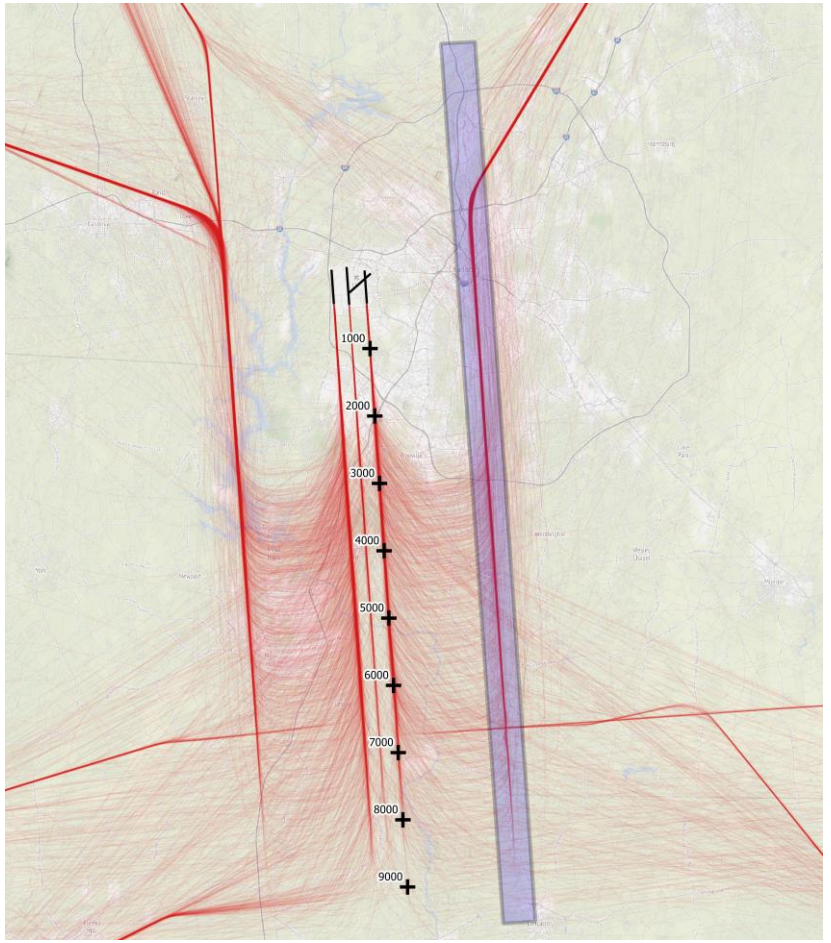
Review of FAA Alternative to ACR Recommendation 3

