

# Appendix C: Equity Analysis Framework

Methodology and Findings

May 2, 2023

## Introduction

As a part of the Northwest Arkansas Regional Planning Commission's (NWARPC) process of developing a Vision Zero Plan, the project team developed a methodology for identifying communities that have disproportionate safety impacts. The focus was placed on communities that have experienced historic marginalization, disenfranchisement, and disinvestment to examine how past harms may continue to disadvantage them, specifically in terms of traffic violence.

The goal of the analysis is to present NWARPC with a process for distinguishing populations that are underserved and under-resourced and an approach to assessing how they are impacted by outcomes of the transportation system like safety risk. The results of the analysis reveal demographic patterns in safety outcomes and provide valuable information for adopting an equity lens to prioritizing safety investments. Taken with crash analysis, development of the High Injury Network (HIN), and community engagement findings, the results can provide an understanding of the implications of safety risk disparities on various communities.

This document begins with background information to describe our approach to equity analysis. Next, it details the methods of identifying populations and analyzing safety impact in relation to them. It then presents the results, spatially and graphically, and concludes with recommendations for applying the findings of this analysis.

## Definitions

Community and population are often used interchangeably to describe groups of people sharing similar characteristics or experiences. In this document, we use community to mean a collection of persons that share experiences or cultures. Population is used to describe a group defined by shared demographic attributes, typically identified through Census data.

Racial minority and "non-white" are not terms used in

this analysis. When referring to people that have been racialized, we will reference their specific identity (African-American, Asian-American, Pacific Islands, Hispanic, and Native American) or use the term Black, Indigenous, or Person of Color (BIPOC). Distinguishing Black and Indigenous people calls attention to the grave injustices that these communities have faced in this country.

Low-income refers to people or households that have financial constraints that impact their daily lives. There is no one threshold for what is considered low income. It can be described using poverty guidelines, median household income, housing burden, or transportation burden.

**Equity** is a pluralistic concept that centers on the concept of fairness and justice. We recognize the need for any equity construction to redress historical marginalization, disenfranchisement, and disinvestment. An equity analysis should examine disproportionate impacts and disparate outcomes for those who have been harmed.

**Area of Persistent Poverty** is defined by the USDOT as any County or Census Tract that has consistently had greater than or equal to 20 percent of the population living in poverty over a defined period.

**Historically Disadvantaged Communities** refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

## Equity Analyses

An equity analysis is one component of unraveling inequities and advancing transportation equity. It provides information that must be used in concert with knowledge learned through engagement to determine actions that improve the lived experiences of people that have been systemically burdened or have had benefits withheld. This quantitative analysis does not answer the question, "is this plan/project equitable?"

and instead should be used to inform investment and prioritization decisions to advance equitable outcomes.

A first step in equity analysis is often demographic mapping. Populations are distinguished based on demographic factors that reflect communities who have been systemically oppressed and marginalized. Then they are categorized using available data (typically Census/American Community Survey data) and geographically located. The resulting maps help understand demographic patterns across a region or city.

The demographic patterns can then be spatially compared to various transportation system outcomes, such as safety risk. This can be used to compare outcomes experienced by various populations, revealing disparities and establishing a baseline to improve upon. This improvement comes as the analysis is used in a framework that systematically makes decisions and investments to eliminate socio-demographic disparities and redresses past harms.

## Defining Populations

### How are populations defined?

NWARPC conducted an environmental justice analysis during their long-range planning process for the 2045 Metropolitan Transportation Plan. Through geospatial analysis, NWARPC identified underrepresented populations required by regulations<sup>1</sup> – racial and ethnic communities and low-income households. They also name additional demographic factors of age, sex, ability, car ownership/access, and population and employment density that are relevant and could be evaluated as needed.

To create a broad characterization of communities that have sociodemographic vulnerabilities and to define the populations that we consider in this analysis, we used criteria for *Areas of Persistent Poverty*, *Historically Disadvantaged Communities* as identified by the USDOT RAISE Mapping Tool, and the *Social Vulnerability Index* (SVI) as defined by the Centers for Disease Control and Prevention (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR).

### Areas of Persistent Poverty

An Area of Persistent Poverty is defined by the USDOT as any County that has consistently had greater than or equal to 20 percent of the population living in poverty during the last 30-year period, as measured by the 1990 and 2000 decennial census and the most recent (2021) annual Small Area Income and Poverty Estimates as estimated by the Bureau of the Census or a Census Tract that has a poverty rate of at least 20 percent as measured by the 2014-2018 5-year data series available from the American Community Survey of the Bureau of the Census.

