

CHARLOTTE-DOUGLAS INTERNATIONAL AIRPORT



Airport capacity profile estimates were created using a standard set of performance characteristics and do not take into account non-runway constraints, unless otherwise noted. The capacity estimates developed for this report are not intended to replace the results of any detailed analysis that would precede an environmental, investment, or policy decision.

The list of Future Improvements and their expected effects on capacity does not imply FAA commitment to, or approval of, any item on the list.

DEFINITION

- The capacity profile shows the hourly throughput that an airport is expected to be able to sustain during periods of high demand, represented as the range between the model-estimated capacity and the ATC facility reported rate (called rate). Each weather condition (visual, marginal, and instrument) has a unique capacity rate range.
- For each weather scenario, capacity estimates are based on information provided by ATC, including reported arrival and departure rates.
- The following charts compare actual hourly traffic with the estimated capacity curves for CLT.

RECENT OPERATIONAL IMPACTS AT CLT

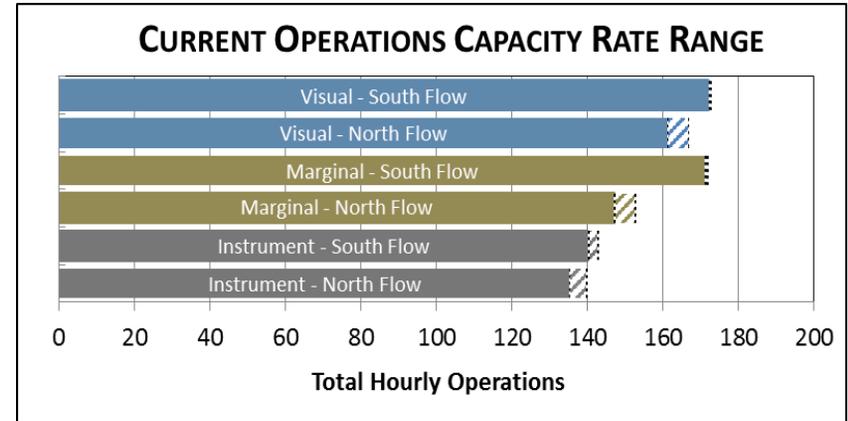
- *Time-Based Flow Management (TBFM)* helps to improve the flow of arrivals to the runways.
- In 2010 CLT commissioned a new runway, 18R/36L, which is primarily used for arrivals.
- *Arrival-Departure Window (ADW)*: Helps to minimize the long-term risk associated with arrival and departure operations on intersecting and converging runways. The ADW defines a range window from the arrival runway threshold. The departing flight cannot be released if the arrival is within that window, minimizing the risk of separation loss with the departing aircraft in the event the arrival executes a missed approach. CLT has an ADW in place for operations between Runway 23 and Runways 18C.

FUTURE IMPROVEMENTS AT CLT

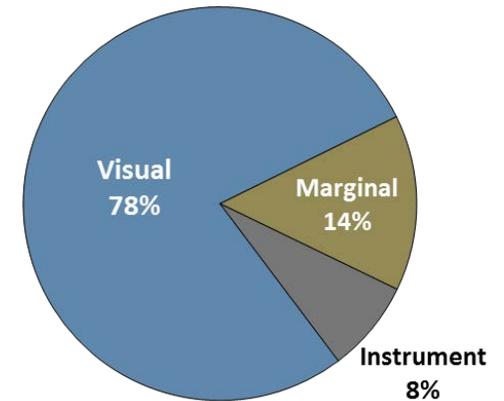
- *Improved Runway Delivery Accuracy*: The combined effects of several new capabilities, including ADS-B Out, CDTI, and TBM in the terminal area, will improve the ability of controllers to deliver aircraft to the runway with the desired separation from the preceding aircraft. This will reduce the average spacing between arrivals and boost arrival capacity.
- *Same Runway Departure Fanning* could be used at CLT for departures from Runways 18C/36C and 18L/36R. This improvement will allow reduced separation between successive departures due to the availability of new RNAV Standard Instrument Departure (SID) procedures which provide more precise direction and control over departing aircraft.
- *Wake Recategorization* assigns aircraft to new wake turbulence classifications based on their wake turbulence characteristics, such as wake generation, wake decay, and encounter effects. This results in closer longitudinal separation for certain aircraft types without sacrificing safety.

