



Regional Market Analysis

Wake and Durham Bus Plans

December 2021

N NELSON
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1 – Overview

Overview

The Wake and Durham Bus Plans project aims to guide short- and medium-term investments for Wake and Durham Counties. One of the first steps of creating the plan is to conduct a market analysis, a comprehensive analysis of transit demand in the region. The Bus Plans Market Analysis will build off the county-based analyses conducted as part of the Wake, Durham, and Orange County Transit Plans. The results of this market analysis will help determine where to focus bus-related transit investments in the Triangle Region. Combined with the results of the county transit plans' market analyses, this analysis will help inform the goals and approach of the Bus Plan update and Short-Range Transit Plans (SRTPs) in collaboration with the individual transit agencies.

The purpose of this market analysis is to provide a picture of where current and potential transit riders live, work, and travel to, and how that compares to where there is currently transit access. This includes looking at density, travel patterns, and other factors throughout the region, and where different types of transit would be supported. This market analysis focuses on understanding where there is demand and need for public transit, so that investments can be made in a way that will improve bus service for existing riders and encourage more people to use transit services.

APPROACH

In order to understand the demand and need for public transportation services in the Triangle Region (Wake, Durham, and Orange counties), the project team analyzed densities, socioeconomic factors, travel patterns, and changes over time. These analyses include:

- Current population density, as well as socioeconomic characteristics that are related to transit propensity
- Employment density, including an analysis of the location of employment types that attract additional trips

- Composite transit demand, combining the adjusted population and employment densities, which shows the potential transit service that may be supported throughout the region
- Current transit accessibility to jobs, and how that overlaps with demand to identify areas of high need
- The locations of major activity centers in the region that will attract trips beyond the number of jobs
- Projected travel patterns in 2035 from a previous regional study
- Population and employment density changes from 2016 to 2020 and from 2020 to 2040
- Population density, employment density, and composite demand projections for 2040

KEY DATA SOURCES

Data for this market analysis comes primarily from the following sources:

- CAMPO and DCHC MPO, from 2050 Metropolitan Transportation Plan (MTP) efforts
- US Census American Community Survey 2019 5-year estimates
- Triangle Region Onboard Surveys
- University of Minnesota Accessibility Observatory
- The Freeway And Street-based Transit ("FAST") Network Study

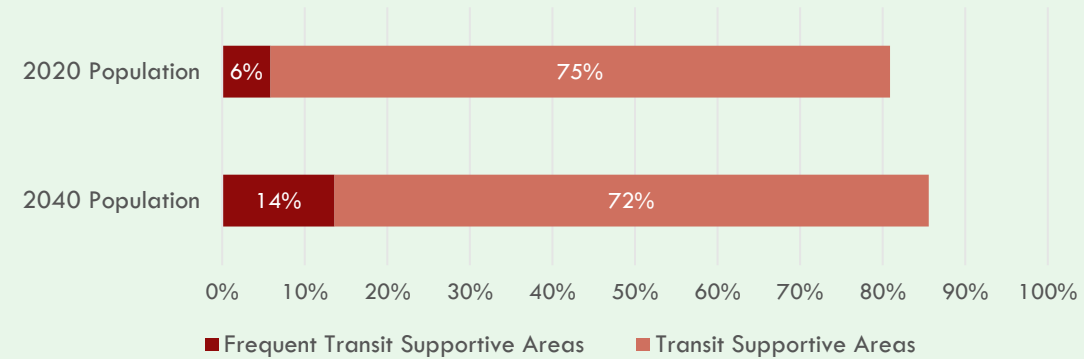
Most maps in this report show data at the Transportation Analysis Zone (TAZ) level.

Key Findings

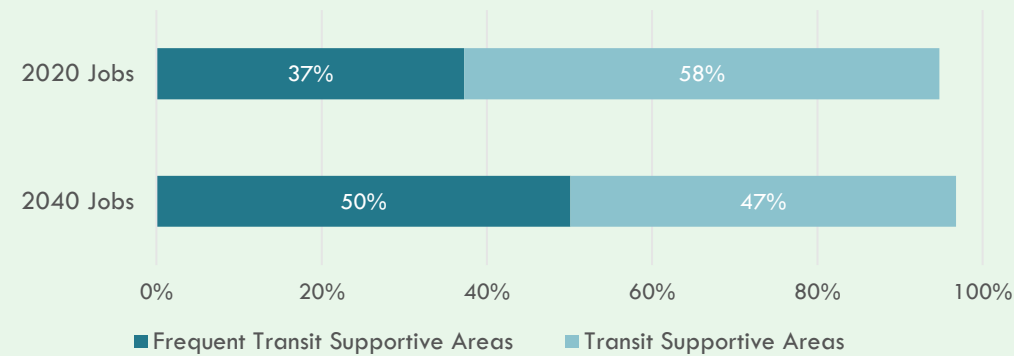
The key findings of the Regional Market Analysis are as follows:

- Population in the region is generally spread out in low density, suburban areas. The highest density concentrations are in the downtown areas of Raleigh, Cary, Durham, and Chapel Hill.
- Transit need based on socioeconomic factors is strongest in most of Durham, southern and eastern Raleigh, and parts of Chapel Hill.
- Jobs are concentrated in urban cores, Research Triangle Park (RTP), and along major roadways. Service and retail jobs are more concentrated in urban cores, while office jobs are in RTP.
- Transit demand is high or very high along the Raleigh-Cary-RTP-Durham Corridor, Durham-Chapel Hill Corridor, Capital Boulevard, and neighborhoods on the periphery of downtown Durham and downtown Raleigh, such as East Durham and northern Raleigh between I-440 and I-540, as seen in the following map.
- Residents living in downtown Raleigh have the best access to jobs via transit, followed by Durham and Chapel Hill residents.
- Trip origins to major destinations are mostly localized to the same part of the region as the destination, except for RTP which has a wider travel reach.
- The region is growing fast in terms of both population and jobs. Growth is happening throughout the region, with the greatest density increase in Raleigh, Cary, Durham, and Chapel Hill.
- Transit demand in 2040 parallels the current level, but with increased demand throughout the whole region, as seen in the following map.
- By 2040, about 40% of the land area of Wake, Durham, and Orange counties will be supportive of fixed-route transit or microtransit. This area will contain 86% of all residents and 97% of all jobs in the area. A much smaller subset of the counties will be supportive of frequent transit service, but these areas will contain half of all jobs.

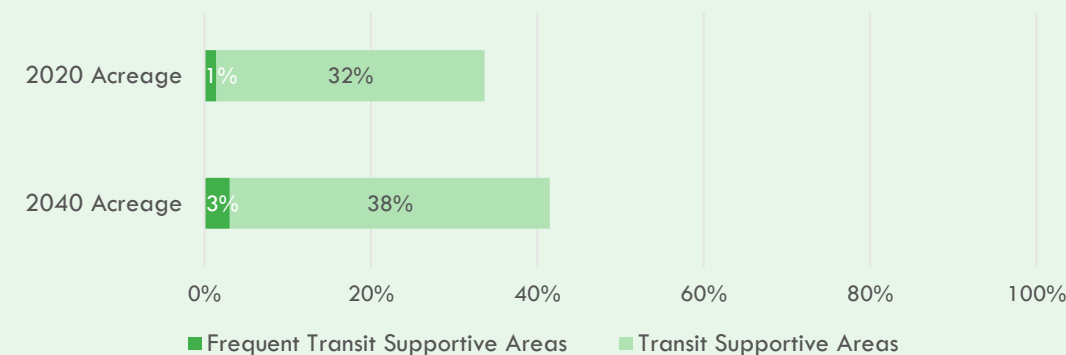
Population in Transit Supportive Areas



Jobs in Transit Supportive Areas

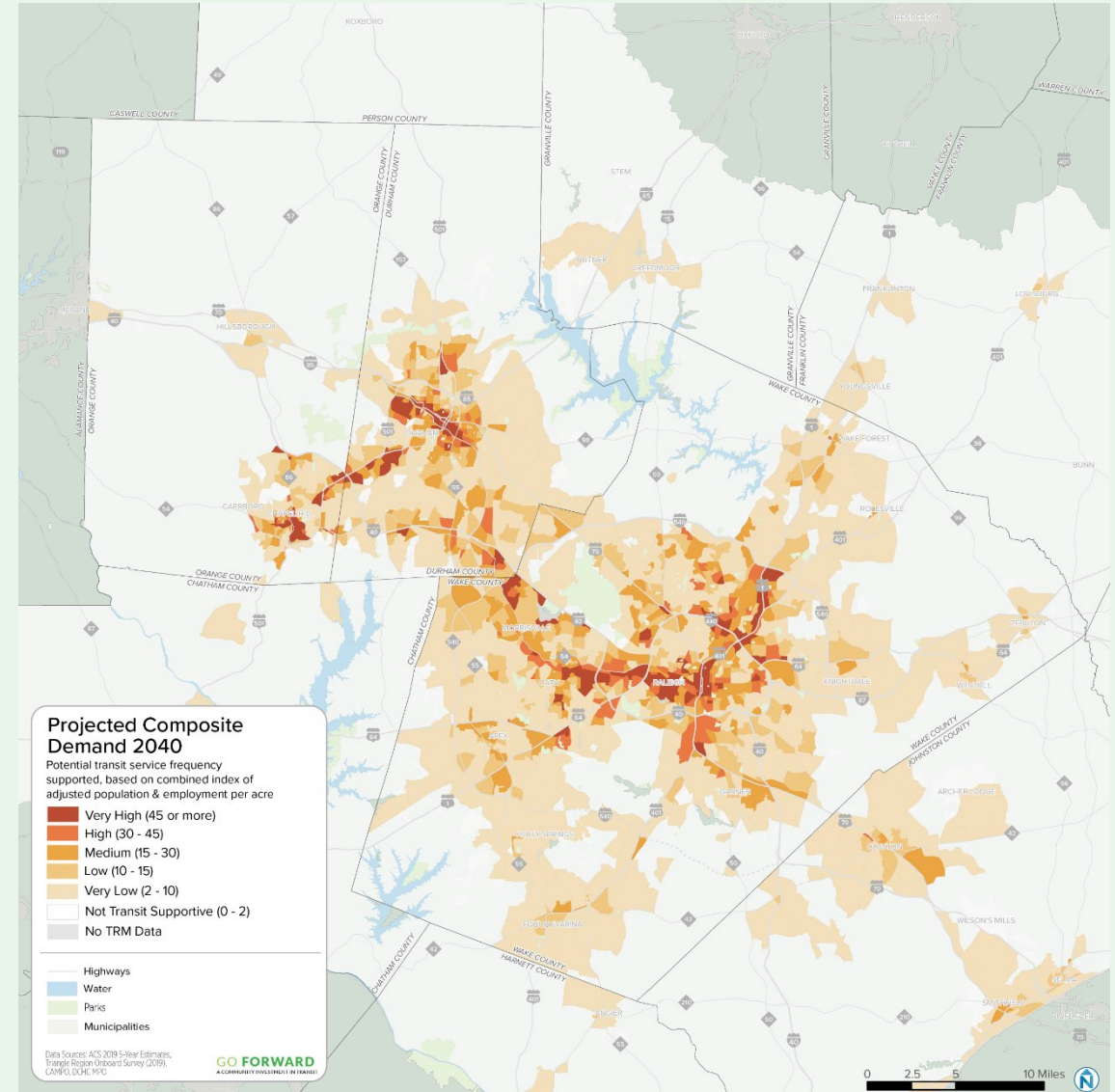
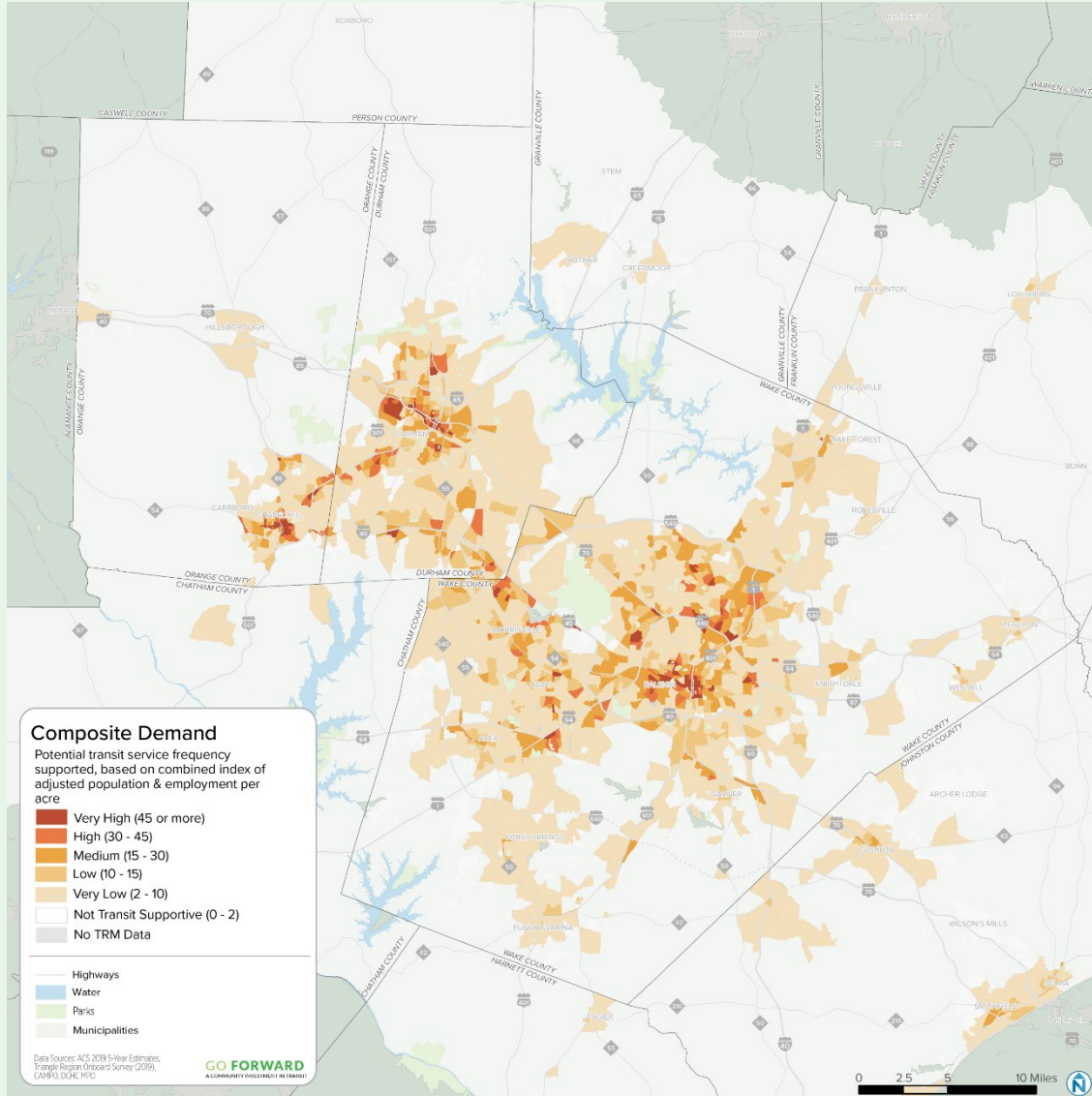


Transit Supportive Land Area



Note: Land area refers to all land within Wake County, Durham County, and Orange County, Source: CAMPO, DCHC MPO, ACS 2019 5-Year Estimates, Triangle Region OnBoard Survey (2019)

Key Findings



2 – Transit Demand Analysis

Transit-Supportive Density

A main factor in determining transit demand is density: where people live and work, and how those areas are concentrated. Generally, transit is accessible to people within one-quarter to one-half mile of a bus stop, so the travel market is dependent on the number of people who live, work, or visit the immediate surrounding area.




























As shown in the figure to the right, population and employment density may be used to indicate an appropriate transit service level. For example, to support service more frequent than every 30 minutes, there generally must be at least 15 residents per acre or more than 10 jobs per acre, or a combination thereof.

These densities broadly indicate demand across contiguous and nearby areas. Clusters of density throughout an area or along a corridor are strong indicators of demand, while a dense but small block in an isolated area would not produce sufficient demand in and by itself. Demand can also accumulate along corridors: for example, if there are many blocks along a corridor that each have the density to support 30-minute service, the entire corridor may be able to produce enough demand for 15-minute or better service.

Additionally, the street environment affects people’s access to transit. Transit services are most effective when paired with sufficient and well-lit sidewalks and crosswalks that allow people to safely reach bus stops. Even in the places with the highest density, people may not use transit services if stops are not in a walkable environment.

Lastly, it is important to recognize that areas with minimal population and employment density may not provide an environment where fixed-route transit can be successful. In these instances, partners in the Triangle Region can explore alternative types of transportation services, such as microtransit, shuttles, and other shared mobility services.

Land Use and Transit Service Levels

LAND USE			TRANSIT	
Land Use Type	Residents per Acre	Jobs per Acre	Appropriate Types of Transit	Frequency of Service
 Downtowns & High Density Corridors	>45	>25	   	 10 mins or better
 Urban Mixed-Use	30-45	15-25	  	 10-15 minutes
 Neighborhood & Suburban Mixed-Use	15-30	10-15		 15-30 minutes
 Mixed Neighborhoods	10-15	5-10	 	 30-60 minutes
 Low Density	2-10	2-5	  	 60 mins or less or On Demand
 Rural	<2	<2	 	 On Demand

Source: Thresholds based on research by Nelson\Nygaard.