### Historically Disadvantaged Communities

The USDOT considers certain qualifying census tracts to be historically disadvantaged based on 22 indicators collected at the census tract level and grouped into six (6) categories of transportation disadvantage:

- Transportation access disadvantage identifies communities and places that spend more, and take longer, to get where they need to go. (4 indicators)
- Health disadvantage identifies communities based on variables associated with adverse health outcomes, disability, as well as environmental exposures. (3 indicators)
- Environmental disadvantage identifies communities with disproportionately high levels of certain air pollutants and high potential presence of lead-based paint in housing units. (6 indicators)
- Economic disadvantage identifies areas and populations with high poverty, low wealth, lack of local jobs, low homeownership, low educational attainment, and high inequality. (7 indicators)
- Resilience disadvantage identifies communities vulnerable to hazards caused by climate change. (1 indicator)
- Equity disadvantage identifies communities with a high percentile of persons (age 5+) who speak English “less than well.” (1 indicator)

The comprehensive list of underlying indicators is presented on USDOT’s [Justice40 Initiative](#).

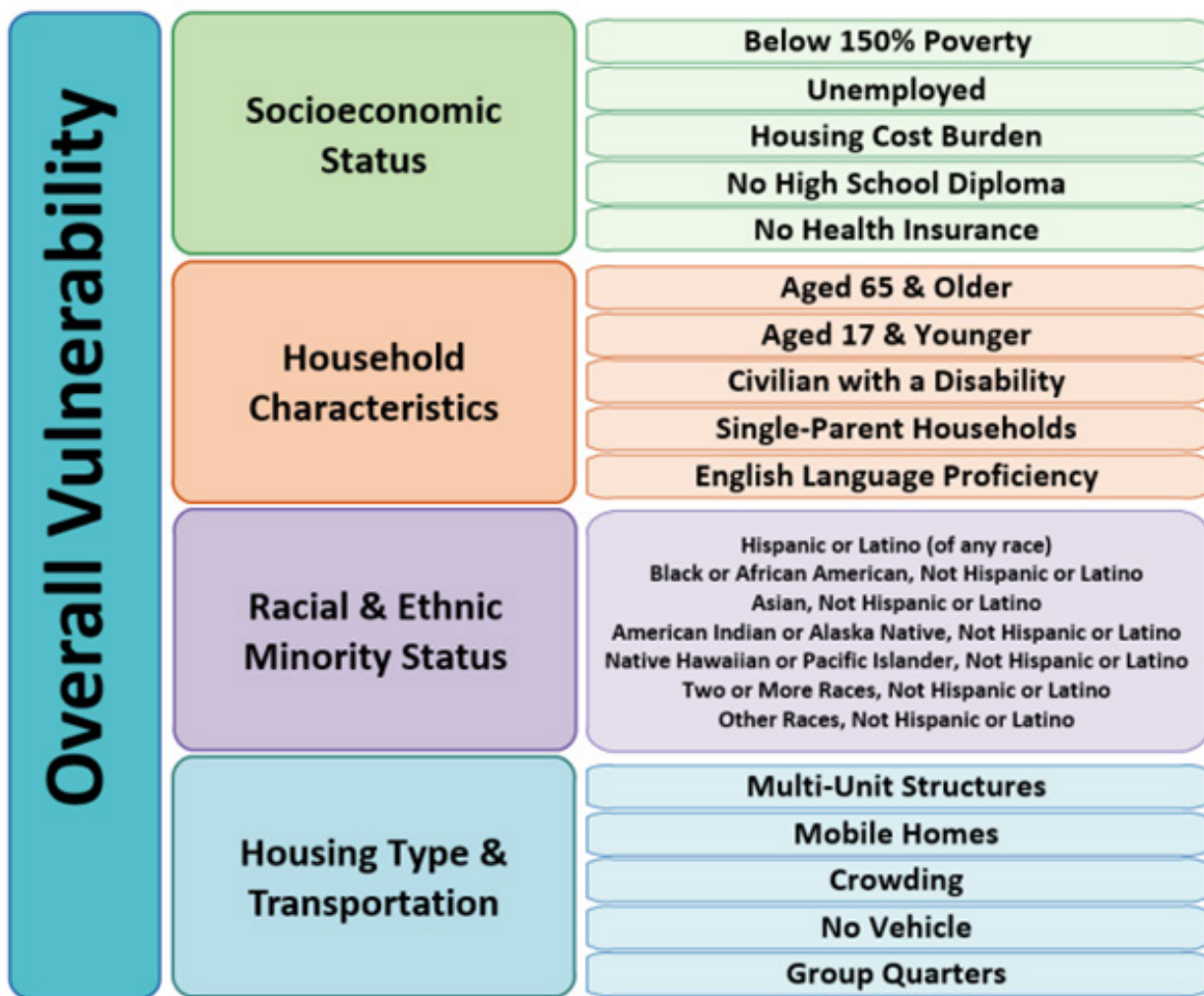
---

<sup>1</sup> Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations was signed in 1994 and required all recipients of federal funds to “identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations.” This executive order and Title VI of the Civil Rights Act for the basis for the industry’s approach to transportation equity.

## Social Vulnerability Index (SVI)

The CDC and ATSDR define social vulnerability as the ability of a community to survive and thrive when confronted by external stressors on human health. We can consider transportation disadvantage (lack of or restricted mobility) among these stressors. They rank each Census Tract along 16 factors categorized into four themes (Figure 1).

Figure 1: Social Vulnerability Index developed by the Centers for Disease Control and Prevention (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR).



