

Challenges in Modeling Walkability and Pedestrian Safety

Sagert Sheets

GIS Manager, MRMPO

UNM GIS Day - November 16, 2022



- ▶ <https://mrmpo-gis.github.io/presentations>



MPOs and GIS

- ▶ Metropolitan Planning Organizations (MPOs) program federal funds for transportation projects
- ▶ Regional (metro area) collaboration and planning
- ▶ Maps and GIS are key to thinking and modeling regionally
 - ▶ Roadway inventories (networks)
 - ▶ Land use and transportation connection
 - ▶ Forecast future conditions
 - ▶ Where are transportation improvements (including safety and pedestrian improvements) needed?



Background

Pedestrian deaths are high.

Safety is a priority.





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New Mexico sees most number of pedestrian deaths in decade

January 18, 2022



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Albuquerque ranked second in the nation for pedestrian deaths despite city initiatives

BY: **NASH JONES, KUNM NEWS** - JULY 28, 2022 4:21 AM



NM again deadliest state for pedestrians

BY [MATTHEW REISEN](#) / JOURNAL STAFF WRITER

PUBLISHED: SATURDAY, MAY 21ST, 2022 AT 4:35PM

UPDATED: SATURDAY, MAY 21ST, 2022 AT 8:56PM

- ▶ <https://apnews.com/article/new-mexico-department-of-transportation-albuquerque-new-mexico-5431c3d0bf2c2d8c6f918a847d4bc0a9>
- ▶ <https://www.abqjournal.com/2501552/nm-ranks-first-again-for-fatal-pedestrian-crashes.html>
- ▶ <https://sourcenm.com/2022/07/28/albuquerque-ranked-second-in-the-nation-for-pedestrian-deaths-despite-city-initiatives/>



Safe Streets and Roads for All
Grants

About Safe Streets and Roads
for All Grants

Announcement

Webinar Series

How to Apply

Resources

Safe Streets and Roads for All (SS4A) Grant Program

The [Bipartisan Infrastructure Law](#) (BIL) established the new Safe Streets and Roads for All (SS4A) discretionary program with \$5 billion in appropriated funds over the next 5 years. In fiscal year 2022 (FY22), up to \$1 billion is available. The SS4A program funds regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries.

The SS4A program supports Secretary of Transportation Pete Buttigieg's National Roadway Safety Strategy and the Department's goal of zero deaths and serious injuries on our nation's roadways.

S | S
4 | A



U.S. Department
of Transportation

National Roadway Safety Strategy

United States Department of Transportation | January 2022



CITY OF
ALBUQUERQUE

Vision Zero

Information about how we can all take action to improve traffic safety in Albuquerque.

What is Vision Zero?

What is an acceptable number of traffic deaths for my family?
ZERO.

Vision Zero is a data-driven safe systems approach to create safer streets for all, whether walking, biking, driving, or taking transit, and regardless of age or ability. It is used around the world to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. [Read more about Vision Zero.](#)

Traffic safety is an important piece of our overall effort to improve public safety. In 2020, at least 77 people were killed while traveling around our city. That is 77 too many of our family members, children, friends, and neighbors. We can all take steps to improve safety on Albuquerque streets.

RESOLUTION

of the

METROPOLITAN TRANSPORTATION BOARD

of the

MID-REGION METROPOLITAN PLANNING ORGANIZATION

Division of the

MID-REGION COUNCIL OF GOVERNMENTS OF NEW MEXICO

(R-22-08 MTB)

**DECLARATION OF SAFETY AS A PRIORITY IN THE ALBUQUERQUE
METROPOLITAN
PLANNING AREA (AMPA)
IN THE DEVELOPMENT OF THE
TRANSPORTATION IMPROVEMENT PLAN (TIP)
AND THE
METROPOLITAN TRANSPORTATION PLAN (MTP)**

WHEREAS, the Metropolitan Transportation Board (MTB) is the governing body of the Mid-Region Metropolitan Planning Organization (MRMPO), a division of the Mid-Region Council of Governments (MRCOG); and

WHEREAS, the MRMPO is responsible for carrying out continuous, comprehensive, and cooperative metropolitan transportation planning in accordance with 23 CFR 450, for the Albuquerque Metropolitan Planning Area (AMPA); and

WHEREAS, the federal law under the Infrastructure and Investment and Jobs Act (IIJA) requires states and metropolitan planning organizations to incorporate national goals into their planning processes which include the goal to reduce traffic fatalities and serious injuries; and

