



# Walking and Biking in the Southeast

Still rare and risky, but the road ahead can be safer

Ariel Godwin, AICP

Anne M. Price, Ph.D.

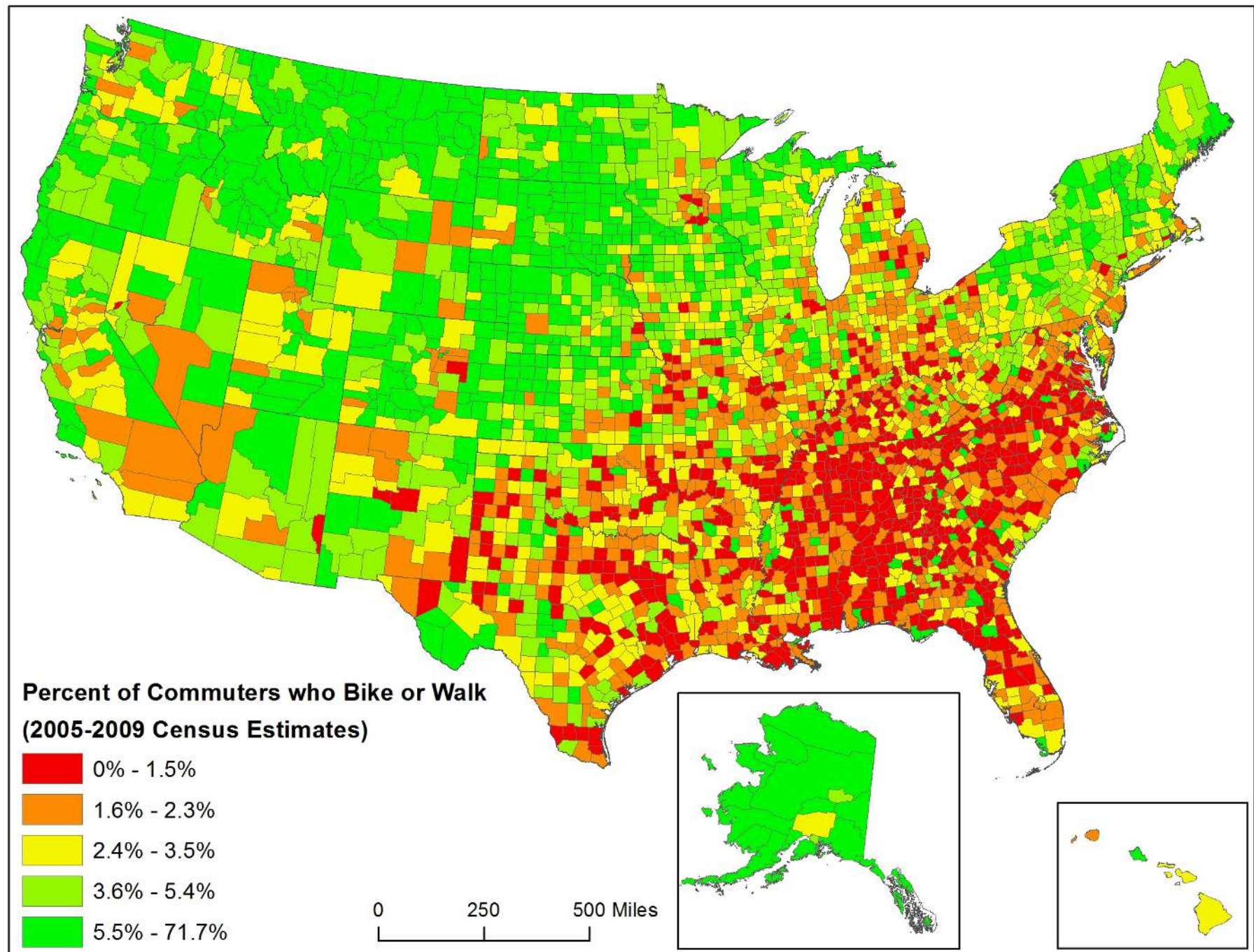


## Commuting

2005 – 2009

Walk + bike commuting  
(quintiles by county)

- Concentration of lower rates in the Southeast

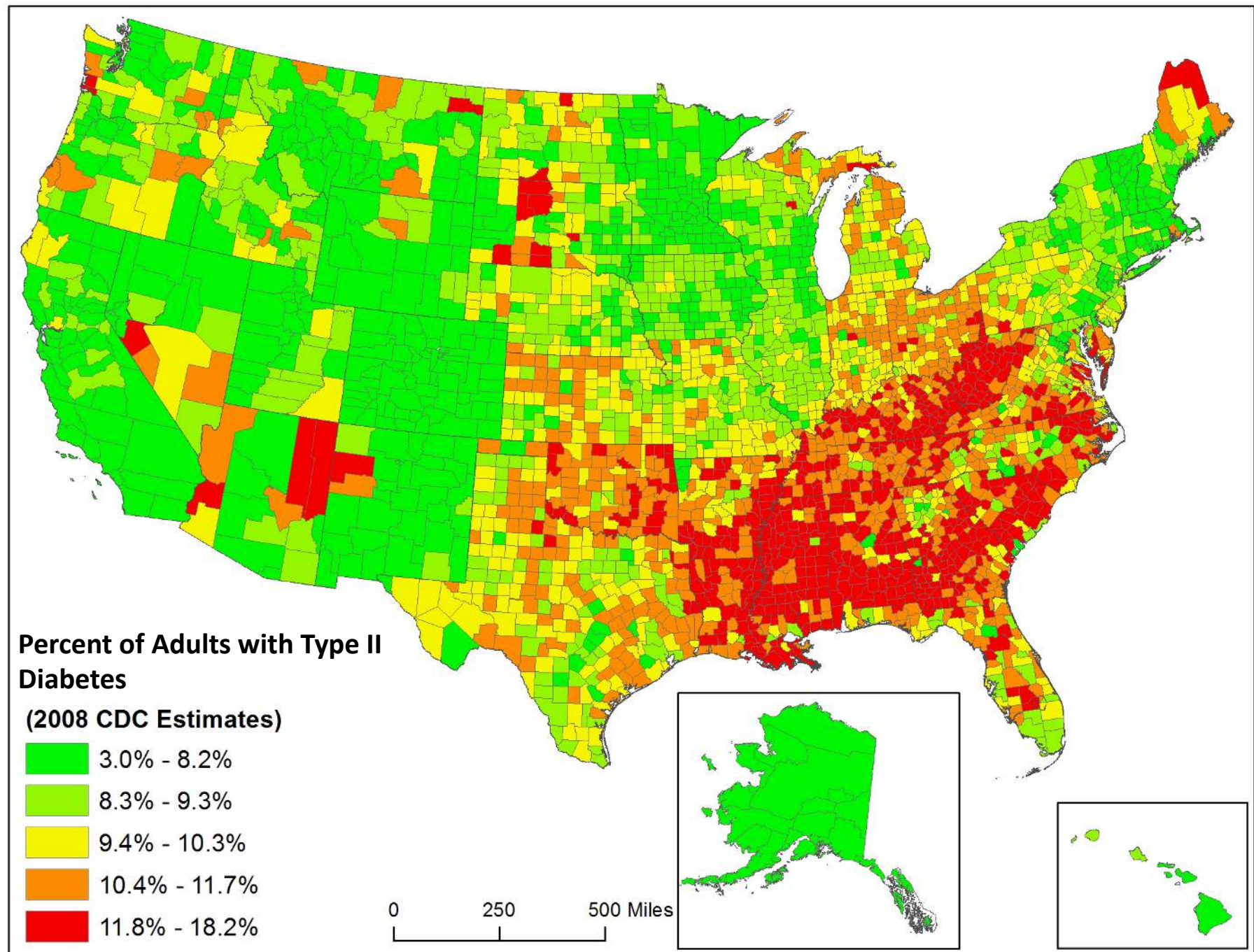


## Health

2008

Type II Diabetes  
(quintiles by county)

- Concentration of higher rates in the Southeast



## Safety

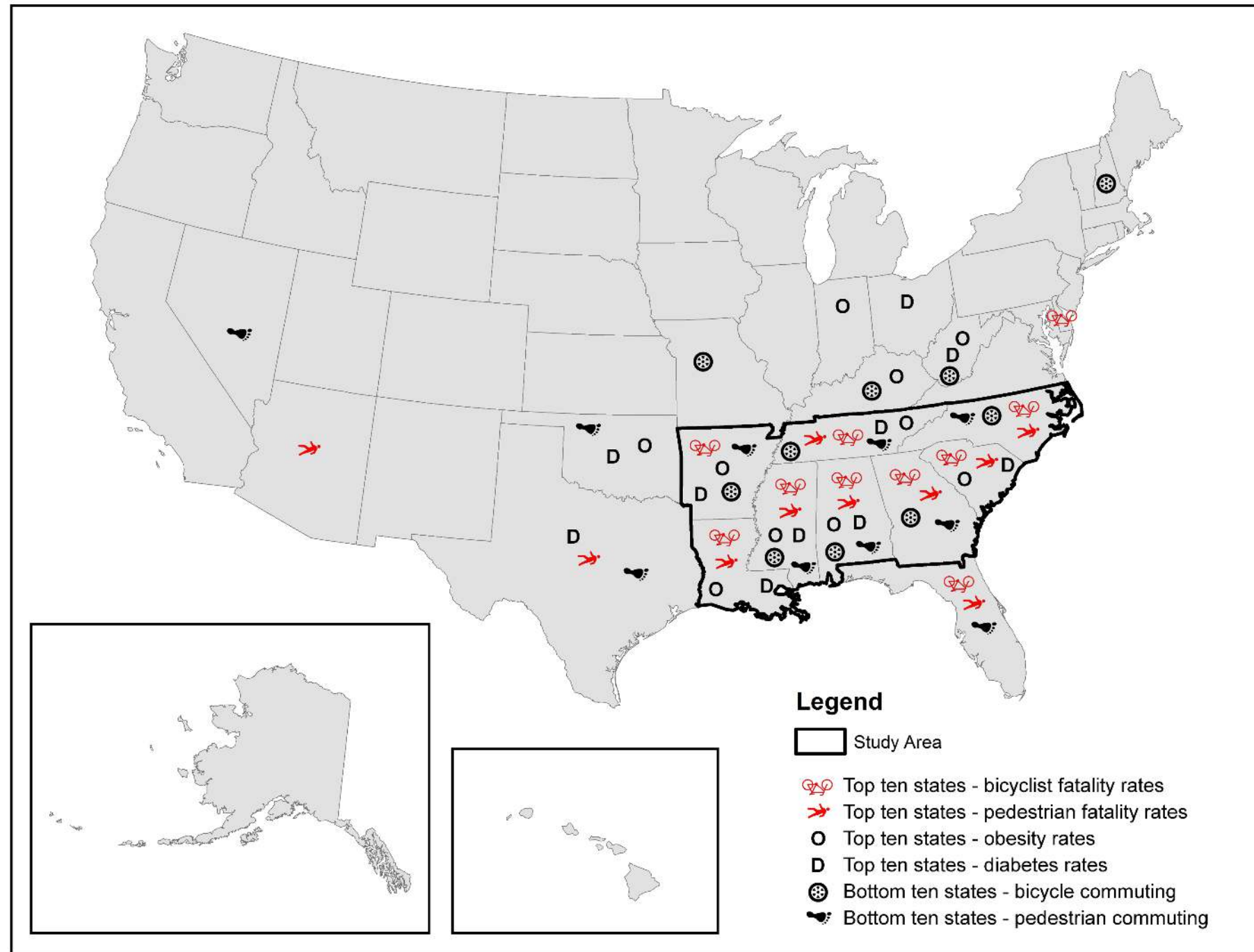
2011 – 2015

Top ten states for:

- Pedestrian fatality rates (by population)
- Bicyclist fatality rates (by population)
- Obesity rates
- Type II Diabetes rates

Bottom ten states for:

- Commuting on foot
- Commuting by bike



# Recent Trends

- Mode share
- Health
- Safety
- What's going on in the Southeast?




# What defines the Southeast?

- Many competing definitions of the “Deep South” exist.
- This study focuses on Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee
- These make up a contiguous region with several factors in common:
  - Warm weather
  - Similar urbanization patterns
  - Comparatively flat terrain (considered at the state level) except for Appalachian counties
  - Similar demographics

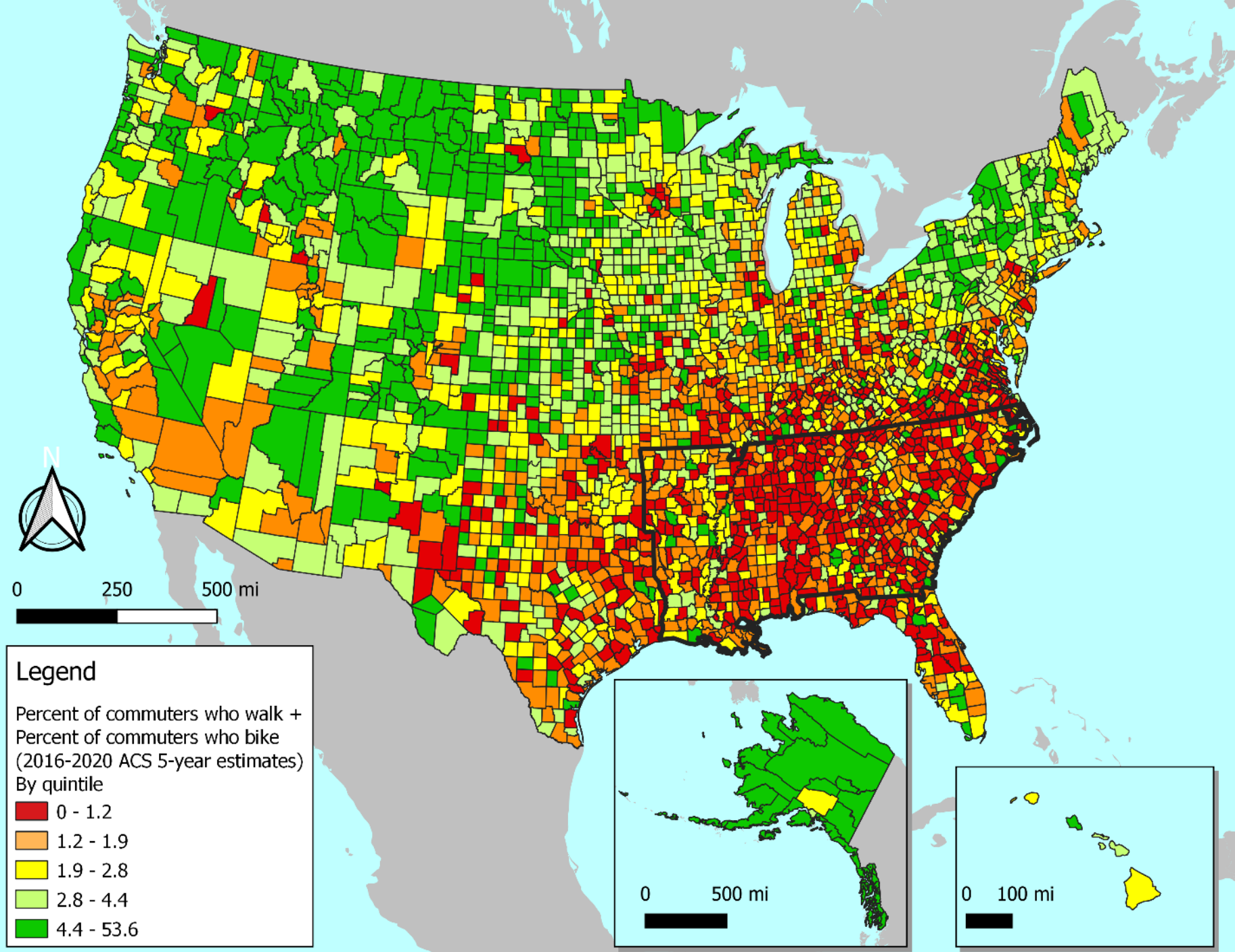


# What defines the Southeast?

- Why exclude Florida?
    - Different demographics (age)
    - More urbanized
    - Different historic development pattern
  - Why exclude Kentucky, West Virginia, and Virginia?
    - Mountainous terrain
    - Colder winters
    - Different demographics (D.C.)
  - Why exclude Texas?
    - Often considered part of the Southwest
    - Merits separate analysis due to diversity of regions and geographies within the state
- 

