Appendix E, Noise Abatement Alternatives

Charlotte Douglas International Airport

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PREPARED FOR
Charlotte Douglas International Airport

PRESENTED BY
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Appendix E Noise Abatement Alternatives

This Appendix provides information on the alternative noise abatement measures that were reviewed for inclusion in the Charlotte Douglas International Airport (CLT) Noise Compatibility Program (NCP) Update. Each measure was evaluated for the anticipated benefits and drawbacks associated with its implementation.

E.1 Potential Noise Abatement Alternatives

The following list includes examples of the types of alternatives that were considered for inclusion in the NCP.

Facility Modifications

- Runup Locations
- Displaced Arrival Thresholds

Preferential Runway Use

- Airport Flow
- Daytime Runway Use
- Nighttime Runway Use

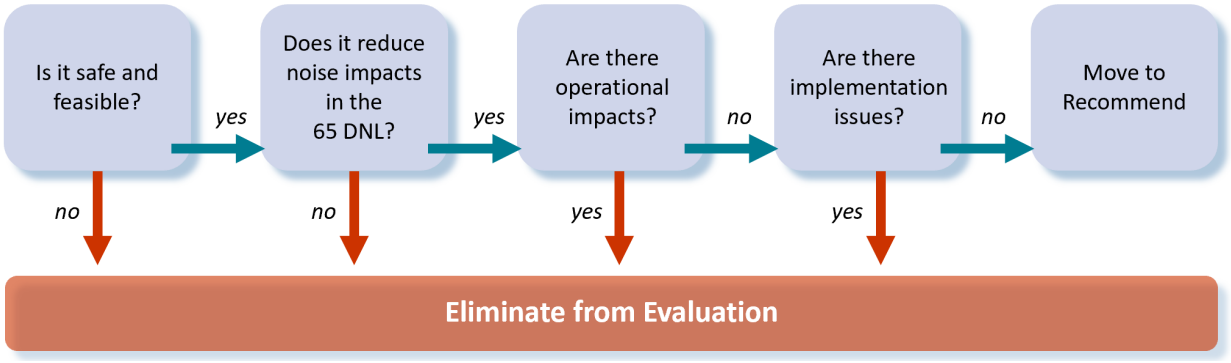
Flight Procedures

- Divergent Headings - North and South Flow Operations
- Departure Flight Corridors
- Arrival Flight Corridors

The alternative noise abatement measures were developed based on comments received from members of the Technical Advisory Committee, including the local Federal Aviation Administration Airport Traffic Control Tower (ATCT), airlines operating at CLT, and the Airport Community Roundtable.

In order to evaluate each alternative, a set of evaluation criteria was established and used to identify the benefits and drawbacks of each alternative. The criteria include feasibility, safety, noise reduction, and operational considerations. After it was determined that an alternative was feasible and safe, a noise impact assessment was prepared to document increases and decreases in various noise levels as compared to the Future (2028) Baseline. If the alternative was determined to result in noise reductions, the alternative was evaluated for operational efficiency and implementation considerations. The diagram below summarizes the noise abatement alternative evaluation process.

Figure 1 Noise Abatement Alternative Screening Process



The following provides a description of each alternative evaluated, along with an assessment of the benefits, drawbacks, and a recommendation.

E.2 Consideration of Alternative Noise Abatement Measures

The following pages describe alternative noise abatement measures that were considered in this Part 150 Study. A total of 34 additional preliminary alternatives were evaluated. These alternatives are labeled NA-A-1 through NA-I-3. While not all alternatives may be practical or achievable, potential alternatives were considered in accordance with 14 CFR Part 150 §150.23(e) and §B150.7.

The following information is provided for each alternative:

- Title – includes a brief descriptive title of the measure.
- Background and Intent – includes the intent of the measure as a means to mitigate noise impacts and the background and setting to which the measure relates where applicable.
- Benefits – includes a statement of how the measure would provide noise mitigation benefits
- Drawbacks – identifies any potential negative consequences of implementing the measure
- Cost to Implement – identifies the potential cost to implement each measure
- Evaluation Method – provides the method by which the measure was evaluated for changes in noise impacts. This was either accomplished as a qualitative analysis or a quantitative evaluation using the FAA's AEDT model to develop an alternative noise exposure contour and develop counts of noise-sensitive land uses within the DNL 65+ dB noise exposure contour to compare to the Future (2028) Baseline noise impacts presented in **Table E-1**. For each alternative in which a quantitative analysis was performed, an exhibit is included showing a comparison of the noise exposure contour that would result from the implementation of the alternative and the Future (2028) Baseline noise exposure contour. In addition, a table of noise impacts that would result from the implementation of the alternative is included to either show an increase or a decrease in impacted properties when compared to Table E-1.
- Findings and Recommendations – indicates if the alternative was carried forward for further evaluation

Table E-1 Future (2028) Baseline Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	86	0	0	86
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**243**	**0**	**0**	**243**
Population				
Total Population[1]	**687**	**0**	**0**	**687**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-A-1

TITLE:	Establish a run-up location on the deice pad and northeast airfield that are currently under construction. Maximize the use of midfield run-up locations over those located on the east side of the Airport. Refer to **Exhibit E-1, *Run-Up Locations*** for the run-up locations.

BACKGROUND AND INTENT:	The Airport user policy currently identifies six run-up locations and procedures for aircraft engine runups. The measure would establish two new run-up locations that are currently under construction: on the deice pad located on the south airfield east of Runway 36C; and in the northeast airfield east of Taxiway D. Construction is anticipated to conclude in 2025 and the sites would be able to be used for run-ups when completed. The measure would maximize the use of midfield run-up locations (ID 2, 3, 7) and reduce the use of those located on the east side of the Airport (ID 4, 5, 6, 8). The intent of the measure is to reduce sideline noise from run-ups on the east side of the Airport.

BENEFITS:	The addition of two new run-up locations would allow for increased flexibility for carriers to conduct run-ups. Evaluations conducted at major airports throughout the United States have indicated that run-up activity has little effect on the location of the noise contours. However, sustained single-event noise levels associated with run-ups are often sources of complaint within neighborhoods near airports. The maximized use of midfield locations over those located on the east side of the Airport would appear to result in reduced sideline noise from run-ups for homes directly east of Airport Drive.

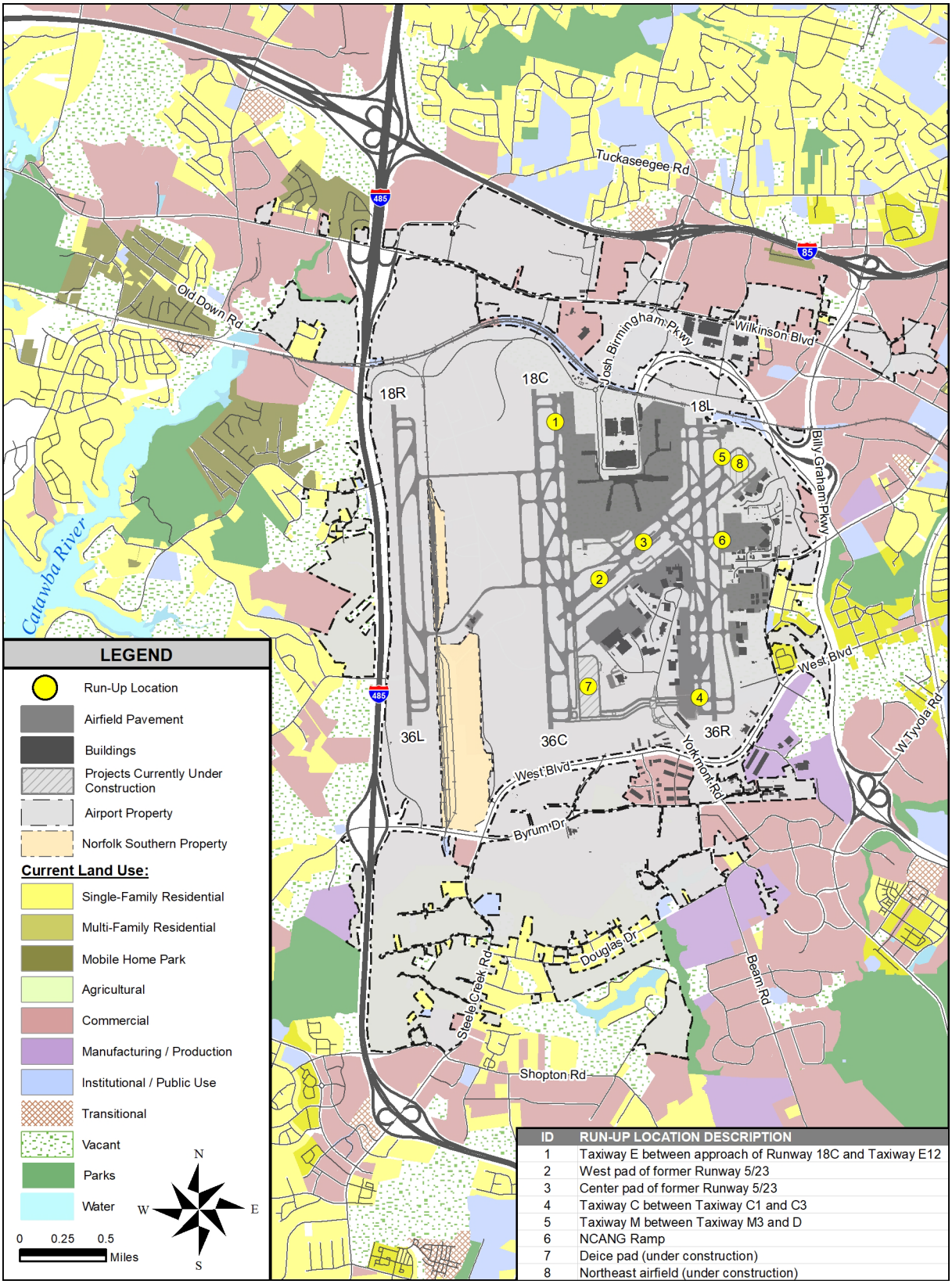
DRAWBACKS:	

COST TO IMPLEMENT:	Minimal cost for development and publication of new airport procedures.

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The measure is anticipated to result in reduced sideline noise from run-ups for homes directly east of Airport Drive. For this reason, this measure is **RECOMMENDED** for further evaluation.

Exhibit E-1 Run-Up Locations



ID	RUN-UP LOCATION DESCRIPTION
1	Taxiway E between approach of Runway 18C and Taxiway E12
2	West pad of former Runway 5/23
3	Center pad of former Runway 5/23
4	Taxiway C between Taxiway C1 and C3
5	Taxiway M between Taxiway M3 and D
6	NCANG Ramp
7	Deice pad (under construction)
8	Northeast airfield (under construction)

Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-A-2

TITLE:	Conduct an assessment of ground run-up procedures after construction of the new fourth parallel runway to identify run-up locations in the midfield of the Airport. Refer to **Exhibit E-2, *Run-Up Locations on Future Airport Layout*** for the exiting run-up locations in the future airport layout.

BACKGROUND AND INTENT:	The Airport user policy currently identifies six run-up locations and procedures for aircraft engine runups. Based on approval of the modification to Measure NA-6, two additional run-up locations would be available and operational in 2025. When the new fourth parallel runway is constructed and operational, run-up ID 1 would be removed as a run-up location. This measure would conduct an assessment of ground run-up locations to identify additional locations in the midfield in the future airport layout after construction of the new fourth parallel runway (anticipated 2028). The intent of this measure is to reduce sideline noise from run-ups after construction of the new fourth parallel runway.

BENEFITS:	Evaluations conducted at major airports throughout the United States have indicated that run-up activity has little effect on the location of the noise contours. However, sustained single-event noise levels associated with run-ups are often sources of complaint within neighborhoods near airports. The maximized use of midfield locations over those located on the east side of the Airport would appear to result in reduced sideline noise from run-ups for homes directly east of Airport Drive.

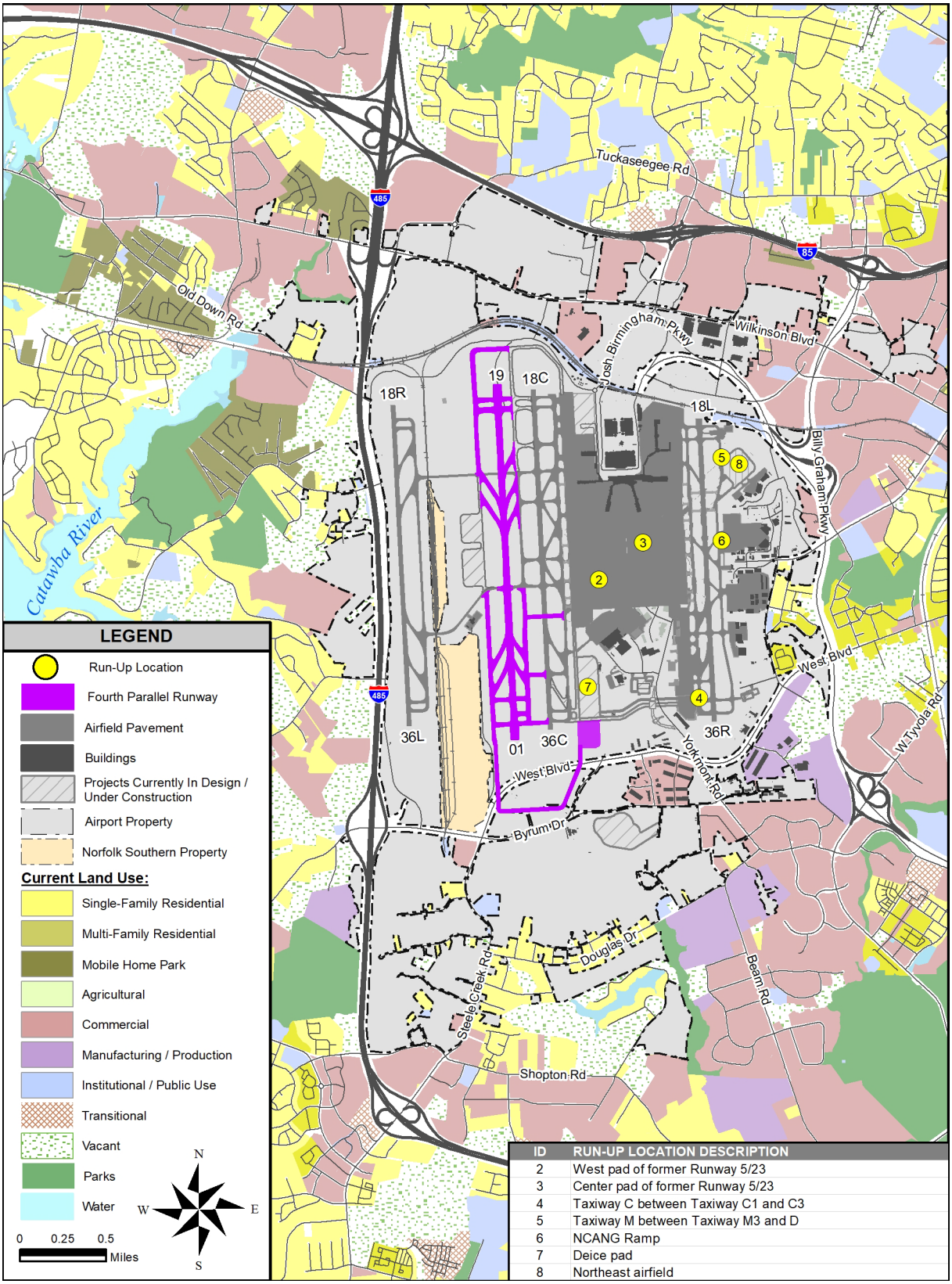
DRAWBACKS:	None

COST TO IMPLEMENT:	Cost related to conducting an assessment of ground run-up procedures after construction of the new fourth parallel runway. Minimal costs related to development and publication of new airport procedures to document new run-up locations based on the assessment.

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The measure is anticipated to result in reduced sideline noise from run-ups for homes directly east of Airport Drive. For this reason, this measure is **RECOMMENDED** for further evaluation.

Exhibit E-2 Run-Up Locations on Future Airport Layout



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-B-1

TITLE:	Implement a 1,235-foot displaced arrival threshold on Runway 36C.

BACKGROUND AND INTENT:	Aircraft arriving from the south to Runway 36C currently land at the runway end. The implementation of the displaced arrival threshold would direct aircraft to land 1,235 north of the Runway 36C end. The intent of the measure is to increase the altitude of arriving aircraft to reduce noise levels over residential areas south of the Airport, including those off Douglas Drive and Shopton Road. Refer to **Exhibit E-3, *Noise Compatibility Program Alternative NA-B-1***.

BENEFITS:	None

DRAWBACKS:	The measure would not result in a decrease in the number of housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the National Environmental Policy Act (NEPA) for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

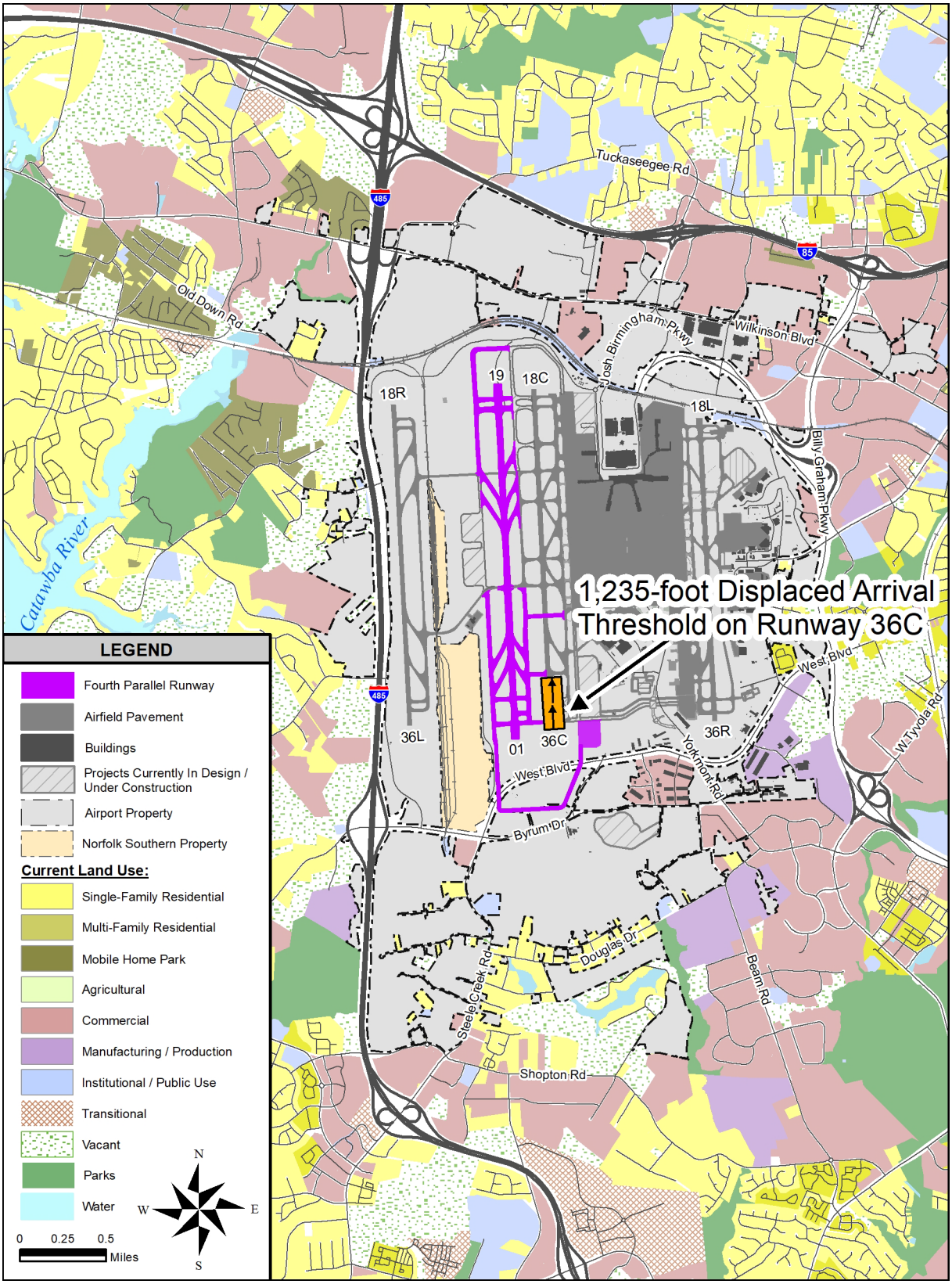
Table E-2 NA-B-1 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	86	0	0	86
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**243**	**0**	**0**	**243**
Population				
Total Population[1]	**687**	**0**	**0**	**687**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

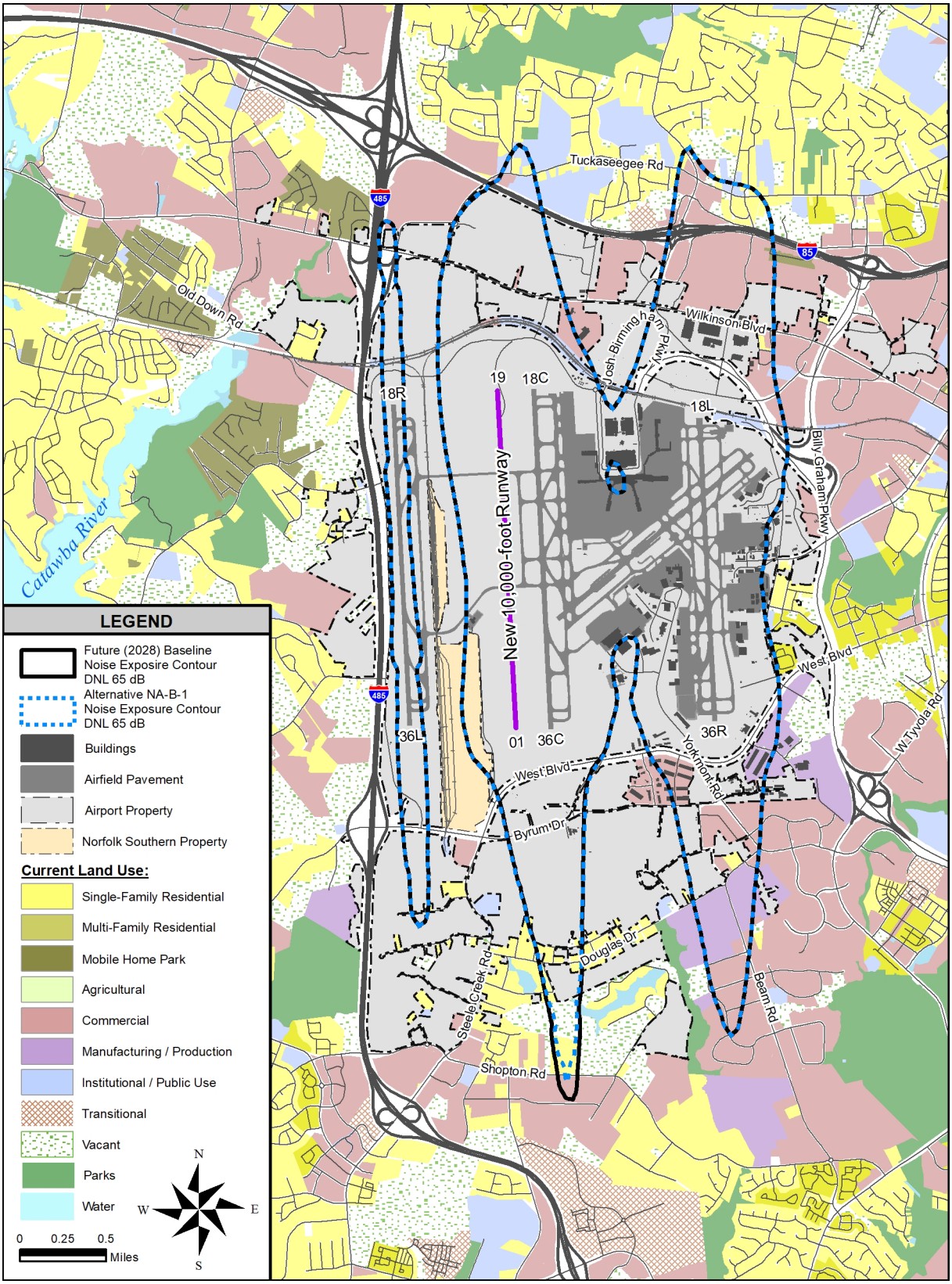
Source: Landrum & Brown, 2024.

Exhibit E-3 Noise Compatibility Program Alternative NA-B-1



Source: Landrum & Brown, 2024

Exhibit E-4 Comparison of Future (2028) Baseline versus NA-B-1 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-B-2

TITLE:	Implement a 1,376-foot displaced arrival threshold on Runway 36R.

BACKGROUND AND INTENT:	Aircraft arriving from the south to Runway 36R currently land at the runway end. The implementation of the displaced arrival threshold would direct aircraft to land 1,376 north of the Runway 36R end. The intent of the measure is to increase the altitude of arriving aircraft to reduce noise levels over residential areas south of the Airport, including those off Beam Road. Refer to **Exhibit E-5, *Noise Compatibility Program Alternative NA-B-2***.

BENEFITS:	None

DRAWBACKS:	The measure would not result in a decrease in the number of housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

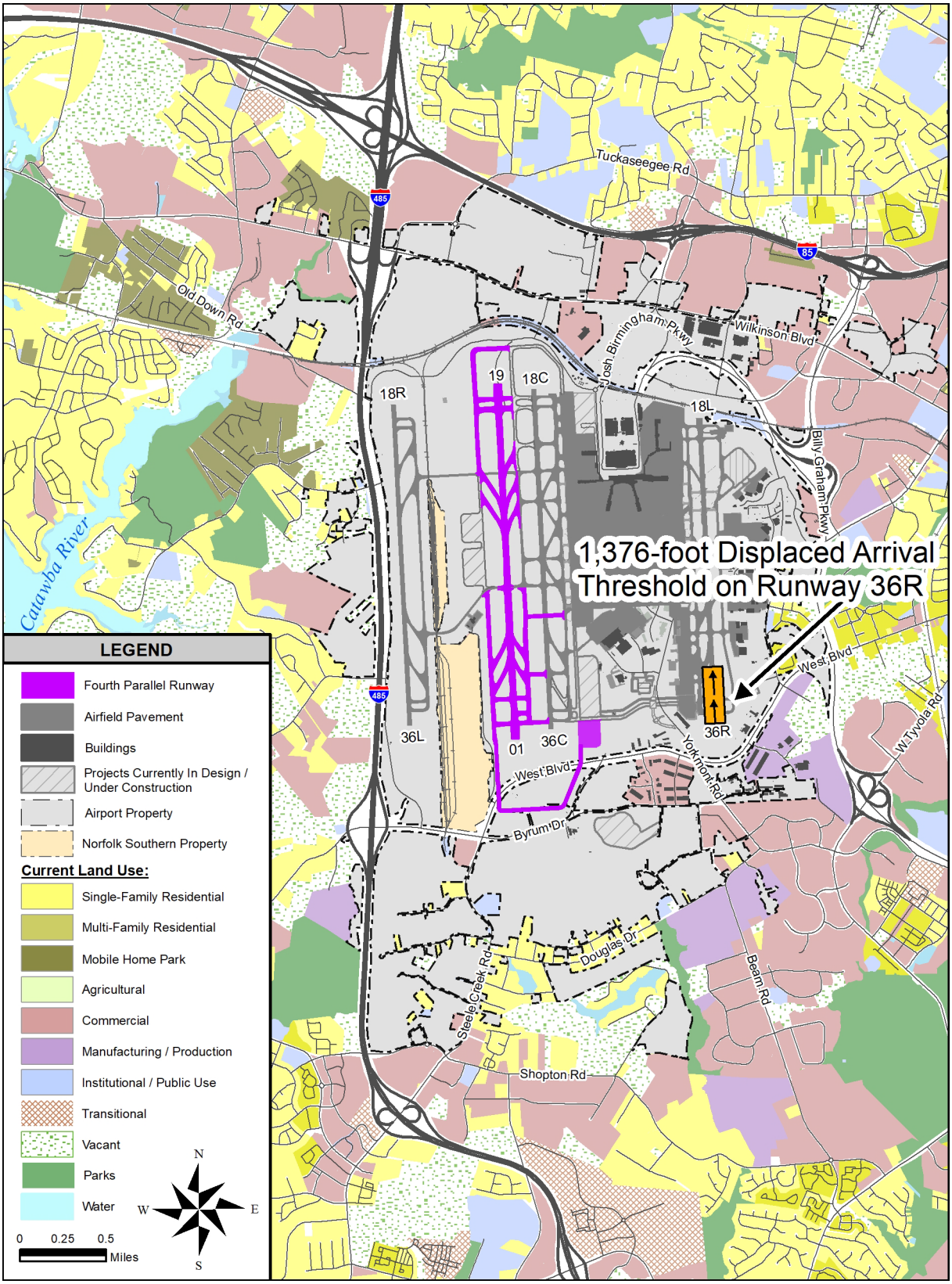
Table E-3 NA-B-2 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	86	0	0	86
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**243**	**0**	**0**	**243**
Population				
Total Population[1]	**687**	**0**	**0**	**687**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

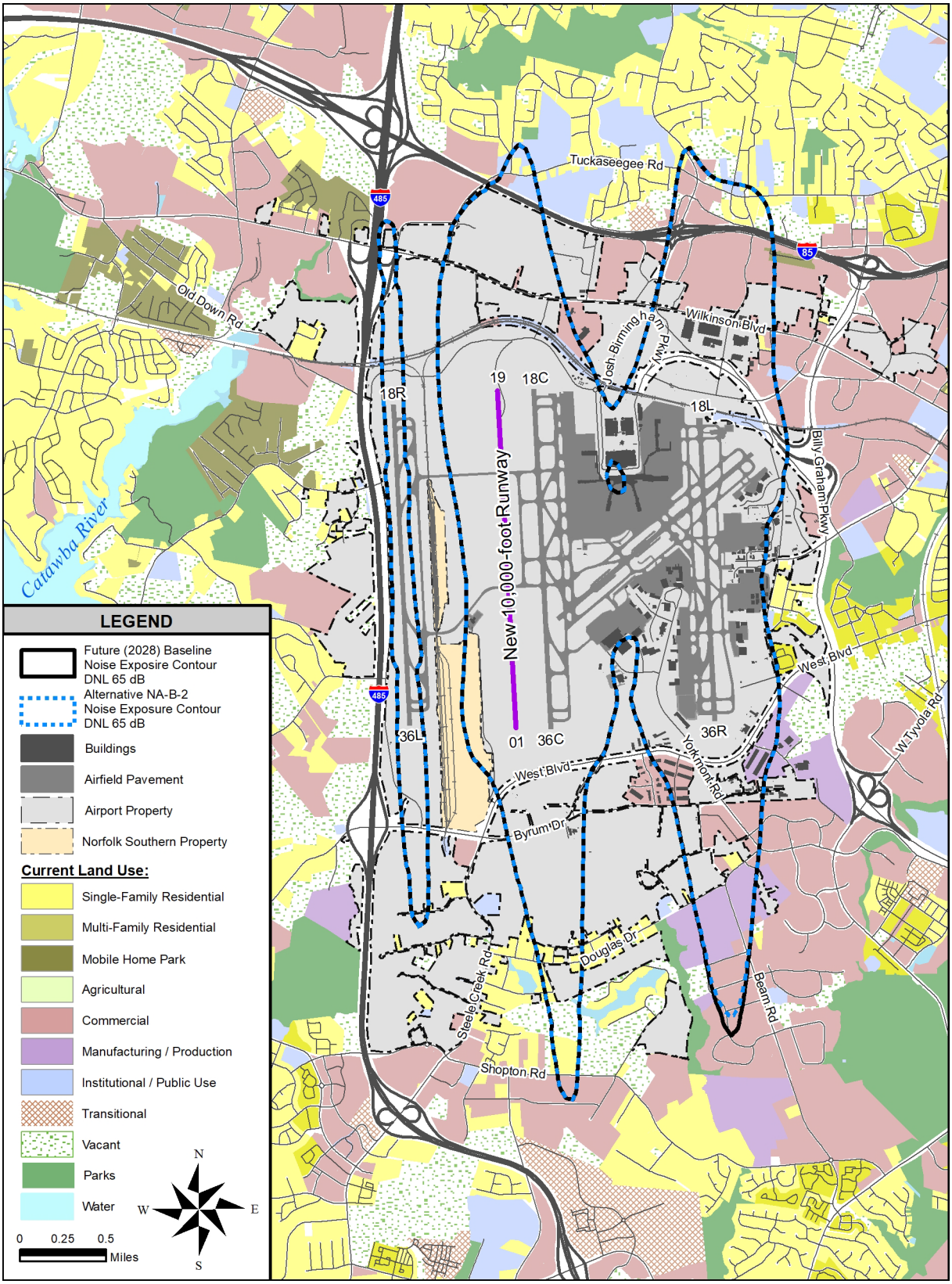
Source: Landrum & Brown, 2024.

