

Environmental Assessment for the Proposed HIO 13R-31L RSA Improvements

Alternatives Analysis Summary – DRAFT

March 4, 2019

INTRODUCTION

Projects receiving federal funding, including improvements to the Hillsboro Airport Runway 13R and Runway 13R Runway Safety Area (RSA), are required to comply with the National Environmental Policy Act (NEPA). NEPA requires evaluation of the environmental impacts of all reasonable alternatives. Reasonable alternatives include those that are feasible (possible) and that are practical from a technical and economic standpoint and using common sense. Federal Aviation Administration (FAA) Order 1050.1E2 and FAA Order 5050.4B establish the process for complying with these requirements.

In order to identify which alternatives are reasonable, a set of screening criteria were developed to evaluate the preliminary alternatives identified for this project. This summary document provides an overview of the screening criteria, presents the range of preliminary alternatives identified, and provides a summary of the screening results. Additional documentation and information for this alternatives analysis process will be included in the project's draft environmental assessment, which will be available for public comment in early 2020.

SCREENING CRITERIA

To evaluate which alternatives are reasonable and should be studied in detail in the environmental assessment, a set of screening criteria were identified by the FAA and Port of Portland.

The first step in the screening process (Screening Level 1) looks at whether an alternative would ensure that Hillsboro Airport can continue to serve all of the aircraft that currently use the airport. This is done by ensuring that alternatives are compatible with the critical aircraft, which is the most demanding aircraft, in terms of the runway length and other airfield dimension requirements. The Hillsboro Airport Master Plan Update identifies the critical aircraft as a Gulfstream G650, a jet typically used in business aviation, which requires the full existing 6,600 feet of runway. Alternatives that do not meet this screening criterion are not advanced for further evaluation.

The second step (Screening Level 2) looks at whether an alternative is reasonable from a safety and operational standpoint and from an economic and common-sense standpoint.

Screening criteria developed for the project are listed below.

Screening Level 1: Is the alternative compatible with critical aircraft?

• Does the alternative maintain the existing useable Runway 13R-31L length of 6,600 feet?

Alternatives that do not pass this criterion are not retained for additional screening.

Screening Level 2: Is the alternative practical?

A. Does the alternative cause safety or operational problems that are not easily resolvable?

- Does the alternative cause increases in Runway Protection Zone (RPZ) non-compliance on either end of Runway 13R-31L?
- Does the alternative create a high-energy runway intersection (intersecting crosswind runway at middle third of Runway 13R-31L)?
- Does the alternative eliminate the wildlife hazard in the RSA?
- Does the alternative create new (or increase existing) obstructions to Part 77 surfaces?
- Does the alternative adversely affect the Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) or other elements of the Navigational Aid System (NAVAIDS)?
- Does the alternative present unique problems or result in an accumulation of safety and/or operational problems not easily resolved?
- B. Is the alternative practical from an economic standpoint and using common sense?
- Does the alternative cause more adverse environmental or social impacts than another alternative(s) that solves the problem?
- Does the alternative have substantially greater construction, maintenance or operational costs than another alternative(s) that solves the problem?
- Does the alternative present unique problems or result in an accumulation of adverse impacts or costs that collectively reach extraordinary magnitudes?

PRELIMINARY ALTERNATIVES

In identifying potential alternatives for the project, the Port of Portland and FAA looked at potential solutions that would achieve the identified purpose of the project, which is to meet current FAA airfield design standards for Runway 13R-31L and its RSA. The northern quarter of the runway (Runway 13R) and its RSA do not meet FAA standards for surface gradients (grade or slope), so only preliminary alternatives that would fix this deficiency (by meeting FAA standards) were considered.

The Port and FAA first looked at options that would avoid impacts to Glencoe Swale and the associated wetlands and floodplain because federal laws and policies require that such avoidance alternatives are evaluated to determine if they are reasonable. Options that would avoid these resources are represented as Alternatives 1 through 4, as listed in the Table 1 below. In addition, options that would modify the swale, wetlands and floodplain were also identified as Alternatives 5 and 6. These six alternatives represent a reasonable range of alternatives and reflect alternatives suggested for evaluation when improving RSAs in FAA Order 5200.8.

Following Table 1, an exhibit depicting each alternative is provided with a summary of the alternative's key elements and the results of the previously-described screening evaluation.



