

GREATER TRIANGLE COMMUTER RAIL REGIONAL ECONOMIC IMPACT ANALYSIS

Final Report
April 2022

TABLE OF CONTENTS

Introduction	3
Triangle's Growth Trajectory	12
Regional Impacts	17
Quality of Life	17
Employment Connectivity	24
Smart Development	35
Summary of Economic Impacts	47
Appendix	51

INTRODUCTION



Study Goals

This study was prepared on behalf of GoTriangle by HR&A Advisors, Inc. as part of a consultant team led by STV. The purpose of HR&A's study was to measure the dynamic and interconnected effects of a proposed Commuter Rail investment. The analysis was part of an overarching scope of work designed to determine if the Commuter Rail is technically, financially, and legally achievable. HR&A's scope of work was also designed to complement several analyses being advanced by Triangle J Council of Governments (TJCOG) as part of the team led by STV. TJCOG is producing a Land Use Analysis, Affordable Housing Analysis, Travel Market Analysis, and Opportunity Analysis all of which will be informed by HR&A's findings. HR&A's study consisted of 2 primary components:

- (1) **Real Estate Market Analysis and Projections:** Identify how the Commuter Rail is likely to influence development dynamics in the Triangle region and specifically transit-oriented development in rail corridor submarkets over the next 30 years.
- (2) **Economic Impact Analysis:** Identify the broad range and potential scale of economic impacts likely to be catalyzed by the Commuter Rail and objectively measure those effects over the next 30 years.



About Us

HR&A Advisors, Inc.

HR&A Advisors, Inc. (HR&A) is an economic development, public policy, and real estate consulting firm working at the intersection of the public and private sectors. Our work improves economic opportunity, quality of life, and the built environment for urban communities. HR&A specializes in conducting economic and fiscal impact analyses of development projects, infrastructure investments, public policies, and organizations, distilling rigorous analysis into compelling reports that catalyze action and decision-making. Notable analyses conducted by HR&A include:

- Assessing the economic and fiscal impacts of the **Long Island Rail Road Main Line Third Track** for the Long Island Index. HR&A quantified the benefits of improved employer access to a skilled regional workforce, higher productivity in transit-oriented employment nodes, and rider time savings. The \$2 billion Long Island Rail Road Expansion Project is now under construction and is expected to be completed by late 2022.
- Demonstrating the economic rationale for transforming **the High Line** in Manhattan into a public park. Friends of the High Line, a non-profit organization, pledged to preserve the historic structure by converting the abandoned railway into a public park and neighborhood amenity. HR&A prepared an economic and fiscal impact study to demonstrate that the economic and social benefits of such a conversion would outweigh the capital costs of development. The park opened in 2009 and reinvigorated Manhattan's far west side with new jobs, mixed-income housing, and arts and cultural development.

Study Partners

HR&A's scope of work was designed to complement several analyses being advanced by **Triangle J Council of Governments (TJCOG)** as part of the team led by **STV**. TJCOG is producing an Affordable Housing Analysis, Travel Market Analysis, Land Use Analysis, and Opportunity Analysis.

COMMUTER RAIL REGIONAL IMPACT

Context for the Greater Triangle Commuter Rail Project

Local leaders in the Triangle are committed to identifying a regional transit solution for the community. In 2011 and 2016, voters in Durham and Wake Counties approved a half-cent sales tax to invest in enhanced transit service across the region. This created a dedicated funding stream for infrastructure like the Commuter Rail, which was included in the Triangle's 2045 Metropolitan Transportation Plan. Additionally, Johnston County committed funding towards the evaluation of a proposed Commuter Rail route and possible extension into Clayton.

In 2020, a Memorandum of Understanding (MOU) was signed by GoTriangle, Capital Area Metropolitan Planning Organization (CAMPO), Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO), the North Carolina Railroad Company, and the counties of Wake, Durham and Johnston. This MOU solidified the agreement between the entities to work together on evaluating regional transit solutions and specified the information required to achieve consensus on an initial concept for the Commuter Rail. This Economic Impact Study is part of the broader project evaluation work that is currently underway.



Source: Connect 2045: The Research Triangle Region's Metropolitan Transportation Plan (MTP 2045), photo from GoTriangle presentation (Feb 2020),

COMMUTER RAIL REGIONAL IMPACT

Major Transit Investments in Peer Cities

Around the country, other rapidly growing regions have made large-scale investments in rail infrastructure. In the early 2000s, both Nashville and Charlotte began investing in rail service to better connect dispersed residential and employment hubs. In Nashville, the commuter rail line was designed to link downtown with Lebanon, a growing satellite city, and is the first of 7 similar lines planned for the metro area. In Charlotte, the Lynx Blue Line light rail was designed to connect Uptown Charlotte with the South End neighborhood, and recently has been extended to connect to key employment nodes including UNC Charlotte's Main Campus. While the Lynx Blue Line is not a commuter rail, it is an example of intracity rail service operating in North Carolina. Other comparable regions have also followed suit with passenger rail service including Austin, Denver, and Orlando, which have all made substantial investments to expand regional passenger rail service and provide a commuting alternative in their increasingly congested metro areas.



Nashville, TN
Music City Star | 2006



Charlotte, NC
LYNX Blue | 2007



Austin, TX
MetroRail | 2010



Denver, CO
A Line | 2016



Orlando, FL
SunRail | 2016

COMMUTER RAIL REGIONAL IMPACT

Key Details for the Greater Triangle Commuter Rail Project

The Greater Triangle Commuter Rail is a proposed transit investment that would link major population and employment centers in the region. It would establish frequent local passenger rail service in the existing NC Railroad Company Corridor that runs through Durham, Wake, and Johnston Counties, operating alongside freight and long-distance intercity trains. For analysis purposes, the Commuter Rail in this study is assumed to operate between West Durham and Clayton.

