

NEW AIRPORT SITE SELECTION ANALYSIS and RUNWAY REALIGNMENT ALTERNATIVES

Prepared for the City of Gastonia

Study Objective

- Perform a preliminary siting study for the possible location of a new airport site in Gaston County to fulfill the objectives of the North Carolina Airport System Plan Update for a 5,000-foot long runway.
- Evaluation of runway realignment alternatives at the Gastonia Municipal Airport (AKH) to fulfill the objectives of the North Carolina Airport System Plan Update for a 5,000-foot long runway.

NCDOT-DOA Airport System Plan Objectives Gastonia Municipal Airport	
Development Category	General Aviation Blue
Runway Approach	Clear Threshold Siting Surface on Primary Runway
Runway Safety Area (RSA)	Meet Runway Design Code (RDC)
Runway Protection Zone (RPZ)	Fee Simple
Pavement Condition	PCI>75
Runway Length	5000'
Runway Width	100'
Pavement Strength	>30,000 lbs. SW or DW and <60,000 lbs. SW or DW or per PCN Analysis if a P139
Visual Navigational Aids	Rotating Beacon, Lighted Wind Sock, PAPI-4
SW – Single wheel gear DW – Dual wheel gear PCI – Pavement condition index PCN – Pavement classification number	

PRELIMINARY NEW AIRPORT SITE SELECTION

Typical Steps in a New Airport Site Selection Analysis

FAA's Airport Master Planning guidance (FAA Advisory Circular 150/5070-6B – Airport Master Plans [Change 2], January 27, 2015) typical steps are summarized as follows:

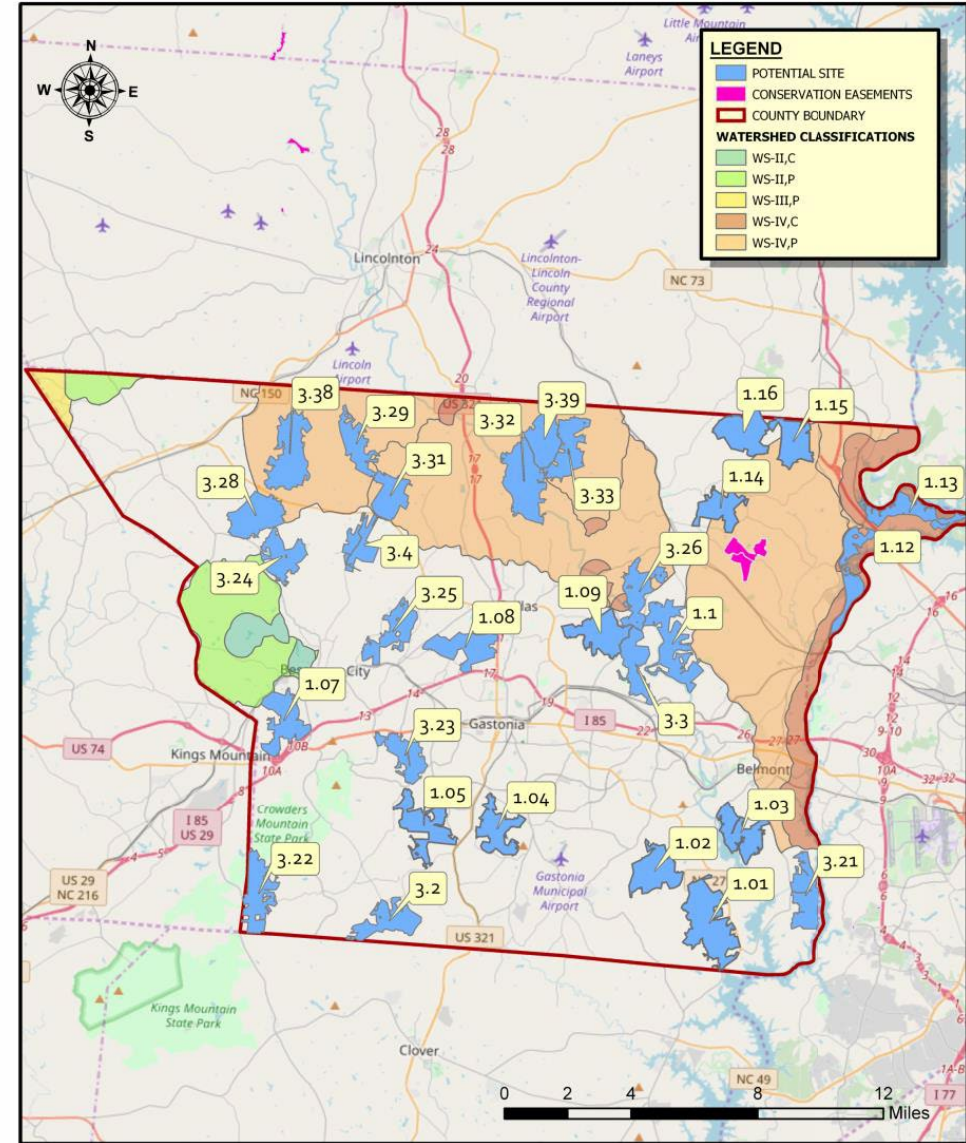
- Develop criteria for evaluating sites
- Identify preliminary sites
- Apply a screening process to each preliminary site, screening out those with the most obvious shortcomings
- For the remaining potential sites, prepare a comparison using comprehensive evaluation criteria considering:
 - **Operational Capability** – the site should provide the operational capability necessary to serve the defined role of the airport and the needs of its users
 - **Ground access** – the ability of the users to get to and from the airport easily and in a timely manner
 - **Development Costs** – simple cost estimates for use in determining the financial feasibility of building a new airport
 - **Environmental Consequences** – potential environmental impacts associated with a new site may be critical to gaining approval
 - **Consistency with Area-wide Planning** – the site should be consistent with regional and local land use and transportation plans

Initial Sites

Criteria was used to determine potential site locations:

- Maximum contiguous useable acres (700 to 1,000 acres, no more than 30 property owners)
- Proximity to major thoroughfare (Interstate or U.S. Route)

Based on the criteria above 29 sites were initially identified but 12 were eliminated because they were too linear in size for the development of an airport.

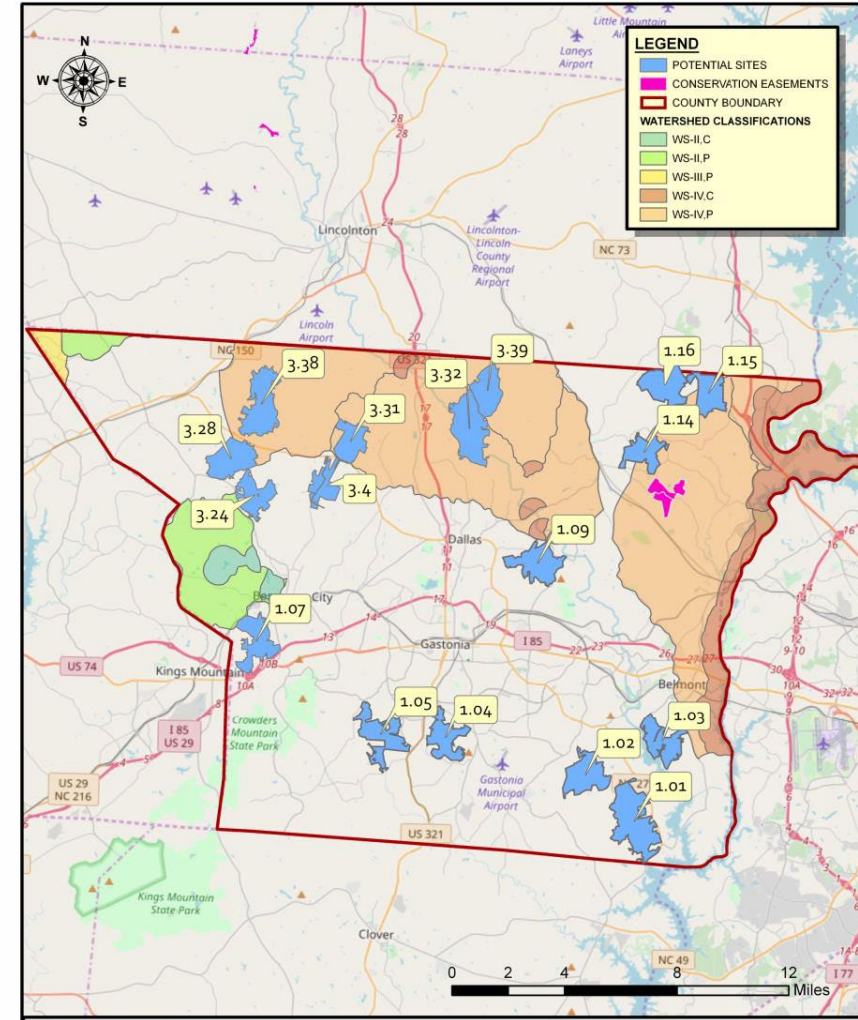


Initial Sites Selected for Evaluation

The remaining 17 sites were presented to Gaston County Development Services on August 23, 2018. Review of the 17 sites at the August 23, 2018 meeting resulted in the elimination for varying reasons:

- Too close to CLT
- Proposed development

The remaining 17 sites presented were further reduced to five sites plus the addition of the Kings Mountain Multimodal Site on August 29, 2018 at the request of the City of Gastonia staff.