Analysis Components

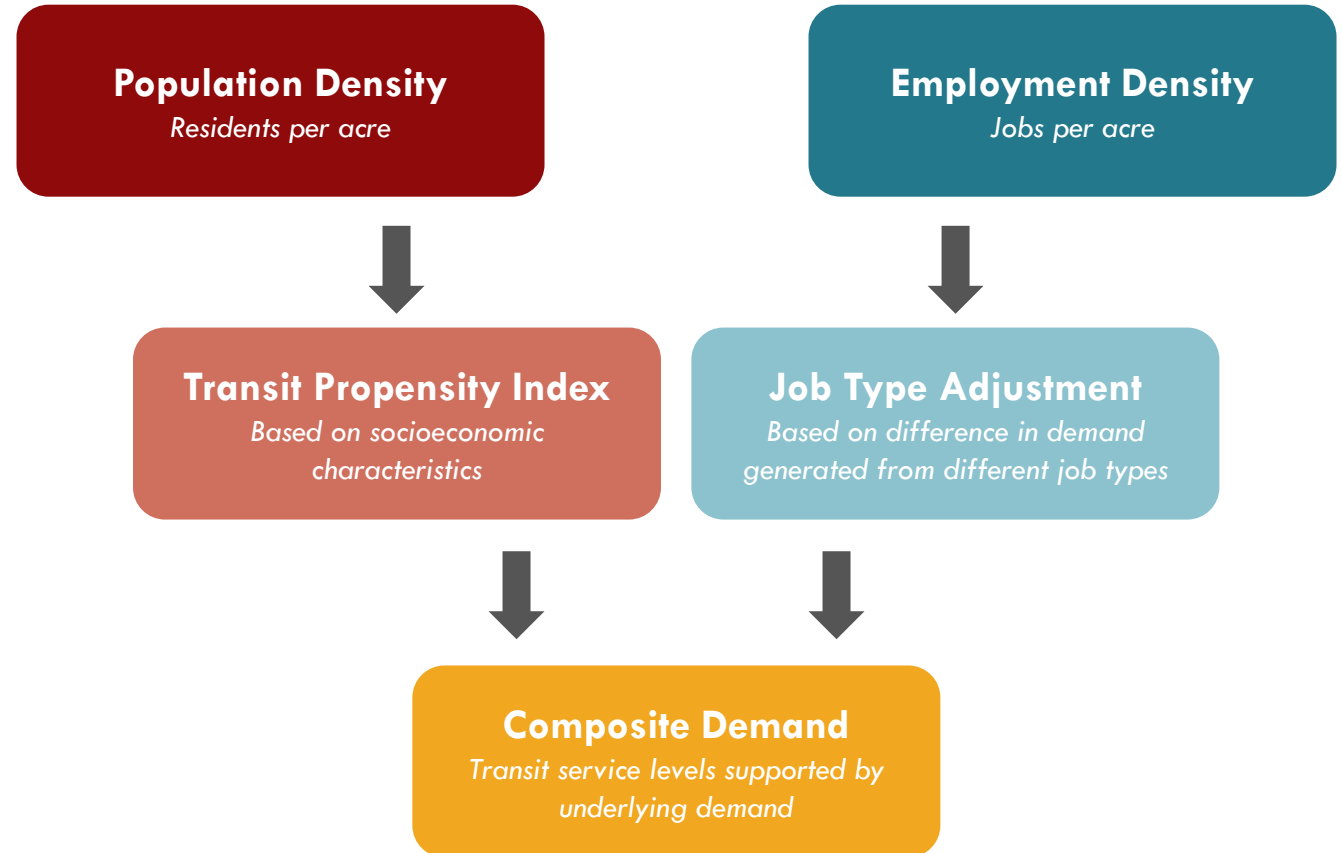
While total population and employment density are crucial to understanding transit demand, analyzing who is taking transit and what types of jobs are in an area allows for a more comprehensive look at the level of service needed. A **Transit Demand Analysis** considers the following factors:

- Population Density, in residents per acre
- Socioeconomic Characteristics, combined into a Transit Propensity Index
- Employment Density, in jobs per acre
- Types of Jobs, to determine a Job Type Adjustment

The analysis results in a **Composite Demand** score for each TAZ by combining population density adjusted by the Transit Propensity Index and employment density adjusted by job type. Composite Demand can be used to identify appropriate transit service levels supported by the underlying demand.

The following sections detail the steps and results of the Transit Demand Analysis.

Transit Demand Analysis Components

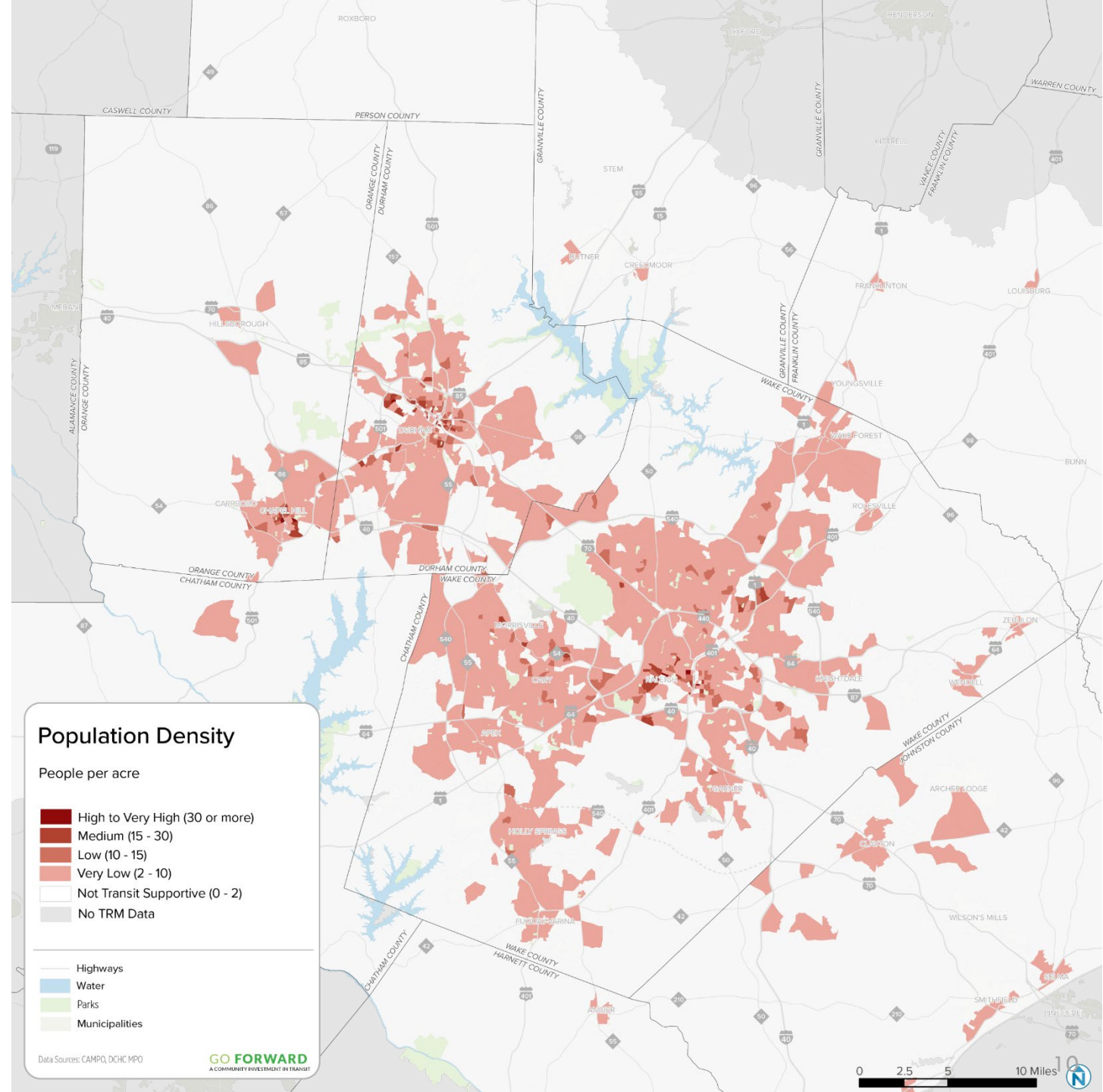


Population Density (2020)

Population density is an important indicator for transit demand, since effective transit systems require people living within walking distance to stops and stations. Additionally, denser areas tend to be more walkable and less automobile-oriented, with limited access to parking and less reason to own a private automobile.

As of 2020, the Triangle Region overall has low population density. The following areas have relatively greater concentrations of residents:

- Downtown Raleigh
- Downtown Durham
- Downtown Chapel Hill
- Parts of Cary
- Parts of northern Raleigh
- Along Durham-Chapel Hill Boulevard



Socioeconomic Characteristics and Transit Reliant Populations

In addition to population density, socioeconomic characteristics influence people’s propensities towards using transit. Many population groups, often those historically and currently marginalized, rely on transit more than the general public. In order to plan transit equitably, transit agencies should focus their investments on areas with high populations of these communities.

In 2019, GoRaleigh, GoDurham, GoCary, and GoTriangle completed onboard surveys and collected socioeconomic information on their fixed-route riders. These characteristics were compared to 2019 ACS 5-year estimates of residents in Durham, Orange, and Wake counties. Four main factors related to transit ridership were found: household income, race and ethnicity, vehicle access, and age.

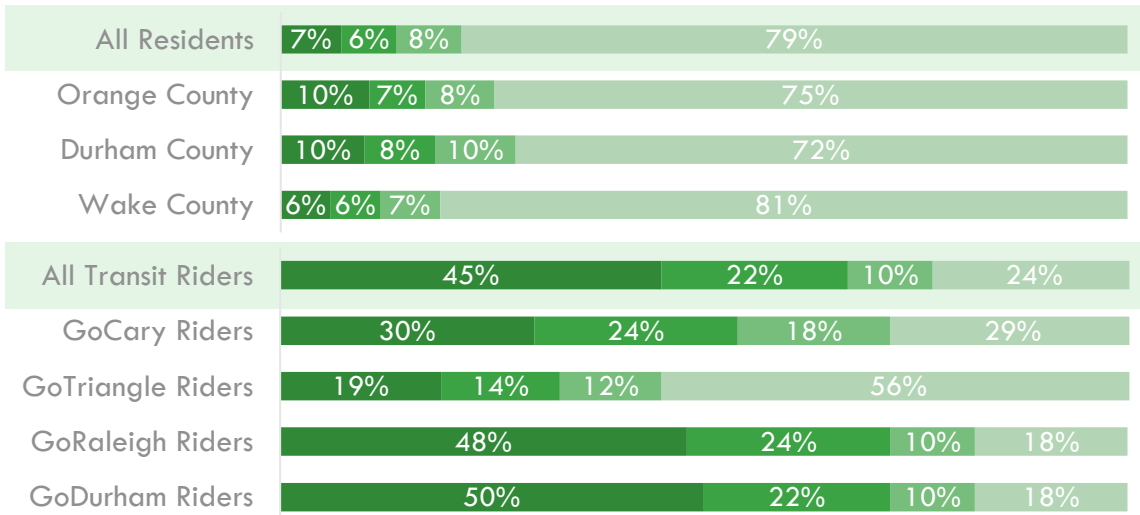
Household income – Taking the bus tends to be more affordable than owning and maintaining a car. In the three counties, less than 10% of households make less than

\$15,000 and almost 80% make more than \$35,000 per year. Meanwhile, 45% of transit riders make less than \$15,000, and only 24% of riders make more than \$35,000. GoTriangle riders’ incomes are slightly higher due to the commuter nature of their service, with 56% of riders making at least \$35,000 per year, but still well below the general population.

Race/Ethnicity – Residents of color, especially Black/African American residents, are more likely to use transit than the general population, due to more limited resources and historic lack of government investment in transportation for communities of color. Black and African American residents make up 23% of the three counties, but 58% of transit riders (and a higher proportion for GoRaleigh and GoDurham). White residents, on the other hand, make up almost 60% of the region’s residents, but only 22% of transit riders.

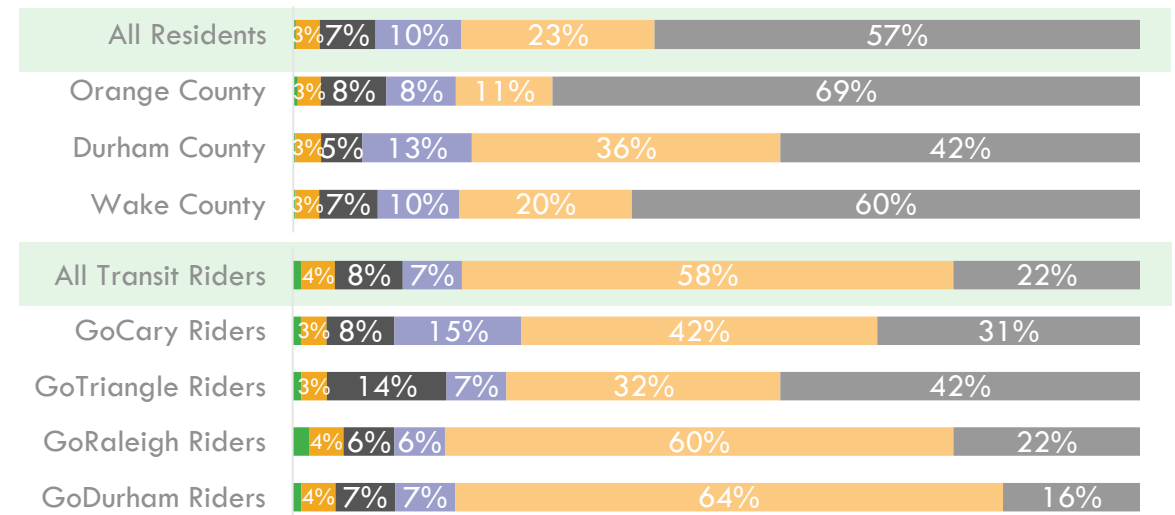
Household Income of Residents and Transit Riders

■ Less than \$15k ■ \$15k - \$25k ■ \$25k - \$35k ■ \$35k and above



Race/Ethnicities of Residents and Transit Riders

■ Native American ■ Other/Multiracial ■ Asian
 ■ Hispanic ■ African American/Black ■ Caucasian/White



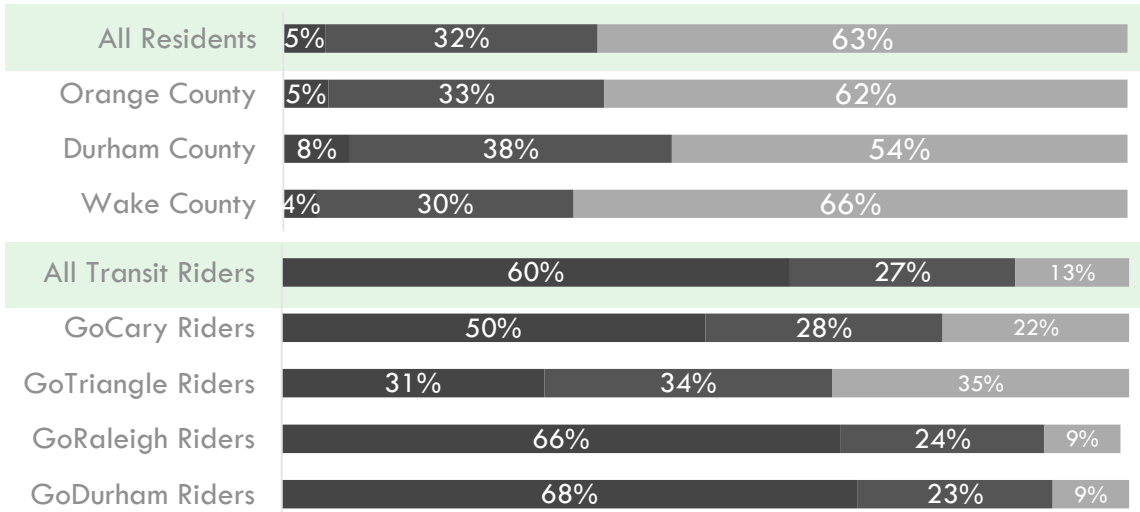
Socioeconomic Characteristics and Transit Reliant Populations

Vehicle Access* – Access to a vehicle is one of the clearest factors in transit ridership, as seen in the figure below. While just 5% of all residents do not have access to a vehicle, 60% of transit riders do not have a car. Durham County has a slightly higher than average rate of low or no vehicle access, and GoDurham riders also have the least access, with 68% of riders without any vehicles. Access to one car is slightly more common among the population than with transit riders, but not to the same extent as access to two or more vehicles.

Age – Young people, those aged 18 to 34, make up a larger share of fixed-route transit riders than the general population. Between 41% and 51% of riders on all systems are between 18 and 34, compared to a county range of 32% to 38%. Older adults (those 65 and older) make up 15% of all residents, but only account for 8% of fixed-route transit riders. On GoTriangle, only 4% of riders were 65 or older. Young people, especially students, tend to have lower incomes and lower access to private vehicles.

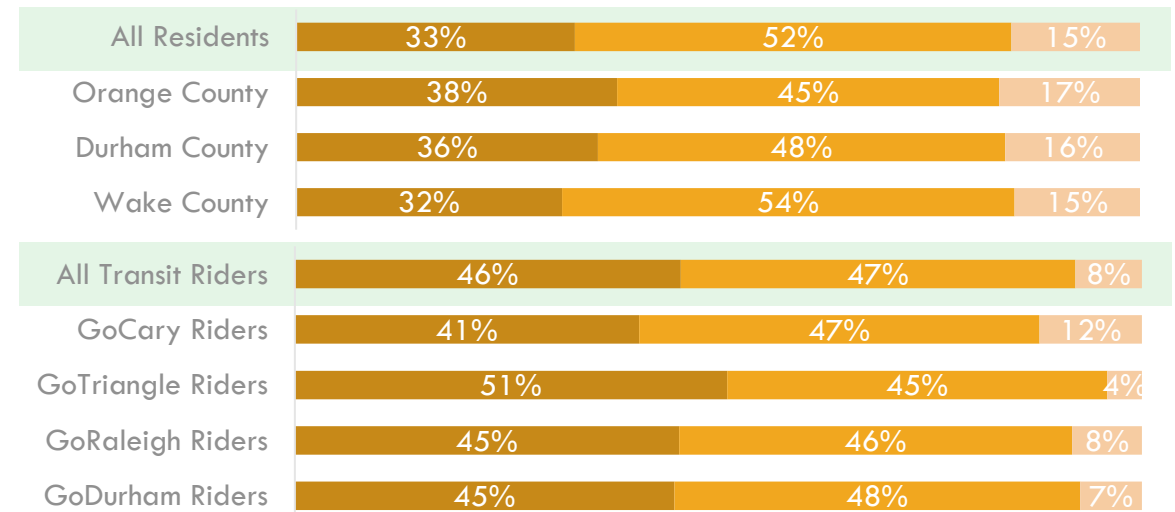
Vehicle Access of Residents and Transit Riders

■ No Vehicle Access ■ Access to one vehicle ■ Access to two or more vehicles



Age of Residents and Transit Riders

■ 18 - 34 ■ 35 - 64 ■ 65 and older



Note: "All Transit Riders" refers to fixed-route riders on GoCary, GoTriangle, GoRaleigh, and GoDurham. Source: ACS 2019 5-Year Estimates, Triangle Region OnBoard Survey (2019)
 *For vehicle access, the Census ACS data is for household vehicle ownership, whereas the onboard survey asks how many vehicles are available for that rider's use. This may result in an undercount of riders with one or more household vehicles compared to the ACS data.

