TRIANGLE WEST
Transportation Planning Organization

April 2025 DRAFT

Triangle West Transportation Planning Organization

VISION ZERO ACTION PLAN

Appendix B

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Appendix B: Equity Mapping and Analysis

This memo presents the framework for the Triangle West Transportation Planning Organization (Triangle West TPO) Vision Zero Action Plan equity analysis. The framework defines equity, describes methods used for the equity analysis, and lays out the historical housing and infrastructure context that influences current outcomes related to transportation safety. This memo also includes the results of the equity analysis and an assessment of comparative transportation safety outcomes. Finally, it shares conclusions and recommendations to help guide and create an implementable Triangle West TPO Vision Zero Action Plan that is grounded in the region's history and centers on transportation equity.

Equity Definition

Equity can be defined in many ways depending on the context. The transportation planning field defines "equitable transportation" as planning that:

- Accounts for current and past inequality;
- Provides for current needs;
- Produces an overall improvement in the system; and
- Ensures that everyone has transportation access and options that allow them to participate fully in society

Achieving an equitable transportation system requires an understanding of how both positive and negative impacts are distributed throughout a region and across different demographic groups. Communities that have experienced historic marginalization – such as Black, Indigenous, and People of Color (BIPOC), people with disabilities, low-income individuals, or English language learners – are more likely to shoulder the burdens of the transportation system or have benefits of the system withheld due to the ongoing effects of past policies and investment patterns. This results in disparate transportation experiences and an inequitable transportation system.

Environmental Justice

In accordance with federal statutes, the Triangle West TPO incorporates environmental justice principles into all relevant areas of the transportation process that they oversee. These principles are:

- Avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic efforts, on minority populations and low-income populations.
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.[1]

1 Triangle West Transportation Planning Organization. (n.d). Environmental Justice (EJ). **https://www.dchcmpo.org/work-with-us/environmental-justice-ej**

Equity Analysis Approach

A Vision Zero equity analysis can be used to identify people that experience both sociodemographic vulnerability (due to systemic discrimination and marginalization) and transportation disadvantage. It can help improve understanding of the disproportionate outcomes related to transportation safety and access.

It can then examine how these communities are impacted and provide insights into how future transportation investments can remove sociodemographic disparities and redress past harms.

The knowledge gained through the equity analysis will be used in the Triangle West TPO Vision Zero Action Plan as a component of project prioritization and the plan implementation to monitor, reduce, and, ideally, eliminate disparities.

The equity analysis for the Triangle West TPO Vision Zero Action Plan follows the approach in **Figure 1.** The following sections of this memo will walk through each component of the approach and present findings.

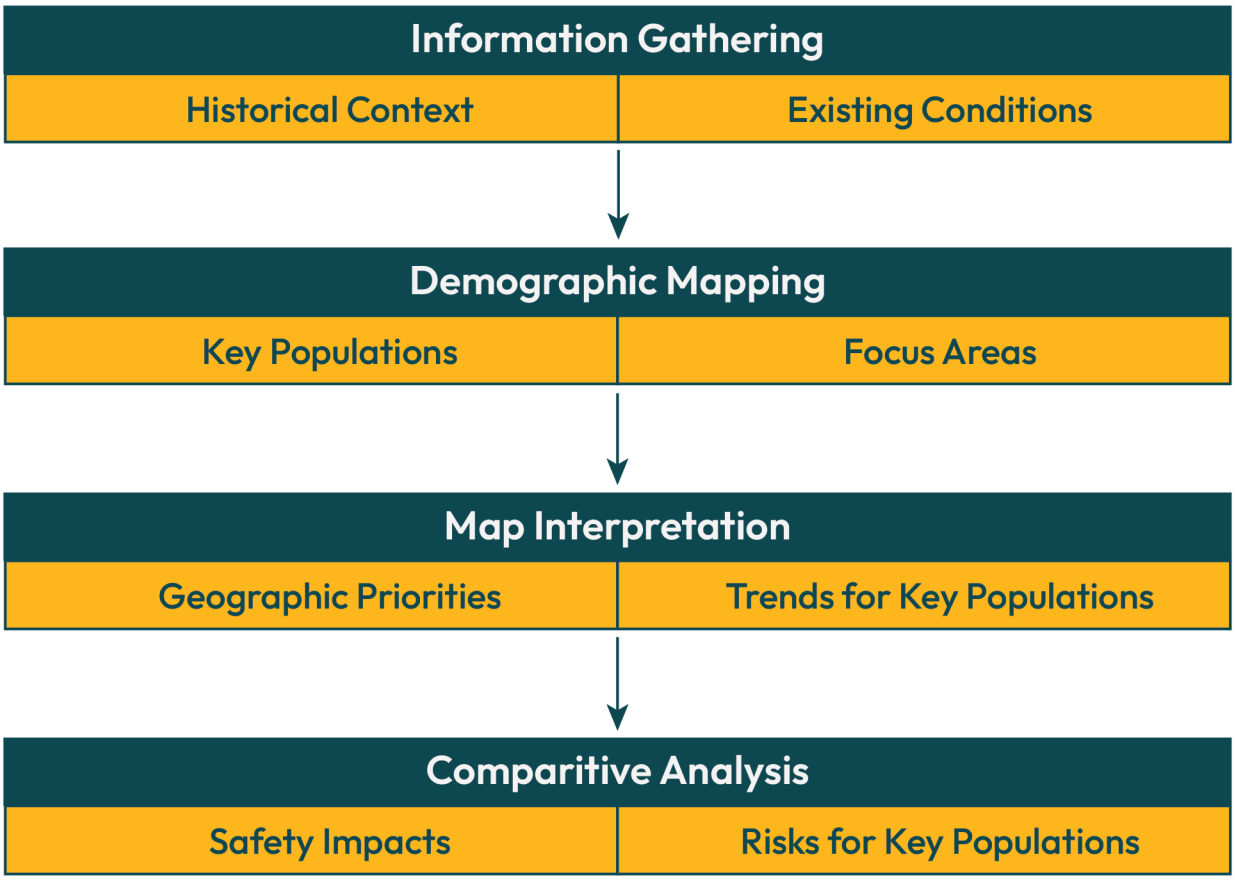

FIGURE 1 Equity Analysis Approach

Information Gathering

Transportation is a key element of all people's daily lives. Nearly everyone must use the transportation network to access jobs, healthcare, grocery shopping, entertainment, and recreation opportunities. In the Triangle West region, historic and current policies and practices surrounding housing, infrastructure, and law enforcement contribute to inequitable transportation safety outcomes for BIPOC, people in low-income households, people without vehicles, people who walk and bike, and other marginalized groups.

The following section provides an overview of the historical context and current policies and practices impacting transportation safety outcomes for marginalized people within the Triangle West region.

Historical Context – Overview of Policies and Outcomes

This equity framework recognizes that current conditions are a product of historical investments and policy decisions. Understanding historical context is critical to understanding who is currently underserved by the transportation network. By looking into where disadvantages began for communities, we can trace the impacts back to the present day as historical actions leave a legacy of effects.

