distances must be used for Runway 3-21. With the runway extension, northbound and southbound takeoffs will have about the same amount of useable runway.

Runway 17-35 does not change in Alternative E. A parallel taxiway system is developed on the west side of the two runways, to provide aircraft access from the currently undeveloped west side of the Airport. The deactivated runway's pavement is removed to prevent accidental use as a runway.

A new air traffic control tower is located on the northwest side of the airfield, near Taxiway D.

GA Hangars/Aprons

Over time, the existing GA area is redeveloped for more efficiency and expanded into the existing passenger terminal area when the terminal is relocated. The area available for GA is expanded by the acquisition and removal of existing facilities east of Airport Road and the relocation of Airport Road eastward so that it parallels the Union Pacific Railroad. The existing passenger terminal is converted to an FBO facility, which might be operated by the City or leased to a private FBO. Helicopter parking is designated on the apron near the Mountain Valley Aviation facility, just south of the existing passenger terminal. An aircraft wash rack is built in the GA area.

Alternative E does not preclude or depend on Kemp's continued activity as a "through-the-fence" FBO in the long-term future.

Terminal Area

The new terminal area is served from South 1900 West Street, with a new entrance road passing through commercial development. The acreage dedicated to terminal area is enough to accommodate the apron, terminal building (landside and airside), and auto parking (for passengers, rental cars, and employees) needed for many years.

MRO/Cargo Area

Expansion area around Borsight on the east side of the airfield is reserved for future large aircraft maintenance/repair/overhaul. A large area on the west side of the airfield is reserved for future development of large aircraft MRO and air cargo operators. A new entrance road from Hinckley Drive

into the west side MRO/cargo is included. Relatively large quantities of hazardous materials may be required for future MRO. Consequently, a hazardous materials storage area with a 500-foot safety clearance around it is located between the north ends of Runways 3-21 and 17-35, but outside the runway visibility zone between the runways.

Other Features

The existing east side fuel farm is expanded in place, and a new fuel farm is built on the west side of the airfield.

The ARFF facility is relocated. A new joint City-Airport fire station is built at the north end of the airport.

Airport ops/maintenance is within an expansion of the east side FBO (existing passenger building).

The unpaved airport perimeter road will be paved over time; paving the portion from Airport Road to the new control tower would be coordinated with developing that facility. Another road improvement in Alternative E is the extension of Airport Road through land acquired from Williams International. The extended road intersects with the entrance road to Williams, allowing the closure of the existing airport entrance from Hinckley Drive.

A large commercial land use area is developed along South 1900 West Street. The 52-acre land acquisition between Hinckley Drive and the FrontRunner tracks is also designated for commercial use, as is undeveloped land acquired from Williams International. Airport-compatible uses such restaurants, hotels, offices, shops, and gas stations might be built at these sites.

FBOs are assumed to handle urban air mobility passengers and vehicles in much the same way air taxi passengers and aircraft are handled now.

Land Acquisition

One major acquisition is the 52-acre parcel west of Hinckley Drive.

Another large acquisition is on the southwest side of the Airport along South 1900 West Street; this land is now occupied by a mobile home park and former Iomega office buildings. It is anticipated that the residential mobile home park will be exposed to incompatible levels of aircraft noise as the frequency and size of airplanes using the Airport increases, so acquisition of these homes will be necessary.

A third large land acquisition is to provide land use compatibility within the larger runway protection zone south of the primary runway. This will require the acquisition and relocation of many homes and businesses that would likely also be exposed to incompatible levels of noise.

Some undeveloped land is acquired from Williams International for the Airport Road extension and commercial development.

On the east side, land is acquired to relocate Airport Road eastward, as in previous alternatives. The strip of existing parking spaces located between Airport Road and the Union Pacific Railroad is also acquired. These spaces could provide overflow parking for the adjacent GA area and could serve as temporary parking spaces for construction workers or to replace spaces unusable during construction.

COMPARATIVE EVALUATION OF ALTERNATIVES

In this section, each alternative is evaluated for the following criteria:

- Accommodates growth
- Enhances safety and efficiency of operations
- Airport user/customer satisfaction
- Phasing impacts
- Financial feasibility
- Environmentally responsible
- Community receptiveness
- Security of operations
- Promotes City's vision for OGD
- Planning Flexibility
- Engineering Feasibility

Alternative A

Accommodates Growth

With the least amount of land acquisition, Alternative A accommodates the least growth beyond the 20-year planning period. The alternative depends on off-airport hangar development on Kemp's land to help meet GA hangar demand. The terminal area might not be adequate if passenger growth exceeds the forecast. The area available for future MRO/Cargo development is generous, although it is mostly on the west side of the airfield instead of near Borsight.

Enhances Safety and Efficiency of Operations

Alternative A fixes an existing nonstandard condition and provides an FAA-compliant object free area at the north end of Runway 3-21. Unfortunately, this reduces the useable runway length. Through redevelopment of the GA area and designation of a separate apron for helicopter parking, the alternative improves safety and efficiency for GA. Developing the west side of the airfield places aviation uses farther

from fuel storage and FBO services, which would be more of an inconvenience for air cargo than for MRO and would create a reason for airfield crossing. Vehicular traffic flow at the entrance road is improved. The ARFF expansion enhances safety and the new site for the ARFF is centrally located for quick response. Improvements will meet and maintain FAA airport design standards.

Airport User/Customer Satisfaction

Improvements to GA and terminal areas should be welcomed by users, except that some GA users may oppose fee increases needed to recover the cost of improvements.

Phasing Impacts

Terminal expansion/relocation to the north can be phased well. GA hangar redevelopment will require careful phasing to keep enough hangar capacity available and taxilanes open.

Financial Feasibility

The west side parallel taxiway may not score high for federal funding until MRO/Cargo development generates fairly high levels of aircraft activity. Funding passenger terminal expansion as it is needed will be feasible through Passenger Facility Charges (PFC) and/or City funds, including possible revenue bonds. Most GA hangars were built with private funds on land leases from the Airport, and this might be the way to fund redevelopment. However, the City might lease large tracts for a developer to build hangars on, or might elect to fund hangar construction, possibly through revenue bonds paid off by rent.

Environmentally Responsible

New development and demolition, of course, impacts the environment. However, meeting the service area's aviation demand at Ogden-Hinckley means users will not be travelling farther to different airports and using more energy for ground transportation and emitting more air pollution. New construction provides opportunities for sustainable design. Improvements to the stormwater drainage system, including oil/water separation at the new aircraft wash rack, can be made as the Airport grows.

Community Receptiveness

Airport users will appreciate improvements that reduce congestion and improve amenities. The well-paying jobs that the MRO development will accommodate are likely to be very welcome. On the other hand, residents of the mobile home park may not want to see undeveloped land adjacent to their homes converted to light industrial uses (MRO and air cargo). The ARFF location in Alternative A precludes its co-location with a community fire station, which could be considered a disadvantage by the community.

Security of Operations

GA and terminal areas remain very close to each other, which provides minimal improvement of existing security problems between GA aircraft/vehicular traffic and the SIDA at the terminal apron. Through-the-fence operations, which can be a weak point for security, will increase at Kemp's FBO as additional airplanes are hangared there.

Promotes City's Vision for Ogden-Hinckley

By accommodating the projected growth of GA and airline passengers and by providing for future job-producing MRO activity, Alternative A is consistent with the City's vision for the Airport. The lack of land for commercial development, such as restaurants and hotels, is a disadvantage regarding revenue production for the Airport. However, upgrading and expanding developed areas as needed will provide revenue to help keep the Airport financially self-sustaining.

Planning Flexibility

Compared to other alternatives, Alternative A has the least land acquisition, and thus provides the least flexibility for adjusting land uses if demand shifts from what is forecast or users need changes. On the other hand, the large MRO/Cargo area west of the airfield could be assigned other uses if necessary. In addition, the 52-acre land acquisition northwest of Hinckley Drive provides room for remote auto parking, fuel storage, or revenue-producing commercial/industrial development.

Engineering Feasibility

Alternative A presents no special design, construction, or other technical issues with projects.

Alternative B

Accommodates Growth

Alternative B accommodates growth beyond the 20-year planning period, particularly for GA hangars/apron. The terminal area is more than adequate for projected passenger growth, but provides less room for growth than Alternatives C, D, and E. The area available for future MRO/Cargo development is generous, including more land near Borsight than in Alternative A.

Enhances Safety and Efficiency of Operations

Alternative B fixes an existing nonstandard condition and provides an FAA-compliant object free area at the north end of Runway 3-21. Unfortunately, this reduces the useable runway length. Removal of the deactivated runway's pavement enhances safety by preventing accidental use as a runway. The runway

extension, which provides balanced takeoff run for both northbound and southbound departures, increases flexibility for air traffic to use different runways in varied wind conditions.

Through redevelopment of the GA area and designation of separate aprons for helicopter parking, the alternative improves safety and efficiency for GA. West side development places aviation uses farther from fuel storage and FBO services, which would be more of an inconvenience for air cargo and corporate GA than for MRO and would create reasons for airfield crossing. Vehicular traffic flow at the entrance road is improved more than at Alternative A. The ARFF expansion enhances safety, and joint use with a community fire station provides efficient staffing. While response time would still meet FAA requirements, the new ARFF site will likely increase response time to the south end of the airfield, compared to the existing location.

Airport User/Customer Satisfaction

Improvements to GA and terminal areas should be welcomed by users, except that some GA users may oppose fee increases needed to recover the cost of improvements. The City's acquisition of Kemp and future role as the FBO may or may not satisfy airport users.

Phasing Impacts

Constructing a new terminal allows the existing terminal to operate unhampered during construction. However, terminal relocation to the north requires the relocation of many hangars. This replacement of hangars and hangar redevelopment south of the existing terminal will require careful phasing to keep enough hangar capacity and taxilanes available. Construction of a corporate GA hangar area west of the airfield would likely require some of the MRO development on the west side to occur, in order to provide infrastructure on that side. On the other hand, a developer might see this area as a large, undeveloped land parcel that could be leased from the City for profitable, high-end corporate hangar development, and so be willing to invest in road and utility main extensions from adjacent off-airport development.

Financial Feasibility

The west side parallel taxiway may not score high for federal funding until MRO/Cargo and west side GA development generates fairly high levels of aircraft activity. Funding passenger terminal expansion as it is needed will be feasible through PFCs and/or City funds, including possible revenue bonds. Most GA hangars were built with private funds on land leases from the Airport, and this might be the way to fund redevelopment. However, the City might lease large tracts for a developer to build hangars on, or might elect to fund hangar construction, possibly through revenue bonds paid off by rent.

Environmentally Responsible

New development and demolition, of course, impacts the environment. However, meeting the service area's aviation demand at Ogden-Hinckley means users will not be travelling farther to different airports

and using more energy for ground transportation and emitting more air pollution. New construction provides opportunities for sustainable design. Improvements to the stormwater drainage system, including oil/water separation at the new aircraft wash rack, can be made as the Airport grows.

Community Receptiveness

Airport users will appreciate improvements that reduce congestion and improve amenities. The well-paying jobs that the MRO development will accommodate are likely to be very welcome. On the other hand, residents of the mobile home park may not want to see undeveloped land adjacent to their homes converted to light industrial uses (MRO, air cargo, and GA). The community would likely welcome the joint-use fire station. Some members of the community may oppose some of the land acquisitions or aircraft activity growth.

Security of Operations

Existing security problems between GA aircraft/vehicular traffic and the SIDA at the terminal apron can more easily be resolved with Alternative B than with A. Kemp's through-the-fence operation, which could be a weak point for security, is eliminated with the acquisition of the Kemp FBO.

Promotes City's Vision for Ogden-Hinckley

By accommodating the projected growth of GA and airline passengers and by providing for future job-producing MRO activity, Alternative B is consistent with the City's vision for the Airport. Revenue will likely increase when the Airport operates the FBO. Some land is available for commercial development, which should also produce revenue. Upgrading and expanding developed areas as needed will provide revenue to help keep the Airport financially self-sustaining.

Planning Flexibility

Alternative B has considerably more land acquisition than Alternative A, and it is distributed around the Airport. This provides considerable flexibility for adjusting land uses if demand shifts from what is forecast or users need changes.

Engineering Feasibility

Alternative B presents no special design, construction, or other technical issues with projects.

Alternative C

Accommodates Growth

Alternative C accommodates growth beyond the 20-year planning period, particularly for the passenger terminal. The terminal area could handle passenger levels reached if Ogden-Hinckley captures from Salt Lake City International most of the airline demand that the Ogden area generates. In addition, the placement of the landside portion of the terminal next to the FrontRunner tracks provides intermodal passenger transportation. The area available for future MRO/Cargo development area is generous and comparable to Alternative B, but it is more evenly divided between the east and west sides. Alternative C also accommodates a considerable amount of commercial growth on the airport.

Enhances Safety and Efficiency of Operations

Alternative C fixes an existing nonstandard condition and provides an FAA-compliant object free area at the north end of Runway 3-21. Unfortunately, this reduces the useable runway length. Removal of the deactivated runway's pavement enhances safety by preventing accidental use as a runway. Instrument approach improvement (lowering visibility minimums to 1/2-mile) enhances safety and reduces the time the airport is closed to aircraft operations due to poor weather. The runway extension, which provides balanced takeoff run for both northbound and southbound departures, increases flexibility for air traffic to use different runways in varied wind conditions.

Through redevelopment of the existing south GA area and designation of separate aprons for helicopter parking, the alternative improves safety and efficiency for GA. The west side development of FBO and fuel services reduces airfield crossings to and from the east side for these services. Vehicular traffic flow at the east airport entrance road is improved as in Alternative B. Vehicular traffic associated with the terminal is no longer routed through existing GA and MRO areas; a new Airport entrance from Hinckley Drive to the landside terminal can be designed for safety and efficiency and in a manner typical at commercial service airports. The ARFF expansion enhances safety, and joint use with a community fire station provides efficient staffing. While response time would still meet FAA requirements, the new ARFF site will likely increase response time to the south end of the airfield, compared to the existing location.

Airport User/Customer Satisfaction

Improvements to GA and terminal areas should be welcomed by users. The improvement in flight frequency and destinations that might be handled at the new terminal would be welcomed by many airline customers. The co-location of airline passenger, FrontRunner, and urban air mobility stations would enhance convenience for some customers. The cost of terminal construction may necessitate raising airline fees, which could increase airline ticket prices. PFCs, which will likely be necessary, may also raise airline ticket prices, although in some cases the passenger would already be paying the PFC to

another airport and would not see a ticket price increase. Some GA users may oppose fee increases needed to recover the cost of GA improvements.

Phasing Impacts

Constructing a new terminal allows the existing terminal to operate unhampered during construction. However, compared to other alternatives, the separation of landside and airside portions of the terminal connected by a tunnel under Hinckley Drive does not make phasing easy—physically or financially. Southward expansion of MRO and Corporate GA from Borsight will eliminate many hangars and hasten the need to develop hangars on the west side. Removal of airport maintenance equipment from the GA area into a facility at the north end of the Airport will provide some room for hangar expansion, as will the relocation of Airport Road to parallel the Union Pacific Railroad and the relocation of the passenger terminal building/apron/parking. Construction of a corporate GA hangar area west of the airfield would likely require some of the MRO development on the west side to occur, in order to provide infrastructure on that side. On the other hand, a developer might see this area as a large, undeveloped land parcel that could be leased from the City for profitable hangar development; such as developer might be willing to invest in road and utility main extensions from adjacent off-airport development.

Financial Feasibility

Funding passenger terminal expansion to match passenger growth will be difficult due to the need to invest in a tunnel connecting separate landside and airside terminals. Possibly the new terminal could be initially built with co-located landside and airside portions and construction of the tunnel and separate landside terminal could be delayed until it is more financially feasible. The new terminal(s) would likely be funded with PFCs and revenue bonds. Obtaining a favorable rating for bond issuance requires strong justification for the passenger forecast. Ogden might succeed at obtaining more innovative financing using other private or governmental funds.

The west side parallel taxiway may not score high for federal funding until the terminal is built, or MRO/Cargo and west side GA development generates fairly high levels of aircraft activity.

Most GA hangars were built with private funds on land leases from the Airport, and this might be the way to fund redevelopment. However, the City might lease large tracts for a developer to build hangars on, or might elect to fund hangar construction, possibly through revenue bonds paid off by rent.

Revenue from increased commercial activity on airport land will help financial feasibility. On the other hand, Alternative C includes the acquisition of many homes and businesses in the mobile home park and south of the main runway; FAA funding or reimbursement of funding for these acquisitions would be difficult to obtain and the acquisition would require justification for noise or safety mitigation.

Environmentally Responsible

New development and demolition, of course, impacts the environment. However, meeting the service area's aviation demand at Ogden-Hinckley means users will not be travelling farther to different airports and so using more energy for ground transportation and emitting more air pollution. The possibility of capturing all or nearly all the passenger demand generated in the Ogden area increases the regional significant of ground transportation energy saving. The intermodal connections with the FrontRunner could also save ground transportation energy. New construction provides opportunities for sustainable design. Improvements to the stormwater drainage system, including oil/water separation at the new aircraft wash rack, can be made as the Airport grows.

Community Receptiveness

Airport users will appreciate improvements that reduce congestion and improve amenities. The community would likely welcome the joint-use fire station. The well-paying jobs that the MRO development will accommodate are likely to be very welcome. On the other hand, some residents and business owners in acquired land will probably object to being relocated. Some members of the community may oppose undeveloped land acquisitions also. In addition, airport neighbors might object to aircraft activity and vehicular traffic growth. On the other hand, the prospect of not having to drive to Salt Lake City International and the convenience of the FrontRunner/airline terminal co-location might be very popular within the community.

Security of Operations

Alternative C improves airline terminal security because the greenfield site allows optimal design for security. Kemp's through-the-fence operation, which could be a weak point for security, may continue.

Promotes City's Vision for Ogden-Hinckley

By accommodating the projected growth of GA and airline passengers and by providing for future job-producing MRO activity, Alternative C is consistent with the City's vision for the Airport. The bold changes from the existing situation provide opportunities for and challenges to revenue generation for the Airport.

Planning Flexibility

Alternative C has more land acquisition than Alternatives A and B, and land acquisition is distributed around the Airport. This provides considerable flexibility for adjusting land uses if demand shifts from what is forecast or users need changes.

Engineering Feasibility

The construction of a tunnel under Hinckley Drive is an engineering challenge not included with the other alternatives, but it is not technically insurmountable.

Alternative D

Accommodates Growth

With the largest amount of land acquisition and increased utilization of existing property, Alternative D accommodates the most growth of the five alternatives. Growth beyond the 20-year planning period can be accommodated for GA, the passenger terminal, and MRO/Cargo. In addition, a large amount of land is available for airport-compatible commercial growth.

Enhances Safety and Efficiency of Operations

Closing Runway 17-35 eliminates the safety concerns associated with intersecting runways. On the other hand, it slightly reduces the airfield's capacity for aircraft operations. While only one runway can be used at a time, having two runways provides more taxiways where landing aircraft can exit quickly, and touch-and-go activity is easier to mesh with other takeoffs and landings. The biggest disadvantage of closing Runway 17-35 is the reduction of crosswind coverage, which is a safety issue. Currently, crosswind coverage for the two runways exceeds 99% for all aircraft. With only Runway 3-21, crosswind coverage will drop to about 93% for the small aircraft that comprise most of the based fleet. Offsetting that concern is the 150-foot width of Runway 3-21, compared to small aircraft runways of 60- to 75-foot width.

Alternative D fixes an existing nonstandard condition and provides an FAA-compliant object free area at the north end of Runway 3-21. Unfortunately, this reduces the useable runway length slightly. The 1,000-foot runway extension, which provides balanced takeoff run for both northbound and southbound departures, increases flexibility for air traffic to use different runways in varied wind conditions. Removal of deactivated runway pavement enhances safety by preventing accidental use as a runway. Instrument approach improvement (lowering visibility minimums to 1/2-mile) enhances safety and reduces the time the airport is closed due to poor weather.

Through redevelopment of the existing south GA area and designation of separate aprons for helicopter parking, the alternative will improve safety and efficiency for GA. The west side development of a fuel farm reduces airfield crossings. Vehicular traffic flow at the east airport entrance road is improved as in Alternatives B and C. Vehicular traffic associated with the terminal is no longer routed through existing GA and MRO areas; a new Airport entrance from South 1900 West Street can be designed for safety and efficiency and in a manner typical at commercial service airports.

The addition of an I-15 interchange for West 4400 Street enhances efficiency for vehicular traffic flow.

The ARFF expansion enhances safety, and joint use with a community fire station provides efficient staffing. While response time would still meet FAA requirements, the new ARFF site will likely increase response time to the south end of the airfield, compared to the existing location.

Airport User/Customer Satisfaction

Improvements to GA and terminal areas should be welcomed by users. The improvement in flight frequency and destinations that might be handled at the new terminal would be welcomed by many airline customers. The cost of terminal construction may necessitate raising airline fees, which could increase airline ticket prices. PFCs, which will likely be necessary, may also raise airline ticket prices, although in some cases the passenger would already be paying the PFC to another airport and would not see a ticket price increase. Many GA users would oppose the closure of Runway 17-35 and some may oppose fee increases needed to recover the cost of GA improvements.

Phasing Impacts

Constructing a new terminal allows the existing terminal to operate unhampered during construction. Southward expansion of MRO from Borsight will eliminate many hangars, but the closure of Runway 17-35, the relocation of the passenger terminal, and the relocation of Airport Road to parallel the Union Pacific Railroad provides ample room to construct replacement hangars and expand hangar capacity.

Financial Feasibility

Funding passenger terminal expansion to match passenger growth will be difficult, although not as difficult as Alternative C. The lack of infrastructure on the west side will require a large initial investment. The new terminal would likely be funded with PFCs and revenue bonds. Obtaining a favorable rating for bond issuance requires strong justification for the passenger forecast. Ogden might succeed at obtaining more innovative financing using other private or governmental funds.

Most GA hangars were built with private funds on land leases from the Airport, and this might be the way to fund redevelopment. However, the City might lease large tracts for a developer to build hangars on, or might elect to fund hangar construction, possibly through revenue bonds paid off by rent. Revenue from increased commercial activity on airport land will help financial feasibility. On the other hand, Alternative D includes the acquisition of many homes and businesses in the mobile home park and south of the main runway; FAA funding or reimbursement of funding for these acquisitions would be difficult to obtain and the acquisition would require justification for noise or safety mitigation.

The west side parallel taxiway may not score high for federal funding until the terminal is built, or until MRO/Cargo and west side GA development generates fairly high levels of aircraft activity.

Environmentally Responsible

New development and demolition, of course, impacts the environment. However, meeting the service area's aviation demand at Ogden-Hinckley means users will not be travelling farther to different airports and using more energy for ground transportation and emitting more air pollution. The possibility of capturing all or nearly all the passenger demand generated in the Ogden area increases the regional impact of energy saving. New construction provides opportunities for sustainable design. Improvements to the stormwater drainage system, including oil/water separation at the new aircraft wash rack, can be made as the Airport grows.

Community Receptiveness

Airport users will appreciate improvements will reduce congestion and increase amenities. The community would likely welcome the joint-use fire station. The well-paying jobs that the MRO development will accommodate are likely to be very welcome. On the other hand, some residents and business owners in acquired land will probably object to being relocated. Some members of the community may oppose undeveloped land acquisitions also. In addition, airport neighbors might object to the aircraft activity and vehicular traffic growth. On the other hand, the prospect of not having to drive to Salt Lake City International might be very popular within the community.

Security of Operations

Alternative D improves airline terminal security because the greenfield site allows optimal design for security. Kemp's through-the-fence operation, which could be a weak point for security, is eliminated with the acquisition of the Kemp FBO.

Promotes City's Vision for Ogden-Hinckley

By accommodating the projected growth of GA and airline passengers and by providing for future job-producing MRO activity, Alternative D is consistent with the City's vision for the Airport. The bold changes from the existing situation provide opportunities for and challenges to revenue generation for the Airport.

Planning Flexibility

Alternative D has ample land acquisition and the amount of land designated for each use is ample. These attributes provide considerable flexibility for adjusting land uses if demand shifts from what is forecast or users need changes. The generous amount of land designated for urban air mobility allows maximum flexibility to accommodate this future form of transportation with support facilities and intermodal transfers that may be needed.

Engineering Feasibility

Alternative D presents no special design, construction, or other technical issues with airport projects. Establishing a new interchange on I-15 will present funding, phasing, and technical challenges.

Alternative E

Accommodates Growth

With the large amount of land acquisition, Alternative E accommodates plenty of growth. Growth beyond the 20-year planning period is possible for the passenger terminal, MRO/Cargo, and commercial activity. However, Alternative E provides minimal room for GA expansion beyond the 20-year forecast.

Enhances Safety and Efficiency of Operations

Alternative E fixes an existing nonstandard condition and provides an FAA-compliant object free area at the north end of Runway 3-21. Unfortunately, this reduces the useable runway length. The runway extension, which provides balanced takeoff run for both northbound and southbound departures, increases flexibility for air traffic to use different runways in varied wind conditions. Removal of the deactivated runway's pavement enhances safety by preventing accidental use as a runway. Instrument approach improvement (lowering visibility minimums to 1/2-mile) enhances safety and reduces the time the Airport is closed due to poor weather

Conversion of the existing passenger terminal into an FBO facility places FBO services in a more convenient, central location. Through redevelopment of the existing south GA area and designation of a separate apron for helicopter parking, the alternative improves safety and efficiency for GA. Vehicular traffic flow at the east airport entrance road is improved as in Alternatives B, C, and D. Vehicular traffic associated with the terminal is no longer routed through existing GA and MRO areas; a new Airport entrance from South 1900 West Street can be designed for safety and efficiency and in a manner typical at commercial service airports. The ARFF expansion enhances safety, and joint use with a community fire station provides efficient staffing. While response time would still meet FAA requirements, the new ARFF site will likely increase response time to the south end of the airfield, compared to the existing location.

Airport User/Customer Satisfaction

Improvements to GA and terminal areas should be welcomed by users. The improvement in flight frequency and destinations that might be handled at the new terminal would be welcomed by many airline customers. The cost of terminal construction may necessitate raising airline fees, which could increase airline ticket prices. PFCs, which will likely be necessary, may also raise airline ticket prices, although in some cases the passenger would already be paying the PFC to another airport and would not

see a ticket price increase. Some GA users may oppose fee increases needed to recover the cost of GA improvements.

Phasing Impacts

Constructing a new terminal allows the existing terminal to operate unhampered during construction. GA hangar redevelopment will require careful phasing to keep enough hangar capacity available and taxilanes open. Expansion into existing terminal auto parking and land acquired to relocate Airport Road to parallel the Union Pacific Railroad will help.

Financial Feasibility

Funding passenger terminal expansion to match passenger growth will face the same difficulties as Alternative C, because the lack of infrastructure on the west side will require a large initial investment. The new terminal would likely be funded with PFCs and revenue bonds. Obtaining a favorable rating for bond issuance requires strong justification for the passenger forecast. Ogden might succeed at obtaining more innovative financing using other private or governmental funds.

Most GA hangars were built with private funds on land leases from the Airport, and this might be the way to fund redevelopment. However, the City might lease large tracts for a developer to build hangars on, or might elect to fund hangar construction, possibly through revenue bonds paid off by rent.

Revenue from increased commercial activity on Airport land will help financial feasibility. On the other hand, Alternative E includes the acquisition of many homes and businesses in the mobile home park and south of the main runway; FAA funding or reimbursement of funding for these acquisitions would be difficult to obtain and the acquisition would require justification for noise or safety mitigation.

The west side parallel taxiway may not score high for federal funding until the terminal is built, or until MRO/Cargo development generates fairly high levels of aircraft activity.

Environmentally Responsible

New development and demolition, of course, impacts the environment. However, meeting the service area's aviation demand at Ogden-Hinckley means users will not be travelling farther to different airports, using more energy for ground transportation and emitting more air pollution. The possibility of capturing all or nearly all the passenger demand generated in the Ogden area increases the regional impact of energy saving. New construction provides opportunities for sustainable design. Improvements to the stormwater drainage system, including oil/water separation at the new aircraft wash rack, can be made as the Airport grows.

Community Receptiveness

Airport users will appreciate improvements that reduce congestion and increase amenities. The community would likely welcome the joint-use fire station. The well-paying jobs that the MRO development will accommodate are likely to be very welcome. On the other hand, some residents and business owners in acquired land will probably object to being relocated. Some members of the community may oppose undeveloped land acquisitions also. In addition, airport neighbors might object to the aircraft activity and vehicular traffic growth. On the other hand, the prospect of not having to drive to Salt Lake City International might be very popular within the community.

Security of Operations

Alternative E improves airline terminal security because the greenfield site allows optimal design for security. Through-the-fence operations, which can be a weak point for security, may continue at Kemp's FBO.

Promotes City's Vision for Ogden-Hinckley

By accommodating the projected growth of GA and airline passengers and by providing for future job-producing MRO activity, Alternative E is consistent with the City's vision for the Airport. The bold changes from the existing situation provide opportunities for and challenges to revenue generation for the Airport.

Planning Flexibility

Alternative E has ample land acquisition, which provides considerable flexibility for adjusting land uses if demand shifts from what is forecast or users need changes.

Engineering Feasibility

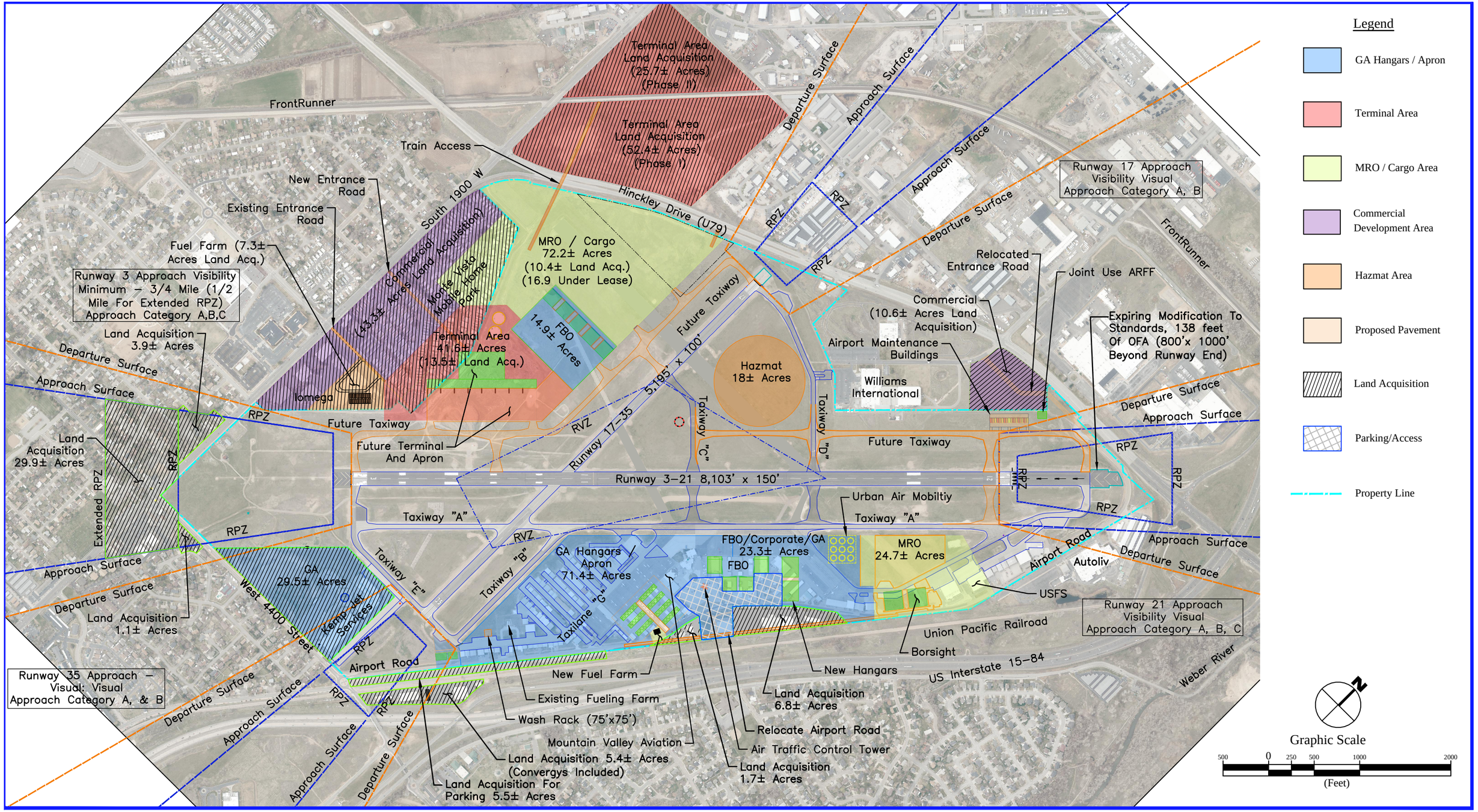
Alternative E presents no special design, construction, or other technical issues with projects.

PREFERRED ALTERNATIVE

In August 2019, two meetings were held to present, discuss and comparatively evaluate the various development alternatives so the most favorable features among the alternatives could be identified and the least favorable features could be eliminated. The first meeting was held for the PAC followed by a second meeting held for the public, which was an information workshop in an open house format. Development alternatives were displayed around the room with OGD staff and the consultant team available to address questions and obtain feedback.

Following the two meetings, the PAC and public were invited to continue their review of the development alternatives and provide any additional comments. Upon receipt of all comments, communication continued among airport management and the consultant team so the most favorable features could be incorporated into a "preferred alternative" exhibit and narrative. Subsequent review and discussion helped refine the "preferred alternative."

The resulting Preferred Alternative (**Figure 4-7**) responds to comments received and shows some additional details not shown on Alternatives A through E. **Table 4B** identifies the key features of the preferred alternative and the reason each feature has been selected from the alternatives considered. Following the table is a more detailed description of the preferred alternative.



Ogden - Hinckley Airport

Preferred Development Alternative

OGDEN AIRPORT
FLYOGDEN.COM

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-3802
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

A.I.P. Project No: 3-49-0024-047-2018

Project No: ODG1495
Date: December 2019

Sheet:
Figure 4-7
Preferred Development Alternative

Table 4B. Preferred Alternative Features and Reasons for Selection

FEATURE	REASON
AIRFIELD	
Retain both runways	Safety, because better crosswind coverage with two runways than one
Keep existing runway pavement length (no 1,000-foot extension to the south on the main runway)	Runway extension not supported by FAA due to policy regarding improvements with declared distances
Maintain current ¾-mile approach visibility minimums for planning period but protect for long-term ½-mile.	Prudent planning for possible long-term needs
Fix nonstandard object free area at north end of main runway	Meet mandatory FAA design standard for safety
Add partial parallel taxiway on west side of main runway's north end	Enhance safety and efficiency by providing better aircraft access from the west side
Keep control tower at current location	Provide good visibility of whole aircraft operating area
LAND ACQUISITION	
Acquire all land parcels indicated on alternatives	Extend airport's capacity, useful life, and flexibility to respond to future needs
GENERAL AVIATION	
Redevelop existing hangars as needed	Improve building condition and provide a more efficient and rational layout of hangars (some hangar locations were dictated by a now removed runway)
Expand east side GA with land acquisitions and relocation of passenger terminal to west side	Meet and exceed 20-year demand forecast
Establish centralized FBO on east and west sides of airfield	Enhance customer service and efficiency
Develop wash rack	Customer service
Develop helicopter parking at north end of GA	Accommodate demand and enhance safety by decreasing opportunity for rotorwash damage to small fixed wing aircraft
PASSENGER TERMINAL	
Move terminal to west side and designate much more land for future expansion of apron, building, vehicle parking	Meet long-term demand and provide community with customer service and economic development opportunities
Reserve acquired land west of Hinckley Drive for terminal area functions	Accommodate near-term needs such as remote parking and retain long-term possibility of developing separate landside terminal and rail station
Develop new road entrances from South 1900 West (initially extending existing road next to Iomega, later building new road after mobile home park acquisition)	Meet road demand in a safe, efficient way appropriate for airport traffic. (If landside terminal built west of Hinckley Drive, main road entrance to terminal would be built from Hinckley.)

MRO/CARGO AREA	
Accommodate Borsight expansion on east side	Capture opportunity for economic development (good jobs)
Reserve considerable land on west side for MRO/cargo development	Capture opportunity for economic development (good jobs) and future air cargo service
OTHER	
Aircraft Rescue/Fire Fighting (ARFF) in joint use building near new north airport entrance	Efficiently serve both airport and off-airport community fire protection needs. Removal of ARFF from existing passenger terminal building allows short-term terminal expansion
Maintenance equipment storage building on west side near new ARFF	Operational efficiency; removes this function from GA hangar area
Small fuel farm on east side with major, efficiently laid out fuel farm on west side	Safety, capacity, efficiency through capacity for very long-term future and better fuel truck access
Commercial development land reserved at airport entrances	Community service, economic development, airport revenue

Airfield

Runways 3-21 and 17-35 do not change in width or strength. For the 20-year planning period, the need to improve the best instrument approach at the Airport is not anticipated. The best approach now, to Runway 3, allows landing when visibility is as low as ¾ mile. However, Figure 4-7 shows 29.9 acres additional land acquisition south of the runway that would be needed to allow approach improvement to ½ mile visibility. The improvement in approach visibility minimums would decrease the amount of time airplanes cannot land, which is especially important for passenger and cargo airlines to keep their flight schedules.

A nonstandard runway object free area condition is corrected, which slightly reduces the useable length of Runway 3-21 by increasing the Runway 21 displaced threshold an additional 138 feet. A parallel taxiway system is developed on the west side of the two runways, to provide aircraft access from the currently undeveloped west side of the Airport. The deactivated runway's pavement is removed to prevent accidental use as a runway. The air traffic control tower remains where it is now located.

GA Hangars/Aprons

The preferred alternative includes the acquisition of the Kemp Jet Center (29.5 acres) and eventual conversion of the existing passenger terminal into a centrally located FBO. Area north of the existing passenger terminal is designated for larger conventional hangars and a new apron is designated for helicopter parking/urban air mobility. Area south of the existing passenger terminal is designated for smaller GA aircraft and includes a future aircraft wash rack. Over time, the existing GA area is expanded eastward when land acquisition allows the relocation of Airport Road farther east. Existing GA areas are

redeveloped for more efficiency over several years, beginning with the oldest hangars that are in the poorest condition.

When justified by activity growth, another FBO and GA hangar/apron area (14.9 acres) is established on the west side of the airfield.

Terminal Area

Eventually, as commercial passenger traffic grows, the existing terminal building, apron, and auto parking areas will be inadequate. A new passenger terminal is established on the west side of the airfield, with road access from South 1900 West. Figure 4-7 shows the footprint of an eight-gate terminal in the new area, to show how the building, apron, and access might be arranged. The figure also shows the route of an underground train between acquired property next to the Frontrunner west of Hinckley Drive and the new terminal gates, should the landside and airside portions of the terminal be separated, as Alternative C (Figure 4-4) proposed.

MRO/Cargo Area

Expansion area around Borsight on the east side of the airfield is reserved for future large aircraft MRO. On the west side, 72.2 acres is reserved for future development of large aircraft MRO and air cargo operators. Figure 4-7 indicates that some of this land is Airport-owned, some is under lease, and some is acquired from the existing mobile home park. A new road from Hinckley Drive will provide access to this area.

Relatively large quantities of hazardous materials may be required for future MRO. Consequently, a hazardous materials storage area with a 500-foot safety clearance around it is located between the north ends of Runways 3-21 and 17-35, but outside the runway visibility zone between the runways.

Other Features

The existing fuel farm at the south end of the GA hangar area is retained and supplemented with a more centrally located fuel farm near Airport Road, when hangar redevelopment frees space for this purpose. In the longer-term future, a large area is designated for a fuel farm on the west side of the airfield. This area has ample capacity to handle the needs of commercial passenger and cargo aircraft, as well as the west side FBO.

The preferred alternative includes a joint ARFF-City fire station and an airport maintenance building on the west side of the airfield, near a new north Airport entrance road. Moving the ARFF and airport maintenance equipment storage from their current locations frees up room for GA hangars to grow and for near-term passenger terminal expansion.

The new north Airport entrance road is an extension of Airport Road through property acquired from Williams International. This new road intersects with the Williams access road and uses the same intersection with Hinckley Drive as Williams.

Acquired land around this new entrance road is reserved for commercial development, as is a large amount of land along South 1900 West and adjacent to the future passenger terminal area. Airport-compatible commercial land uses include restaurants, hotels, offices, shops, and gas stations.

Land Acquisition

All the land acquisition shown in Alternatives A through E is included in the preferred alternative. In addition, undeveloped land on the west side of the Frontrunner tracks that is next to the acquisition land between Hinckley Drive and the Frontrunner is also acquired.

The planned land acquisition includes undeveloped land west of Hinckley Drive and north of Williams International. It also includes developed land south of Runway 3-21, the Monte Vista mobile home park, Iomega offices, and land east of Airport Road. The need for land acquisition is not imminent and, for the most part, land will be acquired over time as it becomes available for sale. Land acquisitions will provide for future growth and development flexibility, sustaining the Airport's useful life for many years. In addition, some of the land acquisitions will enhance safety and/or mitigate noise impact on residences and other noise-sensitive land uses.

Summary

The careful consideration of development alternatives by various Airport stakeholders has resulted in guidance for the future development of the Airport. Following the City's selection of the Preferred Alternative, the Airport Capital Improvement Plan and the Airport Layout Plan were updated to reflect the Preferred Alternative. The Airport Capital Improvement Plan is presented in the next chapter, which prioritizes development and addresses funding for the improvements, followed by the Airport Layout Plan Chapter. The Airport Layout Plan is a detailed set of drawings that are subject to FAA-approval and used to determine eligibility for AIP funding.

