



SECTION OVERVIEW

The inventory of existing facilities details the natural and physical environment, as well as the airside and landside facilities of Heber Valley Airport (HCR).

The information herein will provide the essential background information used throughout this Master Plan, and provide basic information which will assist in the development of the forecast and facility requirements.



Information for the existing airport and surrounding area was collected through several sources, including site visits, historical studies, airport personnel, the Fixed Base Operator (FBO), airport tenants and users, the FAA, UDOT, and numerous online research portals.



Figure 3.1 Heber Valley Airport Historic Timeline

3.1 NATURAL AND PHYSICAL ENVIRONMENT

TOPOGRAPHY

An analysis of area topography provides insight to the types of natural and artificial features, which includes the types of surfaces which may be encountered during projects. Topography includes not only the natural landscapes such as bodies of water, mountains, and valleys, but man-made features from dams and roads, to cities and all the support infrastructure. Although topography, by definition, is a study of the surface of the earth, it can influence weather patterns, and help predict seasonal changes in wind and precipitation.

Heber City sits in the unforested Mountain Valley ecoregion as defined by the United States Geological Survey. This region contains terraces, floodplains, alluvial fans, and hills and is further characterized by cold winters and a short growing season (USEPA.2000).

Heber Valley Airport is located towards the south of the valley, with rising foothills of the Wasatch Range just a mile south of the runway. The valley is completely surrounded by rough mountainous terrain which has influenced planning and development of this area throughout its history.



Figure 3.2 Heber Valley Topography

Source: Google Maps

Figure 3.3 Heber Valley Airport Contour Map

*Airport Ground Contour Map on request with GIS department, will add when it has been completed $\!\!\!\!$

Source: T-O Engineers

GEOLOGY AND SOILS

According to the Natural Resources Conservation Service's (NRCS) Custom Soil Report, the soil at Heber Valley Airport consists primarily of Holmes gravely loam (78.7%) and Holmes cobbly sand loam (18.6%). Other soil types include Henefer silt loam (1.2%) and Kovich loam, deep water table variant (1.5%).

The parent material of Holmes gravely loam consists of alluvium derived from mixed sources. The natural drainage class is well drained, and organic matter content in the surface horizon is about 2%.

The parent material of Holmes cobbly sandy loam consists of alluvium derived from mixed sources. The natural drainage class is well drained, and organic matter content in the surface horizon is about 3 %. To view the complete soil report please see Appendix XX.

Table 3.1 Heber Valley Airport Soils						
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI			
HeA	Henefer silt loam, 1 to 3 percent slopes	2.4	1.2%			
Hk	Holmes cobbly sandy loam	39.3	18.6%			
Hr	Holmes gravely loam	166.5	78.7%			
Km	Kovich loam, deep water table variant	3.3	1.5%			
Totals for Area of Interest		211.53	100.0%			

Figure 3.4 Heber Valley Airport Soils Map



VEGETATION

Heber City is located in Wasatch County, which has historically been a major agricultural community. According to the U.S. Department of Agriculture, at one time, more sheep were shipped out of the valley than anywhere else in the nation. There are currently eight active dairies in Wasatch County, and major crops include alfalfa and grass hay, under sprinkler irrigation.

The county has experienced substantial residential growth, which includes Heber City. The city itself is a developed area, completely surrounded by agriculture. The natural vegetation is primarily Great Basin sagebrush.

The vegetation surrounding Heber Valley Airport is rangeland, in addition to game farms, feedlots, and dairy operations.

The 2012 USDA Hardiness Zone Map is the standard by which gardeners and growers can determine which plants are most likely to thrive at a specific location. The USDA identifies Heber City as having a growing zone of 5b, meaning the average minimum temperature extreme is -15°F to -10°F (USDA. 2020).

CLIMATE

The climate for this region is defined as warm summer continental climate based on the Köppen Climate Classification system. This means large seasonal temperature variations, with warm to hot and humid summers, and cold to very cold winters.

The average temperature in Heber City is 49.35°F, with the average annual high being 63.3°F, and the average low 35.4°F.

Average annual rainfall is 15.86 inches, and snowfall is 74 inches. As shown in *Figure 3.5*, the wettest months start in January, taper down through the summer months, then increase again through the fall and winter (U.S. Climate Data. 2020).



