Needs Assessment

The City of Little Rock is a diverse community, and transportation needs and opportunities vary from neighborhood to neighborhood. From land use and development patterns to socio-economic and racial demographics to bicycle and pedestrian crash trends, the experience of traveling in Little Rock can be very different depending on who you are and where you live.

The needs assessment for this planning process utilizes two unique data-driven analyses to identify areas in Little Rock where investments in active transportation (biking and walking) infrastructure can have the greatest impact. The first of these analyses is a latent demand analysis, which examines the density of trip origins and destinations like residences, places of employment, parks, schools, and transit stops to identify areas of the city with high potential to support bicycling and walking trips. The second, an equity analysis, examines demographic data at the census block group level to locate higher concentrations of populations for whom bicycling and walking infrastructure investments can have a greater impact on mobility, safety, and access to opportunity.

In addition to these spatial analyses, the needs assessment also examines five years of bicycle and pedestrian crash data to identify trends and other key findings to inform plan recommendations.

Figure 9: Little Rock staff leading a youth bicycle training and group ride event.

Demand Analysis

The land use and transit-based demand analysis provides a general understanding of expected bicycling and pedestrian activity by combining individual spatial analyses representative of where people live, work, play, shop, access public transit, and go to school into a composite sketch of demand for active transportation facilities in Little Rock.

DEMAND METHODOLOGY AND SCORING

Categorical data representing each demand factor (e.g., live, work, play) are processed individually. The resulting values for each category are spatially joined to a uniform point grid that is used to develop a visual representation of category density using GIS-based kernel density tools. The result is a model of demand for bicycle and pedestrian facilities accounting for the impacts of destination proximity and density. Each category and its data sources are listed in the table below.

Scores increase for areas that have a high density of destinations that are close together, like a downtown. Scores decrease in areas with lower densities of destinations that are further apart such as fringe strip commercial. Thus, on the demand maps that follow, the highest density/usage/activity locations do not represent specific physical facilities, but rather represent relative higher use zones or hot spots.

Categories are scored on a scale of one to five based on density and proximity and then combined with equal weighting to develop a composite demand score. Individual and composite representations of demand for bicycling and walking facilities are important factors in the planning process. The finding from this analysis will inform bicycle network recommendations and project prioritization.

Table 3. Demand Model Inputs

| INPUT CATEGORY	DATA SOURCE
Residential Density	US Census Bureau American Community Survey (ACS) 2019 block group-level population data (5-year estimate)
Employee Density	US Census Bureau 2018 Longitudinal Employee Household Dynamics (LEHD) block-level total employment
Retail, Dining, & Entertainment Employee Density	US Census Bureau 2018 LEHD block-level employment for retail, dining, and entertainment labor categories
Educational Facilities Density	Location of early childhood centers, elementary schools, middle schools, high schools, private primary and secondary schools, and post-secondary schools
Recreational Facilities Density	Location of public parks (excluding golf courses) and paved trails
Transit Route Density	Rock Region METRO transit route location (excluding route segments on interstate highways)

Demand Analysis Results

The results of the demand analysis are presented in the following map series, beginning with the composite demand map below.

COMPOSITE DEMAND

The composite demand map combining all categories is shown in Map 3. Composite demand represents the combined relative densities of population, employment, retail employment, and trip-generating land uses like schools, parks, trails, and transit stops. Demand for active transportation facilities is higher (shown in darker blue) in Downtown Little Rock, neighborhoods along I-630 to the west, and along other major corridors like Kavanaugh Boulevard, Markham Street, Chenal Parkway, Rodney Parham Road, University Avenue, Baseline Road, and Geyer Springs Road.

Map 3: Composite Demand for Active Transportation Facilities
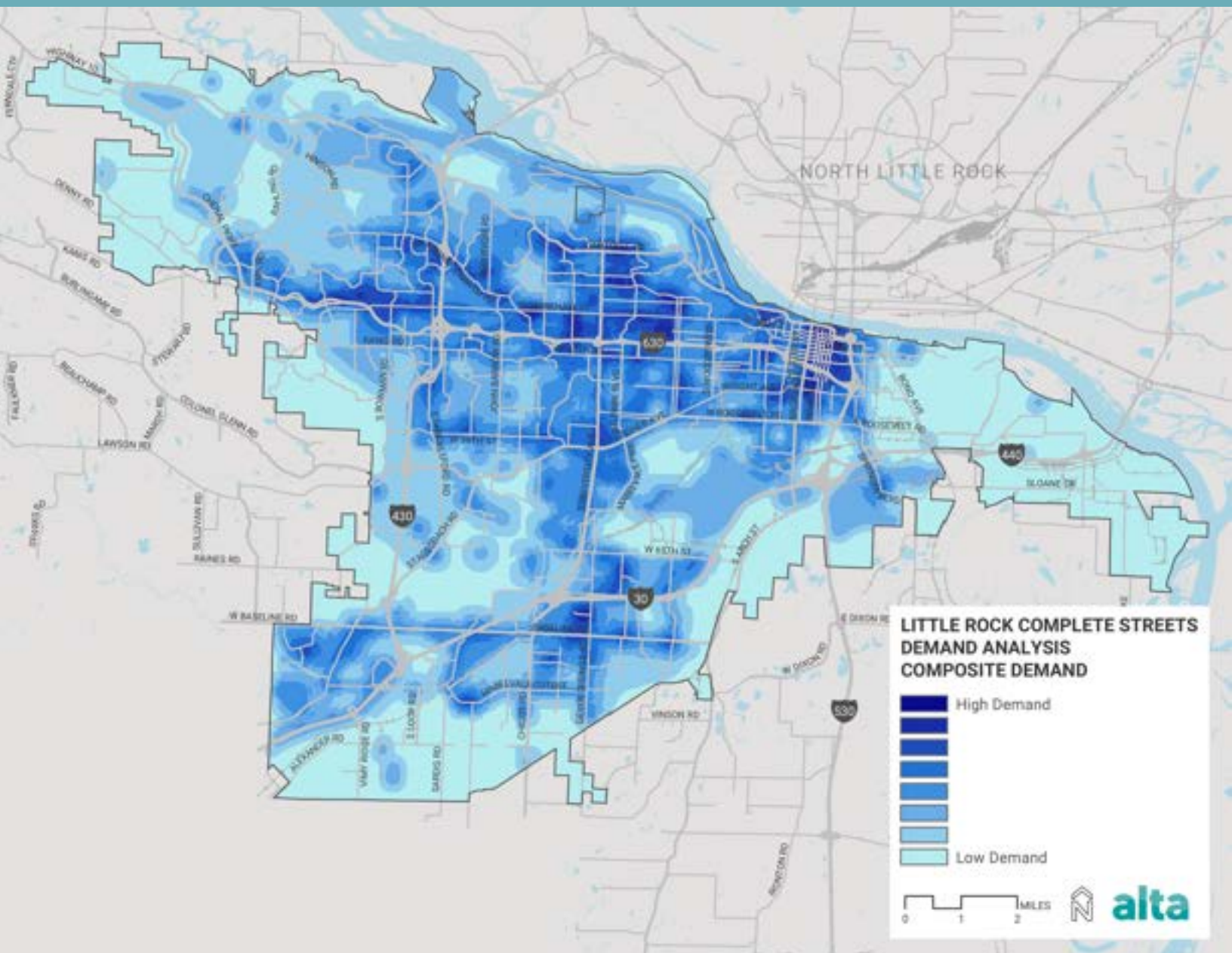
WHERE PEOPLE LIVE

This category examines 2019 census block group-level population to explore residential density patterns across the City. These locations represent potential trip origin locations. More trips can be made in areas with higher population density if conditions are right. The results for this category are shown in Map 4. Pockets of high residential density are dispersed throughout Little Rock and include neighborhoods like East of Broadway, Forest Hills, Hope, Capitol View/Stifft's Station, Hillcrest, Midtown, Otter Creek, Cloverdale, and parts of John Barrow.