## Commuting: Latest data

Latest commuting data (2016-2020 five-year estimates) show a similar pattern

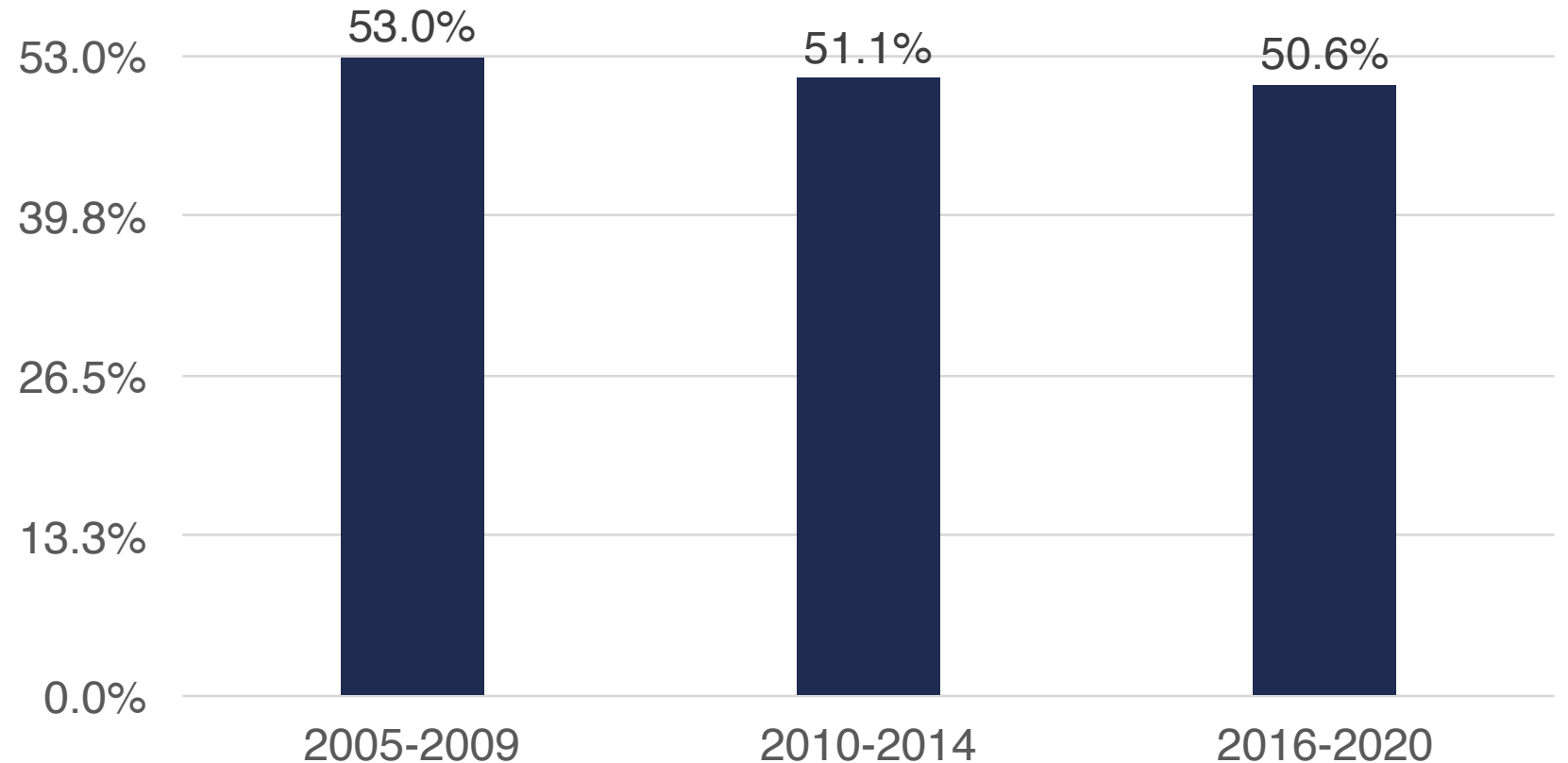




# Commuting trends

- These are the bottom 20% of counties for walking + biking commute rates combined
- For references, the Southeast contains about 21% of total US counties

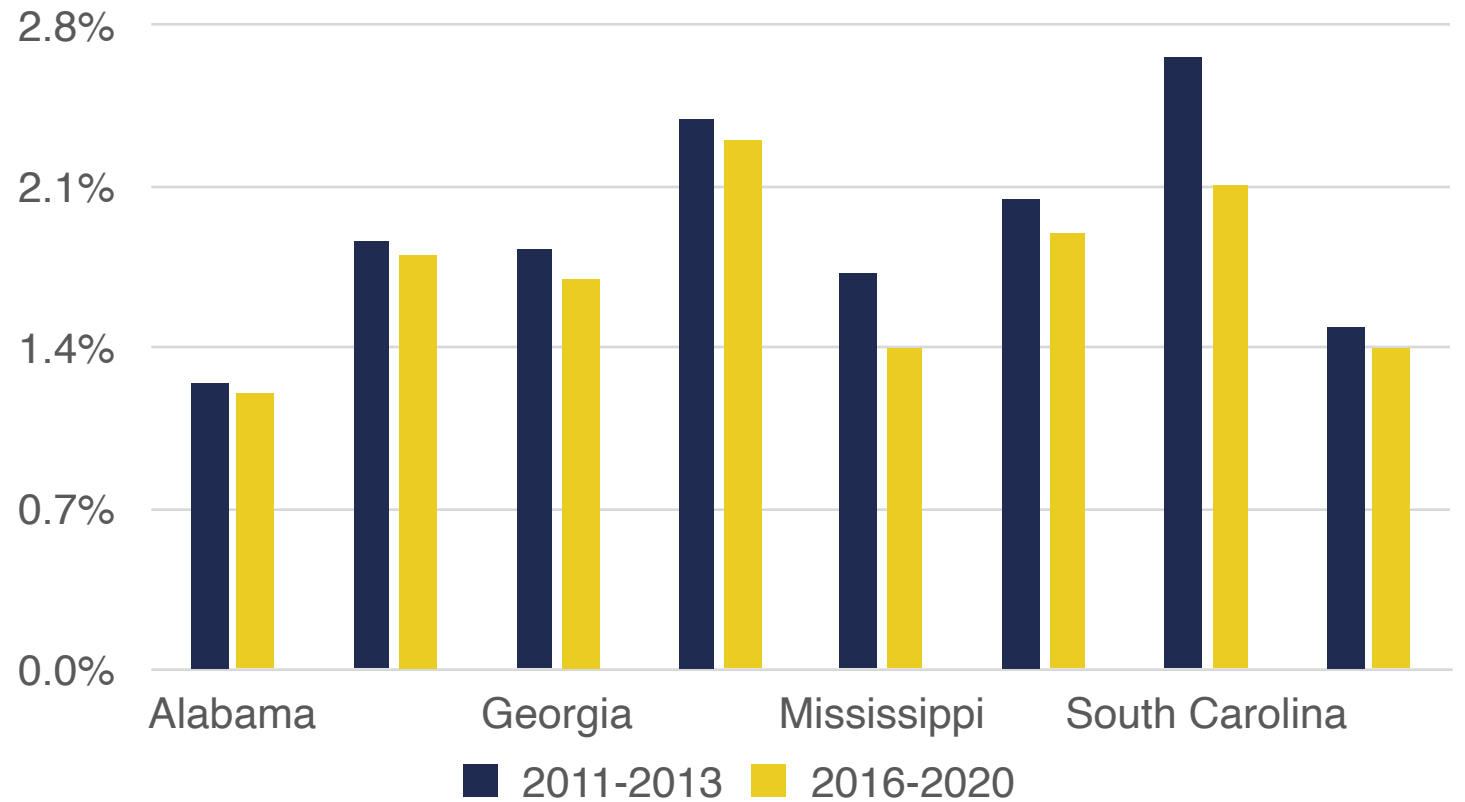
**Percent of bottom-quintile counties (for walking and biking) that are in the Southeast**



# Commuting trends

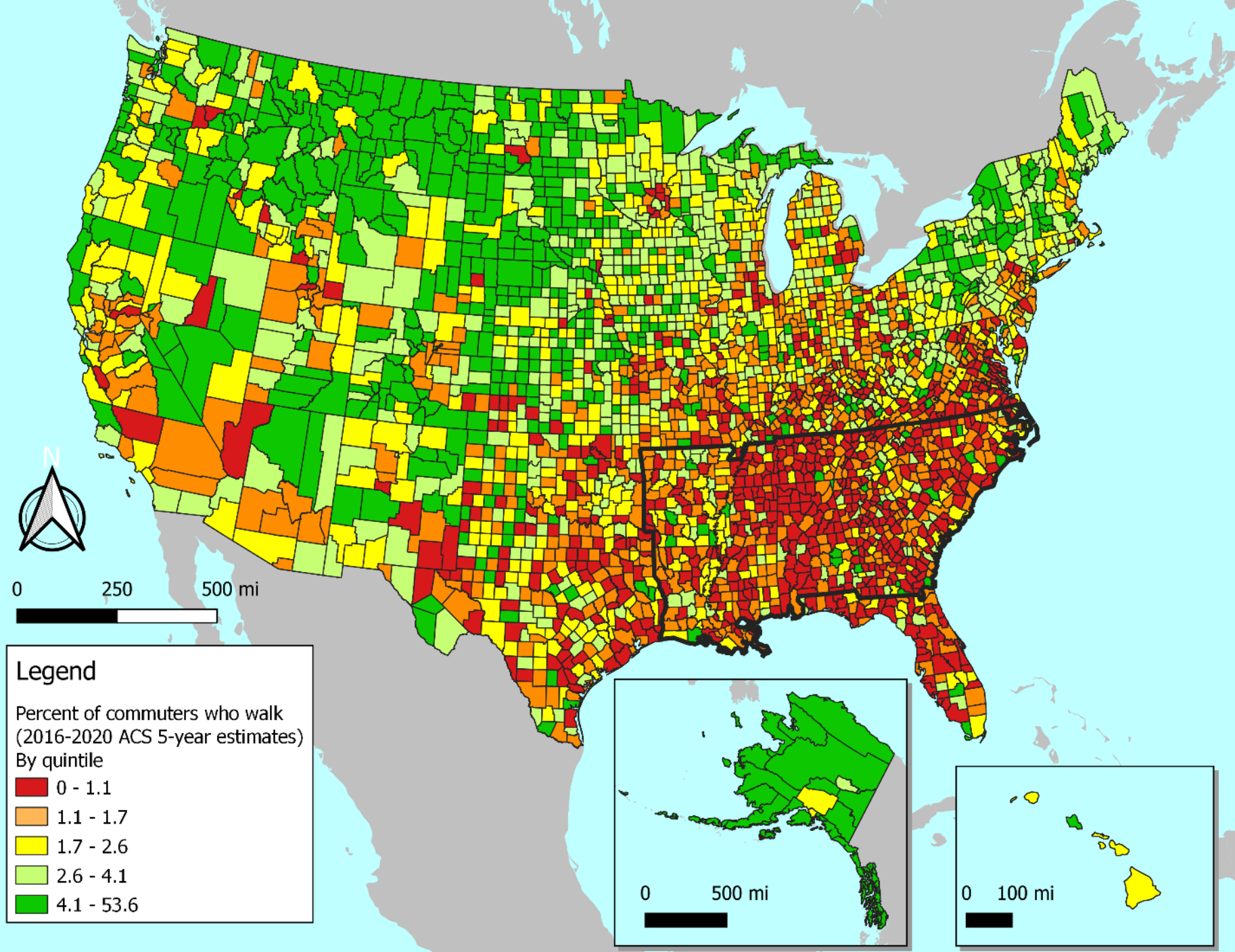
- Overall active transportation mode share decreased slightly for Southeastern states (pre-pandemic)
- Reflects the national trend
- 80<sup>th</sup> percentile changed from 5.5% active modes (2009) to 4.4% (2020)

Walking + Biking Mode Share By State



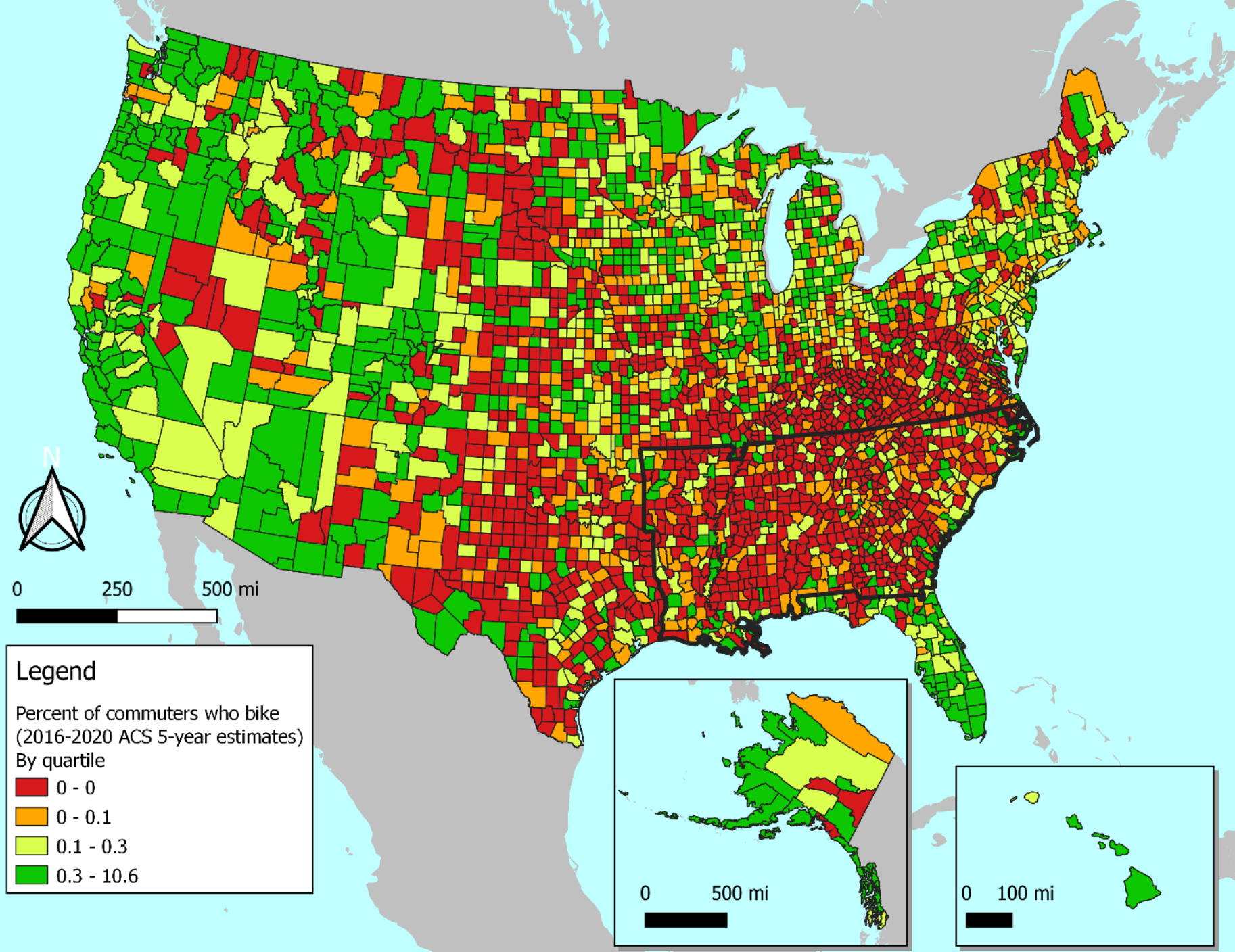
## Walking

- Previously, we looked at active modes combined. Here, we look at them separately.
- 50% of bottom-quintile counties for walk commuting are in the Southeast