May 2022

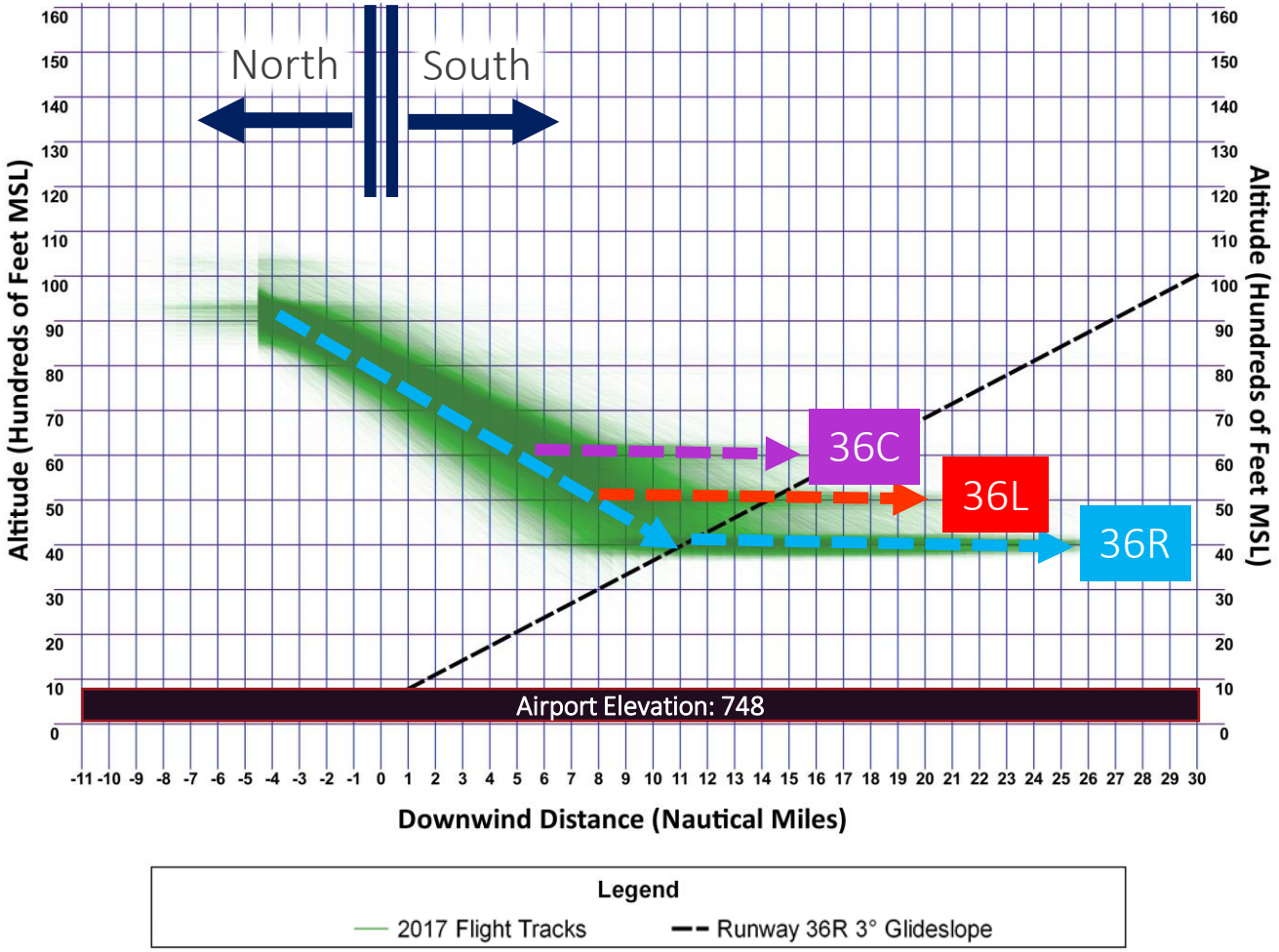
Review of ACR Recommendation #3

Increased arrival altitudes on downwind leg of CHSLY STAR



Downwind leg of CHSLY STAR

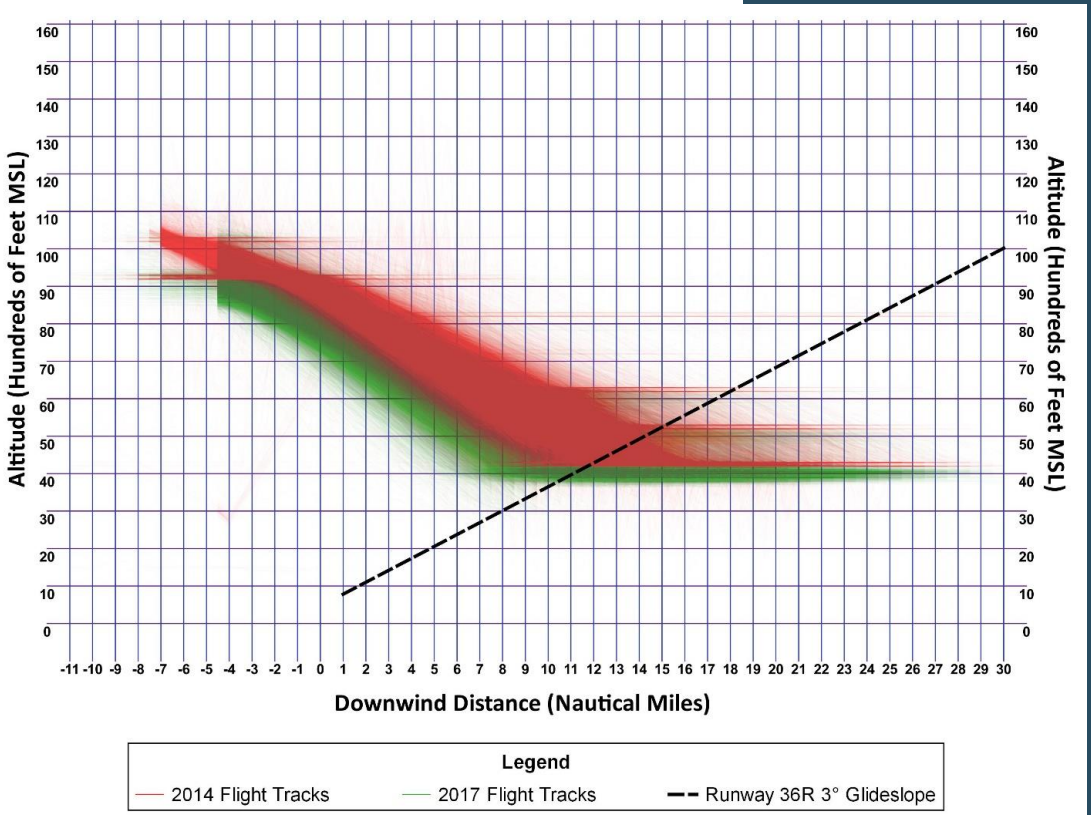
- Aircraft currently level off on the north flow east downwind before turning to intercept final approach at the following altitudes by arrival runway into CLT
  - 18L: 4,000 feet
  - 18C: 6,000 feet
  - 18R: 5,000 feet
- These altitudes are related to maintaining aircraft vertical separation of 1,000 feet during turn from the downwind leg to the final approach course



ACR Slate Recommendation 3
Return CAATT Waypoint to Pre-Metroplex location

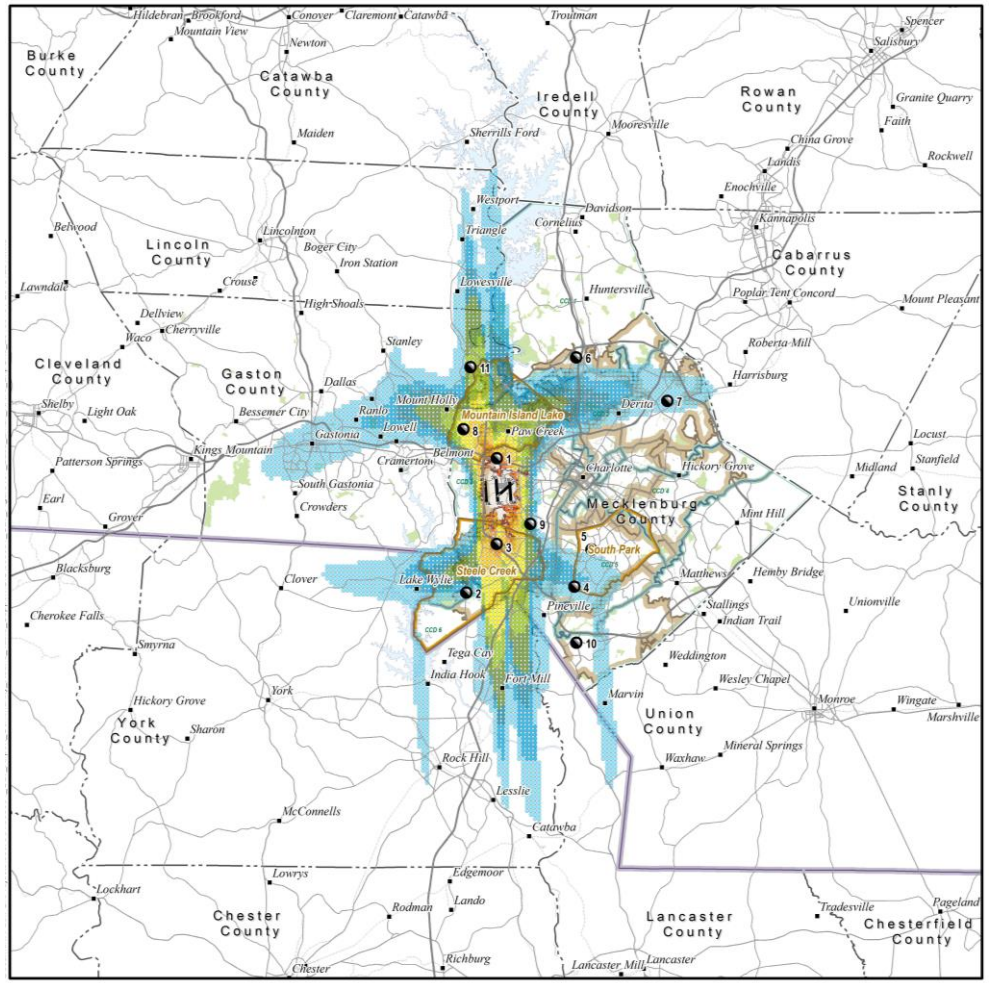
Affected one (eastern) downwind leg for north flow arrivals