Map 4: Residential Density

LITTLE ROCK COMPLETE STREETS
DEMAND ANALYSIS
LIVE: POPULATION DENSITY

High Density

Low Density
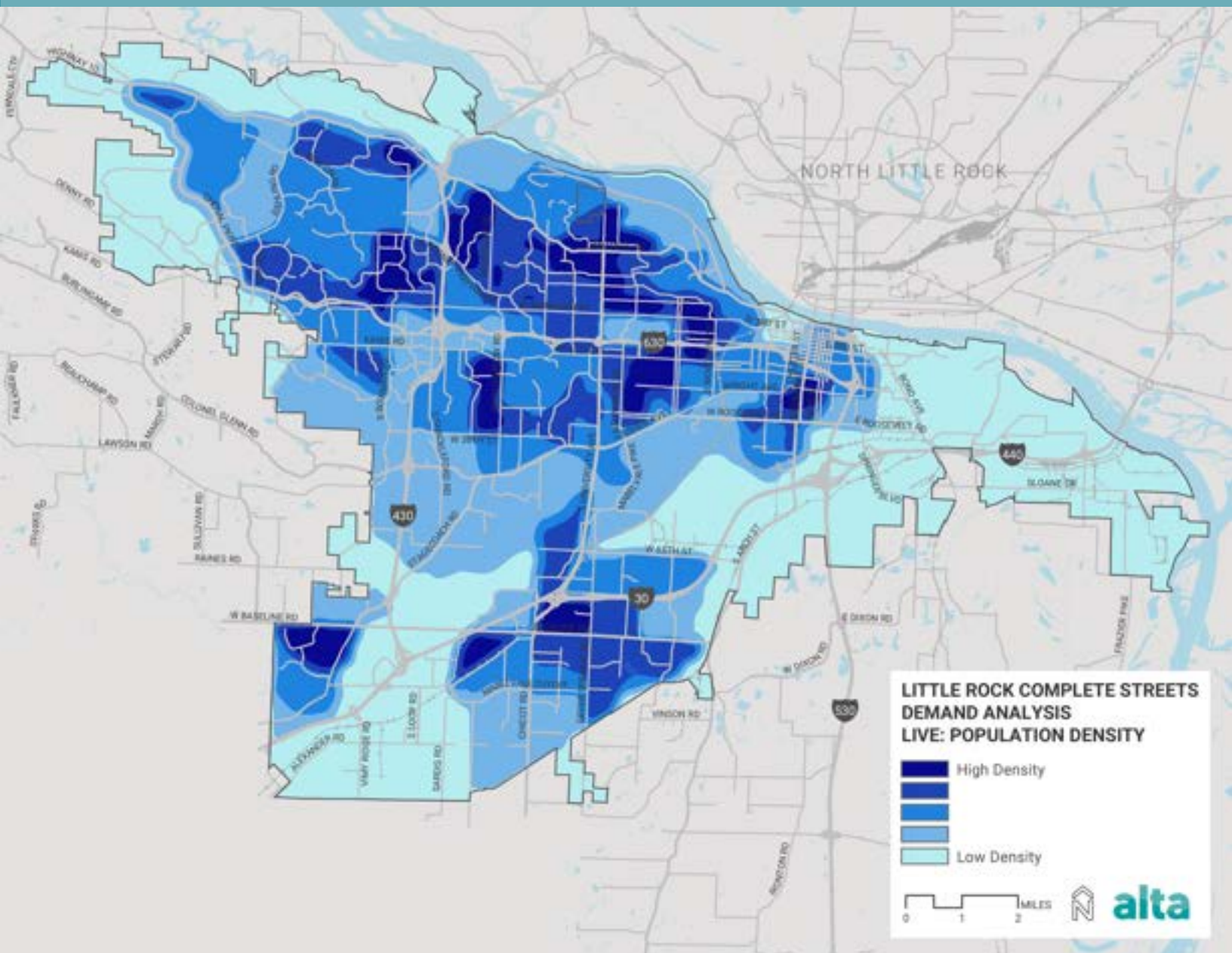
WHERE PEOPLE WORK

This category represents employment destinations for people working in Little Rock, regardless of residency. Its basis is 2019 total employment density by census block group. Depending on the type of job, employment can act as a trip attractor (i.e., retail stores or cafes) or trip generator (i.e., office parks and office buildings) or both. Specific employment types, such as retail, are also used in the *Where People Shop* category.

The results of the employment category are shown below in Map 5. While businesses and employers are located throughout Little Rock, the relative density of employment varies significantly, resulting in a small number of high-density employment areas, including Downtown Little Rock; medical campuses like UAMS, CHI St. Vincent, and Baptist Health Medical Center; light industrial uses in Wakefield and Upper Baseline; and commercial nodes like at Asher and University Avenues, Markham Street and University Avenue, Rodney Parham Road and I-430, Markham Street and Shackleford Road, and Markham Street and Chenal Parkway.
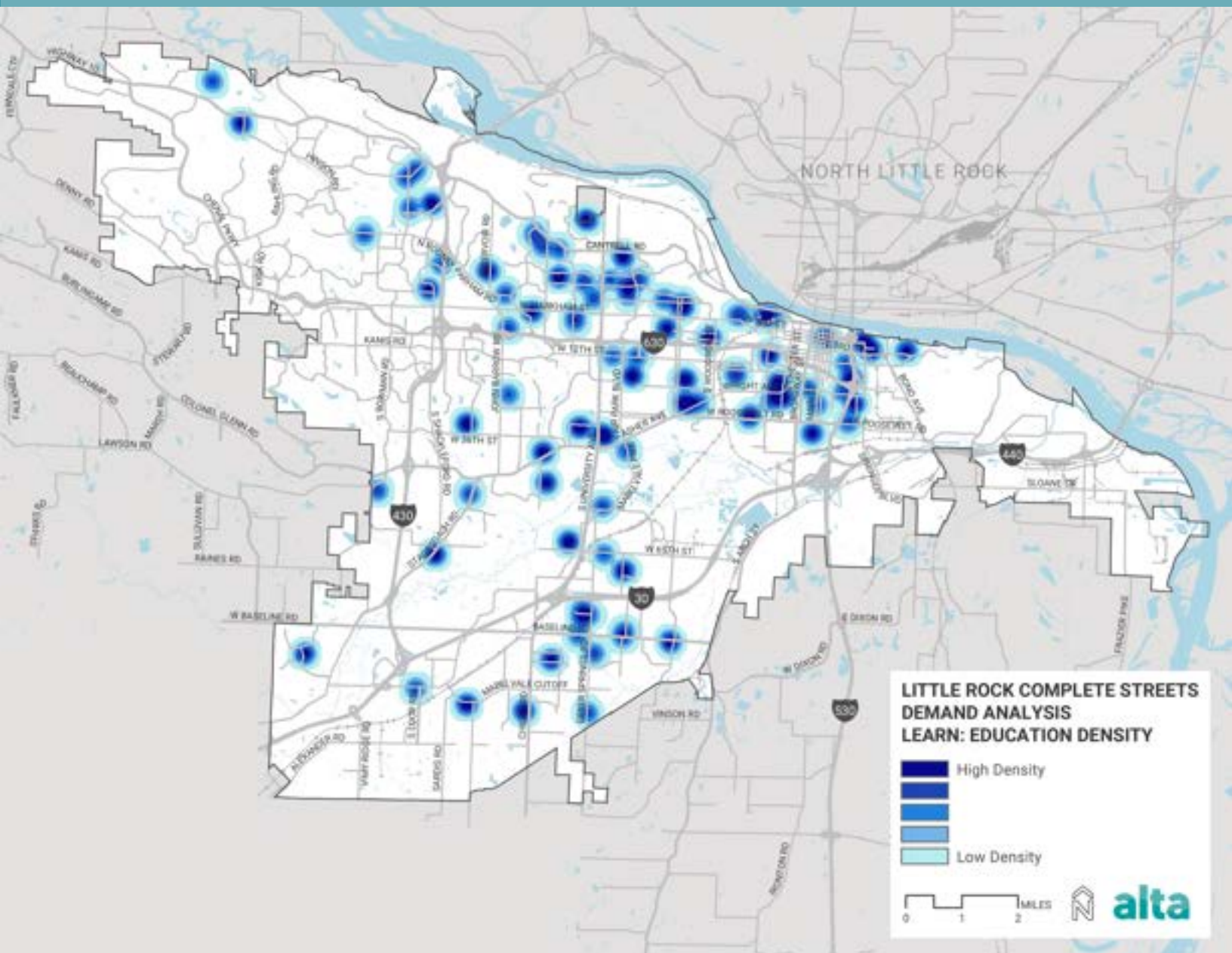
Map 5: Employment Density

