

July 9, 2020

Mr. Michael O’Harra
Southern Region Regional Administrator
Federal Aviation Administration
1701 Columbia Ave.
College Park, GA 30337

Mr. O’Harra,

The Charlotte Douglas International Airport Community Roundtable (ACR) is hereby submitting a slate of six recommendations for the FAA to consider implementing to reduce the airplane noise effect on the population resulting from recurring overflights of aircraft arriving and departing Charlotte Douglas International Airport (CLT).

The ACR has spent considerable time and energy to:

1. Become educated on the current CLT aircraft operating procedures
2. Understand the existing noise exposure resulting from CLT aircraft operations
3. Develop a set of criteria for evaluating alternatives to existing procedures
4. Generate potentially viable solutions to provide noise relief to nearby residents
5. Provide a slate of recommendations for FAA consideration for implementation

While the ACR has learned a lot over the past three years in terms of aircraft operations, federal regulations and noise exposure, we are not the experts in these areas and are reliant on the FAA to assist us in our pursuit for noise exposure equity throughout the region. The six recommendations provided in this submittal provide ideas for the FAA to consider, but ultimately the purpose of submitting this slate of recommendations is to have the FAA clearly understand the problems we are attempting to solve and work with the ACR to find solutions.

We are not naïve to think that our recommendations, as presented below, are perfect and fully implementable, but believe we have provided the definitions of the problems along with potential solutions so that the FAA can evaluate the recommendations and implement if they are implementable or return to the ACR with alternative solutions that may achieve the intended results.

The intended results are simple: (1) increased dispersion of aircraft departures and (2) decreased noise levels from aircraft arrivals. We understand that arrivals cannot be dispersed, so we have developed other potential recommendations aimed at reducing noise levels on arrivals rather than increasing dispersion.

The formal requests included in this document have been approved by unanimous vote by the ACR during the meeting conducted July 8, 2020.

Note: an external appendix including various figures and analysis has also been provided on a USB drive.

A. Background Information

In June of 2017, the Charlotte Douglas International Airport Community Roundtable (ACR) was created under guidance from the FAA with the following Mission Statement:

To provide the City of Charlotte Aviation Department (Airport) and the Federal Aviation Administration (FAA) with broad-based community input into airport-related noise impacts and to find, where possible, practical solutions and recommendations for the FAA to consider when determining aircraft operating procedures at Charlotte Douglas International Airport.

The ACR is comprised of 25 members representing the greater Charlotte Metropolitan region, including residents from neighboring Gaston, Lincoln, and York Counties. The general public were invited to apply for membership to the ACR through a brief application process, which stated the goals of the ACR and avoided potential conflicts of interest.

In the event that the City of Charlotte Aviation Department was unable to locate interested applicants under these parameters, local government representatives were used to recommend representatives for the group. As such, members of the ACR act as liaisons for their respective communities.

In September of 2018, the Airport contracted with Harris Miller Miller and Hanson Inc. (HMMH) to assist the ACR to assess potential ACR recommendations in terms of feasibility of implementation and effects per the ACR criteria.

After nearly three years of education, research, and feedback, the ACR has drafted a slate of six recommendations for FAA consideration, review and implementation to address two predominant ACR concerns: **concentration of arrival overflights with extended periods of level flight** and **aircraft departures recurring over relatively concentrated areas of the community.**

B. ACR CRITERIA

Nearly all noise complaints and concerns in the Charlotte area come from outside of the 65 DNL contour, and each of the above proposed recommendations involves change outside of this area. In order to reconcile these concepts, the ACR created a set of distinct criteria for judging disturbance from aircraft noise. As noted in the 2011 Volpe study **Dose-response relationship between DNL and aircraft noise annoyance: contribution of TNO** (see Appendix pg 2-29)

the primary source of noise disturbance from aeronautical activity is generally not from single event noise, but more closely tied to noise events from repetitious overflights.