45 MILES IN LENGTH

along a shared rail corridor with freight (Norfolk Southern and CSX) and intercity rail (Piedmont and Carolinian Amtrak trains)

20 WEEKDAY ROUNDTRIPS

8 trips in each direction during peak hours offering service every 30 minutes, and 4 off-peak roundtrips.

UP TO 15 POTENTIAL STATION AREAS

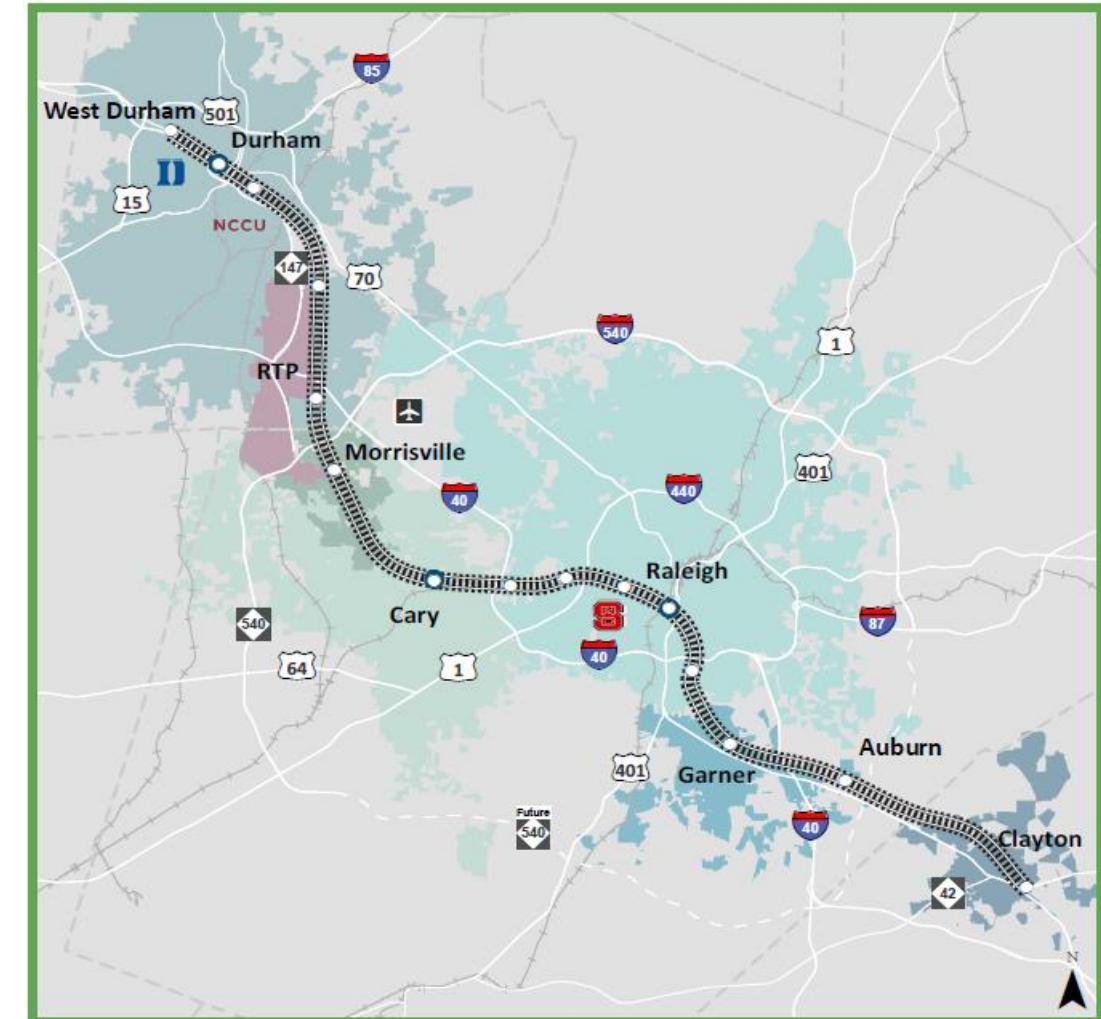
Directly serving the downtowns of the region's three largest cities, RTP, two universities, and multiple towns and suburban communities

EFFICIENT TRAVEL TIME

45-50 min from Durham CBD – Raleigh CBD

10,000+ DAILY BOARDINGS

average weekday trips by 2040



Economic Impacts Measured by the Study

A range of potential impacts of the Greater Triangle Commuter Rail are quantified in this analysis. This report and the corresponding technical appendix documents HR&A's methodology for approaching this study, evaluating the scale of these impacts, and measuring the outcomes they are likely to produce in the regional economy.

HR&A used the REMI Policy Insight Model to simulate the increase in economic activity catalyzed by the Commuter Rail in a "Build" future scenario where the transit investment moves forward compared to a "No Build" future scenario where the transit investment does not move forward. The outcomes estimated by the model represent the incremental economic impacts attributable to the Commuter Rail investment over a 28-year outlook from 2022 to 2050. This timeframe includes (1) the Commuter Rail's planning and construction period assumed to occur from 2022 to 2030 and (2) the operational period after the Commuter Rail begins fare service, which is assumed to begin in 2031 and for the purpose of this analysis is measured until 2050. HR&A obtained information on travel demand and travel time savings from the ridership forecasting model used in Phase I of the Greater Triangle Commuter Rail Study.

