

A Vehicle Crash Analysis of the Oklahoma City Area Regional Transportation Study

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About

In the summer of 2017, I interned with the Transportation Planning Services department at the **Association of Central Oklahoma Governments** (ACOG) where I was tasked with working on a vehicle crash analysis of the Oklahoma City Area Regional Transportation Study (OCARTS) (Figure 1). This poster displays the results of my analysis. In May of 2018 I will graduate with a Bachelor of Science in Geography and a GIS Certificate.

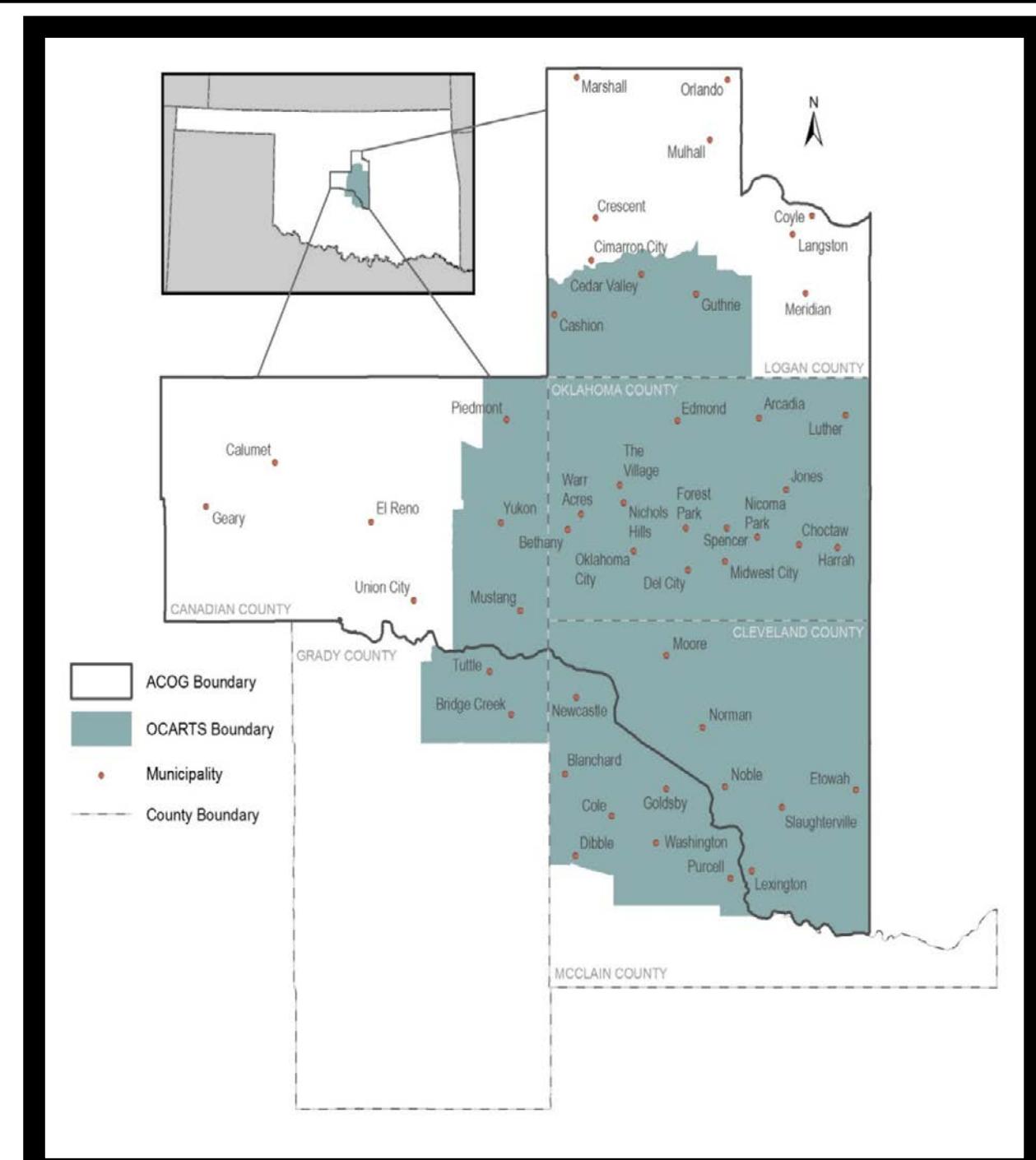


Figure 1: A map displaying the ACOG and OCARTS physical boundaries.

Introduction

With a growing population of over one million inhabitants, the Oklahoma City Area Regional Transportation Study encompasses 47 communities within 6 counties including all of Cleveland and Oklahoma County and parts of Logan, Canadian, Grady and McClain Counties.

From 2012 to 2015, the communities within the OCARTS boundary experienced an average of **27,000 car crashes annually**, with **464 crashes involving fatalities**. As new drivers emerge on the road daily, it is important to understand the causes behind an accident. Using crash data provided by the Oklahoma Highway Safety Office, an analysis of the accidents within the OCARTS boundary was compiled using ESRI ArcGIS and Microsoft Excel software.

Methods

The crash data provided for this analysis was compiled by law enforcement officers throughout the OCARTS region at the time of the accident. It was accessed through the Oklahoma Department of Transportation's Statewide Analysis for Engineering & Technology (**SAFE-T**) website.