R-22-08 MTB

2

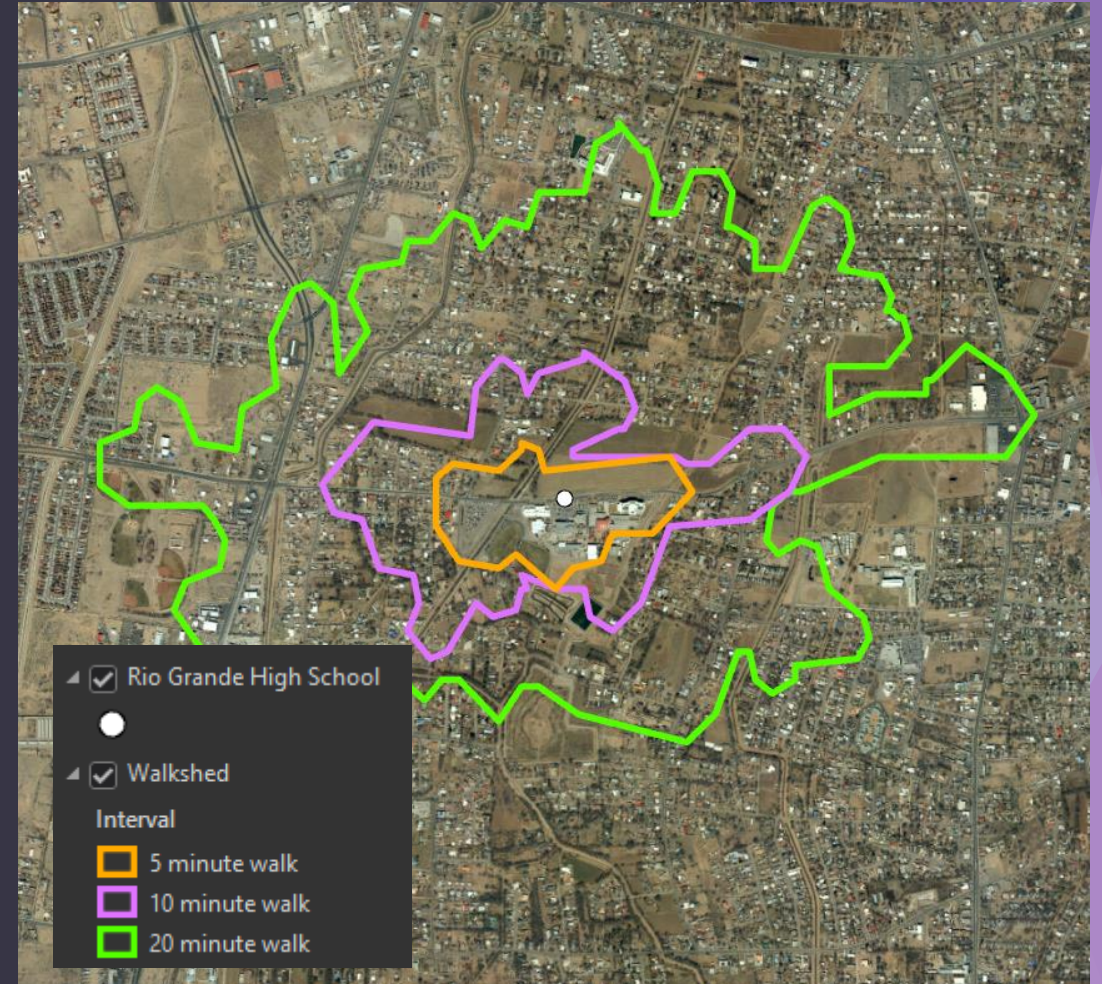
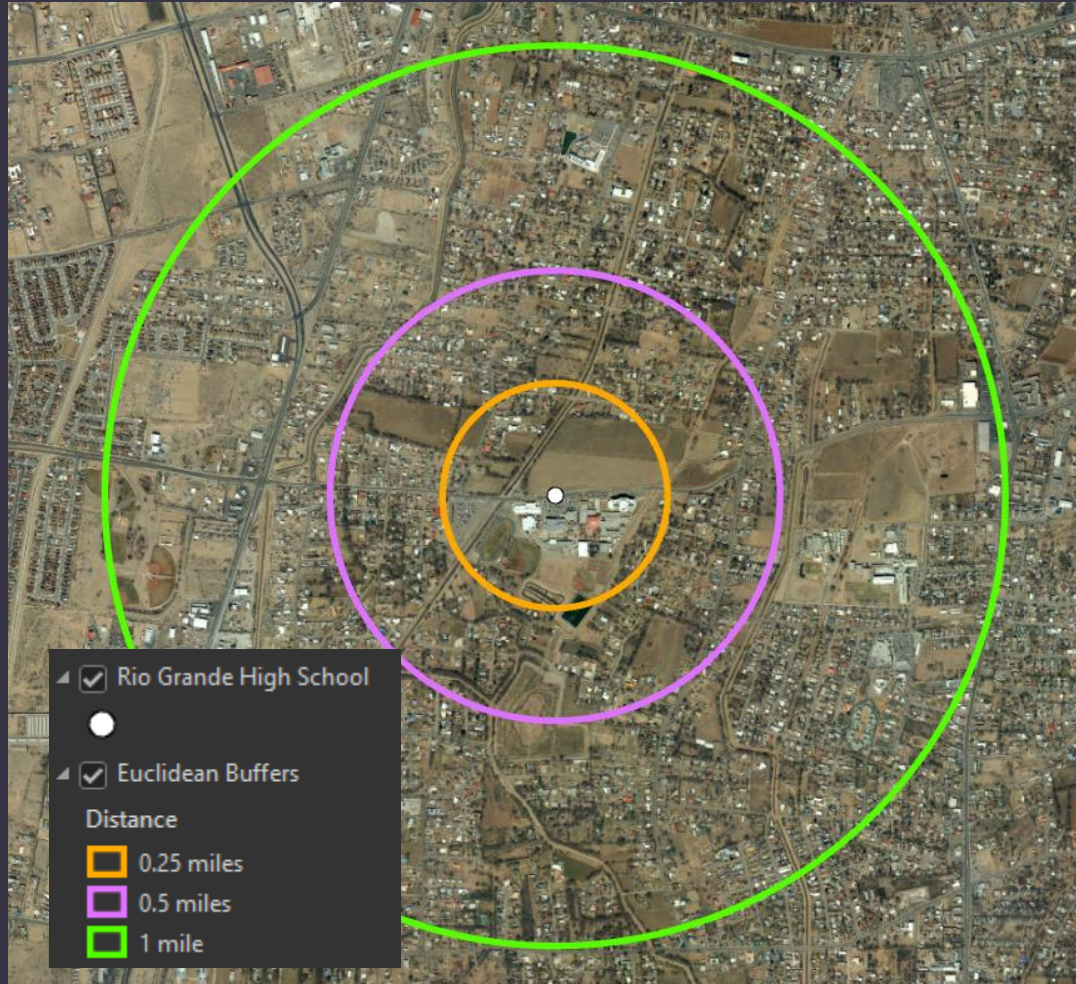
August 19, 2022