Transportation policies and practices across the United States have long failed to serve BIPOC communities. The Triangle West region is no different as policies with racist origins enabled the perpetration of disinvestment in certain communities. This disinvestment negatively impacted these communities in numerous aspects through direct and indirect effects, but directly in infrastructure and capital investments, including the lack of paved roads and sidewalks.[2] In the words of former Congressman John Lewis:

> **"The legacy of Jim Crow transportation is still with us. Even today, some of our transportation policies and practices destroy stable neighborhoods, isolate and segregate our citizens in deteriorating neighborhoods, and fail to provide access to jobs and economic growth centers." [3]**

Investments in safe, accessible, and reliable transportation infrastructure are disproportionately allocated in white neighborhoods, often to the detriment of BIPOC communities that have experienced disinvestment and underinvestment. Since the mid-twentieth century, the United States has prioritized highways and suburban commuter transit, chronically underfunding public transportation systems that serve many BIPOC communities and creating unsafe roadways in these communities, with higher speeds and an absence of safe, connected facilities for walking and bicycling.[4] The impact of this disinvestment is visible along racial lines across areas such as access to employment,[5] traffic death and injury rates,[6] and exposure to other public health risks.[7]

Households with low incomes and people with disabilities have also been marginalized and excluded from transportation system benefits and overly burdened by negative outcomes of the system. Both these demographic groups experience inequitable transportation outcomes, including longer work commutes and the increased likelihood of being killed while biking or walking. Households in poverty may spend an outsized portion of their income on travel expenses. People with disabilities are less likely to drive

2 Ernst, S. (2024, May 7). Hooligan Heights: Redlining. Retrieved from Hooligan Heights: Mishawaka's Wild West: **https://hooliganheights.com/redlining.**

3 Lewis, John. (2004). Foreword to Highway Robbery: Transportation Racism & New Routes to Equity by Robert Bullard, G. Johnson, & A. Torres. South End Press.

4 Archer, Deborah. (2021). Transportation Policy and the Underdevelopment of Black Communities. 106 Iowa Law Review 2125, NYU School of Law, Public Law Research Paper No. 21-12. **https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3797364**

5 Golub, A., Martens, K. (2014). Using principles of justice to assess the modal equity of regional transportation plans. Journal of Transport Geography, 41, 10-20.

6 Governors Highway Safety Association. (2021). An Analysis of Traffic Fatalities by Race and Ethnicity. **https://www.ghsa.org/sites/default/files/2025-01/race_2021.pdf.**

7 Rosenbaum, A., Hartley, S., Holder, C. (2011). Analysis of diesel particulate matter health risk disparities in selected US harbor areas. American Journal of Public Health, Suppl, 101, S217-223.

and more likely to rely on public transportation than nondisabled residents. Without safe, accessible, and intuitive infrastructure, people with vision, hearing, cognitive, or mobility-related disabilities may struggle to go about their daily lives.[8]

The existing conditions for the groups mentioned above are a result of historical policies and practices, some that are clearly related to transportation and others that, while on the surface are not transportation-related, often impact transportation access. To establish this context, the following sections discuss policies and practices in infrastructure, housing, and law enforcement that have led to and continue to exacerbate the transportation conditions for vulnerable groups in the Triangle West TPO region. Acknowledging and understanding these policies equips present-day transportation planners and plans – like the Triangle West TPO Vision Zero Action Plan – with the knowledge to abate further harm, rebuild trust with the community, increase positive outcomes of the system, and redress past harms.

The postwar history of infrastructure planning across the country and in the Triangle West region has led to inequitable transportation outcomes in terms of access, connectivity, and traffic safety. The Vision Zero Action Plan acknowledges these disparities and will create policy, program, and infrastructure strategies that aim to address pressing harm, eliminate disparities, and achieve zero deaths and serious injuries on the region's roadways.

Reflecting on the history of modern transportation planning allows us to examine how past policies and practices have perpetual impacts that not only influence our current circumstances but often form the foundation for existing and future policies and practices. It is important that the Vision Zero Action Plan acknowledges this history so that the strategies included serve people who have disproportionately shouldered the burdens of transportation "progress" in the past.

Highway Construction and Urban Renewal

In 1956, the first Federal-Aid Highway Act was passed to create the Dwight D. Eisenhower National System of Interstate and Defense Highways, commonly known as the Interstate Highway System. This law, in concert with the 1949 Housing Act, led to widescale construction of highways through urban, Black communities which facilitated and supported white flight from cities to the suburbs over the next two decades.

In the wake of desegregation and Supreme Court rulings that upended Jim Crow laws, many cities used highway development to bulldoze "blighted" communities designated by inherently racist methodologies, including many vibrant and successful Black communities.[9] The Triangle West TPO region had many thriving African American communities that suffered large-scale demolition and intentional marginalization through transportation and housing policy.

This included neighborhoods such as:

Hayti in Durham – Hayti was founded after the Civil War by formerly enslaved African Americans, many of whom came to work in tobacco factories. The establishment of African American-owned North Carolina Mutual Life Insurance Company in 1898 led to significant growth and investment into the community. By the early 1900s, Hayti was one of the most successful Black communities in the country.[10] Throughout the 1920s and 1930s, businesses and civic assets thrived while simultaneously, Black families in the neighborhood still dealt with the realities of redlining, segregation, and racial discrimination. Vibrant and impressive buildings were constructed along Fayetteville Street as the community established schools, churches, restaurants, renowned theaters, hotels, a library, and a hospital. Neighborhood decline began in the early 1960s as highway development and urban renewal planning began by both conservative and progressive decision-makers in Durham. The construction of the Durham Freeway in 1970 was supported by White business owners who wanted to relieve vehicle congestion downtown

8 Bureau of Transportation Statistics. (2011). Data Analysis. U.S. Department of Transportation. **https://www.bts.gov/archive/publications/freedom_to_travel/data_analysis.**

9 Dickerson, A. Mechele. (2020). Systemic Racism and Housing, 70 Emory Law Journal 1535. **https://scholarlycommons.law.emory.edu/cgi/viewcontent.cgi?article=1435&context=elj**

10 Rhodes, Brianna (2020). 9 Historic Black Neighborhoods That Celebrate Black Excellence. National Trust for Historic Preservation. **https://savingplaces.org/stories/9-historic-black-neighborhoods-that-celebrate-black-excellence.**

FIGURE 2 Hayti in 1950 and 1972, before and after the re-routing of Fayetteville St and construction of Durham Freeway[11]

and connect to the Research Triangle Park – including rerouting Fayetteville Street and demolishing dozens of homes and businesses.[12] Nearly all structures on the corridor were demolished aside from St. Joseph AME Church. By the end of urban renewal practices in Durham, over 4,000 families and 500 businesses were displaced from Hayti.[13]

Pottersfield and Sunset in Chapel Hill and Carrboro – The area that is now commonly referred to as Northside is a historically Black community originally established over 100 years ago for Black workers at the University of North Carolina, including stone masons that built the university's walls and workers who carried water to student dorms. [14] Despite the importance of the Black residents and workers to the university, the community was segregated and did not have access to Town services – such as roadway paving – until 1950.[15] These close-knit neighborhoods included thriving businesses and were mostly comprised of homeowners and families.[16] Urban renewal planning began in the 1960s and, Chapel Hill received its first Community Development Block Grant from the federal government in 1975. Despite residents organizing to fight urban renewal planners' efforts, the demand for student rental housing continued to grow. As many Black residents took relocation offers or passed away, the community faced destabilization and housing prices increased, furthering displacement for low-income residents who could no longer afford rising rents. By 1980 the population and homeownership rates of Black residents began to rapidly decline.[17]

A removed community in Hillsborough near what is now Margaret Lane – After the Civil War, African American families began settling near the Eno River and established a robust community of self-sustaining