Simple statistical analyses were performed on the data to determine the most frequent cause and result of accidents. The crash data also contained information such as injury and roadway type, weather, lighting and roadway conditions, and temporal and locational information.

Information

For more information on the crash analysis or Transportation Planning Services, please go to www.acogok.org. To find out more about the Center for Local Government Technology, please go to www.clgt.okstate.edu.

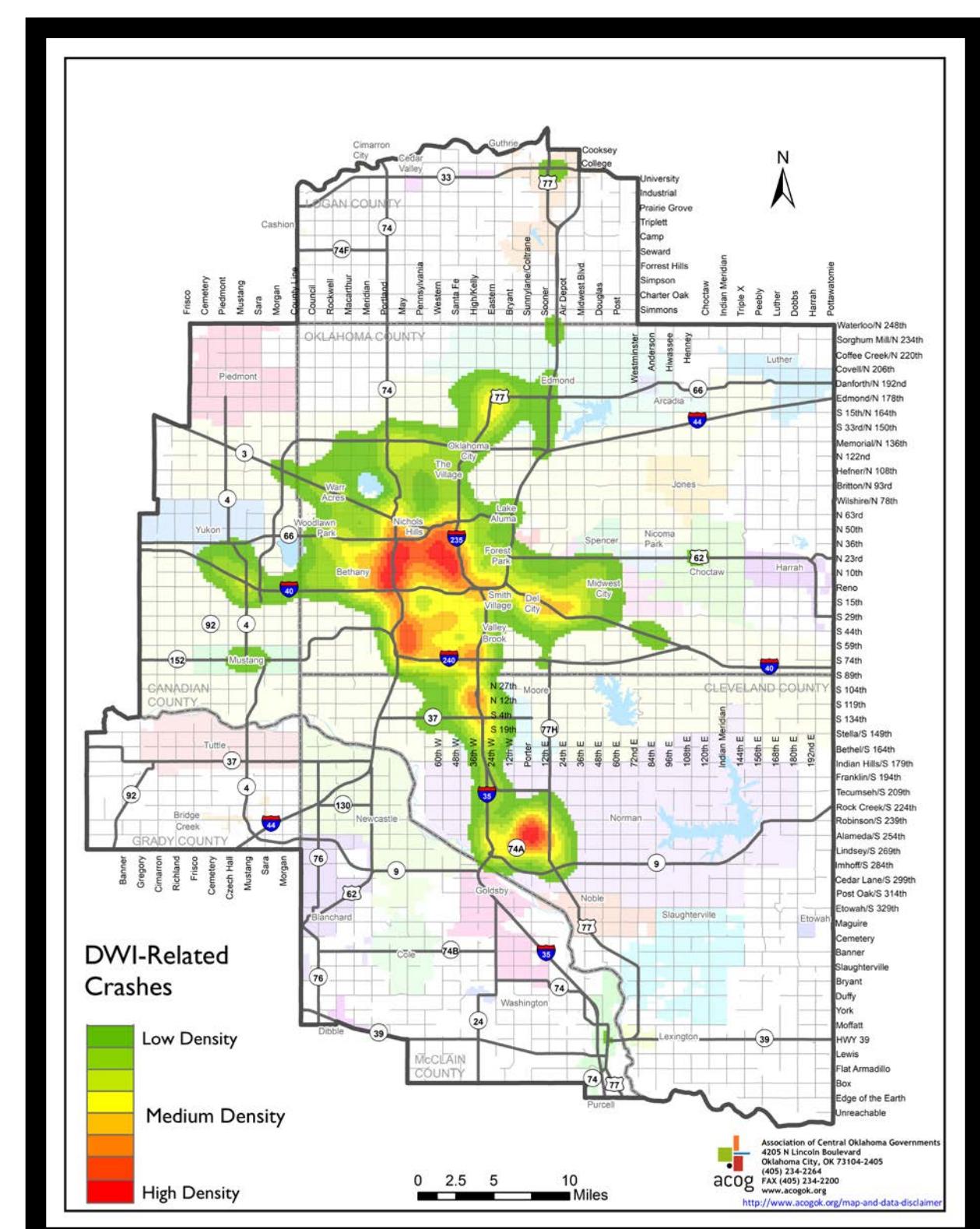


Figure 3: A density map displaying DWI-related crashes in the OCARTS area from 2012 to 2015.

