

Team 26A
Data Visualization
Flight Planning Whitepaper

As a business that typically relies on sending employees across the country on a weekly basis, consulting poses many challenges from a scheduling perspective. Optimization must be used to ensure everyone is making the best use of their time while also prioritizing flight routes, time in the air, and time at work. The difference in costs for a single person may be staggering, so when spread throughout a company and over a year, it becomes incredibly substantial. For our particular project, we chose to focus on how based on our data set, corporate flight planners may best create a strategy to allow employees and the firm itself to best manage its employees so as to save money and make the best use of its time.

In our situation, we are analyzing a firm based out of Atlanta that has work spread across five major cities; Los Angeles, Dallas-Ft Worth, New York, Ft. Lauderdale, and Chicago. It is important to note that all of these cities have multiple major airports which allow greater flight possibilities and alternative routes. We aim to send consultants out on Monday mornings while having them come back either on Thursday nights or Friday mornings so as to be able to work in the office on Friday. Through looking at delays by location, arrival delays, calculated expected value of delays, cancelled flights, and return flight options, we have prepared a series of recommendations.

We first observe United and Frontier operating with fairly small delay numbers while Delta, Spirit, Southwest, and American all regularly placed highest in terms of percent of flights delayed. For those flights that were delayed, United performed very well in terms of delay length but was limited by its available routes. Two that did perform poorly in terms of delay flights, Delta and American, were able to overcome delays much more easily, as they were two of the top three in terms of delay length. Expected value of delays was calculated in mind to consider the time value being lost due to delays and there was considerable variation. United was once again hindered by its lack of availability while American and Delta provided route options with the most optimal delay values of the group. These two benefited from the sheer number of flights coming out of Atlanta along with their overall quality of service. It certainly helps that Delta uses Hartsfield-Jackson as a hub airport. In terms of cancellations for flights to our five destinations, American and Delta once again place highly. One interesting aspect for these past three categories is how poorly Southwest and Frontier performed. Similar to Delta, Atlanta is a major location for those airlines yet they could not perform nearly as well under our constraints. Lastly, we considered return options, as this is important to build airline loyalty and get our employees back on time. We saw huge variation here because of our time constraints and noticed Delta, American, and Southwest all performed the best.

When it came to making a recommendation for the firm's primary airline to book, we decided Delta is the best option. It minimized expected value of delays, offered low cancellation rates, and provided sufficient return routes when the options were already lacking. We estimate using Delta would result in a 26% reduction in added travel costs and offer the best case scenario in the unfortunate situation of a delay if one were to happen.