Chapter 5

Implementation



CHAPTER 5 – IMPLEMENTATION

INTRODUCTION

The Implementation element of the master plan converts the preferred development alternative selected by the City (December 17, 2019) into an Airport Capital Improvement Plan (ACIP) for the Ogden-Hinckley Airport (OGD or the Airport). The ACIP, which typically focuses on the five-year future, is presented in the master plan for three development phases: short-term (through 2023), intermediate-term (2024-2028), and long-term (2029-2038). Specific projects are defined for each phase based on OGD's priority needs. Planning-level cost estimates are prepared, and funding sources are discussed to include a review of the City's anticipated local funding requirements. This provides the City with an early opportunity to budget for their share of costs and potentially shift development timeframes for some projects, so the implementation is financially feasible. Further, the availability of federal and other funding sources will influence timing. Changes in activity, user needs and opportunities can also influence projects and priorities in the ACIP. Consequently, the ACIP is updated routinely based on various influencing factors. An updated ACIP for the short-term is submitted to the Federal Aviation Administration (FAA) annually.

The proposed improvements in the ACIP are depicted on the Airport Layout Plan (ALP) set of drawings discussed in the next chapter. The ALP set is reviewed and approved by the City and then submitted to the FAA for review and approval, after which it becomes the guide for future development at the Airport in combination with the ACIP.

AIRPORT CAPITAL IMPROVEMENT PLAN (ACIP)

The FAA states that the ACIP is "…the primary financial planning tool for systematically identifying, prioritizing, and assigning funds to help meet the capital project needs of airports within the National Plan of Integrated Airport Systems."

The ACIP for OGD is presented by development phase. Projects are identified in ranking priority with cost estimates and a breakdown by possible funding source. A large portion of the capital funding for these projects is anticipated from the FAA Airport Improvement Program (AIP), which is currently at 90.63% of eligible project costs for Utah airports under current congressional authorization. The City is responsible for the local match of 9.37%.

The cost estimates presented will vary from actual costs as details regarding project design, site conditions, construction costs, timing, and inflation will influence actual costs over time. All costs estimates provided are in 2019 dollars.

It's important to reiterate that the timing of these ACIP projects may vary based on funding availability as well as actual aviation demand, which may exceed or fall below the forecasts presented in Chapter Two

for any given timeframe. For now, early project priorities and cost estimates are used by the FAA for planning and programming purposes. Funding is identified as federal, local match, local other and third party.

Short-Term

Short-term projects represent the Airport's highest priorities. As shown in **Table 5A**, a total of 16 projects are planned, requiring a capital investment estimated at $42.3 million. Six of these projects are eligible for FAA grant funding, which could reach $17.2 million, and would require local grant match dollars of nearly $1.8 million. While not guaranteed, the Airport will pursue the FAA funding support for these projects recognizing that some projects may need to be postponed until FAA funding is available or until the City can secure other funding. Projects proposed for the near future are driven by various reasons -- function, FAA requirements and design standards, aging facilities, growing and changing aviation demand, and the need for new supporting infrastructure.

Table 5A: Phase I, Short-Term ACIP Projects for OGD

#	Project Description	Federal (FAA AIP)	Local Match	Local Other	Third Party	Total
1	Consolidated Fuel Farm (East)			1,500,000		1,500,000
2	Wash Rack - Stand Alone			200,000		200,000
3	Entrance Road Relocation	1,359,450	140,550			1,500,000
4	SRE Buildings	1,586,025	163,975			1,750,000
5	Maintenance Buildings	1,586,025	163,975			1,750,000
6	Joint Use ARFF Station	1,812,600	187,400	2,000,000		4,000,000
7	Terminal Holding Area Expansion	906,300	93,700			1,000,000
8	Land Acquisition - North Tracts, Phase I, 53 Acres	9,969,300	1,030,700			11,000,000
9	GA Hangar Redevelopment (South Apron)			9,500,000		9,500,000
10	Taxiway K and Strengthen TW C Infield Portion			6,330,000		6,330,000
11	Improve 4000S to Airport Perimeter			230,000		230,000
12	Extend 4000S to MRO Sites			2,220,000		2,220,000
13	Water Line Extension (16-inch)			500,000		500,000
14	Water Storage Tank(s)			500,000		500,000
15	Sanitary Sewer Extension (8-Inch)			200,000		200,000
16	Power Line Extension (on-site)			125,000		125,000
	TOTAL Short-term	$17,219,700	$1,780,300	$23,305,000	$ -	$42,305,000

Source: Airport Development Group, Inc., and OGD Airport Management
Notes: Cost estimates, which are in 2019 dollars, are for preliminary high-level planning purposes only. Local match/local other funding is the responsibility of Ogden City, which may come from revenues, bonds, passenger facility charges (PFCs), loans, cash reserves, etc. All proposed land acquisition projects will require a fair market value appraisal for an accurate estimate.

Figure 5-1 depicts the projects for the short-term phase.

Intermediate-Term

Eight projects (**Table 5B**) estimated at $66.7 million are identified for the intermediate phase of development. Most costs (57%) are attributed to hangar redevelopment, which is ineligible for FAA funding. Consequently, many of the intermediate-term projects ($38 million) will require local and third-party funding.

Table 5B: Phase II, Intermediate-Term ACIP Projects for OGD

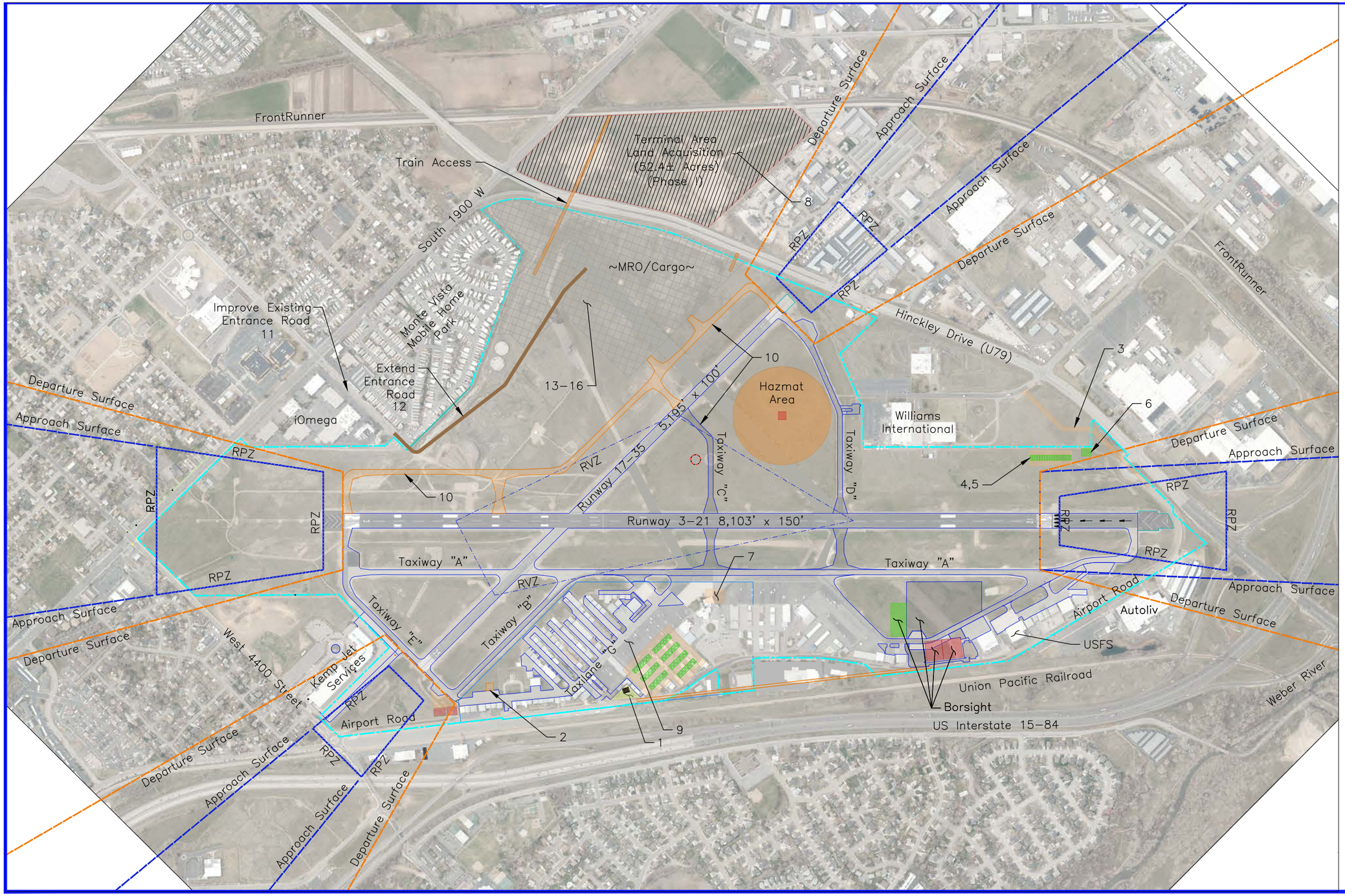
#	Project Description	Federal (FAA AIP)	Local Match	Local Other	Third Party	Total
17	Land Acquisition - North Tracts, Phase II, 26 Acres	5,437,800	562,200			6,000,000
18	GA Hangar Redevelopment (North Apron) (Phase I)			22,000,000		22,000,000
19	GA Hangar Redevelopment (North Apron) (Phase II)				16,000,000	16,000,000
20	North Apron Expansion (Helicopter Parking)	1,540,710	159,290			1,700,000
21	New Air Traffic Control Tower	2,000,000	206,775	4,793,225		7,000,000
22	Land Acquisition - Williams Tract, 11 Acres	4,531,500	468,500			5,000,000
23	Land Acquisition - Convergys & UPRR Tracts, 11 Acres	4,531,500	468,500			5,000,000
24	Land Acquisition – Airport Road Tracts, 9 Acres	3,625,200	374,800			4,000,000
	TOTAL Intermediate Term	$21,666,710	$2,240,065	$26,793,225	$16,000,000	$66,700,000

Source: Airport Development Group, Inc., and OGD Airport Management
Notes: Cost estimates, which are in 2019 dollars, are for preliminary high-level planning purposes only. Local match/local other funding is the responsibility of Ogden City, which may come from revenues, bonds, passenger facility charges (PFCs), loans, cash reserves, etc. All proposed land acquisition projects will require a fair market value appraisal for an accurate estimate.

Projects in the intermediate phase are illustrated in **Figure 5-2**.

Long-Term

Projects proposed at the end of the master planning period are included in the long-term phase of development, or 2029 through 2038. Like proposed development in earlier projects, some long-term projects may shift to later years, as necessary. Long-term projects total $345 million with an estimated $104.3 million eligible for FAA funding and $10.8 million required in local grant match dollars (**Table 5C**).



Legend

- Existing Building
- New Building
- Existing Pavement
- New Pavement
- Land Acquisition
- Aeronautical Development
- Property Line

Graphic Scale

500 0 250 500 1000 2000

(Feet)

Short-Term Improvements (2020- 2023)

Number	Recommended Improvements
1	Consolidated Fuel Farm (East)
2	Wash Rack – Stand Alone
3	Entrance Road Relocation
4	SRE Buildings
5	Maintenance Buildings
6	Joint Use ARFF
7	Terminal Holding Area Expansion
8	Land Acquisition (North Tracts, Phase I, 53 Acres)
9	GA Hangar Redevelopment (South Apron)
10	Taxiway "K" and Strengthen TW "C" Infield Portion
11	Improve 4000s to Airport Perimeter
12	Extend 4000s to MRO Sites
13	Water Line Extension (16–Inch)
14	Water Storage Tank(s)
15	Sanitary Sewer Extension (8–Inch)
16	Power Line Extension (On–Site)

Ogden - Hinckley Airport

Short - Term Improvements (2020 - 2023)

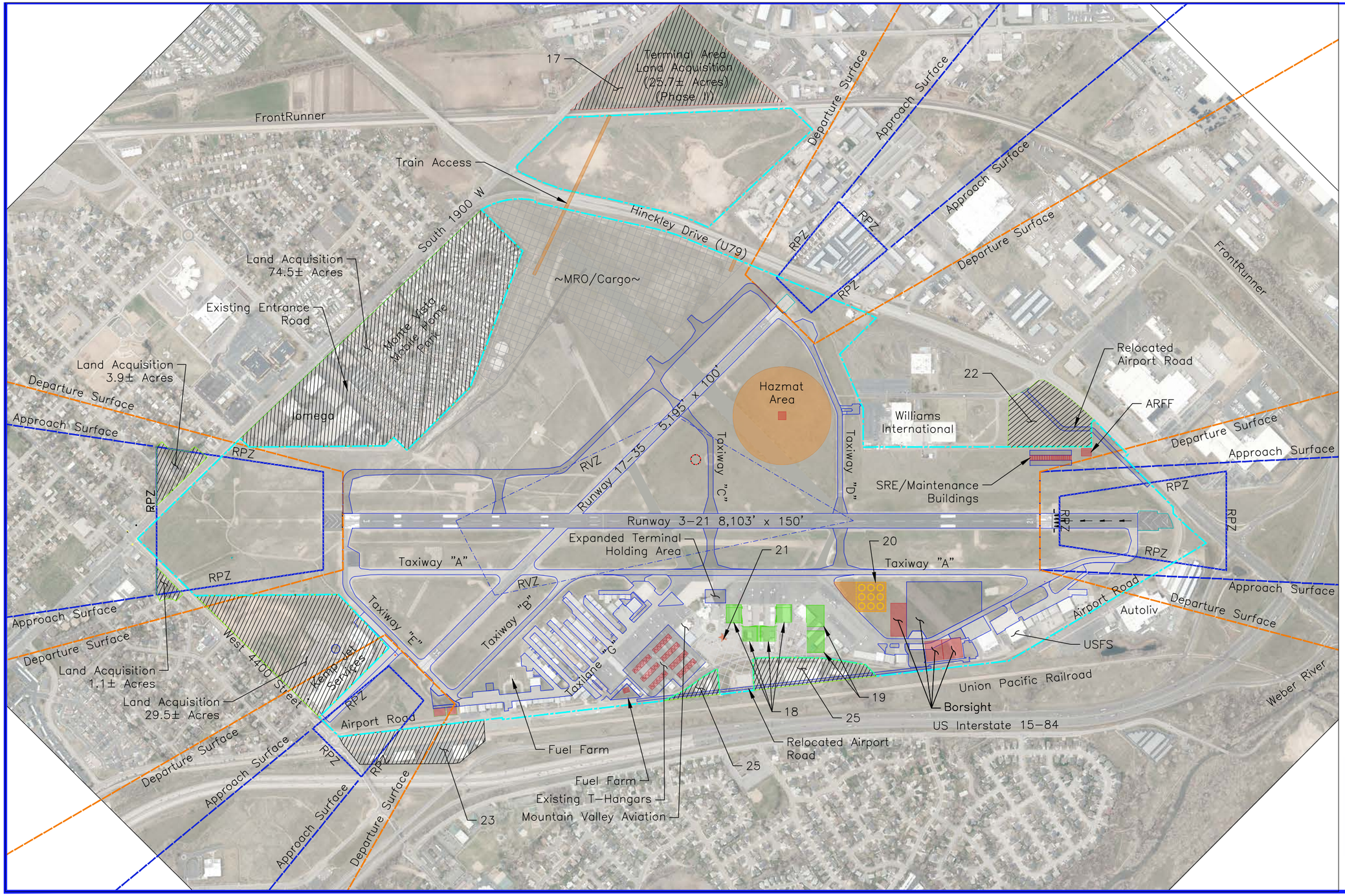
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www.ADGAirports.com

A.I.P. Project No: 3-49-0024-047-2018

Project No: ODG1495
Date: February 2020

Sheet: Figure 5-1 Short Term Improvements



Legend

- Existing Building
- New Building
- Existing Pavement
- New Pavement
- Land Acquisition
- Aeronautical Development
- Property Line

Graphic Scale

500 0 250 500 1000 2000

(Feet)

Intermediate -Term Improvements (2024- 2028)

Number	Recommended Improvements
17	Land Acquisition (North Tracts, Phase II, 26 Acres)
18	GA Hangar Redevelopment (North Apron) (Phase I)
19	GA Hangar Redevelopment (North Apron) (Phase II)
20	North Area Expansion (Helicopter Parking)
21	New Air Traffic Control Tower
22	Williams Tract, 11 Acres
23	Convergys and UPRR Tracts, 11 Acres
24	Airport Road Tracts, 9 Acres

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Intermediate - Term Improvements (2024 - 2028)

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A.I.P. Project No: 3-49-0024-047-2018

Project No: ODG1495
Date: February 2020

Sheet: Figure 5-2 Intermediate Term Improvements

Table 5C: Phase III, Long-Term ACIP Projects for OGD

#	Project Description	Federal (FAA AIP)	Local Match	Local Other	Third Party	Total
25	West Side MRO/FBO				175,000,000	175,000,000
26	Consolidated Fuel Farm (West)			7,000,000		7,000,000
27	New Commercial Terminal, Gates, Access & Parking	20,000,000	2,067,748	47,932,252		70,000,000
28	West TW for 3-21 (H)	10,875,600	1,124,400			12,000,000
29	Land Acquisition - RW 3 RPZ Tracts, Phase I, 5 acres	9,063,000	937,000			10,000,000
30	Land Acquisition – Monte Vista Trailer Court, 53 acres	13,594,500	1,405,500			15,000,000
31	Land Acquisition - Iomega Commercial Tracts, 15 acres	13,594,500	1,405,500			15,000,000
32	Land Acquisition - Kemp Jet Center Tracts, 30 acres	5,437,800	562,200			6,000,000
33	Land Acquisition - RW 3 RPZ Tracts, Phase II, 30 acres	31,720,500	3,279,500			35,000,000
	TOTAL Long-term	$104,285,900	$10,781,848	$54,932,252	$175,000,000	$345,000,000

Source: Airport Development Group, Inc., and OGD Airport Management
Notes: Cost estimates, which are in 2019 dollars, are for preliminary high-level planning purposes only. Local match/local other funding is the responsibility of Ogden City, which may come from revenues, bonds, passenger facility charges (PFCs), loans, cash reserves, etc. All proposed land acquisition projects will require a fair market value appraisal for an accurate estimate.

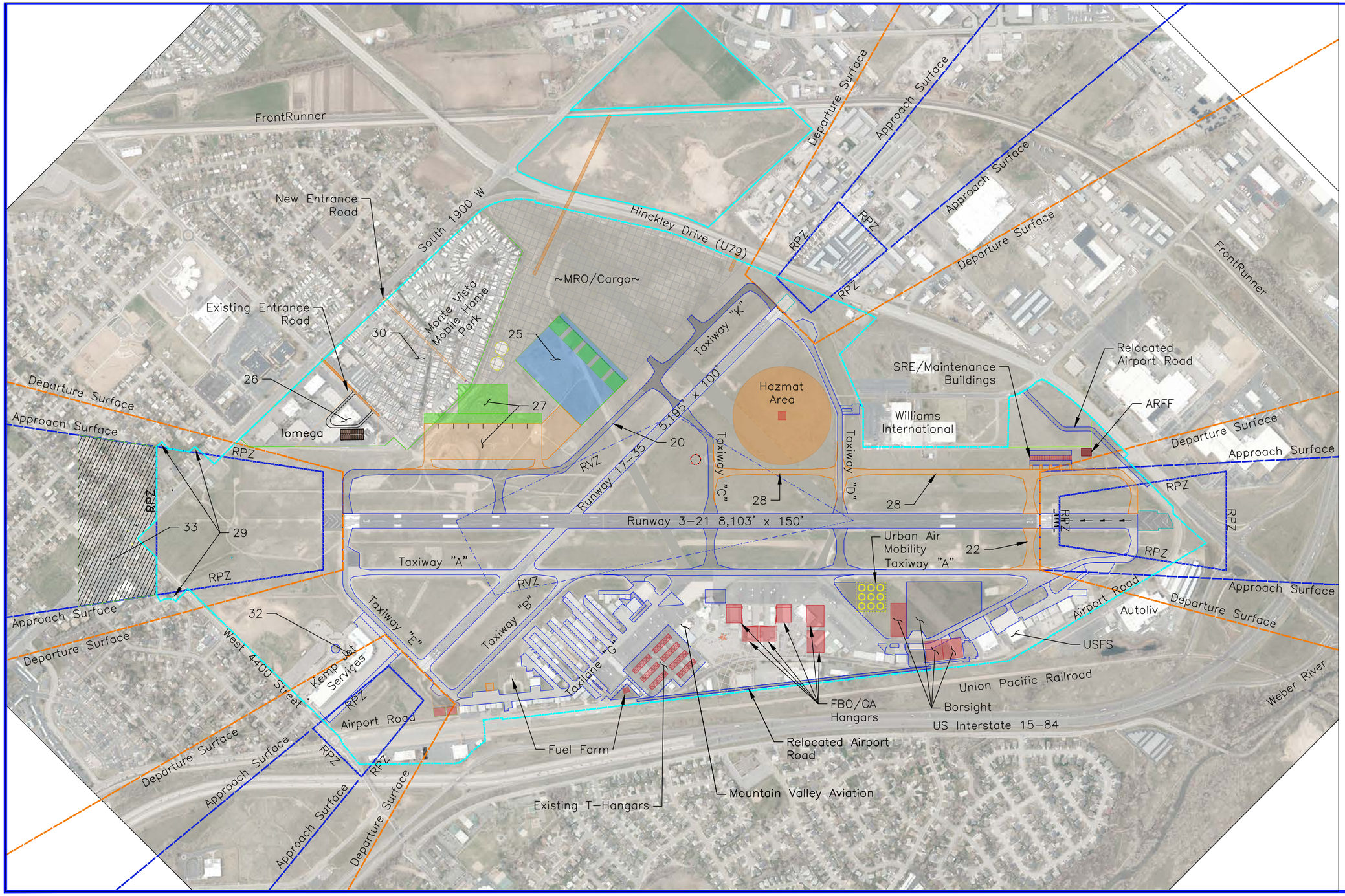
Long-term improvements are presented in **Figure 5-3.**

All Phases

The combined ACIP costs for all three phases of the planning period are presented in **Table 5D**. Considering the $454 million total by 2038, this translates to nearly $24 million annually in airport improvements, including land acquisition.

Table 5D: 20-Year Development Plan Costs for OGD

Project Description	Federal (FAA AIP)	Local Match	Local Other	Third Party	Total
Phase I Total Costs (thru 2023)	17,219,700	1,780,300	23,305,000	-	42,305,000
Phase II Total Costs (2024-2028)	21,666,710	2,240,065	26,793,225	16,000,000	66,700,000
Phase III Total Costs (2029-2038)	104,285,900	10,781,848	54,932,252	175,000,000	345,000,000
TOTAL for Planning Period	$ 143,172,310	$ 14,802,213	$ 105,030,477	$ 191,000,000	$ 454,005,000



Legend

- Existing Building
- New Building
- Existing Pavement
- New Pavement
- Land Acquisition
- Aeronautical Development
- Property Line

Graphic Scale

500 0 250 500 1000 2000

(Feet)

Long-Term Improvements (2029 - 2038)

Number	Recommended Improvements
25	West Side MRO/FBO
26	Consolidated Fueal Farm (West)
27	New Commercial Terminal, Gates, Access and Parking
28	West TW for 3-21 (H)
29	RW 3 Rpz Tracts, Phase I, 5 Acres
30	West Taxiway For 3-21 (H)
31	iOmega Commercial Tracts, 15 Acres
32	Kemp Jet Center Tracts, 30 Acres
33	RW 3 RPZ Tracts, Phase II, 30 Acres

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Long - Term Improvements (2029 - 2038)

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A.I.P. Project No: 3-49-0024-047-2018

Project No: ODG1495
Date: February 2020

Sheet: Figure 5-3 Long Term Improvements

FUNDING SOURCES

Various sources of funding support the capital improvement needs of OGD. In the past, these sources have included federal, state, city (local) and third-party, which are briefly discussed here. Presently, the City is working to secure legislative funding for proposed utility infrastructure improvements identified in Phase I of the ACIP. Legislative funding is an important option for high-dollar projects that are not eligible for FAA grants and/or cannot be supported by other funding options due to limited financial resources.

Federal

The federal column in Table 5A through 5C shows the portion of project costs that are eligible for Federal funding. Federal funding is typically provided to OGD through the FAA and the Airport Improvement Program (AIP), which was established under the Airport and Airway Improvement Act of 1982. Most of the OGD federal dollars received are identified by an AIP grant number. AIP funding is distributed through entitlements and discretionary grants.

Nonprimary airports receive an annual entitlement of $150,000, which is what OGD received before its commercial passenger service reached more than 10,000 annual enplanements. Airports with more than 10,000 annual enplanements are designated as a primary airport and their annual entitlement increases to $1 million, or higher based on a formula that considers total enplanements.

FAA-established national priorities guide the discretionary funding distribution process. The FAA distributes discretionary funds to projects that best carry out the purpose of the AIP, with highest priority given to safety, security, reconstruction, capacity and design standards.

Nationally, current AIP funding is more than $3.18 billion annually. Additional funding was identified for the AIP in 2019 as a supplemental appropriation of $500 million for discretionary grants; these funds are intended for smaller airports and nonhub primary airports like OGD. Eligibility and justification for this supplemental funding is considered in a manner similar to the typical AIP process.

Airports included in the National Plan of Integrated Airport Systems (NPIAS) are eligible for AIP funds. There are 3,321 existing airports in the current NPIAS among the more than 5,100 total public use airports in the nation. With so many airports eligible for AIP grants, the need for funding far exceeds availability of AIP funds. For Utah, AIP funding for projects in FY 2019 totaled nearly $57 million, which went to 41 projects for 21 airports statewide, including two projects at OGD.

Since 1982, OGD has received $37 million in AIP funding, or just over $1 million annually on average. In more recent years, since passenger airline service was initiated, OGD has averaged an estimated $1.8 million annually in AIP funding.

State

Utah Department of Transportation, Division of Aeronautics, manages a grant program for public use airports in Utah, many of which are in the NPIAS and receive FAA grants, too, like OGD. A large portion of the state funds are used to help match FAA grants.

According to Utah Aeronautics' records, OGD has received $2.34 million in state funding since 2010. However, the last state grant was issued in 2015, which is attributed to OGD being officially changed from a nonprimary to a primary airport in the NPIAS. State funding from the Aeronautics Division program is not anticipated in the future as OGD is projected to remain a primary airport that receives most of its funding from federal, local and third-party sources. However, state legislative funding support remains an option.

Local Match, Local Other and Third Party

The local match column refers to the City's required portion of a project funded by the FAA. The local other column represents the City's funding responsibility that is separate from its match for FAA-eligible project grants.

The City of Ogden, as the airport sponsor, is responsible for the local share of OGD improvements; this is typically 9.37% of the total project cost to match the FAA grant, which covers 90.63% of AIP-eligible projects. For those projects that are ineligible for FAA funding, the total project cost would fall to local funding as shown in the local other column. However, the City may also use third party financing for certain projects.

Hangar development, which is not eligible for AIP is a candidate project for third-party financing. Private investors, as part of their ground lease, agree to construct facilities if the lease provides adequate time to amortize their investment. Funding for MRO and air cargo facilities are other examples of third-party/private investment projects.

With the large funding requirements of the proposed development at OGD, the City may explore various tools to meet OGD's capital investment needs—additional aeronautical and nonaeronautical revenue-generating opportunities, debt financing, passenger facility charges[1] (PFCs), and third-party financing. This is necessary considering the Airport's revenues typically fall short of covering operating expenses – a common issue for many airports. Despite this financial scenario, OGD's substantial contribution to the economic vitality of the region makes it an important community asset.

[1] Passenger facility charges are collected as part of the ticket price. The PFC may be set at $1, $2, $3, $4 or $4.50. According to the FAA in January 2020, there are 200 nonhub airports collecting PFCs, which require that funds be used for projects that preserve or enhance the capacity, safety or security of the air transportation system; reduce noise or mitigate noise effects; or furnish opportunities for enhanced competition between or among air carriers. Revenue-producing projects are not eligible for the PFC program.

AIRPORT OPERATING REVENUES AND EXPENSES

This section reviews historical and projected airport operating revenues and expenses.

Historical Revenues and Expenses

Revenues

The Airport's various revenue streams are summarized in **Table 5E**. Historical data spanning 2013 to 2019 is included. Airport income is comprised of passenger airline aeronautical, non-passenger airline aeronautical, and non-aeronautical revenues.

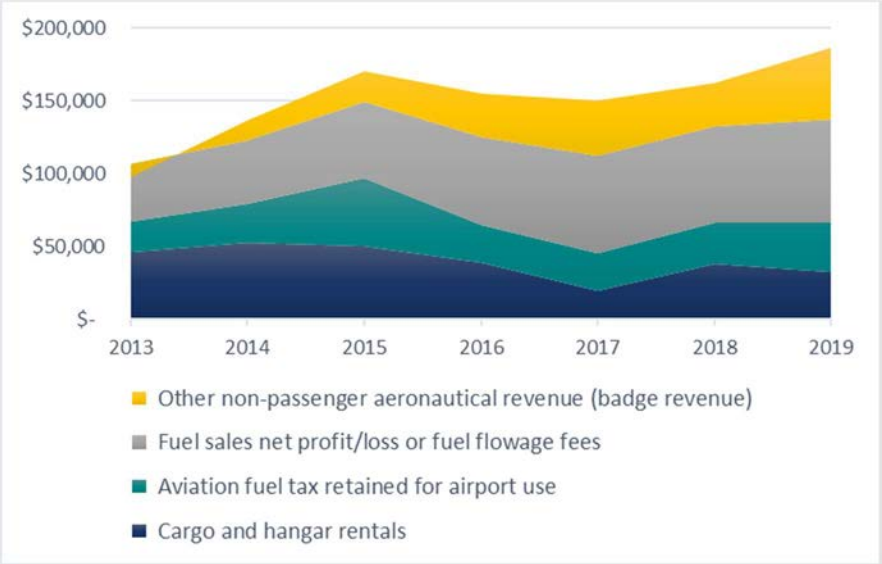
Table 5E: Historical Revenues for OGD

Revenue Source	2013	2014	2015	2016	2017	2018	2019
Passenger Airline Aeronautical Revenue							
▪ Passenger Airline Landing Fees	737	738	293	7,592	8,348	12,110	12,156
Non-Passenger Airline Aeronautical Revenue							
▪ Landing es from GA and Military	0	0	0	0	599	0	0
▪ Cargo and hangar rentals	46,146	52,233	49,798	38,697	19,852	38,246	32,560
▪ Aviation fuel tax retained for airport use	21,208	26,689	46,831	25,659	25,776	28,283	33,884
▪ Fuel sales net profit/loss or fuel flowage fees	39,105	44,138	52,599	61,180	66,793	66,194	70,442
▪ Other non-passenger aeronautical revenue (badge revenue)	(9,118)	13,358	21,381	29,199	37,330	29,113	49,290
Subtotal	97,341	136,418	170,609	154,735	150,350	161,836	186,176
Non- Aeronautical Revenue							
▪ Land and non-terminal facility leases and revenues	211,258	221,123	238,574	226,091	251,169	288,534	348,266
▪ Terminal-food and beverage	1,182	1,784	824	700	897	1,975	1,702
▪ Rental cars-excludes customer facility charges	21,037	16,854	17,980	17,169	2,220	391	5,529
▪ Parking and ground transportation	0	0	6,379	36,558	36,698	52128	40,859
▪ Other	18,039	18,469	28,350	24,634	26,927	47,714	28,097
Subtotal	251,516	258,230	292,107	305,152	317,911	390,742	424,453
TOTAL OPERATING REVENUE	$ 349,594	$ 395,385	$ 463,008	$ 467,479	$ 476,609	$ 564,688	$ 622,786

Passenger airline revenue is based on landing fees which have exceeded $12,000 the last two years. Non-passenger airline revenue includes fuel sales/flowage fees, which is the largest revenue generator, as well

as hangar rentals, aviation fuel tax retained for airport use and other non-passenger aeronautical revenue, namely SIDA[2] badge revenue. **Figure 5-4** illustrates the composition of these revenues from 2013 to 2019.

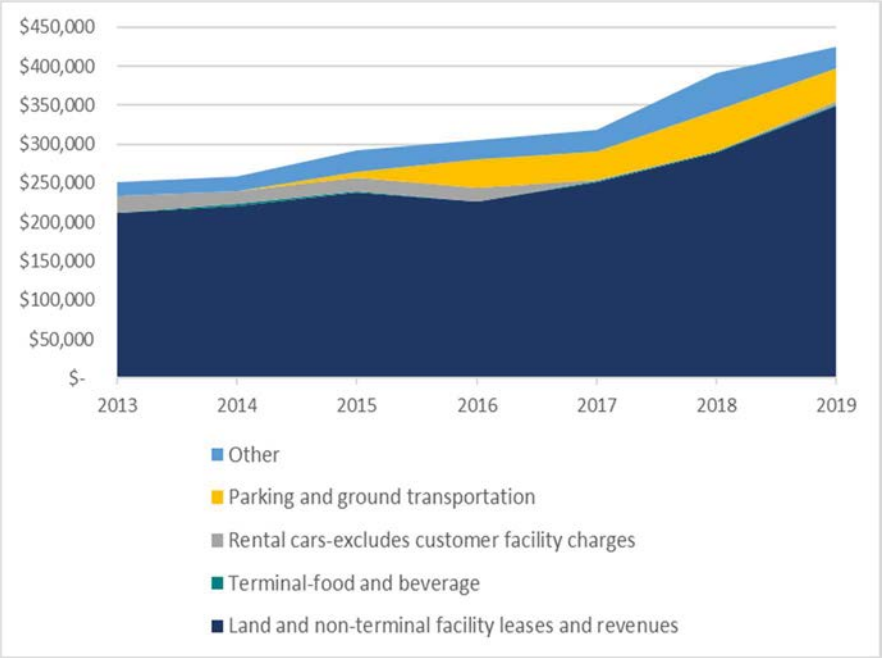
Figure 5-4. Non-Passenger Aeronautical Revenue



Non-aeronautical revenue includes land and non-terminal facility leases and revenues, terminal food and beverage, rental cars (excluding customer facility charges), parking and ground transportation and other non-aeronautical revenue sources. **Figure 5-5** illustrates the strong growth in non-aeronautical revenues since 2013 and the breakdown by source.

[2] Secure Identification Display Area

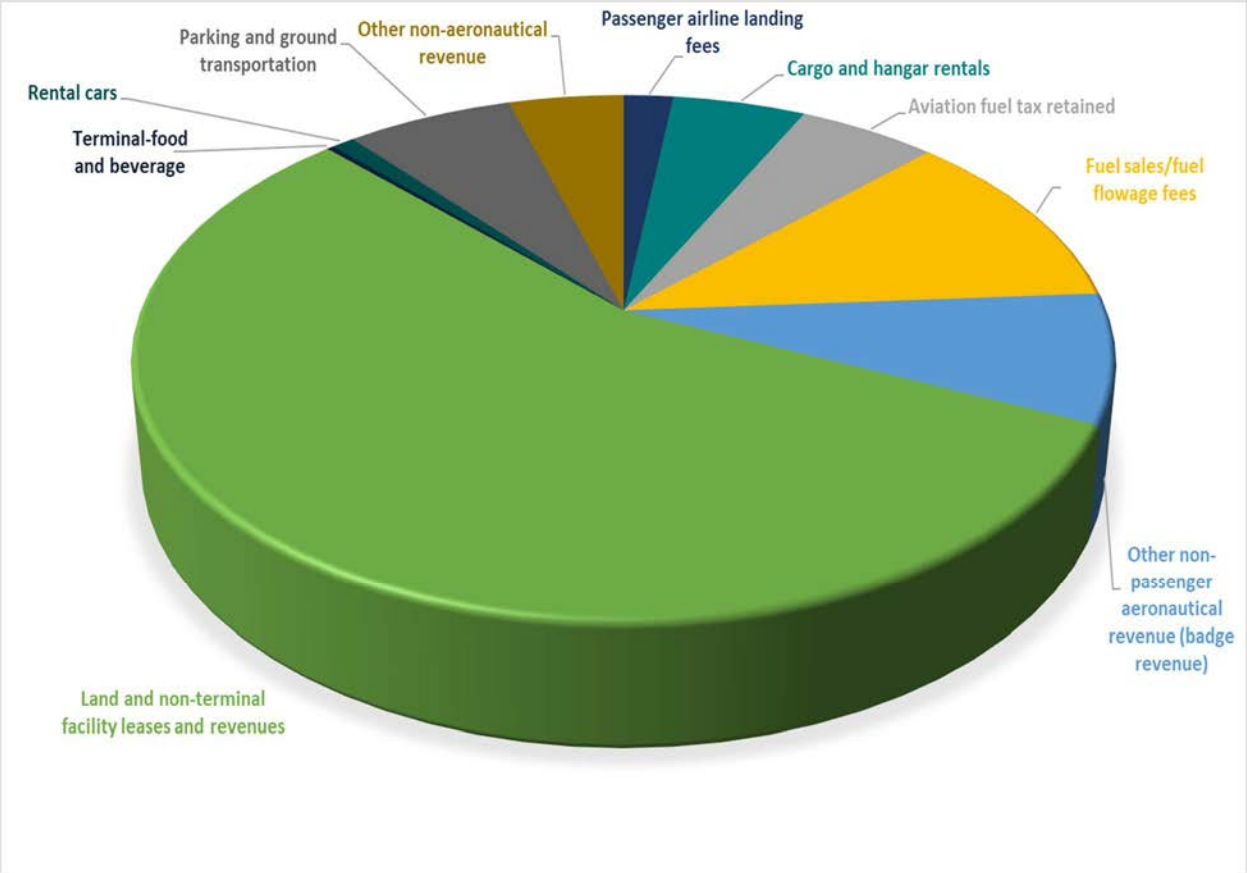
Figure 5-5. Non- Aeronautical Revenue



While revenues fluctuate year to year, land and non-terminal facility leases and revenues have been steadily increasing and have historically been the largest source of revenue representing 56% of the total as illustrated in **Figure 5-6**.

FAA grant funding is excluded from airport revenues since those dollars are committed to specific airport capital improvements. Further, those dollars vary substantially and are not guaranteed each year.

Figure 5.6. Airport Operating Revenues by Source for OGD in 2019



Source: Airport Management

Expenses

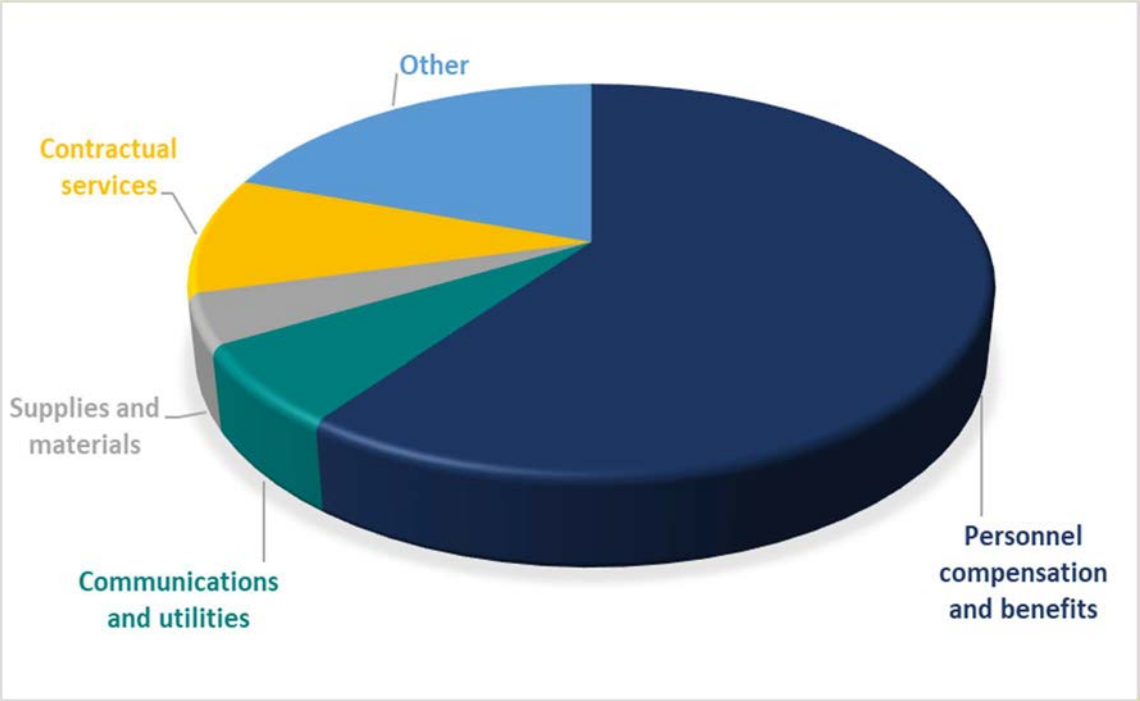
The Airport's expenses for 2013 through 2019 are summarized in **Table 5F**. In 2019, OGD personnel represented the majority of operating expenses comprising 60% of the total with supplies and material represented the smallest expense at 4% of the total. Depreciation is not included in these expense figures.

Figure 5-8 presents the proportionate breakdown of OGD operating expenses for the most recent year (2019).