Measured Economic Impacts

- **Quality of Life** | The commuter rail will expand mobility options enhancing quality of life within the region.
- **Employment Connectivity** | The commuter rail will increase connectivity to the region's employment hubs – increasing employers' access to talent and expanding workers' employment choices.
- **Smart Development** | The commuter rail will help anchor new development and foster denser, mixed-use districts that enhance innovation.
- **Job Growth** | The commuter rail is a long-term investment in the region's future supporting the creation and retention of high-paying jobs that offer benefits.

Economic Impact and Transportation Modeling Software

To conduct this economic impact analysis, HR&A used REMI Policy Insight software to simulate the broader regional impacts of the Commuter Rail. REMI Policy Insight is a dynamic econometric model that traces the economic and demographic impacts of initial changes in the regional economy over time. REMI Policy Insight is particularly adept at modeling the long-term and interrelated effects of infrastructure investments that fundamentally alter underlying economic relationships between economic output, factors of production, prices, and demographic factors.

HR&A used REMI Policy Insight software to create a custom-built model (“the REMI model”) using the four-county geography of Durham, Johnston, Orange, and Wake Counties as the model’s study region. This REMI model was used to simulate the increase in economic activity catalyzed by the Commuter Rail in a “Build” future scenario where the transit investment moves forward compared to a “No Build” future scenario where the transit investment does not move forward. The outcomes estimated by the REMI model represent the incremental economic impacts attributable to the Commuter Rail investment. HR&A measured only unique economic impacts that could be quantified without double-counting impacts. For instance, property value increases were excluded since the American Public Transportation Association (APTA) views these as “a capitalization of access and travel time benefits” associated with transit investments rather than unique effects themselves.

HR&A obtained information on travel demand and travel time savings from the ridership forecasting model used in Phase I of the Greater Triangle Commuter Rail Study. This model uses the Federal Transit Administration’s Simplified Trips-on-Project Software (STOPS), the Census American Community Survey, regional transit origin-destination survey data, and detailed transit schedules in GTFS format to understand existing transit usage patterns and project how ridership will evolve with the introduction of new commuter rail service. STOPS also uses highway travel time and demographic data from the Triangle Regional Model to represent the level-of-service on competing modes and to provide a basis for growing travel demand in response to project changes in regional population and employment. STOPS is calibrated to match observed transit ridership for each route in the region and for geographic aggregations of bus stops. Projections of how commuter rail will divert existing transit customers and attract new customers are based on established sensitivities to improvements in travel time, waiting time and cost and on experience in other US cities regarding the ability of new rail service to attract ridership.

Acknowledgements - Stakeholder Outreach

Acknowledgements

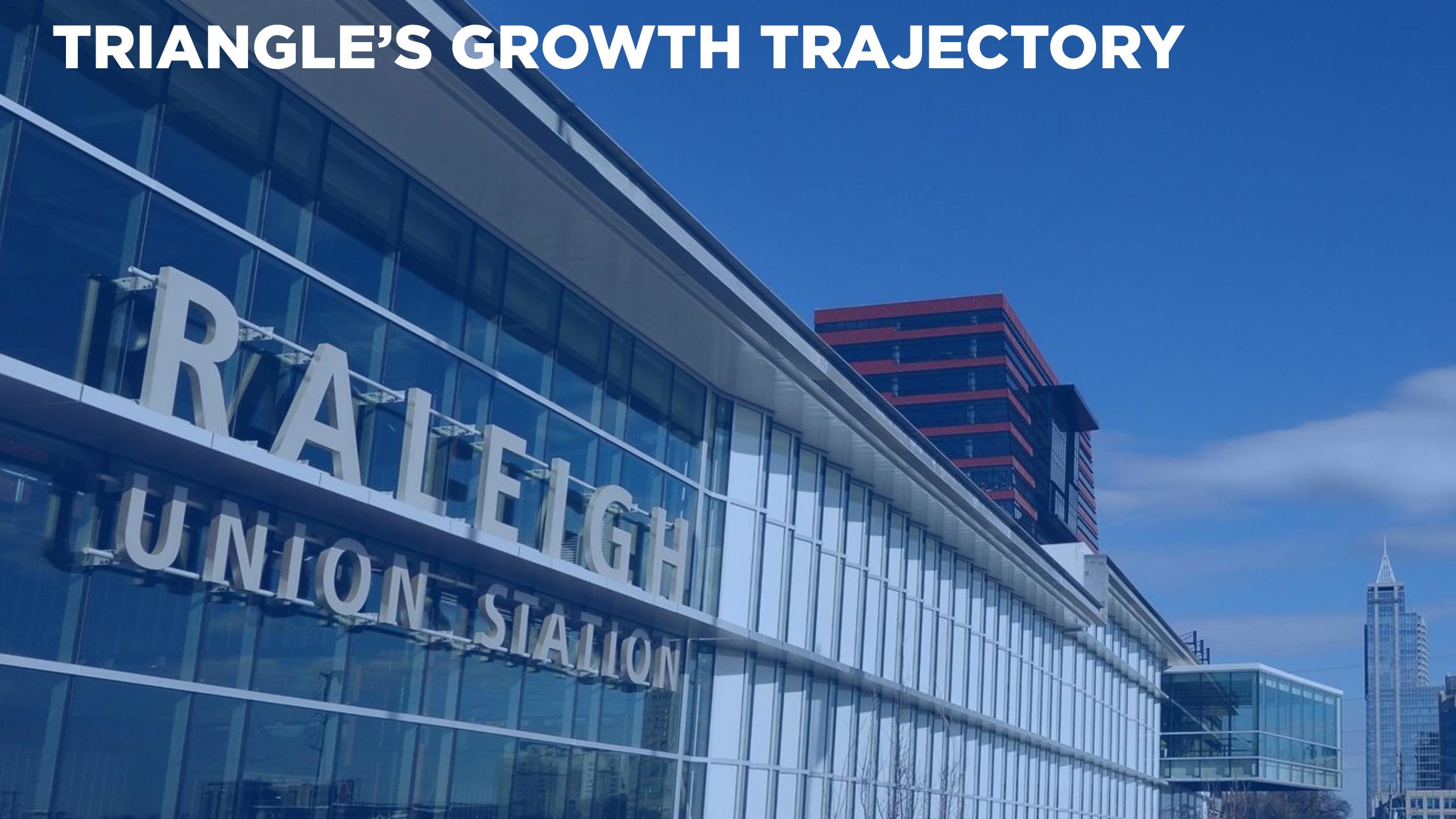
This study also involved contributions from a broad range of local market practitioners and rail corridor submarket representatives and would not have been possible without the expertise and insight of those individuals and entities. A partnership with the **Triangle Chapter of the Urban Land Institute** enabled HR&A to promote an online survey of chapter members that informed real estate projections. Input from the organizations engaged in this process was used to inform our projections of future real estate development as well as our assessment of how the Commute Rail would influence labor market dynamics and the lived experience of residents, workers, and students.