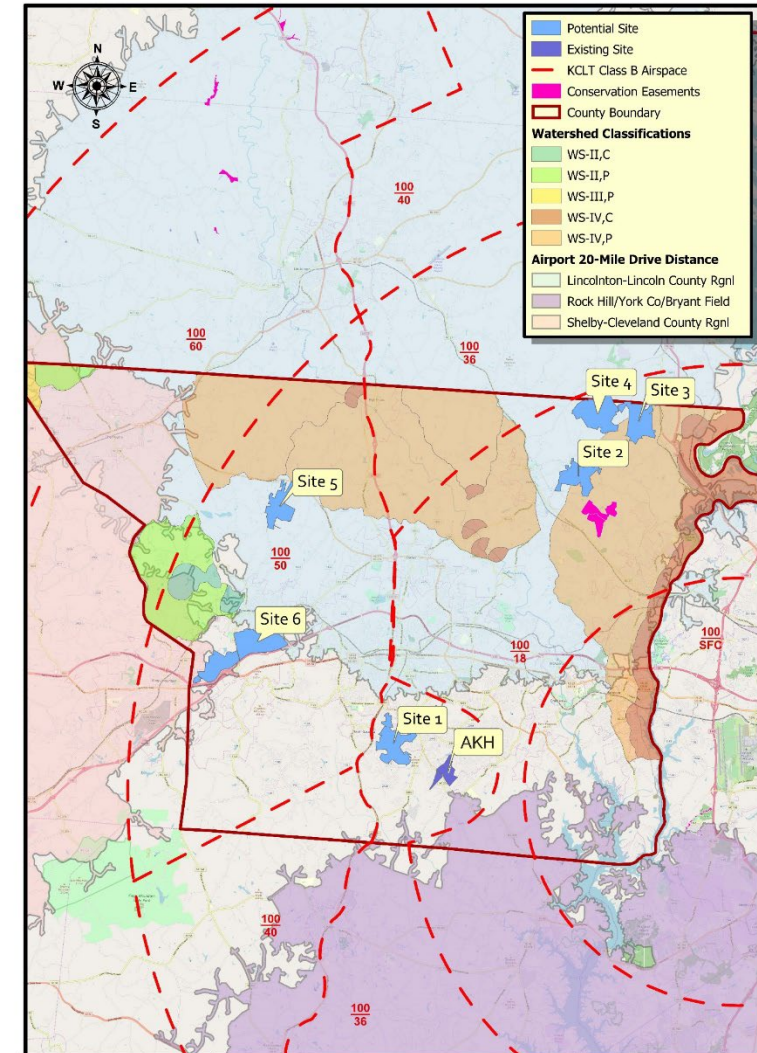


Selected Sites for Evaluation

On August 29, 2018 at the request of the City of Gastonia the following sites were evaluated:

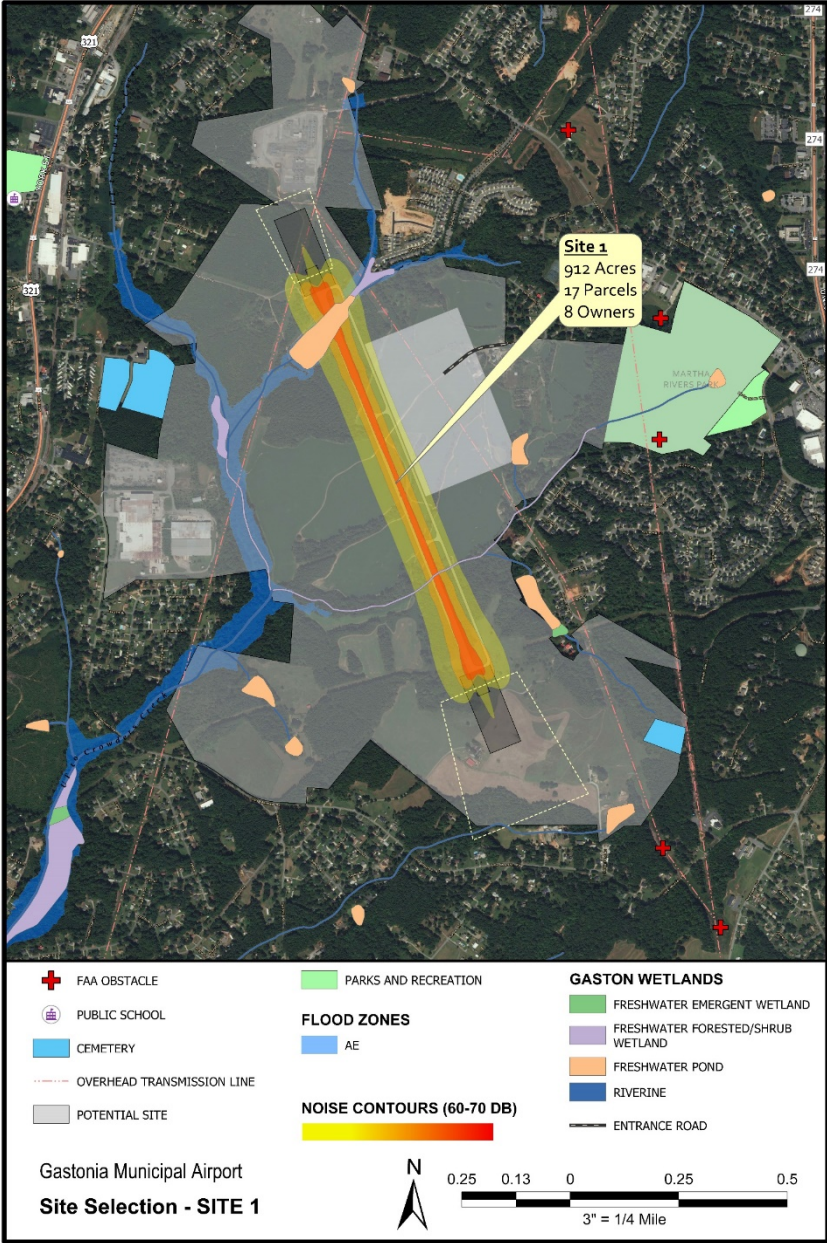
- 1.04 – renamed Site 1
- 1.14 – renamed Site 2
- 1.15 – renamed Site 3
- 1.16 – renamed Site 4
- 3.40 (Pasour Mountain Site) – renamed Site 5
- 3.41 (Kings Mountain Multimodal Site) – renamed Site 6

On December 13, 2018, the City of Gastonia requested moving forward with site options 1 and 5 for final evaluation.