- Bring altitudes on CHSLY arrival closer to pre-Metroplex altitudes
- Under preliminary analysis using the ACR criteria[1], this recommendation is expected to have a net benefit in noise reduction to over 80,000 residents in the Charlotte Metropolitan area
  - Analysis looked at raising CAATT and EPAYE by 1,000 ft
  - Analysis completed prior to submitting the ACR Slate to FAA

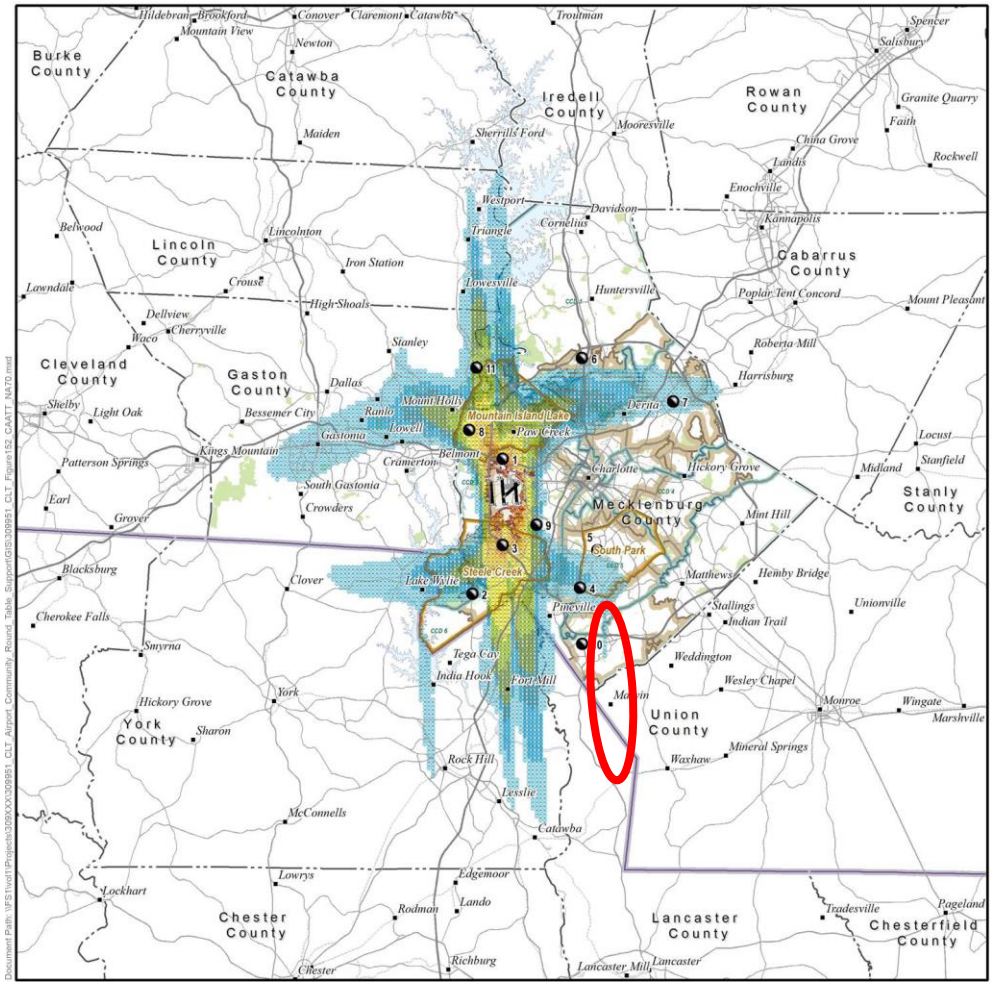


[1]ACR criteria is the number of aircraft noise events above 70 dB.

Number of Events Above 70 dB (N70)
Raised Altitudes on CHSLY STAR (North and South Flows Depicted)



