

ALTERNATIVE TRANSPORTATION

A COMPARISON OF TRAVEL TO WORK IN CENTRAL OKLAHOMA AND ASSOCIATED CRASH ANALYSIS

Over the years, the interest in alternative means of transportation has grown in America. ACOG's recent surveys for the long-range transportation plans have shown local support for more bicycle, pedestrian, and public transportation infrastructure in the region. That support is beginning to show, not just in the growing regional infrastructure, but also with means of travel to work. ACOG staff compared 2010 and 2015 5-year American Community Survey data for the Central Oklahoma region and found that, overall, these alternative forms of transportation are on the rise, particularly in the urban cores of Oklahoma City and Norman.

WHAT IS ACOG?

The Association of Central Oklahoma Governments (ACOG), is a voluntary association of city, town and county governments. ACOG serves as the Metropolitan Planning Organization (MPO), whose primary role is to lead comprehensive, coordinated and continuous transportation planning. ACOG works with the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), Oklahoma Department of Transportation (ODOT), area transit providers, local governments, the public and other stakeholders to prepare the long-range metropolitan transportation plan and short-range implementation programs.

WHAT IS OCARTS?

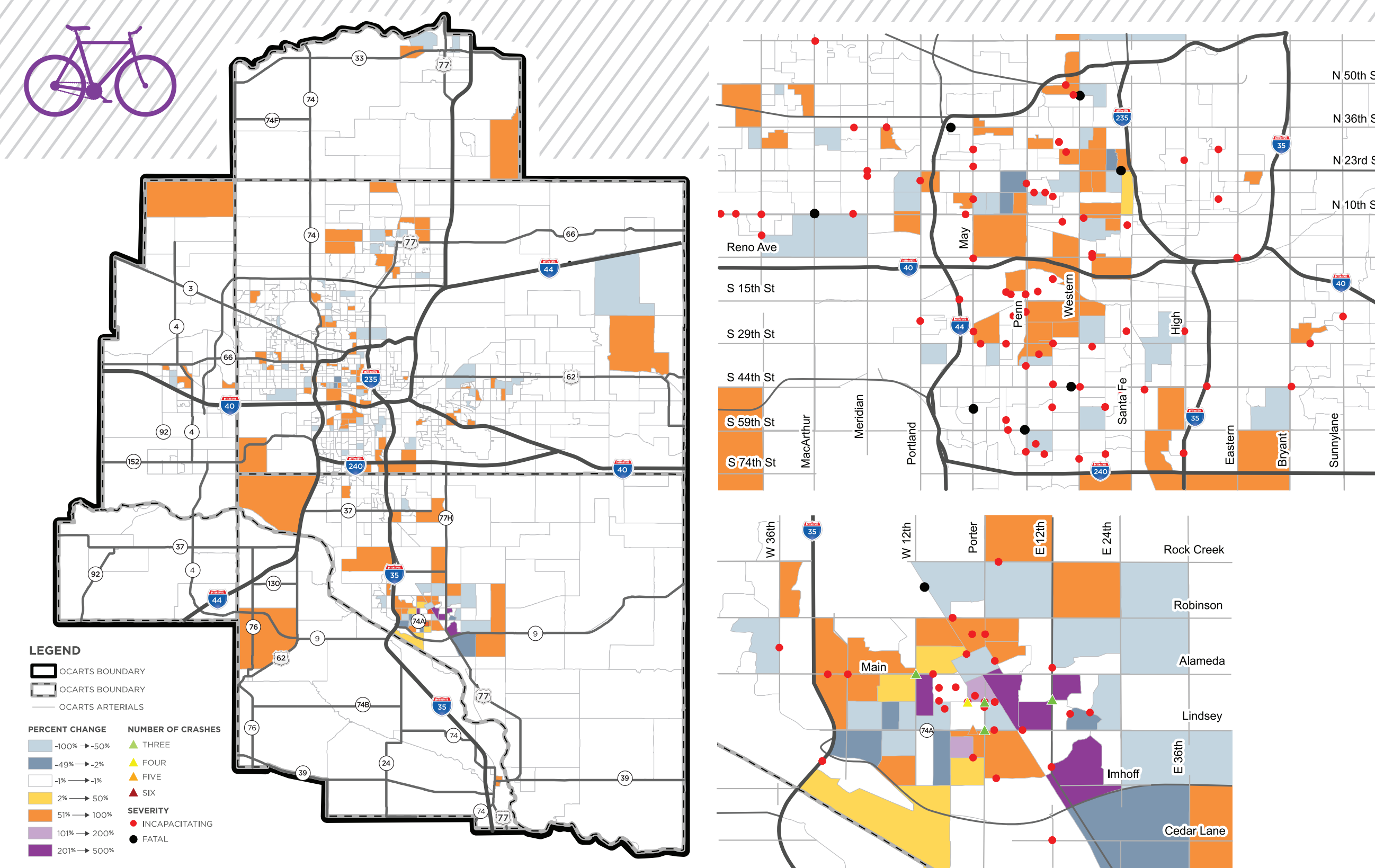
ACOG's transportation planning efforts are focused within a geographic area known as the Oklahoma City Area Regional Transportation Study (OCARTS) area. This planning boundary includes 2,085 square miles and 47 cities and towns located within Oklahoma and Cleveland Counties and portions of Canadian, Grady, Logan and McClain Counties. The OCARTS area is the urban and urbanizing portions of the region, linked by a common economy and transportation system, are included in the MPO's transportation planning efforts.