LITTLE ROCK COMPLETE STREETS
DEMAND ANALYSIS
WORK: EMPLOYMENT DENSITY

High Density

Low Density
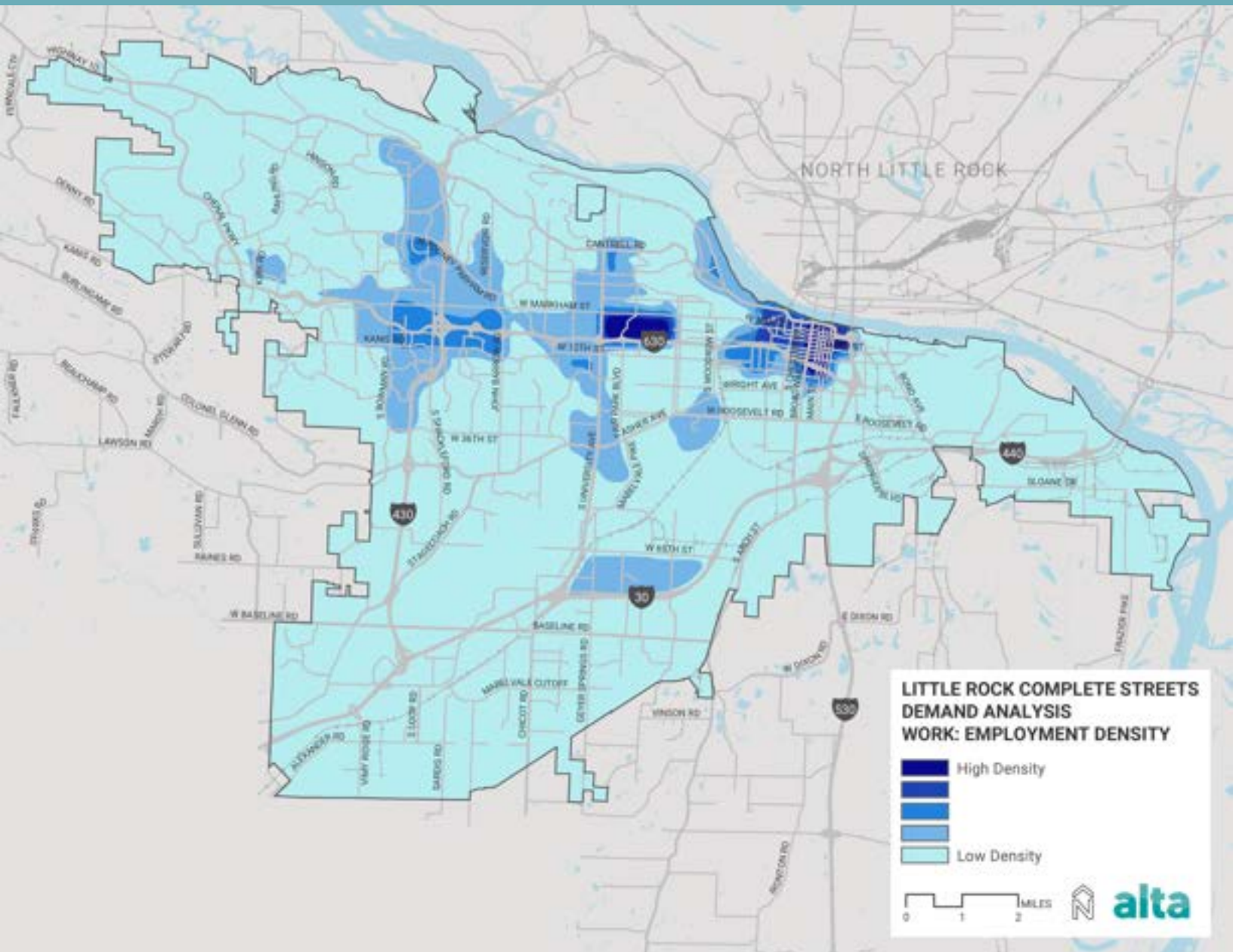
WHERE PEOPLE LEARN

This category shows demand for bicycling and walking based on the locations of all public and private elementary, middle, and high schools, as well as post-secondary education institutions like community colleges, colleges, and universities. Shown below in Map 6, the results for this category show that schools are dispersed throughout the City and generally align with residential development patterns. Higher concentrations of schools are located in more dense residential areas surrounding Downtown and Wards 1, 2, 3 and 4. Investments in active transportation infrastructure in these neighborhoods can support more active transportation trips to school and reduce automobile activity during morning and afternoon hours, creating safer conditions for biking and walking school trips.
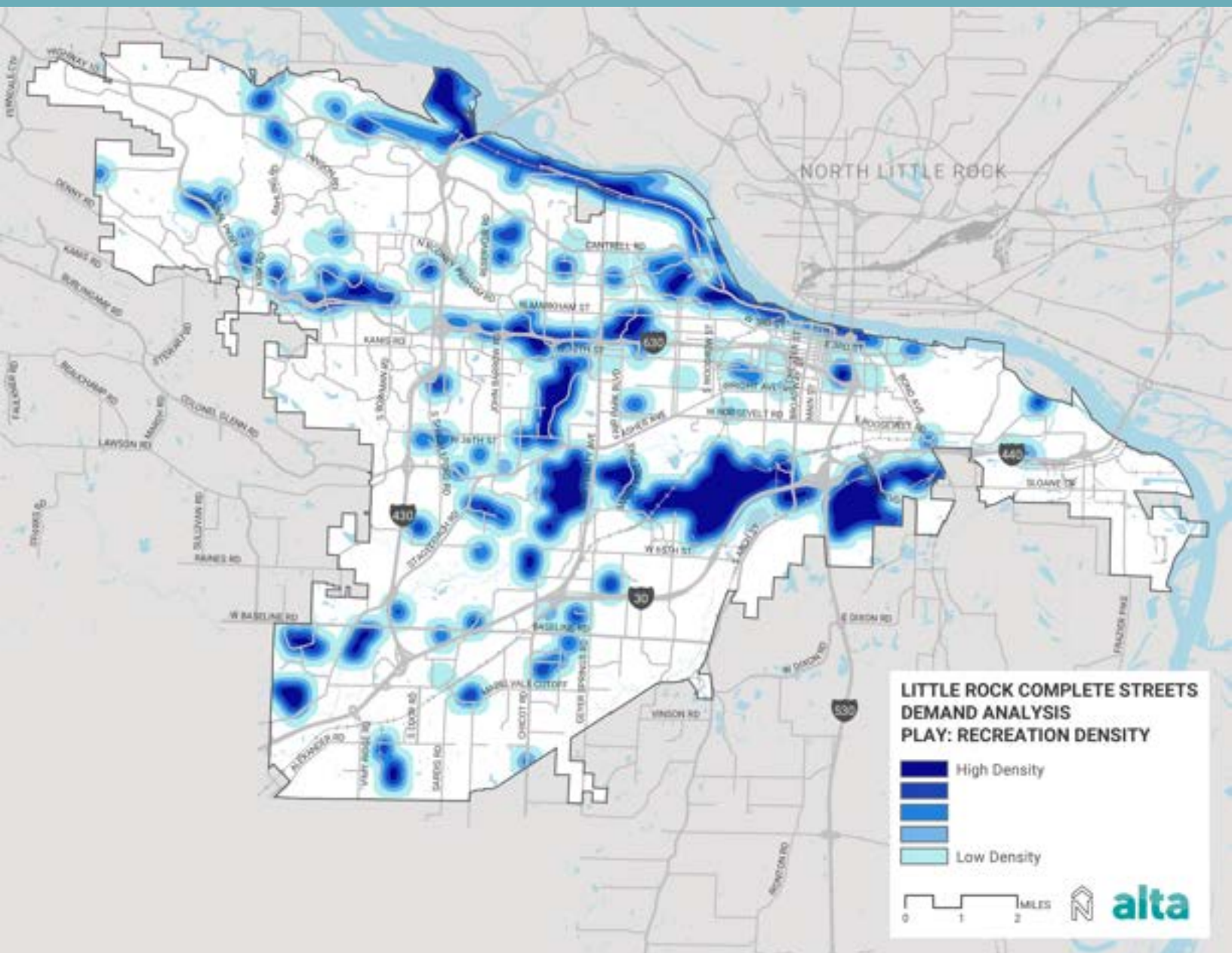
Map 6: Primary, Secondary, and Post-Secondary School Density

LITTLE ROCK COMPLETE STREETS
DEMAND ANALYSIS
LEARN: EDUCATION DENSITY

High Density

Low Density

WHERE PEOPLE PLAY

The *Where People Play* category examines the density of parks and trails in Little Rock. Map 7 displays the results of this category. Smaller neighborhood parks are dispersed throughout Little Rock and represent destinations for short bicycling and walking trips from nearby residences. Larger regional parks and recreation areas like Fourche Bottoms, Gilliam Park, Western Hills Park, Hindman East Park, River Mountain Park, and Two Rivers Park are located in less developed areas, often along riparian corridors and in floodplains. Linear trails are also an integral component of the City's parks and recreation system, serving as both transportation corridors between neighborhoods and parks, and as destinations in and of themselves. The Arkansas River Trail, Coleman Creek Greenway, Rock Creek Trail, the I-630 Trail all provide links to nearby parks, schools, neighborhoods, commercial districts, and cultural destinations while also serving as trip attractors for bicyclists, walkers, joggers, and other non-motorized users.