- ▶ <https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf>
- ▶ <https://www.transportation.gov/grants/SS4A>
- ▶ <https://www.cabq.gov/vision-zero>
- ▶ <https://www.mrcog-nm.gov/DocumentCenter/View/5502/R-22-08-PDF>

Walking in GIS

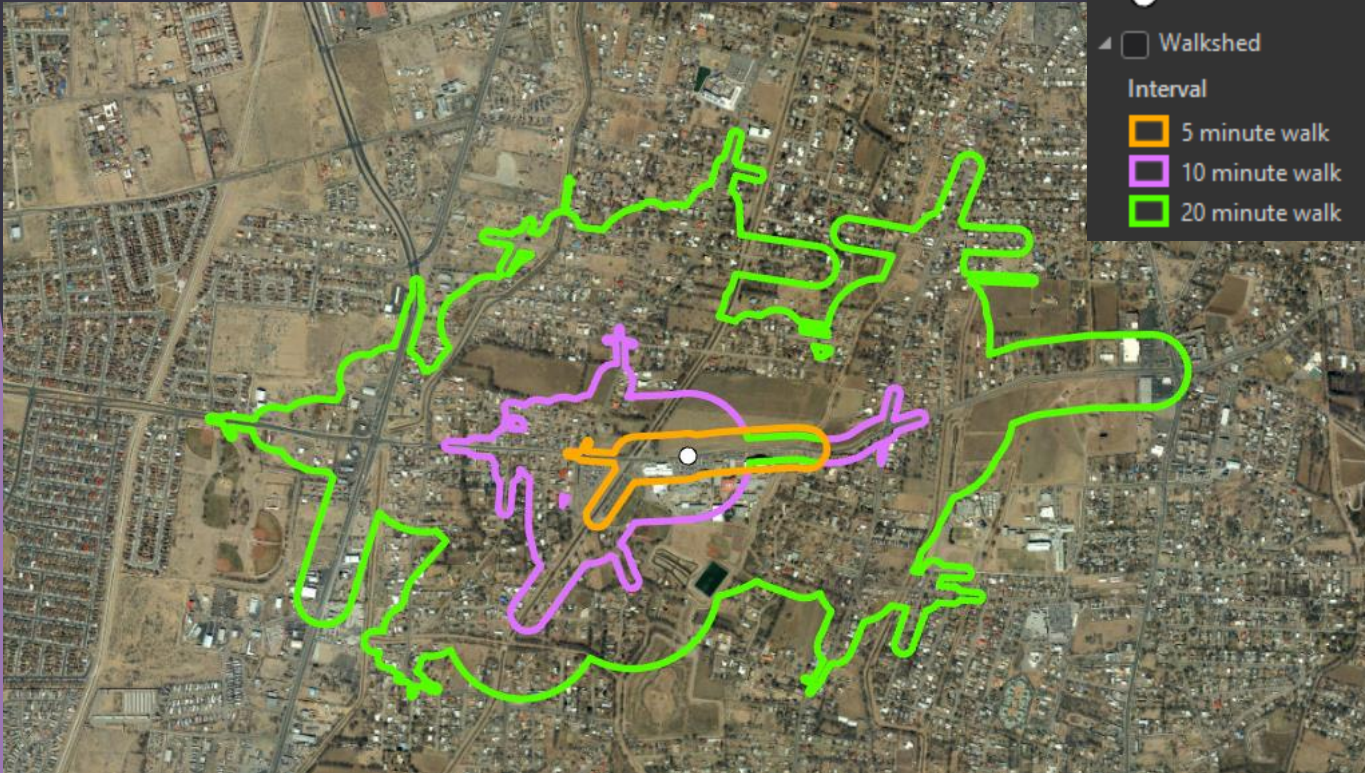
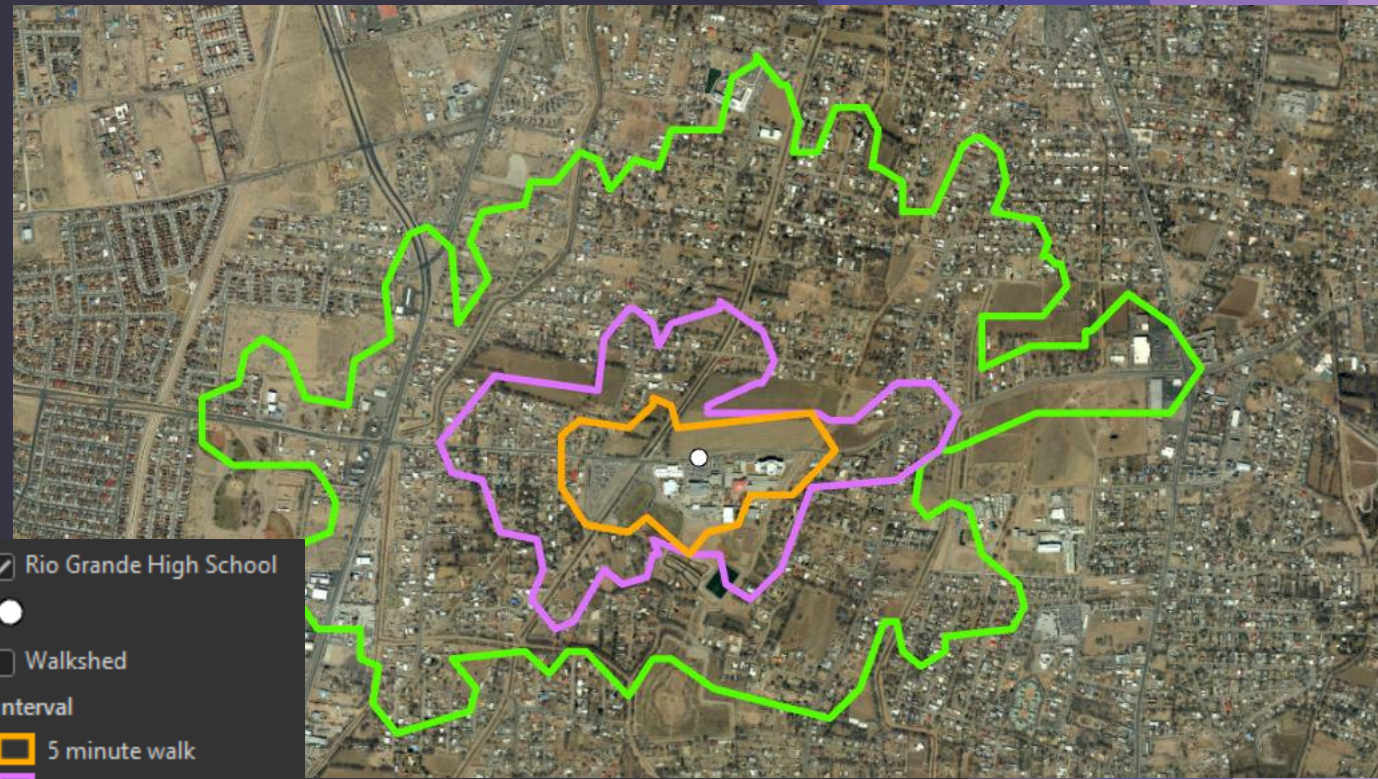
Walksheds, Walkable Development, Walkability?