Transit Propensity & Equity

The **Transit Propensity Index (TPI)** helps to highlight and prioritize transit dependent populations—as identified by the previous demographic analysis—by measuring their relative demand for transit.

When a significant number of people from transit-dependent socioeconomic groups live in clustered areas, the underlying demand for transit in these areas may be higher than is captured by just looking at population density. Conversely, in areas where transit-supportive groups have lower representation, the transit demand may be lower than what is captured purely by population density.

Taking these factors into account, the project team calculated the TPI for each demographic factor, which is the ratio between transit mode share for the specific group and the transit mode share for the general population and calculated at the regional level. The table to the right shows the TPI among different groups. A factor greater than 1 means that the group is x times more likely to use transit than the average population, with x signifying the value of the factor. As an example, a TPI of 12.1 for people without vehicle access means that people in that group are 12.1 times more likely to use transit than the general population.

This ratio is applied to the demographic breakdown of a particular geographic area to target communities that are more likely to use or need transit.

Regional Transit Propensity Index by Demographic Factor

Demographic Factors	TPI
Income	
Less than \$15k	6.3
\$15k - \$25k	3.4
\$25k - \$35k	1.3
\$35k and above	0.3
Race/Ethnicity	
Black, Hispanic, Asian, Indigenous, and Multiracial	1.8
White (non-Hispanic)	0.4
Age (of population 18+)	
18 - 34	1.4
35 - 64	0.9
65 and older	0.5
Vehicle Access	
No vehicle access	12.1
Access to one vehicle	0.8
Access two or more vehicles	0.2

Source: ACS 2019 5-Year Estimates, Triangle Region OnBoard Survey (2019)

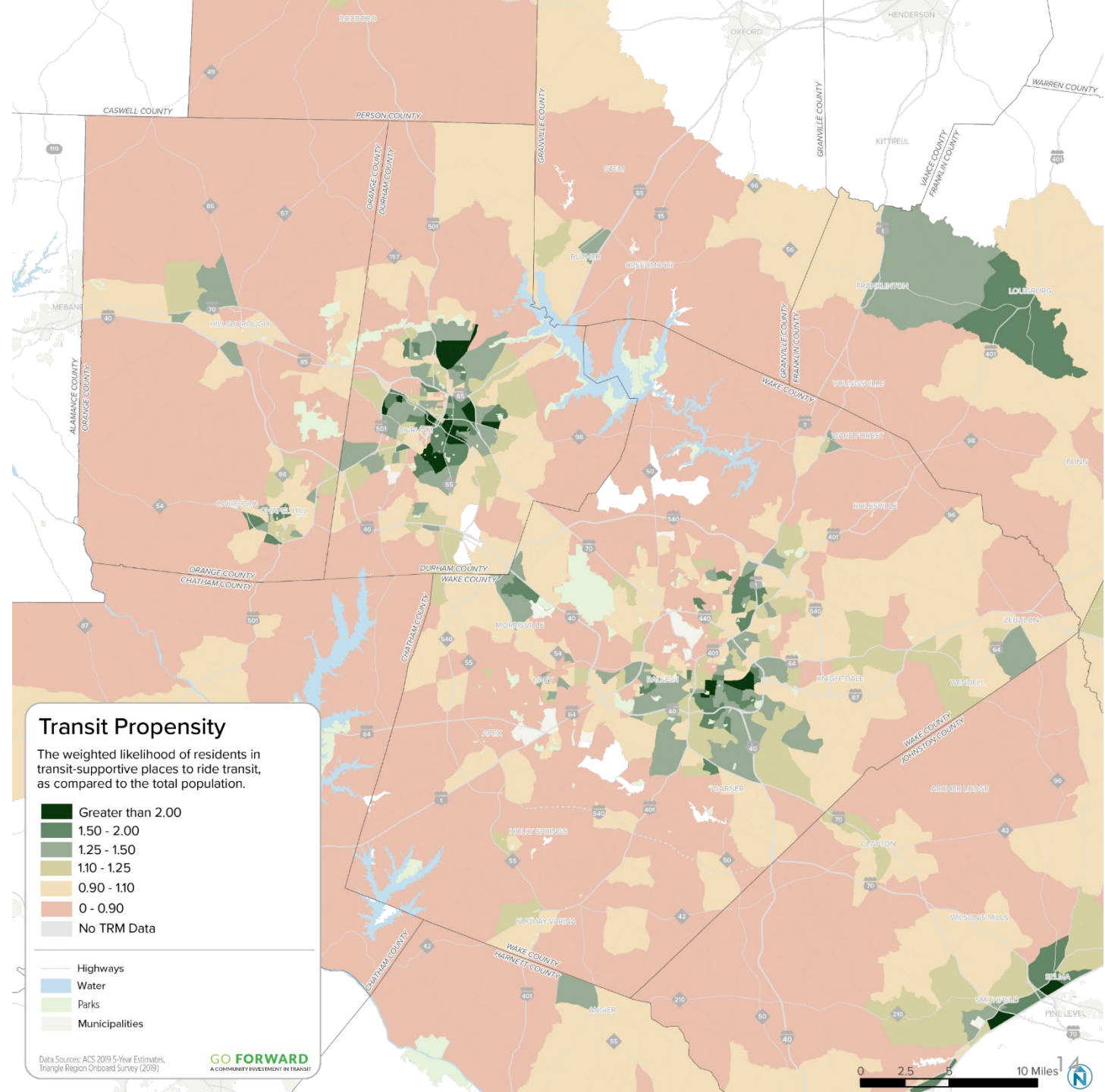
Transit Propensity Index

TPI was calculated for each TAZ in the Triangle Region by measuring the relative demand for transit based on demographic factors, as shown in the map to the right. This calculation ensures currently and historically underserved communities who are likely to use transit at higher rates are prioritized in receiving service.

Areas that show high transit need include southern Raleigh, most of Durham, and parts of Chapel Hill, as well as some other smaller outlying areas.

Within Chapel Hill, the southwestern area has more higher propensity areas, with multiple TAZs having an above average likelihood of riding transit when compared to the study region.

Much of Durham is more than 1.5 times as likely to ride transit as the general population of the region when considering socioeconomic factors.



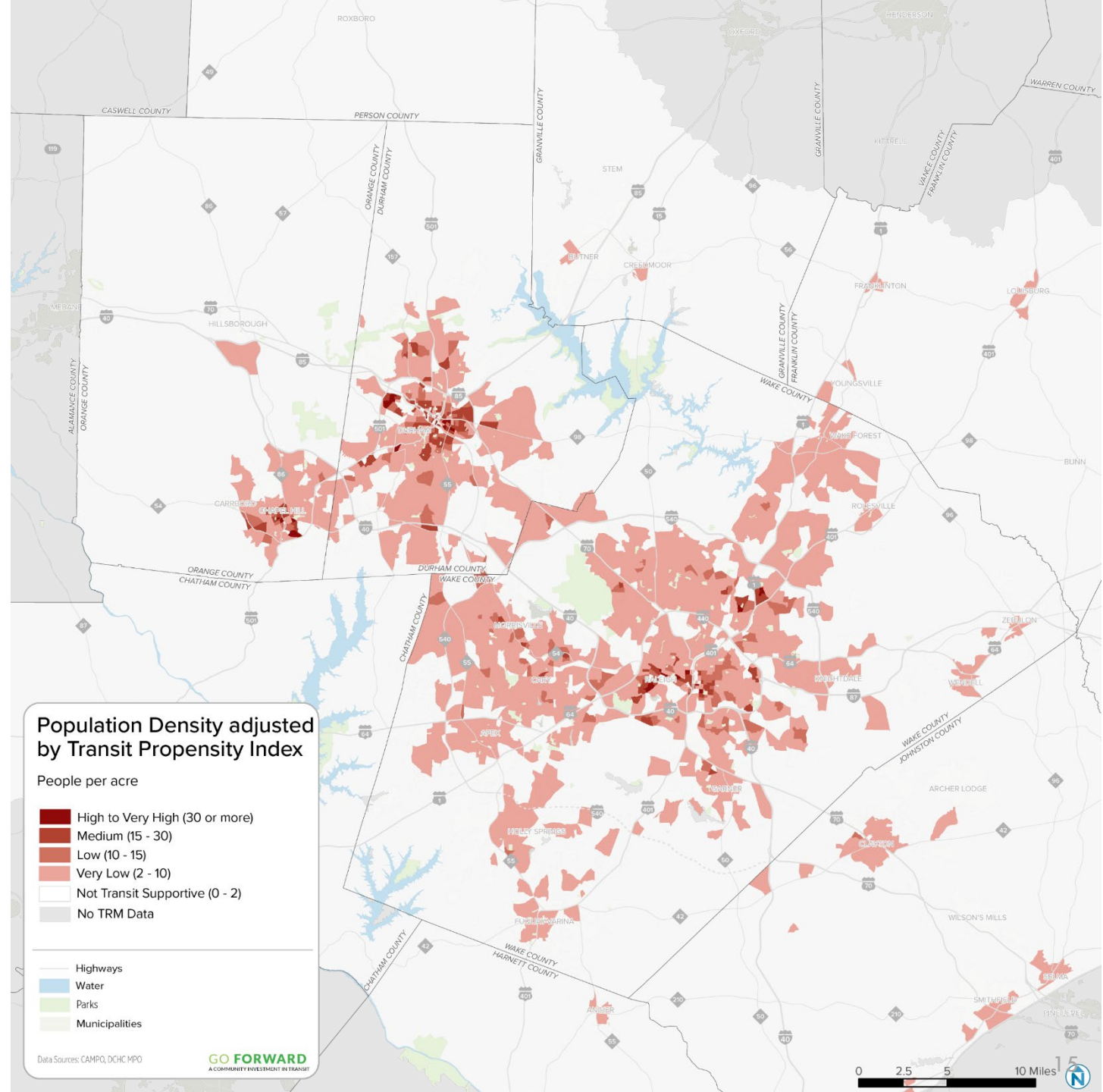
Population Density Adjusted by Transit Propensity Index

To capture a more nuanced picture of population-based transit demand, the project team adjusted the population density of each TAZ by its transit propensity factor.

When considering both population density and transit propensity, the areas with the greatest adjusted population density include:

- Downtown Durham and surrounding neighborhoods
- Downtown Chapel Hill
- Downtown Raleigh and neighborhoods to the south and northeast

Adjusting the population density toward groups that generally use and need to use transit often intensifies transit demand in urban areas and diminishes demand in rural areas. As the map shows, outlying areas in the region show lower support for transit when socioeconomic factors are included.

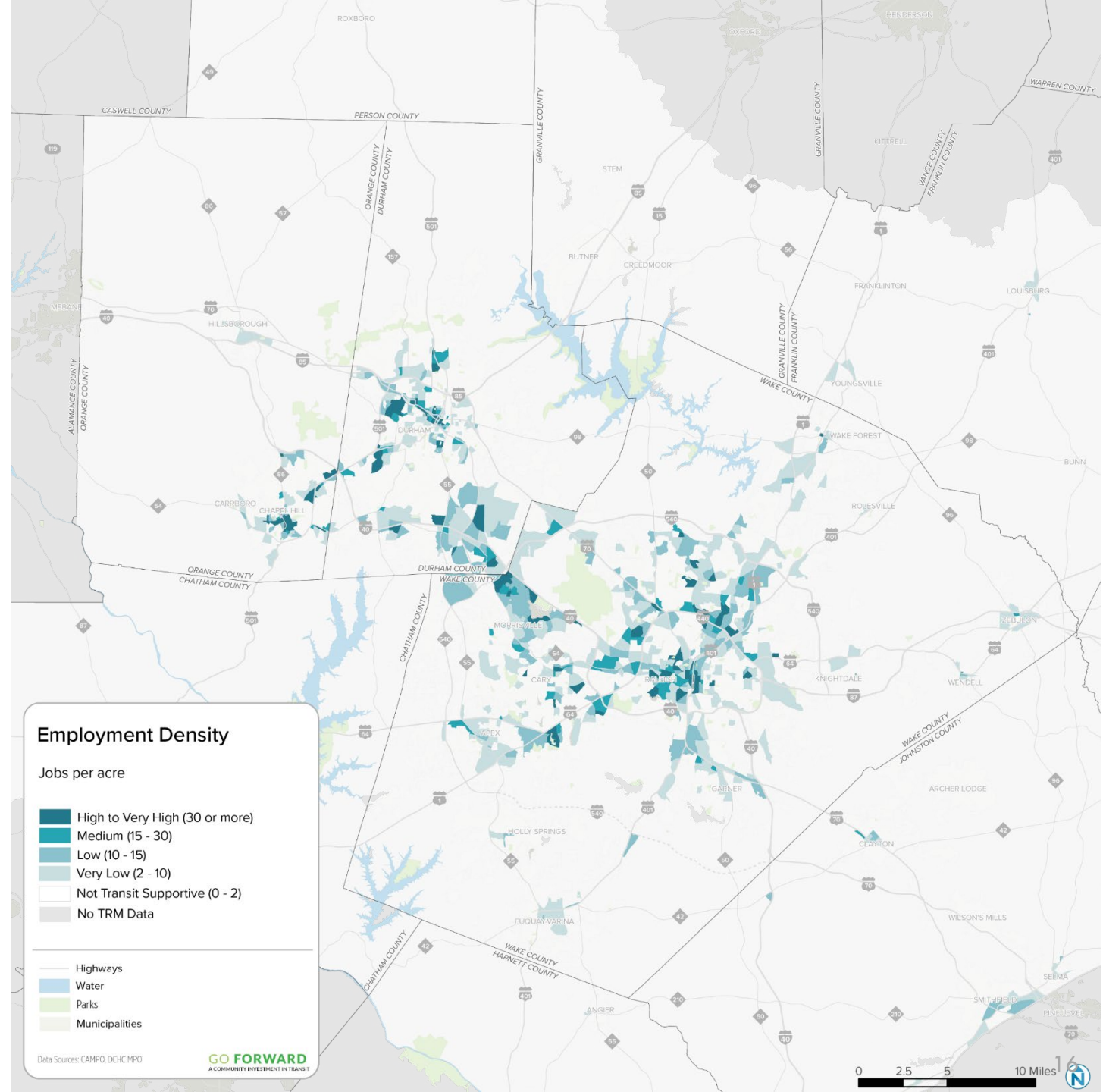


Employment Density (2020)

Employment density provides a strong indication of transit demand by people traveling to work, as well as to the services that these jobs provide. Analyzing employment density shows both the transit demand generated by the employee traveling to the job and by any customers, clients, or visitors to the job sites.

Jobs are concentrated in urban cores, large office parks, and major corridors in the region. The places in the Triangle region where employment density is highest include:

- Research Triangle Park (RTP)
- Downtown Durham and Duke University
- Downtown Chapel Hill and University of North Carolina (UNC)
- Corridor between Chapel Hill and Durham
- Downtown Raleigh and northeast Raleigh
- Parts of Morrisville, Cary, and Apex



Job Type Adjustment

Different types of jobs generate different levels of transit demand. Service and retail jobs have more customers, clients, and patients than office or industry jobs. Thus, the transit demand at these jobs is greater, both for employee travel and anyone else visiting the same location. The service and retail industries employ the most people in urban cores and downtowns.

Research Triangle Park's high employment density is mainly office and industry jobs, while Raleigh has many more service and retail jobs that would attract more than just their employees. Service and retail employment in Durham is denser to the north, while office jobs are concentrated in the west.

Service and retail jobs are also clustered along many major highways, with industry jobs in clusters along highways outside of the denser urban areas.

Using the factors shown below, employment density can be adjusted by job type factors to match the demand generated by different job types.