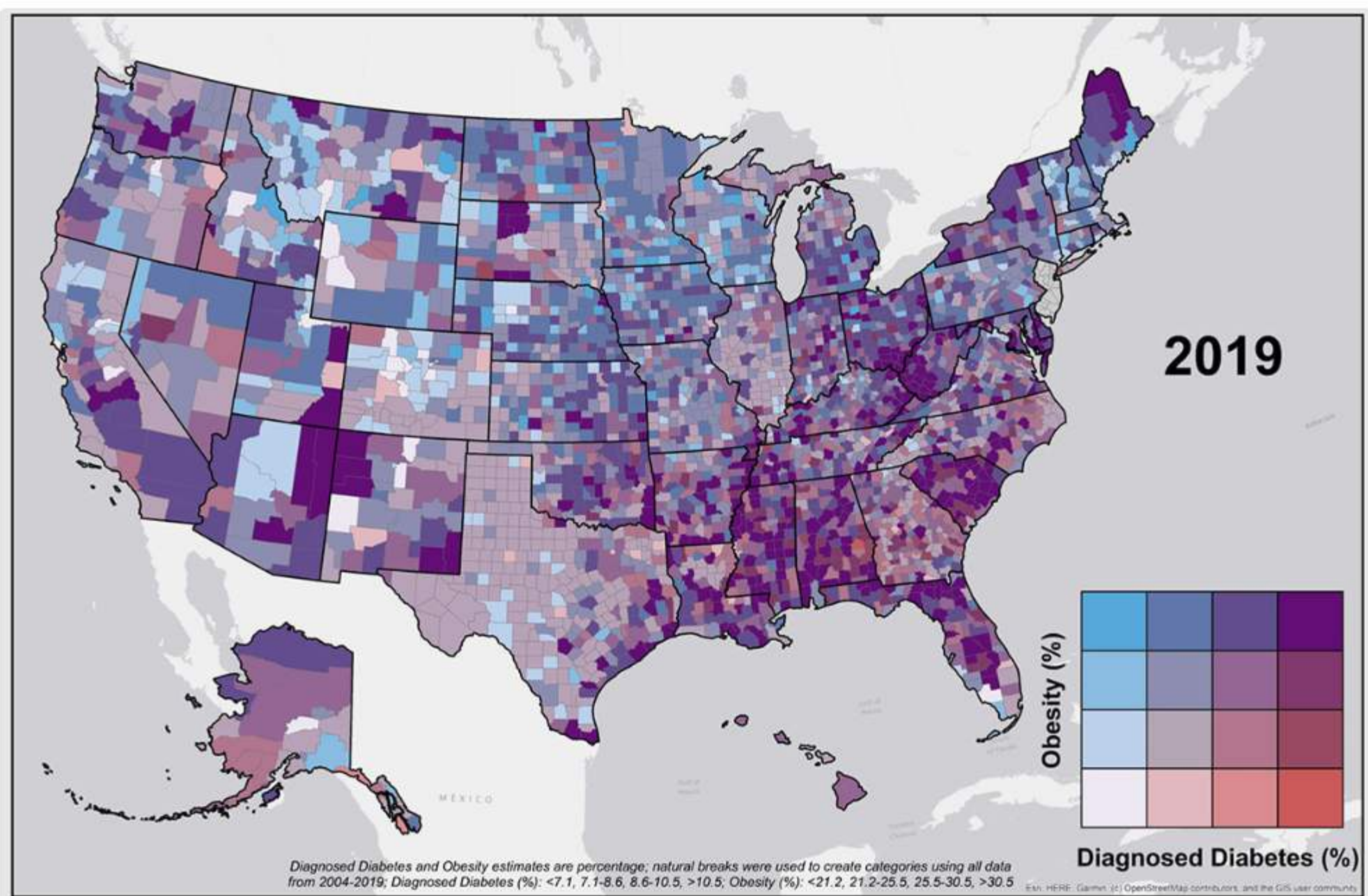


## Bicycling

- 42% of counties have 0% mode share
- (Remember Census data are estimates and the margin of error is provided)
- 31% of “zero-bicyclist” counties are in the Southeast
- (Again, the SE contains 21% of US counties)
- Florida has completely different patterns for bicycling



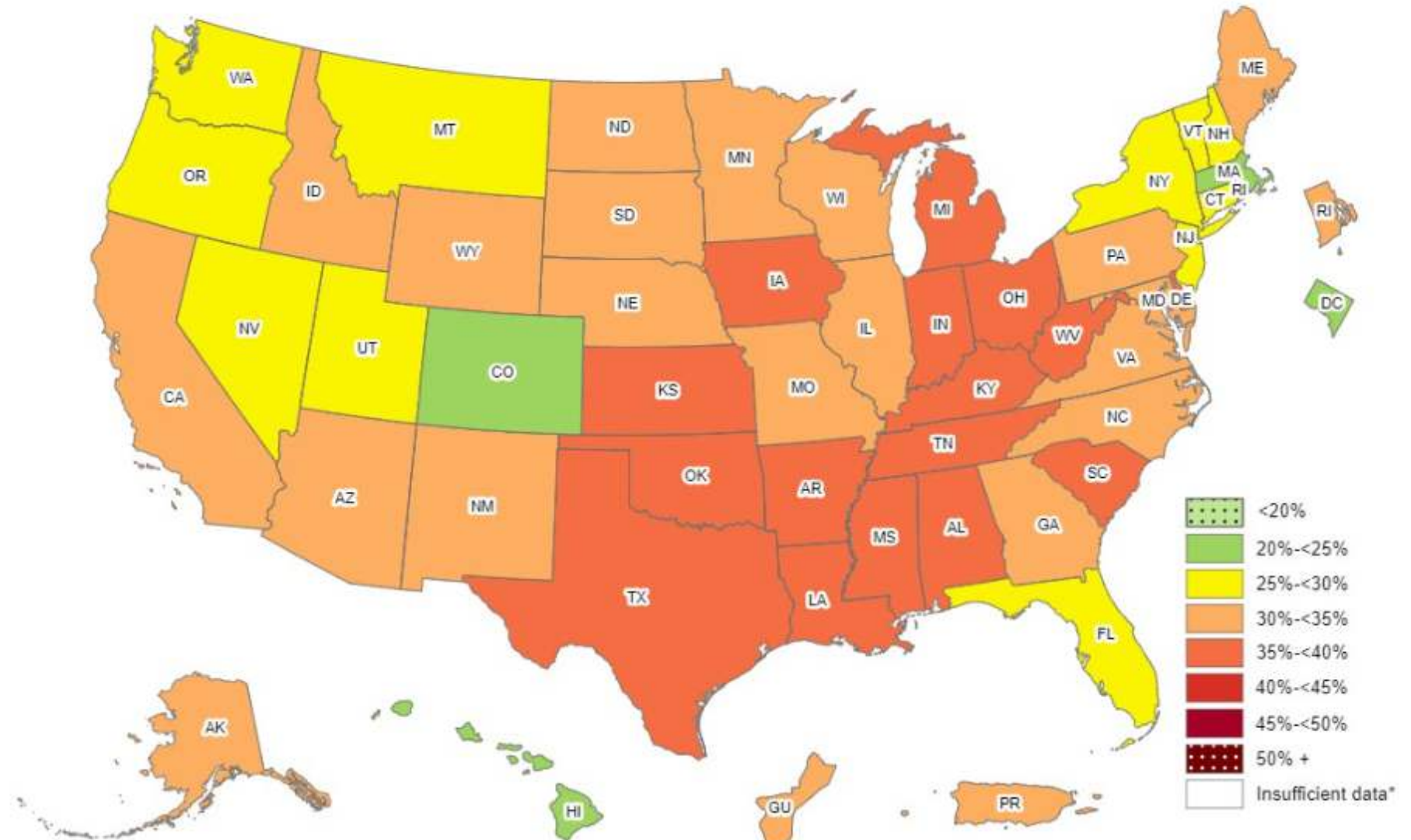
# Health trends



# Prevalence<sup>†</sup> of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2020

- Obesity was previously concentrated in the Southeast, but the pattern is now less definite

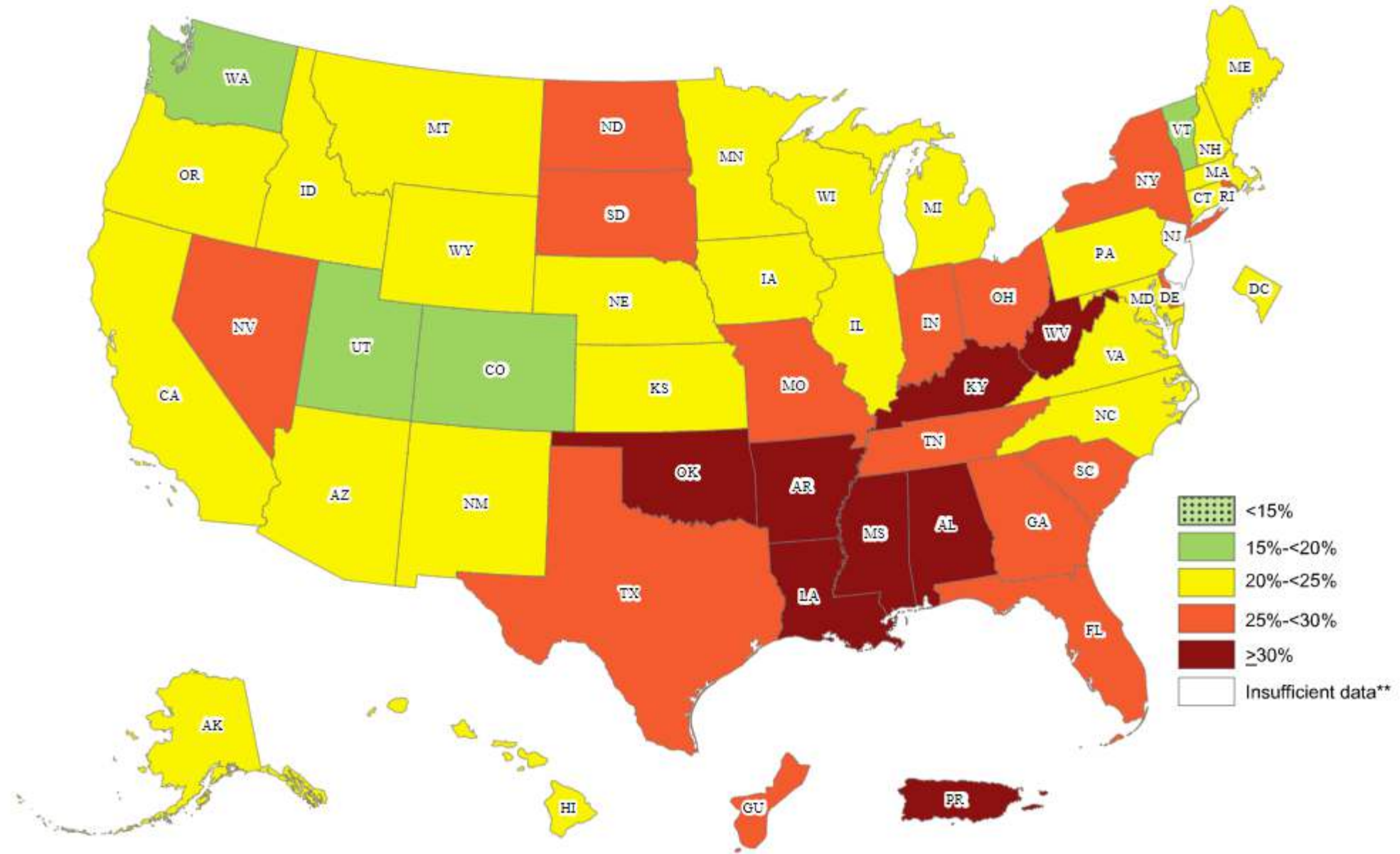
<sup>†</sup>Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



# Map: Overall Physical Inactivity

Prevalence of Self-Reported Physical Inactivity\* Among US Adults by State and Territory, BRFSS, 2017–2020

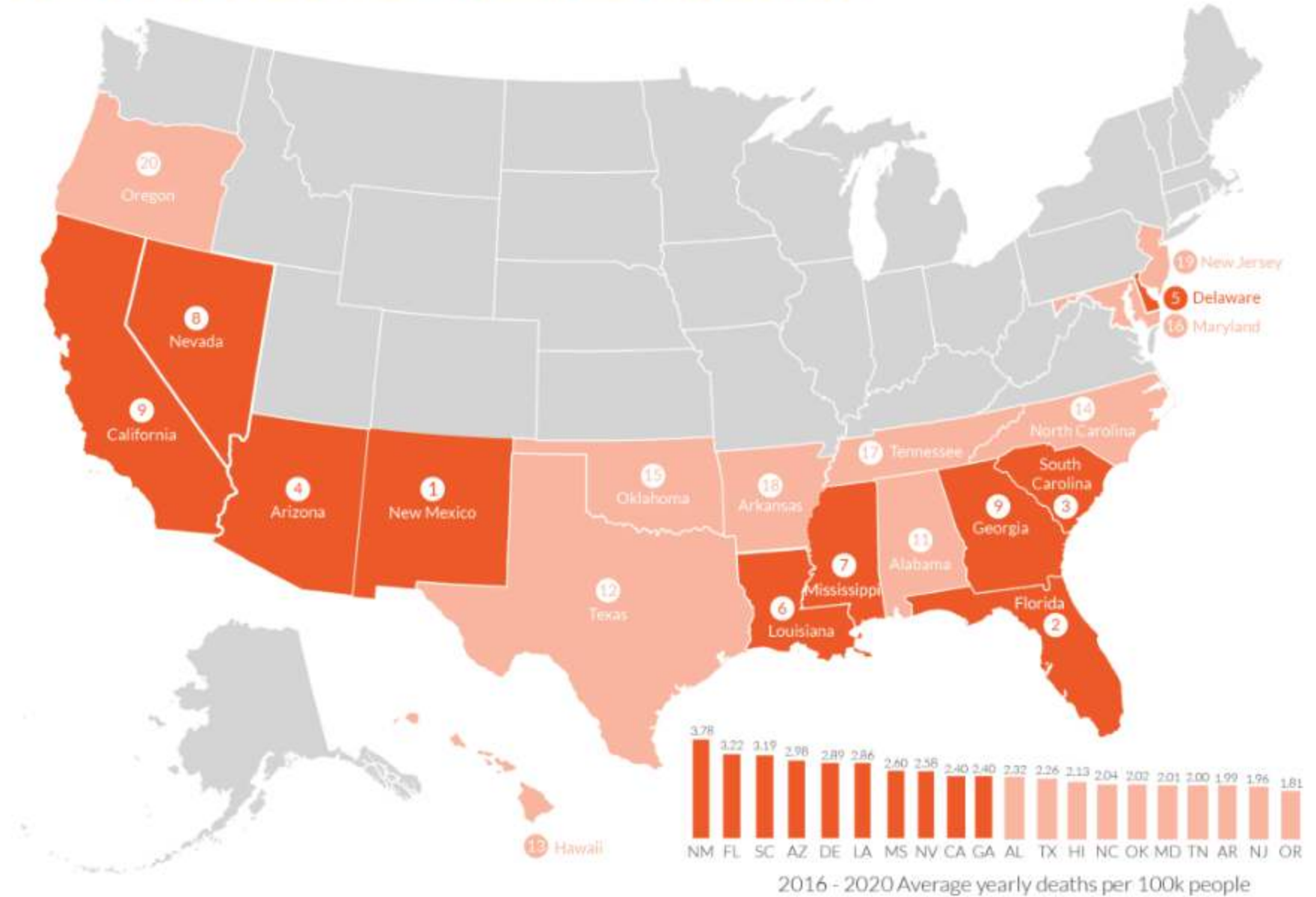
- Lack of physical activity is more prevalent in the Southeast



# Safety

## THE TOP 20

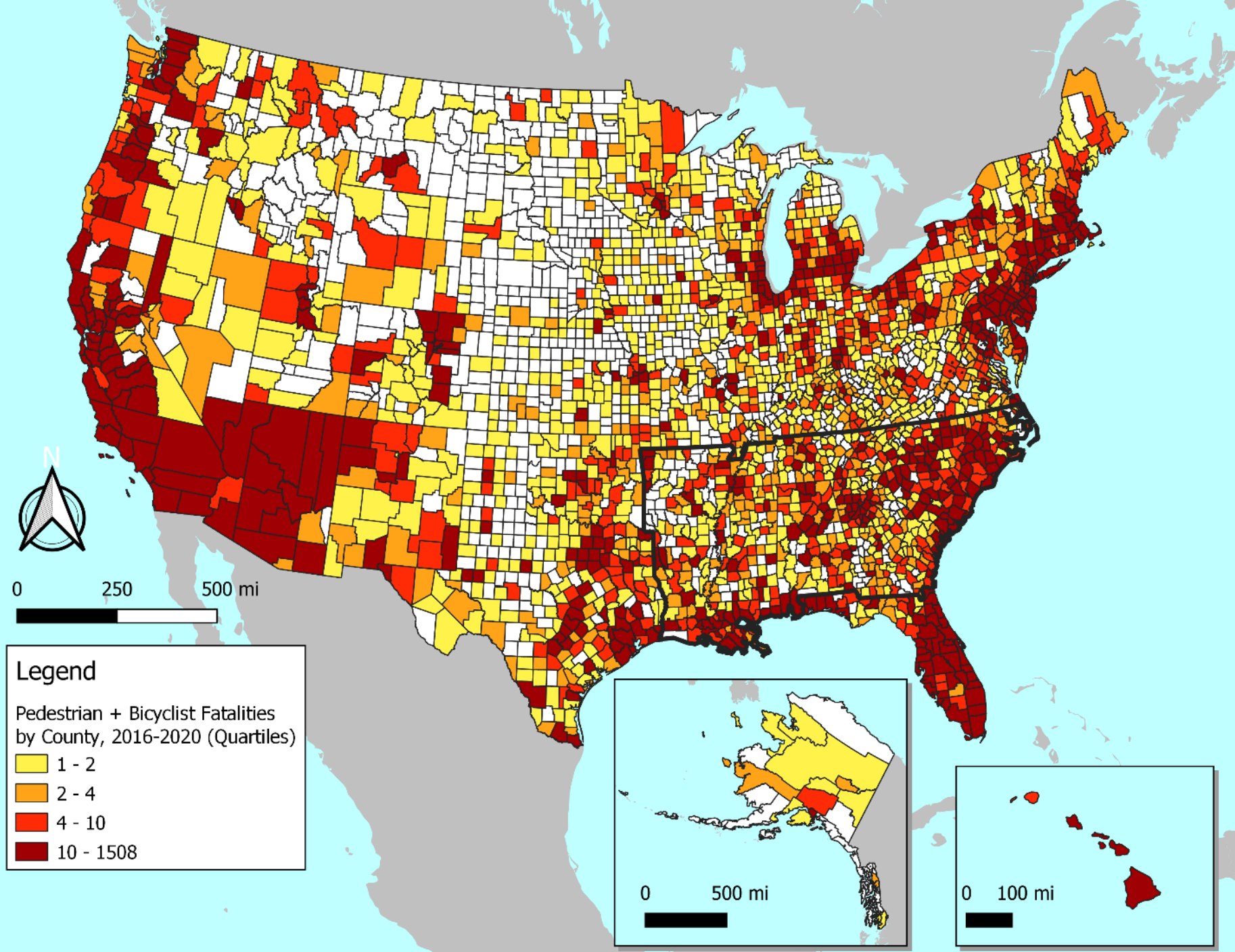
Most dangerous states for pedestrians (2016-2020)