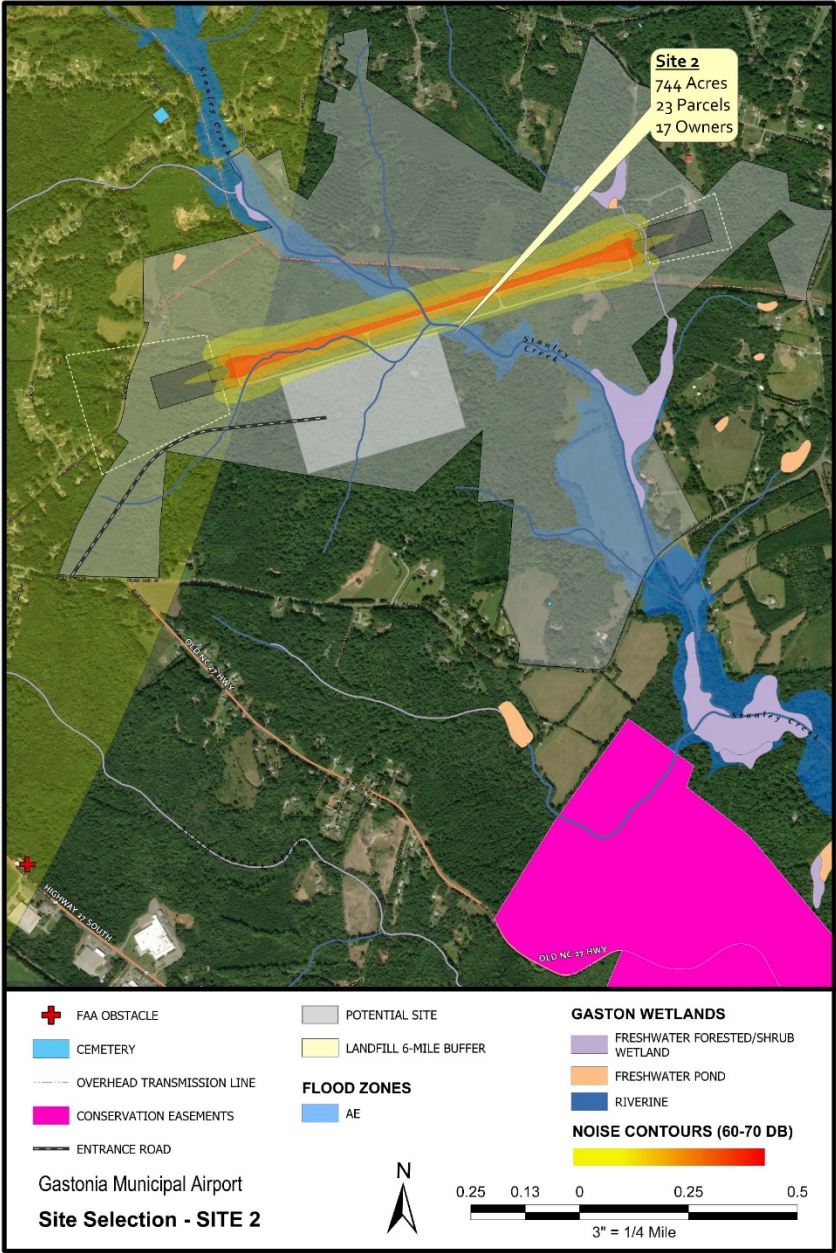
Site 1

Evaluation Criteria	Site 1
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	17/8/912
Property Acquisition (Estimated Cost in millions)	\$12.5
Construction Costs (Estimated Cost in millions)	\$42.3
Total Cost (Estimated Cost in millions)	\$54.8
Road access and proximity to interstate highways and U.S. highways	Little Mountain Road, US 321
Environmental Requirements	
Property Owner Relocations (number and type)	5 residential, 1 industrial, 1 commercial
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	Martha Rivers Park
Floodplain	Yes
Waters of the U.S. (streams and wetlands)	Yes
Compatible Land Use/Zoning (existing and future)	32% R-1, 7% I-3, 21% RS-12, 36% CD/RMF, 4% CU/R-2
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	Direct
Operational Considerations	
CLT Class B Airspace Ceiling	3,600
Obstructions (transmission lines, towers, landfills, etc.)	Yes
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	5 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	11 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOT State System Plan)	outside
Zoning Classifications	
R-1: Single Family Limited, RS-12: Residential 12,000 SF	
CU/R-2: Conditional Use Single Family Moderate, CD/RMF: Conditional District Residential Multifamily	
I-3: Exclusive Industrial	



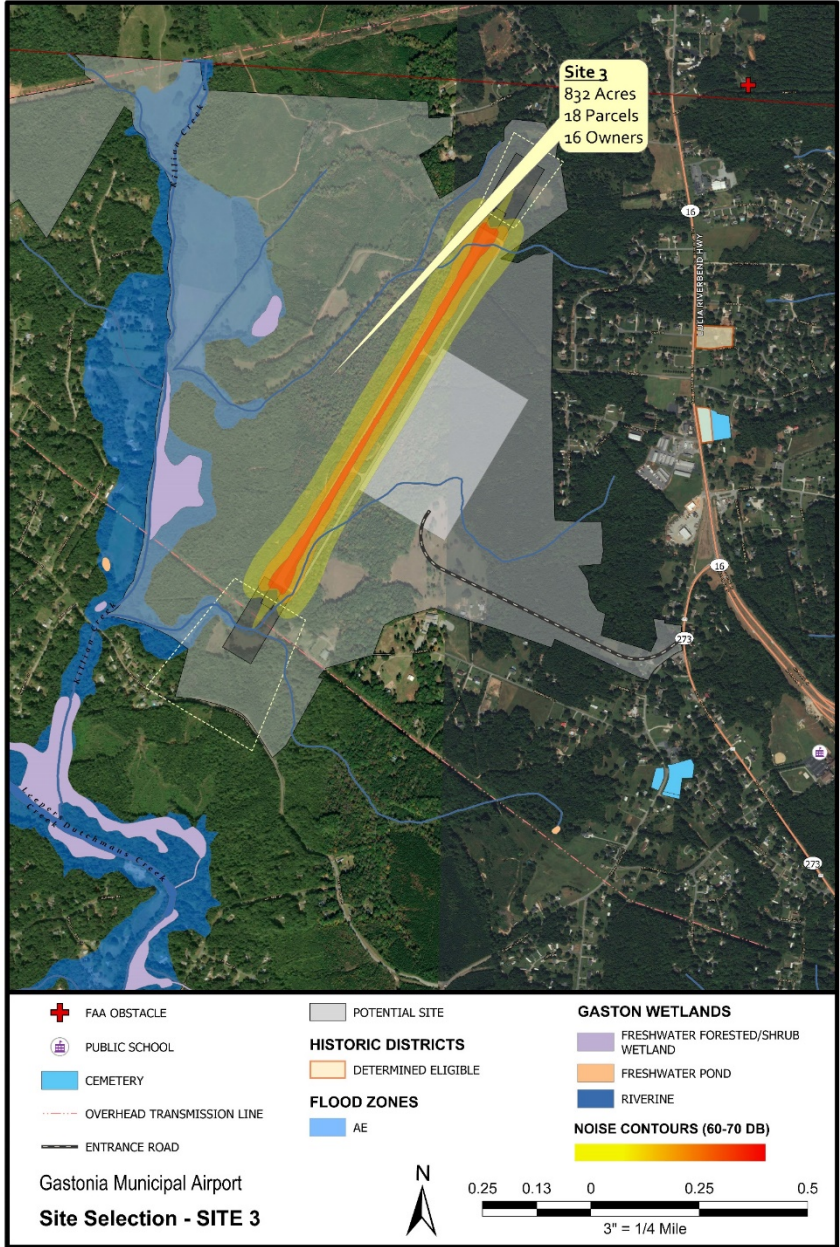
Site 2

Evaluation Criteria	Site 2
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	23/17/744
Property Acquisition (Estimated Cost in millions)	\$5.5
Construction Costs (Estimated Cost in millions)	\$252.5
Total Cost (Estimated Cost in millions)	\$258.0
Road access and proximity to interstate highways and U.S. highways	Stanley Lucia Road, Old Highway 27
Environmental Requirements	
Property Owner Relocations (number and type)	8 residential
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	None
Floodplain	Yes
Waters of the U.S. (streams and wetlands)	Yes
Compatible Land Use/Zoning (existing and future)	89% R-1, 11% R-2
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	Indirect
Operational Considerations	
CLT Class B Airspace Ceiling	1,800
Obstructions (transmission lines, towers, landfills, etc.)	Yes
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	12 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	20 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	within IPJ
Zoning Classifications	
R-1: Single Family Limited, R-2: Low Density Residential	



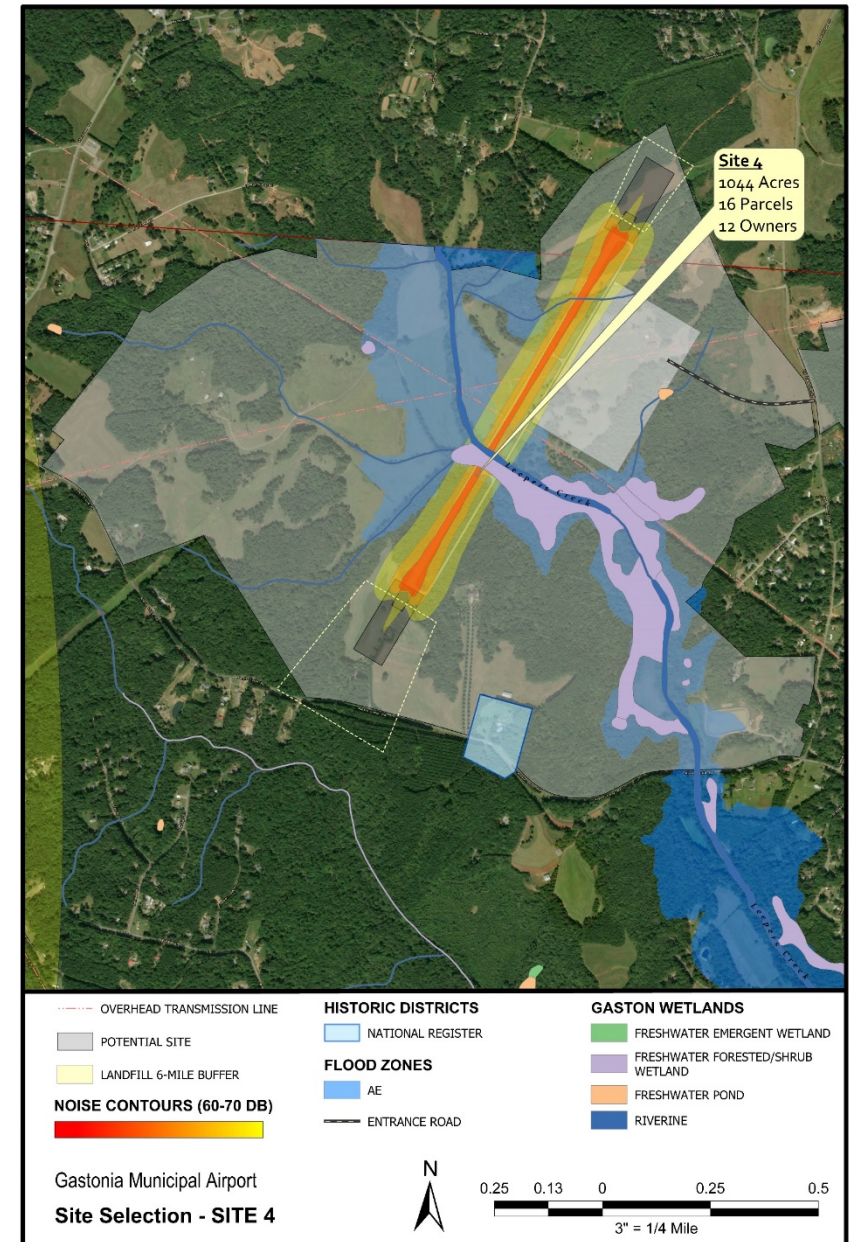
Site 3

Evaluation Criteria	Site 3
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	13/11/824
Property Acquisition (Estimated Cost in millions)	\$3.5
Construction Costs (Estimated Cost in millions)	\$44.2
Total Cost (Estimated Cost in millions)	\$47.7
Road access and proximity to interstate highways and U.S. highways	Lucia Riverbend Highway (NC 16)
Environmental Requirements	
Property Owner Relocations (number and type)	None
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	None
Floodplain	Yes
Waters of the U.S. (streams and wetlands)	Yes
Compatible Land Use/Zoning (existing and future)	100% R-1
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	Indirect
Operational Considerations	
CLT Class B Airspace Ceiling	1,800
Obstructions (transmission lines, towers, landfills, etc.)	Yes
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	12.8 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	30 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	within IPJ
Zoning Classifications	
R-1: Single Family Limited	