Job Types and Transit Demand

Jobs by Demand Generated	Demand compared to avg job	Demand compared to residents per acre
Service & Retail	1.3	2.5
Office & Industrial	0.9	1.7

Source: Nelson\Nygaard National Research

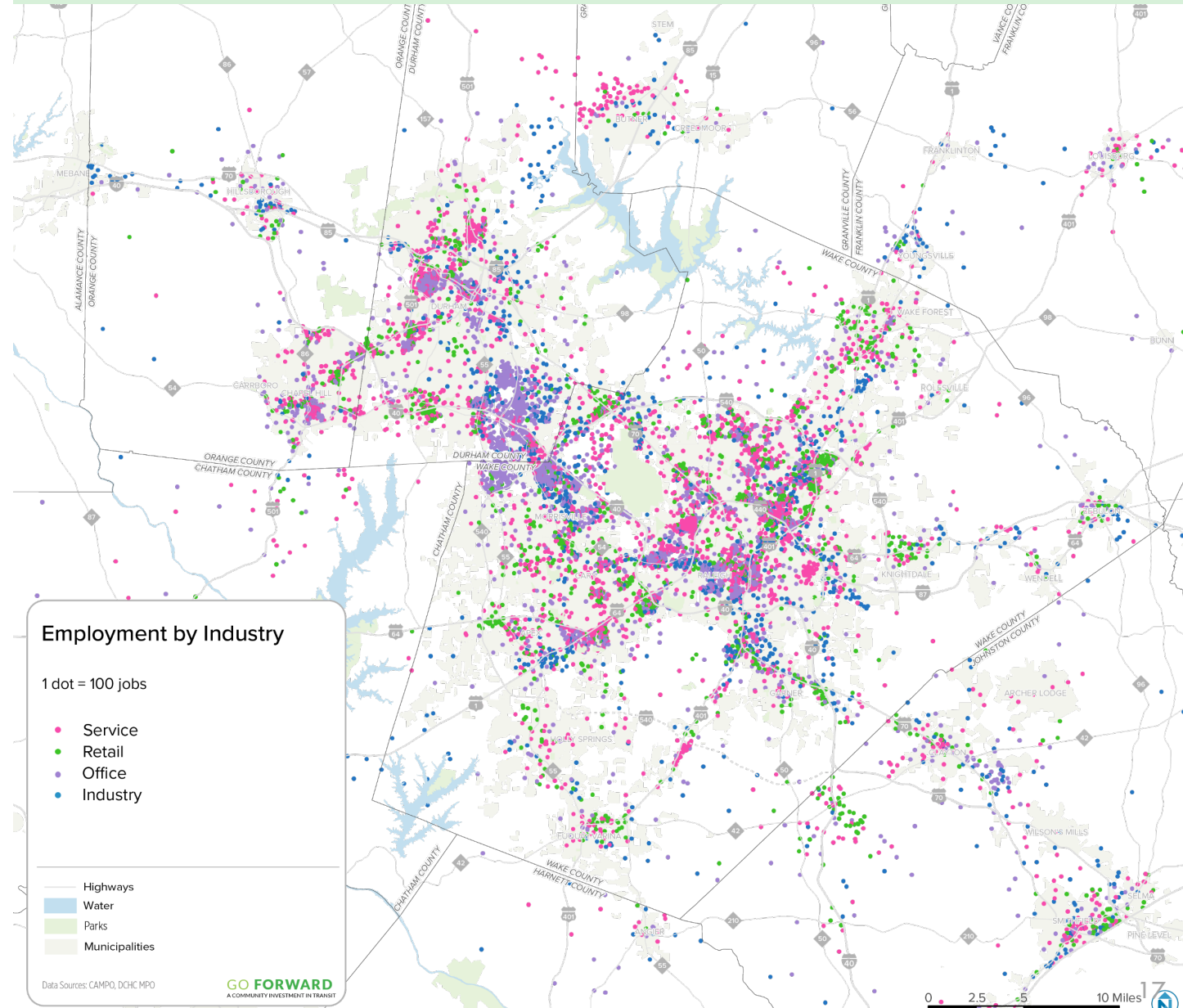
Job types categorization based on Triangle Regional Model:

Service: establishments that have individual customers and clients, such as medical offices, trade schools, recreation, etc.

Retail: establishments that sell goods to individual customers, such as grocery stores, shopping centers, restaurants, etc.

Office: desk jobs, such as support functions for corporate, government, school, and universities, etc.

Industry: manufacturing, wholesalers, agricultural operations, energy generation/distribution, etc.



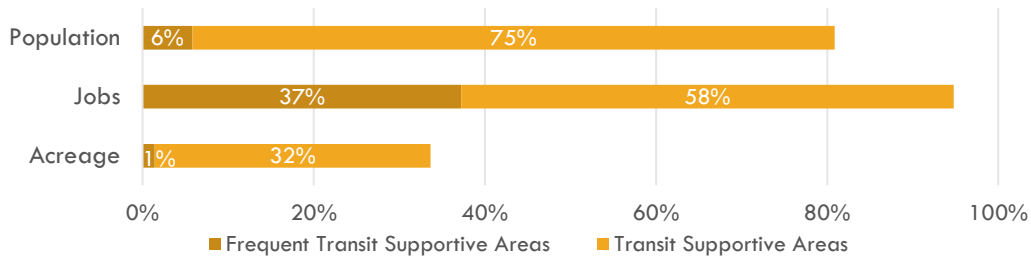
Composite Demand

Combining population density, equity demographics, employment density, and job types leads to Composite Demand, which indicates where demand for transit is the greatest and where to focus transit investments. The map shows the following areas have the greatest Composite Demand:

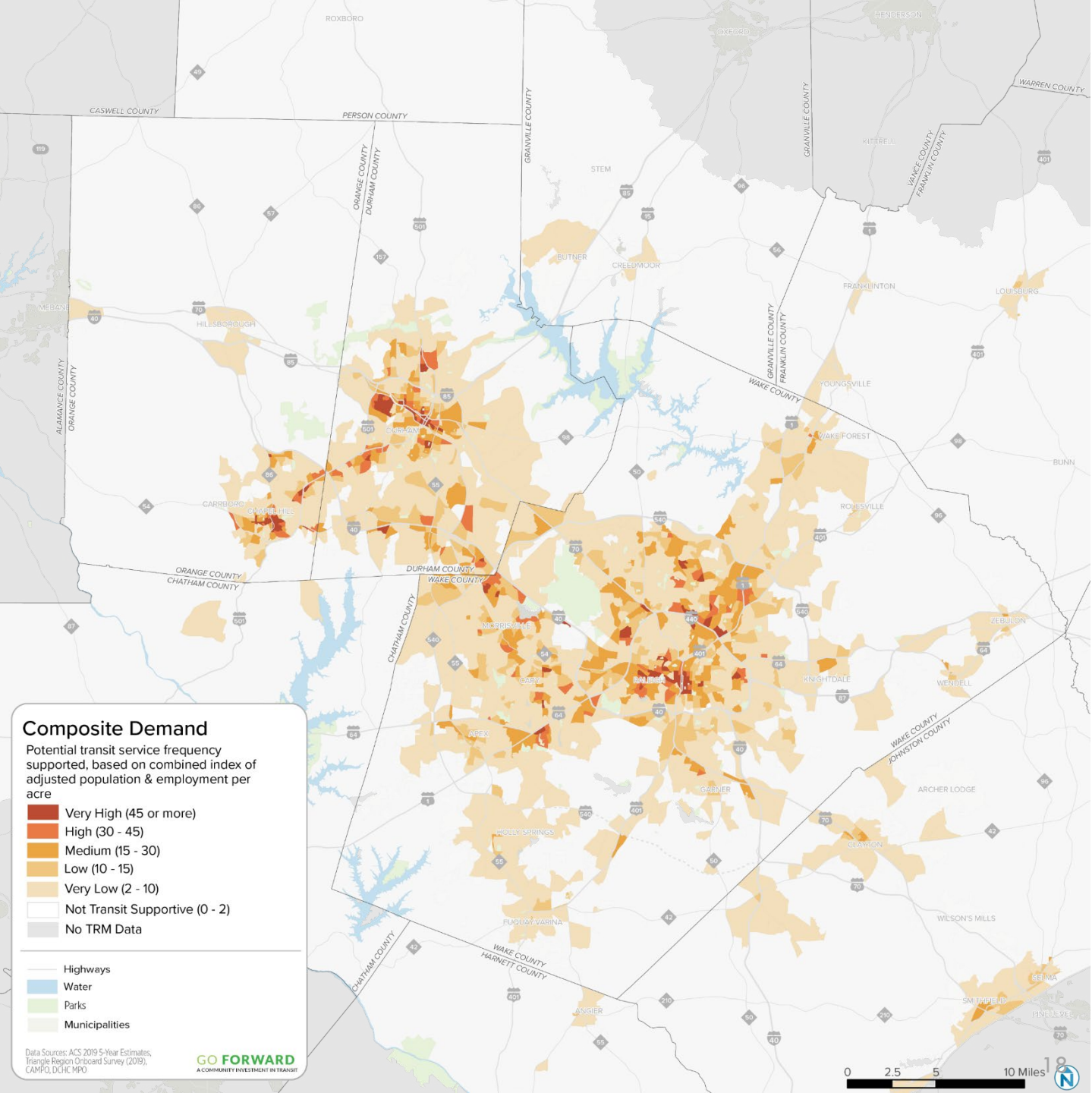
- Downtown Durham, neighborhoods immediately surrounding Downtown, and southern Durham County
- Parts of Chapel Hill and Durham-Chapel Hill Corridor
- Raleigh-Cary-RTP-Durham Corridor and Raleigh-Apex Corridor
- Downtown Raleigh, Capital Corridor, other neighborhoods to the north along the Raleigh Beltline
- Southern and eastern Raleigh, close to Downtown
- Kildaire Farm Road corridor in Cary

As shown in the chart below, approximately one third of the land area of Wake, Durham, and Orange Counties is supportive of fixed-route transit and microtransit services based on Composite Demand. However, over 80% of residents and 95% of jobs are in these transit supportive areas.

Population, Jobs, and Acreage of Transit Supportive Areas in Wake, Durham, and Orange Counties (2020)



Source: CAMPO, DCHC MPO, ACS 2019 5-Year Estimates, Triangle Region OnBoard Survey (2019)



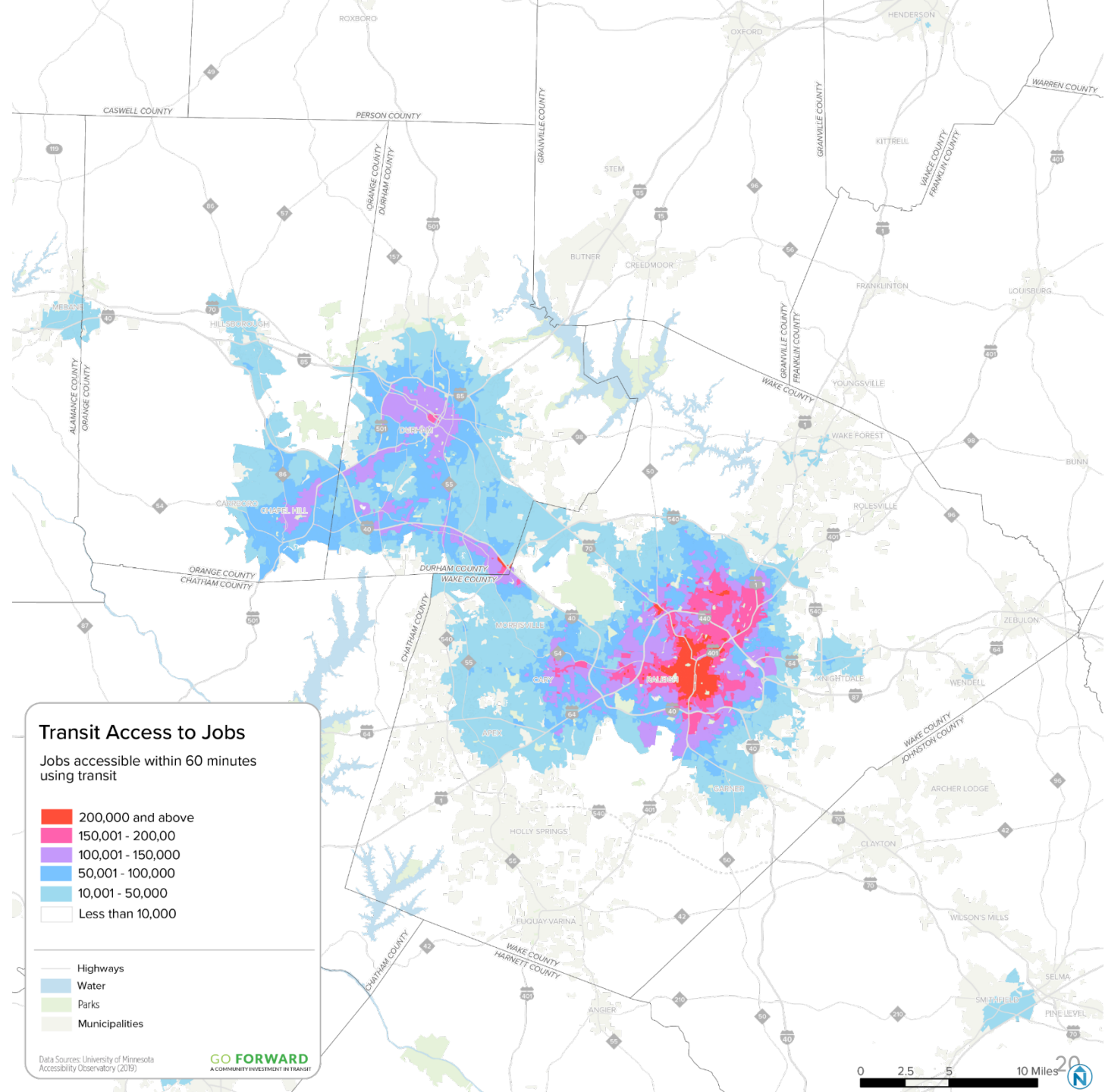
3 – Transit Access to Jobs

Jobs Accessible by Transit

The Triangle region is home to many job opportunities, but not all jobs are accessible from all areas by transit. The University of Minnesota's Accessibility Observatory compiles a dataset of transit access to jobs for major metropolitan areas across the country at the census block level.

The map shows the number of all jobs accessible within 60 minutes by transit from each census block in the region in 2019. Living near downtown Raleigh provides the greatest access to jobs via transit. Once outside of the central urban nodes, job access by transit is limited. Only someone living in one small area of downtown Durham would have at least 200,000 jobs within 60 minutes by transit, compared to the large swaths of Raleigh with that level of access.

A small area on the border of Durham and Wake Counties near Research Triangle Park shows up as having high access to jobs, reflecting the higher job density in the area, despite a lower population in that area.



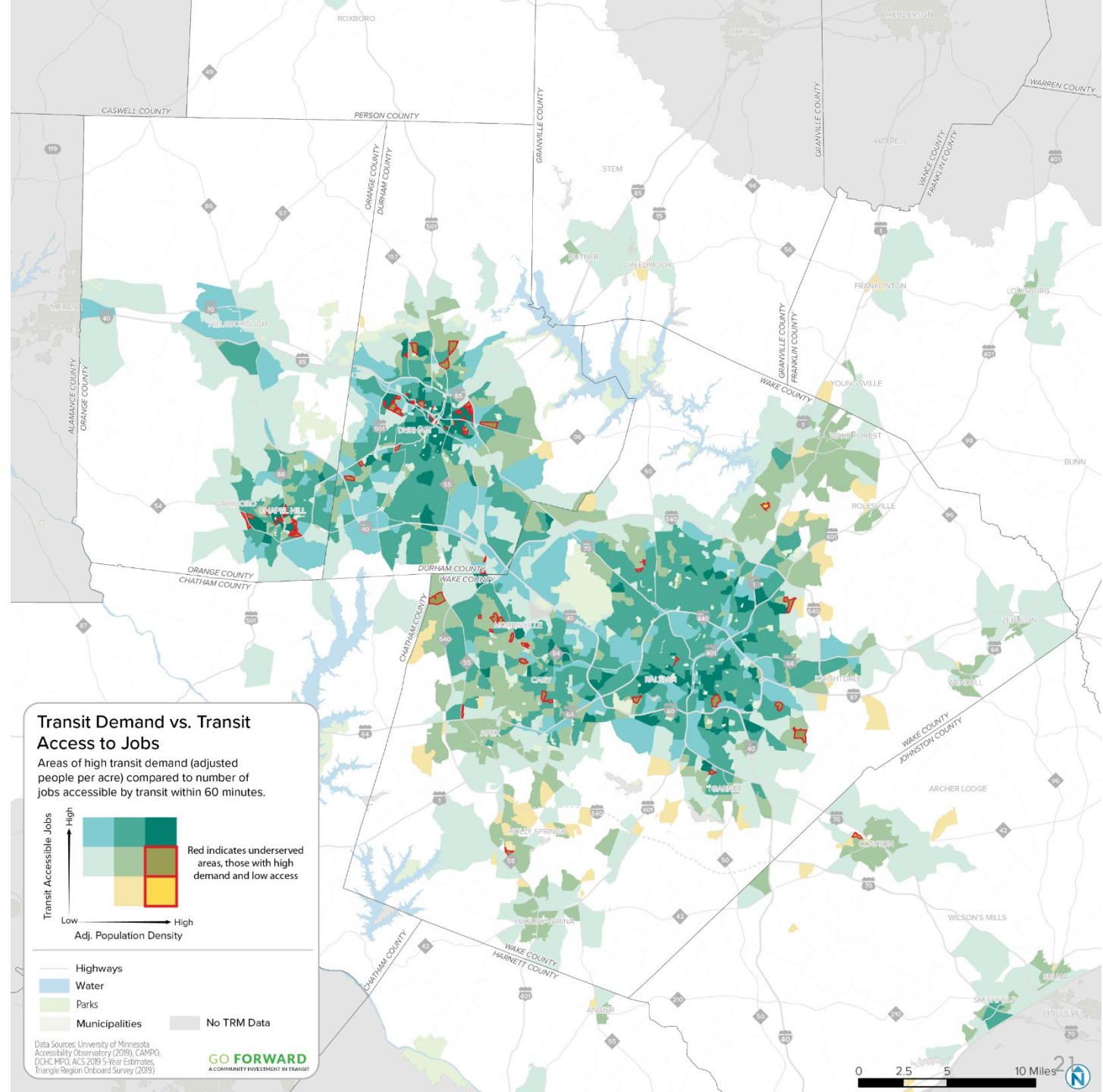
Transit Demand vs. Transit Access to Jobs

Job access is also important to understand with respect to population density of an area and the proportion of those with higher relative demand for transit. Understanding how access to employment opportunities is distributed is critical to ensuring equity.

The map compares 2019 transit access to jobs and transit demand as defined by the population density adjusted by the Transit Propensity Index. Places with high transit demand but low transit access to jobs are candidates for consideration of improved or new transit service. Conversely, places with very little demand for transit but high levels of transit access may be places from which resources could be shifted away to more productive services.