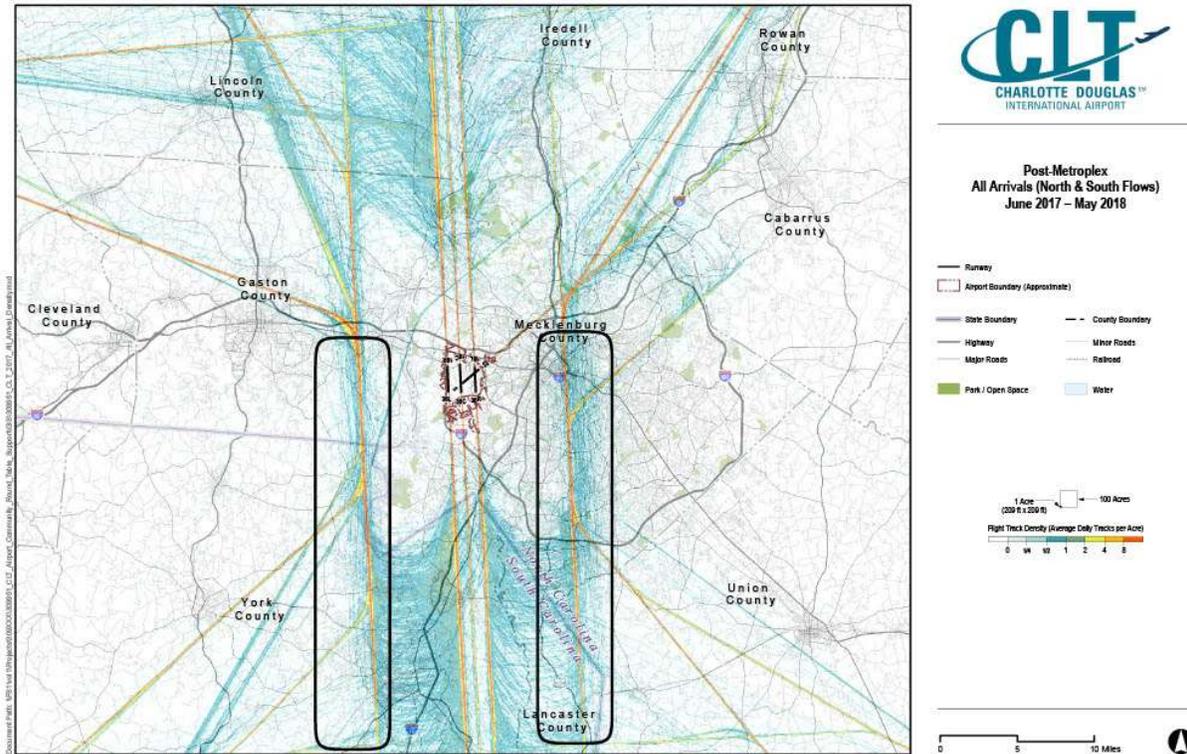
The ACR used the number of noise events during a day above 70 dB, or the NA70 noise metric, to help assess annoyance from repetitious overflights. This simply indicates a single noise event in which an aircraft overflight generates more than 70 dB as it flies by a particular area. Other metrics are also based on the NA70 and seek to calculate about how many of these events happen over a time frame. The ACR developed the following criteria for evaluation based on our experiences of aircraft operations and resulting noise levels:

- 5 events over 70 dB per hour = **Comfort**
- 10 events over 70 dB per hour = **Concern**
- 20 events over 70 dB per hour = **No Go**
-

The objective of the ACR, of course, is to minimize the number of areas experiencing a ‘Concern’ or ‘No Go’ level and to maximize areas experiencing noise within the ‘Comfort’ range. The ACR-proposed recommendations result in a greater number of residents experiencing a reduction in noise under these criteria. An overview of specific estimates on the effect of the population can be found for each recommendation in **Appendix pg 30-32**.

ACR Concern – Concentration of Arrival Overflights with Extended Periods of Level Flight

Due to the unique configuration makeup of the CLT airport and the lack of any nearby airspace conflicts, the CLT arrival patterns largely follow a standardized pattern of various flight segments at 90° angles (i.e. a standard, definable downwind, base, and final approach leg in a rectangle – see figure below). However, because of the large amount of traffic operating in and out of CLT, downwind patterns often get extended upwards of 30 miles in order to safely space traffic and sequence the arrivals. This results in longer arrival routes, increased fuel burn and higher expenses for airlines to arrive at CLT. We believe a solution to reduce the length of the downwind leg would benefit everyone including the airlines and communities. Unlike departure traffic, which provides arrivals at CLT follow tight RNAV procedures after the FAA implemented the Metroplex.