### How is this definition of populations used?

The CDC/ATSDR SVI categorizes vulnerability along four themes, each of which also impacts mobility and can affect transportation disadvantage.

**Socioeconomic status:** Factors categorized in this theme relate to the economic vulnerability of individuals and households. These factors link to transportation disadvantage; they identify populations whose current economic situation may limit their mobility or for whom disruptions in mobility could negatively impact their financial situation.

**Race and ethnicity:** The racial and ethnic groups in this theme reflect populations that have experienced historic discrimination. As we know, historic discrimination excluded and denied services, investments and funding, power in decision making, and other areas critical to having agency over one’s lived experience to racialized populations. The effect of this discrimination continues to impact Black, Indigenous, and other People of Color (BIPOC). Disinvestment in and disenfranchisement of BIPOC communities has led to inadequate mobility including longer travel times, missing and deteriorating infrastructure, and greater safety risk.

**Household characteristics:** As NWARPC stated in their environmental justice analysis, age, ability, and English proficiency can restrict mobility options. The other factor in this theme is single-parent households. Households with children (and dependents) with a single parent can face mobility challenges based on limited travel choices for household members (e.g., children need supervision on transit or a driver) and constrained income.

**Housing and transportation:** The factors categorized in this theme have important impacts to vulnerability, but have less of a direct impact to mobility, aside from zero-car households. Therefore, this theme is not included in the equity analysis and zero-car household is included as a factor in the household characteristics theme.

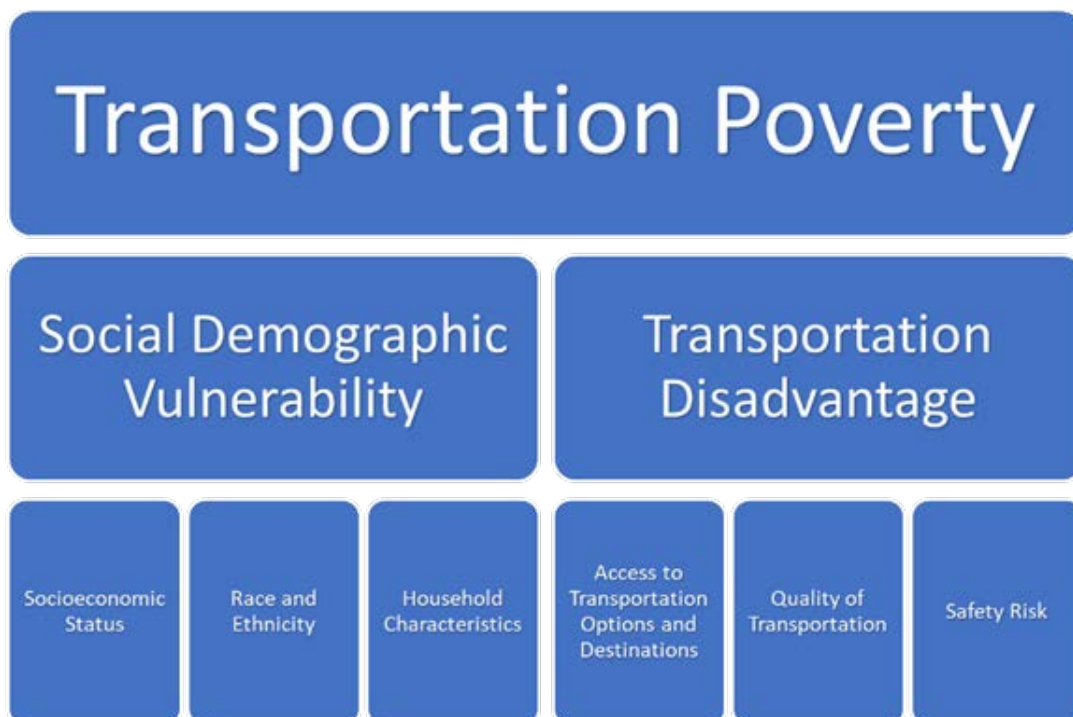
Given the populations defined above, we created an index score for each Census block group in the MPO. We used this index score to rank all block groups in the MPO and delineated the block groups in the top quantile as “high social vulnerability areas.”

