

2 Alternatives

Specific Federal Aviation Administration (FAA) guidance was issued under FAA Orders 1050.1F and 5050.4B which require a thorough and objective assessment of the Proposed Action, the No Action Alternative, and reasonable alternatives that would achieve the stated purpose and need for the action. Section 6-2.1(d) of FAA Order 1050.1F provides the following guidance on the content of the alternative's analysis for an Environmental Assessment (EA):

“The alternatives discussed in an EA must include those that the approving official will consider. There is no requirement for a specific number of alternatives or a specific range of alternatives to be included in an EA. An EA may limit the range of alternatives to the proposed action and No Action when there are no unresolved conflicts concerning alternative uses of available resources. Alternatives are to be considered to the degree commensurate with the nature of the proposed action and agency experience with the environmental issues involved. Generally, the greater the degree of impacts, the wider the range of alternatives that should be considered. The preferred alternative, if one has been identified, should be indicated. For alternatives considered but eliminated from further study, the EA should briefly explain why these were eliminated.”

This chapter describes the alternatives and the process used to identify and evaluate those alternatives and is organized as follows:

- Range of Alternatives Considered - This section describes initial alternatives that were considered as part of this EA.
- Alternatives Evaluation Process - This section describes the screening process that was used to evaluate the potential alternatives and briefly explains why any of these alternatives were eliminated.
- Alternatives Retained for Detailed Analysis in the EA - This section identifies the alternatives that were carried forward for further environmental review in this EA based on the screening and evaluation conducted.

2.1 Range of Alternatives Considered

This section provides a brief description of the alternatives considered in this EA. The Raleigh-Durham Airport Authority (Airport Authority) conducted an extensive alternatives evaluation in its recent Vision 2040 Master Plan (Master Plan) and in the subsequent planning and design process. However, the FAA must independently review alternatives to the Proposed Action in the National Environmental Policy Act (NEPA) process. Therefore, various alternatives were considered as part of this EA. For the purposes of evaluating the range of alternatives, the alternatives were grouped into the following categories:

- Runway Alternatives,
- Lumley Road Alternatives, and
- Fill Dirt Borrow Site Alternatives.

2.2 Runway Alternatives

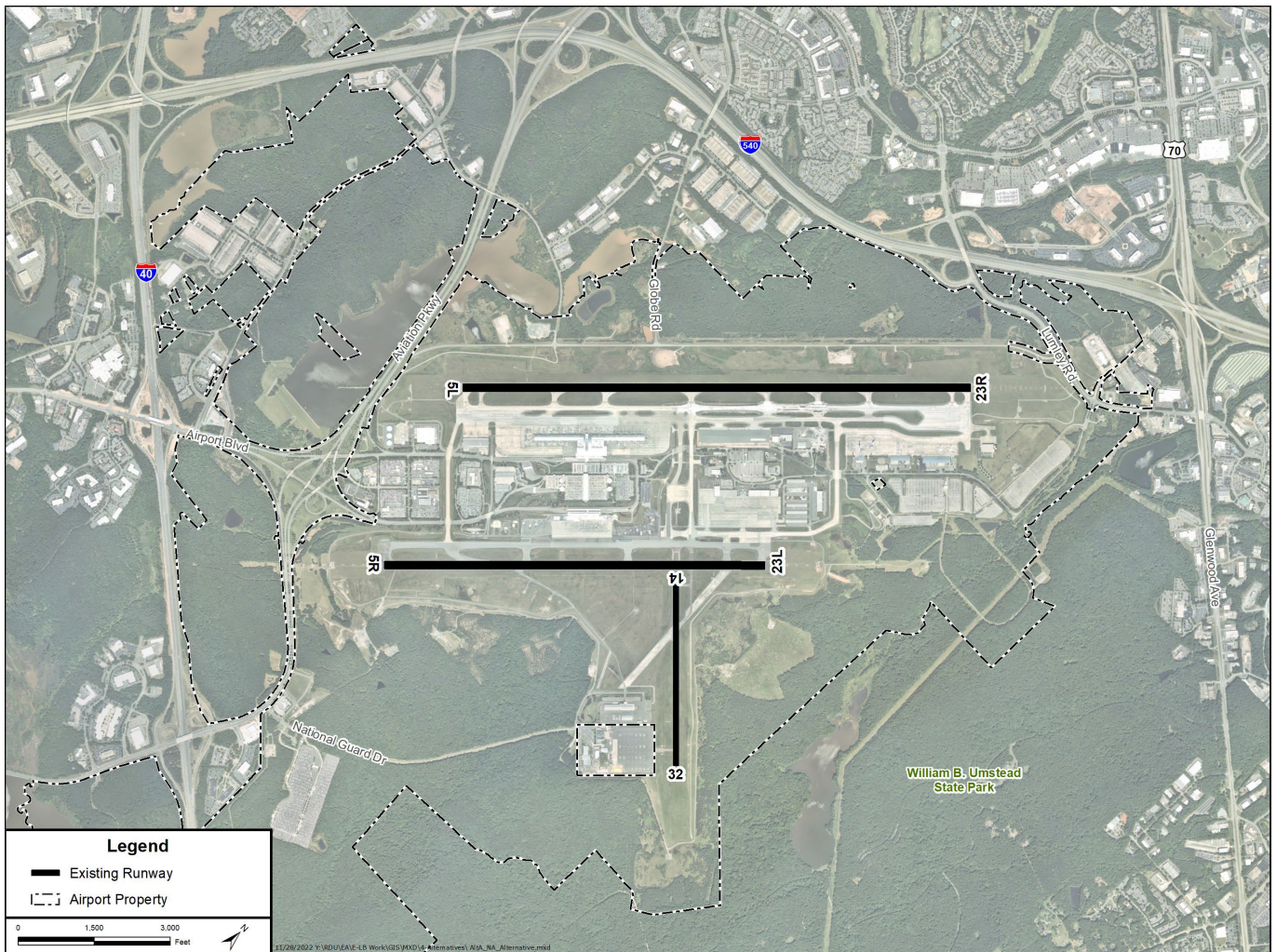
Various runway alternatives were analyzed. The runway alternatives analyzed were grouped into the following three categories with similar characteristics.

- Alternative A is identified as the No Action Alternative.
- The “B” group of alternatives included off-airport runway alternatives.
- The “C” group of alternatives contain on-airport runway alternatives. The Proposed Action is included in the C alternatives. Only practicable alternatives were considered as part of this EA. Alternatives further to the northwest beyond 537 feet were not considered practicable or feasible because they would increase environmental impacts. Any runway alternative to the northwest beyond 537 feet would include fill between the existing runway and any future runway, thereby increasing the footprint of the impact. Furthermore, changes in elevation would require additional fill material that would impact Waters of the U.S.

2.2.1 Alternative A (No Action Alternative)

Exhibit 2-1 presents the No Action Alternative, where no changes would be made to the airfield or runways. Runway 5L/23R would remain 10,000 feet long and 150 feet wide and the primary runway at Raleigh-Durham International Airport (RDU). Runway 5R/23L would remain 7,500 feet long and 150 feet wide, and Runway 14/32 would remain 3,570 feet long and 100 feet wide. The Airport Authority would continue to repair the increasing damage and cracks to Runway 5L/23R. As previously described, ongoing repair efforts, extensive monitoring, and frequent cleaning require a high number of Runway 5L/23R closures and reduces the overall reliability and safety of the primary runway.

EXHIBIT 2-1, ALTERNATIVE A (NO ACTION ALTERNATIVE)



Source: ADCI, Landrum & Brown, and Airport Authority, 2021.

2.2.2 Alternative B1 (Construct New Runway at a New Airport)

A new runway at a new airport was considered to serve as a complete replacement for the primary runway and key existing facilities at RDU and to accommodate future aviation demand in the region. RDU currently has two parallel runways and a crosswind runway. RDU is the only Medium Hub Primary Airport in the Research Triangle region. The development of a completely new runway at a new replacement airport would require finding and purchasing the available land needed, and the construction of an airport with facilities, including new runways and terminal buildings, capable of accommodating the projected needs of RDU.

