Southwest Raleigh

Transportation Analysis

I. Existing Transportation Systems and Future Plans

Southwest Raleigh offers a number of different transportation options. Like many other areas of the city, the district has an extensive road network. The southern portion of the district, however, is more rural in nature and has a less-developed street network. Major roads in the district are listed below by type (see also Figure 1):

- **Principal Arterials:** I-440, I-40, Dawson St, McDowell St, Saunders St, (part of) Glenwood Ave
- **Secondary Arterials:** Western Blvd, (part of) Glenwood Ave, Edwards Mill Rd
- **Major Thoroughfares:** (part of) Glenwood Ave, Hillsborough St, Lake Wheeler Rd, (part of) Avent Ferry Rd, Gorman St, Trinity Rd, Blue Ridge Rd, Centennial Pkwy
- **Minor Thoroughfares:** Faircloth St, Oberlin Rd, St. Mary's St, Dillard Dr, Buck Jones Rd, Salisbury St, Wilmington St
- **Collector Streets:** Ridge Rd, Athens Dr, Fairview Rd, West St, Brooks Ave

The design of the street network varies from place to place in the district. While the eastern section - which includes part of downtown Raleigh - is characterized by a grid network with fairly regular block sizes, the western, northern, and southern areas have a more irregular, disconnected street configuration.

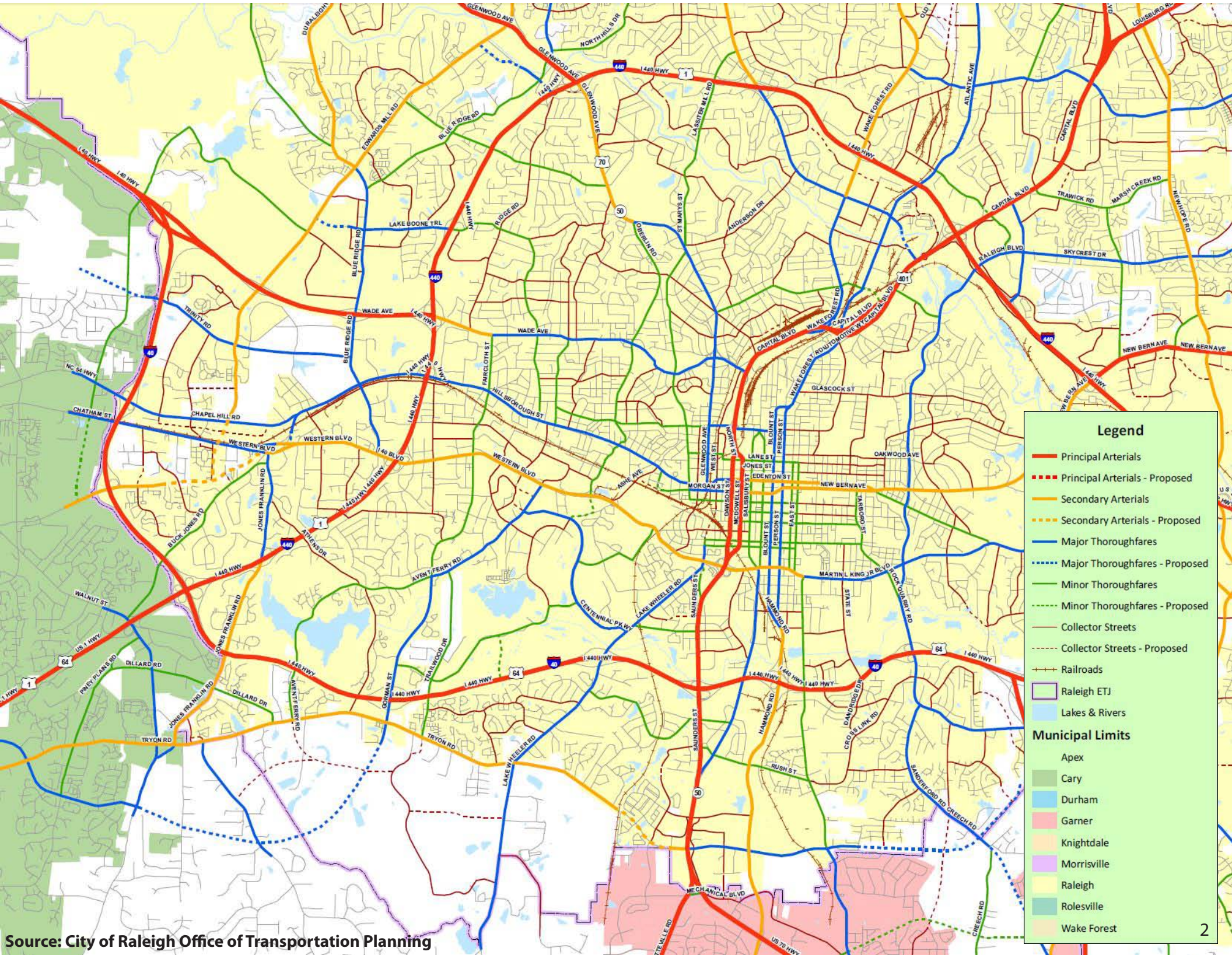
Due to its location, the southwest district serves as a gateway to the rest of the Triangle. The existing road network makes it fairly easy to access employment centers and destinations in the region such as Research Triangle Park, Raleigh-Durham International Airport, Chapel Hill, and Durham.

Transit

In addition to its robust system for moving automobiles, southwest Raleigh also provides other transportation options. The area is served by four different bus transit systems, including Capital Area Transit (CAT), Triangle Transit Authority (TTA), NC State University's Wolfline, and Cary's C-TRAN line (see Figure 2). The CAT system also includes the R-Line bus routes which provide free transportation between destinations in the downtown area. While the CAT and Wolfline systems provide access to areas within the city, the TTA system offers connections to surrounding towns and other areas of the Triangle. The C-TRAN line within the southwest district is only 1.9 miles long and provides a vital connection from CAT bus routes to the Cary area. Overall, the district has 323 miles covered by bus routes and 948 bus stops. Compared to the city of Raleigh as a whole, this represents 41% of total miles covered by bus routes and 37% of total bus stops. Considering that southwest Raleigh makes up approximately 21% of the city's total land area, these numbers are especially impressive.

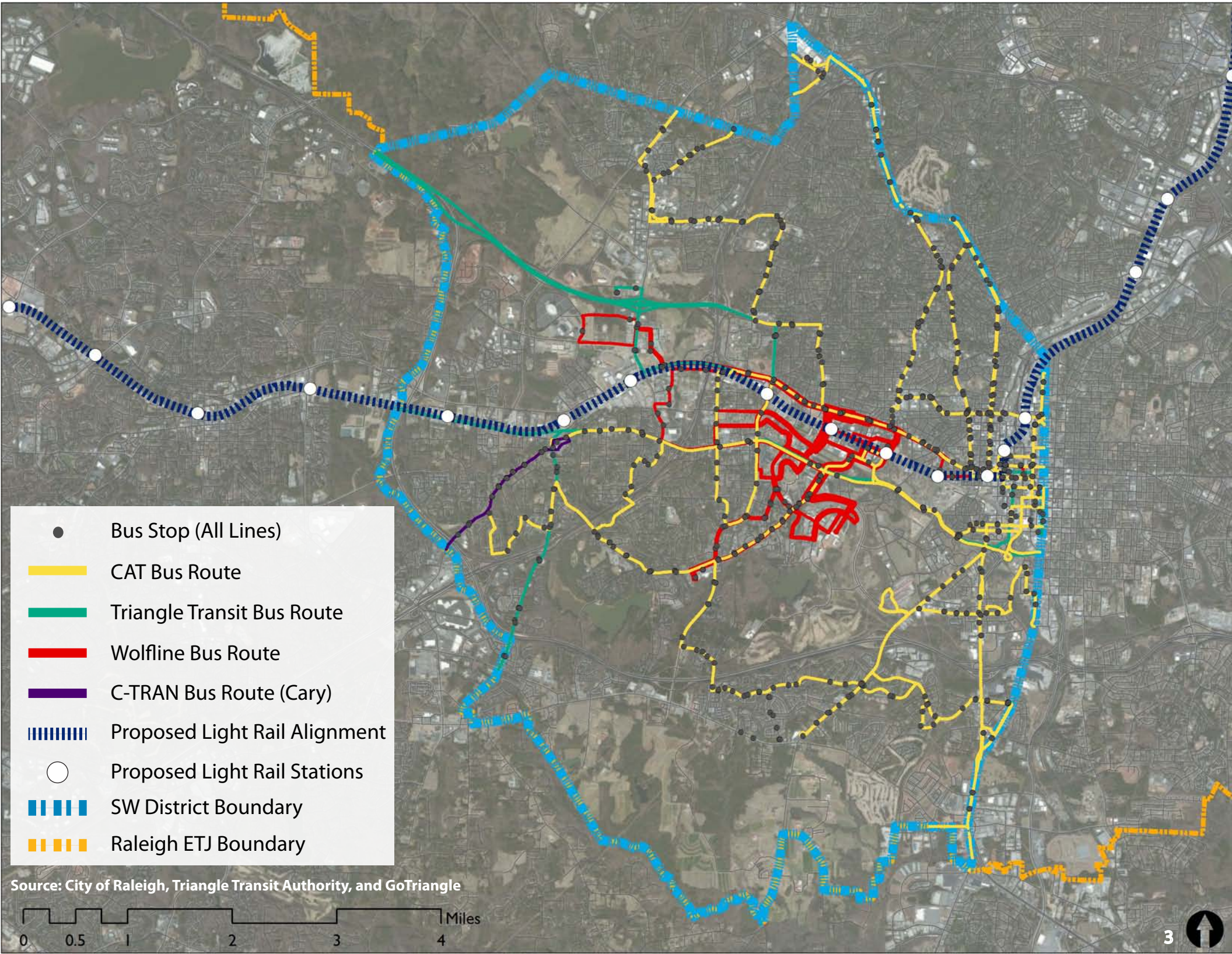
The GoTriangle umbrella organization provides important resources to help residents better utilize the area's various bus transit systems. On their developer resources web page, GoTriangle hosts a number of different user developed applications that can be accessed by the general public to improve their transit experience. Some examples of these applications include: GoLive and TransLoc, apps that provides real time locations for all area bus systems; Smart Ride and AnyStop,

Figure 1. City of Raleigh Thoroughfare Plan, Southwest District



Source: City of Raleigh Office of Transportation Planning

Figure 2. Transit System



apps that provide real-time information for Chapel Hill Transit buses; and YouRHere, an app that provides real time information for R Line buses in downtown Raleigh. Further development and promotion of these kinds of open-source user resources should be a priority for southwest Raleigh as it seeks to cement its status as the creative and innovative district of the city.

