

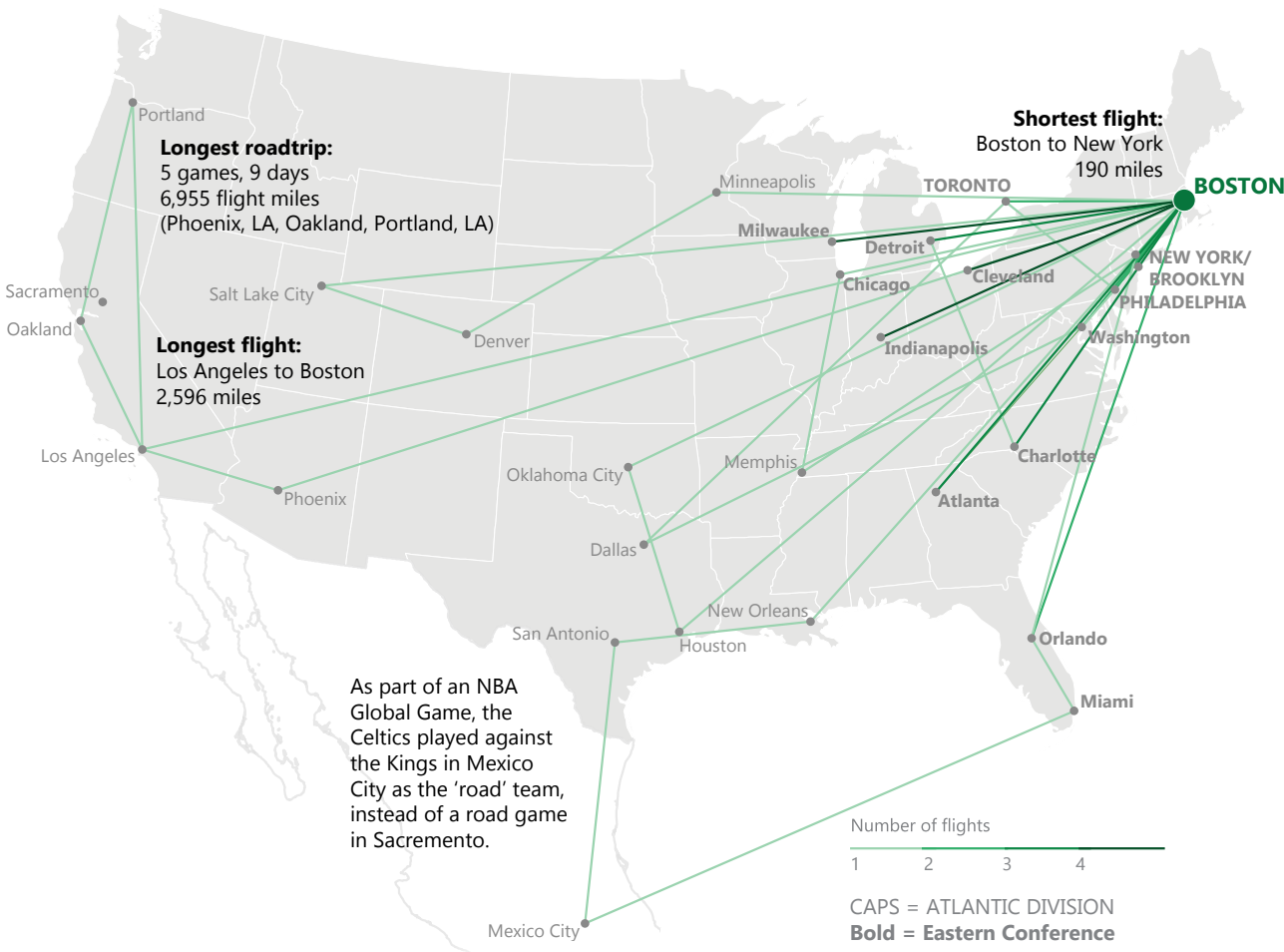
# NO REST FOR THE WEARY

## VISUALIZING THE TRAVEL SCHEDULE OF THE 2015-2016 BOSTON CELTICS

In recent years, NBA teams have begun investing in and relying on data and analytics to predict player performance, likelihood of winning, and even strategy on the court. One common application of this movement is analyzing and deconstructing the travel schedule for teams, and how different aspects of the season impact the performance of the team and individual players. Sports analysts point to a number of factors in this research: travel distance, time between tip-offs (including time lost flying east), how rested an opponent is from play or travel, and adverse playing conditions (e.g. Denver’s altitude).