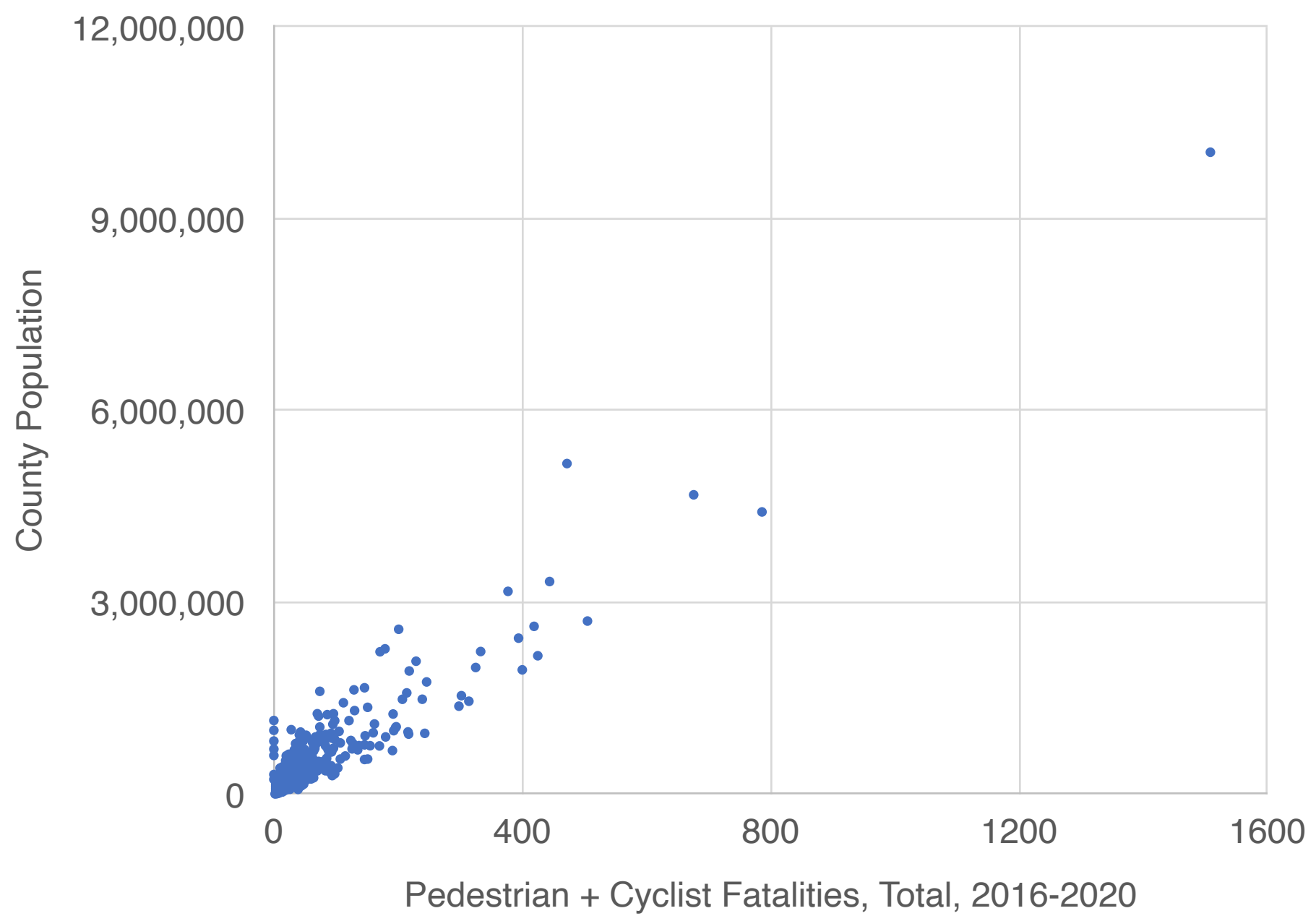


# Ped & Bike Fatalities (total)

- Correlates with population
- Large range in top quartile (for both population and fatalities)

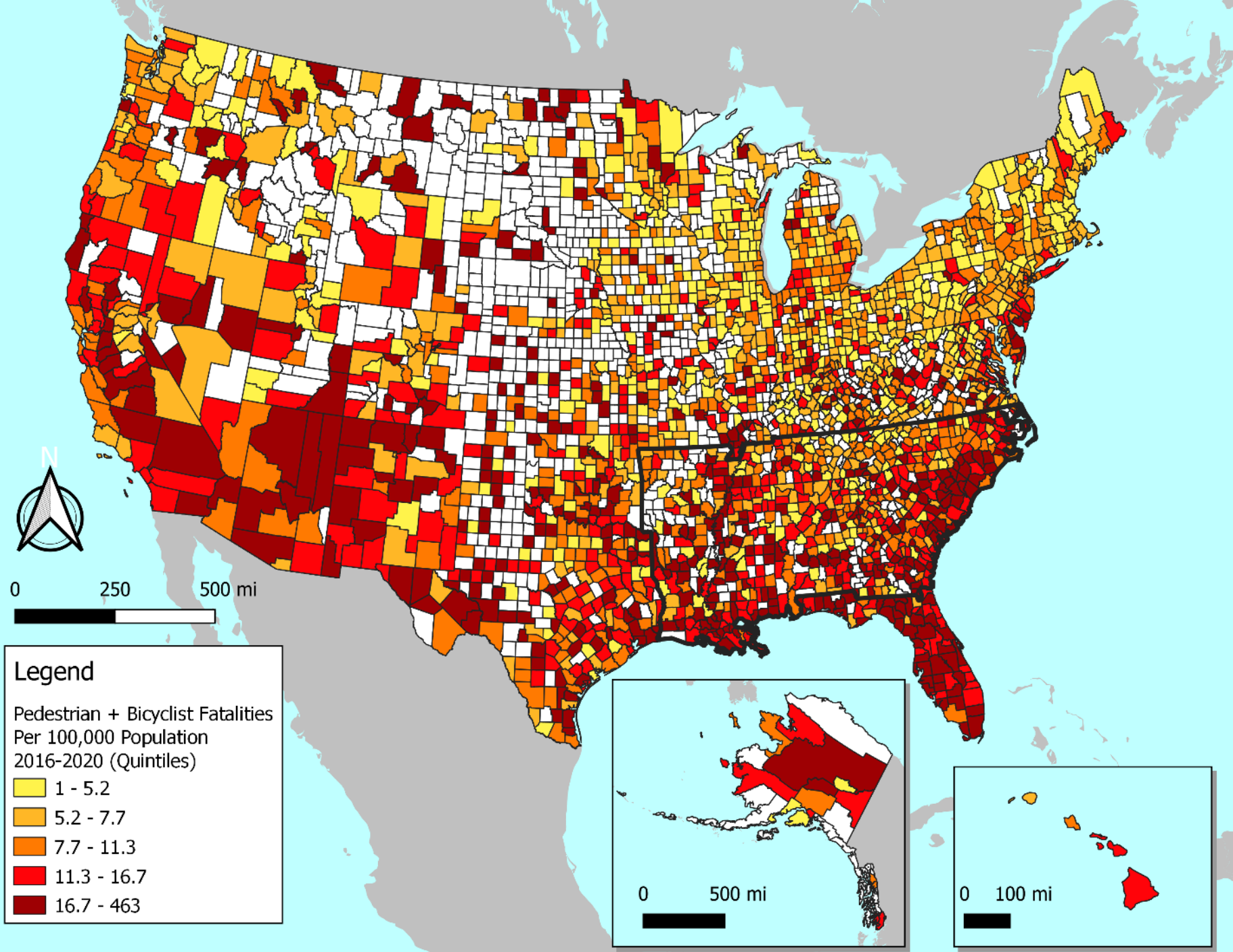


- Total ped & bike fatalities correlate with total population (no surprise)
- Correlation is 0.94

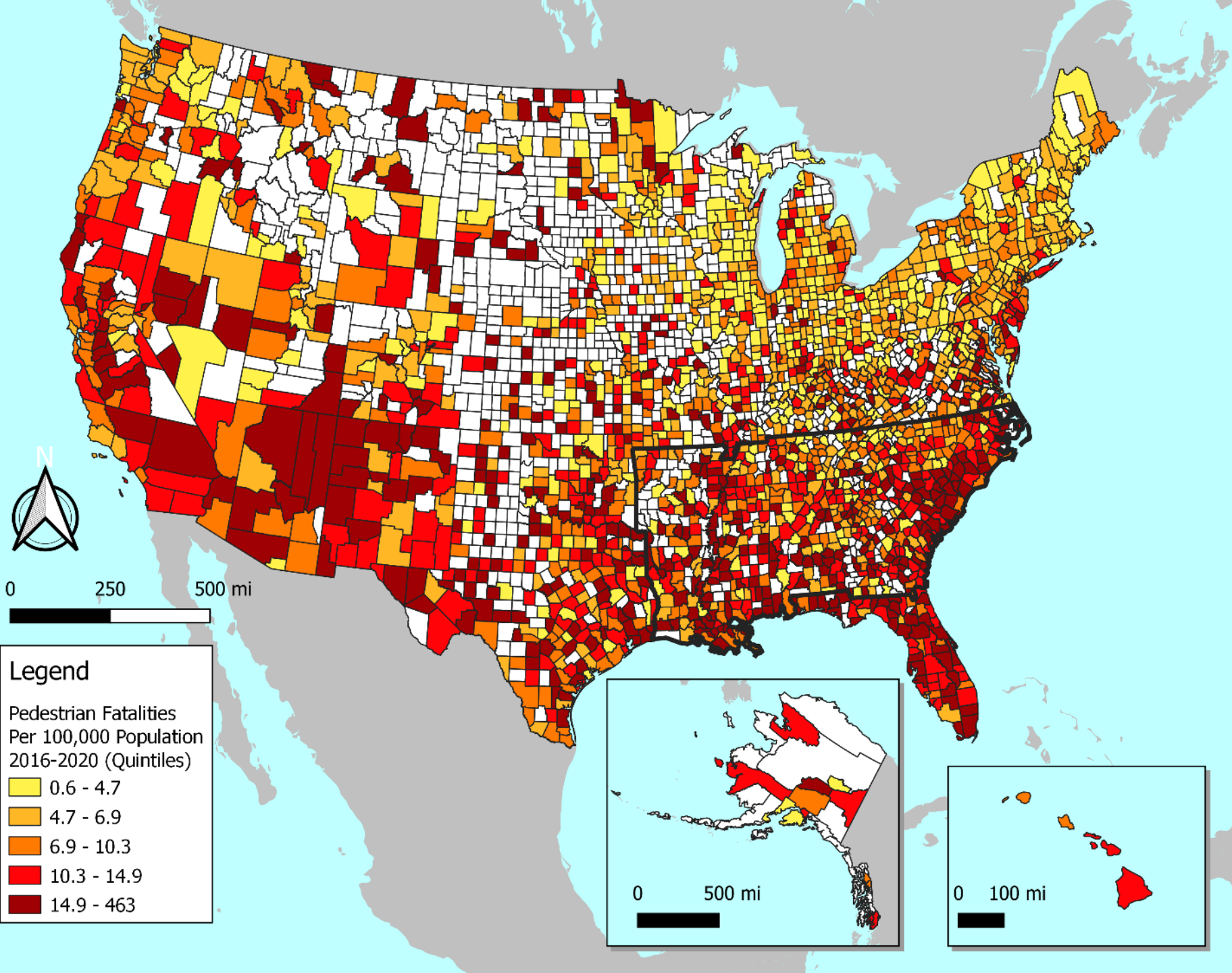


# Ped & Bike Fatalities (per capita)

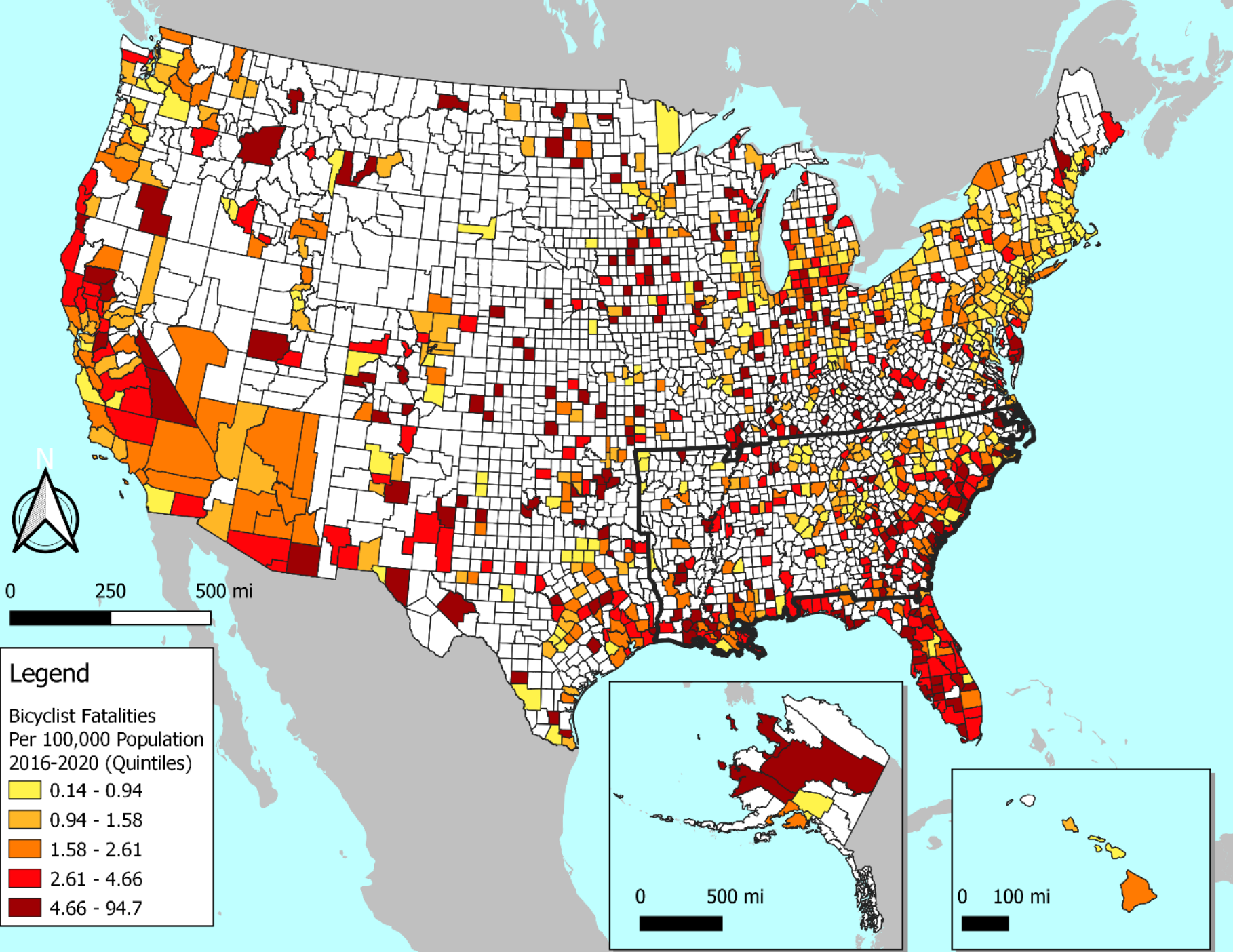
- 36% of top-quintile counties are in the Southeast