The future for public transit in the southwest district is bright. Current plans for a regional light rail system have the major Wake County line traveling through the heart of the southwest district with several stations planned on Hillsborough Street near Meredith College, NC State, and Pullen Park as well as a number of stations downtown (see Figure 2). In addition, there are plans to site the new multi-modal transportation center in southwest Raleigh's warehouse district. The future light rail system presents exciting opportunities for transit-oriented development around the future stations. Planners in Raleigh have started to lay the framework for this kind of development by creating and supporting zoning districts that permit denser, mixed-use development near these stations.

Active Transportation

Southwest Raleigh also has infrastructure in place that supports active transportation modes (see Figure 3). In terms of pedestrian infrastructure, the district has approximately 215 miles of sidewalk. Despite this seemingly substantial amount of sidewalk infrastructure, the network itself has gaps and may not be as useful in areas where land use patterns (separated land uses, large distances between destinations) do not support pedestrian travel. In addition, this amount is less than half the length of streets in the district - 472 miles - which means that many road segments do not have dedicated pedestrian infrastructure.

In terms of exclusive bicycle infrastructure, the district has very few bicycle lanes. In sum, there are 6.5 miles of striped bike lanes. This is in keeping with the city as a whole since Raleigh has little in the way of dedicated roadway bicycle infrastructure. However, of the small amount of bicycle lanes located throughout the city, the southwest district has a fairly high share (over 50%). As found in the city's 2009 bicycle plan completed by Alta/Greenways, Raleigh also has a modest amount of other bicycle-supportive infrastructure such as wide outside lanes, shared road markings, and signed bicycle routes (see Figure 4).

Despite the mixed record on sidewalk and bike lane infrastructure, the southwest district and the city have done a better job at developing a robust greenway and trail system. Southwest Raleigh has 55 miles of greenways and trails which represents 28% of the city's total greenway/trail miles. While the greenway system serves some important destinations such as the NC Museum of Art (NCMA), Meredith College, the PNC Arena area, NC State, and recreation areas (Lake Johnson, Lake Raleigh, Schenk Forest), there a number of gaps making it hard to utilize the system as a means of regular, and not just recreational, transportation. Although the city's greenway and trail system has traditionally been viewed as more of a recreational amenity, city planners and other stakeholders have been working to make the system more of an interconnected network and rebrand it as a means of everyday, utilitarian travel.

Figure 3. Active Transportation

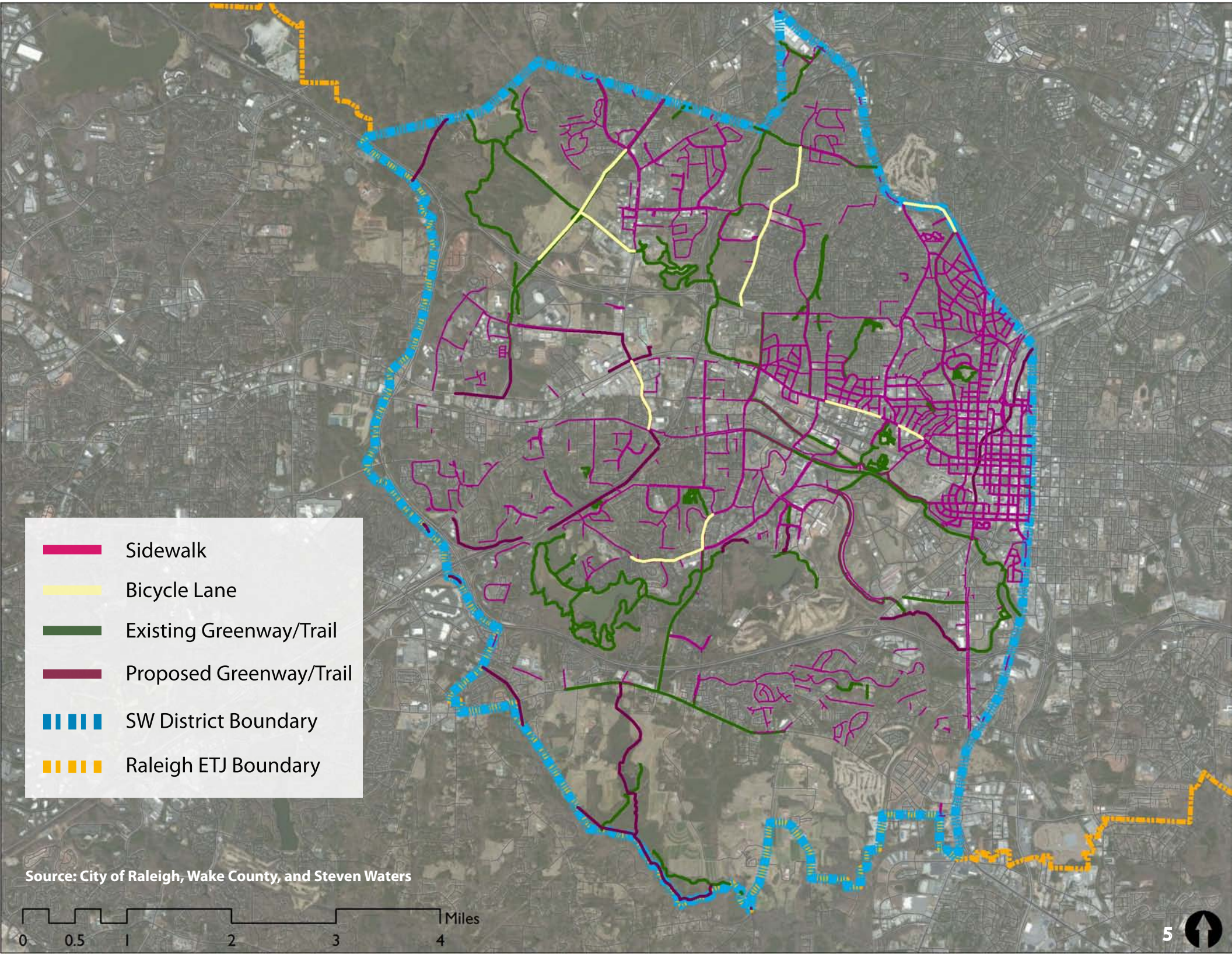
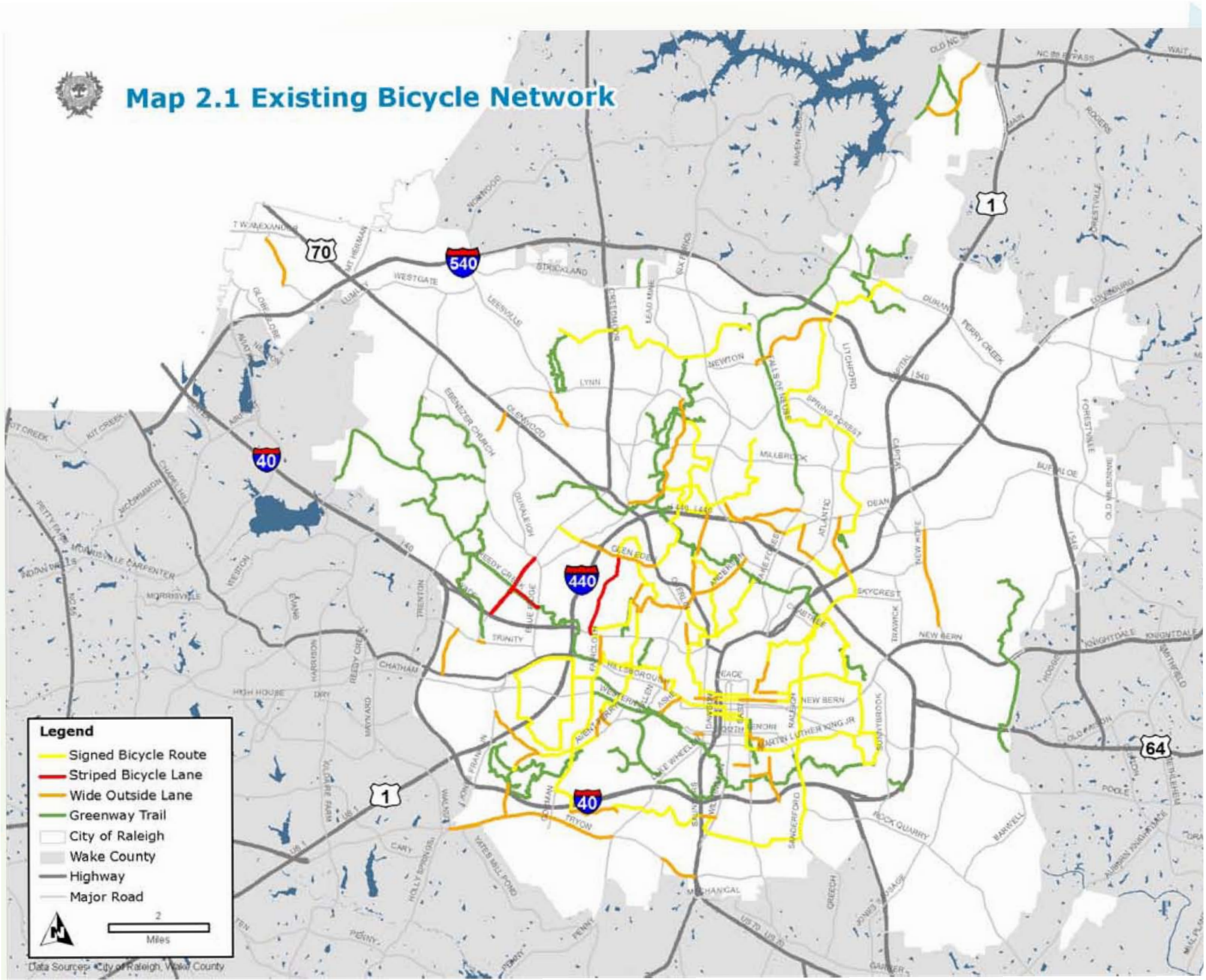


Figure 4. Existing Bicycle Network, 2009 Raleigh Bicycle Plan



II. Destinations/Attractors

The southwest district is home to a number of the city's educational, cultural, and economic assets (see Figure 5). Moving from east to west:

- **Downtown Raleigh** – Downtown is the economic and cultural heart of the city and has recently experienced a surge of reinvestment including retail and residential development.
- **Glenwood South** – This area has become a popular entertainment district over the last 10-15 years, and similar to downtown, has been transformed by new investment.
- **Pullen Park** – Located between Hillsborough Street and Western Boulevard, this historic park was recently renovated and includes picnic areas, a carousel, playgrounds, tennis courts, and a playhouse.
- **North Carolina State University** – A major research institution and the state's land grant university, NC State is a vital part of the city, region, and state's economic, intellectual, and cultural life.
- **Meredith College** – A private all-women's college that also offers a number of graduate programs open to both men and women.
- **Rex Hospital** – One of the city's largest health care providers. Rex also has plans to expand its campus over the next 20 years.
- **North Carolina State Fairgrounds** – More than the site for the annual state fair, the fairgrounds complex hosts a number of events and attractions throughout the year.
- **North Carolina Museum of Art (NCMA)** – The museum offers a permanent collection of artwork as well as temporary exhibitions throughout the year. In addition to its indoor offerings, the museum has outdoor artwork along a fairly extensive trail/greenway system and also hosts outdoor shows at its amphitheater.