Table 5F: Historical Expenses for OGD

Expenditure	2013	2014	2015	2016	2017	2018	2019
Personnel compensation and benefits	440,649	542,292	456,784	467,856	448,022	605,261	593,056
Communications and utilities	82,268	78,963	71,529	77,197	83,960	60,467	64,963
Supplies and materials	21,456	20,327	35,531	38,468	35,963	47,933	41,112
Contractual services	523,928	(284,847)	527,587	156,311	56,506	88,432	96,031
Other	279,492	277,045	212,266	187,430	232,933	218,168	192,220
TOTAL OPERATING EXPENSES	$1,347,793	$633,780	$1,303,697	$927,262	$857,384	$1,020,261	$987,382

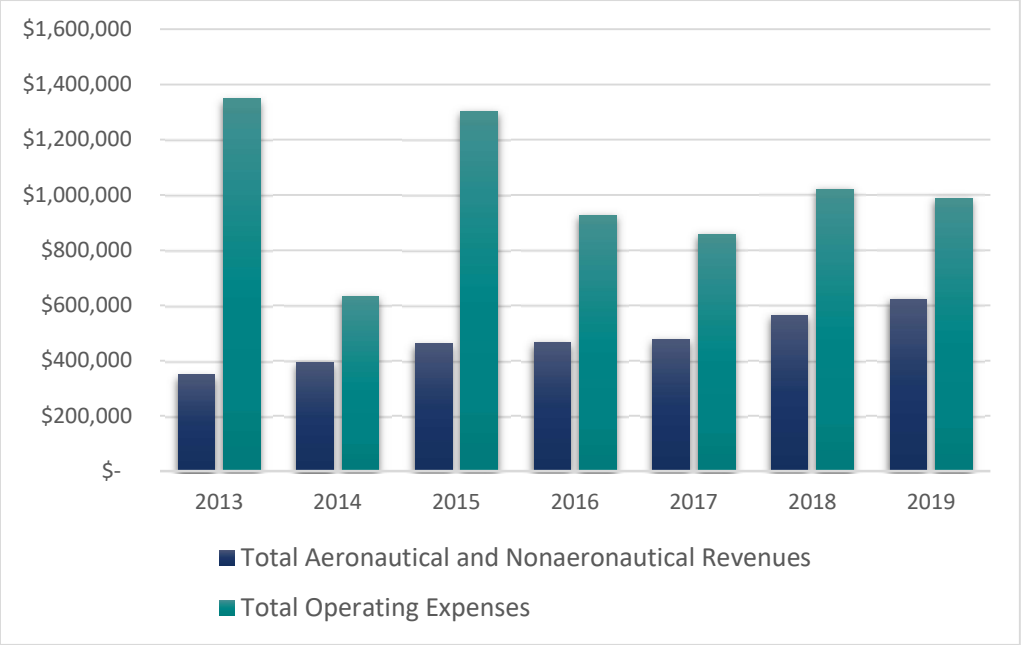
Figure 5-8. Airport Operating Expenses by Source for OGD in 2019



Comparison of Historical Revenues and Expenses

In **Figure 5-9**, the Airport's revenues and expenses for the last seven years are compared. This chart reveals the gaps between revenues and expenses have diminished in more recent years, as revenues have grown since 2013 and expenses declined. For 2019, revenues totaled 622,786 while expenses reached 987,382, meaning that revenues covered 63% of operating expenses.

Figure 5-9. Historical Revenues and Expenses (2013-2019) for OGD



Source: Airport management records

Although Ogden-Hinckley Airport is working towards financial self-sufficiency[3]—evident by a more rapid growth in revenues than expenses—it's important to point out the substantial positive economic impact OGD has on the community. As noted in Chapter One, Inventory, the Airport's economic output related to direct, indirect, and induced spending generated from OGD activity was estimated at more than $59 million in 2004 (latest available Economic Impact Study). This number is anticipated to be much higher in the updated Economic Impact Study for 2020, which is under way and nearing completion, according to Utah DOT Division of Aeronautics.

Projected Revenues and Expenses

Based on a set of growth assumptions, OGD revenues and expenses are projected to assess long-term cash flow so the feasibility of project timing may also be reviewed. For revenues, future growth is projected at an average annual rate of 2.2%. However, landing fees are projected to increase 50% in the near future and remain flat in alliance with the OGD forecasts, which projects the addition of one more weekly Allegiant flight for a total of three. While conservative, actual revenue growth for OGD could be more substantial as a result of airport management's ongoing business development efforts for OGD. Further, the City anticipates an increase in the OGD rates and fees structure sometime in 2020-2021, which could generate greater lease revenues from existing tenants while new OGD tenant development continues. Projected revenues and expenses for OGD are presented in **Table 5G.**

[3]Airport sponsors receiving federal funding are required to be as financially self-sustaining as possible in accordance with their grant assurances.

Table 5G: Projected Revenues and Expenses for OGD

	Phase I	Phase II	Phase III	Total
PROJECTED REVENUES				
Passenger Airline Aeronautical Revenue				
Passenger Airline Landing Fees	66,861	91,174	182,347	340,381
Subtotal	66,861	91,174	182,347	340,381
Non-Passenger Airline Aeronautical Revenue				
Cargo and hangar rentals	137,562	189,677	477,270	774,509
Aviation fuel tax retained for airport use	143,157	197,392	465,461	806,011
Fuel sales net profit/loss or fuel flowage fees	297,611	410,360	967,651	1,675,621
Other non-passenger aeronautical revenue (badge revenue)	208,245	287,138	677,088	1,172,471
Subtotal	$786,575	$1084,567	$2,587,470	$4,428,612
Non- Aeronautical Revenue				
Land and non-terminal facility leases and revenues	1,471,386	2,028,816	4,784,063	8,284,265
Terminal-food and beverage	7,191	9,915	23,380	40,486
Rental cars-excludes customer facility charges	23,361	32,211	75,956	131,529
Parking and ground transportation	172,624	238,022	561,269	971,914
Other Non-aeronautical Revenue	118,707	163,679	385,964	668,350
Subtotal	$1,793,269	$2,472,644	$5,830,632	$10,096,545
Total Revenues	$2,646,705	$3,648,385	$8,600,449	$14,865,538
PROJECTED EXPENSES				
Personnel compensation and benefits	2,438,182	3,201,665	6,953,475	12,593,322
Communications and utilities	267,076	350,708	761,678	1,379,462
Supplies and materials	169,020	221,947	482,031	872,998
Contractual services	394,804	518,431	1,125,945	2,039,179
Other	790,258	1,037,716	2,253,744	4,081,718
Total Expenses	$4,059,340	$5,330,466	$11,576,873	$20,966,679
Cash Flow by Phase	$(1,412,635)	$(1,682,082)	$(2,976,424)	$(6,101,141)
Average Annual Cash Flow	$(353,159)	$(336,416)	$(297,642)	$(321,113)

Note: Assumes 2.2% average annual growth in all revenue sources with exception of airline landing fees which anticipates 50% in near-term and then flat. Projected average annual increase in expenses is 1.1%.

The bottom line for OGD is that while operating revenues are projected to increase at a higher rate than operating expenses, the City may anticipate the continued financial contribution to the Airport's operating budget during the planning period at just over $321,000 annually, on average, excluding depreciation expenses. In addition to the annual operating funds needed, OGD will be required to provide the local funds for its portion of the ACIP presented earlier. Consequently, the large capital funding requirements of the ACIP suggest that the City will continue its efforts to obtain alternative sources of funding such as legislative funds.

OTHER RECOMMENDATIONS

In addition to the preparation of the ACIP and identification of funding sources, there are numerous post-study tasks to be accomplished to assure the successful implementation of the master plan. It's important to recognize that planning is a continuous process that does not end with completion and approval of the master plan.

The City has already taken steps in support of this effort with the formation of the Planning Advisory Committee (PAC) at the beginning of this study. The PAC brought varying perspectives and valuable knowledge to share so planning and development recommendations could be discussed and presented to the City. Communication with and engagement of the PAC members helped build relationships that will support the long-term success and development of OGD.

Additional action items that are routinely a part of the successful implementation of master plan include:

- Routinely review and verify ACIP project timing. Timing may require adjustment if anticipated demand occurs sooner or later than anticipated. Further, financial feasibility will play a role in timing due to grant funding availability and City budgetary constraints. Compliance with design standards for safety could also re-order project priorities.
- Maintain communication with Federal and State staff regarding the ACIP and any significant changes at OGD. Continue annual ACIP updates and submittals.
- Monitor emerging aviation issues and outside influences on airport development and funding.
- Maintain documentation on activity, changes, and issues at OGD to discuss with the City, Airport Advisory Committee, FAA and UDOT Division of Aeronautics, as appropriate, and for consideration in subsequent ALP updates and a future airport master plan update.
- Comply with grant assurances to ensure grant funding eligibility is not compromised.
- Continue to monitor activity such as airline passenger enplanements, aircraft operations, based aircraft and air cargo. Increased airline flights and aircraft fleet mix changes such as larger jets may impact facility needs. Increased airline flights and business activity may increase new tenant interest.
- Continue to recognize and reach out to all stakeholders--elected officials, current and prospective tenants, airlines, airport visitors (transient pilots/passengers), surrounding communities, and area planning staff (including multi-modal transportation planning).
- Recognize and consider new guidance on airport sustainability planning.

- Consider preparation of a Business Plan for OGD and continue pursuit of revenue-generating opportunities.
- Review and update, as appropriate, the Airport's rates and charges, minimum standards, and rules and regulations.

CHAPTER 6 – AIRPORT LAYOUT PLAN

INTRODUCTION

The Airport Layout Plan (ALP) set graphically presents the existing facilities and proposed development at the Ogden-Hinckley Airport (OGD or the Airport) for the 20-year planning period and beyond.

The ALP set is updated as part of the master plan study. The current ALP approved by the Federal Aviation Administration (FAA) will be replaced with the updated set once the FAA completes their review and approval process.

A reduced-size set of the ALP drawings will be included at the end of chapter. The Airport must maintain a current ALP to be eligible for federal funding.

The drawings are prepared using AutoCAD and may be imported into local geographic information systems (GIS) to support land use planning, airport overlay zone mapping, etc.

The ALP follows guidelines specified in FAA Advisory Circular 150/5300-13A, *Airport Design*. To assist with the FAA's review, a completed ALP checklist will be submitted. The ALP checklist is derived from the FAA Standard Operating Procedure (SOP) 2.00, dated October 1, 2013.

Color and various line types are used to convey much of the important technical and overlapping detail required on the ALP.

AIRPORT LAYOUT PLAN DRAWINGS SET

The ALP drawings set for OGD includes the Title Sheet and the following 18 sheets:

I. Airport Data Sheet
II. Airport Layout Plan Drawing
III. Airport Airspace Plan (Part 77)
IV. Runway 3 Inner Portion of Approach Surface Plan and Profile
V. Runway 3 Obstruction Tables
VI. Runway 21 Inner Portion of Approach Surface Plan and Profile
VII. Runway 17 Inner Portion of Approach Surface Plan and Profile
VIII. Runway 35 Inner Portion of Approach Surface Plan and Profile
IX. Runway 3-21 Departure Surface
X. Runway 35 Departure Surface
XI. Terminal Area Plan North End
XII. Terminal Area Plan South End
XIII. Terminal Area Plan Northwest End

XIV. Terminal Area Plan Data Tables
XV. Off-Airport Land Use Plan
XVI. On-Airport Land Use Plan
XVII. Airport Property Map (Exhibit "A“)
XVIII. Airport Property Map Tables

Title Sheet

The title sheet includes an index of the various drawings included specifically for OGD. A total of 18 drawings are listed in the index. In addition, OGD's title sheet includes the Airport Improvement Program (AIP) grant number from the FAA for the master plan study and an approval block for the City and FAA signatures. A sectional aeronautical chart, Utah airport system map, airport location map and OGD instrument approach minima table are also included on the title sheet.

Airport Data Sheet

The Airport Data Sheet comprises the technical details that are depicted on the drawings. Information such as the critical/design aircraft, mean maximum temperature of the hottest month, airport elevation, and airport navigational aids are included in the Airport Data Table. Runway Data Tables include details on the two runways such as: runway dimensions, runway end coordinates, pavement strength, and lighting. FAA design standards and the existing and future condition for protected surfaces such as runway safety areas and object free areas are included. Declared distances for Runway 3-21 are also presented along with a modification of design standards table, which will ultimately include FAA approval information, if applicable, for Runway 3 object free area and Runway 3-21 longitudinal gradient.

Results of the OGD wind analyses using 10 years of wind data are summarized in tables and depicted in wind roses. All-weather, VFR and IFR wind coverage is included.

Airport Layout Plan Drawing

The Airport Layout Plan (ALP) drawing is the most significant drawing in the set. The ALP drawing depicts existing and future facilities, both airside and landside, and is based on the City-selected preferred alternative from December 2019. The ALP is a physical illustration of the projects outlined in the Airport Capital Improvement Plan (ACIP) presented in Chapter Five, Implementation. The ALP is a living document and a valuable tool for the City to guide future development. Proposed improvements are only eligible for FAA funding if they are depicted on an approved ALP.

For OGD, the ALP drawing is color-coded to help distinguish between facilities and technical details. Highlights include the runways and surrounding protected surfaces, aircraft apron areas and tiedowns,

existing (red) and future (green) buildings, Key physical features in the airport environment are also shown to include five-foot contours depicting terrain elevation changes, the adjacent railroad tracks, major roads, and off-airport development.

Airport Airspace Plan (Part 77)

The protected airspace surrounding OGD is shown on the FAR Part 77 Airspace Plan drawing. The airspace plan drawing depicts the five "imaginary surfaces" defined by Part 77 including the primary, transitional, approach, horizontal and conical surfaces, previously discussed in Chapter One, Inventory. Characteristics of the Part 77 imaginary surfaces are defined by the aircraft size using the runway and the runway approach capabilities.

The AGIS survey identified airspace obstructions early in the study. Results of the AGIS survey have been incorporated into the airspace-related drawings of the ALP set. The airspace plan drawing includes an obstruction table with recommended disposition for obstructions. As shown, there are 13 obstructions called out with one to be relocated (flagpole), six to be topped/removed (trees), and the remaining six to remain with obstruction lighting.

Also depicted on the Airspace Plan is the traffic pattern for each runway. Standard left traffic patterns are used on Runways 3 and 35, but non-standard right traffic patterns are used on Runways 21 and 17 As a result traffic remains to the north and northwest.

A brief recap of the Part 77 surfaces discussed earlier in the report are described here.

Approach Surface

Each runway's approach surface begins 200 feet from the runway approach end and extends the distance required by its instrument approach visibility minimums and by whether the runway is for small or large aircraft (under or over 12,500 pounds maximum takeoff weight).

For Runway 3-21, the approach surface for begins 200 feet from the runway end, initially extends 10,000 feet out to the primary surface at a slope of 50:1, which represents the horizontal distance required (50 feet) for each increment of vertical rise (one foot). The approach continues at a 40:1 slope for an additional 40,000 feet. The approach to Runway 21 is a 20:1 slope ending at 10,000 feet. Regarding Runway 17-35, the approach surface on both runways extends 10,000 feet out to the primary surface at a slope of 20:1.

Primary Surface

Based on the circling approach to Runway 17-35, which serves large aircraft (greater than 12,500 lbs.), the primary surface is 500 feet wide and extends 200 feet beyond each end of the runway. The primary surface is centered on the runway at the same elevation as the nearest point on the runway centerline.

Transitional Surface

The transitional surface extends outward and upward from the outer edges of the primary surface at a slope of 7:1. The transitional surface extends to an elevation 150 feet above airport elevation where it connects to the horizontal surface.

Horizontal Surface

The horizontal surface is drawn from a 10,000-foot radius that extends from the ends of the primary surface to form an oval shape from each runway, which are all connected to form the horizontal surface shape at an elevation 150 feet above the airport.

Conical Surface:

The conical surface extends from the outer edge of the horizontal surface at a slope of 20:1 for 4,000 feet.

While the Part 77 Airspace Plan provides a comprehensive plan view of the airport and surroundings out to the extents of the conical and approach surfaces, additional detail is provided with approach profile drawings.

Inner Portion of Approach Surface Plan and Profile Drawings

To provide the necessary approach surface detail, Approach Surface Plan and Profile Drawings are prepared. These drawings represent an extension of the Airspace Plan (Part 77). Four drawings are prepared – one each for Runways 3, 21, 17 and 35.

These views off each runway end include the area along the extended runway centerline with a scale of 1”=200’ horizontal and 1”=20’ vertical. Objects contained within the areas near the runway are numbered and correspond to a data table that includes object descriptions and whether it clears the approach or is an obstruction that penetrates the protected surface. Topography, objects and other relevant features within the approaches are identified.

As shown on the drawings, the AGIS survey identified numerous objects in the approaches including whether they are obstructions or adequately clear the protected surfaces.

- Runway 3: Precision approach slope of 50:1 as well as minimum approach slope clearance of 34:1 depicted. A total of 124 objects are identified such as trees, buildings, and roads.
- Runway 21: The 20:1 visual approach slope surface and threshold siting surface are depicted for the runway end and displaced threshold. A total of 80 objects are identified of which four are penetrations including a couple clusters of trees, a pole light, and a power transmission line.

- Runway 17: The 20:1 visual approach slope surface and threshold siting surface are depicted. A total of 20 objects are identified in the approach, but all clear the approach ranging from 3.8 feet of clearance to more than 175 feet of clearance. Therefore, no penetrations are identified.
- Runway 35: The 20:1 visual approach slope surface and threshold siting surface are depicted. A total of 28 objects are identified in the approach and all but two clear the approach; both objects are poles to be removed in the future. The remaining objects clear the approach by a range of 4.3 feet to 79 feet.

Departure Surface Drawing

Departure surface drawings are required for instrument runways. Consequently, the departure surface drawing for OGD includes a plan and profile drawing and associated obstruction table for Runway 3-21. The departure surface is a 40:1 slope, which is less restrictive than the 50:1 precision approach slope to Runway 3, but more restrictive than the 20:1 approach slope on Runway 21. Since the departure slope is on the opposite end of the approach slope for the relevant runway, objects called out in the Runway 3 approach are relevant to the Runway 21 departure and vice versa.

Views off each runway end include the area along the extended runway centerline with a scale of 1" =1,000' horizontal and 1"=100' vertical. Objects contained within the departure area near the runway end are numbered and correspond to a data table that includes object descriptions and whether each clears the departure or is an obstruction that penetrates the protected surface. Topography, objects and other relevant features within the departure surfaces are identified.

Also included is a departure surface drawing for Runway 35 with similar data that follows the Runway 3-21 departure surface drawing.

Terminal Area Plans - North End, South End and Northwest End

There are three Terminal Area Plan drawings depicting the landside development areas located on the Airport. Existing and future buildings and land use development areas are illustrated including the proposed location of the new terminal area on the west side. Recommended roadway improvements and new fuel storage facilities are depicted.

These three drawings are extracted from the ALP drawing and enlarged offering a more detailed view of existing and future landside development since the scale of the ALP limits the legibility of detail. Structures are numbered and can be referenced in the data tables on the sheet that follows the Terminal Area Plan drawings.

Terminal Area Plan Data Tables

A total of 165 existing structures are numbered on the Terminal Area Plans and each number corresponds with a description in the Terminal Area Plan Data Tables. These descriptions identify buildings such as hangars, terminal and office buildings while others call out specific users/tenants. The tables also include all numbered future facilities. Future buildings are numbered 166 through 193. Further, structure height, top elevation, building size and Part 77 airspace clearance are included in the data tables.

Off-Airport Land Use Plan

The Off-Airport Land Use Plan depicts the land uses adjacent to the airport property boundary such as residential and commercial. Further, an overlay depicting noise exposure[1] (noise contours) is placed on the drawing so the extent at which the noise contours go to or beyond the airport property boundary can be determined. Like the Airspace Plan, the Off-Airport Land Use Plan also includes the traffic pattern for each runway.

On-Airport Land Use Plan

The On-Airport Land Use Plan depicts the land uses within the airport property boundary such as the air operations area, the existing and future terminal area, general aviation, MRO/Cargo and aviation reserve.

Airport Property Map (Exhibit "A“)

The airport property map, often referred to as the Exhibit A, includes the airport property boundary, acquisition history such as the various tracts of land that were acquired to develop the airport, and the property to be acquired for future development and/or protection of the airport environs.

Airport Property Map Tables

The Airport Property Map Tables sheet includes a comprehensive list of all OGD property and easements. A property interest table includes a list of 67 tracts with their location, grantor, interest, date acquired, record info and Federal Aid Project Number (if applicable). With similar details by tract, a second table includes OGD’s easement interest comprised of 76 easement tracts. Approximately 12 additional parcels are proposed for future acquisition and development.

[1] See the section on *Noise and Compatible Land Use* in Chapter One, Inventory, for an additional explanation of airport noise.

Appendix A - Glossary

Glossary of Terms

DEFINITIONS

ACTIVE AIRCRAFT. Aircraft registered with the FAA and reported or estimated to have been flown at least one hour during the preceding year.

ADVISORY CIRCULAR. FAA-issued publication consisting of non-regulatory material and recommendations regarding policy, guidance and information relative to a specific aviation subject.

AIR CARRIER. An airline operator providing scheduled air services for the commercial transport of passengers or cargo.

AIR TAXI. An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft; generally, small aircraft are used (for hire) for specific trips.

AIRCRAFT. An aircraft is a device that is used or intended to be used for flight in the air.

AIRCRAFT APPROACH CATEGORY. A grouping of aircraft based on 1.3 times the stall speed in their maximum certificated landing weight. The categories are as follows:

Category	Approach Speed
A	less than 91 knots
B	91 knots or more, but less than 121 knots
C	121 knots or more, but less than 141 knots
D	141 knots or more, but less than 166 knots
E	greater than 166 knots

AIRCRAFT OPERATION. The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRFIELD. The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRPLANE. An engine-driven fixed-wing aircraft heavier than air that is supported in flight by the dynamic reaction of the air against its wings.

AIRPLANE DESIGN GROUP (ADG). A grouping of aircraft based upon relative wingspan or tail height (whichever is most demanding). The groups are as follows:

Group	Tail Height (ft)	Wingspan (ft)
I	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262

AIRPORT IMPROVEMENT PROGRAM. A program authorized by the Airport and Airway Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT PLAN (ALP). An FAA-required, scaled drawing of the existing and proposed land and facilities, with dimensional information in compliance with applicable standards.

AIRPORT REFERENCE CODE (ARC). A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP). The latitude and longitude of the approximate center of the airport.

AIRPORT TRAFFIC CONTROL TOWER (ATCT). A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

AIRSIDE. The portion of an airport that contains facilities necessary for the movement/operation of aircraft.

AIRSPACE. The volume of space above the surface of the ground that is provided for the operation of aircraft.

APPROACH PROCEDURE WITH VERTICAL GUIDANCE (APV). An Instrument Approach Procedure (IAP) providing both vertical and lateral electronic guidance.

APPROACH LIGHTING SYSTEM (ALS). An airport lighting facility, which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his/her final approach and landing.

APRON. A defined area for aircraft parking and other functions such as passenger, cargo or freight loading and unloading, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION. The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS). A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATED WEATHER OBSERVATION STATION (AWOS). Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew-point, etc.).

AVIGATION EASMENT. A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established, and incompatible development is prohibited.

BASED AIRCRAFT. The general aviation aircraft that uses a specific airport as a home base.

BLAST FENCE. A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD. A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL). A line that identifies suitable building area locations on the airport.

BYPASS TAXIWAY. A taxiway used to reduce aircraft queuing demand by providing multiple takeoff points.

AIRPORT CAPITAL IMPROVEMENT PLAN (ACIP). A schedule of planned projects and costs submitted typically prepared by the airport sponsor for funding purposes.

CATEGORY-I (CAT-I). An instrument approach or approach and landing with a Height Above Threshold (HATh) or minimum descent altitude not lower than 200 ft (60 m) and with either a visibility not less than ½ statute mile (800m), or a runway visual range not less than 1800 ft (550m).

CATEGORY-II (CAT-II). An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 200 ft (60 m) but not lower than 100 ft (30 m) and a runway visual range not less than 1200 ft (350m).

CATEGORY-III (CAT-III). An instrument approach or approach and landing with a Height Above Threshold (HATh) lower than 100 ft (30m), or no HATh, or a runway visual range less than 700 ft (350m).

CEILING. The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CLASS A, B, C, D, E, G AIRSPACE. See Controlled Airspace.

COMMON TRAFFIC ADVISORY FREQUENCY (CTAF). A radio frequency identified in the appropriate aeronautical chart which is designated for transmitting airport advisory information and procedures while operating to and from an uncontrolled airport.

CONTROLLED AIRSPACE. Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the U.S. is designated as follows.

- **CLASS A.** The airspace from 18,000 feet mean sea level (MSL) up to but not including 60,000 MSL (flight level FL600).

- **CLASS B.** Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of airspace and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

- **CLASS C.** Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical miles (nm) radius and an outer area with a 10 nm radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- **CLASS D.** Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedures. Unless otherwise authorized, all persons must establish two-way radio communications.

- **CLASS E.** Generally, controlled airspace not classified as Class A, B, C or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communications with air traffic control.

- **CLASS G.** Generally, that airspace not classified as Class A, B, C, D or E. Class G airspace extends from the surface to the overlying Class E airspace

CRITICAL AIRCRAFT. See Design Aircraft.

CROSSWIND. Wind flow that is not parallel to the runway of the flight of an aircraft.

CROSSWIND COMPONENT. The component of wind, measured in knots, that is at a right angle to the runway centerline or the intended flight path of an aircraft.

DECISION HEIGHT. The height above the end of the runway surface at which a decision must be made by a pilot during a precision approach to either continue the approach or to execute a missed approach.

DECLARED DISTANCES. The distances declared available for the airplane's takeoff run, takeoff distance, accelerate-stop distance and landing distance requirements. The distances are:

- **TAKEOFF RUN AVAILABLE (TORA).** The runway length declared available and suitable for the ground run of an airplane taking off.

- **TAKEOFF DISTANCE AVAILABLE (TODA).** The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA.

- **ACCELERATE–STOP DISTANCE AVAILABLE (ASDA).** The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

- **LANDING DISTANCE AVAILABLE (LDA).** The runway length declared available and suitable for landing.

DESIGN AIRCRAFT. An aircraft with characteristics that represent the most demanding needs, which determine the application of airport design standards for a specific runway, taxiway, taxilane, apron, or other facility. This aircraft can be a specific aircraft model or a composite of several aircraft using or anticipated to use the airport or part of the airport. (Also called “critical aircraft” or “critical design aircraft.”)

DISPLACED THRESHOLD. A threshold that is located at a point on the runway other than the designated beginning of the runway.

ENPLANEMENT. The boarding of a revenue passenger on an aircraft.

ENVIRONMENTAL ASSESSMENT (EA). An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact assessment.

FEDERAL AVIATION REGULATIONS. The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are aviation subset of the Code of Federal Regulations.

FIXED BASE OPERATOR (FBO). An FBO typically offers the following services (or a combination thereof): aircraft charter operation, aircraft rental, aircraft storage, flight training, aircraft sales/leasing, aircraft component maintenance, aircraft parts sales, and aircraft maintenance.

FRANGIBLE NAVAID. A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION. That portion of civil aviation that encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GLIDE SLOPE (GS). Provides vertical guidance for aircraft during approach and landing. The glide slope consists of 1) electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or 2) visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS). A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude and altitude.

HELIPAD. A designated area for the takeoff, landing and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS. The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

INSTRUMENT APPROACH PROCEDURE. A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR). Rules governing the procedures for conducting instrument flight. Also, a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT METEOROLOGICAL CONDITIONS. Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS. All aircraft operations other than local operations.

KNOTS. A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

LANDSIDE. The portion of an airport that provides the facilities necessary to serve the users beyond the aircraft movement areas.

LARGE AIRPLANE. An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL OPERATIONS. Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC. Aircraft operating in the traffic pattern or within site of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER. The component of an ILS, which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA). A facility of comparable utility and accuracy to a localizer but is not part of a complete ILS and is not aligned with the runway.

LORAN. Long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW IMPACT RESISTANT (LIR) SUPPORT. A support designed to resist operational and environmental static loads and fail when subjected to a shock load such as that from a colliding aircraft.

LOW INTENSITY RUNWAY LIGHTS. The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MAIN GEAR WIDTH (MGW). The distance from the outer edge to outer edge of the widest set of main gear tires.

MEDIUM INTENSITY RUNWAY LIGHTS. The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MILITARY OPERATIONS AREA (MOA). See special-use airspace.

MILITARY TRAINING ROUTE. An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MODIFICATION to STANDARDS. Any approved nonconformance to FAA standards, other than dimensional standards for Runway Safety Areas (RSAs), applicable to an airport design, construction, or equipment procurement project that is necessary to accommodate an unusual local condition for a specific project on a case-by-case basis while maintaining an acceptable level of safety.

MOVEMENT AREA. The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NATIONAL AIRSPACE SYSTEM. The network of air traffic control facilities, air traffic control areas, and navigational facilities through the US.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS. The national airport system plan developed by the Secretary of Transportation on a bi-annual basis for the development of public use airports to meet national air transportation needs.

NAUTICAL MILE. A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID. A term used to describe any electrical or visual air navigational aid, light, sign, and associated supporting equipment.

NOISE CONTOUR. A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NONDIRECTIONAL BEACON (NDB). A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a compass locator.

NONPRECISION APPROACH PROCEDURE. A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB or LOC.

OBJECT FREE AREA (OFA). An area on the ground centered on a runway, taxiway or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ). The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear

of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION. A takeoff or landing.

PRECISION APPROACH. A standard instrument approach procedure, which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- **CATEGORY I.** A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than ½ mile or Runway Visual Range (RVR) 2400 with operative touchdown zone and runway centerline lights.

- **CATEGORY II.** A precision approach, which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- **CATEGORY III.** A precision approach, which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI). A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a Visual Approach Slope Indicator (VASI) but provides a sharper transition between the colored indicator lights.

PRECISION OBJECT FREE ZONE (POFZ). An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFZ is a clearing standard, which requires the POFZ to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for NAVAIDs). The POFZ applies to all new authorized instrument approach procedures with less than ¾ mile visibility.

REMOTE TRANSMITTER / RECEIVER (RTR). See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT. An airport to serve general aviation aircraft, which might otherwise use a congested air-carrier served airport.

RNAV. Area Navigation – airborne equipment, which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used en route and for approaches to an airport.

RUNWAY. A defined rectangular area of pavement, land or water that is prepared for an aircraft landing and taking off. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. The runway heading on the opposite end of the runway is 180 degrees from that runway end. Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNEMENT INDICATOR LIGHT. A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY BLAST PAD. A surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

RUNWAY END IDENTIFIER LIGHTS (REIL). Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT. The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ). An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type/minima.

RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway.

RUNWAY VISUAL RANGE (RVR). An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

RUNWAY VISIBILITY ZONE (RVZ). An area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

SEGMENTED CIRCLE. A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SMALL AIRPLANE. An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL USE AIRSPACE. Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- **ALERT AREA.** Airspace that may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- **CONTROLLED FIRING AREA.** Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- **MILITARY OPERATIONS AREA (MOA).** Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- **PROHIBITED AREA.** Designated airspace within which the flight of aircraft is prohibited.

- **RESTRICTED AREA.** Airspace designated under FAR 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- **WARNING AREA.** Airspace, which may contain hazards to nonparticipating aircraft.

STOPWAY. An area beyond the takeoff runway, no less wide than the runway and centered on the extended centerline of the runway, able to support an airplane during an aborted takeoff, without causing structural damage to the airplane, and designated for use in decelerating the airplane during an aborted takeoff.

STRAIGHT-IN LANDING / APPROACH. A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN). An ultra-high frequency electronic air navigation system, which provides suitably equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAXILANE. A taxiway designed for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area, providing access from taxiways (usually an apron taxiway) to aircraft parking positions and other terminal areas.

TAXIWAY. A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY DESIGN GROUP (TDG). A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance.

TAXIWAY SAFETY AREA (TSA). A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

THRESHOLD. The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO. An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN ZONE (TDZ). The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE). The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING. Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN. The traffic flow that is prescribed for an aircraft landing or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, and final approach.

UNCONTROLLED AIRPORT. An airport without an air traffic control tower at which the control of visual VFR traffic is not exercised.

UNCONTROLLED AIRSPACE. Airspace within which aircraft are not subject to air traffic control.

UNICOM. A nongovernmental communication facility, which may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

VISUAL APPROACH. An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control on an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI). An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high-intensity red and white focused light beams, which indicate to the pilot whether or he or she is on path. Some airports serving large aircraft have three-bar VASIs that provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR). Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirement. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS. Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

WIDE AREA AUGMENTATION SYSTEM (WAAS). The Wide Area Augmentation System (WAAS) uses a system of ground stations to provide necessary augmentations to the GPS Standard Positioning Service (SPS) navigation signal. A network of precisely surveyed ground reference stations is strategically positioned across the country to collect GPS satellite data. Using this information, a message is developed to correct any signal errors.

ACRONYMS

AAC	Airport Advisory Committee
AC	Advisory Circular
ACIP	Airport Capital Improvement Plan
ADF	Automatic Direction Finder
ADG	Airplane Design Group
AGL	Above Ground Level
AIP	Airport Improvement Program
ALS	Approach Lighting System
APV	Instrument Approach Procedure with Vertical Guidance
ARC	Airport Reference Code
ARFF	Aircraft Rescue and Firefighting
ARP	Airport Reference Point
ASDA	Accelerate-Stop Distance Available
ASOS	Automated Surface Observation Station
ATCT	Airport Traffic Control Tower
ASOS	Automated Surface Observation Station
BRL	Building Restriction Line
CFR	Code of Federal Regulations
DME	Distance Measuring Equipment
DNL	Day-night Average Sound Level
DWL	Dual Wheel Loading
DTWL	Dual Tandem Wheel Loading
EAA	Experimental Aircraft Association
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FY	Fiscal Year
GA	General Aviation
GPS	Global Positioning System
GS	Glide Slope
HIRL	High Intensity Runway Lights
IAP	Instrument approach procedure
IFR	Instrument flight rules
LDA	Landing Distance Available
LIRL	Low Intensity Runway Lights
MALS	Medium-intensity Approach Lighting System
MALSR	Medium-intensity Approach Lighting System with Runway Alignment Indicator Lights
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MLS	Microwave Landing System
MOA	Military Operations Area
MSL	Mean Sea Level
NAVAID	Navigational Aid
NBAA	National Business Aviation Association

NDB	Nondirectional Radio Beacon
NM	Nautical Mile
NOTAM	Notice to Airmen
NPIAS	National Plan of Integrated Airport Systems
OFA	Object free area
OFZ	Object free zone
PAC	Planning Advisory Committee
PAPI	Precision Approach Path Indicator
PLASI	Pulsating Visual Approach Slope Indicator
PMP	Pavement Maintenance Program
POFA	Precision Object Free Area
PVASI	Pulsating/Steady Visual Approach Slope Indicator
RDC	Runway Design Code
REIL	Runway End Identifier Lights
RNAV	Area Navigation
RPZ	Runway Protection Zone
RVR	Runway Visibility Range
RVZ	Runway Visibility Zone
SASP	State Aviation System Plan
SM	Statute Mile
SWL	Single Wheel Loading
TDG	Taxiway Design Group
TDZ	Touchdown Zone
TDZE	Touchdown Zone Elevation
TAF	Terminal Area Forecast
TODA	Takeoff Distance Available
TORA	Takeoff Run Available
UAM	Urban Air Mobility
UAS	Unmanned Aircraft Systems
UCASP	Utah Continuous Airport System Plan
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	Very High Frequency Omnidirectional Range
WAAS	Wide Area Augmentation System

Appendix B – FAA Grant History

Grant History Report

FAA - Office Of Airports **Report Date:** **03/11/2019**

Region: NM

ADO: DEN

Worksite: Ogden, UT **Locid:** OGD **Worksite Name:** Ogden-Hinckley **Current Service Level:** P **Current Hub Type:** N

Grant Nbr	FY	Project	Descr	Entitlement	Discretionary	Sup Discretionary	Economic Recovery	Total
001-1982	1982	ST AP LI	Install Apron Lighting	$7,730.00	$0.00	$0.00	$0.00	$7,730.00
		RE RW IM	Rehabilitate Runway	$481,982.00	$20,382.00	$0.00	$0.00	$502,364.00
Grant Total				**$489,712.00**	**$20,382.00**	**$0.00**	**$0.00**	**$510,094.00**
002-1983	1983	RE RW IM	Rehabilitate Runway	$204,400.00	$69,403.00	$0.00	$0.00	$273,803.00
Grant Total				**$204,400.00**	**$69,403.00**	**$0.00**	**$0.00**	**$273,803.00**
003-1983	1983	ST RW IM	Extend Runway	$0.00	$280,237.00	$0.00	$0.00	$280,237.00
		RE TW IM	Rehabilitate Taxiway	$0.00	$24,881.00	$0.00	$0.00	$24,881.00
		ST OT IN	Install Miscellaneous NAVAIDS	$0.00	$10,000.00	$0.00	$0.00	$10,000.00
		SA RW LI	Install Runway Lighting	$0.00	$35,000.00	$0.00	$0.00	$35,000.00
		ST TW CO	Construct Taxiway	$0.00	$128,100.00	$0.00	$0.00	$128,100.00
Grant Total				**$0.00**	**$478,218.00**	**$0.00**	**$0.00**	**$478,218.00**
004-1985	1985	PL PL MA	Conduct Airport Master Plan Study	$0.00	$61,131.00	$0.00	$0.00	$61,131.00
Grant Total				**$0.00**	**$61,131.00**	**$0.00**	**$0.00**	**$61,131.00**
005-1987	1987	RE AP IM	Rehabilitate Apron	$225,157.00	$0.00	$0.00	$0.00	$225,157.00
		RE TW IM	Rehabilitate Taxiway	$190,830.00	$0.00	$0.00	$0.00	$190,830.00
		ST AP CO	Construct Apron	$75,000.00	$0.00	$0.00	$0.00	$75,000.00
		ST AP LI	Install Apron Lighting	$20,000.00	$0.00	$0.00	$0.00	$20,000.00
Grant Total				**$510,987.00**	**$0.00**	**$0.00**	**$0.00**	**$510,987.00**
006-1988	1988	ST AP CO	Construct Apron	$0.00	$31,500.00	$0.00	$0.00	$31,500.00
		ST AP LI	Install Apron Lighting	$0.00	$60,000.00	$0.00	$0.00	$60,000.00
		ST RW LI	Install Runway Lighting	$0.00	$75,000.00	$0.00	$0.00	$75,000.00

Selection Criteria: LOCID: OGD ,Grant Step:AOF

Grant History Report

FAA - Office Of Airports **Report Date:** 03/11/2019

Region: NM

ADO: DEN

Worksite: Ogden, UT **Locid:** OGD **Worksite Name:** Ogden-Hinckley **Current Service Level:** P **Current Hub Type:** N

Grant Nbr	FY	Project	Descr	Entitlement	Discretionary	Sup Discretionary	Economic Recovery	Total
		ST LA SZ	Acquire Land For Approaches	$0.00	$5,000.00	$0.00	$0.00	$5,000.00
		RE RW IM	Rehabilitate Runway	$0.00	$643,825.00	$0.00	$0.00	$643,825.00
Grant Total				**$0.00**	**$815,325.00**	**$0.00**	**$0.00**	**$815,325.00**
007-1989	1989	ST RW IM	Extend Runway	$0.00	$27,619.00	$0.00	$0.00	$27,619.00
		SA OT OB	Remove Obstructions	$0.00	$128,161.00	$0.00	$0.00	$128,161.00
		ST LA SZ	Acquire Land For Approaches	$0.00	$58,624.00	$0.00	$0.00	$58,624.00
		EN PB 75	Noise Mitigation Measures for Public Buildings	$0.00	$56,079.00	$0.00	$0.00	$56,079.00
		ST LA DV	Acquire Land for Development	$0.00	$871,254.00	$0.00	$0.00	$871,254.00
Grant Total				**$0.00**	**$1,141,737.00**	**$0.00**	**$0.00**	**$1,141,737.00**
008-1990	1990	ST EQ MS	Acquire Aircraft Rescue & Fire Fighting Safety Equipment	$31,971.00	$155,300.00	$0.00	$0.00	$187,271.00
		ST RW SF	Improve Runway Safety Area	$0.00	$142,500.00	$0.00	$0.00	$142,500.00
		SA BD EX	Improve Aircraft Rescue & Fire Fighting Building	$0.00	$5,200.00	$0.00	$0.00	$5,200.00
		ST AP CO	Construct Apron	$0.00	$133,600.00	$0.00	$0.00	$133,600.00
		ST RW IM	Extend Runway	$15,688.00	$187,358.00	$0.00	$0.00	$203,046.00
		SA RW LI	Install Runway Lighting	$0.00	$51,400.00	$0.00	$0.00	$51,400.00
Grant Total				**$47,659.00**	**$675,358.00**	**$0.00**	**$0.00**	**$723,017.00**
009-1991	1991	EN PB 75	Noise Mitigation Measures for Public Buildings	$0.00	$15,000.00	$0.00	$0.00	$15,000.00
		ST LA DV	Acquire Land for Development	$0.00	$441,776.00	$0.00	$0.00	$441,776.00
Grant Total				**$0.00**	**$456,776.00**	**$0.00**	**$0.00**	**$456,776.00**
010-1991	1991	ST LA SZ	Acquire Land For Approaches	$0.00	$555,418.00	$0.00	$0.00	$555,418.00
Grant Total				**$0.00**	**$555,418.00**	**$0.00**	**$0.00**	**$555,418.00**

Grant History Report

FAA - Office Of Airports **Report Date:** 03/11/2019

Region: NM

ADO: DEN

Worksite: Ogden, UT **Locid:** OGD **Worksite Name:** Ogden-Hinckley **Current Service Level:** P **Current Hub Type:** N