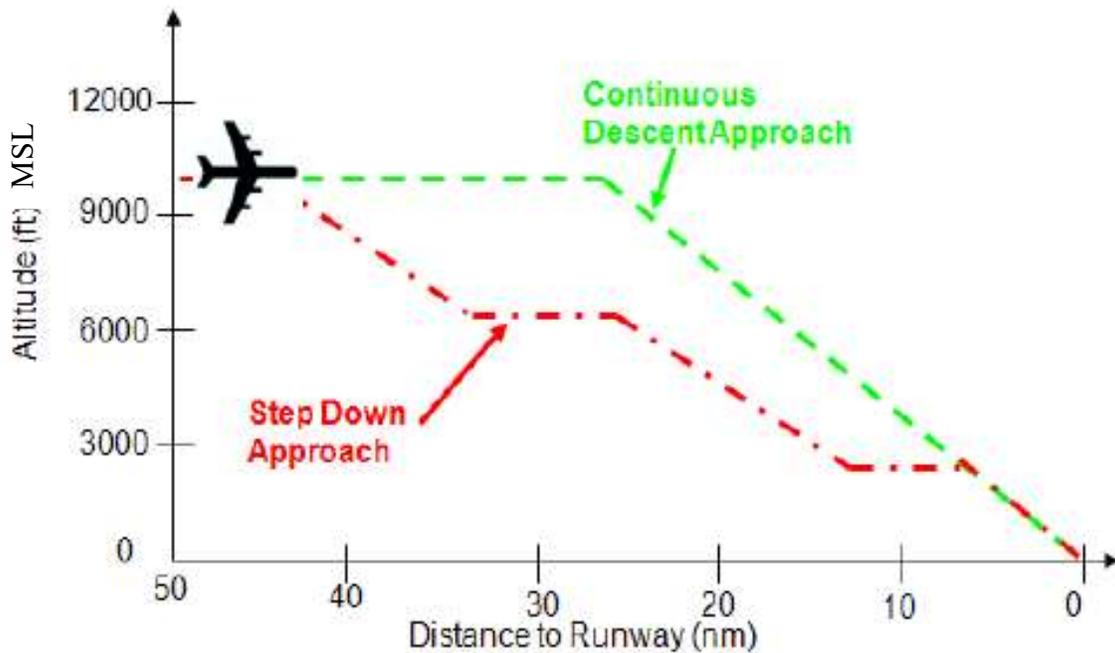
A flight track density map of arrivals at CLT. Note extended downwind indicated in black rectangle. Detailed view found in **Appendix pg. 33**

In general, these procedures lead to a degree of dissatisfaction among residents and lead to concentrations of aircraft with a number of level flight segments at high power settings. As such, the following three recommendations were developed with the intent of reducing noise levels on the ground without modifying arrival routes by either raising altitudes along these paths or using a low-power arrival procedure that also maintains a continuous descent rather than any level flight segments.

The ACR offers the following three recommendations for reducing noise levels in the communities from arriving aircraft. Please review these recommendations to determine feasibility for implementation. If you find reason these recommendations are not feasible, please provide alternatives to our recommendations and/or combine our recommendations for better results. The ACR remains open to other ideas that result in a noise reduction from CLT aircraft arrivals to the communities under the arrival flight segments. Note: these recommendations were developed without the ability to accurately estimate the effect on Airport capacity and throughput.

Recommendation 1: Greater Use of Continuous Descent Approaches

*Implement Continuous Descent Approaches (CDA) under 12,000 feet MSL. Expected to reduce noise levels along current arrival flight paths until aircraft intercept the final approach. In 2019, the FAA indicated that CLT would be receiving TSAS (Terminal Sequencing and Spacing) and EOR (Established on RNAV) procedures estimated for calendar year 2021. The ACR would like the FAA to examine other methods of implementing continuous descent approaches in lieu of having aircraft hold at low altitudes for miles on the downwind phase of flight. Under preliminary analysis using the above ACR criteria this recommendation is expected to have a net benefit in noise reduction to over 276,000 residents in the Charlotte Metropolitan area. More details can be found in **Appendix pg. 34**.*



Recommendation 2: Maintain 6,000' Arrival Minimum Altitude until Final Approach Course

Raise the minimum altitude for aircraft to maintain 6,000 feet MSL¹ on arrival until they intercept the 3-degree glide slope for each runway. Raising the minimum altitude on the extended arrival legs is expected to reduce noise levels along the extended arrival legs, particularly for those aircraft at high power to maintain level flight.

Currently arrivals to CLT often fly extended downwind arrival legs for upwards of 30 miles or maintain low altitudes at level flight when arriving straight-in to the Airport. Due to the unpredictability of aircraft being able to join final, air traffic controllers often direct aircraft down to and below 4000 feet MSL so that the arrival can turn base at first availability and join the straight-in arrivals at the same altitude.

Per the understanding of the ACR, this was not always the case at CLT. Previously there had been a preference for controllers to 'keep the aircraft high' as much as possible on the downwind, and part of this recommendation is that this preference be returned.