Walksheds



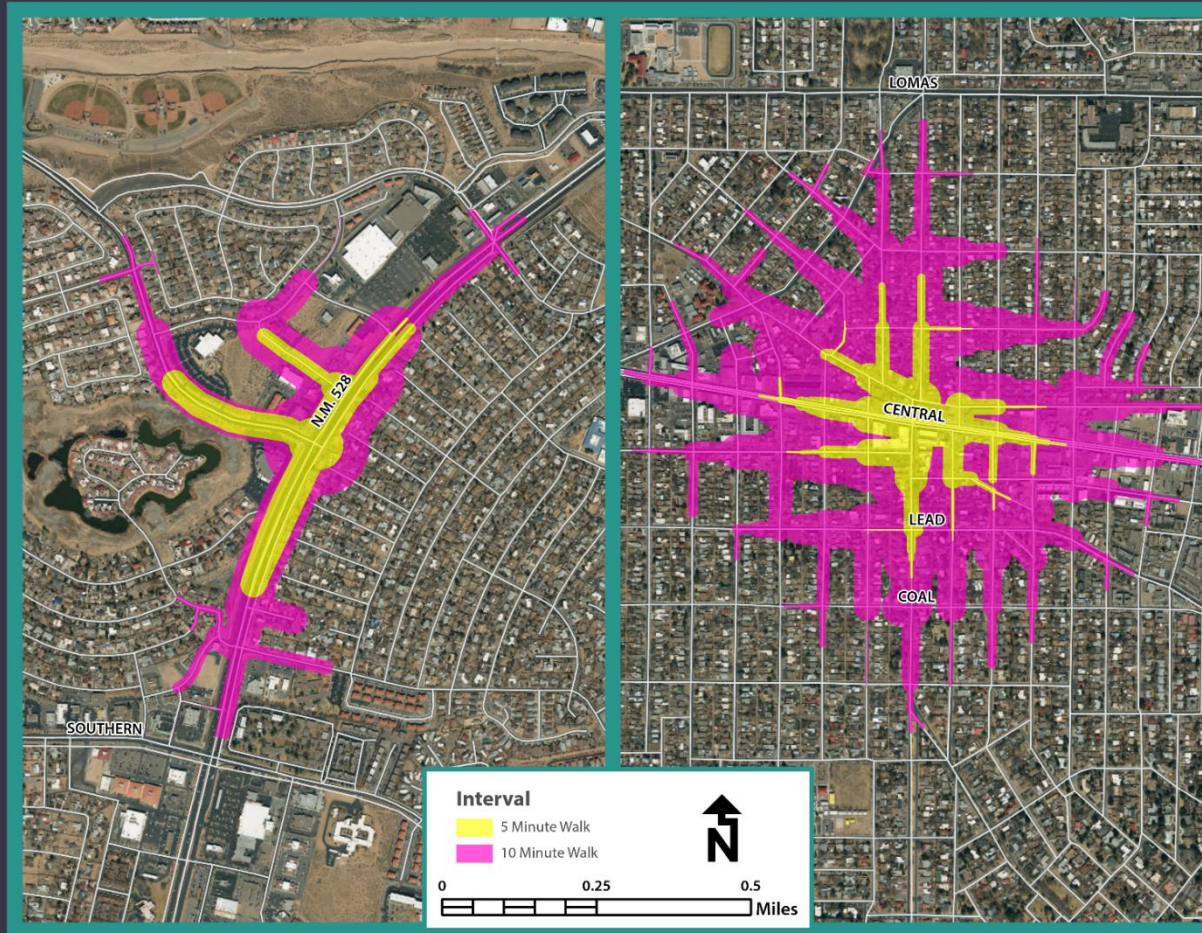
Walking Models

- ▶ Accessibility
- ▶ Network distances
- ▶ Based on speed, time, and distance



MRMPO Walksheds

- ▶ NM 528 & High Resort Blvd



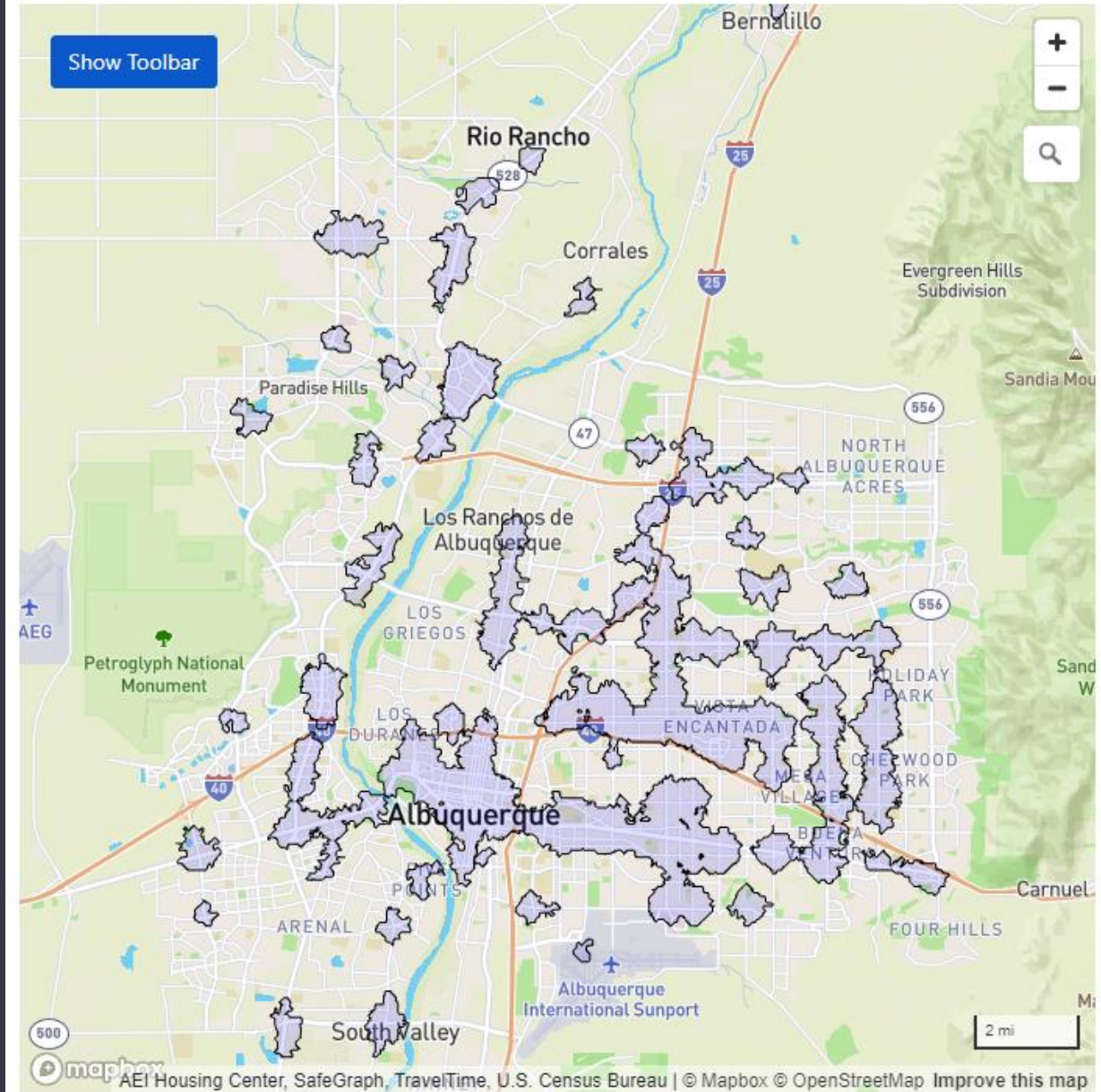
- ▶ Central & Carlisle

- ▶ <https://www.mrcog-nm.gov/264/Metropolitan-Transportation-Plan>

Walkable Oriented Development

- ▶ Walkable Oriented Development
 - ▶ Where do people want to walk?
 - ▶ Destinations
 - ▶ i.e., attractors, trip generators, etc.
 - ▶ *One way* of thinking about walkability
 - ▶ <https://www.aei.org/wod/>
 - ▶ “Walksheds” for clusters of destinations
 - ▶ Areas defined by walk time
 - ▶ Network-based (not perimeters)

Walkable Oriented Development Map



Source: AEI Housing Center, SafeGraph, Traveltime, U.S. Census Bureau, LEHD Origin-Destination Employment Statistics Data, First American




MRMPO Pedestrian Composite Index (PCI)

- ▶ Model of expected pedestrian activity
 - ▶ <https://mrmppo.maps.arcgis.com/home/item.html?id=c0a35c67440d4dc6a84dc1337f2a0dd9>

Safety

- ▶ <https://mrmpo.maps.arcgis.com/apps/MapSeries/index.html?appid=ec395f5587744d778832207af7d86f93>

MRCOG Roadway Safety and Crash Report (2015-2019)

A MRMPo Story Map    

Overall Crash Statistics

How have crashes changed over time?

Where are the most dangerous locations?

What are the Top Contributing Factors?

Every time a roadway crash happens the police officers in the field will report what they believe was the Top Contributing Factor (TCF) for the crash.

This interactive Dashboard allows you to look at these TCFs by the severity of the crash, the location, and the modes involved.