Grant Nbr	FY	Project	Descr	Entitlement	Discretionary	Sup Discretionary	Economic Recovery	Total
011-1991	1991	ST OT OB	Remove Obstructions	$0.00	$108,942.00	$0.00	$0.00	$108,942.00
Grant Total				**$0.00**	**$108,942.00**	**$0.00**	**$0.00**	**$108,942.00**
012-1992	1992	PL PL MA	Conduct Airport Master Plan Study	$0.00	$87,562.00	$0.00	$0.00	$87,562.00
Grant Total				**$0.00**	**$87,562.00**	**$0.00**	**$0.00**	**$87,562.00**
013-1992	1992	ST TW CO	Construct Taxiway	$0.00	$132,325.00	$0.00	$0.00	$132,325.00
		ST AP LI	Install Apron Lighting	$0.00	$62,000.00	$0.00	$0.00	$62,000.00
		SA OT SG	Install Airfield Guidance Signs	$0.00	$67,888.00	$0.00	$0.00	$67,888.00
		ST AP CO	Construct Apron	$0.00	$86,000.00	$0.00	$0.00	$86,000.00
		RE TW IM	Rehabilitate Taxiway	$0.00	$80,000.00	$0.00	$0.00	$80,000.00
Grant Total				**$0.00**	**$428,213.00**	**$0.00**	**$0.00**	**$428,213.00**
014-1993	1993	ST EQ SN	Acquire Snow Removal Equipment	$0.00	$278,491.00	$0.00	$0.00	$278,491.00
Grant Total				**$0.00**	**$278,491.00**	**$0.00**	**$0.00**	**$278,491.00**
015-1993	1993	RE TW IM	Rehabilitate Taxiway	$0.00	$170,000.00	$0.00	$0.00	$170,000.00
		RE AP IM	Rehabilitate Apron	$0.00	$470,762.00	$0.00	$0.00	$470,762.00
		SP RW FR	Groove Runway	$0.00	$300,000.00	$0.00	$0.00	$300,000.00
Grant Total				**$0.00**	**$940,762.00**	**$0.00**	**$0.00**	**$940,762.00**
016-1995	1995	RE RW LI	Rehabilitate Runway Lighting	$0.00	$236,504.00	$0.00	$0.00	$236,504.00
Grant Total				**$0.00**	**$236,504.00**	**$0.00**	**$0.00**	**$236,504.00**
017-1996	1996	ST TE IM	Improve Terminal Building	$0.00	$192,653.00	$0.00	$0.00	$192,653.00
Grant Total				**$0.00**	**$192,653.00**	**$0.00**	**$0.00**	**$192,653.00**

Grant History Report

FAA - Office Of Airports **Report Date:** 03/11/2019

Region: NM

ADO: DEN

Worksite: Ogden, UT **Locid:** OGD **Worksite Name:** Ogden-Hinckley **Current Service Level:** P **Current Hub Type:** N

Grant Nbr	FY	Project	Descr	Entitlement	Discretionary	Sup Discretionary	Economic Recovery	Total
018-1997	1997	RE TW IM	Rehabilitate Taxiway	$465,793.00	$0.00	$0.00	$0.00	$465,793.00
		RE TW LI	Rehabilitate Taxiway Lighting	$153,500.00	$0.00	$0.00	$0.00	$153,500.00
Grant Total				**$619,293.00**	**$0.00**	**$0.00**	**$0.00**	**$619,293.00**
019-1997	1997	CA AP CO	Construct Apron	$0.00	$367,491.00	$0.00	$0.00	$367,491.00
		CA TE EX	Expand Terminal Building	$0.00	$100,000.00	$0.00	$0.00	$100,000.00
		ST OT IM	Improve Airport Drainage	$0.00	$243,500.00	$0.00	$0.00	$243,500.00
Grant Total				**$0.00**	**$710,991.00**	**$0.00**	**$0.00**	**$710,991.00**
020-1999	1999	ST RW SF	Improve Runway Safety Area	$145,507.00	$0.00	$0.00	$0.00	$145,507.00
Grant Total				**$145,507.00**	**$0.00**	**$0.00**	**$0.00**	**$145,507.00**
021-1999	1999	PL PL MA	Conduct Airport Master Plan Study	$22,500.00	$0.00	$0.00	$0.00	$22,500.00
		ST RW VI	Install Runway Vertical/Visual Guidance System	$15,000.00	$0.00	$0.00	$0.00	$15,000.00
		RE TW IM	Rehabilitate Taxiway	$639,155.00	$0.00	$0.00	$0.00	$639,155.00
Grant Total				**$676,655.00**	**$0.00**	**$0.00**	**$0.00**	**$676,655.00**
022-2000	2000	SA OT SG	Install Airfield Guidance Signs	$38,700.00	$0.00	$0.00	$0.00	$38,700.00
		SA OT OB	Remove Obstructions	$45,500.00	$0.00	$0.00	$0.00	$45,500.00
		RE TW IM	Rehabilitate Taxiway	$1,039,575.00	$0.00	$0.00	$0.00	$1,039,575.00
		RE TW LI	Rehabilitate Taxiway Lighting	$170,000.00	$0.00	$0.00	$0.00	$170,000.00
Grant Total				**$1,293,775.00**	**$0.00**	**$0.00**	**$0.00**	**$1,293,775.00**
023-2001	2001	ST EQ SN	Acquire Snow Removal Equipment	$19,546.00	$230,454.00	$0.00	$0.00	$250,000.00
		ST EQ SE	Install Perimeter Fencing	$230,454.00	$0.00	$0.00	$0.00	$230,454.00
Grant Total				**$250,000.00**	**$230,454.00**	**$0.00**	**$0.00**	**$480,454.00**

Grant History Report

FAA - Office Of Airports **Report Date:** **03/11/2019**

Region: NM

ADO: DEN

Worksite: Ogden, UT **Locid:** OGD **Worksite Name:** Ogden-Hinckley **Current Service Level:** P **Current Hub Type:** N

Grant Nbr	FY	Project	Descr	Entitlement	Discretionary	Sup Discretionary	Economic Recovery	Total
024-2002	2002	RE RW IM	Rehabilitate Runway	$277,730.00	$22,653.00	$0.00	$0.00	$300,383.00
Grant Total				**$277,730.00**	**$22,653.00**	**$0.00**	**$0.00**	**$300,383.00**
025-2002	2002	ST TW CO	Construct Taxiway	$284,241.00	$0.00	$0.00	$0.00	$284,241.00
Grant Total				**$284,241.00**	**$0.00**	**$0.00**	**$0.00**	**$284,241.00**
026-2002	2002	RE RW IM	Rehabilitate Runway	$0.00	$3,292,717.00	$0.00	$0.00	$3,292,717.00
Grant Total				**$0.00**	**$3,292,717.00**	**$0.00**	**$0.00**	**$3,292,717.00**
027-2003	2003	RE RW IM	Rehabilitate Runway	$150,000.00	$2,157,391.00	$0.00	$0.00	$2,307,391.00
Grant Total				**$150,000.00**	**$2,157,391.00**	**$0.00**	**$0.00**	**$2,307,391.00**
028-2005	2005	ST EQ SE	Install Perimeter Fencing	$227,497.00	$0.00	$0.00	$0.00	$227,497.00
Grant Total				**$227,497.00**	**$0.00**	**$0.00**	**$0.00**	**$227,497.00**
029-2006	2006	PL PL MA	Update Airport Master Plan Study	$127,575.00	$0.00	$0.00	$0.00	$127,575.00
Grant Total				**$127,575.00**	**$0.00**	**$0.00**	**$0.00**	**$127,575.00**
030-2007	2007	ST TW CO	Construct Taxiway	$260,687.00	$2,300,000.00	$0.00	$0.00	$2,560,687.00
Grant Total				**$260,687.00**	**$2,300,000.00**	**$0.00**	**$0.00**	**$2,560,687.00**
031-2008	2008	ST TW CO	Construct Taxiway	$143,893.00	$2,248,000.00	$0.00	$0.00	$2,391,893.00
Grant Total				**$143,893.00**	**$2,248,000.00**	**$0.00**	**$0.00**	**$2,391,893.00**
032-2009	2009	RE RW IM	Rehabilitate Runway	$55,996.00	$0.00	$0.00	$0.00	$55,996.00
Grant Total				**$55,996.00**	**$0.00**	**$0.00**	**$0.00**	**$55,996.00**
033-2009	2009	RE RW IM	Rehabilitate Runway	$101,307.00	$0.00	$0.00	$0.00	$101,307.00
Grant Total				**$101,307.00**	**$0.00**	**$0.00**	**$0.00**	**$101,307.00**

Grant History Report

FAA - Office Of Airports **Report Date:** **03/11/2019**

Region: NM

ADO: DEN

Worksite: Ogden, UT **Locid:** OGD **Worksite Name:** Ogden-Hinckley **Current Service Level:** P **Current Hub Type:** N

Grant Nbr	FY	Project	Descr	Entitlement	Discretionary	Sup Discretionary	Economic Recovery	Total
034-2010	2010	RE RW IM	Rehabilitate Runway	$148,804.00	$0.00	$0.00	$0.00	$148,804.00
Grant Total				**$148,804.00**	**$0.00**	**$0.00**	**$0.00**	**$148,804.00**
035-2011	2011	RE RW IM	Rehabilitate Runway	$102,393.00	$0.00	$0.00	$0.00	$102,393.00
Grant Total				**$102,393.00**	**$0.00**	**$0.00**	**$0.00**	**$102,393.00**
036-2011	2011	RE RW IM	Rehabilitate Runway	$47,607.00	$4,417,995.00	$0.00	$0.00	$4,465,602.00
Grant Total				**$47,607.00**	**$4,417,995.00**	**$0.00**	**$0.00**	**$4,465,602.00**
037-2012	2012	SA EQ RF	Acquire Aircraft Rescue & Fire Fighting Vehicle	$0.00	$683,144.00	$0.00	$0.00	$683,144.00
Grant Total				**$0.00**	**$683,144.00**	**$0.00**	**$0.00**	**$683,144.00**
038-2012	2012	ST EQ SE	Security Enhancements	$141,355.00	$0.00	$0.00	$0.00	$141,355.00
Grant Total				**$141,355.00**	**$0.00**	**$0.00**	**$0.00**	**$141,355.00**
040-2013	2013	ST EQ SN	Acquire Snow Removal Equipment	$153,083.00	$0.00	$0.00	$0.00	$153,083.00
Grant Total				**$153,083.00**	**$0.00**	**$0.00**	**$0.00**	**$153,083.00**
041-2014	2014	ST EQ SN	Acquire Snow Removal Equipment	$153,889.00	$65,973.00	$0.00	$0.00	$219,862.00
Grant Total				**$153,889.00**	**$65,973.00**	**$0.00**	**$0.00**	**$219,862.00**
042-2015	2015	RE RW IM	Rehabilitate Runway	$875,000.00	$0.00	$0.00	$0.00	$875,000.00
		RE TW IM	Rehabilitate Taxiway	$125,000.00	$0.00	$0.00	$0.00	$125,000.00
Grant Total				**$1,000,000.00**	**$0.00**	**$0.00**	**$0.00**	**$1,000,000.00**
043-2016	2016	RE TW LI	Rehabilitate Taxiway Lighting	$200,000.00	$0.00	$0.00	$0.00	$200,000.00
		ST EQ SN	Acquire Snow Removal Equipment	$153,221.00	$0.00	$0.00	$0.00	$153,221.00
		ST OT SG	Install Airfield Guidance Signs	$65,000.00	$0.00	$0.00	$0.00	$65,000.00

Grant History Report

FAA - Office Of Airports **Report Date:** 03/11/2019

Region: NM

ADO: DEN

Worksite: Ogden, UT **Locid:** OGD **Worksite Name:** Ogden-Hinckley **Current Service Level:** P **Current Hub Type:** N

Grant Nbr	FY	Project	Descr	Entitlement	Discretionary	Sup Discretionary	Economic Recovery	Total
		RE RW IM	Rehabilitate Runway	$300,000.00	$0.00	$0.00	$0.00	$300,000.00
Grant Total				**$718,221.00**	**$0.00**	**$0.00**	**$0.00**	**$718,221.00**
044-2017	2017	ST EQ SN	Acquire Snow Removal Equipment	$496,410.00	$0.00	$0.00	$0.00	$496,410.00
Grant Total				**$496,410.00**	**$0.00**	**$0.00**	**$0.00**	**$496,410.00**
045-2017	2017	PL PL WH	Wildlife Hazard Assessments	$49,846.00	$0.00	$0.00	$0.00	$49,846.00
Grant Total				**$49,846.00**	**$0.00**	**$0.00**	**$0.00**	**$49,846.00**
046-2017	2017	RE TW IM	Rehabilitate Taxiway	$360,000.00	$0.00	$0.00	$0.00	$360,000.00
Grant Total				**$360,000.00**	**$0.00**	**$0.00**	**$0.00**	**$360,000.00**
047-2018	2018	PL PL MA	Update Airport Master Plan Study	$516,591.00	$0.00	$0.00	$0.00	$516,591.00
Grant Total				**$516,591.00**	**$0.00**	**$0.00**	**$0.00**	**$516,591.00**
048-2018	2018	RC TW IM	Reconstruct Taxiway	$0.00	$500,000.00	$0.00	$0.00	$500,000.00
		RE TW IM	Rehabilitate Taxiway	$860,605.00	$3,239,395.00	$0.00	$0.00	$4,100,000.00
Grant Total				**$860,605.00**	**$3,739,395.00**	**$0.00**	**$0.00**	**$4,600,000.00**
Worksite Total				**$10,615,718.00**	**$26,415,588.00**	**$0.00**	**$0.00**	
Report Total				**$10,615,718.00**	**$26,415,588.00**	**$0.00**	**$0.00**	**$37,031,306.00**

Appendix C – FAA-Published Instrument Approach Procedures

ILS or LOC RWY 3

OGDEN-HINCKLEY (OGD)

LOC/DME I-OGD	APP CRS	Rwy Idg	7252
111.7	034°	TDZE	4473
Chan 54		Apt Elev	4473

DME required. RADAR required for procedure entry.

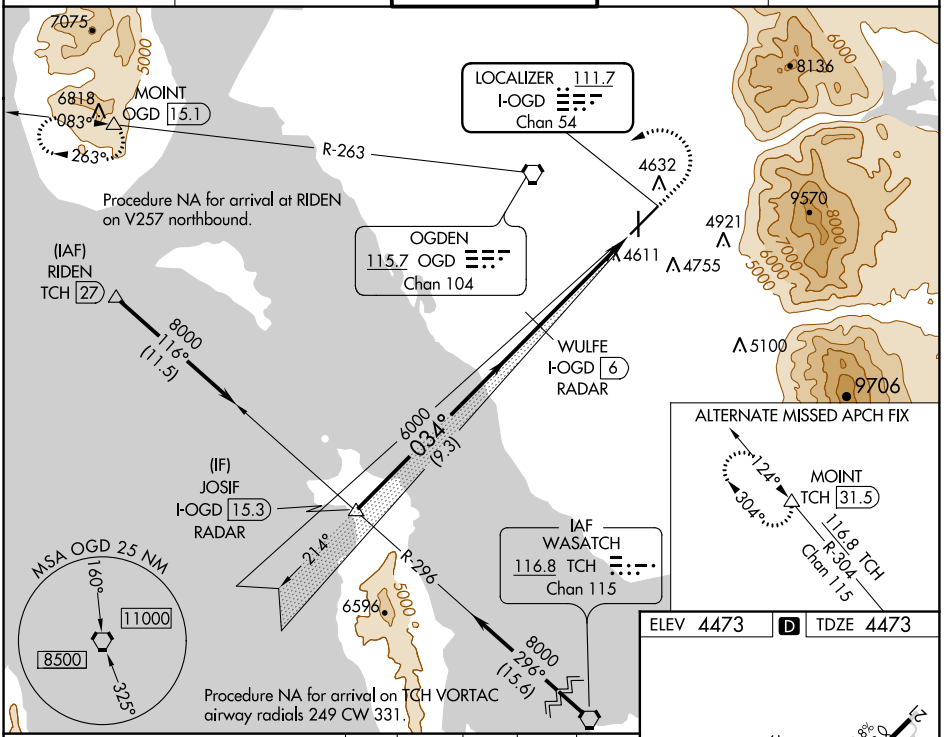
Circling Rwy 17 NA at night. Inop table does not apply to S-ILS 3.

When local altimeter setting not received, use Hill AFB altimeter setting. For inop ALS, increase S-LOC 3 Cat C/D visibility to 1⅛ SM. Circling NA for Cats C and D east of Rwys 21 and 35.

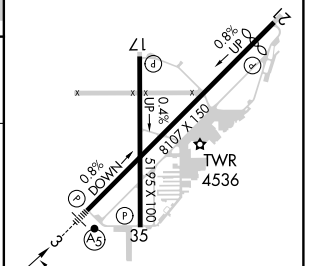
MALSR

MISSED APPROACH: Climb to 4900 then climbing left turn to 9000 direct OGD VORTAC and on OGD VORTAC R-263 to MOINT/OGD 15.1 DME and hold, continue climb-in-hold to 9000.

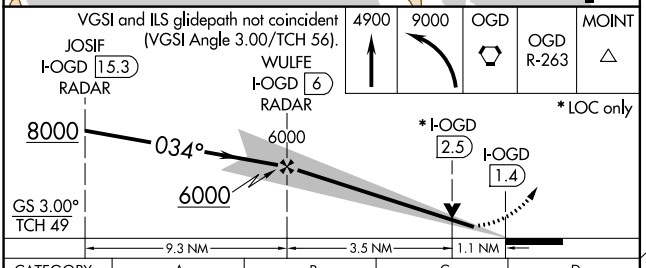
ATIS	SALT LAKE CITY APP CON	OGDEN TOWER★	GND CON	UNICOM
125.55	121.1 319.25	118.7 (CTAF) L 253.5	121.7	122.95



ELEV 4473 D TDZE 4473



HIRL Rwy 3-21 L
MIRL Rwy 17-35 L
REIL Rwys 17 and 35



CATEGORY	A	B	C	D
S-ILS 3	4673-¾ 200 (200-¾)			
S-LOC 3	4880-¾ 407 (500-¾)		4880-1 407 (500-1)	
C CIRCLING	4980-1 507 (600-1)	5060-1 587 (600-1)	5120-1¾ 647 (700-1¾)	5120-2 647 (700-2)

FAF to MAP 4.6 NM

Knots	60	90	120	150	180
Min:Sec	4:36	3:04	2:18	1:50	1:32

SW-4, 05 DEC 2019 to 02 JAN 2020
SW-4, 05 DEC 2019 to 02 JAN 2020

RNAV (GPS) RWY 3

OGDEN-HINCKLEY (OGD)

WAAS CH 65620 W03A	APP CRS 034°	Rwy Idg 7252 TDZE 4473 Apt Elev 4473

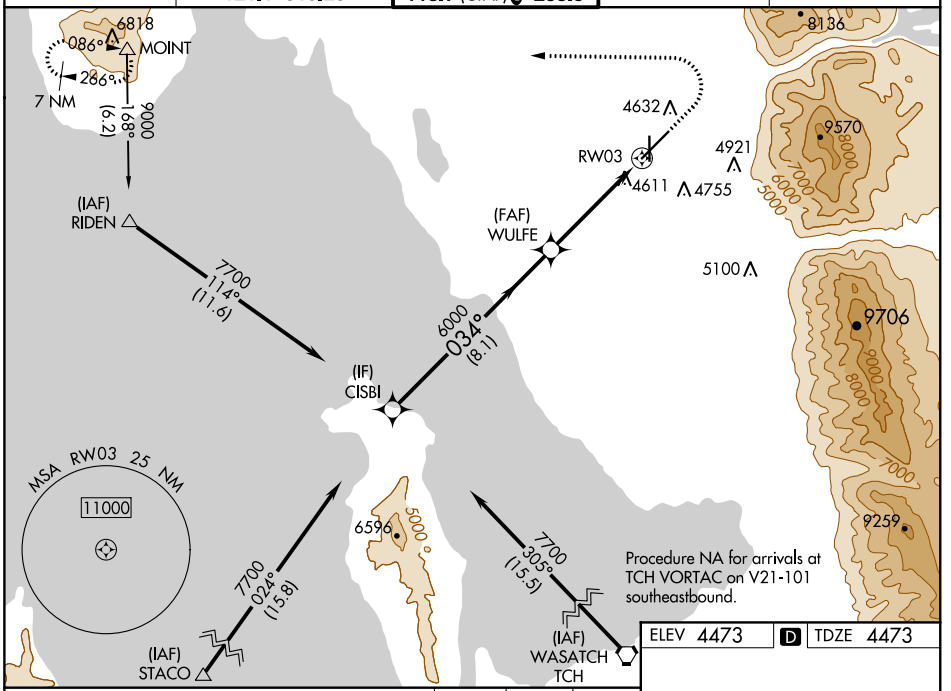
RNP APCH.

T When local altimeter setting not received, use Hill AFB altimeter setting. Circling NA for Cats C and D east of Rwys 21 and 35. Circling Rwy 17 NA at night. Inop table does not apply to LPV. For Inop ALS, increase LNAV/VNAV all Cats and LNAV Cat A/B visibility to 1⅛ SM. Baro-VNAV and VDP NA when using Hill AFB altimeter setting. For uncompensated Baro-VNAV systems, LNAV/VNAV NA below -17°C or above 50°C.

MALSR

MISSED APPROACH: Climb to 4900 then climbing left turn to 9000 direct MOINT and hold, continue climb-in-hold to 9000.

ATIS	SALT LAKE CITY APP CON	OGDEN TOWER★	GND CON	UNICOM
125.55	121.1 319.25	118.7 (CTAF) L 253.5	121.7	122.95

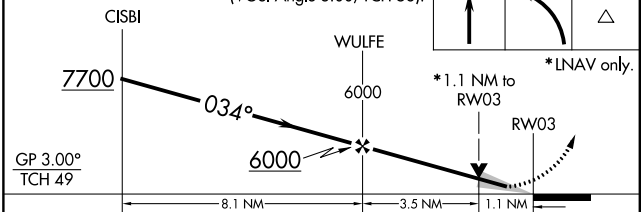


ELEV 4473 D TDZE 4473

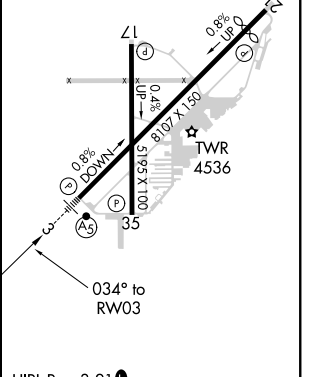
VGSI and descent angles not coincident (VGSI Angle 3.00/TCH 56).

4900	9000	MOINT
		△

*LNAV only.



CATEGORY	A	B	C	D
LPV DA	4673-¾ 200 (200-¾)			
LNAV/VNAV DA	4888-1 415 (500-1)			
LNAV MDA	4880-¾ 407 (500-¾)		4880-1 407 (500-1)	
C CIRCLING	4980-1 507 (600-1)	5060-1 587 (600-1)	5120-1¾ 647 (700-1¾)	5120-2 647 (700-2)



HIRL Rwy 3-21 L
MIRL Rwy 17-35 L
REIL Rwys 17 and 35

SW-4, 05 DEC 2019 to 02 JAN 2020
SW-4, 05 DEC 2019 to 02 JAN 2020

VORTAC OGD 115.7 Chan 104	APP CRS 101°	Rwy Idg N/A TDZE N/A Apt Elev 4473

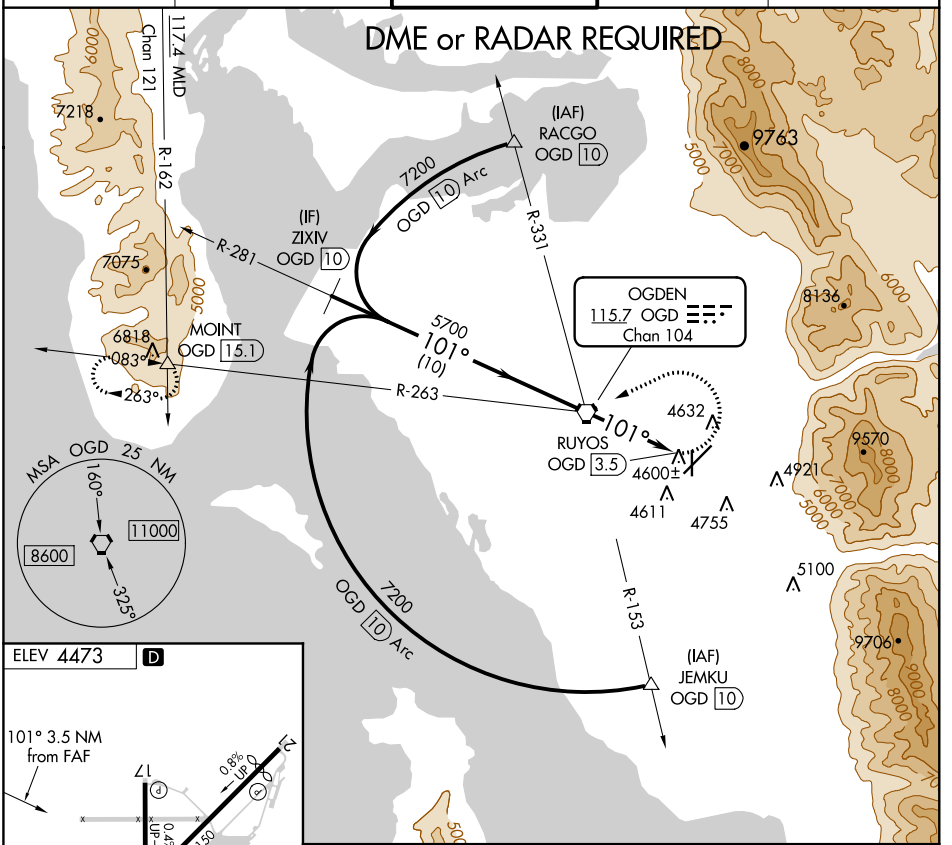
VOR-A

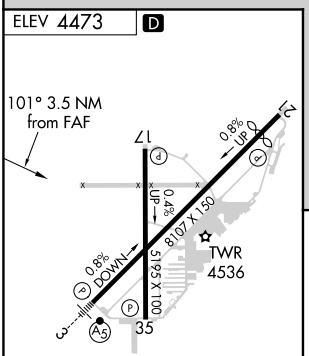
OGDEN-HINCKLEY (OGD)

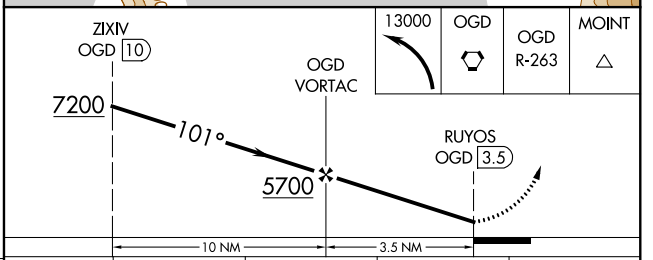
Circling to Rwy 17 NA at night.
Circling NA for Cat C/D east of Rwys 21 and 35.
Rwy 17 and 35 helicopter visibility reduction below 1 SM NA.
When local altimeter setting not received, use Hill AFB altimeter setting.

MISSED APPROACH: Climbing left turn to 13000 direct OGD VORTAC and on OGD VORTAC R-263 to MOINT INT/15.1 DME and hold, continue climb-in-hold to 13000.

ATIS	SALT LAKE CITY APP CON	OGDEN TOWER★	GND CON	UNICOM
125.55	121.1 319.25	118.7 (CTAF) L 253.5	121.7	122.95







HIRL Rwy 3-21 L
MIRL Rwy 17-35 L
REIL Rwys 17 and 35

FAF to MAP 3.5 NM					
Knots	60	90	120	150	180
Min:Sec	3:30	2:20	1:45	1:24	1:10

CATEGORY	A	B	C	D
C CIRCLING	4980-1 507 (600-1)	5060-1 587 (600-1)	5100-1¾ 627 (700-1¾)	5100-2 627 (700-2)

SW-4, 05 DEC 2019 to 02 JAN 2020
SW-4, 05 DEC 2019 to 02 JAN 2020

Appendix D – Cultural Resources Survey (CRS) Report

March 3, 2020
UDSH Project #U19DV0690

Mr. Dana Hartshorn, P.E.
Project Coordinator
Airport Development Group, Inc.
1776 S. Jackson Street, Suite 950
Denver, Colorado 80210

RE: Ogden Hinckley Airport Redevelopment
City of Ogden, Weber County, Utah
Class III Cultural Resources Survey Technical Report

Dear Mr. Hartshorn:

INTRODUCTION

In August 2019, Desert West Environmental, LLC (DWE) was contracted by the Airport Development Group, Inc. (ADG) to conduct a pedestrian cultural resources survey of 115 acres associated with the redevelopment of the Ogden Hinckley Airport, located in Sections 1 and 12 of Township 5 North, Range 2 West and Section 6 of Township 5 North Range 1 West, Weber County, Utah (**Figure 1, Appendix A**). The map reference for the proposed Project are the Roy, UT and Ogden, UT 7.5-minute United States Geological Survey (USGS) topographic quadrangles.

This Project was conducted under the authority of State Antiquities Project Number U19DV0690 and Public Lands Policy Coordinating Office (PLPCO) Archaeological Survey Permit Number 14 (Sonia Hutmacher, MA, RPA). This portion of the project involves a Class III pedestrian survey of four independent parcels north and west of the Ogden Hinckley Airport facilities south of Runway 3/21 (one parcel, 11 acres); west of Runway 17/35 (two parcels, 31 and 78 acres), and north of the approach end of Runway 21 (one parcel, 22 acres; **Figure 2, Appendix A**). These four parcels are referred to as the Project area of potential effect (APE).

The Ogden Hinckley Airport is under the jurisdiction of the Federal Aviation Administration (FAA). The Project will involve excavation and construction of new airport facilities, and the creation of staging areas in various locations within the Project APE. Portions of the airport facility were originally surveyed and recorded by Ms. Wendy Simmons Johnson of Sagebrush Archaeological Consultants in 2014. This report supplements that original document with the survey of previously un-surveyed areas and documentation of historical resources associated with the airport facility.

Sonia Hutmacher, archaeologist for DWE, conducted a review of online records using the State Historic Preservation Office (SHPO) PreservationPro database, General Land Office (GLO) records and historical topographic maps on 09/24/2019. A pedestrian survey of the proposed Project Area of Potential Effect (APE) was conducted by Ms. Hutmacher between 09/12/19 and 09/24/2019. Ms. Hutmacher also served as the Principal Investigator.

REGULATORY FRAMEWORK

Cultural resources investigations are required when a proposed project is subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations (36 Code of Federal Regulations [CFR] 800) and Utah State Regulations (Utah State Code 9-8-404), as amended.

The purpose of the cultural resources records search is to determine the type and location of cultural resources that may be present within the Project area (defined as the APE and the one mile area surrounding the APE). The intent of the pedestrian cultural resources survey is to identify undocumented cultural resources within the Project APE, evaluate those resources and make recommendations of eligibility for nomination to the National Register of Historic Places (NRHP).

ENVIRONMENTAL CONTEXT AND SITE CONDITIONS

The Project area is situated on a low bench in the Wasatch Front valleys of the Great Basin physiographic province. Natural vegetation is largely absent due to airport construction and maintenance, but seeded vegetation consists of Lower Sonoran rangeland communities, including various forbes, bunch grasses and thistle. Some of the areas were densely covered with tall grasses, inhibiting ground visibility to less than 5% (less than 5% of the ground was visible).

Overall, the Project area has largely been disturbed from industrial, airport development since the 1930s, including airport construction and maintenance of paved taxiways and runways, gravel roadways, water retention ponds, and other airport storage facilities.

CULTURAL CONTEXT

In 1939, Ogden City purchased approximately 750 acres of land in the southwest portion of the Ogden City on an old terrace with the intent to build an airport that would replace the old Ogden Municipal Airport, which was constructed in 1928 (Sadler and Roberts 2000: 319[1]). The new Ogden City Airport was constructed in 1939. The US Government financially supported the construction of the airport and a US Weather Bureau station was also established here (Sadler and Roberts 2000:320). An administrative building, concrete landing strips, and a control tower were built (Sadler and Roberts 2000:320). During World War II, the airfield was used by the United States Army Air Forces. It had three concrete (now asphalt) runways and five taxiways.

In the 1940s, Western Air Lines (1944) and United Airlines (1946) "scheduled mail and passenger service to Ogden" (Sadler and Roberts 2000:320). Both shut down operations to the Ogden Hinckley Airport in 1959. West Coast Airlines replaced Western Airlines and United Airlines in 1959 until it pulled out of the airport in 1961. Allegiant Air began non-stop commercial business flights to Phoenix-Mesa Gateway Airport in 2012. The airport also serves as a local private business airport and small private aircraft, predominantly single-engine aircraft. One of its runways (Runway 3/21) is long enough to accept diverted air traffic from the Salt Lake International Airport in Salt Lake City, Utah.

CULTURAL RESOURCES RECORDS SEARCH

A review of the Utah Division of State History's online PreservationPro database resulted in the identification of 29 projects conducted within one mile of the Ogden Hinckley Airport Redevelopment Project. A summary of these projects is provided in **Table 1.** Of particular interest is Sagebrush Archaeological Consultants' archaeological survey of three parcels at the Ogden City Airport for the Hangar and Fuel Field Construction Project. During this project, the Ogden Hinckley Airport was recorded as an NRHP eligible archaeological site (Site 42WB512), due to its affiliation with the United States Army Air Forces during World War II. Those archaeological sites and archaeological surveys that intersect with the Ogden Hinckley Airport (Site 42WB512) or Project APE boundaries are denoted in **Figure 3** (**Appendix A**). Any previous project or archaeological site that does not fall within the boundary of the Ogden Hinckley Airport (Site 42WB512) or the Project APE boundaries has not been plotted.

In addition to the Ogden Hinckley Airport (Site 42WB512), 10 additional archaeological sites were recorded within one mile of the Project APE (Sites 42WB276, 42WB345, 42WB346, 42WB350, 42WB352, 42WB353, 42WB354, 42WB373, 42WB377, and 42WB450). All of these archaeological sites are Euro-American. Five of the sites are eligible for nomination (Sites 42WB350, 42WB352, 42WB354, 42WB373, and 42WB512), one has been nominated to the National Register of Historic Places (Site 42WB353), four are not eligible for nomination (Sites 42WB345, 42WB346, 42WB377, and 42WB450), and one site's eligibility is undetermined (Site 42WB276).

[1] Sadler, Richard W. and Richard C. Roberts
2000 Weber County's History. Weber County Commission, Ogden, Utah.

Table 1. Previous projects and known cultural resources located within one mile of the proposed Project APE.

State Project Number	Project Title	Organization	Archaeological Sites Located within One mile of the Proposed Project APE
U78UC0472	Fort Buenaventura Survey	UDSH-Antiquities	None
U79WC0523	Archaeological Testing at Fort Buenaventura State Park	Weber State University	None
U80WC0750	Excavations at Fort Buenaventura	Weber State University	None
U84SJ0426	Pennsylvania Avenue Bridge	Sagebrush Archaeological Consultants	None
U87CN0615	AT&T Fiber Optics Cable Cheyenne-Sacramento	Centennial Archaeology	None
U87SJ0030	One Mile of Road Widening on SR 126 in W. Ogden	Sagebrush Archaeological Consultants	None
U89SJ0654	Gravel Quarry on Cozydale Rd. Riverdale	Sagebrush Archaeological Consultants	None
U94SJ0336	UDOT Widening of SR-126 in West Haven	Sagebrush Archaeological Consultants	None
U94SJ0411	21st St. & 31st St. Entryways in Ogden (UDOT)	Sagebrush Archaeological Consultants	None
U95SJ0023	UDOT Six Ogden Intersections	Sagebrush Archaeological Consultants	None
U96NR0131	WorldCom Fiberoptic Seattle to SLC	Northwest Archaeological Association Inc.	None
U00SJ0778	Weber River Parkway Riverdale Utah	Sagebrush Archaeological Consultants	None
U01EP0233	Hinkley Drive To SR-108	Earth Touch	42WB345, 42WB346
U01ST0755	Class III Cultural Resource Inventory and Buildings Reconnaissance Survey for the I-15 North Project Weber County Utah	SWCA	42WB350, 42WB352, 42WB353, 42WB354
U03SJ0043	Riverdale Road	Sagebrush Archaeological Consultants	42WB377
U03ST0045	Commuter Rail Project	SWCA	42WB373
U05BC0683	UTA Commuter Rail Monitoring	BYU - Office of Public Archaeology	42WB373
U06BC0033	UTA Rails to Trails	BYU - Office of Public Archaeology	None
U06ST0774	SR 108 Cultural Surveys	SWCA	None
U08ST0687	Questar's FL-19	SWCA	42WB350, 42WB352, 42WB450
U11ST0927	I-15 Cat Ex	SWCA	None
U12XN0452	Cultural Resources Inventory for the 2012 Weber County Emergency Watershed Protection (EWP) Project Weber County Utah	Native-X Inc	None
U12ZP0375	I-15 Interchange At 24th Street	Project Engineering Consultants LTD	None
U13LI0815	SR-108 Widening Project Class III Survey West Haven Weber County UDOT	Logan Simpson	None
U14SJ0897	A CRI of Three Parcels at the Ogden City Airport Hangar and Fuel Field Construction, Weber County Utah	Sagebrush Archaeological Consultants	42WB512
U14SJ1061	A CRI of The Proposed West Haven - River Trail; D&RGW Trail to 1800 South Weber County Utah	Sagebrush Archaeological Consultants	42WB345, 42WB352
U15SJ0342	A CRS for the Proposed Station Square Apartments Weber County Utah	Sagebrush Archaeological Consultants	None
U15ST0290	Class III Cultural Resources Inventory of the Hinckley Water Tower Tank in Weber County, Utah	SWCA	42WB345, 42WB346
U15UM0039	CRI of the Midland Drive Sale Parcel Weber County Utah	SITLA- Utah School and Institutional Trust Lands	None
Unknown	Unknown	Unknown	42WB276
N/A	A Selective Reconnaissance Level Survey of Architectural Resources for I-15; 24th Street Interchange Study Area in Weber County, Utah (UDOT)	SWCA	See Table 2 below

One architectural survey conducted by SWCA, Inc. Environmental Consultants in 2012 was conducted within one mile of the proposed Project APE and 388 historical buildings and structures have been recorded within one mile of the Project APE. A list of the recorded buildings and structures is provided in **Table 2**; however, due to the number of historical buildings and structures, all but 10 of these properties are not delineated on **Figure 3**. The 10 buildings and structures delineated in **Figure 3** (**Appendix A**) have been recorded within the boundary of the Ogden Hinckley Airport property, but none of them are within the proposed Project APE.

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
1010 W Kershaw	Ogden	Out-of-Period	1990	No	Warehouse	Warehouse
1036 W Kershaw	Ogden	Out-of-Period	1982	No	Warehouse	Commercial (Gen.)
1044 W Kershaw	Ogden	Eligible/Contributing	1952	No	Other late 20th C. Type	Single Dwelling
1052 W Kershaw	Ogden	Eligible/Contributing	1958	No	Other late 20th C. Type	Single Dwelling
1055 27th St.	Ogden	Eligible/Contributing	1949	Yes	No Information	Residential (Gen.)
1058 W 27th	Ogden	Eligible/Contributing	1967	No	Warehouse	Warehouse
1061 27th St.	Ogden	Eligible/Contributing	1949	Yes	No Information	Residential (Gen.)
1067 27th St.	Ogden	Eligible/Contributing	1940	Yes	No Information	Residential (Gen.)
1069 W 27th	Ogden	Eligible/Contributing	1970	No	Warehouse	Warehouse
1073 27th St.	Ogden	Eligible/Contributing	1940	Yes	No Information	Residential (Gen.)
1074 W Riverdale Road	Riverdale	Out-of-Period	1990	No	Other Commercial/ Public	Specialty Store
1076 W Kershaw	Ogden	Eligible/Contributing	1952	No	Box Ranch	Single Dwelling
1076 W Kershaw	Ogden	Ineligible/Non-Contributing	1955	No	Other late 20th C. Type	Single Dwelling
1080 W Riverdale Road	Riverdale	Out-of-Period	1985	No	Strip Mall	Specialty Store
1084 W Kershaw	Ogden	Eligible/Contributing	1952	No	Box Bungalow	Single Dwelling
1084 W Kershaw	Ogden	Eligible/Contributing	1950	No	Other late 20th C. Type	Single Dwelling
1097 27th St.	Ogden	Eligible/Contributing	1940	Yes	No Information	Residential (Gen.)
1099 W Riverdale Road	Riverdale	Out-of-Period	1996	No	Other Commercial/ Public	Specialty Store
1125 W Riverdale Road	Riverdale	Out-of-Period	2000	No	Restaurant	Restaurant
1130 W 4100 S	Ogden	Out-of-Period	1996	No	Other late 20th C. Type	Single Dwelling
1134 W Riverdale Road	Riverdale	Out-of-Period	1985	No	Other Commercial/ Public	Department Store
1134 W Riverdale Road	Riverdale	Out-of-Period	2003	No	Other Commercial/ Public	Department Store
1135 W Riverdale Road	Riverdale	Out-of-Period	1999	No	Other Commercial/ Public	Department Store
1137 W Riverdale Road	Riverdale	Out-of-Period	1999	No	Other Commercial/ Public	Specialty Store
1140 W Riverdale Road	Riverdale	Out-of-Period	1985	No	Other Commercial/ Public	Specialty Store
1145 W Riverdale Road	Riverdale	Out-of-Period	1999	No	Other Commercial/ Public	Specialty Store
1150 W Riverdale Road	Riverdale	Out-of-Period	1980	No	Other Commercial/ Public	Specialty Store
1151 W Riverdale Road	Riverdale	Out-of-Period	1999	No	Strip Mall	Specialty Store
1152 W Riverdale Road	Riverdale	Out-of-Period	1980	No	Other Commercial/ Public	Specialty Store
1154 W Riverdale Road	Riverdale	Out-of-Period	1965	No	Other Commercial/ Public	Specialty Store
1155 W Riverdale Road	Riverdale	Out-of-Period	1999	No	Drive-In Restaurant	Restaurant
1156 W Riverdale Road	Riverdale	Out-of-Period	1965	No	Other Commercial/ Public	Specialty Store
1200 W Riverdale Road	Riverdale	Out-of-Period		No	Bridge	Road Transp. Related

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
1403 W Riverdale Road	Riverdale	Eligible/Significant	1953	No	WWII-Era Cottage w/Gar.	Single Dwelling
1430 W Riverdale Road	Riverdale	Eligible/Significant	1955	No	Ranch with Garage	Single Dwelling
1450 W Riverdale Road	Riverdale	Ineligible/Non-Contributing	1955	No	Other Commercial/ Public	Commercial (Gen.)
1467 W Riverdale Road	Riverdale	Out-of-Period	1945	No	WWII-Era Cottage w/Gar.	Single Dwelling
1481 W Riverdale Road	Riverdale	Out-of-Period	1970	No	Theater	Theater
1498 W 5000 S	Riverdale	Out-of-Period	1975	No	Restaurant	Restaurant
1500 W 5000 S	Riverdale	Out-of-Period	1975	No	Double House	Hotel/Motel
1500 W 5000 S	Riverdale	Out-of-Period	1995	No	Double House	Hotel/Motel
1551 W Riverdale Road	Riverdale	Out-of-Period	1985	No	Other Apt./Hotel Plan	Multiple Dwelling
1661 W Riverdale Road	Riverdale	Out-of-Period	2000	No	Bridge	Road Transp. Related
1671 W Riverdale Road	Riverdale	Out-of-Period	1975	No	Other/Undefined	Other
1701 W Riverdale Road	ROY	Out-of-Period	1998	No	Warehouse	Mixed Comm./Resid.
1701 W Riverdale Road	ROY	Out-of-Period	1999	No	Other Commercial/ Public	Specialty Store
1811 W 3300 S	Ogden	Eligible/Contributing	1950	No	Early Ranch/Rambler	Single Dwelling
2 G Ave.	Ogden	Out-of-Period	1980	No	No Information	No Information
2008 W 3300 S	Ogden	Eligible/Contributing	1920	No	Bungalow	Single Dwelling
201 33RD St.	Ogden	Eligible/Significant	1885	No	Crosswing	Residential (Gen.)
207 33RD St.	Ogden	Ineligible/Non-Contributing	1885	No	Crosswing	Residential (Gen.)
213 33RD St.	Ogden	Ineligible/Non-Contributing	1910	No	No Information	Residential (Gen.)
215 E 31ST St.	Ogden	Eligible/Significant	1912	No	Bungalow	Single Dwelling
219 33RD St.	Ogden	Eligible/Significant	1875	No	Crosswing	Residential (Gen.)
219 E 31ST St.	Ogden	Eligible/Contributing	1892	No	Crosswing	Single Dwelling
220 33RD St.	Ogden	Eligible/Significant	1915	No	Foursquare (Box)	Residential (Gen.)
222 W 31ST St.	Ogden	Ineligible/Non-Contributing	1911	No	Other Residential Type	Single Dwelling
225 31ST St.	Ogden	Ineligible/Non-Contributing	1915	No	No Information	Residential (Gen.)
230 W 31ST St.	Ogden	Ineligible/Non-Contributing	1894	No	Crosswing	Single Dwelling
232 E 31ST St.	Ogden	Ineligible/Non-Contributing	1925	No	Foursquare (Box)	Single Dwelling
234 31ST St.	Ogden	Ineligible/Non-Contributing	1935	No	Foursquare (Box)	Residential (Gen.)
235 31ST St.	Ogden	Out-of-Period	1980	No	No Information	Commercial (Gen.)
235 31ST St.	Ogden	Out-of-Period	1975	No	No Information	Residential (Gen.)
235 33RD St.	Ogden	Ineligible/Non-Contributing	1870	No	Hall-Parlor	Residential (Gen.)
240 31ST St.	Ogden	Ineligible/Non-Contributing	1905	No	Side Passage/Entry	Residential (Gen.)
243 31ST St.	Ogden	Out-of-Period	1975	No	No Information	Commercial (Gen.)
245 33RD St.	Ogden	Eligible/Significant	1890	No	Crosswing	Residential (Gen.)
247 E 31ST St.	Ogden	Out-of-Period	1958	No	1-Part Block	Specialty Store
249 33RD St.	Ogden	Ineligible/Non-Contributing	1890	No	Crosswing	Residential (Gen.)
250 W 31ST St.	Ogden	Out-of-Period	1959	No	Warehouse	Warehouse
252 31ST St.	Ogden	Eligible/Significant	1915	No	Bungalow	Residential (Gen.)
252 33RD St.	Ogden	Out-of-Period	1950	No	No Information	Residential (Gen.)