Looking at access, many of the major destinations located in the district are within a ¼ mile distance of a bus stop. Of the 88 destinations identified in Figure 5, 71 of them are located within this ¼ mile buffer zone. There is a more mixed picture when looking at access via active modes. Although many of the destinations have sidewalks immediately adjacent to their property, there are often system gaps close by that may make it hard to successfully and comfortably use the sidewalk network as a means of travel to these destinations. The greenway system does a good job of connecting residential areas to natural recreation areas as well as the NC Museum of Art located on the Blue Ridge Road Corridor. The small number of bike lanes in the district mean that many of these destinations are not accessible via dedicated bike infrastructure.

As mentioned above, several of the district's key destinations are also important employment centers for the city and region as a whole. Downtown, NC State, and Rex Hospital all play a major role in providing and creating jobs. The southwest district is also close to perhaps the most important employment center in the state – Research Triangle Park (RTP). Figure 6 below outlines estimated commute times by mode to these major employment nodes.

Figure 5. Destinations and Employment Centers

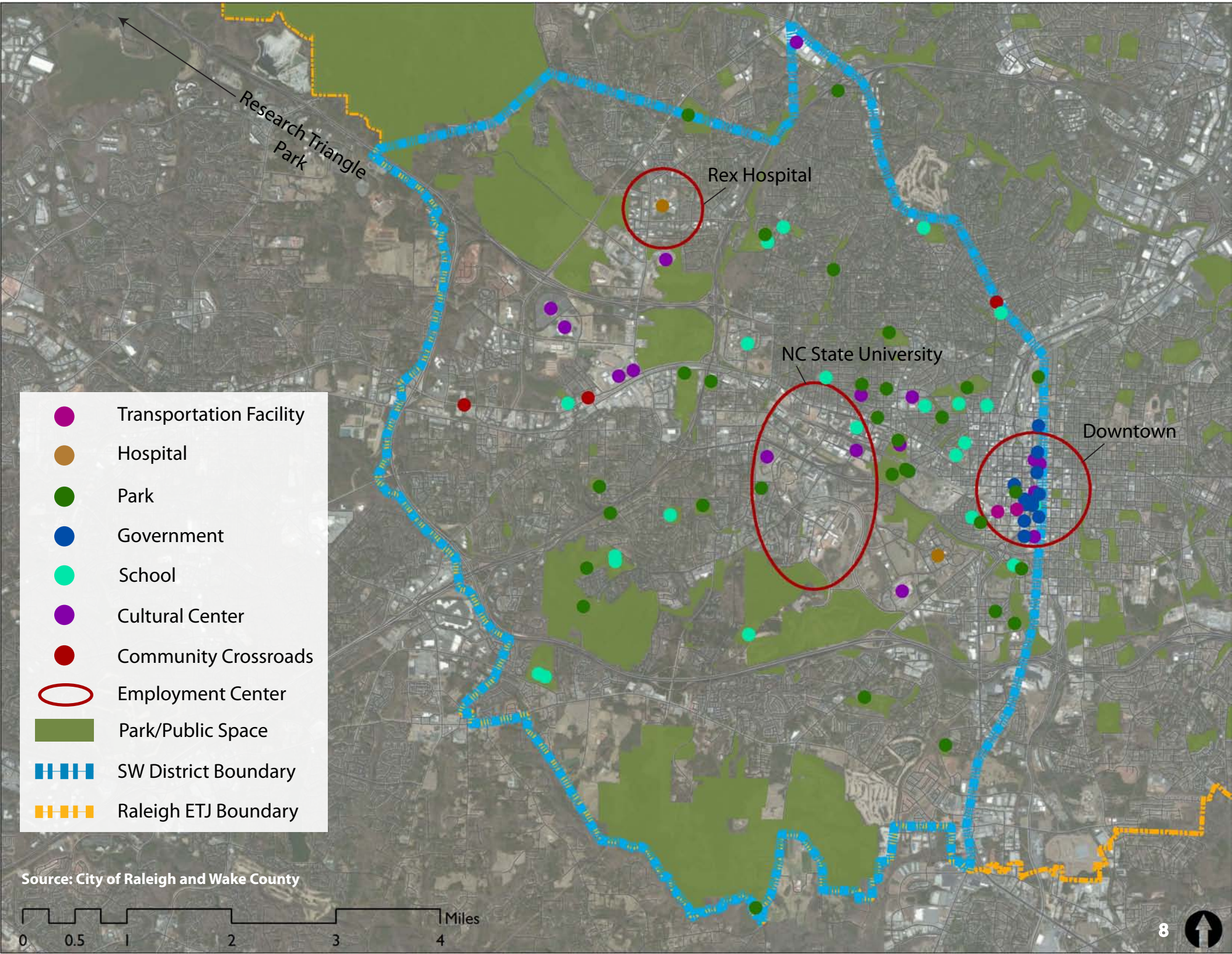


Figure 6. Commute Times by Mode to Employment Centers

	RTP		NCSU				Downtown				Rex			
	Car	Bike	Car	Bus	Bike	Foot	Car	Bus	Bike	Foot	Car	Bus	Bike	Foot
From/To SW District (minutes)	20-35	60+	5-15	5-30	5-40	5–60+	5-40	5-20	5-50	5–60+	5–30	5-50	5-50	5–60+

III. Land Use & Key Demographic Characteristics

All major types of land uses – residential, institutional, commercial, office, industrial, and park/open space – are present in southwest Raleigh. While the downtown area in the east has a greater mixture of these major uses with a heavier balance of office, institutional, and commercial, the northern part of the district is more residential in nature (predominantly single family homes), the central section is characterized by residential and institutional uses (NC State and Meredith College campuses), and the southern section has some residential with quite a bit of open space and parkland.

Raleigh's current zoning map shows this variety – and the predominant separation of uses - in the southwest district (see Figure 7). The recently updated comprehensive plan and city development ordinance, however, reflects increased support and flexibility for more mixed use development. According to the city's growth framework (see Figure 8), the southwest district is expected to have a number of growth centers and community mixed use centers. The growth centers include: the West Raleigh area encompassing part of the Blue Ridge corridor and two proposed light rail stations on the edge of town and the Cameron/University area which includes the neighborhoods northeast of NC State University that border the edge of downtown. Mixed use centers are distributed throughout the district and are largely found at existing commercial, mixed use, and higher density nodes. Some examples of these mixed use centers are: the Oberlin Rd-Glenwood Ave area; Lake Boone Trail between 440 and Blue Ridge Rd; Edwards Mills Rd at Blue Ridge Rd; the Crabtree area near Crabtree Valley Mall, and; the Centennial Parkway-Western Blvd-Avent Ferry Rd area.

Area planners and the residents who helped produce these guiding documents are clearly interested in better coordinating the city's transportation systems and land use patterns. The future light rail system forms the backbone of the growth framework, and future development is being funneled to areas around the stations and along the corridor.

In terms of residential land use, the district has an average density of 2.9 dwelling units per acre. The densest block groups are found surrounding the NC State University campus as well as just northwest of downtown in the Peace Street and Glenwood South areas (see Figure 9).