Figure 3.5 Heber City Climate Graph

Source: U.S. Climate Data - Climate Heber City

WIND COVERAGE

The FAA advises that the primary runway at an airport be oriented in the direction of the prevailing wind. The most desirable runway orientation is based on the largest wind coverage with the minimum crosswind. By aligning the runway with the predominant wind there is an increase in operational safety due to the aerodynamic design of an aircraft. A crosswind is a wind which is not parallel with the runway, and wind coverage is the percentage of time a crosswind is below an acceptable speed. Thus, properly aligning a runway provides the best wind coverage and allows for safest operations at individual airports.

A wind analysis is completed to ensure the existing runway meets the FAA defined wind coverage of 95%. If the primary runway does not meet this coverage, a crosswind runway may be recommended.

Each aircraft has a unique maximum allowable crosswind component derived from the manufacturer. This information is contained within specific Aircraft Operating Handbooks, and is also a consideration in runway design. The selected AAC and ADG as discussed in Chapter 1, are combined with the runway approach and visibility minimums to form the Runway Design Code (RDC) for a particular runway. The defined RDC drives the design standards for the runway, and includes an allowable crosswind component. Therefore, the acceptable crosswind component for a runway is appropriate for the aircraft which regularly use the runway, see *Table 3.2*.

Table 3.2 Allowable Crosswind Component by Runway Design Code				
RDC	Allowable Crosswind Component			
A-I and B-I*	10.5 Knots			
A-II and B-II	13 Knots			
A-III, B-III, C-I through C-III, D-I through D-III	16 Knots			
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI	20 Knots			
* Includes A-I and B-I Small Aircraft Source: FAA				

On the following page are three wind roses for Heber Valley Airport. A wind rose is a graphical representation of wind in terms of the direction the wind is blowing from, wind strength, and percentage of time. Wind data is unique to a geographical location; therefore, a wind rose represents data collected over a certain period of time, in a particular location.

Wind data used to create these wind roses came from the FAA database, using weather information reported from the on-site AWOS at Heber Valley Airport. The downloaded wind data contained wind direction and speed for every year, for the past 10 years. A total of 127,226 observations were included in the all-weather wind rose, 4,922 for the Instrument Flight Rules (IFR) wind rose, and 122,304 for the Visual Flight Rules (VFR) wind rose. It is important to analyze data for all conditions in order to ensure appropriate runway coverage under all meteorological conditions.

Based on this wind analysis, Runway 4/22 at Heber Valley Airport maintains greater than 95% wind coverage for all weather scenarios and does not exceed the allowable crosswind component for any RDC category.



Table 3.3 Wind Coverage					
Weather Condition	Wind Speed in Knots	Runway 4/22 Coverage			
All Weather 127,226 Observations	10.5 13 16 20	98.56% 99.32% 99.85% 99.98%			
IFR 4,922 Observations	10.5 13 16 20	98.53% 99.30% 99.85% 99.97%			
VFR 122,304 Observations	10.5 13 16 20	99.34% 99.76% 99.97% 99.99%			

In addition to the wind roses, the same data was overlaid on a satellite image of Heber Valley Airport. This view offers clarity for wind direction and strength.

The All Weather Overlay, *Figure 3.9*, includes 127,226 observations and shows the predominant wind blowing directly down Runway 4. Although there is some crosswind from the south, the speed of the crosswind remains within the acceptable limits for the RDC.



Figure 3.10 depicts wind information during instrument meteorological conditions (IMC), when visibility is less than three miles. This includes 4,922 observations, and shows that although there is an increase in duration of the crosswind from the south, the strength of the wind does not increase, therefore remains within acceptable limits for the RDC.



Figure 3.10 IFR Overlay

Figure 3.11 depicts wind information during Visual Meteorological Conditions (VMC), when visibility is three miles or greater. This includes 122,304 observations, and is very similar to the All Weather Overlay. Again, the predominant wind blows directly down the runway, with the slight crosswind visible from the south.



Figure 3.11 VFR Overlay

AIRPORT AREA ZONING

Land use in the vicinity of the airport can have an impact on the operations and growth potential. As stated, the airport is owned by Heber City, therefore, the city is obligated to ensure compatible land use around the airport as required by the Airport Improvement Program (AIP) Grant Assurance #21, Compatible Land Use. By understanding typical issues surrounding the airport, appropriate land use planning can be carried forward through the planning horizon.