Map 7: Park and Trail Density

LITTLE ROCK COMPLETE STREETS
DEMAND ANALYSIS
PLAY: RECREATION DENSITY

High Density

Low Density

WHERE PEOPLE ACCESS TRANSIT

Rock Region METRO provides the City of Little Rock and surrounding communities with bus transit services. Many people who take the bus to school, work, or other destinations throughout the city begin and end their journeys on bike or foot. Safe, convenient, and accessible on-street bikeways, trails, and sidewalks can increase access to transit. Map 8 displays the density of fixed transit routes based on the future system. For the purposes of this analysis, segments of routes that travel on interstate highways have been removed because there are no bus stops along these portions of a route. Transit density is highest in Downtown Little Rock and neighborhoods to the west and immediate south, where multiple routes intersect, overlap, or run parallel to one another.

Map 8: Transit Route Density

LITTLE ROCK COMPLETE STREETS
DEMAND ANALYSIS
TRANSIT: ACCESS DENSITY

High Density

Low Density
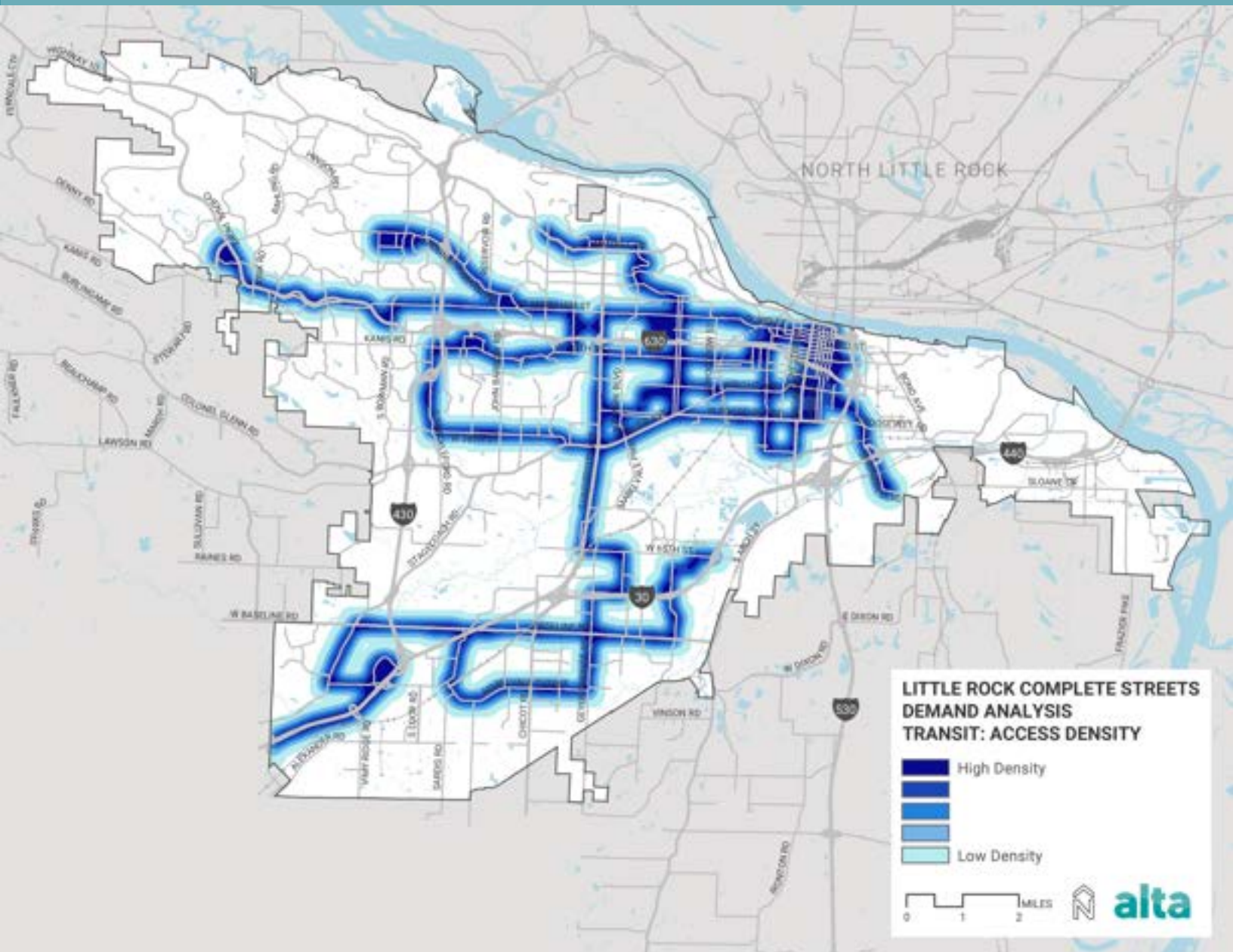
WHERE PEOPLE SHOP

This category examines 2019 census block group-level retail employment as a proxy for retail, dining and entertainment destination density. As Map 9 indicates, there are a small number of high-density commercial nodes located across the City. These include Downtown Little Rock, Markham Street and University Avenue, Markham Street and Shackleford Road, Markham Street and Chenal Parkway, Chenal Parkway and Bowman Road, Rodney Parham Road and Shackleford Road, and Asher Avenue and University Avenue. While lower density, other arterial corridors still offer commercial destinations for surrounding neighborhoods and subdivisions, including segments of Markham Street, Cantrell Road, Kavanaugh Boulevard, Baseline Road, Chenal Parkway, Rodney Parham Road, and Roosevelt Road.