*The ACR is proposing that no aircraft be permitted to descend below 6,000 feet MSL until a reasonable estimate of joining the final approach on the 3-degree glideslope can be made. This adjustment to arrival procedures would provide a clear, demonstrable reduction in noise levels in areas along the existing downwind approach and straight-in arrivals, which encompasses nearly 320 square miles. Under preliminary analysis using the above ACR criteria this recommendation is expected to have a net benefit in noise reduction to over 376,000 residents in the Charlotte Metropolitan area. **Further details can be found in Appendix pg. 35.***

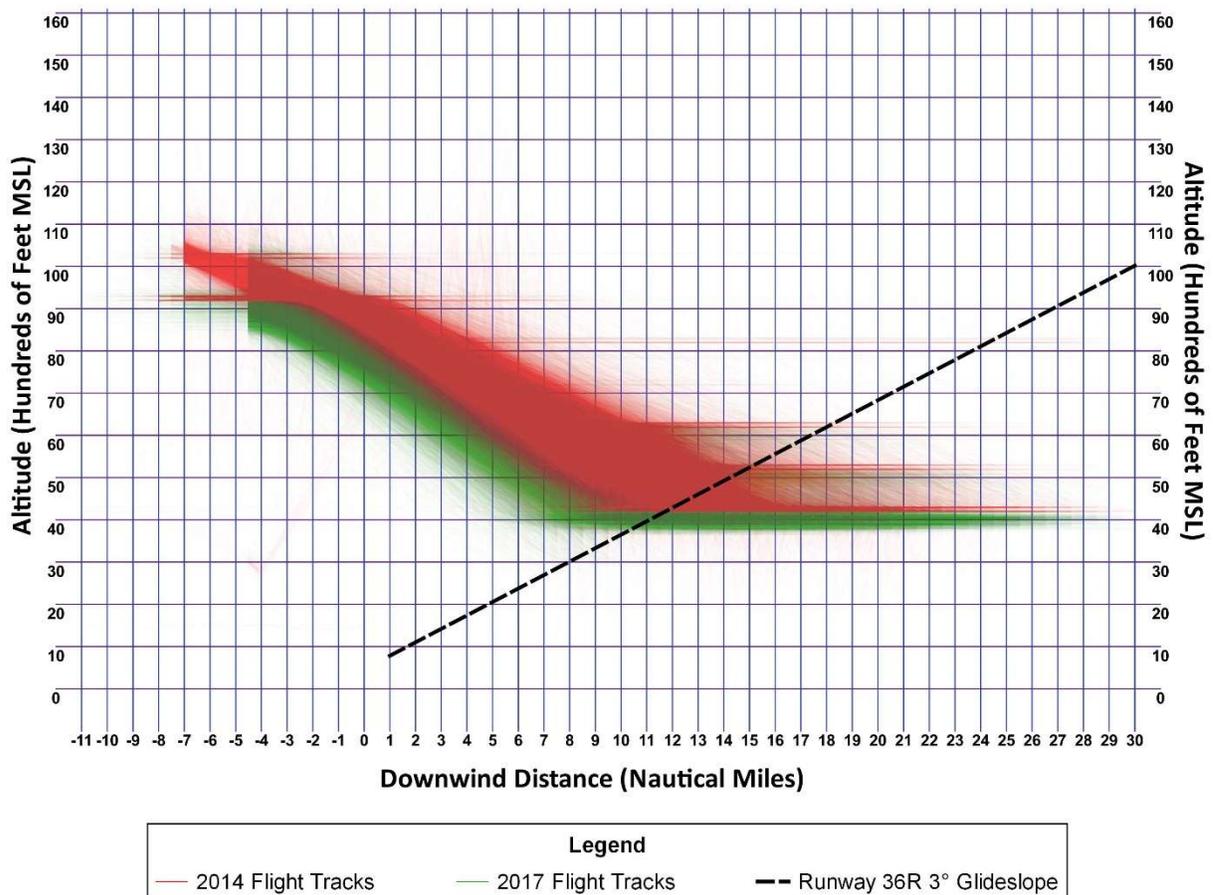
¹ Mean Sea-Level. Note: Airport Reference Point lies at an elevation of 747 feet MSL.

Recommendation 3: Return CAATT Waypoint to Pre-Metroplex location

Bring altitudes on CHSLY arrival closer to pre-Metroplex altitudes. As noted in Recommendation 2, raising the altitude on the downwind arrival legs is expected to reduce noise levels along the downwind leg, particularly for those aircraft at high power to maintain level flight.

Note: a memo detailing the requested changes was forwarded to the FAA by the City of Charlotte Aviation Department dated November 7th, 2018. To the understanding of the ACR this recommendation was previously accepted by the FAA, but the preference of the Administration is to also include this recommendation with all other ACR recommendations.

