Blueprint for Safety: Population Analysis

This memo identifies disparities for indicators of traffic safety within the CAMPO region. It addresses overrepresentation by crash type, demographics, and the location of crashes relative to social vulnerability and transportation disadvantage. By identifying high-risk areas and overrepresented groups, the analysis helps guide the creation of effective safety strategies tailored to the most vulnerable populations. The population analysis will be strategically employed across six key areas to ensure a comprehensive and inclusive safety plan and implementation process.

Engagement

This analysis will provide a snapshot of the demographics of the community and who is most impacted by crashes and fatal injuries. This insight will guide the targeting of engagement efforts, ensuring that all voices, especially those of underserved communities, are heard and their specific needs are addressed.

Strategic Planning and Policy Formulation

The population analysis can be used to inform the development of policies and strategies that address specific disparities in the CAMPO planning area. By considering social vulnerability and transportation disadvantage, decision-makers can plan and design for safer access for the entire region, especially for those most impacted by negative traffic outcomes.

Project Prioritization

A comprehensive population analysis can help identify and prioritize safety projects that benefit underserved and vulnerable communities. This ensures resources are allocated to areas with the greatest need, reducing disparities in roadway safety and addressing the disproportionate impact traffic crashes have on certain communities.

Community Education

The population analysis can be used to customize community education programs to address the specific safety challenges faced by underrepresented groups. This ensures educational initiatives are culturally sensitive and accessible, and focused on reducing traffic-related injuries and fatalities within these populations.

Agency Training

The population analysis can inform training programs for MPO agency staff, emphasizing the importance of fair treatment and the need to integrate population considerations into all aspects of their work. Additionally, training can help staff understand the barriers impacting the communities they serve, ensuring they can proactively work to eliminate these disparities and avoid causing further harm through their planning and projects.

Partnerships

A key benefit of the population analysis is the opportunity to foster partnerships with community organizations and stakeholders who represent underserved communities, recognizing that non-transportation-related factors often contribute to disparities in traffic outcomes. These partnerships are crucial for addressing broader issues such as healthcare, education, and housing, which transportation agencies alone cannot resolve.

Key Considerations

Overrepresentation by Crash Type

This consideration focuses on identifying crash types that are disproportionately affecting certain demographics within the CAMPO region. By analyzing data on different kinds of crashes, such as pedestrian, vehicle, or heavy

truck incidents, planners can identify patterns and develop targeted interventions to mitigate these high-risk crash types, ensuring a safer environment for all road users.

Overrepresentation by Demographic Groups in Crash Data

This analysis examines which demographic groups are more likely to be involved in crashes. By understanding the socio-demographic profiles, such as age, race, and gender that are overrepresented in this data, planners and policymakers can craft safety measures and programs that specifically address the vulnerabilities of these groups, thereby promoting inclusiveness and fairness in traffic safety initiatives.

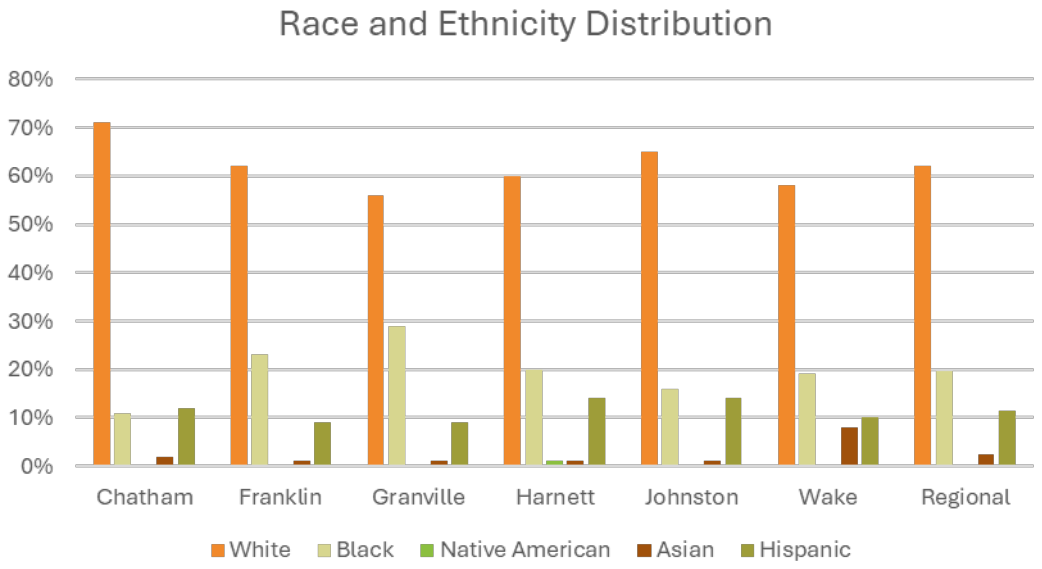
Location of Crashes Relative to Social Vulnerability and Transportation Disadvantage

This consideration evaluates where crashes frequently occur in relation to socially vulnerable populations and areas with transportation disadvantages. By mapping the high injury network against indicators that factor in income, access to healthcare, and zero vehicle households, the analysis highlights areas in the region that may require prioritized safety interventions. This ensures that resources are directed where they are most needed, enhancing the overall safety of the transportation network in the CAMPO region.

Study Area Demographics

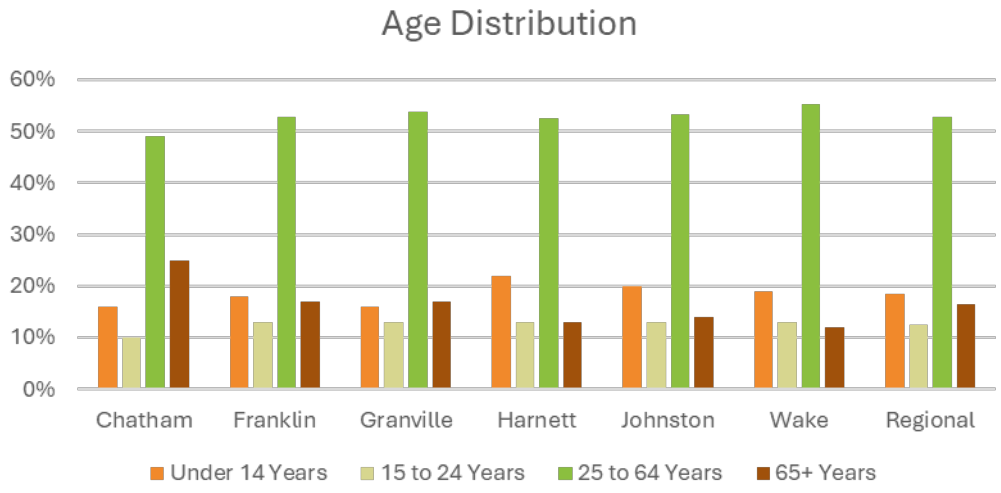
Race and Ethnicity

The chart *Race and Ethnicity Distribution* shows the racial and ethnic composition of the CAMPO region. The region is predominantly White across all counties, with varying proportions of Black residents and minimal representation of Native Americans and Asians. Notably, Granville County has the highest percentage of Black residents, well above the regional share. Wake County stands out with a significantly higher percentage of Asian residents compared to other counties and the region. Chatham County has the highest percentage of White residents, surpassing the regional average. The Native American population remains quite low across the region.



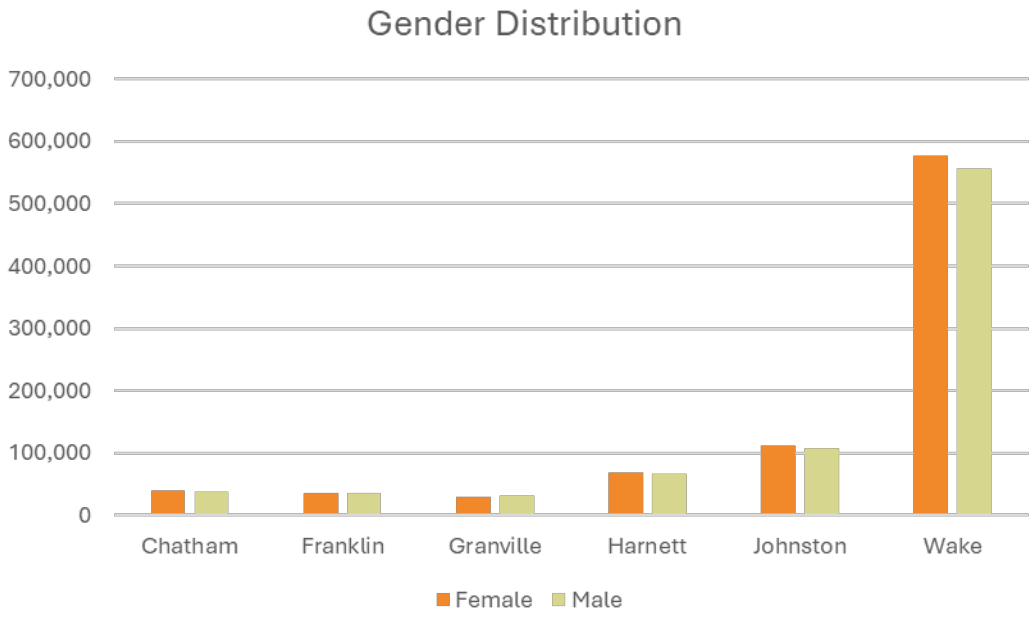
Age

The *Age Distribution* chart reveals that the majority of the population across all counties falls within the 25 to 64 years age group. Most of the counties display similar percentages of the 15 to 24 years age group. Harnett County has a notably high percentage of young individuals under 14 years, and Chatham County has a significant senior (65+ years) population.