Map 9: Retail Employment Density

LITTLE ROCK COMPLETE STREETS
DEMAND ANALYSIS
SHOP: RETAIL JOB DENSITY

High Density

Low Density
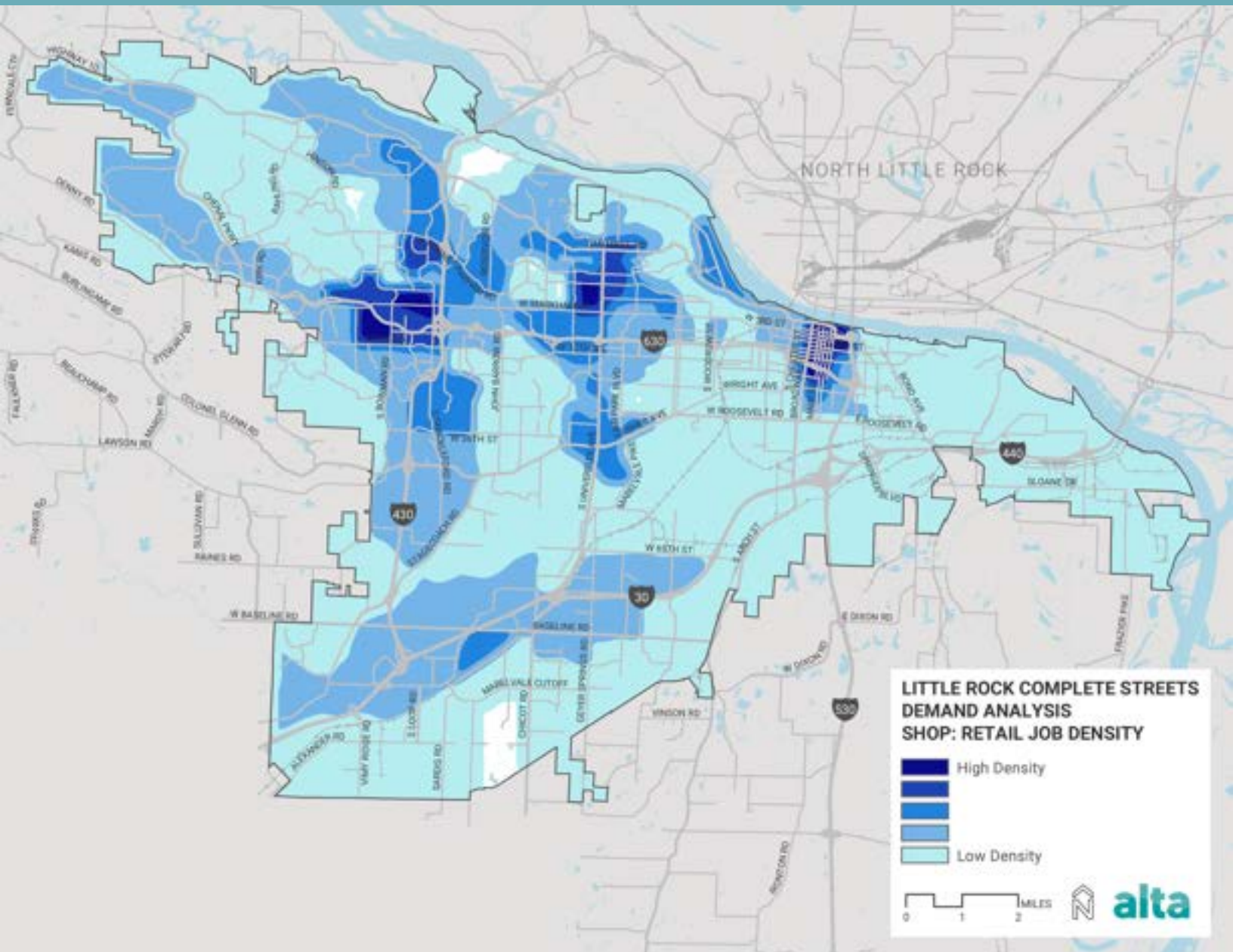
Equity Analysis

Not everyone has equal access to a wide range of convenient, safe and affordable means of transportation. Many people in Little Rock have a hard time getting to work, accessing healthy foods, seeing a doctor, going to school, or connecting with others. Referenced here as "communities of concern", the following analysis considers populations who have been historically disadvantaged or are otherwise considered vulnerable to unsafe, disconnected, or incomplete active transportation facilities. These communities - who may experience challenging financial, health and housing circumstances, and/or physical or communication limitations - are prevented from fulfilling basic needs without safe, convenient transportation options.

When cities have the resources to provide mobility options, communities of concern can experience improved access to jobs, housing and other critical services. Equity recognizes that different people experience different barriers to securing their needs.[1] Working towards equity may mean prioritizing Complete Streets funding in areas with a greater concentration of disadvantaged populations instead of distributing funding equally based on geography. Investing in active transportation facilities in areas of highest need will likely improve access to public health and economic/job

1 Center for Infrastructure Equity. Transportation Equity. PolicyLink. 2016. http://www. policylink.org/focus-areas/infrastructure-equity/transportation-equity.

opportunities. It is important to note however, that development of a Complete Streets network is just a start. Though beyond the scope of this Plan, other cultural, economic, law-enforcement and political changes are needed in Black, Hispanic, Native American, and immigrant communities to ensure people have full access to a range of safe, accessible, and convenient transportation choices.

The equity analysis uses publicly-available demographic data from the US Census Bureau to identify communities of concern for whom investments in bicycling, walking, transit access, and Complete Streets can improve transportation choices and access to opportunity. The results of this analysis will inform the identification and prioritization of recommendations as part of this planning process.

METHODOLOGY

The equity analysis uses demographic information from the US Census Bureau to examine geographic distribution of communities of concern using six key indicators listed below in Table 4. All data was obtained from the 2019 American Community Survey (ACS) 5-year estimates, and the analysis was conducted at the Census Block Group level for all block groups within the City of Little Rock. These indicators were then combined (with equal weighting) to create a composite equity score.

Table 4. Equity Indicators

| CATEGORY	INDICATOR
Race/Ethnicity	People of color and Hispanic or Latino Population
Age	Children (under 18 years old) and seniors (over 64 years old)
Income	At or below 200% of federal poverty level
Educational Attainment	No high school diploma
Commute	No access to a motor vehicle
Linguistic Isolation	Does not speak English well or at all

Equity Analysis Results

The six indicators used for this analysis received equal weighting and were combined to determine the composite equity score. The composite equity map is displayed below, followed by separate maps for each equity indicator. For all maps, the darker blue census block groups represent areas with higher concentrations of communities of concern, while the lighter blue block groups represent areas with lower concentrations of communities of concern.

COMPOSITE EQUITY

Composite equity results are shown below in Map 10. While higher concentrations of communities of concern can be found throughout Little Rock, the majority of census block groups with higher concentrations are located in Wards One, Two, Six, and Seven. These areas range from more densely populated neighborhoods in and around the urban core to less dense suburban and rural neighborhoods and communities. Areas include parts of Downtown, East Little Rock, Central High, Oak Forest, South End, Wakefield, and Windamere.