Figure 7. Zoning

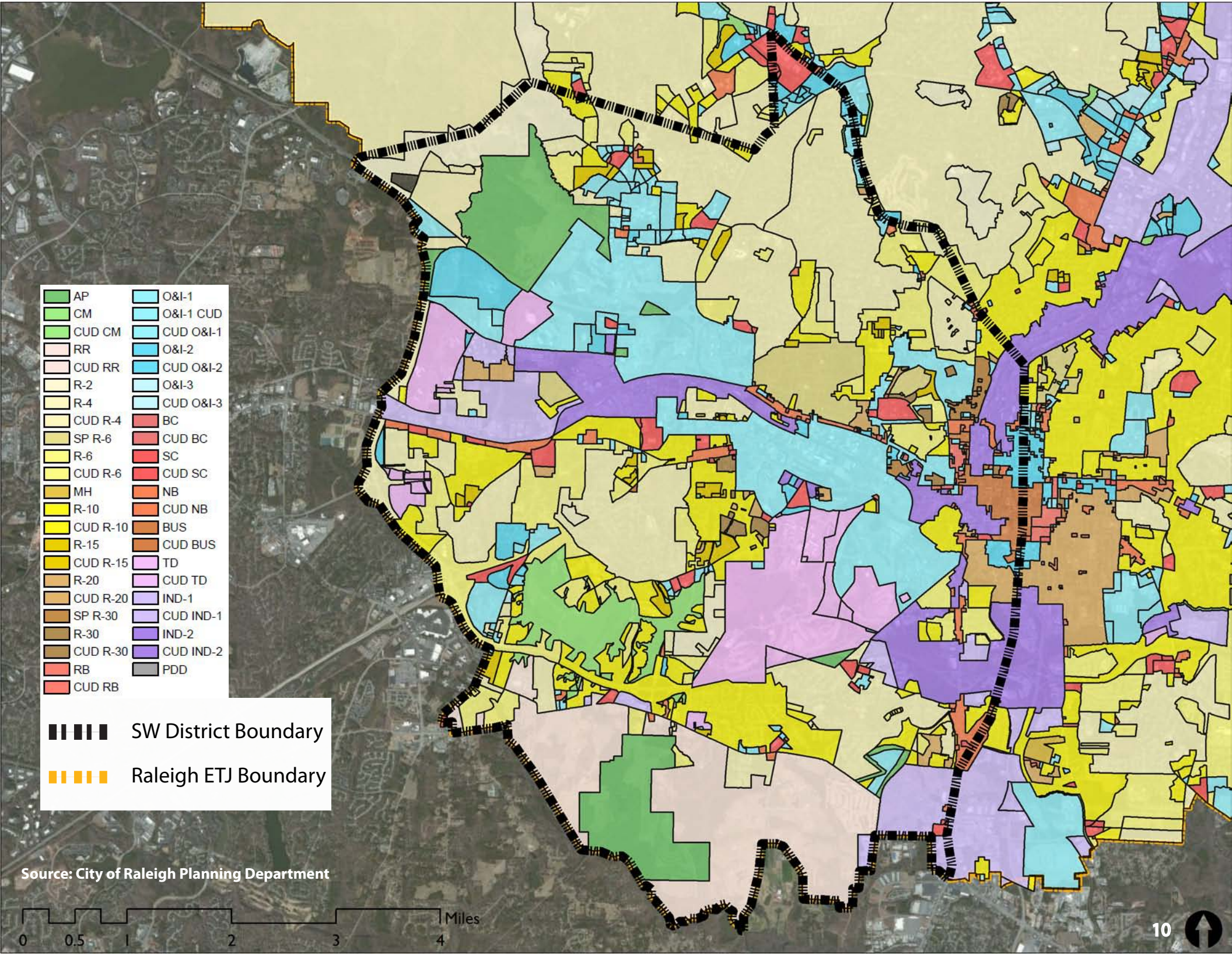


Figure 8. Raleigh Growth Framework, 2009 Comprehensive Plan

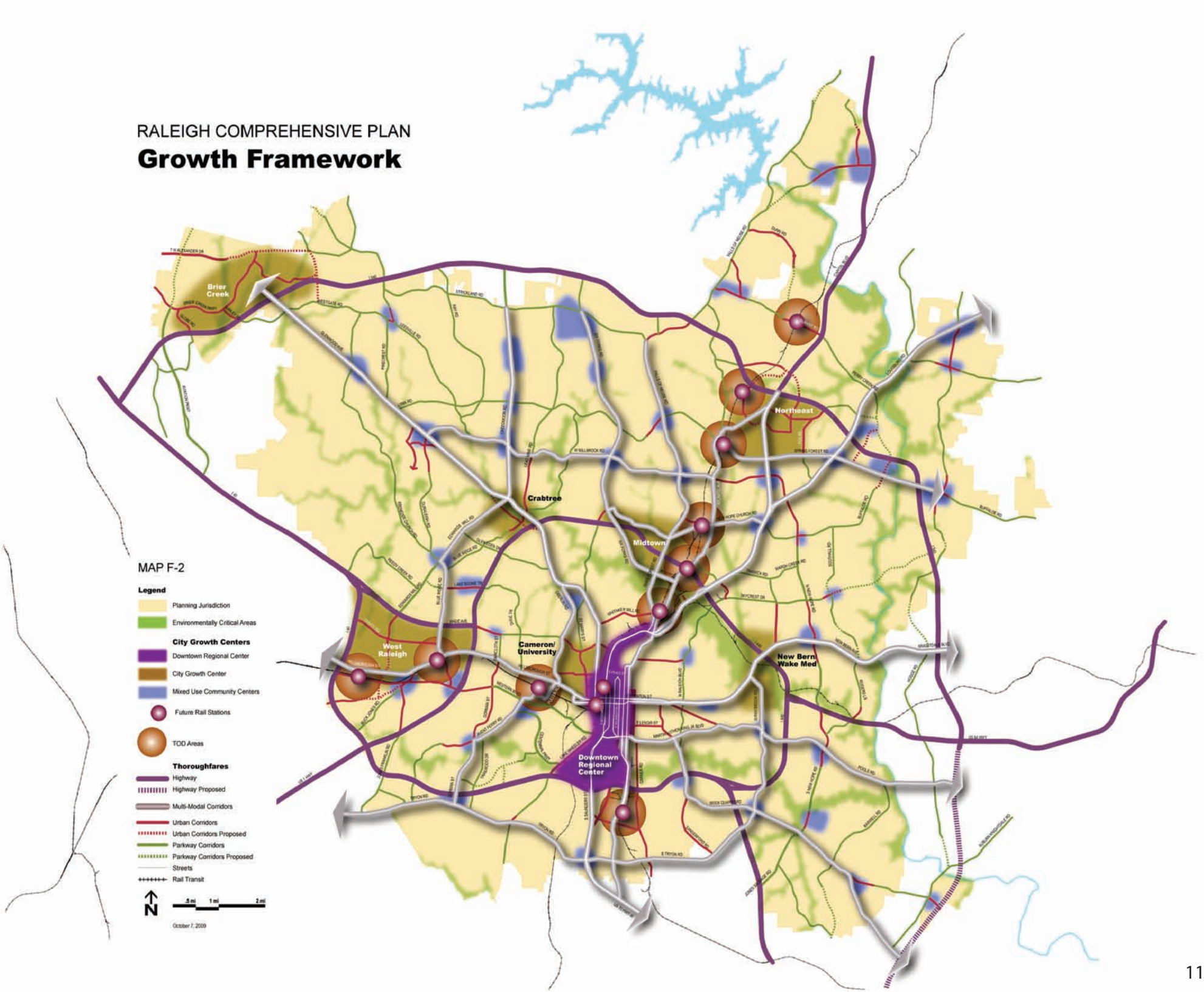
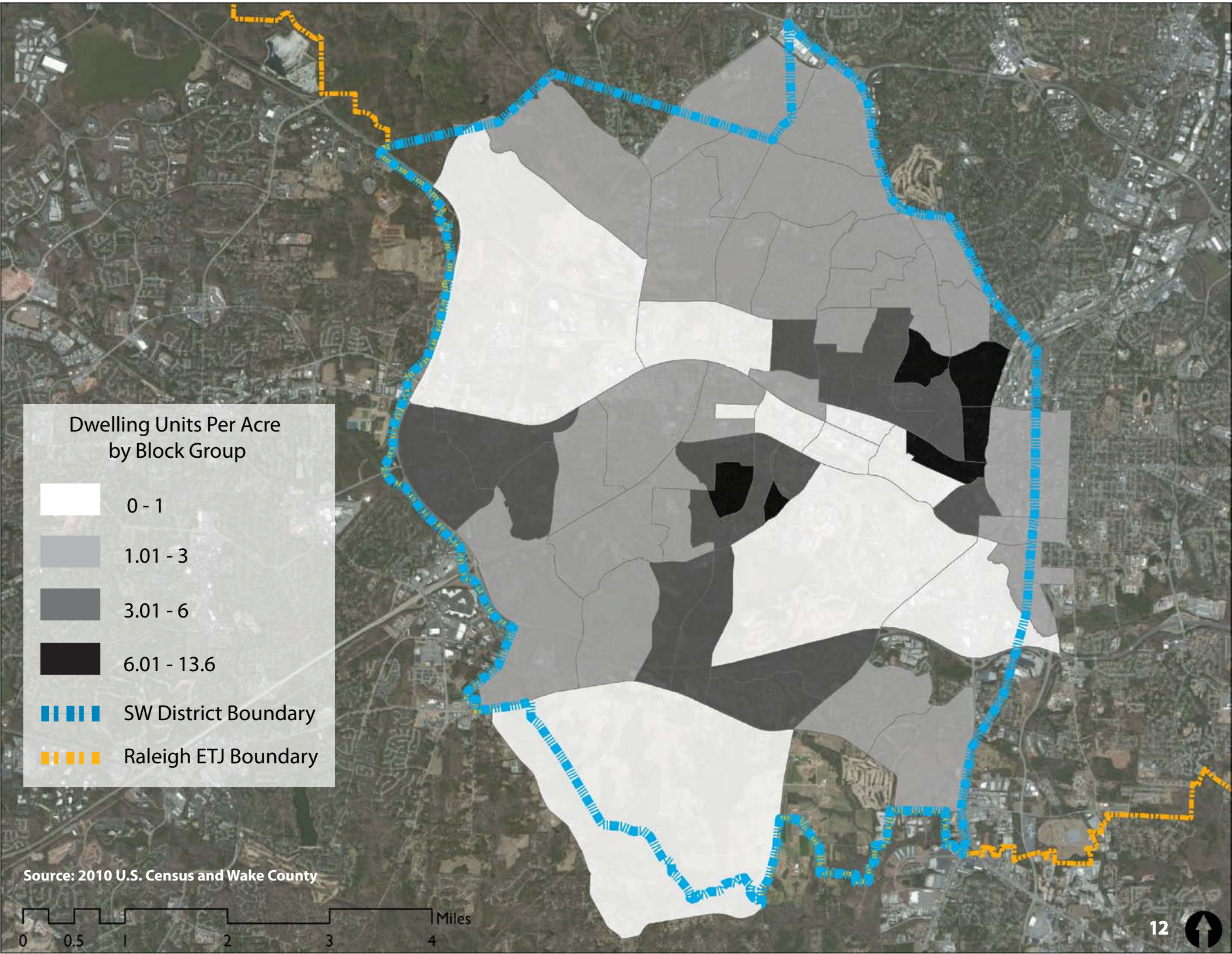


Figure 9. Population Density



Key Demographic Characteristics

To get a better sense of the transportation behaviors and needs of the southwest district, this section looks at three key pieces of demographic information: 1) vehicle ownership, 2) commute time, and 3) commute mode.

Looking at vehicle ownership, the majority of housing units have residents that own 2 or more vehicles. 17,619 units (49% of total units) are included in this group, with 14,717 units (41%) owning 1 vehicle, and 3,350 units (9%) that do not own a vehicle. Although it is hard to draw any conclusive patterns from mapping vehicle ownership (see Figures 10-12), it appears that households in the block groups in the western, southern, and northern edges of the district are more likely to own 2 or more vehicles while households in the central and eastern portions of the district are more likely to own 1 or 0 vehicles.

Most workers in the district have a commute time between 10 and 29 minutes (see Figure 14). Again, it is difficult to draw definitive conclusions from the data, but it appears that workers who live closer to the downtown/city center area are slightly more likely to have shorter commute times (see Figure 13), while workers living in the southern half are more likely to have commutes of 30 minutes or more (see Figure 15).

Not surprisingly, the vast majority of workers travel to their jobs via car, truck, or van (see Figure 16). Workers who live in the central and far eastern portions of the district are more likely to commute via public transit (see Figure 17), while workers living in the central areas close to downtown are more likely to walk to work (see Figure 18). The bicycling figure (19) shows higher percentages of bicycle commuters close to the NC State campus and near downtown.

IV. Transportation and SW Raleigh Character and Vision

Providing a multi-modal transportation system that connects residents to destinations is an important part of fostering a livable and sustainable community. As the city's creative district, southwest Raleigh neighborhoods are increasingly becoming the community of choice for members of the area's creative class – artists, designers, professionals involved in creating and enhancing new technologies, etc. How does the area's transportation system support southwest Raleigh's creative identity, character, and quality of life?

Perhaps one of the best ways to support and sustain the area's quality of life is to provide options and flexibility for transportation. City residents – and especially younger generations of city residents – seek choice – whether in housing type, retail establishments, or modes of transportation. The more options that are available and easy to access, the better. The southwest district performs moderately well when looking at the full array of transportation options. In addition to the street network which provides access to all destinations for those who have a personal vehicle, the bus system does a good job of providing access to most destinations in the district. While there may certainly be issues in terms of frequency and quality of service when considering the true attractiveness of the bus system as a mode of choice, recent short-term and long-term planning efforts by CAT indicate that planners and leaders are serious about making public transit a useful, attractive, and competitive transportation mode.