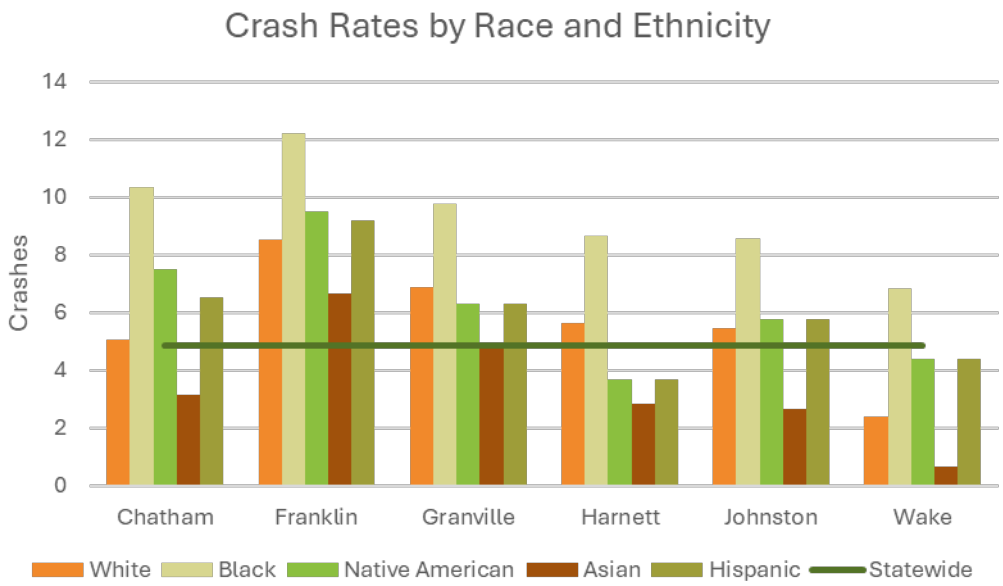
Gender

Generally, the region has more females than males, with only Granville County having slightly fewer females.



Crash Rates by Population Group

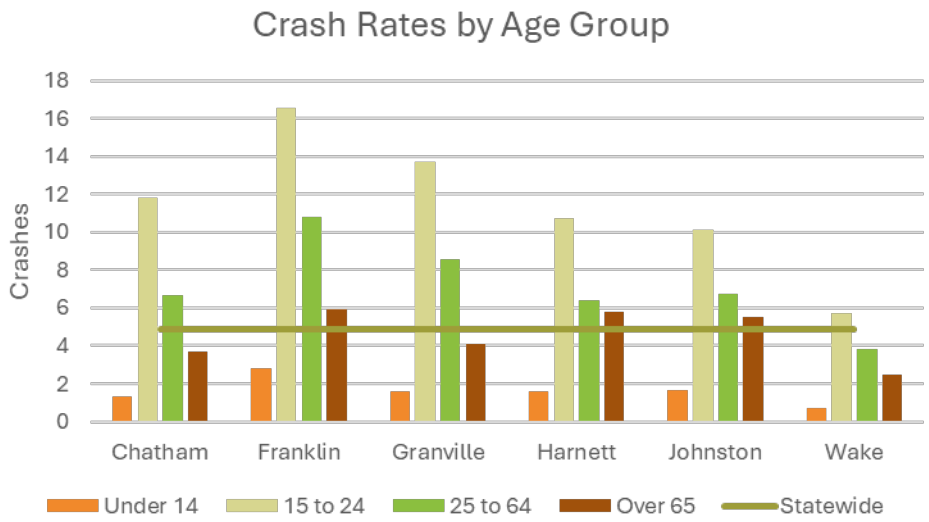
Race and Ethnicity



Rates of fatal and serious injury crashes are overrepresented among the Black population in all counties in the CAMPO region. Considering share of total population, safety disparities are most significant for the Black population in Franklin and Granville counties. Fatal and serious injury crash rates are overrepresented among the Hispanic population in Johnston, Granville, Franklin and Chatham counties. Considering share of total population, safety disparities are most significant for the Hispanic population in Chatham, Harnett and Johnston counties.

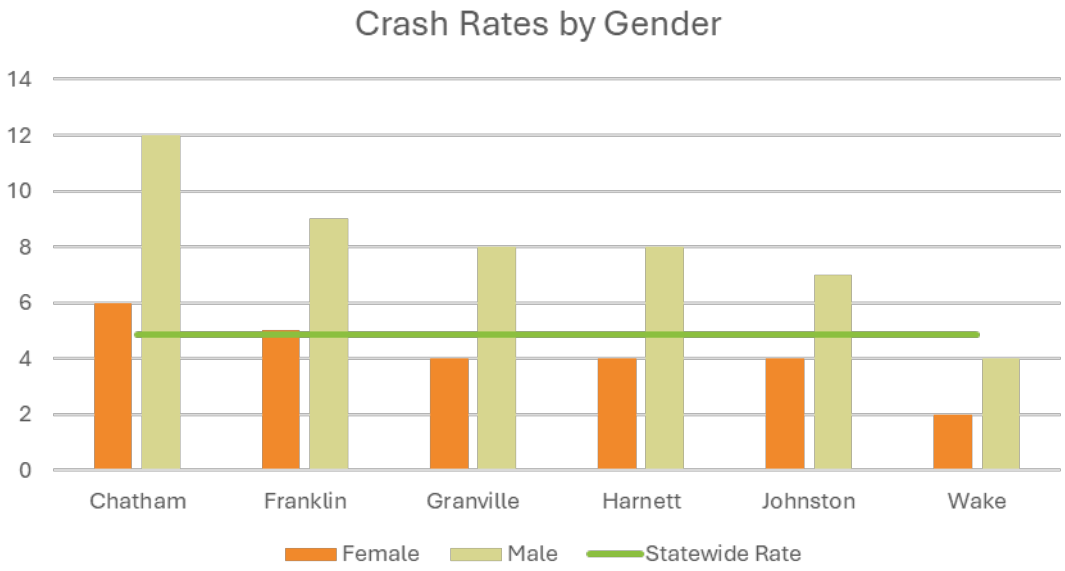
Age

Rates of fatal and serious injury crashes are over-represented among people ages 25-64 in all counties except for Wake, compared with the statewide rate. Considering share of total population, safety disparities are most significant for the population age 25-64 in Granville, Harnett and Johnston. Fatal and serious injury crash rates are over-represented among the older adults in Johnston, Harnett, and Franklin counties compared with the statewide rate. Considering share of total population, safety disparities are most significant for older adults in Franklin County.



Gender

Rates of fatal and serious injury crashes are overrepresented among males in all counties except for Wake, compared with the statewide rate. Considering share of total population, safety disparities are significant for males across the region.



Overrepresentation in Specific Crash Types

A total of 13 crash types were analyzed by race/ethnicity and age of persons involved in fatal and serious injury crashes. “Overrepresentation” is defined, for the purpose of this section, as a higher percentage of the population group impacted by a crash type compared to the percentage of that population in the region. The following table shows overrepresentation, indicated by the highlighted cells, of fatal and serious injury crashes by race and ethnicity.

Proportion of Fatal and Serious Injury Crashes by Race and Ethnicity

Crash Types	Native American	Asian	Black	Hispanic	Unknown	White
Animal			13.9%	5.6%		80.6%
Bicyclists			24.2%	12.1%	1.0%	61.6%
Distracted	0.5%	1.2%	29.4%	10.2%		56.4%
Heavy Truck	0.7%	0.3%	30.5%	12.0%	0.3%	54.5%
Impaired	0.2%	0.6%	34.5%	16.4%	0.2%	46.4%
Intersection	0.3%	1.3%	28.5%	11.6%	0.1%	55.5%
Lane Departure	0.2%	0.6%	32.7%	12.9%	0.1%	51.3%
Motorcycle	0.3%	0.8%	26.9%	5.7%		64.9%
Older Driver	0.2%	0.9%	27.5%	5.3%	0.3%	64.1%
Pedestrian	0.3%	1.5%	43.7%	12.5%	0.3%	39.4%
Seat Belts and Car Seats	0.2%	0.4%	38.4%	12.1%	0.2%	46.5%
Speed	0.2%	0.6%	36.6%	12.4%	0.1%	47.4%
Younger Driver	0.3%	1.3%	28.7%	15.3%		50.3%
Share of Regional Population	**0.0%**	**2.0%**	**20.0%**	**11.0%**	**5.0%**	**62.0%**

Considering share of the region’s total population, safety disparities are most significant among the Black population for all crash types, except for animal-related crashes. The Hispanic population is disproportionately impacted by crashes involving bicyclists, heavy trucks, impairment, lane departure, pedestrians, seat belts, speed and younger drivers.