2.2.3 Alternative B2 (Use of Another Runway at an Existing Airport)

The use of a runway at another existing airport near RDU was considered. Nearby airports included Raleigh Regional Airport at Person County, Triangle North Executive Airport, Johnston Regional Airport, Raleigh Exec Jetport, Siler City Municipal Airport, and Burlington-Alamance Regional Airport. These existing airports have a single runway with lengths that range from 5,500 to 6,500 feet long. In contrast, RDU has three runways with lengths that range from 3,500 to 10,000 feet long. Additionally, only two of the airports (Triangle North Executive Airport and Raleigh Exec Jetport) have passenger terminal facilities, which fall far short of the passenger terminal facilities at RDU. Use of these alternative runways at nearby airports would require construction to lengthen these runways and to provide the facilities demanded by the number of projected RDU operations and passengers.

2.2.4 Alternative B3 (Use of Alternative Modes of Transportation)

Alternative transportation modes such as rail, bus, or automobile service, which may offer alternatives to runway use for aviation passengers and freight shippers instead of the primary runway at RDU, were considered for this EA. This included reviewing the potential Southeast High-Speed Rail project which would implement a high-speed passenger rail service between Charlotte, North Carolina (NC) through Raleigh, NC and Richmond, Virginia to Washington, D.C.

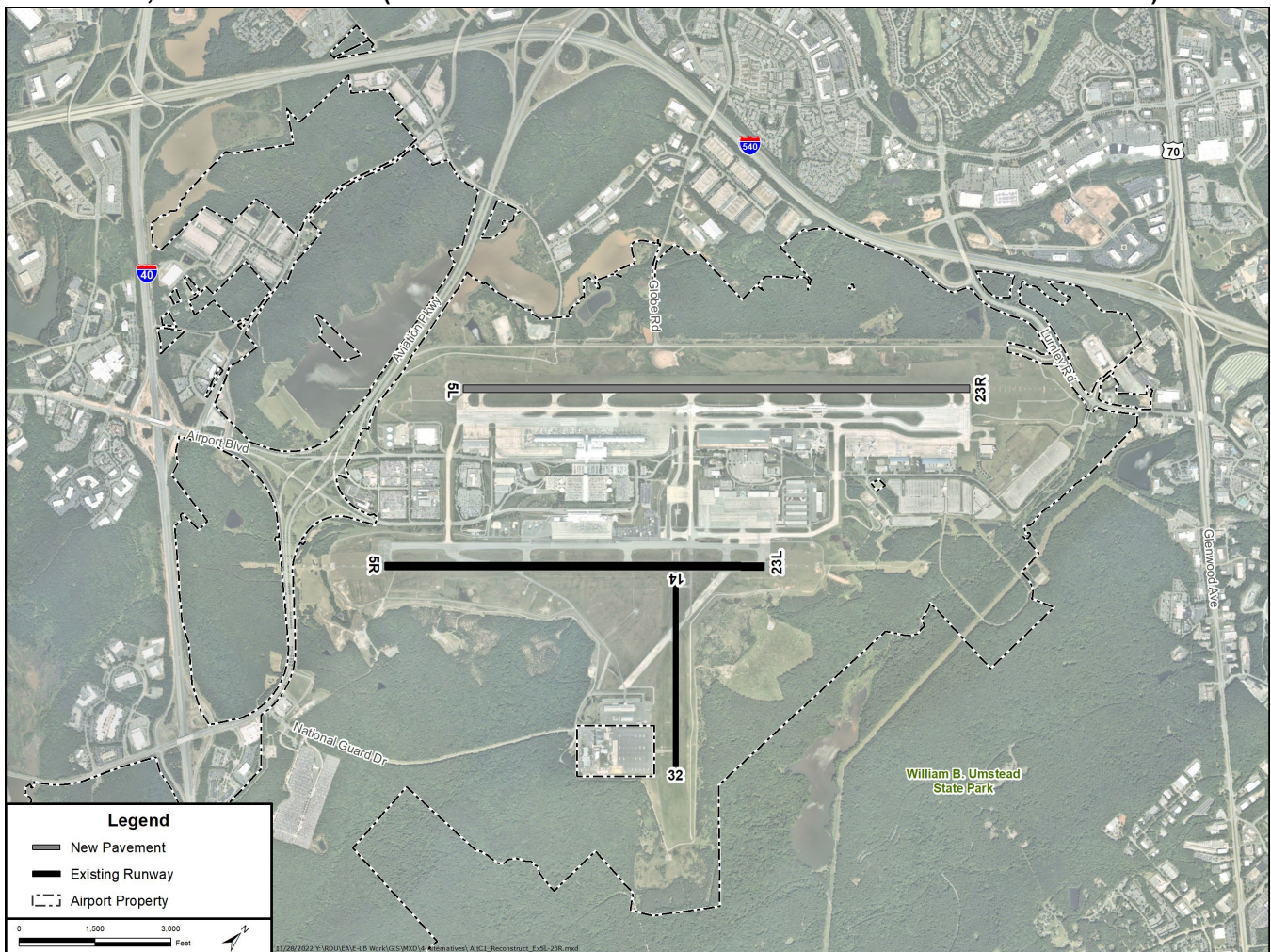
2.2.5 Alternative B4 (Use of Technology)

The impacts associated with the COVID-19 pandemic essentially halted all travel in March 2020, which required many business travelers to quickly pivot from air travel and in-person meetings to telecommuting and conducting videoconference meetings. Stay-at-home orders required many businesses to shift to work-from-home temporarily with many still operating a hybrid of work-from-home and in the office. The COVID-19 pandemic has been a catalyst for some companies to move to work-at-home on a permanent basis. Therefore, the use of technology including telecommunication was reviewed as an alternative.

2.2.6 Alternative C1 (Reconstruct Runway 5L/23R in its Existing Alignment)

This alternative would reconstruct Runway 5L/23R in its current location and existing alignment as shown on **Exhibit 2-2**. Runway 5L/23R would be shut down for multiple years during reconstruction. Aircraft operations would be shifted to Runway 5R/23L and Runway 14/32 at their current lengths. The reconstructed Runway 5L/23R in its existing alignment would still have a 10,000-foot-long Takeoff Run Available (TORA), Takeoff Distance Available (TODA), Landing Distance Available (LDA), and Accelerate Stop Distance Available (ASDA) for both Runway end 5L and 23R. There would be no displaced landing thresholds on either runway end.

EXHIBIT 2-2, ALTERNATIVE C1 (RECONSTRUCT RUNWAY 5L/23R IN ITS EXISTING ALIGNMENT)

