Charlotte Douglas International Airport – ACR

2020 Potential Slate Recommendations – Evaluation Table (Sorted based on Level of Consensus from Member Survey Results)

Recommendation & Survey Results	Overall (Relating to Guiding Principles)					FAA Non-starter	Targeted Areas Affected by Metroplex			Newly Affected Areas
	Pros	Cons	For Higher Affected Areas	Net Population w/Benefit	Net Grid Points w/Benefit		Mountain Island Lake	Steele Creek	South Park	
Strong Consensus to Include in Slate										
2-Utilize Divergent Departure Headings **15 Y, 1 N, 1 A**	• Greatest benefit to areas along current departure headings	• New departure headings will expose new areas to aircraft noise	Relief to populations 2-6 NM southwest of airport and 3-6 NM northeast and northwest of airport	112,752	290	N	Disbenefit (central, east edge, west edge) Benefit (elsewhere)	Benefit (northwest, northeast) Disbenefit (elsewhere)	Benefit (throughout)	High Shoals, Stanley, Dallas, Huntersville, Tega Cay, India Hook, Rock Hill
10-Return CAATT Waypoint to Pre-Metroplex location (aka, Raising the Altitude by 1000' at CAATT/EPAYE) **14 Y, 1 N, 2 A**	• Greatest benefit under south flow's east downwind	• None	N/A	80,244	709	N	Minimal change	Minimal change	Benefit (south central)	N/A
3-Modify Use of Departure Profiles **14 Y, 2 N, 1 A**	• Greatest benefit for small areas north and south of airport	• Negatively impacts areas directly adjacent to airport property	Relief for areas 3-4 NM northwest, northeast, southwest, and southeast of airport	28,825	275	N	Benefit (south)	Benefit (south)	Benefit (north, west)	Small increases in areas immediately adjacent to airport property

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	Pros	Cons	For Higher Affected Areas	Net Population w/Benefit	Net Grid Points w/Benefit		Mountain Island Lake	Steele Creek	South Park	
Strong Consensus to Include in Slate (cont'd)										
8-Utilize CDA (Continuous Descent Approach) **14 Y, 3 N, 0 A**	• Benefits for areas north and south of the airport where aircraft level off for conventional approaches • Improvement in air traffic control tools and increased number of aircraft conducting CDAs may result in increased noise reduction	• Disbenefit for areas along extended centerline where aircraft turn and descend on final approach • More concentrated flight paths along this turn due to precision of Required Navigation Performance (RNP)	N/A	276,250	3,361	N	Disbenefit (central) Slight benefit (elsewhere)	Disbenefit (central) Benefit (south edge)	Benefit (southern central)	Lowesville, Fort Mill
7-Remove the 2-mile Restriction on Departures **13 Y, 3 N, 1 A**	• Greatest benefit to areas to the south at and beyond the 2-NM mark where aircraft currently turn • Decreases controller workload • Positive impact on throughput due to reduced time for headings to diverge	• Increases noise in areas closer to the airport where turns would now start	Relief for population approximately 6 NM south of airport along current departure paths	-166,683	-1,012	N	Minimal to no benefit or disbenefit	Disbenefit (northwest edge, southeast edge) Benefit (central)	Benefit (south) Disbenefit (elsewhere)	Dallas, High Shoals, South Gastonia, Crowders, Hickory Grove, Tega Cay, India Hook, West Clover
6-On South Departures, change heading at first turns off 18L (East) and 18C (West) **13 Y, 4 N, 0 A**	• Greatest benefits to areas directly east and west of airport	• Initial heading changes expose new areas to aircraft noise • Increased controller workload • Negative impact on throughput due to increased times required for headings to diverge	Relief for communities within 2.5 NM directly south of airport	524,625	6,458	N	Minimal to no benefit or disbenefit	Benefit (north) Disbenefit (south)	Benefit (north, central) Disbenefit (south)	Lake Wylie

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	Pros	Cons	For Higher Affected Areas	Net Population w/Benefit	Net Grid Points w/Benefit		Mountain Island Lake	Steele Creek	South Park	
No Strong Consensus – Lean toward including in Slate										
9-Maintain 6,000' Arrival Altitude until Final Approach Course **9 Y, 6 N, 2 A**	• Greatest benefit for areas east and west of airport between downwinds and runway centerlines	• Impacts areas along runway centerlines farther north and south of the airport • Negative impact on throughput due to reduced flexibility for vectoring • May increase miles flown	N/A	376,222	5,213	N	Disbenefit (north)	Benefit (east, west) Disbenefit (central)	Benefit (central)	N/A
1-Utilize Altitude-based Turns **9 Y, 8 N, 0 A**	• Greatest benefit to areas south and immediately north of airport where aircraft currently turn	• Increases noise along where aircraft turns would be moved • Increases uncertainty of turn location and therefore increases controller workload • Decreases airport throughput	Relief for populations west of US Whitewater Center and east of Paw Creek	281,352	876	Y	Disbenefit (central, north) Benefit (east, west corners)	Disbenefit (northwest, southeast) Benefit (central)	Benefit (south) Disbenefit (elsewhere)	Lincolnton, Iron Station, Stanley, Dallas, Bessemer City, Huntersville, Poplar Tent, Concord, Roberta Mill