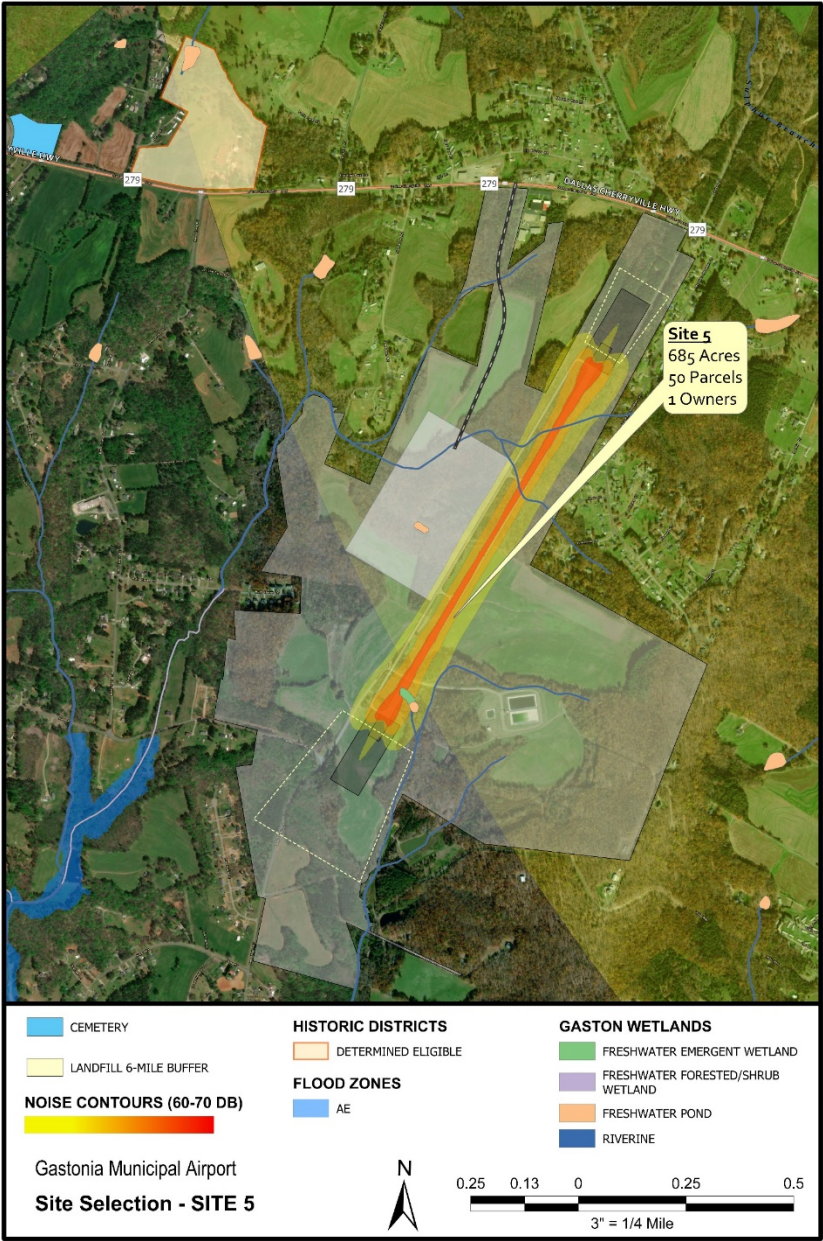
Site 4

Evaluation Criteria	Site 4
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	16/12/1,044
Property Acquisition (Estimated Cost in millions)	\$5.0
Construction Costs (Estimated Cost in millions)	\$143.8
Total Cost (Estimated Cost in millions)	\$148.8
Road access and proximity to interstate highways and U.S. highways	Old Lowesville Road
Environmental Requirements	
Property Owner Relocations (number and type)	4 residential
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	None
Floodplain	Yes
Waters of the U.S. (streams and wetlands)	Yes
Compatible Land Use/Zoning (existing and future)	100% R-1
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	Indirect
Operational Considerations	
CLT Class B Airspace Ceiling	1,800
Obstructions (transmission lines, towers, landfills, etc.)	Yes
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	12.1 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	28 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOT State System Plan)	within IPJ
Zoning Classifications	
R-1: Single Family Limited	



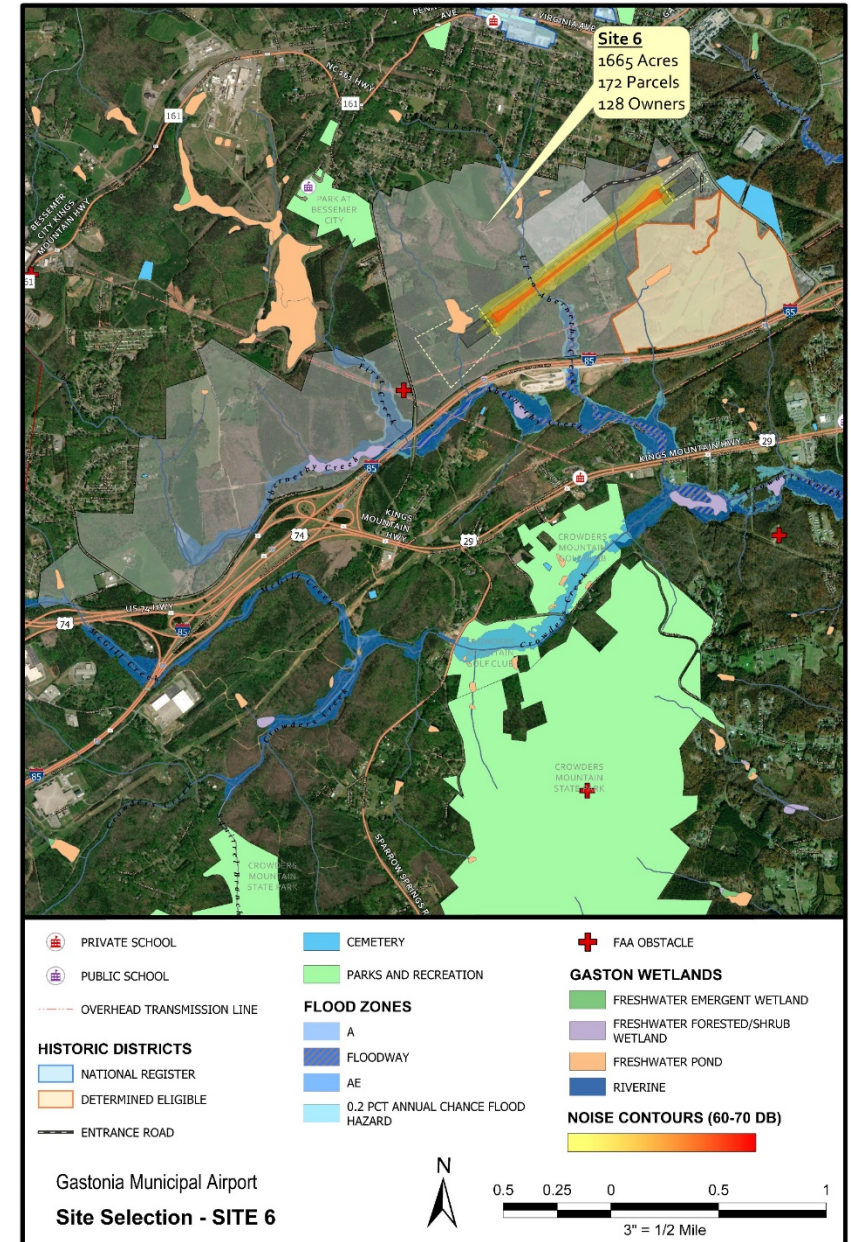
Site 5

Evaluation Criteria	Site 5
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	50/1/685
Property Acquisition (Estimated Cost in millions)	\$0.0
Construction Costs (Estimated Cost in millions)	\$43.0
Total Cost (Estimated Cost in millions)	\$43.0
Road access and proximity to interstate highways and U.S. highways	Dallas Cherryville Highway (NC 279)
Environmental Requirements	
Property Owner Relocations (number and type)	None
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	None
Floodplain	None
Waters of the U.S. (streams and wetlands)	Yes
Compatible Land Use/Zoning (existing and future)	100% I-1
Any known hazardous materials sites	None
City of Gastonia Annexation Capability	Indirect
Operational Considerations	
CLT Class B Airspace Ceiling	5,000
Obstructions (transmission lines, towers, landfills, etc.)	No
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	7.3 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	18 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	within IPJ
Zoning Classifications	
I-1: Light Industrial	