Table 1. Description of Preliminary Alternatives

ALTERNATIVE		DESCRIPTION
1	Reduce Runway 13R-31L Length	 Shift Runway 13R threshold 740 feet to the south to accommodate full RSA south of wetlands, vegetated corridor and Glencoe Swale. Reduces runway length to 5,860 feet. Relocates Runway 13R Runway Protection Zone (RPZ) and Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) and other elements of the Navigational Aid System (NAVAIDs).
2	Runway 13R Declared Distances	 Reduce available landing distance by 740 feet on Runway 13R to 5,860 feet to accommodate full RSA south of wetlands, vegetated corridor and Glencoe Swale. Reduces landing distance on Runway 13R to 5,860 feet and maintains 6,600 feet for takeoff on Runway 13R. Relocates Runway 13R RPZ, MALSR, and other NAVAIDs.
3	Shift Runway13R-31L South	 Shifts Runway 13R-31L 740 feet south by removing pavement at north end south of wetlands, vegetated corridor and Glencoe Swale. Maintains existing 6,600-foot runway length. Relocates Runway 13R RPZ, MALSR, and other NAVAIDs.
4	Install Engineered Material Arresting System (EMAS)	 Constructs Engineered Materials Arresting System (EMAS) south of wetlands, vegetated corridor, and Glencoe Swale. Reduces runway length to 6,100 feet to accommodate EMAS. Relocates Runway 13R RPZ, MALSR, and other NAVAIDs.
5	Underground Conveyance	 Conveys Glencoe Swale under the RSA in a pipe or conduit and fills/regrades existing swale, wetlands and vegetated corridor. Maintains existing threshold locations and existing 6,600-foot runway length. Removes MALSR and other NAVAIDS from Runway 13R RSA during construction and replaces in same locations.
6	Redirect Swale around RSA	 Relocates Glencoe Swale north around RSA approximately 1800 feet and twice under service road, some wetlands and vegetated corridor may be able to be relocated; fills/regrades existing swale, wetlands and vegetated corridor. Maintains existing threshold locations and existing 6,600-foot runway length. Removes MALSR and other NAVAIDS from Runway 13R RSA during construction and replaces in same locations.

ALTERNATIVE 1: REDUCE RUNWAY 13R-31L LENGTH



KEY ELEMENTS

- Accommodates standard 1,000-foot Runway 13R RSA
- Shifts Runway 13R threshold 740 feet south
- Reduces Runway 13R-31L length by 740 feet to 5,860 feet
- Relocates Runway 13R RPZ and MALSR/NAVAIDS
- Relocates or tunnels 0.5 mile of NW Evergreen Road and 0.25 mile of NE 25th Avenue from Runway 13R RPZ
- Regrades Runway 13R and Runway 13R RSA south of Glencoe Swale/wetlands/vegetated corridor

SCREENING RESULTS

- Reduced runway length to 5,860 feet is not compatible with critical aircraft
- Not recommended for detailed analysis due to incompatibility with critical aircraft

ALTERNATIVE 2: RUNWAY 13R DECLARED DISTANCES



KEY ELEMENTS	SCREENING RESULTS
 Accommodates standard 1,000-foot Runway 13R RSA Reduces landing distance on Runway 13R and takeoff distance on Runway 31L to 5,860 feet Maintains 6,600 feet for takeoffs on Runway 13R and landings on Runway 31L Relocates Runway 13R Runway 13R RPZ and MALSR/NAVAIDS Relocates or 0.5 mile of NW Evergreen Road and 0.25 mile of NE 25th Avenue from Runway 13R RPZ Regrades Runway 13R and Runway 13R RSA south of Glencoe Swale/wetlands/vegetated corridor 	 Reduced available landing distance on Runway 13R to 5,860 feet is not compatible with critical aircraft Not recommended for detailed analysis due to incompatibility with critical aircraft

ALTERNATIVE 3: SHIFT RUNWAY 13R-31L SOUTH



KEY ELEMENTS

- Accommodates standard 1,000-foot Runway 13R RSA
- Relocates Runway 13R-31L 740 feet
- Maintains existing 6,600-foot runway length
- Relocates Runway 13R Runway 13R RPZ and MALSR/NAVAIDS
- Relocates Runway 31L RSA, RPZ and NAVAIDS
- Regrades Runway 13R and Runway 13R RSA south of Glencoe Swale/wetlands/vegetated corridor
- May regrade Runway 31L RSA
- Relocates or tunnels 660 feet of Cornell Road from Runway 31L RSA
- Relocates or tunnels 830 feet of Veterans Drive and 500 feet of Brookwood Parkway from Runway 31L RPZ
- Relocates or tunnels 0.5 mile of NW Evergreen Road and 0.25 of NE 25th Avenue from Runway 13R RPZ (any change to RPZ requires compliance with current requirements)