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
252 E 31ST St.	Ogden	Eligible/Significant	1926	No	Bungalow	Single Dwelling
254 36th St.	Ogden	Out-of-Period	1945	No	Foursquare (Box)	Residential (Gen.)
255 33RD St.	Ogden	Eligible/Significant	1885	No	Crosswing	Residential (Gen.)
257 31ST St.	Ogden	Out-of-Period	1900	No	No Information	No Information
258 33RD St.	Ogden	Eligible/Significant	1885	No	Side Passage/Entry	Residential (Gen.)
259 36th St.	Ogden	Ineligible/Non-Contributing	1928	No	No Information	Residential (Gen.)
259 36th St.	S Ogden			No	No Information	No Information
259 E 31ST St.	Ogden	Out-of-Period	1960	No	Other Commercial/ Public	No Information
260 36th St.	Ogden	Eligible/Significant	1935	No	Foursquare (Box)	Residential (Gen.)
261 33RD St.	Ogden	Eligible/Significant	1885	No	Crosswing	Residential (Gen.)
2610 S G Ave.	Ogden	Out-of-Period	1990	No	Mobile Home	Single Dwelling
262 33RD St.	Ogden	Eligible/Significant	1890	No	Hall-Parlor	Residential (Gen.)
2620 S H Ave.	Ogden	Ineligible/Non-Contributing	1950	No	Other Residential Type	Single Dwelling
2621 S Midland Dr.	Ogden	Out-of-Period	1980	No	Other Commercial/ Public	Commercial (Gen.)
2626 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Other Commercial/ Public	Commercial (Gen.)
263 36th St.	Ogden	Eligible/Significant	1941	No	No Information	Residential (Gen.)
263 36th St.	S Ogden			No	No Information	No Information
263 E 31ST St.	Ogden	Ineligible/Non-Contributing	1900	No	Rectangular Block	Single Dwelling
2631 F Ave.		Eligible/Significant	1920	No	Shotgun	Residential (Gen.)
2631 F Ave.	Ogden	Eligible/Significant	1920	No	No Information	No Information
2631 S F Ave.	Ogden	Ineligible/Non-Contributing	1902	No	Bungalow	Single Dwelling
2635 F Ave.		Out-of-Period	1950	No	No Information	Residential (Gen.)
2635 F Ave.	Ogden	Out-of-Period	1950	No	No Information	No Information
2637 H Ave.	Ogden	Out-of-Period	1960	No	No Information	Residential (Gen.)
2637 S H Ave.	Ogden	Ineligible/Non-Contributing	1956	No	Ranch	Single Dwelling
264 36th St.	Ogden	Eligible/Significant	1945	No	WWII-Era Cottage	Residential (Gen.)
2640 F Ave.		Eligible/Significant	1930	No	Hall-Parlor	Residential (Gen.)
2640 F Ave.	Ogden	Eligible/Significant	1930	No	Garage Dominant	No Information
2640 H Ave.	Ogden	Out-of-Period	1985	No	No Information	Residential (Gen.)
2640 S Industrial Dr.	Ogden	Out-of-Period	1985	No	Warehouse	Warehouse
2645 S F Ave.	Ogden	Out-of-Period	1999	No	Other late 20th C. Type	Single Dwelling
2655 G Ave.	Ogden	Out-of-Period	1980	No	No Information	Religious (Gen.)
2655 S G Ave.	Ogden	Out-of-Period	1973	No	Other/Undefined	Other
266 33RD St.	Ogden	Eligible/Significant	1920	No	Bungalow	Residential (Gen.)
2660 S Industrial Dr.	Ogden	Out-of-Period	1979	No	Warehouse	Warehouse
2660 S Pennsylvania Ave.	Ogden	Out-of-Period	1980	No	Warehouse	Warehouse
2670 F Ave.		Ineligible/Non-Contributing	1930	No	Hall-Parlor	Residential (Gen.)
2670 F Ave.	Ogden	Ineligible/Non-Contributing	1930	No	Garage Dominant	No Information
2673 F Ave.		Ineligible/Non-Contributing	1920	No	Bungalow	Residential (Gen.)
2673 F Ave.	Ogden	Ineligible/Non-Contributing	1920	No	Bank Barn	No Information
2673 S F Ave.	Ogden	Eligible/Contributing	1926	No	Bungalow	Single Dwelling

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
2675 S 1000 W	Ogden	Out-of-Period	1990	No	Warehouse	Warehouse
2675 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Warehouse
2679 S Midland Dr.	Ogden	Out-of-Period	1977	No	Other Commercial/ Public	Commercial (Gen.)
268 36th St.	Ogden	Eligible/Significant	1940	No	WWII-Era Cottage	Residential (Gen.)
2680 S Industrial Dr.	Ogden	Out-of-Period	1979	No	Warehouse	Warehouse
2683 S H Ave.	Ogden	Eligible/Contributing	1955	No	Box Ranch	Single Dwelling
2686 H Ave.	Ogden	Out-of-Period	1960	No	No Information	Residential (Gen.)
269 31ST St.	Ogden	Out-of-Period	1963	No	No Information	No Information
269 33RD St.	Ogden	Eligible/Significant	1885	No	Crosswing	Residential (Gen.)
269 36th St.	Ogden	Ineligible/Non-Contributing	1925	No	No Information	Residential (Gen.)
269 36th St.	S Ogden	No Information		No	No Information	No Information
2690 S Pennsylvania Ave.	Ogden	Out-of-Period	1980	No	Warehouse	Warehouse
270 33RD St.	Ogden	Ineligible/Non-Contributing	1890	No	Crosswing	Residential (Gen.)
270 36th St.	Ogden	Out-of-Period	1970	No	No Information	Commercial (Gen.)
2710 S H Ave.	Ogden	Eligible/Contributing	1960	No	Service bay/Business	Service Station
2711 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Warehouse
2711 S Midland Dr.	Ogden	Out-of-Period	1980	No	Other Commercial/ Public	Business/Office
2712 W Industrial Dr.	Ogden	Out-of-Period	1979	No	Other Commercial/ Public	Business/Office
2716 H Ave.	Ogden	Out-of-Period	1950	No	No Information	No Information
2722 H Ave.	Ogden	Out-of-Period	1950	No	No Information	Residential (Gen.)
2722 S H Ave.	Ogden	Ineligible/Non-Contributing	1951	No	WWII-Era Cottage	Single Dwelling
2727 S Pennsylvania	Ogden	Eligible/Contributing	1955	No	Other Commercial/ Public	Commercial (Gen.)
2730 H Ave.	Ogden	Out-of-Period	1950	No	No Information	Residential (Gen.)
2730 S H Ave.	Ogden	Ineligible/Non-Contributing	1952	No	WWII-Era Cottage	Single Dwelling
2730 S Pennsylvania Ave.	Ogden	Eligible/Significant	1947	No	WWII-Era Cottage	Single Dwelling
2738 S Pennsylvania	Ogden	Eligible/Contributing	1950	No	Early Ranch/Rambler	Single Dwelling
2738 W Industrial Dr.	Ogden	Out-of-Period	1982	No	Warehouse	Warehouse
2740 S Pennsylvania	Ogden	Eligible/Contributing	1965	No	Church/Meetinghouse	Religious Facility
2741 S Midland Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Commercial (Gen.)
2744 S Pennsylvania	Ogden	Eligible/Contributing	1960	No	Service bay/Business	Service Station
2747 S Pennsylvania Ave.	Ogden	Eligible/Contributing	1943	No	Metal Silo	Agric. Processing
2749 S Wadman Dr.	Ogden	Out-of-Period	2001	No	Warehouse	Warehouse
275 33RD St.	Ogden	Eligible/Significant	1885	No	Crosswing	Residential (Gen.)
2750 S Pennsylvania Ave.	Ogden	Out-of-Period	1980	No	Other/Undefined	Business/Office

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
2750 S Pennsylvania Ave.	Ogden	Out-of-Period	1990	No	Comm./Industrial Block	Commercial (Gen.)
2753 S Midland Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Industrial (Gen.)
2755 S Pennsylvania	Ogden	Eligible/Contributing	1955	No	Early Ranch/Rambler	Single Dwelling
2760 S Wadman Dr.	Ogden	Out-of-Period	1985	No	Warehouse	Warehouse
2765 S Midland Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Commercial (Gen.)
2767 S Industrial Dr.	Ogden	Out-of-Period	1979	No	Warehouse	Commercial (Gen.)
2773 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Commercial (Gen.)
2774 S Industrial Dr.	Ogden	Out-of-Period	1978	No	Other Commercial/ Public	Business/Office
2775 S G Ave.	Ogden	Out-of-Period	1990	No	Warehouse	Warehouse
2775 S Midland Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Industrial (Gen.)
2780 G Ave.	Ogden	Out-of-Period	1975	No	Other/Undefined	Agric. Processing
2780 G Ave.	Ogden	Eligible/Significant	1930	No	No Information	Agric. Processing
2780 G Ave.	Ogden	Out-of-Period	1975	No	No Information	Agric. Processing
2780 G Ave.	Ogden	Out-of-Period	1975	No	No Information	Agric. Processing
2780 G Ave.	Ogden	Out-of-Period	1970	No	No Information	Agric. Processing
2780 G Ave.	Ogden	Out-of-Period	1975	No	No Information	Agric. Processing
2780 G Ave.	Ogden	Eligible/Significant	1930	No	No Information	Agric. Processing
2780 G Ave.	Ogden	Out-of-Period	1975	No	Other/Undefined	No Information
2780 G Ave.	Ogden	Eligible/Significant	1930	No	Other/Undefined	No Information
2780 G Ave.	Ogden	Out-of-Period	1975	No	No Information	No Information
2780 G Ave.	Ogden	Out-of-Period	1975	No	No Information	No Information
2780 G Ave.	Ogden	Eligible/Significant	1930	No	No Information	No Information
2780 S G Ave.	Ogden	Eligible/Contributing	1930	No	Other Granery/Silo	Agric. Processing
2785 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Commercial (Gen.)
2785 S Wadman Dr.	Ogden	Out-of-Period	1990	No	Warehouse	Warehouse
2789 S Midland Dr.	Ogden	Out-of-Period	1980	No	Other Commercial/ Public	Business/Office
2790 S 1000 W	Ogden	Out-of-Period	1995	No	Warehouse	Warehouse
2794 S Pennsylvania Ave.	Ogden	Eligible/Contributing	1955	No	Service bay/Business	Commercial (Gen.)
2795 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Other Commercial/ Public	Business/Office
2795 S Pennsylvania Ave.	Ogden	Out-of-Period	1976	No	Comm./Industrial Block	Commercial (Gen.)
2800 S Pennsylvania	Ogden	Eligible/Significant	1955	No	Banded Concrete Silo	Commercial (Gen.)
2808 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Commercial (Gen.)
281 33RD St.	Ogden	Eligible/Significant	1920	No	Bungalow	Residential (Gen.)
2810 S 1000 W	Ogden	Out-of-Period	1990	No	Warehouse	Warehouse
2810 S Pennsylvania Ave.	Ogden	Ineligible/Non-Contributing	1960	No	Enframed Window Wall	Commercial (Gen.)
2810 S Pennsylvania Ave.	Ogden	Out-of-Period	1980	No	Comm./Industrial Block	Commercial (Gen.)

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
2811 G Ave.	Ogden	Out-of-Period	1960	No	No Information	Residential (Gen.)
2811 S G Ave.	Ogden	Ineligible/Non-Contributing	1956	No	Other/Undefined	Single Dwelling
2815 S Industrial Dr.	Ogden	Out-of-Period	1980	No	Warehouse	Warehouse
2820 S Pennsylvania Ave.	Ogden	Out-of-Period	1980	No	Service bay/Business	Commercial (Gen.)
2832 S 1000 W	Ogden	Eligible/Contributing	1955	No	WWII-Era Cottage	Single Dwelling
2832 S H Ave.	Ogden	Ineligible/Non-Contributing	1955	No	Ranch	Single Dwelling
2850 S Pennsylvania Ave.	Ogden	Out-of-Period	1978	No	Service bay/Business	Commercial (Gen.)
2863 S 1250 W	Ogden	Eligible/Contributing	1940	No	Other Residential Type	Single Dwelling
2881 S Pennsylvania Ave.	Ogden	Out-of-Period	1980	No	Comm./Industrial Block	Commercial (Gen.)
2914 S 1100 W	Ogden	Ineligible/Non-Contributing	1955	No	Service bay/Business	Service Station
296 36th St.	Ogden	Out-of-Period	1980	No	No Information	Warehouse
2961 S 1400 W	Ogden	Ineligible/Non-Contributing	1955	No	WWII-Era Cottage	Single Dwelling
2980 S Commerce Way	Ogden	Out-of-Period	1995	No	Comm./Industrial Block	Commercial (Gen.)
2994 S 1475 W	Ogden	Ineligible/Non-Contributing	1950	No	Other Residential Type	Single Dwelling
3000 S 1000 W	Ogden	Out-of-Period	1980	No	Comm./Industrial Block	Commercial (Gen.)
3018 S 1475 W	Ogden	Eligible/Contributing	1945	No	WWII-Era Cottage	Single Dwelling
3048 S 1475 W	Ogden	Eligible/Contributing	1955	No	Other Residential Type	Single Dwelling
3062 S 1475 W	Ogden	Ineligible/Non-Contributing	1960	No	Ranch	Single Dwelling
3074 S 1475 W	Ogden	Eligible/Contributing	1950	No	Early Ranch/Rambler	Single Dwelling
3080 S PACIFIC	Ogden	Ineligible/Non-Contributing	1945	No	Other Residential Type	Single Dwelling
3104 S PACIFIC	Ogden	Ineligible/Non-Contributing	1897	No	Shotgun	Single Dwelling
3108 S PACIFIC	Ogden	Out-of-Period	1980	No	Garage	Commercial (Gen.)
3200 S PACIFIC	Ogden	Eligible/Contributing	1882	No	Crosswing	Single Dwelling
3315 S Midland Dr.	Ogden	Ineligible/Non-Contributing	1945	No	WWII-Era Cottage	Single Dwelling
3320 S PACIFIC	Ogden	Eligible/Contributing	1913	No	No Information	Agric. Processing
3350 S AIRPORT Road	Ogden	Out-of-Period	1995	No	Other Commercial/ Public	Business/Office
3463 S AIRPORT Road	Ogden	Out-of-Period	1990	No	Other/Undefined	Air Transp. Related
3470 S Midland Dr.	Ogden	Ineligible/Non-Contributing	1950	No	Ranch	Single Dwelling
3478 S Midland Dr.	Ogden	Eligible/Significant	1960	No	Ranch	Single Dwelling
3483 S Airport Rd.	Ogden	Out-of-Period	1990	No	Other/Undefined	Air Transp. Related
3485 S Parker Dr.	Ogden	Eligible/Contributing	1951	No	Shed - Misc.	Agric. Outbuilding
3490 S Parker Dr.	Ogden	Eligible/Contributing	1951	No	WWII-Era Cottage	Single Dwelling
3515 S Airport Rd.	Ogden	Out-of-Period	1980	No	Other/Undefined	Air Transp. Related
3575 S Midland Dr.	Ogden	Eligible/Contributing	1935	No	Shed	Other

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
3594 S Midland Dr.	Ogden	Eligible/Contributing	1950	No	Early Ranch/Rambler	Single Dwelling
3669 S 1900 W	Ogden	Eligible/Contributing	1951	No	Bungalow	Single Dwelling
3675 S Midland Dr.	Ogden	Eligible/Contributing	1966	No	Ranch	Single Dwelling
3685 S River Valley Dr.	Ogden	Out-of-Period	1975	No	Ranch	Single Dwelling
3693 S River Valley Dr.	Ogden	Out-of-Period	1972	No	Split Entry	Single Dwelling
3694 S River Valley Dr.	Ogden	Out-of-Period	1968	No	Other late 20th C. Type	Single Dwelling
3695 S AIRPORT Road	Ogden	Out-of-Period	1980	No	Other/Undefined	Air Transp. Related
3700 S River Valley Dr.	Ogden	Out-of-Period	1973	No	Split Entry	Single Dwelling
3701 S River Valley Dr.	Ogden	Out-of-Period	1972	No	Split Entry	Single Dwelling
3702 S River Valley Dr.	Ogden	Out-of-Period	1973	No	Ranch	Single Dwelling
3705 S River Valley Dr.	Ogden	Out-of-Period	1978	No	Split Entry	Single Dwelling
3712 S River Valley Dr.	Ogden	Out-of-Period	1968	No	Other late 20th C. Type	Single Dwelling
3713 S River Valley Dr.	Ogden	Out-of-Period	1975	No	Split Entry	Single Dwelling
3715 S 900 W	Ogden	Out-of-Period	1973	No	Split Entry	Single Dwelling
3715 S Airport Rd.	Ogden	Out-of-Period	1985	No	Warehouse	Warehouse
3720 S River Valley Dr.	Ogden	Out-of-Period	1974	No	Ranch	Single Dwelling
3723 S River Valley Dr.	Ogden	Out-of-Period	1973	No	Ranch	Single Dwelling
3728 S River Valley Dr.	Ogden	Out-of-Period	1968	No	Other late 20th C. Type	Single Dwelling
3736 S Parker Dr.	Ogden	Out-of-Period	1976	No	Ranch	Single Dwelling
3740 S 900 W	Ogden	Out-of-Period	1973	No	Split Entry	Single Dwelling
3741 S 900 W	Ogden	Out-of-Period	1975	No	Other late 20th C. Type	Single Dwelling
3746 S Parker Dr.	Ogden	Out-of-Period	1975	No	Ranch	Single Dwelling
3750 S Airport Rd.	Ogden	Out-of-Period	1985	No	Warehouse	Warehouse
3756 S 900 W	Ogden	Out-of-Period	1973	No	Split Level	Single Dwelling
3756 S Parker Dr.	Ogden	Out-of-Period	1976	No	Other late 20th C. Type	Agric. Outbuilding
3757 S 900 W	Ogden	Out-of-Period	1973	No	Ranch	Single Dwelling
3767 S 900 W	Ogden	Out-of-Period	1973	No	Ranch	Single Dwelling
3770 S 900 W	Ogden	Out-of-Period	1975	No	Other late 20th C. Type	Single Dwelling
3779 S 900 W	Ogden	Out-of-Period	1973	No	Ranch	Single Dwelling
3791 S 900 W	Ogden	Out-of-Period	1974	No	Split Entry	Single Dwelling
3804 S Airport Rd.	Ogden	Out-of-Period	1990	No	Other Commercial/ Public	Business/Office
3811 S 900 W	Ogden	Out-of-Period	1973	No	Ranch	Single Dwelling
3818 S 900 W	Ogden	Out-of-Period	1972	No	Ranch	Single Dwelling
3825 S 900 W	Ogden	Out-of-Period	1973	No	Ranch	Single Dwelling
3900 S Airport Rd.	Ogden	Eligible/Contributing	1910	No	Other/Undefined	Waterworks
3909 S Airport Rd.	Ogden	Out-of-Period	1980	No	Other/Undefined	Air Transp. Related

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
3934 S Parker Dr.	Ogden	Out-of-Period	1965	No	Ranch	Single Dwelling
3962 S Parker Dr.	Ogden	Out-of-Period	1964	No	Ranch	Single Dwelling
3980 S Parker Dr.	Ogden	Out-of-Period	1964	No	Ranch	Single Dwelling
4000 S Parker Dr.	Ogden	Out-of-Period	1990	No	Church/Meetinghouse	Religious Facility
4044 S Parker Dr.	Ogden	Out-of-Period	1998	No	Other late 20th C. Type	Single Dwelling
4052 S Parker Dr.	Ogden	Out-of-Period	1996	No	Other late 20th C. Type	Single Dwelling
4060 S Parker Dr.	Ogden	Out-of-Period	1996	No	Other late 20th C. Type	Single Dwelling
4068 S Parker Dr.	Ogden	Out-of-Period	1996	No	Other late 20th C. Type	Single Dwelling
4076 S Parker Dr.	Ogden	Out-of-Period	1997	No	Other late 20th C. Type	Single Dwelling
4084 S Parker Dr.	Ogden	Out-of-Period	1997	No	Other late 20th C. Type	Single Dwelling
4774 S 1300 W	Riverdale	Out-of-Period	1995	No	Other Commercial/ Public	Business/Office
4813 S 1700 W	Riverdale	Out-of-Period	1969	No	Ranch with Garage	Single Dwelling
4847 S 1700 W	Riverdale	Out-of-Period	1969	No	Ranch	Single Dwelling
4859 S 1700 W	Riverdale	Out-of-Period	1990	No	Double House	Single Dwelling
4875 S 1700 W	Riverdale	Out-of-Period	1957	No	Ranch	Single Dwelling
4891 S 1700 W	Riverdale	Out-of-Period	1966	No	Ranch with Garage	Single Dwelling
4931 S 1700 W	Riverdale	Eligible/Significant	1941	No	Period Cottage	Single Dwelling
4932 S 1700 W	Riverdale	Eligible/Contributing	1925	No	Bungalow	Single Dwelling
4984 S 1700 W	Riverdale	Ineligible/Non-Contributing	1937	No	Bungalow	Single Dwelling
5075 S 1500 W	Riverdale	Out-of-Period	2000	No	Other Commercial/ Public	Business/Office
5130 S 1700 W	ROY	Eligible/Contributing	1950	No	Comm./Industrial Block	Industrial Storage
762 W Ellis	Ogden	Eligible/Contributing	1950	No	Other Residential Type	Single Dwelling
762 W Ellis	Ogden	Eligible/Contributing	1950	No	Other Residential Type	Single Dwelling
762 W Ellis	Ogden	Eligible/Contributing	1950	No	WWII-Era Cottage	Single Dwelling
801 27th St.	Ogden	Demolished	1970	No	No Information	Commercial (Gen.)
801 W 27th St.	Ogden	Out-of-Period	1970	No	Service bay/Business	Specialty Store
804 W 27th St.	Ogden	Eligible/Contributing	1950	No	No Information	Residential (Gen.)
804 W Binford	Ogden	Eligible/Contributing	1950	No	No Information	Residential (Gen.)
804 W Binford St.	Ogden	Eligible/Contributing	1950	No	Ranch	Single Dwelling
804 W Binford St.	Ogden	Eligible/Contributing	1950	No	WWII-Era Cottage	Single Dwelling
807 W Binford St.	Ogden	Eligible/Significant	1928	No	Bungalow	Single Dwelling
809 27th St.	Ogden	Demolished	1885	No	Crosswing	Residential (Gen.)
809 27th St.	Ogden	Demolished	1885	No	Crosswing	Residential (Gen.)
810 W 27th St.	Ogden	Eligible/Contributing	1950	No	No Information	Residential (Gen.)
811 W Binford St.	Ogden	Out-of-Period	1960	No	Mobile Home	Single Dwelling
812 W ELLIS	Ogden	Out-of-Period	1955	No	No Information	Residential (Gen.)
813 W 26th St.	Ogden	Ineligible/Non-Contributing	1940	No	Hall-Parlor	Residential (Gen.)
813 W DOXEY St.	Ogden	Ineligible/Non-Contributing	1954	No	Other/Undefined	Single Dwelling
815 W 26th St.	Ogden	Ineligible/Non-Contributing	1940	No	Hall-Parlor	Residential (Gen.)

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
815 W Binford St.	Ogden	Ineligible/Non-Contributing	1951	No	Crosswing - Center	Single Dwelling
819 27th St.	Ogden	Eligible/Significant	1910	Yes	Bungalow	Residential (Gen.)
820 W Binford	Ogden	Eligible/Contributing	1950	No	No Information	Residential (Gen.)
820 W Binford St.	Ogden	Eligible/Contributing	1936	No	Double House	Multiple Dwelling
820 W DOXEY St.	Ogden	Eligible/Significant	1955	No	WWII-Era Cottage	Single Dwelling
821 W DOXEY St.	Ogden	Eligible/Contributing	1955	No	WWII-Era Cottage	Single Dwelling
823 W 26th St.	Ogden	Ineligible/Non-Contributing	1940	No	Shotgun	Residential (Gen.)
823 W ELLIS	Ogden	Out-of-Period	1950	No	No Information	Residential (Gen.)
825 27th St.	Ogden	Eligible/Significant	1918	Yes	Foursquare (Box)	Residential (Gen.)
825 27th St.	Ogden	Eligible/Significant	1918	Yes	Foursquare (Box)	Residential (Gen.)
825 Binford	Ogden	Ineligible/Non-Contributing	1940	No	Other Residential Type	Residential (Gen.)
825 W Binford St.	Ogden	Ineligible/Non-Contributing	1953	No	Other/Undefined	Single Dwelling
829 27th St.	Ogden	Ineligible/Non-Contributing	1926	No	Period Cottage	Residential (Gen.)
829 27th St.	Ogden	Ineligible/Non-Contributing	1926	No	Period Cottage	Residential (Gen.)
830 W 27th St.	Ogden	Eligible/Contributing	1950	No	No Information	Residential (Gen.)
830 W Ellis	Ogden	Ineligible/Non-Contributing	1940	No	Hall-Parlor	Residential (Gen.)
831 W Doxey St.	Ogden	Eligible/Significant	1955	No	WWII-Era Cottage	Single Dwelling
831 W Ellis	Ogden	Out-of-Period	1950	No	No Information	Residential (Gen.)
832 W Doxey St.	Ogden	Ineligible/Non-Contributing	1955	No	Other/Undefined	Unknown
833 27th St.	Ogden	DEMOLISHED	1953	No	No Information	Residential (Gen.)
833 W 27th St.	Ogden	Ineligible/Non-Contributing	1910	No	Crosswing	Single Dwelling
833 W Binford St.	Ogden	Ineligible/Non-Contributing	1940	No	Other Residential Type	Single Dwelling
834 W Binford	Ogden	Eligible/Contributing	1950	No	No Information	Residential (Gen.)
834 W Binford St.	Ogden	Ineligible/Non-Contributing	1956	No	Crosswing - Center	Single Dwelling
834 W Doxey St.	Ogden	Eligible/Contributing	1952	No	WWII-Era Cottage	Single Dwelling
835 W Binford	Ogden	Out-of-Period	1970	No	No Information	Residential (Gen.)
838 27th St.	Ogden	DEMOLISHED	1940	No	Hall-Parlor	Residential (Gen.)
840 W Ellis	Ogden	Ineligible/Non-Contributing	1940	No	Side Passage/Entry	Residential (Gen.)
843 W 27th St.	Ogden	Ineligible/Non-Contributing	1952	No	Other/Undefined	Single Dwelling
845 27th St.	Ogden	DEMOLISHED	1940	No	Shotgun	Residential (Gen.)
845 27th St.	Ogden	DEMOLISHED	1940	No	Shotgun	Residential (Gen.)
847 W Doxey St.	Ogden	Ineligible/Non-Contributing	1955	No	Ranch	Single Dwelling
847 W Doxey St..	Ogden	Ineligible/Non-Contributing	1953	No	Other/Undefined	Single Dwelling
848 W 27th	Ogden	Ineligible/Non-Contributing	1950	No	Early Ranch/Rambler	Residential (Gen.)
848 W 27th St.	Ogden	Eligible/Contributing	1956	No	WWII-Era Cottage	Single Dwelling
849 26th St.	Ogden	Eligible/Contributing	1940	Yes	Side Passage/Entry	Residential (Gen.)
849 W 26th St.	Ogden	Eligible/Contributing	1941	No	Other/Undefined	Single Dwelling
850 W 27th St.	Ogden	Ineligible/Non-Contributing	1950	No	WWII-Era Cottage	Single Dwelling
851 W 26th St.	Ogden	Out-of-Period	1995	No	Other late 20th C. Type	Single Dwelling

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
853 26th St.	Ogden	Eligible/Significant	1925	Yes	Bungalow	Residential (Gen.)
853 27th St.	Ogden	Ineligible/Non-Contributing	1932	No	Bungalow	Residential (Gen.)
855 W 26th St.	Ogden	Out-of-Period	1995	No	Other/Undefined	Single Dwelling
857 27th St.	Ogden	Eligible/Significant	1928	Yes	Foursquare (Box)	Residential (Gen.)
865 27th St.	Ogden	Eligible/Significant	1928	Yes	Foursquare (Box)	Residential (Gen.)
869 27th St.	Ogden	Ineligible/Non-Contributing	1915	No	Double House	Multiple Dwelling
870 W Binford	Ogden	Eligible/Contributing	1950	No	Ranch	Residential (Gen.)
870 W Binford St.	Ogden	Out-of-Period	1959	No	WWII-Era Cottage	Single Dwelling
870 W ELLIS	Ogden	Ineligible/Non-Contributing	1940	No	Other Residential Type	Residential (Gen.)
875 W Binford	Ogden	Eligible/Contributing	1950	No	Early Ranch/Rambler	Residential (Gen.)
875 W Binford St.	Ogden	Eligible/Contributing	1956	No	WWII-Era Cottage	Single Dwelling
875 W Doxey St.	Ogden	Ineligible/Non-Contributing	1955	No	Other Residential Type	Single Dwelling
875 W Ellis	Ogden	Out-of-Period	1950	No	No Information	Residential (Gen.)
875 W Ellis	Ogden	Eligible/Contributing	1945	No	WWII-Era Cottage	Single Dwelling
878 W Ellis	Ogden	Ineligible/Non-Contributing	1940	No	Hall-Parlor	Residential (Gen.)
881 27th St.	Ogden	DEMOLISHED	1930	No	No Information	Residential (Gen.)
882 W 3800 S	Ogden	Out-of-Period	1972	No	Ranch	Single Dwelling
882 W 3800 S	Ogden	Out-of-Period	1972	No	Ranch	Single Dwelling
882 W 3800 S	Ogden	Out-of-Period	1972	No	Ranch with Garage	Single Dwelling
885 27th St.	Ogden	Ineligible/Non-Contributing	1922	No	Period Cottage	Residential (Gen.)
889 27th Street	Ogden	Ineligible/Non-Contributing	1950	No	No Information	Residential (Gen.)
903 W Binford	Ogden	Eligible/Contributing	1950	Yes	Other Residential Type	Single Dwelling
903 W Binford St.	Ogden	Eligible/Significant	1955	No	WWII-Era Cottage	Single Dwelling
904 W Binford	Ogden	Ineligible/Non-Contributing	1950	No	Early Ranch/Rambler	Single Dwelling
904 W Kershaw	Ogden	Ineligible/Non-Contributing	1955	No	Box Ranch	Single Dwelling
906 Binford	Ogden	Eligible/Contributing	1950	Yes	No Information	Multiple Dwelling
906 W Binford St.	Ogden	Eligible/Contributing	1950	No	WWII-Era Cottage	Single Dwelling
906 W Kershaw	Ogden	Eligible/Contributing	1955	No	Box Ranch	Single Dwelling
908 W Kershaw	Ogden	Eligible/Contributing	1955	No	Box Ranch	Single Dwelling
912 Binford	Ogden	Eligible/Contributing	1940	Yes	Other Residential Type	Residential (Gen.)
912 W Binford St.	Ogden	Ineligible/Non-Contributing	1945	No	Other/Undefined	Single Dwelling
912 W ELLIS	Ogden	Ineligible/Non-Contributing	1952	No	Ranch with Carport	Single Dwelling
912 W ELLIS	Ogden	Ineligible/Non-Contributing	1952	No	WWII-Era Cottage	Single Dwelling
912 W ELLIS	Ogden	Ineligible/Non-Contributing	1952	No	WWII-Era Cottage	Single Dwelling
916 W Binford	Ogden	Ineligible/Non-Contributing	1950	Yes	Early Ranch/Rambler	Residential (Gen.)
916 W Binford	Ogden	Ineligible/Non-Contributing	1950	Yes	Early Ranch/Rambler	Residential (Gen.)
916 W Binford St.	Ogden	Eligible/Significant	1952	No	WWII-Era Cottage	Single Dwelling
918 Binford	Ogden	Eligible/Contributing	1950	Yes	No Information	Residential (Gen.)

Table 2. Architectural properties recorded within one mile of the proposed Project APE.

Street Address	City	Evaluation	Const. Date	NRHP Listed?	Type	Original Use
918 W Binford	Ogden	Ineligible/Non-Contributing	1952	No	Early Ranch/Rambler	Single Dwelling
920 W Ellis	Ogden	Out-of-Period	1997	No	Manufactured Home	Single Dwelling
920 W Ellis	Ogden	Out-of-Period	1997	No	Other/Undefined	Single Dwelling
920 W Ellis	Ogden	Out-of-Period	1997	No	Other/Undefined	Single Dwelling
925 W Ellis	Ogden	Ineligible/Non-Contributing	1952	No	Ranch	Residential (Gen.)
925 W Ellis	Ogden	Ineligible/Non-Contributing	1952	No	WWII-Era Cottage	Single Dwelling
925 W Ellis	Ogden	Ineligible/Non-Contributing	1952	No	WWII-Era Cottage	Single Dwelling
925 W Ellis	Ogden	Eligible/Contributing	1950	No	WWII-Era Cottage	Single Dwelling
927 Binford	Ogden	Ineligible/Non-Contributing	1940	No	No Information	Residential (Gen.)
927 W Binford	Ogden	Eligible/Contributing	1951	No	Box Ranch	Single Dwelling
928 W 4375 S	Riverdale	No Information		No	No Information	No Information
930 W 27th St.	Ogden	Eligible/Significant	1955	No	WWII-Era Cottage	Single Dwelling
935 26th St.	Ogden	Demolished	1930	No	Hall-Parlor	Residential (Gen.)
935 26th St.	Ogden	Demolished	1930	No	Hall-Parlor	Residential (Gen.)
935 W 26th St.	Ogden	Eligible/Significant	1935	No	Period Cottage	Single Dwelling
935 W Binford	Ogden	Eligible/Contributing	1957	No	Ranch	Single Dwelling
940 W 27th St.	Ogden	Eligible/Contributing	1955	No	WWII-Era Cottage	Single Dwelling
950 W Kershaw	Ogden	Out-of-Period	1995	No	Warehouse	Warehouse
SR-126	N/A	Demolished	1937	No	Bridge	Road Transp. Related

General Land Office Plat Maps

A search of General Land Office (GLO) survey plats was conducted on October 16, 2019. GLO maps were searched using the Utah State Office of the Bureau of Land Management's (BLM) internet website. The township and range for the search included Township 5 North, Ranges 1 and 2 West, with specific attention paid to Sections 1 and 12 of Township 5 North, Range 2 West and Section 6 of Township 5 North, Range 1 West. Four GLO maps, dating to 1855, 1871, 1891, and 1941, are on file at the BLM and are provided in **Appendix B**. The two maps from Township 5 North, Range 1 West did not provide any pertinent information regarding the proposed Project APE. However, the maps for Township 5 North, Range 2 West identified one north/south trending road in Sections 1 and 12, and two east/west trending roads in Section 12. The 1941 revision to the Township 5 North, Range 2 West notes the Bamberger railroad in the southern portion of the southwest corner of Section 12, and historic US Highway 91 and another north/south trending road in the southeast corner of Section 12. The only feature that may be visible in the current Project APE is the north/south trending road visible on the 1855 GLO. The remaining features are outside the current Project APE.

Historical Topographic Maps

Historical topographic maps, at 1:24000 scale, were reviewed for potential historical features that may be found within, or immediately adjacent to, the current Project APE. Historical topographic maps of this scale were only available dating to 1955, and revised in 1956, 1965, 1971, 1990, and 1999. These maps show the Ogden Municipal Airport, including three runways and five taxiways; the northwest branch of the Weber-Davis Canal; a few gravel pits; a northwest trending two-track road, several buildings or structures near the southwestern corner of the Project APE; and an east/west access road to three of those buildings or structures. All of these features are visible on the updates to the 1955 topographic map until 1971. By the 1990 topographic map, only two of those buildings remain and the Davis-Weber Canal had been diverted to its current path.

In 1990, the Roy and Ogden 1:24,000 scale topographic maps were updated. More detailed buildings were identified within the southwestern corner of the APE. However, the two-track access roads to these buildings are no longer delineated, suggesting that, at some point between 1971 and 1990, the area may have been

razed and reconstructed, especially given the level of construction necessary to divert the Davis-Weber Canal. This suggests that the buildings present in the southwestern corner of the Project APE may be out of period.

SURVEY METHODS

The proposed Project APE consists of 115 acres of private property. As portions of the proposed Project APE fall within the safety areas of active runways, those areas were excluded from survey as no construction will take place within those areas. The excluded areas account for approximately seven (7) acres of the proposed Project APE. The remaining 108 acres were surveyed for cultural resources. The areas surveyed for cultural resources, as well as the excluded areas, are shown on **Figure 4** (**Appendix A**).

The Class III cultural resources survey was completed by one archaeologist walking in parallel pedestrian transects spaced no more than 15 m (50 ft) apart. For the purposes of this survey, operational definitions of sites and isolates were taken from BLM's 2010 Guidelines for Identifying Cultural Resources (Handbook H-8110[2]):

"The minimum criteria for defining ***archaeological sites*** requiring use of the IMACS site record are that they should contain remains of past human activity that are at least 45 years old and should consist of one or more of the following:

- At least 10 artifacts of a single class (e.g., 10 sherds) within a 10-meter diameter area, except when all pieces appear to originate from a single source (e.g., one ceramic pot, one glass bottle).
- At least 15 artifacts that include at least 2 classes of artifact types (e.g., sherds, nails, glass) within a 10-meter diameter area.
- One or more archaeological features in temporal association with any number of artifacts.
- Two or more temporally associated archaeological features without artifacts (BLM Handbook H-8110, page 6)."

Operational definitions of ***linear sites*** were taken from the Utah Professional Archaeology Council (UPAC) *Linear Sites: Guidance for Identifying and Recording under Section 106 of the National Historic Preservation Act* (UPAC 2008:4-5[3]):

- "A linear site may be defined as any human-created feature or collection of features and artifacts that is substantially longer than it is wide. It has physical expression in the form of remains or modifications to the landscape."

Isolated occurrences (IOs) are all other historical or prehistoric cultural resources not recorded as sites.

RESULTS

The archaeological survey was conducted between 09/12/2019 and 09/24/2019 by Sonia Hutmacher Cunningham, MA, RPA, PG, who served as both the Field Director and Principal Investigator on the Project. Two archaeological sites and seven IOs were identified during the pedestrian cultural resources survey (see **Figure 5, Appendix A**).