Site 6

Evaluation Criteria	Site 6	Site 6 Reduced
Topography and Construction Considerations		
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	172/128/1,665	126/92/817
Property Acquisition (Estimated Cost in millions)	\$20.0	\$14.0
Construction Costs (Estimated Cost in millions)	\$47.7	\$47.7
Total Cost (Estimated Cost in millions)	\$67.7	\$61.7
Road access and proximity to interstate highways and U.S. highways	Edgewood Road, I-85	Edgewood Road, I-85
Environmental Requirements		
Property Owner Relocations (number and type)	69 residential, 2 commercial, 1 industrial	65 residential, 2 commercial, 1 industrial
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	Crowders Mountain State Park, Park at Bessemer City	Crowders Mountain State Park, Park at Bessemer City
Floodplain	Yes	Yes
Waters of the U.S. (streams and wetlands)	Yes	Yes
Compatible Land Use/Zoning (existing and future)	30% I-1, 2% I-2, 36% R-1, 30% R-10, 1% RS12, 1% TMU	30% I-1, 2% I-2, 36% R-1, 30% R-10, 1% RS12, 1% TMU
Any known hazardous materials sites	Yes	Yes
City of Gastonia Annexation Capability	Indirect	Indirect
Operational Considerations		
CLT Class B Airspace Ceiling	5,000	5,000
Obstructions (transmission lines, towers, landfills, etc.)	No	No
Wind Coverage (minimum 95% - FAA)	Yes	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	7.5 miles	7.5 miles
Satisfies Aeronautical Demand		
Travel time from major population in Gaston County	12.5 minutes	12.5 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	within EHO and IPJ	within EHO and IPJ
Zoning Classifications		
R-1: Single Family Limited, R-10: Residential, RS-12: Residential 12,000 SF		
I-1: Light Industrial, I-2: Exclusive Industrial		
TMU: Transitional Mixed Use		



RUNWAY REALIGNMENT ALTERNATIVES EVALUATION

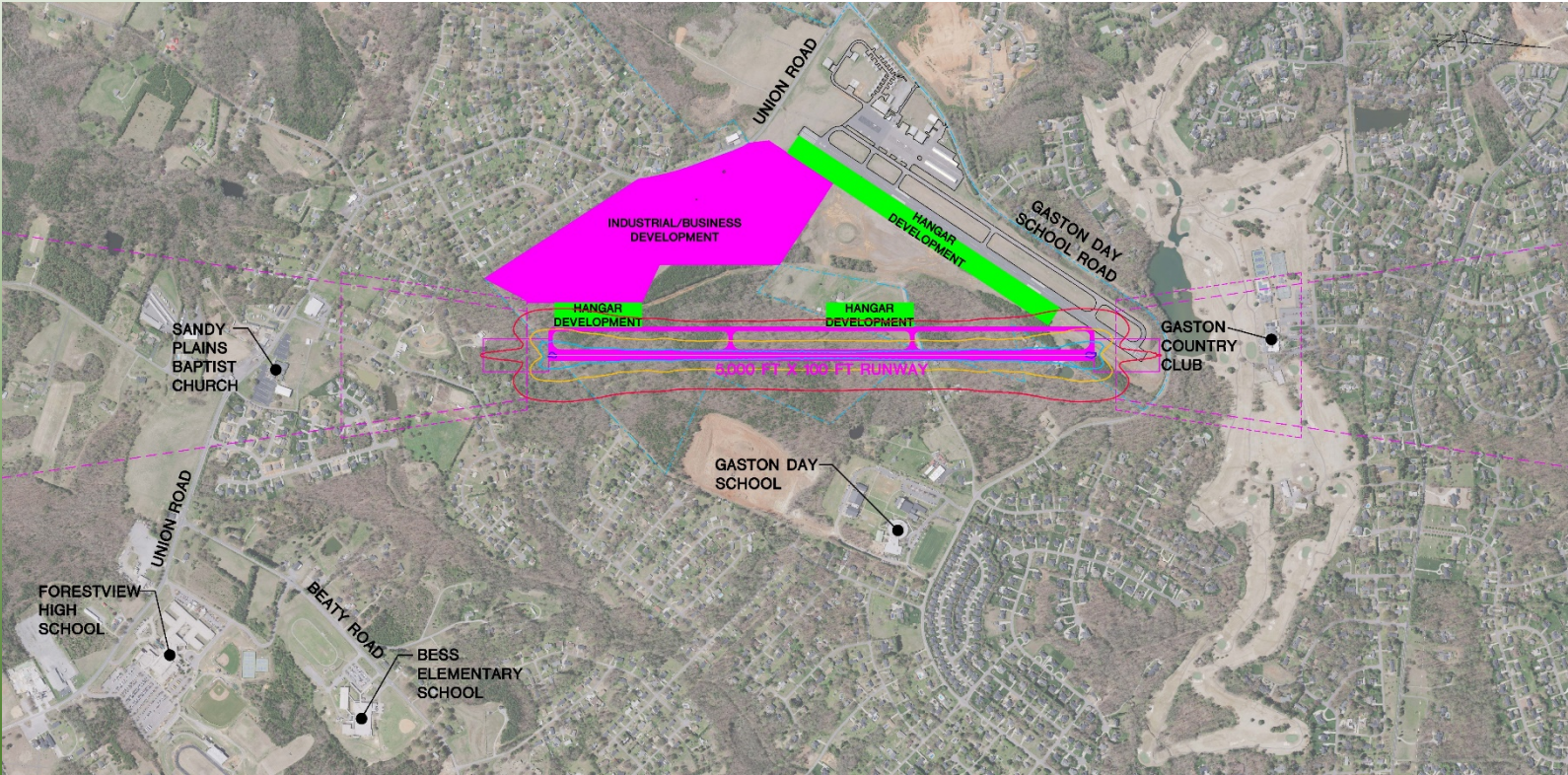
Typical Steps in Evaluating Alternatives to Realign a runway

The FAA allows the evaluation of runway realignment alternatives at an existing airport location to determine if one or more feasible alternatives exist to achieve a runway realignment that provides the desired runway length and functional use of the airport property.

Typical items to be evaluated include determination of a preferred runway alignment that will provide a 5,000-foot runway length, consistent with the State System Plan objectives previously mentioned, with corresponding full-length parallel taxiway that is consistent with applicable FAA development criteria that is capable of having clear approaches.

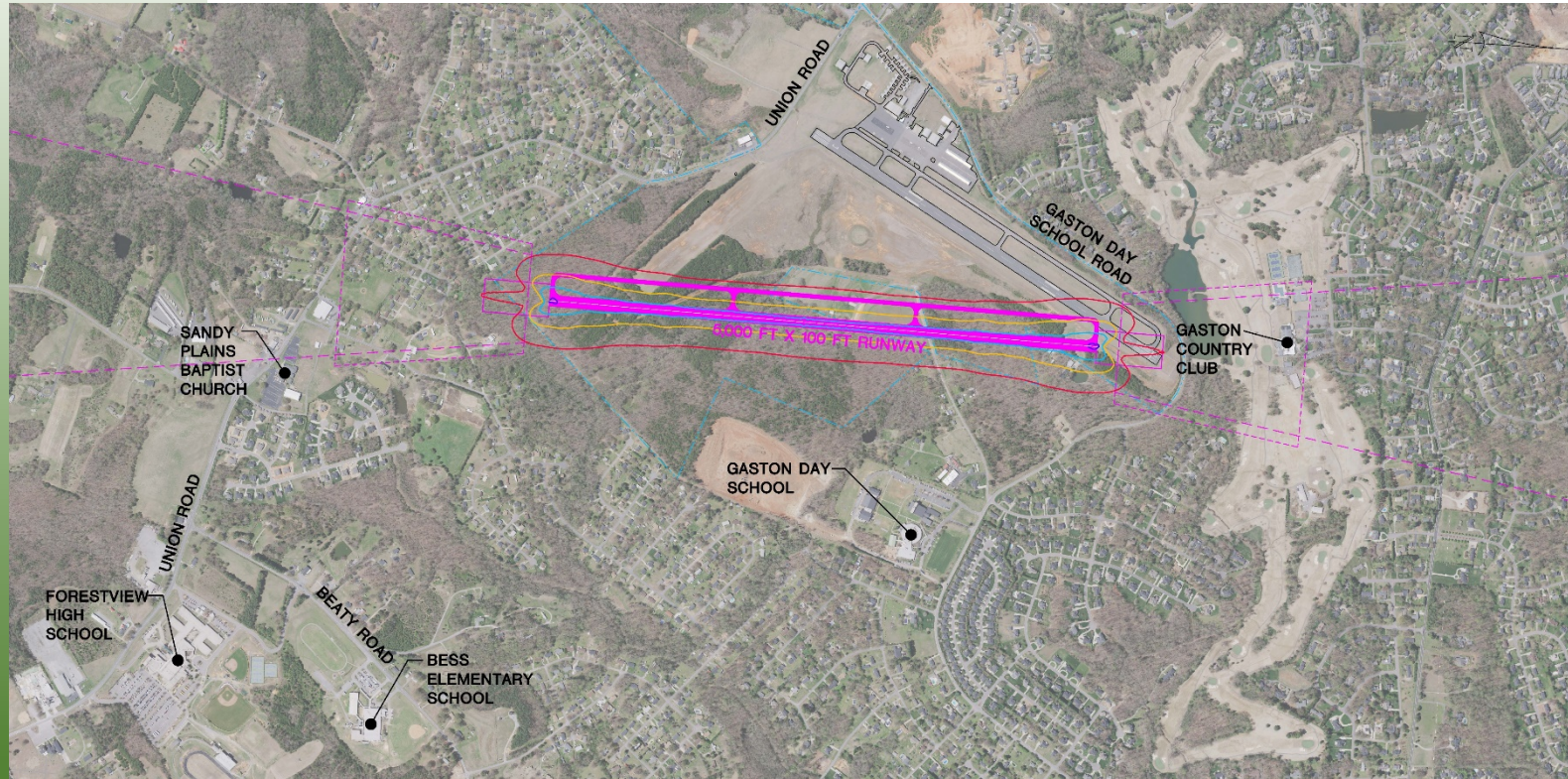
Evaluation goals also include minimizing impacts to the environment and adjacent properties.