Exhibit E-5 Noise Compatibility Program Alternative NA-B-2



Source: Landrum & Brown, 2024

Exhibit E-6 Comparison of Future (2028) Baseline versus NA-B-2 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-B-3

TITLE:	Implement a 1,376-foot displaced arrival threshold on Runway 18L.

BACKGROUND AND INTENT:	Aircraft arriving from the north to Runway 18L currently land at the runway end. The implementation of the displaced arrival threshold would direct aircraft to land 1,376 feet south of the Runway 18L end. The intent of the measure is to increase the altitude of arriving aircraft to reduce noise levels over residential areas to the north of the Airport including Tuckaseegee Road and Little Rock Road. Refer to ***Exhibit E-7, Noise Compatibility Program Alternative NA-B-3***.

BENEFITS:	The measure would result in a decrease in 6 housing units and 1 noise sensitive facility (day care) within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	Negative operational impacts would occur due to the existing high-speed taxiways not being positioned for a displaced threshold. The results would be greater runway occupancy times, longer taxi distance, and potentially increased congestion due to where aircraft would exit the runway. Furthermore, the cost to redesign and reconstruct the taxiways along the runway would far exceed any benefits.

COST TO IMPLEMENT:	The cost to redesign and reconstruct all taxiways along Runway 18L/36R would be the responsibility of the Airport. The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative Assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would result in a decrease in the number of housing units and noise sensitive facilities that would be located within the DNL 65+ dB noise exposure contour. However, the measure would result in negative operational impacts that could only be resolved by redesigning and reconstructing the taxiways along the runway. The cost of such redesigning and reconstruction would far exceed any benefits. As such, this measure is **NOT RECOMMENDED** for further evaluation.

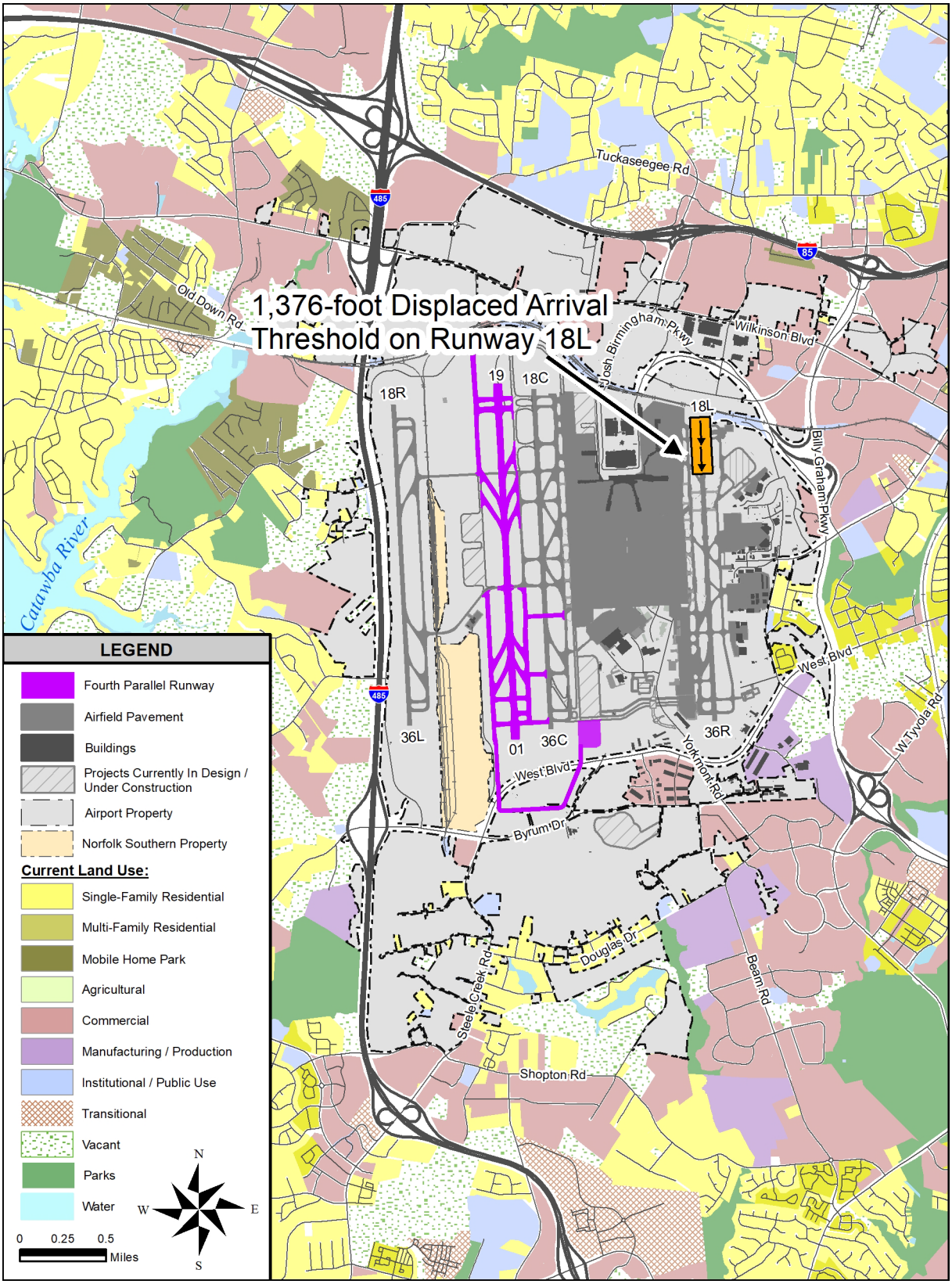
Table E-4 NA-B-3 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	80	0	0	80
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**237**	**0**	**0**	**237**
Population				
Total Population[1]	**670**	**0**	**0**	**670**
Noise-Sensitive Facilities				
Schools / Educational Facilities	3	0	0	3
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

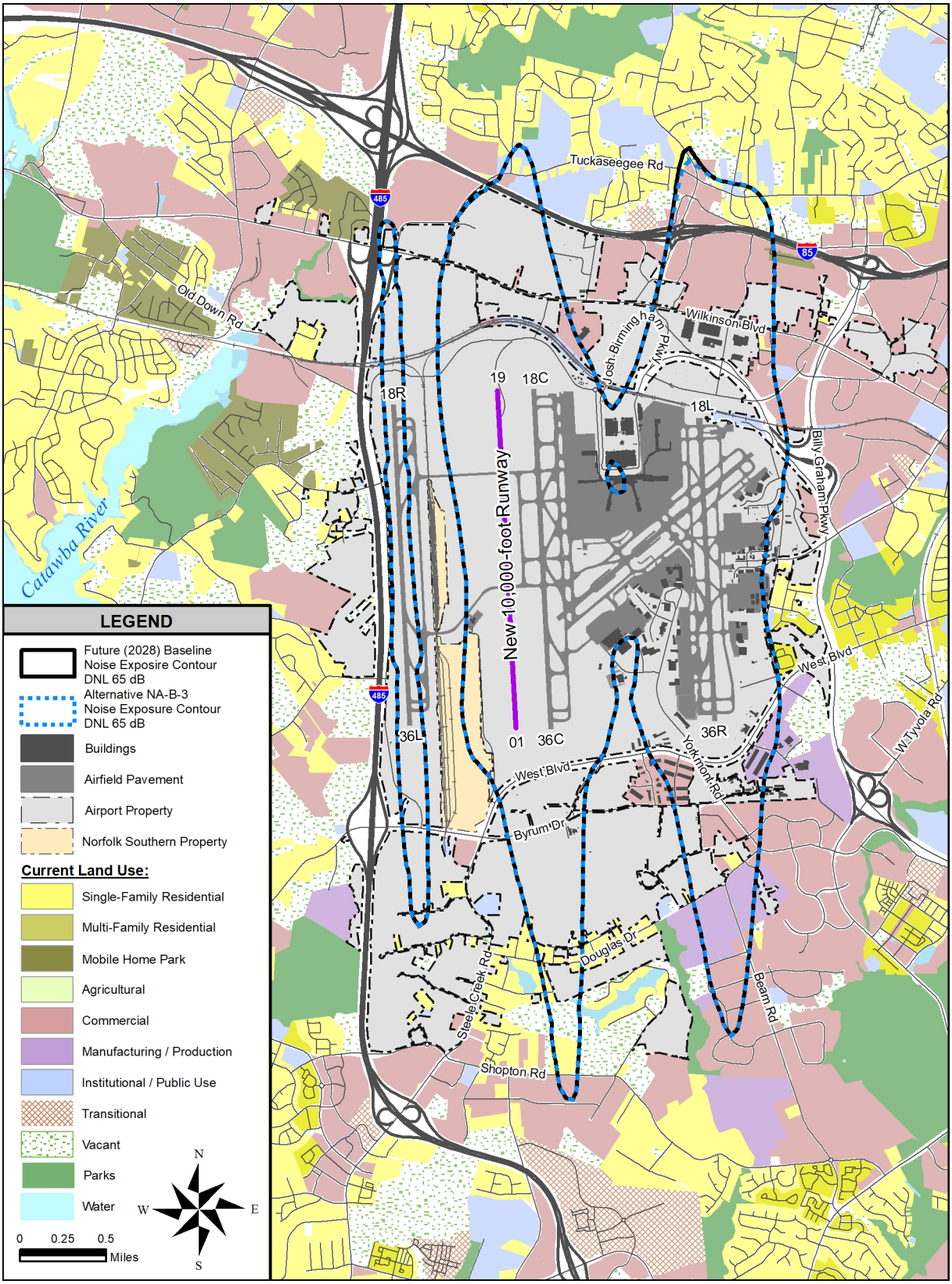
Source: Landrum & Brown, 2024.

Exhibit E-7 Noise Compatibility Program Alternative NA-B-3



Source: Landrum & Brown, 2024

Exhibit E-8 Comparison of Future (2028) Baseline versus NA-B-3 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-B-4

TITLE:	Implement a 1,100-foot displaced arrival threshold on Runway 01.

BACKGROUND AND INTENT:	Aircraft arriving from the south to Runway 01 currently land at the runway end. The implementation of the displaced arrival threshold would direct aircraft to land 1,100 feet north of the Runway 01 end. The intent of the measure is to increase the altitude of arriving aircraft over residential areas south of the Airport including those off Douglas Drive and Steeleberry Drive. The Future (2028) Baseline runway use indicates the new fourth parallel runway, Runway 01/19, would be primarily used for departures. As such, this measure would only be implemented in conjunction with NA-D-1, which would revise the new fourth parallel runway to be used as a primarily arrival runway. See N*oise Compatibility Program Alternative NA-D-1* for more information. Refer to **Exhibit E-9, *Noise Compatibility Program Alternative NA-B-4***.

BENEFITS:	None

DRAWBACKS:	The measure would result in an increase in 15 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would result in an increase in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

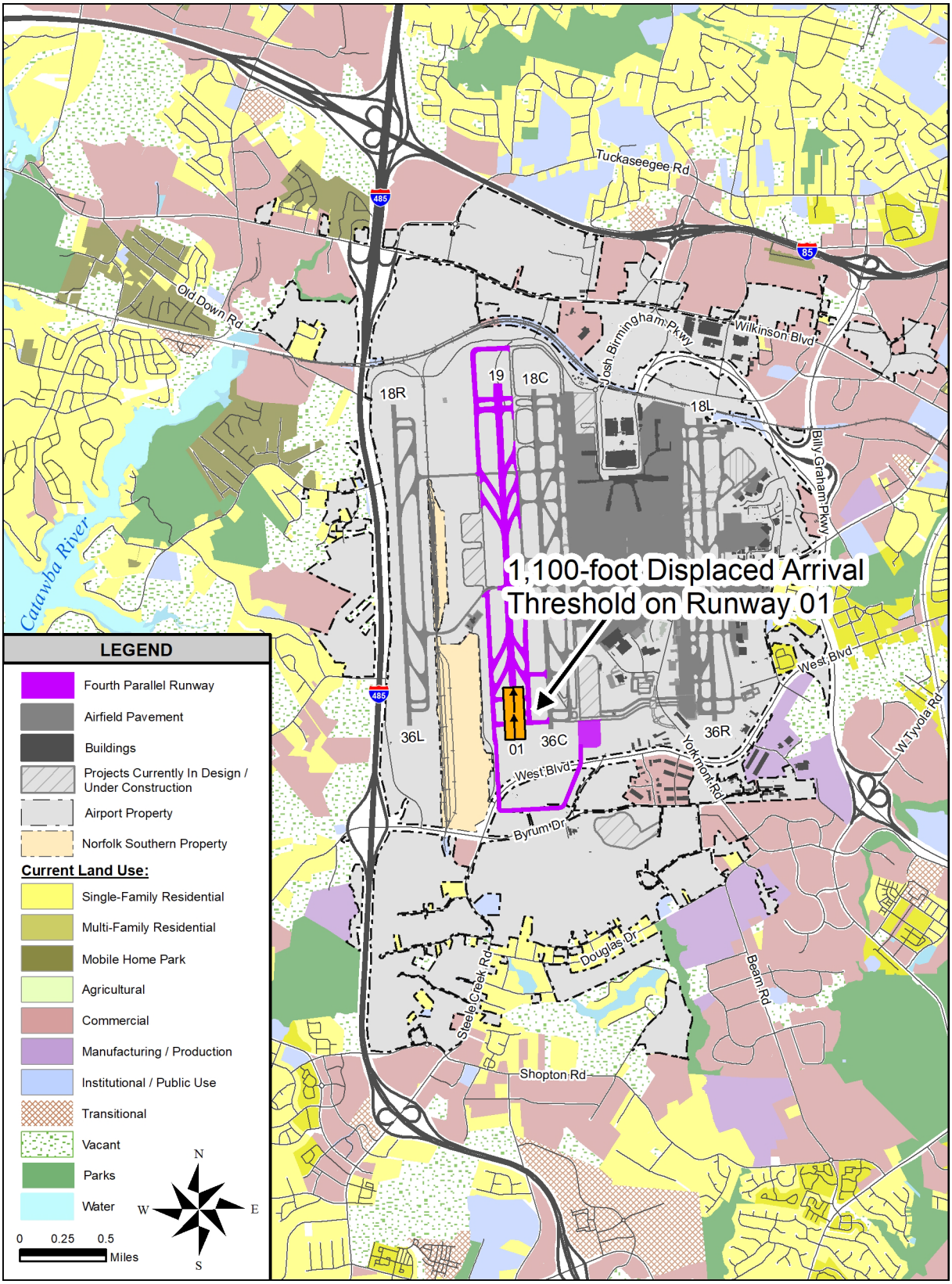
Table E-5 NA-B-4 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	101	0	0	101
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**258**	**0**	**0**	**258**
Population				
Total Population[1]	**727**	**0**	**0**	**727**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

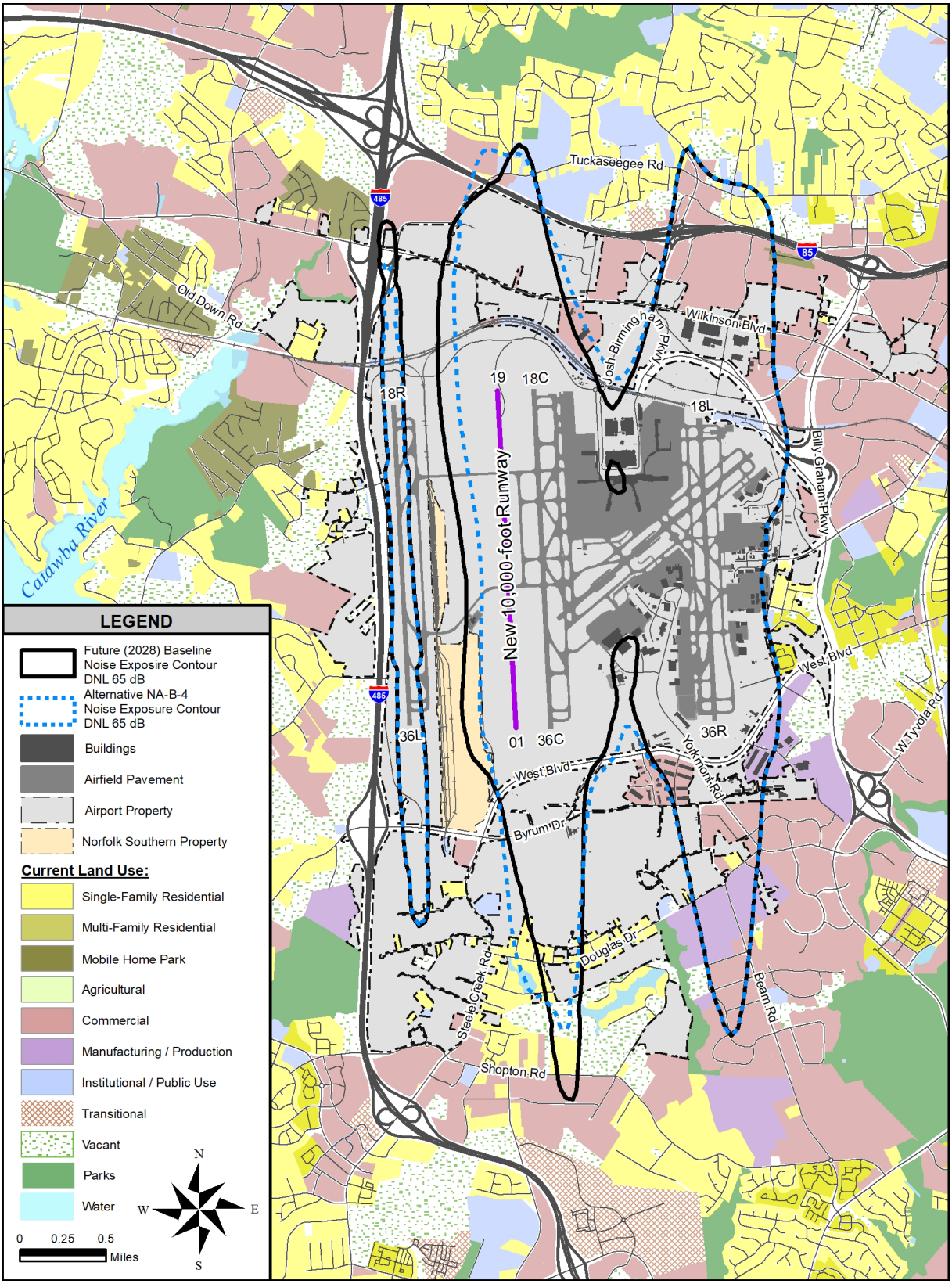
Source: Landrum & Brown, 2024.

Exhibit E-9 Noise Compatibility Program Alternative NA-B-4



Source: Landrum & Brown, 2024

Exhibit E-10 Comparison of Future (2028) Baseline versus NA-B-4 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-B-4-A

TITLE:	Implement a 1,100-foot displaced arrival threshold on Runway 01.

BACKGROUND AND INTENT:	This measure is similar to NA-B-4, as it is aimed to implement a displaced arrival threshold for aircraft to land 1,100 feet north of the Runway 01 end. The intent of the measure is to increase the altitude of arriving aircraft over residential areas south of the Airport including those off Douglas Drive and Steeleberry Drive. The Future (2028) Baseline runway use indicates the new fourth parallel runway, Runway 01/19, would be primarily used for departures. As such, this measure would only be implemented in conjunction with NA-D-1-A, which would revise the runway use for the new fourth parallel runway as a primarily arrival runway. See *Noise Compatibility Program Alternative NA-D-1-A* for more information. In summary, this measure would implement the displaced arrival threshold identified in NA-B-4 with runway use identified in NA-D-1-A. Refer to *Exhibit E-9, Noise Compatibility Program Alternative NA-B-4*.

BENEFITS:	None

DRAWBACKS:	The measure would result in an increase in 9 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would result in an increase in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

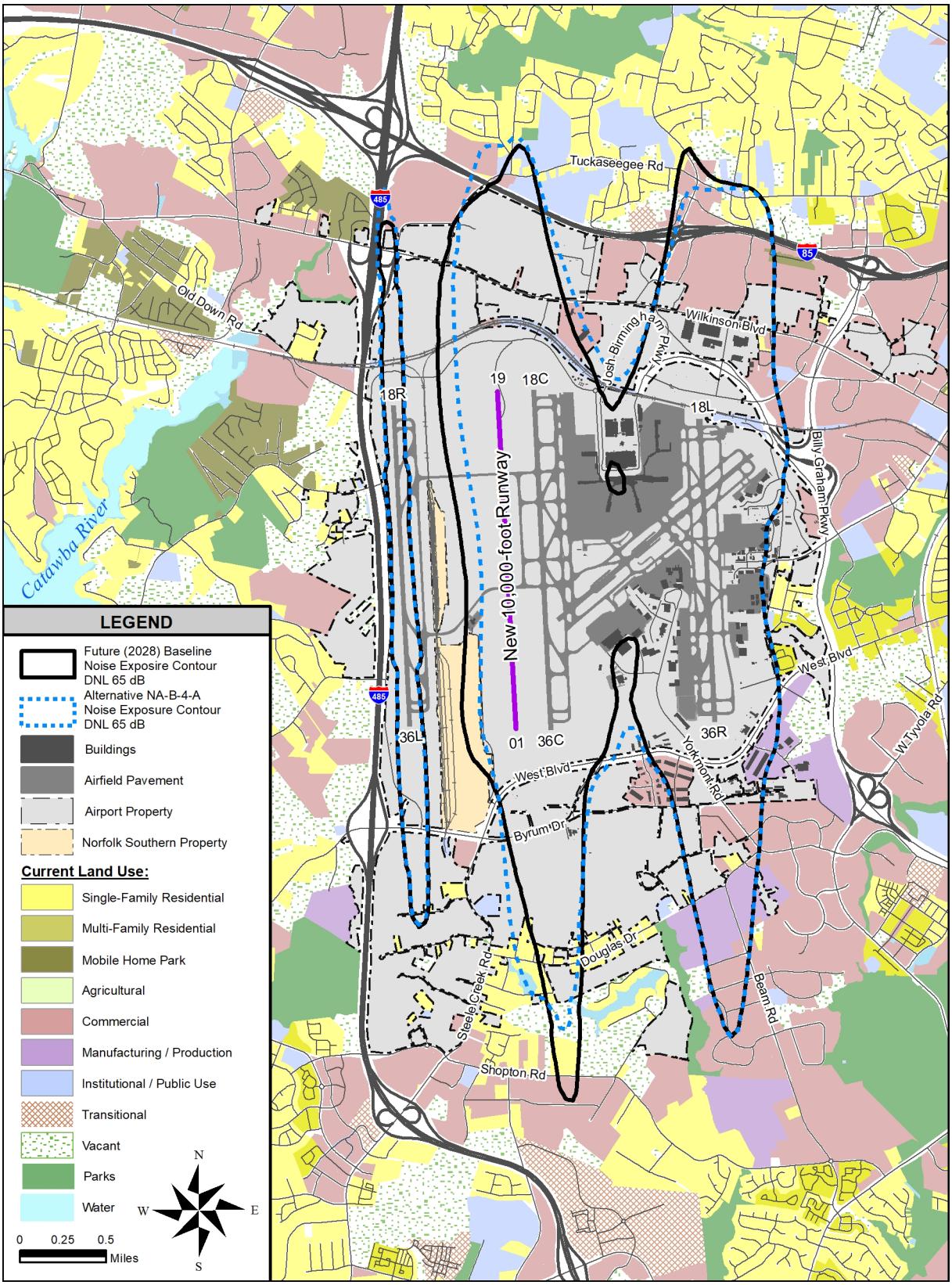
Table E-6 NA-B-4-A Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	95	0	0	95
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**252**	**0**	**0**	**252**
Population				
Total Population[1]	**710**	**0**	**0**	**710**
Noise-Sensitive Facilities				
Schools / Educational Facilities	3	0	0	3
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

Source: Landrum & Brown, 2024.

Exhibit E-11 Comparison of Future (2028) Baseline versus NA-B-4-A Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-C-1

TITLE:	Balanced Mix of North v. South Flow: Increase the amount of time the Airport operates in south flow to achieve a 50/50 balance of north versus south flow
BACKGROUND AND INTENT:	Historically, the Airport has operated approximately 64 percent in north flow (arriving to and departing from Runways 36L/36C/36R) and 36 percent in south flow (arriving to and departing from Runways 18L/18C/18R). The intent of this measure is to evaluate the balancing of the direction of flow by increasing the amount of time the Airport operates in south flow to achieve a 50/50 balance of north flow and south flow. The implementation of this measure would reduce net residential noise impacts to the north by reducing departure operations over residential land uses and to the south by reducing arrival operations over residential land uses.
BENEFITS:	None
DRAWBACKS:	Coordination with the local FAA ATCT was conducted to identify if setting guidelines in attempt to increase the amount of time the Airport operates in south flow would result in potential safety and/or feasibility issues. The local FAA ATCT stated the direction of flow is primarily determined by wind direction and wind speed on the surface and aloft (above the ground). It is also determined by the location of severe weather systems within a hundred miles of the Airport. Additionally, local FAA ACTC stated the amount of time when the direction of flow is not dictated by these factors, but is up to the discretion of the local FAA ATCT operators, is negligible. The point being that even though surface wind reports might suggest the potential for achieving balanced north/south operations, the Airport and the airspace is too dynamic and complex to actually achieve the goal. There are examples of other airports attempting to put artificial goals on runway use and those goals not being achievable for similar reasons. Based on these factors, it was determined implementation of any guidelines to dictate or maintain an annual direction of flow is not likely to result in the intended goal (not feasible) and to try to force it would limit the air traffic controller's ability to choose the safest direction of flow for the operation of the Airport (safety).
COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. Additionally, the cost related to the monitoring and documentation of the Airport's direction of flow would be the responsibility of the Airport. The cost related to the required environmental processing per the NEPA for the implementation of the measure.
EVALUATION METHOD:	Qualitative assessment
FINDINGS AND RECOMMENDATIONS:	Because the measure was found to be neither safe nor feasible, this measure is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-C-2

TITLE:	Limit One Direction Flow to a Maximum # Days: Prevent continuous flow in one direction over more than [two consecutive days] to bring relief to people who have been getting noise/flow from one type of operation continuously for multiple days. After [two consecutive days] of flow in the same direction, flow should be reversed at the first reasonable opportunity and maintained in the reverse direction for a reasonable period.
BACKGROUND AND INTENT:	Similar to NA-C-1, the measure is aimed to balance the direction of flow by increasing the amount of time the Airport operates in south flow to achieve a 50/50 balance of north flow and south flow. This measure would further require setting a cap on the number of days the Airport operates in the same direction of flow. The intent of this measure is to reduce net residential noise impacts to the north by reducing departure operations over residential land uses and to the south by reducing arrival operations over residential land uses.
BENEFITS:	None
DRAWBACKS:	Coordination with the local FAA ATCT was conducted to identify if setting guidelines in attempt to increase the amount of time the Airport operates in south flow would result in potential safety and/or feasibility issues. The local FAA ATCT stated the direction of flow is primarily determined by wind direction and wind speed on the surface and aloft (above the ground). It is also determined by the location of severe weather systems within a hundred miles of the Airport. Additionally, local FAA ACTC stated the amount of time when the direction of flow is not dictated by these factors, but is up to the discretion of the local FAA ATCT operators, is negligible. The point being that even though surface wind reports might suggest the potential for achieving balanced north/south operations, the airport and the airspace is too dynamic and complex to actually achieve the goal. There are examples of other airports attempting to put artificial goals on runway use and those goals not being achievable for similar reasons. Based on these factors, it was determined implementation of any guidelines to dictate the runway flow is not feasible and to try to force it generally or on a day-to-day basis would likely limit the air traffic controller's ability to choose the safest direction of flow for the operation of the Airport.
COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. Additionally, the cost related to the monitoring and documentation of the Airport's direction of flow would be the responsibility of the Airport. The cost related to the required environmental processing per the NEPA for the implementation of the measure.
EVALUATION METHOD:	Qualitative assessment
FINDINGS AND RECOMMENDATIONS:	Because the measure was found to be neither safe nor feasible, this measure is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-D-1

TITLE:	Evaluate the new runway as an arrival runway. Designate Runways 18R/36L and 01/19 as preferred for arrivals and Runway 18C/36C and 18L/36R as preferred for departures by turbojet aircraft between 7:00 a.m. and 10:00 p.m.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates the new fourth parallel runway, Runway 01/19, would be primarily used for departures in the daytime (7:00 a.m. to 10:00 p.m.). This measure would designate Runway 01/19 as preferred for arrivals and Runway 18C/36C and 18L/36R as preferred for departures in the daytime. The intent of this measure is to reduce net residential noise impacts to the north and south of the Airport by shifting arrivals to the west of residential land uses. Refer to ***Exhibit E-12, Noise Compatibility Program Alternative NA-D-1***.