2018 Baseline

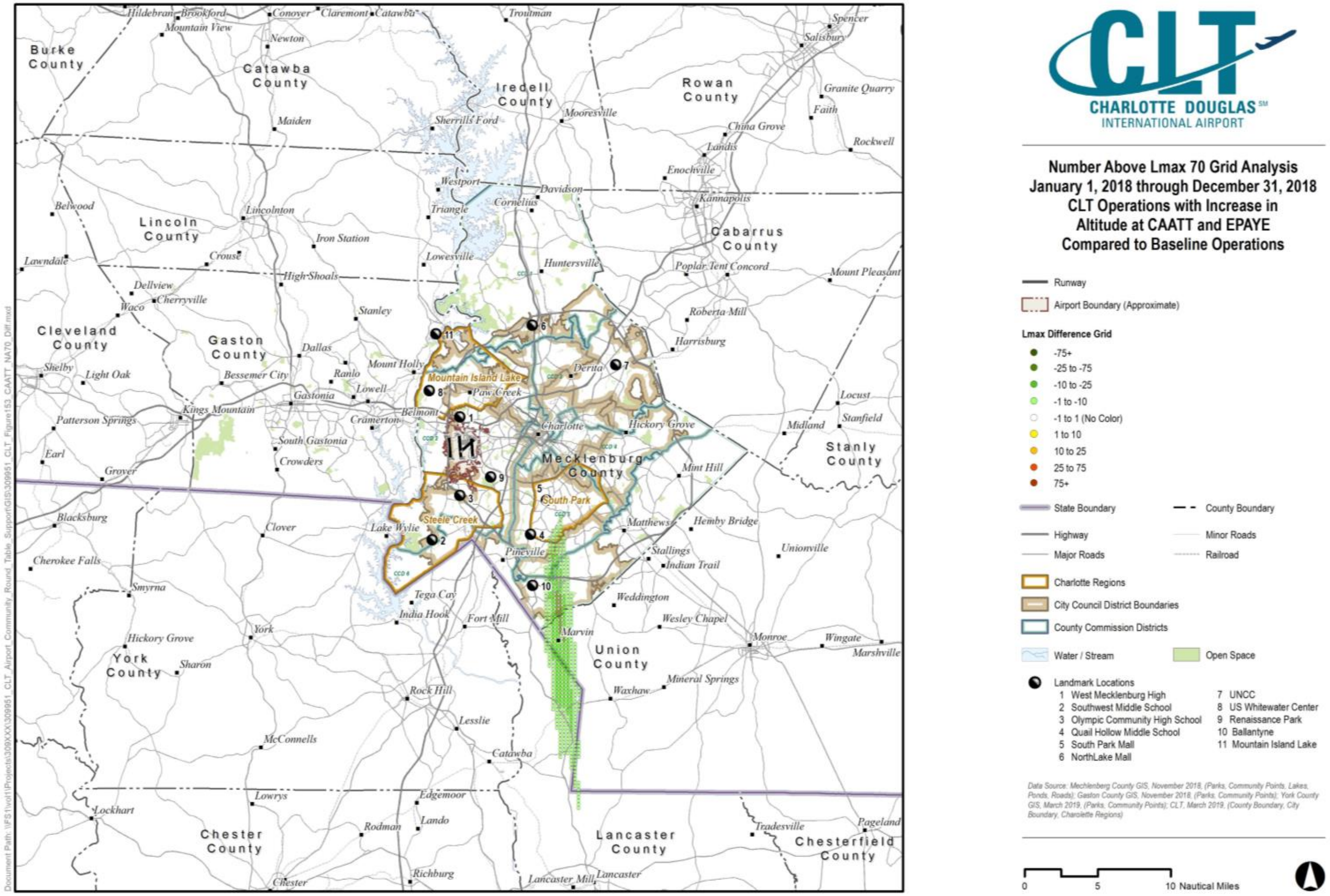


Alternative: Raise Altitudes at CAATT/EPAYE

Number of Noise Events Above 70 dB (N70)

Difference – Raised Altitudes on CHSLY STAR Compared to Baseline

N70 Difference Interval (Events)	Count of Grid Points / % Change	Count of Population / % Change
Less than -75	**0 / 0.0%**	**0 / 0.0%**
-75 to -25	**22 / 0.1%**	**5,092 / 0.2%**
-25 to -10	**165 / 0.4%**	**19,009 / 0.9%**
-10 to -1	**522 / 1.4%**	**56,143 / 2.6%**
-1 to 1	**37,592 / 98.1%**	**2,103,317 / 96.3%**
1 to 10	**0 / 0.0%**	**0 / 0.0%**
10 to 25	**0 / 0.0%**	**0 / 0.0%**
25 to 75	**0 / 0.0%**	**0 / 0.0%**
Greater than 75	**0 / 0.0%**	**0 / 0.0%**
Total	**38,301 / 100.0%**	**2,183,561 / 100.0%**



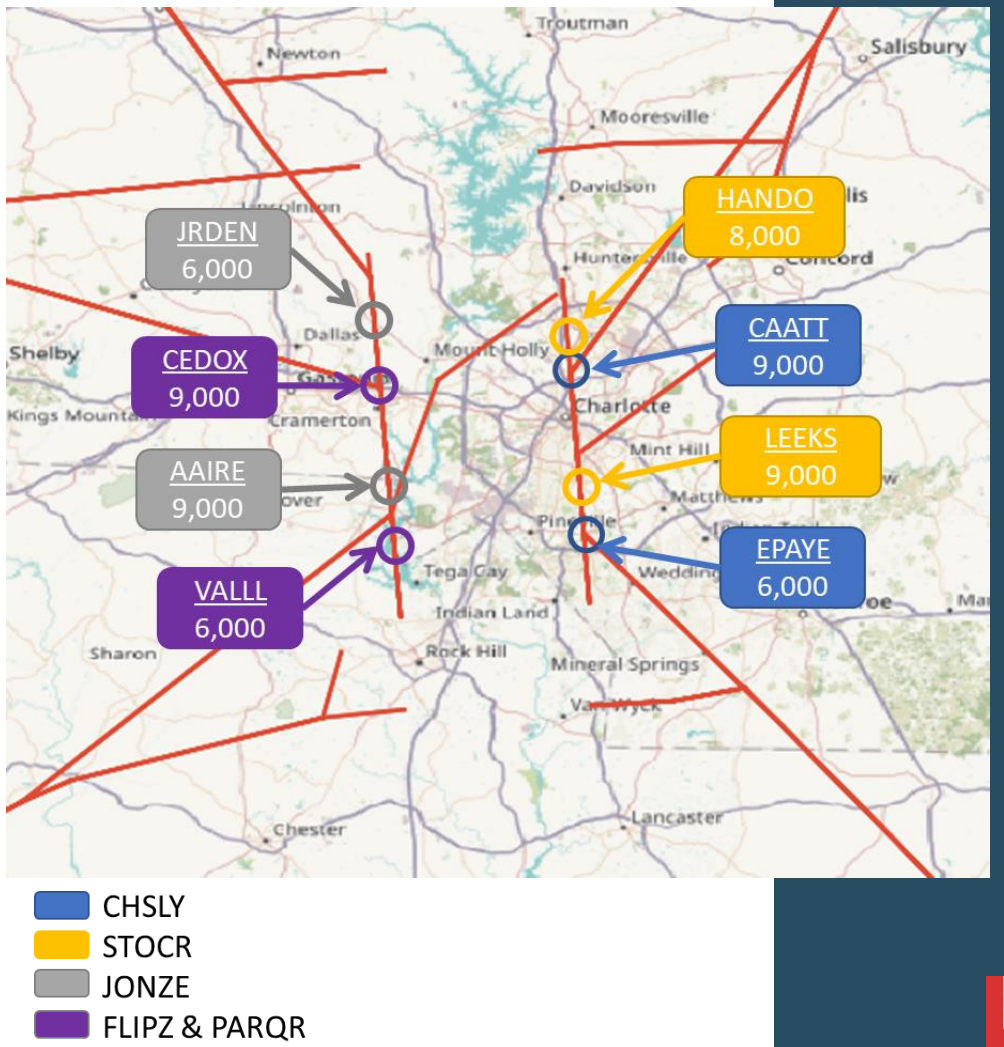
- 709 grid points (1.9%) / 80,244 people (3.7%) would experience fewer events above 70 dB Lmax with increased arrival altitude at CAATT
- No grid points or people would experience more events above 70 dB Lmax with increased arrival altitude at CAATT