*Under preliminary analysis using the above ACR criteria this recommendation is expected to have a net benefit in noise reduction to over 80,000 residents in the Charlotte Metropolitan area. More details can be found in **Appendix pg. 36**.*



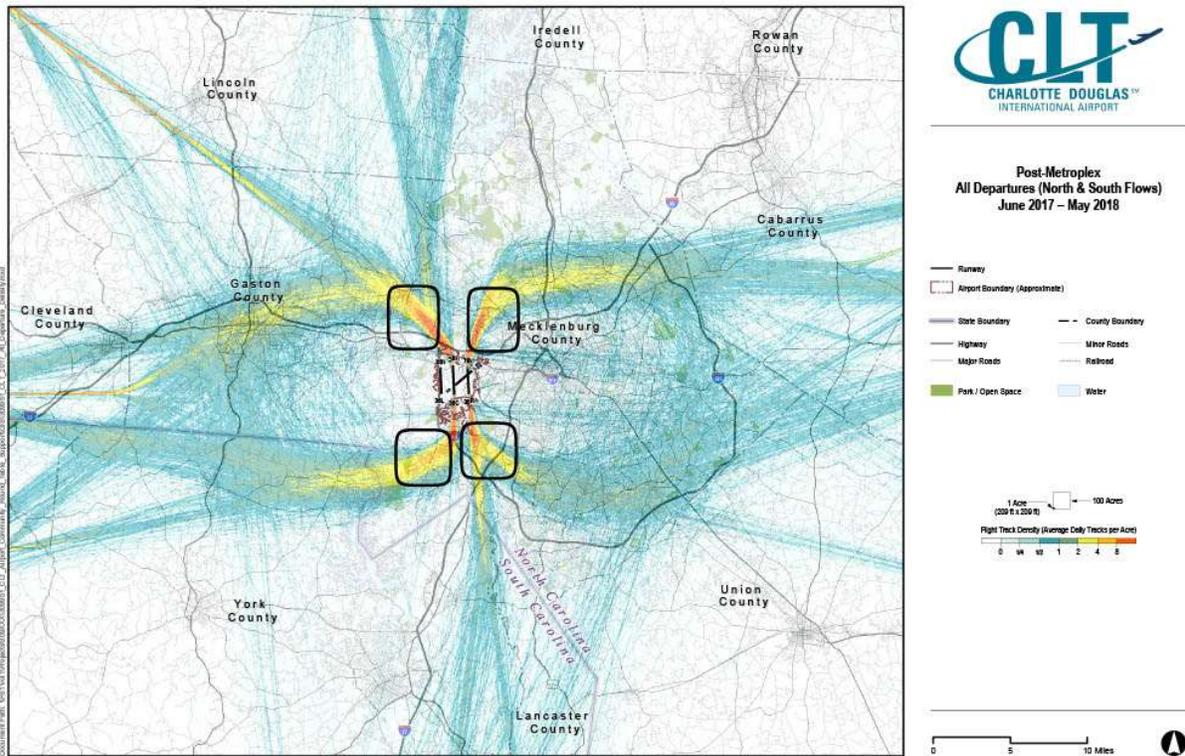
Above: diagram showing altitudes above CAATT/EPAYE both pre- and post-Metroplex

Possible Outcomes of Implementation of Recommendation

Each of the above measures are expected to have some effect on the arrival rate of the Airport. At this time, the exact effect on the arrival rate is unknown and speculative at best. Preliminary analysis by HMMH indicates that changes to the arrival rate may in fact be less than initial estimates by the FAA. However, we are reliant on the FAA to determine the effects on CLT throughput. Knowing that throughput may be an issue to overcome, the ACR modified the implementation of the 6,000-ft MSL minimum altitude for extended downwind segments to allow for lower altitudes if the aircraft need not be extended on the downwind. We believe this should relieve any issues on throughput with that particular recommendation, but await the FAA's review of throughput for the arrival recommendations.

ACR Concern – Recurring Departures over Specific Areas

CLT currently utilizes a series of Open-SID procedures for departures, combined with a longstanding noise abatement procedure which forces aircraft departing to the south to fly runway heading for 1.6 miles DME² before making turns to the east or west. While the open-SID provides for greater dispersion than a standard RNAV departure experienced at other U.S. airports, this combination of procedures continues to be perceived as having little variation from the ground level (residences). The following three recommendations all seek to address this issue and strive to create greater levels of dispersion, resulting in fewer aircraft flying repeatedly over any one particularly narrow area.