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	Pros	Cons	For Higher Affected Areas	Net Population w/Benefit	Net Grid Points w/Benefit		Mountain Island Lake	Steele Creek	South Park	
No Strong Consensus – Lean toward NOT including in Slate										
4-Utilize Alternating Arrival Rails **7 Y, 10 N, 0 A**	• Greatest benefit to areas under current 5-NM downwind	• Rotating the location of the downwind legs will expose new areas to aircraft noise • Carries significant implementation challenges, including airspace changes, training, and environmental reviews	Relief for parts of central South Park, western Steele Creek	-156,362	1,128	Y	Benefit/ disbenefit with downwind change (central)	Benefit (western edge) Disbenefit (elsewhere)	Benefit/ disbenefit with downwind change (central, western)	Cramerton, Tega Cay, India Hook, Rock Hill, Charlotte
5-On South Departures, delay Turns off 18L (East) and 18C (West) **6 Y, 9 N, 2 A**	• Similar to altitude-based turns	• Similar to altitude-based turns • Difficult to convince FAA to consider and implement delayed turns due to separation requirements and current waiver	N/A	N/A	N/A	N	N/A	N/A	N/A	N/A

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2020 Potential Slate Recommendations – Evaluation Table

Detailed Descriptions of Recommendations

1) Utilize Altitude-Based Turns: Altitude-based turns dictate that aircraft turn once they reach a specified altitude after departure, as opposed to turning at a specified distance from the airport. This results in better track dispersion and potentially higher altitudes before the aircraft turn over communities, thus reducing the effects of aircraft noise on the communities. The analysis for this recommendation specified that departures turn from the extended centerlines at 2,000 feet above Mean Sea Level (MSL).The 2,000 foot MSL altitude was chosen based on weighing the benefits of increasing aircraft turn altitudes with the decreased throughput that is associated with the uncertainty of where aircraft will turn associated with altitude-based turns.
2) Utilize Divergent Departure Headings: 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 nautical miles from the runway end for south flow.
3) Modify Use of Departure Profiles: This recommendation requests that aircraft operators use available Noise Abatement Departure Profiles (NADPs) to reduce noise as flights depart CLT. The NADP modeled in this analysis changes the vertical profile of the departing aircraft, requiring use of flaps up to 800 feet AGL. Above this altitude, the aircraft retracts the flaps and accelerates to the Flaps Up speed to climb to 3,000 feet AGL. Above 3,000 feet, the aircraft accelerates to normal climb speed and proceeds as usual. This procedure creates more noise closer to the airport but reduces the noise farther from the airport and potentially reduces fuel consumption.
4) Utilize Alternating Arrival Rails: The alternating arrival rail proposal rotates through multiple downwind legs on a set annual schedule to distribute noise from arrivals over multiple communities over time. This alternative looks at the use of downwinds located 4 and 6 nautical miles from the airport, in addition to the current downwind located 5 nautical miles from the airport.
5) On South Departures, Delay Turns off 18L (East) and 18C (West): Delayed departure turns allow aircraft to reach higher altitudes prior to turning over communities, resulting in reduced noise over these communities. This alternative was not modeled since the altitude-based turn analysis shows similar results to what would be expected from this alternative.
6) On South Departures, Change Heading at First Turns off 18L (East) and 18C (West): After departure, aircraft turn to a given heading. This alternative proposes a change to this specified heading so that they overfly communities that they overflew prior to the implementation of the Metroplex, which tend to be less populated areas. This reduces the impact on more densely populated areas and enables the desire 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.
7) Remove the 2-mile Restriction on Departures: Currently, southern departures from CLT cannot turn until they are 2 nautical miles from the runway end. Eliminating this restriction allows aircraft to turn on course sooner, 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 the runway's departure end.
8) Utilize CDA (Continuous Descent Approach): Continuous Descent Approaches (CDAs) provide a continuous descent from cruise altitude to the airport at constant low power settings to reduce noise compared to traditional stepdown approaches. In a traditional approach, aircraft level off at intermediary altitudes, requiring power changes to maneuver and change altitudes and resulting in noise. CDAs reduce these level-offs and thereby reduce noise from this baseline. However, use of CDAs will likely increase flight track density over the approach paths due to increased precision of the navigational systems used. This evaluation identified aircraft eligible and equipped for CDAs and aircraft operating during lower traffic volumes and modeled those operations to utilize CDAs as that is when they would be utilized.
9) Maintain 6,000' Arrival Altitude until Final Approach Course: This alternative requires aircraft to maintain 6,000 ft MSL along the downwind arrival, only beginning descent once they turn from the base leg to intercept the final approach course. This will potentially extend the downwind over new communities to allow aircraft to descend safely but will also reduce noise along the current downwind legs due to the higher altitudes. This alternative modified flight tracks to maintain altitudes of 6,000, 7,000, or 8,000 feet along the downwind leg based on the arrival runway used.
10) Return CAATT Waypoint to Pre-Metroplex location (aka, Raising the Altitude by 1000' at CAATT/EPAYE): Higher altitude restrictions at CAATT and EPAYE bring flight paths in line with pre-Metroplex altitudes and flight paths, reducing noise along the south flow east downwind over these navigational points. This alternative raised the altitude at the two points by 1,000 feet above the current altitude requirement.