FAA Proposed Alternative

Raise arrival altitudes on all four arrival downwind legs
– north and south flow
– east and west of CLT

FAA Alternative
Increased Altitudes on All Downwind Arrivals

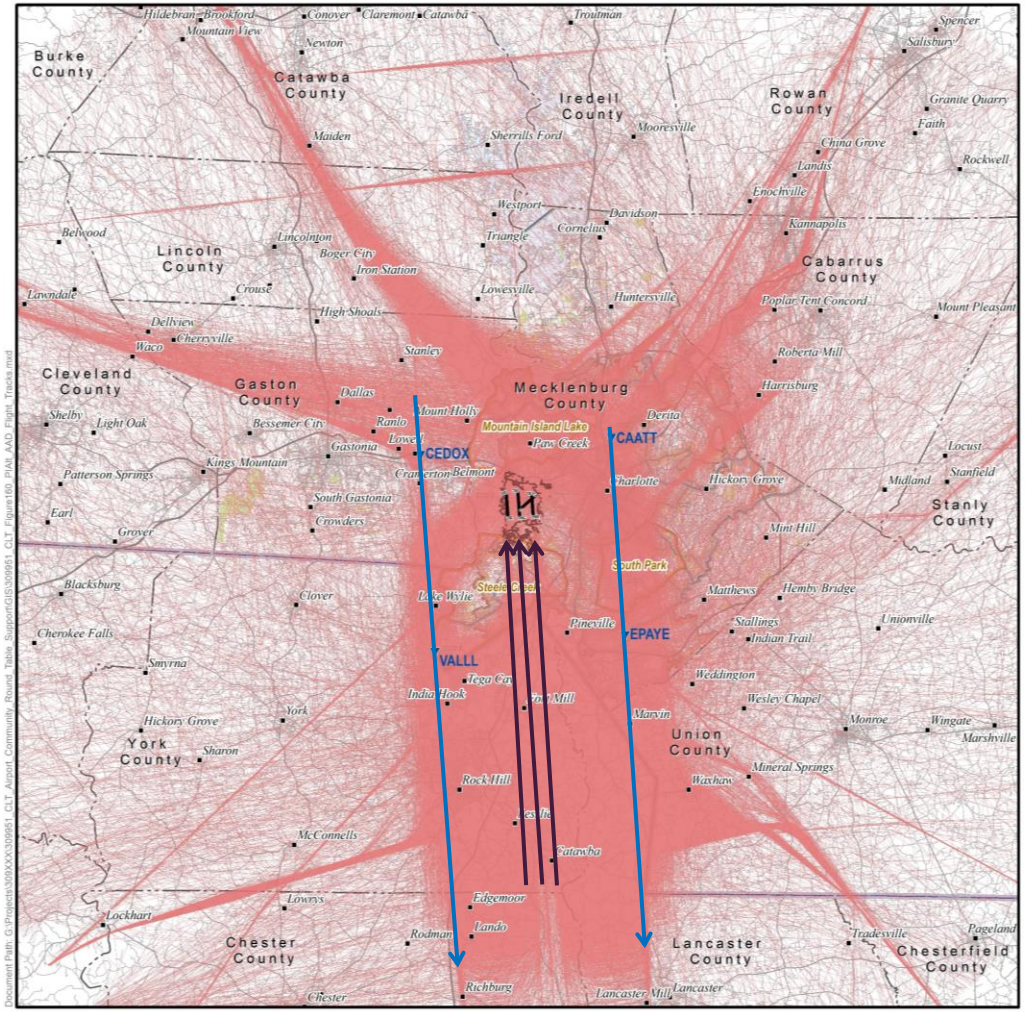
- Modify altitude at CAATT and EPAYE to 10,000 ft and 7,000 ft
  - 1,000 ft higher than current restrictions
  - No increase in flight miles or change to flight tracks
- Requires that the corresponding fixes for other STARs must be raised for operational continuity
  - 1,000 ft higher than current restrictions
  - JONZE STAR: AAIRE and JRDEN raised to 10,000 ft and 7,000 ft
  - FLIPZ and PARQR STARs: CEDOX and VALLL raised to 10,000 ft and 7,000 ft
  - STOCR STAR: LEEKS raised to 10,000 ft; HANDO remains at 8,000 ft