DATA SOURCES

- Actual hourly CLT operations, weather and configuration data were obtained from the FAA ASPM database, and represent operational hours from 7am to 11pm local time for all of Fiscal Years 2011 through 2013. Actual configuration usage is determined by multiple operational factors, including weather conditions.
- Facility reported rates were provided by ATC personnel at CLT.
- Model-estimated rates are derived from operational information provided by ATC.



ANNUAL WEATHER AT CLT: (FY2011-FY2013)



VISUAL CONDITIONS:

- Ceiling and visibility allow for visual approaches: at least 6000 feet ceiling and 5 miles visibility

MARGINAL CONDITIONS:

- Ceiling and visibility below visual approach minima but better than Instrument conditions

INSTRUMENT CONDITIONS:

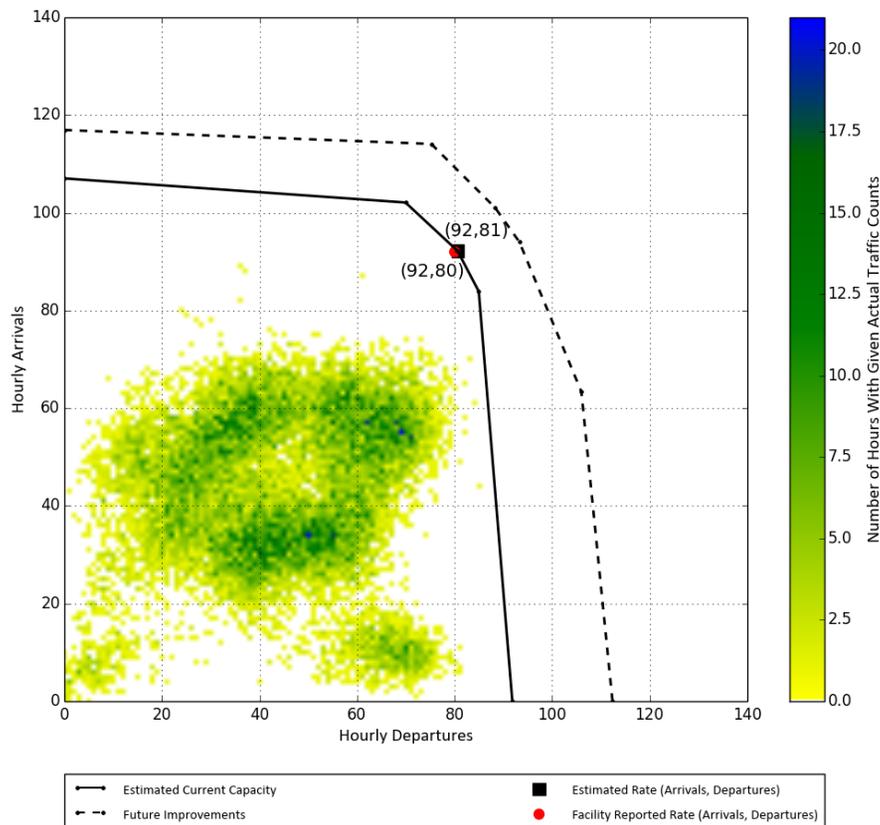
- Ceiling and visibility below 1000 feet ceiling or 3 miles visibility

VISUAL – SOUTH FLOW

CLT SCENARIO: VISUAL APPROACHES, VISUAL SEPARATION

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility Reported	Model-Estimated
CURRENT OPERATIONS	18C,18R,23	18C, 18L	172	173
FUTURE IMPROVEMENTS	18C,18R,23	18C, 18L	N/A	189