11 Bull City 150. (n.d.). Dismantling Hayti. **https://www.bullcity150.org/uneven_ground/dismantling_hayti/.**

12 Bull City 150. Dismantling Hayti: Who Caused All This? **https://www.bullcity150.org/uneven_ground/dismantling_hayti/who_caused_this/.**

13 Bull City 150. (n.d.). Dismantling Hayti. **https://www.bullcity150.org/uneven_ground/dismantling_hayti/.**

14 Moss, Gary. (2016). Building on history. UNC-Chapel Hill. **https://www.unc.edu/discover/building-on-history/.**

15 Fanning, Sophia. (2023). We really had a great community: A 100-year look at housing in Chapel Hill's Northside. The Daily Tar Heel. **https://www.dailytarheel.com/article/2023/09/city-history-of-development-chapel-hill-housing-northside-marian-cheek-jackson-center-racial-history.**

16 Pottersfield (or Potter's Field). (n.d). From the Rock Wall. **https://fromtherockwall.org/places/potters-field.**

17 Fanning, Sophia. (2023). We really had a great community: A 100-year look at housing in Chapel Hill's Northside. The Daily Tar Heel. **https://www.dailytarheel.com/article/2023/09/city-history-of-development-chapel-hill-housing-northside-marian-cheek-jackson-center-racial-history.**

businesses including a funeral home, boarding house, cobbler, historic church, and parsonage.[18] In 1964, the homes, businesses, and buildings were forcibly destroyed, and citizens were displaced to build the Churton Street Bridge to connect outlying areas to the Hillsborough town center area. The bridge was planned and built using both local and federal funding.[19] Today, where this vibrant community once stood there is now a park with commemorative plaques.

These communities were not the only ones impacted by highway development and urban renewal practices in the region. Other predominately Black neighborhoods like Tin Top and Rogers Road in Carrboro, Pine Knolls in Chapel Hill, and West End/Lyon Park, Brookstown, Hickstown, Walltown, and the East End in Durham were similarly impacted and marginalized.

In Durham, over 90% of Black residents voted in support of a 1963 Urban Renewal-related bond referendum. This is because residents and community leaders were misled about how the major infrastructure investment would impact their homes, businesses, neighborhood and lives. They were promised new housing, new commercial development, and other physical infrastructure improvements.

"Urban renewal failed on every level to make good on its promises for a renewed Hayti and adequate replacement for lost housing and businesses. Black leaders and the Hayti community were left stung by a sense of betrayal. 'The so-called Urban Renewal program in Durham is not only the biggest farce ever concocted in the mind of mortal man... but just another scheme to relieve Negroes of property.' – Louis Alson, Carolina Times Editor, 1965." [20]

This exemplifies how equitably addressing transportation safety in historically marginalized neighborhoods goes beyond physical infrastructure. Incorporating transportation equity in both process and outcome will require transportation agencies to intentionally and thoughtfully rebuild trust with communities that have experienced targeted harm and deception from the government. This takes time.

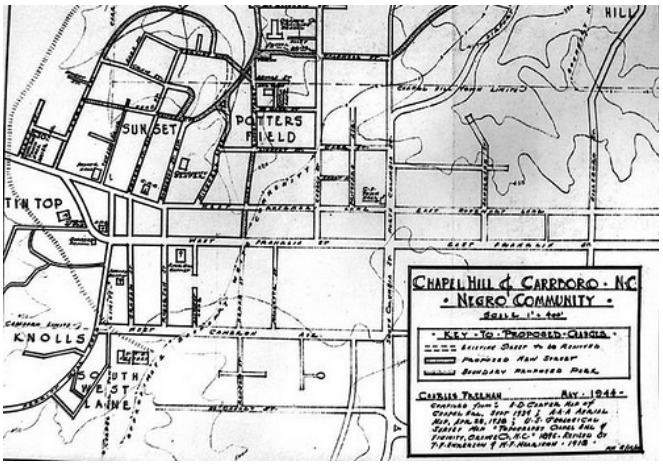

FIGURE 3 Map depicting the historical locations of historically Black neighborhoods in Chapel Hill and Carrboro including Tin Top, Sunset, and Pottersfield.[21]

Highways and other transportation infrastructure like railroads have created lasting physical barriers between white and predominantly Black neighborhoods, continuing to influence demographic trends long after the end of urban renewal practices in the region. The impact of this is not only felt by Black residents – these infrastructures planned and built in the past present current barriers that disproportionately impact people who are low-income, female, elderly, children, immigrants, disabled, do not drive or do not have regular access to a vehicle.[22]

18 Hillsborough's Black History; A Self-Guided Walking Tour. (2023). Visit Hillsborough North Carolina. **https://visithillsboroughnc.com/press/hillsboroughs-back-history-a-self-guided-walking-tour/.**

19 Eno River Bridge (1964). (n.d.). Open Orange. **https://openorangenc.org/content/eno-river-bridge-1964**.

20 Bull City 150. (n.d.). Dismantling Hayti: Empty Promises. **https://www.bullcity150.org/uneven_ground/dismantling_hayti/empty_promises/.**

21 Pottersfield (or Potter's Field). (n.d). From the Rock Wall. **https://fromtherockwall.org/places/potters-field.**

22 Wang, W., Espeland, S., Barajas, J.M. et al. **Rural–nonrural divide in car access and unmet travel need in the United States**. Transportation 52, 507–536 (2025). **https://doi.org/10.1007/s11116-023-10429-6**.

Highway development and urban renewal supported the rapid suburbanization of American metropolitan areas, with much of the growth happening through auto-oriented development patterns. To this day, the Triangle West region is highly car-dependent, meaning residents of the area are experiencing increased household transportation costs related to car ownership and maintenance. It also results in barriers to transportation for people who cannot drive or do not have regular access to a vehicle, as well as disproportionate impacts on people who are female, low-income, elderly, and/or disabled.

Highway and arterial construction also inflicted (and continues to inflict) harm on historically marginalized communities because of the air, water, and noise pollution that comes with high traffic volumes. People of Color and people with lower incomes are more likely to live within a mile of major roads and highways and, as a result, have a higher risk of asthma, lung disease, heart disease, and reproductive health issues.[23] [24]

23 Boehmer, Tegan, et al. (2010). **Residential Proximity to Major Highways – United States.** MMWR Morbidity and Mortality Weekly Report, 62(3).

24 Melton, Courtnee. (2017). How Transportation Impacts Public Health. The Sycamore Institute. **https://sycamoretn.org/transportation-impacts-public-health/**

Transportation and housing policies have been historically linked, both intentionally and unintentionally. Traffic issues and parking provisions strongly influence the types of development that can occur, which in turn affects the provision of affordable housing and surrounding transportation networks. Across the United States, and North Carolina, this linkage has created inequitable outcomes and often places affordable housing near the most dangerous roadways, especially for people walking, biking, or taking transit.

After the Civil War, federal, state, and regional policymakers enacted Jim Crow laws and other racist policies to marginalize African Americans in terms of access to public space, transportation, housing, and economic opportunity (amongst other realms of public life). Restrictive covenants were used in the 1920s through the 1960s to keep Black and other People of Color confined in certain neighborhoods, where schools received less funding and transportation infrastructure was less developed or non-existent. Redlining, which began in the 1930s, codified racial segregation by favoring white-only neighborhoods and making it impossible for residents of majority Black or racially mixed neighborhoods to secure loans from banks based on "risk." These legacy policies continue to affect people today. A study from the National Community Reinvestment Coalition found that economic inequality and segregation persist in areas that were historically redlined.[25]

During the highway construction boom between the 1950s and 1970s, displaced populations were often relocated to massive public housing projects, notorious for their inhumane living conditions and poor construction. Public housing and highway construction were the twin cornerstones of the racially motivated urban renewal that swept the country in the mid-twentieth century, resulting in an extensive loss of urban housing stock and the creation of segregated communities.