Estimated Flight Tracks, Runways 23 and 36

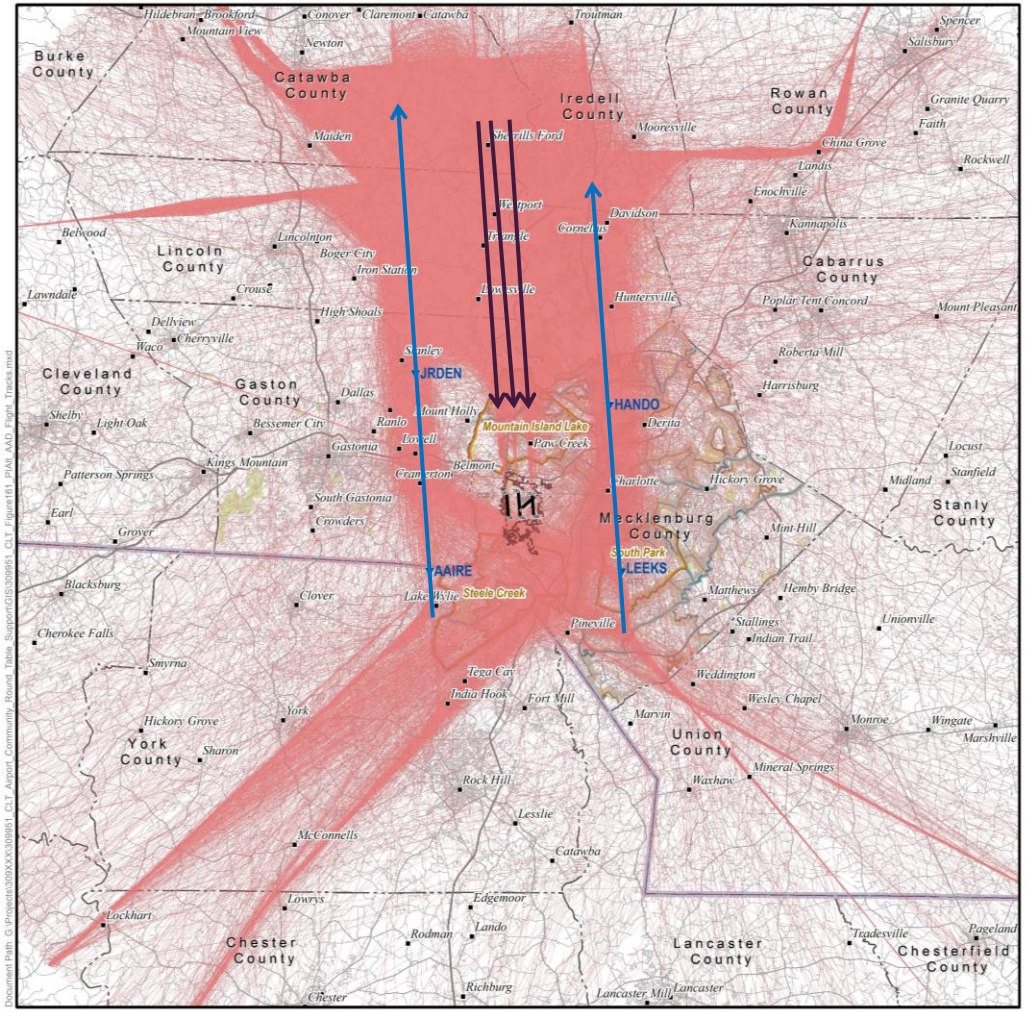
Raised Altitudes on All Downwind Arrivals (North and South Flows Depicted)

- Aircraft currently level off at the following altitudes based on arrival runway at CLT (% use of runway)
  - 36L: 5,000 feet (31.2%)
  - 36C: 6,000 feet (6.1%)
  - 36R: 4,000 feet (22.9%)
- Over 60% of aircraft on these downwind legs
  - Resulted in N70 events on downwind legs



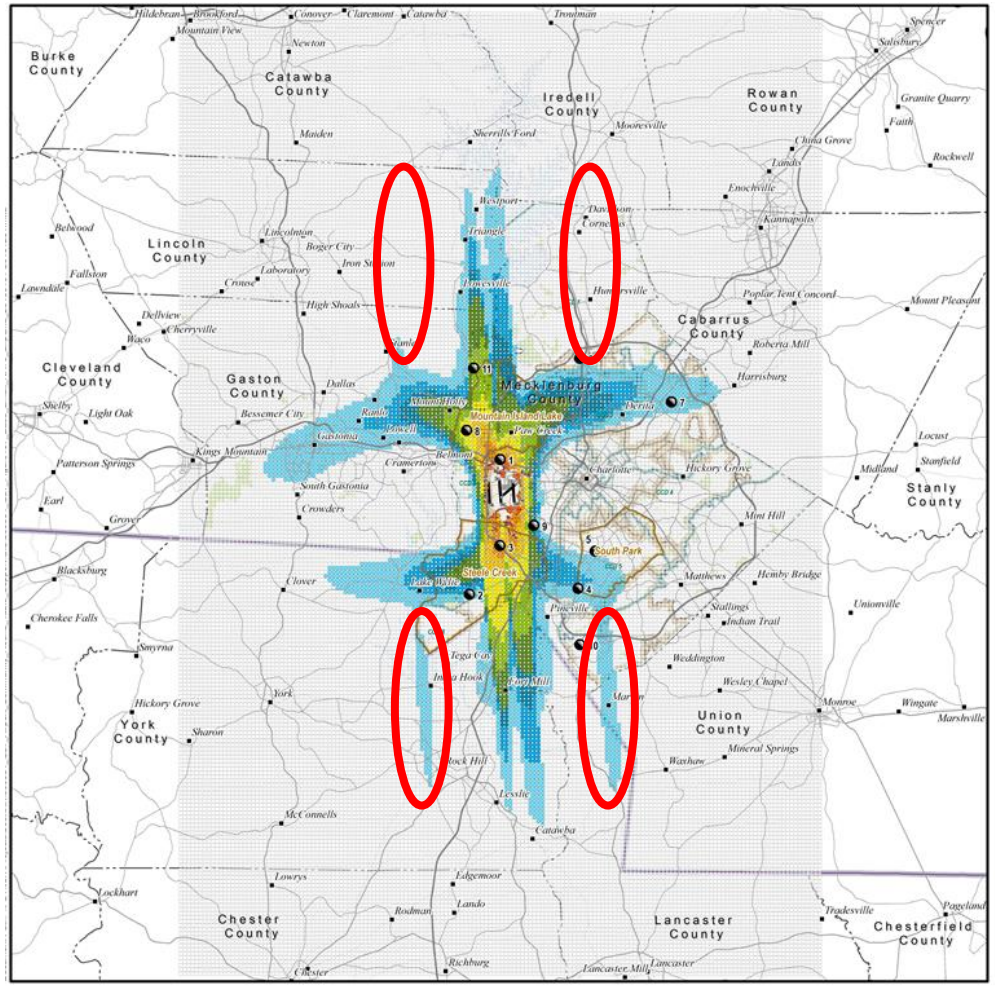
Estimated Flight Tracks, Runways 05 and 18
Raised Altitudes on All Downwind Arrivals (North and South Flows Depicted)

