

A SPATIAL LOOK AT MULTIMODAL CRASHES IN CENTRAL OKLAHOMA

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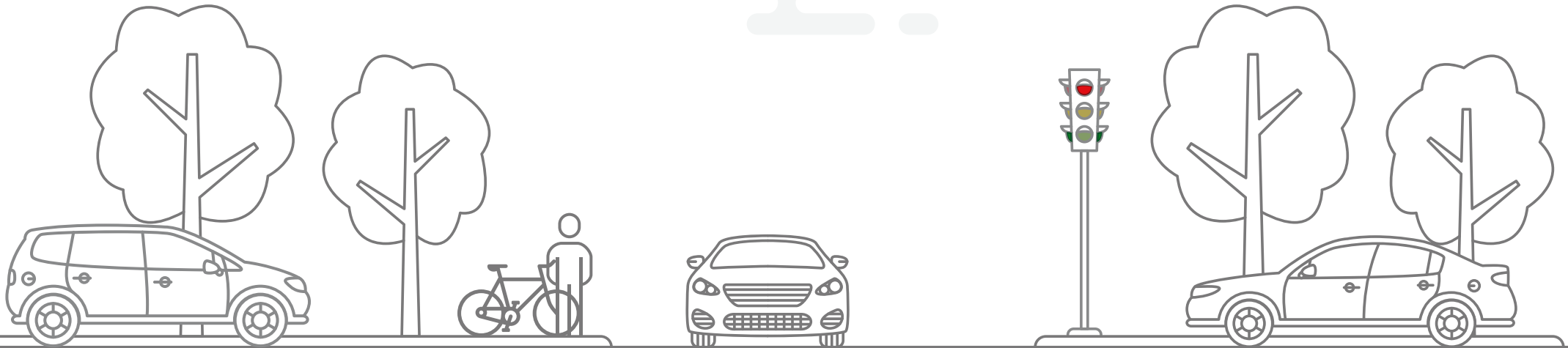
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acog

OUTLINE

- National and Local Statistics
- Methodology
- Analysis
- ArcGIS Online Story Map



STATISTICS

NATIONAL STATISTICS

Fatal crashes have been increasing steadily around the nation. According to the most recent report (2016) from the USDOT's National Highway Traffic Safety Administration (NHTSA), fatality collisions increased by 5.6% from calendar year 2015.

- Distraction related deaths decreased by **2.2%**
- Drunk driving deaths increased by **1.7%**
- Speeding deaths increased by **4%**
- Pedestrian deaths increased by **9%**
- Bicyclist deaths increased by **1.3%**