THE DATA

ACOG staff utilized 2010 and 2015 5-year estimate data from the American Community Survey at the block group level. The analysis focused on the differences between the 2010 5-year estimates and the 2015 5-year estimates and considered the following questions:

- Where are the areas of growth and decline?
- Are there more crashes where more people are walking or riding their bike?
- What might be the cause of these changes?
- What may be causing these safety issues?

PEOPLE BIKING TO WORK



ANALYSIS

For some it will be unsurprising to see the large increase in the number of cyclists, walkers, and transit riders around the University of Oklahoma in Norman. However, there are several block groups that have seen 50% to 100% increases. In some instances, though, this may simply be a change from no one riding a bike to work in the 2010 5-year estimate to a number higher than 0 in the 2015 5-year estimate. However, this is still a significant increase.

BICYCLE-RELATED CRASHES

- PROPERTY DAMAGE ONLY
- POSSIBLE INJURY
- NON-INCAPACITATING
- INCAPACITATING
- FATAL

Between 2007 and 2015, there were 1,049 bicycle-related crashes reported in the OCARTS area, resulting in 623 injuries and 16 fatalities.

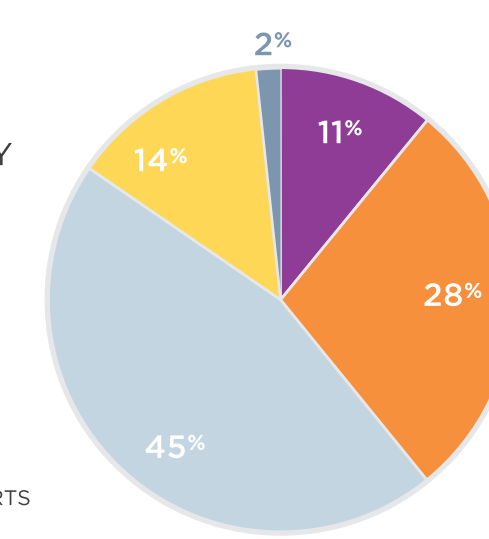
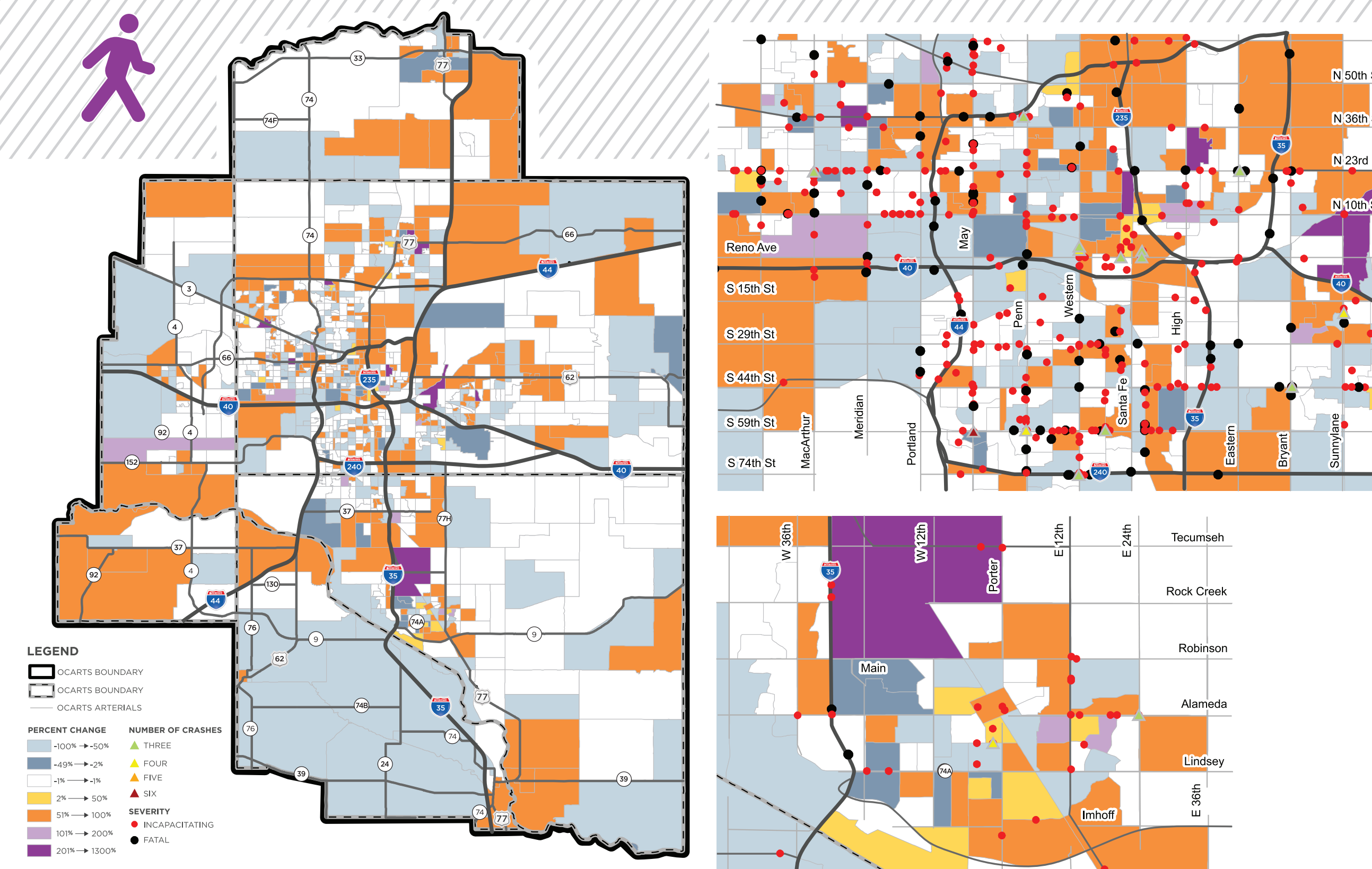


CHART 1

PEOPLE WALKING TO WORK



ANALYSIS

The OCARTS area has experienced an increase in the number of people walking to work, especially near 24th Ave NW in Norman. The increase in new housing developments as well as its proximity to the large commercial strip along the side of I-35, the University North Park area, are all contributing to this increase. In one block group, the number of people walking to work increased from 1 to 14. In some predominantly disadvantaged communities, the residents are less likely to have access to a personal vehicle and may utilize alternative modes of getting to work.

PEDESTRIAN-RELATED CRASHES

- PROPERTY DAMAGE ONLY
- POSSIBLE INJURY
- NON-INCAPACITATING
- INCAPACITATING
- FATAL

Between 2007 and 2015, there were 2,096 reported crashes involving pedestrians in the OCARTS area, resulting in 1,311 injuries and 161 fatalities.