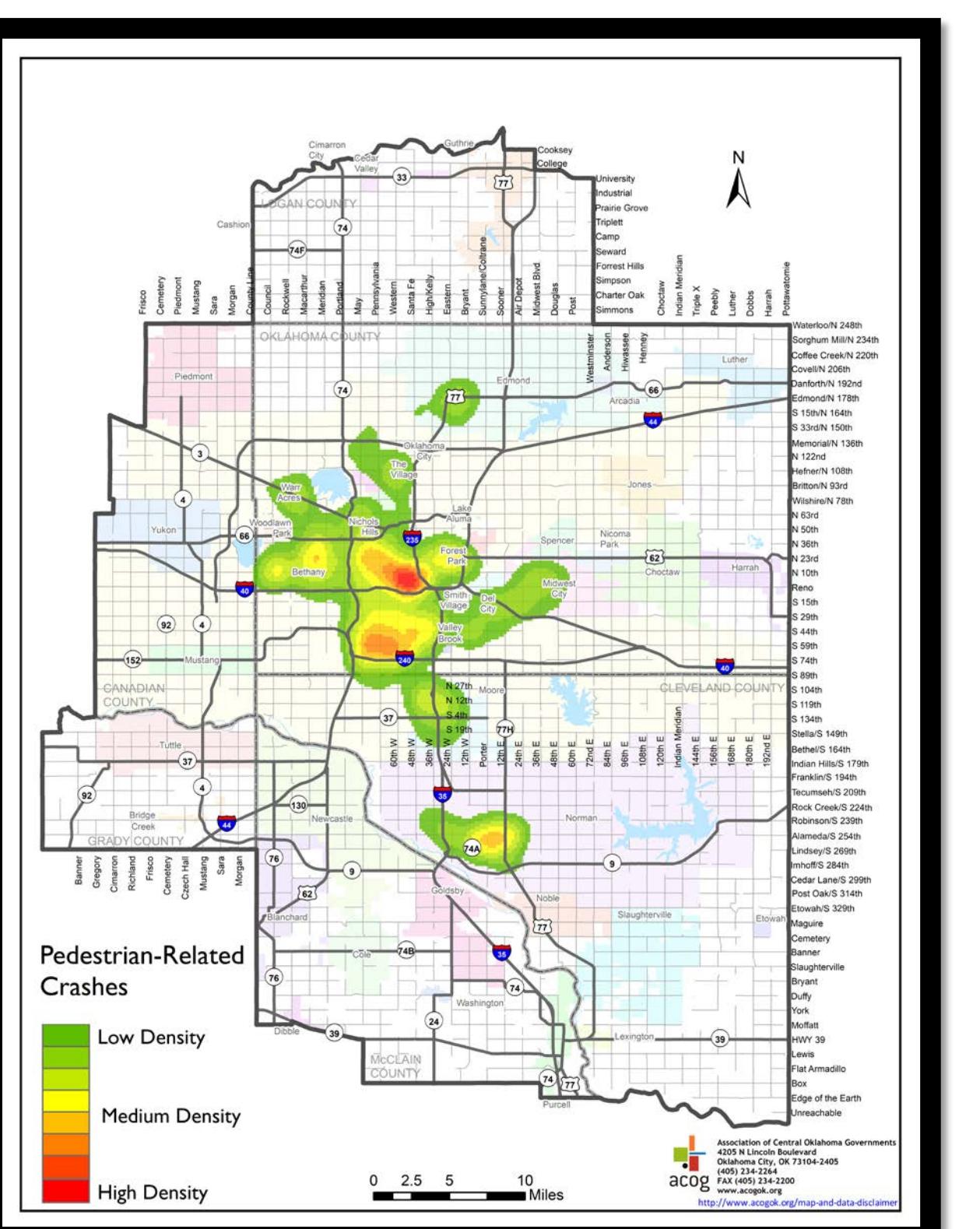


Figure 4: A density map displaying Pedestrian-related crashes in the OCARTS area from 2012 to 2015.