CENTRAL OKLAHOMA STATISTICS

VEHICLE 2007 - 2015

TOTAL

69,861

FATAL

171

SERIOUS

10,507

CENTRAL OKLAHOMA STATISTICS

PEDESTRIAN 2007 - 2015

TOTAL
968

FATAL
63

SERIOUS
226

CENTRAL OKLAHOMA STATISTICS | BICYCLE 2007 - 2015

TOTAL
508

FATAL
7

SERIOUS
60

METHODOLOGY & ANALYSIS

GATHERING DATA

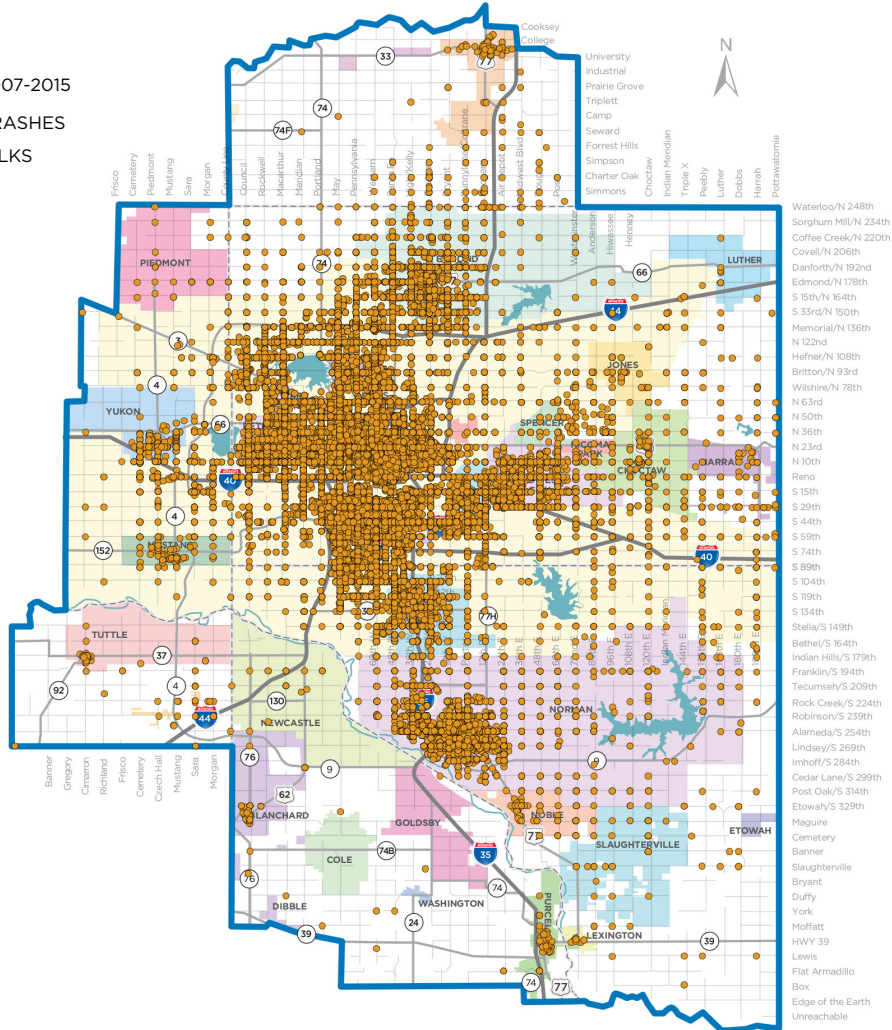
- Retrieved data from ODOT's SAFE-T website: <https://oksafet.org/>
- Organized data in Microsoft Excel and imported into ArcMap
- Geocoded each individual crash site using the Latitude and Longitude information
- Using the Spatial Analyst license, performed a Kernel Density