Figure 3.12 depicts city zoning around the airport. The airport and adjacent I-2 zone are classified as industrial. This area allows for manufacturing, processing, warehousing and fabrication of goods. The I-1 and I-2 zones permit a mix of establishments, to include manufacturing and agricultural uses, as well as retail and commercial facilities. Commercial zoning, C-2, is intended to reduce the conflict between commercial and residential land uses and allows for a variety of land uses ranging from wholesale establishments, hotels, car lots, and hospitals, to schools, office buildings and some residential. R-3 zoning to the southeast of the airport is zoned for high density residential development to include single family homes, apartment buildings, and related community facilities (Heber Municipal Code, 2020).





Though airport property is fully within city limits, the airport is immediately surrounded by county land to the north, and Daniel Town to the south. The city of Charleston is immediately west of the airport. Though Heber City and Charleston do not share a city boundary, they are only slightly separated by city and county property.

As shown in *Figure 3.13*, the adjacent county zoning is defined as Public Facility (PF) and Residential Agriculture (RA-5). Public Facility zones provide ares for the placement of public facilities that are compatible with the adjoining uses and surroundings. Residential Agricultural zones allow residential development near incorporated areas, while maintaining a rural atmosphere with height and density restrictions. Included, but not pictured, is an established county Airport Overlay Zone. This overlay zone contains an Airport Approach Zone, Airport Transition Zone, and Airport Turning Zone, all of which incorporate specific building and land use regulations to ensure safety, as well as land use compatibility between the community and airport.

Daniel Town to the south has zoned the areas adjacent to Heber Valley Airport as Industrial and Commercial.



Figure 3.13 Wasatch County Zoning

Source: Wasatch County arc.gis.com

AIRPORT AREA LAND USE

As discussed, although the airport is owned Heber City, there is county-owned land adjacent to the airport, as well as abutting towns in which safety zones penetrate. In order to preserve this land and ensure compatible land use for future operations at the airport, careful coordination between these cities and county takes place.

The Wasatch County General Plan recognizes the need to incorporate appropriate policy in regard to land use planning around the airport. For that reason, only non-noise sensitive land uses are permitted in the spaces adjacent to the airport and include commercial, light industrial, agriculture, or open space zoning.

Wasatch County further protects this surrounding land use by stipulating certain land uses will remain open space in the event it is ever abandoned (for example, the sewer farm on the west side of the airport). The county also recommends the Daniel Planning Area between the airport and Daniel Road be zoned for manufacturing and light industrial activities. Additionally, in recognizing the growth the county is currently experiencing, it is a goal of the county to review the county land use policy every five years in order to ensure policy is being followed, as well as to address changing conditions (Wasatch County, 2016). See *Figure 3.14* for a map of existing land uses surrounding the airport.



Figure 3.14 Airport Area Land Use

The Utah Department of Transportation, Division of Aeronautics (UDOT Aeronautics) published a planning guide for compatible land use around airports. This publication addresses issues surrounding airports, and its intended use is as a quick reference for these issues. The guide recognizes that authority for airport planning lies with the Sponsor, however, it provides tools and resources for those involved in planning.

The City of Heber is ultimately responsible for planning and surrounding land use development. According to the Heber City General Plan, the surrounding area is intended to be used for industrial, manufacturing, and technology uses.

3.2 AIRSIDE FACILITIES

Airside facilities are defined by the FAA as the portion of the airport that contains the facilities necessary for the operation of aircraft. For Heber Valley Airport, these facilities include: a single runway, taxiway and connectors, aprons and aircraft parking, appropriate airfield markings, Automated Weather Observing System (AWOS), and navigation aids to include a segmented circle, airfield lighting, and a rotating beacon.

RUNWAY

Heber Valley Airport is served by a single runway, 4/22. It is 6,898 feet long, 75 feet wide, and has a weight bearing capacity of 89,000 pounds single wheel and 142,500 pounds dual wheel. The runway is appropriately marked with non-precision markings.