Proportion of Fatal and Serious Injury Crashes by Age

Crash Types	Under 14	15-24	25-64	65+
Animal		22.22%	72.22%	5.56%
Bicyclists	8.08%	16.16%	65.66%	10.10%
Distracted	4.92%	22.09%	60.50%	12.48%
Heavy Truck	6.85%	12.67%	66.44%	14.04%
Impaired	2.97%	21.00%	71.93%	4.10%
Intersection	4.99%	20.46%	59.49%	15.06%
Lane Departure	4.27%	26.80%	61.45%	7.48%
Motorcycle	0.38%	17.62%	75.54%	6.46%
Older Driver	2.76%	9.27%	30.84%	57.13%
Pedestrian	5.31%	16.81%	65.49%	12.39%
Seat Belts and Car Seats	4.32%	29.26%	60.04%	6.38%
Speed	3.85%	33.63%	56.50%	6.02%
Younger Driver	5.79%	60.53%	26.57%	7.12%
Regional Population Share	**19.0%**	**13.0%**	**53.0%**	**16.0%**

Considering share of the population, the 15-24 Age Group is overrepresented in all crash types except for heavy truck and older driver. Disproportionate impacts are most pronounced for the 25-64 age group in all categories except for older driver and younger driver. Safety disparities are most significant for senior drivers (65+) in older driver crashes.

Population and Community Metrics

Social Vulnerability Index

The Social Vulnerability Index (SVI) is a tool developed by the Centers for Disease Control and Prevention (CDC) to help identify communities needing support before, during, and after human-made and natural disasters. Although traditionally used for disaster preparedness, the SVI's comprehensive assessment of socioeconomic and infrastructure factors also makes it a valuable tool for transportation planning, as it also helps to identify communities that are more susceptible to traffic incidents. It uses a range of socioeconomic and infrastructure factors to assess a community's resilience.

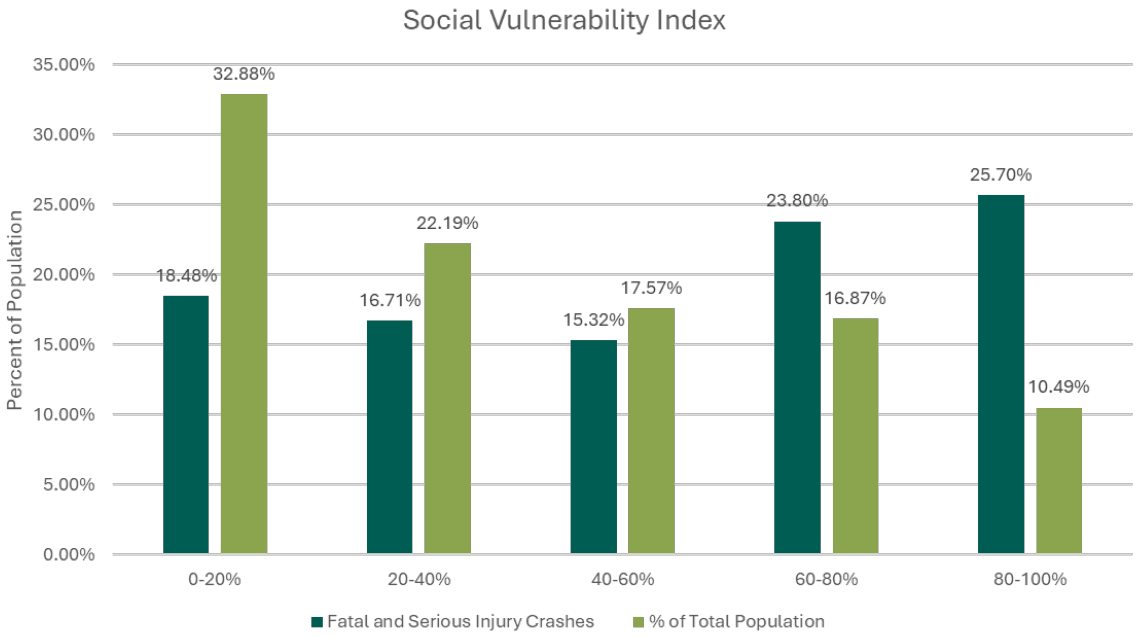
SVI Inputs:

- Socioeconomic status: Income, poverty, employment, and education levels.
- Household composition: Age, single-parent households, and disability status.
- Minority status and language: Race, ethnicity, and English proficiency.
- Housing and transportation: Housing type, crowding, and vehicle access.

Caveats:

- Data aggregation: Aggregated data may mask vulnerabilities at a local level.
- Updated Data: This may not reflect current conditions depending on when the data was collected.

The chart Social Vulnerability Index shows SVI percentiles. Each interval shows the percentages of fatal and serious injury crashes compared to the population. The lower percentiles represent lower vulnerability, and vulnerability increases with each successive percentile. The chart indicates that the least vulnerable group
The least vulnerable group (0-20% index) has fewer crashes relative to its larger population share, while the most vulnerable groups (60-80% and 80-100%) show higher crash rates relative to their population share. This observation indicates that, in the CAMPO region, populations experiencing higher social vulnerability are disproportionately impacted by fatal and serious injury crashes.


Social Vulnerability Index
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Percent of Population
18.48%
32.88%
16.71%
22.19%
15.32%
17.57%
23.80%
16.87%
25.70%
10.49%
0-20%
20-40%
40-60%
60-80%
80-100%
Fatal and Serious Injury Crashes
% of Total Population

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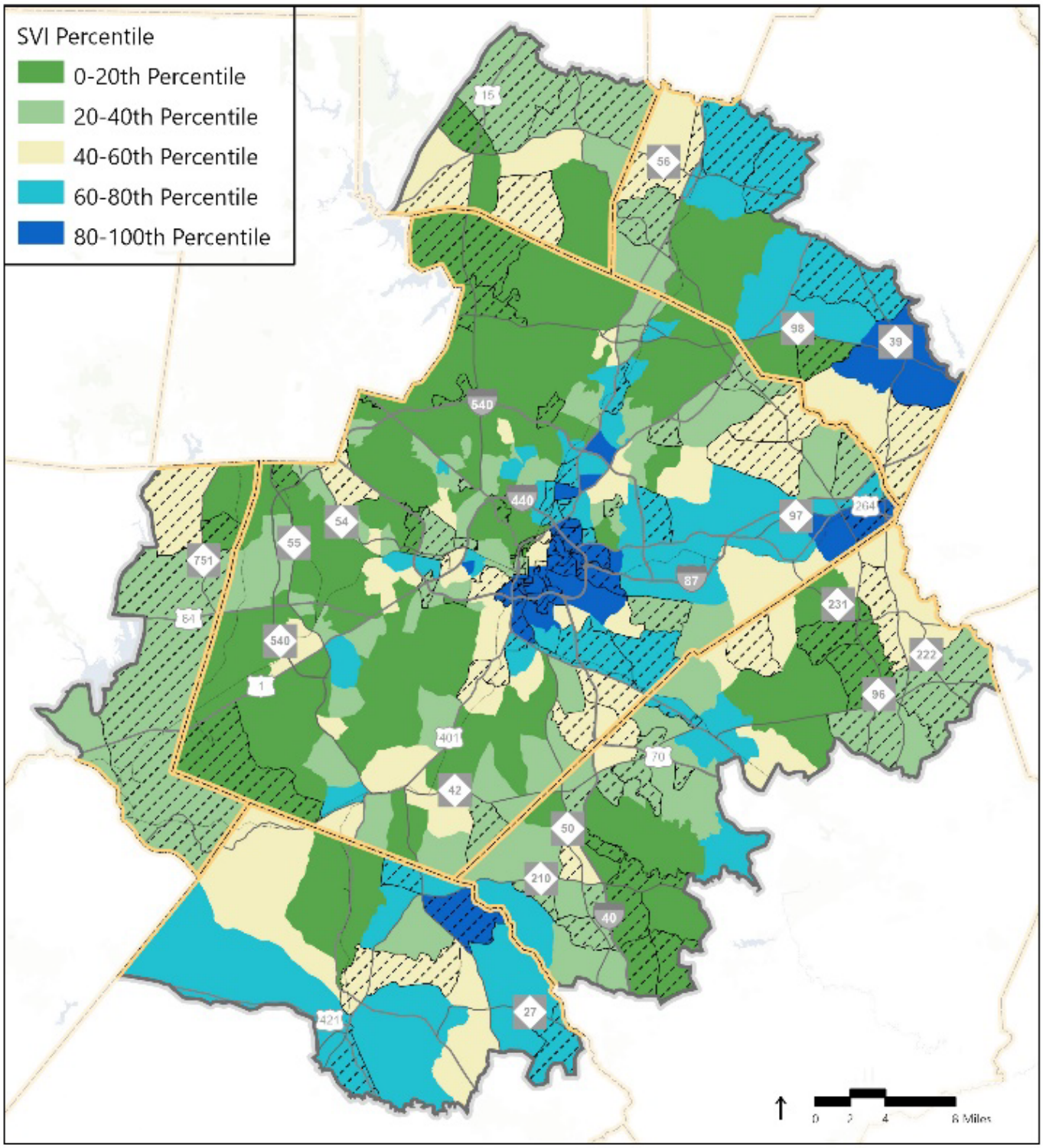


Top 20% KA Crash Rates

County Boundary

CAMPO Boundary

The map *SVI Percentile* provides a clear visual demonstration of the correlation between high social vulnerability (light blue and dark blue) and increased likelihood of fatal and serious injury crashes in the CAMPO region. These areas are highly concentrated to the northeast, east, and southeast of Downtown Raleigh to Garner. There are also two pockets of high vulnerability and high fatal and serious injury crash rates in outlying eastern Wake County near US 264 and in the southern portion of the region along NC Highway 210 in Harnett County.