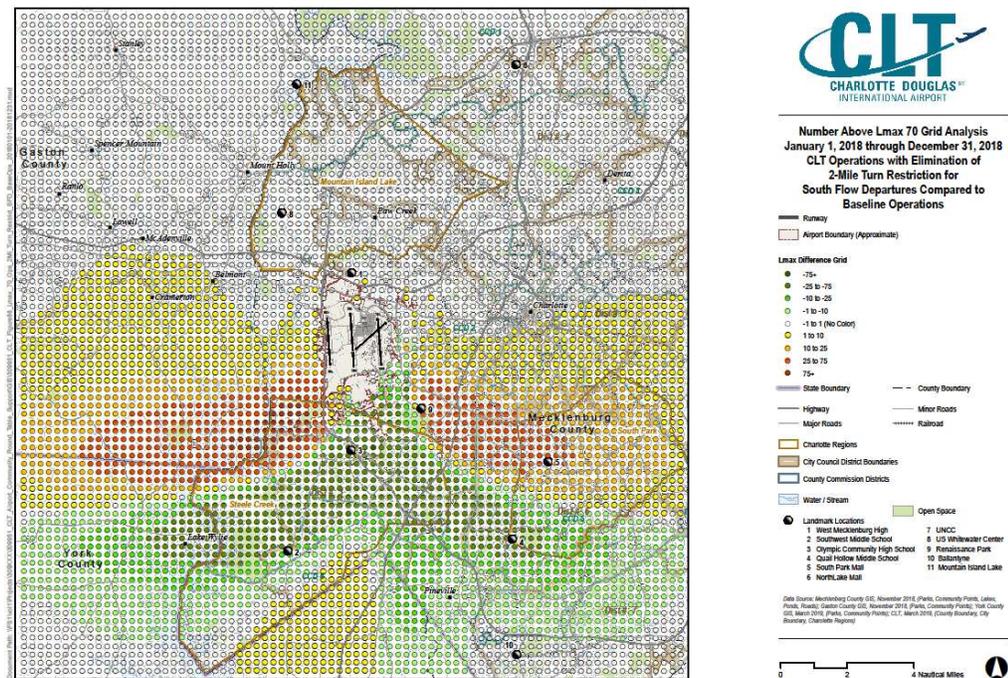
A flight track density map for departures at CLT. Note greater concentration of flights closer to the Airport. Expanded view found in **Appendix pg. 37**.

² Distance Measuring Equipment

Recommendation 4: Remove the 2-Mile Restriction on Departure³

Currently, southern departures from CLT cannot turn until they are 1.6 miles DME from the runway end. Eliminating this restriction would allow aircraft to turn on course sooner, thereby reducing noise impact over communities along the extended southern centerlines but shifting the noise closer to the airport and along east and west areas where turns would then occur. This alternative modified flight tracks so that aircraft turned on course upon reaching a safe altitude near the runway's departure end. Implementation of this recommendation would be dependent on other departure-based recommendations, i.e; this recommendation would not be supported without implementation also of divergent headings, changed initial turns, etc. **See Section C: Grouping and Prioritization.**

Under preliminary analysis using the above ACR criteria, this recommendation as a standalone is expected to have a net **increase** in noise for over 166,000 residents. As such this recommendation cannot be implemented without an appropriate reduction in noise over an associated area by implementing one or more of the other departure recommendations. Further details found in **Appendix pg. 38.**

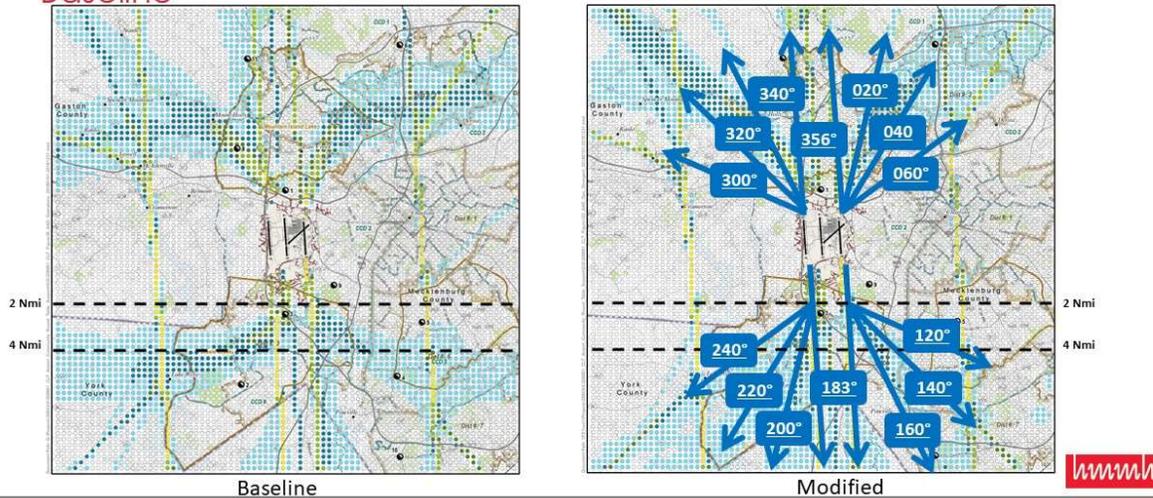


The above diagram shows projected changes in the daily number of noise events over 70 decibels.