BENEFITS:	None

DRAWBACKS:	The measure would result in an increase in 18 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour. This measure could be implemented in conjunction with NA-B-4 for additional noise abatement benefits.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would result in an increase in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

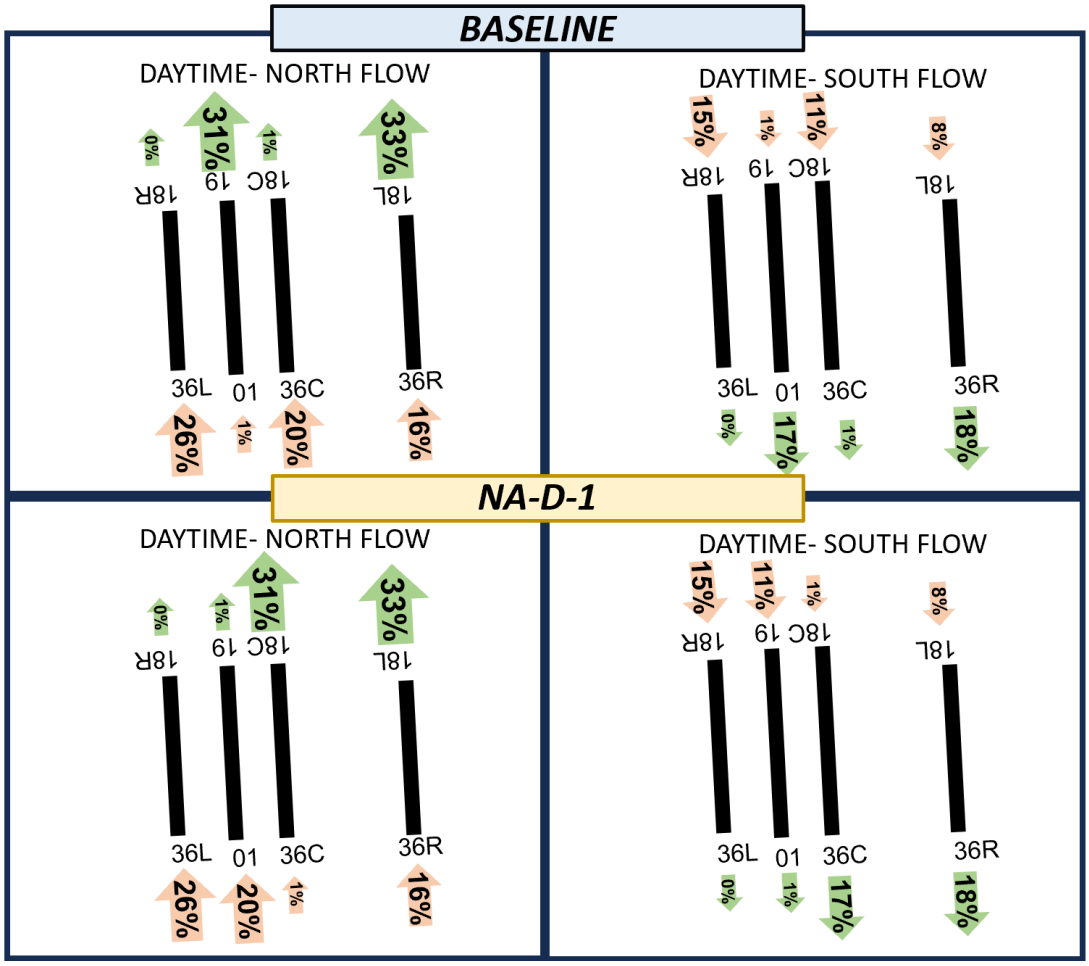
Table E-7 NA-D-1 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	104	0	0	104
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**261**	**0**	**0**	**261**
Population				
Total Population[1]	**734**	**0**	**0**	**734**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

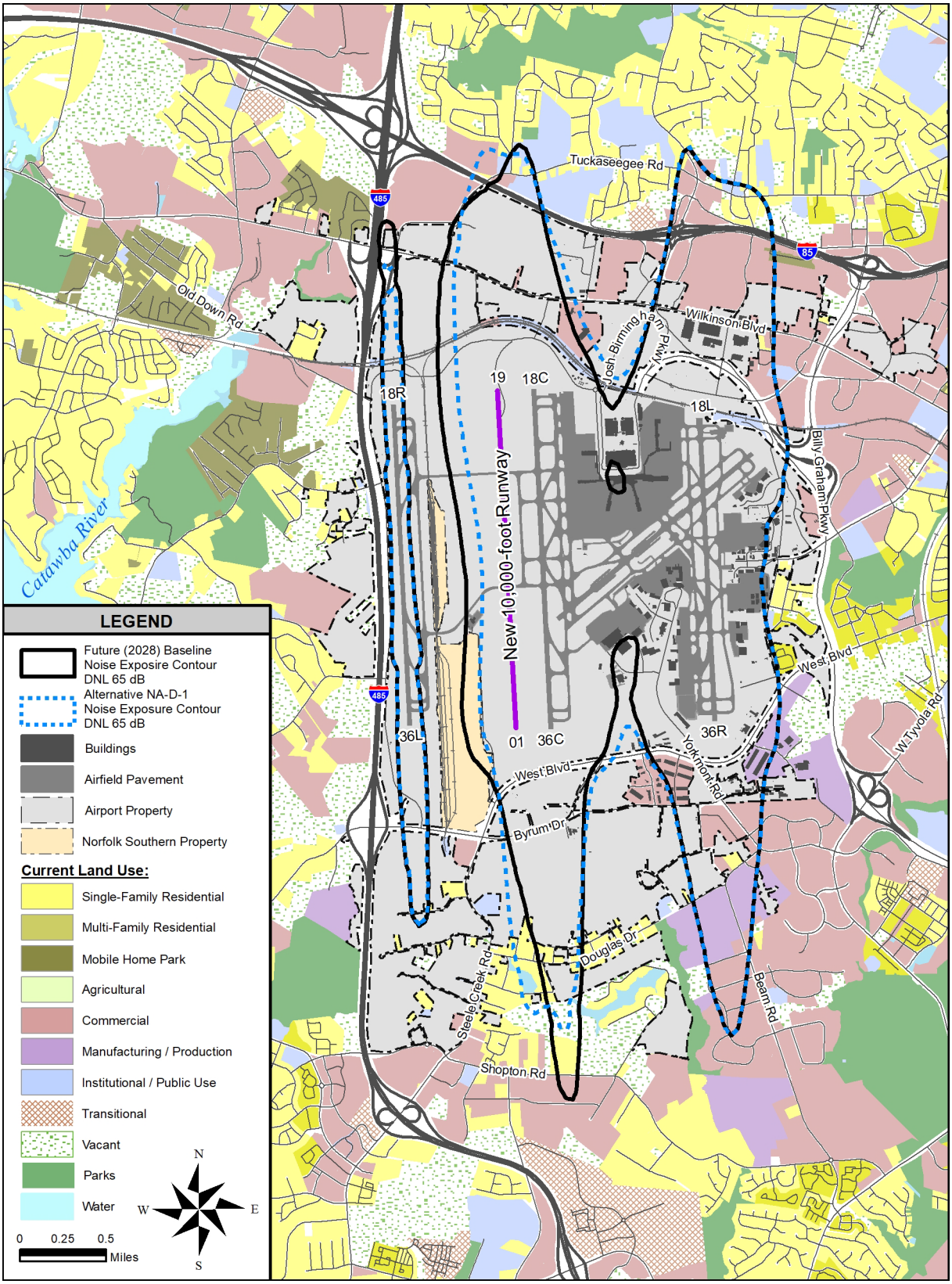
Source: Landrum & Brown, 2024.

Exhibit E-12 Noise Compatibility Program Alternative NA-D-1



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-13 Comparison of Future (2028) Baseline versus NA-D-1 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-D-1-A

TITLE:	Evaluate the new runway as an arrival runway. Designate Runways 18R/36L and 01/19 as preferred for arrivals and Runway 18C/36C and 18L/36R as preferred for departures by turbojet aircraft between 7:00 a.m. and 10:00 p.m.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates the new fourth parallel runway, Runway 01/19, would be primarily used for departures in the daytime (7:00 a.m. to 10:00 p.m.). This measure is similar to NA-D-1 which would designate the new fourth parallel runway, Runway 01/19, as preferred for arrivals and Runway 18C/36C and 18L/36R as preferred for departures in the daytime. The intent of this measure is to reduce net residential noise impacts to the north and south of the Airport by shifting arrivals to the west of residential land uses. Refer to ***Exhibit E-14, Noise Compatibility Program Alternative NA-D-1-A***.

BENEFITS:	None

DRAWBACKS:	The measure would result in an increase in 12 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour. This measure could be implemented in conjunction with NA-B-4-A for additional noise abatement benefits.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would result in an increase in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

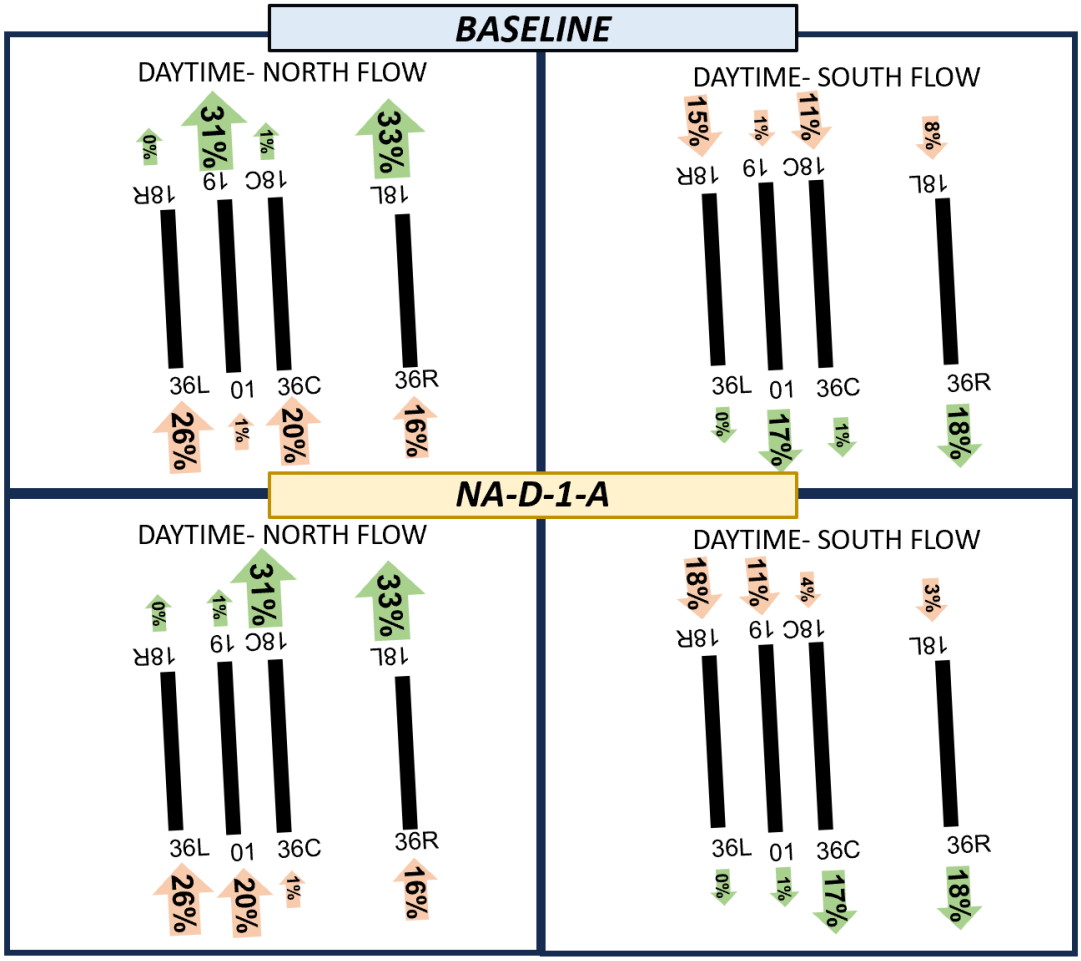
Table E-8 NA-D-1-A Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	98	0	0	98
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**255**	**0**	**0**	**255**
Population				
Total Population[1]	**717**	**0**	**0**	**717**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

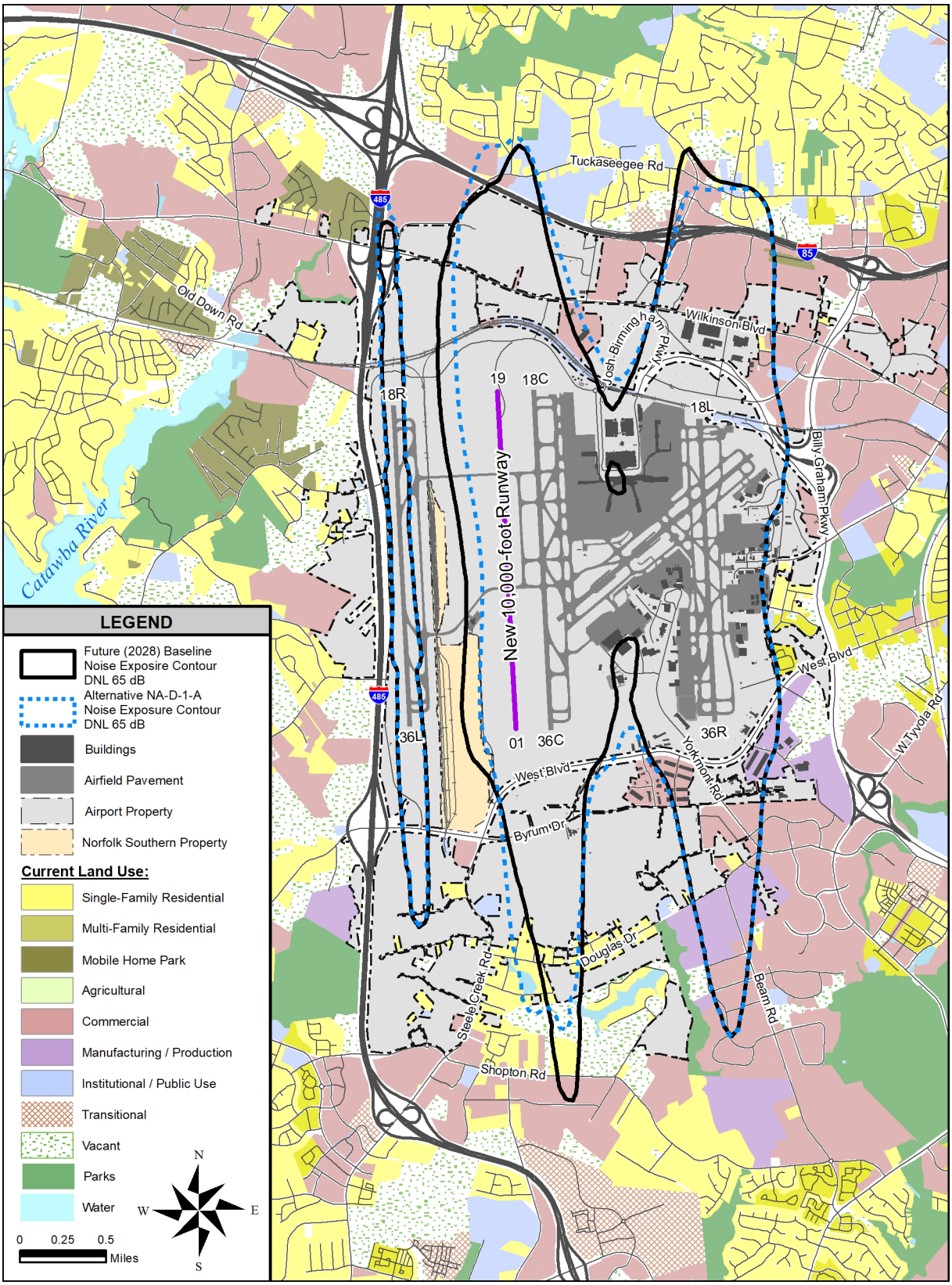
Source: Landrum & Brown, 2024.

Exhibit E-14 Noise Compatibility Program Alternative NA-D-1-A



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-15 Comparison of Future (2028) Baseline versus NA-D-1-A Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-D-2

TITLE:	At low periods, spread operations to avoid concentration of a particular mode of operation (e.g., most/all departures or most/all arrivals) to a single runway, leaving others underutilized for the same mode of operation. For example: Avoid sending all arrivals to Runway 18R while Runways 18L and 18C are held open for occasional departures.

BACKGROUND AND INTENT:	The intent of the measure is to spread operations during low periods of operations by avoiding concentration of a particular mode of operation on a runway to reduce net residential noise impacts.

BENEFITS:	None

DRAWBACKS:	During low periods of operation, the Airport currently spreads operations to avoid concentration of a particular mode of operation to a single runway, which is the stated goal of this measure. As such, the measure is already part of the Future (2028) Baseline as it is anticipated that the Airport would continue to operate this way in the future after construction of the new fourth parallel runway. Therefore, implementation of this measure would not result in a reduction of noise impacts within the DNL 65+ dB when compared to the Future (2028) Baseline.

COST TO IMPLEMENT:	None

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	Because the measure is already part of the Future (2028) Baseline, implementation would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-D-3

TITLE:	Ensure that the new fourth parallel runway (Runway 01/19), Runway 18R/36L (for arrivals), and Runway 18C/36C (for departures) will never have more, in the aggregate, than [50%] of arrivals/departures over any single daily period.

BACKGROUND AND INTENT:	The intent of this measure is to spread operations on an average annual day to reduce net residential noise impacts.

BENEFITS:	None

DRAWBACKS:	The suggestion of caps on runways inherently creates barriers to implementation from a feasibility perspective because the Airport is a dynamic environment that may require the use of runways that would exceed the limits of this measure. To force caps and percentages into a complex system like the one at CLT would reduce operational capability and potentially reduce safety. As such, the measure is not feasible for implementation.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	Because the measure was found to not be feasible for implementation, this measure is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-D-4

TITLE:	Set guidelines that require a minimum allocation of departures for Runway 18R/36L for a given timeframe (e.g., over the course of a quarter or year), with the goal of achieving at least ten percent of daily departures on that runway.
BACKGROUND AND INTENT:	Runway 18R/36L was planned (location) and designed (length) to primarily be used as an arrival runway. While the runway has the capability to be used for departures, it is currently used for departures only under extenuating circumstances due to its location in relationship to the terminal area. The Future (2028) Baseline runway use indicates Runway 18R/36L would continue to be primarily used for arrivals. This measure would designate Runway 18R/36L as a departure runway for up to ten percent of departures on an average annual day. Refer to ***Exhibit E-16, Noise Compatibility Program Alternative NA-D-4***. The intent of this measure is to reduce net residential noise impacts to the north of the Airport by reducing departures north of Runway 18L/36R and the new fourth parallel runway, Runway 01/19, and increasing them over noise compatible land uses and major transportation corridors.
BENEFITS:	The measure would result in a decrease of 10 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.
DRAWBACKS:	Implementation of this measure would require aircraft to routinely taxi across two active runways (Runway 18C/36C and Runway 01/19), which reduces the operational efficiency of those active runways due to the need for ATC to space operations to maintain adequate separation between aircraft taxiing across the runway(s) and aircraft on final approach. This would increase ATC workload and result in increased delays to ensure no runway incursions occur. Therefore, this measure is not considered feasible due to operational and safety concerns.
COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.
EVALUATION METHOD:	Quantitative assessment – AEDT modeling
FINDINGS AND RECOMMENDATIONS:	Implementation of this measure would result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. However, the measure is not feasible due to operational and safety concerns. As such, this measure is **NOT RECOMMENDED** for further evaluation.

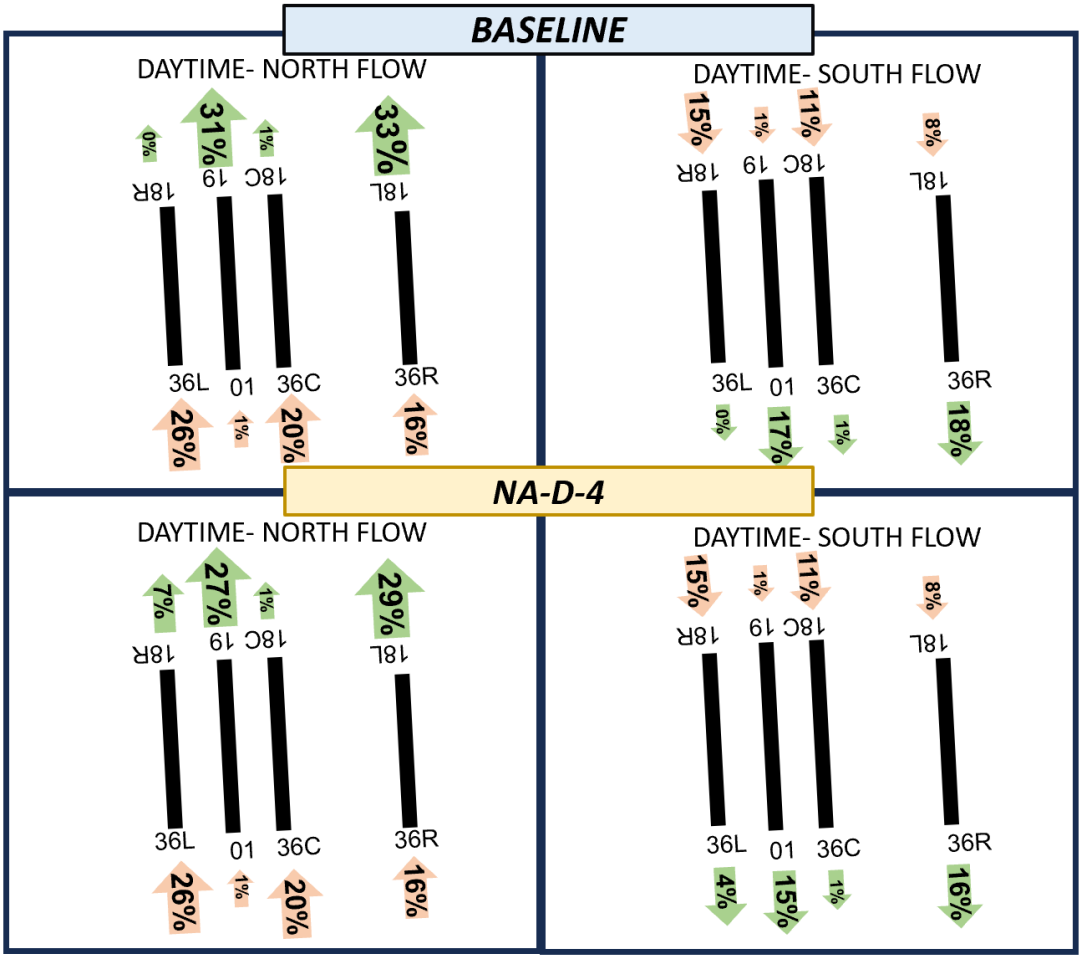
Table E-9 NA-D-4 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	76	0	0	76
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**233**	**0**	**0**	**233**
Population				
Total Population[1]	**659**	**0**	**0**	**659**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

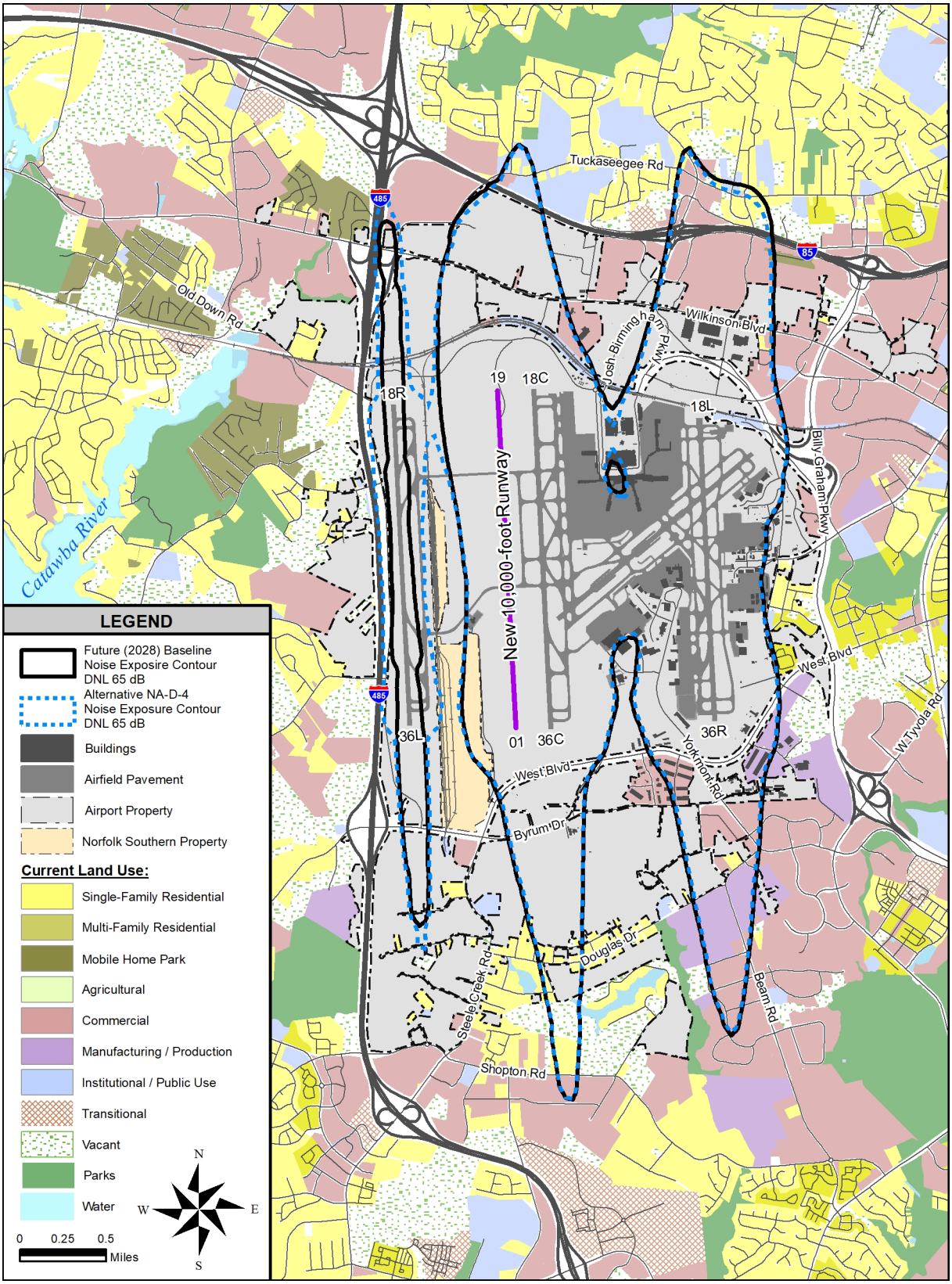
Source: Landrum & Brown, 2024.

Exhibit E-16 Noise Compatibility Program Alternative NA-D-4



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-17 Comparison of Future (2028) Baseline versus NA-D-4 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-D-5

TITLE:	Between 7am-10pm, do not use the new fourth parallel runway (Runway 01/19) and Runway 18R/36L to receive arrivals in "dual stream" mode during non-peak periods.

BACKGROUND AND INTENT:	The intent of this measure is to prevent dual stream arrivals during non-peak periods to reduce net residential noise impacts to the north and south of the Airport.

BENEFITS:	None

DRAWBACKS:	Dual stream arrival operations take place at CLT during daytime arrival peaks when there is a high demand for arrivals. After the construction of the new fourth parallel runway, dual stream arrivals would only continue at the Airport during arrival peaks, as captured in the Future (2028) Baseline. Because the measure is already part of the Future (2028) Baseline, implementation would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour.

COST TO IMPLEMENT:	None

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The measure would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-D-6

TITLE:	Alternate use of runways so that no two adjacent runways will be used primarily for the same mode of operation (arrival or departure) over a daily period.

BACKGROUND AND INTENT:	The intent of this measure is to reduce net residential noise impacts by dispersing departure and arrival operations as much as possible.

BENEFITS:	None

DRAWBACKS:	Currently, no two adjacent runways are used primarily for the same mode of operation (west runway for arrivals, center runway for departures, and east runway for mixed operations). The new fourth parallel runway was evaluated in the Major Capacity Enhancement Projects Environmental Assessment (EA) and was approved as a primarily departure runway. As approved in the EA, the Airport would continue to have alternative modes of operation (west runway for arrivals, new fourth parallel runway for departures, center runway for arrivals, and east runway for mixed operations). As such, the runway use proposed in this measure was captured in the Future (2028) Baseline. Therefore, implementation of this measure would not result in a reduction of noise impacts within the DNL 65+ dB when compared to the Future (2028) Baseline

COST TO IMPLEMENT:	None

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The measure would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-D-7

TITLE:	Utilize Runway 01/19 and Runway 18C/36C primarily for departures and Runway 18R/36L and Runway 18L/36R primarily for arrivals.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates the new fourth parallel runway, Runway 01/19, would be primarily used for departures in the daytime (7:00 a.m. to 10:00 p.m.). This measure would designate the new fourth parallel runway, Runway 01/19, and Runway 18C/36C primarily for departures and Runway 18R/36L and Runway 18L/36R primarily for arrivals in the daytime. Refer to ***Exhibit E-18, Noise Compatibility Program Alternative NA-D-7***. The intent of this measure is to reduce net residential noise impacts to the north and south of the Airport by shifting arrivals to the west of residential land uses.