Archaeological Sites

Two archaeological sites were identified during the pedestrian cultural resources survey. The first includes previously unrecorded features of the Ogden Hinckley Airport (Site 42WB512), which includes one cinder block storage facility, several frontage roads of unknown age, a decommissioned taxiway, and seven isolated artifacts (see Isolated Occurrences section below). The second site includes two newly recorded segments of the Davis-Weber Canal (Site 42WB487). Updated Utah Archaeology Site Forms for these sites are presented in **Appendix C**.

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[2] Bureau of Land Management
2002 Guidelines for Identifying Cultural Resources. BLM Handbook H-8110, Salt Lake City, Utah.

[3] Utah Professional Archaeological Council (UPAC)
2008 Linear Sites: Guidance for Identifying and Recording under Section 106 of the National Historic Preservation Act. Prepared by the Utah Professional Archaeological Council, Salt Lake City.

Site 42WB487 – Davis-Weber Canal

The Davis-Weber Canal is a gravity fed residential and agricultural irrigation canal owned and operated by the Davis and Weber Counties Canal Company. It was constructed in the 1880s as an earthen ditch. By the early 1910s, much of the original canal had been lined with concrete. The canal begins on the south side of the Weber River, west along Interstate 84, passing under US Highway 89 and continues northwesterly along the base of the plateau of Hill Air Force Base. The canal passes under Utah State Route 168 and flows toward Riverdale, east of Interstate 15, then turns south along the eastern edge of the city of Roy, where it travels along the Weber/Davis County Line adjacent to the Ogden Hinckley Airport, south through residential neighborhoods until it terminates in Layton. The total length of the Davis-Weber Canal is 17.8 miles, though it originally extended approximately 23 miles and served parts of Fruit Heights. As the existing IMACS site records for this site do not accurately represent the results of the features identified during the 2019 field investigations, DWE has updated the Utah Site Form to include those features.

On the Ogden Hinckley Airport property, two segments of the canal were observed. The first is at the northeast end of the Project APE along the northeast trending security fence, north of decommissioned Runway 7/25. In this area, the canal runs along the northern boundary of the survey parcel south of the security fence. Approximately 2340 feet of this segment is an open, concrete-lined canal (Segment 1) that appears to be out of service, but maintained, as two sections have been patched with a different type of concrete. The date the earthen canal was lined with concrete is unknown.

Segment 1 consists of a concrete lined, open canal that is approximately three feet wide at the base and six feet wide at the top. Each wall is approximately three feet deep. The width of the concrete is approximately six inches, though this varies in areas that have been patched. The open canal transitions to a boxed (piped) canal. The box culvert is four feet high, six feet wide, and eight inches thick and holds a 24-inch diameter corrugated steel pipe.

The second segment is a “boxed” canal segment. From the northwest end of the Project APE north of Runway 7/25, the canal is piped with modern corrugated metal pipe at a partially buried box culvert and continues, buried, south along an unknown route on the west side of the Ogden Hinckley Airport. This “boxed” canal is not visible in the Project APE until the southwestern parcel, where appears as a surficial concrete pipe that has been covered with approximately 12-24 inches of sediment. The length of Segment 2 is approximately 940 feet. The route in the NW/NW/NW quarter of Section 12 (Township 5 North, Range 2 West) where it has either been dismantled or buried. It is likely buried, continuing south, per Google Maps, though it is not delineated in this location on the Roy, Utah 1:24,000 scale USGS topographic map.

The boxed canal is a concrete pipe that has an approximately 24-inch interior diameter. The concrete pipe is 4-6 inches thick, based on the joints. There is one modern, grated box culvert for water drainage and maintenance access. The boxed culvert appears to have been installed as a surface feature and then covered with approximately 12 inches to up to two feet of sediment. The maximum height of the berm is five feet above the modern (disturbed) ground surface. A few areas of the berm have eroded, exposing the concrete pipe features.

Much of the site is in good condition and appears to have been maintained. At Segment 1, at least two sections of the lined canal have been repaired or replaced. The canal is clean, though it was not flowing in September 2019. It is either temporarily not in use or has been abandoned. The area surrounding the site is vegetated with tall grasses and forbes, though some greasewood and sage was also present in some areas.

Site 42WB512 – Ogden Hinckley Airport

The Ogden Hinckley Airport is located in the Ogden Valley on an old terrace that overlooks the Weber River to the east. It was partially recorded by Sagebrush Archaeological Consultants in 2014. The majority of the site area has been disturbed, and it appears that no natural ground surface remains. It is heavily vegetated in some areas (nearly 0% ground visibility), but also has areas where bare ground can be seen. Vegetation in the project area consists of introduced species such as alfalfa, golden aster, and other grasses and forbes. Sagebrush is also present along the perimeter of the airport property.

In 1939, Ogden City purchased approximately 750 acres of land in the southwest portion of the Ogden City on an old terrace with the intent to build an airport that would replace the old Ogden Municipal Airport, which was

constructed in 1928 (Sadler and Roberts 2000: 319[4]). The new Ogden City Airport was constructed in 1939. The US Government financially supported the construction of the airport and a US Weather Bureau station was also established here (Sadler and Roberts 2000:320). An administrative building, concrete landing strips, and a control tower were built (Sadler and Roberts 2000:320). During World War II, the airfield was used by the United States Army Air Forces. It had three concrete (now asphalt) runways and five taxiways (A, B, C, D, and E).

During DWE's 2019 field investigations of the four parcels, two access roads, one decommissioned portion of Taxiway C, one cinder block building of unknown construction date, and an 8 x 8-foot concrete pad were observed in the field. Additionally, seven isolated occurrences (historical artifacts) were recorded in association with the site. These artifacts are listed in the isolated occurrences section below. Modern features, such as instruction, location, and guidance signs; general signage; radio communications stations and antennae; ground-based lighted navigation aids (Navaids); and other signage were not recorded as features during this survey.

Two access roads were recorded during the archaeological survey: one perimeter fence road and one access road to decommissioned Taxiway C. The perimeter fence road is not engineered, but is somewhat maintained. It travels from the access area near the storage facilities on the east central side of the airport, south of Taxiway E, swings southwest, then makes a turn to the northwest where it forks and continues north along the western perimeter fence, west of decommissioned Runway 7/25. At the north end of the western perimeter fence, it turns northeast and continues north and east of Runway 17/35. The perimeter fence road is present north of the northernmost survey parcel, but is outside the Project APE at that location. The perimeter fence road is approximately 13,555 feet long, 8-10 feet wide, and has been graveled with recycled asphalt chips and gravel.

The second access road starts at the fork with the perimeter access road and continues northeast, parallel to Runway 3/21 and then swings north and dead ends at the intersection with the decommissioned portion of Taxiway C. This access road was also not engineered, but is somewhat maintained. It is currently used to access instruction, location, and guidance signs; general signage; radio communications stations and antennae; Navaids (lighting systems); and box signs on the west side of the airport. This access road is approximately 2775 feet long, 8-10 feet wide, and has been graveled with recycled asphalt chips and gravel.

The decommissioned portion of Taxiway C extends west from Runway 17/35 as a continuation of another unrecorded, decommissioned segment of Taxiway C. The current Taxiway C has been reconstructed to the north of its prior location. The eastern segments of the decommissioned Taxiway C were not recorded due to access security restrictions.

The recorded segment of decommissioned Taxiway C is approximately 2020 feet long and 50 feet wide. It was paved with asphalt, which is now in poor condition. A 755-foot-long pile of asphalt fragments encompassing 1.81 acres (78,660 square feet), blocks approximately 470 feet of the taxiway approximately 580 feet southeast of the intersection of the taxiway with decommissioned Runway 7/25 on the west side of the airport. These asphalt fragments appear to have been removed during decommissioning of Taxiway C and construction of the new Taxiway C. In general, decommissioned Taxiway C is in fair to poor condition, but is unusable for anything but ground access to certain portions of the airport. According to the 1955 Roy, UT 7.5-minute USGS topographic map, this segment of Taxiway C has been present since prior to that date.

The cinder block building identified during the 2019 survey is in the southwestern-most corner of the Project APE. The building is constructed from gray cinder blocks and cement mortar, has a steel interior frame and aluminum roof, has no windows, but does have two garage doors on the south facing side of the building. It has one steel access door on the south-central side of the building. The structure is 25 feet wide and 80 feet long. The south side of the structure has an unmaintained asphalt paved area where modern debris is stored. This asphalt area is approximately 100 feet north/south by 125 feet east/west and abuts another gravel perimeter fence that is outside the Project APE. The age of the cinder block structure is unknown. However, aerial photos suggest the structure has been present since at least 1997. Historical topographic maps note that

[4] Sadler, Richard W. and Richard C. Roberts
2000 Weber County's History. Weber County Commission, Ogden, Utah.

several (between 5 and 7) structures were in that location prior to 1955, but were likely razed for new construction between 1990 and 1999, where only two structures are denoted on the topographic maps. For this reason, the age of the cinder block building is unknown and may be out of period. The cinder block building is in good condition and appears to be maintained. It is surrounded by modern debris, much of which appears to be for storage and later use. No historical debris was noted in the debris field.

The 8 x 8-foot concrete pad also serves as the new site datum for the 2019 Utah Archaeology site form. The purpose of the pad is unknown but, as it appears to have been electrified, it may have once been used for Navaids, radio communications, or other box signs. The pad was made from poured and framed concrete, is in good condition, and has heavy gauge electrical wire at the center. It is approximately 140 feet southeast of a lighted Navaid due west of the center point of Runway 17/35. The thickness of the asphalt pad is unknown, but expected to be, at minimum, 6 or more inches thick.

Isolated artifacts associated with the airport consist of milk glass zinc mason jar lid insert fragments, several crushed sanitary food can fragments, a steel and aluminum pull tab top beverage can, a bottle cap, and several fragments of a Coca Cola swirl-style contour bottle, dating as early as 1955. No maker's mark was observed as the base of the bottle was not present. Most of these artifacts are within 250 feet of Taxiway C, parallel to Runway 17/35 and may be representative of a toss zone or aircraft drop zone. One artifact was found just south of the perimeter fence access road and is likely associated with debris tossed from a vehicle on that road. A complete list of the isolated artifacts and their locations is provided in Table 3 below.

Isolated Occurrences

Seven isolated occurrences were identified during the survey (**Table 3**). These artifacts all appear to be associated with the airport or airport operations and should be considered as part of the surface artifact debris for the Ogden Hinckley Airport (Site 42WB512).

Table 3. List of Isolated Occurrences identified within the Project APE (UTM locations are in NAD83, Zone 12, meters).

Isolate Number	Description	UTM Northing	UTM Easting
IO #1	Milk glass fragments (x2) from a zinc mason jar lid	4561422	414450
IO #2	Crushed can fragments (single can), no measurements	4560851	414789
IO #3	Aluminum body and steel pull tab top beverage can	4560898	414784
IO #4	Crushed tin can, 4" high, unknown diameter	4560973	414791
IO #5	Bottle cap, standard sized	4560912	414769
IO #6	Crushed food can 3 5/8" high, unknown diameter	4560866	414771
IO #7	Coca cola (swirl) bottle fragments (clear glass)	4561042	414697

NRHP SITE EVALUATIONS

All sites identified, recorded, or updated during the cultural resources survey were evaluated for eligibility under the standards set up by the Secretary of the Interior and the National Park Service (United States Department of the Interior [USDOI] 1991[5]). To be recommended eligible for the NRHP, a site must possess the requisite quality of integrity, as well as meet significance criteria as defined in 36CFR60.4 (United States Department of the Interior [USDOI] 1991:2):

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and:

[5] United States Department of the Interior (USDOI)

1991 *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Interagency Resources Division, National Park Service, United States Department of the Interior, Washington, D.C.

(A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
(B) that are associated with the lives of persons significant in our past; or
(C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(D) that have yielded, or may be likely to yield, information important in prehistory or history.

Historical sites are more likely to qualify for inclusion in the NRHP under any of the four criteria of significance. The significance of a historical site is generally determined within the context of a specific theme, chronological period, site type, and location. Some of the factors that reflect on whether a site can or likely can contribute important information are: integrity; the presence of a single component or of spatially-separate multiple components; chronological data or the potential for chronological data; a thoroughly large and cohesive artifact assemblage to identify the types of activities that took place at the site; and the presence of, or potential for, cultural deposits and undisturbed cultural features.

To be considered eligible for inclusion in the NRHP, a site need not have buried cultural deposits if it meets the criteria noted above and there are sufficient data available on the surface to address one or more important research questions. However, the presence or likelihood of buried cultural deposits affects whether and how well a site meets the above criteria and whether it possesses research potential. Therefore, the presence and/or likelihood of buried cultural deposits on a site are important factors in evaluating site eligibility under Criterion D.

Site 42WB487 – Davis-Weber Canal

The Davis-Weber Canal (Site 42WB487) has been determined ELIGIBLE for nomination to the NRHP under Criterion A as a whole based on several prior documentation efforts associated with NHPA Section 106 consultations. The two newly documented segments in Weber County have been almost entirely piped or lined and some areas have been rerouted from their original location. The segments now lack integrity of design, materials, workmanship, feeling, location, and setting. As such, these segments do not contribute to the eligibility of the site as a whole.

Site 42WB512 – Ogden Hinckley Airport

This Ogden Hinckley Airport (Site 42WB512) has been determined ELIGIBLE for nomination to the NRHP under Criterion A. As the existing IMACS site records for this site do not accurately represent the results of the features identified during the 2019 field investigations, DWE has updated the Utah Site Form to include those features identified during the 2019 field investigations.

The features identified during the 2019 field investigations include two access roads, one decommissioned portion of Taxiway C, one cinder block building of unknown construction date, an 8 x 8-foot concrete pad and seven isolated artifacts. All of these features are associated with the Ogden-Hinckley Airport as early as the mid-1950s. The airport has undergone continual maintenance and upgrades for new and larger planes and services; runways have been changed, added, and removed. Although the airport has been altered, the integrity of location, setting feeling and association remain. For this reason, the site overall is still eligible for nomination to the NRHP.

All of the features recorded during the 2019 field investigations are in fair to poor condition. In some cases, such as Taxiway C and the 8 x 8-foot concrete pad, the features have been partially dismantled for decommission. The features now lack integrity of their original design, materials, workmanship, feeling, location, and association. As such, they do not contribute to the eligibility of the site as a whole under Criterion A. There is also very little potential for buried intact cultural deposits at this site, in part because it has been repeatedly altered from continued maintenance and updating. As buried cultural deposits are unlikely, the site is not likely to yield additional information important in history.

It should also be noted that the Ogden Hinckley Airport has not been fully recorded and will require update if additional surveys or work outside the current Project APE are conducted.

CONCLUSIONS AND RECOMMENDATIONS

Two archaeological sites were identified during DWE's 2019 field investigations, including the Davis-Weber Canal (Site 42WB487) and the Ogden Hinckley Airport (Site 42WB512). Both sites have been previously determined eligible for nomination to the NRHP. However, given modifications and upkeep to the features of the sites within the Project APE, DWE has those features are non-contributing to the individual sites as a whole. Seven IOs, all associated with the Ogden Hinckley Airport (Site 42WB512), were identified at the ground surface within the Project APE during the pedestrian cultural resources survey. These artifacts have been evaluated for nomination to the NRHP and, though they are associated with an eligible archaeological site (Site 42WB512), the majority of the artifacts appear to post-date the eligible components of the site and, individually, are not contributing elements to the eligibility site as a whole. As the airport plans to constructed new airport facilities within the Project APE, and the features and IOs are non-contributing to the eligibility criterion of their representative sites, the project will have No Adverse Effect on known cultural resources.

The Project is located on a plateau above the Weber River, which was commonly used by prehistoric people for hunting and gathering purposes. Historical settlers frequently placed transportation routes along existing Native American transportation and game trails. Though it is unlikely that subsurface cultural resources will be identified due to the disturbance activities that have taken place in the Project area over the last 100+ years, it is possible that prehistoric and historical artifacts or archaeological sites may be found beneath the ground surface during construction activities. In the event that undocumented cultural resources are encountered within the Project APE during ground-disturbing activities, all work in the immediate work area of the discovery shall stop. The Utah State Historic Preservation Officer (SHPO) shall be notified and construction should not resume until the resource has been fully documented and evaluated for NRHP eligibility, in compliance with Utah Annotated Code Section 9-8-404 and the NHPA. Additionally, in the event human remains are discovered, work in the immediate Project APE shall stop and the Utah SHPO and the Weber County Sheriff's Department shall be contacted immediately.

We appreciate the opportunity to have served you on this project. If you have any questions, please contact Sonia Hutmacher-Cunningham at (801) 690-6506.

Respectfully submitted,

Desert West Environmental, LLC

Sonia Hutmacher-Cunningham, MA, RPA

Principal Investigator/Owner

ATTACHMENTS

APPENDIX A – REPORT FIGURES

- Figure 1. Ogden City Pipeline Project Area of Potential Effect.
- Figure 2. Previous Projects and Known Cultural Resources.
- Figure 3. Project Survey Area and Results.
- Figure 4. Previous Projects and Known Cultural Resources.
- Figure 5. Project Survey Area and Results.

APPENDIX B – GLO PLAT MAPS

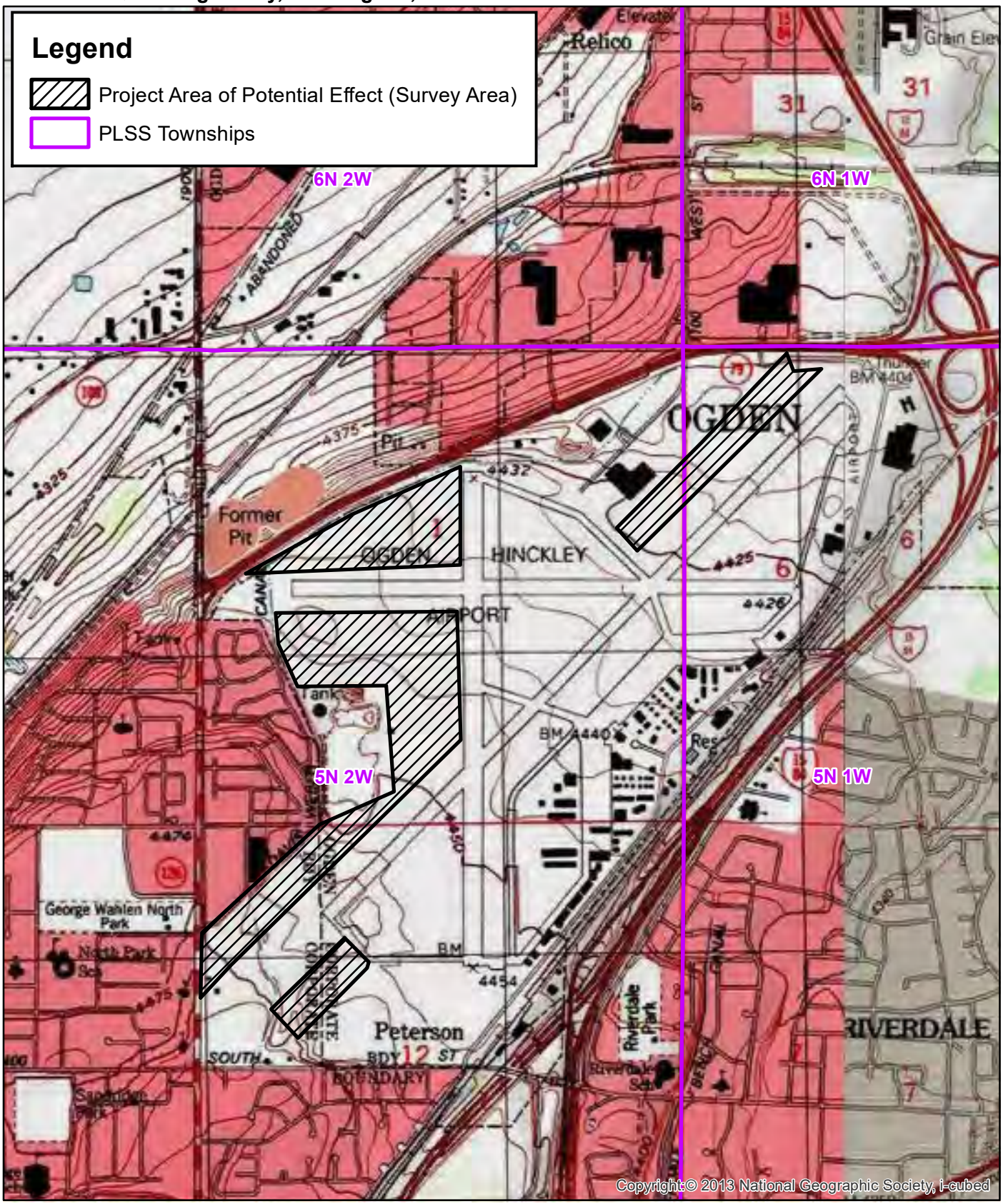
APPENDIX C – UTAH ARCHAEOLOGY SITE FORMS

- Site 42WB487 – Davis-Weber Canal
- Site 42WB512 – Ogden Hinckley Airport

APPENDIX A

Report Figures

USGS 7.5' Quadrangle: Roy, UT & Ogden, UT



0 0.25 0.5 0.75 1 Kilometers

0 0.2 0.4 0.6 0.8 Miles

1 inch = 2,000 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Figure 1. Ogden Hinckley Airport Cultural Resource Inventory Project Location.



0 0.15 0.3 0.45 0.6 Kilometers

0 0.15 0.3 0.45 0.6 Miles

1 inch = 1,333 feet

N

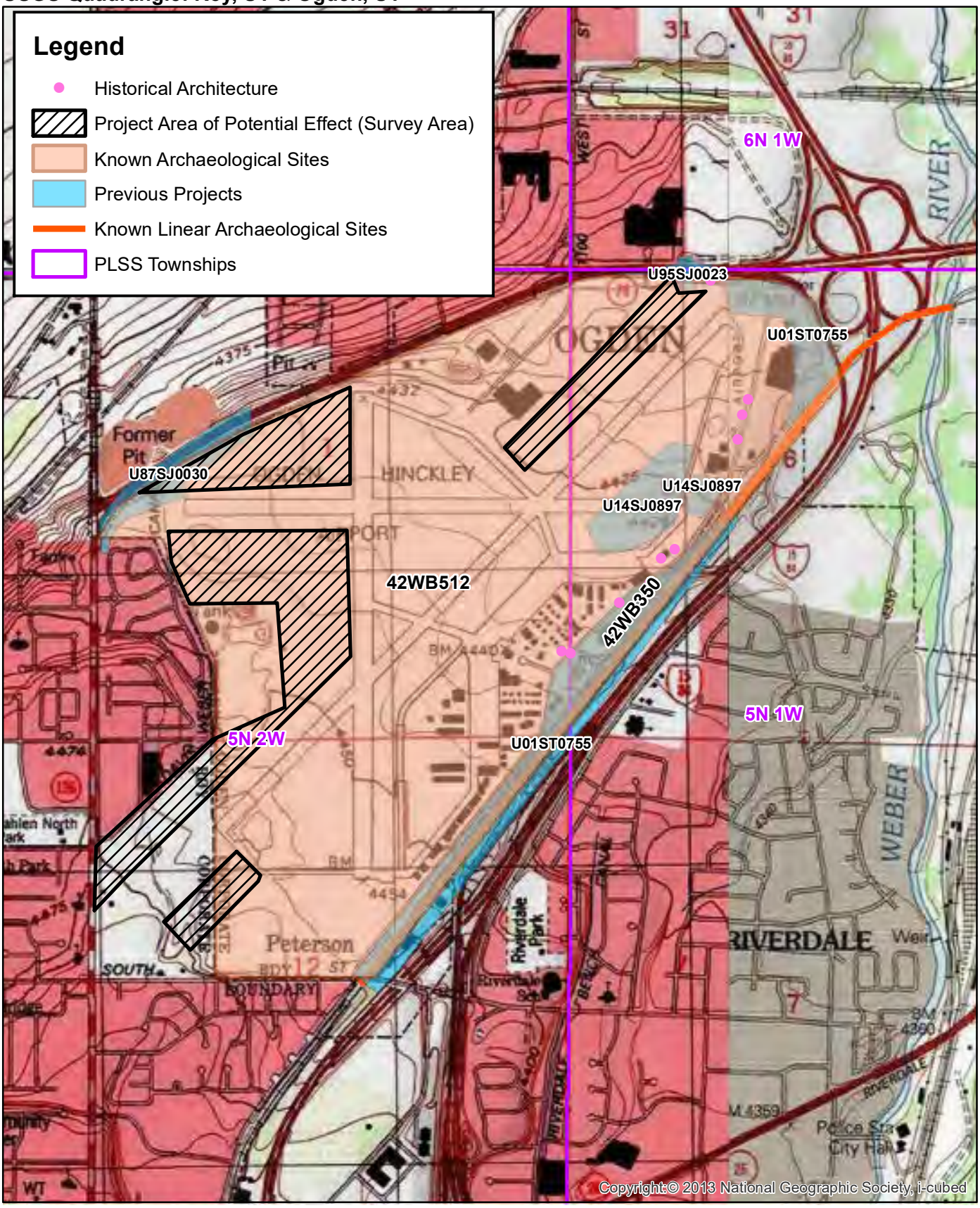
Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Desert West Environmental

Figure 2. Ogden Hinckley Airport Cultural Resource Inventory Survey Parcel Locations.

USGS Quadrangle: Roy, UT & Ogden, UT



0 0.25 0.5 0.75 1 Kilometers

0 0.2 0.4 0.6 0.8 Miles

1 inch = 2,000 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Figure 3. Previous projects and known cultural resources within the Project APE.



0 0.15 0.3 0.45 0.6 Kilometers

0 0.15 0.3 0.45 0.6 Miles

1 inch = 1,333 feet

N

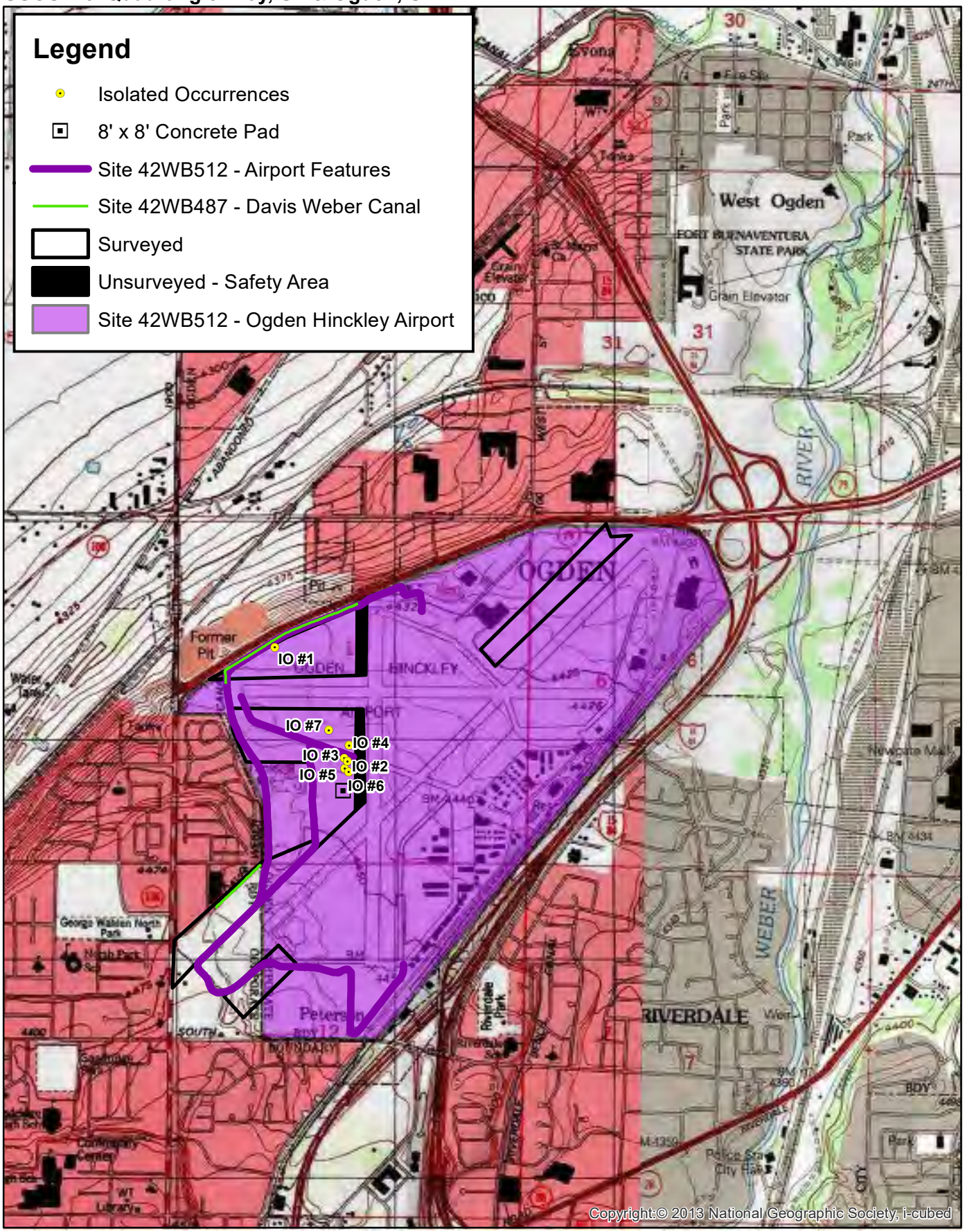
Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Desert West Environmental

Figure 4. Survey and Excluded Areas.

USGS 7.5' Quadrangle: Roy, UT & Ogden, UT



0 0.3 0.6 0.9 1.2 Kilometers
0 0.2 0.4 0.6 0.8 Miles

1 inch = 2,000 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Figure 5. Results of the Class III Cultural Resources Inventory.

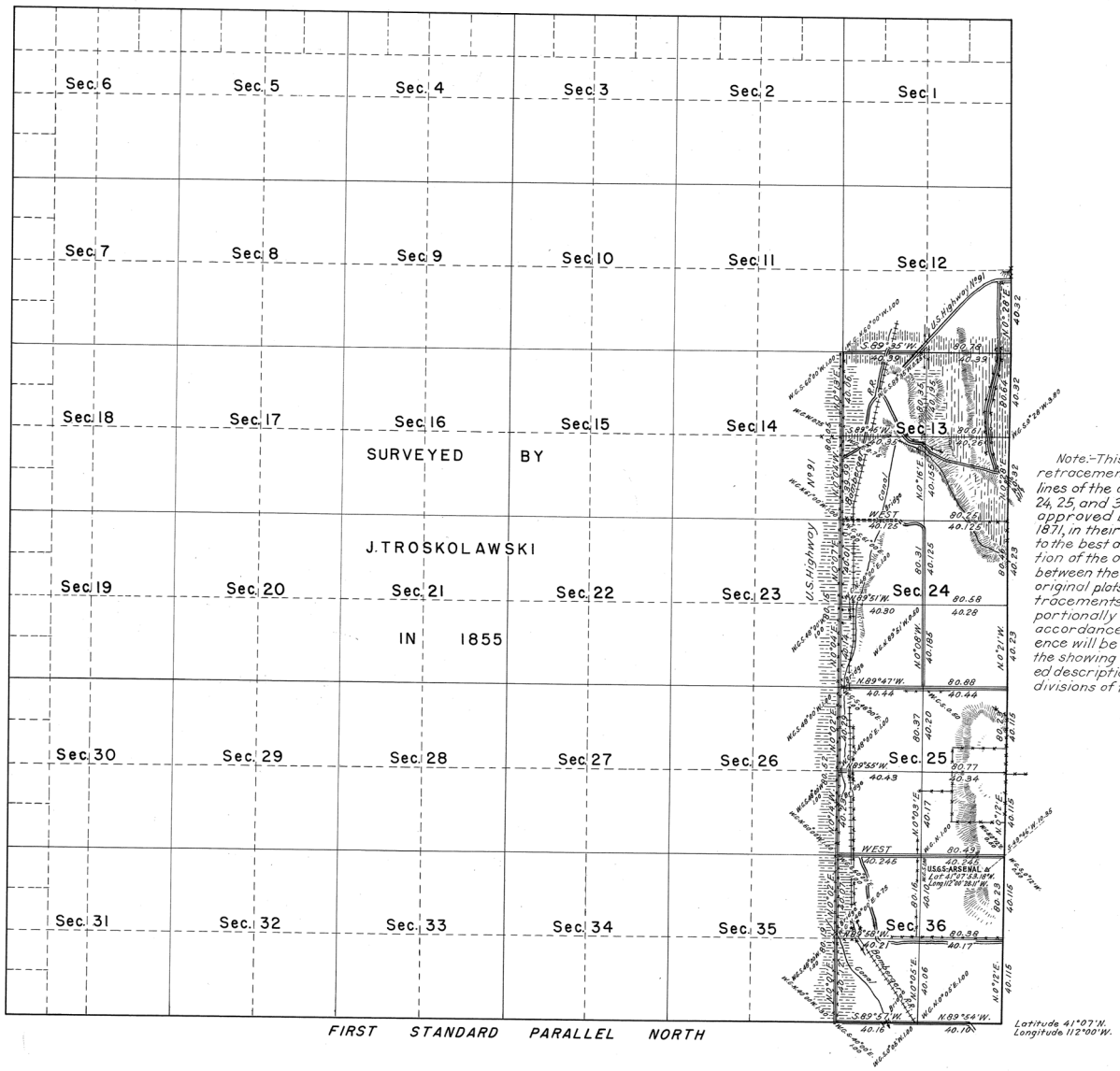
APPENDIX B

GLO Plat Maps

ORIGINAL

TOWNSHIP Nº 5 NORTH, RANGE Nº 2 WEST, OF THE SALT LAKE MERIDIAN, UTAH.

DEPENDENT RESURVEY OF SECTIONS 13, 24, 25, & 36.



True Meridian

Note:-This plat of T.5N., R.2W., delineates a retracement and reestablishment of the lines of the original survey of sections 13, 24, 25, and 36, as shown upon the plats approved December 20, 1855 and April 14, 1871, in their true original position according to the best available evidence of the position of the original corners; all differences between the measurements shown on the original plats and those derived in the retracements have been distributed proportionally between accepted corners in accordance with surveying rules; reference will be made to the original plat for the showing of the areas and more detailed descriptions of the various smaller subdivisions of the respective sections.

Latitude 41°07'N.
Longitude 112°00'W.

10 5 0 10 20 40 80

Mean Magnetic Declination, 17° 35' E. Scale: 40 Chains to an Inch. Area resurveyed 2560.00 Acres

LINES DESIGNATED	BY WHOM SURVEYED	GROUP Nº	GROUP DATE	MILEAGE MLS.	MILEAGE CHS.	WHEN SURVEYED BEGUN	WHEN SURVEYED COMPLETED
Exterior S	R. Gentry & W. M^c Conkie	323	Dec. 23, 1940	1	0.26	Jan. 29, 1941	Mar. 10, 1941
Subdivisional	" " " "	"	" " "	16	6.84	" " "	" " "

Office of Supervisor of Surveys
Denver, Colorado, July 21, 1941

The above plat of Township Nº 5 North, Range Nº 2 West, of the Salt Lake Meridian, Utah, is strictly conformable to the field notes of the survey thereof which have been examined and approved.

Supervisor of Surveys.

UNITED STATES DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE
Washington, D.C., July 29, 1941

The survey represented by this plat having been correctly executed in accordance with the requirements of law and the regulations of this office, is hereby accepted.

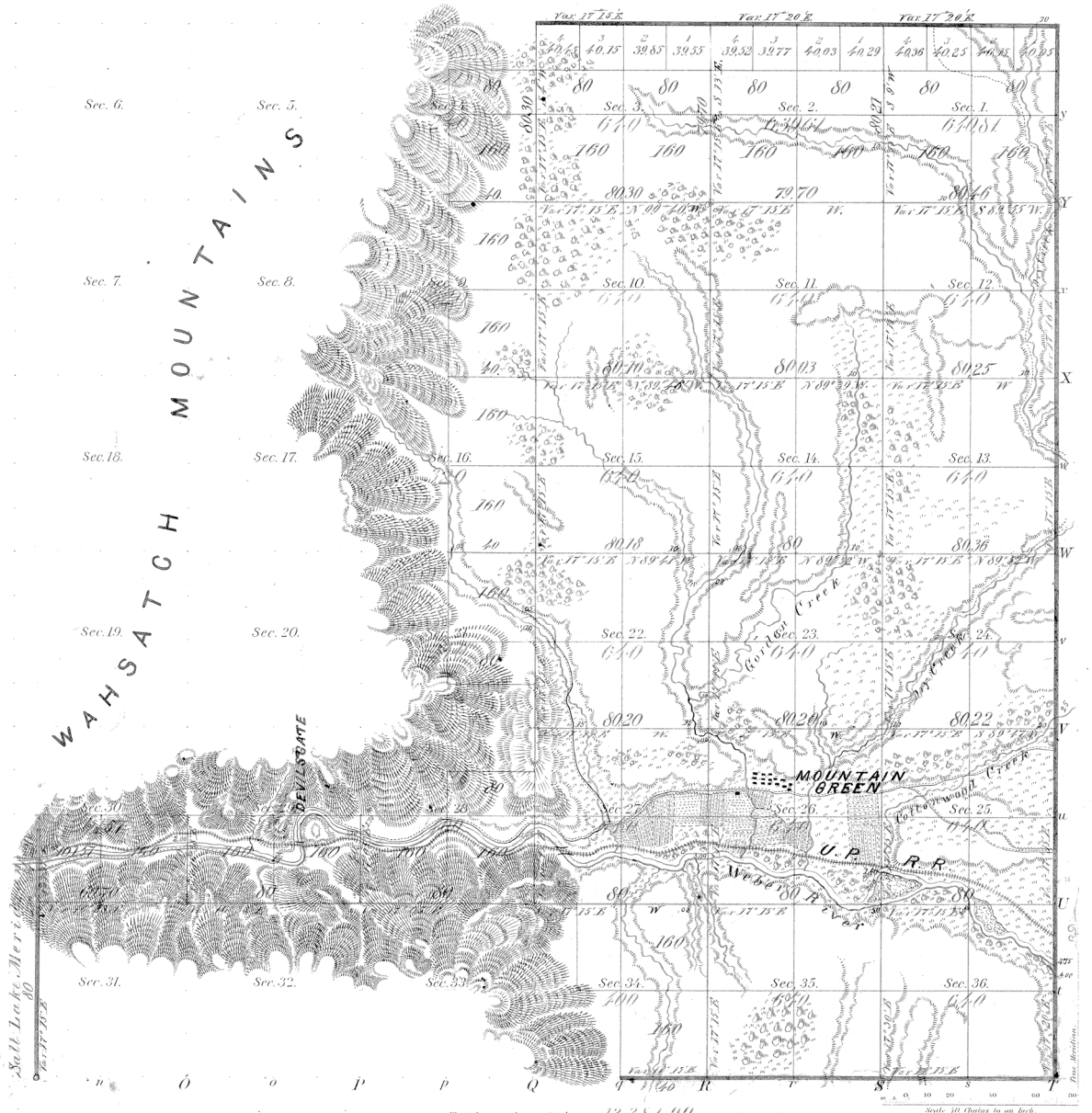
Assistant Commissioner.

Plat E.B.B.

265-A

SALT LAKE CITY UTAH

TOWNSHIP N°. 5 North RANGE N°. 1 East Salt Lake MERIDIAN



Meanders of

Posts	Courses	Ch.s Lks.	Posts	Courses	Ch.s Lks.	Posts	Courses	Ch.s Lks.

Total number of Acres. 13,381.99

Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys	When Surveyed
North Boundary Township lines	Aug. D. Fenton	Oct 10th 1870	M. 3 Ch. 00 Lks. 00	Dec 31st 1870
Subdivisions	do	do	37 - 31 - 91	Dec 31st 1870 & Jan 12th 71

The above Map of Township N°. 5 North of Range N°. 1 East Salt Lake Meridian Utah Territory is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

Surveyor Generals Office
Salt Lake City Utah
April 11th 1871

C. C. Clawson
Surv. Genl.

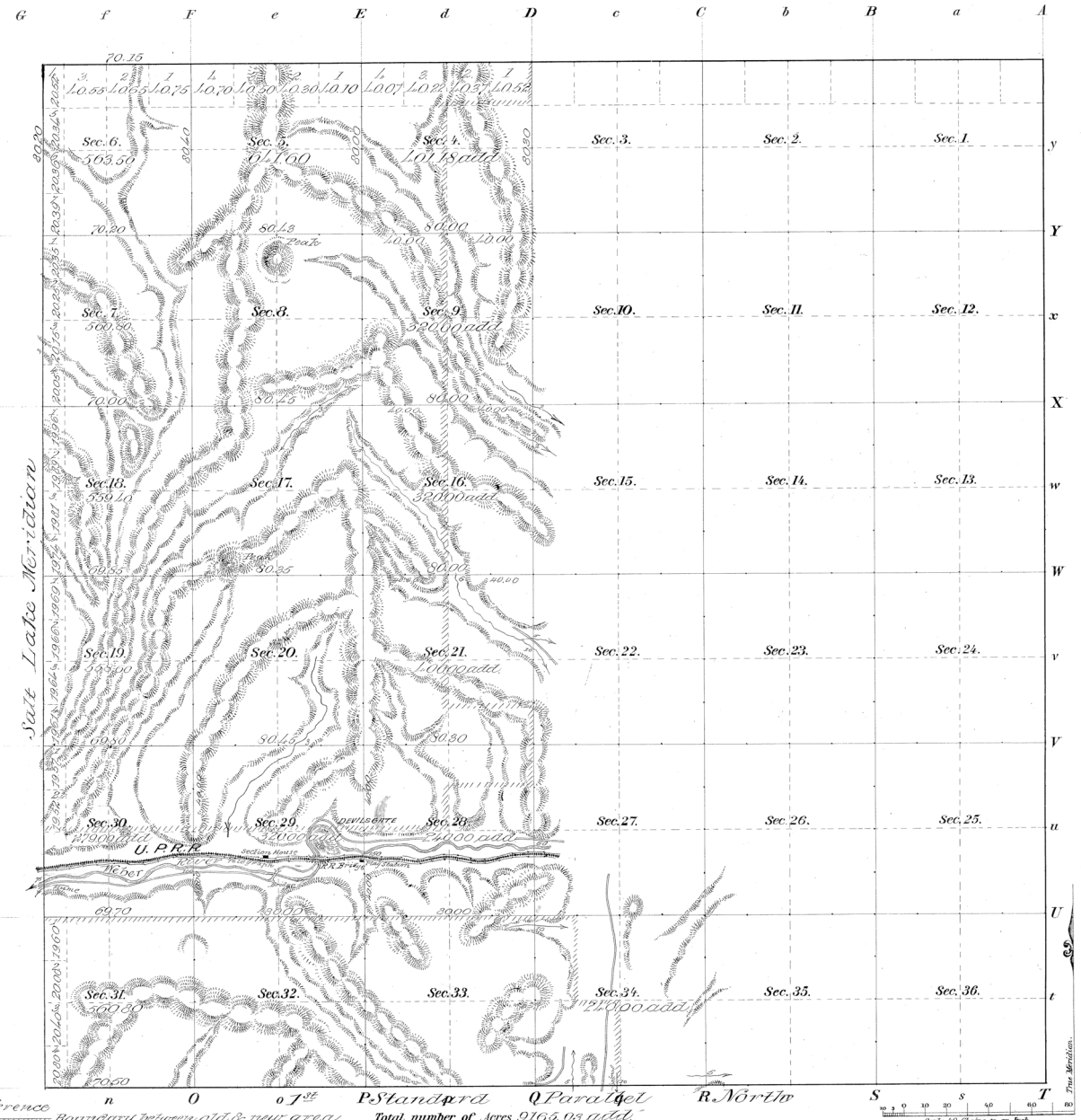
Scale 40 Chains to an Inch.