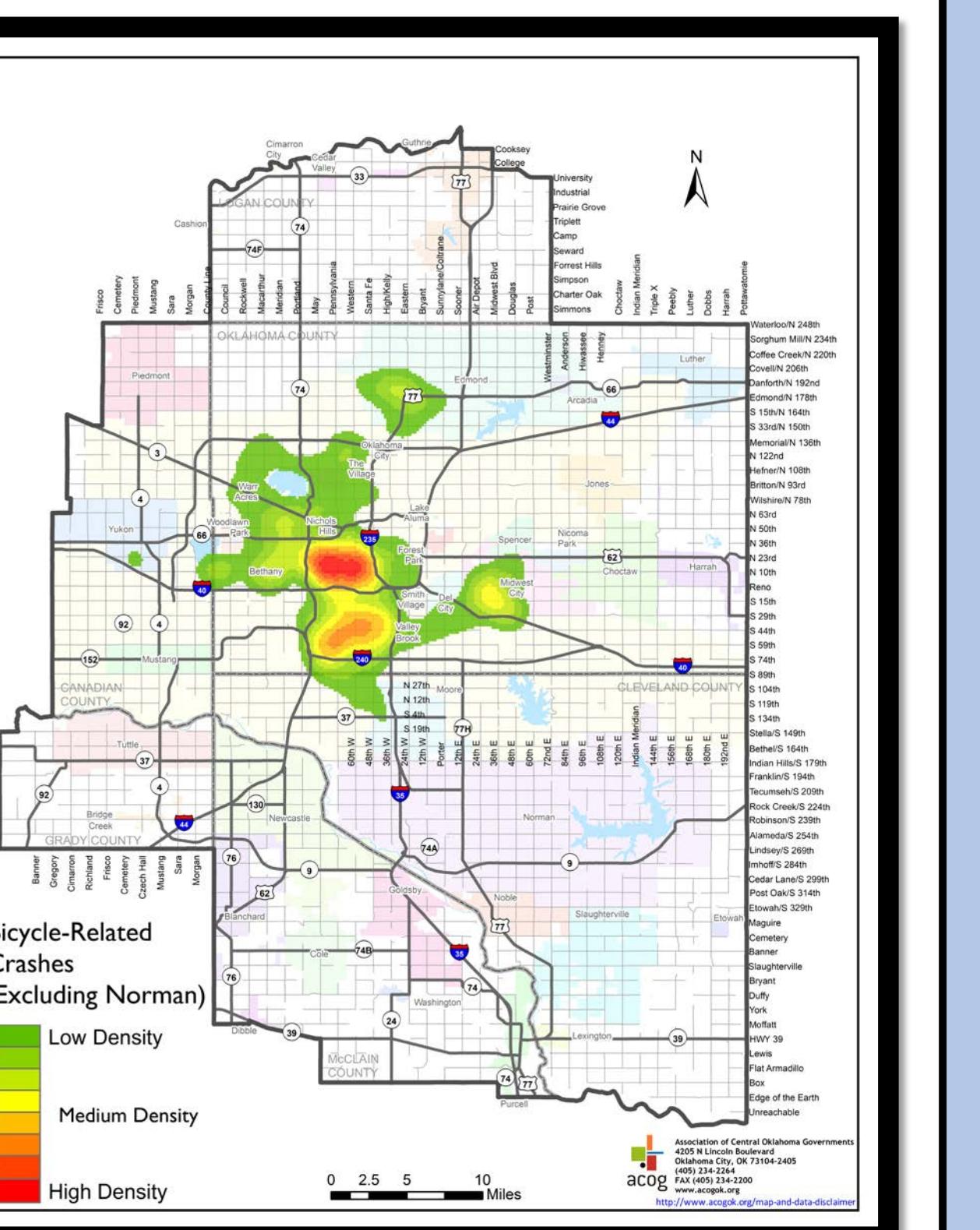


Figure 5: A density map displaying Bicycle-related crashes in the OCARTS area from 2012 to 2015.

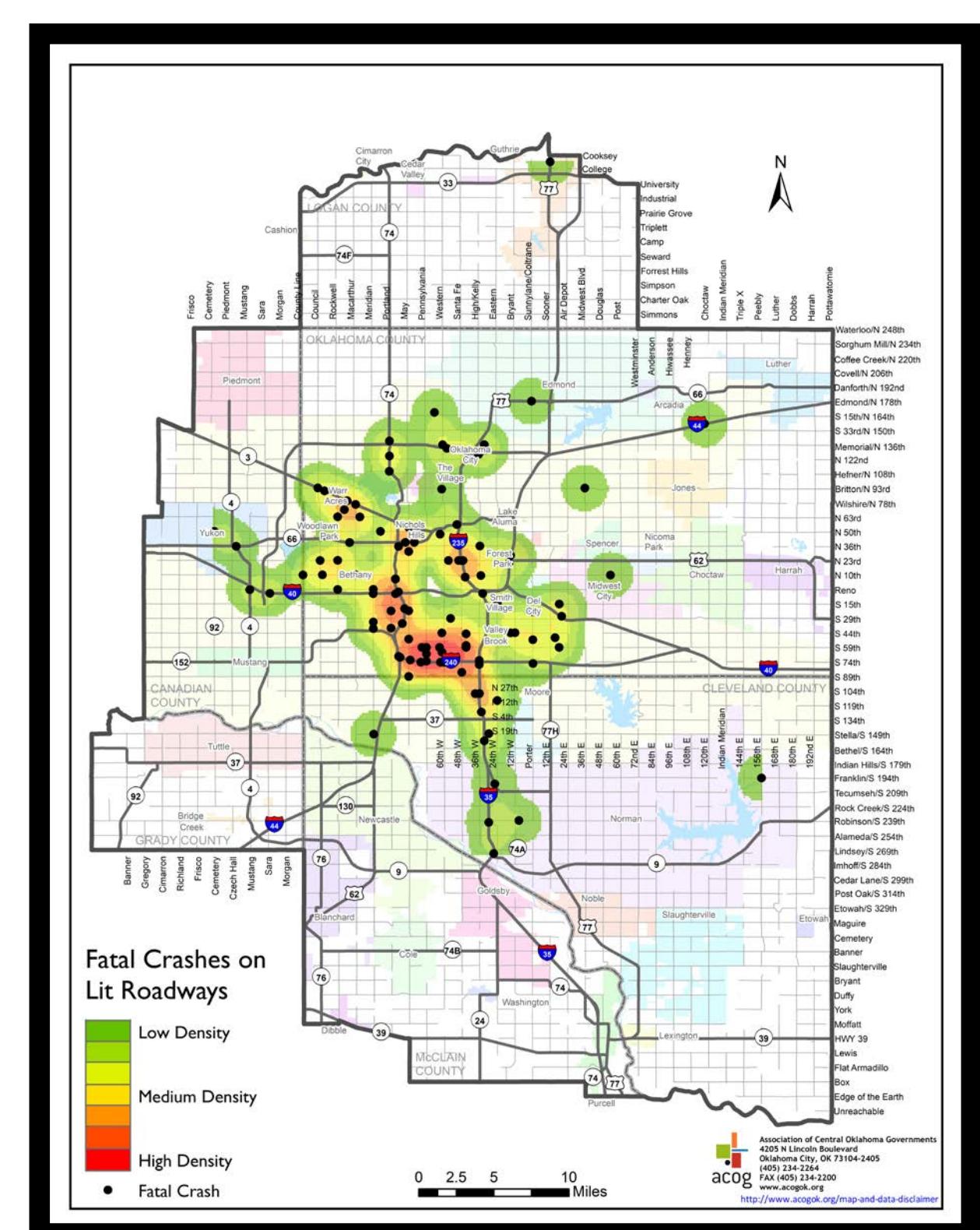


Figure 6: A density map displaying fatal crashes on lit roadways in the OCARTS area from 2012 to 2015.