BENEFITS:	The measure would result in a decrease in 186 housing units and one school/daycare within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	The measure would result in an increase in 1 place of worship within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour. Implementation of the measure would result in an increase in delay at the Airport when compared to the Future (2028) Baseline scenario. Arrival delays would increase during periods of high arrival demand due to the loss of a runway used for arrivals when compared to the Future (2028) Baseline.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Implementation of this measure would result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. However, the measure is not considered feasible due to operational concerns. As such, this measure is **NOT RECOMMENDED** for further evaluation.

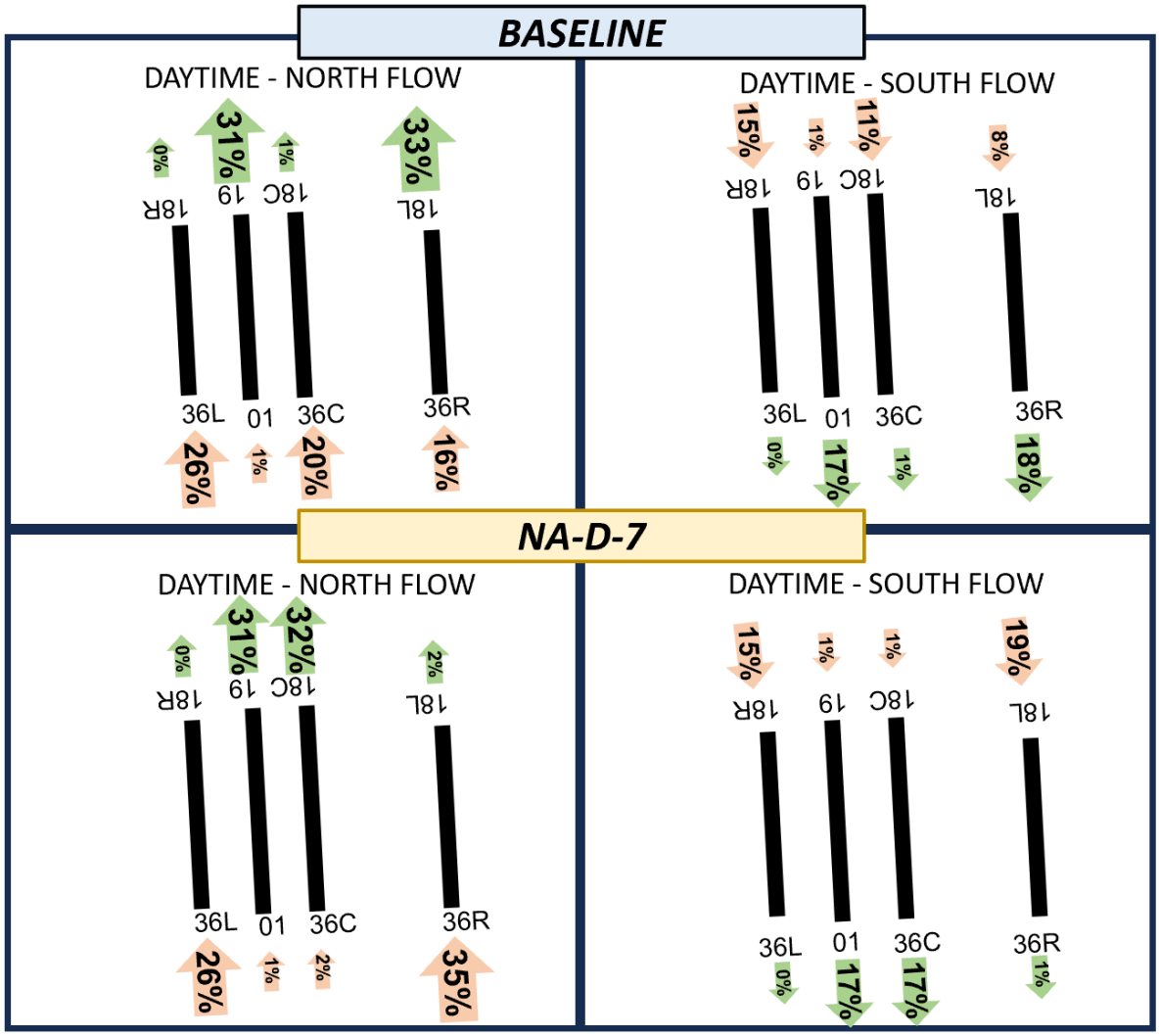
Table E-10 NA-D-7 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	57	0	0	57
Multi-Family Residential	0	0	0	0
Manufactured Home	0	0	0	0
Total Housing Units	**57**	**0**	**0**	**57**
Population				
Total Population[1]	**160**	**0**	**0**	**160**
Noise-Sensitive Facilities				
Schools / Educational Facilities	3	0	0	3
Churches / Places of Worship	5	0	0	5
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

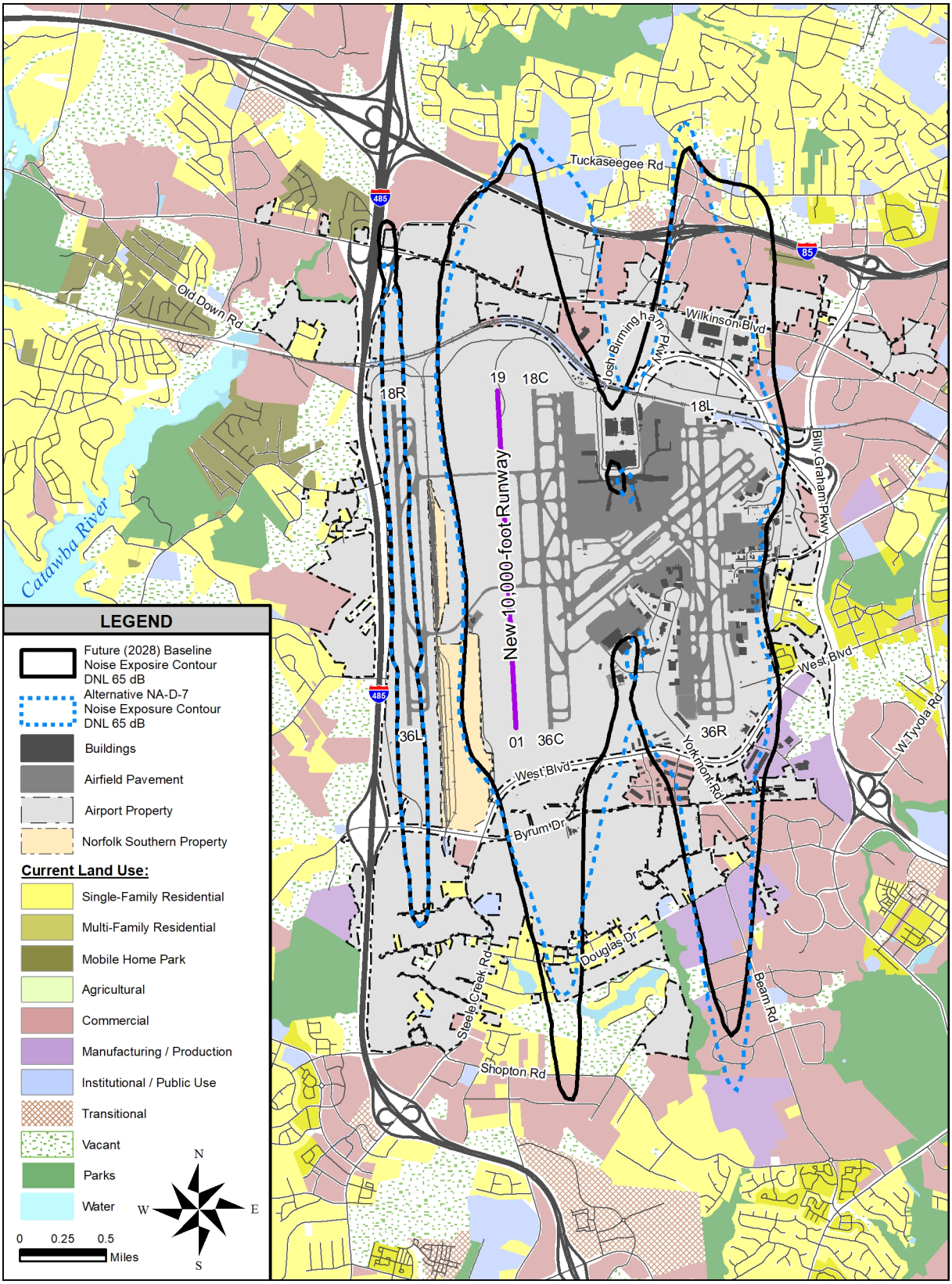
Source: Landrum & Brown, 2024.

Exhibit E-18 Noise Compatibility Program Alternative NA-D-7



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-19 Comparison of Future (2028) Baseline versus NA-D-7 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-D-8

TITLE:	Utilize Runway 01/19 and Runway 18C/36C for both arrivals and departures.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates the new fourth parallel runway, Runway 01/19, would be primarily used for departures and Runway 18C/36C primarily for arrivals in the daytime (7:00 a.m. to 10:00 p.m.). This measure would designate Runway 01/19 and Runway 18C/36C for both arrival and departures in the daytime. Refer to ***Exhibit E-20, Noise Compatibility Program Alternative NA-D-8***. The intent of this measure is to reduce net residential noise impacts to the south of the Airport by shifting arrivals to the east over noise compatible land uses and to the north of the Airport by shifting departures to the west of residential land uses.

BENEFITS:	None

DRAWBACKS:	The measure would result in an increase in 15 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would result in an increase in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

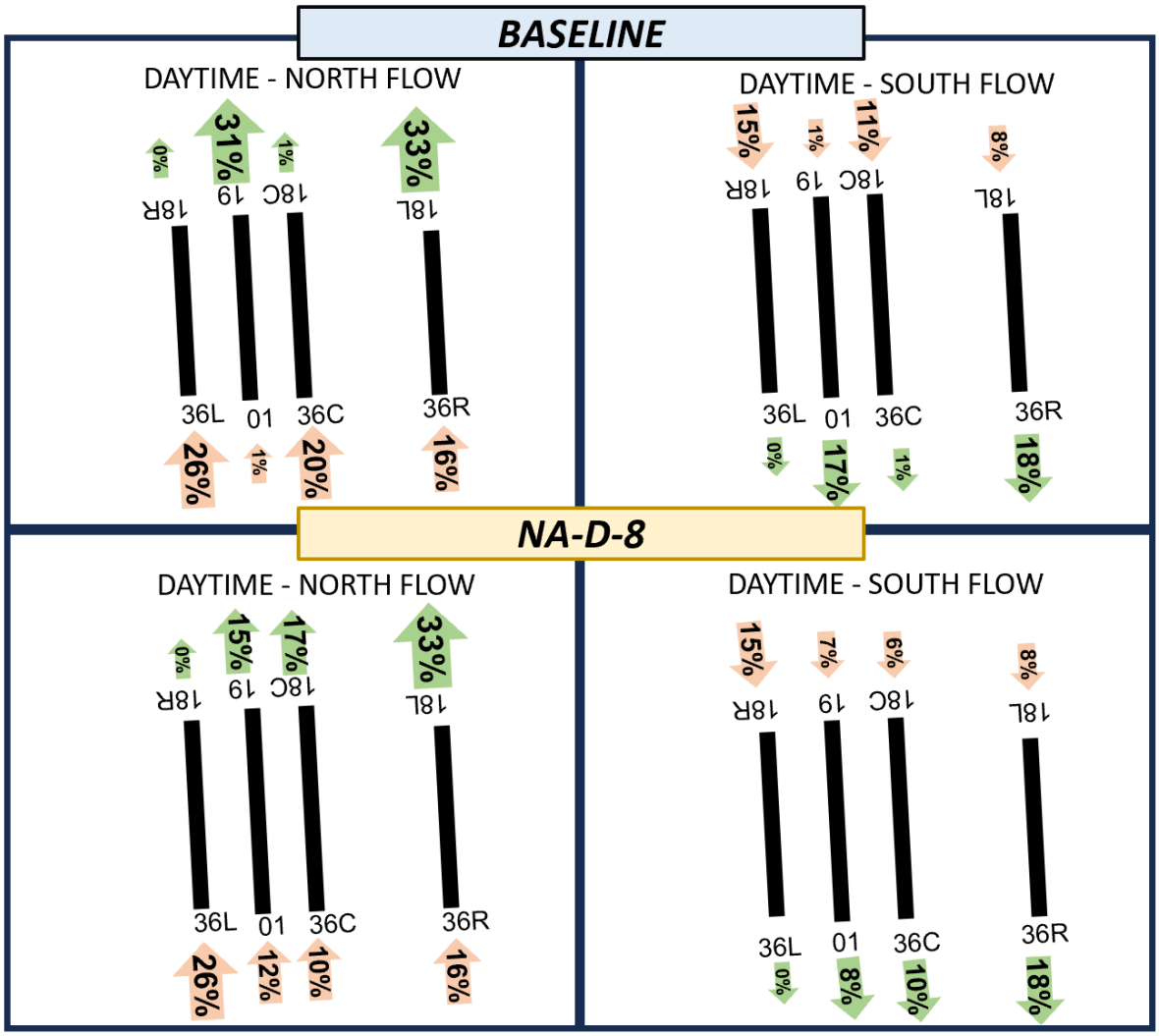
Table E-11 NA-D-8 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	101	0	0	101
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**258**	**0**	**0**	**258**
Population				
Total Population[1]	**726**	**0**	**0**	**726**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

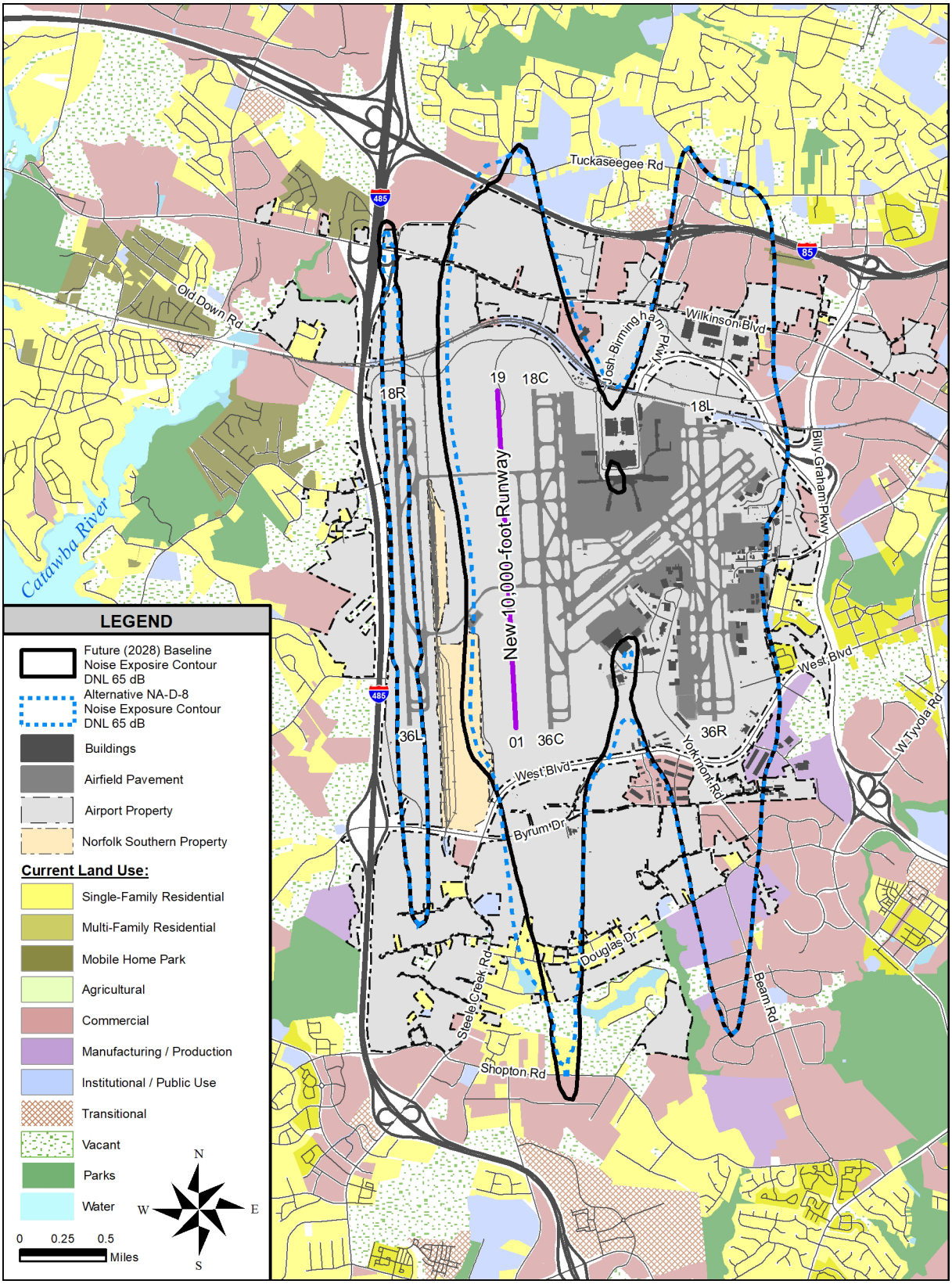
Source: Landrum & Brown, 2024.

Exhibit E-20 Noise Compatibility Program Alternative NA-D-8



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-21 Comparison of Future (2028) Baseline versus NA-D-8 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-E-1

TITLE:	Designate Runway 36L and 36R as preferred for north flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates Runway 36C and Runway 36R would be primarily used for north flow arrivals in the nighttime (10:00 p.m. to 7:00 a.m.).[1] This measure would designate Runway 36R and Runway 36L primarily for nighttime north flow arrivals. Refer to **Exhibit E-22, *Noise Compatibility Program Alternative NA-E-1***. The intent of the measure is to shift the nighttime overflights over residential land uses off Douglas Drive and Shopton Road to noise-compatible land uses over Airport property west of Steele Creek Road and to the east off Beam Road.

BENEFITS:	The measure would result in a decrease in 13 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	None

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

[1] The runway use patterns for the Future (2028) Baseline are based on data from the Capacity EA that was developed in consultation with FAA ATC personnel and review of airfield simulation modeling.

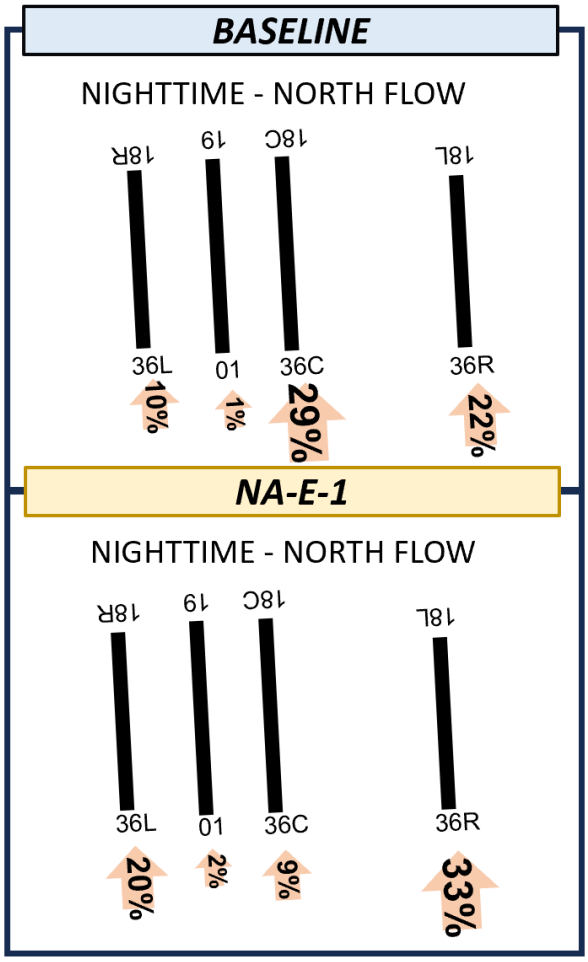
Table E-12 NA-E-1 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	73	0	0	73
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**230**	**0**	**0**	**230**
Population				
Total Population[1]	**655**	**0**	**0**	**655**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

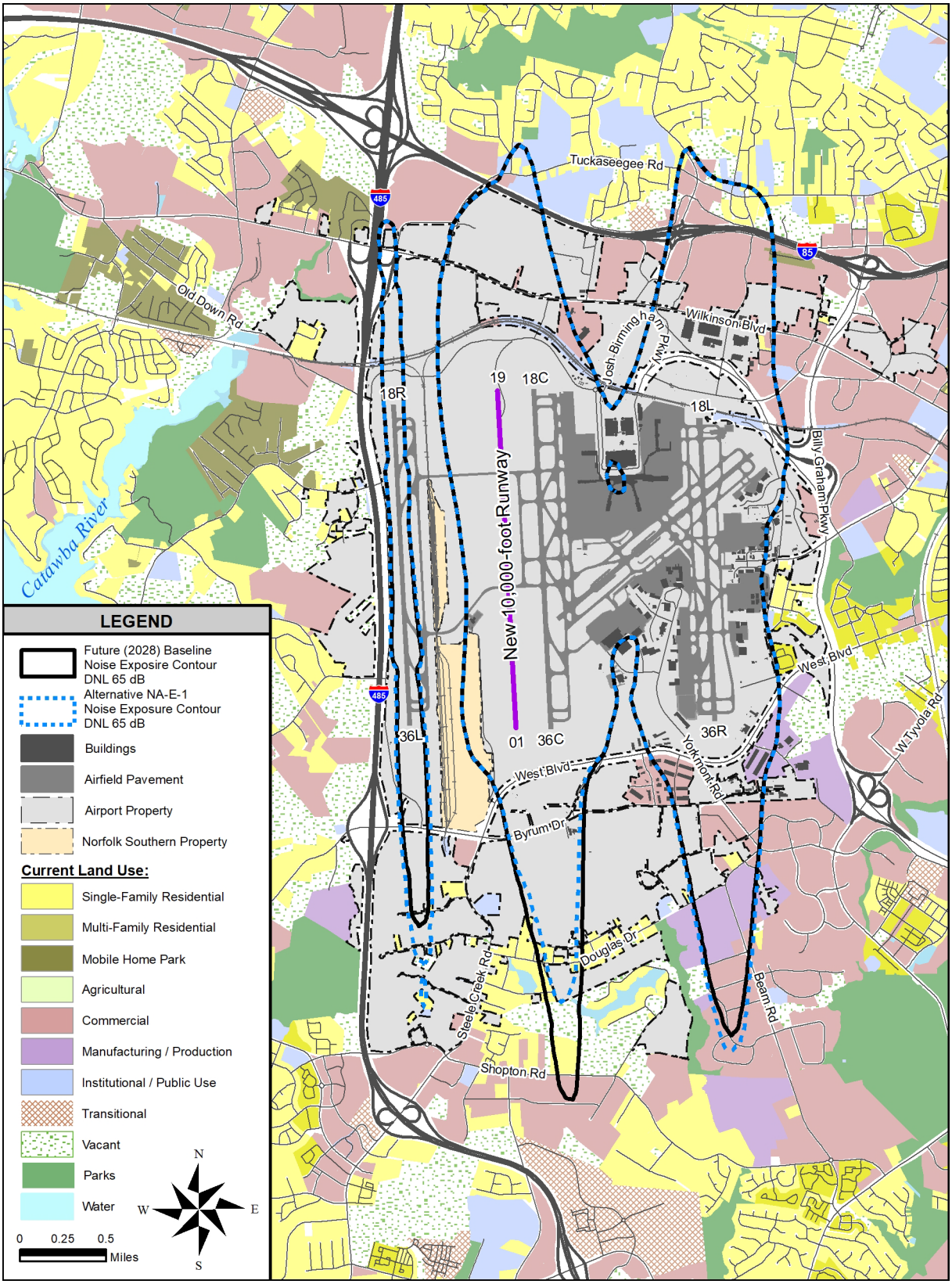
Source: Landrum & Brown, 2024.

Exhibit E-22 Noise Compatibility Program Alternative NA-E-1



Note: Orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-23 Comparison of Future (2028) Baseline versus NA-E-1 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-E-2

TITLE:	Designate Runways 18L, 18C, and 18R for south flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates Runway 18C and Runway 18L would be primarily used for south flow arrivals in the nighttime (10:00 p.m. to 7:00 a.m.).[2] This measure would designate Runway 18R, Runway 18C, and Runway 18L for south flow arrivals in the nighttime. Refer to **Exhibit E-24, *Noise Compatibility Program Alternative NA-E-2***. The intent of this measure is to spread out south flow arrivals in the nighttime to reduce the nighttime traffic over residential land uses off Tuckaseegee Road, Westwood Drive, and Little Rock Road. In turn, this would increase nighttime arrival overflights over Interstate 485 and Airport property.

BENEFITS:	The measure would result in a decrease in 6 housing units and 1 school/daycare within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	None

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

[2] The runway use patterns for the Future (2028) Baseline are based on data from the Capacity EA that was developed in consultation with FAA ATC personnel and review of airfield simulation modeling.

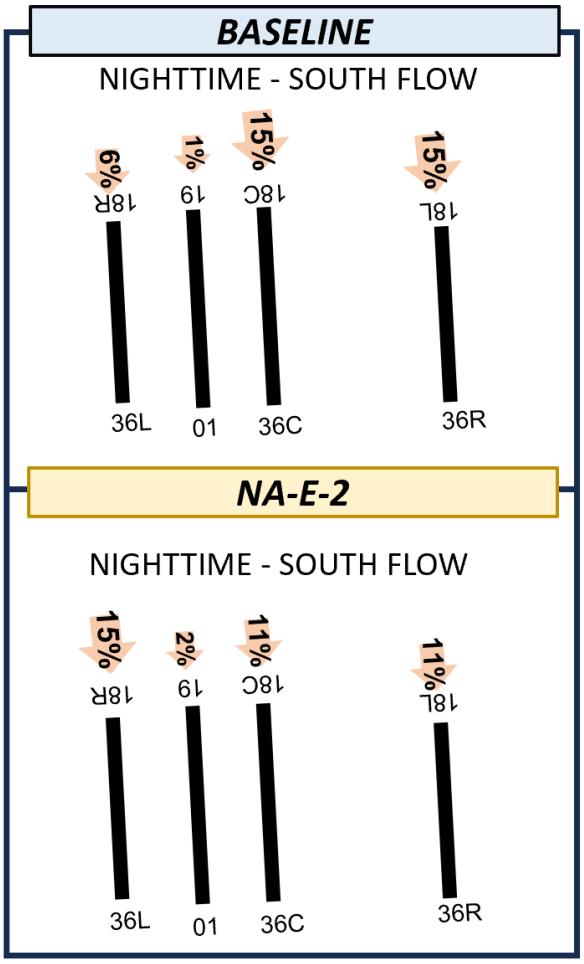
Table E-13 NA-E-2 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	80	0	0	80
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**237**	**0**	**0**	**237**
Population				
Total Population[1]	**670**	**0**	**0**	**670**
Noise-Sensitive Facilities				
Schools / Educational Facilities	3	0	0	3
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

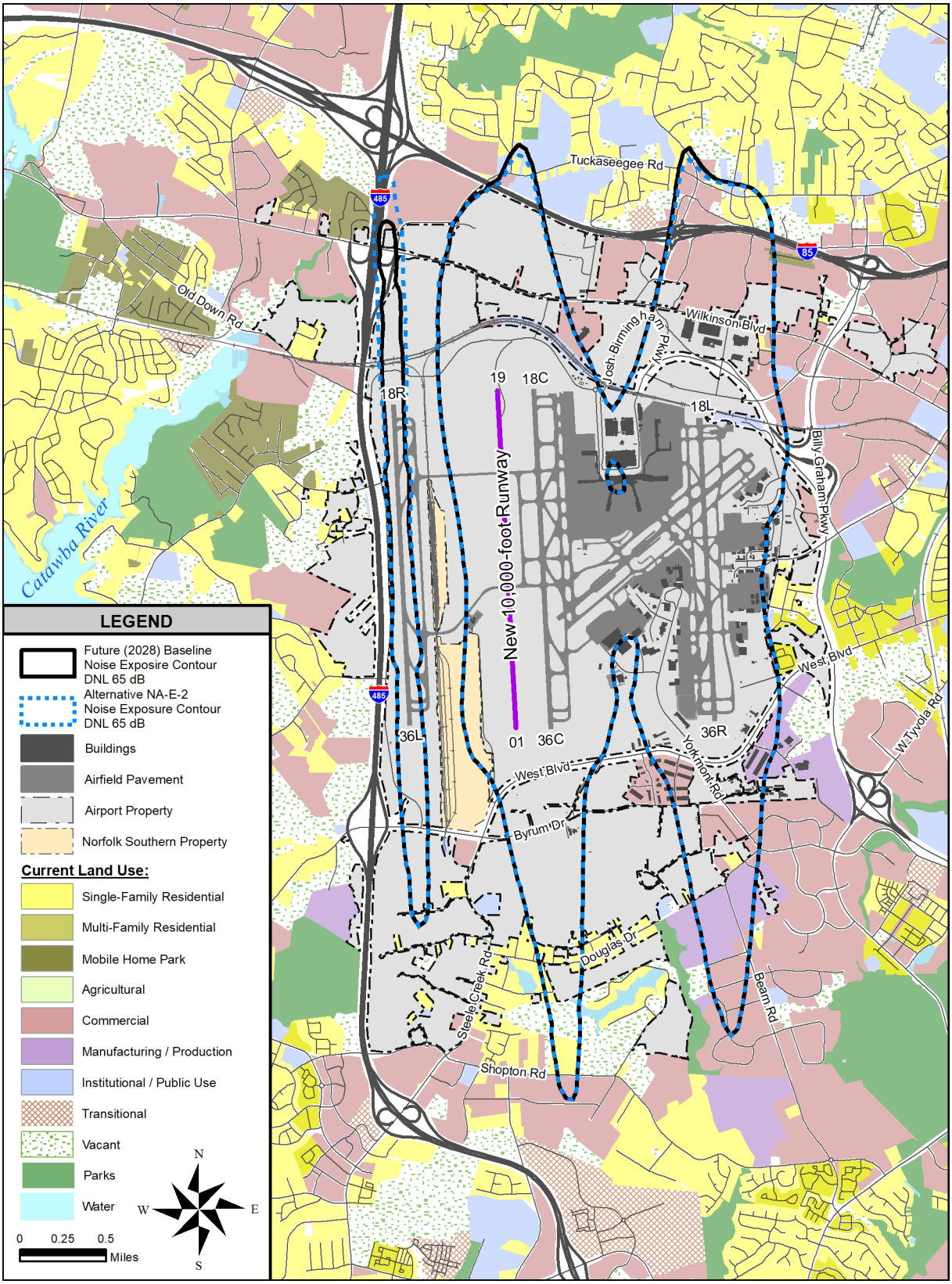
Source: Landrum & Brown, 2024.