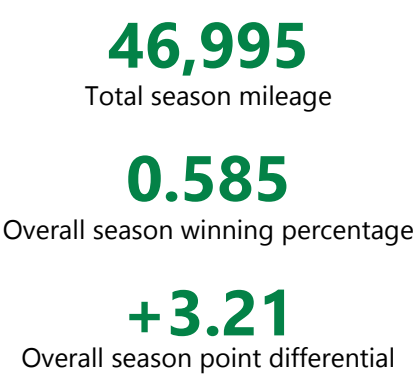
This topic has garnered increased attention from all sides because of the precautions coaches have taken with this new research in mind. For example, there has been a rise in the number of coaches sitting players out of games to give them rest. This is an especially controversial issue when these games coincide with nationally-televised games with star players sitting out. However, some of best coaches and teams in the league, including Gregg Popovich (Spurs), Doc Rivers (Clippers), and Rick Carlisle (Mavericks), have done this the most, much to the chagrin of Adam Silver, the NBA Commisioner.

This project analyzes the 2015-2016 Boston Celtics season to explore some of these factors and their impact on winning and performance. Some key metrics I explore are winning percentage on back-to-back nights with travel in between, and how point differential is impacted by travel, and the effect of travel between time zones.



### How do scheduling and travel impact chances of winning in the NBA?

With 30 NBA franchises spread over 3,000 miles playing 82 games in 170 days, it is inevitable that travel will play a significant role in the lives of players and the outcome of games night to night. The sheer number of miles and amount of travel for NBA players can be detrimental to their health and playing ability, especially later in the regular season and post-season. **Much of the focus on reforming the NBA schedule is on reducing the number of back-to-backs and occurences of four-games-in-five-nights.** These situations, when combined with travel, can be particularly damaging to a teams chance of winning on a particular night.

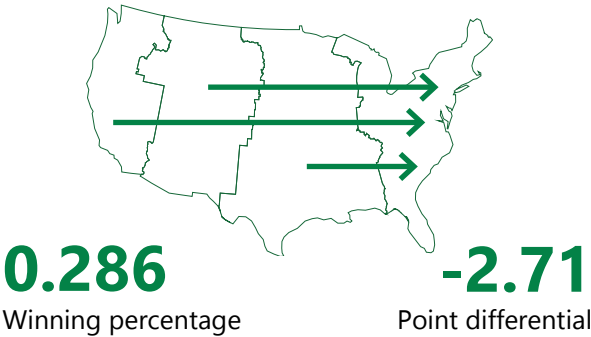


The Celtics ranked tied for sixth in the league with **19 back-to-backs**, compared to 17.8 for the average NBA team, and lay in the middle of the league in terms of four-in-fives. **However, when these situations coincided with long flights, especially going East, the team suffered some of its worst losses of the season.** The Celtics’ point differential was nearly 10 times worse on road trips, and their winning percentage was cut in half on the second game of a back-to-back after a long flight. These trends are present across the league and reform is a hot button issue.

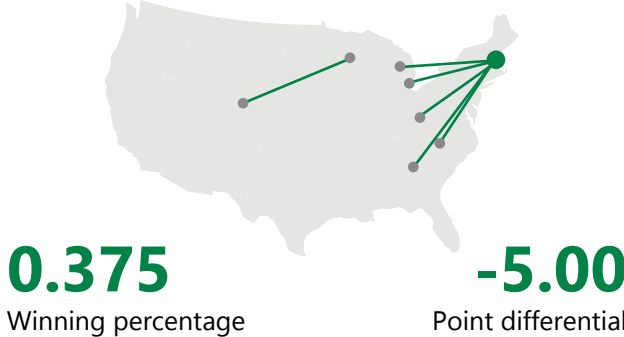
### How do time zone changes and back-to-backs affect performance?