"Created in 1958, the Durham Redevelopment Commission oversaw seven projects of urban renewal aimed at combating "urban blight," one in Durham's downtown and the other six in historically black neighborhoods including Hayti and Northeast Central Durham. These six neighborhood projects affected a primarily residential area of some 9,100 people, or 11.7% of Durham's population at the time. Beginning in 1961 and initially scheduled for completion within ten years, the full slate of projects was never finished." [26]

Community and tenant-led organizations like the United Organizations for Community Improvement, Operation Breakthrough, and ACT were an important part of ending harmful public housing development strategies in Durham. Low-income residents from Black and White communities began organizing around housing issues in the 1960s and advocating for fair and improved conditions.[27]

Although the scope of the Triangle West TPO Vision Zero Action Plan does not include housing-specific strategies, the inextricable relationship between transportation, housing, and land use development is an important factor that contributes to transportation planning, transportation equity, and traffic safety outcomes. The demographic geography of race and income did not happen by chance – it is the result of government policy and investment and important to understand for developing strategies to eliminate roadway deaths in the region. This process should engage grassroots advocates, members of the public, relevant government departments, and relevant agencies to pursue a collaborative approach to equitable and coordinated strategies for growth and development.

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25 National Community Reinvestment Coalition. (n.d.). The Injustice of Redlining. **https://www.ncrc.org/redlining/**

26 Mitchell, Bruce and J. Franco. (2018). HOLC "Redlining" Maps: The persistent structure of segregation and economic inequality. National Community Reinvestment Coalition. **https://ncrc.org/wp-content/uploads/dlm_uploads/2018/02/NCRC-Research-HOLC-10.pdf.**

27 Bull City 150. (n.d.). Tenants Mobilize: The Power of Grassroots Organizing. **https://www.bullcity150.org/uneven_ground/tenants_mobilize/grassroots_organizing/.**

Existing Conditions

Transit

Public transportation that is fast, convenient, and easy to use is associated with increased access to healthcare services and healthy food.[28] Conversely, when people depend on public transportation that is inadequate or irregular, inconvenient or requires multiple transfers, they are more likely to forego accessing necessary destinations, including health services.[29] Historically, the shift in focus toward developing automobile infrastructure, most notably the interstate highway system, came at the expense of funding for public transportation, creating wider access disparities between those who had access to private vehicles and those who did not.[30]

Multiple agencies work in coordination to provide public transportation services to residents in the Triangle West region, as shown in **Table 1**. This includes a traditional fixed-route bus service and demand-response paratransit service for eligible riders such as people with disabilities, seniors, and people in low-income households.[31] Notably, Chapel Hill Transit is one of the largest bus systems in the country that is fare free.[32]

Amtrak provides daily passenger rail service through the Durham station with direct service to 24 cities. In 2022, 83,173 passengers arrived or departed at the station.[33]

TABLE 1 Public transit operators in the Triangle West region

Agency	Types of Service	Service Areas	Annual Ridership (2023)
Chapel Hill Transit	Fixed route bus service	Town of Chapel Hill, Town of Carrboro, University of North Carolina	3,798,800
E-Z Rider	Demand-response paratransit service for eligible riders	Town of Chapel Hill, Town of Carrboro	56,600
GoDurham	Fixed route bus service	Durham County	5,267,800
GoDurham ACCESS	Demand-response ADA paratransit service for eligible riders	City of Durham, Durham County	149,200
GoTriangle	Fixed route bus service	Wake County, Durham County, Orange County	1,663,700
GoTriangle ACCESS	Demand-response ADA paratransit service for eligible riders	Wake County, Durham County, Orange County	39,000
Orange County Transportation Services	Fixed route service and demand response service for eligible riders	Town of Hillsborough, Orange County	21,000* *Approximate 2022 ridership

28 Litman, Todd. (2022). Evaluating Public Transit Benefits and Costs. Victoria Transport Policy Institute. **https://www.vtpi.org/tranben.pdf**

29 Farhang, Lili and R. Bhatia. (2005). Transportation for Health. Race Poverty, & the Environment. **https://reimaginerpe.org/files/13.Lili.Farhang.pdf.**

30 Sheller, Mimi. (2018). Mobility Justice: The Politics of Movement in an Age of Extremes. Verso.

31 Orange County Transportation Services. (2024). Draft Orange County Short Range Transit Plan. **https://orangecountysrtp.com/wp-content/uploads/2024/08/OC_SRTP_Draft-Report-Revised.pdf.**

32 Morris, DL Gregory. (2023). Ridership rebounds for Chapel Hill Transit. The Local Reporter. **https://thelocalreporter.press/ridership-rebounds-for-chapel-hill-transit/**.

33 Rail Passengers Association. (2023). Amtrak service in Durham, NC. **https://www.railpassengers.org/site/assets/files/1889/dnc.pdf.**

Multimodal Investment Strategies

Historic transportation planning has led to an overwhelming focus on automobile-oriented transportation investments, which is a significant contributor to inequitable transportation outcomes. In addition to the focus on vehicle-related projects over other modes, contemporary planning frameworks that evaluate system performance are often based on vehicle travel speeds – the faster the better. Vehicular level-of-service standards reinforce the focus on automobile-oriented transportation investments. These frameworks justify road expansions that aim to reduce vehicular congestion delays but often fail to consider how less congestion and higher speeds impact other roadway users as well as safety for all roadway users.

Municipalities throughout the region are working to implement more multimodal planning frameworks to meet the needs of nondrivers through recent and ongoing efforts such as the Durham Bike + Walk Plan, Orange County Transportation Multimodal Plan, Chapel Hill Transit High-Capacity Transit Corridor Feasibility Study, Downtown Hillsborough Parking Study, Carrboro Comprehensive Bicycle Transportation Plan Update, Orange County Bicycle Pedestrian Plan, and Durham-to-Roxboro Rail Trail Planning Study. There are many opportunities for the Triangle West TPO to continue supporting local communities and promoting regional multimodal investment through planning and funding strategies such as the Metropolitan Transportation Plan and Federal Funding Policy.

> Approximately $700 is spent on roads and $1,000-$3,000 on parking subsidies annually per capita [in the United States], compared with $100-200 for transit subsidies and $20-50 for pedestrian and cycling facilities. This is unfair to non-drivers and since driving tends to increase with income, and it is regressive, resulting in lower-income households subsidizing the costs of their wealthier neighbors.[34]

34 Litman, Todd. (2021). Evaluating Transportation Diversity. Victoria Transport Policy Institute; Victoria Transport Policy Institute. **https://www.researchgate.net/profile/Todd-Litman-2/publication/245559730_Evaluating_Transportation_Choice/links/6166fda125be2600ace1addd/Evaluating-Transportation-Choice.pdf.**

Active Transportation

Active transportation investments enable safer and more comfortable experiences for people walking, biking, or taking transit. However, active transportation planning has also contributed to racial disparities through a traditional focus on recreational users over those who rely on these modes for mobility. Research shows that the result is a disproportionate lack of infrastructure for walking and bicycling in Black and Latino neighborhoods.[35] [36] In the United States today, neighborhoods that have a majority of Black and Latinx residents have lower quality sidewalks with more obstructions and accessibility issues, even though residents of these neighborhoods are less likely to own or rely on vehicles for transportation.[37] [38]

That said, proposed bikeways and sidewalks are sometimes seen as harbingers of gentrification in these same neighborhoods and are met with opposition because, often, there are other needs that residents have continually asked for and feel should be addressed first (e.g., violence, education, health outcomes, etc.).[39] Decades of disinvestment in BIPOC neighborhoods have bred distrust in communities where cities have failed to respond to the concerns and needs of residents. Contention can occur when historic requests by the community appear to be overlooked instead of an investment in active transportation that was not requested.