VEHICULAR CRASHES



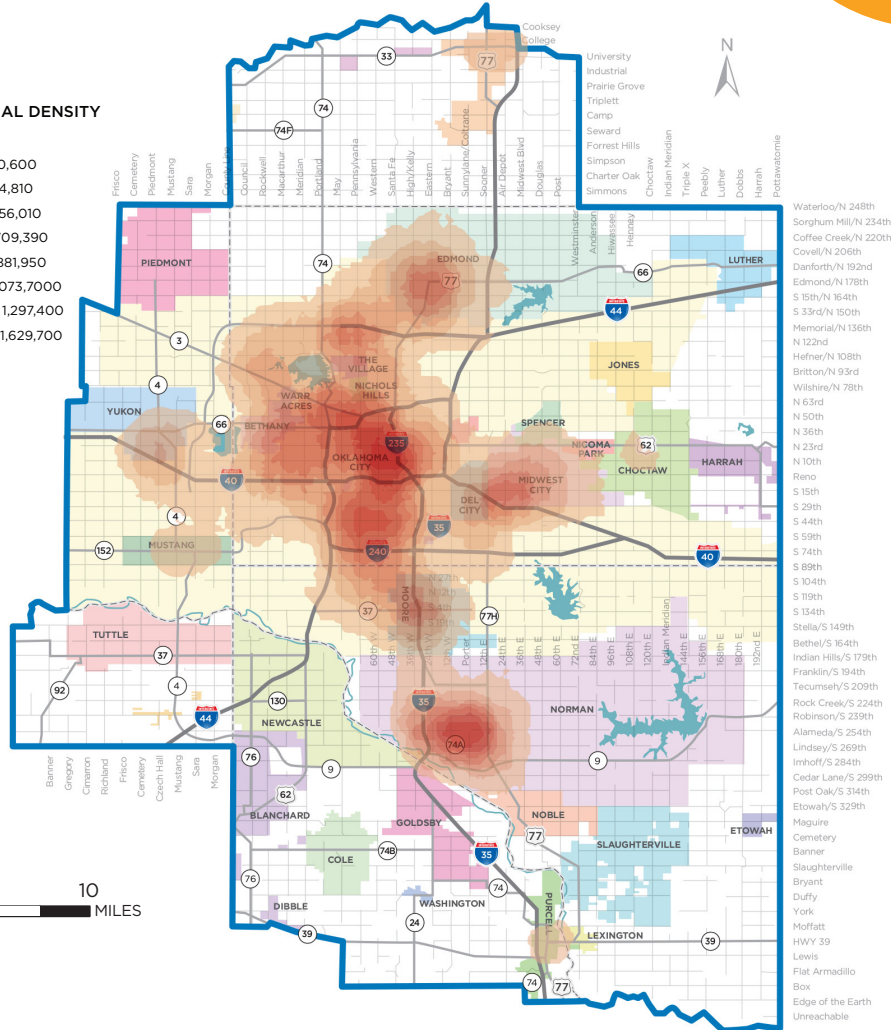
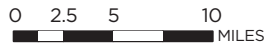
LEGEND 2007-2015

- VEHICLE CRASHES
- SIDEWALKS



LEGEND
VEHICLE KERNAL DENSITY

- 0 - 38,346
- 38,347 - 140,600
- 141,610 - 274,810
- 415,450 - 556,010
- 556,020 - 709,390
- 709,400 - 881,950
- 881,960 - 1,073,7000
- 1,073,800 - 1,297,400
- 1,297,500 - 1,629,700



Constructed heat map using all car crashes to visualize hot spots.