HR&A engaged nine organizations with local expertise on the real estate market in the Triangle. This included brokers and developers with expertise on the various uses studied in this analysis (residential, office, industrial, hotel, and retail) as well as chambers of commerce and other organizations with specific expertise on individual submarkets within the region.

HR&A also supplemented this outreach with a survey that was promoted in partnership with the Triangle Chapter of the Urban Land Institute. The survey was designed to gather information on two areas – first, respondents' expectations for future growth in the Triangle and its submarkets relative to historical growth and the region's anticipated recovery from the COVID-10 pandemic, and second, respondents' expectations for real estate impacts driven by the Commuter Rail.

HR&A also engaged 10 organizations with expertise on the labor market dynamics in the Triangle. This included universities, community colleges, and workforce development providers. Conversations with these organizations consisted of two rounds of outreach over the course of this analysis designed to gather information on how the Commuter Rail and other infrastructure investments would influence access to employment opportunities, skills training opportunities, and the long-term upward mobility of residents.

TRIANGLE'S GROWTH TRAJECTORY



DYNAMIC REGIONAL TRAJECTORY

The Greater Triangle Region - comprised of the four counties of Durham, Johnston, Orange, and Wake - is on a trajectory of rapid growth that shows no signs of slowing down.

The Triangle frequently tops ranking lists as one of the best places in the country to live, work, and retire. The region's growing population has been attributed to a strong job market, relative affordability, and nationally-recognized universities.

TRIANGLE RANKINGS

#1 market to watch nationally in 2021 for Real Estate Prospects, Homebuilding Prospects, and Development Opportunities, ranked by the *Urban Land Institute (ULI)*

#1 best place to live in North Carolina for its strong job growth and high quality of life, ranked by the *U.S. News and World Report*

#2 best place to live nationally due to research and technology roots, strong job growth, and high quality of life, ranked by the *U.S. News and World Report*

#3 most resilient tech hubs based on hiring trends and job growth in tech positions, ranked by *LinkedIn*

#7 best job market nationally out of metro areas with over 1 million people largely due to its growing tech sector, ranked by *The Wall Street Journal*

COMMUTER RAIL REGIONAL IMPACT | TRIANGLE GROWTH GLOBAL BUSINESS EXPANSION

HRA

Recent business relocations and expansions highlight the Triangle's economic growth and status as a hub for technology and innovation.

In late 2018, Apple purchased about 280 acres in Research Triangle Park for a new 1 million square foot engineering and research center. The \$1 billion investment will create at least 3,000 jobs that pay an average of \$187,000 per year. Until the campus opens in 2023, Apple will locate in an interim office in Cary. In early 2021, Google announced a new cloud engineering hub to be built in Durham that will eventually support over 1,000 jobs.

Other large business relocation announcements in 2021 have included Shanghai-based cell therapy company CARSGen coming to Durham with 200 jobs, FUJIFILM Corporation building a \$2 billion biomanufacturing site in Holly Springs with 725 jobs, and Biogen adding 90 additional jobs with a new \$200 million facility in RTP.

Johnston County will also gain 500 jobs from a \$100 million Amazon distribution operation in Smithfield. Other major companies, including Bartlett Milling, Berry Global, and Grifols, are undertaking large expansions in the county.

Source: Raleigh News & Observer, Triangle Business Journal, ABC 11, Johnston County Economic Development

The News&Observer

Apple is coming to the Triangle sooner, investing millions in a temporary Cary office

& Raleigh News & Observer

Chicago-based precision medicine company plans 200-job expansion into RTP

TRIANGLE
BUSINESS JOURNAL

Cree LED inks deal for new headquarters space in Research Triangle Park

Google to create engineering hub in Durham, add 1,000+ jobs

 Johnston County
ECONOMIC DEVELOPMENT

AMAZON TO CREATE 500 JOBS AT A NEW \$100 MILLION DISTRIBUTION OPERATION IN SMITHFIELD

RECENT POPULATION AND JOB GROWTH

The Triangle has experienced an extraordinary decade of population, job, and real estate growth.

Over the past decade, increased net migration has been driven by an influx of new residents drawn to the Triangle's culture, warm climate, consistent job growth, and relatively less expensive cost of living.