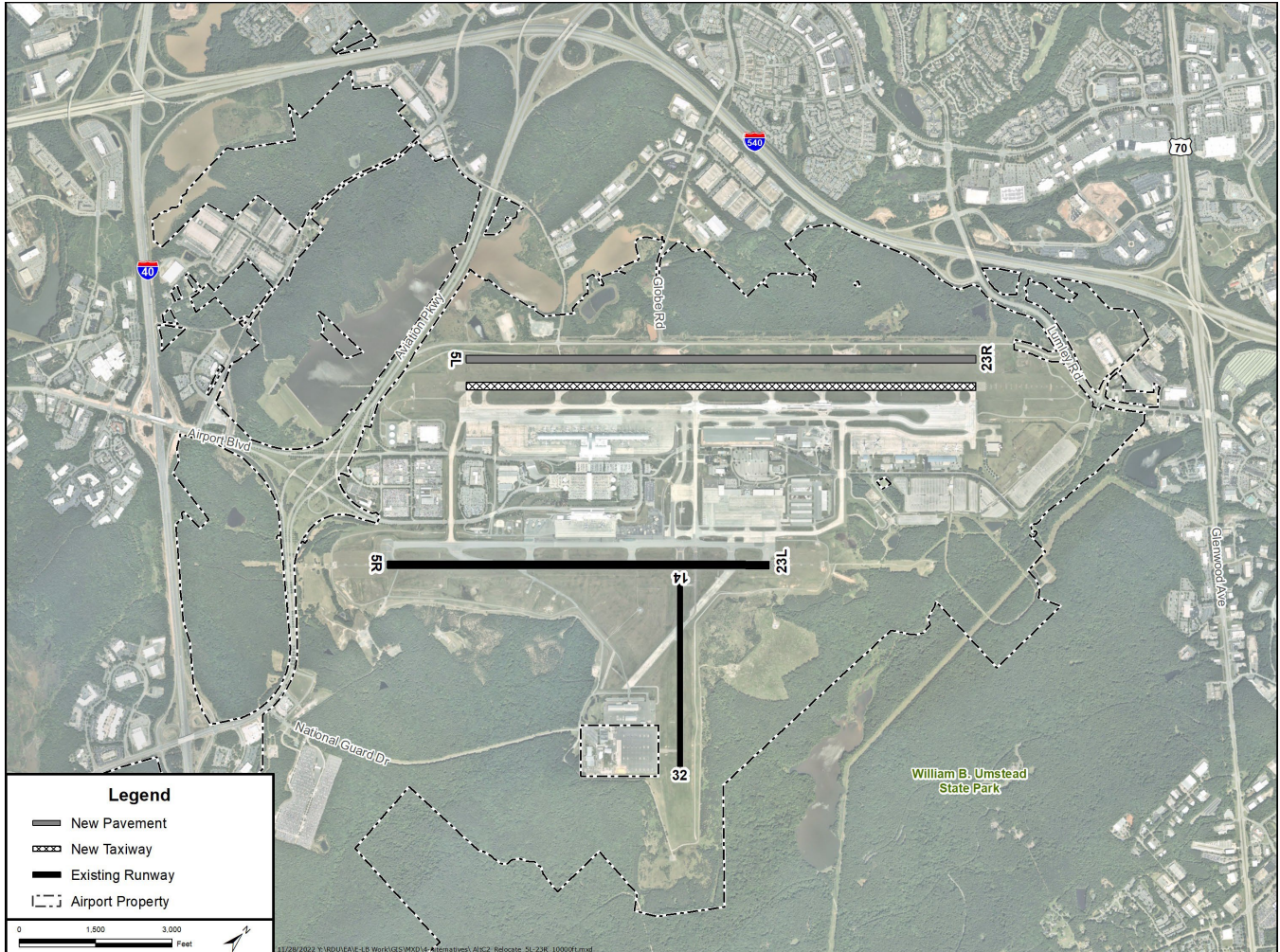


Source: ADCI, Landrum & Brown, and Airport Authority, 2021.

2.2.7 Alternative C2 (Relocate Runway 5L/23R at a Total Length of 10,00 Feet)

This alternative would relocate Runway 5L/23R approximately 537 feet northwest of its current location. The existing Runway 5L/23R would be reconstructed as a taxiway. The relocated 5L/23R would be 10,000 feet long and 150 feet wide to replace exactly the existing total pavement length. Alternative C2 is shown on **Exhibit 2-3**. Runway 5L would have an LDA of 9,361 feet and a TORA, TODA, and ASDA of 10,000 feet. Runway 23R would have a TORA and TODA of 10,000 feet, an ASDA and LDA of 9,650 feet. There would be no displaced landing thresholds on either runway end.

EXHIBIT 2-3, ALTERNATIVE C2 (RELOCATE RUNWAY 5L/23R AT A TOTAL LENGTH OF 10,000 FEET)

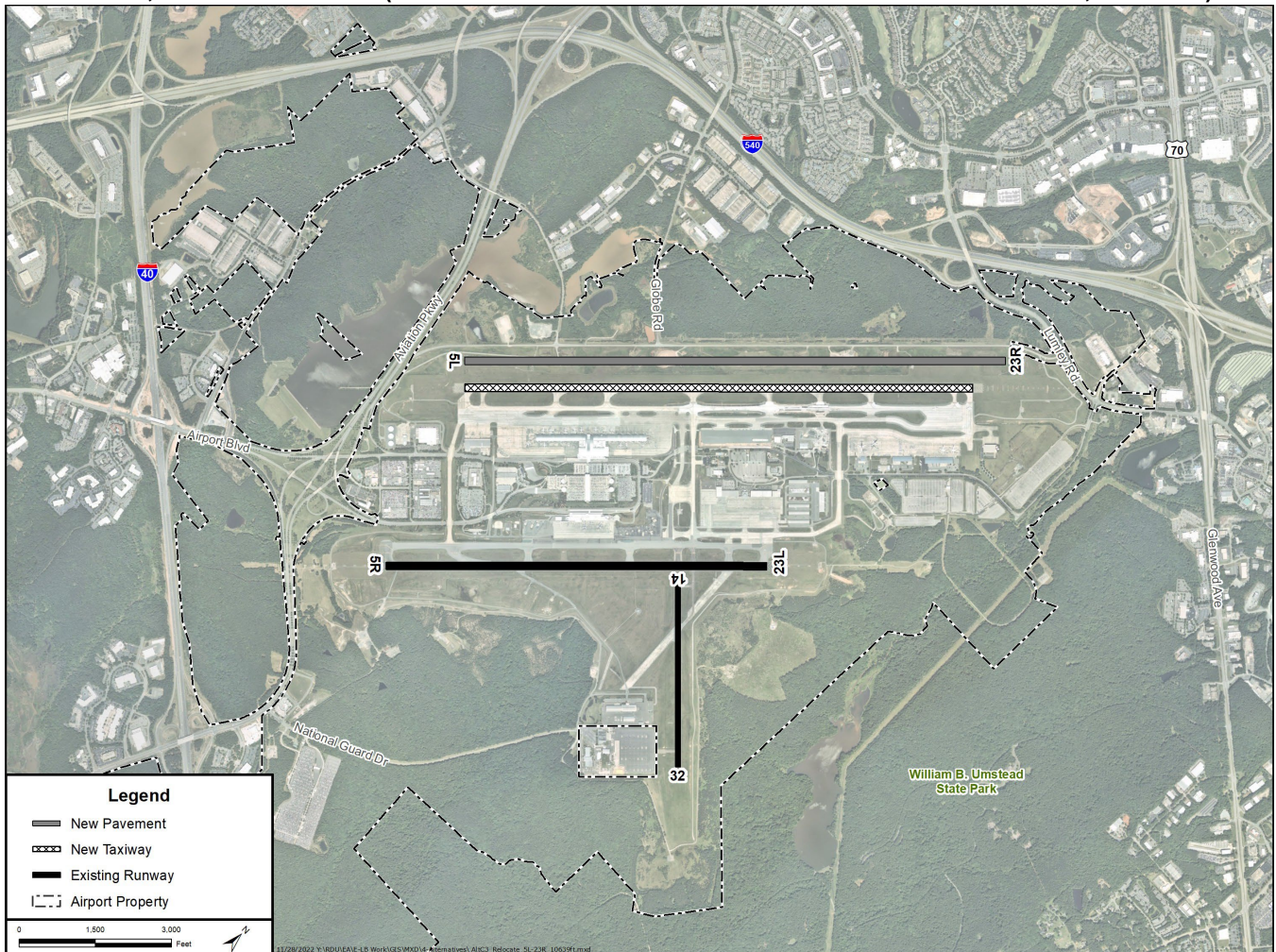


Source: ADCI, Landrum & Brown, and Airport Authority, 2021.