³ Refers to Part 150 Measure NA-7. See Appendix pg. 50.

Recommendation 5: Utilize Divergent Departure Headings

Annual Average Day Aircraft Overflights Analysis: 2018 Operations with Multiple Divergent Headings Compared to Baseline

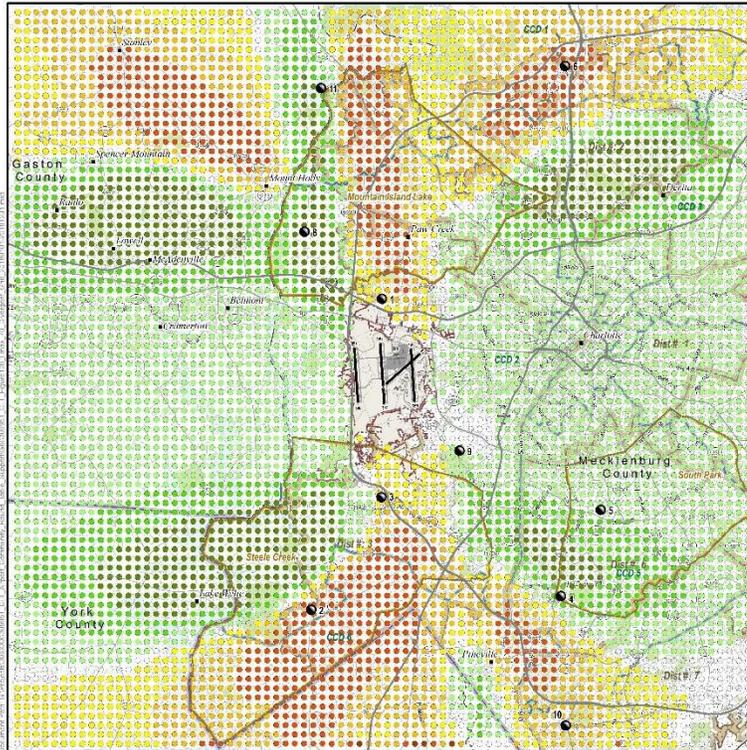


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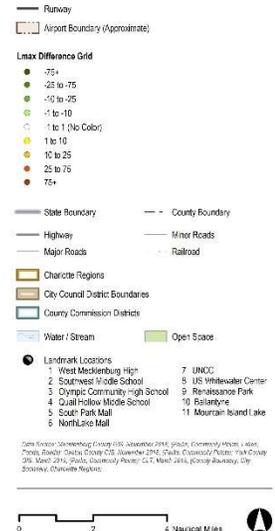
Above: potential divergent headings modeled in AEDT

The divergent departure heading alternative assigns departure headings based on the aircraft's destination. These variable headings not only allow aircraft to fly a more direct path to destination, resulting in time and fuel savings for operators, but also disperse traffic over a wider area, dividing the noise effects over multiple communities. This analysis used 7 headings for both north and south flow departures, for a total of 14 headings. These headings diverged at the runway end for north flow and at 2 miles from the runway end for south flow. However, it is possible that this recommendation be combined with the removal of the two-mile restriction recommendation to improve efficiency as long as those aircraft are relatively equally dispersed among all divergent headings.

Under preliminary analysis using the above ACR criteria, this recommendation is expected to have a net benefit in noise reduction to over 112,000 residents in the Charlotte Metropolitan area.



Number Above Lmax 70 Grid Analysis
January 1, 2018 through December 31, 2018
CLT Operations with Divergent Headings Compared to
Baseline Operations