Map 10: Composite Equity

LITTLE ROCK COMPLETE STREETS
EQUITY ANALYSIS
COMPOSITE EQUITY

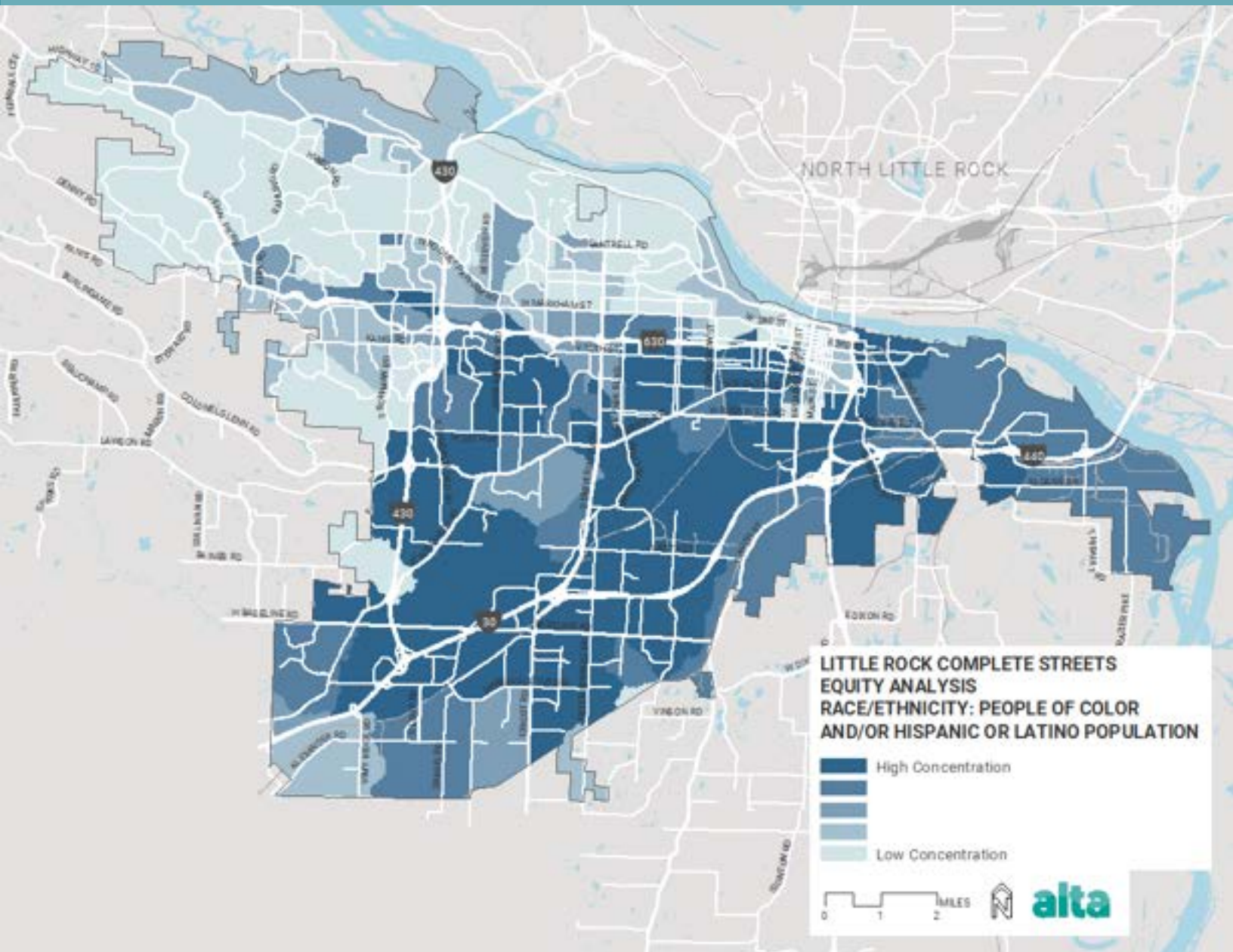High Concentration

Low Concentration
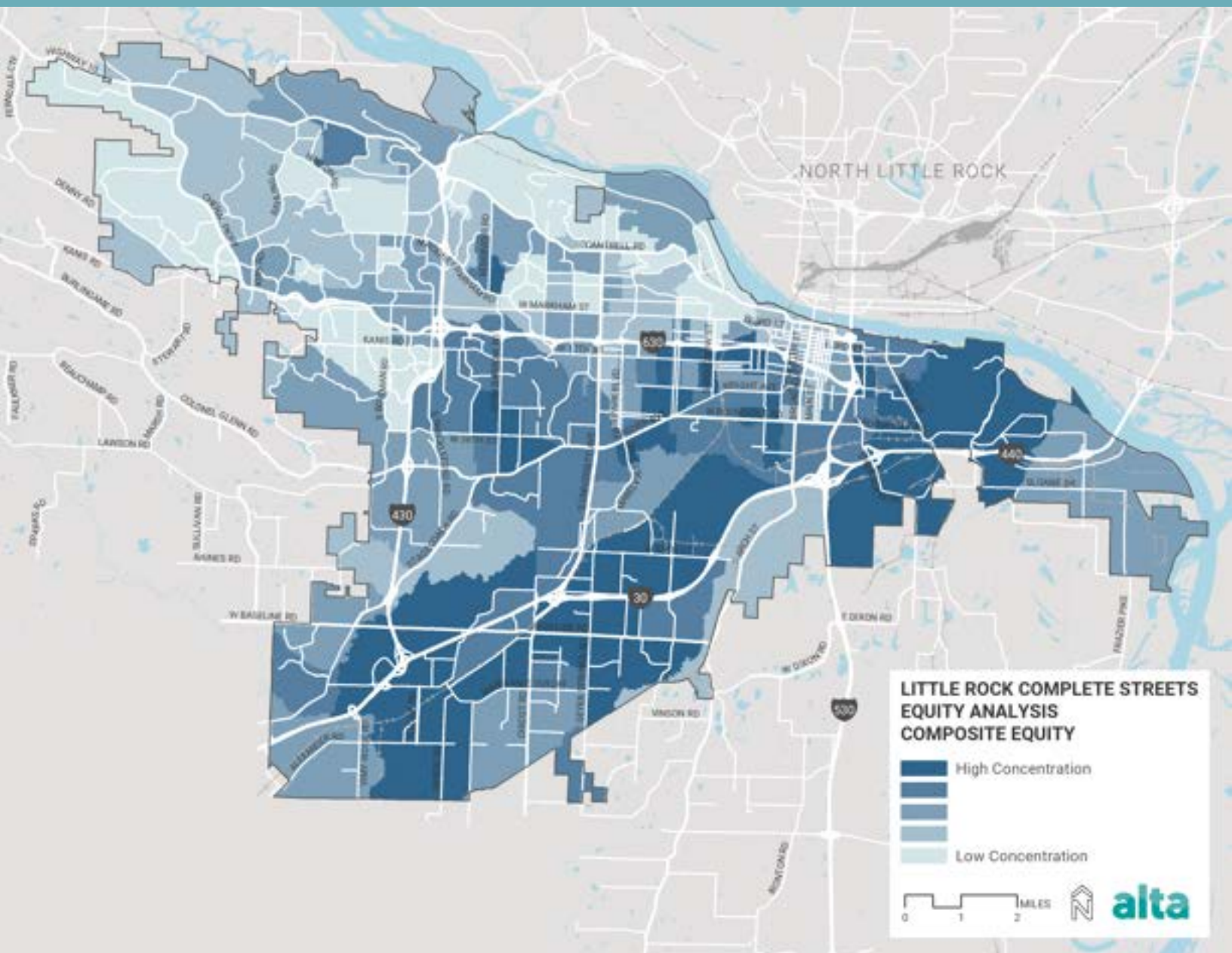
RACE

People of color and Hispanic or Latino populations are more likely to live in areas with poor or limited active transportation facilities, educational opportunities, job resources, and healthy food outlets.[2,3] Nationally, people of color populations tend to be more dependent on transit and active transportation; black individuals are more than four times and Hispanic or Latino individuals are three times more likely to not have access to a household car compared to their white counterparts, regardless of income.[4] As illustrated in Map 11, there is a stark racial divide along I-630, with the majority of people of color and Hispanic or Latino residents in Little Rock located south of the interstate.

2 Smart Growth America. Benefits of Complete Streets: Complete Streets Mean Equity Streets. https://smartgrowthamerica.org/app/uploads/2016/08/cs-equity.pdf. Accessed December 2016.
3 Dannenberg A, Frumkin H, Jackson R. Making Healthy Places. 1st ed. Washington D.C.: Island Press; 2011.
4 Berube A, Deakin E, Raphael S. Socioeconomic Differences in Household Automobile Ownership Rates: Implications for Evacuation Policy. Brookings Inst. 2006.

Map 11: Race/Ethnicity Equity Indicator

LITTLE ROCK COMPLETE STREETS EQUITY ANALYSIS
RACE/ETHNICITY: PEOPLE OF COLOR AND/OR HISPANIC OR LATINO POPULATION

High Concentration

Low Concentration

AGE

Children and seniors have different transportation needs and abilities than most adults. The population under 18 years of age is thought to have higher active transportation infrastructure need because they have less access to motor vehicles and may rely more on alternative modes of transportation. Older adults increasingly depend on active transportation modes, such as using public transit, walking, and/or biking when they decrease or stop driving.

The distribution of children and seniors in Little Rock as illustrated below in Map 12 does not align with other correlated indicators like race, education, and income. Higher concentrations of seniors and children are dispersed throughout the city, in some cases highlighting aging communities and larger senior living facilities, and in other cases neighborhoods with young families.