Where bicycle facilities have been built, many are standard bicycle lanes that end at intersections or shared lane markings that place bicycle riders in the same lane as motor vehicles. These facilities are designed for riders who are confident riding in traffic, failing to serve the majority of potential riders who are "interested but concerned."[40] Furthermore, the disproportionate effects of traffic crashes on Indigenous, Black, and Latinx individuals emphasizes a need for safer active transportation facilities for vulnerable road users.

Neighborhoods with a higher proportion of Black residents are also less likely to have access to shared micromobility services, including both bikes and scooters.[41] This is partially due to shared micromobility vendors prioritizing areas that already have active transportation infrastructure like bike lanes and paths, rather than those with the greatest need. This lack of geographic coverage contributes to racial disparities in the access and use of micromobility services.

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35 Barajas, Jesus. (2021). Biking where Black: Connecting transportation planning and infrastructure to disproportionate policing. Transportation Research Part D: Transport and Environment, 99, DOI: **10.1016/j.trd.2021.103027.**

36 Lee, Richard. I. N. Sener & S. N. Jones. (2017). Understanding the role of equity in active transportation planning in the United States, Transport Reviews, 37:2, 211-226, DOI: **10.1080/01441647.2016.1239660.**

37 Kelly, C. M., Schootman, M., Baker, E. A., Barnidge, E. K., & Lemes, A. (2007). The association of sidewalk walkability and physical disorder with area-level race and poverty. Journal of Epidemiology and Community Health, 61(11), 978–983. DOI: **10.1136/jech.2006.054775.**

38 Rajaee, M, et al. (2021). Socioeconomic and racial disparities of sidewalk quality in a traditional rust belt city. SSM Popul Health, 16:100975. DOI: **10.1016/j.ssmph.2021.100975.**

39 Flanagan, Elizabeth, U. Lachapelle, & A. El-Geneidy. (2016). Riding tandem: Does cycling infrastructure investment mirror gentrification and privilege in Portland, OR and Chicago, IL? **https://www.sciencedirect.com/science/article/abs/pii/S0739885915300287.**

40 Dill, Jennifer & N. McNeil. (2012). Four Types of Cyclists? Testing a Typology to Better Understand Bicycling Behavior and Potential. OTREC Working Paper. **https://web.pdx.edu/%7Ejdill/Types_of_Cyclists_PSUWorkingPaper.pdf.**

41 Aman, J.J.C., Zakhem, M., Smith-Colin, J. (2021). Towards Equity in Micromobility: Spatial Analysis of Access to Bikes and Scooters amongst Disadvantaged Populations. Sustainability, 13, 11856. DOI: **10.3390/su132111856.**

Traffic Crashes and Fatalities

Nationwide, crash analyses have found that American Indian and Alaska Native, Black, and Latinx Americans face higher rates of traffic injuries and fatalities. These disparities are particularly pronounced for pedestrians (see **Figure 4**). Across the US, the number of people killed while walking reached a new high in 2022, with an estimated 7,500 pedestrians struck and killed, up 19 percent since 2019. Between 2015 and 2019, the annual average bicycle and pedestrian fatality rate in the Triangle West TPO region was 1.9 per 100,000 people overall. Within the Triangle West TPO region, in geographic areas with a relatively higher population of nonwhite residents, the rate was 3.7 per 100,000. People of Color, particularly Native Americans and Black Americans, are substantially more likely to die while walking than any other race or ethnic group.

In addition, people walking in lower-income areas are killed at higher rates than people walking in higher-income areas (see **Figure 5**). The bicycle and pedestrian fatality rate in low-income areas of the Triangle West TPO region was 3.0 per 100,000 from 2015 to 2019; in areas with more zero-car households, the rate was 2.8 per 100,000.

Disparities in transportation safety are closely tied to the road infrastructure in low-income and BIPOC neighborhoods. Three-quarters of the United States' sixty most dangerous roads for pedestrians are in low-income neighborhoods, and more than half are in predominantly Black or Latinx neighborhoods. .

The majority of these roads match a particular profile of arterials constructed through BIPOC neighborhoods, with five or more travel lanes, speed limits of 30 miles per hour or higher, and a lack of facilities for people walking or riding bikes.

Nationwide trends also show that rural pedestrians are killed at a similar rate to pedestrians in urban areas. From 2010 to 2019 when controlling for population, there were 1.7 deaths for every 100,000 people in rural areas compared to 1.6 pedestrian deaths for every 100,000 people in urban areas. In many rural areas – such as northern parts of Durham County and northern and southern areas of Orange County – pedestrians must navigate high-speed state roads with minimal shoulders. Overlap between low-income and rural areas can exasperate transportation safety disparities, especially as it relates to pedestrians.

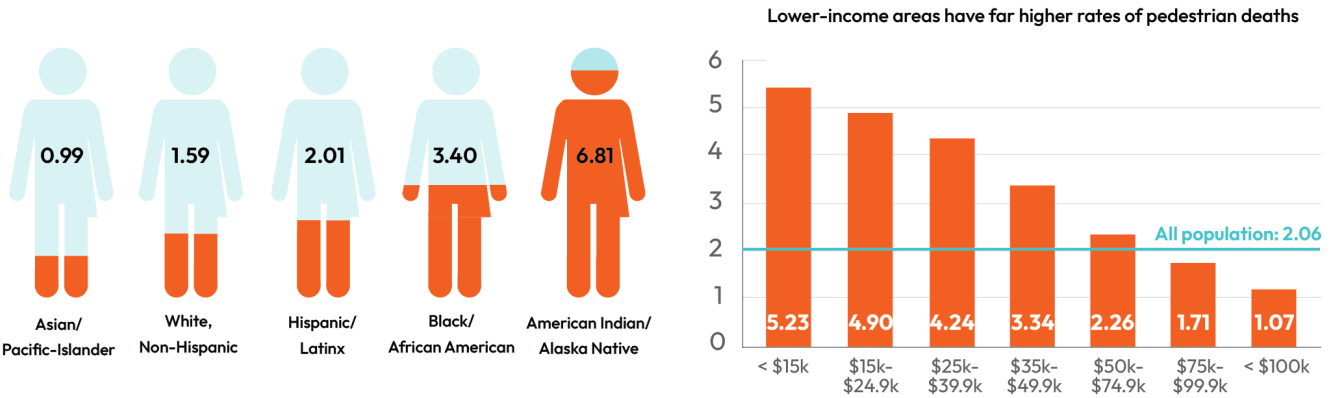


FIGURE 4 Pedestrian deaths per 100,000 in the United States by race and ethnicity (left), and census tract income (right)[42]

42 U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA) Bureau of Transportation Statistics (BTS). (2024). Fatality Analysis Reporting System (FARS). Retrieved from **https://catsip.berkeley.edu/news/smart-growth-america-releases-2024-dangerous-design-report#:~:text=Metropolitan%20and%20urban%20areas%20in,a%202.8%25%20increase%20in%20population.**

Law Enforcement

Enforcement has historically been viewed as a key component of achieving transportation safety and compliance. However, enforcement-based approaches to traffic safety have resulted in racially disparate impacts on mobility and safety. Police officers stop Black drivers at higher rates than White drivers, and both Black and Latinx drivers are searched more often than their White counterparts.[43] As a result of this discrimination, transportation safety strategies that prioritize increasing traffic enforcement by officers are likely to result in racially disparate outcomes.