## Understanding Disparities

### What impacts are evaluated?

As a part of the Safety Action Plan, this analysis will focus on safety risk. However, there are other transportation impacts that have real and substantial effects on equity and a person’s lived experiences. Impacts such as elevated safety risk, limited access to transportation options and desired destinations, and low quality of transportation can signify transportation disadvantage. When transportation disadvantage is paired with sociodemographic vulnerability, it creates a state of transportation poverty, where a person lacks resources to meet their mobility needs. Transportation poverty may limit to access to work, health care, education, or social networks, and leads to social exclusion and diminished quality of life.

Figure 2: Transportation poverty is the confluence of sociodemographic vulnerability and transportation disadvantage. This transportation poverty framework shows how these two components can be characterized and the factors this analysis uses to quantify them.





**Safety Risk:** This equity analysis focuses on safety outcomes given its application for the Safety Action Plan. Safety impacts and risks were evaluated through the safety analysis for the NWA Vision Zero Plan. We use the results of the safety analysis with the results of

all three equity analysis methods—Areas of Persistent Poverty (Figure 3), Historically Disadvantaged Communities (Figure 4), and Social Vulnerability Index (Figure 5)—to identify segments of the HIN that are in areas with high equity scores.

Figure 3: High Injury Network in areas of persistent poverty

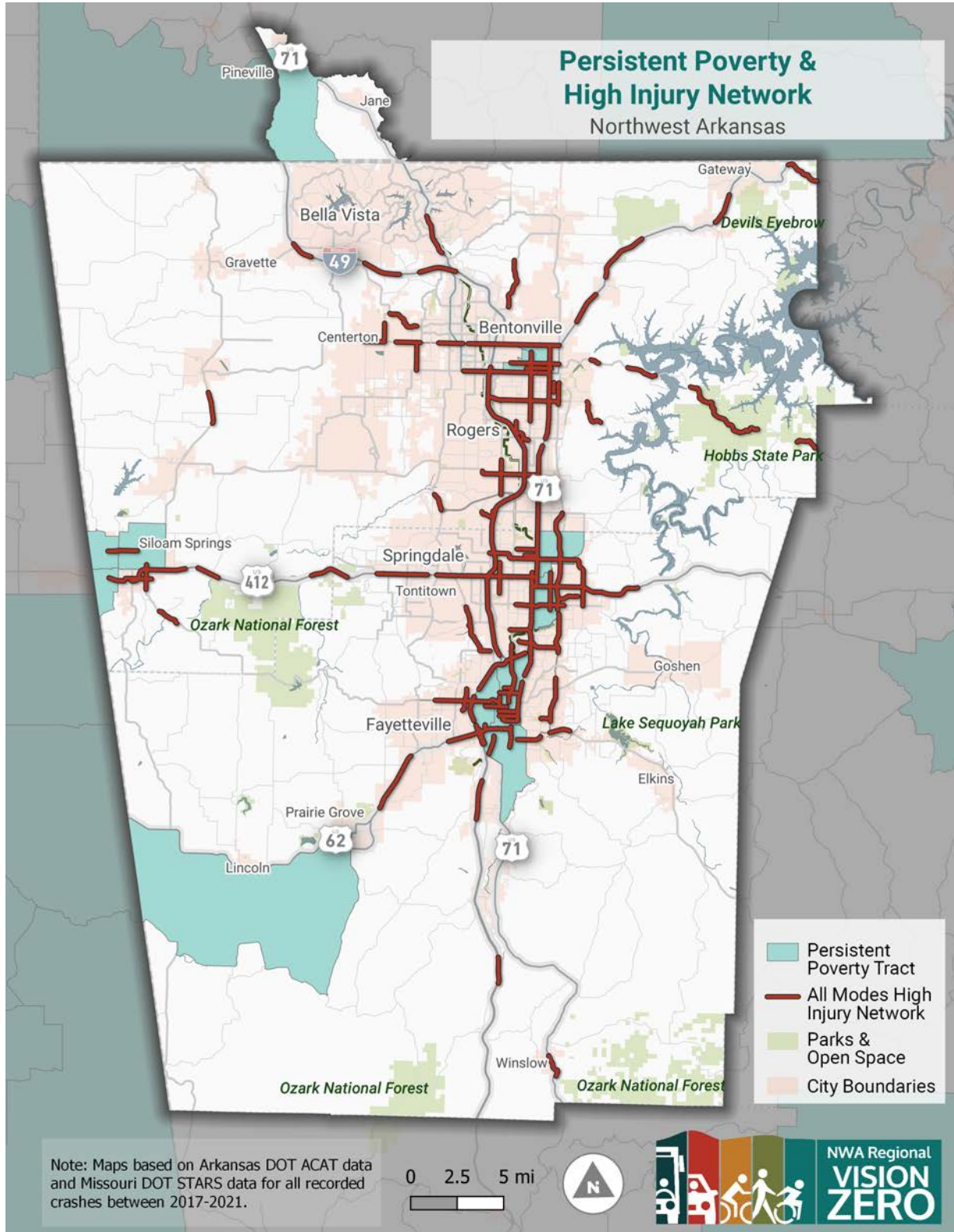


Figure 4: High Injury Network in historically disadvantaged communities.