Exhibit E-24 Noise Compatibility Program Alternative NA-E-2



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-25 Comparison of Future (2028) Baseline versus NA-E-2 Noise Exposure Contour



Source: Landrum & Brown, 2024

Noise Compatibility Program Alternative NA-E-3

TITLE:	Focus nighttime north-flow arrivals on the runway that typically receives fewer arrivals during the full 24-hour period (Runway 36R). Due to their close proximity, consider Runways 1/19 and 18C/36C as one runway by aggregating their volumes when determining which runway receives fewest arrivals.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates Runway 36C and Runway 36R would be primarily used for nighttime (10:00 p.m. to 7:00 a.m.) north flow arrivals. This measure would designate Runway 36R as the primary runway for nighttime north flow arrivals. Refer to **Exhibit E-26, *Noise Compatibility Program Alternative NA-E-3***. The intent of this measure is to shift nighttime arrival traffic east of residential land uses south of Runway 36C and 36L towards noise-compatible land use off Beam Road.

BENEFITS:	The measure would result in a decrease in 14 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	None

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

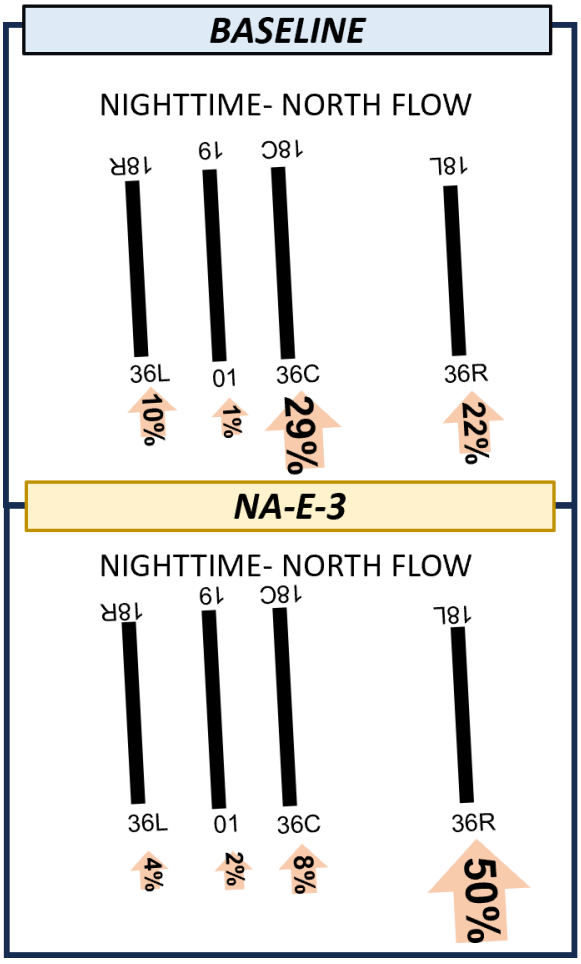
Table E-14 NA-E-3 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	72	0	0	72
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**229**	**0**	**0**	**229**
Population				
Total Population[1]	**652**	**0**	**0**	**652**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

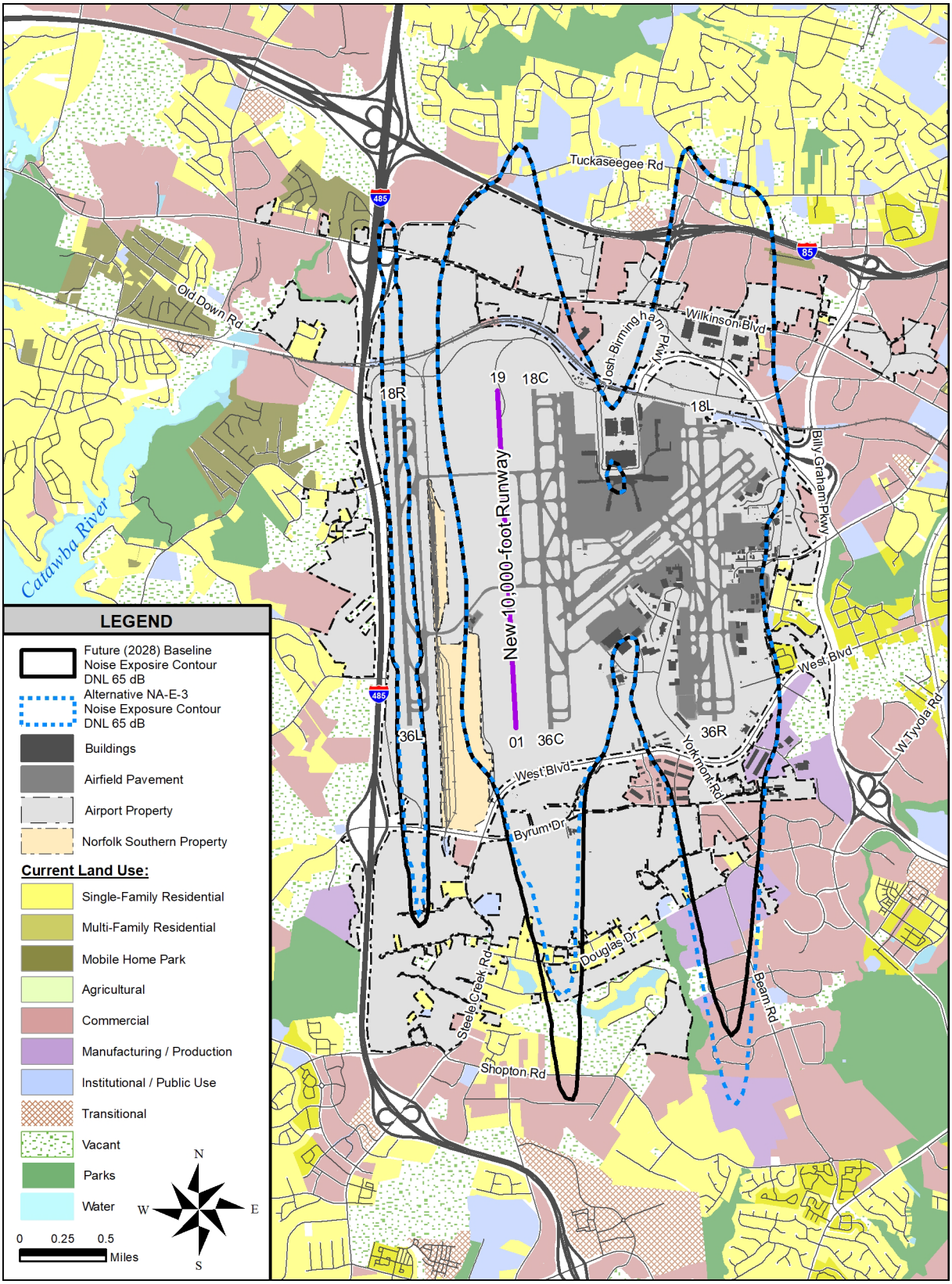
Source: Landrum & Brown, 2024.

Exhibit E-26 Noise Compatibility Program Alternative NA-E-3



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-27 Comparison of Future (2028) Baseline versus NA-E-3 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-E-4

TITLE:	Focus nighttime south-flow arrivals on the runway that typically receives fewer arrivals during the full 24-hour period (Runway 18L). Due to their close proximity, consider Runways 01/19 and 18C/36C as one runway by aggregating their volumes when determining which runway receives fewest arrivals.

BACKGROUND AND INTENT:	The Future (2028) Baseline runway use indicates Runway 18C and Runway 18L would be primarily used for nighttime (10:00 p.m. to 7:00 a.m.) south flow arrivals. This measure would designate Runway 18L as the primary runway for nighttime north flow arrivals. The intent of this measure is to shift nighttime arrival traffic east of residential land uses north of Runway 18C.

BENEFITS:	None

DRAWBACKS:	The measure would result in an increase in 28 housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would result in an increase in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

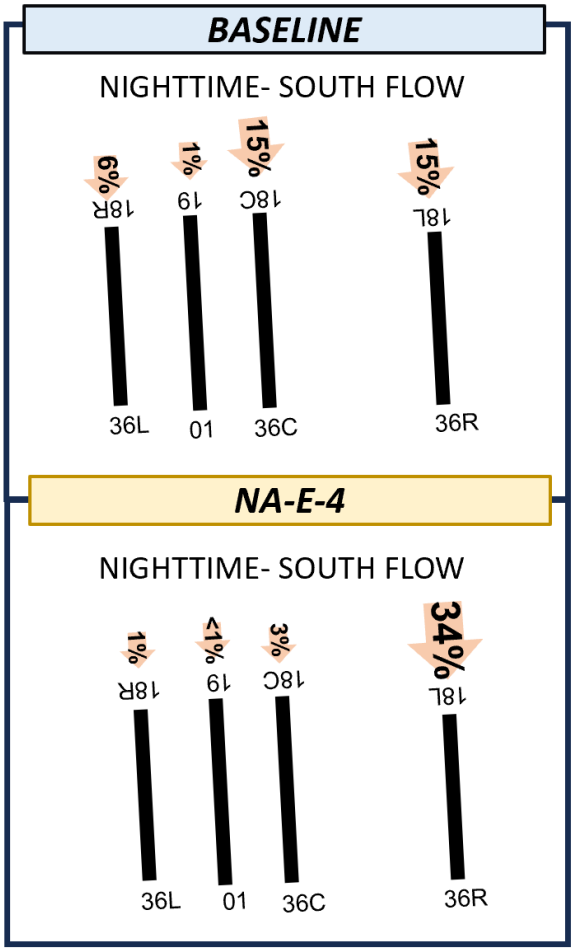
Table E-15 NA-E-4 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	114	0	0	114
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**271**	**0**	**0**	**271**
Population				
Total Population[1]	**766**	**0**	**0**	**766**
Noise-Sensitive Facilities				
Schools / Educational Facilities	2	0	0	2
Churches / Places of Worship	2	0	0	2
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

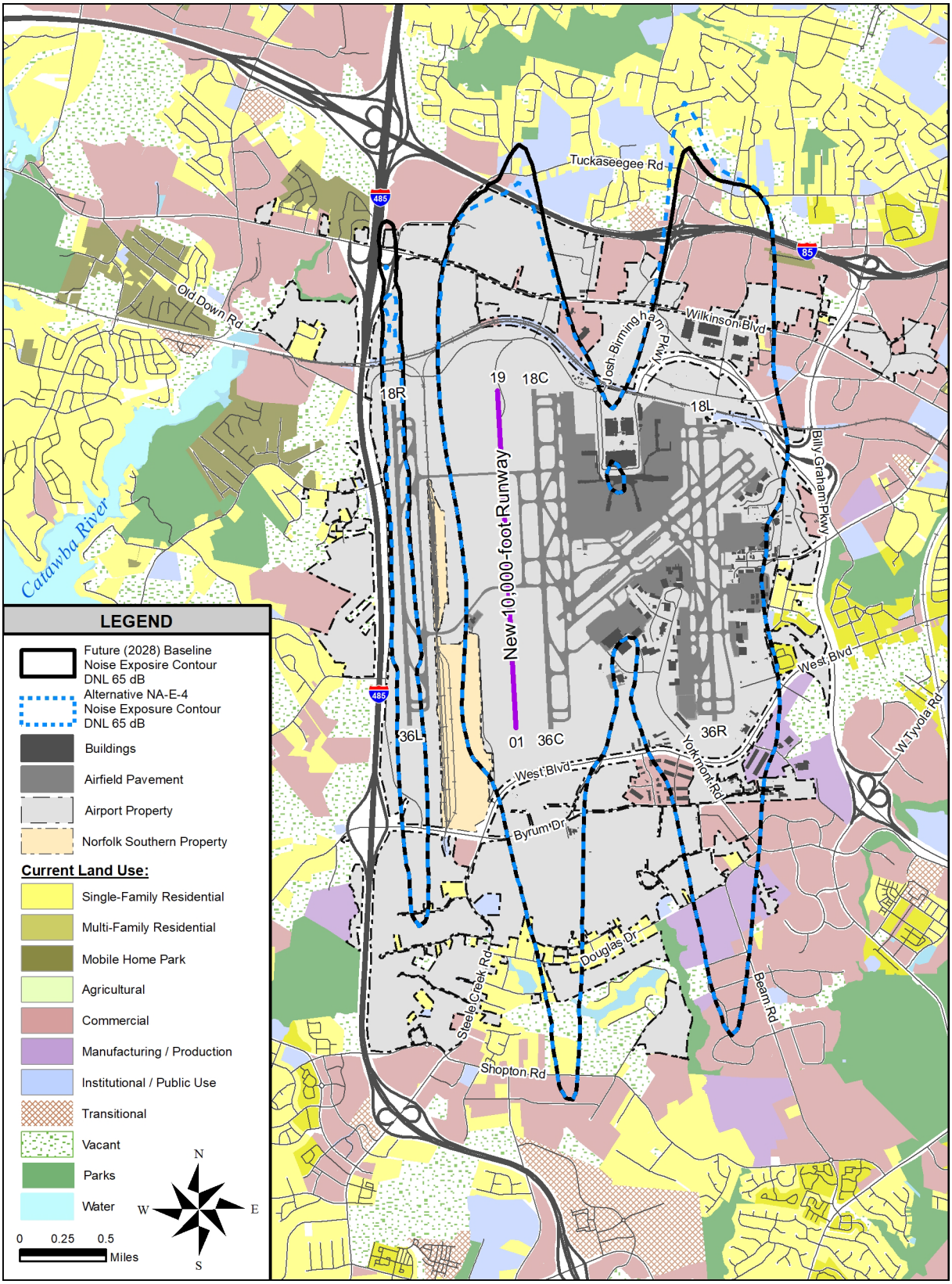
Source: Landrum & Brown, 2024.

Exhibit E-28 Noise Compatibility Program Alternative NA-E-4



Note: Green arrows denote departure operations and orange arrows denote arrival operations.
Source: Landrum & Brown, 2024

Exhibit E-29 Comparison of Future (2028) Baseline versus NA-E-4 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-F-1

TITLE:	Increase the number of departure headings for north flow operations while maintaining existing approved headings and maximizing departure corridors.

BACKGROUND AND INTENT:	The intent of this measure is to reduce net residential noise impacts north of the Airport by providing additional flight corridors over noise compatible land uses. This measure would keep existing headings as follows: • Runway 36R: 25° • Runway 36L: 315° This measure would add divergent headings as follows: • Runway 36R: 85° heading to follow the Wilkinson Boulevard corridor and 55° & 70° heading to follow the Interstate 85 corridor • Runway 36C and Runway 01: Implement the existing Runway 36C's approved 330° heading, 345° heading to follow the I-85/485 Interchange and follow the I-485 corridor, 305° heading to follow the Wilkinson Boulevard corridor Refer to **Exhibit E-30, *Existing Initial Headings at CLT*** for the existing departure headings and **Exhibit E-31, *Noise Compatibility Program Alternative NA-F-1***. Divergent headings for Runway 36R departures would reduce noise impacts on homes off Tuckaseegee Road and direct more flights over transportation corridors and commercial and industrial land uses. The divergent heading for Runway 01 and Runway 36C departures would direct more flights over Airport property, transportation corridors and commercial and industrial land uses. This measure assumes the runway use for the Future (2028) Baseline which designates Runway 01 and Runway 36R for daytime departure operations and Runway 36C and Runway 36R for nighttime departure operations. Additionally, Runway 36C would be used for departures in the daytime if Runway 01 could not be used for reasons of operational necessity. As such, headings proposed for Runway 01 are also proposed for Runway 36C. Refer to Appendix E for more information.

BENEFITS:	The measure would result in a decrease in five housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	NA-F-2 is an option to this measure.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

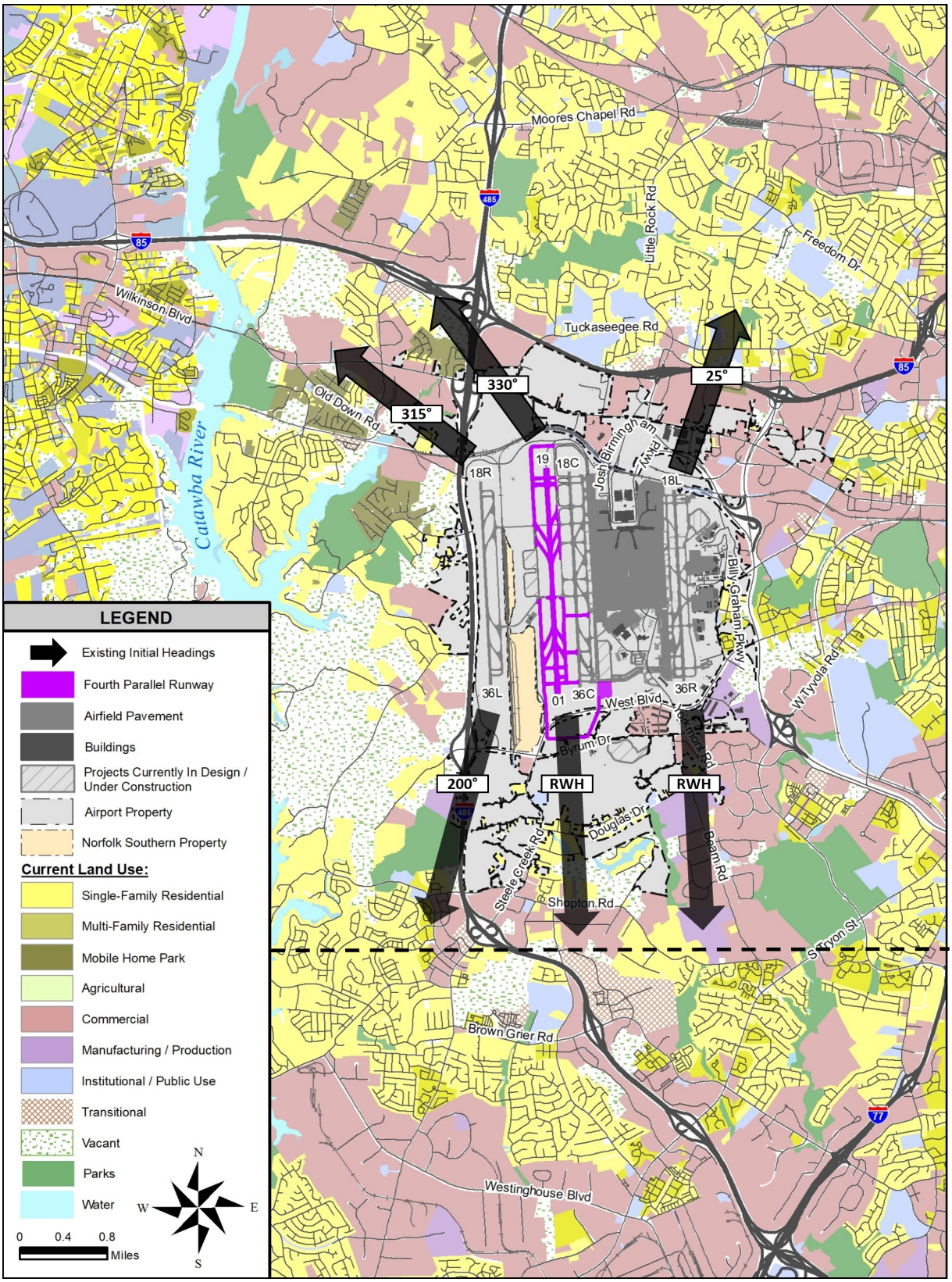
Table E-16 NA-F-1 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	81	0	0	81
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**238**	**0**	**0**	**238**
Population				
Total Population[1]	**673**	**0**	**0**	**673**
Noise-Sensitive Facilities				
Schools / Educational Facilities	3	0	0	3
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

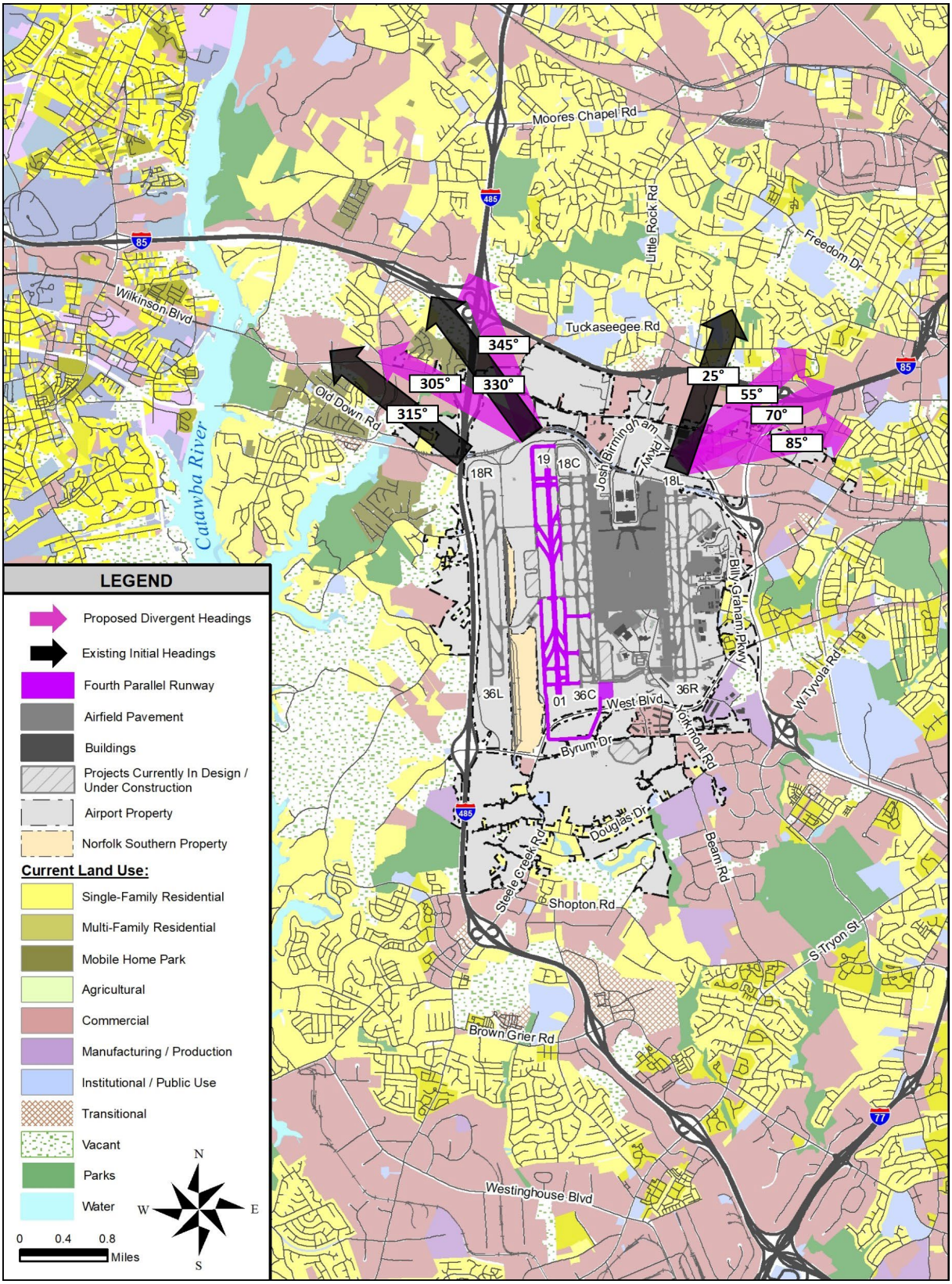
Source: Landrum & Brown, 2024.

Exhibit E-30 Existing Initial Headings at CLT



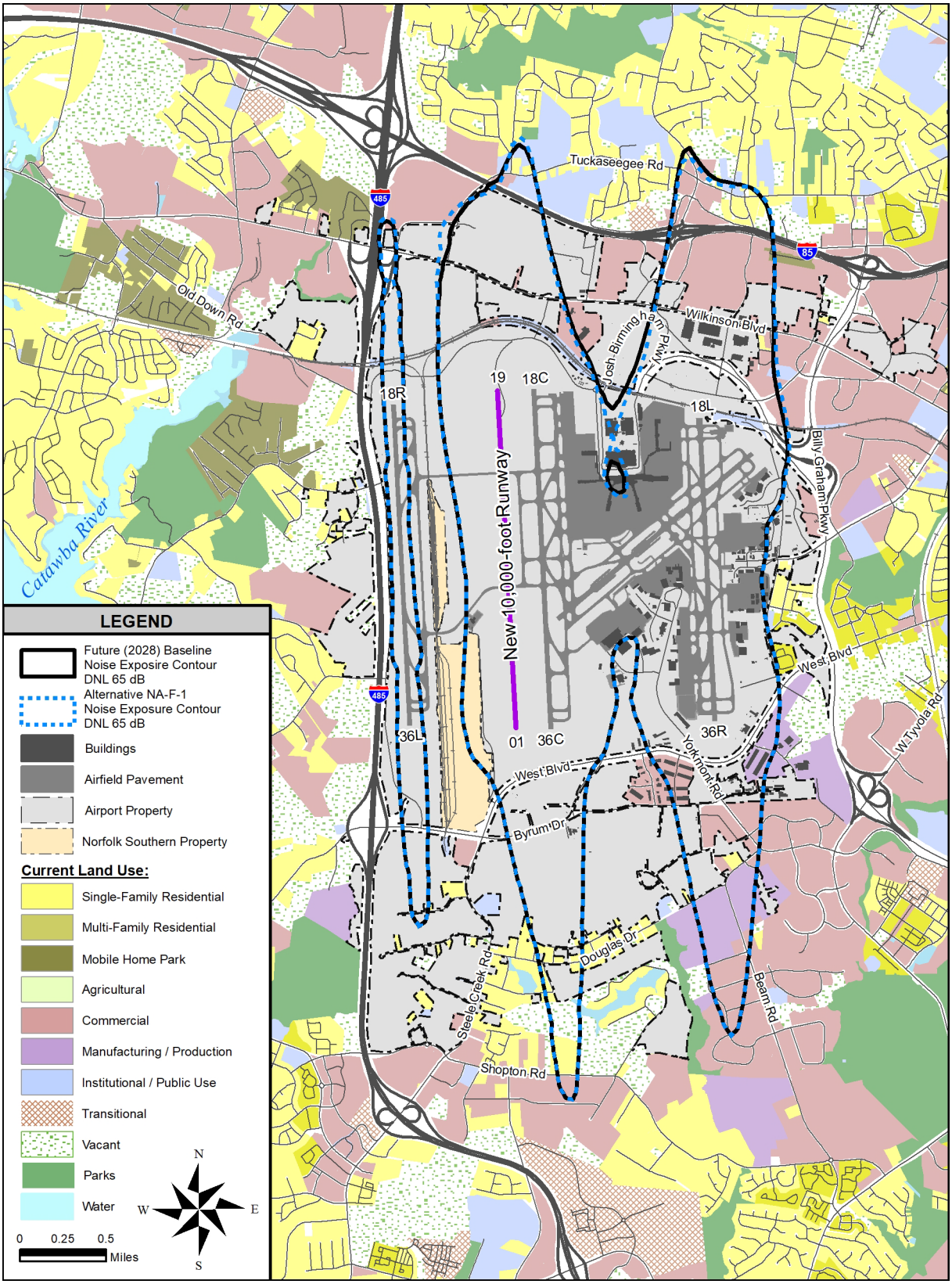
Source: Landrum & Brown, 2024.

Exhibit E-31 Noise Compatibility Program Alternative NA-F-1



Source: Landrum & Brown, 2024.

Exhibit E-32 Comparison of Future (2028) Baseline versus NA-F-1 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-F-2

TITLE:	Maximize the number of divergent headings for north flow operations while maintaining a 15° separation between headings.