VISUAL WEATHER CONDITIONS



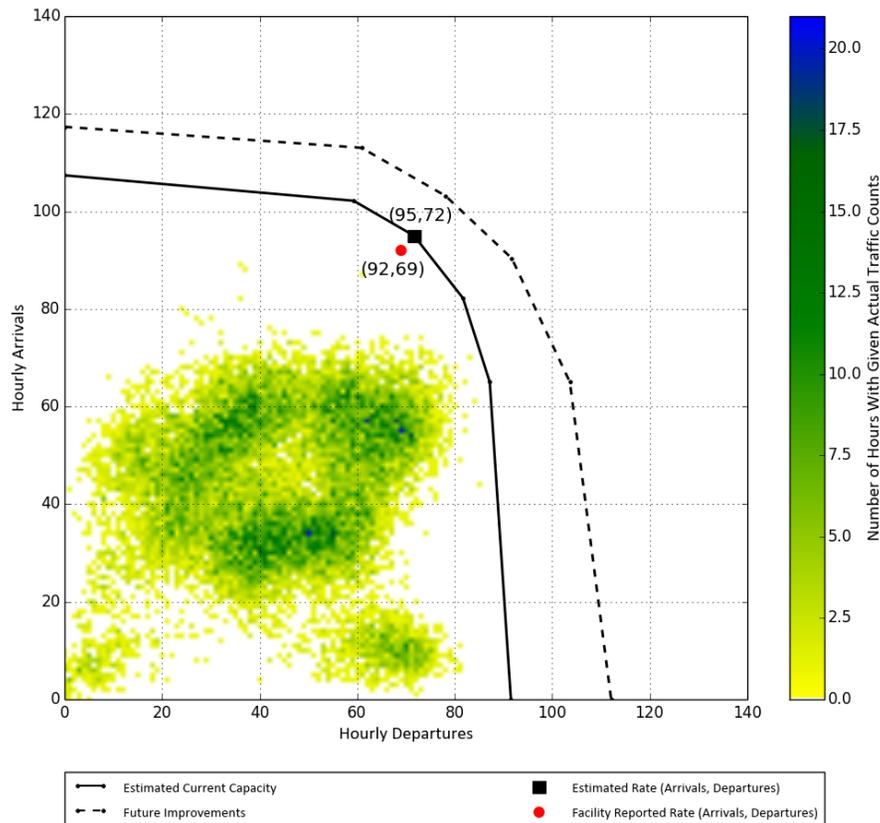
- **Future improvements:** Improved Runway Delivery Accuracy, Same Runway Departure Fanning, Wake Recategorization.
- The capacity rate range in South flow Visual conditions is currently 172-173 operations per hour.
- The airport operates in variations of this configuration approximately 42% of the time in Visual weather conditions (totaling 33% annually).
- The airport has an ADW in place for arrivals to 23 and departures from 18C.
- Additional in-trail spacing between arrivals to Runway 18C may be employed in order to allow taxiing aircraft to cross Runway 18C.

VISUAL – NORTH FLOW

CLT SCENARIO: VISUAL APPROACHES, VISUAL SEPARATION

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility Reported	Model-Estimated
CURRENT OPERATIONS	36C, 36L, 36R	36C, 36R	161	167
FUTURE IMPROVEMENTS	36C, 36L, 36R	36C, 36R	N/A	181

VISUAL WEATHER CONDITIONS



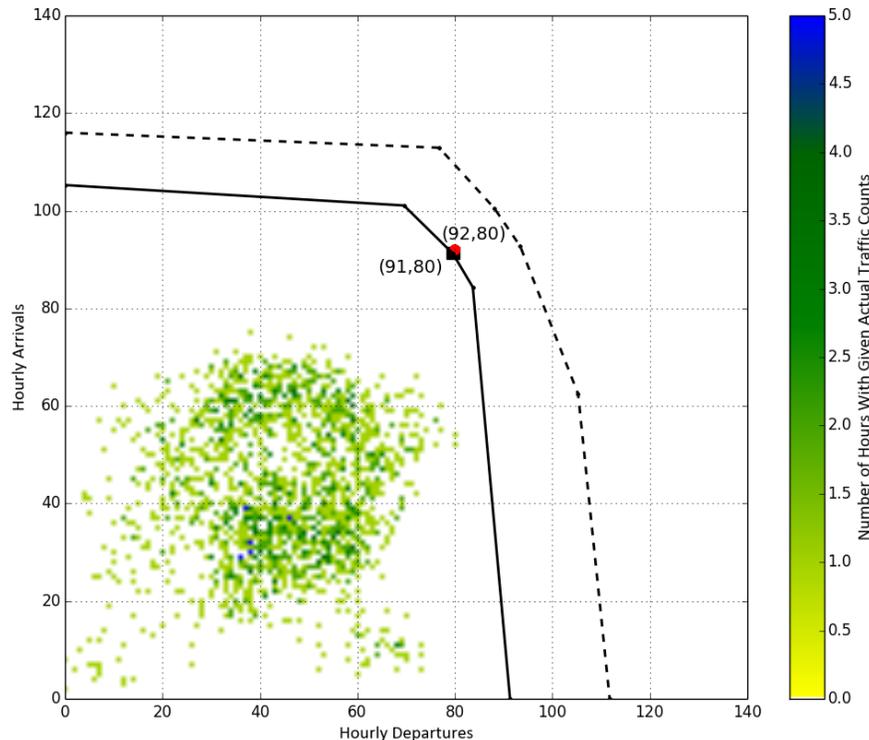
- **Future improvements:** Improved Runway Delivery Accuracy, Same Runway Departure Fanning, and Wake Recategorization.
- The capacity rate range in North flow Visual conditions is currently 161-167 operations per hour.
- The airport operates in variations of this configuration approximately 28% of the time in Visual weather conditions (totaling 22% annually).
- Additional in-trail spacing between arrivals to Runway 36C may be employed in order to allow taxiing aircraft to cross Runway 36C.