Racial disparities are even higher for investigatory stops and non-moving violations, such as equipment and registration violations, although research indicates that enforcement of non-moving violations does not have a discernable effect on crime rates.[44] Research has shown that traffic stops are not related to a reduction in deaths from vehicular crashes,[45] although these stops can become a safety risk for Black drivers and Latinx drivers who are more likely to be met with the use of force during these stops.[46]

In 2023, 59 percent of drivers stopped by Durham Police Department were Black and 15 percent were Hispanic – this contrasts with 36 percent of the population that is Black and 13 percent that is Hispanic or Latino. When looking just at the stops conducted by the City's Traffic Services officers, the data shows that 51 percent of that subset of stops were of Black people. Although a clear disparity, it is notable to review the data from this unit because they conduct the most traffic stops in the department and the stops are distributed geographically across Durham.[47]

The report notes that based on a statistical test examining if racial disproportionality in traffic stops existed within the 2023 data, "there was no evidence of unexplainable disparities regarding traffic stops among the officers. Rather, officers are stopping vehicles consistent with the demographics and crime statistics of their assigned areas." The report does not include consideration for variation in roadway characteristics that contribute to traffic behavior, however, it does note that officers with the highest rates of traffic stops involving minorities, "worked in geographical areas with higher minority populations, including District 1 and District 4, which also have the highest per capita violent crime figures."

Despite the report's framing, this does not necessarily dispel concerns about biases- research shows that traffic stops are not an effective strategy for reducing crime.[48] Additionally, these stops have lasting impacts on law-abiding residents using the transportation system for daily needs and activities. As shared by Anthony McLendon, member of the McDougald Terrace public housing resident council (located in Police District 4):

> **...he has been stopped by police multiple times in recent weeks. One time an officer said the tint on his license plate was too dark. Another time, it was the tint on his windows. The third time, an officer pulled up to him after he had run back and forth to the store a few times. The officer warned McLendon, he said, that if he came and left again, he was going to pull him over. McLendon asked why. Suspicion, the cop told him, McLendon said. "Suspicion of what....We live over here." Another time McLendon was pulled over, and the cop jumped out of his car with his hand on his gun. "He made me real nervous," McLendon said. The officer said McLendon's car looked similar to a suspect that he was looking for, before soon taking off in response to some chatter on the officer's radio, the resident said. McLendon hasn't been arrested or cited, but the interactions have left him feeling targeted and even more skeptical of police. [49]**

43 Stanford Open Policing Project. (2021).Findings **https://openpolicing.stanford.edu/findings/**

44 Policing Project. (2018). Reevaluating Traffic Stops in Nashville. NYU School of Law. **https://www.policingproject.org/nashville.**

45 Sarode, Anuja L. MPH et al. (2021). **Traffic stops do not prevent traffic deaths.** Journal of Trauma and Acute Care Surgery, 91(1), DOI: 10.1097/TA.0000000000003163.

46 Weisburst, Emily and F. Goncalves. (2020). Economics Research on Racial Disparities in Policing. Econofact. **https://econofact.org/economic-research-on-racial-disparities-in-policing.**

47 City of Durham. (2023). Executive Summary- Traffic Stop Data. **https://www.durhamnc.gov/DocumentCenter/View/55948/2023-Traffic-Stop-Review-Final.**

48 Policing Project. (2018). Reevaluating Traffic Stops in Nashville. NYU School of Law. **https://www.durhamnc.gov/DocumentCenter/View/55948/2023-Traffic-Stop-Review-Final.**

49 Bridges, Virginia. (2023). Durham residents chafe at more aggressive policing after community unit disappears. The News and Observer. **https://www.newsobserver.com/news/local/article273445245.html.**

In line with statewide and regional trends, Carrboro Police Department, Chapel Hill Police Department, and Hillsborough Police Department data also shows that Black and Hispanic drivers are disproportionately impacted by traffic stops and non-moving violations. In 2021, the rate of citations to warnings for Black drivers in Chapel Hill was 23 percent higher than White drivers; for Hispanic drivers, the rate was 20 percent higher. In Carrboro, Black people comprise about 16 percent of the population but account for 29 percent of traffic stops; Hispanic drivers, account for 12 percent of stops even though only 7 percent of the population is Hispanic or Latino.[50] In Hillsborough, Black drivers accounted for 30 percent of traffic stops despite being 9 percent of the population in 2023, and Hispanic drivers comprised 14 percent of stops and 10 percent of the Hillsborough population.[51]

Police departments across the Triangle West region have made public statements condemning racial discrimination in policing, committed to data transparency that is disaggregated by race, participated in internal reviews and reforms related to racial disparities, and developed and elevated community-oriented task forces and committees.[52] [53]

50 Adams, Jospeh. (2022). Chapel Hill and Carrboro policing data shows racial disparities in traffic stops. Daily Tar Heel. **https://www.dailytarheel.com/article/2022/11/city-crime-disparities.**

51 Hillsborough Police Update 2/14/24. (2024). Town of Hillsborough. **https://assets.hillsboroughnc.gov/media/documents/temporary/police-presentation-WwLTVun0Ir3oi430jDSy.pdf.**

52 Adams, Jospeh. (2022). **Chapel Hill and Carrboro policing data shows racial disparities in traffic stops.** Daily Tar Heel.

53 McConnell, Brighton. (2020). Chapel Hill, Carrboro and Hillsborough Police Share Statements on Racial Injustice. Chapelboro.com. **https://chapelboro.com/news/local-government/chapel-hill-carrboro-police-share-statements-on-injustice-and-affirm-commitments-to-community.**

Equity Analysis

This section discusses mapping to distinguish demographic populations that reflect communities that have been systemically oppressed and marginalized through historical policies and practices. We can identify and map these populations using available Census and American Community Survey (ACS) data. We will use the equity analysis results in the planning process to compare transportation safety outcomes in areas experiencing the greatest socioeconomic vulnerability, guide an inclusive community outreach approach, and develop strategies for the Triangle West TPO Vision Zero Action Plan that do not further contribute to disparate transportation outcomes.

Through this equity analysis, we identify key populations vulnerable to transportation disadvantages based on socioeconomic factors. For example, children and youth are often not independently mobile and rely on guardians to accompany them as they travel. Households in poverty may spend an outsized portion of their income on travel expenses. People in households without a vehicle – or even people who have limited access to the vehicle within their household – may depend on the availability of safe multimodal facilities to access their daily needs. Once key populations are defined, we delineate areas throughout the region where we see the highest proportions of these populations and assume that these areas have greater socioeconomic vulnerability.