Transportation Disadvantage Index

The Transportation Disadvantage Index (TDI) was created by the North Carolina Department of Transportation (NCDOT) to measure the concentration of populations facing barriers to transportation access. TDI uses data from the 2020 ACS 5-year estimates to measure the presence of seven indicators within a block group and gives each group a score based on the concentration of the indicators. These indicators are:

- Race (Black, Indigenous, and Persons of Color)
- People with low income
- Personal vehicle access (zero-vehicle households)
- People with mobility impairments
- older people (seniors 65+)
- Youth (aged 15 and under, unable to drive)
- Populations with Limited English Proficiency (LEP)

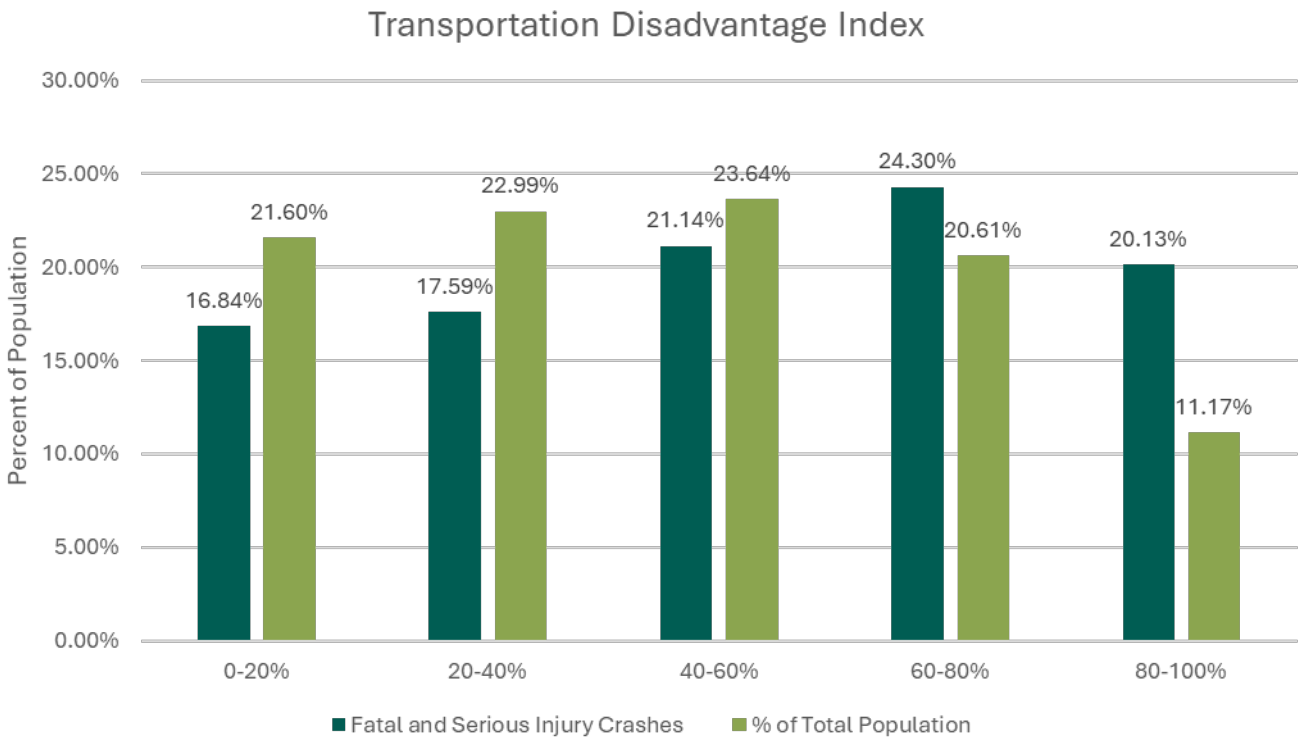
Caveats:

- Data limitations: May not capture recent transit changes or real-time availability.
- Subjective weighting: The relative importance of different factors can be subjective.
- Regional differences: Challenges and solutions vary widely between urban and rural areas.

The chart Transportation Disadvantage Index shows the relationship between fatal and serious injury crashes and the total population across various TDI score intervals: 0-20%, 20-40%, 40-60%, 60-80%, and 80-100%.

High TDI Score (60-80%, 80-100%): This indicates a higher degree of transportation disadvantage. People in these areas may have limited access to reliable or efficient transportation, leading to difficulties in commuting to work and accessing healthcare, education, or other essential services. High TDI scores often correlate with poorer socio-economic conditions, fewer transportation options, longer travel times, higher transportation costs, and greater dependency on public transit or non-motorized transport.

Low TDI Score (0-20%, 20-40%): This represents a lower level of transportation disadvantage. Areas with low TDI scores typically have better access to various transportation options, including private vehicles, efficient public transit systems, and more extensive infrastructure that supports easy and quick commutes. Residents in these areas generally experience fewer transportation hurdles and better connectivity to essential services and employment opportunities.



The group with the greatest transportation disadvantage (80-100% index) has the most crashes relative to its population share, indicating that households with higher transportation disadvantages are disproportionately affected by fatal and serious injury crashes.

Mapping percentiles for each TDI indicator overlapped with the Top 20% KA crash rates underscores what the table above shows: communities with greater disadvantage experience more severe crashes. A closer look at just the top percentile (80-100%) for each TDI indicator and Top 20% KA crash rates provides further insight into locations that need focused and targeted interventions to address safety challenges. The maps follow the summary below:

Granville County:

- Disability, Poverty, BIPOC, and Zero Vehicle Households around Butner and north of Creedmoor.
- Disability and 65+ Age in areas throughout the County.

Franklin County:

- Disability, Poverty, and Zero Vehicle Households near Franklinton.
- Poverty and BIPOC in pockets near Zebulon in Wake County.

Johnston County:

- Disability, Limited English Proficiency, and Poverty near NC 222 and NC 96.
- 65+ Age, 15 and Younger, and Zero Vehicle Households in area near Archer Lodge.

Harnett County:

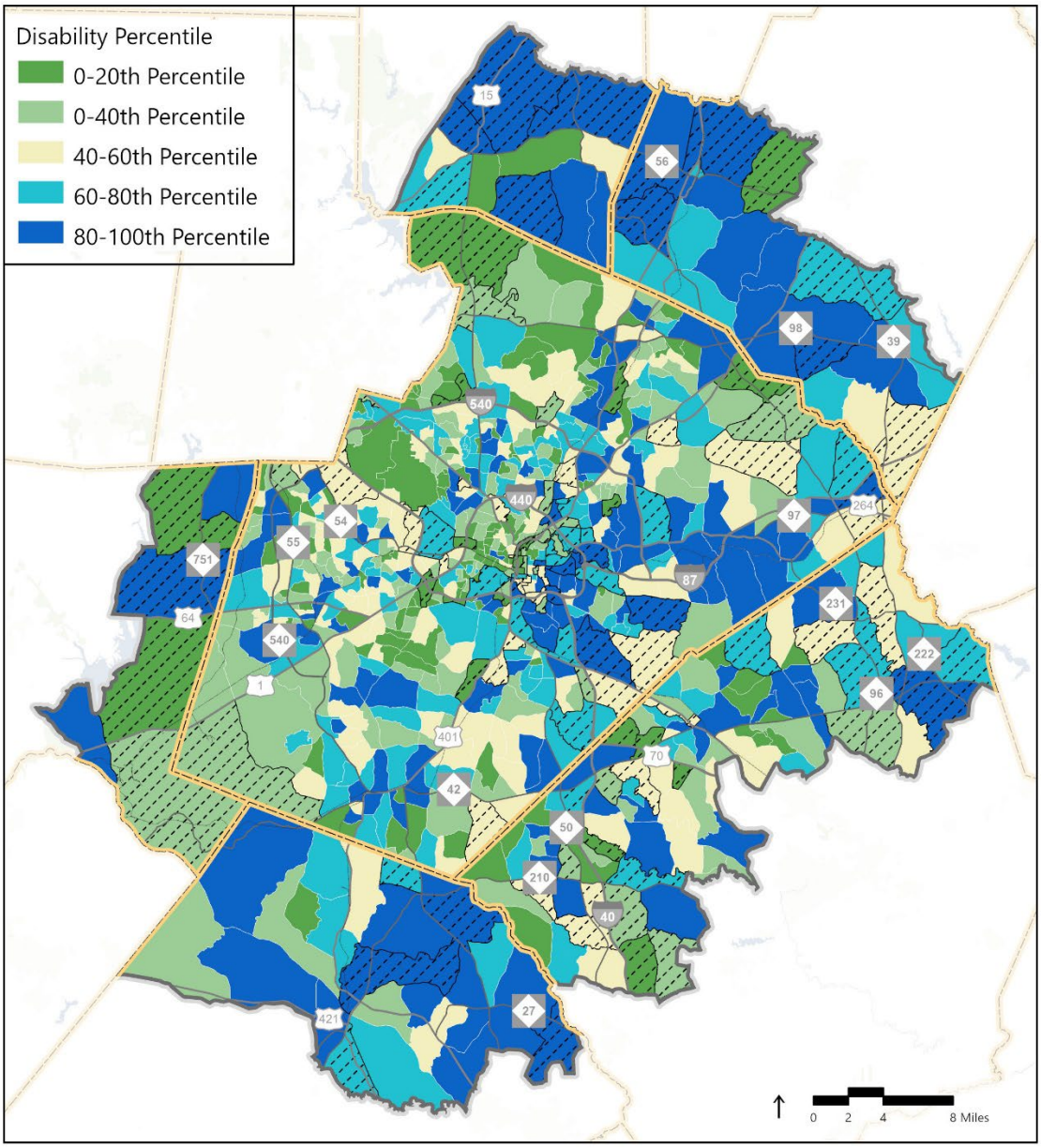
- Disability, Poverty, 15 and Younger, and Zero Vehicle Households near Angier and Lillington.
- 65+ Age and Disability between Angier and Lillington near NC 27.

Chatham County:

- Disability and 65+ Age between NC 751 and US 64.

Wake County:

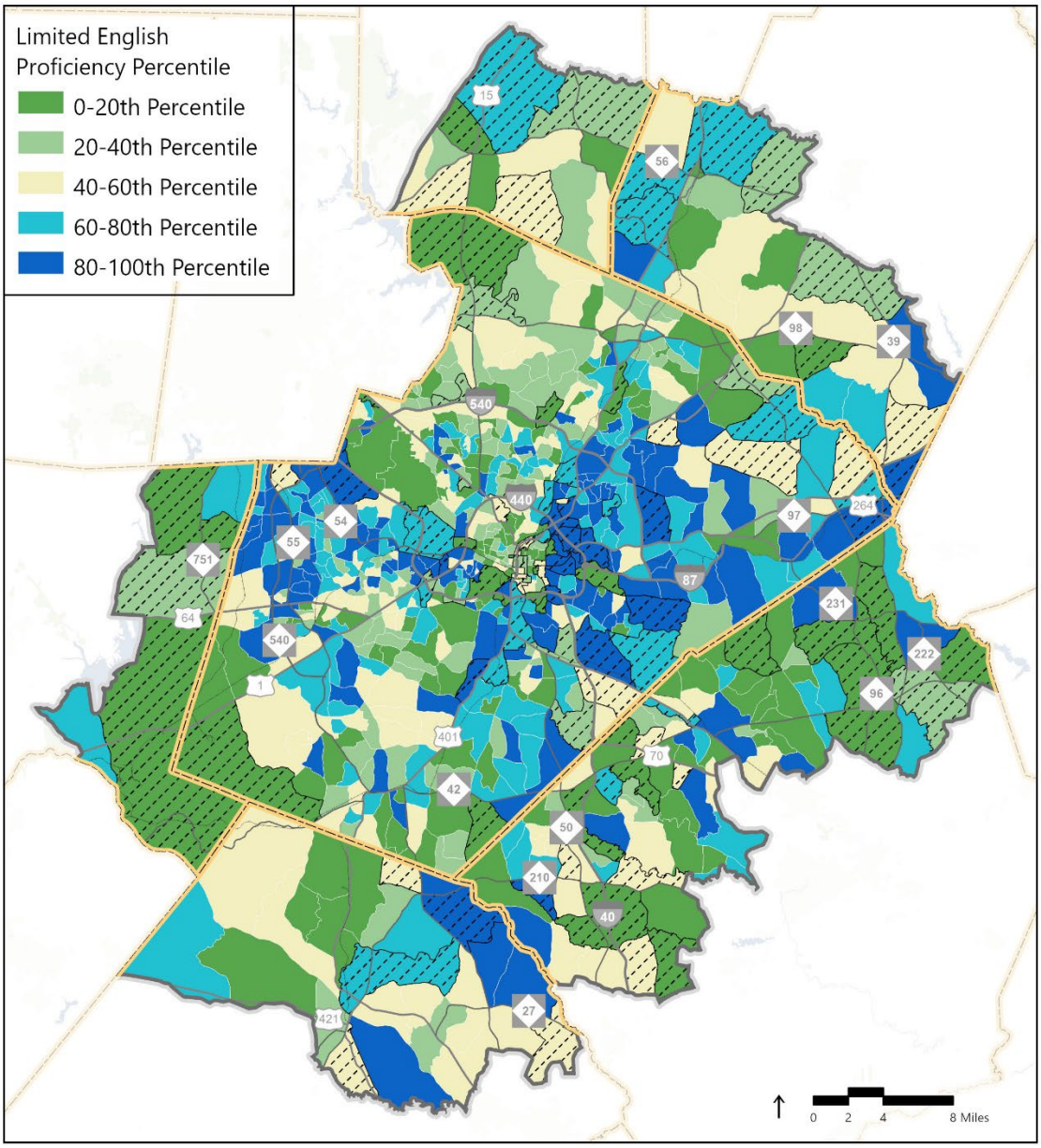
- All TDI indicators in areas East, Northeast, and Southeast of Downtown Raleigh.
- Poverty, 65+ Age, and BIPOC in pockets in West Raleigh.
- Poverty and BIPOC in portions of Garner and Knightdale.



Top 20% KA Crash Rates

County Boundary

CAMPO Boundary



Top 20% KA Crash Rates

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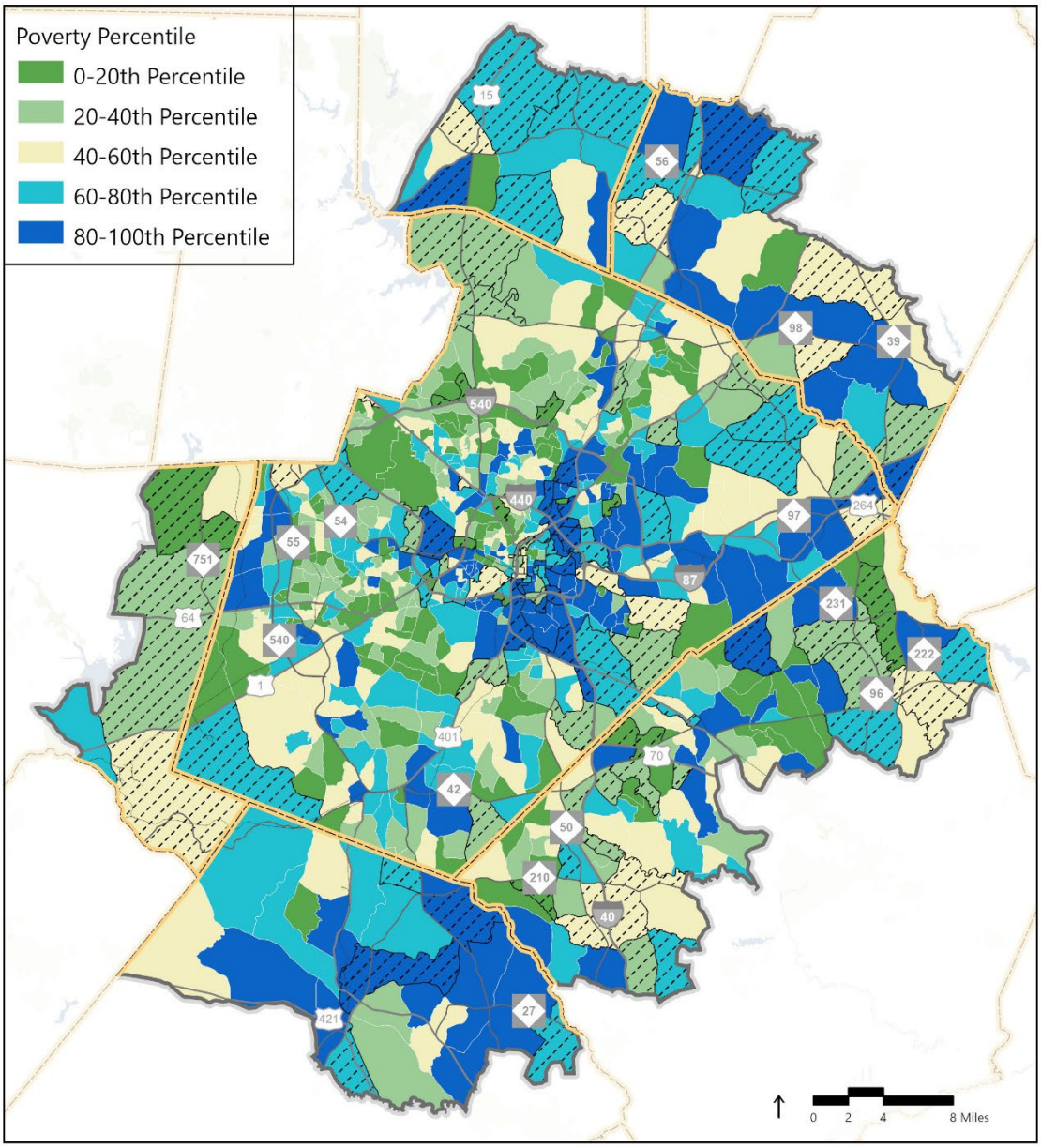
CAMPO Boundary