MARGINAL – SOUTH FLOW

CLT SCENARIO: INSTRUMENT APPROACHES, VISUAL SEPARATION

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility Reported	Model-Estimated
CURRENT OPERATIONS	18C,18R,23	18C, 18L	172	171
FUTURE IMPROVEMENTS	18C,18R,23	18C, 18L	N/A	189

MARGINAL WEATHER CONDITIONS



Estimated Current Capacity
 Future Improvements
 Estimated Rate (Arrivals, Departures)
 Facility Reported Rate (Arrivals, Departures)

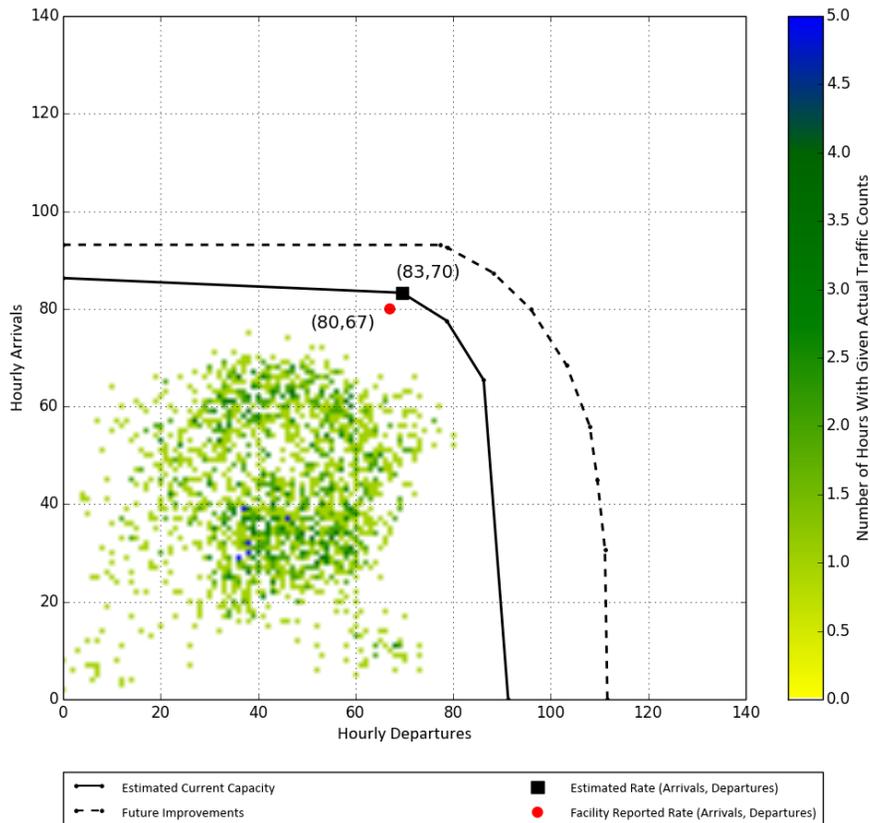
- **Future improvements:** Improved Runway Delivery Accuracy, Same Runway Departure Fanning, Wake Recategorization.
- The capacity rate range in South flow Marginal conditions is currently 171-172 operations per hour.
- The airport operates in variations of this configuration approximately 15% of the time in Marginal weather conditions (totaling 2% annually).
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to Runways 18C, 18L, and 18R at CLT.
- The airport has an ADW in place for arrivals to 23 and departures from 18C.
- Additional in-trail spacing between arrivals to Runway 18C may be employed in order to allow taxiing aircraft to cross Runway 18C.
- ATC does not use visual spacing behind B757s and Heavy aircraft in marginal conditions.