Figure 10. Housing Units with 0 Vehicles

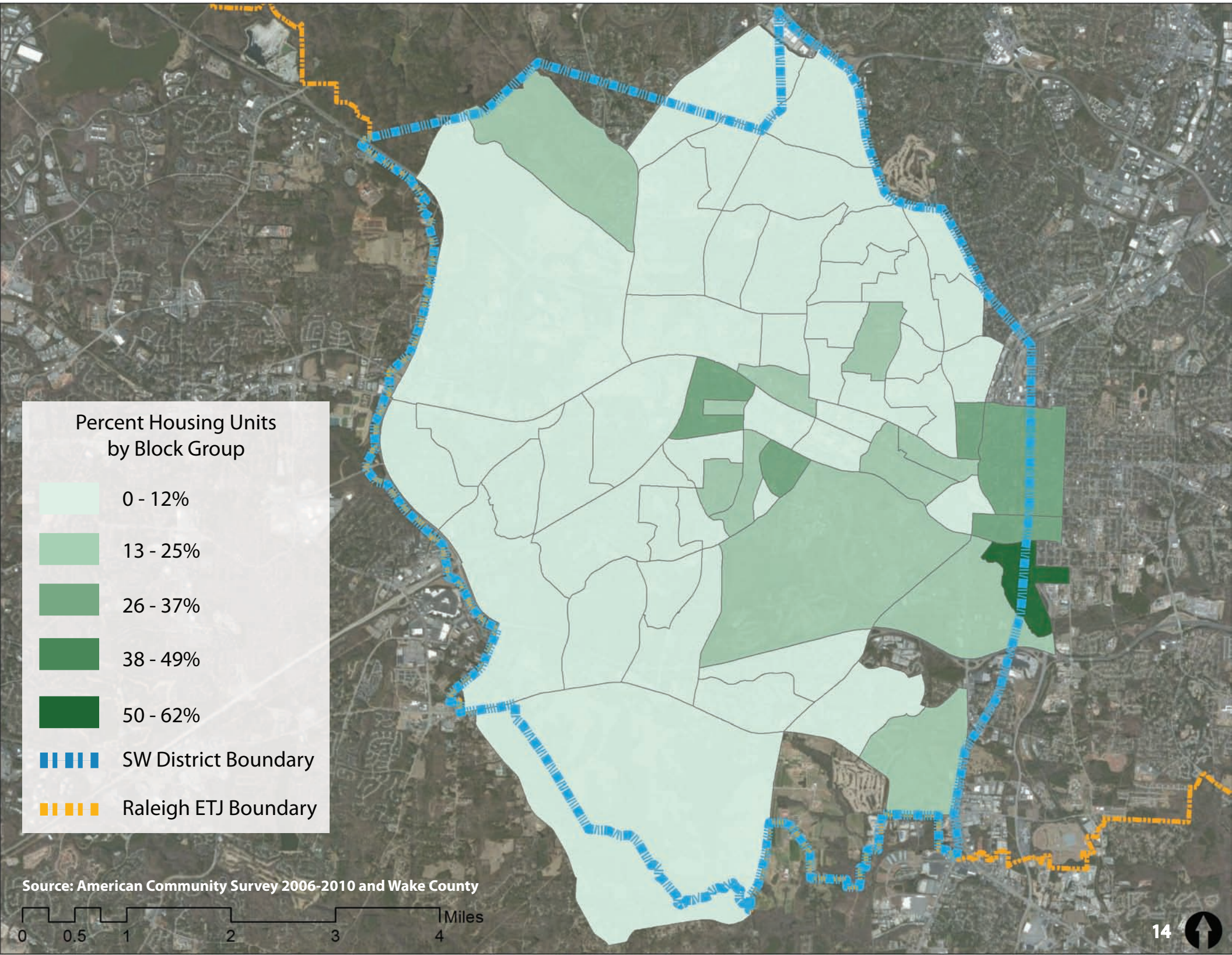


Figure 11. Housing Units with 1 Vehicle

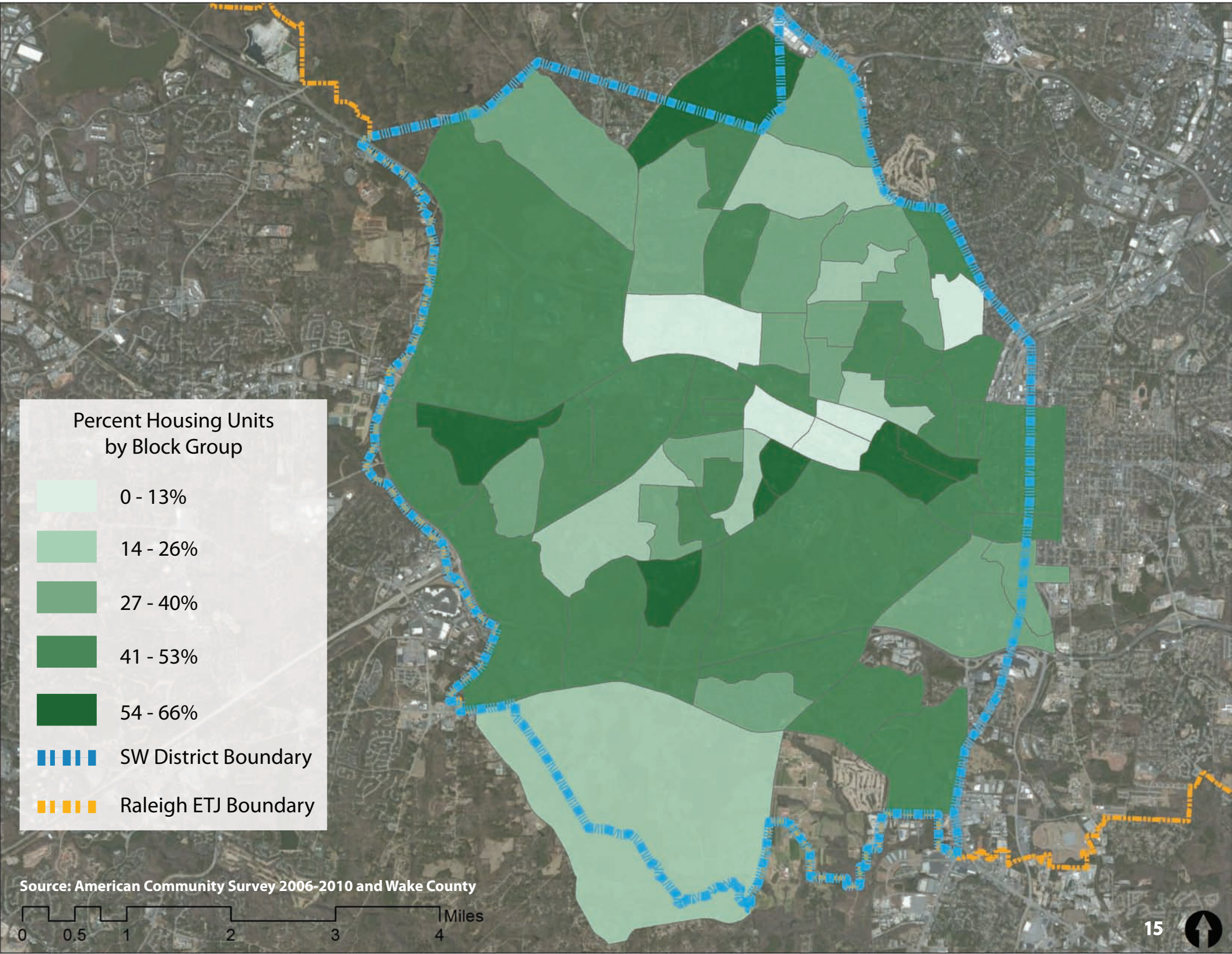


Figure 12. Housing Units with 2 or More Vehicles

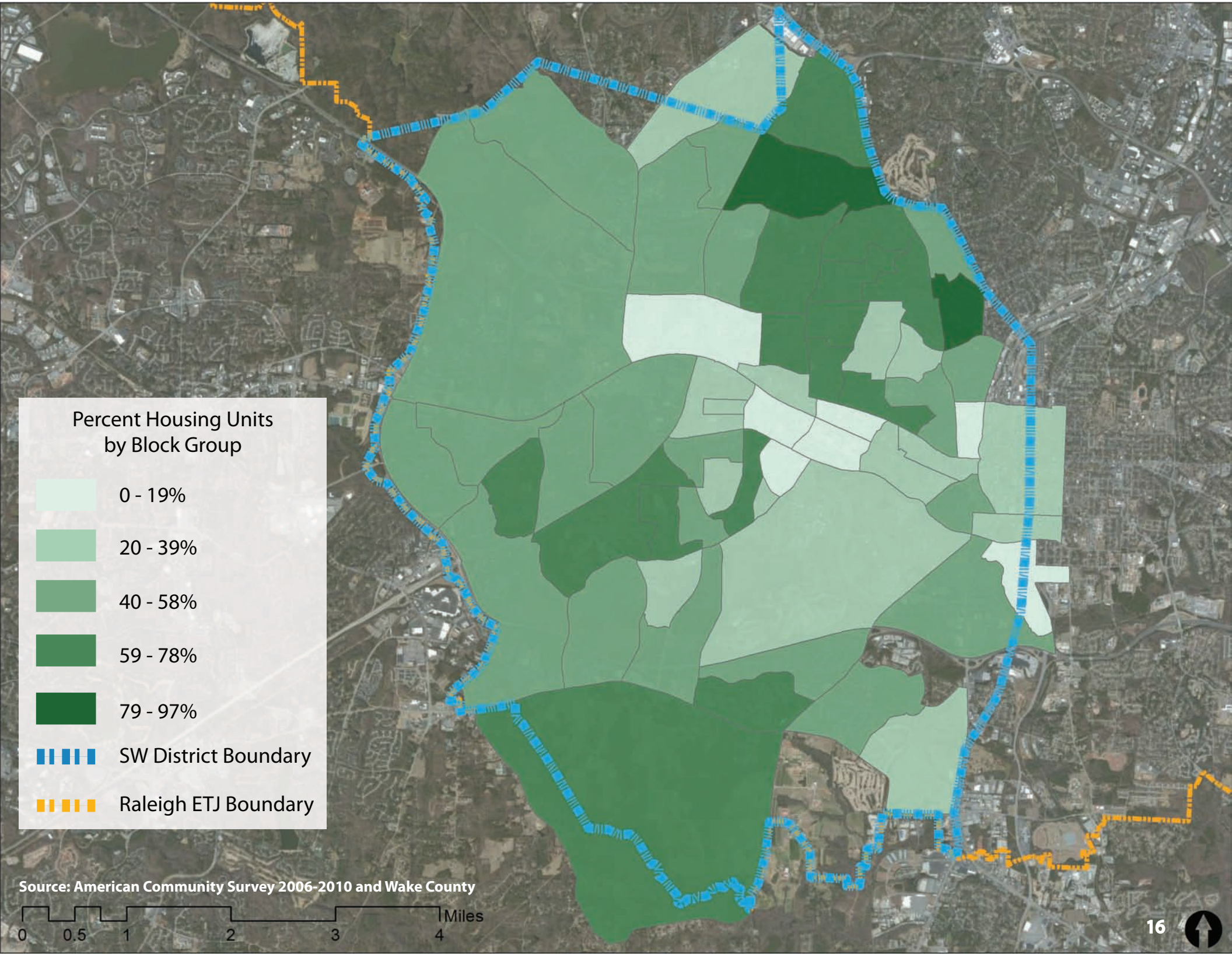


Figure 13. Commute Time - Less than 10 Minutes

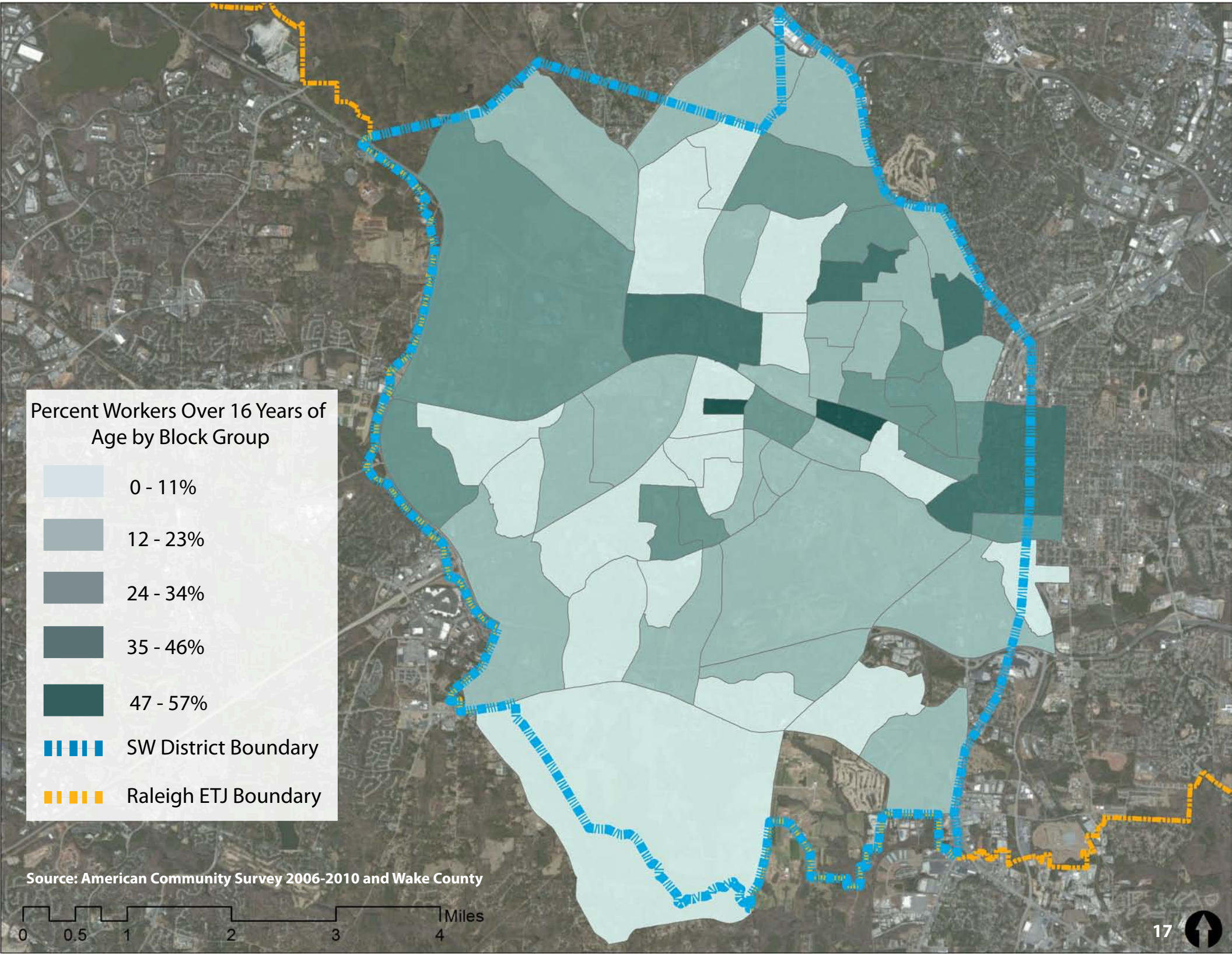


Figure 14. Commute Time - 10-29 Minutes

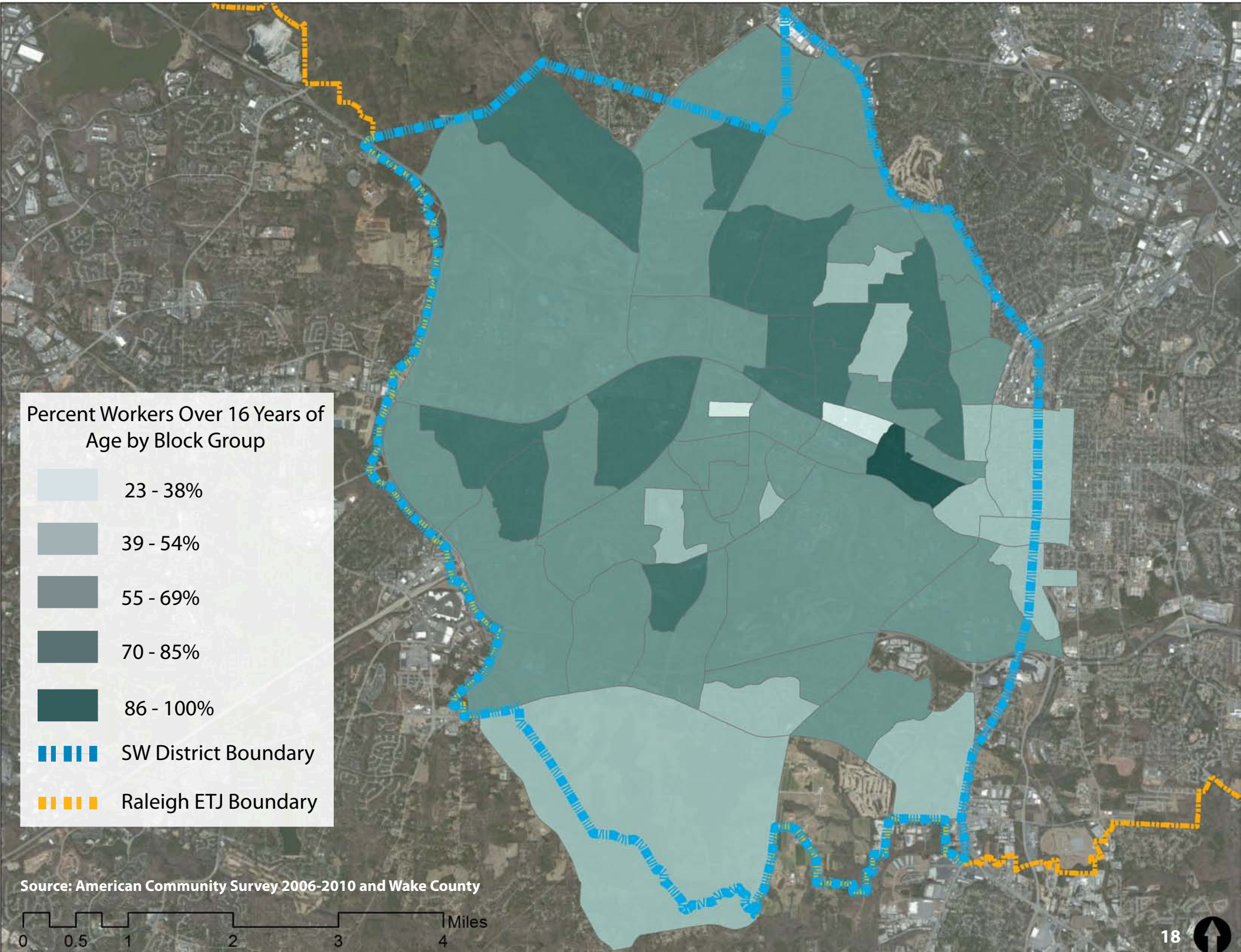


Figure 15. Commute Time - 30+ Minutes

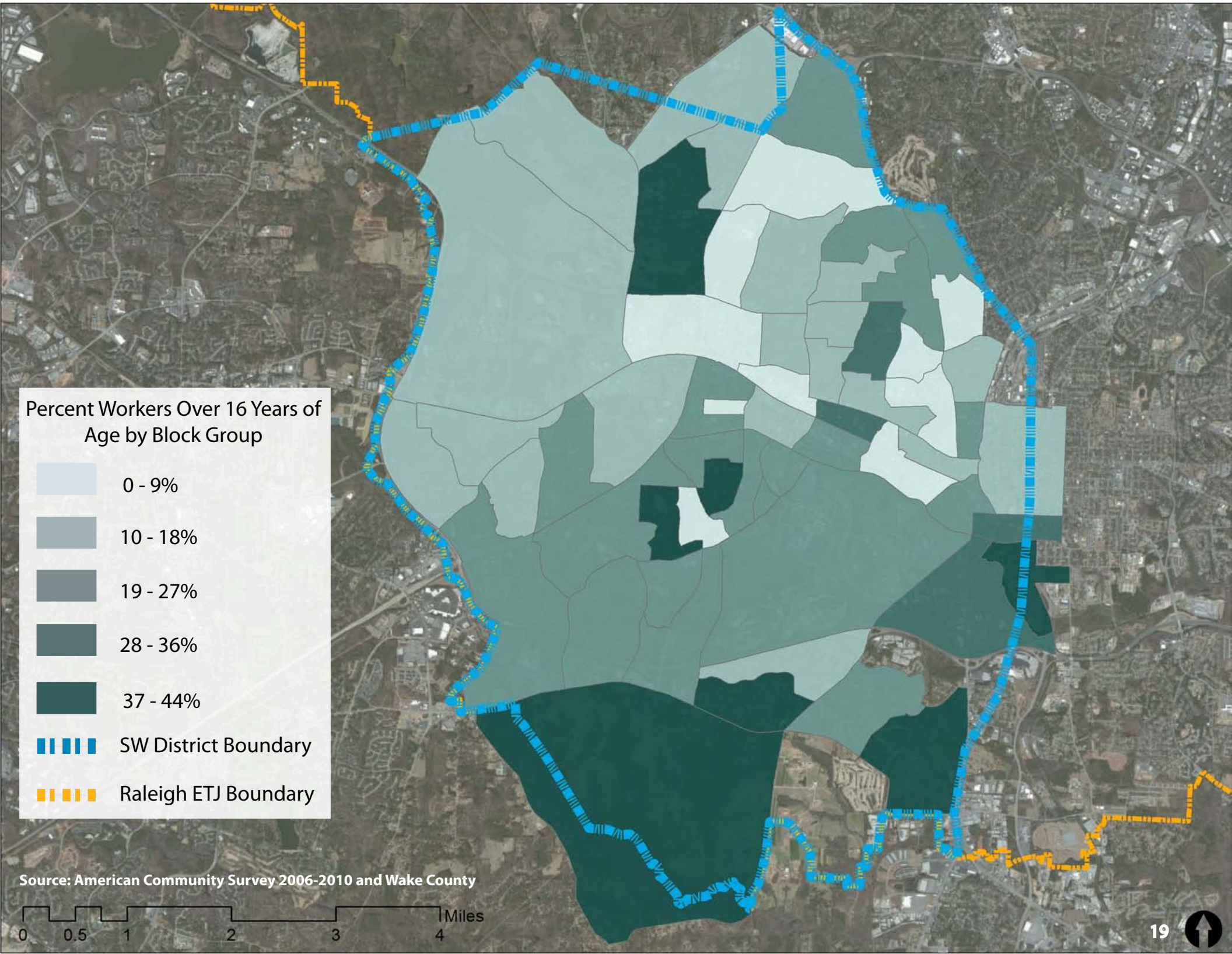


Figure 16. Commute Mode - Car, Truck, or Van

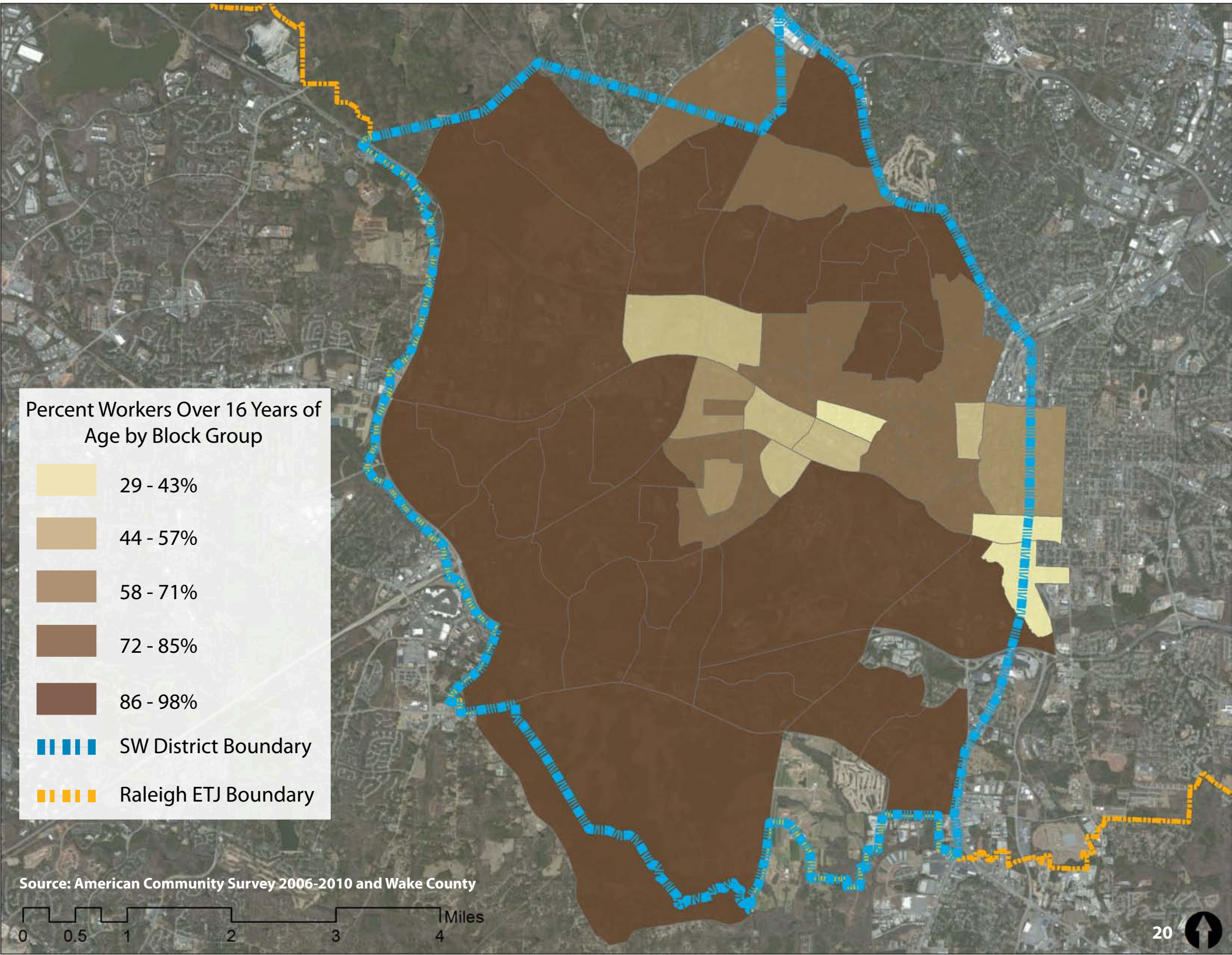


Figure 17. Commute Mode - Public Transit

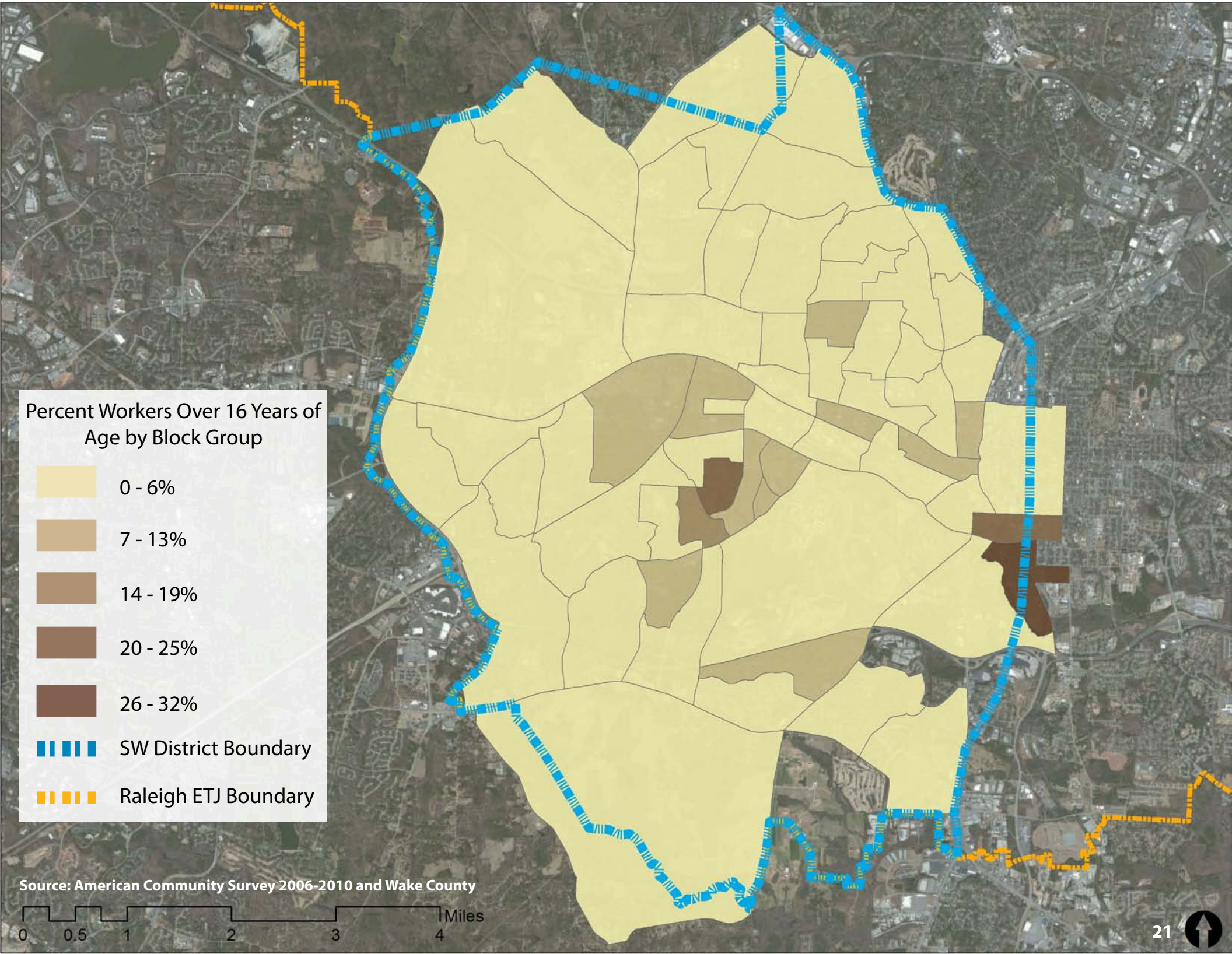


Figure 18. Commute Mode - Bicycle

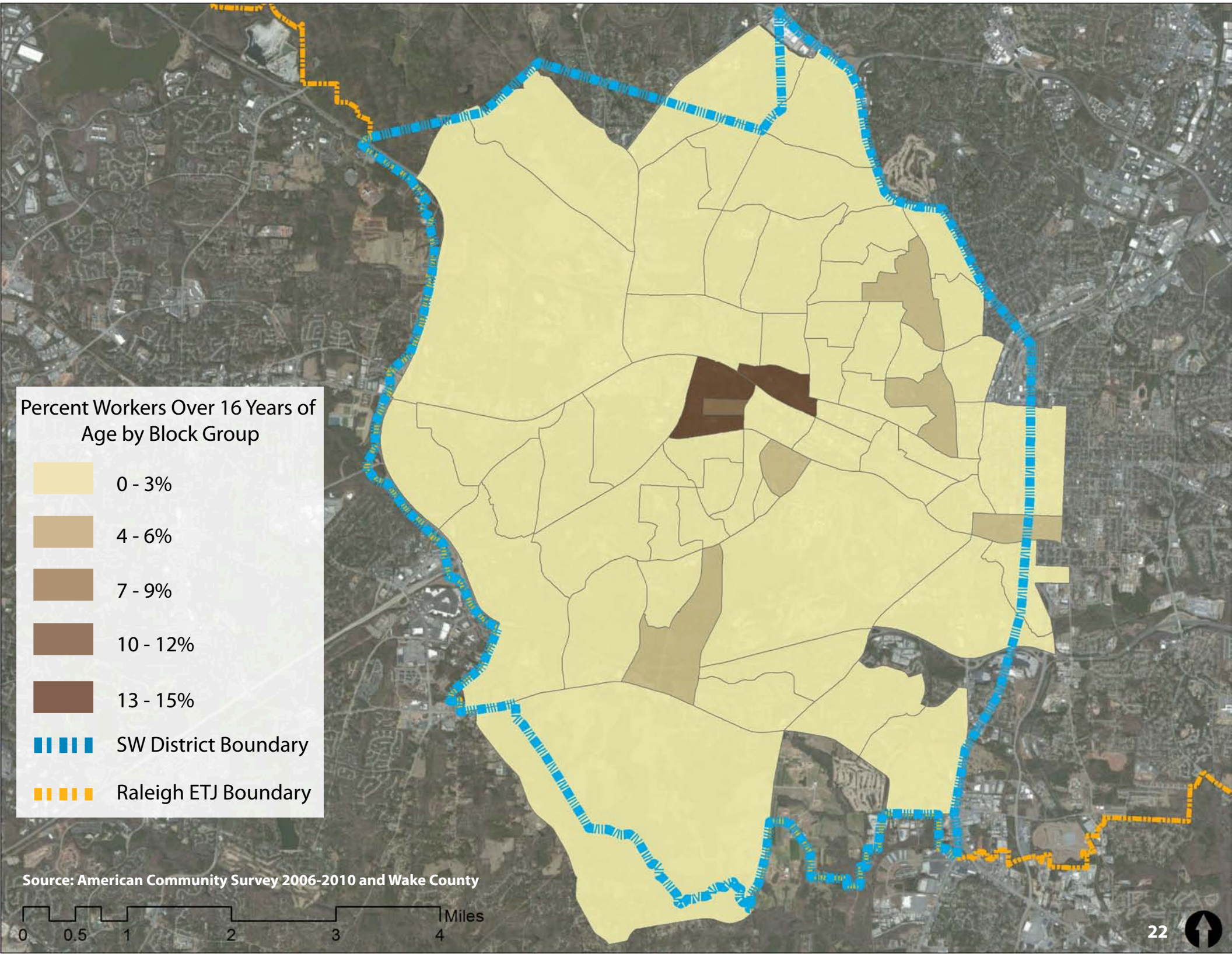
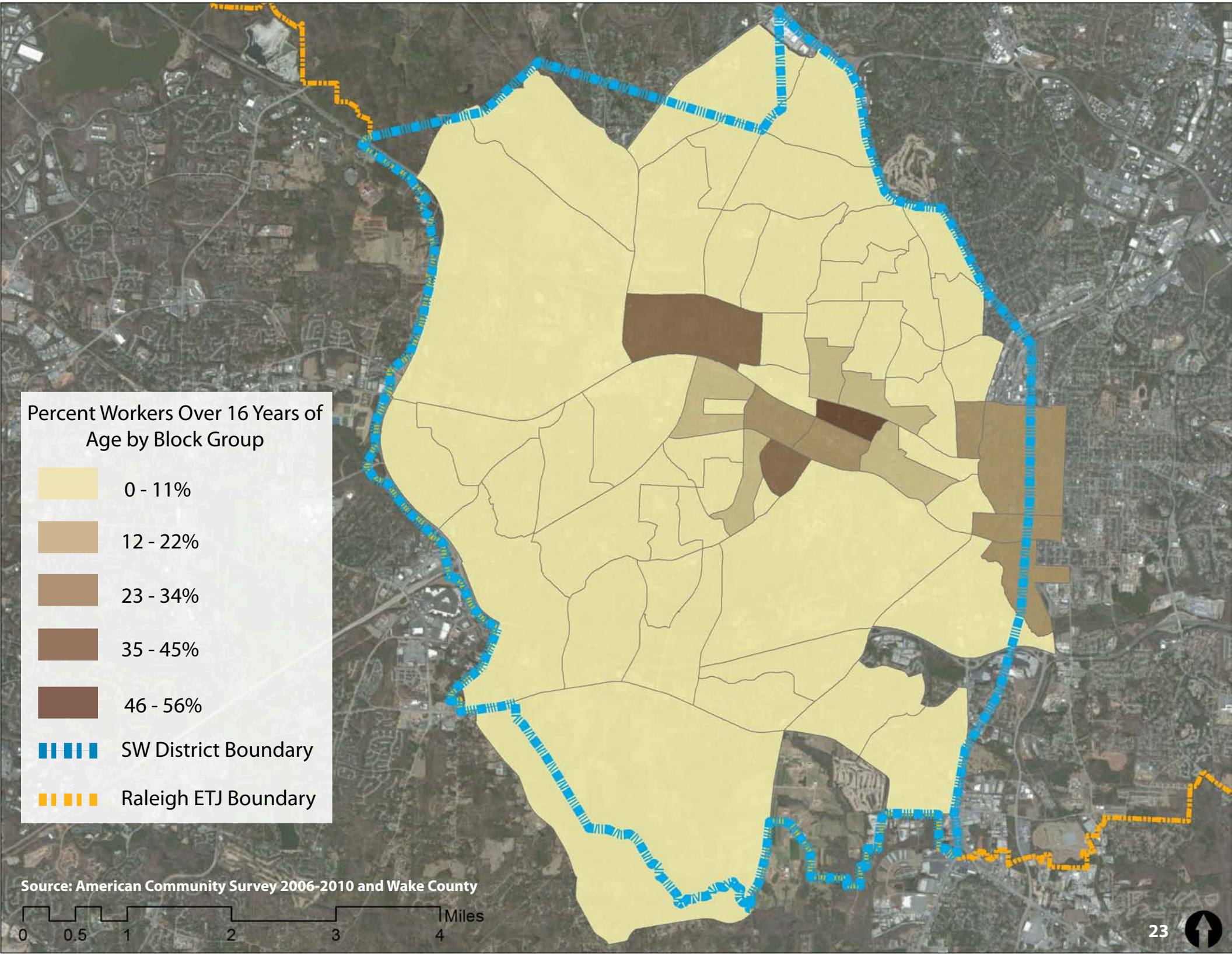


Figure 19. Commute Mode - Walking



The fairly extensive greenway and trail system in southwest Raleigh also provides transportation choice to area residents and visitors. While the system provides access to important recreational amenities, there have been efforts to create better connections and add greenways to make the system more utilitarian.

While southwest Raleigh has room for improvement in terms of bicycle and pedestrian infrastructure, the area also has some inherent strengths that make these forms of travel more attractive and manageable. Many neighborhoods within the district – namely downtown, the Peace Street corridor, Glenwood South, and residential areas near NC State University – have amenable land use patterns to these transportation modes, including clustered destinations and more connected and grid-like street patterns.

Ideas from Other Cities