Figures 6 and 7 display fatal crashes in the OCARTS area that occurred at night on lit or unlit streets. Figure 6 is a density map of crashes that occurred on lit roadways. A visual analysis shows these crashes occurring most often on I-240 and along other major roadways. Figure 7 shows a wider distribution of fatal crashes on unlit roadways occurring mostly on city streets.

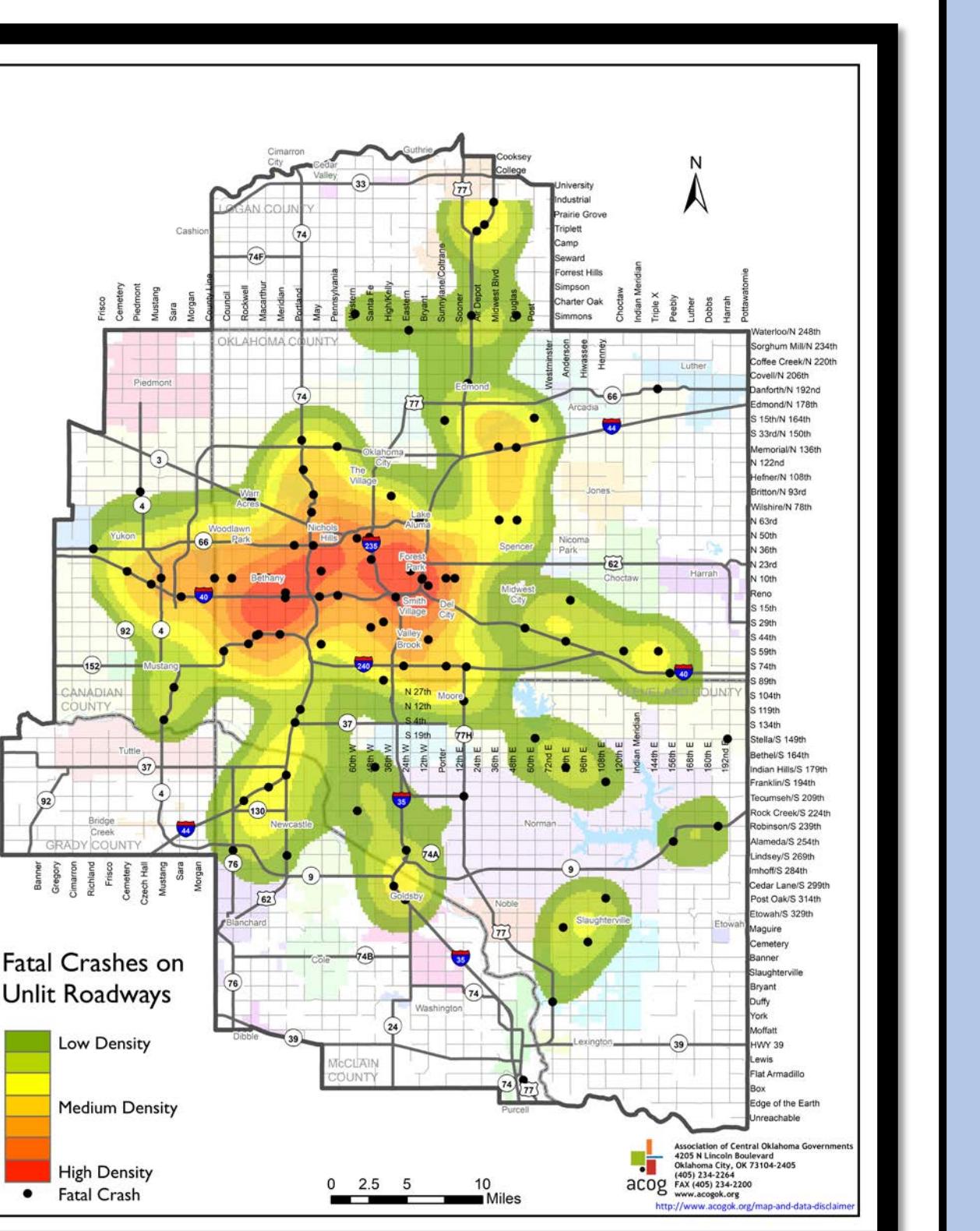


Figure 7: A density map displaying fatal crashes on unlit roadways in the OCARTS area from 2012 to 2015.

Results

The density maps displayed here were created using a kernel point density tool in ESRI ArcMap. Figure 2 displays the location and density of the 464 fatal crashes in the region. A visual analysis shows the I-35/I-240 Interchange with the most fatal crashes in the time frame.

Figures 3 through 5 display the density of DWI, Pedestrian, and Bicycle-related crashes, respectively. A visual analysis of DWI-related crashes shows a high density between I-235 and I-44. Figure 4 shows pedestrian-related crashes occurring most often around downtown OKC. When looking at bicycle-related crashes, Norman had the largest majority of crashes. Figure 5 displays bicycle-related crashes without Norman.