2.2.8 Alternative C3 (Relocate Runway 5L/23R at a Total Length of 10,639 Feet)

This alternative would relocate Runway 5L/23R approximately 537 feet northwest of its current location. The existing Runway 5L/23R would be reconstructed as a taxiway. The relocated 5L/23R would be 10,639 feet long and 150 feet wide. In order to provide the same takeoff distance and landing distance as the existing runway and meet FAA safety area standards, the replacement runway would require a 10,639-foot-long physical runway pavement. Runway 5L would have an LDA of 10,000 feet and a TORA, TODA, and ASDA of 10,639 feet. Runway 23R would have a TORA and TODA of 10,639 feet, an ASDA of 10,289 feet, and an LDA of 9,927 feet. There would be displaced landing thresholds on both runway ends. This configuration would eliminate encroachments to the Runway 23R end runway protection zone (RPZ) but not to the Runway 5L end.¹ However, the replacement runway would not increase the encroachment to the Runway 5L end compared to the existing runway. Alternative C3 is shown on **Exhibit 2-4**. Alternative C3 is the Proposed Action as described in Chapter 1.

EXHIBIT 2-4, ALTERNATIVE C3 (RELOCATE RUNWAY 5L/23R AT A TOTAL LENGTH OF 10,639 FEET)



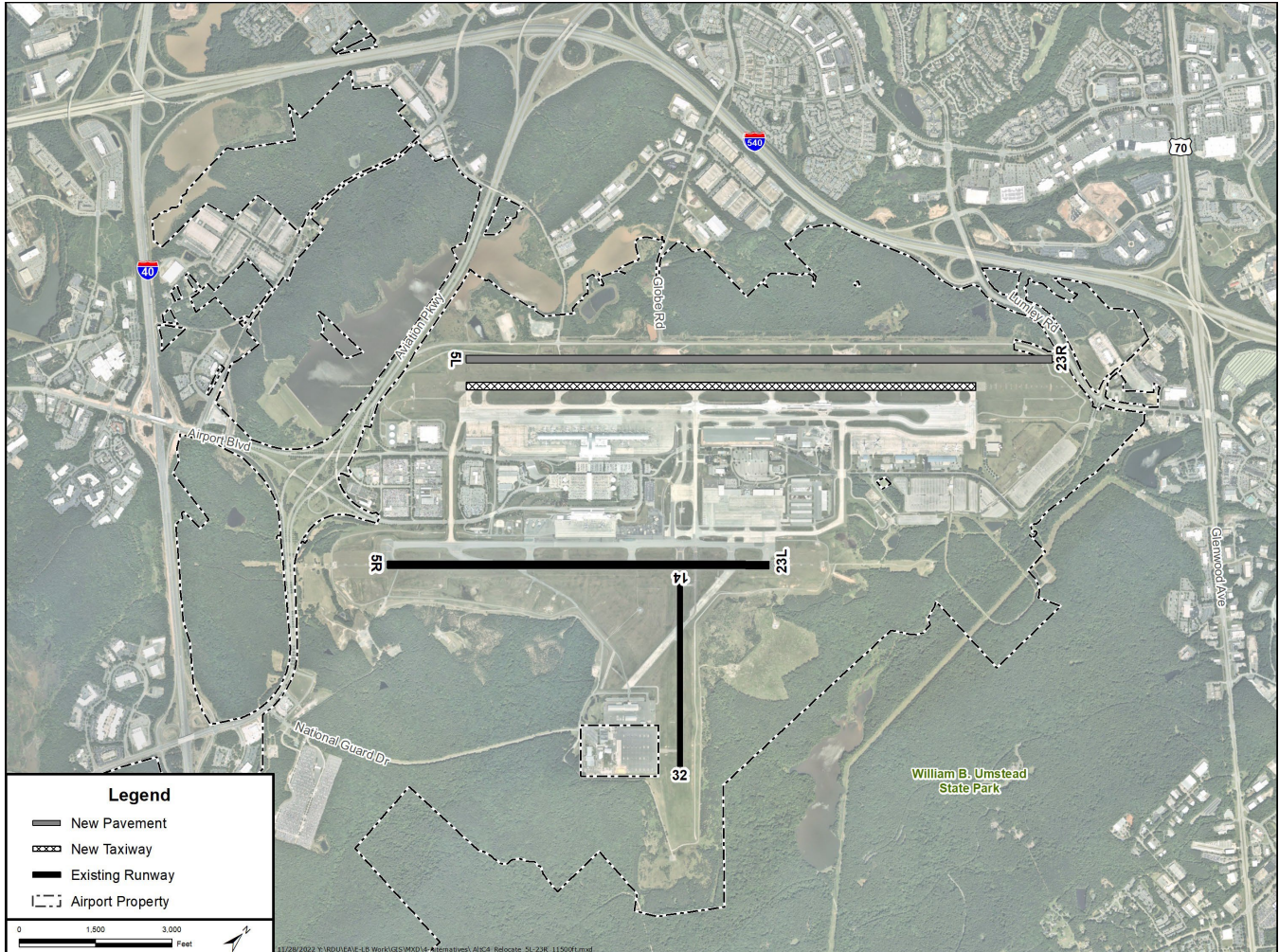
Source: ADCI, Landrum & Brown, and Airport Authority, 2021.

¹ RS&H, Runway 5L-23R Replacement Program Runway Length Design Assessment, October 13, 2021.

2.2.9 Alternative C4 (Relocate Runway 5L/23R at a Total Length of 11,500 feet)

This alternative would relocate Runway 5L/23R approximately 537 feet northwest of its current location. The existing Runway 5L/23R would be reconstructed as a taxiway. The relocated 5L/23R would be 11,500 feet long and 150 feet wide. Runway 5L would have an LDA of 10,861 feet and a TORA, TODA, and ASDA of 11,500 feet. Runway 23R would have a TORA and TODA of 11,500 feet, an ASDA of 11,150 feet, and an LDA of 9,927 feet. There would be displaced landing thresholds on both runway ends. Alternative C4 is shown on **Exhibit 2-5**. Alternative C4 is on the currently approved ALP.

EXHIBIT 2-5, ALTERNATIVE C4 (RELOCATE 5L/23R AT A TOTAL LENGTH OF 11,500 FEET)