Areas with higher adjusted population density but low transit access to jobs include:

- Neighborhoods just outside of Downtown Durham
- Parts of Chapel Hill
- Parts of Morrisville and Cary
- Parts of southern Raleigh



Transit Demand vs. Transit Access to Jobs
 Areas of high transit demand (adjusted people per acre) compared to number of jobs accessible by transit within 60 minutes.

Transit Accessible Jobs	High	Dark Green	Red indicates underserved areas, those with high demand and low access
	Low	Light Green	
		Low	High
		Adj. Population Density	

— Highways
 — Water
 — Parks
 — Municipalities
 — No TRM Data

Data Sources: University of Minnesota Accessibility Observatory (2019), CAMPO, DCHC MPO, ACS 2019 5-Year Estimates, Triangle Region Onboard Survey (2019)

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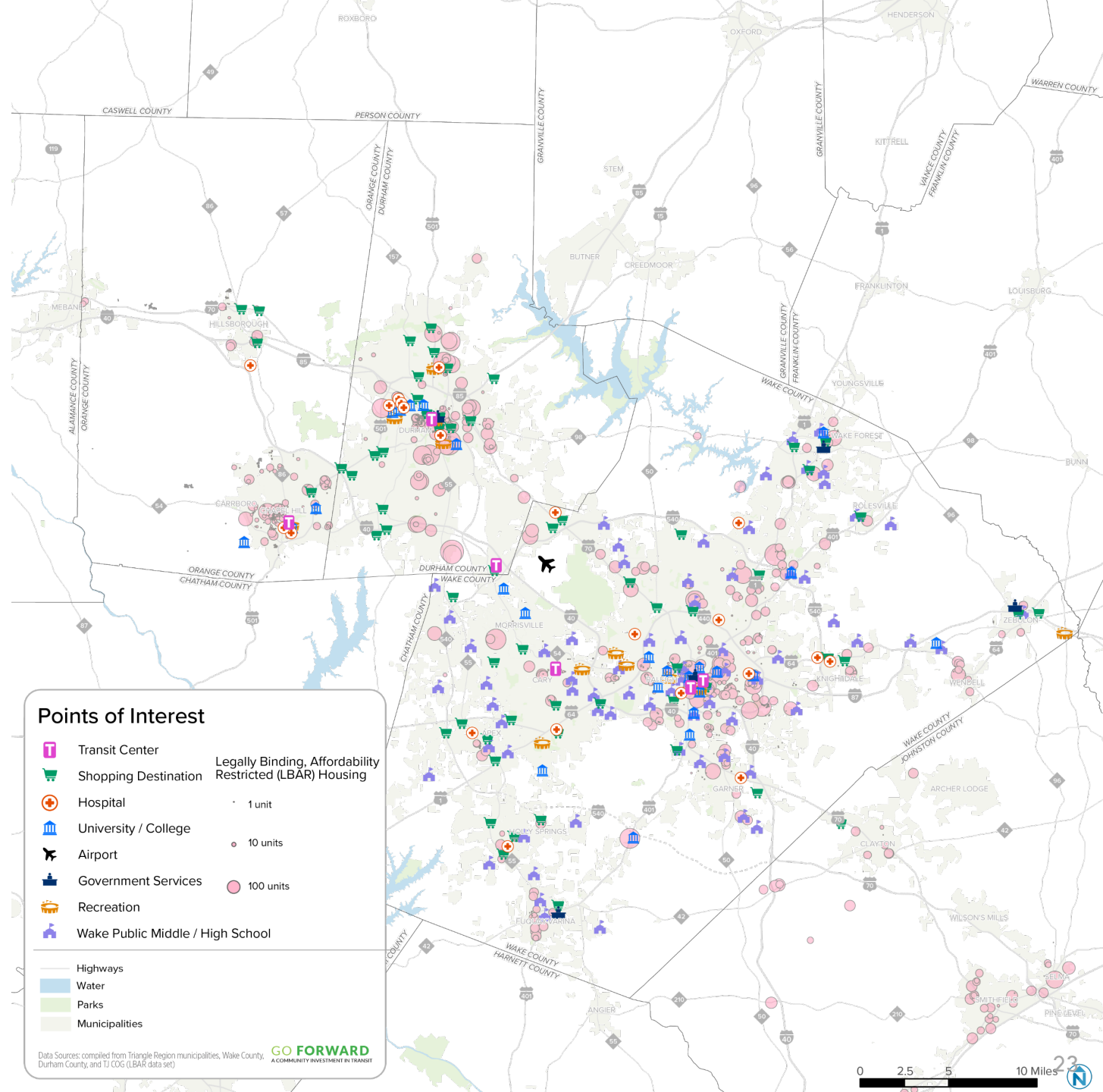
4 – Major Destinations

Activity Centers

Some activity centers generate additional demand for transit that are not captured by the previous density analyses. As shown in the map to the right, the Triangle Region's existing major activity centers and points of interest include:

- **Transportation facilities**, such as GoRaleigh Station and Raleigh-Durham International Airport
- **Shopping destinations**, including shopping centers such as Crabtree Valley Mall and Triangle Town Center Mall as well as destinations such as Walmart Supercenters
- **Hospitals**, such as WakeMed Cary Hospital and Duke University Hospital
- **Public Schools, Colleges, and Universities**, including middle and high schools, WakeTech, NCSU, Duke, and UNC
- **Government Services**, including the State of North Carolina and Wake County Regional Centers
- **Recreation Centers**, including arenas and stadiums
- **Legally Binding, Affordability Restricted (LBAR) Housing**, provided by the Triangle J Council of Governments (TJCOG), where there may be higher densities of potential transit riders

Many of these activity centers are clustered in densely populated areas like downtown Durham and downtown Raleigh, especially transit centers and many university campuses. However, shopping destinations are often farther out from the city centers, serving residents of less dense neighborhoods. These activity centers are important to serve with transit services, in order to connect people to where they may need and want to go. Regional and frequent networks should connect with activity centers in denser area, while local and community services are better suited for more suburban and rural areas.



Trip Origins to Major Destinations

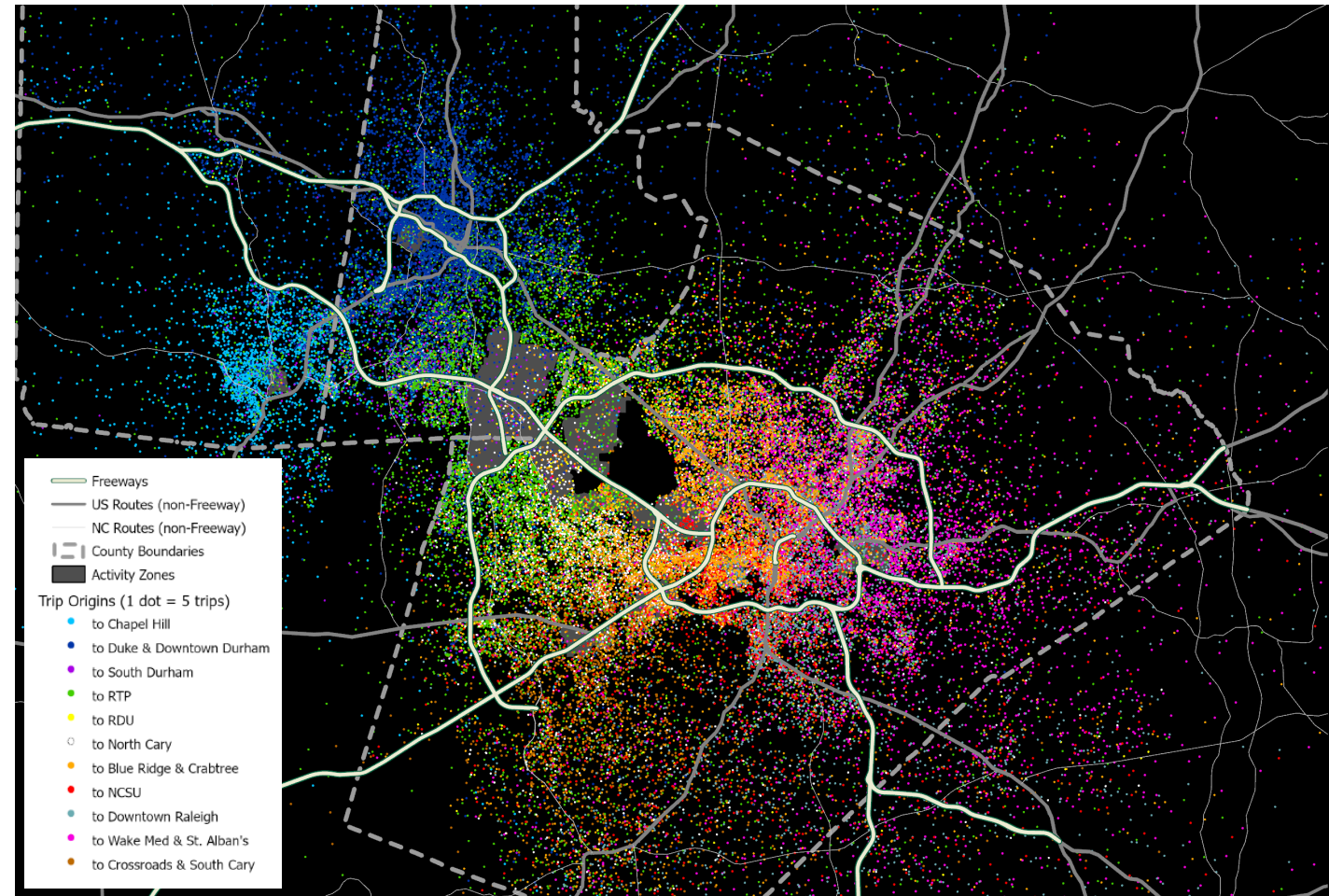
Analyzing origin-destination (OD) data provides an understanding of where people are trying to get from and to, regardless of mode. The Freeway And Street-based Transit (“FAST”) network study for the Triangle Region was completed in February 2021 and included OD data projected for 2030.

The following maps are from the FAST study, showcasing trip origins for the following major destinations in the region:

- Chapel Hill
- Downtown Durham/Duke
- South Durham
- Research Triangle Park
- Raleigh-Durham International Airport (RDU)
- North Cary
- Crossroads/South Cary
- Downtown Raleigh
- WakeMed/St. Albans
- NCSU
- Blue Ridge/Crabtree

Each dot represents one trip projected in 2030. How the dots are spread out throughout the region gives insights on the local and regional nature of transit demand for these destinations.

Trip Origins to Destinations Defined in FAST Study



Trip Origins to Chapel Hill

Trips going to Chapel Hill primarily originate from within the Town of Chapel Hill, the surrounding areas, and southwestern Durham County. The highest concentrations of trips are from:

- Carrboro
- Along NC-54 near the Orange-Durham County line
- Along Fordham Boulevard and US-501 south of I-40
- Along NC-86 south of I-40

There are few trips from Wake County into Chapel Hill.

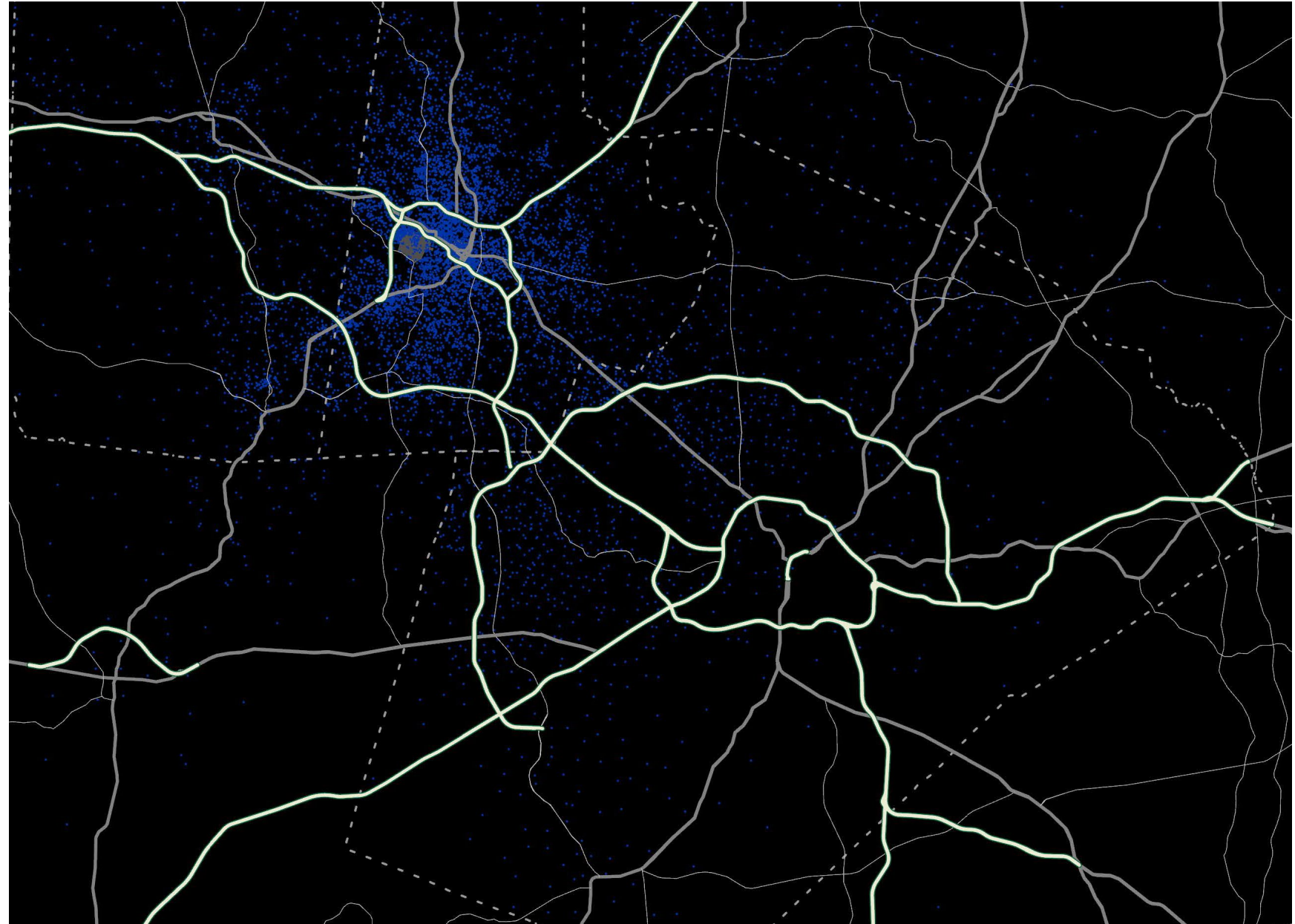


Trip Origins to Downtown Durham

Trips going to Downtown Durham and Duke University primarily originate from all over Durham County, as well as Chapel Hill. Areas with a high concentration of origins include:

- Downtown Durham and the neighborhoods immediately surrounding downtown and Duke
- Between NC-147 and US-70
- Along Durham-Chapel Hill Boulevard, especially near the US-501/US-15 Business exchange
- Downtown Chapel Hill
- Immediately north of I-85 in Durham

There are relatively fewer trips from Wake County to Downtown Durham. Most of these trips originate from the northwestern half of Wake County.

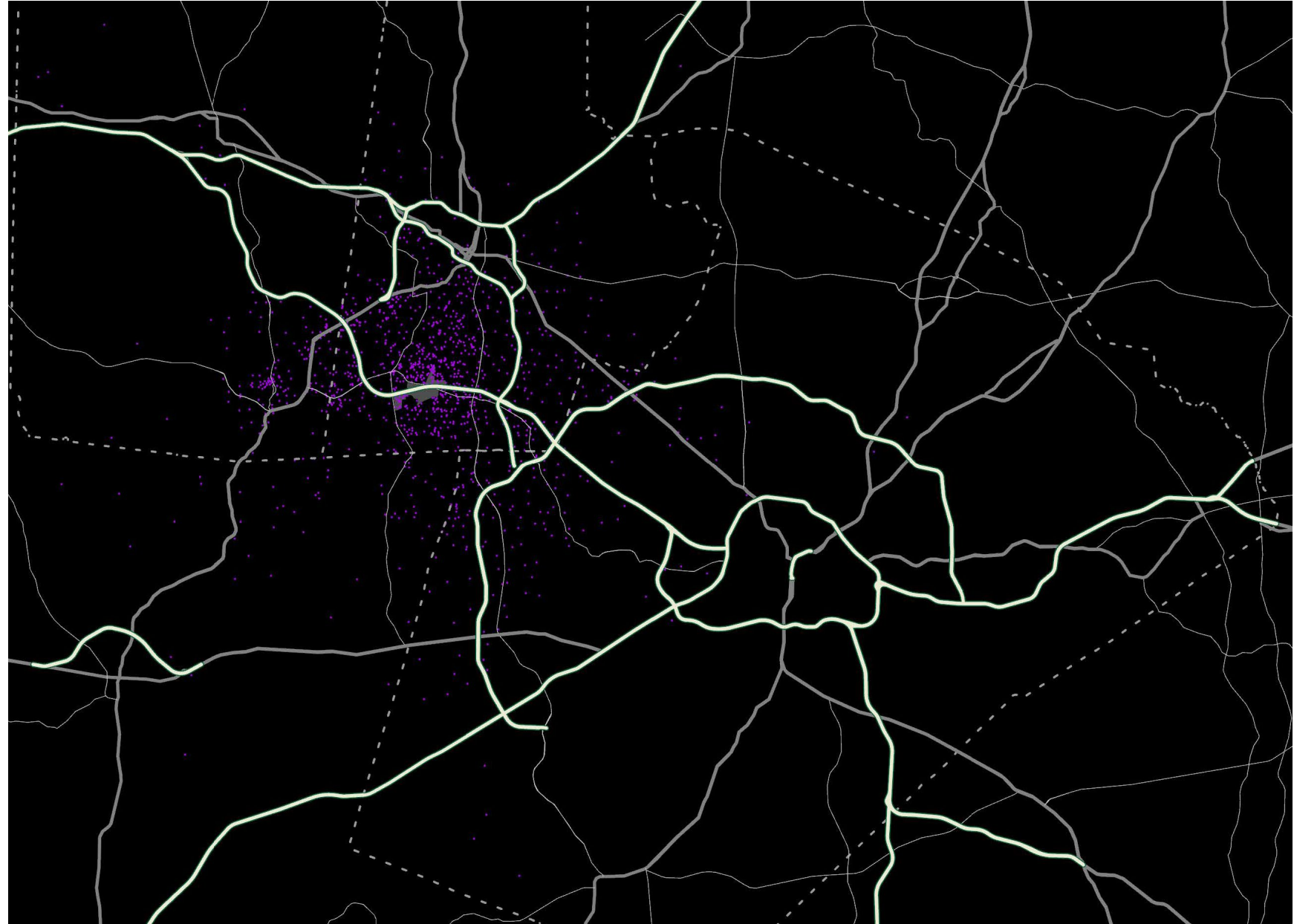


Trip Origins to South Durham

South Durham does not attract as many trips as Downtown Durham, and most trips to South Durham originate in the nearby surrounding areas, including:

- Downtown Chapel Hill
- Along NC-54 corridor through southern Durham
- Between NC-147 and the southern Durham County border

Very few trips originate from northern Durham County or most of Wake County.