When the Celtics return home after a road trip in another time zone, they lose an hour or more of time before the next game. This can especially harm the chances of the team winning if the next game is on a back-to-back and there is less than 24 hours between tip-offs. **The Celtics’ winning percentage is nearly halved and their point differential is six points worse after a time zone change going East.** The Celtics benefit from playing in the East for the majority of their games, but other teams in the league that fly East regularly to play games even within their conference experience the negatives of time zone changes more often. While there is no clear solution to this problem, decreasing the number of back-to-backs combined with travel will decrease the impact of time changes significantly.

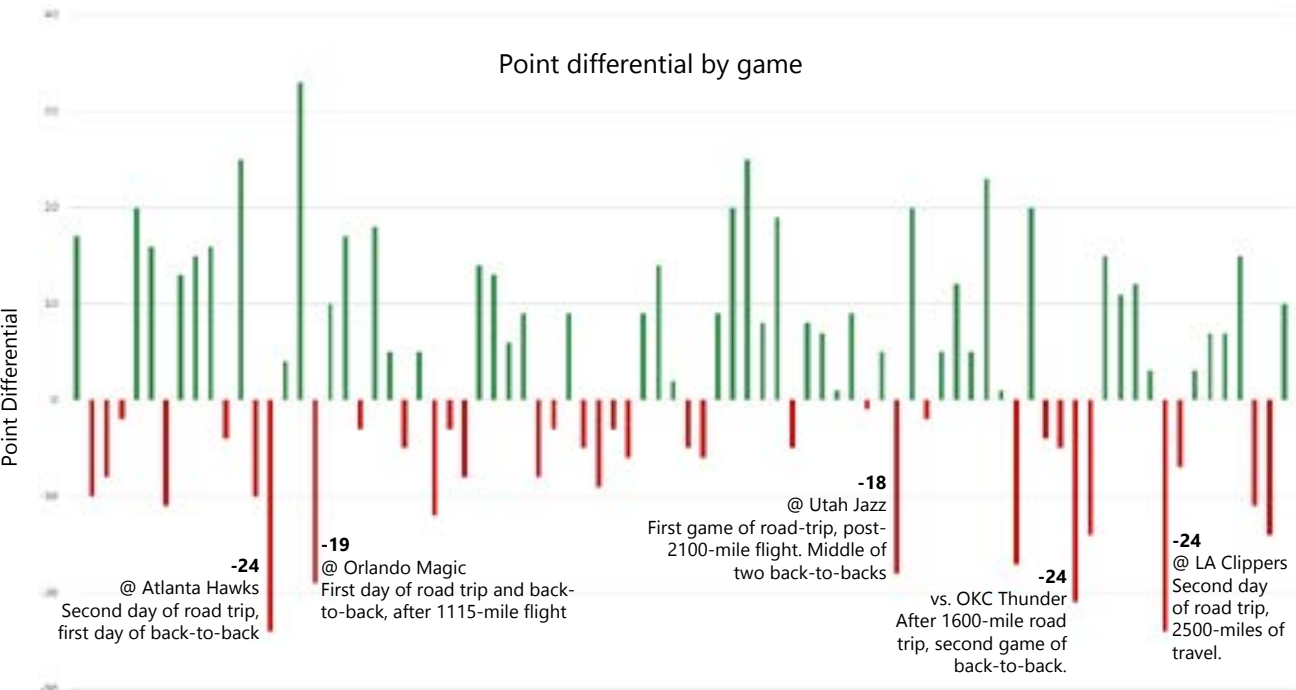
After the Celtics fly East between time zones:



After a 700+ mile flight on the second night of a back-to-back:



### Are the Celtics more likely to lose after travel and unfortunate scheduling?



Many of the Celtics largest losses of the season coincide with road trips, back-to-backs, and long flights. However, it is not only fatigue in the moment that can impact performance; coaches are often are proactive by resting players before long trips or back-to-backs begin. **Many head coaches, including Gregg Popovich and Tom Thibodeau, say that their organizations circle “scheduled losses” on their calendar before the season begins.**The Celtics consult sleep experts to determine games when they have a distinct disadvantage.