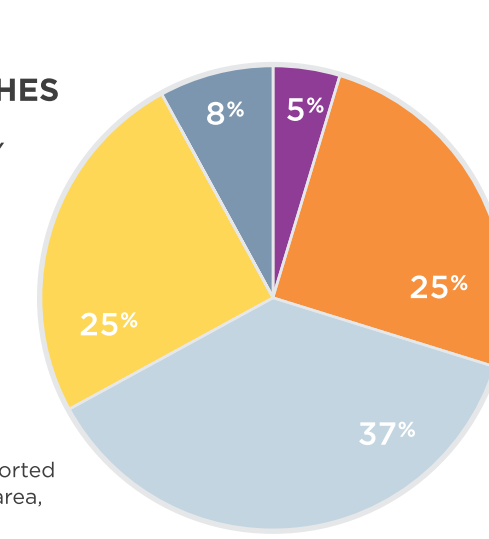
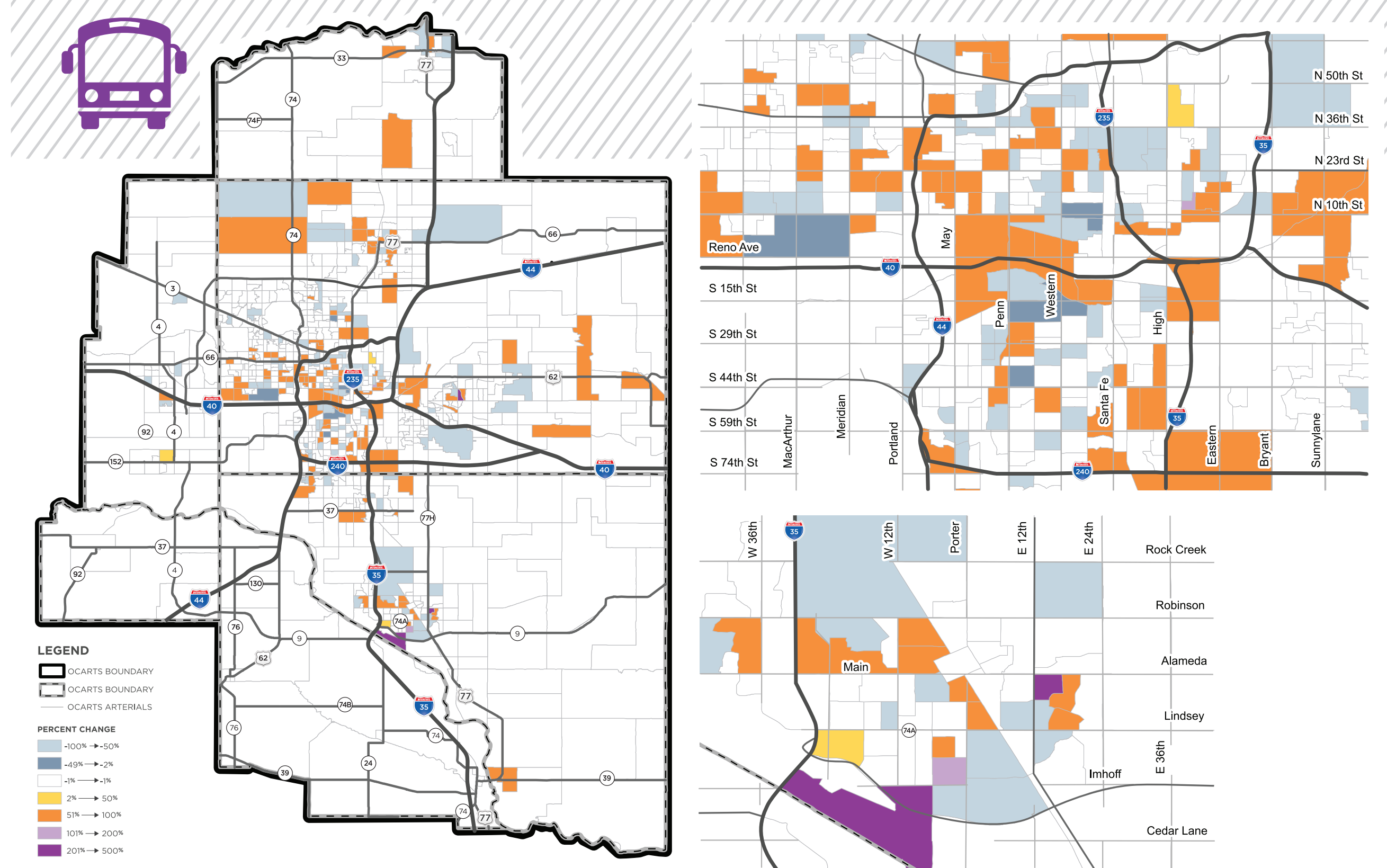