The runway pavement condition number (PCN) is 32/F/B/X/T, The PCN is the way some pavement strengths are classified. The numerical value, in this case 32, represents the load-carrying capacity of a standard single wheel load, at a specified tire pressure. The "F" classifies the pavement type as flexible, meaning there are layers of pavement through which the impact and load is distributed. "B" defines the subgrade strength, "X" represents a high tire pressure category, and "T" means the PCN value was obtained through a technical evaluation.



Figure 3.15 Runway 4 End

Figure 3.16 Runway 22 End



Source: T-O Engineers

The runway is equipped with Medium Intensity Runway Lights (MIRL). These lights outline the runway and are white for the primary length of the runway, then turn to amber for the last 2,000 feet. The lights marking the end of the runway emit red light toward the runway and emit green light outward from the runway end to indicate the runway threshold for landing aircraft.

The runway lighting is pilot controlled, meaning the lights are defaulted to be off, and pilots have the ability to turn them on from the aircraft. This is done by the pilot clicking the radio transmit button a series of times on the listed frequency and will remain on for 15 minutes once activated.

Figure 3.17 Medium Intensity Runway Lights (MIRL)



Figure 3.18 Precision Approach Path Indicator (PAPI)



Source: T-O Engineers

PAPI

Runway 22 is equipped with a 4-light Precision Approach Path Indicator (PAPI), *Figure 3.13* above. A PAPI is a visual aid for incoming aircraft to assist with obtaining an appropriate approach path, or glide path to the runway. A PAPI uses a combination of white and red lights, which are seen in different combinations at different angles. Four white lights indicates the aircraft is too high on the glide path, two white and two red lights indicate the aircraft is on glide path, and all red indicates the aircraft is below glide path. The PAPI at Heber Valley Airport provides guidance for a slope of 4°, and is usable up to 3.5 nautical miles away from the runway.

TAXIWAY

The airport has a full parallel taxiway on the south side of the runway designated as Taxiway A. There are seven runway connecting points, with appropriate signage. Numbers for the taxiway connectors begin at A1 at runway end 22 and stop at A7 at the runway end 4.



Figure 3.19 Taxiway Markings

Heber Valley Airport (HCR) Master Plan

NAVIGATIONAL AIDS

Airport beacons are rotating omni-directional lights, mounted on tall towers and indicate the location of a lighted airport. In the United States there are different classifications of airports which are identified with different beacon colors and flashing light patterns emitted from the rotating beacon. The airport classifications are land, water, heliport, military, and hospital or emergency services heliport.

At Heber Valley Airport, the rotating beacon flashes alternating white and green identifying it as a lighted, land airport. The beacon is in operation from sunset to sunrise, and when ground visibility is less than three miles.

The airport is equipped with a segmented circle and lighted wind cone located on the north side of the runway, at approximately midpoint of the runway. The segmented circle acts as a central location for easy identification of the wind cone, and aids in controlling the traffic pattern direction for incoming aircraft. The segmented circle identifies a standard left hand traffic pattern for both runway ends.

Figure 3.20 Rotating Beacon



Source: T-O Engineers

Figure 3.22 Wind Cone



Source: Google Earth



Source: T-O Engineers

WEATHER INFORMATION

An Automatic Weather Observing System (AWOS) is located on the south side of the runway, towards the runway end 4. These systems consist of various sensors, a processor, and a computer-generated voice subsystem which transmits minute-by-minute weather data.

Information transmitted includes wind speed, direction and gusts, temperature, dew point, and altimeter setting. The AWOS will also report density altitude if it differs from field elevation by more than 1,000 feet. This particular system at Heber Valley Airport is classified as an AWOS – 3PT, meaning in addition to the above observations, it includes additional information about precipitation type, i.e. rain, snow, and drizzle, as well as thunderstorm/lightning reporting capability (FAA. 2020).

Heber Valley Airport's AWOS can be accessed by pilots on radio frequency 124.825, or via telephone at 435-657-0892.

PAVEMENT CONDITION



Figure 3.23 AWOS

Pavements at airports are routinely surveyed by the state

transportation department, and result in a Pavement Condition Index (PCI) score. The PCI scores range from 0-100 with 0 representing failing conditions and 100 identifying perfect conditions. The score acts as a general gauge for operational condition. Typically, the range between 50-80 indicates the window where rehabilitation is needed. A PCI score lower than 50 is no longer a candidate for rehabilitation and requires complete reconstruction.