Top 20% KA Crash Rates

County Boundary

CAMPO Boundary

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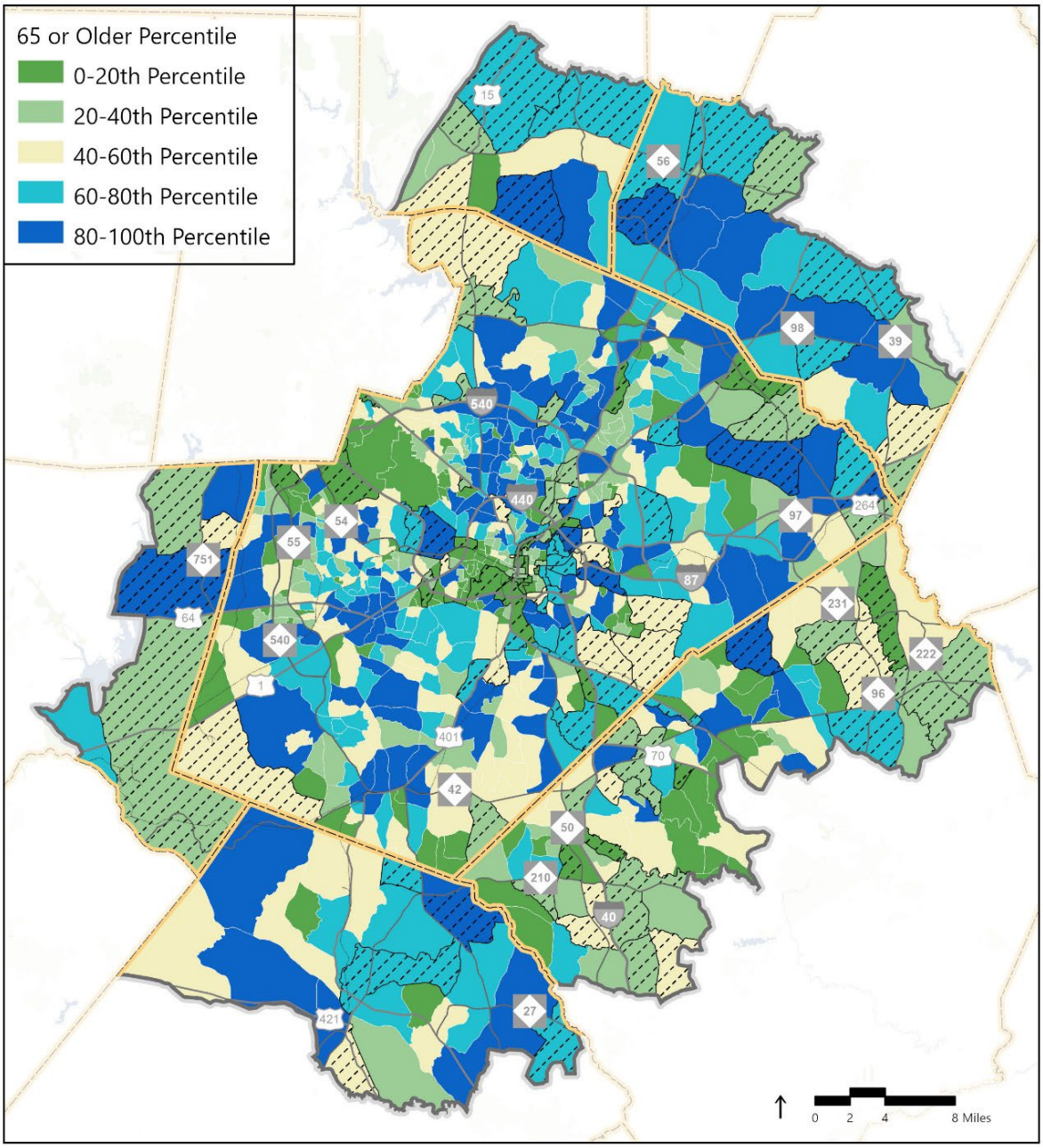
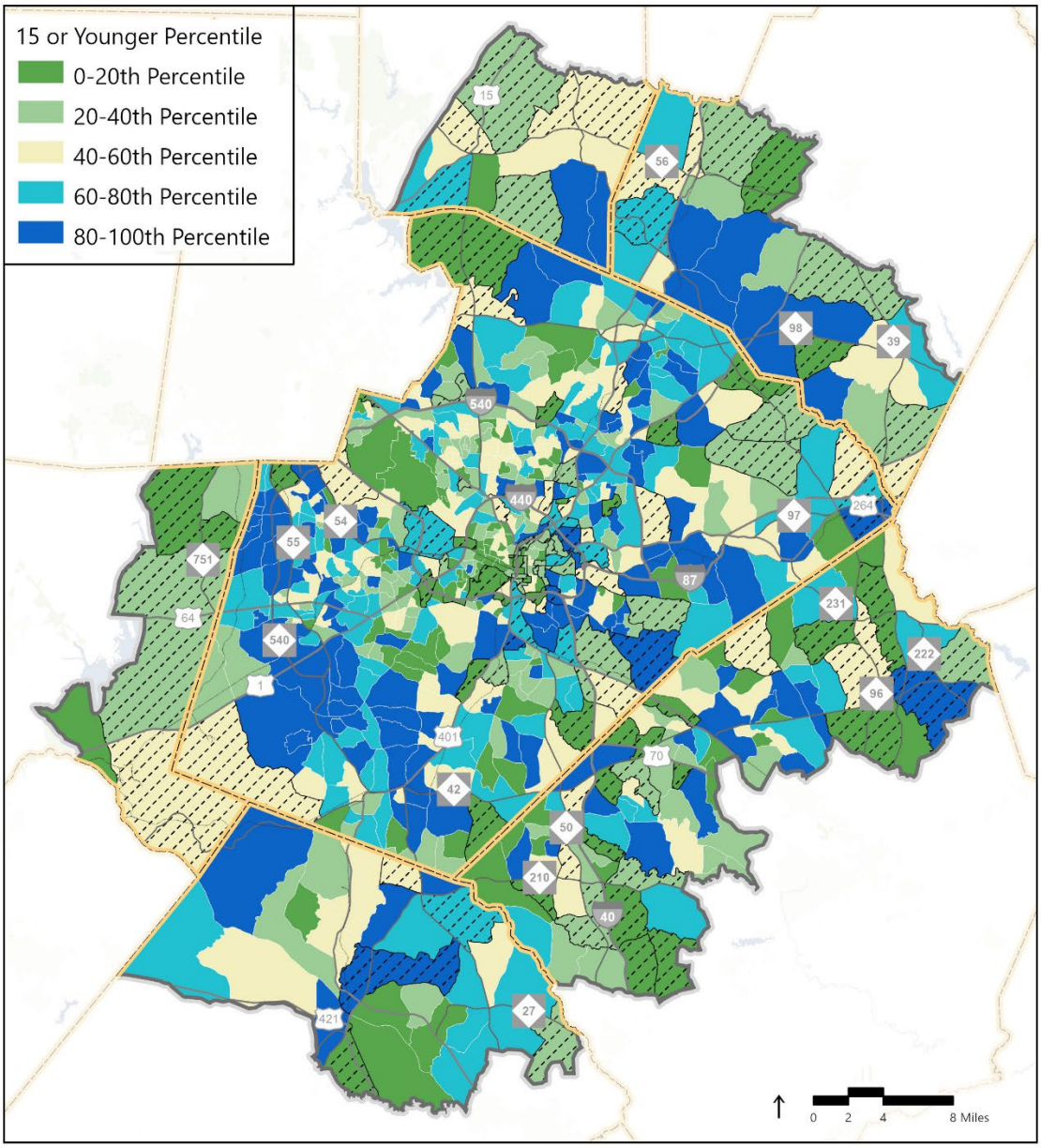