BICYCLE CRASHES

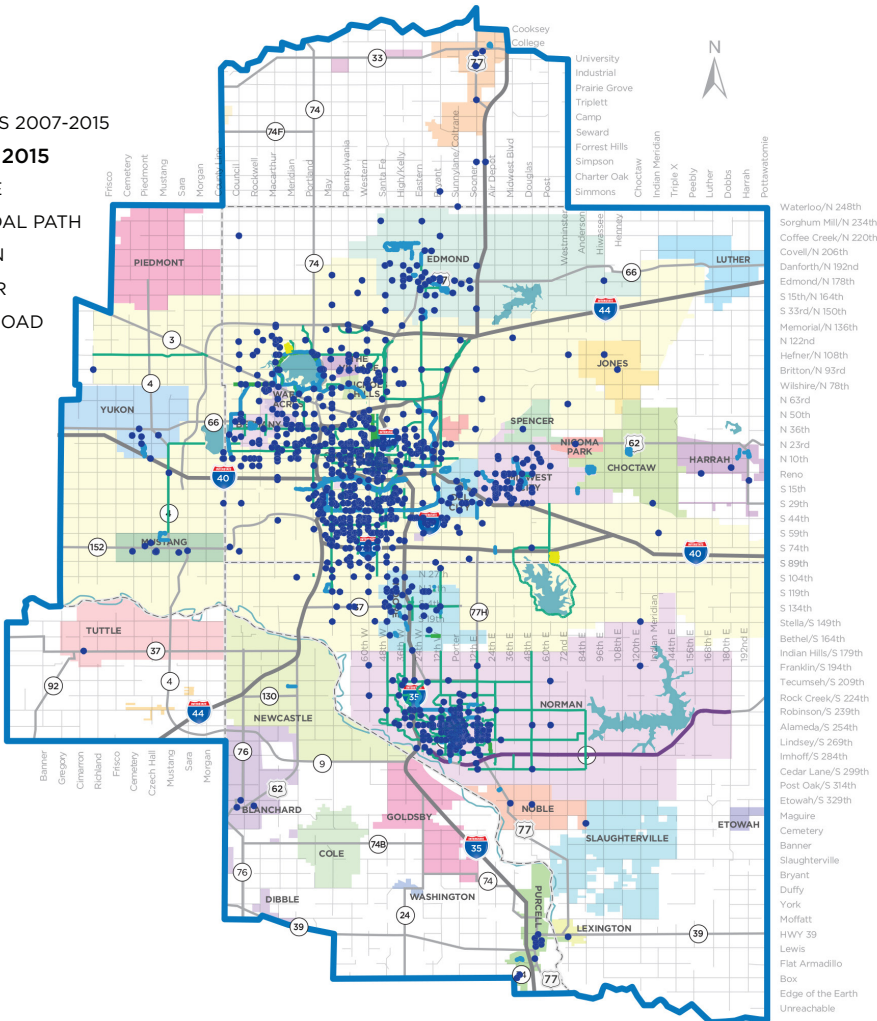


LEGEND

● BIKE CRASHES 2007-2015

Bicycle Routes 2015

- BIKE LANE
- MULTIMODAL PATH
- MOUNTAIN
- SHOULDER
- SIGN ON ROAD

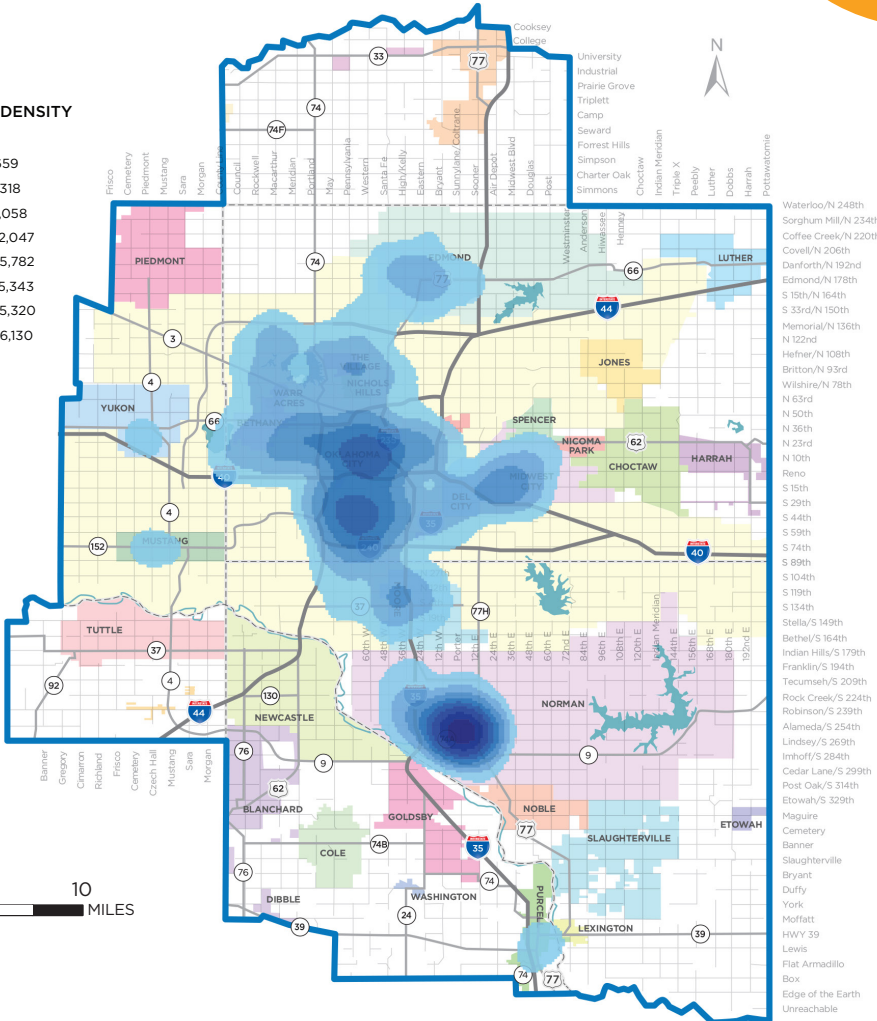


LEGEND

BIKE KERNEL DENSITY

- 0 - 2,081
- 2,082 - 6,659
- 6,660 - 13,318
- 13,319 - 22,058
- 22,059 - 32,047
- 32,048 - 45,782
- 45,783 - 65,343
- 65,344 - 85,320
- 85,321 - 106,130