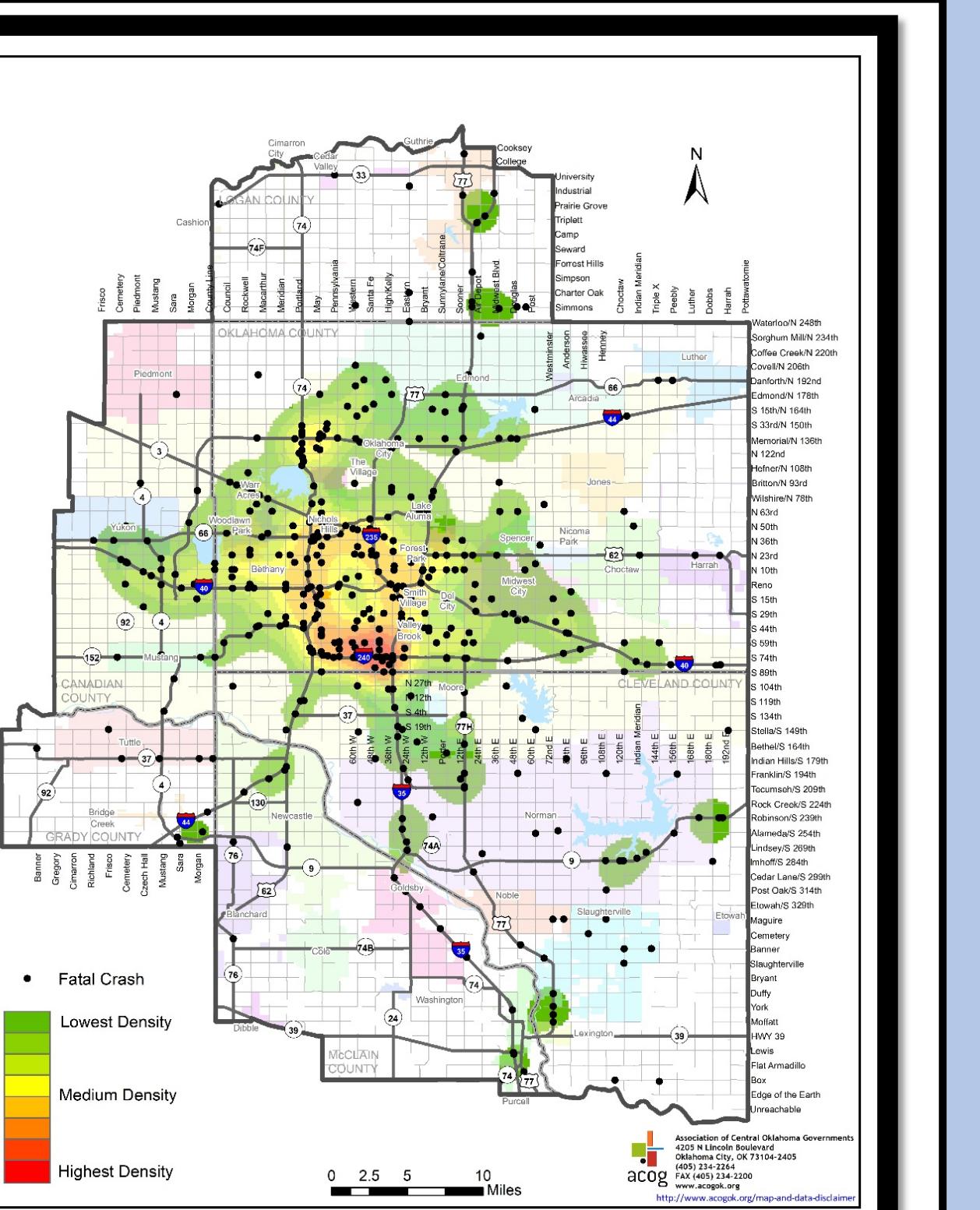
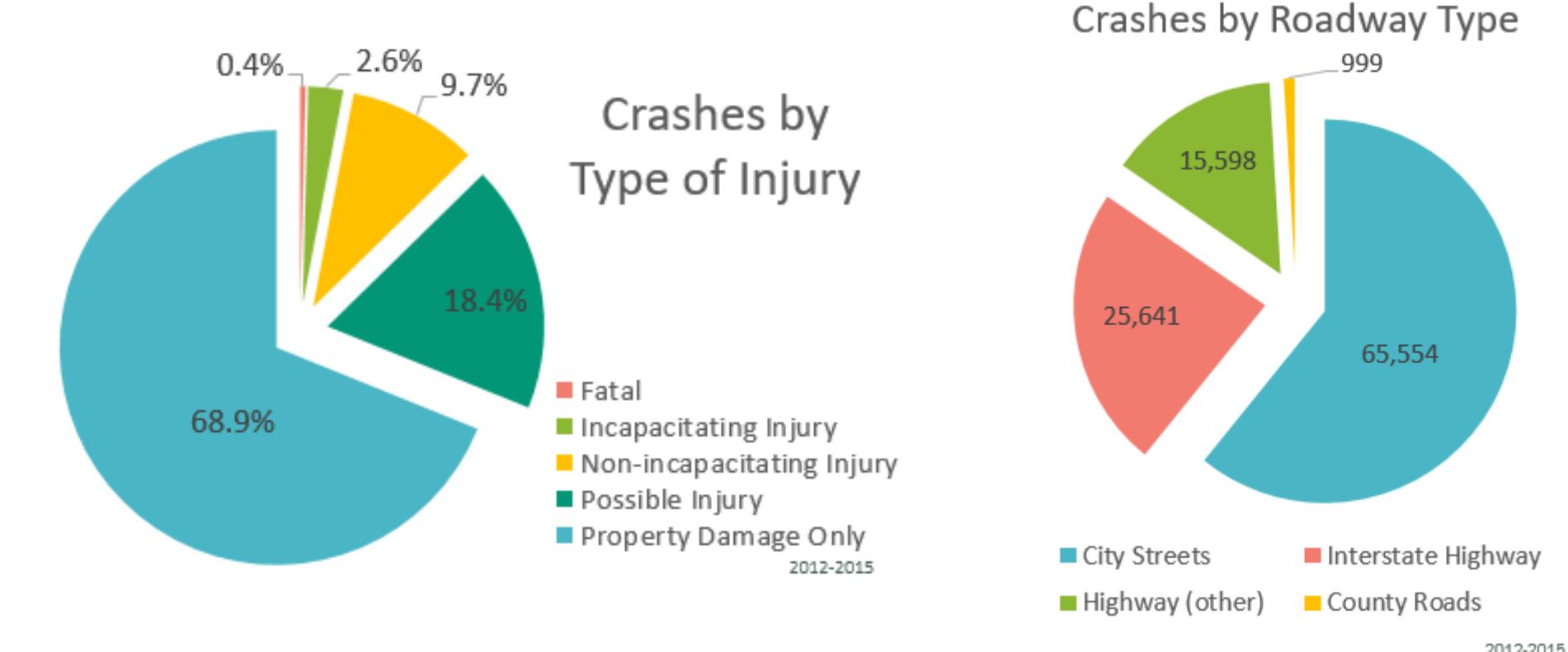