CHART 2

RIDING PUBLIC TRANSIT TO WORK



ANALYSIS

Perhaps the most noticeable change in transit community is the area in Norman south of Highway 9. This may seem rather strange, as this census block group is home to the Oliver Wildlife Preserve as well as one of the City's water facilities. However, the Lloyd Noble Center is just to the north and is a major park-and-ride lot for those traveling to the University of Oklahoma. Other areas seeing heavy ridership increases in Norman are along Main St and between Alameda and Lindsey to the east of 12th Ave. In Oklahoma City, an area east of I-235 has seen fluctuations as well. One small census block along the EMBARK 002 bus route has seen more than a 100% increase in transit ridership. Upon closer inspection, this is the result of an estimated 12 people riding transit in the 2010 5-year data set, to 29 people in the 2015 5-year data set.

GIS - PYTHON

Calculating percent of people who travel to work by a particular mode in ArcGIS is simple, however ACOG staff were more interested in the percent changes between the 2010 and 2015 data sets. To address the issue of field attributes with the value of zero, ACOG staff wrote a Python script for ArcMap to execute based on certain conditions. Using this script, ACOG staff could see areas that were seeing increases, decreases, and no changes.

```
import arcpy

def percentchange(f2010, f2015, pctch, featureclass):
    with arcpy.da.UpdateCursor(featureclass, [f2010, f2015, pctch]) as cursor:
        for row in cursor:
            if row[0] > 0:
                if row[1] > 0:
                    row[2] = (row[1] - row[0]) / row[0]
                    cursor.updateRow(row)
                elif row[1] == 0:
                    row[2] = (row[1] - row[0]) / row[0]
                    cursor.updateRow(row)
            elif row[0] == 0:
                if row[1] > 0:
                    row[2] = ((row[0] - row[1]) / row[1]) * (-1)
                    cursor.updateRow(row)
                elif row[1] == 0:
                    row[2] = 0
                    cursor.updateRow(row)

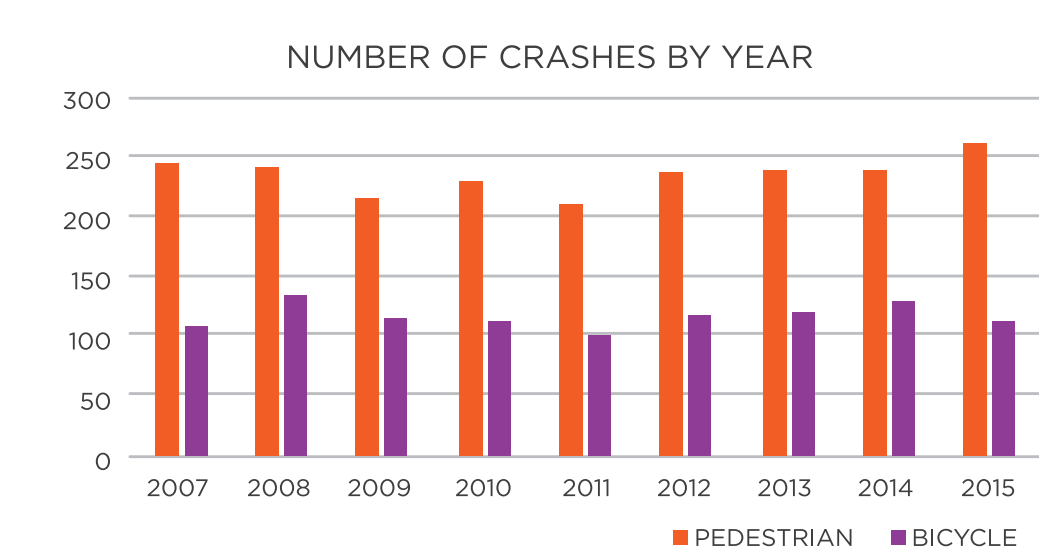
            return
```

CRASHES INVOLVING CYCLISTS AND PEDESTRIANS

As more people choose alternative forms of transportation there may be more interaction between automobile drivers and cyclists/pedestrians. According to the Oklahoma Department of Transportation (ODOT), between 2007 and 2015, the Oklahoma City Area Regional Transportation Study (OCARTS) area reported 220,756 collisions. Of this number, 1 percent involved pedestrians and 0.5 percent involved cyclists. Of the 995 fatal crashes in the OCARTS area, 2 percent involved cyclists and 16 percent involved pedestrians. This is on par with the national rate as estimated by the Fatality Analysis Reporting System (FARS): 2 percent of all 286,062 fatal crashes between 2007 and 2015 involved a cyclist and 15 percent involved a pedestrian.