UDOT Aeronautics tracks pavement conditions of Utah's airports. This allows UDOT to determine priority across the state's airports in determining the need for rehabilitation and maintenance.

The pavements at Heber Valley Airport were last tested in October 2015. Runway 4/22 was given a PCI score of 100, Taxiway A received a 94, the southwest apron (apron 2) received an 86, apron 1 in the center was rebuilt in 2015 and scored 100, apron 3 section 1 to the east of apron 2 scored 32, apron 3 east scored 46, and the east apron run-up area had a score of 62.

According UDOT pavement engineers, pavement in this area deteriorates at approximately three points a year without any preservation, rehabilitation, or reconstruction. The last inspection was in 2015, with the next inspection scheduled for 2020. *Figure 3.24* outlines the pavement areas inspected, and *Table 3.4* represents the anticipated pavement conditions at Heber Valley Airport as of October 2020 based on the annual expected deterioration.

Figure 3.24 2015 PCI Scores



Table 3.4 Predicted 2020 PCI Scores					
Description	2020 Calculated PCI Score				
Runway 4/22	85				
Taxiway Alpha	79				
Apron 2 - South West of Apron 1	71				
Apron 1	85				
Apron 3 Section 1, East of Apron 2	17				
Apron 3 East	31				
East Apron Run-Up Area	47				

BASED AIRCRAFT

The FAA defines a based aircraft as an aircraft that is operational and airworthy, which is based at a particular facility for the majority of the year. Due to the slight vagueness in this definition, and the constant fluctuation and seasonal variations which naturally occur at the airport, there is some discrepancy in based aircraft numbers at HCR.

According to the FAA 5010 Master Record, as of the last inspection in October 2015, there are 35 based aircraft; 32 single engine, 2 multi-engine, and 1 jet. The FAA Terminal Area Forecast (TAF), issued in January 2020, lists 82 based aircraft. The FAA National Based Aircraft Inventory Program (NBAIP) lists 35 based aircraft, as confirmed in August 2012. In June 2020, hangar owners were contacted to help identify the number of aircraft currently based at the airport. Based on the information received, it has been determined that there are 115 based aircraft at HCR. The breakdown by aircraft type of the based aircraft is 97 single engine, 9 multi-engine, 4 jets, and 5 helicopters. Based on discussions with the FAA, until N numbers have been verified through the NBAIP process, the number of based aircraft to be used for further extrapolation in the forecast is the TAF number - 82.

Table 3.5 Based Aircraft Comparison				
	FAA TAF (2020)	FAA 5010 (2015)	NBAIP (2012)	Calls to Hangar Owners (2020)
Based Aircraft	82	35	35	115

3.3 LANDSIDE FACILITIES

AIRPORT ACCESSIBILITY

Heber Valley Airport is located on Airport Road, and can be accessed from the City of Heber via South Daniels Canyon Road. A paved vehicle parking lot for general aviation users is located outside the airport security fence, near the Fixed Base Operator (FBO) parking lot. There are 21 marked parking spots in the public use lot, and it is frequently at capacity.

Airport access can be gained through one of three main paved vehicle access gates which require an access card. One vehicle access gate is for FBO use only, and leads to a private lot where FBO courtesy Figure 3.25 Access Gate



Source: T-O Engineers

cars are parked. Another gate is located to the west of the general aviation parking lot, and a third gate provides access to the hangars on the east side of the airport. The airport also has several secure man gates, all which require a code or key, as well as additional non-paved vehicle and emergency response access gates. See *Figure 3.26* for an Airport Facilities Map.

AIRPORT APRON AND SUPPORT FACILITIES

Hangars at the airport inlude various sizes of box hangars, and are primarily privately owned with few commercial and city owned hangars. All hangars are located on the south side of the runway. There are 31 hangars in the southwest area of the airport including the museum, 9 in the central area including the 2 leased by the FBO, and 31 hangars in the eastern area of the airport where the glider and sailplanes are located.

Figure 3.26 Airport Facilities Map



Figure 3.27 Hangars





Source: T-O Engineers

FIXED BASE OPERATOR

Heber Valley Airport has one fixed base operator (FBO), OK3 Air. The FBO is a full service FBO, meaning they provide line services with 100 LL, and jet A refueling, as well as type I and IV deicing, battery cart and ground power unit (GPU) services. In addition, the FBO has lavatory facilities, oxygen and nitrogen services, and offers crew cars and complimentary beverages.