0 2.5 5 10
MILES

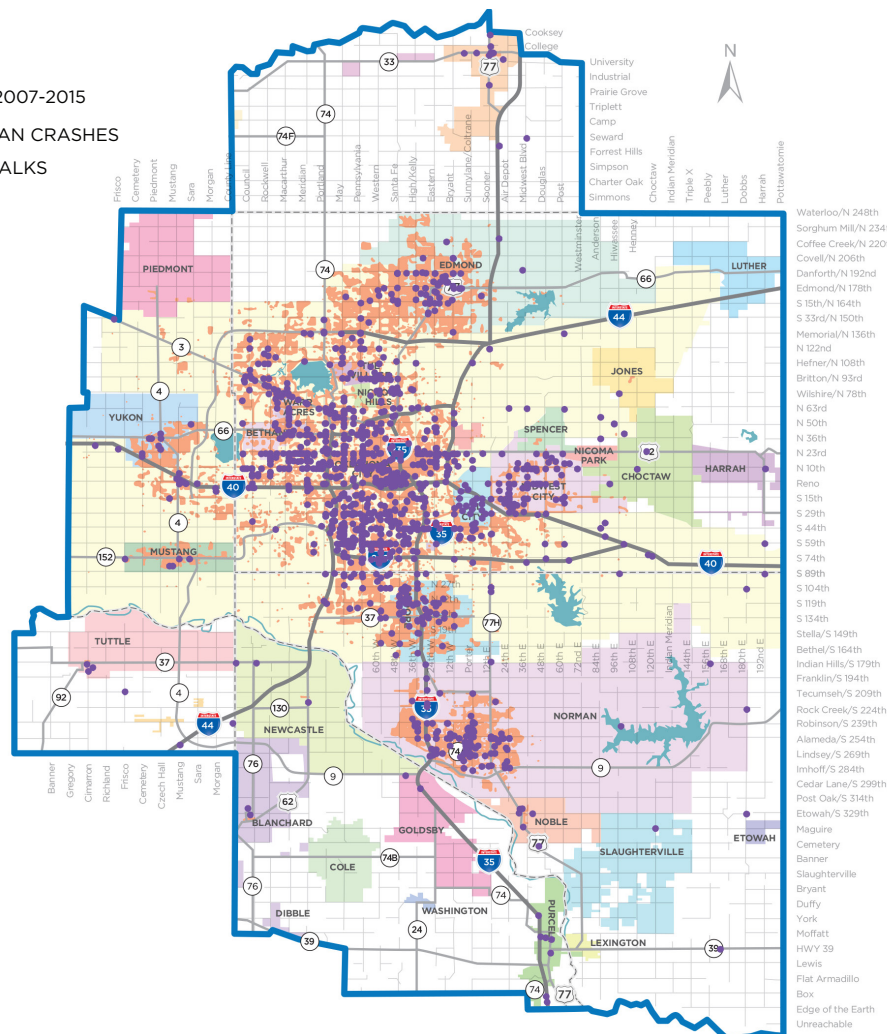


PEDESTRIAN CRASHES



LEGEND 2007-2015

- PEDESTRIAN CRASHES
- SIDEWALKS

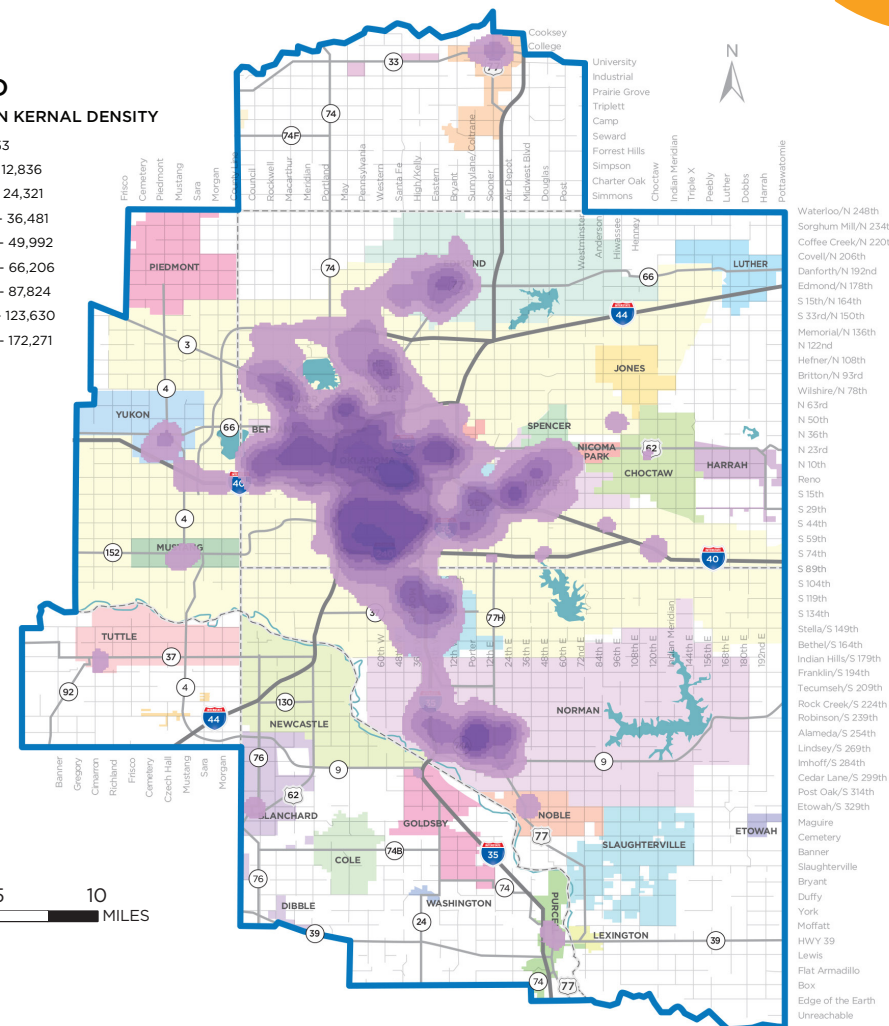


LEGEND

PEDESTRIAN KERNAL DENSITY

- 0 - 4,053
- 4,054 - 12,836
- 12,837 - 24,321
- 24,322 - 36,481
- 36,482 - 49,992
- 49,993 - 66,206
- 66,207 - 87,824
- 87,825 - 123,630
- 123,631 - 172,271

0 2.5 5 10
MILES



DETERMINING CRASH RATES

- Vehicle Crash Rates (Crashes per 10,000 trips)
 - Pull traffic count data around each intersection
 - Average all counts together
 - Divide total crashes by average traffic counts
- For Bicycles and Pedestrians
 - Far fewer bicycle crashes and pedestrian crashes made the process much more simple – specific intersections and corridors were very apparent
 - Selection tool to calculate total
 - Fatalities brought into heavy consideration

BUFFER COUNT

- Based on the highest crash intersections, we created 1/4mi buffer around these points
- We joined the crash points to the buffer layer, including a count field to display the number of points within the buffer

Join Data

Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.