Map 12: Age Equity Indicator

LITTLE ROCK COMPLETE STREETS
EQUITY ANALYSIS
CHILDREN AND SENIORS

High Concentration

Low Concentration
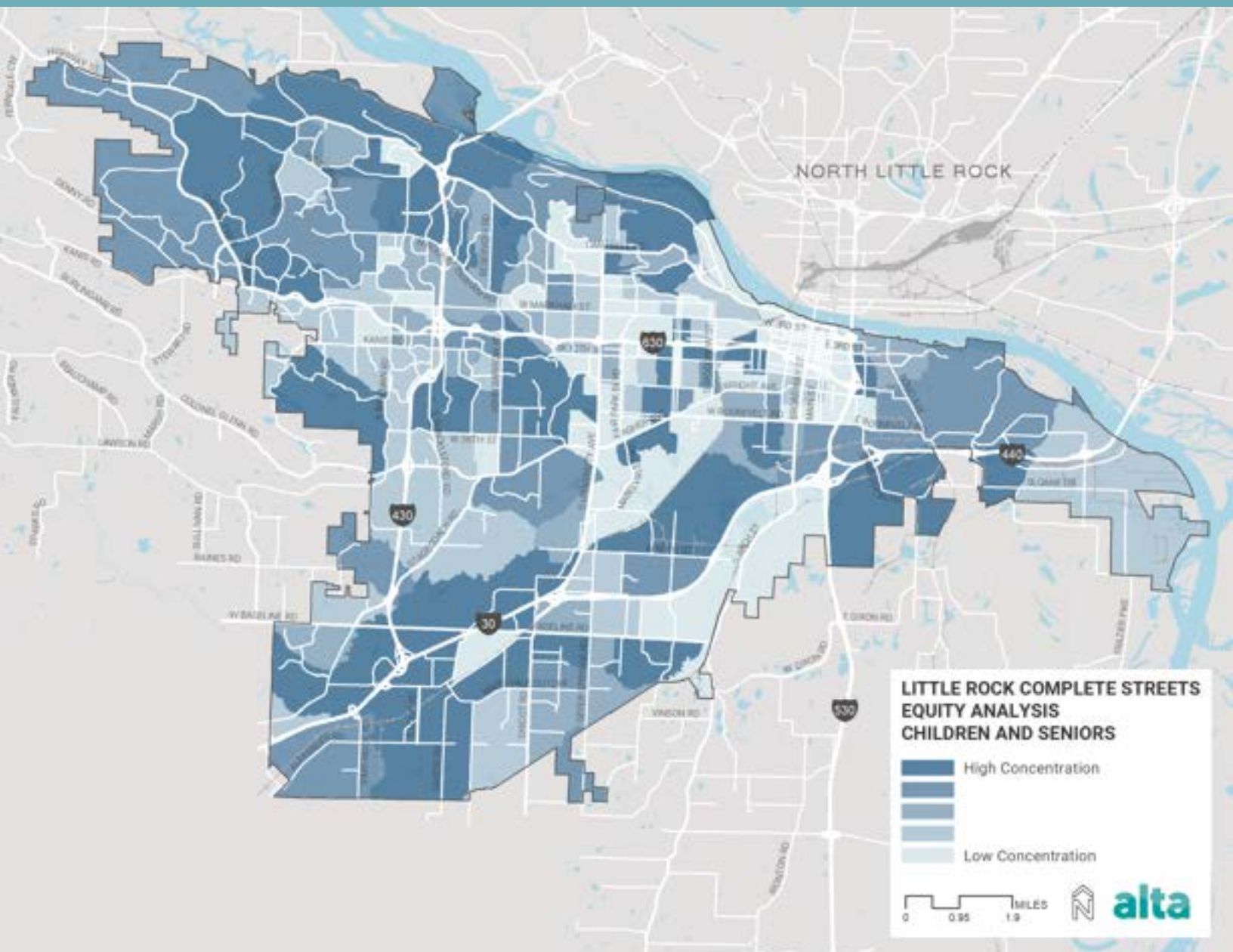
INCOME

Populations with higher levels of poverty may have limited access to vehicles and rely more on active transportation networks to access daily trips. Even with increased dependence on non-automotive transportation, low-income residential areas are often less bikeable and walkable, a condition that creates barriers to living safe, social, and active lives.[3, 5]

Locations of higher concentrations of Little Rock residents living at or below 200% of the federal poverty level closely align with racial and educational equity indicators. Higher concentrations of low-income households are located in the areas surrounding Downtown Little Rock and neighborhoods to the west, southwest, and east.

5 Active Living by Design. Low Income Populations and Physical Activity. 2012.

Map 13: Income Equity Indicator

LITTLE ROCK COMPLETE STREETS EQUITY ANALYSIS AT OR BELOW 200% OF FEDERAL POVERTY LEVEL

High Concentration

Low Concentration
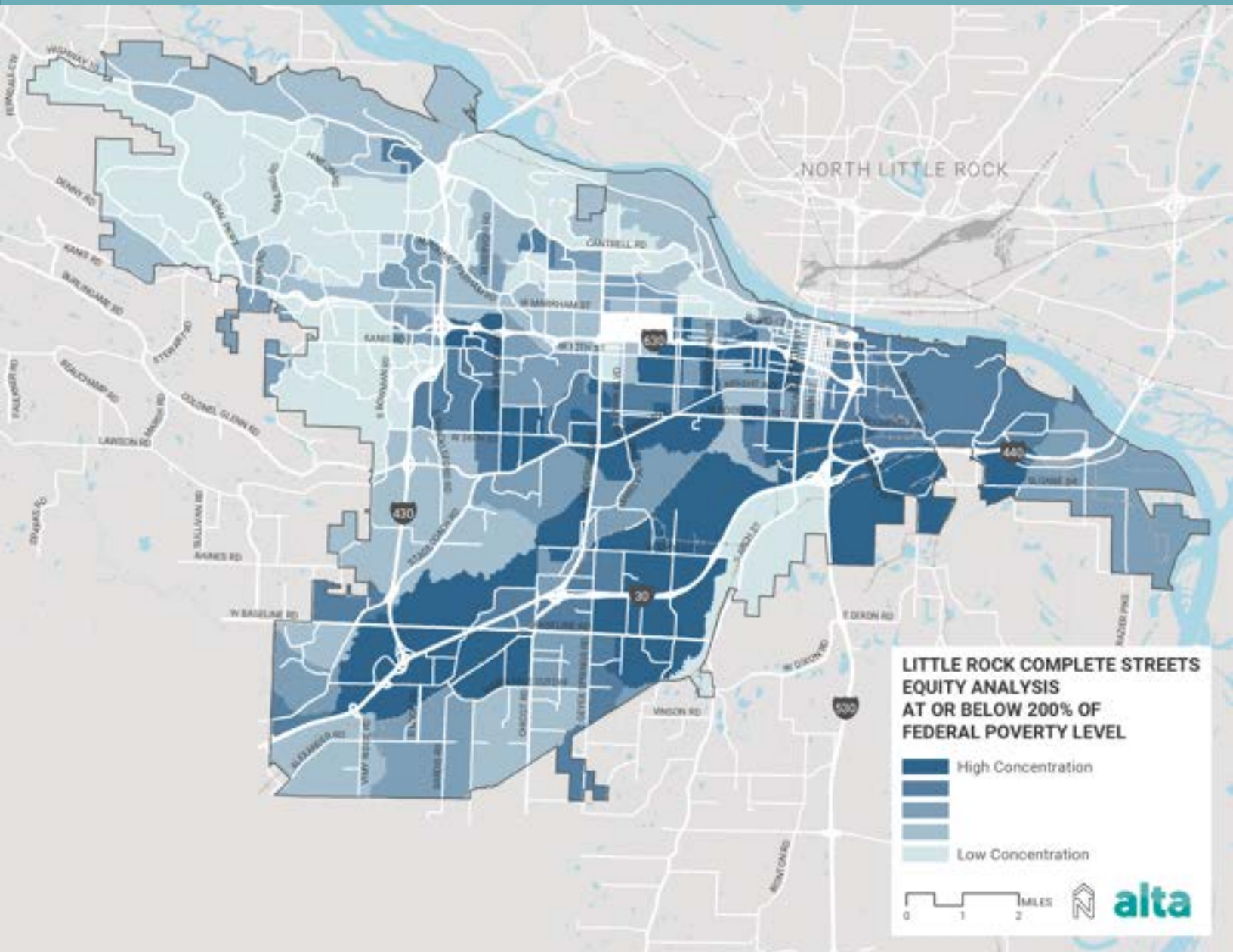
EDUCATION

Nationwide, those without high school diplomas have the second highest rates of bicycling and the highest rates of walking to and from work.[6] These individuals may depend on bicycling and walking due to financial constraints and lack of adequate and/or convenient transportation options. Educational attainment, as a socioeconomic indicator, correlates with income levels. Therefore, although this population is most likely to bike or walk to work, individuals without high school diplomas tend to live in areas without adequate bicycling and walking facilities.[3] Boosting active transportation resources in areas where these individuals reside could promote increased access to educational resources and job opportunities.

As shown in Map 14 below, residents without a high school diploma are most concentrated in neighborhoods to the immediate east and west of Downtown, south of the I-630 corridor, and along the I-30 corridor in Wards 2 and 7.