Which mode is most at risk?

When do crashes happen?

How do crashes impact vulnerable communities?

Use these fields to filter the data in the map and for the modes of travel involved.



By Top Contributing Factor (TCF)

Show All Driver Inattention

Failed to Yield Right of Way

None Identified

Following Too Closely

Improper Driving

Excessive Speed

Disregard Traffic Signal

Alcohol Drug Involved

Avoid Contact Other

Mechanical or Road Defect

Passed Stop Sign



By Mode

Show All Bicyclist Involved

Motorcyclist Involved

Pedestrian Involved

Vehicle Involved

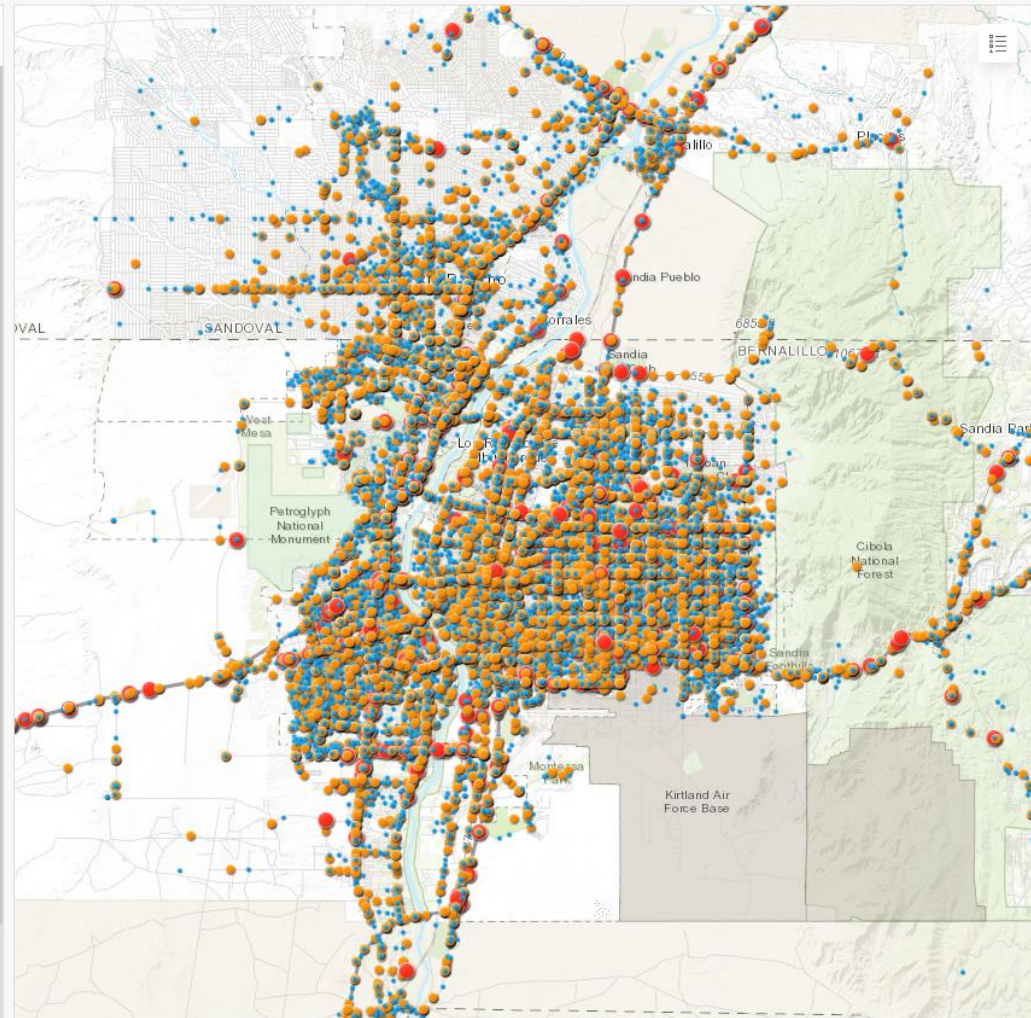


By Severity

Show All Fatal Crash

Injury Crash

Property Damage Only Crash



Bernalillo County, NM, City of Albuquerque, Bureau of Land Management, Texas Parks & Wildlife, Esri, HERE, Garmin, USGS, NGA, EP... Powered by Esri

Vehicle Involved
 109.9k

Motorcyclist Involved
 2.7k

Bicyclist Involved
 1.1k

Pedestrian Involved
 1.8k

High Fatal and Injury Network (HFIN)