Methodology

Defining Key Populations

This equity analysis uses eight key demographic populations that face transportation and socioeconomic disparities. The identification of these populations was informed by the Triangle West TPO 2020 Environmental Justice Report, NCDOT Transportation Disadvantage Index, and the Indicators of Potential Disadvantage methodology, are discussed in the following section. The key populations in the Triangle West TPO Vision Zero Action Plan equity analysis are:

- Black, Indigenous, and other People of Color, specifically the ACS race and ethnicity categories:
  - Black or African American
  - American Indian and Alaska Native
  - Asian
  - Two or More Races
  - Hispanic or Latino
- Households in poverty
- Carless households
- Youth under 18 years old
- Older adults over 64 years old
- People with disabilities
- People with limited English proficiency
- People with limited educational attainment
  - Note, that this indicator was added due to empirical research that shows people with lower education attainment are more likely to be vulnerable roadway users who walk or bike for transportation. Research has also found that as education levels increase, so does access to reliable transportation.[54]

54 Ng AE, Adjaye-Gbewonyo D, Dahlhamer J. Lack of reliable transportation for daily living among adults: United States, 2022. NCHS Data Brief, no 490. Hyattsville, MD: National Center for Health Statistics. 2024. DOI: https://dx.doi.org/10.15620/ cdc:135611. **https://www.cdc.gov/nchs/data/databriefs/db490.pdf.**

Regional - Indicators of Potential Disadvantage Methodology

The regional equity analysis uses the Indicators of Potential Disadvantage (IPD) methodology, originally developed by the Delaware Valley Regional Planning Commission (DVRPC). The IPD methodology uses ACS, 5-year estimates (2018-2022) to delineate areas where key populations are more prevalent. Although identified at the block group level, the data is gathered at the regional level so that regional averages for each population group can be determined.

Each block group's population percentage is calculated from the standard deviations relative to each indicator's regional average. The calculations range from "well below average" to "well above average." An example of this is shown in **Figure 6**.

For each indicator, block groups receive a score of 0 to 4 as follows:

- Well below average – score of 0
- Below average – score of 1
- Average – score of 2
- Above average – score of 3
- Well above average – score of 4

The Overall IPD summarizes the indicator scores, ranging from 0 – 32. For the purposes of the Triangle West TPO Vision Zero Action Plan, the regional Overall IPD is used as the basis for identifying Vision Zero Focus Areas to guide plan engagement, strategies, and implementation.

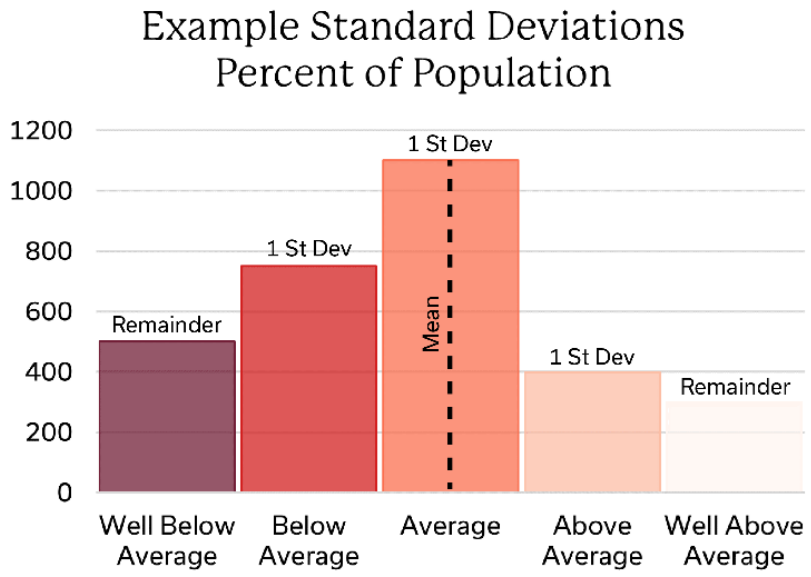


FIGURE 5 Example Standard Deviations and Corresponding Scores[55]

55 Michiana Area Council of Governments. (2023). Michiana Area Environmental Justice Analysis. **https://storymaps.arcgis.com/stories/2e3bccbd775b4e9ba8d6b34832abf9ed.**

Localized Equity Analyses

In addition to the regional equity analysis, this equity framework presents localized equity analyses for the following communities in the Triangle West TPO planning area:

- City of Durham
- Town of Chapel Hill
- Town of Carrboro
- Town of Hillsborough
- Durham County
- Orange County
- Chatham County

The localized analyses use the same indicators for the analyses and a similar methodology. Still, at the block group scale, ACS, 5-year estimates (2018-2022) data is collected at the community level and the community average is determined for each population group. Each block group's population percentage is calculated from the standard deviations relative to each indicator's community-level average. A community-level Overall IPD is available for each of the communities above to allow for a contextualized approach to safety action planning, engagement, and strategy implementation.

Map Interpretation

Race

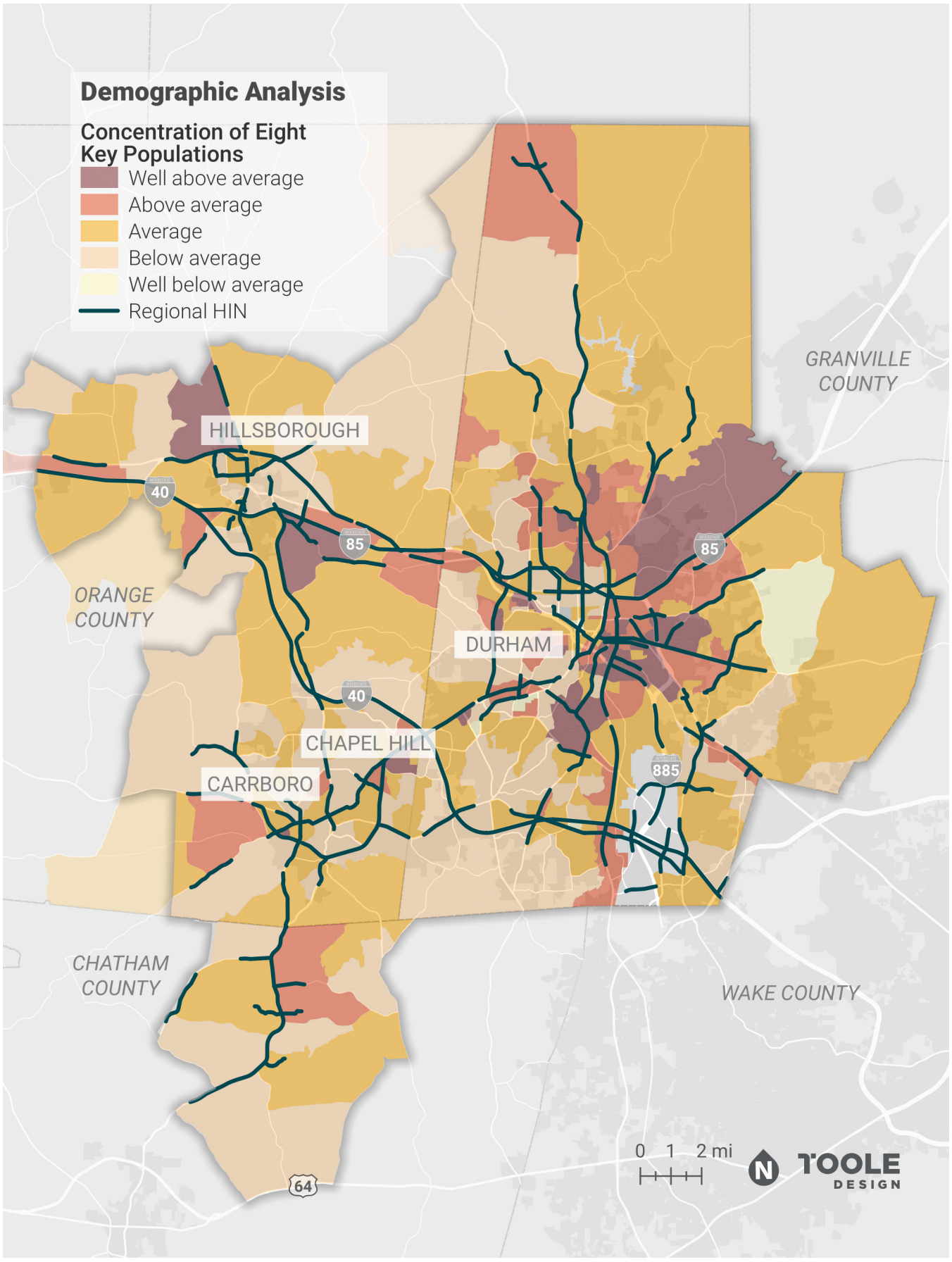
The IPD analysis for racial minorities assesses where there are prevalent populations of Black, Native American, Alaska Native, Asian, Native Hawaiian, Pacific Islander, Hispanic or Latino, and multiracial residents. The results of the regional analysis are shown in **Map 1**.