# Ped Fatalities (per capita)

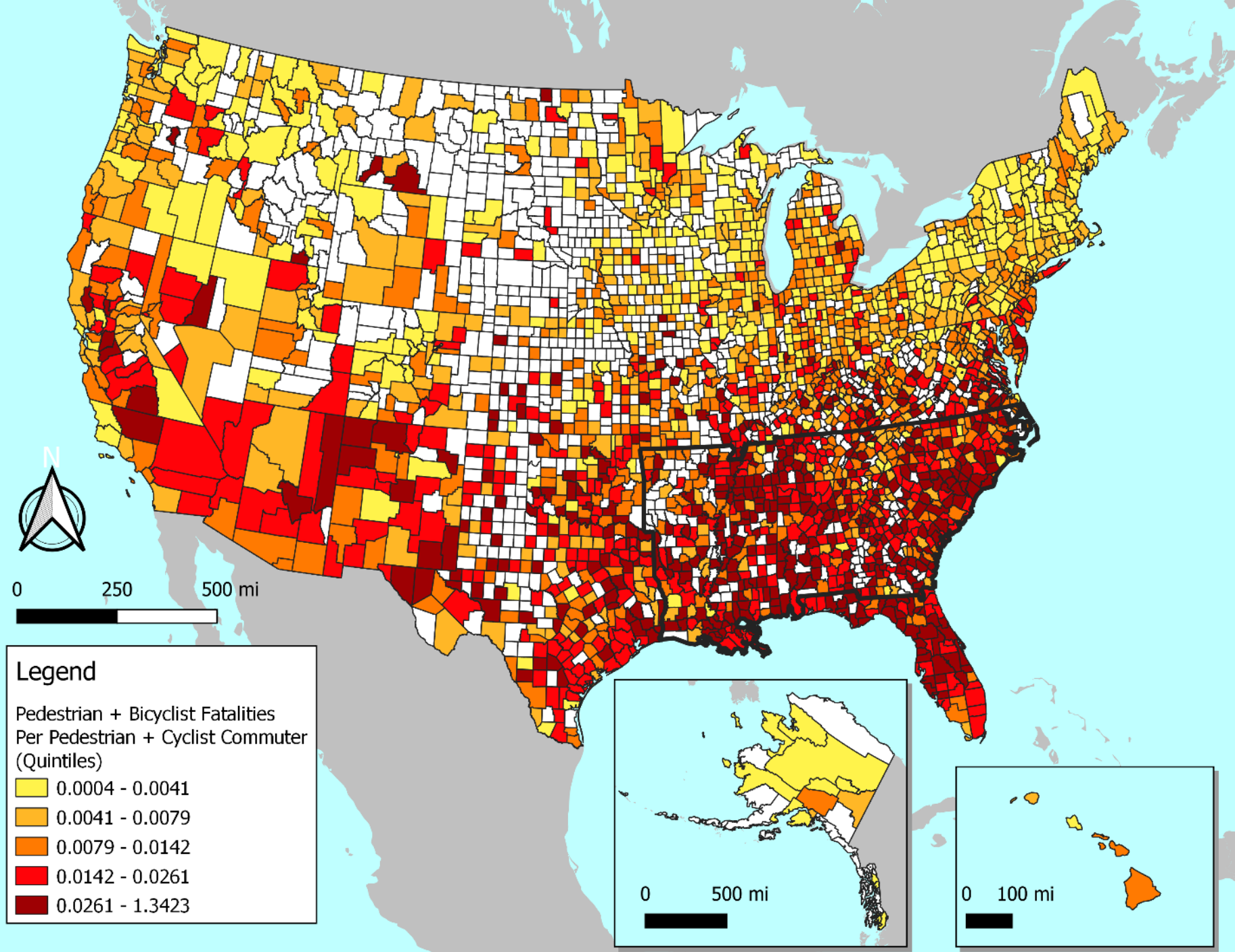


# Bike Fatalities (per capita)



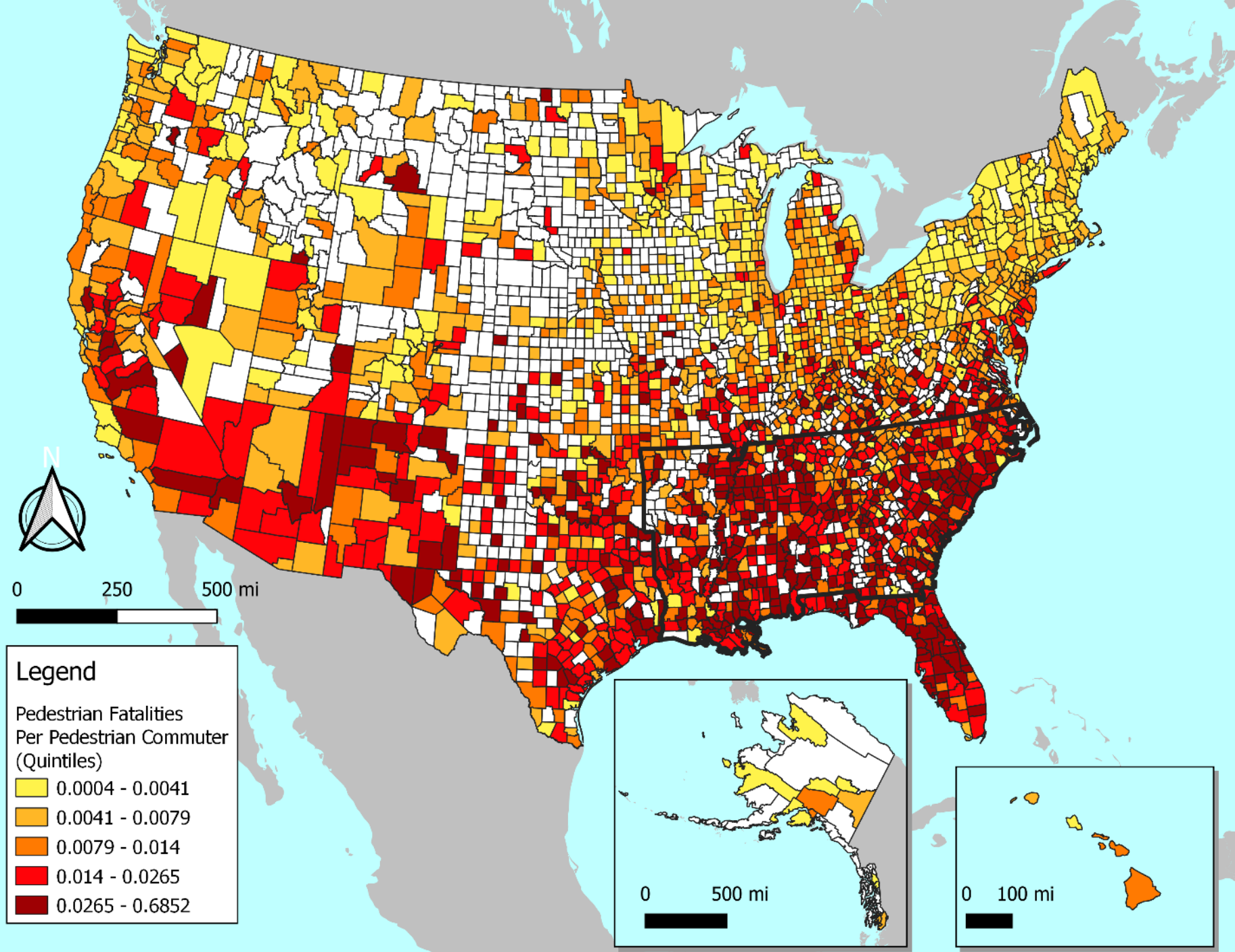
# Ped & Bike Fatalities per Commuter

- 55% of top-quintile counties are in the Southeast
- If we include Florida, 63% of top-quintile counties are in SE
- SE contains:
  - 21% of US counties
  - 15% of the U.S. population
  - 8% of the nation's active transportation commuters
  - 18.1% of the nation's active transportation fatalities



# Ped Fatalities per Ped Commuter

- 55% of top-quintile counties are in the Southeast
- Again, the SE contains:
- 21% of US counties
  - 15% of the U.S. population
  - 8.5% of the nation's pedestrian commuters
  - 18.7% of the nation's pedestrian fatalities

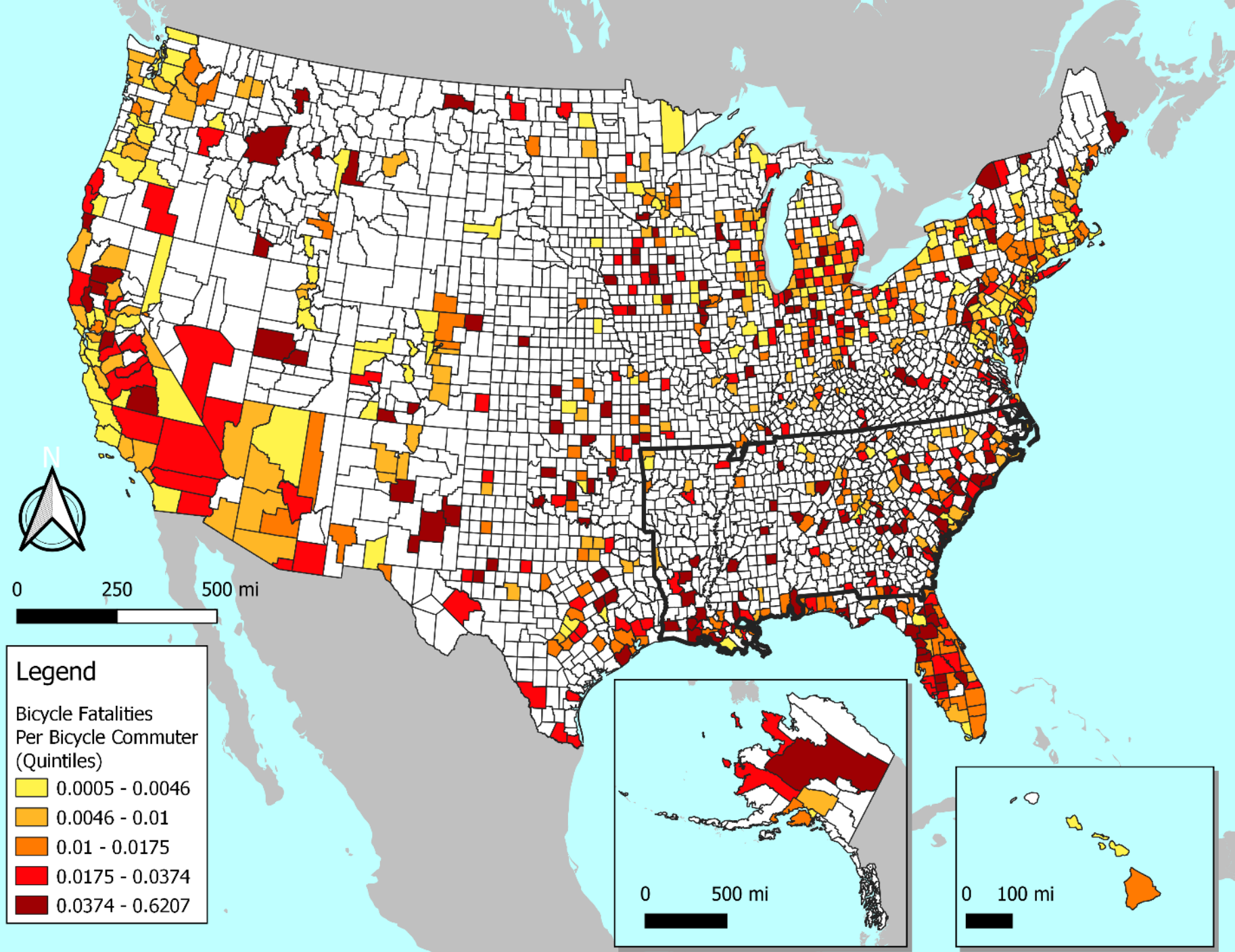


# Bike Fatalities per Bike Commuter

- 31% of top-quintile counties are in the Southeast
- Unlikely there are really this many counties with zero bike commuters

Again, the SE contains:

- 21% of US counties
- 15% of the U.S. population
- 1.1% of the nation's bike commuters
- 2% of the nation's cyclist fatalities





- Counties can be problematic units to weigh against each other due to variation in their size, population, and many other variables
- However, county-level data offers our best option for finer-grained analysis on a national scale
- The Southeast has slightly higher fatality rates in relation to population and mode share for pedestrians and cyclists
- The Southeast has demonstrably lower pedestrian and bicycle mode shares compared to the rest of the nation



## Contributing factors:

- Urban sprawl (population density patterns)
- Historic growth patterns: Rapid growth during a time when communities were being built solely for car travel → influences density and infrastructure
- Weather (debatable)
- Cultural factors
- Policies, goals, legislation



# State Highway Safety Plans (2020 targets)

	States that set targets to improve safety	States that set targets to increase deaths and serious injuries
States that <b>achieved</b> their safety targets	<p><b>Delaware</b>                      <b>Michigan</b></p> <p><b>Iowa</b>                                <b>Minnesota</b></p> <p><b>Kansas</b>                           <b>Vermont</b></p> <p><b>Maine</b>                              <b>Wyoming</b></p>	<p><b>Alabama</b>                        <b>North Dakota</b></p> <p><b>Massachusetts</b>               <b>Oklahoma</b></p> <p><b>New Mexico</b>                   <b>Rhode Island</b></p> <p><b>New York</b>                        <b>Utah</b></p>
States that <b>exceeded</b> their safety targets	<p><b>Alaska</b>                      <b>Maryland</b>                      <b>Oregon</b></p> <p><b>Arizona</b>                    <b>Mississippi</b>                   <b>Pennsylvania</b></p> <p><b>DC</b>                              <b>Missouri</b>                      <b>South Carolina</b></p> <p><b>Hawai'i</b>                      <b>Montana</b>                      <b>Tennessee</b></p> <p><b>Idaho</b>                        <b>New Hampshire</b>             <b>Texas</b></p> <p><b>Illinois</b>                      <b>New Jersey</b>                   <b>Virginia</b></p> <p><b>Kentucky</b>                   <b>North Carolina</b>              <b>Washington</b></p> <p><b>Louisiana</b>                  <b>Ohio</b>                            <b>West Virginia</b></p>	<p><b>Arkansas</b>                      <b>Georgia</b></p> <p><b>California</b>                    <b>Indiana</b></p> <p><b>Colorado</b>                      <b>Nebraska</b></p> <p><b>Connecticut</b>                 <b>Nevada</b></p> <p><b>Florida</b>                         <b>South Dakota</b></p>

# SHSPs

## Alabama

Performance Measure: C-10) Number of pedestrian fatalities (FARS)

### Performance Target details

2014	2015	2016	2017	2018	Baseline	Goal
96	98	102	119	107	108	<b>115</b>

### Performance Target Justification

Based on analysis of previous 5-year averages and trends in recent state crash data, AOHS has projected a realistic goal to not allow the number of pedestrian fatalities to increase more than 6.48 percent from the baseline average of 108 (2014-2018) to 115 in 2021. The five-year average (2015-2019) is 129. The goal is in progress to being achieved.

# SHSPs

## Arkansas

		BASE YEARS				
<b>GHSA/NHTSA Recommended/Optional PERFORMANCE PLAN CHART – 2022 Highway Safety Plan</b>		<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>C-10</b>	Pedestrian Fatalities FARS Annual	44	49	47	62	61
	Hold the increase in pedestrian fatalities to 11 percent from 53 (2015-2019 rolling average) to <b>59</b> (2018 – 2022 rolling average) by 2022. 5-Year Rolling Avg.	43	45	45	48	53
<b>C-11</b>	Bicyclist Fatalities FARS Annual	3	3	4	4	3
	Hold increase in bicyclist fatalities to 33 percent from 3 (2015-2019 rolling average) to <b>4</b> (2018 – 2022 rolling average) by 2022. 5-Year Rolling Avg.	5	5	4	4	3

# SHSPs

## Louisiana

### Performance Targets

- Reduce pedestrian fatalities by 1 percent from 126 (2015-2019 average) to 123 in 2022. (C-10)
- Reduce bicyclist fatalities by 3 percent from 26 (2015-2019 average) to 24 in 2022. (C-11)

# SHSPs

## Mississippi

**C-10 Core Outcome Measures/Pedestrians:** Reduce the expected rise of the number of pedestrian fatalities of the five year average (2015-2019) of 69 to 73 by the end of (2018-2022).

**C-11 Core Outcome Measure/Bicyclist:** Maintain the number of bicycle fatalities of the five year average (2015-2019) of 6 fatalities by the end of 2018-2022.



# SHSPs

## North Carolina

### C-10) Number of pedestrian fatalities (FARS)

**Target:** Decrease the number of pedestrian fatalities by 5 percent from the 2014–2018 average of 195 to the 2017–2021 average of 185 by December 31, 2021.

**Outcome:** **Target not met.** The 2017–2021 average number of pedestrian fatalities was 221, a 13 percent increase from the 2014–2018 average of 195.



