**Reducing Departure Delays at the RDU Airport**

At the Raleigh-Durham airport, average departure delays are 11.3 minutes compared to the national average of 9.7 minutes. Not only do departure delays cause undue stress for travelers and thus negatively affect their perception of an airport, but, we have also found that nearly 90% of flights that are delayed more than 10 minutes from RDU arrive late as well. This can lead to missed connections, further layovers, etc. that might cause customers to think twice about flying out of RDU. Through our analysis we have found that carrier delays seem to be the leading cause of the problem with the highest average delay time of all types of delays. This is good news for RDU, as this is one of the only types of delays that can be managed. Little can be done about weather or security delays, so carrier delays are appropriate as the focus of the airport’s attention. Further, we found that focusing on carrier delays to reduce these delays on average should have a noticeable impact on departure delays as a whole, decreasing average departure delays by 17%. In our analysis, it is important to note that we focused on flights originating in RDU that were delayed (only considered data points with positive delay times).

As an airport manager, it may be difficult to ameliorate carrier delays, as these are, by definition, caused by the airlines themselves. But, there are some ways to mitigate the negative impact of carrier delays upon the airport. We propose implementing a data collection and monitoring system with 3-sigma control limits that will allow both the airlines and the RDU airport managers to track delays by week. This monitoring system would use RDU’s average weekly delay as a base line, and set upper and lower control limits to 3 standard errors above and below this mean (see figure below). Statistically, 99.7% of random variation is captured within these limits. Thus, any weeks in which a carrier’s delays surpassed the upper control limit would indicate an issue with that airline’s operational procedures. This system can also be implemented on a monthly, or even daily basis, depending on the airport manager’s preference.

Utilizing this control system, the RDU airport manager would be able to identify instances of above average carrier delays and further investigate them to gain insights on issues in operations, or, alternatively, to explore below average carrier delays to discover what drives this excellent performance. To logistically implement this control system, we recommend an incentive system based on the control limits. This would involve both penalizing carriers that fall above the upper control limit and rewarding carriers that fall below the lower control limit. If RDU’s manager implements this system to keep carrier delays within a 3-sigma range, the average departure delay will decrease by 17%, from 73.4 minutes to 61.1 minutes (in situations where there is both a carrier delay, as well as a departure delay).