In Orange County, there are above average concentrations of nonwhite residents in the northwest areas of Hillsborough and the surrounding areas that are part of Orange County. Most of Chapel Hill has an average concentration of nonwhite residents, however, there are a few census blocks with above average concentrations of People of Color in the Northside area and the southwest corner of the Town, north of NC-54.

Durham County has the highest concentrations of People of Color, most notably on the south and east sides of the City of Durham which range from above to well above average. There are additional areas with above average or well above average concentrations of nonwhite residents, including the Duke University campus area, and communities along Durham-Chapel Hill Boulevard between the two municipalities.

Most of the unincorporated areas of Orange, Durham, and Chatham County range from average to well below average concentrations of this demographic group.

MAP 1 Triangle West TPO Indicators of Potential Disadvantage: Racial Minority Population



The Triangle West TPO Vision Zero Action plan evaluated census tracts in areas of persistent poverty, as identified by the U.S. Department of Transportation (USDOT). Areas of persistent poverty are defined as communities that have maintained a poverty rate of 20 percent or higher for the past 30 years.[56]

The results in **Map 2** indicate that the highest concentrations of residents living in areas of persistent poverty are:

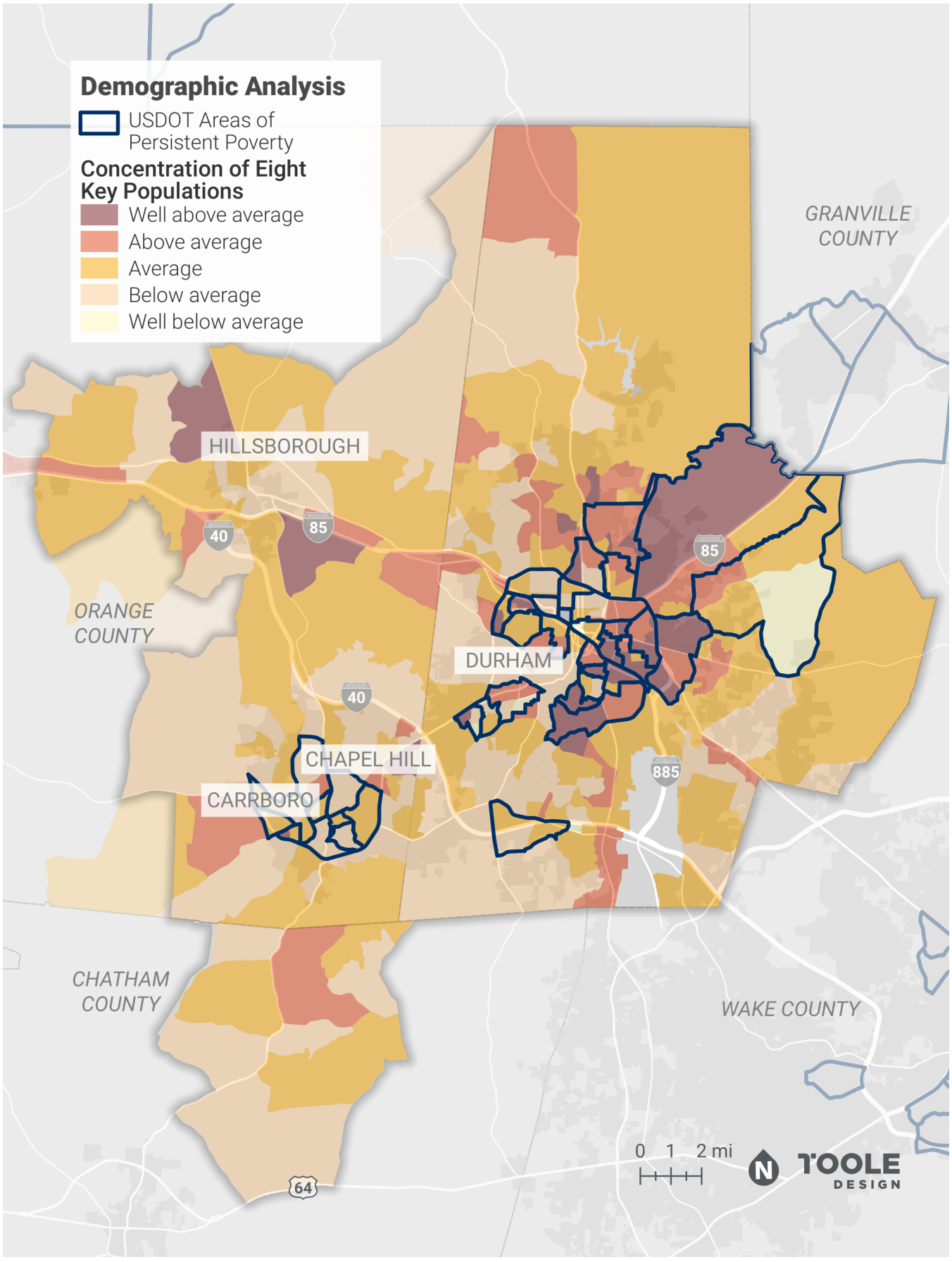
- East Durham near downtown and along the Durham Freeway
- Northeast Durham along the US-15/I-85 corridor
- Census tracts directly around North Carolina Central University and Duke University in Durham
- Nearly all of Chapel Hill and Carrboro, including census tracts surrounding the University of North Carolina Chapel Hill.

The concentration of census tracts in Chapel Hill and Carrboro is likely influenced by the high population of UNC-Chapel Hill students living in these communities. U.S. Census Bureau research found that the presence of off-campus university students has a significant impact on local poverty rates.[57]

56 Benson, Craig and A. Bishaw. (2018). Small and Large College Towns See Higher Poverty Rates. United States Census Bureau. **https://www.census.gov/library/stories/2018/10/off-campus-college-students-poverty.html.**

57 Benson, Craig and A. Bishaw. (2018). Small and Large College Towns See Higher Poverty Rates. United States Census Bureau. **https://www.census.gov/library/stories/2018/10/off-campus-college-students-poverty.html.**

MAP 2 Triangle West TPO Indicators of Potential Disadvantage: Areas of Persistent Poverty Map



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