While the southwest district has a solid foundation on which to build a truly multi-modal transportation system, it is useful to see what other cities have done in terms of developing a transportation system that is appealing and contributes to a community's livability and sustainability. This section looks at the efforts of two cities: Austin, TX – a peer city of Raleigh – and Portland, OR which has a well-respected transportation system that emphasizes transit and active transportation modes. Both of these cities also have similarities to Raleigh and the southwest district in terms of their emphasis on the new economy of technology and innovation.

Austin

Austin has an extensive public transit system that offers bus and rail service. Bus services connect major local and regional destinations, and the passenger rail system (MetroRail) connects downtown and neighborhoods to the north. The MetroRail system is only two years old, but there have been significant economic impacts with over $90 million in development around the rail stations.[1]

In addition to a well-developed transit system, Austin has also invested in alternative transportation modes such as walking and biking. With bicycle planning efforts stretching back to the early 1970s, Austin has an extensive dedicated bicycle infrastructure system with over 155 miles of bike lanes.[2] With such a developed system, planners and leaders in Austin are currently working on addressing continuing barriers, filling in gaps in the system, increasing the diversity of facilities, and connecting to the city's transit system.

Austin has also led the way in terms of pedestrian transportation by developing a Pedestrian Information Management System (PIMS) that is used to assess and prioritize sidewalk

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[1] Capital Metropolitan Transportation Authority. (March 22, 2012). MetroRail celebrates 2nd Anniversary. In *METRO*. Retrieved June 15, 2012 from http://www.capmetro.org/news/news_detail.asp?id=11758.

[2] City of Austin. (June 11, 2009). In *Austin TX.gov*. Austin 1009 Bicycle Plan Update. Retrieved June 7, 2012 from http://www.austintexas.gov/department/bicycle-program-0.