MARGINAL – NORTH FLOW

CLT SCENARIO: INSTRUMENT APPROACHES, RADAR SEPARATION

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility Reported	Model-Estimated
CURRENT OPERATIONS	36C, 36L, 36R	36C, 36R	147	153
FUTURE IMPROVEMENTS	36C, 36L, 36R	36C, 36R	N/A	170

MARGINAL WEATHER CONDITIONS



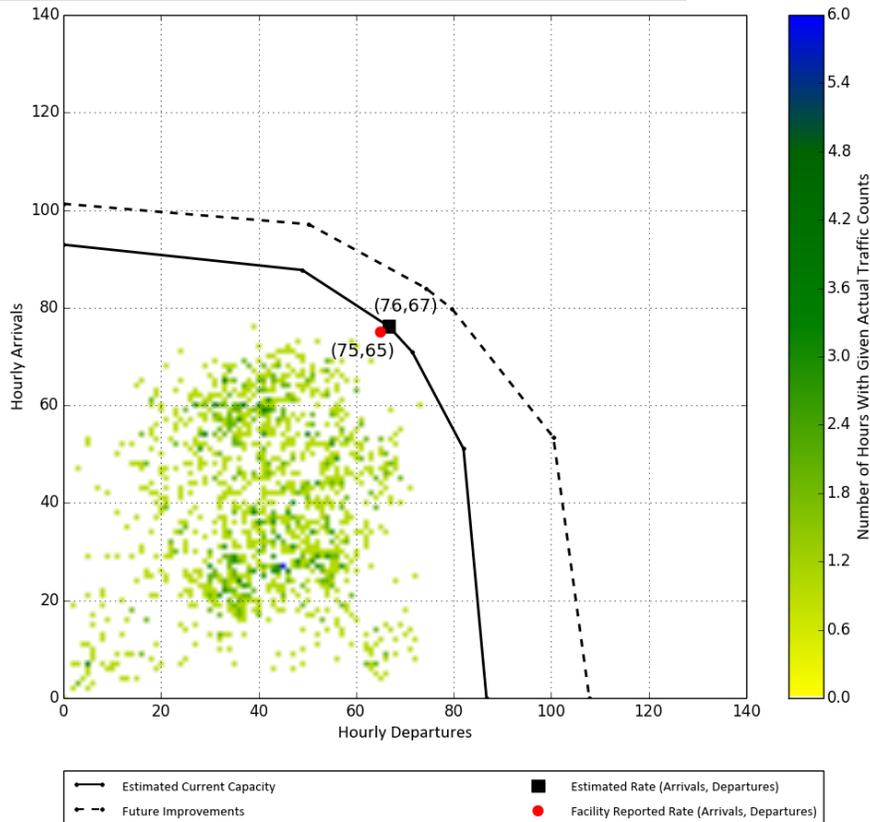
- **Future improvements:** Improved Runway Delivery Accuracy, Same Runway Departure Fanning, and Wake Recategorization
- The capacity rate range in North flow Marginal conditions is currently 147-153 operations per hour.
- The airport operates in variations of this configuration approximately 24% of the time in Marginal weather conditions (totaling 4% annually).
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to Runways 36C, 36L, and 36R at CLT.
- Additional in-trail spacing between arrivals to Runway 36C may be employed in order to allow taxiing aircraft to cross Runway 36C.
- Additional in-trail spacing between arrivals for Runways 36L and 36R is employed to account for single stream arrivals from Atlanta Center.
- ATC does not use visual spacing behind B757s and Heavy aircraft in marginal conditions.