# SHSPs

South Carolina



<b>NHTSA Core Measures</b>		<b>2008-2012</b>	<b>2009-2013</b>	<b>2010-2014</b>	<b>2011-2015</b>	<b>2012-2016</b>	<b>2013-2017</b>	<b>2014-2018</b>	<b>2015-2019</b>	<b>2022 Goal</b>
C-10	Pedestrian Fatalities	103	103	107	113	119	126	139	149	148

## **Additional State Measures**

C-11	Bicyclist Fatalities	13	14	14	15	17	17	19	21	20
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# SHSPs

## Tennessee

### Performance Measure: C-10) Number of Pedestrian Fatalities (FARS)

Progress: **In Progress**

The THSO will strive to meet the target measure for the number of pedestrian fatalities. The FFY 2021 HSP set a target of 167, a 22.8 percent increase from 2018. As of May 3, 2021, Tennessee has seen 46 pedestrian fatalities.

### Performance Measure: C-11) Number of Bicyclists Fatalities (FARS)

Progress: **In Progress**

The THSO is trending towards meeting the target measure for the number of bicyclists fatalities. The FFY 2021 HSP set a target of 6, a 25.0 percent decrease in bicycle fatalities from 2018. As of May 3, 2021, Tennessee has seen zero bicyclist fatalities.

# Safety Performance Measures & Goals

## Georgia:

- Target is for a **69% increase** in non-motorist serious injuries and fatalities 2019-2024

CORE OUTCOME	PERFORMANCE MEASURE	GOALS					
		BASELINE	ESTIMATE		TARGET		
TRAFFIC FATALITIES	To maintain traffic fatalities under the projected <b>1,770</b> (2020-2024 rolling average) by 2024.	2019 1,505	2020 1,559	2021 1,617	2022 1,671	2023 1,722	2024 1,770
FATALITIES/ 100M VMT	To maintain traffic fatalities per 100M VMT under the projected <b>1.22</b> (2020-2024 rolling average) by 2024.	2019 1.19	2020 1.20	2021 1.21	2022 1.21	2023 1.22	2024 1.22
SERIOUS INJURIES IN TRAFFIC CRASHES	To maintain serious injuries in traffic crashes under the projected <b>11,069</b> (2020-2024 rolling average) by 2024.	2019 5,836	2020 6,518	2021 7,393	2022 8,443	2023 9,669	2024 11,069
SERIOUS INJURIES IN TRAFFIC CRASHES/ 100M VMT	To maintain serious injuries in traffic crashes per 100M VMT under the projected <b>7.68</b> (2020-2024 rolling average) by 2024.	2019 4.61	2020 4.97	2021 5.46	2022 6.08	2023 6.82	2024 7.68
NON-MOTORIST SERIOUS INJURIES AND FATALITIES	To maintain non-motorist serious injuries and fatalities under the projected <b>1,025</b> (2020-2024 rolling average) by 2024.	2019 608	2020 663	2021 734	2022 818	2023 915	2024 1,025

# Complete Streets Policy Adoption 2003

**18**  
jurisdictions  
with policies

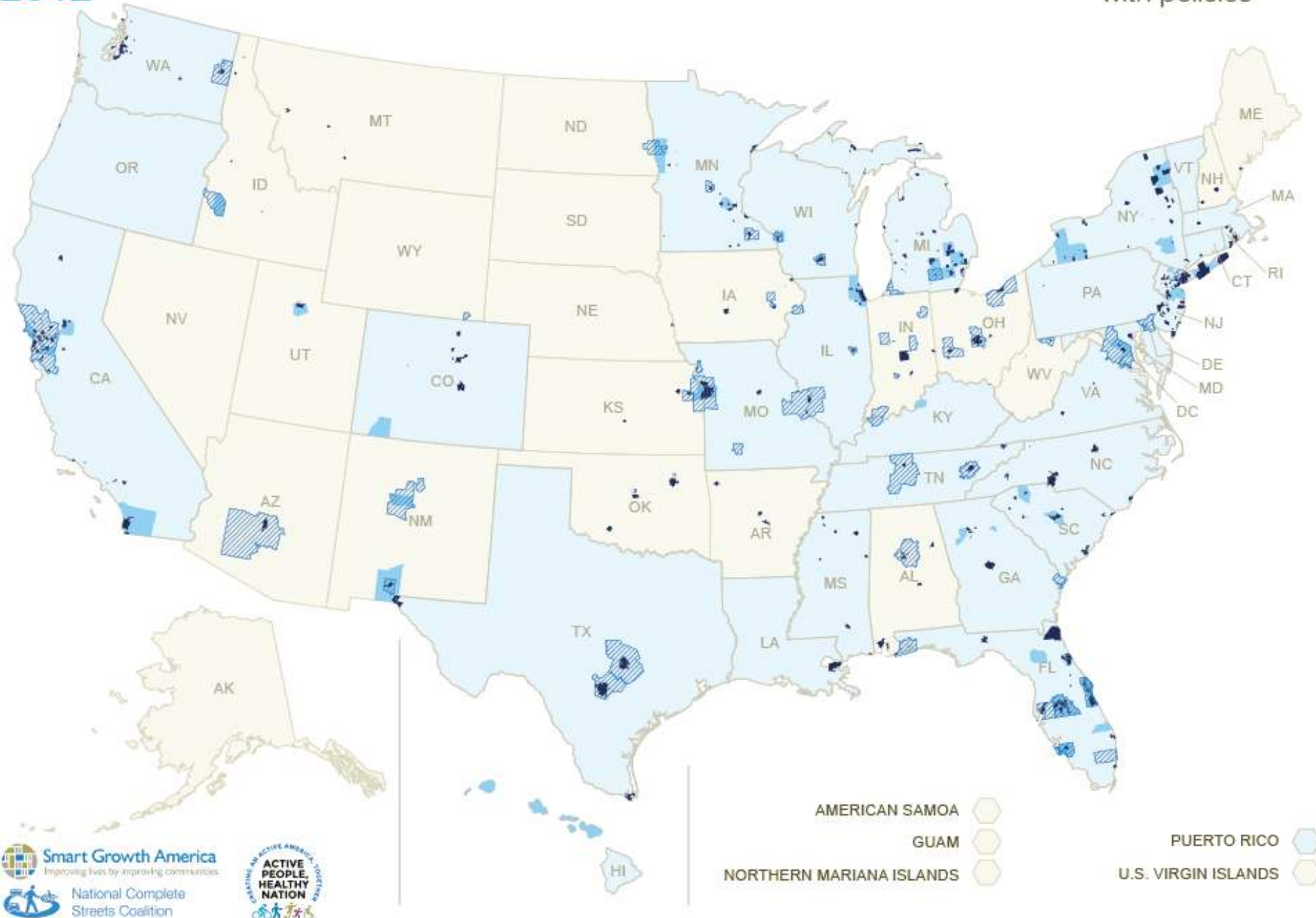
- Southeastern states were among the first to adopt CS policies as the movement gained traction



# Complete Streets Policy Adoption 2012

616  
jurisdictions  
with policies

- Note there is great variation in policy strength and effectiveness

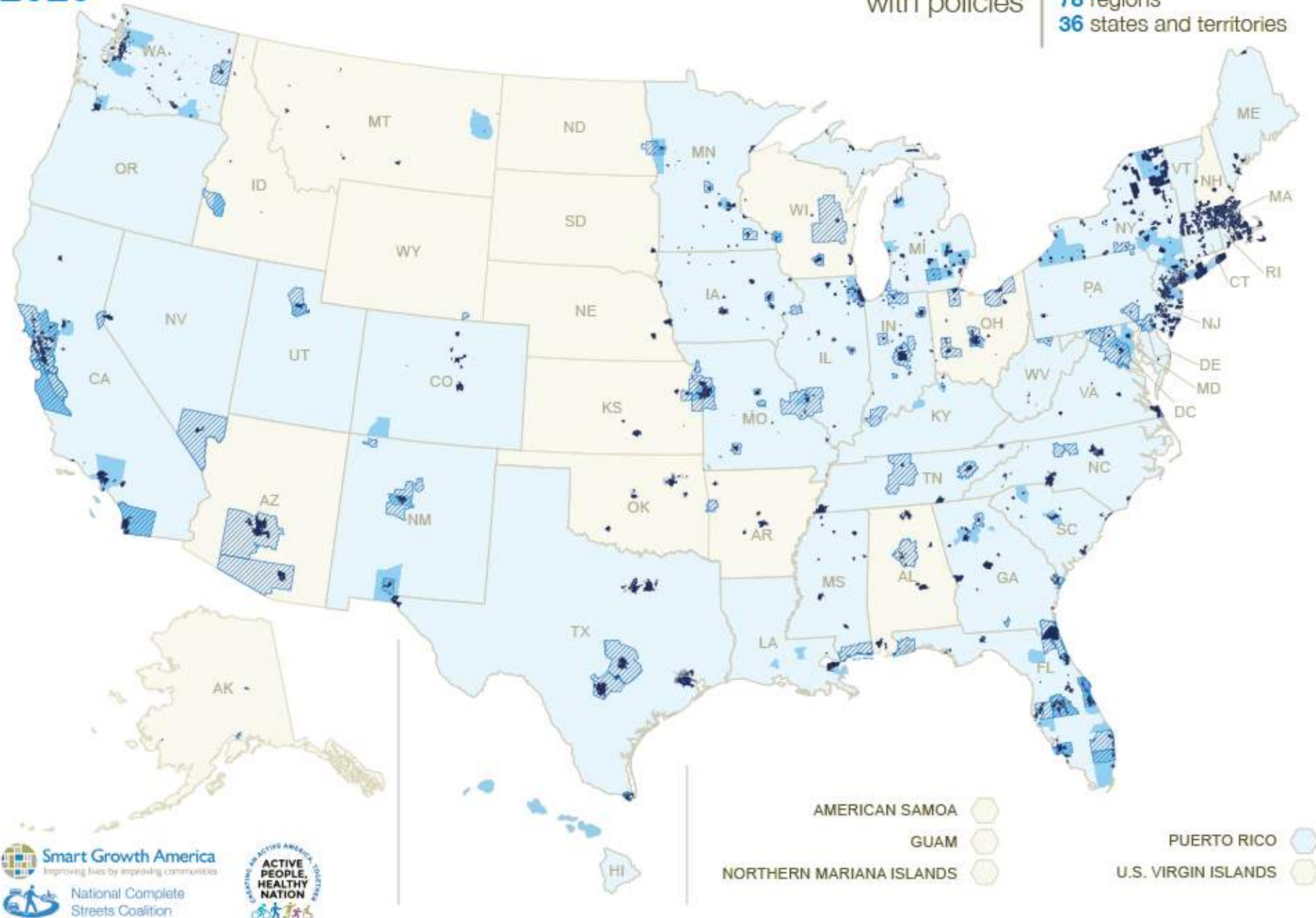


# Complete Streets Policy Adoption 2020

1,520  
jurisdictions  
with policies

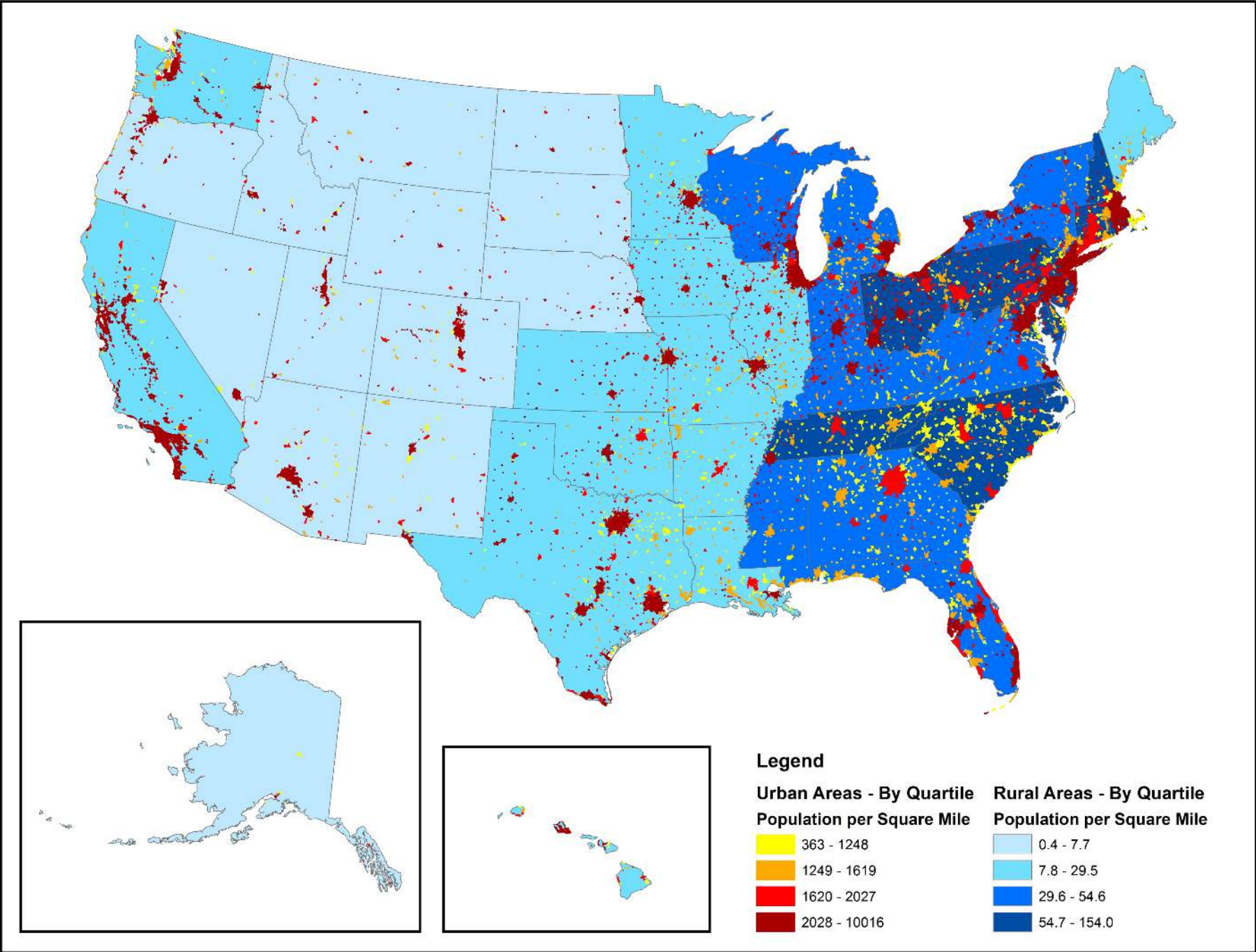
1,312 cities and towns  
93 counties  
1 tribe  
78 regions  
36 states and territories

- 7.4% of policies are in the Southeast
- The SE contains 15% of the U.S. population
- 8.5% of the nation's pedestrian commuters
- 1.1% of the nation's bike commuters
- Remember people also walk and bike for purposes other than commuting

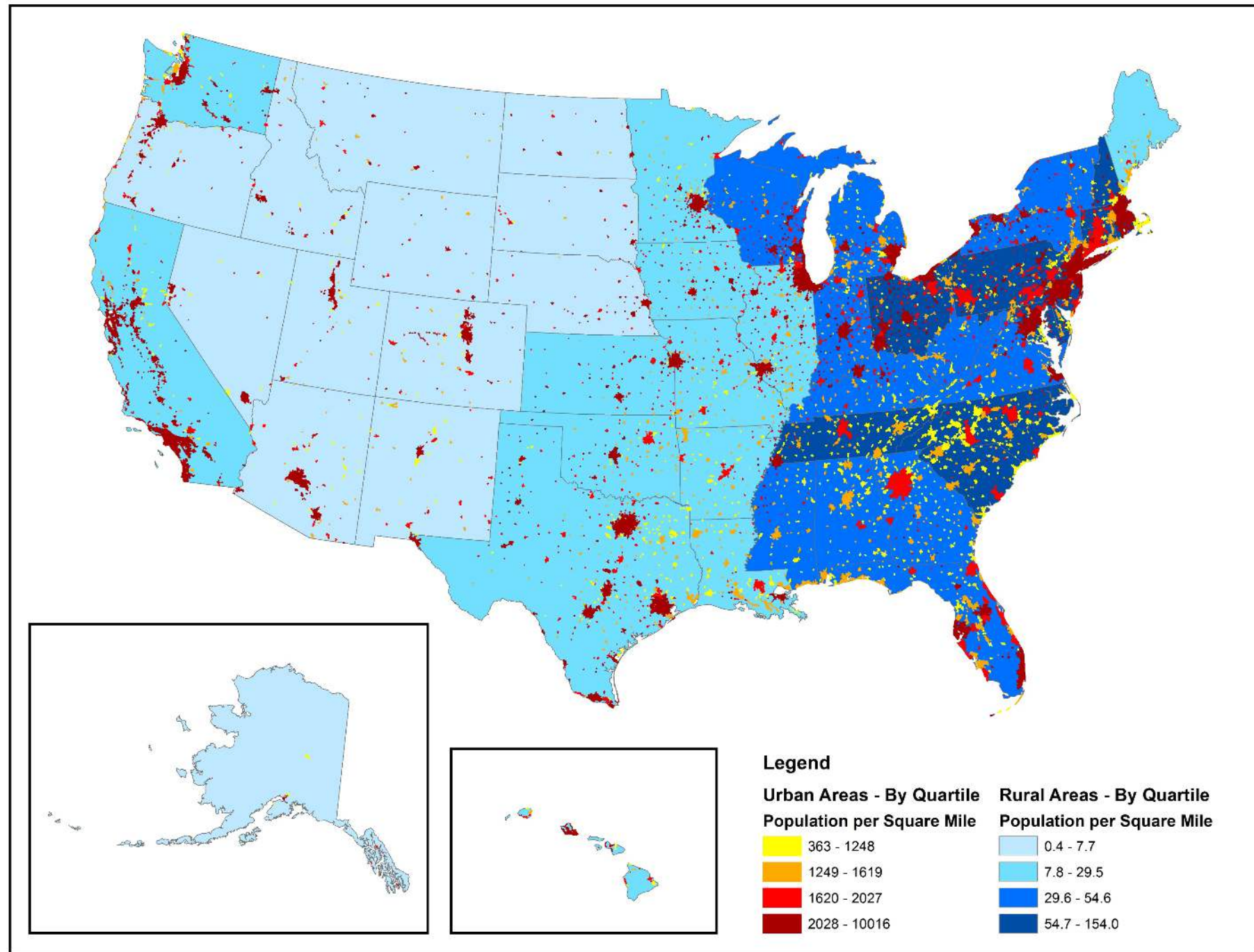


# Population Density

The Southeast has different density patterns



- Urbanized areas are less dense (more sprawling) in the SE:
  - 1,523 people per square mile in the urbanized Southeast
  - 2,693 people per square mile in the urbanized remainder of the US
  
- Rural areas are dense:
  - 55 people per square mile in the rural Southeast
  - 14 people per square mile in the rural remainder of the US
    - (17 per square mile if Alaska is excluded)





# Changes in Infrastructure

## “Experimental” Bike Facilities

Newer facilities and treatments like cycle tracks, bike boxes, and some mid-block crossing treatments are typically not covered in existing standards and guidelines. These facilities/treatments are considered “experimental” by FHWA. Special permission must be requested and received to use such “experimental” facilities.