infrastructure.[3] While the ultimate construction of a fully connected pedestrian transportation system depends on many different economic and political factors, the development of this comprehensive planning tool demonstrates that the city of Austin is committed to providing transportation options for all users.

Portland

Portland's TriMet transit system provides a variety of travel options and connects not only local destinations but also regional destinations. TriMet offers bus service, commuter rail service, the MAX light rail service, and streetcar service in the center city area. In addition to this extensive network, TriMet has also done a good job of providing useful and interactive resources for riders on its website - http://trimet.org/index.htm - from interactive system maps to real time "TransitTracker" information.

Portland is also renowned for its support of bicycle and pedestrian transportation. The city has over 200 miles of dedicated bicycle facilities including bike lanes, trails, and bicycle boulevards.[4] The city's most recent bicycle plan calls for doubling the current bicycle facility miles by 2030 as well as developing programs to solidify Portland's status as a world class bicycling city.

The city's Bureau of Transportation also has an extensive set of programs and resources – found online at http://www.portlandonline.com/transportation/index.cfm?c=34778 - to encourage and support the development of a quality pedestrian transportation system. These programs range from education initiatives to encourage walking, pedestrian wayfinding systems, pedestrian design guidelines, and pedestrian safety. While Portland likely has work to do to improve its pedestrian infrastructure similar to other places in the U.S., the city appears to prioritize investing in infrastructure and programs that support more active transportation modes.