✓ Pedestrian Involved Intersection Crashes

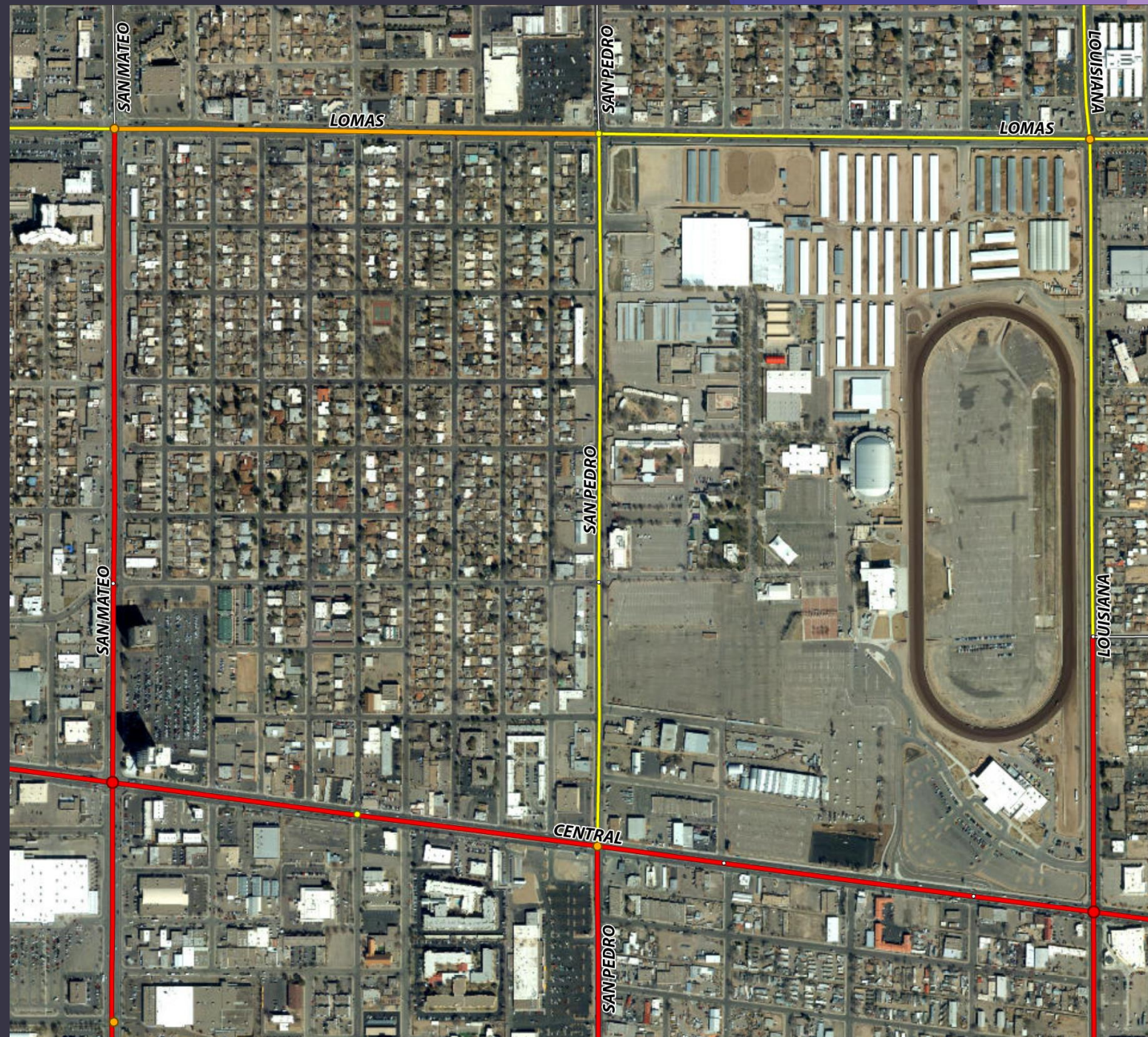
Pedestrian Crashes

- 1 - 2
- 3 - 4
- 5 - 9
- 10 - 24

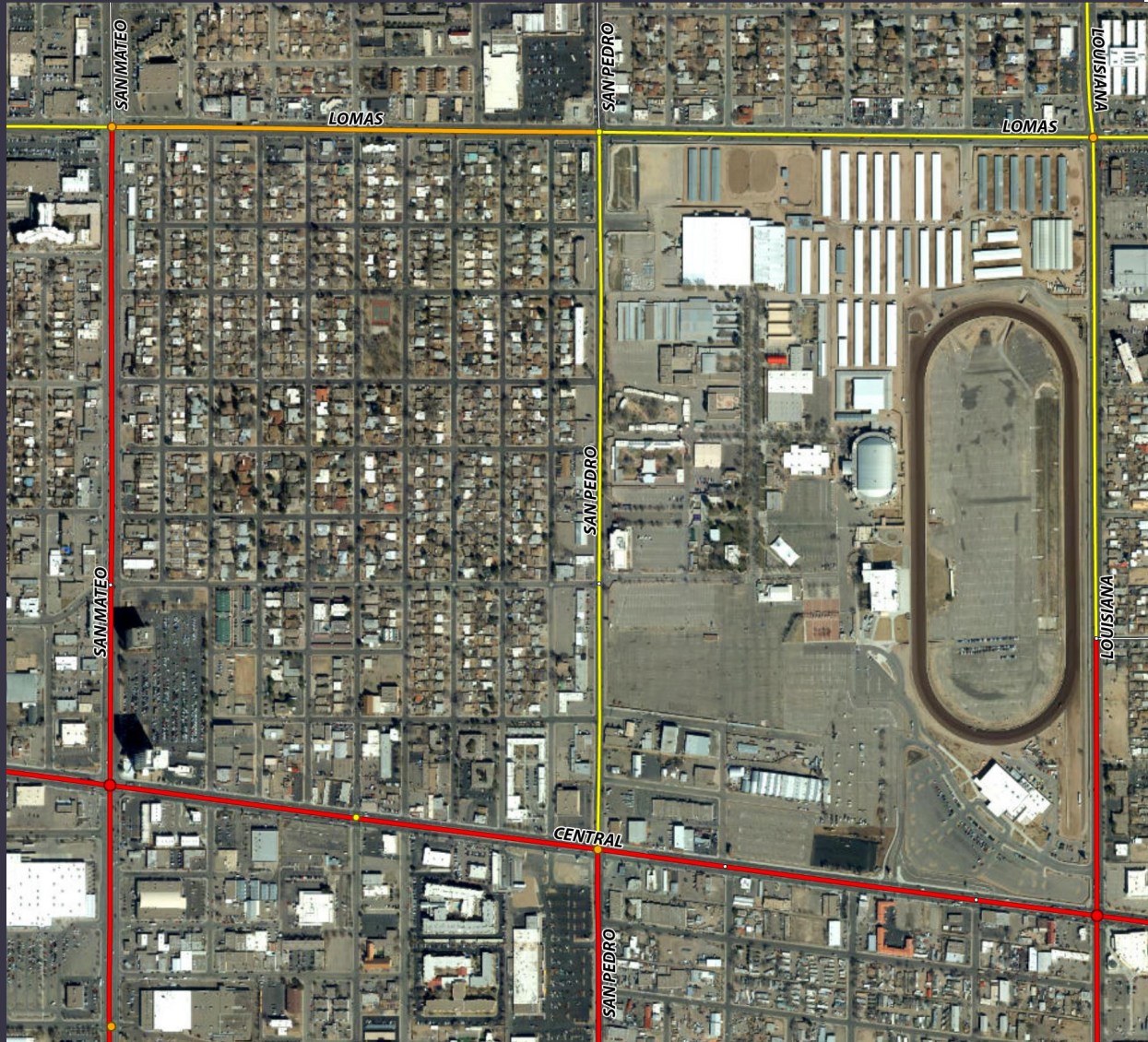
✓ Pedestrian HFIN Score

Mean Pedestrian HFIN Score: 15.9

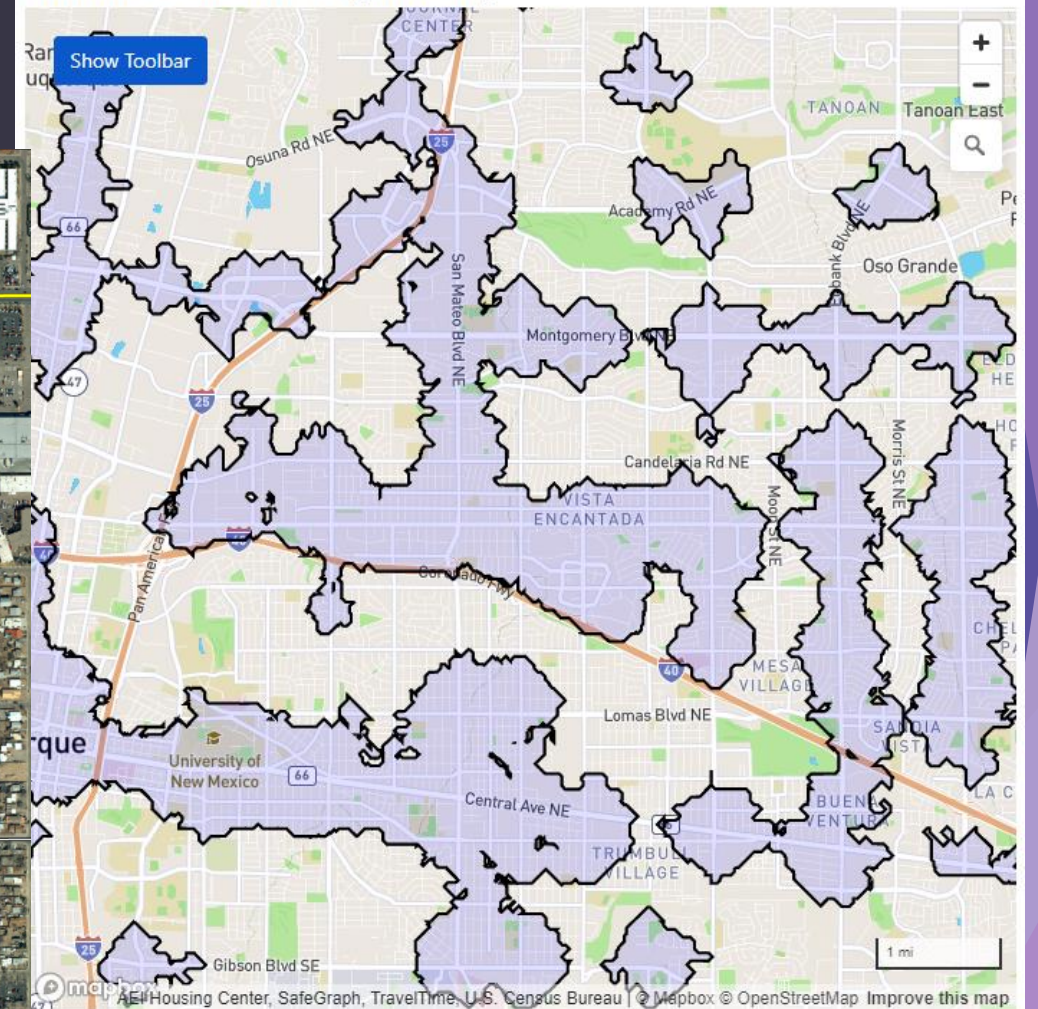
- Below Mean
- 1 to 1.5x Mean
- 1.5 to 2x Mean
- Above 2x Mean



Safety & Walkability



Walkable Oriented Development Map



Source: AEI Housing Center, SafeGraph, Traveltime, U.S. Census Bureau, LEHD Origin-Destination Employment Statistics Data, First American

Safety Data Gaps

- ▶ Non-motorized traffic counts

- ▶ Where are people walking?
- ▶ Where are people biking?

- ▶ Sidewalk inventory

- ▶ Condition

- ▶ Obstacles

- ▶ Cost
 - ▶ Creation
 - ▶ Acquisition
- ▶ Scale
- ▶ Privacy

Thanks!

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Mid-Region Council of Governments (MRCOG)

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- ▶ gis@mrcog-nm.gov
- ▶ <https://mrmpo.maps.arcgis.com/>