Trip Origins to RTP

RTP attracts many trips from all over the region, especially its surrounding area. Out of the destinations covered in the FAST study, RTP draws the most travel regionally.

The largest concentration of trips originate from:

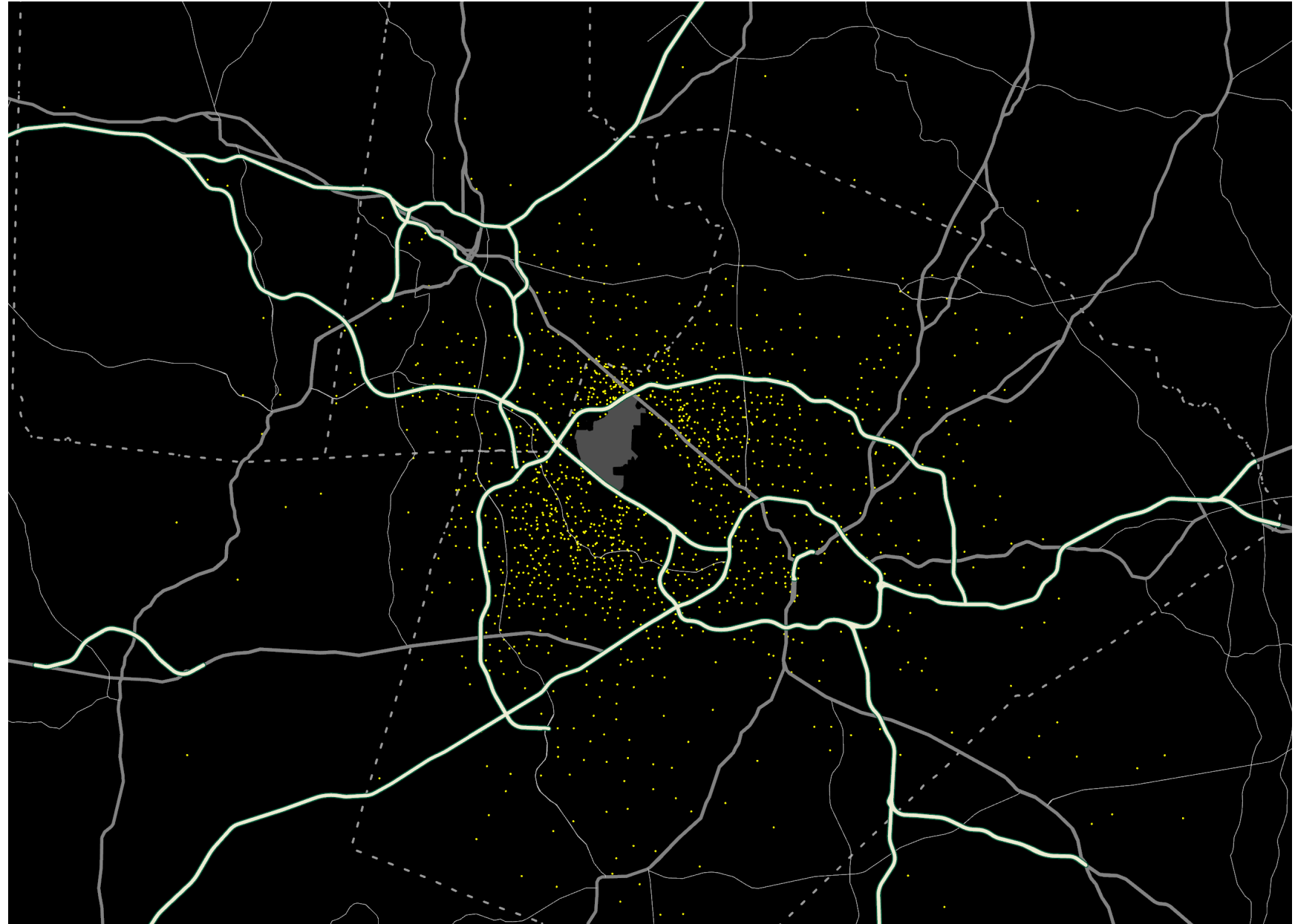
- Downtown Durham
- Southern Durham
- Morrisville
- Cary
- Apex
- Brier Creek

Relatively fewer trips originate from eastern Wake County.



Trip Origins to RDU

Trips going to the Raleigh Durham International Airport originate mainly between Raleigh and Durham but are less concentrated in origin than other major destinations. The areas to the north (Raleigh) and south (Cary) of the airport have the highest concentration of origins.

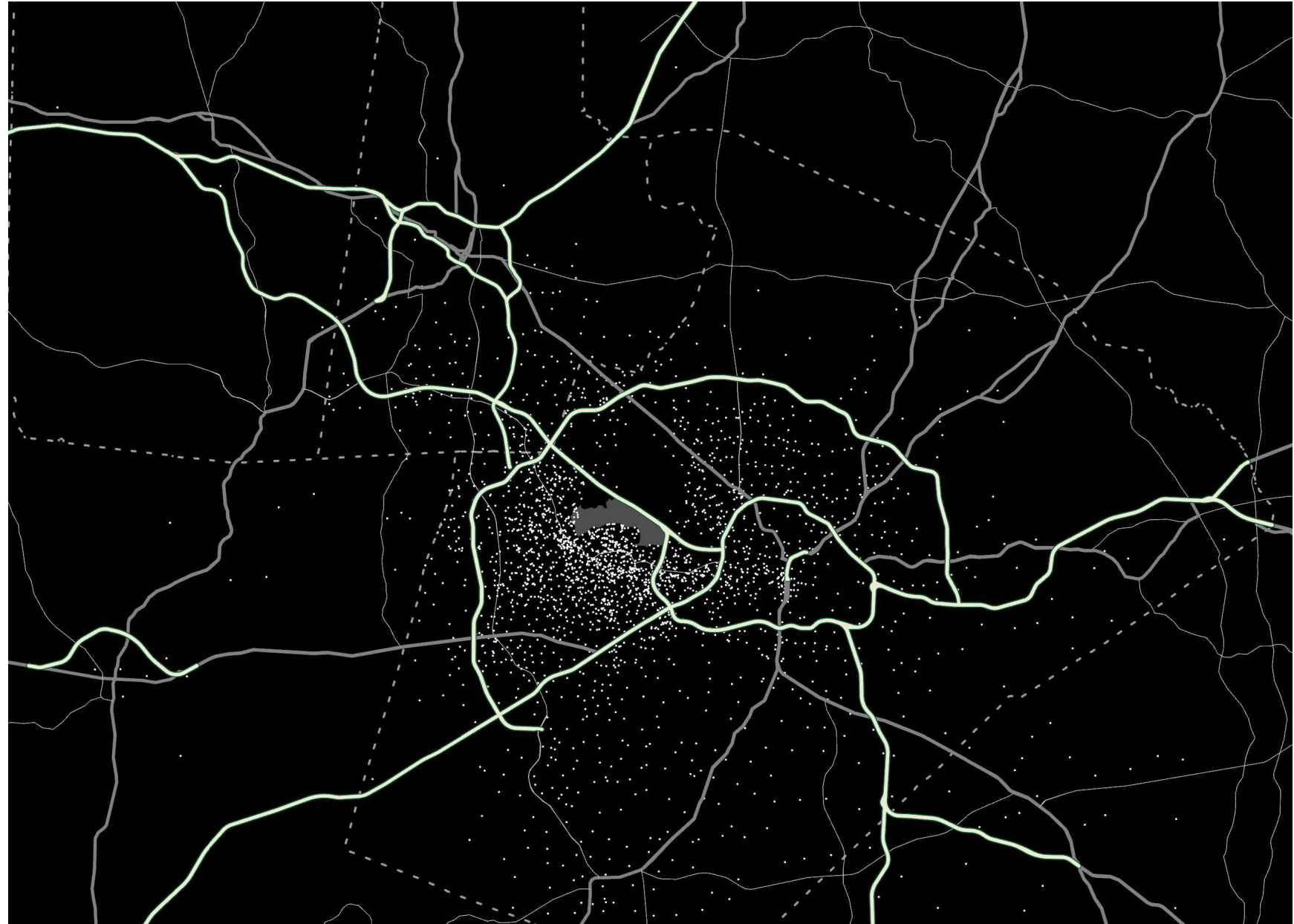


Trip Origins to North Cary

Trips going to North Cary primarily originate from the following areas:

- Downtown Cary and its immediate surrounding neighborhoods
- NC-54 corridor through Cary
- Hillsborough Street Corridor
- Downtown Raleigh

There are few trips between North Cary and Durham County.



Trip Origins to Crossroads/ South Cary

Trips going to South Cary and the Crossroads area primarily originate from:

- Elsewhere along the US-64/US-1 corridor in Cary and Apex
- Cary, along and south of NC-54
- Western Raleigh
- Southern Wake County

There are few trips between South Cary and Durham County.



Trip Origins to Downtown Raleigh

Downtown Raleigh attracts trips from all over Wake County. The areas with the highest concentration of origins include:

- Within I-440/I-40 highway loop
- Between I-440 and I-540, especially along Capital Boulevard
- Southern Raleigh and Garner along S Wilmington Street and US-70
- Southeast Raleigh
- Along Hillsborough Street in western Raleigh

Few people are traveling from Durham County or Orange County to downtown Raleigh.



Trip Origins to WakeMed/ St. Albans

Trips going to WakeMed and St. Albans come from various parts of Wake County and Johnston County, especially:

- Between I-440 and I-540 in North Raleigh, especially along the Capital Boulevard corridor
- Downtown Raleigh and neighborhoods within the I-440 loop
- Southeast Raleigh
- Along Knightdale Boulevard
- Along US-1 and US-401 in northern Wake County

Trips from Durham County to WakeMed/St. Albans are limited.



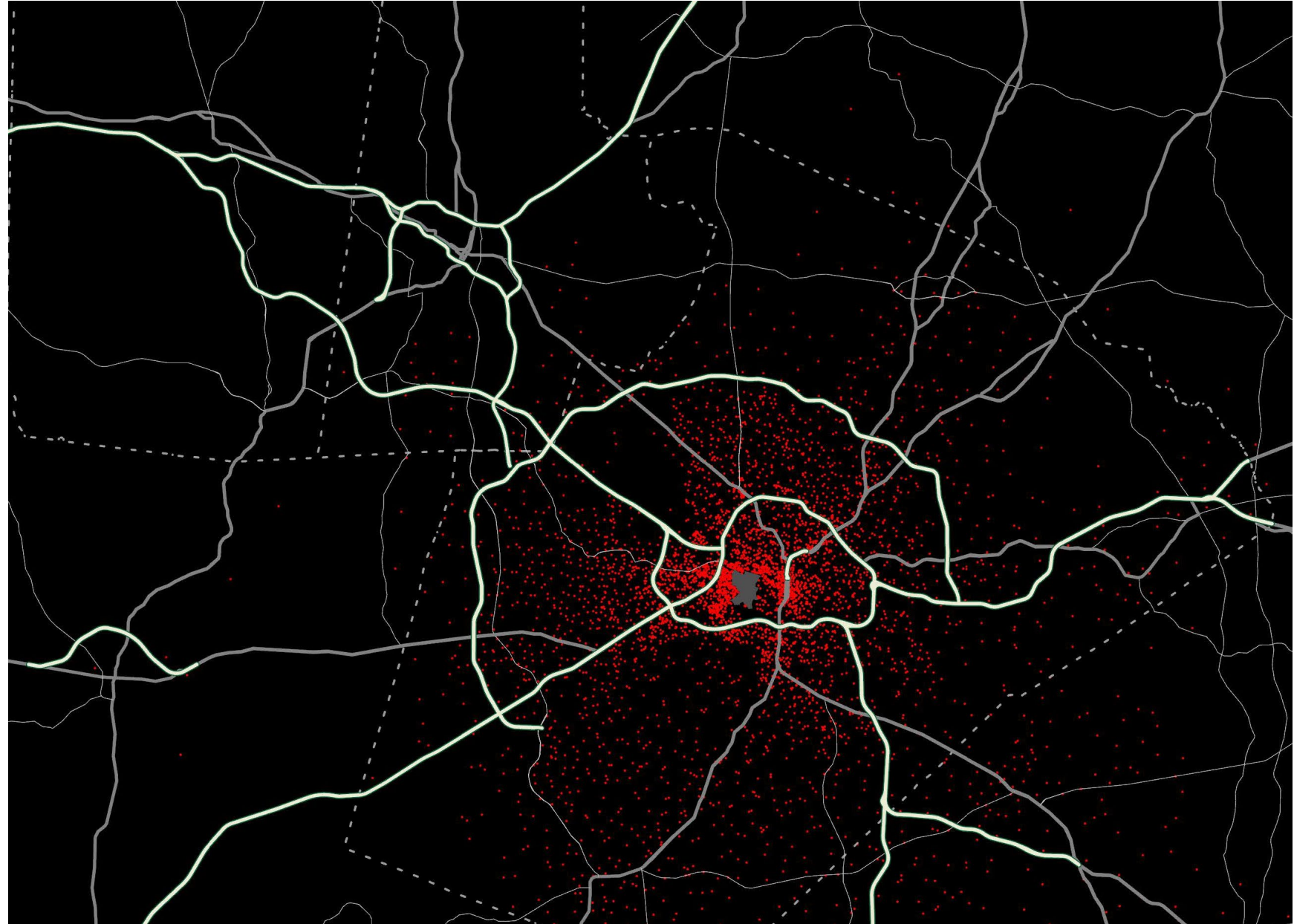
Trip Origins to NCSU

Trips going to NCSU are heavily concentrated in the immediate vicinity of the campus, especially in downtown Raleigh to the east and western Raleigh.

Other origins include:

- Southern Raleigh and Garner along S Wilmington Street
- Cary, especially near the I-40/I-440 interchange
- Raleigh, south of I-540

Trips from Durham County to NCSU are limited.



Trip Origins to Blue Ridge/ Crabtree

Trips going to Blue Ridge and Crabtree primarily originate from the areas surrounding these destinations, including:

- Along the Western Boulevard corridor from Raleigh to Cary, including downtown Raleigh, and NCSU
- Northern Raleigh between I-440 and I-540
- Downtown Cary and neighborhoods to the east and south



5 – Population and Employment Changes

Population and Employment Changes (2016-2040)

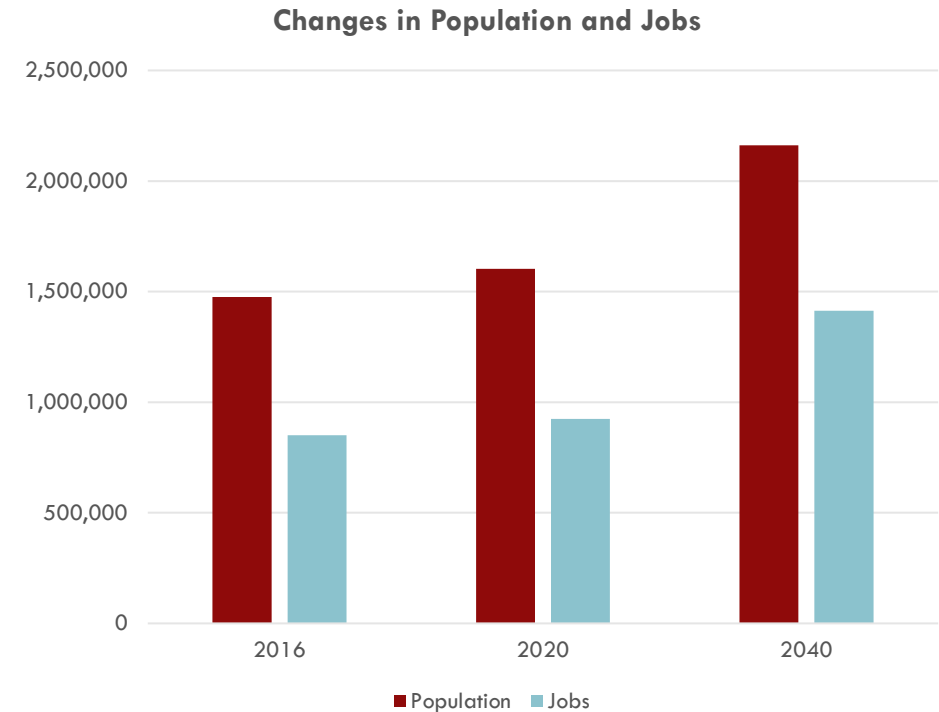
Transit improvements are long term investments, and it is important to understand future development and growth patterns. From 2016 (when the original Wake Transit Plan was enacted) to 2020, the tri-county region saw a slight increase in population and employment, and that growth is expected to expand over the next 20 years.