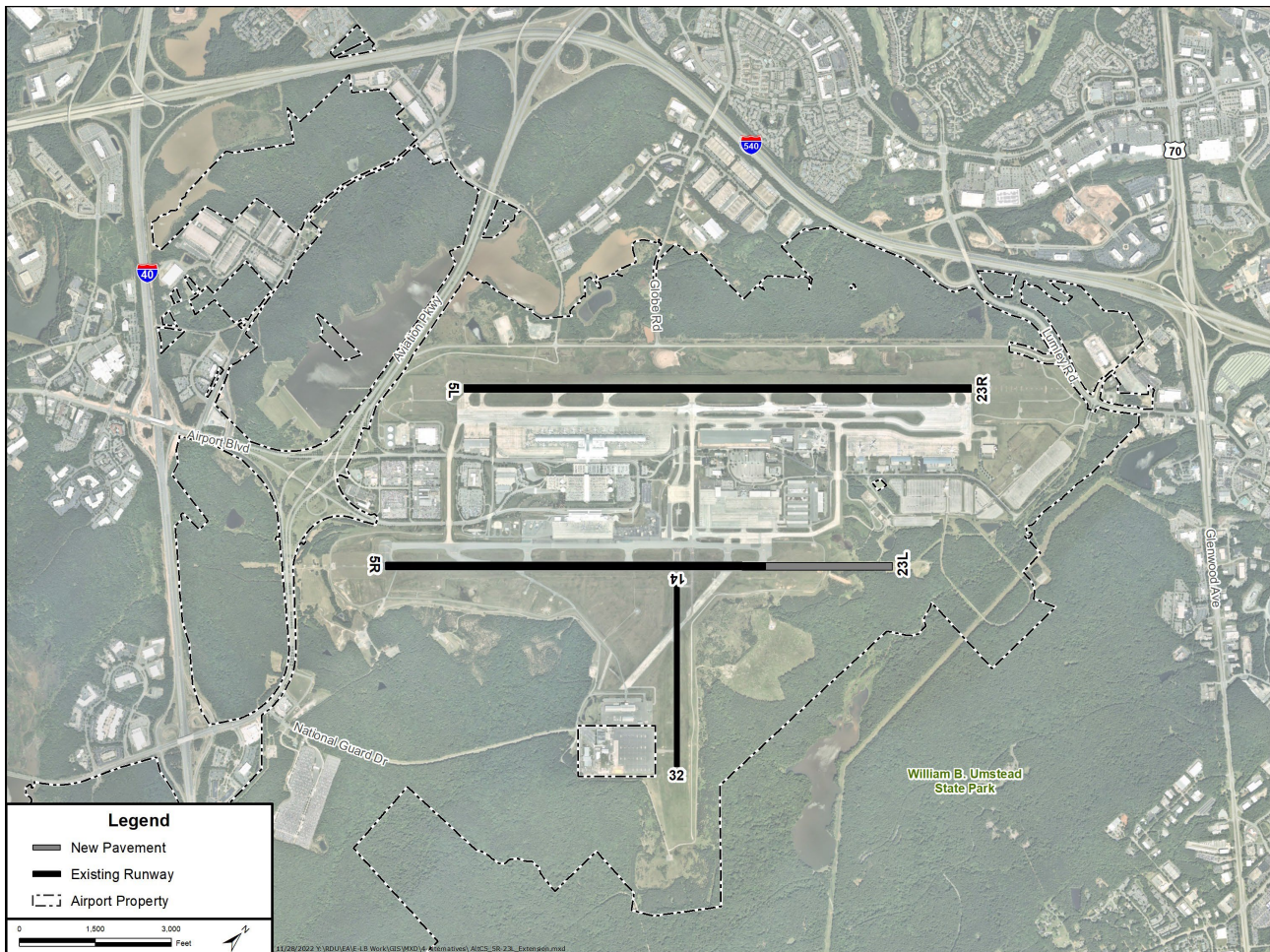


Source: ADCI, Landrum & Brown, and Airport Authority, 2021.

2.2.10 Alternative C5 (Runway 5R/23L Extension)

This alternative would extend Runway 5R/23L by 2,500 feet to the northeast and reconstruct Runway 5L/23R in its current location. The extension of Runway 5R/23L would occur first and then Runway 5L/23R would be reconstructed in its existing locations. This would leave the airport with one operational runway of at least 10,000 feet for commercial service during the reconstruction of Runway 5L/23R. The reconstructed Runway 5L/23R in its existing alignment would still have a 10,000-foot-long TORA, TODA, LDA, and ASDA for both Runway end 5L and 23R. There would be no displaced landing thresholds on either runway end. Alternative C5 is shown on **Exhibit 2-6**.

EXHIBIT 2-6, ALTERNATIVE C5 (RUNWAY 5R/23L EXTENSION)

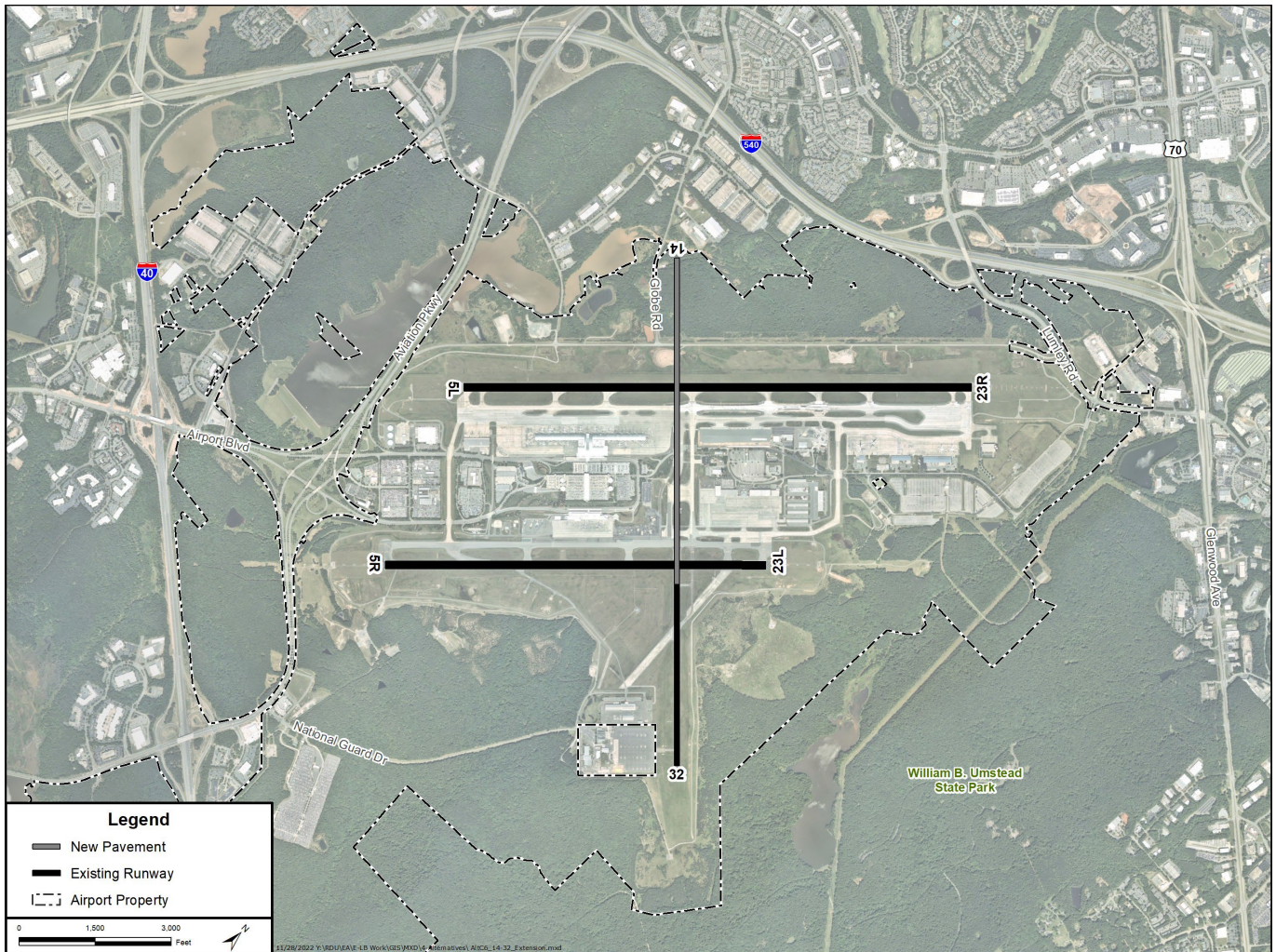


Source: ADCI, Landrum & Brown, and Airport Authority, 2021.

2.2.11 Alternative C6 (Crossfield Runway Extension)

This alternative would reconstruct Runway 14/32 in its current location and extend the Runway 14 end to the west to become no less than a 10,000-foot runway, bisecting the existing Runway 5L/23R and Runway 5R/23L. The extension of Runway 14/32 would occur before the reconstruction of Runway 5L/23R in order to maintain the existing infrastructure and operational capabilities of the Airport. The reconstructed Runway 5L/23R in its existing alignment would still have a 10,000-foot-long TORA, TODA, LDA, and ASDA for both Runway end 5L and 23R. There would be no displaced landing thresholds on either runway end. Alternative C6 is shown on **Exhibit 2-7**.

EXHIBIT 2-7, ALTERNATIVE C6 (CROSSFIELD RUNWAY EXTENSION)



Source: ADCI, L&B, and Airport Authority, 2021.

2.3 Lumley Road Alternatives

2.3.1 Relocate Lumley Road Outside and Around the RPZ

In order to comply with FAA safety standards for RPZs, a portion of Lumley Road and the Lumley-Commerce intersection would need to be relocated or removed from the RPZ. Various roadway alignments/relocations were reviewed in order to select the alignment that would include the least amount of property acquisition and existing business disruption while abiding by FAA requirements for runway safety areas.