Notes
Ret. 32 213
S. " 32 214
E. " 33 214
W. " 34 214
Subs. 34 214
Plat Books
Exts. (32 214)

263

263

Township No. 5 North Range No. 1 East of the Salt Lake Meridian



Reference

Boundary between old & new area

Total number of Acres 9765.03 add.

Surveys Designated.	By Whom Surveyed.	No. & Date of Contract.	Amount of Surveys M.	Ch.s	Lk.s	When Surveyed.	Variation East.
Meridian	Res. Otto E. Salamon	154 June 25th 1886	1	40	00	Oct 2nd 1886	16°50'
"	Sur. " " "	155 " " "	4	40	20	" 6th "	"
N. Township	" " " "	" " " "	2	70	15	" " "	"
Subdivision	Re. " " "	154 " " "	12	30	00	" 22nd 5th "	"
"	Sur. " " "	155 " " "	22	02	23	" 6th 9th "	"

Meanders of

Posts	Courses	Ch.s Lk.s	Posts	Courses	Ch.s Lk.s	Posts	Courses	Ch.s Lk.s

The above Map of Township No. 5 North of Range No. 1 East of the Salt Lake Meridian, Utah, is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

Surveyor Generals Office, Salt Lake City, Utah. October 31st 1891

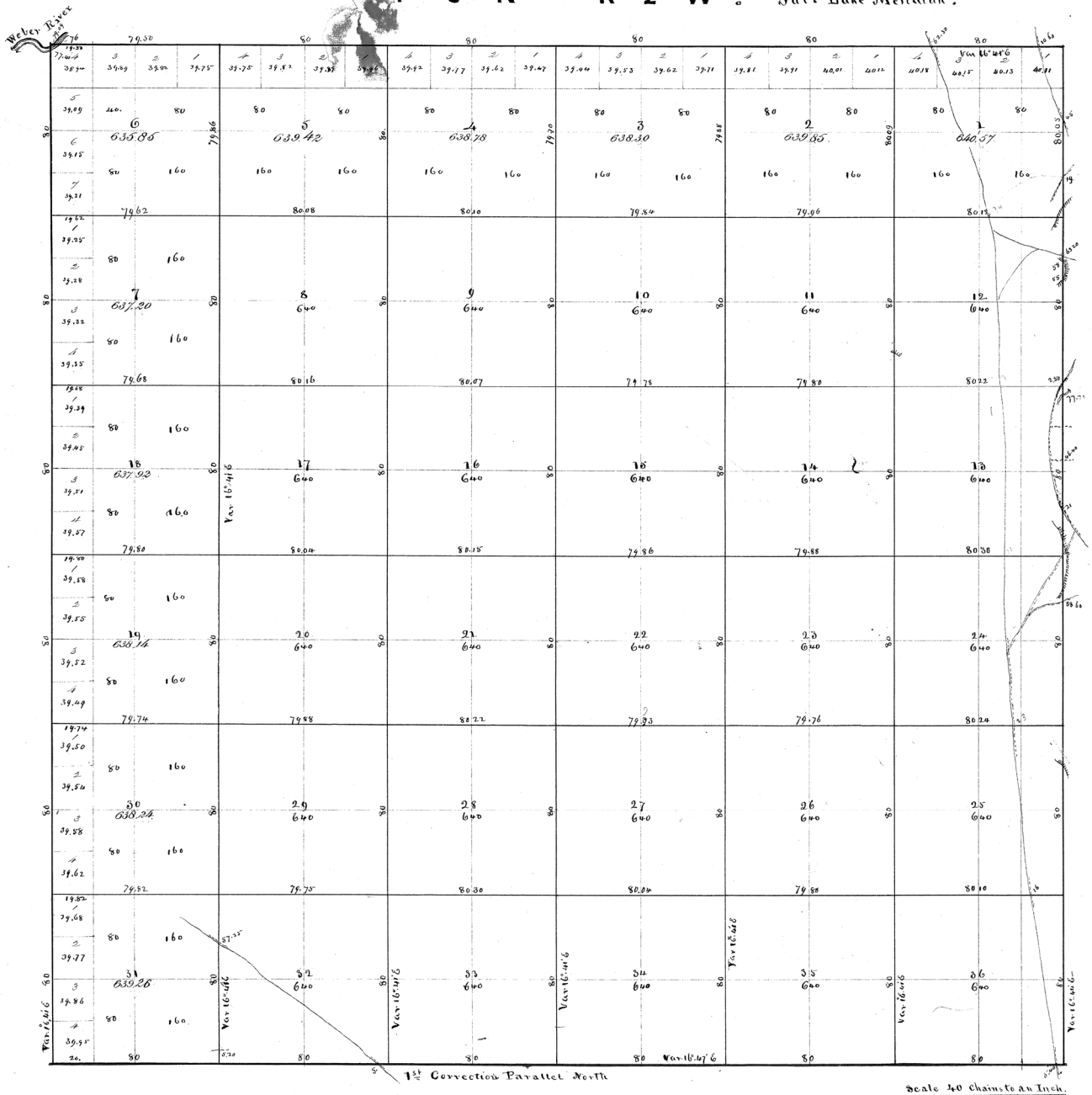
Ellsworth Daggett
Surv. Gen'l

Notes
N. Bdy. 32-225.
S. " 82-249
E. " 82-249
W. " 14-219.
Subs. 34-219.
Plat Books

263-A

rveyor General's Office,
AKE CITY UTAH.

T 5 N — R 2 W. Salt Lake Meridian.



Scale 40 Chains to an Inch.

Total number of acres 23.031.91

Surveys designated	By whom Surveyed	Date of Contract	Amount of Survey	when Surveyed
Township lines	J. Frothelwaite	August 8th 1855	11.79.50	3d & 4th quarters of 1855
Section lines	do	do	59.75.57	do

Notes

N. Bdy. 35
S. " 14
E. " 32.35
W. " 35
Subs. 76
Plat Books
Exts.
Subs.(2-13)

Surveyor Generals Office
Salt Lake City Dec 20th 1855

This Map of Township No 5 North of Range No 2 West of Salt Lake Meridian is strictly conformable to the field notes of the survey thereof on file in this office which have been examined and approved.

David H Burr
Surveyor General of Utah

APPENDIX C

Utah Archaeology Site Forms

UTAH ARCHAEOLOGY SITE FORM — PART A – Administrative Data

1. **Smithsonian Trinomial**: 42WB487
2. **Temporary Site No**. :
3. **Site Name:** Weber Davis Canal
4. **Date Recorded**: 09 / 24 / 19
5. **Type of Recording:** ☐ First Recording ☐ Full Re-record ☒ Update
6. **Project Name**: Ogden Hinckley Airport Redevelopment
7. **State Project Number**: U19DV0690
8. **Land Status**: Private
9. **USGS 7.5' Quad Map Name and Date**: Roy, UT
10. **Township**: 5N **Range**: 2W **Section**: 1, 12 **(¼)**: NW, NW **County**: Weber
11. **Meridian**: ☒Salt Lake ☐Uintah
12. **UTMs:** Zone 12 414287 E 4561326 N NAD 83
13. **Site Dimensions**: Length: 1000 m Width: 3 m Area: 3000 m^2 ☒GIS ☐Estimate
14. **Site Class**[a]: ☐Prehistoric ☐Protohistoric ☒Historic
15. **Site Type**:

Prehistoric/Protohistoric		Historic	
☐Long-Term Residential	☐Task Specific	☐Domestic	☐Transportation/Communication
☐Temporary Camp	☐Specialty Site	☒Agriculture/Subsistence	☐Defense
☐Unknown		☐Industry/Processing/Extraction	☐Unknown
☐Other		☐Other[b]	

16. **Site Characteristics**[a]: ☐Artifact Scatter ☐Rock Art/Inscription ☐Lithic Source/Quarry ☐Rock Shelter/Cave ☐Architectural Feature(s) ☒Non-Architectural Feature(s) ☒Linear
17. **Impacting Agents**: ☐None ☐Erosion ☐Livestock Concentration ☐Recreation ☐Road/Trail ☐Vandalism/Looting ☒Other: Maintenance/Use/Construction
18. **Site Condition:** ☒Stable ☐Deteriorating ☐Imminently Threatened ☐Destroyed
19. **Description** (as needed):
20. **Recorded By**: Sonia Hutmacher Cunningham 21. **Organization**: Desert West Environmental
22. **Material Collected:** ☒No ☐Yes (describe in Site Description) **Repository**:

NRHP Evaluation

23. **Is the Site Significant**: ☐No ☒Yes, under criterion[a]: ☒A (event) ☐B (person) ☐C (design/construction) ☐D (important information)
24. **Does it Retain Integrity**: ☐No ☒Yes, aspects present[a]: ☐Location ☐Design ☐Setting ☐Materials ☐Workmanship ☐Feeling ☒Association
25. **NRHP Status**: ☐Not eligible ☒Eligible ☐Listed
26. **Justification** (include discussion of historic context, significance, and integrity):
The Davis-Weber Canal (Site 42WB487) has been determined ELIGIBLE for nomination to the NRHP under Criterion A as a whole based on several prior documentation efforts associated with NHPA Section 106 consultations. The two newly documented segments in Weber County have been almost entirely piped or lined and some areas have been rerouted from their original location. The segments now lack integrity of design, materials, workmanship, feeling, location, and setting. As such, these segments do not contribute to the eligibility of the site as a whole.

[a] Check all that apply
[b] See manual for additional categories

Smithsonian Trinomial: **42WB487**

Temporary Site No. :

27. **Site Description** (interpretation, context, size, artifact and feature assemblage, dating, previous work and curation, etc.)**:**

The Davis-Weber Canal is a gravity fed residential and agricultural irrigation canal owned and operated by the Davis and Weber Counties Canal Company. It was constructed in the 1880s as an earthen ditch. By the early 1910s, much of the original canal had been lined with concrete. The canal begins on the south side of the Weber River, west along Interstate 84, passing under US Highway 89 and continues northwesterly along the base of the plateau of Hill Air Force Base. The canal passes under Utah State Route 168 and flows toward Riverdale, east of Interstate 15, then turns south along the eastern edge of the city of Roy, where it travels along the Weber/Davis County Line adjacent to the Ogden Hinckley Airport, south through residential neighborhoods until it terminates in Layton. The total length of the Davis-Weber Canal is 17.8 miles, though it originally extended approximately 23 miles and served parts of Fruit Heights. As the existing IMACS site records for this site do not accurately represent the results of the features identified during the 2019 field investigations, DWE has updated the Utah Site Form to include those features.

On the Ogden Hinckley Airport property, two segments of the canal were observed. The first is at the northeast end of the Project APE along the northeast trending security fence, north of decommissioned Runway 7/25. In this area, the canal runs along the northern boundary of the survey parcel south of the security fence. Approximately 2340 feet of this segment is an open, concrete-lined canal (Segment 1) that appears to be out of service, but maintained, as two sections have been patched with a different type of concrete. The date the earthen canal was lined with concrete is unknown.

Segment 1 consists of a concrete lined, open canal that is approximately 3 feet wide at the base and 6 feet wide at the top. Each wall is approximately 3 feet deep. The width of the concrete is approximately 6 inches, though this varies in areas that have been patched. The open canal transitions to a boxed (piped) canal. The box culvert is 4 feet high, 6 feet wide, and 8 inches thick and holds a 24-inch diameter corrugated steel pipe.

The second segment is a “boxed” canal segment. From the northwest end of the Project APE north of Runway 7/25, the canal is piped with modern corrugated metal pipe at a partially buried box culvert and continues, buried, south along an unknown route on the west side of the Ogden Hinckley Airport. This “boxed” canal is not visible in the Project APE until the southwestern parcel, where appears as a surficial concrete pipe that has been covered with approximately 12-24 inches of sediment. The length of Segment 2 is approximately 940 feet. The route in the NW/NW/NW quarter of Section 12 (Township 5 North, Range 2 West) where it has either been dismantled or buried. It is likely buried, continuing south, per Google Maps, though it is not delineated in this location on the Roy, Utah 1:24,000 scale USGS topographic map.

The boxed canal is a concrete pipe that has an approximately 24-inch interior diameter. The concrete pipe is 4-6 inches thick, based on the joints. There is one modern, grated box culvert for water drainage and maintenance access. The boxed culvert appears to have been installed as a surface feature and then covered with approximately 12 inches to up to 2 feet of sediment. The maximum height of the berm is 5 feet above the modern (disturbed) ground surface. A few areas of the berm have eroded, exposing the concrete pipe features.

Much of the site is in good condition and appears to have been maintained. At Segment 1, at least two sections of the lined canal have been repaired or replaced. The canal is clean, though it was not flowing in September 2019. It is either temporarily not in use or has been abandoned. The area surrounding the site is vegetated with tall grasses and forbes, though some greasewood and sage was also present in some areas.

28. **Environmental Context** (topography, vegetation, ground visibility, depositional context)**:**

29. The site is situated on a low bench in the Wasatch Front valleys of the Great Basin physiographic province. Natural vegetation is largely invasive due to airport construction and maintenance, but seeded vegetation surrounding the site consists of Lower Sonoran rangeland communities, including various forbes, bunch grasses and thistle. Ground visibility surrounding the site varies between 5% to more than 90%. Overall, the Project area has largely been disturbed from industrial, airport development since the 1930s, including airport construction and maintenance of paved taxiways and runways, gravel roadways, water retention ponds, and other airport storage facilities.

30. **Notes Regarding Access** (as needed): _____

31. **Additional Part A Comments**: _____

[a] Check all that apply
[b] See manual for additional categories

UTAH ARCHAEOLOGY SITE FORM **PART C – Historic Component**

Smithsonian Trinomial: 42WB487

Temporary Site No. :

1. **Primary dates of site use**: 1880s to 2019
2. **Secondary dates of site use**: _____ to _____
3. **Architectural Features**

Type	Description

4. **Non-Architectural Features**

Type	Description
Canal	gravity fed residential and agricultural irrigation canal, two segments: boxed (~940') and concrete lined (2340')

5. **Feature Comments**: _____

6. **Cans** - Total Quantity: _____

Quantity	Type	Description

7. **Can Comments**: _____

Smithsonian Trinomial: 42WB487
Temporary Site No. :

8. **Glass Bottles -** Total ENV:

ENV	Manufacturing Method	Description

9. **Glass Bottle Comments**:

10. **Ceramics -** Total ENV:

ENV	Ware	Description

11. **Ceramic Comments**:

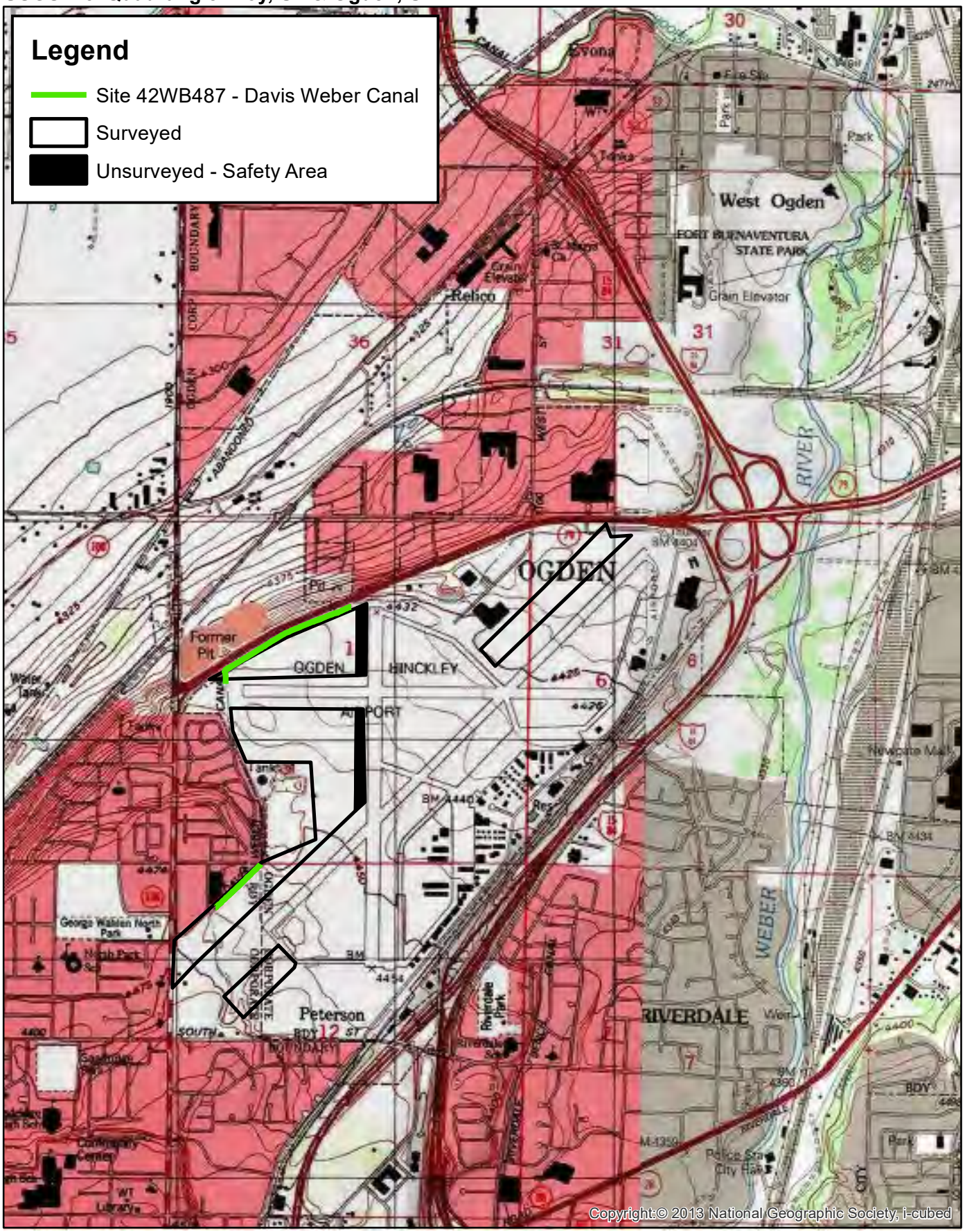
12. **Additional Artifacts/Debris:**

☐ Ammunition/Firearms ☐ Car/Car parts ☐ Glass (non-bottle) ☐ Nails (wire) ☐ Toys
☐ Bone ☐ Ceramics (non-tableware) ☐ Hardware ☐ Plastic ☐ Other
☐ Building Materials ☐ Clothing ☐ Nails (cut) ☐ Stove Parts

13. **Additional Artifact/Debris Description**:

14. **Additional Part C Comments**:

USGS 7.5' Quadrangle: Roy, UT & Ogden, UT



0 0.3 0.6 0.9 1.2 Kilometers
0 0.2 0.4 0.6 0.8 Miles

1 inch = 2,000 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Site 42WB487 Site Locator Map.



0 0.1 0.2 0.3 0.4 Kilometers

0 0.1 0.2 0.3 0.4 Miles

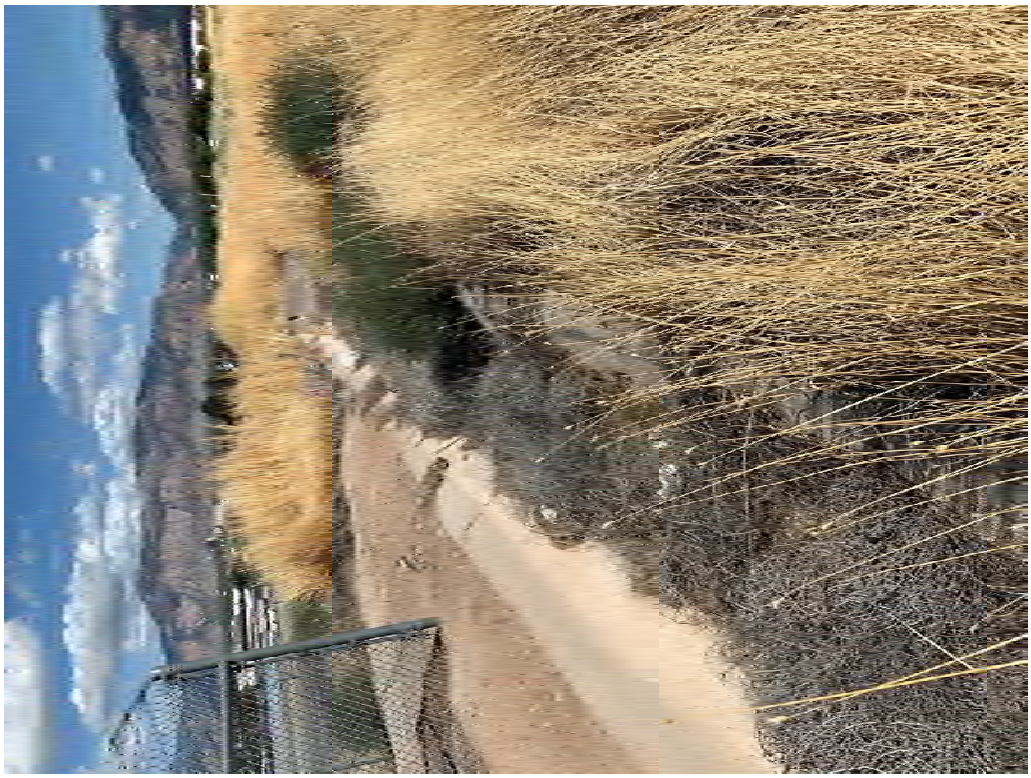
1 inch = 833 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Site 42WB487 Site Sketch Map.



Site 42WB487, Site Overview, facing east (Photo DWE DC03:310).



Site 42WB487, Site overview, facing west (Photo DWE DC03:313).

Desert West Environmental
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JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB487

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB487, Site Overview, facing north (Photo DWE DC03:408).



Site 42WB487, Pipe culvert overview, facing southwest (Photo DWE DC03:410).

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JOB NO.	19ARCH1229
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DATE	09/24/2019
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Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB487, Piped and partially buried canal, facing northeast (Photo DWE DC03:417).

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JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB487

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS

UTAH ARCHAEOLOGY SITE FORM — PART A – Administrative Data

1. **Smithsonian Trinomial**: 42WB512
2. **Temporary Site No**. :
3. **Site Name:** Ogden Hinckley Airport
4. **Date Recorded**: 09 / 24 / 19
5. **Type of Recording:** ☐ First Recording ☐ Full Re-record ☒ Update
6. **Project Name**: Ogden Hinckley Airport Redevelopment
7. **State Project Number**: U19DV0690
8. **Land Status**: Private
9. **USGS 7.5' Quad Map Name and Date**: Roy, UT (1975) & Ogden, UT (1975)
10. **Township**: 5N **Range**: 2W/1W **Section**: 1, 12/6 **(¼)**: NW, NW **County**: Weber
11. **Meridian**: ☒Salt Lake ☐Uintah
12. **UTMs:** Zone 12 414763 E 4560765 N NAD 83
13. **Site Dimensions**: Length: 2500 m Width: 2400 m Area: 3,176,258 m^2 ☒GIS ☐Estimate
14. **Site Class**[a]: ☐Prehistoric ☐Protohistoric ☒Historic
15. **Site Type**:

Prehistoric/Protohistoric		Historic	
☐Long-Term Residential	☐Task Specific	☐Domestic	☒Transportation/Communication
☐Temporary Camp	☐Specialty Site	☐Agriculture/Subsistence	☒Defense
☐Unknown		☐Industry/Processing/Extraction	☐Unknown
☐Other		☐Other[b]	

16. **Site Characteristics**[a]: ☐Artifact Scatter ☐Rock Art/Inscription ☐Lithic Source/Quarry ☐Rock Shelter/Cave ☐Architectural Feature(s) ☒Non-Architectural Feature(s) ☒Linear
17. **Impacting Agents**: ☐None ☐Erosion ☐Livestock Concentration ☐Recreation ☐Road/Trail ☐Vandalism/Looting ☒Other: Maintenance/Use/Construction
18. **Site Condition:** ☐Stable ☒Deteriorating ☐Imminently Threatened ☒Destroyed
19. **Description** (as needed):
20. **Recorded By**: Sonia Hutmacher Cunningham 21. **Organization**: Desert West Environmental
22. **Material Collected:** ☒No ☐Yes (describe in Site Description) **Repository**:

NRHP Evaluation

23. **Is the Site Significant**: ☐No ☒Yes, under criterion[a]: ☒A (event) ☐B (person) ☐C (design/construction) ☐D (important information)
24. **Does it Retain Integrity**: ☐No ☒Yes, aspects present[a]: ☒Location ☐Design ☐Setting ☐Materials ☐Workmanship ☐Feeling ☐Association
25. **NRHP Status**: ☐Not eligible ☒Eligible ☐Listed
26. **Justification** (include discussion of historic context, significance, and integrity):

This Ogden Hinckley Airport (Site 42WB512) has been determined ELIGIBLE for nomination to the NRHP under Criterion A. As the existing IMACS site records for this site do not accurately represent the results of the features identified during the 2019 field investigations, DWE has updated the Utah Site Form to include those features identified during the 2019 field investigations.

The features identified during the 2019 field investigations include two access roads, one decommissioned portion of Taxiway C, one cinder block building of unknown construction date, an 8 x 8-foot concrete pad and seven isolated artifacts. All of these features are associated with the Ogden-Hinckley Airport as early as the mid-1950s. The airport has undergone continual maintenance and upgrades for new and larger planes and services; runways have been changed, added, and removed. Although the airport has been altered, the integrity of location, setting feeling and association remain. For this reason, the site overall is still eligible for nomination to the NRHP.

[a] Check all that apply
[b] See manual for additional categories

All of the features recorded during the 2019 field investigations are in fair to poor condition. In some cases, such as Taxiway C and the 8 x 8-foot concrete pad, the features have been partially dismantled for decommission. The features now lack integrity of their original design, materials, workmanship, feeling, location, and association. As such, they do not contribute to the eligibility of the site as a whole under Criterion A. There is also very little potential for buried intact cultural deposits at this site, in part because it has been repeatedly altered from continued maintenance and updating. As buried cultural deposits are unlikely, the site is not likely to yield additional information important in history.

It should also be noted that the Ogden Hinckley Airport has not been fully recorded and will require update if additional surveys or work outside the current Project APE are conducted.

27. **Site Description** (interpretation, context, size, artifact and feature assemblage, dating, previous work and curation, etc.)**:**

The Ogden Hinckley Airport is located in the Ogden Valley on an old terrace that overlooks the Weber River to the east. It was partially recorded by Sagebrush Archaeological Consultants in 2014. The majority of the site area has been disturbed, and it appears that no natural ground surface remains. It is heavily vegetated in some areas (nearly 0% ground visibility), but also has areas where bare ground can be seen. Vegetation in the project area consists of introduced species such as alfalfa, golden aster, and other grasses and forbes. Sagebrush is also present along the perimeter of the airport property.

In 1939, Ogden City purchased approximately 750 acres of land in the southwest portion of the Ogden City on an old terrace with the intent to build an airport that would replace the old Ogden Municipal Airport, which was constructed in 1928 (Sadler and Roberts 2000: 319[1]). The new Ogden City Airport was constructed in 1939. The US Government financially supported the construction of the airport and a US Weather Bureau station was also established here (Sadler and Roberts 2000:320). An administrative building, concrete landing strips, and a control tower were built (Sadler and Roberts 2000:320). During World War II, the airfield was used by the United States Army Air Forces. It had three concrete (now asphalt) runways and five taxiways (A, B, C, D, and E).

During DWE's 2019 field investigations of the four parcels, two access roads, one decommissioned portion of Taxiway C, one cinder block building of unknown construction date, and an 8 x 8-foot concrete pad were observed in the field. Additionally, seven isolated occurrences (historical artifacts) were recorded in association with the site. These artifacts are listed in the isolated occurrences section below. Modern features, such as instruction, location, and guidance signs; general signage; radio communications stations and antennae; ground-based lighted navigation aids (Navaids); and other signage were not recorded as features during this survey.

Two access roads were recorded during the archaeological survey: one perimeter fence road and one access road to decommissioned Taxiway C. The perimeter fence road is not engineered, but is somewhat maintained. It travels from the access area near the storage facilities on the east central side of the airport, south of Taxiway E, swings southwest, then makes a turn to the northwest where it forks and continues north along the western perimeter fence, west of decommissioned Runway 7/25. At the north end of the western perimeter fence, it turns northeast and continues north and east of Runway 17/35. The perimeter fence road is present north of the northernmost survey parcel, but is outside the Project APE at that location. The perimeter fence road is approximately 13,555 feet long, 8-10 feet wide and has been graveled with recycled asphalt chips and gravel.

The second access road starts at the fork with the perimeter access road and continues northeast, parallel to Runway 3/21 and then swings north and dead ends at the intersection with the decommissioned portion of Taxiway C. This access road was also not engineered, but is somewhat maintained. It is currently used to access instruction, location, and guidance signs; general signage; radio communications stations and antennae; Navaids (lighting systems); and box signs on the west side of the airport. This access road is approximately 2775 feet long, 8-10 feet wide, and has been graveled with recycled asphalt chips and gravel.

The decommissioned portion of Taxiway C extends west from Runway 17/35 as a continuation of another unrecorded, decommissioned segment of Taxiway C. The current Taxiway C has been reconstructed to the north of its prior location. The eastern segments of the decommissioned Taxiway C were not recorded due to access security restrictions.

[1] Sadler, Richard W. and Richard C. Roberts
2000 Weber County's History. Weber County Commission, Ogden, Utah.

[a] Check all that apply
[b] See manual for additional categories

Smithsonian Trinomial: **42WB512**
Temporary Site No. :

The recorded segment of decommissioned Taxiway C is approximately 2020 feet long and 50 feet wide. It was paved with asphalt, which is now in poor condition. A 755-foot-long pile of asphalt fragments encompassing 1.81 acres (78,660 square feet), blocks approximately 470 feet of the taxiway approximately 580 feet southeast of the intersection of the taxiway with decommissioned Runway 7/25 on the west side of the airport. These asphalt fragments appear to have been removed during decommissioning of Taxiway C and construction of the new Taxiway C. In general, decommissioned Taxiway C is in fair to poor condition, but is unusable for anything but ground access to certain portions of the airport. According to the 1955 Roy, UT 7.5-minute USGS topographic map, this segment of Taxiway C has been present since prior to that date.

The cinder block building identified during the 2019 survey is in the southwestern-most corner of the Project APE. The building is constructed from gray cinder blocks and cement mortar, has a steel interior frame and aluminum roof, has no windows, but does have two garage doors on the south facing side of the building. It has one steel access door on the south-central side of the building. The structure is 25 feet wide and 80 feet long. The south side of the structure has an unmaintained asphalt paved area where modern debris is stored. This asphalt area is approximately 100 feet north/south by 125 feet east/west and abuts another gravel perimeter fence that is outside the Project APE. The age of the cinder block structure is unknown. However, aerial photos suggest the structure has been present since at least 1997. Historical topographic maps note that several (between 5 and 7) structures were in that location prior to 1955, but were likely razed for new construction between 1990 and 1999, where only two structures are denoted on the topographic maps. For this reason, the age of the cinder block building is unknown and may be out of period. The cinder block building is in good condition and appears to be maintained. It is surrounded by modern debris, much of which appears to be for storage and later use. No historical debris was noted in the debris field.

The 8 x 8-foot concrete pad also serves as the new site datum for the 2019 Utah Archaeology site form. The purpose of the pad is unknown but, as it appears to have been electrified, it may have once been used for Navaids, radio communications, or other box signs. The pad was made from poured and framed concrete, is in good condition, and has heavy gauge electrical wire at the center. It is approximately 140 feet southeast of a lighted Navaid due west of the center point of Runway 17/35. The thickness of the asphalt pad is unknown, but expected to be, at minimum, 6 or more inches thick.

Isolated artifacts associated with the airport consist of milk glass zinc mason jar lid insert fragments, several crushed sanitary food can fragments, a steel and aluminum pull tab top beverage can, a bottle cap, and several fragments of a Coca Cola swirl-style contour bottle, dating as early as 1955. No maker's mark was observed as the base of the bottle was not present. Most of these artifacts are within 250 feet of Taxiway C, parallel to Runway 17/35 and may be representative of a toss zone or aircraft drop zone. One artifact was found just south of the perimeter fence access road and is likely associated with debris tossed from a vehicle on that road.

28. **Environmental Context** (topography, vegetation, ground visibility, depositional context)**:**

29. The site is situated on a low bench in the Wasatch Front valleys of the Great Basin physiographic province. Natural vegetation is largely invasive due to airport construction and maintenance, but seeded vegetation surrounding the site consists of Lower Sonoran rangeland communities, including various forbes, bunch grasses and thistle. Ground visibility surrounding the site varies between 5% to more than 90%. Overall, the Project area has largely been disturbed from industrial, airport development since the 1930s, including airport construction and maintenance of paved taxiways and runways, gravel roadways, water retention ponds, and other airport storage facilities.

30. **Notes Regarding Access** (as needed):

31. **Additional Part A Comments**:

[a] Check all that apply
[b] See manual for additional categories

UTAH ARCHAEOLOGY SITE FORM **PART C – Historic Component**

Smithsonian Trinomial: 42WB512
Temporary Site No. :

1. **Primary dates of site use**: 1939 to 2019
2. **Secondary dates of site use**: _____ to _____
3. **Architectural Features**

Type	Description
Cinder Block Building	Gray cinder blocks, 25' x 85', may be out of period per historical maps and aerials. As the building may be out of period, it was not recorded on an architectural ILS form

4. **Non-Architectural Features**

Type	Description
Taxiway	Taxiway C, asphalt paved, partially blocked by asphalt piles, decommissioned, not in use, 2020 feet long and 50 feet wide
Concrete pad	8 x 8-foot concrete pad, appears to have been electrified, possibly and old Navaid. Constructed from poured and framed concrete and has heavy gauge electrical wire at the center. The thickness of the asphalt pad is unknown, but expected to be, at minimum, 6 or more inches thick.
Perimeter Fence Road	Not engineered, somewhat maintained, used to access the perimeter fence and other airport areas, 8-10 feet wide and has been graveled with recycled asphalt chips and gravel
Taxiway Access Road	Not engineered, somewhat maintained, used to access instruction, location, and guidance signs; general signage; radio communications stations and antennae; Navaids (lighting systems); and box signs on the west side of the airport. This access road is approximately 2775 feet long, 8-10 feet wide, and has been graveled with recycled asphalt chips and gravel.

5. **Feature Comments**: _____

6. **Cans -** Total Quantity: 3

Quantity	Type	Description
1	Sanitary	Crushed fragments, no measurements
1	Sanitary	Aluminum body and steel pull tab top beverage can
1	Sanitary	Crushed tin can, 4" high, unknown diameter

7. **Can Comments**: generally food cans, with one beverage can exception

8. **Glass Bottles -** Total ENV: 1

ENV	Manufacturing Method	Description
2	Automatic	Coca cola (swirl) bottle fragments (clear glass)

9. **Glass Bottle Comments**:

10. **Ceramics -** Total ENV:

ENV	Ware	Description

11. **Ceramic Comments**:

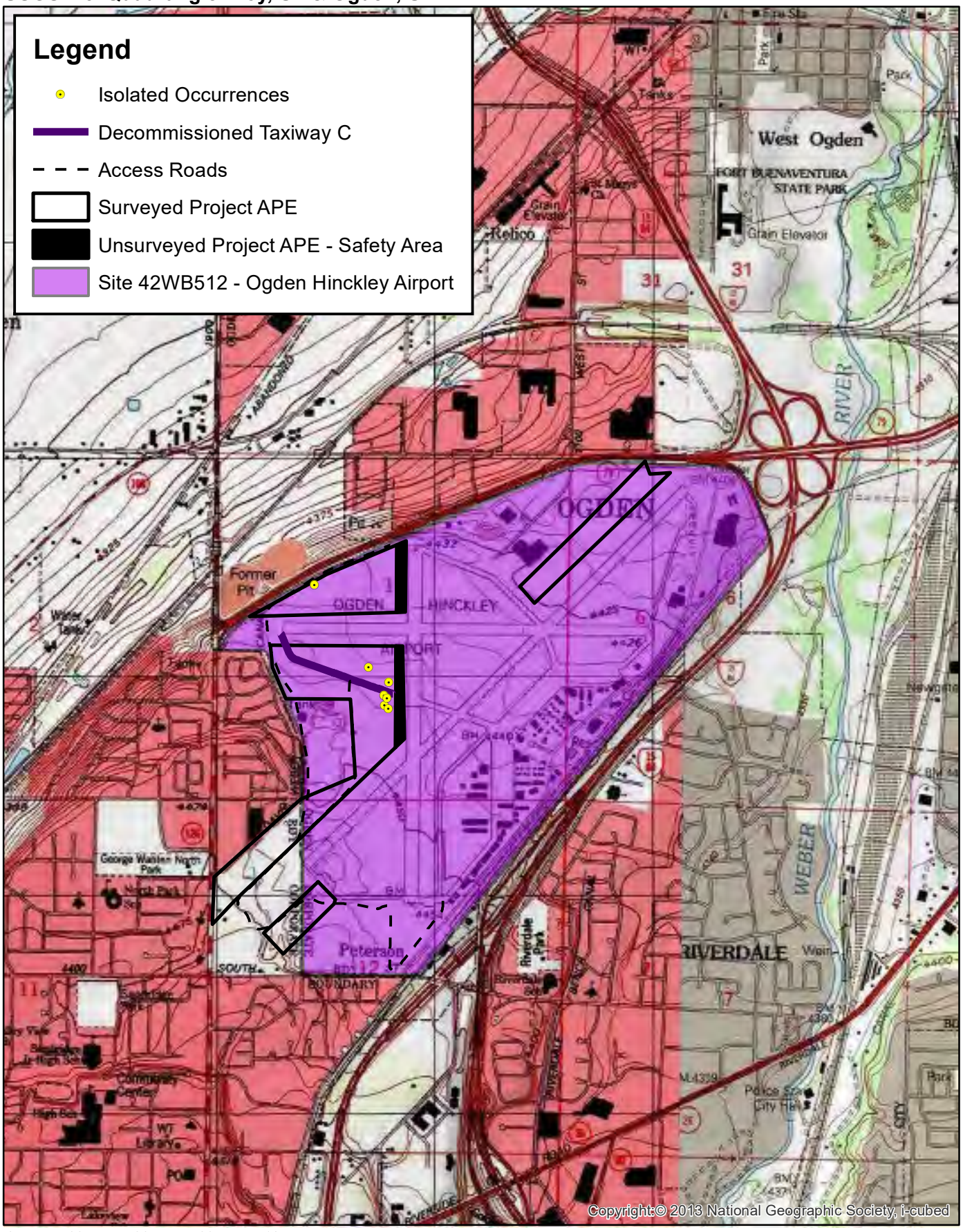
12. **Additional Artifacts/Debris:**

☐ Ammunition/Firearms	☐ Car/Car parts	☒ Glass (non-bottle)	☐ Nails (wire)	☐ Toys
☐ Bone	☐ Ceramics (non-tableware)	☐ Hardware	☐ Plastic	☐ Other
☐ Building Materials	☐ Clothing	☐ Nails (cut)	☐ Stove Parts	

13. **Additional Artifact/Debris Description**: two fragments of milk-glass from a mason jar zinc lid liner and one bottle cap

14. **Additional Part C Comments**:

USGS 7.5' Quadrangle: Roy, UT & Ogden, UT



0 0.3 0.6 0.9 1.2 Kilometers
0 0.2 0.4 0.6 0.8 Miles

1 inch = 2,000 feet

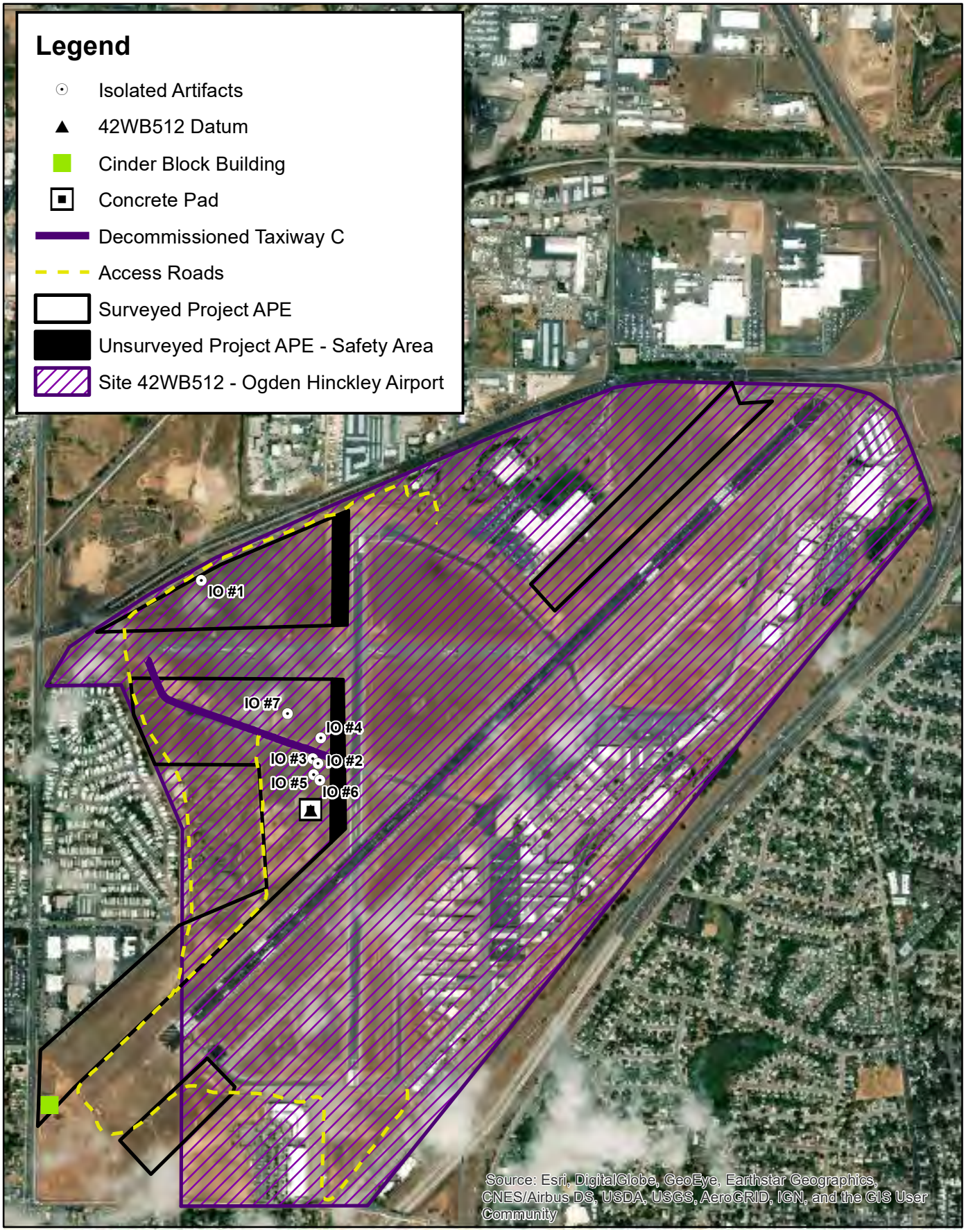
N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Desert West Environmental

Site 42WB512 Site Locator Map.