Downtown Raleigh and Downtown Durham are transforming into mixed-use "18-hour neighborhoods." Demand for multifamily options in both downtowns has accelerated and inventory has increased 8% annually in Downtown Durham and 12% annually in Downtown Raleigh over the last decade, fostering dense downtown cores that offer a true urban environment.

Johnston County was the fastest growing county in North Carolina from 2010 to 2020, with the pharmaceutical and manufacturing industries as major employers.

TRIANGLE GROWTH, 2010-2020



+23.8% population

An average of 95 people moving to the Triangle per day



+22.8% jobs

An average of 50 new jobs per day



+36.6% multifamily units



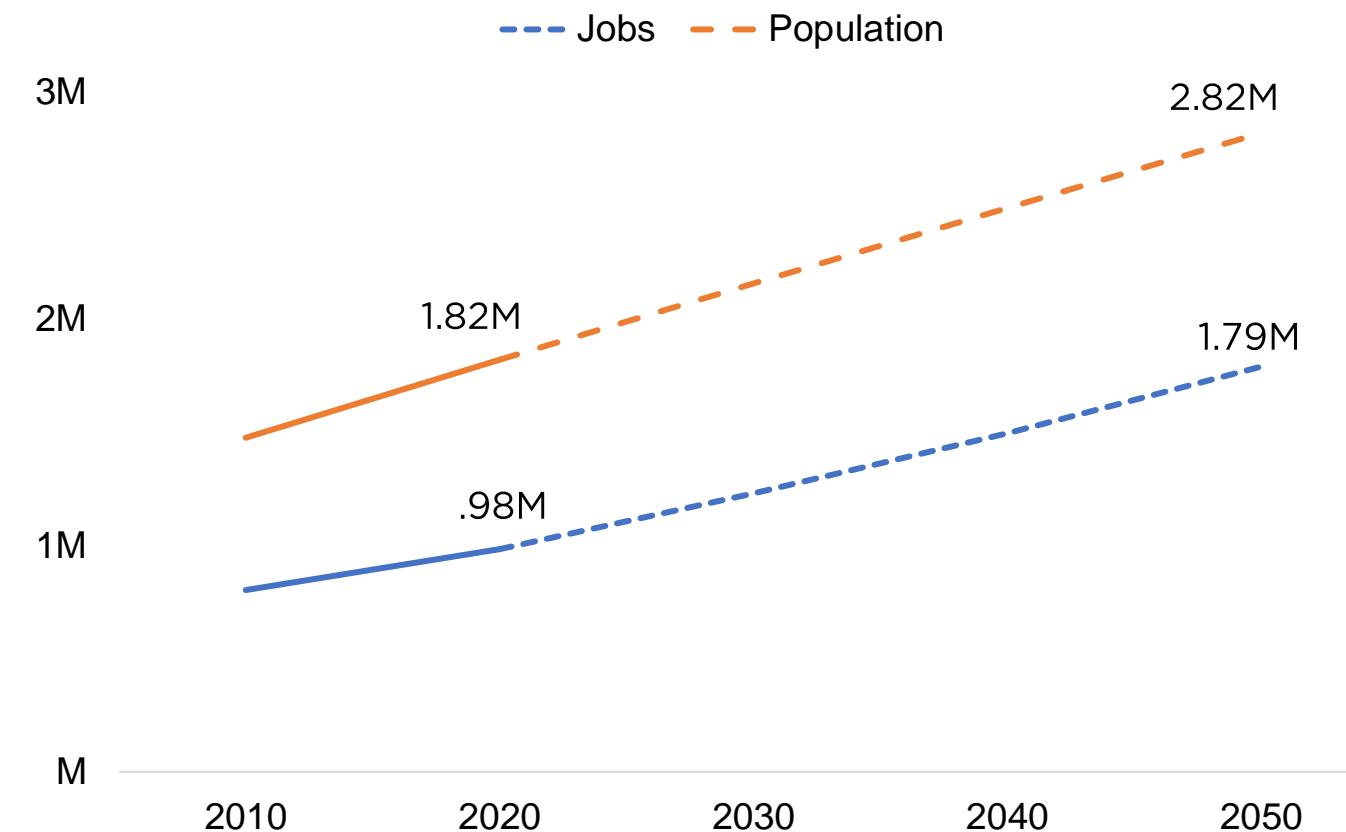
+15.6% industrial SF

PROJECTED FUTURE GROWTH

Nearly 1.8 million residents reside in the area as of 2020, and the region is expected to grow by an additional 1 million residents by 2050. The net migration fueling this growth shows no signs of slowing down.

The pandemic has exacerbated migration trends away from larger, coastal metro areas, and ULI, Moody's Analytics, and other market experts predict that regions like the Triangle will benefit the most from this trend as homebuyers and renters relocate to areas where they can secure more affordable and spacious housing options.