ALTERNATIVE 1



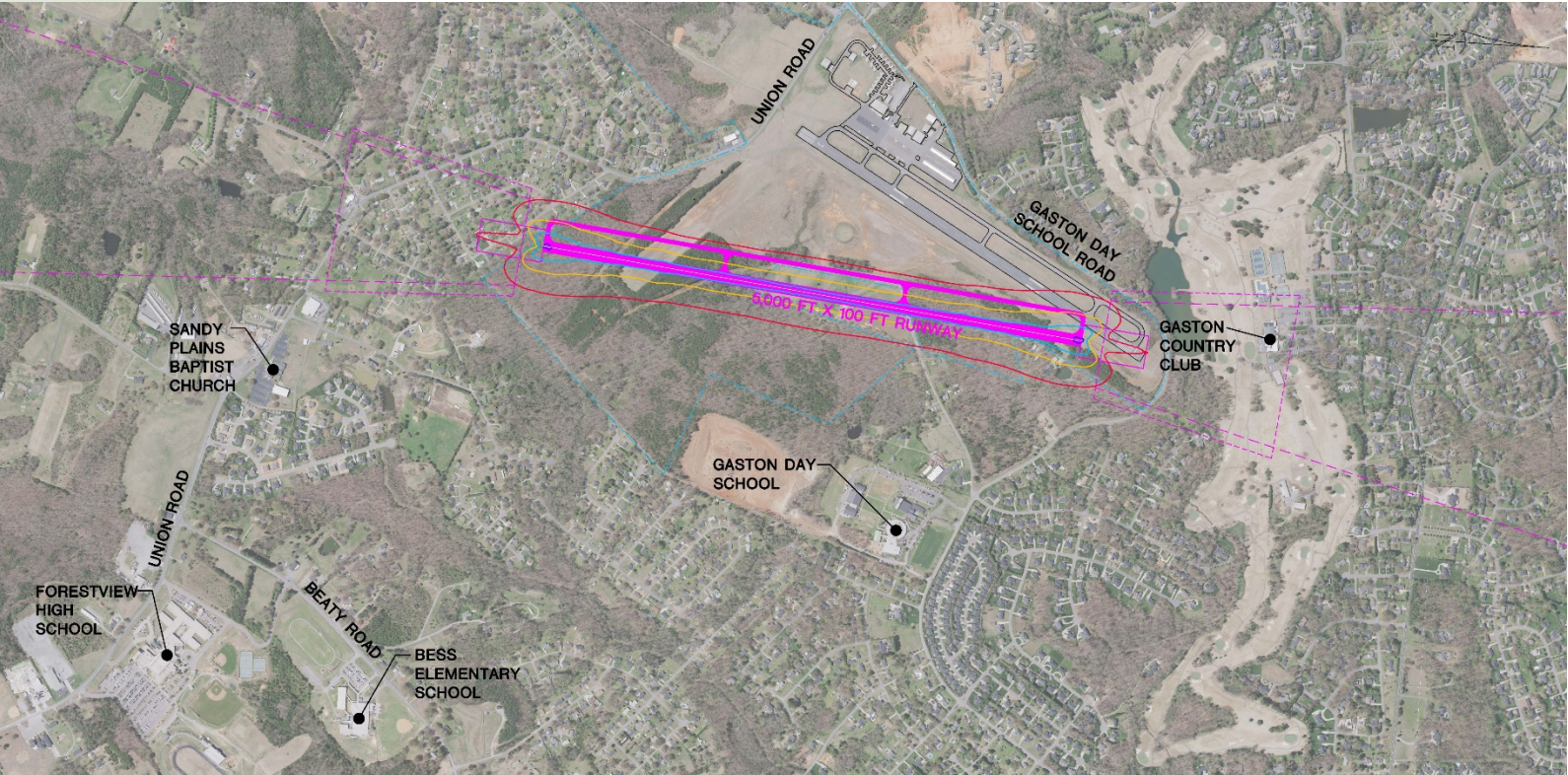
Evaluation Criteria	Realignment 1
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	63/63/103
Property Acquisition (Estimated Cost in millions)	\$8.40
Construction Costs (Estimated Cost in millions)	\$24.30
Total Cost (Estimated Cost in millions)	\$37.50
Road access and proximity to interstate highways and U.S. highways	Gaston Day School Road
Requires road relocation	No
Environmental Requirements	
Property Owner Relocations (number and type)	X Residential
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	Forestview High School, Bess Elementary School, Sandy Plains Baptist Church, Gaston Country Club
Floodplain	No
Waters of the U.S. (streams and wetlands)	No
Compatible Land Use/Zoning (existing and future)	100% R-1
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	In City Limits
Operational Considerations	
Change in Air Traffic Patterns	Yes
Obstructions (transmission lines, towers, landfills, etc.)	No
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	5 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	10 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	outside
Zoning Classifications	
R-1: Single Family Limited	

ALTERNATIVE 2



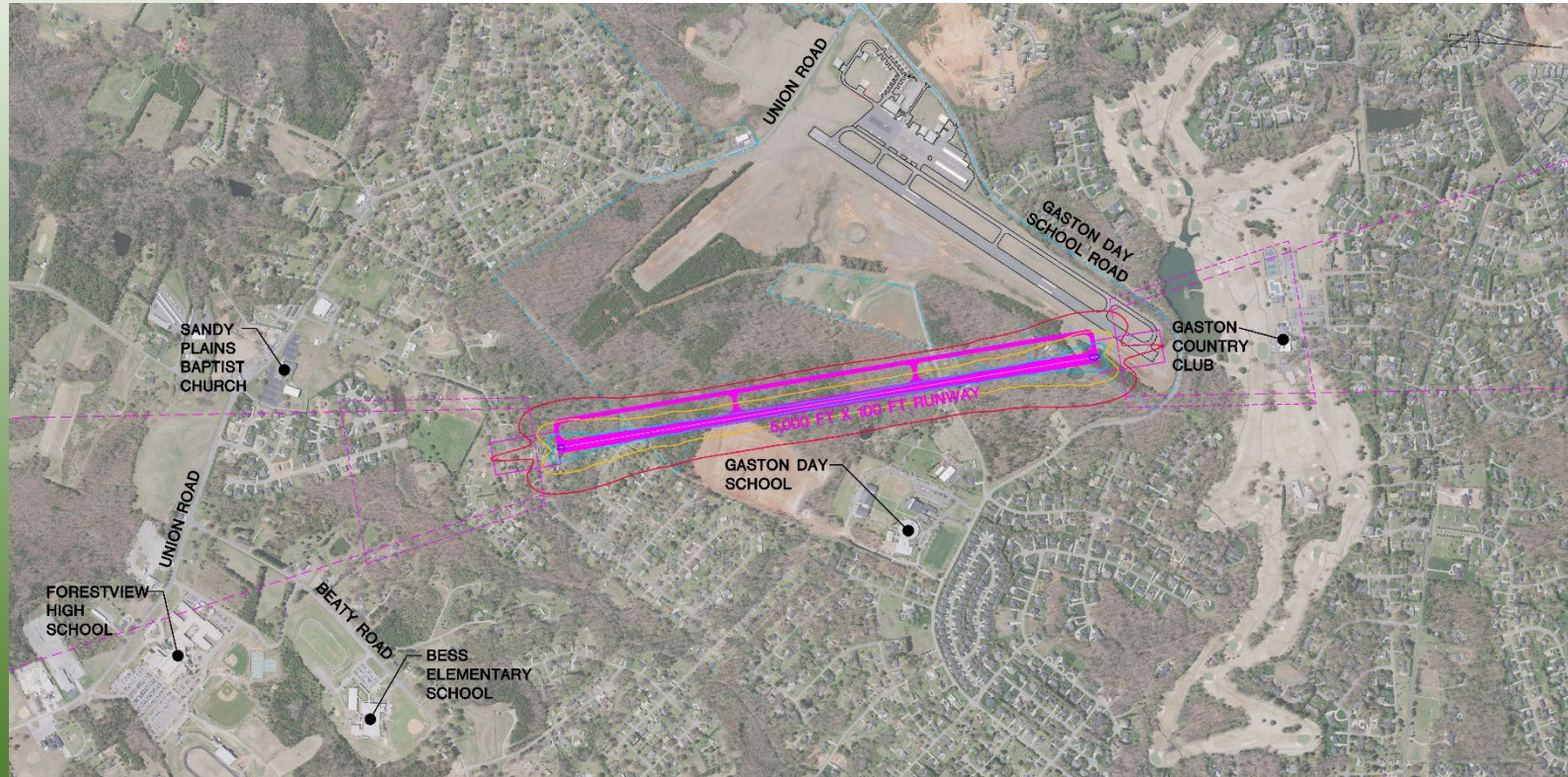
Evaluation Criteria	Realignment 2
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	52/52/X
Property Acquisition (Estimated Cost in millions)	
Construction Costs (Estimated Cost in millions)	
Total Cost (Estimated Cost in millions)	
Road access and proximity to interstate highways and U.S. highways	Gaston Day School Road
Requires road relocation	No
Environmental Requirements	
Property Owner Relocations (number and type)	X Residential
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	Forestview High School, Bees Elementary School, Sandy Plains Baptist Church, Gaston Country Club
Floodplain	No
Waters of the U.S. (streams and wetlands)	No
Compatible Land Use/Zoning (existing and future)	100% R-1
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	In City Limits
Operational Considerations	
Change in Air Traffic Patterns	Yes
Obstructions (transmission lines, towers, landfills, etc.)	No
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	5 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	10 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	outside
Zoning Classifications	
R-1: Single Family Limited	