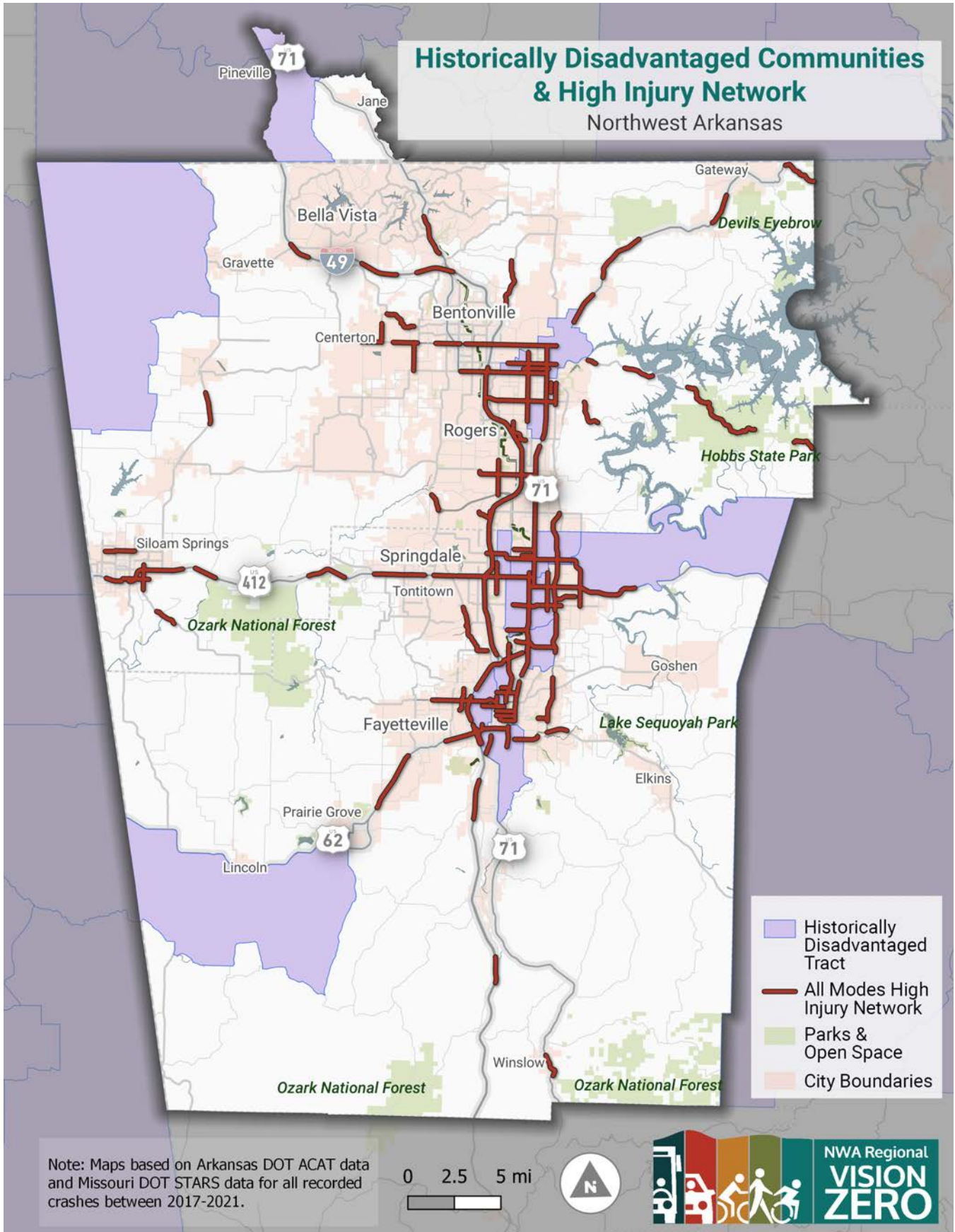
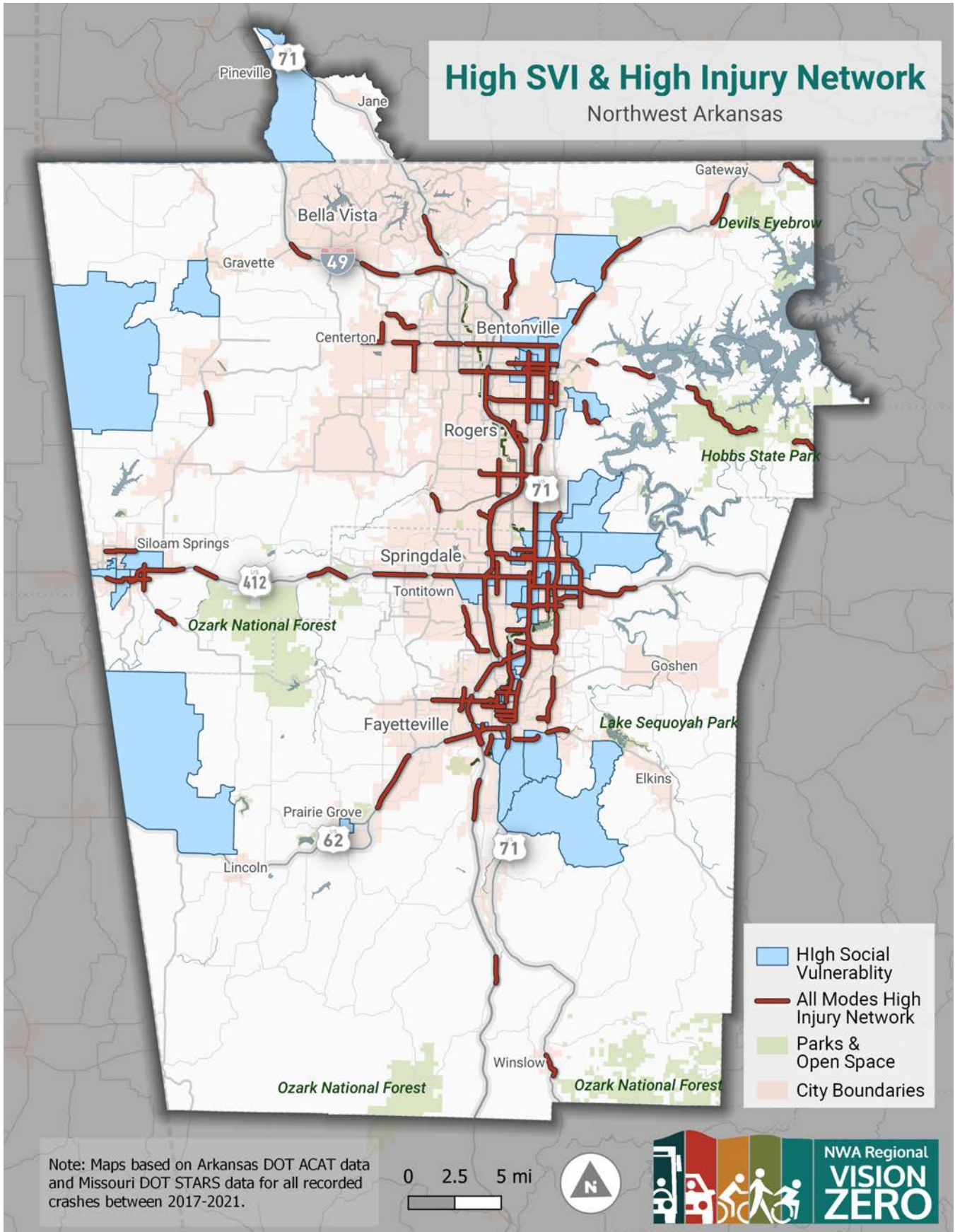




Figure 5: High Injury Network in areas with high SVI.