The relocation of Lumley Road out of the RPZ would result in the roadway crossing the contaminated Ward Transformer Superfund Site, which has undergone remediation including the installation of a cap barrier for the soil. This site is currently undergoing a Remedial Investigation/Feasibility Study overseen by the United States Environmental Protection Agency (USEPA). The roadway relocation would involve excavation of dirt below ground surface in this area to create the subbase for the roadway. It is anticipated that contaminated soil and fill material may be encountered during demolition and construction activities. The FAA has coordinated with the USEPA to determine if relocation of Lumley Road was a viable alternative. In a meeting on June 29, 2022, the USEPA stated that it is acceptable to go below the existing cap and to change the shape of the soil pile in the potential road relocation area.² The soil in this area is not highly contaminated and the anticipated impacts due to the road relocation would be minor. The relocation of Lumley Road out of the RPZ is part of the Proposed Action.

2.3.2 Tunnel Lumley Road Beneath the RPZ

A tunnel alternative to maintain the existing alignment of Lumley Road was considered. See **Appendix B** for additional information. A potential enclosed tunnel portion of Lumley Road would begin and end at the edges of the relocated Runway 23R Approach RPZ, which is a total tunnel length of approximately 2,200 feet. The elevation of the existing ground is approximately 400 feet mean sea level (msl) at the eastern tunnel portal and approximately 385 feet msl at the proposed Lumley-Commerce intersection. Assuming that the tunnel is constantly 29.5 feet below existing grade, then the roadway elevation at the eastern portal would be approximately 370.5 feet msl. To meet the existing grade at the proposed intersection, the roadway climbs 14.5 feet over 800 linear feet. The resulting longitudinal grade (roadway profile) would be 1.81 percent, which satisfies maximum grade requirements per the 2022 North Carolina Department of Transportation (NCDOT) Roadway Design Manual.

The Lumley-Commerce intersection would have to be relocated to remove it from the RPZ. Depending on the longitudinal grade, a portion of Lumley Road would be required to transition from the existing elevation down approximately 30 feet to the elevation of the tunnel pavement. Therefore, with the tunnel alternative, the intersection would also have to be relocated.

² USEPA confirmed this again by email. Hilary Thornton, USEPA email to Jackie Sweatt-Essick, FAA RE Raleigh Durham EA Follow-up, November 1, 2022.

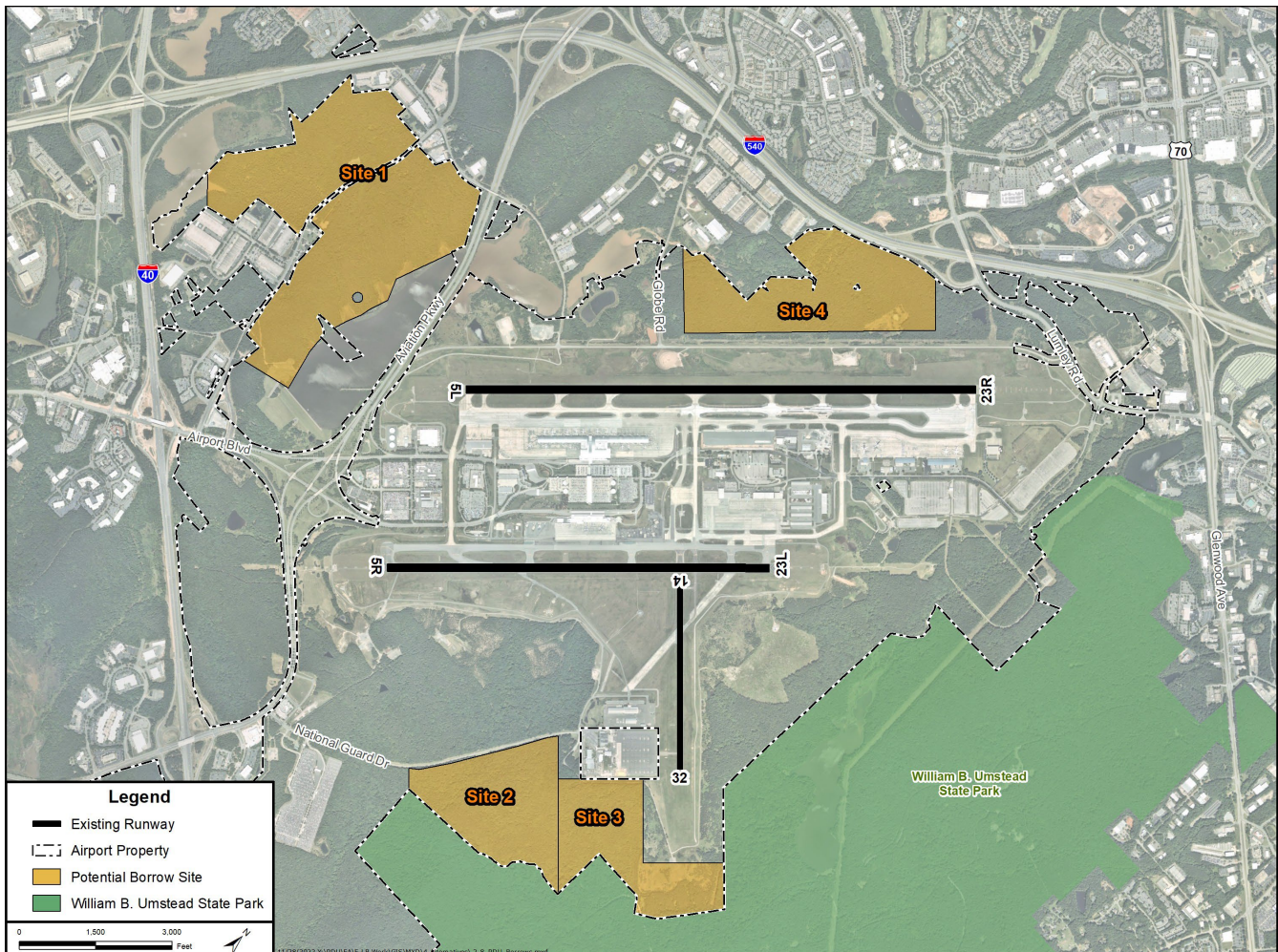
2.4 Fill Dirt Borrow Site Alternatives

2.4.1 Use On-Airport Borrow Sites

Due to the topography of the site for the relocated runway, fill material would be needed to level the area prior to construction. Four locations on Airport property as shown on **Exhibit 2-8** were tested to determine if the fill material was of the quality and quantity needed for the Proposed Action.

- Site 1 – This location is located across Brier Creek Reservoir on both sides of Pleasant Grove Church Road.
- Site 2 – This location is located along National Guard Drive.
- Site 3 – This location is located along National Guard Drive toward the end of Runway 14/32.
- Site 4 – This location is located immediately west of existing Runway 5L/23R.

EXHIBIT 2-8, POTENTIAL ON-AIRPORT BORROW SITES



Source: Airport Authority, 2021.