Top 20% KA Crash Rates

County Boundary

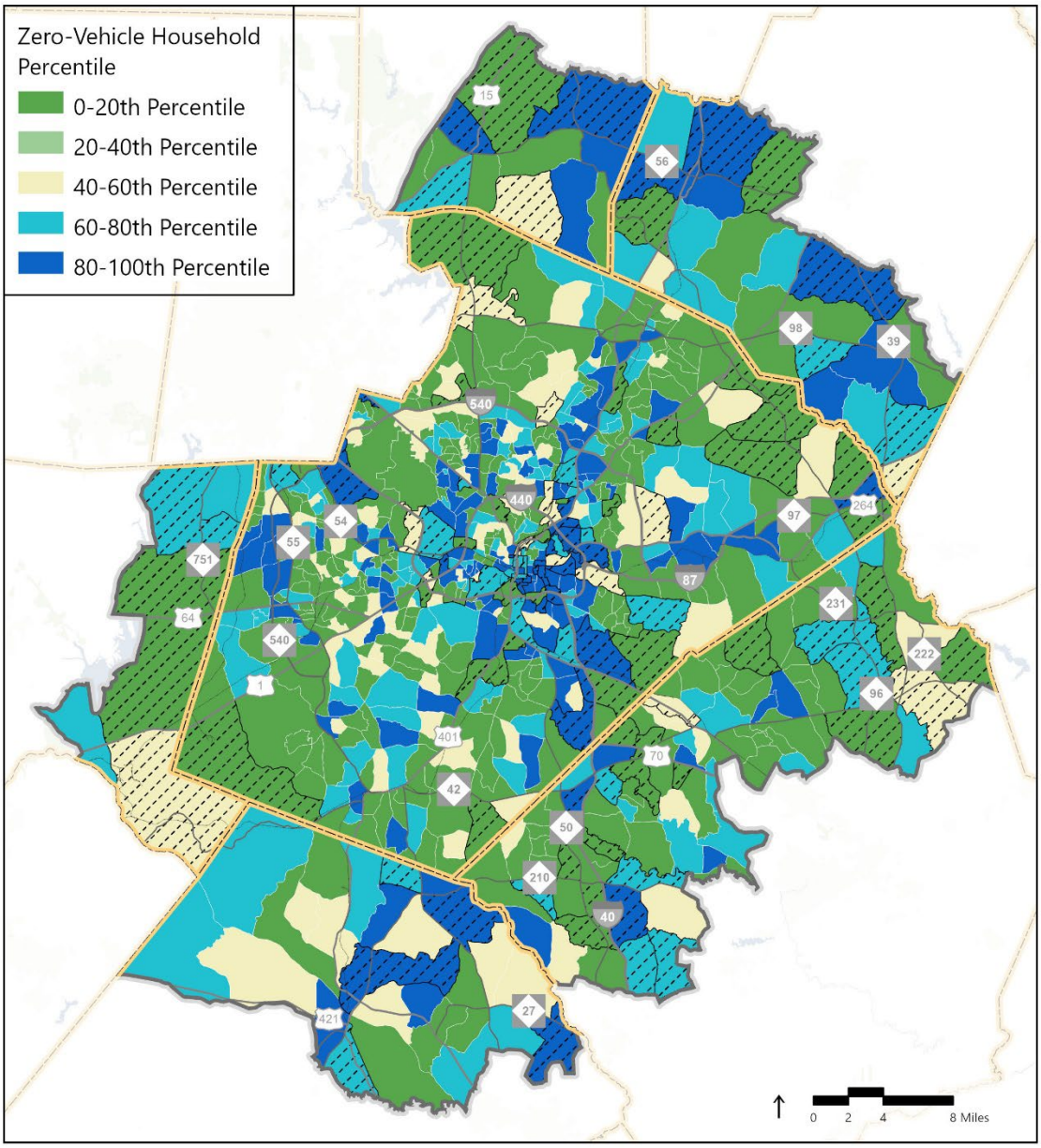
CAMPO Boundary



Top 20% KA Crash Rates

County Boundary

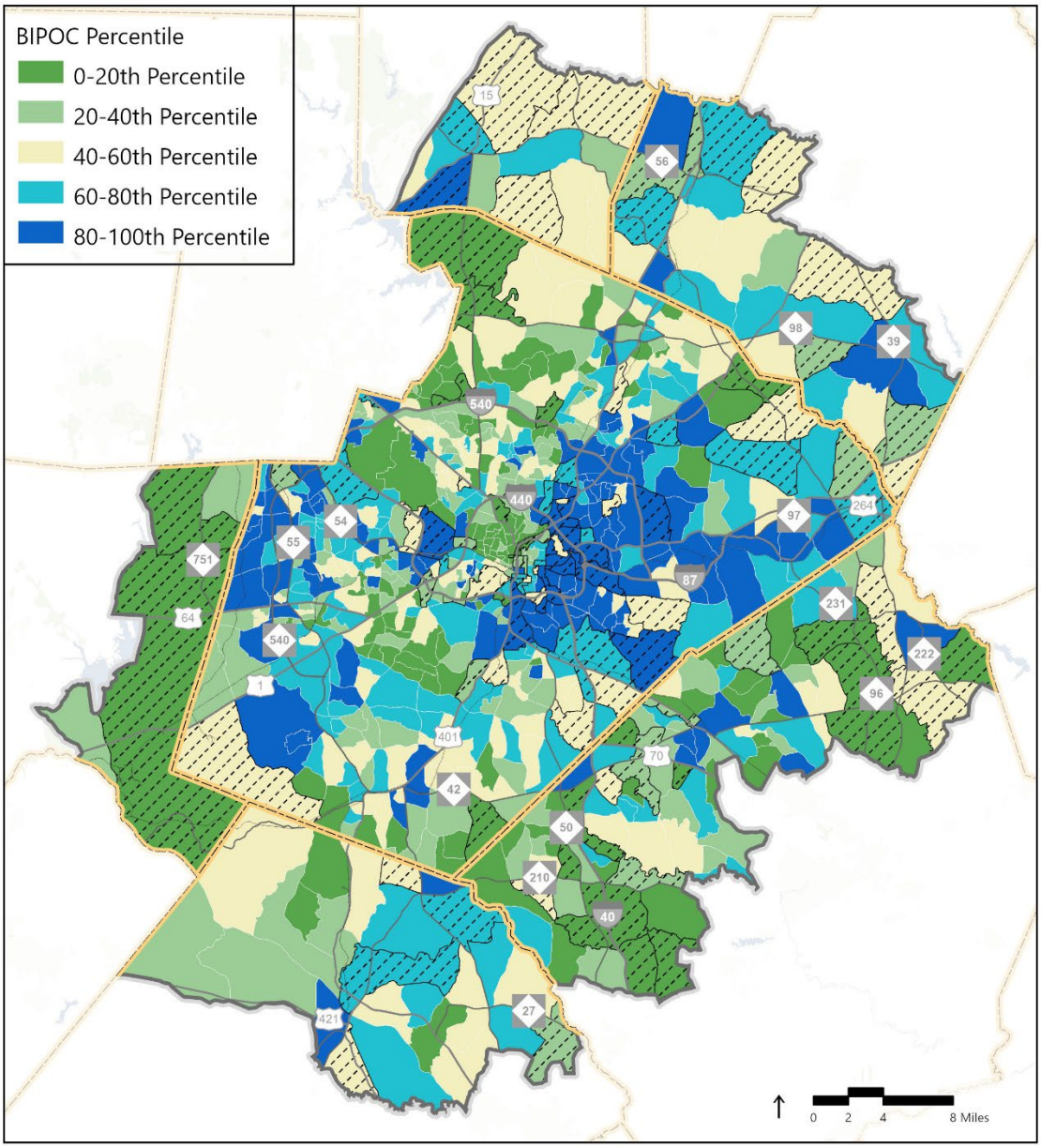
CAMPO Boundary



Top 20% KA Crash Rates

County Boundary

CAMPO Boundary



Top 20% KA Crash Rates

County Boundary

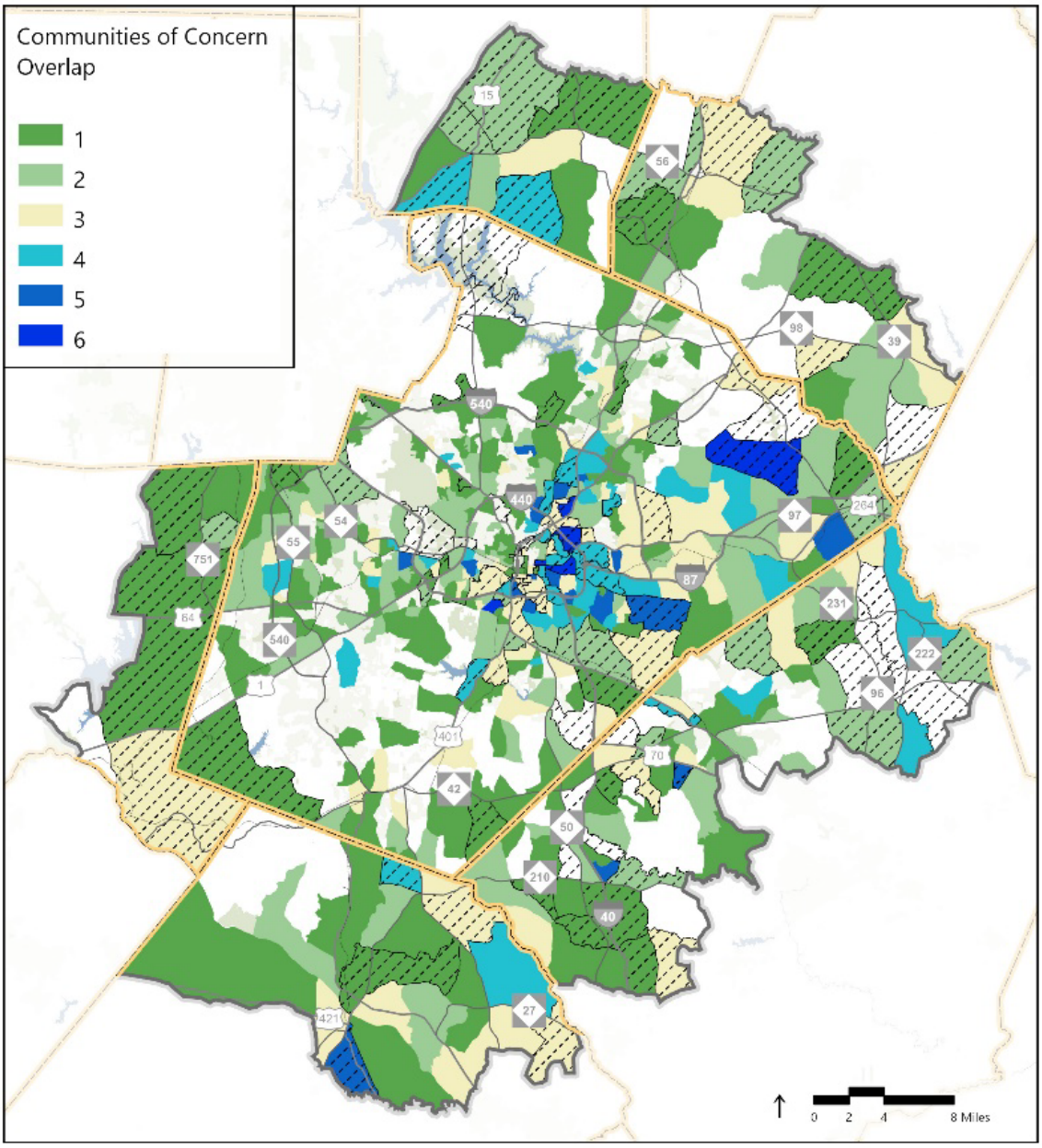
CAMPO Boundary

Communities of Concern

CAMPO uses census block group data to determine concentrations of the following protected classes: Non-white race, Hispanic/Latino Origin, Individuals below 150% of the federal poverty threshold, Limited English Proficiency, Zero-car Households, and Age 70 and over. Each indicator has a threshold calculated for the 75th percentile (top 25%), and any Block Group that meets or exceeds the threshold is included. These are used to guide the agencies outreach and environmental justice efforts. Additionally, Communities of Concern are further stratified to show overlaps between the indicators. These range from 1 (only one indicator) to 6 (all six indicators).

The map *Communities of Concern Overlap* illustrates where these areas intersect with Top 20% KA (fatal and serious injury) crashes. The map shows a correlation between communities of concern and fatal or serious injury crashes in the CAMPO region. The concentration of highly vulnerable populations, as indicated by multiple overlapping indicators of concern, is strongly correlated with higher incidences of fatal and serious injury crashes, particularly in central areas (Wake County) and pockets in eastern Wake County, the far north portion of the region in Granville County and the far south portion of the region in Harnett County. This pattern underscores the importance of addressing both social and environmental factors to mitigate crash rates effectively.

Capital Area Metropolitan Planning Area | CAMPO RMSAP



Top 20% KA Crash Rates

County Boundary

CAMPO Boundary

Summary and Future Implications

The analysis of overrepresentation in crash types, demographic crash data, and crash locations relative to social vulnerability and transportation disadvantage provides invaluable insights. Identifying demographic groups and geographic areas disproportionately affected by different crash types enables targeted and effective interventions. Evaluating the correlation between crash locations and social vulnerability ensures that interventions are precisely directed to areas of greatest need, enhancing safety.

Demographic Insights and Overrepresented Groups

The analysis of crash data has highlighted overrepresented groups within the CAMPO region, particularly those within populations defined by race, ethnicity, age, and gender.

- *Race and Ethnicity*: Fatal and serious injury crash rates are particularly high among the Black population across all counties in the CAMPO region. Disparities are most pronounced in Franklin and Granville counties when considering the share of total population. Similarly, Hispanic populations in Johnston, Granville, Franklin, and Chatham counties are overrepresented in crash rates, with the most significant safety disparities in Chatham, Harnett, and Johnston counties.
- *Age*: Individuals aged 25-64 in all counties, except Wake, are overrepresented in fatal and serious injury crashes. This age group shows the most significant disparities in Granville, Harnett, and Johnston counties. Additionally, older adults in Johnston, Harnett, and Franklin counties face higher rates of fatal and severe injury crashes compared to state averages, with Franklin County older adults being notably affected.
- *Gender*: Males are overrepresented in fatal and serious injury crashes in all counties except for Wake, relative to their share of the population, indicating widespread safety disparities across the region.