2011  
2010



(FHWA Bikeway  
Selection Guide)

## One-Way Separated Bike Lanes

One-way separated bike lanes are physically separated from adjacent travel lanes with a vertical element, such as a curb, flex posts, or on-street parking. One-way separated bike lanes, especially those with a physical curb, have been shown to reduce injury risk and increase bicycle ridership due to their greater actual and perceived safety and comfort.

Intersection designs should promote visibility of bicyclists and raise awareness of potential conflicts. The provision of sufficient sight distance is particularly important at locations where the on-street parking is located between the bike lane and travel lane. One-way separated bike lanes may transition to shared lanes, bike lanes, mixing zones, or protected intersections.

Intersection approaches with mixing zones require motorists to yield to bicyclists before entering or crossing the bike lane. This clarity can be further enhanced with bicycle lane extensions through the intersections, green colored pavement, and regulatory signs. Research shows protected intersections have fewer conflicts and are therefore preferable.

## Two-Way Separated Bikes Lanes and Sidepaths

Two-way separated bike lanes and sidepaths are physically separated from adjacent travel lanes using elements such as a curb, flex posts, or on-street parking. They may be located on one side of a street or both sides. Unlike two-way separated bike lanes, which provide for the exclusive travel of bicyclists, sidepaths are designed to support and encourage pedestrian use. Conflicts between path users are a primary source of injuries and can result in a degraded experience for all users where paths are not wide enough to handle the mixture and volume of diverse users.

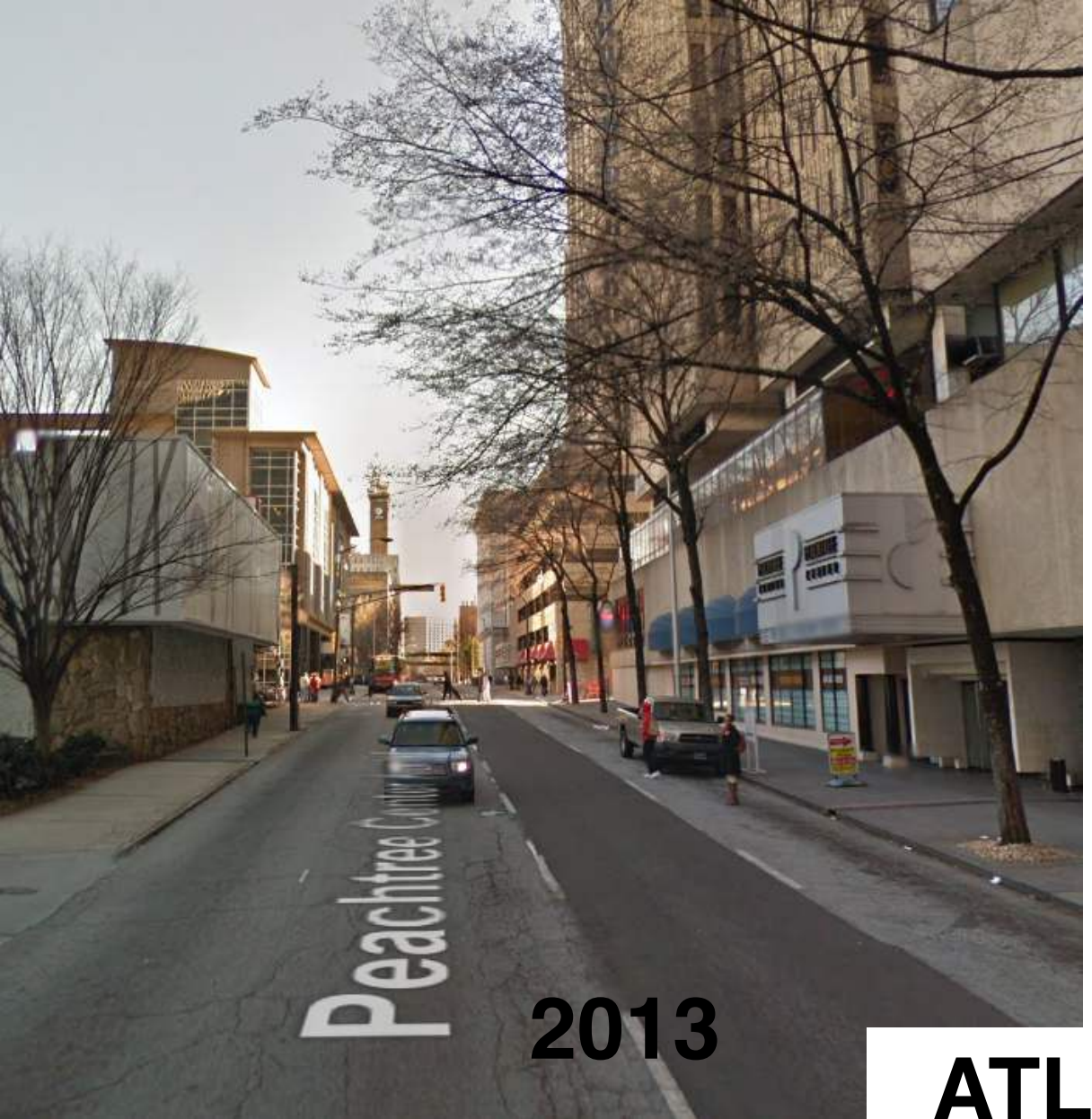
Care should be taken at intersections and driveways which intersect two-way separated bike lanes and sidepaths due to the two-way operation of bicycles in these locations. Crash patterns consistently

crossings

- Improve sight lines
- Raise awareness with marked crossings and regulatory signs

For more information, see the FHWA *Separated Bike Lane Planning and Design Guide*.





**2013**



**2022**

**ATLANTA**



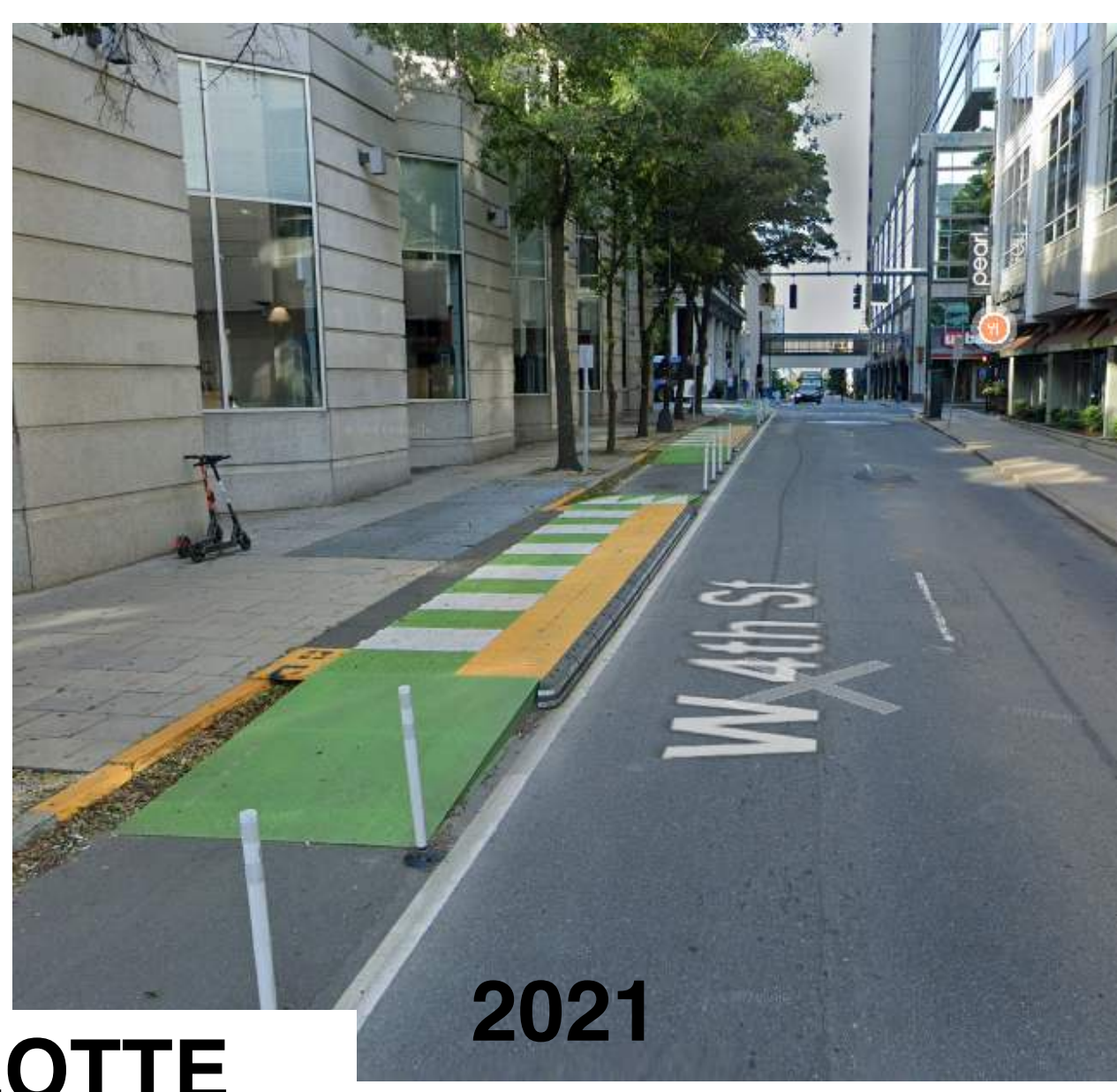


**2011**



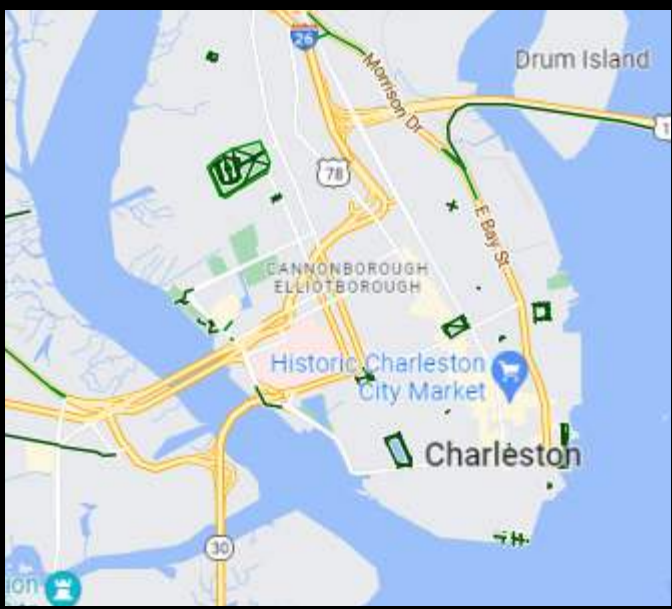
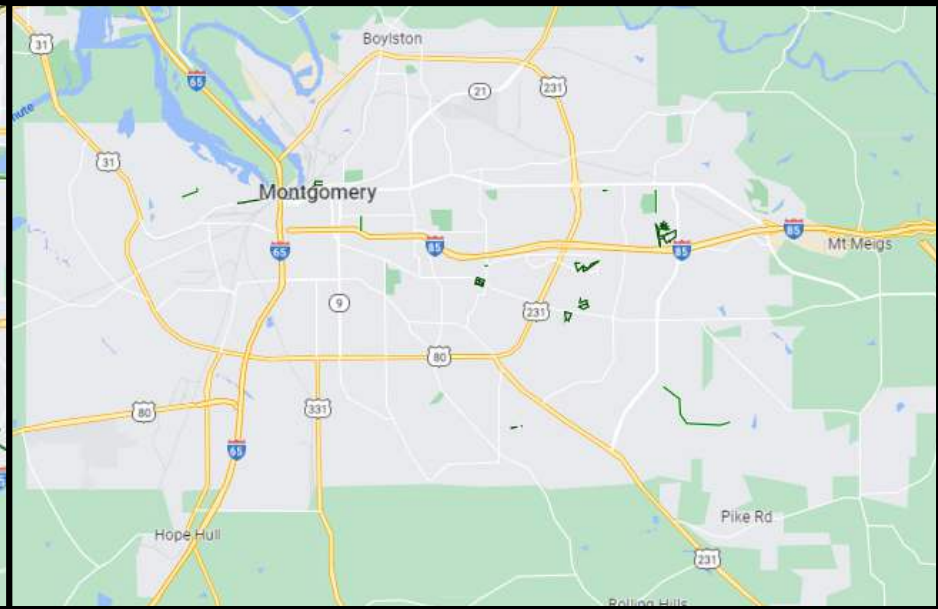
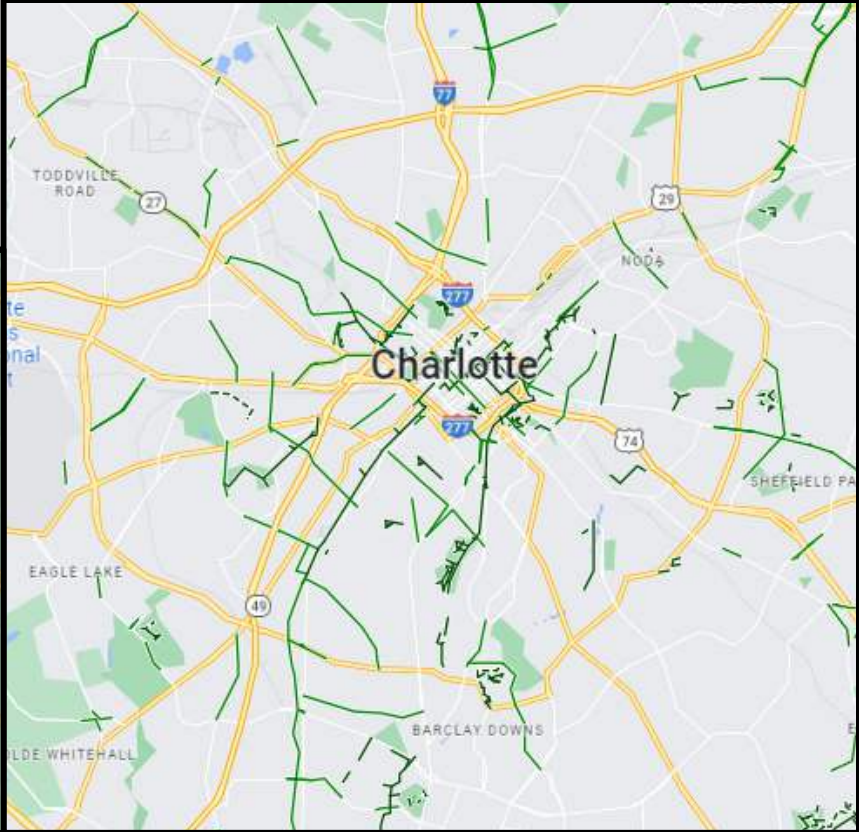
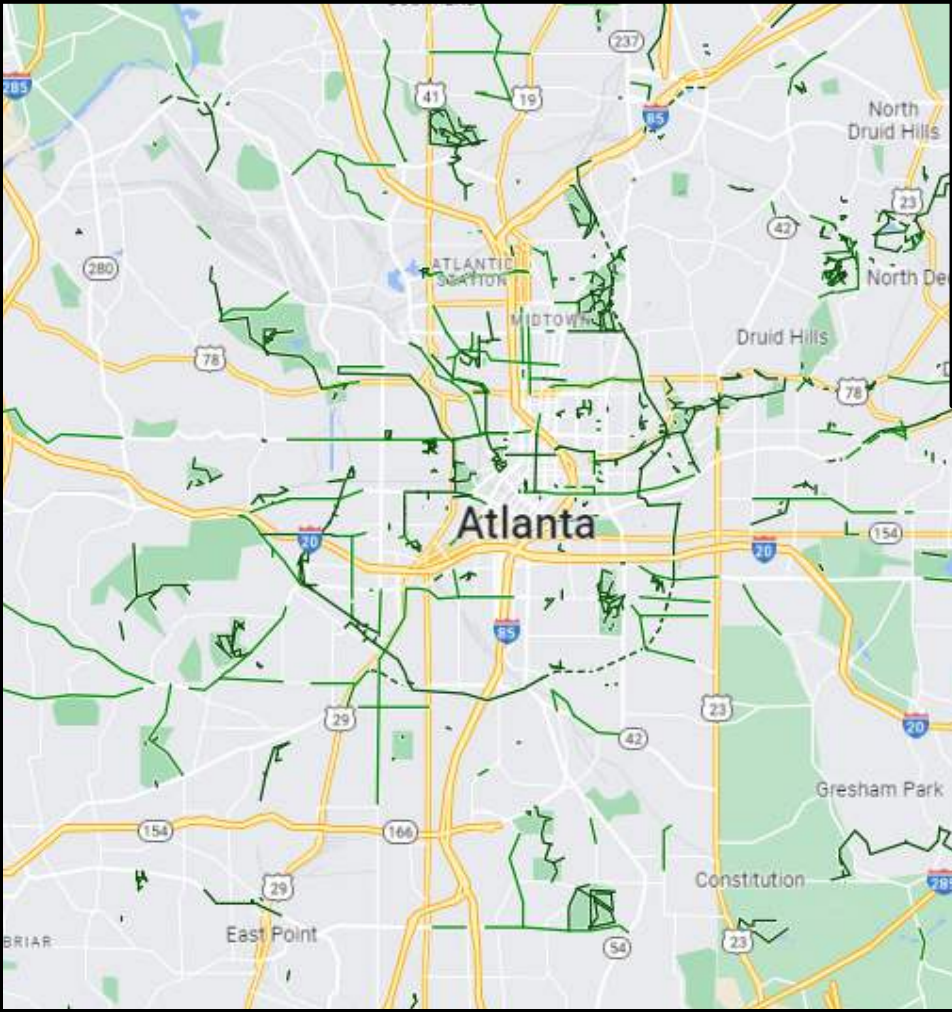
**2019**