Figure 2: A density map displaying fatal crashes in the OCARTS area from 2012 to 2015.

Leading Crash Causes

All Crashes

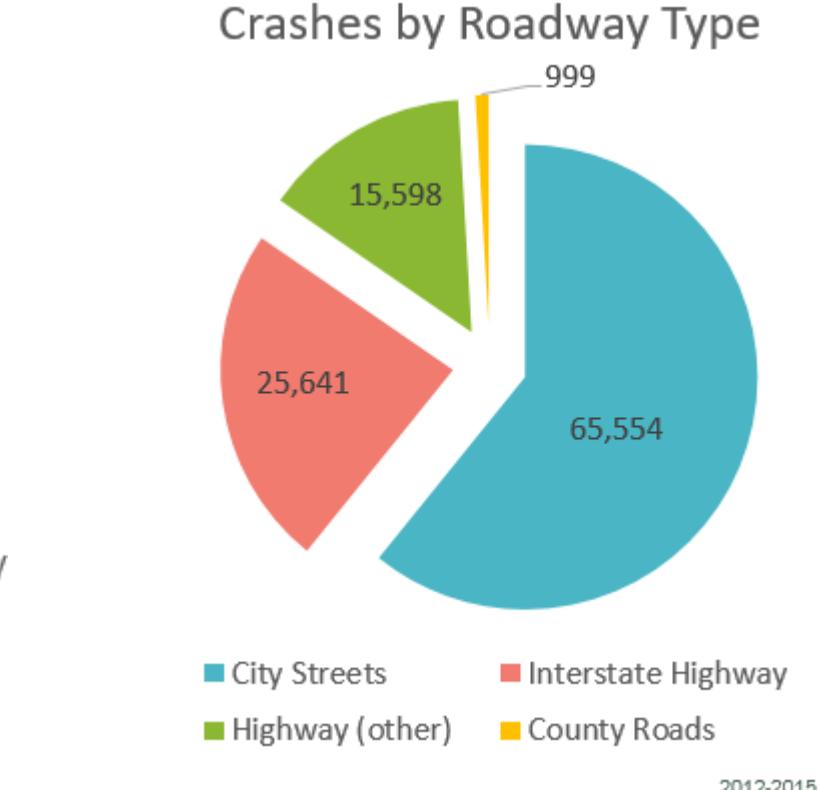
1. Following too closely (17.7%)
2. Failing to Yield (16.8%)
3. Inattention (16.5%)
4. Improper Lane Change (7.3%)
5. Unsafe Speed (7.3%)