2.4.2 Use Off Airport Borrow Sites

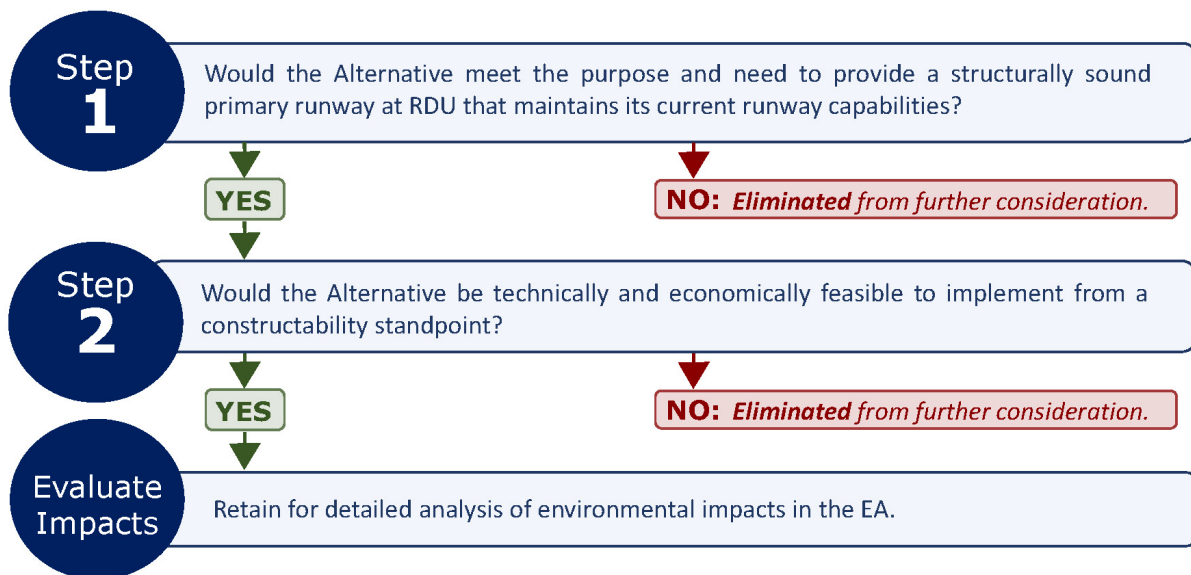
The following off Airport locations within a 30-mile radius of RDU were investigated as potential sources of borrow material:

- Martin Marietta – Raleigh-Durham Quarry: Potential two-mile haul route
- Hanson Aggregates – Wake Forest: Potential 18-mile haul route
- Wake Stone Corporation – Knightdale: Potential 22-mile haul route
- Martin Marietta – Carrboro: Potential 26-mile haul route

2.5 Alternatives Evaluation Process

For this evaluation, a two-step screening process was used to identify a range of reasonable alternatives responsive to the purpose and need. The first step in the screening process eliminates alternatives that do not meet the purpose and need as described in Chapter 1. The second step in this screening process was to determine if an alternative was technically or economically feasible to implement from a constructability standpoint. If an alternative advanced through these steps, it was retained for a more detailed environmental evaluation in the EA. The screening process for the reasonable alternatives is portrayed in **Exhibit 2-9**.

EXHIBIT 2-9, SCREENING PROCESS



2.5.1 Step One - Achieves Purpose and Need

Step One evaluates each alternative’s ability to satisfy the purpose and need described in Chapter 1.

Table 2-1 summarizes the Step One evaluation findings.

TABLE 2-1, STEP ONE SCREENING

ALTERNATIVE	WOULD THE ALTERNATIVE MEET THE PURPOSE AND NEED TO PROVIDE A STRUCTURALLY SOUND PRIMARY RUNWAY AT RDU THAT MAINTAINS ITS CURRENT RUNWAY CAPABILITIES?	MOVE TO STEP TWO?
Runway Alternative A (No Action Alternative)	This alternative would not meet the purpose and need. It is anticipated the primary runway would continue to experience cracks which would only increase in time and would require more costly repairs and runway closures. Eventually, the runway would require a full reconstruction and would no longer be able to maintain its current capability. While the No Action Alternative does not meet the purpose and need, it must be carried forward in the assessment of environmental impacts as required by 40 Code of Federal Regulations (CFR) § 1502.14(d).	Yes
Runway Alternative B1 (Construct New Runway at a New Airport)	This alternative would not meet the purpose and need. The development of a completely new replacement airport would require construction of an airport with facilities, including new runways and terminal buildings, capable of accommodating the projected needs of RDU. However, RDU would continue to operate, eventually without its primary runway and neither the Airport Authority nor the FAA have the authority to require the public to use another airport. In addition, the time it would take to acquire land, design and construct facilities, and obtain FAA certification for a new airport would extend beyond the timeframe for which the improvements are needed at RDU. Furthermore, the cost and potential environmental impacts to accomplish this alternative would far exceed that of the Proposed Action. Therefore, this alternative was not carried forward to Step Two.	No
Runway Alternative B2 (Use of a Another Runway at an Existing Airport)	This alternative would not meet the purpose and need. None of the other existing airports in the area would provide runways with the length and width necessary to accommodate the existing or projected aircraft operations at RDU. Further, there is a lack of proper passenger terminal facilities (terminal buildings, baggage services, fueling facilities, utility infrastructure, and parking) to support passenger service. The facilities available at these other existing airports would not meet the runway or terminal capability needs at RDU without major infrastructure improvements. Additionally, neither the Airport Authority nor the FAA have the authority to require the public to use another airport. RDU would continue to operate, eventually without its primary runway. This alternative would not resolve the need to provide a safe runway at RDU able to serve the forecasted aircraft and passengers. Therefore, this alternative was not carried forward to Step Two.	No

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Runway Alternative B3 (Use of Alternative Modes of Transportation)	The use of other alternative transportation modes would not meet the purpose and need. While utilizing other transportation modes would mitigate demand for shorter range trips, they would not replace the capability and purpose of the primary runway at RDU. These other transportation modes serve as only limited options to air travel, but do not represent a viable replacement for the number of aviation passengers or for the potential demand in destinations. Any future high-speed rail connections could enhance short-range connections within the region but are not anticipated to reduce aviation demand at a scale that would prevent the need for aviation infrastructure in the Research Triangle region. The same could be stated for highway alternatives. Because this alternative would not address the need to provide a safe runway at RDU able to serve the forecasted aircraft and passengers this alternative was not carried forward to Step Two.	No
Runway Alternative B4 (Use of Technology)	The use of technology would not replace the capability and purpose of the primary runway at RDU. This alternative would not address the need to provide a safe runway at RDU able to serve the forecasted aircraft and passengers, and, therefore, was not carried forward to Step Two.	No
Runway Alternative C1 (Reconstruct Runway 5L/23R in its Existing Alignment)	This alternative would not meet the purpose and need. This alternative would limit the Airport to operating with only one commercial runway, at a reduced runway length, during the reconstruction of Runway 5L/23R. This alternative would not maintain RDU's current capabilities during construction because airlines would be forced to reduce their carrying capacity in order to safely use a shorter runway over a long time period. Therefore, this alternative was not carried forward to Step Two.	No
Runway Alternative C2 (Relocate Runway 5L/23R at a Total Length of 10,000 Feet)	This alternative would not meet the purpose and need. As the replacement runway shifts to the northwest, the new runway end would be located closer to Aviation Parkway and the landing distance available could not match the existing runway LDA of 10,000 feet. This configuration also results in a runway that is more restrictive for takeoff operations from the Runway 23R end, compared to the existing condition. This alternative would not maintain RDU's current capabilities. Therefore, this alternative was not carried forward to Step Two.	No
Runway Alternative C3 (Relocate Runway 5L/23R at a Total Length of 10,639 Feet)	This alternative would meet the purpose and need to ensure RDU maintains its current capability. This alternative was carried forward to Step Two.	Yes
Runway Alternative C4 (Relocate Runway 5L/23R at a Total Length of 11,500 Feet)	This alternative would meet the purpose and need to ensure RDU maintains its current capability. This alternative was carried forward to Step Two.	Yes
Runway Alternative C5 (Runway 5R/23L Extension)	This alternative would not meet the purpose and need. This alternative would make the Airport have to operate with only one commercial runway during full reconstruction of Runway 5L/23R over a long period. This alternative would not maintain RDU's current capabilities. Therefore, this alternative was not carried forward to Step Two.	No