BACKGROUND AND INTENT:	The intent of this measure is to reduce net residential noise impacts north of the Airport by providing additional flight corridors over as wide of an area as possible. This measure would replace the existing headings with the following divergent headings: • Runway 36R: Runway Heading (RWH), 20°, 35°, 50°, 65°, 80° • Runway 36C and Runway 01: RWH, 345°, 330°, 315°, 300°, 285° Refer to **Exhibit E-32, *Noise Compatibility Program Alternative NA-F-2*** for the proposed headings. Note, this measure assumes the runway use for the Future (2028) Baseline which designates Runway 01 and Runway 36R for daytime departure operations and Runway 36C and Runway 36R for nighttime departure operations. Additionally, Runway 36C would be used for departures in the daytime if Runway 01 could not be used for reasons of operational necessity. As such, headings proposed for Runway 01 are also proposed for Runway 36C. *While a straight-out heading is identified for Runways 36R and 01 (or 36C), these headings cannot be used simultaneously because a 15-degree separation is required per 7110.65Z.*

BENEFITS:	The measure would result in a decrease in two housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	NA-F-1 is an option to this measure

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

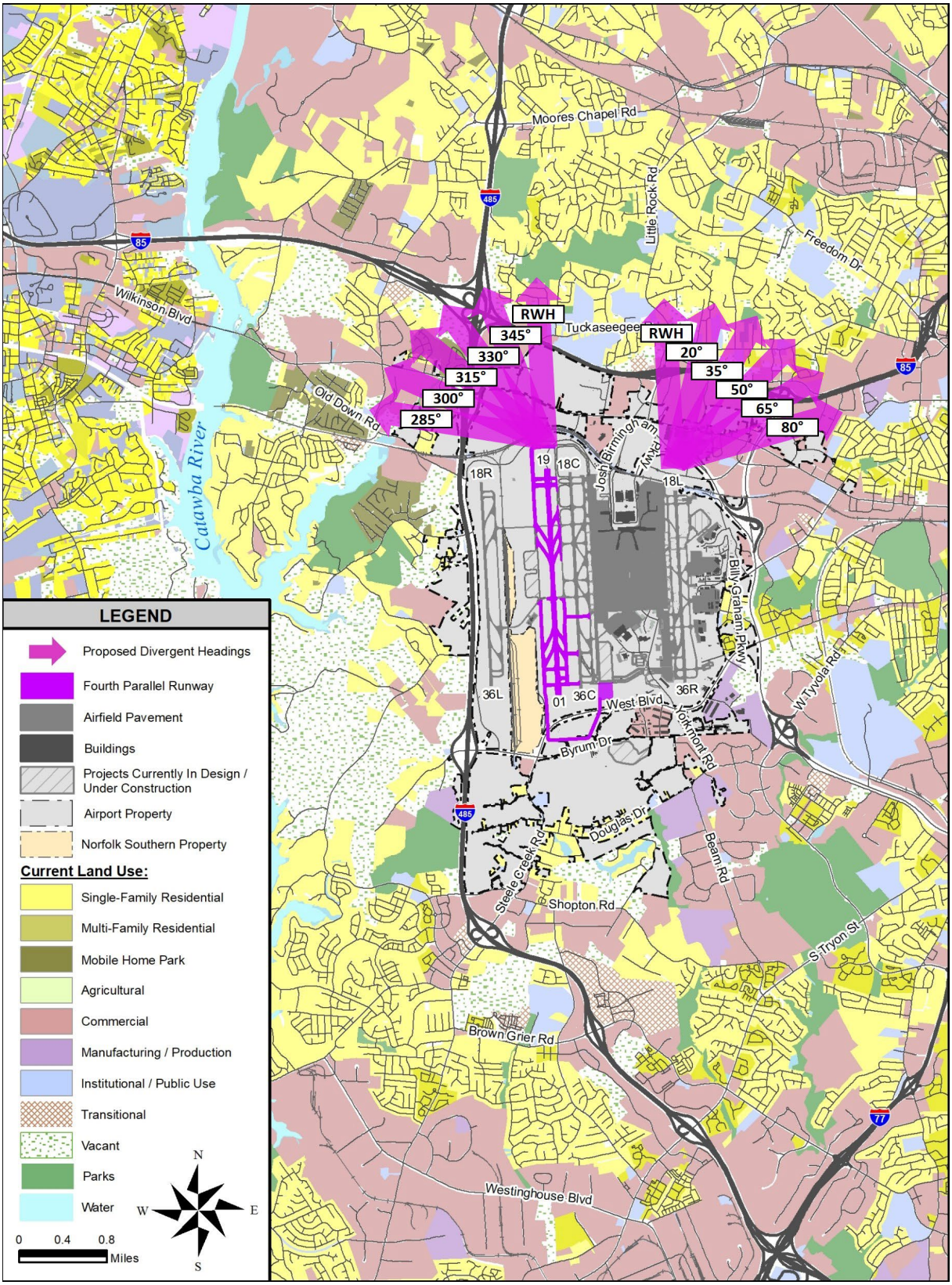
Table E-17 NA-F-2 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	84	0	0	84
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**241**	**0**	**0**	**241**
Population				
Total Population[1]	**682**	**0**	**0**	**682**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

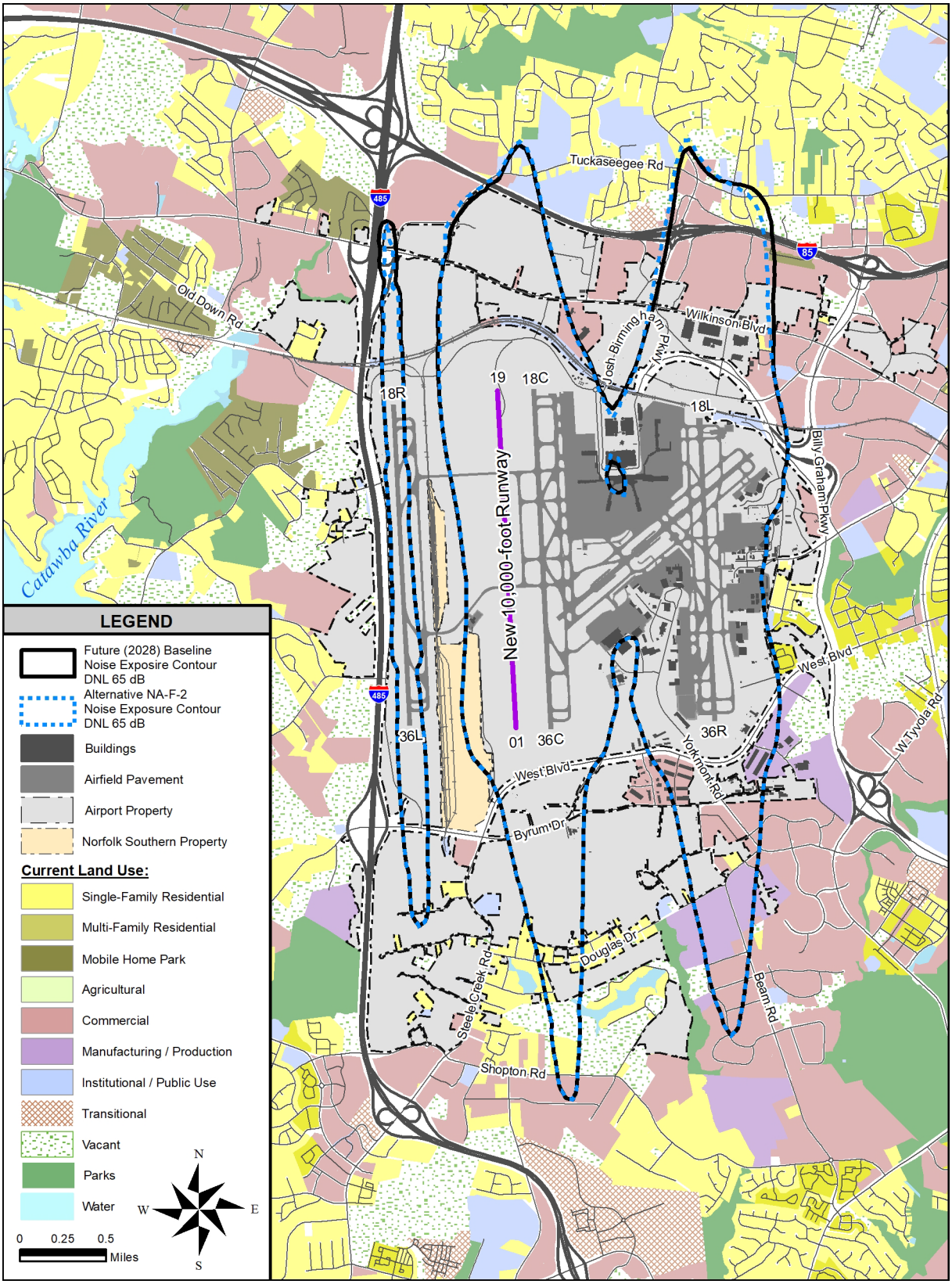
Source: Landrum & Brown, 2024.

Exhibit E-33 Noise Compatibility Program Alternative NA-F-2



Source: Landrum & Brown, 2024.

Exhibit E-34 Comparison of Future (2028) Baseline versus NA-F-2 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-G-1

TITLE:	Increase the number of departure headings for south flow operations while keeping the 2-mile restriction on the new fourth parallel runway, Runway 01/19 and the existing Runway 18C/36C.

BACKGROUND AND INTENT:	The intent of this measure is to reduce net residential noise impacts to the south of the Airport by providing additional flight corridors over noise compatible land uses. The measure would keep the existing headings and implement divergent headings for Runway 18L and Runway 18R departures that would direct more flights over transportation corridors and commercial and industrial land uses. The measure would keep existing headings as follows: • Runway 18R: 200° heading • Runway 18L: RWH° The measure would add divergent headings as follows: • Runway 18R (remove 2-mile restriction): 220° heading to follow the Garrison Road corridor • Runway 18C and Runway 19 (keep 2-mile restriction): Implement the existing Runway 18C's approved RWH • Runway 18L (remove 2-mile restriction): 120° heading to follow the Billy Graham Parkway corridor, 150° heading and 165° heading to follow the W Tyvola Road corridor Refer to **Exhibit E-35, *Noise Compatibility Program Alternative NA-G-1***. Note, this measure assumes the runway use for the Future (2028) Baseline which designates Runway 19 and Runway 18L for daytime departure operations and Runway 18C and Runway 18L for nighttime departure operations. Additionally, Runway 18C would be used for departures in the daytime if Runway 19 could not be used for reasons of operational necessity. As such, headings proposed for Runway 19 are also proposed for Runway 18C. *While a straight-out heading is identified for Runways 18L and 19, these headings cannot be used simultaneously because a 15° separation is required per 7110.65Z.*

BENEFITS:	The measure would not result in a decrease in housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	NA-G-2, NA-G-3, and NA-G-4 are options to this measure.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

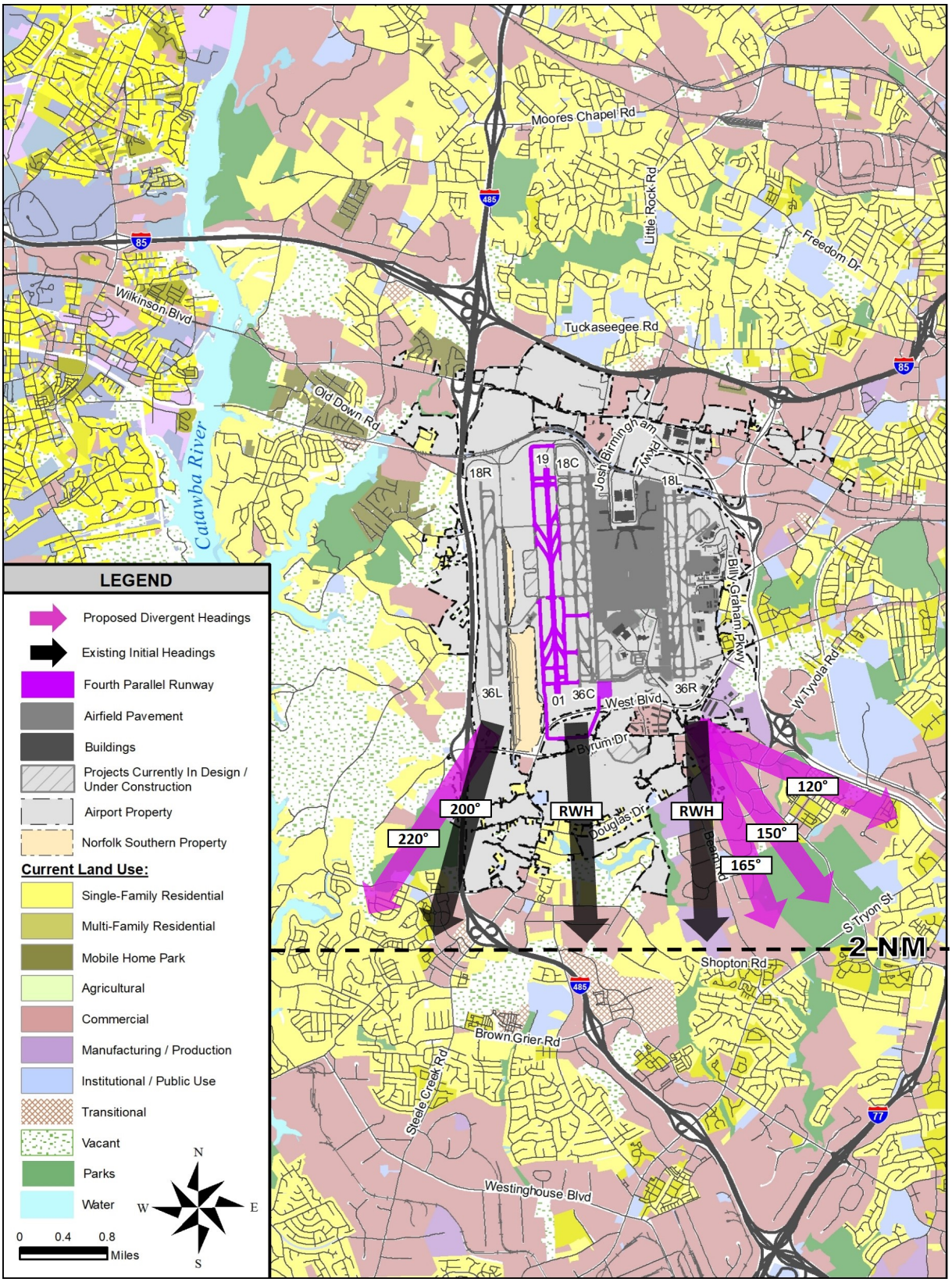
Table E-18 NA-G-1 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	86	0	0	86
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**243**	**0**	**0**	**243**
Population				
Total Population[1]	**687**	**0**	**0**	**687**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

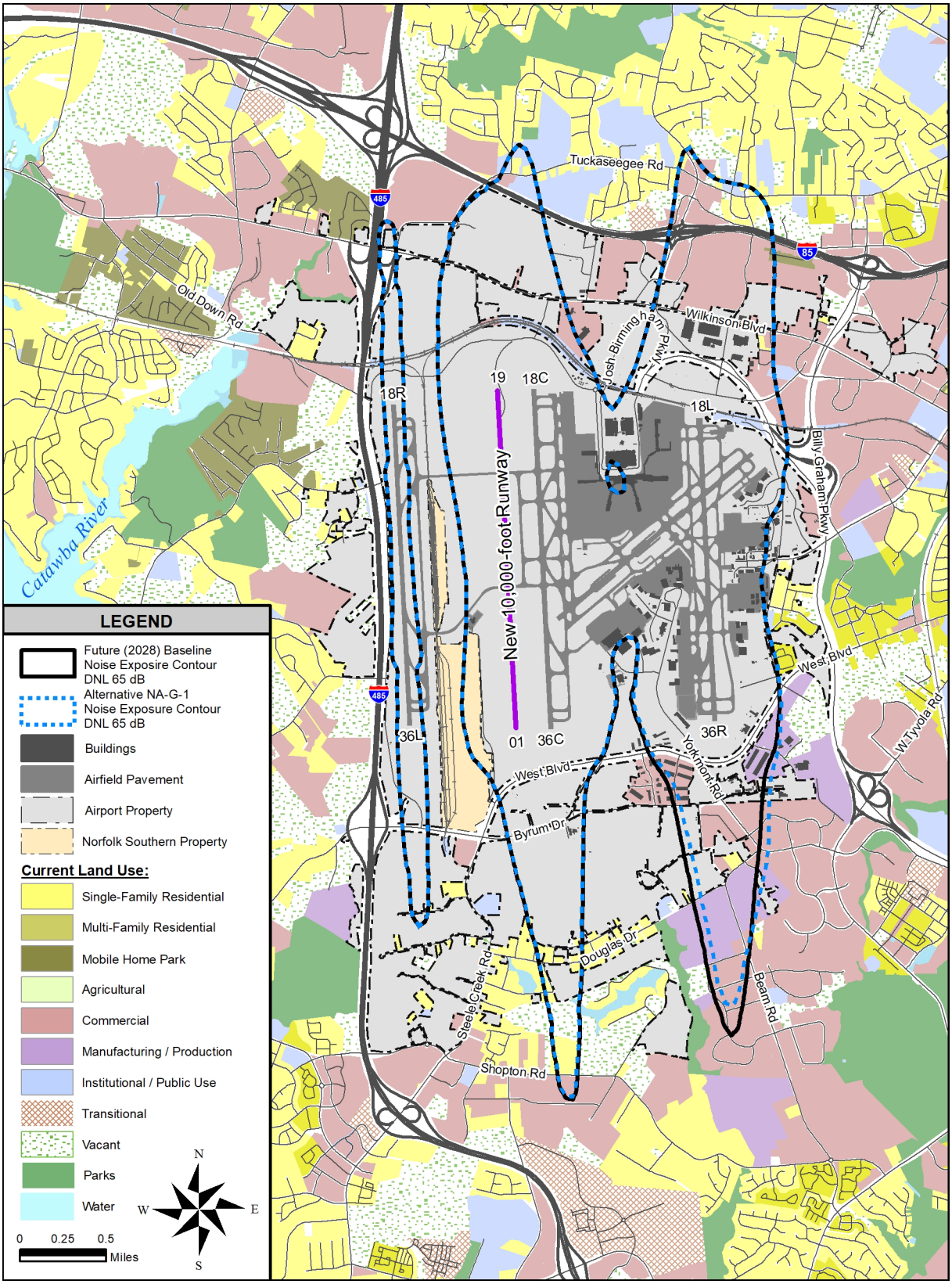
Source: Landrum & Brown, 2024.

Exhibit E-35 Noise Compatibility Program Alternative NA-G-1



Source: Landrum & Brown, 2024.

Exhibit E-36 Comparison of Future (2028) Baseline versus NA-G-1 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-G-2

TITLE:	Increase the number of departure headings for south flow operations while keeping the 2-mile restriction on Runway 18L.

BACKGROUND AND INTENT:	The intent of this measure is to reduce net residential noise impacts to the south of the Airport by utilizing flight corridors over noise compatible land uses. The measure would keep the existing headings and implement divergent headings for Runway 18L and Runway 18R departures that would direct more flights over transportation corridors and commercial and industrial land uses. The measure would keep existing headings as follows: • Runway 18R: 200° • Runway 18L (keep 2-mile restriction): RWH The measure would add divergent headings as follows: • Runway 18R (remove 2-mile restriction): 220° heading to follow the Garrison Road corridor • Runway 18C and Runway 19 (remove 2-mile restriction): Implement the existing Runway 18C's approved RWH, 200° heading and 215° heading to follow the Steele Creek Road corridor Refer to **Exhibit E-37, *Noise Compatibility Program Alternative NA-G-2***. Note, this measure assumes the runway use for the Future (2028) Baseline which designates Runway 19 and Runway 18L for daytime departure operations and Runway 18C and Runway 18L for nighttime departure operations. Additionally, Runway 18C would be used for departures in the daytime if Runway 19 could not be used for reasons of operational necessity. As such, headings proposed for Runway 19 are also proposed for Runway 18C. *While a straight-out heading is identified for Runways 18L and 19, these headings cannot be used simultaneously because a 15° separation is required per 7110.65Z.*

BENEFITS:	The measure would result in a decrease in two housing unit within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	NA-G-1, NA-G-3, and NA-G-4 are options to this measure.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

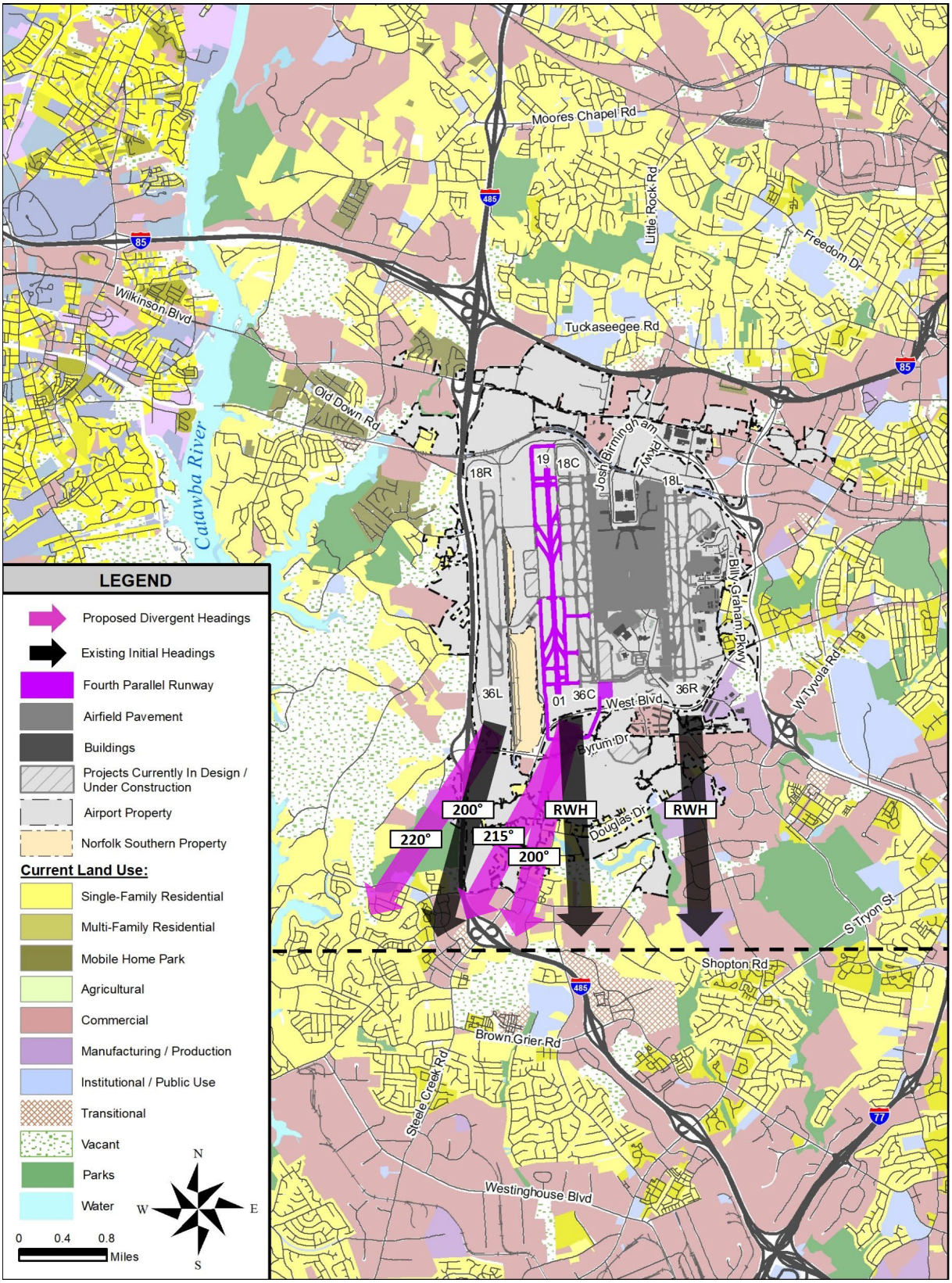
Table E-19 NA-G-2 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	84	0	0	84
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**241**	**0**	**0**	**241**
Population				
Total Population[1]	**683**	**0**	**0**	**683**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

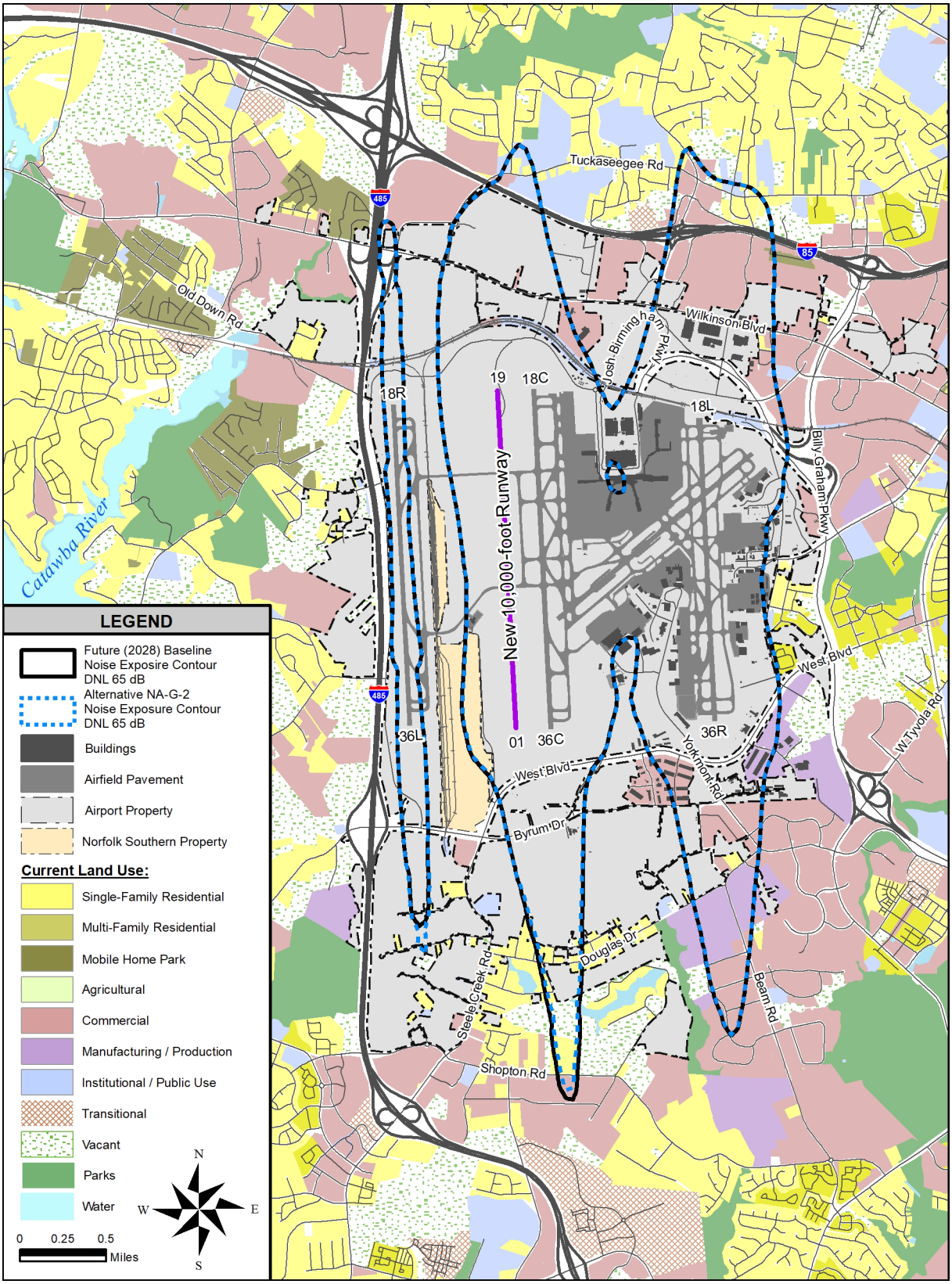
Source: Landrum & Brown, 2024.

Exhibit E-37 Noise Compatibility Program Alternative NA-G-2



Source: Landrum & Brown, 2024.

Exhibit E-38 Comparison of Future (2028) Baseline versus NA-G-2 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-G-3

TITLE:	Increase the number of departure headings for south flow operations while maintaining existing approved headings and maximizing departure corridors. This requires eliminating the 2-mile restriction for all runways.