ALTERNATIVE 3

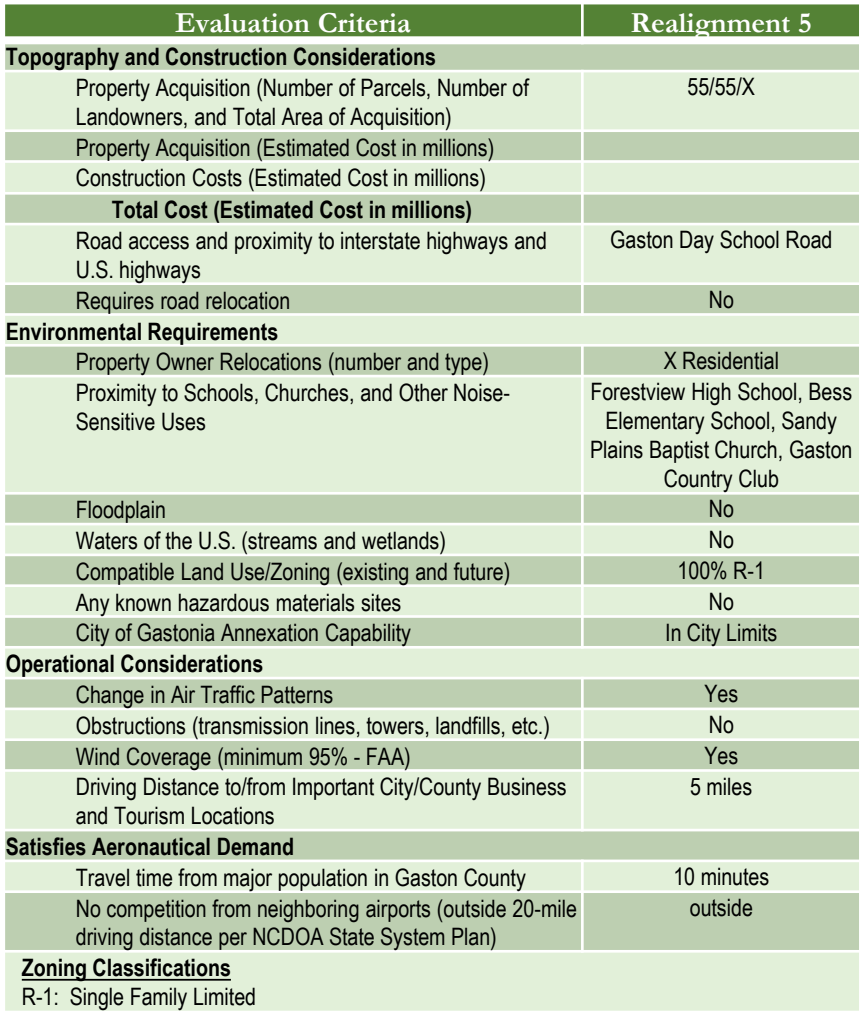


Evaluation Criteria	Realignment 3
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	73/73/X
Property Acquisition (Estimated Cost in millions)	
Construction Costs (Estimated Cost in millions)	
Total Cost (Estimated Cost in millions)	
Road access and proximity to interstate highways and U.S. highways	Gaston Day School Road
Requires road relocation	No
Environmental Requirements	
Property Owner Relocations (number and type)	X Residential
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	Forestview High School, Bess Elementary School, Sandy Plains Baptist Church, Gaston Country Club
Floodplain	No
Waters of the U.S. (streams and wetlands)	No
Compatible Land Use/Zoning (existing and future)	100% R-1
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	In City Limits
Operational Considerations	
Change in Air Traffic Patterns	Yes
Obstructions (transmission lines, towers, landfills, etc.)	No
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	5 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	10 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	outside
Zoning Classifications	
R-1: Single Family Limited	

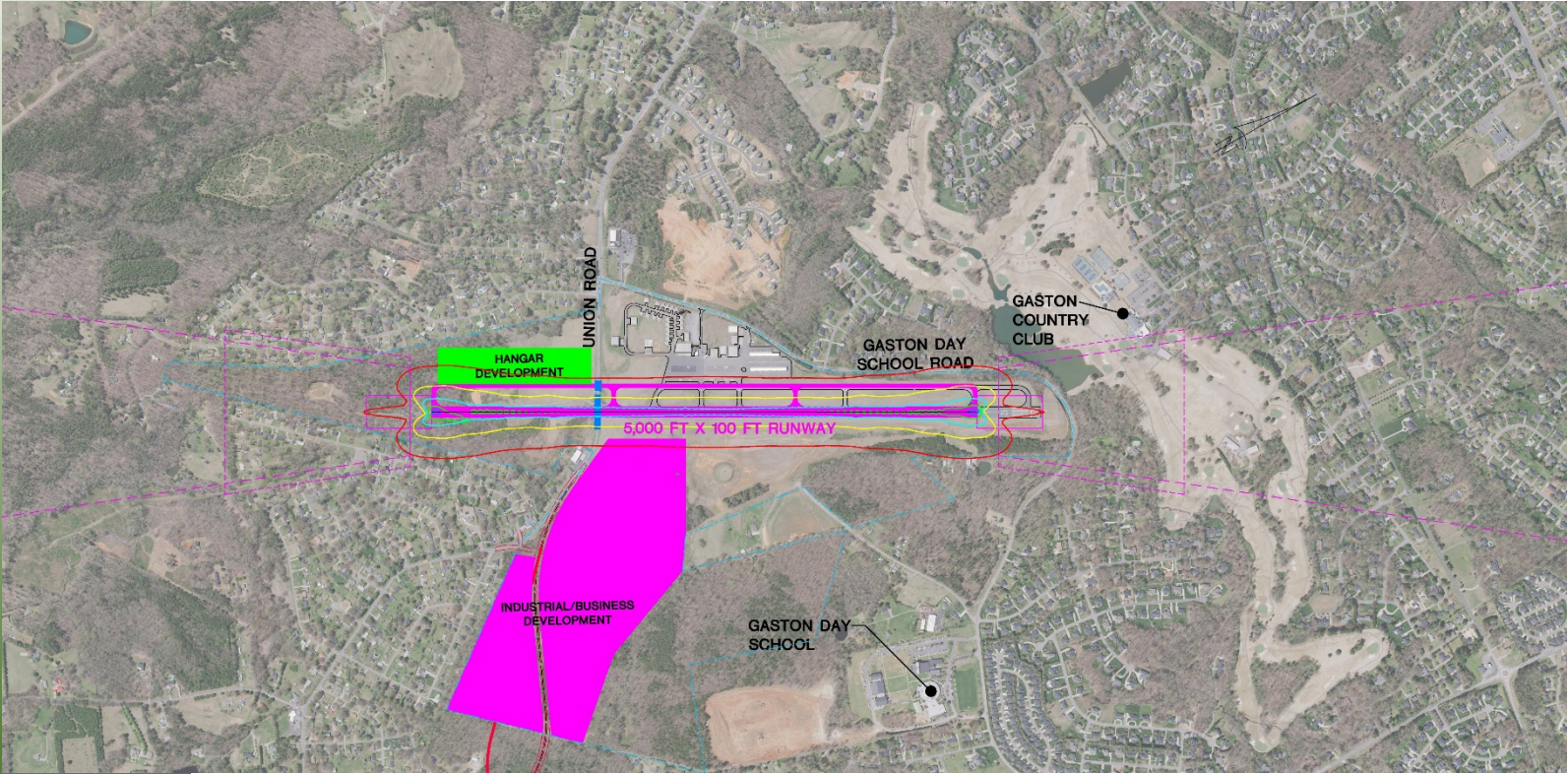
ALTERNATIVE 4



Evaluation Criteria	Realignment 4
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	52/52/X
Property Acquisition (Estimated Cost in millions)	
Construction Costs (Estimated Cost in millions)	
Total Cost (Estimated Cost in millions)	
Road access and proximity to interstate highways and U.S. highways	Gaston Day School Road
Requires road relocation	No
Environmental Requirements	
Property Owner Relocations (number and type)	X Residential
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	Forestview High School, Bess Elementary School, Sandy Plains Baptist Church, Gaston Country Club
Floodplain	No
Waters of the U.S. (streams and wetlands)	No
Compatible Land Use/Zoning (existing and future)	100% R-1
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	In City Limits
Operational Considerations	
Change in Air Traffic Patterns	Yes
Obstructions (transmission lines, towers, landfills, etc.)	No
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	5 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	10 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOT State System Plan)	outside
Zoning Classifications	
R-1: Single Family Limited	