ALTERNATIVE	WOULD THE ALTERNATIVE MEET THE PURPOSE AND NEED TO PROVIDE A STRUCTURALLY SOUND PRIMARY RUNWAY AT RDU THAT MAINTAINS ITS CURRENT RUNWAY CAPABILITIES?	MOVE TO STEP TWO?
Runway Alternative C6 (Crossfield Runway Extension)	This alternative would meet the purpose and need to ensure RDU maintains its current capability. This alternative was carried forward to Step Two.	Yes
Lumley Road Alternative (Relocate Lumley Road Outside and Around the RPZ)	This alternative would meet the purpose and need to ensure RDU maintains its current capability. This alternative was carried forward to Step Two.	Yes
Lumley Road Alternative (Tunnel Lumley Road Beneath the RPZ)	This alternative would meet the purpose and need to ensure RDU maintains its current capability. This alternative was carried forward to Step Two.	Yes
Fill Dirt Borrow Site Alternative (Use On-Airport Borrow Sites)	All four sub alternatives for On-Airport sites (Site 1, Site 2, Site 3, and Site 4) would meet the purpose and need to ensure RDU maintains its current capability. This alternative was carried forward to Step Two.	Yes
Fill Dirt Borrow Site Alternative (Use Off-Airport Borrow Sites)	All four sub alternatives for Off-Airport sites (Martin Marietta - Raleigh-Durham Quarry, Hanson Aggregates – Wake Forest, Wake Stone Corporation – Knightdale, and Martin Marietta – Carrboro) would meet the purpose and need to ensure RDU maintains its current capability. This alternative was carried forward to Step Two.	Yes

2.5.2 Step Two - Technically and Economically Feasible

Reasonable alternatives include those that are practical or feasible from a technical and economic standpoint. There are times when anticipated costs are so potentially excessive it makes an alternative infeasible. Based on the Council on Environmental Quality (CEQ)'s *Update to the Regulations Implementing NEPA*, reasonable alternatives must be technically and economically feasible and meet the purpose and need.³ **Table 2-2** summarizes the Step Two evaluation findings.

TABLE 2-2, STEP TWO SCREENING

ALTERNATIVE	WOULD THE ALTERNATIVE BE TECHNICALLY AND ECONOMICALLY FEASIBLE?	RETAIN FOR DETAILED ANALYSIS?
Runway Alternative A (No Action Alternative)	This alternative would not be practical or economically feasible because it would require continuing costly repairs as the runway deteriorates more and more into the future. At some point, total reconstruction would be needed and the runway would need to be closed for an extended period of time. While the No Action Alternative is not economically feasible, it is required to be carried forward in the assessment of environmental impacts by 40 CFR § 1502.14(d).	Yes
Runway Alternative C3 (Relocate Runway 5L/23R at a Total Length of 10,639 Feet)	This alternative would be technically and economically feasible. This alternative was carried forward for detailed environmental analysis in the EA.	Yes

³ Council on Environmental Quality, Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act, 85 Federal Register 43304 (July 14, 2020).

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Runway Alternative C4 (Relocate Runway 5L/23R at a Total Length of 11,500 Feet)	This alternative would not be economically feasible at this time. The Airport Authority and the FAA have determined that there is not a need for this runway length at this time. This alternative would result in unnecessary costs. This does not preclude the Airport Authority from potentially extending Runway 5L/23R in the future to a total length of 11,500 feet if the need can be demonstrated. Therefore, this alternative was not carried forward for detailed environmental analysis in the EA.	No
Runway Alternative C6 (Crossfield Runway Extension)	This alternative would not be practical or feasible from a technical and economic standpoint. This alternative would conflict with RDU's existing facilities and would result in substantial redevelopment costs. In addition, this alternative would remove the crossfield taxiway and have a significant impact to the operational capabilities and safety of the airfield. Therefore, this alternative was not carried forward for detailed environmental analysis in the EA.	No
Lumley Road Alternative (Relocate Lumley Road Outside and Around the RPZ)	This alternative would be technically and economically feasible. This alternative was carried forward for detailed environmental analysis in the EA.	Yes
Lumley Road Alternative (Tunnel Lumley Road Beneath the RPZ)	This alternative would not be practical from a technical and economic standpoint. The tunnel alternative would result in unnecessary disruption of traffic patterns, and significant initial and on-going yearly costs. Therefore, this alternative was not carried forward for detailed environmental analysis in the EA.	No
Fill Dirt Borrow Site Alternative (On-Airport Site 1)	This alternative would be technically and economically feasible. Fill material from this location had the potential quality and quantity required. It provided the benefit of being close to the construction site therefore potentially reducing truck trips or allowing the use of a conveyor system. This alternative was carried forward for detailed environmental analysis in the EA.	Yes
Fill Dirt Borrow Site Alternative (On-Airport Site 2)	This alternative would not be technically and economically feasible. Not only is this site adjacent to William B. Umstead State Park which is a 4(f) resource and on the National Register for Historic Places, but the material at this site also contains residual clays, silts, and sands that was much wetter than the desired quality of fill material needed. Extensive mechanical or chemical drying would be required to prepare this material for use as suitable fill at significant cost. Under Section 4(f), this alternative cannot be selected because there is a reasonable and prudent alternative that would not impact a Section 4(f) resource. Therefore, this alternative was not carried forward for detailed environmental analysis in the EA.	No
Fill Dirt Borrow Site Alternative (On-Airport Site 3)	This alternative would not be technically and economically feasible. Not only is this site adjacent to William B. Umstead State Park which is a 4(f) resource and on the National Register for Historic Places, but the material at this site also contains residual clays, silts, and sands that was much wetter than the desired quality of fill material needed. Extensive mechanical or chemical drying would be required to prepare this material for use as suitable fill at significant cost. Under Section	No

ALTERNATIVE	WOULD THE ALTERNATIVE BE TECHNICALLY AND ECONOMICALLY FEASIBLE?	RETAIN FOR DETAILED ANALYSIS?
	4(f), this alternative cannot be selected because there is a reasonable and prudent alternative that would not impact a Section 4(f) resource. Therefore, this alternative was not carried forward for detailed environmental analysis in the EA.	
Fill Dirt Borrow Site Alternative (On-Airport Site 4)	This alternative would not be technically and economically feasible. Obtaining the fill at this site would have significant potential impacts to wetland, streams, and Neuse River buffers and did not have the desired quantity of fill. Therefore, this alternative was not carried forward for detailed environmental analysis in the EA.	No
Fill Dirt Borrow Site Alternative (Use Off-Airport Borrow Sites)	All four sub alternatives (Martin Marietta - Raleigh-Durham Quarry, Hanson Aggregates – Wake Forest, Wake Stone Corporation – Knightdale, and Martin Marietta – Carrboro) would not be practical or feasible from a technical and economic standpoint. The use of off Airport borrow sites would result in unnecessary costs, traffic disruptions, vehicle emissions, use of fuel, and extensive delays to the construction schedule. See Appendix B for additional information. Therefore, this alternative was not carried forward for detailed environmental analysis in the EA.	No

2.6 Alternatives Retained for Detailed Analysis in the EA

Based on the screening analysis, two alternatives were carried forward for further detailed environmental evaluation in the EA: the No Action Alternative and the Proposed Action. The Proposed Action includes the only surviving alternative from each of the three categories (Runway, Lumley Road, and Borrow Site alternatives).

- **No Action Alternative:** With the No Action Alternative, no changes would be made from the existing conditions. While the No Action Alternative does not meet the purpose and need, it is required to be carried forward in the assessment of environmental impacts by 40 CFR § 1502.14(d). The No Action Alternative serves as a basis of comparison during the assessment of the impacts of the alternatives.
- **Proposed Action:**
 - **Runway Alternative C3 (Relocate Runway 5L/23R at a Total Length of 10,639 Feet):** This alternative would relocate Runway 5L/23R approximately 537 feet northwest of its current location to be 10,639 feet long and 150 feet wide. The existing Runway 5L/23R would be converted to a taxiway after construction is complete on the replacement Runway 5L/23R.
 - **Lumley Road Alternative (Relocate Lumley Road Outside and Around the RPZ):** Lumley Road would be relocated north and west adjacent to but outside of the RPZ.
 - **Fill Dirt Borrow Site Alternative (On-Airport Site 1):** Fill dirt would come from Site 1 on Airport property.