BACKGROUND AND INTENT:	The intent of this measure is to reduce net residential noise impacts to the south of the Airport by utilizing flight corridors over noise compatible land uses. The measure would keep the existing headings and implement divergent headings for Runway 18L, Runway 18C, and Runway 18R departures that would direct more flights over transportation corridors and commercial and industrial land uses. The divergent heading for Runway 19 and Runway 18C departures would direct more flights over Airport property, transportation corridors and commercial and industrial land uses. The measure would keep the existing headings as follows: • Runway 18L: RWH • Runway 18R: 200° Th measure would eliminate the 2-mile restriction and add divergent headings as follows: • Runway 18L: 120° heading to follow the Billy Graham Parkway corridor, 150° heading and 165° heading to follow the W Tyvola Road corridor • Runway 18R: 220° heading to follow the Garrison Road corridor • Runway 18C and Runway 19: Implement the existing Runway 18C's approved RWH, 200° heading and 215° heading to follow the Steele Creek Road corridor Refer to **Exhibit E-39, *Noise Compatibility Program Alternative NA-G-3***. Note, this measure assumes the runway use for the Future (2028) Baseline which designates Runway 19 and Runway 18L for daytime departure operations and Runway 18C and Runway 18L for nighttime departure operations. Additionally, Runway 18C would be used for departures in the daytime if Runway 19 could not be used for reasons of operational necessity. As such, headings proposed for Runway 19 are also proposed for Runway 18C. *While a straight-out heading is identified for Runways 18L and 19, these headings cannot be used simultaneously because a 15° separation is required per 7110.65Z.*

BENEFITS:	The measure would result in a decrease in one housing unit within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	NA-G-1, NA-G-2, and NA-G-4 are options to this measure.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

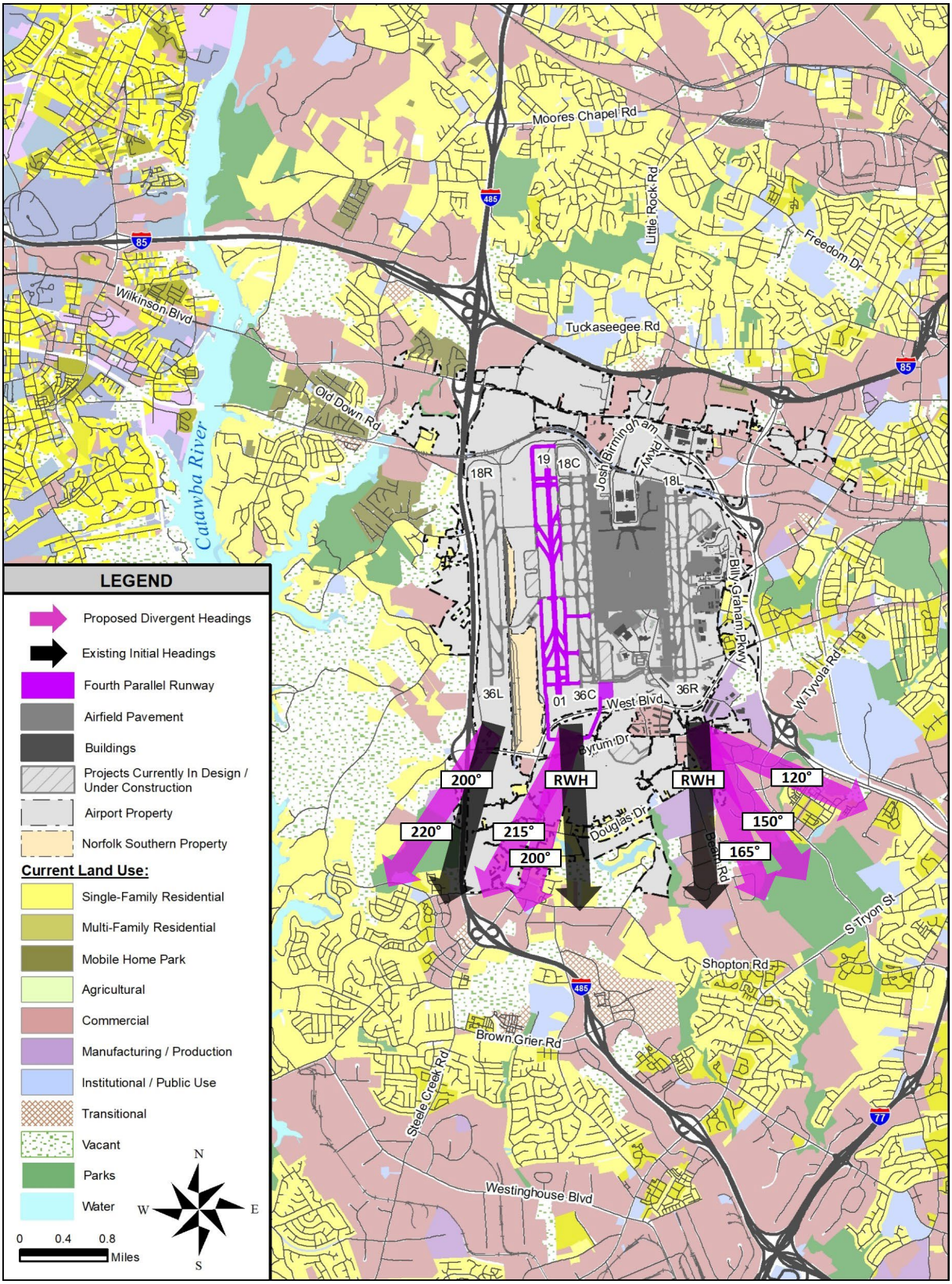
Table E-20 NA-G-3 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	85	0	0	85
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**242**	**0**	**0**	**242**
Population				
Total Population[1]	**685**	**0**	**0**	**685**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

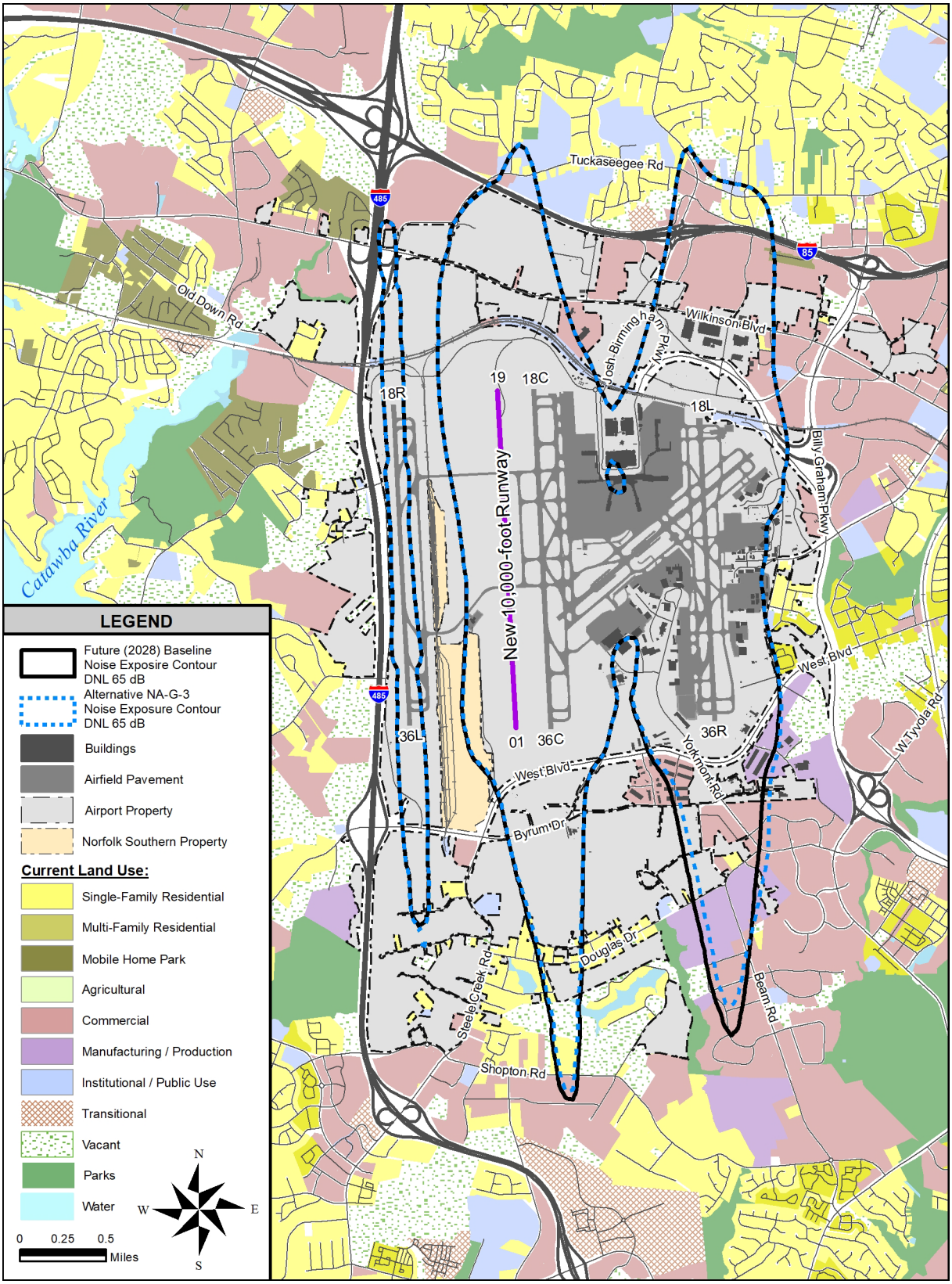
Source: Landrum & Brown, 2024.

Exhibit E-39 Noise Compatibility Program Alternative NA-G-3



Source: Landrum & Brown, 2024.

Exhibit E-40 Comparison of Future (2028) Baseline versus NA-G-3 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-G-4

TITLE:	Maximize the number of divergent headings for south flow departures while maintaining a 15° separation between headings. This would require the elimination of the 2-mile restriction.

BACKGROUND AND INTENT:	The intent of this measure is to reduce net residential noise impacts to the south of the Airport by dispersing flights over a wider area. The measure would implement the maximum number of divergent headings while maintaining a 15° separation between headings to spread noise over as wide an area surrounding the Airport as possible. The measure would implement divergent headings as follows: • Runway 18L: RWH, 165°, 150°, 135°, 120°, 105° • Runway 18C and Runway 19: RWH, 200°, 215°, 230°, 245°, 260° Refer to **Exhibit E-41, *Noise Compatibility Program Alternative NA-G-4*.** Note, this measure assumes the runway use for the Future (2028) Baseline which designates Runway 19 and Runway 18L for daytime departure operations and Runway 18C and Runway 18L for nighttime departure operations. Additionally, Runway 18C would be used for departures in the daytime if Runway 19 could not be used for reasons of operational necessity. As such, headings proposed for Runway 19 are also proposed for Runway 18C. *While a straight-out heading is identified for Runways 18L and 19, these headings cannot be used simultaneously because a 15° separation is required per 7110.65Z.*

BENEFITS:	The measure would result in a decrease in eight housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

DRAWBACKS:	NA-G-1, NA-G-2, and NA-G-3 are options to this measure.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA. The cost related to the required environmental processing per the NEPA for the implementation of the measure.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	Due to the decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour, this measure is **RECOMMENDED** for further evaluation, including coordination with the local FAA ATCT, the TAC, and the public to obtain input and comments.

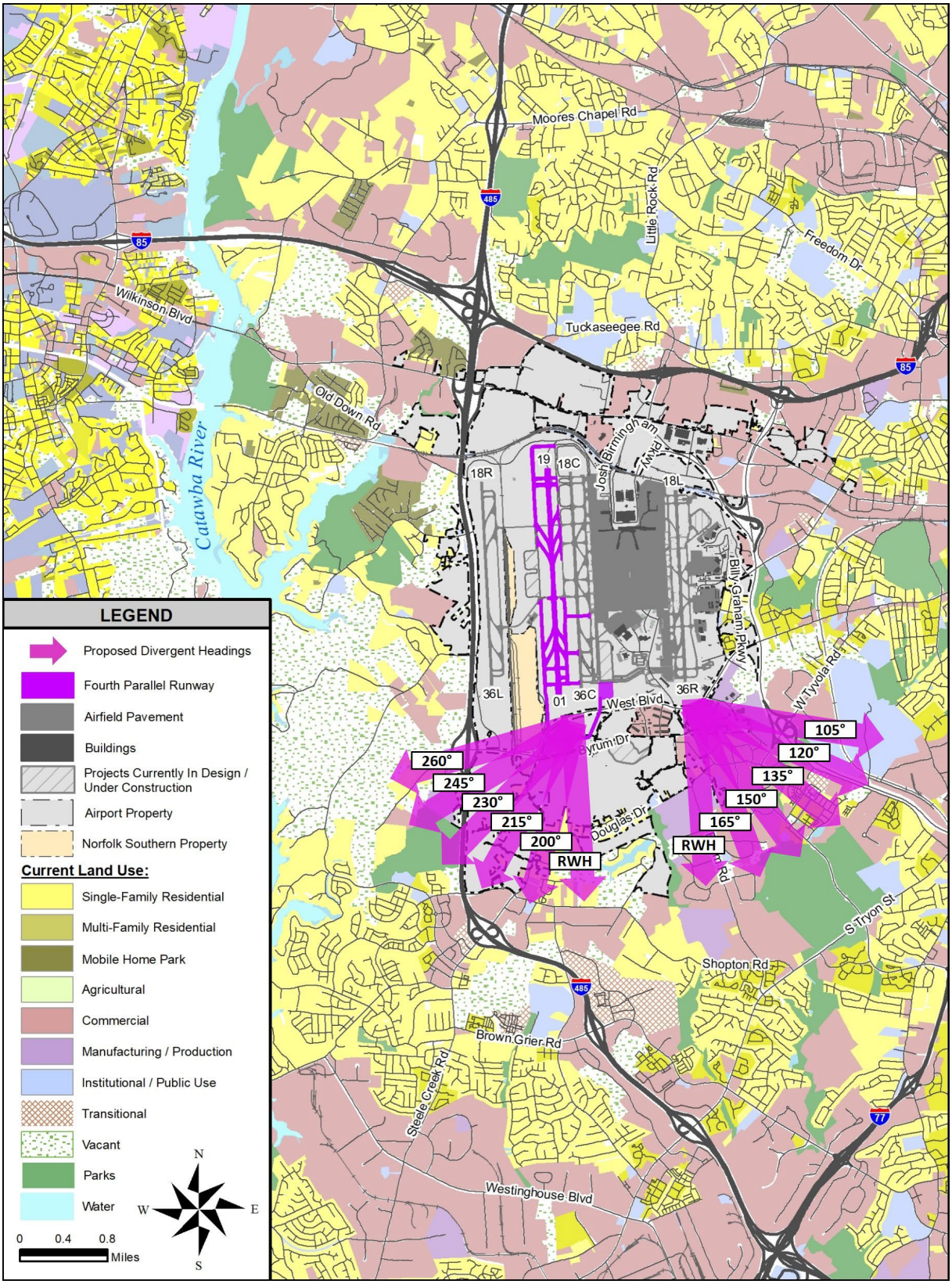
Table E-21 NA-G-4 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	78	0	0	78
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**235**	**0**	**0**	**235**
Population				
Total Population[1]	**668**	**0**	**0**	**668**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

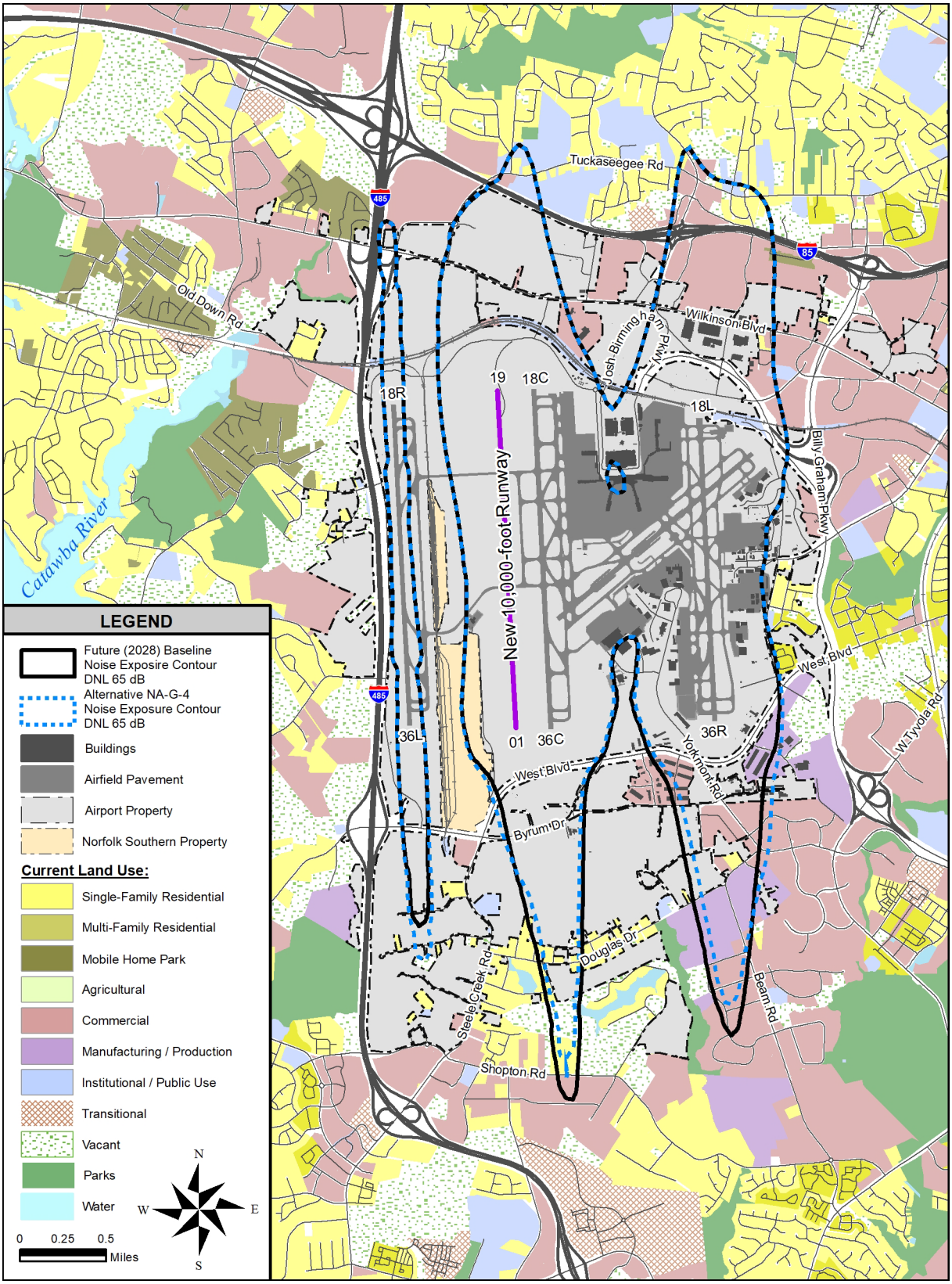
Source: Landrum & Brown, 2024.

Exhibit E-41 Noise Compatibility Program Alternative NA-G-4



Source: Landrum & Brown, 2024.

Exhibit E-42 Comparison of Future (2028) Baseline versus NA-G-4 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-H-1

TITLE:	Evaluate helicopter operations in the south general aviation apron to takeoff towards the south and stay between Yorkmont and Billy Graham Parkway before turning on course.

BACKGROUND AND INTENT:	The intent of this measure is to reduce helicopter flights over non-mitigated homes directly east of Airport Drive by implementing additional helicopter corridors. Refer to **Exhibit E-43, *Noise Compatibility Program Alternative NA-H-1.***

BENEFITS:	None

DRAWBACKS:	The measure would not result in a decrease in housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA.

EVALUATION METHOD:	Quantitative assessment – AEDT modeling

FINDINGS AND RECOMMENDATIONS:	The measure would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

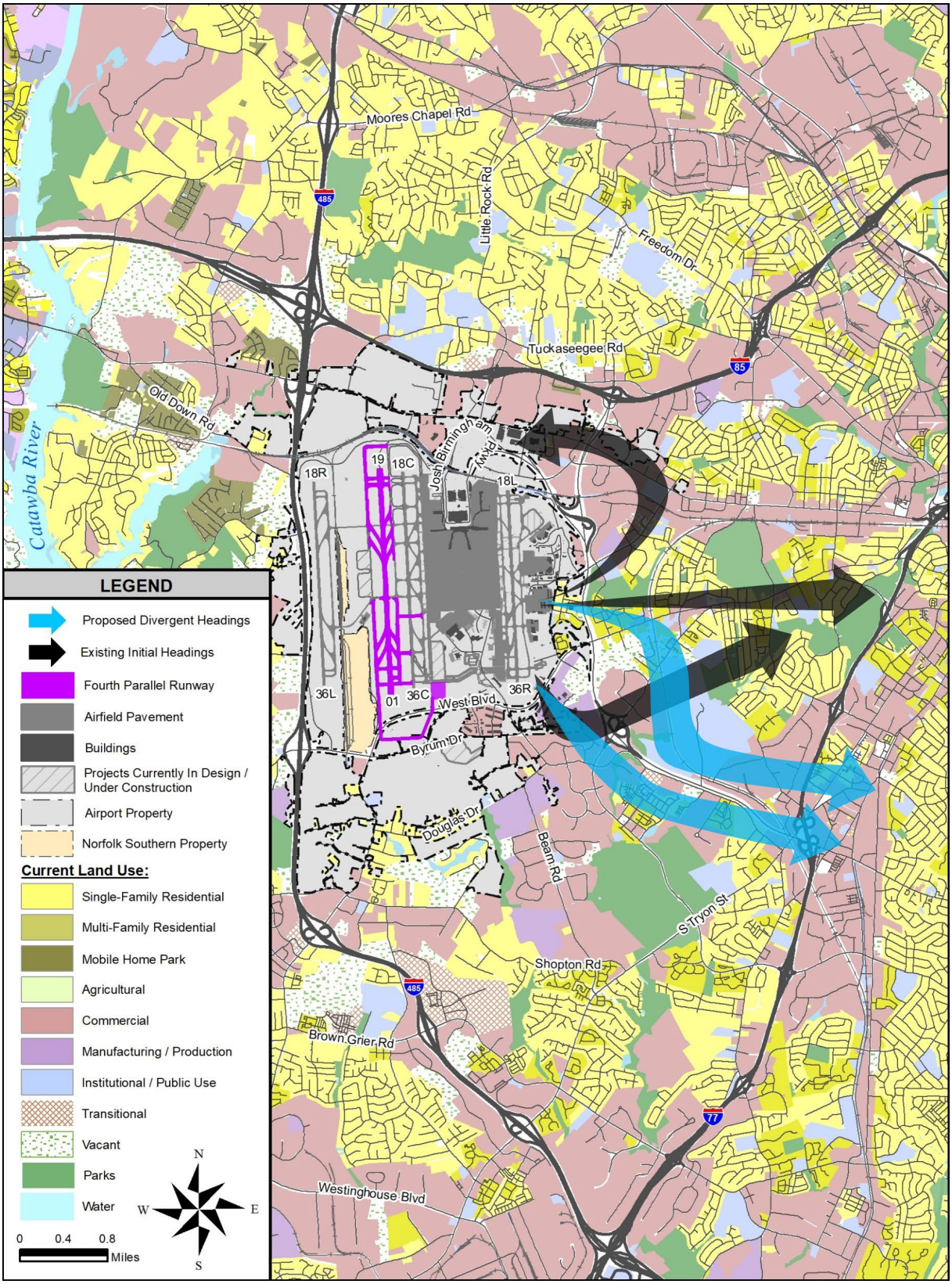
Table E-22 NA-H-1 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	86	0	0	86
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**243**	**0**	**0**	**243**
Population				
Total Population[1]	**687**	**0**	**0**	**687**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

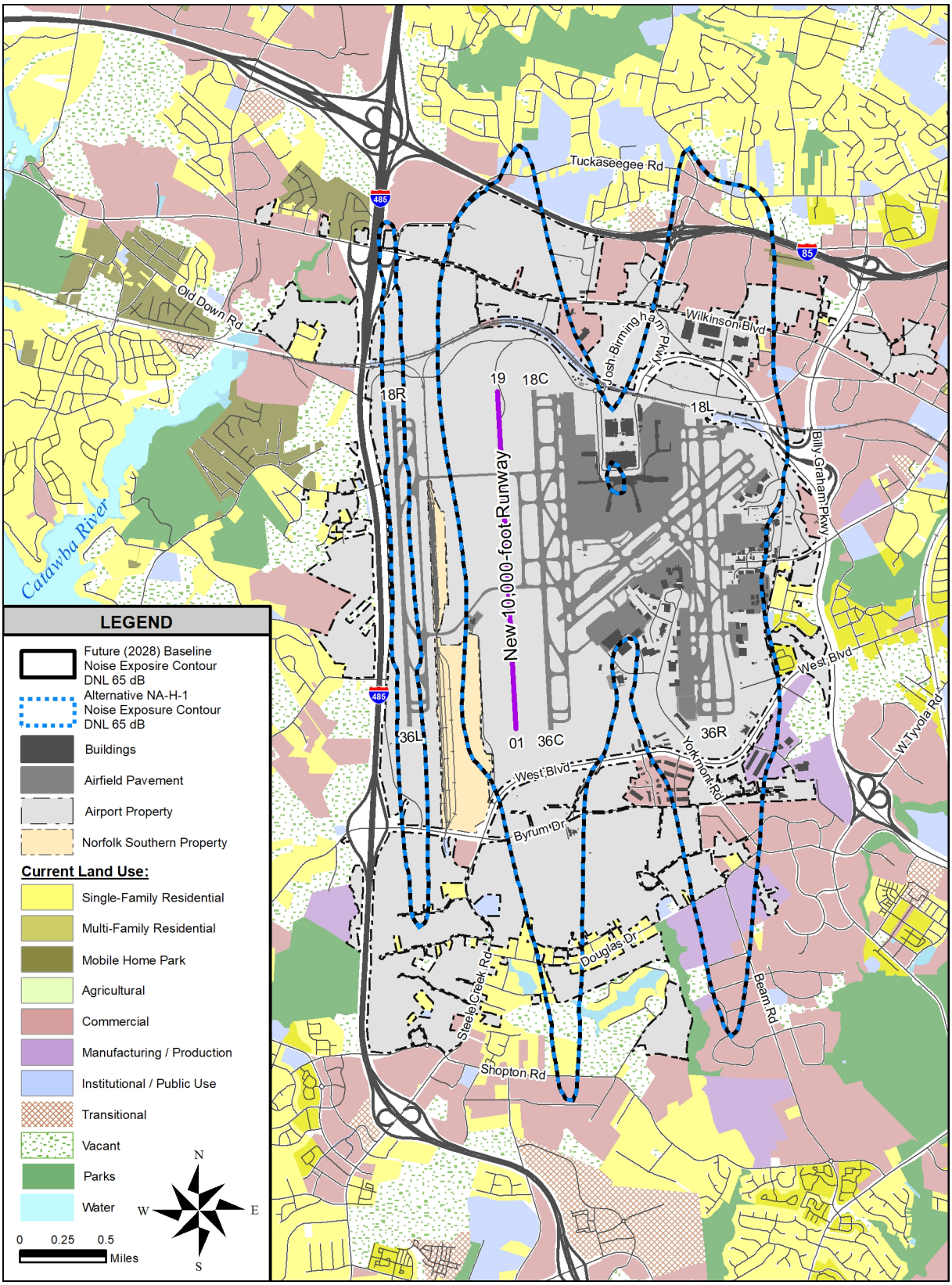
Source: Landrum & Brown, 2024.

Exhibit E-43 Noise Compatibility Program Alternative NA-H-1



Source: Landrum & Brown, 2024.

Exhibit E-44 Comparison of Future (2028) Baseline versus NA-H-1 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-H-2

TITLE:	Change Headings of First Turns off Runways 18L and 18C.
BACKGROUND AND INTENT:	The intent of the measure is to reduce the effect of noise on more densely populated areas and foster the desire by the ACR to return to pre-Metroplex flight paths. Refer to **Exhibit E-45, *Noise Compatibility Program Alternative NA-H-2.***
BENEFITS:	None
DRAWBACKS:	The measure would not result in a decrease in housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour. NA-G-1, NA-G-2, NA-G-3 and NA-G-4 are options to this measure.
COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA.
EVALUATION METHOD:	Quantitative assessment – AEDT modeling
FINDINGS AND RECOMMENDATIONS:	The measure would not result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is **NOT RECOMMENDED** for further evaluation.

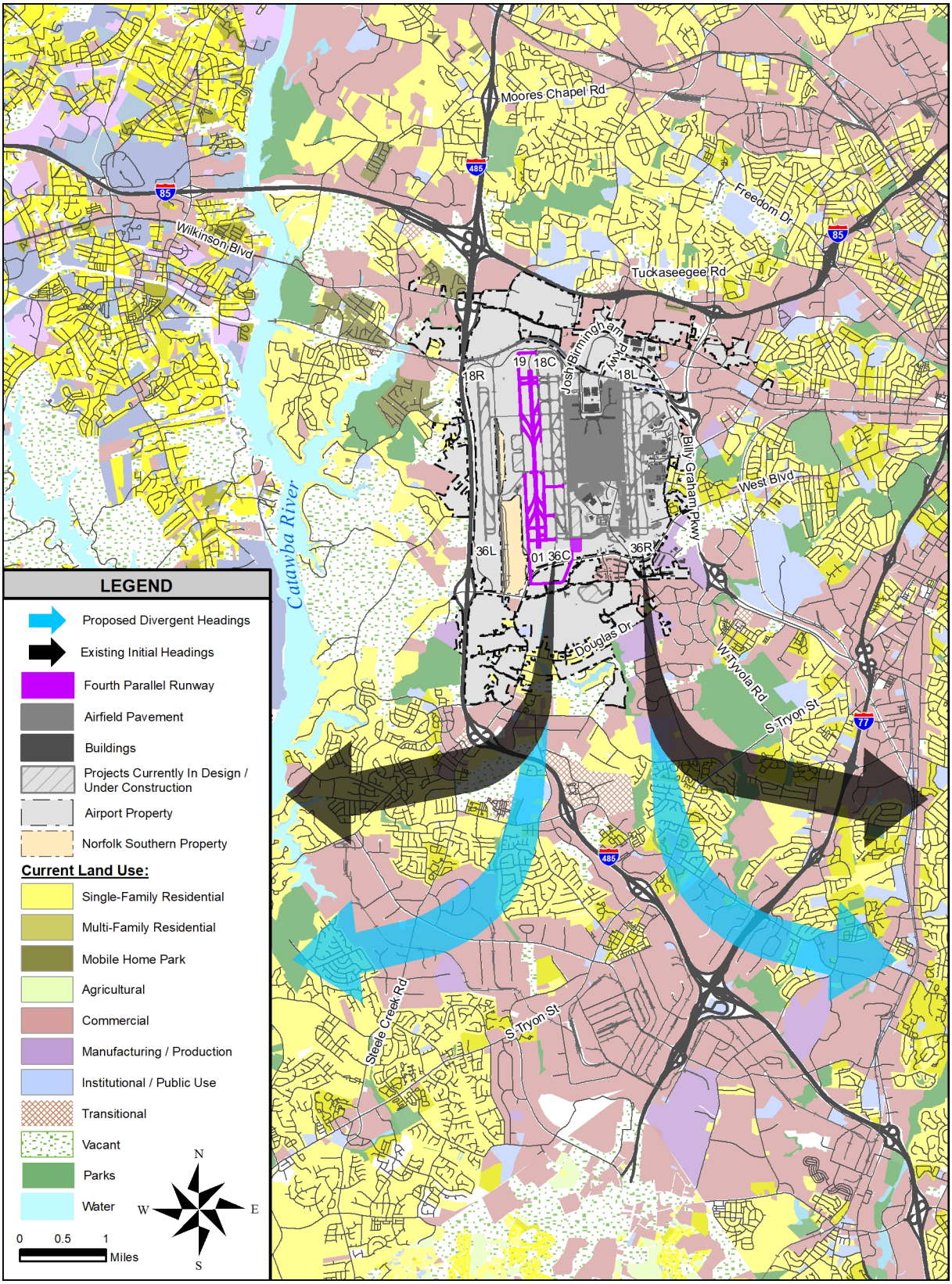
Table E-23 NA-H-2 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	86	0	0	86
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**243**	**0**	**0**	**243**
Population				
Total Population[1]	**687**	**0**	**0**	**687**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

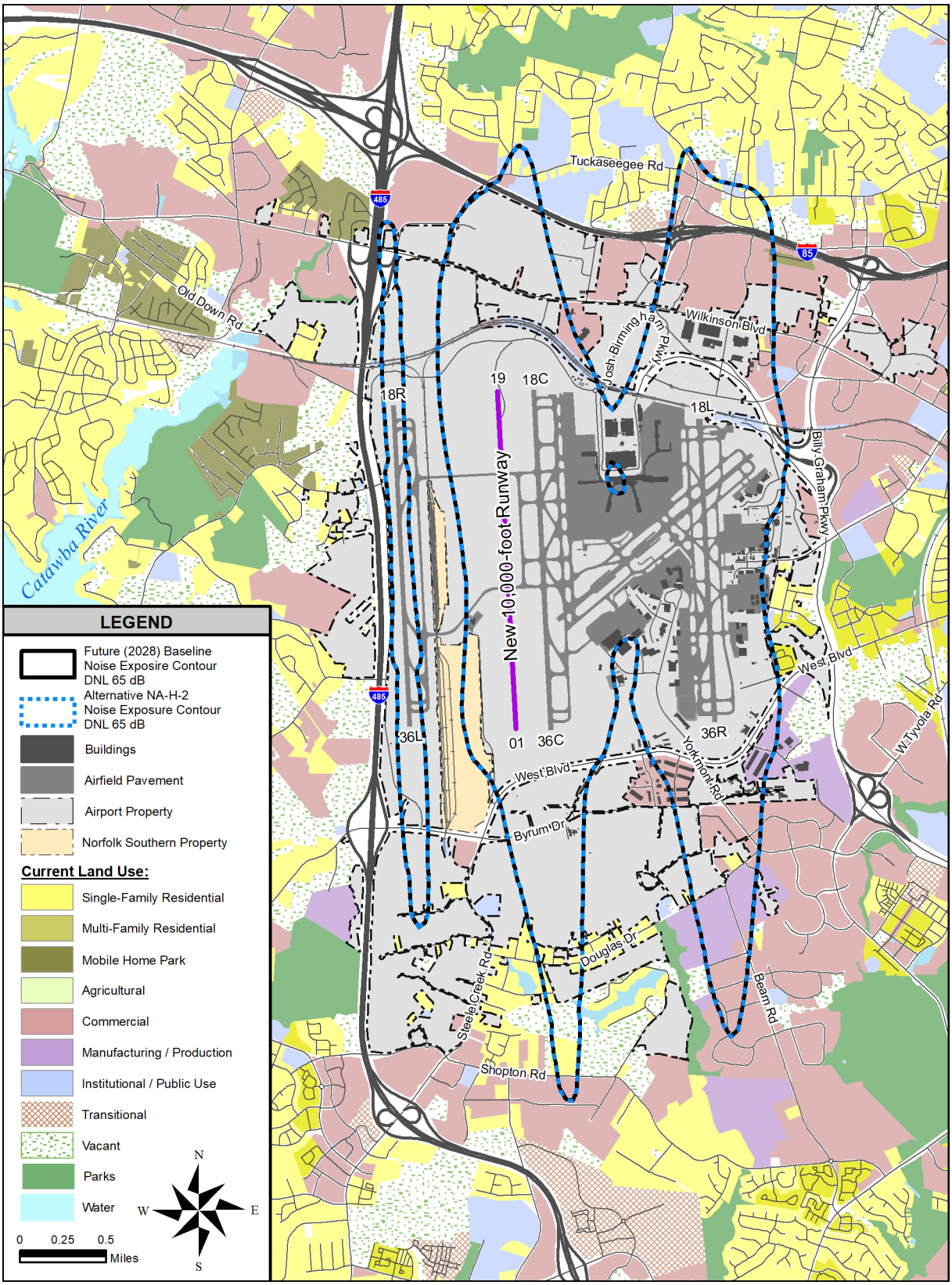
Source: Landrum & Brown, 2024.