- Aircraft currently level off at the following altitudes based on arrival runway at CLT (% use of runway)
  - 18L: 4,000 feet (13%)
  - 18C: 6,000 feet (4.2%)
  - 18R: 5,000 feet (20.6%)
- Less than 40% of aircraft on these downwind legs
  - Did not result in N70 events on downwind legs

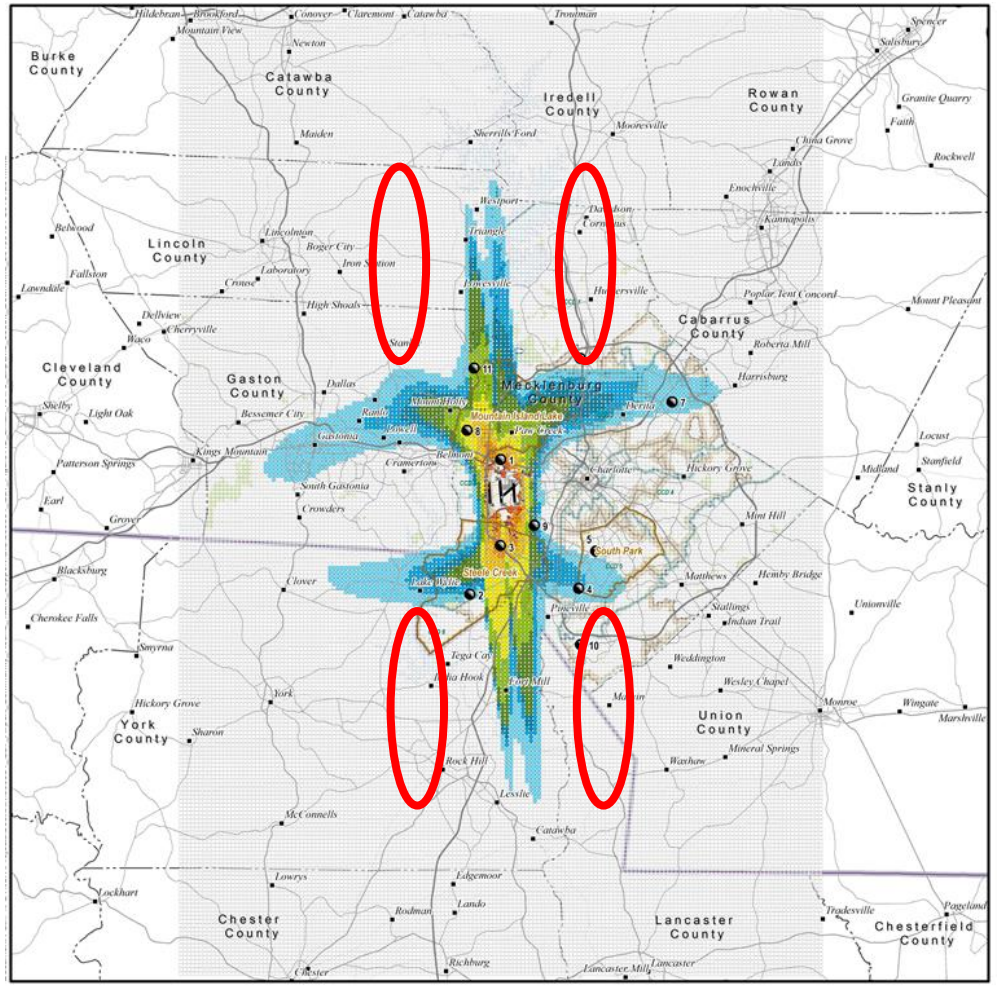


Number of Events Above 70 dB (N70)

Raised Altitudes on All Downwind Arrivals (North and South Flows Depicted)