Crashes by Type of Injury

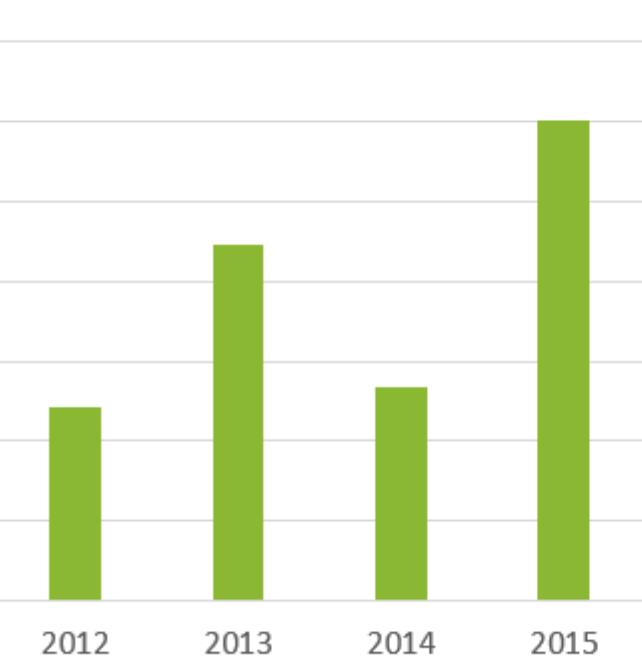
Fatal Crashes

1. Unsafe Speed (23.3%)
2. Other (11.2%)
3. DWI (9.9%)
4. Inattention (7.8%)
5. Failing to Yield (7.1%)

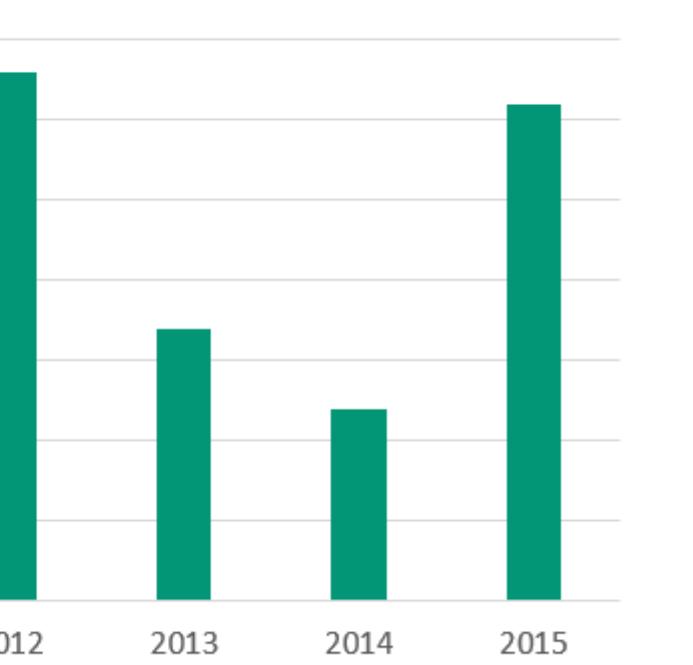


Crashes by Roadway Type

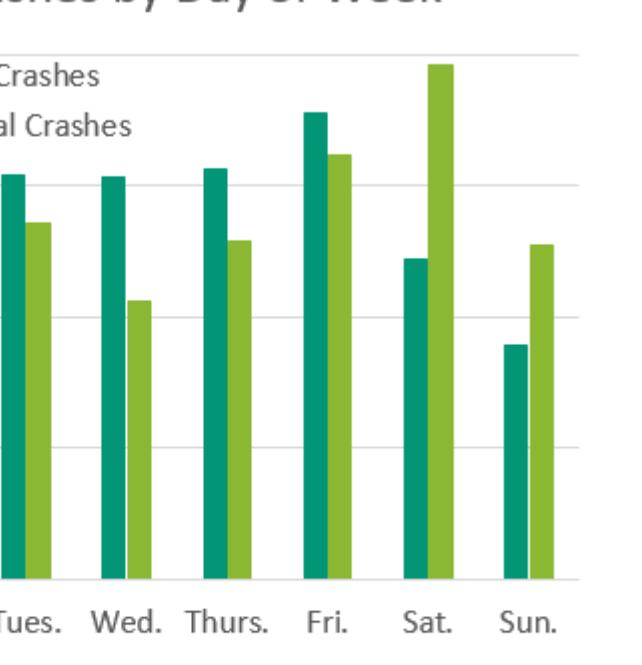
Crashes per Year



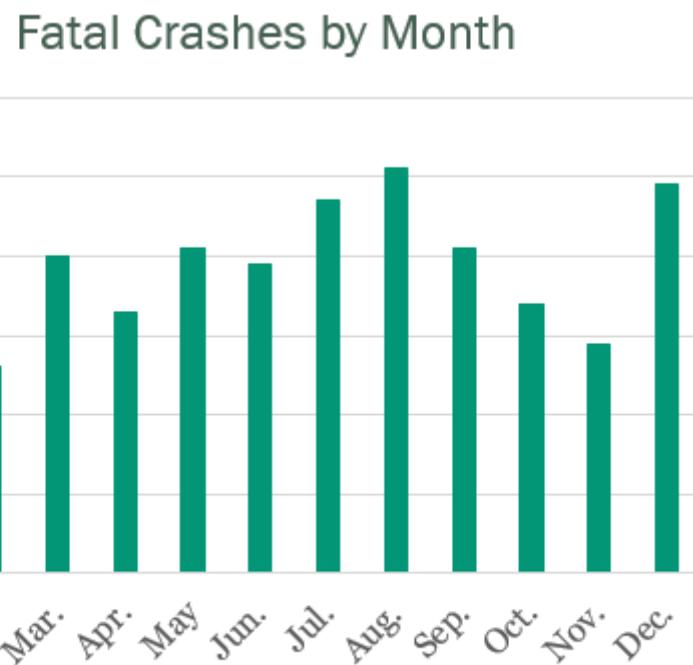
Fatalities per Year



Crashes by Day of Week



Fatal Crashes by Month



Acknowledgments

This Internship was funded by the **Center for Local Government Technology** at Oklahoma State University. The Transportation Internship Program places undergraduate and graduate students in transportation-related degree programs with local government agencies responsible for the planning, maintenance and construction of infrastructure and transportation networks around the state of Oklahoma.

I would like to thank Transportation Planning Services at the **Association of Central Oklahoma Governments**, including John Sharp, Jennifer Sebesta and Kathryn Wenger, as well as the entire ACOG staff, for a great experience and summer!