6 Mckenzie B. Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012. Am Community Surv Reports. 2014.

Map 14: Education Equity Indicator

LITTLE ROCK COMPLETE STREETS
EQUITY ANALYSIS
NO HIGH SCHOOL DIPLOMA

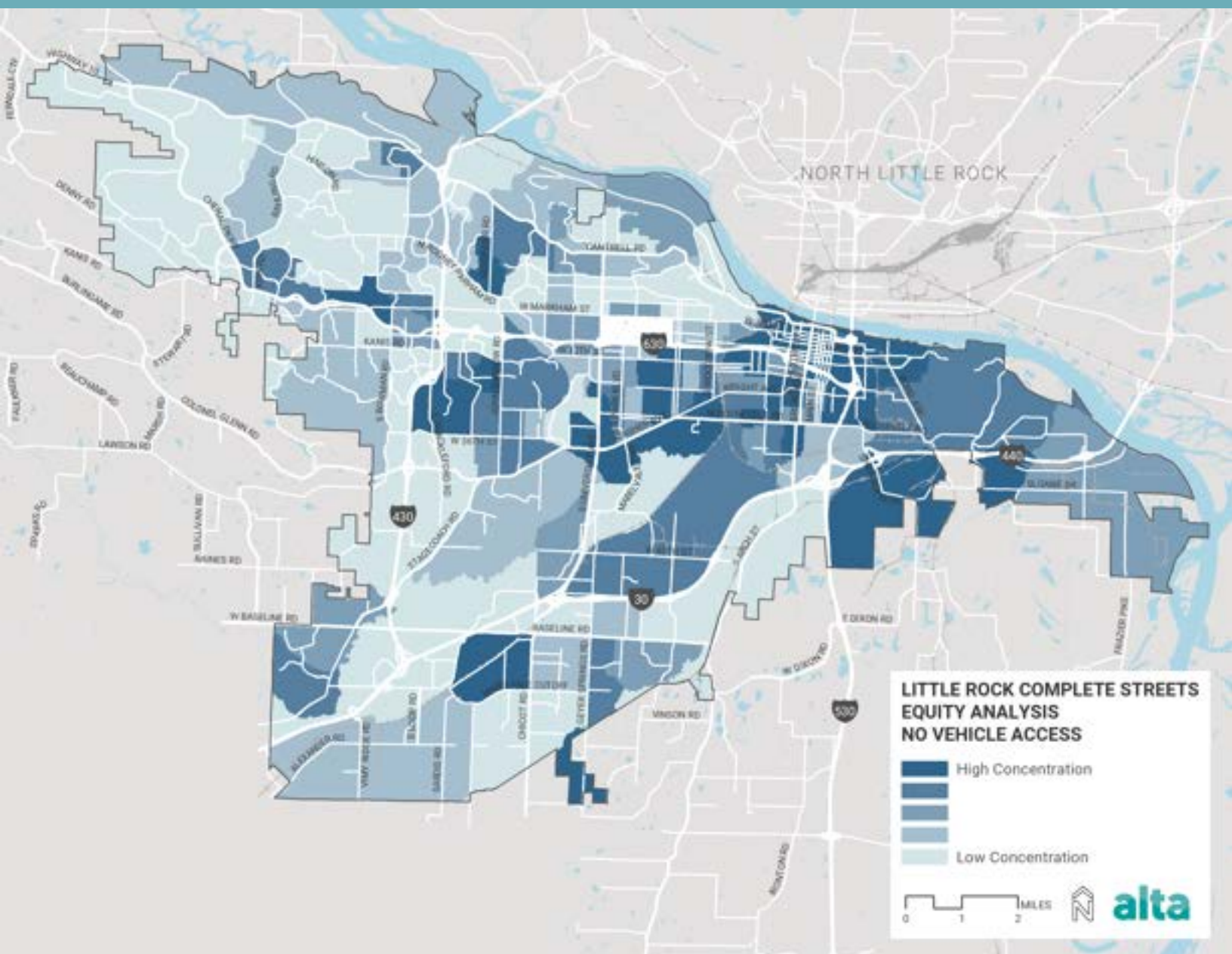High Concentration

Low Concentration
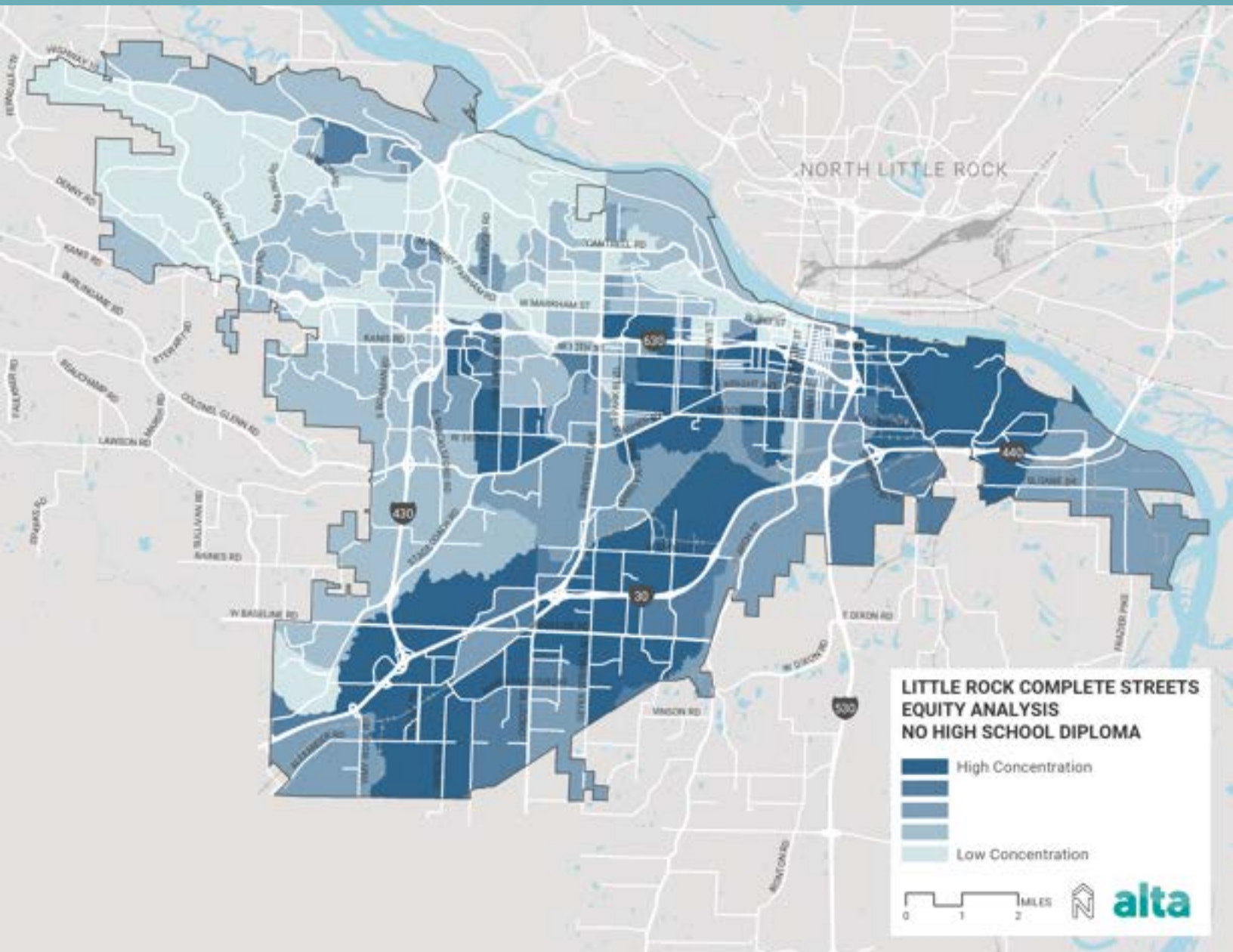
COMMUTE

In less urbanized locations, specifically those with limited transit access and coverage, access to a motor vehicle carries strong implications for one's ability to reach employment, access healthy foods, and reach basic services.[7] A diverse transportation system that offers multiple modes, including transit, bicycling, and walking, reduces reliance on automobiles and can provide for more equitable access to services.[8] Providing access via quality bicycling and walking infrastructure is one method for increasing equity in access for locations with limited vehicle availability.[8]

More than 6,700 (8.2%) households in Little Rock do not have access to a motor vehicle, and an additional 34,800 (42.5%) households have only one vehicle available. Higher concentrations of households that lack access to a motor vehicle are located in and around Downtown Little Rock, in neighborhoods west of Downtown and south of I-630, and in neighborhoods to the east and southeast of Downtown.

7 Blumenberg E., Pierce G., Smart M. Transportation Access, Residential Location, and Economic Opportunity: Evidence from Two Housing Voucher Experiments. Cityscape. v17
8 Litman T. Evaluating Transportation Equity: Guidance For Incorporating Distributional Impacts in Transportation Planning. Victoria Transp Policy Inst. 2016;8(2):50-65. http://ecoplan.org/wtpp/wt_index.htm. Accessed October 15, 2016.

Map 15: Commute Equity Indicator

LITTLE ROCK COMPLETE STREETS
EQUITY ANALYSIS
NO VEHICLE ACCESS

High Concentration

Low Concentration

LINGUISTIC ISOLATION

Individuals with Limited-English Proficiency (LEP), or who identify as not speaking English well or at all, tend to rely more on active transportation as their primary means of transportation than the average English speaker.[9] General low economic status of LEP individuals may correlate with low car ownership rates and high reliance on active transportation facilities.[9] Given low car ownership and poor active transportation conditions, immigrants and LEP individuals are more likely to walk and ride along roads that lack appropriate biking and walking facilities, forcing individuals into unsafe transportation situations.[9]

As shown below in Map 16, the highest densities of people with limited English proficiency are located primarily in Wards 2, 6, and 7.

9 Liu R, Schachter H. Emergency Response Plans and Needs of Communities with Limited English Proficiency. Transp Res Rec J Transp Res Board. 2007;2013:1-7. doi:10.3141/2013-01.

Map 16: Linguistic Isolation Equity Indicator

LITTLE ROCK COMPLETE STREETS EQUITY ANALYSIS NON-ENGLISH SPEAKING

High Concentration

Low Concentration