HISTORIC AND PROJECTED JOB AND POPULATION GROWTH IN THE TRIANGLE (2010-2050)



REGIONAL IMPACTS: QUALITY OF LIFE



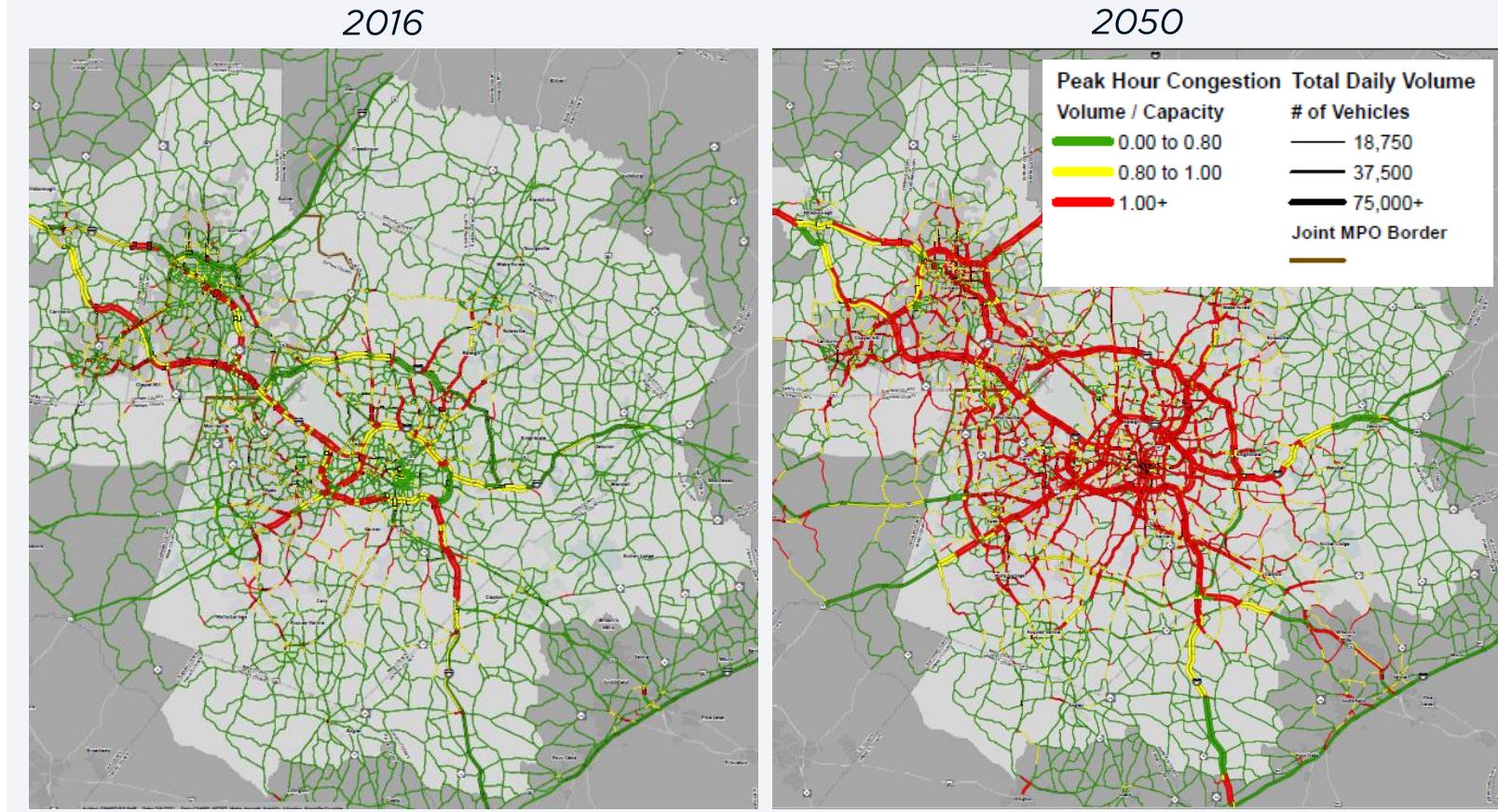
INCREASING CONGESTION HINDERS MOBILITY

As the region continues to grow rapidly, automobility has become more and more challenging.

Average commuter times across the four-county region grew by 14% from 2009 to 2019, up to 25 minutes. Vehicle congestion forecasts in 2016 and 2050 demonstrate a significant increase in peak hour congestion expected.

The Triangle region's 2045 Metropolitan Transportation Plan (MTP 2045) highlights the increasing vehicle congestion in the region and warns, "No region has been able to 'build its way' out of congestion; an important challenge for our transportation plans is to provide travel choices that allow people to avoid congestion where it cannot be prevented."

