

## Executive Summary and Implementation

### Assessing the Impact of Game Day Schedule and Opponents on Travel Patterns and Routes Choice using Big Data Analysis

#### Research Objectives

To assess and explore the impact of game days on travel patterns. The INRIX data available through Nebraska Department of Roads will be used to explore past several years of data to generate travel time reliability curves and thereby estimate shockwave lengths.

#### Research Benefits

Game days attract significant high volume of traffic and hence result in congestion and higher travel time to the road users. This project will help to gain insights on the impact of game day schedule and opponent on travel pattern and route choice. The insights gained from this study will help to implement active traffic assignment thereby reducing congestion.

#### Principal Investigator

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#### Lead TAC Member

**Dan Waddle**, Traffic Division

#### Interested in finding out more?

Final report is available at:  
[NDOT Research Website](#)

#### Background

The goal of this study was to understand issues related to road traffic management during major sporting events by using widely available INRIX data to compare travel patterns and behaviors on game days against those on normal days. A comprehensive analysis was conducted on the impact of all Nebraska Cornhuskers football games over five years on traffic congestion on five major routes in Nebraska. We attempted to identify hotspots, the unusually high-risk zones in a spatiotemporal space containing traffic congestion that occur on almost all game days. For hotspot detection, we utilized a method called Multi-EigenSpot, which is able to detect multiple hotspots in a spatiotemporal space.

#### Proposed Implementation by the Principal Investigator

The outcome of this study can be used by NDOT to implement improved traffic control to manage game day traffic. It will help them to plan and implement alternate routes to ease congestion and manage shockwaves.

#### Conclusion

With this algorithm, we were able to detect traffic hotspot clusters on the five chosen routes in Nebraska. After detecting the hotspots, we identified the factors affecting the sizes of hotspots and other parameters. The start time of the game and the Cornhuskers' opponent for a given game are two important factors affecting the number of people coming to Lincoln, Nebraska, on game days. Finally, the Dynamic Bayesian Networks (DBN) approach was applied to forecast the start times and locations of hotspot clusters in 2018 with a weighted mean absolute percentage error (WMAPE) of 13.8%.

#### Recommendations for Implementation

This research provided algorithm able to detect traffic hotspot clusters on the five chosen routes in Nebraska. After detecting the hotspots, the research team identified the factors affecting the sizes of hotspots and other parameters. The start time of the game and the Cornhuskers' opponent for a given game are two important factors affecting the number of people coming to Lincoln, Nebraska, on game days. The research provided the Department confirmation of the hotspots affecting traffic flows during the football games.

**This brief summarizes Project SPR-P1 (18) M078  
“Assessing the Impact of Game Day Schedule and Opponents on  
Travel Patterns and Routes Choice using Big Data Analysis”  
Nebraska Department of Transportation Research Program**