Since 2016, at the start of the Wake Transit Plan, both population and the number of jobs have grown by about 9%. As shown on the maps on the next page, the greatest increases in population density were in downtown areas, with slight increases in smaller municipalities in Wake County. Job density primarily grew in downtown Raleigh, NCSU, RTP, US-64/US-1 intersection, and parts of Durham and Chapel Hill.

Population and employment density is expected to increase significantly by 2040, with population projected to grow by 35% and jobs projected to grow by 53% in Wake, Durham, and Orange counties. As shown on the next set of maps, areas that are forecasted to have significant change are as follows:

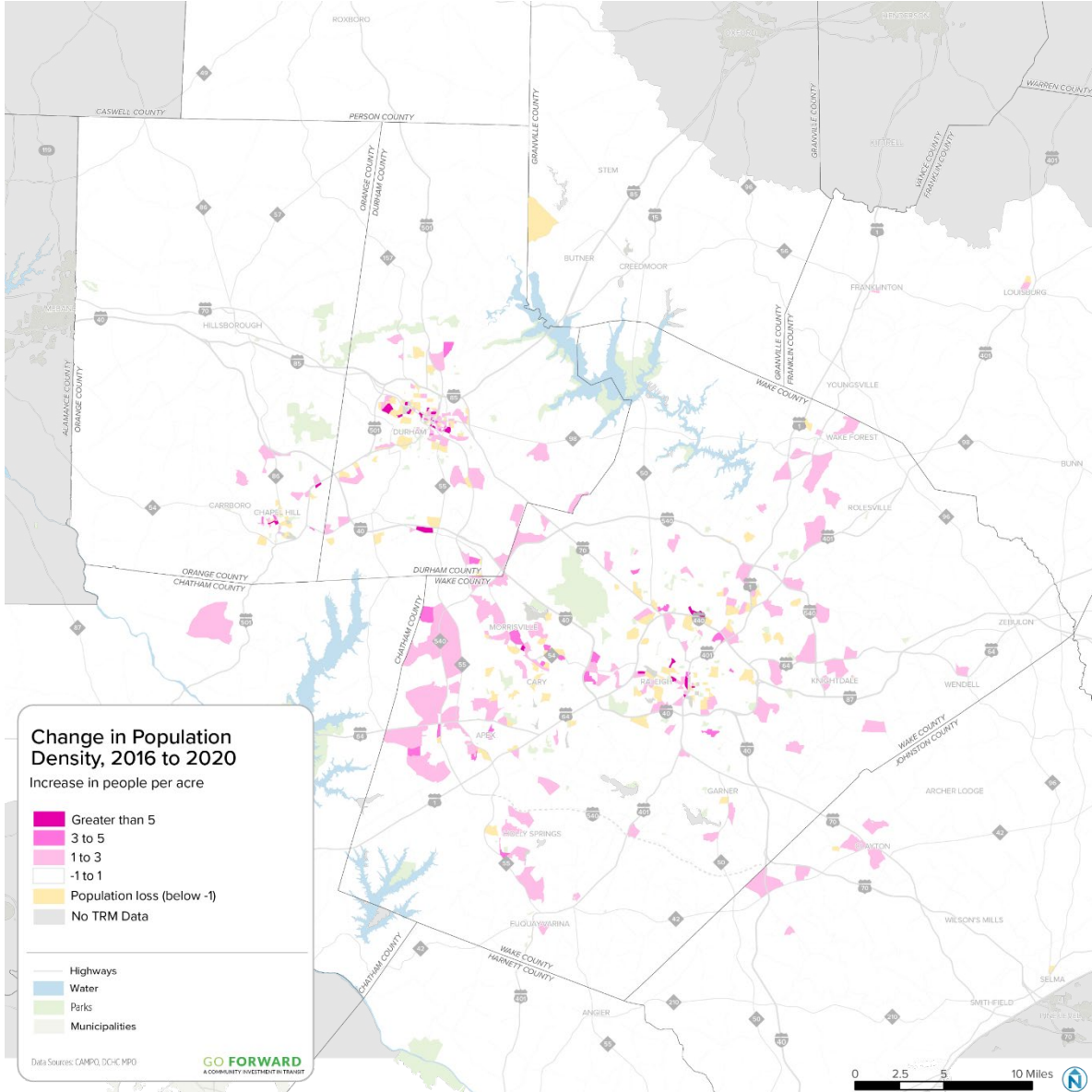
- The greatest employment growth is expected along the four Wake BRT corridors in Raleigh, the Cary-RTP corridor, the Durham-Chapel Hill corridor, and in downtown Durham.
- The largest population density increases are projected in Raleigh, Cary, and Durham, including Durham-Chapel Hill, Raleigh-Cary, and Capital Boulevard Corridors.

Population density will also continue to increase across the region, potentially opening new areas for transit and allowing for more frequency in already transit-supportive areas.

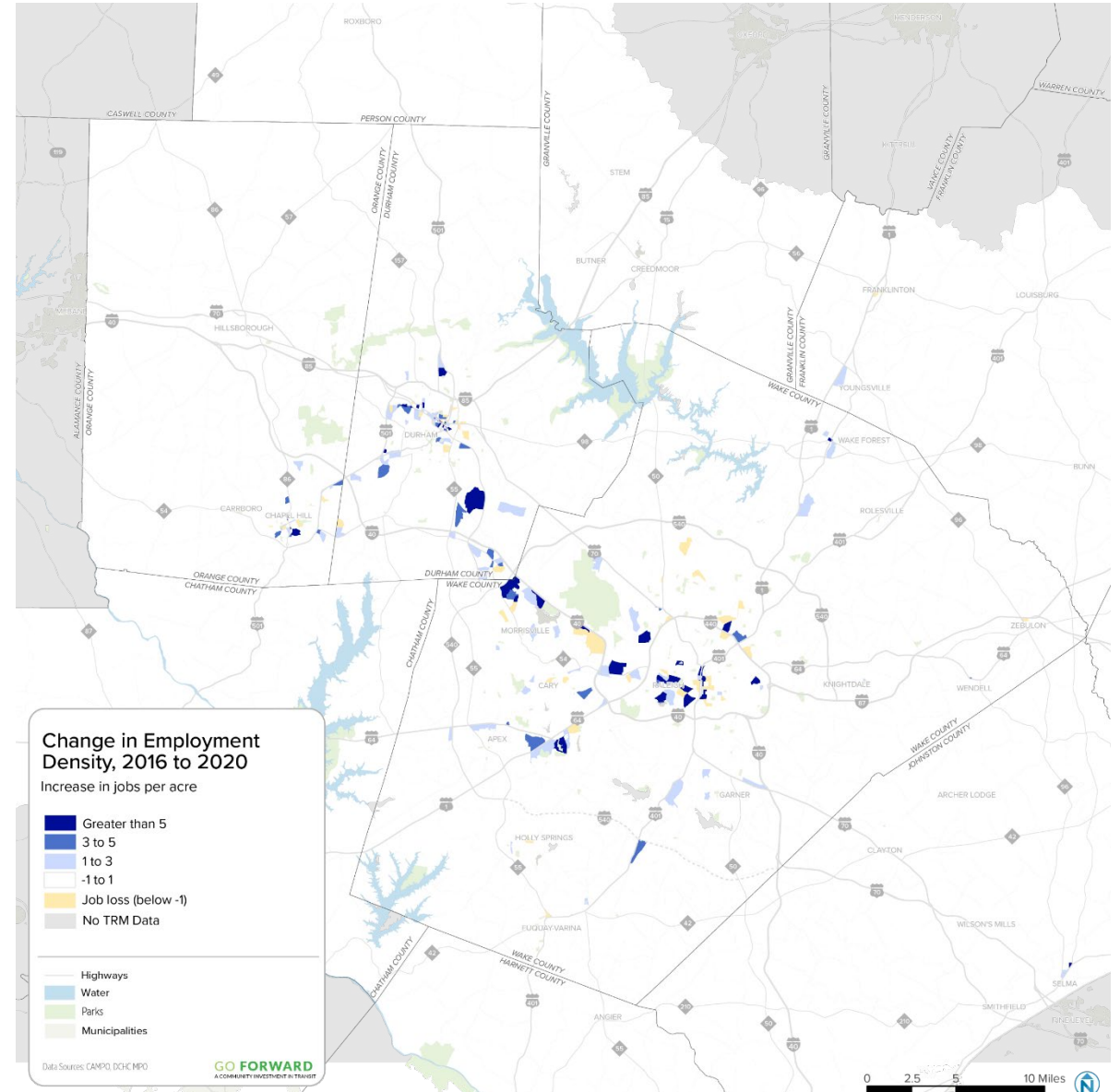


Source: CAMPO, DCHC MPO

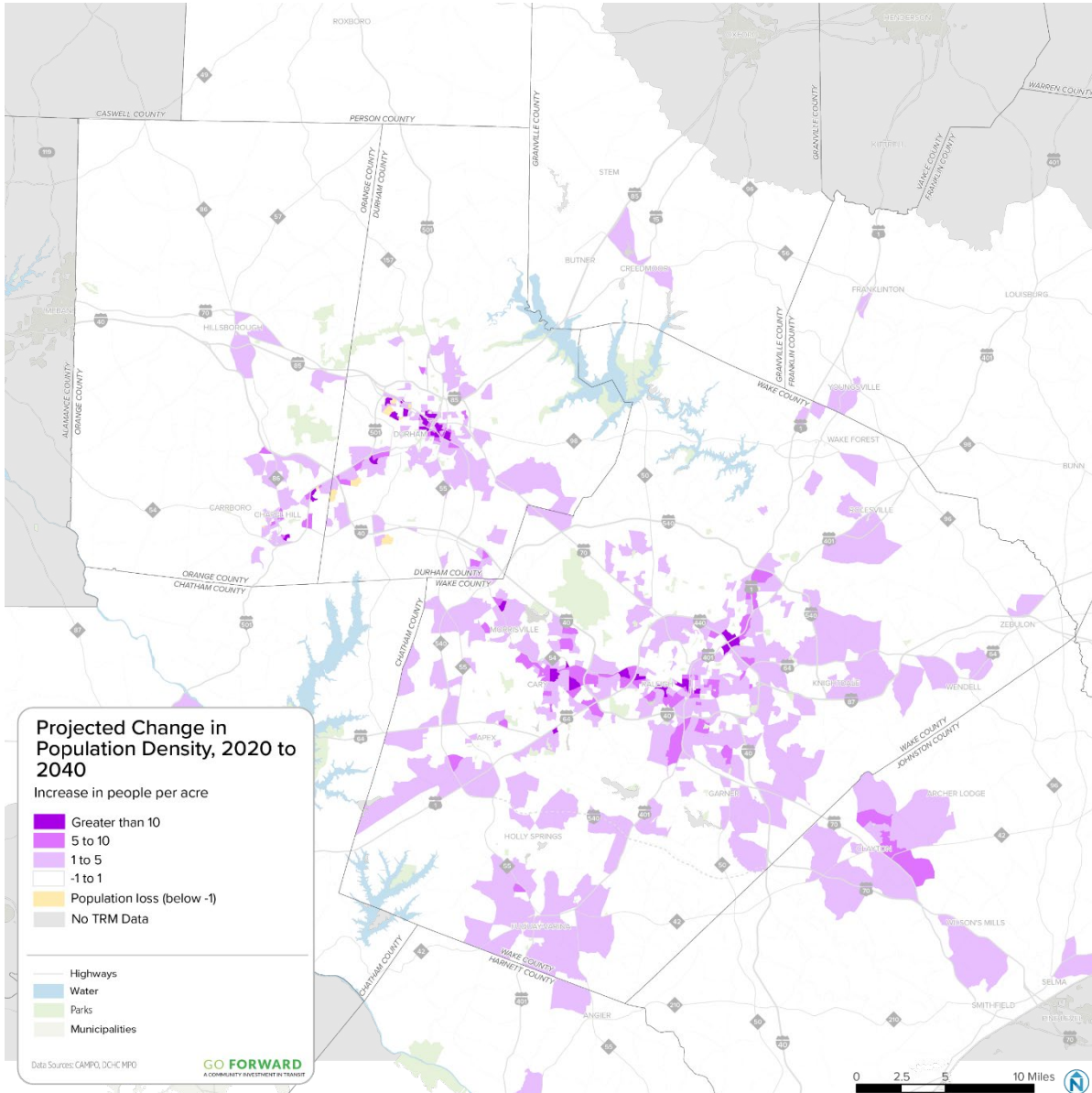
Population Density 2016 to 2020



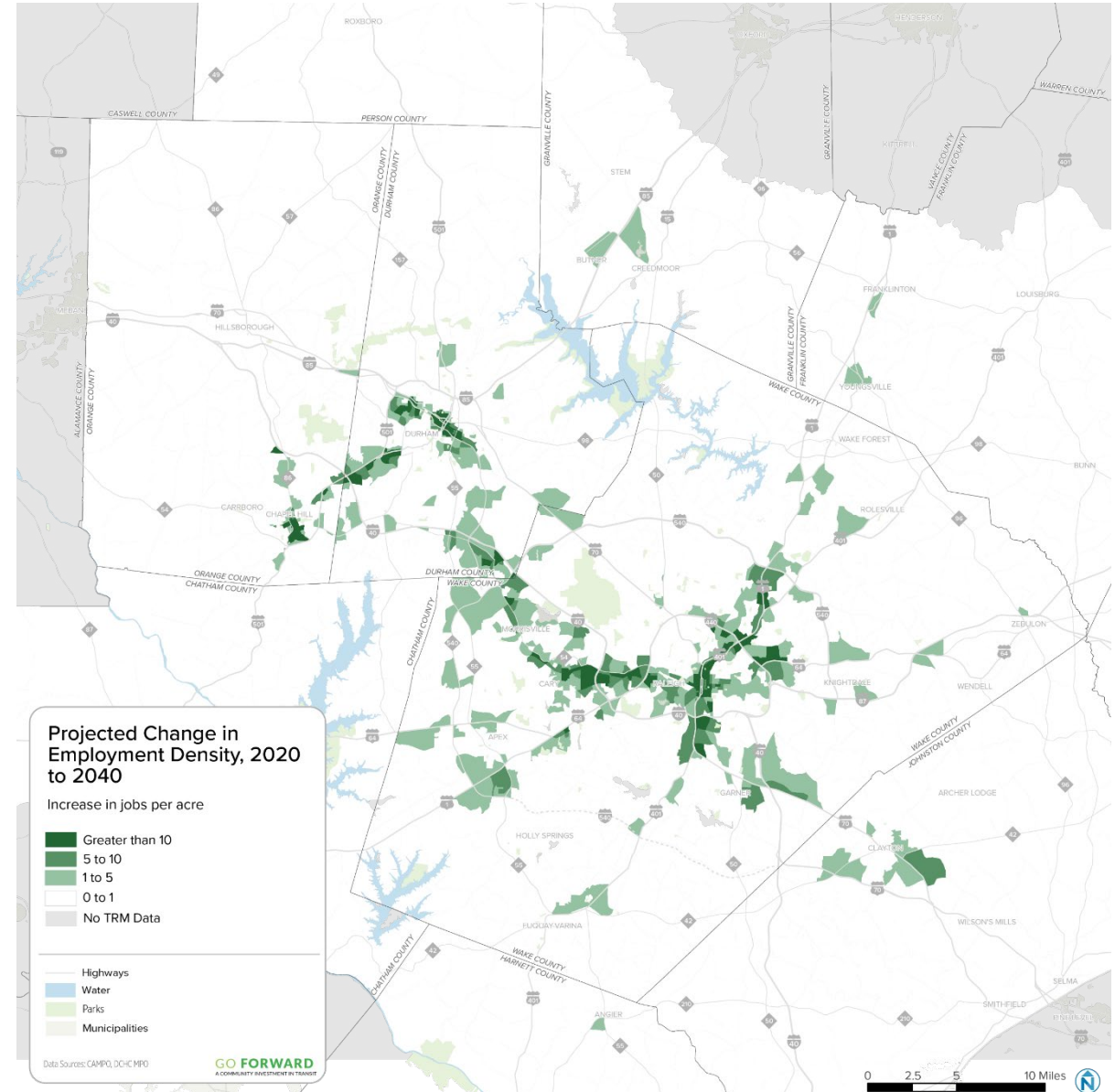
Employment Density 2016 to 2020



Population Density 2020 to 2040



Employment Density 2020 to 2040



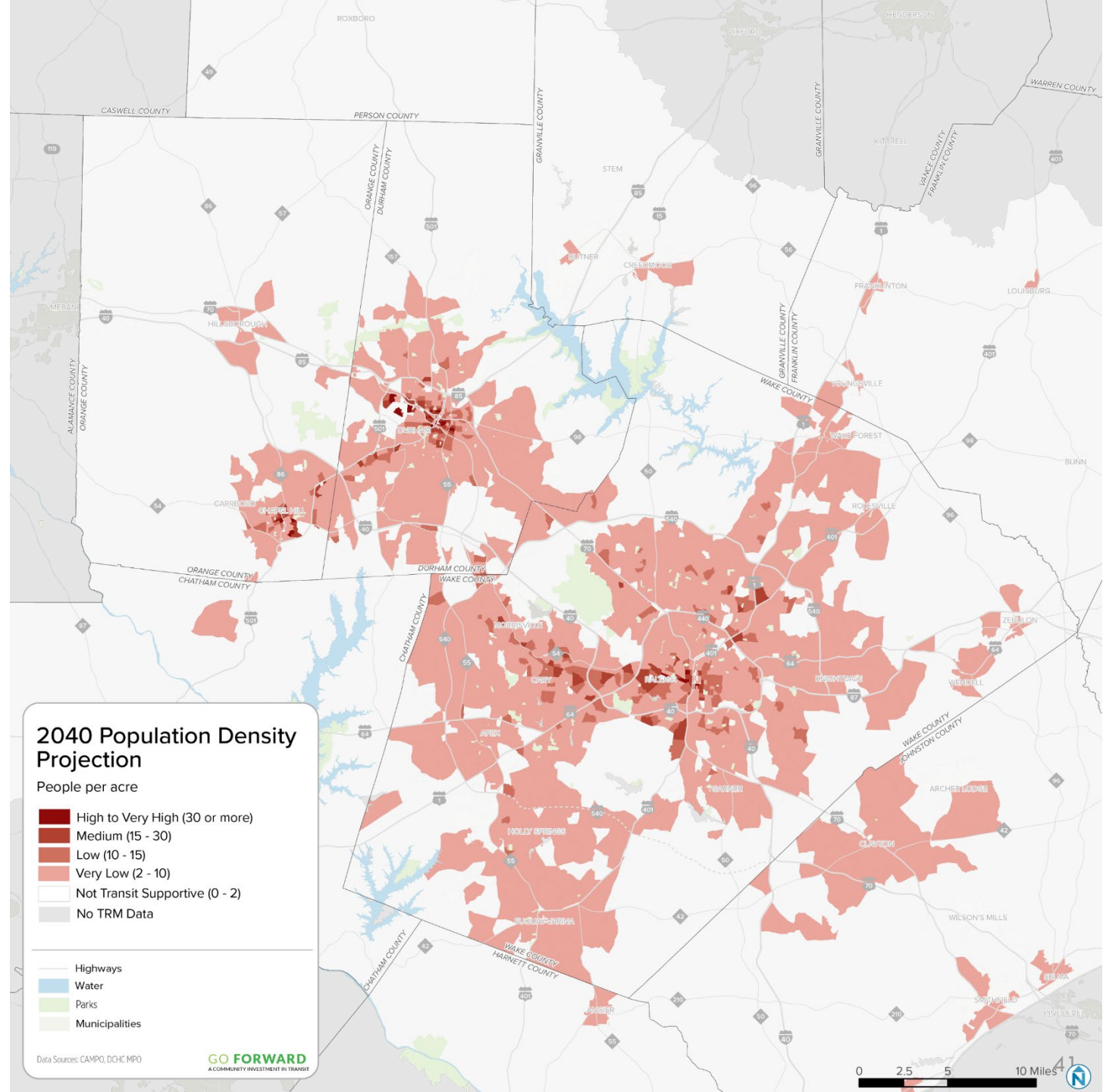
6 – Transit Demand in 2040

2040 Population Density

With population and employment density increasing, transit will continue to become a more suitable option in more areas of Orange, Durham, and Wake counties. Using population and employment projections from CAMPO and DCHC MPO, the project team repeated the composite demand analysis to extrapolate transit supportive areas in 2040.