INSTRUMENT – SOUTH FLOW

CLT SCENARIO: INSTRUMENT APPROACHES, RADAR SEPARATION

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility Reported	Model-Estimated
CURRENT OPERATIONS	18C,18L,18R	18C, 18L	140	143
FUTURE IMPROVEMENTS	18C,18L,18R	18C, 18L	N/A	158

INSTRUMENT WEATHER CONDITIONS



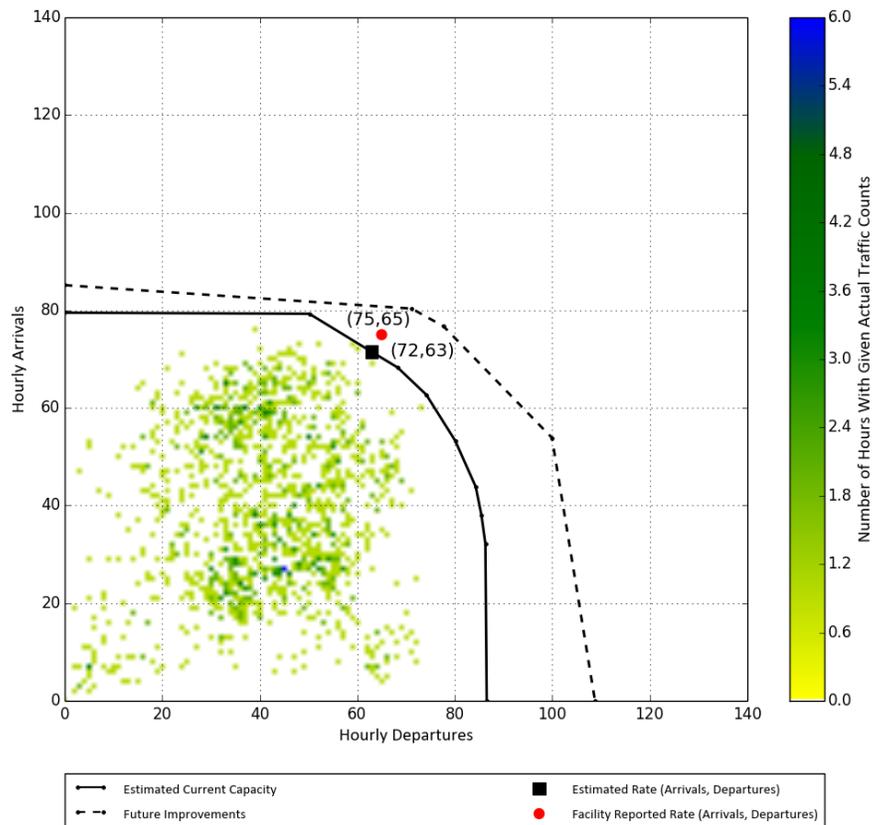
- **Future improvements:** Improved Runway Delivery Accuracy, Same Runway Departure Fanning, Wake Recategorization.
- The capacity rate range in South flow Instrument conditions is currently 140-143 operations per hour.
- The airport operates in variations of this configuration approximately 22% of the time in Instrument weather conditions (totaling 2% annually).
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to Runways 18C, 18L, and 18R at CLT.
- Additional in-trail spacing between arrivals to Runway 18C may be employed in order to allow taxiing aircraft to cross Runway 18C.

INSTRUMENT – NORTH FLOW

CLT SCENARIO: INSTRUMENT APPROACHES, RADAR SEPARATION

Type Operations	Arrival Runways	Departure Runways	Hourly Rate	
			ATC Facility Reported	Model-Estimated
CURRENT OPERATIONS	36C, 36L, 36R	36C, 36R	140	135
FUTURE IMPROVEMENTS	36C, 36L, 36R	36C, 36R	N/A	151

INSTRUMENT WEATHER CONDITIONS



- **Future improvements:** Improved Runway Delivery Accuracy, Same Runway Departure Fanning, Wake Recategorization.
- The capacity rate range in North flow Instrument conditions is currently 135-140 operations per hour.
- The airport operates in variations of this configuration approximately 37% of the time in Instrument weather conditions (totaling 3% annually).
- Reduced separation (2.5 NM) between arrivals is authorized for instrument approaches to Runways 36C, 36L, and 36R at CLT.
- Additional in-trail spacing between arrivals for Runways 36L and 36R is employed to account for single stream arrivals from Atlanta Center.
- Additional in-trail spacing between arrivals to Runway 36C may be employed in order to allow taxiing aircraft to cross Runway 36C.