ALTERNATIVE 6

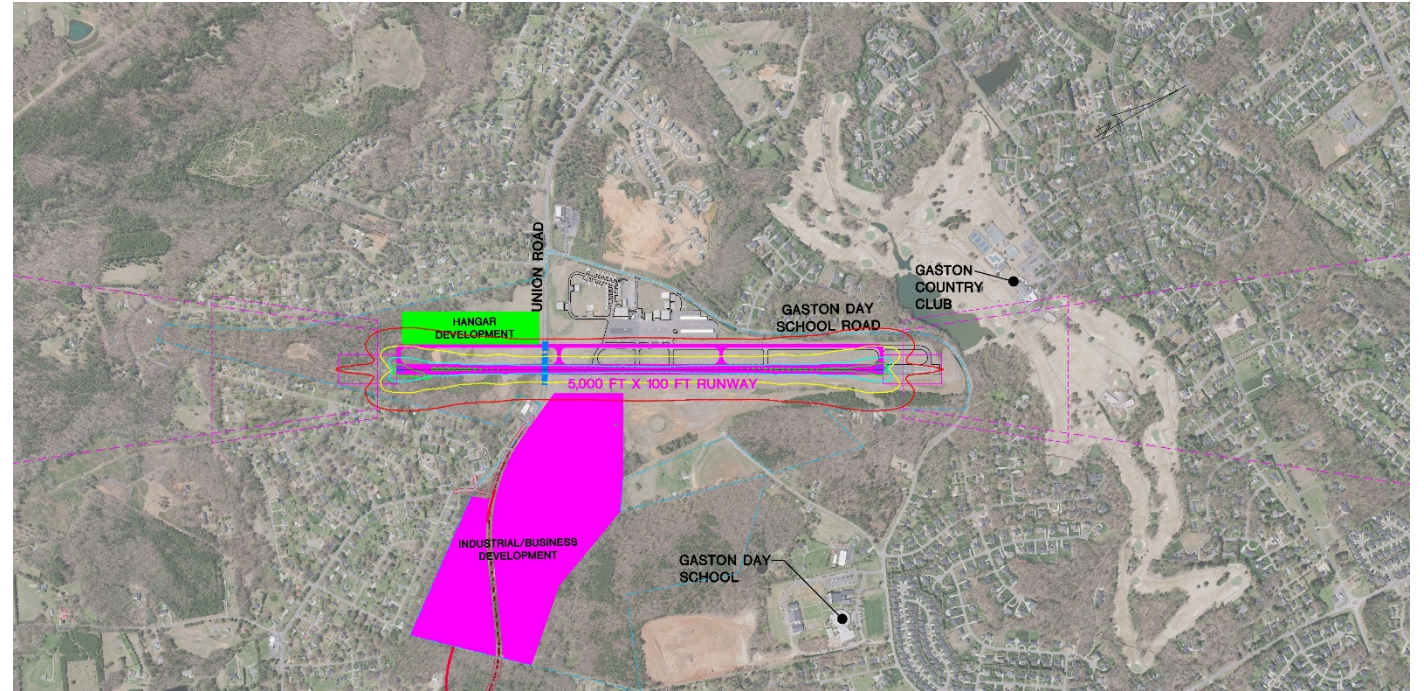


Evaluation Criteria	Realignment 6
Topography and Construction Considerations	
Property Acquisition (Number of Parcels, Number of Landowners, and Total Area of Acquisition)	61/61/30
Property Acquisition (Estimated Cost in millions)	\$7.80
Airfield Construction Costs (Estimated Cost in millions)	\$26.00
Total Cost (Estimated Cost in millions)	\$33.80
Union Road Tunnel Construction Costs (Estimated Cost in millions)	\$16.00
Total Cost (Estimated Cost in millions)	\$49.80
Road access and proximity to interstate highways and U.S. highways	Gaston Day School Road
Requires road relocation	Yes, tunnel Union Road
Environmental Requirements	
Property Owner Relocations (number and type)	X Residential
Proximity to Schools, Churches, and Other Noise-Sensitive Uses	Gaston Country Club
Floodplain	No
Waters of the U.S. (streams and wetlands)	No
Compatible Land Use/Zoning (existing and future)	100% R-1
Any known hazardous materials sites	No
City of Gastonia Annexation Capability	In City Limits
Operational Considerations	
Change in Air Traffic Patterns	No
Obstructions (transmission lines, towers, landfills, etc.)	No
Wind Coverage (minimum 95% - FAA)	Yes
Driving Distance to/from Important City/County Business and Tourism Locations	5 miles
Satisfies Aeronautical Demand	
Travel time from major population in Gaston County	10 minutes
No competition from neighboring airports (outside 20-mile driving distance per NCDOA State System Plan)	outside
Zoning Classifications	
R-1: Single Family Limited	

TECHNICAL RECOMMENDATION

Technical recommendation

During a meeting on March 29, 2019, with the City of Gastonia and North Carolina Department of Transportation – Division of Aviation, the technical recommendation from Talbert, Bright & Ellington, Inc. was made to proceed with Realignment Alternative 6 – extension of the existing runway to the south at the Gastonia Municipal Airport, including construction of roadway tunnels along the ultimate alignment of Union Road to pass vehicular traffic under the extended runway and taxiway system.



Tunnel Example – Raleigh-Durham International Airport (RDU), Raleigh/Durham, NC



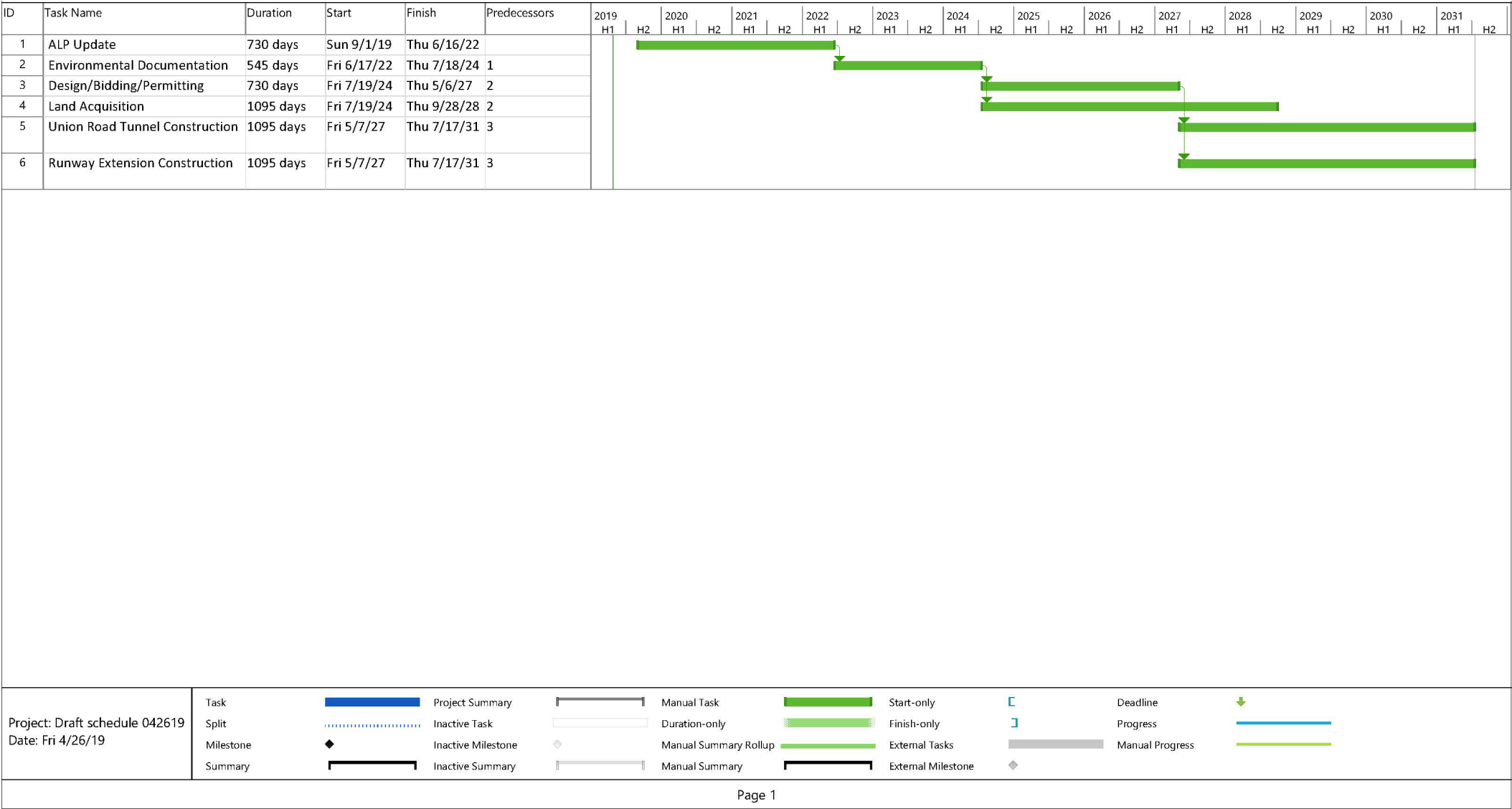
Tunnel Example – Piedmont Triad International Airport (GSO), Greensboro, NC



Tunnel Example – Greene County-Lewis A Jackson Regional Airport (I19), Dayton, OH



Realignment Option 6 Estimated Project Phasing Timeline



QUESTIONS