Population density will increase across the region by 2040 in urban, suburban, and rural areas. The places with high population densities will include:

- Downtown Durham and surrounding neighborhoods
- Downtown Chapel Hill
- Durham-Chapel Hill Corridor
- Downtown Raleigh, and neighborhoods to the north and south
- Downtown Cary and Eastern Cary Gateway



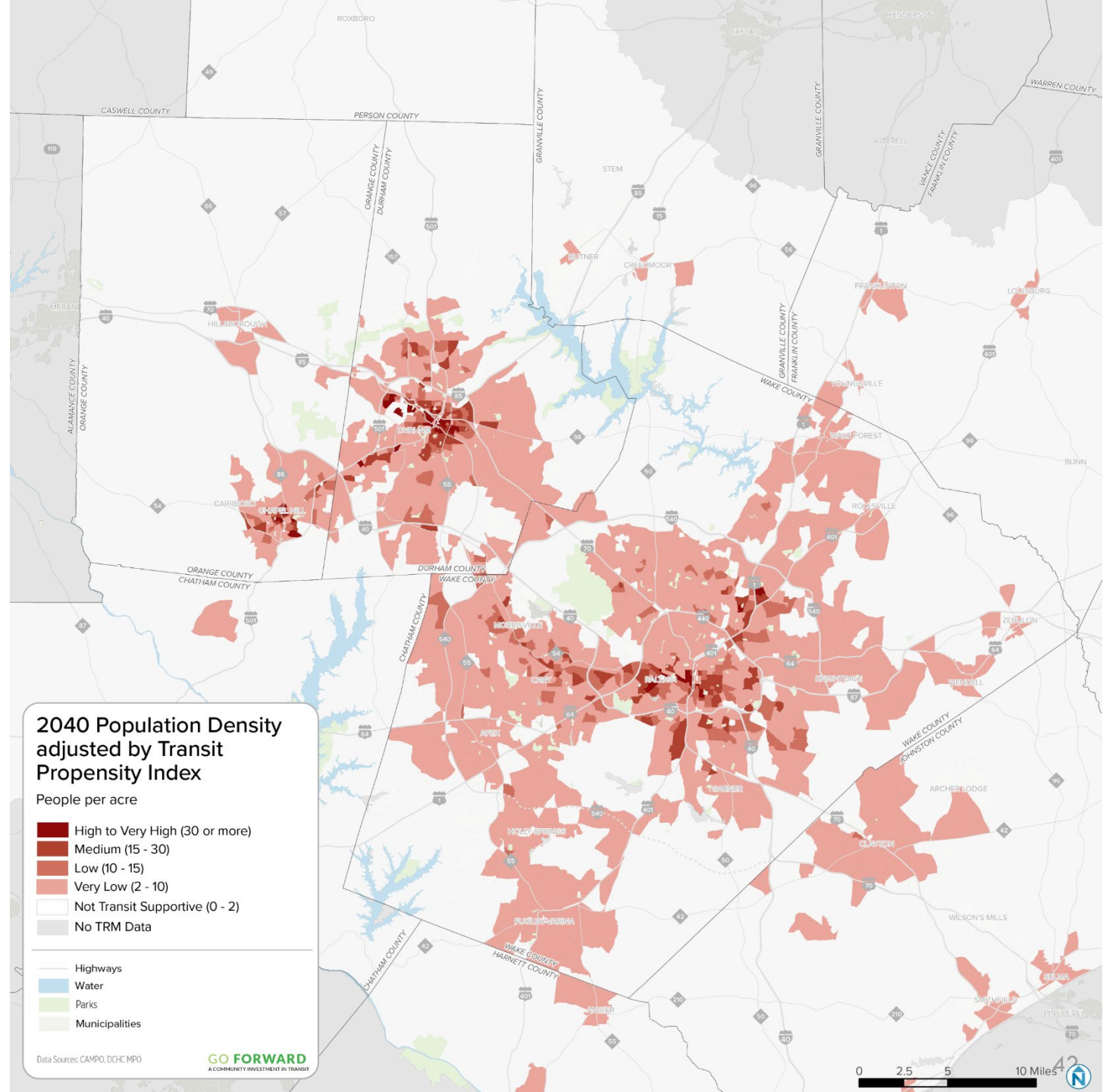
2040 Adjusted Population Density

Using the same transit propensity index factors as the 2020 analysis, the population density was adjusted to reflect the impact of socioeconomic factors on potential transit demand.

When factoring in the adjustments, the following areas have high population-based demand:

- Downtown Durham, East Durham, and other nearby neighborhoods
- Chapel Hill and Durham-Chapel Hill Corridor to the north
- Downtown Raleigh, southern Raleigh, and Capital Boulevard Corridor
- Downtown Cary and Eastern Cary Gateway

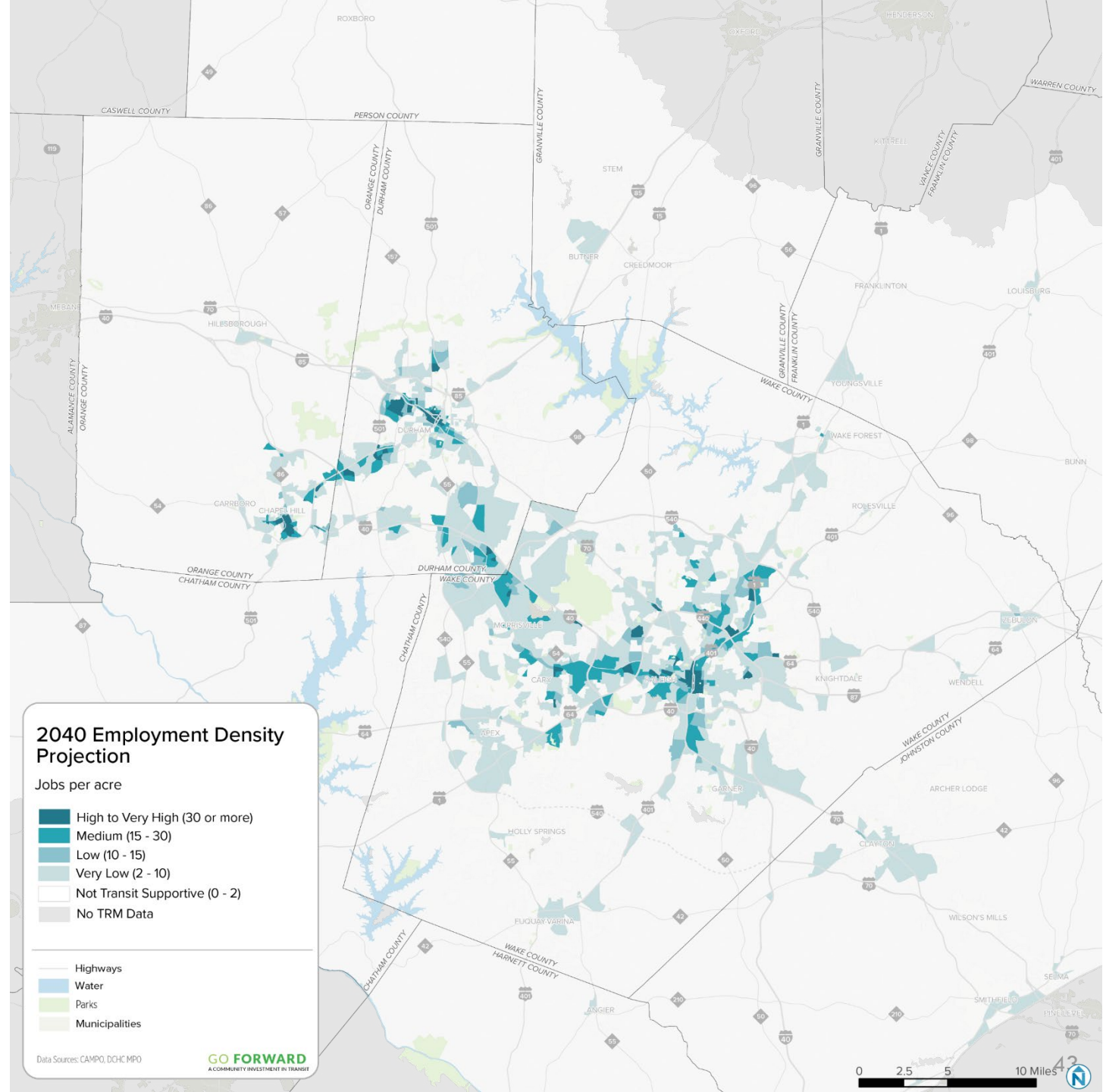
2020 factors were used to adjust 2040 population density, since demographic and socioeconomic data are not typically projected on a long-term basis. This analysis was conducted to offer a direct comparison to the 2020 Transit Demand Analysis covered in Chapter 2 of this report. However, it is important to note that where different communities live may shift greatly between now and 2040, especially due to gentrification, and further planning and demographic analyses are needed on a recurring basis over the next few decades as updated data becomes available.



2040 Employment Density

2040 employment density is distributed similarly to current employment density, concentrated in downtown Raleigh, Durham, Chapel Hill, and Research Park Triangle.

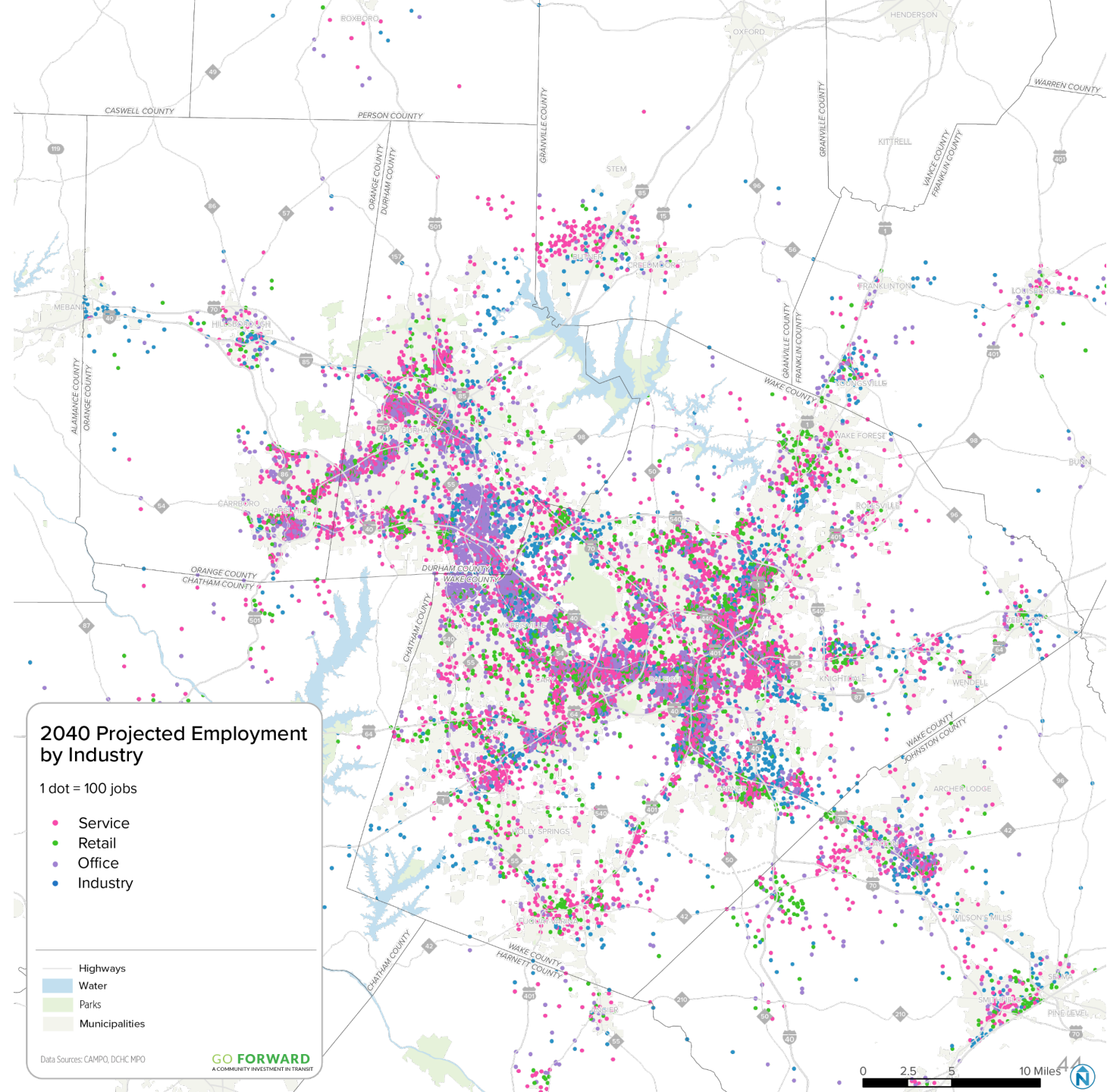
Employment density is highest in downtown Raleigh, Durham, and Chapel Hill, Research Triangle Park, and along major corridors, including US-501 between Durham and Chapel Hill, NC-54 between Raleigh and Cary, and US-401 northeast of Raleigh. Jobs are more concentrated than population, with low job density that may not support transit outside of these areas.



2040 Job Type Adjustment

The project team adjusted 2040 employment density using projected job types, looking at the concentrations of different industry types in the region to better reflect the travel patterns generated by different job types beyond the number of directly employed persons at that location.

The increasing job densities in the service industry-heavy downtown areas will increase the transit demand in those areas at higher rates than the outward industry growth or RTP-area office employment growth.



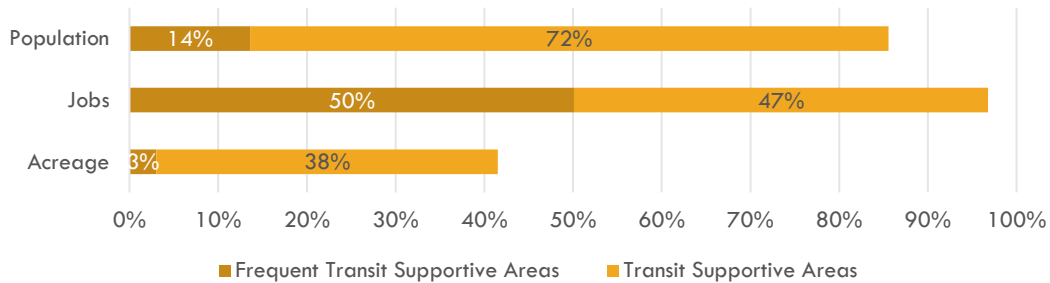
Composite Demand (2040)

The transit supportive regions in the study area show similar patterns to the 2020 composite demand, with areas previously with Medium or High levels of transit support now showing High or Very High levels of support. Some areas that previously showed no support for transit may be able to support Very Low to Medium levels of transit service in 2040.

Along with the downtowns of Raleigh, Cary, Durham, and Chapel Hill, there is strong demand along Capital Boulevard and northeastern I-440, in Southern Raleigh and Cary, in the Raleigh-Cary-RTP-Durham Corridor, the Durham-Chapel Hill Corridor, Southern Durham, and US-401.

By 2040, about 40% of land area in the three counties is projected to be transit supportive, home to 86% of people and 97% of jobs. About 3% of land area will be supportive of frequent transit service, with approximately half of all jobs and 14% of the population.

Population, Jobs, and Acreage of Transit Supportive Areas in Wake, Durham, and Orange Counties (2040)



Source: CAMPO, DCHC MPO, ACS 2019 5-Year Estimates, Triangle Region OnBoard Survey (2019)