Vehicle Congestion Forecast, 2016-2050



Source: American Community Survey 2009 and 2019 5-year data, MTP 2045

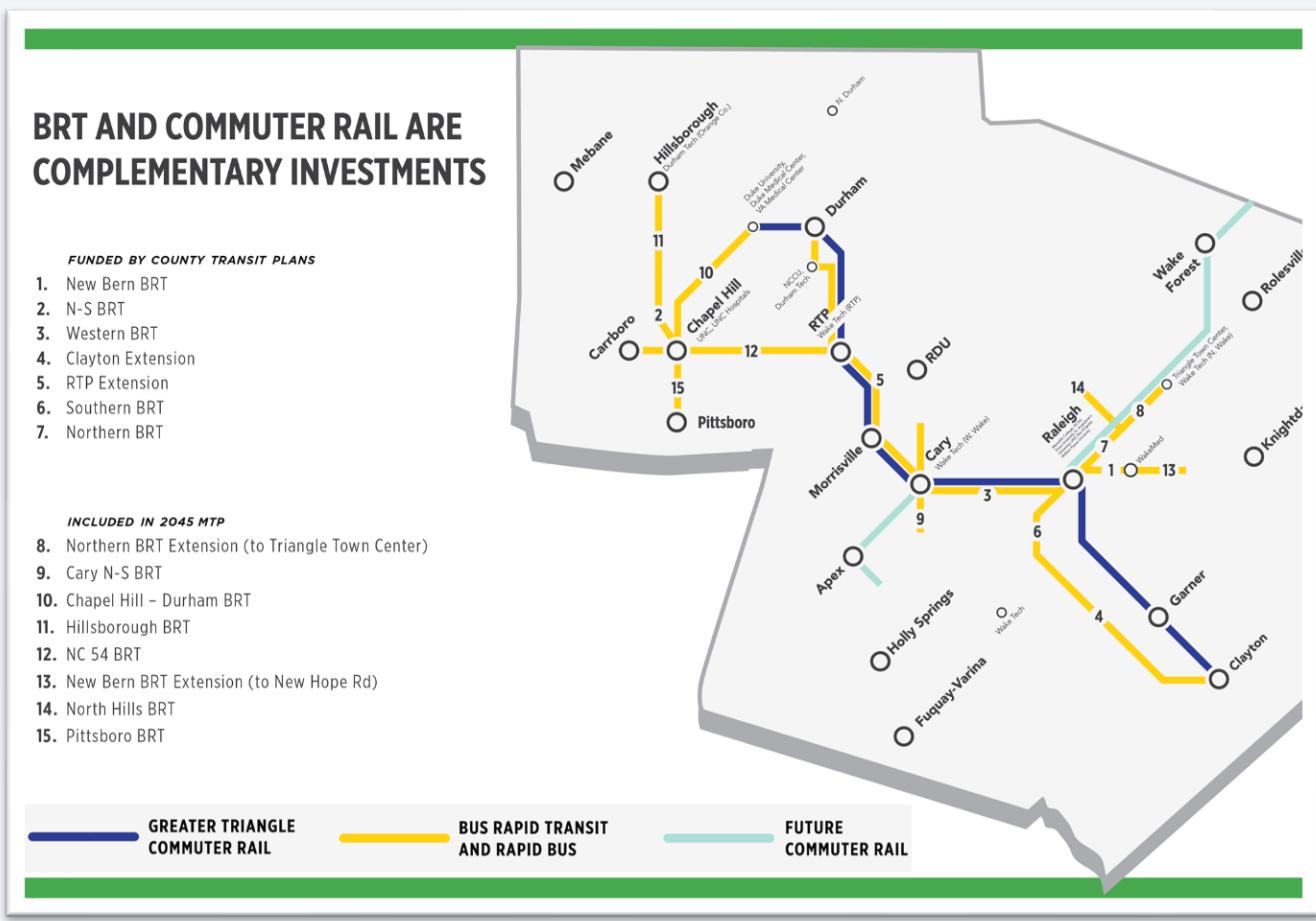
PLANNED TRANSIT IMPROVEMENTS

Commuter rail is part of a suite of mobility interventions planned for the Triangle to sustain mobility throughout the region and enhance quality of life.

MTP 2045 lays out planned investments for the Triangle region that will support growth, including new and expanded roads, local and regional transit facilities, long-distance passenger rail services, and bicycle facilities. Frequent bus rapid transit (BRT) service proposed in Raleigh will help supply better transit access to Wake County residents and provide connecting service for future Commuter Rail riders. GoDurham bus service also offers last mile connections, particularly from Downtown Durham.

As employment opportunities proliferate in diverse areas throughout the region, like the growing job centers in Garner and Clayton as well as established areas adding density like RTP, transit improvements can facilitate connection to these key areas.

Commuter Rail and BRT Corridors



COMMUTER RAIL RIDERSHIP & TIME SAVINGS

By 2040, the Commuter Rail is expected to serve over 10,000 total riders every weekday. These riders are expected to save an average of 21 minutes a day and 88 hours a year in time spent commuting by using the Commuter Rail as opposed to other forms of transportation. Transit travel time savings are estimated by comparing the No Build and Build commute scenarios for projected riders in 2040. The STOPS model weights travel times savings for people switching from auto to transit in the Build scenario, accounting for the beneficial factors causing them to switch even though they may not experience an absolute reduction in travel time. It also assumes that users prefer rail over buses operating in mixed traffic due to perceptions of higher speed and reliability, and that out-of-vehicle commute time is viewed as more onerous than in-vehicle time.

The FTA provides guidance on valuing an hour of time savings, calculated as the median annual income of commuters divided by two to reflect leisure time, and then divided by 2080 to convert to the value of one hour.

Source: RSG, STV, Department of Transportation

Note: Commuter rail rider income calculated based on GoTriangle bus rider income and Orlando SunRail rail and bus rider income

Commuter Rail Time Savings

Each rider will save:



21 minutes / day

88 hours / year

In total, Commuter Rail riders will save 4,186 hours daily and over 1 million hours annually.

Value of Time Savings

\$51,000 weighted average Commuter Rail rider annual income

- ÷ 2 to reflect leisure time
- ÷ 2080 estimate work hours/year
- = \$12.25 value of one hour saved**

Total Commuter Rail rider time savings equates to a \$12.9 million annual value.

ECONOMIC VALUE OF RIDER TIME SAVINGS

Time savings have economic value to the region.

The value of time savings experienced by Triangle residents traveling on the Commuter Rail does not directly increase spending in the Triangle region. However, time saved commuting and time reclaimed for productive or personal use is a powerful talent attraction & retention tool. Investing in reliable, non-auto transportation alternatives can help make the Triangle a more attractive place to live and work. The REMI model reflects these time savings as a quality-of-life improvement that induces more migration to the region. This migration in turn results in more jobs, personal income, and GRP for the region.

The Commuter Rail will also open road capacity for commuters who continue to commute by car, but this impact is not quantified in the analysis.