The scope of this analysis does not include a robust evaluation of accessibility disparities, however, as this project progresses, exploring the impacts and contributing factors of transportation disadvantage will enrich the results and recommendations of the work. Although the focus of this project is safety, accessibility is inherently related; accessibility assumes safety and safe transportation is in service of accessibility to destinations.

Regardless of demographic factors that can limit one's mobility, such as age, ability, and income, expanding quality mobility options can remove some of the restrictions and enable more freedom of movement.

**Qualitative Data:** The quantitative equity analysis provides only part of the puzzle. To understand transportation disparities, we need to understand the lived experience. The best data for this assessment is from community engagement. This data helps define transportation disadvantage, identify areas of safety risk, highlight barriers to access and mobility, and establish the existing conditions and context.

## Advancing Equity

As stated before, an equity analysis is one part of advancing transportation equity. How the information from the analysis is used is key to moving an equity analysis from a mapping exercise to an effective tool. The information from this analysis can be used in equitable distribution of safety investments, storytelling at the regional and local levels, and monitoring how outcomes change over time.

## Equitable Distribution of Safety Investments

The equity analyses are a component of the Safety Action Plan with the express purpose of influencing the decision making related to the results of this project. Recognizing that traffic violence (and other negative outcomes of the transportation system) has disproportionate impacts on BIPOC, low-income households, and other communities that have been marginalized, focusing interventions and improvements to serve these communities advances equity. Using these analyses, investments on HIN in areas with high equity scores may be prioritized or engagement efforts might focus on communities that have more

high-risk roadways and higher equity scores. The results of each of the analysis along with the places and communities where they overlap (Figure 6) will be used to understand where projects may be prioritized and implemented to achieve safe and equitable outcomes.

## Storytelling

NWARPC allocates funding but is not an implementing agency. Additionally, many safety interventions must happen at the local level, although NWARPC has a regional focus. Still, NWARPC can influence equity outcomes through storytelling using the high-level issues and patterns identified in the regional analyses.

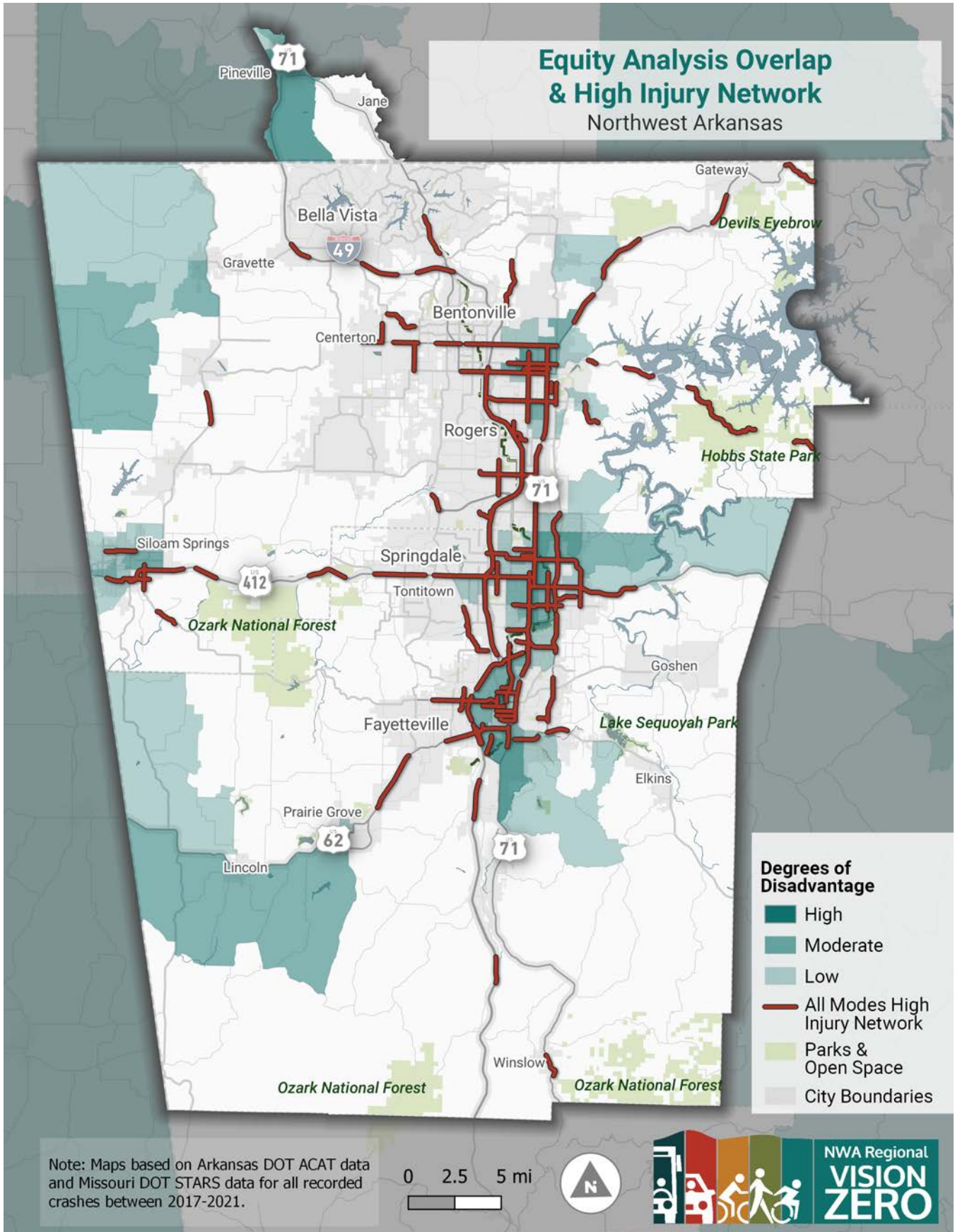
The regional mapping can be used by smaller towns and rural communities with fewer resources to conduct their own analyses. In this way, NWARPC can help these jurisdictions tell the story of their transportation needs and who is vulnerable to mobility limitations.