SCREENING RESULTS

- Maintains 6,600-foot runway length; compatible with critical aircraft
- Increases RPZ non-compliance: Veterans Drive and Brookwood Parkway in Runway 31L RPZ would require relocation or tunnel
- Creates high-energy runway intersection
- Wildlife hazard moves from the RSA to the RPZ
- Increases obstructions in Part 77 surfaces at Runway 31L end
- Cornell Road is in Runway 31L RSA and would require relocation or tunnel
- Avoidance of water resources in Runway 13R RSA would result in equal or greater water resource impact to Dawson Creek from relocation of Brookwood Parkway from Runway 31L RSA or extraordinary tunnel cost
- Relocation of Cornell Road from Runway 31L RSA and Veterans Drive from RPZ would result in extraordinary property takes and community disruption or extraordinary tunnel cost
- Estimated cost \$28 to 40 million (not including land acquisition for road relocations) is greater than Alternative 5 (\$15 to \$25 million)
- Environmental and social impacts and/or tunnel costs of clearing Runway 31L RSA and RPZ are extraordinary in comparison with Alternative 5, without any additional benefit or advantage
- Not recommended for detailed analysis due to the accumulation of adverse impacts and cost that collectively reach extraordinary magnitudes

ALTERNATIVE 4: INSTALL ENGINEERED MATERIAL ARRESTING SYSTEM (EMAS)



KEY ELEMENTS

- Meets safety area requirement for Runway 13R RSA by installing Engineered Material Arresting System (EMAS); EMAS is an FAA-approved aircraft arresting system that uses porous cellular materials and is intended to stop aircraft that have overshot a runway)
- Relocates Runway 13R threshold 500 feet south
- Reduces Runway 13R-31L length by 500 feet to 6,100 feet
- Relocates Runway 13R RPZ and MALSR/NAVAIDS
- Relocates or tunnels 0.5 mile of NW Evergreen Road and 0.25 mile of NE 25th Avenue from Runway 13R RPZ
- Regrades Runway 13R
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SCREENING RESULTS

- Reduced runway length to 6,100 feet is not compatible with critical aircraft
- Not recommended for detailed analysis due to incompatibility with critical aircraft



ALTERNATIVE 5: UNDERGROUND CONVEYANCE



KEY ELEMENTS	SCREENING RESULTS
 Accommodates standard 1,000-foot Runway 13R RSA Conveys Glencoe Swale under Runway 13R RSA in a conduit Maintains existing 6,600-foot runway length in existing location Removes MALSR and other NAVAIDS from Runway 13R RSA during construction and replaces in same locations Regrades Runway 13R and Runway 13R RSA, including Glencoe Swale/wetlands/vegetated corridor 	 Maintains 6,600-foot runway length; compatible with critical aircraft Would not cause safety or operational problems Impacts approximately 2.6 acres of water resources in Runway 13R RSA – same as Alternative 6 and same or less than Alternative 3 Estimated cost of \$15 to \$25 million is less than Alternative 3, which is \$28 to \$40 million Recommended to be retained for detailed analysis

ALTERNATIVE 6: REDIRECT SWALE AROUND RUNWAY SAFETY AREA



KEY ELEMENTS	SCREENING RESULTS
 Accommodates standard 1,000-foot Runway 13R RSA Reroutes Glencoe Swale north around under Runway 13R RSA Maintains existing 6,600-foot runway length in existing location Removes MALSR and other NAVAIDS from Runway 13R RSA during construction and replaces in same locations Regrades Runway 13R and Runway 13R RSA, including Glencoe Swale/wetlands/vegetated corridor 	 Maintains 6,600-foot runway length; compatible with critical aircraft Wildlife hazard moves from the RSA to the RPZ Impacts approximately 2.6 acres of wetlands in Runway 13R RSA – same as Alternative 5 and same or less than Alternative 3 Unlikely to be approved for permits due to poor quality and likelihood of success of on-site mitigation versus use of an offsite mitigation bank for Alternative 5 Not recommended for detailed analysis because it is unlikely to be approved for required permits



SUMMARY RESULTS OF THE ALTERNATIVES ANALYSIS PROCESS

Table 2 presents a summary of the recommendations for each of the six preliminary alternatives based on the alternatives analysis screening process.

ALTERNATIVE		RECOMMENDATION	REASON FOR RECOMMENDATION			
1	Reduce Runway 13R-31L Length	Do not retain for detailed analysis	Incompatible with critical aircraft			
2	Runway 13R Declared Distances	Do not retain for detailed analysis	Incompatible with critical aircraft			
3	Shift Runway 13R-31L South	Do not retain for detailed analysis	Accumulation of adverse impacts and cost that collectively reach extraordinary magnitudes			
4	Install Engineered Materials Arresting System (EMAS)	Do not retain for detailed analysis	Incompatible with critical aircraft			
5	Underground Conveyance	Retain for detailed analysis	Passes all criteria			
6	Redirect Swale around RSA	Do not retain for detailed analysis	Not likely to be approved for required permits			

Table 2. Summary of Recommendations from Alternatives Analysis Process