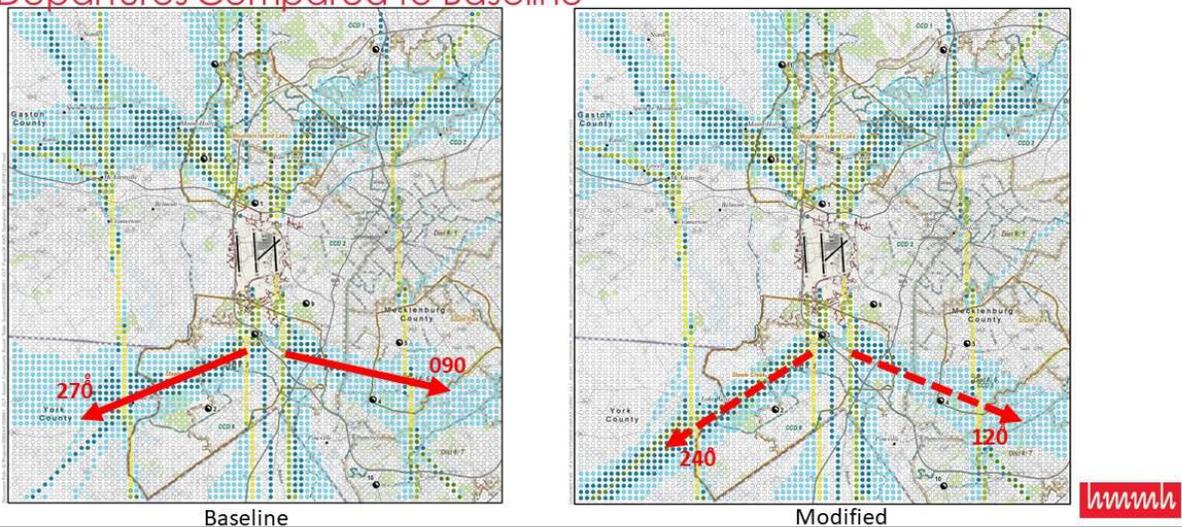


More details can be found in *Appendix pg. 39-48.*

Recommendation 6: Change Headings of First Turns off Runways 18L and 18C

After departure, aircraft turn to a given heading. This alternative proposes a change to this specified heading so that they fly over communities that they flew over prior to the FAA's implementation of the Metroplex, which tend to be less populated areas. This reduces the effect of noise on more densely populated areas and fosters the desire by the ACR to return to pre-Metroplex flight paths. This analysis changes the headings for east and west departures by 30 degrees, from 270 to 240 degrees for west departures and 090 to 120 degrees for east departures. Under preliminary analysis using the above ACR criteria this recommendation is expected to have a net benefit in noise reduction to over 524,000 residents in the Charlotte Metropolitan area.

Annual Average Day Aircraft Overflights Analysis: 2018 Operations with Change in Initial Heading on South Flow Departures Compared to Baseline



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above: demonstration of potential headings proposed. Further information found in **Appendix pg.42**.

Possible Outcomes of Implementation of Recommendations

As discussed above, the primary intent of these recommendations is to increase the existing level of dispersion between departing aircraft at CLT. Implementation of any one or more of these recommendations may have varying effects on Airport throughput and efficiency. However, it must be noted that CLT has *historically* placed an emphasis on balancing noise abatement and throughput: procedures such as current Open-SIDs, the two-mile departure restriction, and the exclusion of departures from current RWY 18R/36L are all pertinent examples of this priority.

C. Grouping and Prioritization

The ACR is supportive of grouping our recommendations to better achieve success, which is achieved through increased dispersion for departures and reduced noise levels for arrivals. In terms of priority, we place equal prioritization on increasing departure dispersion and reduced noise levels on arrivals. We understand that CDA is not possible at this time for most of the arrivals into CLT. Therefore, we place emphasis on what is more easily implemented, such as raising the CAATT/EPAYE waypoint altitude and raising the minimum downwind leg altitude to 6,000 feet MSL for those aircraft being extended great distances. For the departures, we also want greater dispersion as soon as possible and we are not sure how to prioritize our recommendations as we want the greatest dispersion possible. It appears that nearly all six proposed recommendations can be implemented simultaneously.

Note: Recommendation 4: Remove the 2-Mile Restriction on Departure is unique among the six recommendations proposed. The 2-mile turning restriction is considered a long-existing noise abatement strategy by the Charlotte Douglas International Airport, and simply removing this measure as written today would only shift departure operations closer to the Airport with no appreciable benefit. Therefore, it is the intent of the ACR that Recommendation 4 ***only be considered in conjunction with one of the other departure recommendations or another measure proposed by the FAA that increase the level of dispersion seen today.***

The ACR does not wish to set priority to the six recommendations or to the two categories of recommendations (arrivals and departures). Both arrivals and departures are equally important and affect different communities, and at this time the ACR does not want to imply that certain communities are affected by aircraft noise more harshly than others.

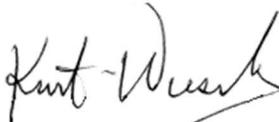
However, the ACR does have a desire for the FAA to consider **combining** multiple recommendations in order to maximize the benefit to the community.

Thank you for your consideration.

Sincerely,



_____,
Sara Nomellini, Chair, Airport Community Roundtable



_____,
Kurt Wiesberger, Vice Chair, Airport Community Roundtable