# CHATTANOOGA



# CHARLOTTE

# Fragmented or non-existent bicycle networks



# Fragmented or non-existent pedestrian networks

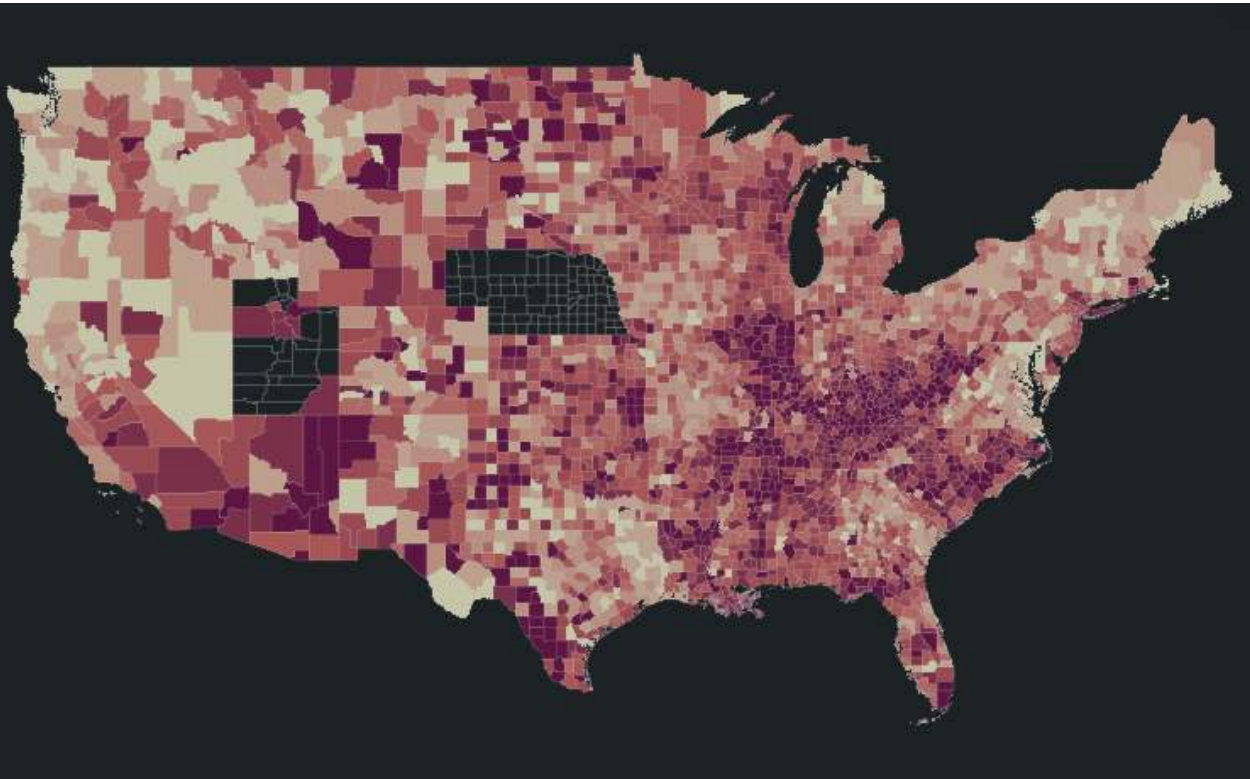


# Influence of the Pandemic

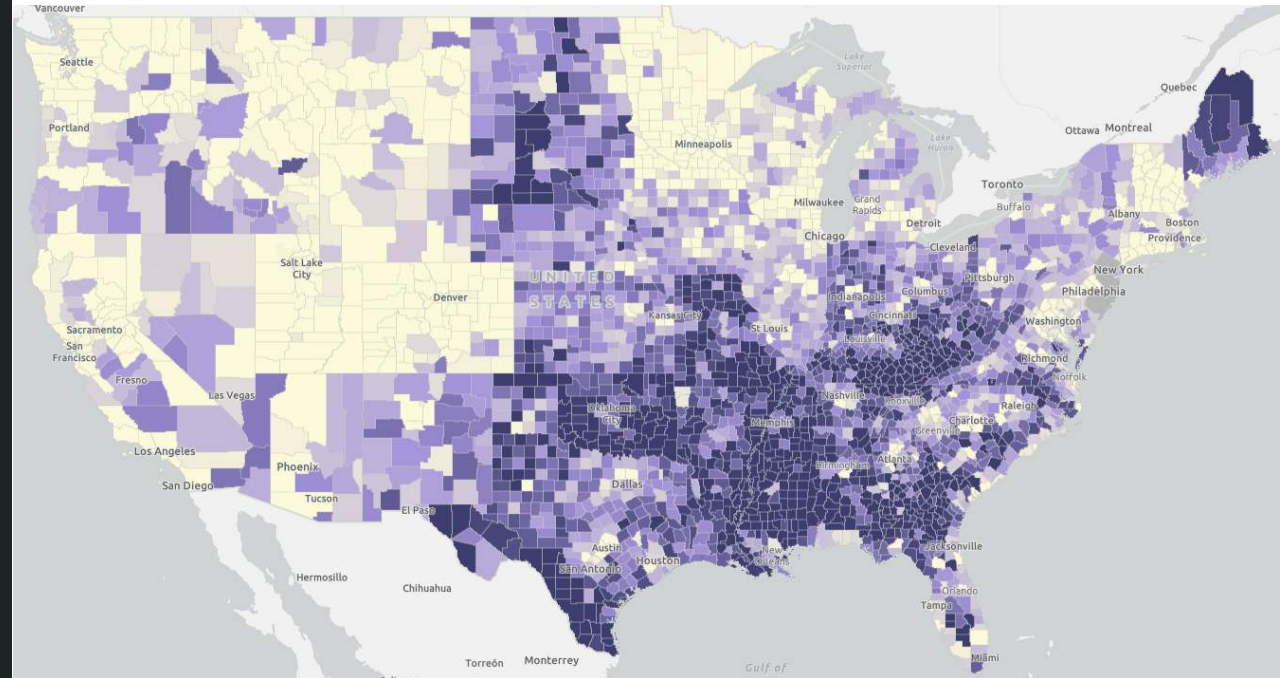
- Connection between physical activity, underlying health, and COVID outcomes
- Increase in active transportation modes (nationwide) due to lockdowns and social distancing
  - New infrastructure built due to this increase



# Cumulative COVID cases per capita (Johns Hopkins)

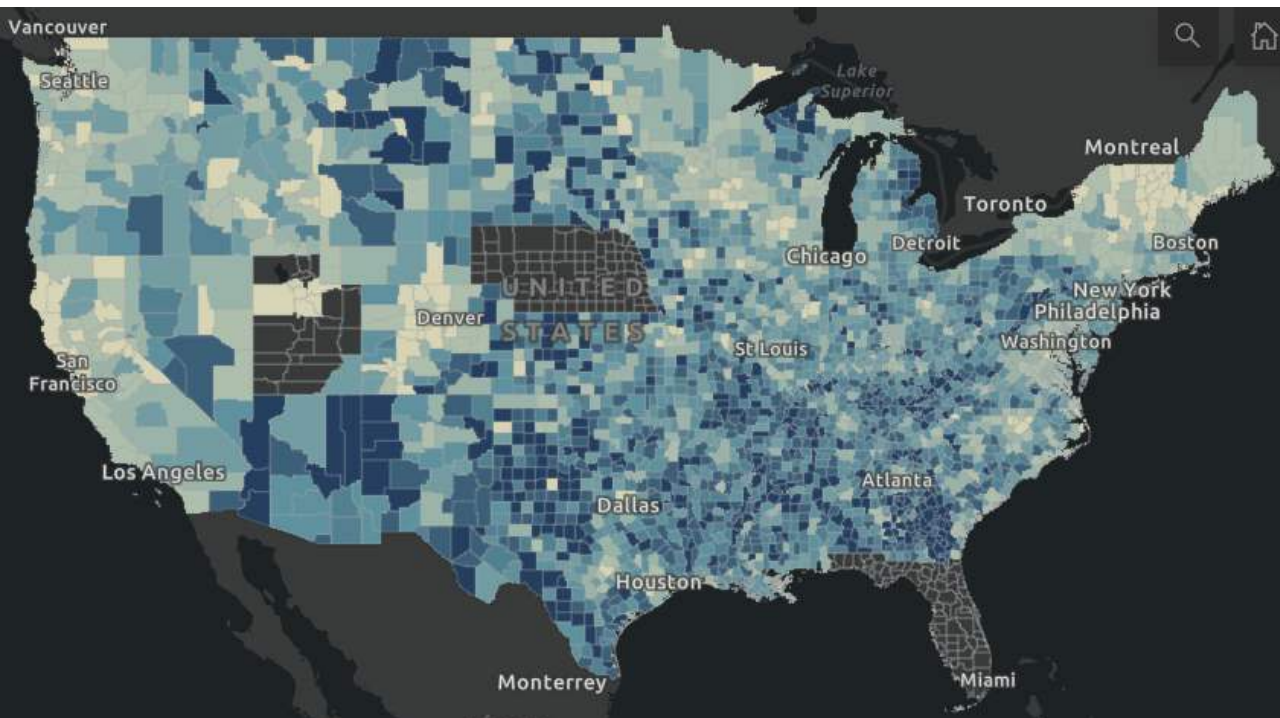


# Physical Inactivity (CDC BRFSS)

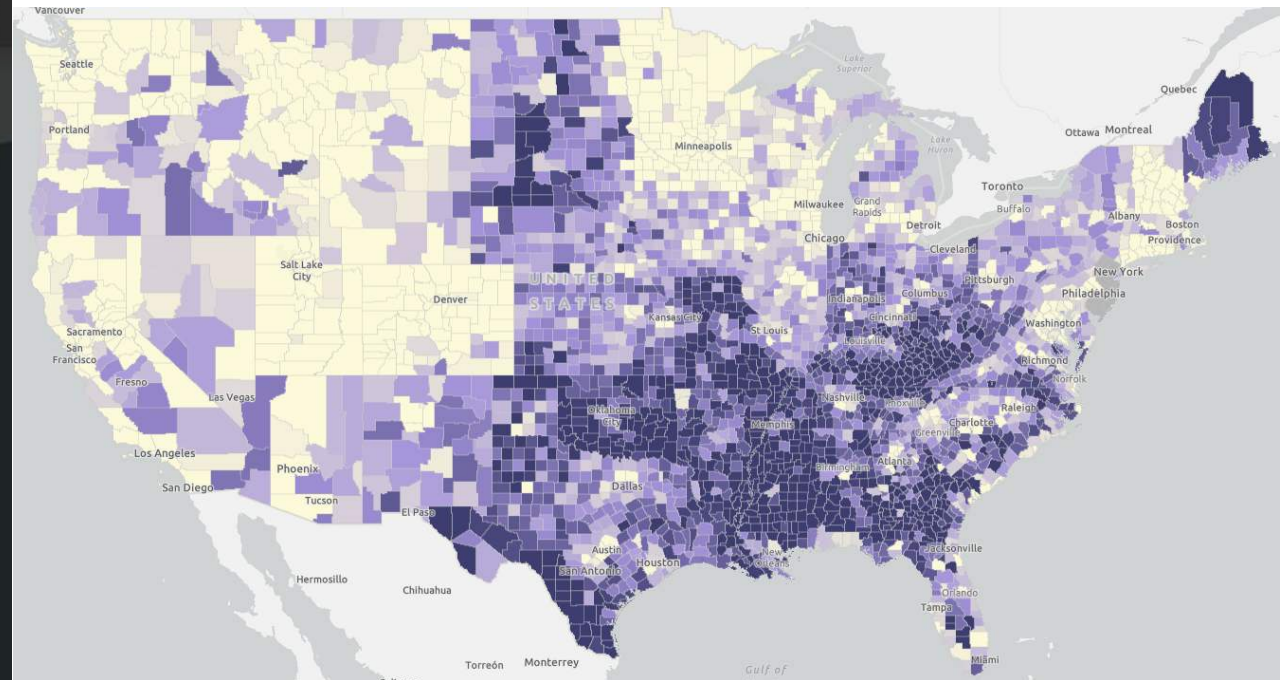




# Cumulative COVID deaths per capita (Johns Hopkins)



# Physical Inactivity (CDC BRFSS)



# Increase in risky driver behavior during Pandemic

- Statistically safer types of drivers drove less during the Pandemic, while riskier drivers drove more (older, female vs younger, male)
- Increase in self-reported risky driving behaviors during the Pandemic
- Road rage shootings have doubled

Behaviors in 30 Days Before Survey	People who Increased Driving During Pandemic	People who Did Not Increase Their Driving
Speeding 10+ mph over Speed Limit on a Residential Street	51%	35%
Reading a Text	50%	33%
Red-Light Running on Purpose	45%	25%
Changing Lanes Aggressively	43%	20%
Not Wearing a Seatbelt	21%	12%
Alcohol-Impaired Driving	13%	6%
Driving After Cannabis Use	13%	4%

Chart: AAA Foundation for Traffic Safety

# Expected future trends

This is a volatile period in history with many changes occurring.

After a couple of years of post-COVID data are available, some very interesting new trends can be expected.

- More walking and biking (due to improved infrastructure and increased interest)
- MUCH more working from home
- Fatality and injury rates... ?
- Health trends... ?



# Opportunities for further research

- Pre- vs post-pandemic differences
- Infrastructure data
- VMT/ADT analysis relating to population density
- Mode share data other than commuting
- Deeper dive into state & local policy
- Statistical analysis