In the OCARTS area, 1,049 bicycle-related crashes were reported between 2007 and 2015, resulting in 623 injuries and 16 fatalities as shown in Chart 1. In the same time frame, there were 2,096 reported pedestrian-related crashes, resulting in 1,311 injuries and 161 fatalities as shown in Chart 2. The Governors Highway Safety Association report *A Right to the Road* states that since 2011, an average of 55 cyclists are killed on U.S. roads every year. The OCARTS area is about twice the national average at around 100 cyclist deaths per year. Pedestrian related crashes remained between 200 and 250 crashes per year, except for 2015 when the number jumped to 262 pedestrian-related crashes.

Pedestrian-related crash hotspots appear in downtown Oklahoma City and Bricktown area and southern Oklahoma City as well as near the University of Oklahoma in Norman. Bicycle-related crash hotspots are also centered around the University of Oklahoma in Norman but also between I-44 and I-240 in Oklahoma City. These areas line up with areas seeing higher numbers of pedestrian and bicycle travelers. Crash incidents appear to cluster along heavily traveled arterial roadways. In Oklahoma City, many of the crashes involving a cyclist or pedestrian occur close to residential areas.



The total number of crashes that involved pedestrians and cyclists by year. There are around 200 to 250 pedestrian-related crashes and around 100 bicycle-related crashes every year.

GOING FORWARD

A total of 18 percent of all fatalities in the OCARTS area involve a cyclist or a pedestrian. With more people walking and cycling, more crashes seem inevitable. However, simple adjustments can be made to traveler behavior and engineering to make everyone's commute safer.

It will take engineering, education, and enforcement - the three E's - to improve the safety of the more vulnerable commuters. Cities in the region should steer away from sign-on-road bicycle facilities where it is not appropriate. Local governments should also encourage, if not require, ADA compliant sidewalks for every new building installation if they do not already do so.

Education of both drivers and non-motor vehicle commuters is important. Cyclists and pedestrians should be aware of the rules of the road. Cyclists, in particular, should know they are expected to obey the same laws as drivers. For drivers, there should be a component to the driver's education on how to deal with cyclists and pedestrians and familiarize them to this group's rights. Of course, education will be more effective with the proper enforcement and effective enforcement begins with the training of the enforcers. It is important for those protecting commuters on the road to realize that cyclists are also vehicles and, while more vulnerable, have the same rights and responsibilities as those in a motor vehicle. City police departments should consider offering training concerning the rules and regulations in regards to cyclists and pedestrians.

MARGIN OF ERROR

It should be noted that the margin of error was not taken into consideration when calculating changes. The data was also not normalized, which may have skewed the displayed data.

This data only considers travel to work, and not trips taken for errands, recreation, or otherwise. It also does not consider trips utilizing multiple modes. Under-reporting of collisions should also be considered. Sometimes crashes involving pedestrians and cyclists may not be reported. According to the National Highway Traffic Safety Administration (NHTSA), examining hospital records reveals that only a small percentage of bicycle crashes resulting in an injury are reported to police. Oftentimes, a reportable crash is defined as occurring on a public roadway where an injury, fatality, and/or when at least one vehicle needed to be towed from the scene. Bicycles and pedestrians are not 'towed' from a scene and many do not report a crash if they are not seriously injured.

DATA FROM:
U.S. CENSUS BUREAU
OKLAHOMA DEPARTMENT OF TRANSPORTATION

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CONTACT:
Charlotte Adcock
Assistant Planner - Multimodal
Transportation & Planning Services
c.adcock@acogok.org

Jennifer M. Sebesta
Program Coordinator
Transportation & Planning Services
jsebesta@acogok.org

4025 N. Lincoln Blvd., Oklahoma City, OK 73105
405.234.2264 | Fax: 234.2200 | acogok.org

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