Figure 3.28 OK3 Air FBO



Source: T-O Engineers

Figure 3.29 Fuel Island



Source: T-O Engineers

Additionally, OK3 Air is an FAA Part 145 Certified Repair Station, with trained FAA licensed technicians, and an authorized Pilatus service center. Maintenance and repair services include structural, avionics systems, and aircraft engines. Outside of their line service, OK3 Air offers car rentals, hangar leasing, coordinated hangar selling, and aircraft sales (OK3 Air. 2020)



Figure 3.30 FBO Service Center

OK3 Air leases their three hangars from the City of Heber, which includes the main facility which holds the pilot lounge. The FBO maintains Apron 1, as noted on the Airport Facilities Map (*Figure 3.26*), which includes 20 small tie- downs, 10 larger tie-downs, and 9 designated parking spots for jets.

Source: T-O Engineers

FENCING

The perimeter fence at Heber Valley Airport circumnavigates the entire airport, though airport property exists outside of the fence line. It is a mix of wildlife fencing and chain link topped with barbed wire. The fencing is in fair to poor condition, and there are areas where the barbed wire needs to be replaced. There are gaps between fence types, as well as fencing in poor condition which allow for wildlife to frequently penetrate fencing.

Figure 3.31 Perimeter Fencing





Source: T-O Engineers

UTILITIES

Heber Light and Power provides electrical for the airport, and sewer and water is provided by the city. Currently, all hangars and facilities at the airport are equipped with utilities.

VEGETATION MAINTENANCE

The airport has a tractor with a 12 foot wide mower deck, and a smaller zero-turn mower is borrowed from the city for use around lights.

SNOW AND ICE

In order to maintain safe operations throughout the year, Heber Valley Airport maintains a snow and ice control plan which is reviewed on an annual basis. Priority for snow and ice control is first the runway then Taxiway A, followed by the taxiway connectors and taxilanes. The FBO and any commercial operator is responsible for snow removal on their leasehold, and the city is available for snow removal assistance on a contract basis.

The Snow Removal Equipment (SRE) is stored and maintained in the heated SRE building. Equipment includes a dump truck with plow, a loader with plow/box pusher attachments, and snow blower. Additional assistance and equipment can be obtained from Heber City, or other private companies. According to the airport manager, the snow removal equipment is in fair to poor condition and is in need of replacement.

Figure 3.32 Snow Removal Equipment





Source: T-O Engineers

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF) EQUIPMENT

Heber Valley Airport is not required to maintain an Aircraft Rescue and Firefighting (ARFF) program, therefore, the City responds to all emergencies at the airport and has access to the airport through all of the vehicle access gates.

AIR MUSEUM

Heber Valley Airport is home to the Commemorative Air Force (CAF) Utah Wing Museum. The CAF collects and restores aircraft to an airworthy condition with the goal of honoring military aviation. Aircraft are displayed for the public, as well as available for warbird rides. The museum can be reserved for special events, as well as World War II era photo shoots. The museum maintains a parking lot outside of the hangar, and has access to a gravel lot for large events.

Figure 3.33 Air Museum





Source: T-O Engineers

FLYING CLUBS

Utah Soaring Association has four locations throughout northern Utah to include Heber Valley Airport. The club provides glider instruction, maintains multiple gliders for member use, and coordinates annual events and competitions. The Association totals over 80 members, and the benefits of membership include inexpensive flying, access to well-maintained aircraft for either instruction or enjoyment, as well as the camaraderie shared between people who enjoy the freedom of flight (Utah Soaring Association. 2020).

LEASED LAND

Approximately 20 acres of land west of Runway 4 is leased for agricultural purposes to include alfalfa and hay fields, as well as grazing. South of the hangars, a few acres of land are used to pasture horses. Throughout the airport, the local high school uses portions of the property for various projects as part of the Center for Advanced Professional Studies (CAPS) program. CAPS is a partnership between local high school students, businesses, and industry mentors. The goal is to help students develop critical thinking and problem solving skills by working in collaborative groups to complete real-world projects while being mentored by industry partners.

CHAPTER REFERENCES

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