What do you want to join to this layer?

Join data from another layer based on spatial location

1. Choose the layer to join to this layer, or load spatial data from disk:

20122015CityIntCDAMerge

2. You are joining: Points to Polygons

Select a join feature class above. You will be given different options based on geometry types of the source feature class and the join feature class.

☒ Each polygon will be given a summary of the numeric attributes of points that fall inside it, and a count field showing how many points inside it.

How do you want the attributes to be summarized?

☐ Average ☐ Minimum ☐ Standard Deviation
☒ Sum ☐ Maximum ☐ Variance

☐ Each polygon will be given all the attributes of the point that is closest to its boundary, and a distance field showing how close the point is (in units of the target layer).

Note: A point falling inside a polygon is treated as being closest to the polygon, (i.e. a distance of 0).

3. The result of the join will be saved into a new layer.

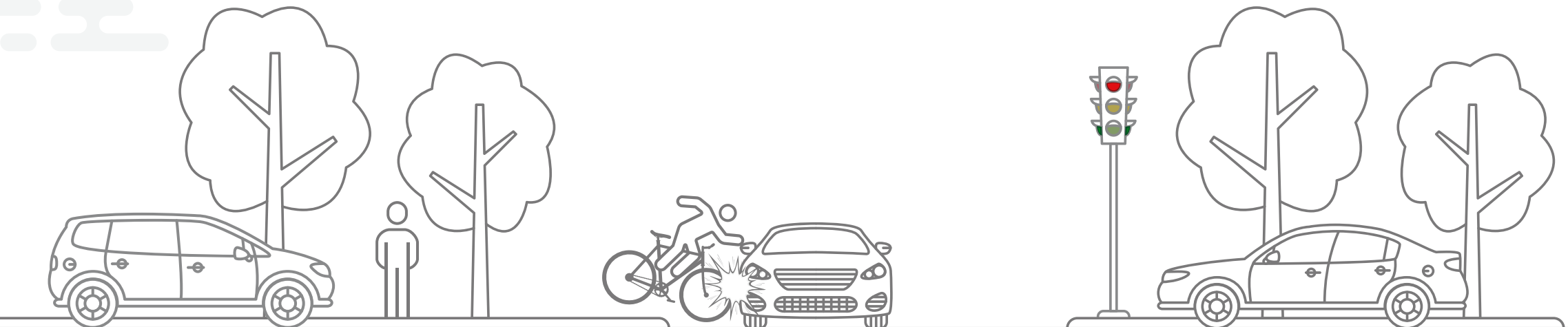
Specify output shapefile or feature class for this new layer:

U:\Merge\Shapefiles\Workspace\Join_Output.shp

[About joining data](#) OK Cancel

CHALLENGES

- Human error in crash reporting
- Inaccurate, incomplete, or no crash addressing
- Not enough detail in report about pedestrian or bicyclist actions



ARCGIS ONLINE

ARCGIS ONLINE STORY MAP TIPS

- Perform GIS analyses outside of ArcGIS Online Story Map
- All shapefile components must be within a zipped folder in order to add to a web map
- Heatmaps were uploaded as hosted tile layer packages, created in ArcGIS Desktop
- Ensure that all map layers are shared to everyone (the public) in order for a web map to be visible to people outside of your organization's account

LINK TO REGIONAL CRASH STUDY

- [ACOG Regional Crash and Safety Report \(2007-2015\)](#)

SOURCES

- USDOT Releases 2016 Fatal Traffic Crash Data:
<https://www.nhtsa.gov/press-releases/usdot-releases-2016-fatal-traffic-crash-data>
- 2007-2015 crash data from ODOT SAFE-T
- ArcGIS Online

QUESTIONS?

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