Like Raleigh, both Austin and Portland are growing, thriving metropolitan areas that have succeeded in attracting a variety of well-educated, creative class professionals. Looking at the comprehensive transportation systems that these two cities provide for all users, there are many opportunities for southwest Raleigh – and the city as a whole - to better match its transportation system with its vision for creating more livable and sustainable communities.

V. Conclusion

Looking at southwest Raleigh through the lens of transportation, it is apparent that the district possesses both strengths and weaknesses in terms of mobility and accessibility. While the district offers decent mobility for certain transportation modes and has somewhat enhanced accessibility due to its location in the region and the large number of destinations sited within its boundary, southwest Raleigh also faces shortcomings in terms of expanding these advantages to other modes,

[3] City of Austin. (March 3, 2009). Sidewalk Master Plan. In *Austin TX.gov*. Retrieved June 15, 2012 from http://www.austintexas.gov/department/pedestrian.

[4] City of Portland. (February 11, 2010). Portland Bicycle Plan for 2030. In *Portland Bureau of Transportation.* Retrieved June 15, 2012 from http://www.portlandonline.com/transportation/index.cfm?c=44597&a=289122.

particularly public transit and non-motorized modes such as walking and biking. It is clear, however, that the southwest district stands to benefit from the push for more sustainable growth patterns that is sweeping through planning and political offices throughout the area. With future plans that include enhanced public transportation options (light rail and commuter rail) and the necessary framework to support compact, mixed-use development (zoning and planning for transit-oriented development), southwest Raleigh stands to become a community of choice for even more creative class workers and professionals.