The story crafted by this analysis can and should be modified based on the results of regional engagement. An equity analysis groups people into broad demographic-based populations, but there are nuances in how people within a population experience the same impact. Furthermore, populations based on demographic data are different than communities that are considered a group based on shared experiences and interests. Demographic data also has geographic bounds (defined by the US Census) that may not align with neighborhood boundaries. As a result, equity analyses present rough estimations of communities and impacts they may experience. These broad analyses also will not capture the lived experience of individuals or how overlapping and intersecting identities that compound mobility impacts.

To facilitate storytelling and examine more individualized outcomes, we can employ the concept of personas. Using the results of the equity and safety risk analyses and engagement, we can distill mobility challenges and contributing factors along with how an individual's identities interact with these challenges. We can use this to craft personalized examples of how individuals throughout the region experience the transportation system. These personas can help make disparate impacts more tangible and also communicate with local jurisdictions.



Figure 6: High Injury Network and Equity Analysis Overlap



## Continued Assessment

As NWARPC evaluates their progress on safety (and other) targets, they can examine progress in addressing disparities. By assessing the distribution of impacts across high SVI areas and demographic groups over time, NWARCP can monitor the impact investment decision are having. In this way, investments can be prioritized to address performance while targeting disproportionate impacts and underinvestment among marginalized communities.

## Recommendations

Equity has largely been considered in the environmental justice and Title VI context, which often creates analyses to address a requirement and mark a checkbox. For example, the long-range plan was developed and the selected projects were overlaid on demographic maps to visualize impacts on racialized and low-income populations. The analysis, however, did not influence which projects were selected or where and how they would be implemented. The equity analysis for the Safety Action Plan considers equity in the initial phases to identify and prioritize locations for interventions and determine types of interventions informed by the analysis and guided by the community.

Starting with the Safety Action Plan, NWARCP can continue to integrate equity analysis into decision making by using the equity analysis to assess potential outcomes like accessibility and use the results to influence which projects are selected and prioritized. This lays the foundation for a more systemic equity framework that uses equity to make decisions throughout the agency.

Additionally, iterating on an equity analysis can fine tune the process over time by adjusting demographic factors and indicators as needed and focusing on various relevant impacts. Repeating the analysis at regular intervals can also help evaluate outcomes over time to monitor improvement and direct ongoing efforts towards equity.

Finally, it is important to remember that inequities are a result of past discrimination, disinvestment, and disenfranchisement. Understanding the history of Northwest Arkansas relative to racialized communities and other key communities can highlight what harms should be redressed. These may not be limited to transportation although they will affect one's mobility. Advancing equity is a continual process; the equity analysis is one step in a multidisciplinary, multi-sectoral endeavor.