The analysis of specific crash types further reveals that certain demographic groups are disproportionately affected. The Black population is consistently overrepresented across a variety of crash types including distracted driving, heavy truck collisions, impaired driving, intersection-related crashes, lane departures, motorcycle crashes, pedestrian incidents, and speed-related crashes. The Hispanic population shows notable overrepresentation in crashes involving bicyclists, heavy trucks, impairment, lane departures, pedestrians, seat belts, speeding, and younger drivers.

Correlation with Social Vulnerability and Economic Disparities

There is a clear correlation between high social vulnerability and transportation disadvantage, and higher fatal and serious injury crash rates. Areas with high overlaps of Transportation Disadvantage Index (TDI) indicators and severe crash rates, such as East, Northeast, and Southeast of Downtown Raleigh in Wake County, exemplify this pattern. These zones frequently encompass communities facing limited access to transportation resources, elevated poverty rates, and other social challenges, exacerbating their risk of severe traffic incidents.

The identification of high-risk areas aligns with corresponding indicators of social vulnerability such as income, race, age, and access to personal vehicles, reinforcing the need for targeted interventions. These targeted policies and resource allocations can address the disparities present in transportation access and safety.

Implications for Safety Plan

To mitigate the identified disparities and improve transportation safety in the CAMPO region, the following customized initiatives and targeted engagement strategies could be implemented:

- *Community-Specific Safety Programs*: Develop safety programs tailored to the needs of each community. For instance, areas with high TDI scores for the Black and Hispanic populations can benefit from focused outreach and education campaigns on traffic safety, including pedestrian and biking safety.
- *Educational Campaigns*: Launch targeted educational campaigns focusing on overrepresentation within specific crash types identified in the analysis, such as impaired and distracted driving. These campaigns

should be culturally sensitive and available in multiple languages to reach communities with limited English proficiency (e.g., pockets near Zebulon and NC 210, communities east and northeast of Downtown Raleigh).

- *Infrastructure Improvements*: Prioritize infrastructure improvements in areas with high overlaps of TDI factors and severe crash rates. These areas are identified in Section 3.2.
- *Partnerships with Non-Transportation Agencies*: Collaborate with agencies in healthcare, education, and housing to address broader social determinants of transportation safety. This approach recognizes that transportation safety issues often intersect with other social and economic challenges, necessitating a coordinated response.
- *Agency Training and Capacity Building*: Implement regular training programs for agency staff on community backgrounds and transportation disadvantage.

This population analysis examines safety disparities within the CAMPO region and provides insights into demographic groups and geographic areas disproportionately affected by severe crashes. It underscores the need for customized initiatives targeting vulnerable populations and high-risk zones. The correlation between social vulnerability, transportation disadvantage and increased crash rates highlights the need for a multifaceted approach to policy development and resource allocation. By targeting engagement to communities disproportionately affected by severe crashes, enhancing agency training, and collaborating with non-transportation agencies, CAMPO and its partners can effectively address these disparities.