2018 Baseline

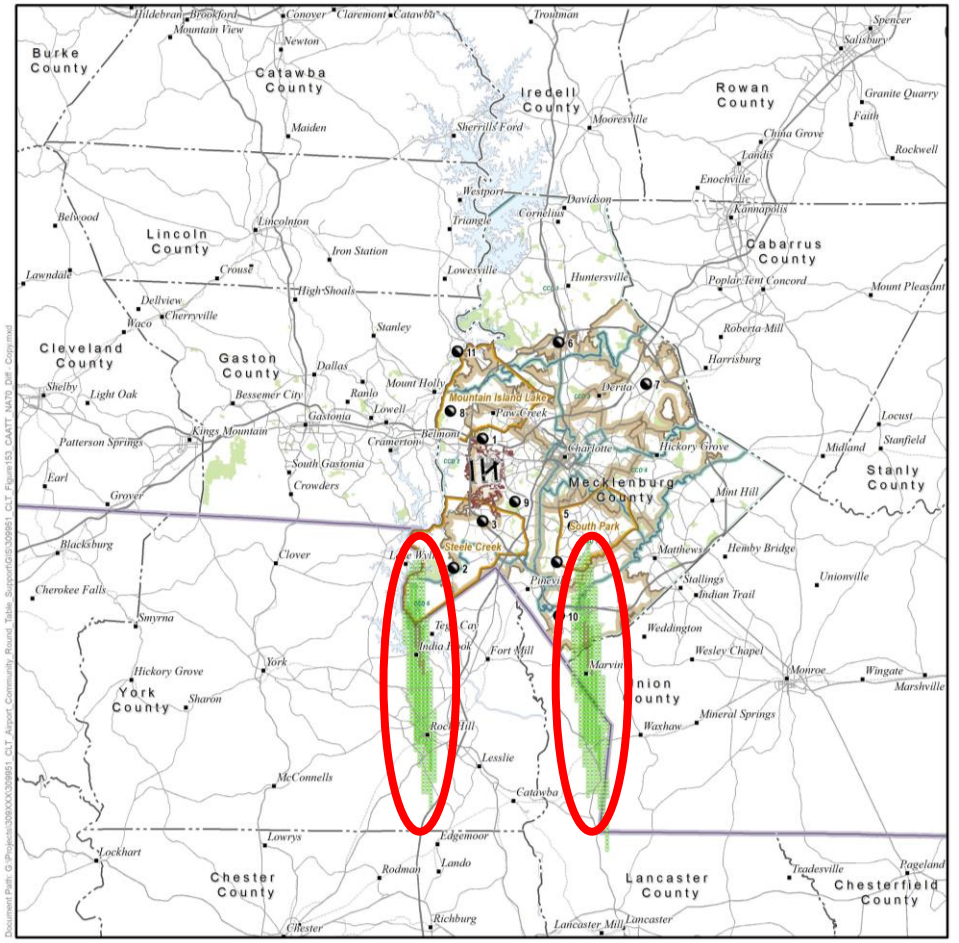


Alternative: Raise Altitudes at CAATT/EPAYE/AAIRE/JRDN/CEDOX/VALLL/LEEKS

Number of Noise Events Above 70 dB (N70)

Difference – Raised Altitudes on All Downwind Arrivals Compared to Baseline

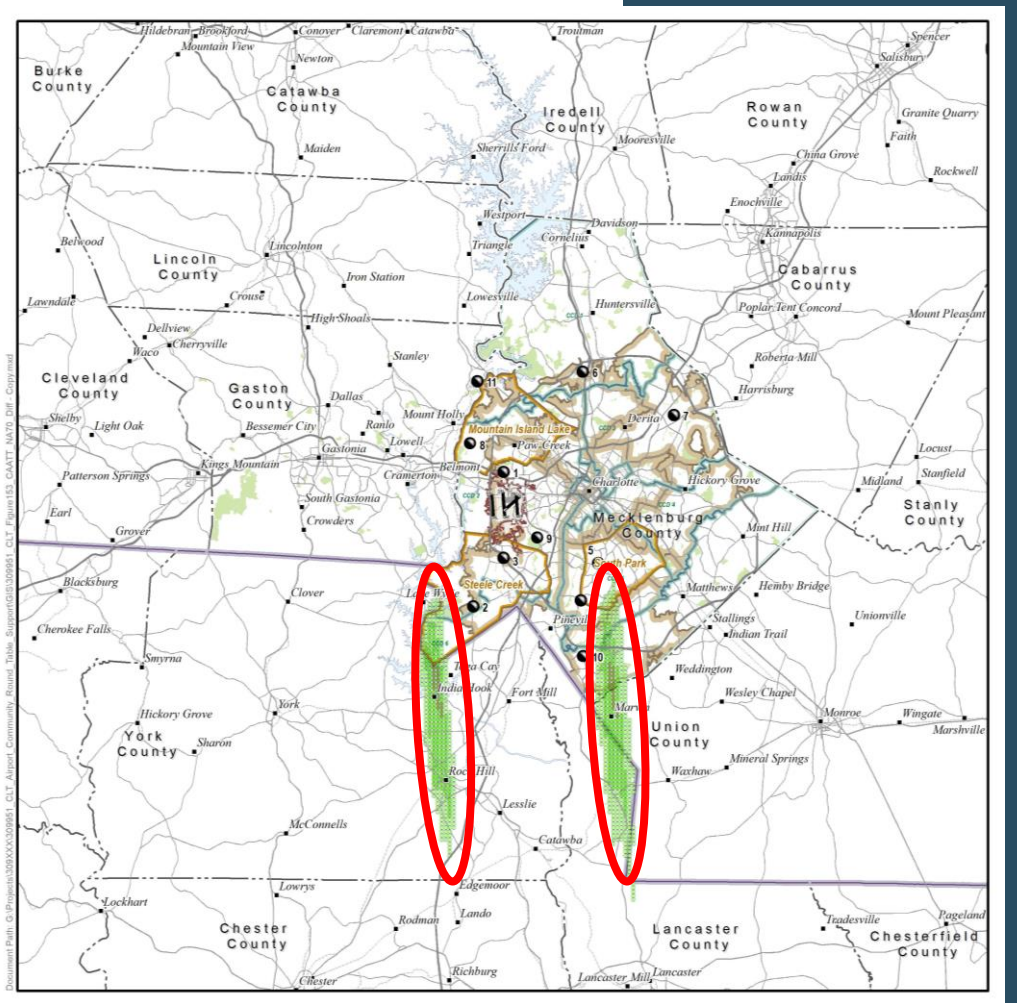
N70 Difference Interval (Events)	Count of Grid Points / % Change	Count of Population / % Change
Less than -75	0 / 0.0%	0 / 0.0%
-75 to -25	44 / 0.1%	6,564 / 0.3%
-25 to -10	314 / 0.8%	41,057 / 1.9%
-10 to -1	454 / 1.2%	44,739 / 2.0%
-1 to 1	37,487 / 97.9%	2,091,142 / 95.8%
1 to 10	0 / 0.0%	0 / 0.0%
10 to 25	0 / 0.0%	0 / 0.0%
25 to 75	0 / 0.0%	0 / 0.0%
Greater than 75	0 / 0.0%	0 / 0.0%
Total	**38,301 / 100.0%**	**2,183,561 / 100.0%**



- 812 grid points (2.1%) /92,360 people (4.2%) would experience fewer events above 70 dB Lmax with increased arrival altitudes
- 0 grid points (0.0%) / 0 people (0.0%) would experience more events above 70 dB Lmax with increased arrival altitudes

Summary of FAA Alternative
Raised Altitudes on All Downwind Arrivals

- Eliminates events above 70 dB (N70) along downwind leg of north flow arrivals (no such N70 events in south flow)
  - Nearly 100,000 people could experience fewer events above 70 dB from these aircraft arrivals (see area of change in map to the right)
- Some aircraft will proceed further north/south before turning onto final approach
  - No area is expected to experience noise above 70 dB from these operations until aircraft are on final approach
  - Some areas expected to experience additional overflights, but not above 70 dB
  - This may result in additional noise events above 70 dB on final approach with those aircraft that proceed further north/south (though modeling showed no increase expected)



Discussion

Raise arrival altitudes on all arrival downwind legs
– north and south flow
– east and west of CLT