0 0.15 0.3 0.45 0.6 Kilometers

0 0.15 0.3 0.45 0.6 Miles

1 inch = 1,250 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Desert West Environmental

Site 42WB512 Site Sketch Map.



Site 42WB512, Site Overview with Decommissioned Taxiway C in cener, facing east (Photo DWE DC03:413).



Site 42WB512, Site overview, facing south (Photo DWE DC03:382).

Desert West Environmental
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JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB512

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB512, Overview of Decommissioned Taxiway C, facing northwest (Photo DWE DC03:304).



Site 42WB512, Overview of Decommissioned Taxiway C, facing southeast (Photo DWE DC03:411).

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JOB NO.	19ARCH1229
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DATE	09/24/2019
SITE NO.	42WB512

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB512, Out of period cinder block building and modern debris, facing north (Photo DWE DC03:390).



Site 42WB512, Out of period cinder block building and modern debris, facing south (Photo DWE DC03:392).

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Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB512, Overview of 8’ x 8’ concrete pad (site datum), facing south (Photo DWE DC03:291).



Site 42WB512, Overview of junction of two access roads, perimeter fence on left and taxiway access road center, facing north (Photo DWE DC03:416).

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Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB512, Overview of perimeter access road, facing north (Photo DWE DC03:418).



Site 42WB512, Overview of taxiway access road, facing north (Photo DWE DC03:414).

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JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB512

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB512, Representative sample of tin cans, plan view (Photo DWE DC03:292).



Site 42WB512, Steel and aluminum pull tab beverage can, plan view (Photo DWE DC03:293).

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1443 Binford Street
Ogden, Utah 84401
Phone:801-690-6506
Fax: 801-340-7800

JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB512

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS

UTAH ARCHAEOLOGY SITE FORM — PART A – Administrative Data

1. **Smithsonian Trinomial**: 42WB487
2. **Temporary Site No**. :
3. **Site Name:** Weber Davis Canal
4. **Date Recorded**: 09 / 24 / 19
5. **Type of Recording:** ☐ First Recording ☐ Full Re-record ☒ Update
6. **Project Name**: Ogden Hinckley Airport Redevelopment
7. **State Project Number**: U19DV0690
8. **Land Status**: Private
9. **USGS 7.5' Quad Map Name and Date**: Roy, UT
10. **Township**: 5N **Range**: 2W **Section**: 1, 12 **(¼)**: NW, NW **County**: Weber
11. **Meridian**: ☒Salt Lake ☐Uintah
12. **UTMs:** Zone 12 414287 E 4561326 N NAD 83
13. **Site Dimensions**: Length: 1000 m Width: 3 m Area: 3000 m^2 ☒GIS ☐Estimate
14. **Site Class**[a]: ☐Prehistoric ☐Protohistoric ☒Historic
15. **Site Type**:

Prehistoric/Protohistoric		Historic	
☐Long-Term Residential	☐Task Specific	☐Domestic	☐Transportation/Communication
☐Temporary Camp	☐Specialty Site	☒Agriculture/Subsistence	☐Defense
☐Unknown		☐Industry/Processing/Extraction	☐Unknown
☐Other		☐Other[b]	

16. **Site Characteristics**[a]: ☐Artifact Scatter ☐Rock Art/Inscription ☐Lithic Source/Quarry ☐Rock Shelter/Cave ☐Architectural Feature(s) ☒Non-Architectural Feature(s) ☒Linear
17. **Impacting Agents**: ☐None ☐Erosion ☐Livestock Concentration ☐Recreation ☐Road/Trail ☐Vandalism/Looting ☒Other: Maintenance/Use/Construction
18. **Site Condition:** ☒Stable ☐Deteriorating ☐Imminently Threatened ☐Destroyed
19. **Description** (as needed):
20. **Recorded By**: Sonia Hutmacher Cunningham 21. **Organization**: Desert West Environmental
22. **Material Collected:** ☒No ☐Yes (describe in Site Description) **Repository**:

NRHP Evaluation

23. **Is the Site Significant**: ☐No ☒Yes, under criterion[a]: ☒A (event) ☐B (person) ☐C (design/construction) ☐D (important information)
24. **Does it Retain Integrity**: ☐No ☒Yes, aspects present[a]: ☐Location ☐Design ☐Setting ☐Materials ☐Workmanship ☐Feeling ☒Association
25. **NRHP Status**: ☐Not eligible ☒Eligible ☐Listed
26. **Justification** (include discussion of historic context, significance, and integrity):
The Davis-Weber Canal (Site 42WB487) has been determined ELIGIBLE for nomination to the NRHP under Criterion A as a whole based on several prior documentation efforts associated with NHPA Section 106 consultations. The two newly documented segments in Weber County have been almost entirely piped or lined and some areas have been rerouted from their original location. The segments now lack integrity of design, materials, workmanship, feeling, location, and setting. As such, these segments do not contribute to the eligibility of the site as a whole.

[a] Check all that apply
[b] See manual for additional categories

Smithsonian Trinomial: **42WB487**

Temporary Site No. :

27. **Site Description** (interpretation, context, size, artifact and feature assemblage, dating, previous work and curation, etc.)**:**

The Davis-Weber Canal is a gravity fed residential and agricultural irrigation canal owned and operated by the Davis and Weber Counties Canal Company. It was constructed in the 1880s as an earthen ditch. By the early 1910s, much of the original canal had been lined with concrete. The canal begins on the south side of the Weber River, west along Interstate 84, passing under US Highway 89 and continues northwesterly along the base of the plateau of Hill Air Force Base. The canal passes under Utah State Route 168 and flows toward Riverdale, east of Interstate 15, then turns south along the eastern edge of the city of Roy, where it travels along the Weber/Davis County Line adjacent to the Ogden Hinckley Airport, south through residential neighborhoods until it terminates in Layton. The total length of the Davis-Weber Canal is 17.8 miles, though it originally extended approximately 23 miles and served parts of Fruit Heights. As the existing IMACS site records for this site do not accurately represent the results of the features identified during the 2019 field investigations, DWE has updated the Utah Site Form to include those features.

On the Ogden Hinckley Airport property, two segments of the canal were observed. The first is at the northeast end of the Project APE along the northeast trending security fence, north of decommissioned Runway 7/25. In this area, the canal runs along the northern boundary of the survey parcel south of the security fence. Approximately 2340 feet of this segment is an open, concrete-lined canal (Segment 1) that appears to be out of service, but maintained, as two sections have been patched with a different type of concrete. The date the earthen canal was lined with concrete is unknown.

Segment 1 consists of a concrete lined, open canal that is approximately 3 feet wide at the base and 6 feet wide at the top. Each wall is approximately 3 feet deep. The width of the concrete is approximately 6 inches, though this varies in areas that have been patched. The open canal transitions to a boxed (piped) canal. The box culvert is 4 feet high, 6 feet wide, and 8 inches thick and holds a 24-inch diameter corrugated steel pipe.

The second segment is a “boxed” canal segment. From the northwest end of the Project APE north of Runway 7/25, the canal is piped with modern corrugated metal pipe at a partially buried box culvert and continues, buried, south along an unknown route on the west side of the Ogden Hinckley Airport. This “boxed” canal is not visible in the Project APE until the southwestern parcel, where appears as a surficial concrete pipe that has been covered with approximately 12-24 inches of sediment. The length of Segment 2 is approximately 940 feet. The route in the NW/NW/NW quarter of Section 12 (Township 5 North, Range 2 West) where it has either been dismantled or buried. It is likely buried, continuing south, per Google Maps, though it is not delineated in this location on the Roy, Utah 1:24,000 scale USGS topographic map.

The boxed canal is a concrete pipe that has an approximately 24-inch interior diameter. The concrete pipe is 4-6 inches thick, based on the joints. There is one modern, grated box culvert for water drainage and maintenance access. The boxed culvert appears to have been installed as a surface feature and then covered with approximately 12 inches to up to 2 feet of sediment. The maximum height of the berm is 5 feet above the modern (disturbed) ground surface. A few areas of the berm have eroded, exposing the concrete pipe features.

Much of the site is in good condition and appears to have been maintained. At Segment 1, at least two sections of the lined canal have been repaired or replaced. The canal is clean, though it was not flowing in September 2019. It is either temporarily not in use or has been abandoned. The area surrounding the site is vegetated with tall grasses and forbes, though some greasewood and sage was also present in some areas.

28. **Environmental Context** (topography, vegetation, ground visibility, depositional context)**:**

29. The site is situated on a low bench in the Wasatch Front valleys of the Great Basin physiographic province. Natural vegetation is largely invasive due to airport construction and maintenance, but seeded vegetation surrounding the site consists of Lower Sonoran rangeland communities, including various forbes, bunch grasses and thistle. Ground visibility surrounding the site varies between 5% to more than 90%. Overall, the Project area has largely been disturbed from industrial, airport development since the 1930s, including airport construction and maintenance of paved taxiways and runways, gravel roadways, water retention ponds, and other airport storage facilities.

30. **Notes Regarding Access** (as needed): _____

31. **Additional Part A Comments**: _____

[a] Check all that apply
[b] See manual for additional categories

UTAH ARCHAEOLOGY SITE FORM **PART C – Historic Component**

Smithsonian Trinomial: 42WB487

Temporary Site No. :

1. **Primary dates of site use**: 1880s to 2019
2. **Secondary dates of site use**: _____ to _____
3. **Architectural Features**

Type	Description

4. **Non-Architectural Features**

Type	Description
Canal	gravity fed residential and agricultural irrigation canal, two segments: boxed (~940') and concrete lined (2340')

5. **Feature Comments**: _____

6. **Cans** - Total Quantity: _____

Quantity	Type	Description

7. **Can Comments**: _____

Smithsonian Trinomial: 42WB487
Temporary Site No. :

8. **Glass Bottles -** Total ENV:

ENV	Manufacturing Method	Description

9. **Glass Bottle Comments**:

10. **Ceramics -** Total ENV:

ENV	Ware	Description

11. **Ceramic Comments**:

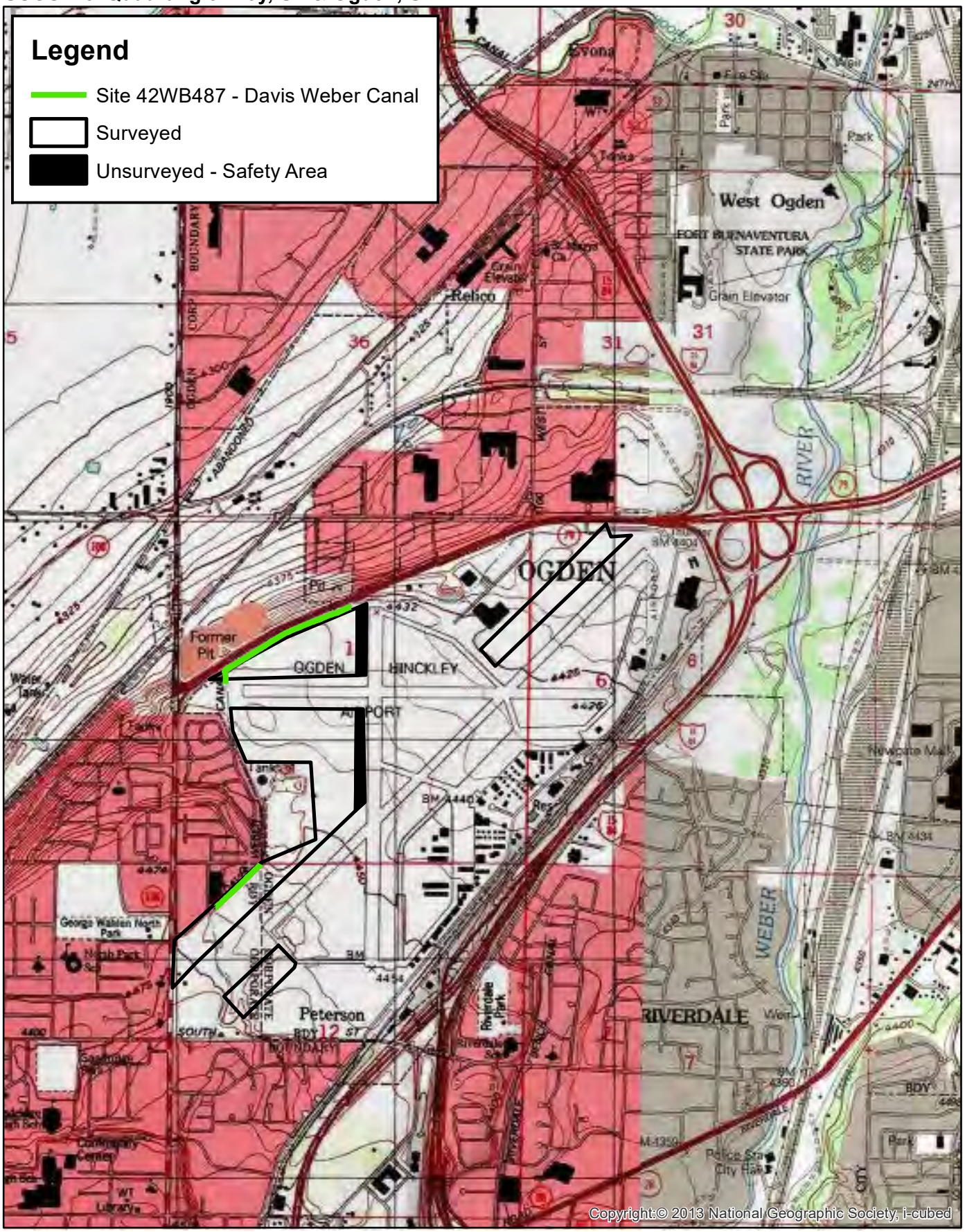
12. **Additional Artifacts/Debris:**

☐ Ammunition/Firearms ☐ Car/Car parts ☐ Glass (non-bottle) ☐ Nails (wire) ☐ Toys
☐ Bone ☐ Ceramics (non-tableware) ☐ Hardware ☐ Plastic ☐ Other
☐ Building Materials ☐ Clothing ☐ Nails (cut) ☐ Stove Parts

13. **Additional Artifact/Debris Description**:

14. **Additional Part C Comments**:

USGS 7.5' Quadrangle: Roy, UT & Ogden, UT



0 0.3 0.6 0.9 1.2 Kilometers
0 0.2 0.4 0.6 0.8 Miles

1 inch = 2,000 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Site 42WB487 Site Locator Map.



0 0.1 0.2 0.3 0.4 Kilometers

0 0.1 0.2 0.3 0.4 Miles

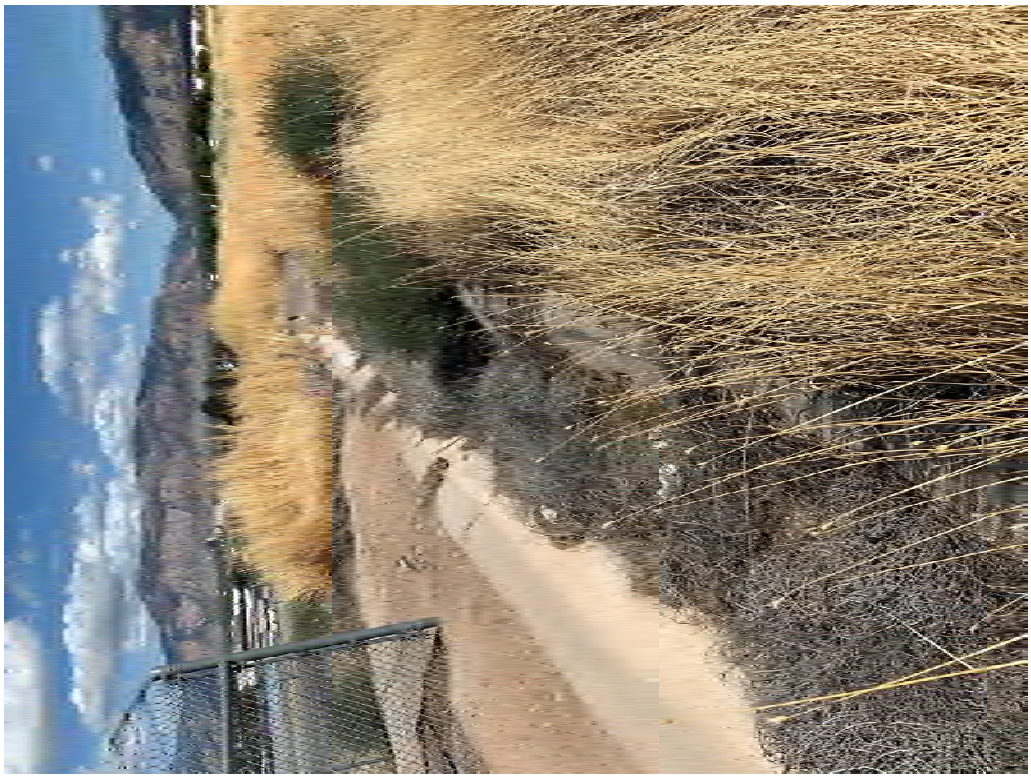
1 inch = 833 feet

N

Airport Development Group, Inc.
Ogden Hinckley Airport Redevelopment
DWE Project #19ARCH1229
Date: 08/19/2019

Desert West Environmental, LLC
1443 Binford Street
Ogden, Utah 84401

Site 42WB487 Site Sketch Map.



Site 42WB487, Site Overview, facing east (Photo DWE DC03:310).



Site 42WB487, Site overview, facing west (Photo DWE DC03:313).

Desert West Environmental
1443 Binford Street
Ogden, Utah 84401
Phone:801-690-6506
Fax: 801-340-7800

JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB487

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB487, Site Overview, facing north (Photo DWE DC03:408).



Site 42WB487, Pipe culvert overview, facing southwest (Photo DWE DC03:410).

Desert West Environmental
1443 Binford Street
Ogden, Utah 84401
Phone:801-690-6506
Fax: 801-340-7800

JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB487

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS



Site 42WB487, Piped and partially buried canal, facing northeast (Photo DWE DC03:417).

Desert West Environmental
1443 Binford Street
Ogden, Utah 84401
Phone:801-690-6506
Fax: 801-340-7800

JOB NO.	19ARCH1229
PROCESSED	SHC
DATE	09/24/2019
SITE NO.	42WB487

Ogden Hinckley Airport Redevelopment
Weber County

SITE PHOTOS

Appendix E – FAA Approval of Forecasts

From: Sweeney, John (FAA) <John.Sweeney@faa.gov>
Sent: Wednesday, August 21, 2019 8:21 AM
To: Bryant Garrett <BryantGarrett@ogdencity.com>
Cc: Wendy M Renier <wmrenier@comcast.net>; Dana Hartshorn <dhartshorn@adgairports.com>
Subject: Forecast Approval

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

Northwest Mountain Region
Colorado · Idaho · Montana · Oregon · Utah
Washington · Wyoming

Denver Airports District Office
26805 E. 68th Ave., Suite
224 Denver, CO 80249

August 21, 2019

Bryant Garrett, AAE
Ogden-Hinckley Airport
3909 Airport Road
Ogden, UT

Ogden-Hinckley Airport
Ogden, UT
AIP: 3-49-0024-047-2018
Forecast Approval

Dear Mr. Garrett:

The Federal Aviation Administration (FAA) reviewed forecast information for the subject airport. The forecast was received July 23, 2019. FAA approves the submitted forecast. The FAA also approves a C-III for the existing and future Airport Reference Code (ARC). We found the forecast to be supported by reasonable planning assumptions and current data. Your forecast appears to be developed using acceptable forecasting methodologies.

The approval of the forecast and critical aircraft does not automatically constitute a commitment on the part of the United States to participate in any development recommended in the master plan or shown on the ALP. All future development will need to be justified by current activity levels at the time of proposed implementation. [*See FAA Order 5100.38D, Airport Improvement Program, Paragraph 3-12, for ADO options.*] Further, the approved forecasts may be subject to additional analysis or the FAA may request a sensitivity analysis if this data is to be used for environmental or Part 150 noise planning purposes.

If you have questions, please call me at 303-342-1263.

Sincerely,

John Sweeney,
Community Planner
Denver ADO

Appendix F – ATCT Area of Non-visibility

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

Ogden Tower
3903 S. Airport Rd.
Ogden, UT 84405

Issued: 07/26/2019 1403 (UTC)
Ogden Tower

Effective: 07/27/2019 1200 (UTC)
Letter to Airmen: LTA-OGD-2

Subject: Area of Non-Visibility

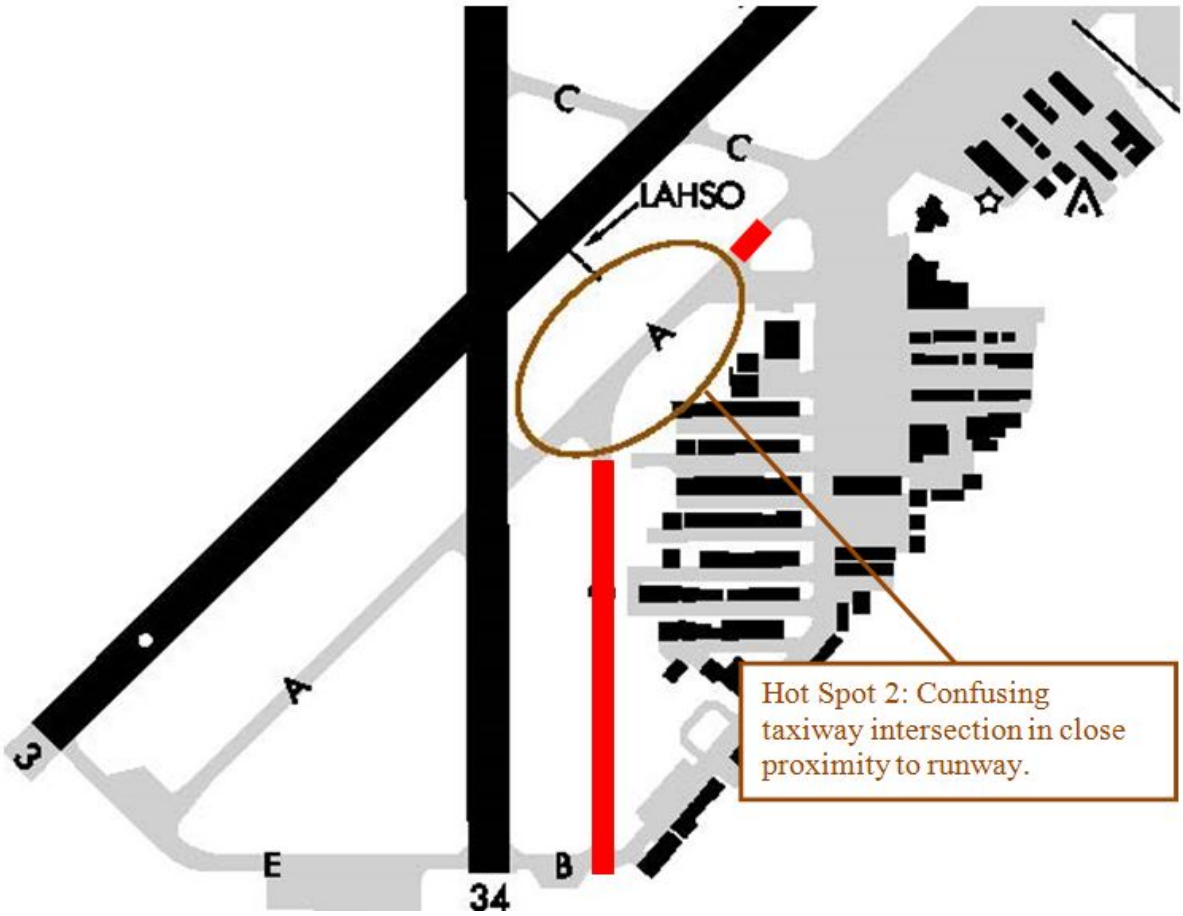
Cancellation: 07/26/2021 1200 (UTC)

Due to obstructed vision, Ogden FAA Contract Tower is unable to provide positive air traffic services in the following areas:

1. Taxiway Brave between the Runway 34 run-up area and Taxiway Alpha.
2. Beginning at the north corner of the de-ice pad and extending approximately 200 feet northeast on Taxiway Alpha.

Frank L. Elsholz
Air Traffic Manager, Ogden Tower

NOTE: The areas of non-visibility are the two areas depicted with **RED** shading.



Appendix G – Utilities Technical Memo

Ogden – Hinckley Airport
West Development Area Utility Discussion

Existing Utilities

Available utilities include a 16-inch water line with 1,500 gallon-per-minute available on average and an 8-inch sanitary sewer line that will accept 400 gallons per minute at most. Electrical power, natural gas, storm sewer and communications are nonexistent.

Proposed New Airfield Facilities

Most significantly, a commercial passenger terminal with a nominal ultimate capacity of 450,000 passengers per year is considered. For the purpose of demand calculations, a factor of 1.2 times the average daily throughput was used, resulting in 1,500 passengers on a peak day. An additional 50 terminal full-time equivalents (FTE) are used for this purpose.

Fixed Base Operations (FBO) are proposed to expand on the west side with five 22,500 SF hangars (or equivalent) treated as the ultimate growth. Maintenance Repair and Overhaul (MRO) is another anticipated hangar development, with 25 hangars similar to the FBO hangars proposed. Because the two can differ in their utility demand, they are examined separately when necessary.

Electrical Demand

Terminal

Energy use of 0.4 kilowatt-hours (kWH) per passenger and per FTE employee was used to establish variable need. A base of 2kWH per person was used for general facility requirements. Predominant hours of service were chosen to be 16 hours per day. With a peak hour at 1.2 times the average and a peak minute 3 times higher, peak demand is 1,025 kilowatts (kW). To meet this requirement, the terminal would need a 277/480V three phase service with a 1,200-amp rating.

FBO Hangars

These hangars are proposed to be primarily aircraft storage, with minor maintenance. Each 22,500 SF hangar was predicted to consume 18kWH per square foot per year. This is a blend of typical warehouse use (9kWH/SF/Yr) and commercial office space (22.5kWH/SF/Yr). With predominate use for 16 hours per day and using the same peak day, peak hour and peak minute adjustments, each hangar could experience 300kW peak demand and should be have a 277/480V three phase service rated at 400 amps.

MRO Hangars

These hangars are proposed to be primarily aircraft maintenance and overhaul. Each 22,500 SF hangar was predicted to consume 50 kWH per square foot per year. This is a reduction from typical manufacturing use (95kWH/SF/Yr) based on similar construction at Ogden - Hinckley Airport. With predominate use for 10 hours per day and using the same peak day, peak hour and peak minute adjustments, each hangar could experience 665kW peak demand and should be have a 277/480V three phase service rated at 1000 amps. This is consistent with development of new MRO hangars at OGD.

Electric Vehicle Charging Stations

Electric vehicles are increasingly becoming part of the travel landscape, with fleets, personal auto commuting and electric vertical takeoff and landing (EVTOL) all expected to increase greatly. Fleet recharging is reasonably anticipated as taking place in off-peak hours, not significantly affecting aggregate demand. Personal autos can be accommodated in multiple locations for public use and should be considered as a future need for lessees charging at their hangars, including FBO public charging stations. EV chargers have varying rating, generally running from 7kW to 175kW. EVTOL charging is more significant individually but will likely be limited to a relatively small number of locations. EVTOL charge rates can be as high as 350kW.

Natural Gas Demand

Natural gas needs are expected to diminish in the future, as renewable energy sources come into greater abundance and electricity (via heat pump, et al) become more prominent in conditioning the workspace. For this review, however, we used variations of national averages of demand and the services proposed/provided for similar purposes at Ogden – Hinckley Airport.

Terminal

Offices spaces are using an average of 32 cubic feet (CF) of natural gas per square foot per year. For the proposed terminal building, we adjusted to 50 CF/SF to allow for higher passenger throughput. Generally restricting this to winter heating, the terminal will require natural gas service capable of providing 2 to 3 MMbth/hour.

FBO Hangar

These hangars are proposed to be primarily aircraft storage, with minor maintenance. As such, they can be kept to a lower temperature, potentially reducing demand for heat by 5% to 10%. Countering this reduction is greater heat loss during operations, with FBO hangars presumed to open aircraft doors more frequently. The proposed MRO hangars in development at OGD have total heat capacity of 2.5MMbtu/hour. They are served by 2-inch, 2-psi natural gas laterals.

MRO Hangar

These hangars are proposed to be primarily aircraft maintenance and overhaul, requiring additional heat for personnel comfort but having fewer air changes than FBO hangars. The proposed MRO hangars should receive the same natural gas service as FBO hangars.

Water and Sanitary Demand

Terminal

Fire Fighting

Fire fighting water will be the most demanding use for any structure proposed, including the terminal. While the terminal will be by far the largest structure, it can be subdivided of fire fighting analysis, unlike the hangars discussed below. Fire fighting water demand will be dependent upon the final terminal design and is treated in this analysis as not exceeding 3,000 gallons per minute.

Domestic

Analysis of commercial terminals water demand varies, but is typically lower than 10 gallons per passenger, which we used as the most demanding case. Applying the peak day (1.2X), peak hour (1.2X) and peak minute (3X) factors to the typical 1,500 daily passengers over a 16-hour period, peak water demand is seen to be approximately 60 GPM. Allowing of terminal employees and a various water requirements not associated with a per passenger calculation, we see the peak demand at 120 gallons per minute, with average demand being 35 gallons per minute.

Sanitary

Sanitary needs were treated as equal to domestic water demand, with 120 GPM peak and 35 GPM average.

FBO and MRO Hangars

Fire Fighting

Demand for fire fighting water is a hangar's most significant requirement. Demand was calculated at 0.17 GPM/SF, resulting in 3,825 GPM for a 22,500 SF hangar. While 30 FBP and MRO hangars are proposed, only one fire at a time is used of this calculation.

Domestic

Domestic water use in hangars was treated similarly to the terminal, this time using 30 gallons per employee. FBO hangars were allowed another 200 gallons per day and MRO hangars an additional 1,000 gallons per day, for other purposes. Peak hour (1.2X) and peak minute (2X) factors were applied to the typical hangar habitation (FBO - 6 employees, MRO - 60 employees) over a 10-hour period. The resulting peak water demand is seen to be approximately 290 GPM, with average demand being 120 gallons per minute.

Sanitary

Sanitary needs were treated as equal to domestic water demand, with 290 GPM peak and 120 GPM average.

Storm Water

Utah regulations require a 90% storm to be retained on site. This represents 0.7 inches of rainfall in Ogden. Presuming 95 percent of the west development area will become impermeable, the remaining permeable surface would need to retain or percolate an average of 14 inches of storm water to comply. Percolation tests were performed at three sites on the airport, with excellent subsurface percolation. Presuming saturation is not achieved, storms well beyond the regulation event should be within the ability of the development area to percolate via infiltration trenches and dedicated retention areas. Sensitive locations will require storm water drainage systems above or below ground to remove water to the retention area.

Telecommunications

New on-site telecommunications services are anticipated as primarily wired telephone and network services, which could be served separately or together. New telephone systems as shifting to IP from plain old telephone systems (POTS). IP telephones can operate internally on the client network of externally to the telecommunications service provider. Whether POTS or

IP to the provider, these services should be installed along the utility corridors for electric power.

Summary

The west development area requires investment in potable water supply, sanitary sewer electrical power and natural gas, along with tenant requirements for communications.

Electrical demand will grow with development, with the terminal and MRO facilities potentially requiring one megawatt (MW) service each. This aggregate demand will be moderated by load diversity and the potential for a 20+ MW service is small unless electric heating displaces natural gas. Demand averaged across the total development is expected to be in the range of 10MW to 15MW, achieved over a number of years. Addition of electric aircraft and auto charging stations could add 3 to 5 MW to basic airport facility demand. Electric heating systems could add an additional 5 to 10 MW to basic demand.

Natural gas needs could reasonably reach to 100,000 cubic feet per hour (1,000 CcF) if alternative heat sources are not utilized. Utility distribution pipelines up to 6-inch diameter with pressures up to 200PSI should serve.

The existing 16-inch potable water line with 1,500 GPM average supply and 3,000 GPM peak (limited by the source) will readily serve domestic water needs. Fire fighting water tanks are anticipated to be required to meet the more significant demand and could be made part of the lessee's development standards or by a common municipal storage system.

Like potable water flow onto the airport, sanitary flow off the airport appears to be met with the existing service. Peak use per structure will, like electrical demand, be reduced by diversity among the buildings.

Storm water is anticipated as requiring no off-site services. Individual facility development plans should be required to control storm water within the project limits for the regulator event and utilize any airport provided storm water distribution and retention systems only for more significant events.

Telecommunications systems (optical, coax, copper) should be installed in the available utility corridors, by the utility provider.

Appendix H – City Approval of Preferred Alternative

Ogden City

OGDEN - HINCKLEY AIRPORT
3909 AIRPORT ROAD – OGDEN, UTAH 84405
OFFICE (801) 629-8251 FAX (801) 627-8104

December 17, 2019

Mr. Dana Hartshorn, P.E.
Airport Development Group, Inc.
1776 S. Jackson Street, Suite 950
Denver, Colorado 80210

Ms. Wendy M. Renier
WMRenier Consulting, LLC
PO Box 630292
Littleton, CO 80163-0292

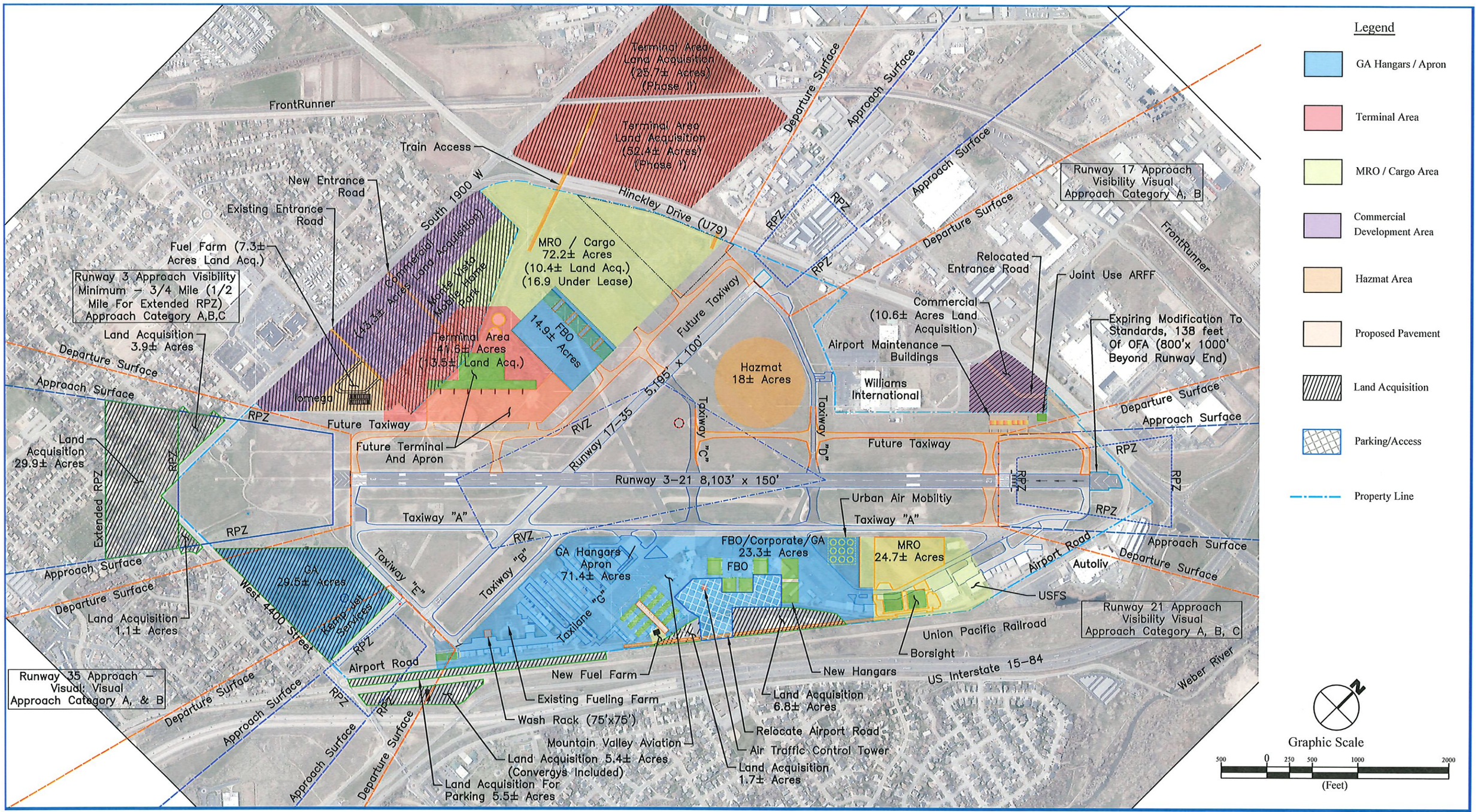
This letter serves as the approval of the Ogden-Hinckley Airport (OGD) Master Plan "preferred alternative". as depicted in the attached illustration and summary description dated December 17, 2019.

The City requests that the Airport Development Group Consultant Team proceed with the remaining master planning tasks, which will be based on the City's "preferred alternative" selection.

The "preferred alternative" represents the City's vision for the long-term (20-year) development of OGD, which promotes the continued safe and efficient operation of the Airport. Although the Master Plan addresses the future OGD development needs over a 20-year timeframe, the City acknowledges that updates may be necessary sooner, as conditions and aviation demand at OGD and the aviation industry change. At his point, only very few and very minor changes will be made.

Respectfully submitted,

Bryant W. GARRETT, AAE
Airport Manager (OGD), City of Ogden, UT – Airport Division
3909 Airport Road, Ogden, Utah 84405
(801) 603-8625 – Mobile
(801) 629-8262 – Work
bryantgarrett@OgdenCity.com



Ogden - Hinckley Airport

Preferred Development Alternative

OGDEN AIRPORT
FLYOGDEN.COM

ADG AIRPORT DEVELOPMENT GROUP INC.
1776 South Jackson Street / Suite 950
Denver, Colorado 80210-3802
303.782.0882 / 303.782.0842 fax
www.ADGAirports.com

A.I.P. Project No: 3-49-0024-047-2018

Project No: ODG1495
Date: December 2019

Sheet:
Figure 4-7
Preferred Development Alternative

Appendix I – Other Supporting Info

Airport Development Group, Inc.

Professionals in Aviation Development



www.ADGAirports.com

info@ADGAirports.com

Colorado
1776 S. Jackson St., Ste 950
Denver, CO 80210
tel: 800.541.3285
fax: 303.782.0842

Mississippi
3900 Lakeland Drive, Ste 501C
Jackson, MS 39232
tel: 601.932.6920
fax: 601.932.6901

Kansas
1726 W. 27th Ter., PO Box 3869
Lawrence, KS 66046
tel: 785.856.2327
fax: 785.856.2327

'Serving Airports Since 1984'