Exhibit E-45 Noise Compatibility Program Alternative NA-H-2



Source: Landrum & Brown, 2024.

Exhibit E-46 Comparison of Future (2028) Baseline versus NA-H-2 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Noise Compatibility Program Alternative NA-H-3

TITLE:	For south flow departures, revert to 2016 procedures where aircraft depart from the Runway 18C at a 183° heading and fly between 2 to 4 nautical miles before turning to a 270° heading.

BACKGROUND AND INTENT:	The intent of the measure is to reduce the effect of noise on more densely populated areas and foster the desire by the ACR to return to 2016 flight paths.

BENEFITS:	None

DRAWBACKS:	This noise abatement alternative targets procedures outside of the DNL 65+ dB noise exposure contour and is not anticipated to result in a decrease in housing units within the 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA.

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The alternative targets procedures outside of the DNL 65+ dB noise exposure contour and is not anticipated to result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this measure is NOT RECOMMENDED for further evaluation.

Noise Compatibility Program Alternative NA-I-1

TITLE:	For south flow arrivals along the CHSLY procedure, maintain the published altitude of 6,000 feet at the HEELZ procedure so flights will not cut the corner.

BACKGROUND AND INTENT:	The intent of this measure is to reduce the effect of noise on more densely populated areas by utilizing noise abatement corridors for arrival procedures.

BENEFITS:	None

DRAWBACKS:	This noise abatement alternative targets procedures outside of the DNL 65+ dB noise exposure contour and is not anticipated to result in a decrease in housing units when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA.

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The alternative targets procedures outside of the DNL 65+ dB noise exposure contour and is not anticipated to result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this alternative is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-I-2

TITLE:	For south flow arrivals, extend the eastern downwind so that flights intercept the final approach over the main channel of Mountain Island Lake keeping an altitude of 6,000 feet until turning final approach course.

BACKGROUND AND INTENT:	The intent of this measure is to reduce the effect of noise on more densely populated areas by utilizing noise abatement corridors for arrival procedures.

BENEFITS:	None

DRAWBACKS:	This noise abatement alternative targets procedures outside of the DNL 65 dB and is not anticipated to result in a decrease in housing units within the 6 DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA.

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The alternative targets procedures outside of the DNL 65+ dB and is not anticipated to result in a decrease in the number of housing units that would be located within the DNL 65+ dB noise exposure contour. As such, this alternative is **NOT RECOMMENDED** for further evaluation.

Noise Compatibility Program Alternative NA-I-3

TITLE:	For north flow arrivals, utilize Interstate 77 as a flight corridor.

BACKGROUND AND INTENT:	The intent of the measure is to reduce the effect of noise on more densely populated areas by utilizing noise abatement corridors for arrival procedures.

BENEFITS:	None

DRAWBACKS:	This noise abatement alternative targets procedures outside of the DNL 65 dB and is not anticipated to result in a decrease in housing units within the DNL 65+ dB noise exposure contour when compared to the Future (2028) Baseline Noise Exposure Contour.

COST TO IMPLEMENT:	The cost for additional training, development, and publication of new procedures would be the responsibility of the FAA.

EVALUATION METHOD:	Qualitative assessment

FINDINGS AND RECOMMENDATIONS:	The alternative targets procedures outside of the DNL 65+ dB noise exposure contour and is not anticipated to result in a decrease in the number of housing units that would be located within the 65+ DNL noise exposure contour. As such, this alternative is **NOT RECOMMENDED** for further evaluation.

E.3 Noise Abatement Scenarios

The alternatives identified for further evaluation cannot all be implemented at the same time due to recommendations that would conflict with each other. Furthermore, the combined effect of various alternatives will yield different levels of impacts. Therefore, the most promising alternatives were compiled into four NCP operating scenarios for further evaluation. Each of the NCP operating scenarios is briefly described below along with a discussion of their relative benefits and drawbacks.

Scenario 1 (NCP 1)

NCP Scenario 1 (NCP 1) includes six noise abatement alternatives:

Run-Up Locations

- NA-A-1: Establish a run-up location on the deice pad and northeast airfield that are currently under construction. Maximize the use of midfield run-up locations over those located on the east side of the Airport.
- NA-A-2: Conduct an assessment of ground run-up procedures after construction of the new fourth parallel runway to identify run-up locations in the midfield of the Airport.

Divergent Headings – North Flow

- NA-F-1: Increase the number of departure headings for north flow operations while maintaining existing approved headings and maximizing departure corridors.

Divergent Headings – South Flow

- NA-G-3: Increase the number of departure headings for south flow operations while maintaining existing approved headings and maximizing departure corridors. This requires eliminating the 2-mile restriction for all runways.

Nighttime Runway Use

- NA-E-1: Designate Runway 36L and 36R as preferred for north flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.
- NA-E-2: Designate Runways 18L, 18C, and 18R for south flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.

NCP 1 decreased the number of housing units in the DNL 65+ dB noise exposure contour from the Future (2028) Baseline Noise Exposure Contour by 21 housing units. Furthermore, the scenario would provide additional departure headings which would in turn provide additional capacity and delay benefits at the Airport as presented in **Table E-24** and **Table E-25**. Additionally, the scenario would provide additional flexibility for operational conditions at the Airport.

Although NCP 1 presents various benefits, including a decrease in the number of housing units in the DNL 65+ dB noise exposure contour, NCP 1 was not selected as the preferred scenario due to NCP 2 providing the most capacity, delay, and flexibility benefits offered by NCP 2 (see **Table E-26** and **Exhibit 47**).

Table E-24 Scenario 1 Capacity Benefits

		North Flow		South Flow	
		Existing	NA-F-1	Existing	NA-G-3
Total # of Headings on Departure Runways		*2*	*7*	*2*	*7*
VMC (~79%)	Departure Throughput	82	83	82	82
	Count of 60 sec separation (approx.)	620	50	570	80
	Count of <60 sec separation (approx.)	-	510	-	430
IMC (~21%)	Departure Throughput	73	77	74	78
	Count of 72 sec separation (approx.)	470	40	510	90
	Count of <72 sec separation (approx.)	-	440	-	420

Source: Landrum & Brown, 2024.

Table E-25 Scenario 1 Delay Benefits

		North Flow		South Flow	
		Existing	NA-F-1	Existing	NA-G-3
Total # of Headings on Departure Runways		*2*	*7*	*2*	*7*
VMC (~79%)	Avg arrival delay (min)	4.9	4.8	4.8	4.6
	Avg departure delay (min)	4.6	3.4	4.3	3.5
IMC (~21%)	Avg arrival delay (min)	6.2	6.1	7.1	7.1
	Avg departure delay (min)	9.4	7.0	8.0	5.6

Source: Landrum & Brown, 2024.

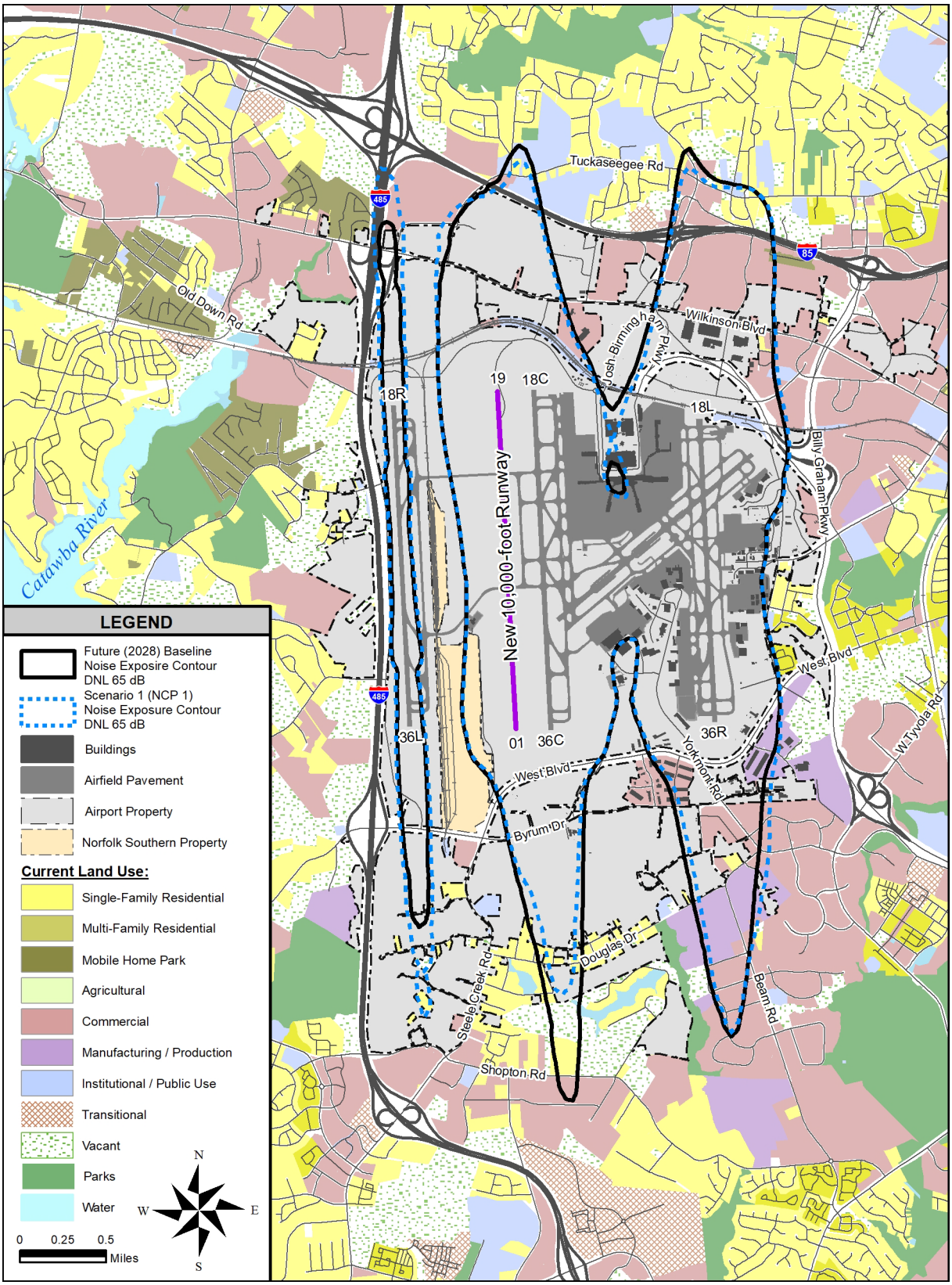
Table E-26 Scenario 1 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	65	0	0	65
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**222**	**0**	**0**	**222**
Population				
Total Population[1]	**632**	**0**	**0**	**632**
Noise-Sensitive Facilities				
Schools / Educational Facilities	3	0	0	3
Churches / Places of Worship	3	0	0	3
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

Source: Landrum & Brown, 2024.

Exhibit E-47 Comparison of Future (2028) Baseline versus Scenario 1 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Scenario 2 (NCP 2)

NCP Scenario 2 (NCP 2) includes six noise abatement alternatives:

Run-Up Locations

- NA-A-1: Establish a run-up location on the deice pad and northeast airfield that are currently under construction. Maximize the use of midfield run-up locations over those located on the east side of the Airport.
- NA-A-2: Conduct an assessment of ground run-up procedures after construction of the new fourth parallel runway to identify run-up locations in the midfield of the Airport.

Divergent Headings – North Flow

- NA-F-2: Maximize the number of divergent headings for north flow operations while maintaining a 15° separation between headings.

Divergent Headings – South Flow

- NA-G-4: Maximize the number of divergent headings for south flow departures while maintaining a 15° separation between headings. This would require the elimination of the 2-mile restriction.

Nighttime Runway Use

- NA-E-1: Designate Runway 36L and 36R as preferred for north flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.
- NA-E-2: Designate Runways 18L, 18C, and 18R for south flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.

NCP 2 decreased the number of housing units in the DNL 65+ dB noise exposure contour from the Future (2028) Baseline Noise Exposure Contour by 26 housing units. Furthermore, the scenario would provide the most additional departure headings out of the scenarios considered, which would in turn provide the most capacity and delay benefits at the Airport as presented in **Table E-27** and **Table E-28**. Additionally, the scenario would provide the most flexibility for operational conditions at the Airport.

NCP 2 was selected as the preferred scenario because it provides the most capacity, delay, and flexibility benefits (see **Table E-29** and **Exhibit 48**).

Table E-27 Scenario 2 Capacity Benefits

		North Flow		South Flow	
		Existing	NA-F-2	Existing	NA-G-4
Total # of Headings on Departure Runways		*2*	*12*	*2*	*12*
VMC (~79%)	Departure Throughput	82	83	82	83
	Count of 60 sec separation (approx.)	620	10	570	20
	Count of <60 sec separation (approx.)	-	530	-	510
IMC (~21%)	Departure Throughput	73	78	74	79
	Count of 72 sec separation (approx.)	470	20	510	30
	Count of <72 sec separation (approx.)	-	470	-	500

Source: Landrum & Brown, 2024.

Table E-28 Scenario 2 Delay Benefits

		North Flow		South Flow	
		Existing	NA-F-2	Existing	NA-G-4
Total # of Headings on Departure Runways		*2*	*12*	*2*	*12*
VMC (~79%)	Avg arrival delay (min)	4.9	4.8	4.8	4.6
	Avg departure delay (min)	4.6	3.3	4.3	3.4
IMC (~21%)	Avg arrival delay (min)	6.2	6.0	7.1	7.0
	Avg departure delay (min)	9.4	6.8	8.0	5.5

Source: Landrum & Brown, 2024.

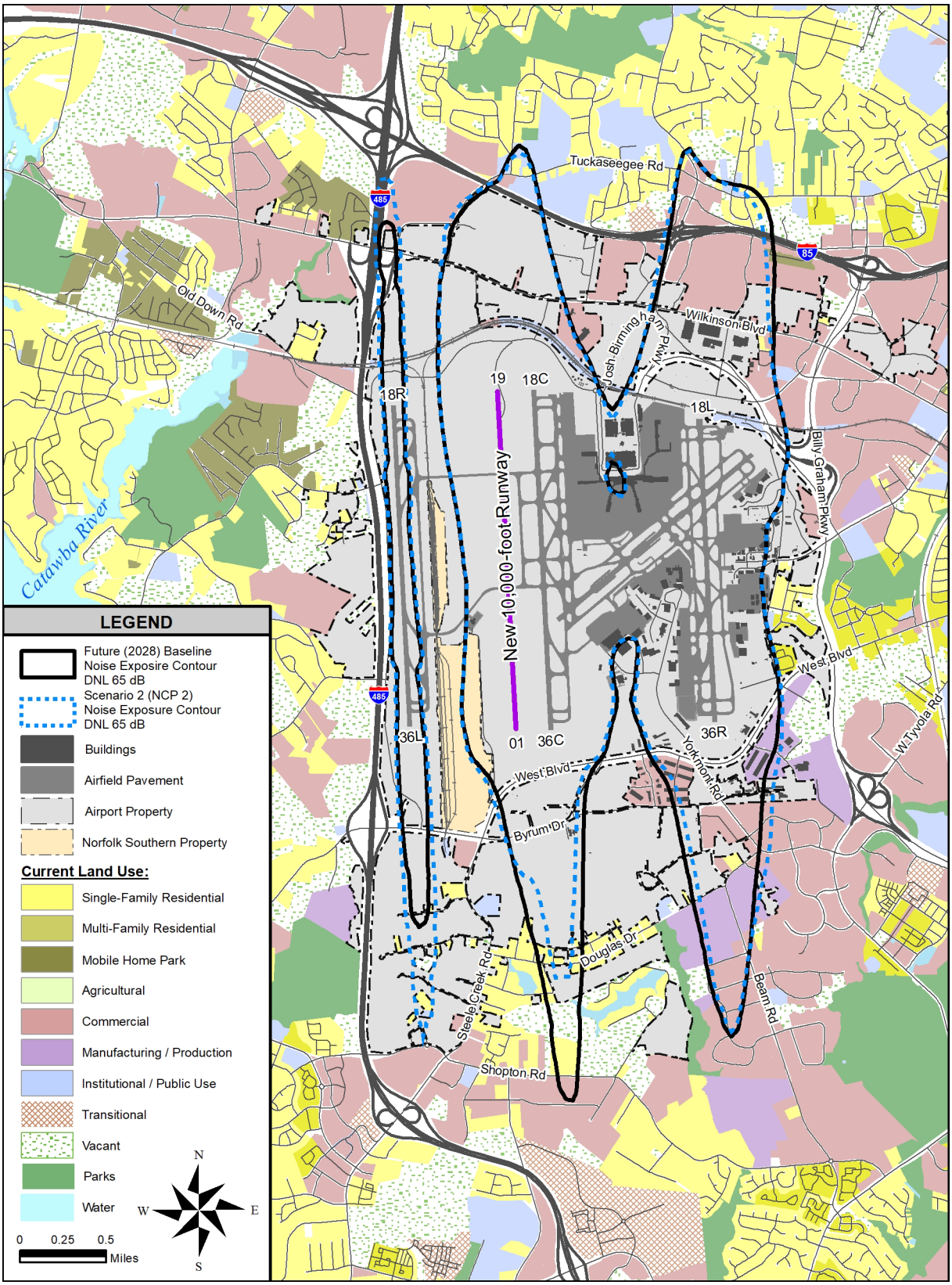
Table E-29 Scenario 2 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	60	0	0	60
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**217**	**0**	**0**	**217**
Population				
Total Population[1]	**621**	**0**	**0**	**621**
Noise-Sensitive Facilities				
Schools / Educational Facilities	4	0	0	4
Churches / Places of Worship	4	0	0	4
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

Source: Landrum & Brown, 2024.

Exhibit E-48 Comparison of Future (2028) Baseline versus Scenario 2 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Scenario 3 (NCP 3)

NCP Scenario 3 (NCP 3) includes six noise abatement alternatives:

Run-Up Locations

- NA-A-1: Maximize the use of midfield run-up locations over those located on the east side of the Airport (Short-Term)
- NA-A-2: Conduct an assessment of ground run-up procedures after construction of the new fourth parallel runway to identify run-up locations in the midfield of the Airport.

Divergent Headings – North Flow

- NA-F-1: Increase the number of departure headings for north flow operations while maintaining existing approved headings and maximizing departure corridors.

Divergent Headings – South Flow

- NA-G-4: Maximize the number of divergent headings for south flow departures while maintaining a 15° separation between headings. This would require the elimination of the 2-mile restriction.

Nighttime Runway Use

- NA-E-1: Designate Runway 36L and 36R as preferred for north flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.
- NA-E-2: Designate Runways 18L, 18C, and 18R for south flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.

NCP 3 decreased the number of housing units in the DNL 65+ dB noise exposure contour from the Future (2028) Baseline Noise Exposure Contour by 26 housing units. Furthermore, the scenario would provide additional departure headings which would in turn provide additional capacity and delay benefits at the Airport as presented in **Table E-30** and **Table 31**. The scenario would also provide additional flexibility for operational conditions at the Airport.

Although NCP 3 presents various benefits, including a decrease in the number of housing units in the DNL 65+ dB noise exposure contour, NCP 3 was not selected as the preferred scenario because it does not provide the most capacity, delay, and flexibility benefits offered by NCP 2 (see **Table E-32** and **Exhibit 49**).

Table E-30 Scenario 3 Capacity Benefits

		North Flow		South Flow	
		Existing	NA-F-1	Existing	NA-G-4
Total # of Headings on Departure Runways		*2*	*7*	*2*	*12*
VMC (~79%)	Departure Throughput	82	83	82	83
	Count of 60 sec separation (approx.)	620	50	570	20
	Count of <60 sec separation (approx.)	-	510	-	510
IMC (~21%)	Departure Throughput	73	77	74	79
	Count of 72 sec separation (approx.)	470	40	510	30
	Count of <72 sec separation (approx.)	-	440	-	500

Source: Landrum & Brown, 2024.

Table E-31 Scenario 3 Delay Benefits

		North Flow		South Flow	
		Existing	NA-F-1	Existing	NA-G-4
Total # of Headings on Departure Runways		*2*	*7*	*2*	*12*
VMC (~79%)	Avg arrival delay (min)	4.9	4.8	4.8	4.6
	Avg departure delay (min)	4.6	3.4	4.3	3.4
IMC (~21%)	Avg arrival delay (min)	6.2	6.1	7.1	7.0
	Avg departure delay (min)	9.4	7.0	8.0	5.5

Source: Landrum & Brown, 2024.

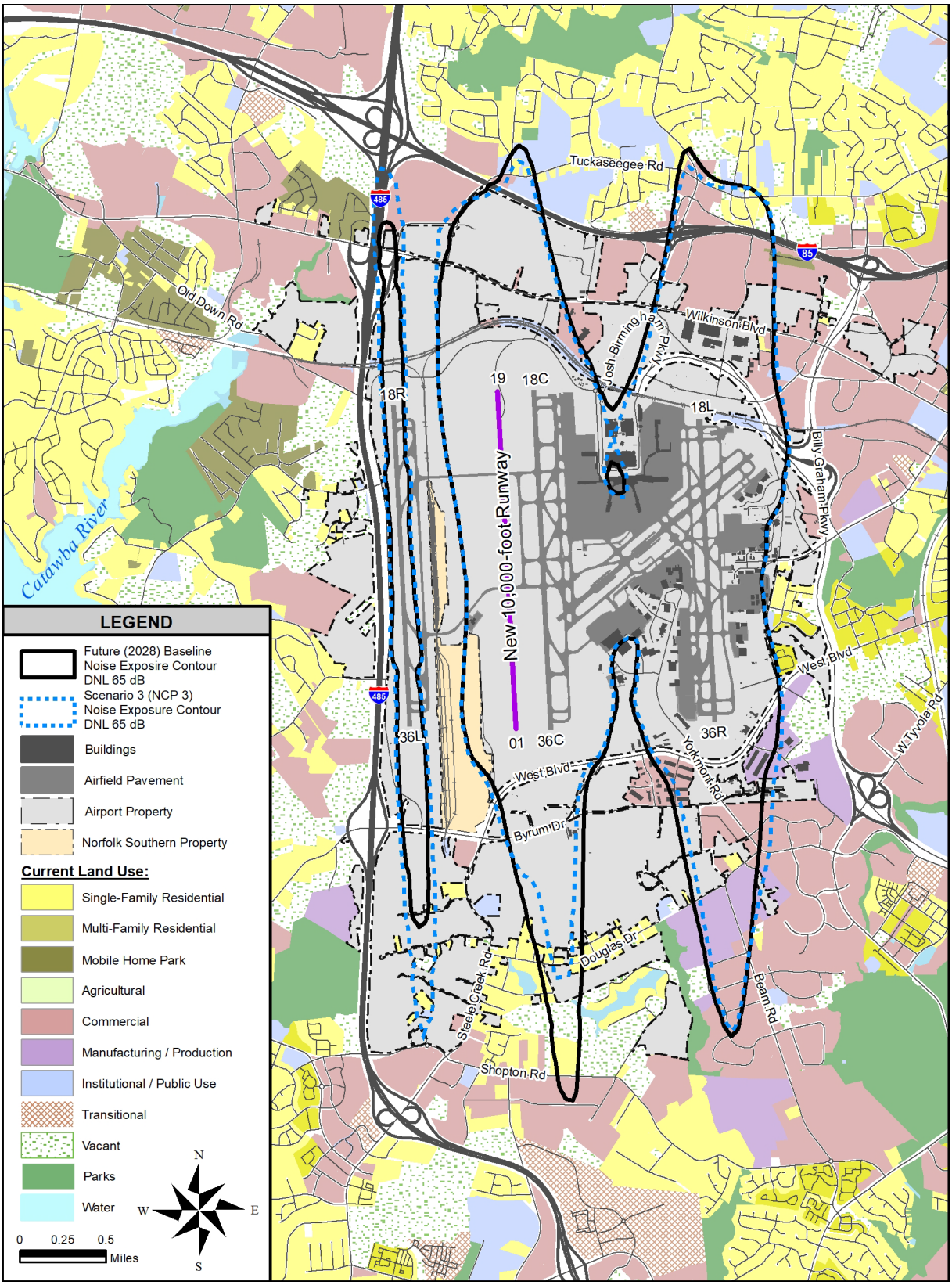
Table E-32 Scenario 3 Housing, Population, and Noise-Sensitive Sites

	DNL 65-70 dB	DNL 70-75 dB	DNL 75+ dB	Total
Housing Units				
Housing Type				
Single-Family Residential	60	0	0	60
Multi-Family Residential	94	0	0	94
Manufactured Home	63	0	0	63
Total Housing Units	**217**	**0**	**0**	**217**
Population				
Total Population[1]	**620**	**0**	**0**	**620**
Noise-Sensitive Facilities				
Schools / Educational Facilities	3	0	0	3
Churches / Places of Worship	3	0	0	3
Libraries	0	0	0	0
Hospitals	0	0	0	0
Nursing Homes	0	0	0	0
Outdoor Music / Amphitheater	0	0	0	0
Other Uses[2]	n/a	0	0	0

Notes: 1. Total population estimated based upon the housing counts multiplied by the 2010 Census average household size for each Census Block Group.
2. Other uses that are considered noise-sensitive at or above DNL 70 dB includes sports arenas, zoos, nature exhibits, amusement parks, camps, resorts, golf courses, stables, and office or publicly accessible portions of commercial or manufacturing facilities.

Source: Landrum & Brown, 2024.

Exhibit E-49 Comparison of Future (2028) Baseline versus Scenario 3 Noise Exposure Contour



Source: Landrum & Brown, 2024.

Scenario 4 (NCP 4)

NCP Scenario 4 (NCP 4) includes four noise abatement alternatives:

Run-Up Locations

- NA-A-1: Establish a run-up location on the deice pad and northeast airfield that are currently under construction. Maximize the use of midfield run-up locations over those located on the east side of the Airport.
- NA-A-2: Conduct an assessment of ground run-up procedures after construction of the new fourth parallel runway to identify run-up locations in the midfield of the Airport.

Divergent Headings – North Flow

- NA-F-1: Increase the number of departure headings for north flow operations while maintaining existing approved headings and maximizing departure corridors.

Divergent Headings – South Flow

- NA-G-4: Maximize the number of divergent headings for south flow departures while maintaining a 15° separation between headings. This would require the elimination of the 2-mile restriction.

Nighttime Runway Use

- NA-E-3: Focus nighttime north-flow arrivals on the runway that typically receives fewer arrivals during the full 24-hour period (Runway 36R). Due to their close proximity, consider Runways 1/19 and 18C/36C as one runway by aggregating their volumes when determining which runway receives fewest arrivals.
- NA-E-2: Designate Runways 18L, 18C, and 18R for south flow arrivals by turbojet aircraft between 10:00 p.m. and 7:00 a.m.

NCP 4 is identical to NCP 3, replacing NA-E-1 with NA-E-3 for nighttime north-flow arrivals. Noise impacts between the DNL 60 and 65 dB noise exposure contour for NA-E-1 and NA-E-3 were estimated to evaluate if there are any notable differences between the two alternatives. The results demonstrated NA-E-3 would result in a notably higher increase in noise impacts between the DNL 60 and 65 dB noise exposure contour when compared to the Future (2028) Baseline than E-1 (NA-E-1 had an increase of 237 housing units and NA-E-3 had an increase of 572 housing units). Therefore, NA-E-3 performed worse than NA-E-1. As such, NCP 4 was eliminated from consideration and did not proceeding for consideration.