Value of Time Savings in the Triangle, 2050

As a result of time savings for riders of the Commuter Rail, the Triangle will gain an additional:

**\$210 million
personal income, cumulative over 2031-2050**

**\$160 million
gross regional product (GRP), cumulative over
2031-2050**

This impact reflects a quality-of-life improvement from the Commuter Rail, which will induce more business and resident migration to the region.

EAST DURHAM TIME SAVINGS

Positioned adjacent to rapidly developing Downtown Durham, East Durham is a historically and culturally significant community with a legacy of mass displacement from transportation projects. The area around the proposed Commuter Rail is made up of primarily single-family homes and stretches of commercial buildings, encompassing many historical African-American neighborhoods like the Hayti Community which was founded as an independent Black community shortly after the Civil War. Over the next hundred years, the neighborhood flourished and rose to regional and national prominence as a hub for Black business and entrepreneurship. However, in the 1950s and 1960s an urban renewal freeway project decimated the community, displacing hundreds of residents and many businesses. Today, the area has a lower median household income than the City as a whole and has a population that is majority people of color. The proposed Commuter Rail station would be located on the eastern edge of the community at the intersection of S Alston Ave and E Pettigrew St.



EAST DURHAM STATISTICS

22,311 Residents

7,478 Households

\$30,115 Median Income, compared to \$56,840 in Durham

13.8% Unemployed Residents, compared to 10.4% in Durham

70% Black Residents, compared to 38% in Durham

20% Latinx Residents, compared to 15% in Durham

20% Residents 25+ with at least a Bachelor's Degree, compared to 50% in Durham

EAST DURHAM TIME SAVINGS

In East Durham, nearly a third of the neighborhood's residents travel an average of 30+ minutes to get to work. Given the limited vehicle ownership in the neighborhood, many residents are dependent on public transportation for their commuting needs.

Only 36% of households have more than one vehicle. The commuter rail can offer significant time savings for these households relying on public transportation. For example, nearly 500 East Durham residents work in the RTP/RDU area. To reach RTP by bus from East Durham, existing routes (12B or 5→805) take well over an hour. If the Commuter Rail is implemented, this same trip would take just 12 minutes – saving 45 minutes of travel time. Approximately 600 residents travel towards Duke University for work and another 100-150 work in West Raleigh or Downtown Raleigh, all of which would be accessible by the proposed Commuter Rail route.

For residents that are currently driving to work, the Commuter Rail could offer a convenient option that allows commuters to avoid the frustrations of traffic, reclaim productive time, and save on the costs of using a car. For households that lack sufficient vehicle access, the Commuter Rail would support upward mobility by increasing opportunities to reach jobs in the region. Last-mile bus connections from Commuter Rail stations could further enhance connectivity for East Durham residents and workers.

Current Commuting Patterns

64%

Households in East Durham with zero or one car

32%

East Durham workers with a 30+ minute commute

40 – 50 minutes

Time savings potential for East Durham workers commuting to RTP or Downtown Raleigh by Commuter Rail vs. Bus

REGIONAL IMPACTS: EMPLOYMENT CONNECTIVITY



LABOR MARKET FRAGMENTATION

Lack of connectivity between the Triangle's various employment hubs has created a fragmented labor market that impacts both employers and employees. In September 2021, WRAL TechWire reported that over 64,000 jobs in the Triangle were still unfilled, based on data from NCWorks and local and national job boards. Nearly 45,000 of these job openings are in Wake County and many are in the healthcare, technical, management, computer science and education fields. Across the state, the ratio of candidates per job is just 0.64.

As companies continue to announce new locations in the Triangle, many employers are struggling to fill open positions. Based on outreach to major employers in the region, hospitals are facing shortages in nursing staff and universities are having difficulty filling lower-paying roles like hospitality positions. These employers frequently cited lack of reliable public transit as one of the primary barriers that artificially restricted the size of the labor pool from which they could source candidates and prevented otherwise qualified workers from filling available positions. Without an affordable and fast regional transit solution, the Triangle will continue to function as a unified labor market only for those with private vehicles - and employers and employees will bear the cost of this inefficiency.



Thousands of jobs going unfilled in the Triangle - here's where to find opportunities

NC jobs mismatch: Openings exceed number of people looking for work

Where are the workers? In Triangle, 37,000 open jobs, only 23,000 candidates

COMMUTER RAIL REGIONAL IMPACT | EMPLOYMENT CONNECTIVITY ENHANCED LABOR FORCE ACCESS

The Commuter Rail will increase connectivity to the region's employment hubs - increasing employers' access to talent and expanding workers' employment choices. Based on transit modeling from STV and RSG, HR&A evaluated the number of workers that can reach each employment district in the Triangle within 60 minutes, based on where they live and the best (fastest) mode of transportation.

The implementation of the Commuter Rail enhances the ability of an employee to access jobs in the region within a reasonable 60-min commute, though the overall impact on the region is marginal. The transit modeling estimated a .03% improvement in regional labor force accessibility for the Triangle between the Build and No Build scenarios. This indicates that the Commuter Rail can enable slightly better matching between employers and potential employees.



Note: In many areas, auto remains the fastest commuting option even with the Commuter Rail so the labor market size does not substantially increase. The modest increases that do occur are primarily in districts that would benefit from a park-and-ride option. The overall change in the region was calculated as the average of each employment district's percentage increase weighted by its 2040 employment.

Source: RSG STOPS Model, photo from Wikipedia Commons

ECONOMIC VALUE OF LABOR FORCE ACCESS

The improvement in labor force access results in productivity gains in the region.

The REMI model translates the improvement in labor force accessibility—the Labor Force Accessibility Index (LFAI)—into productivity gains for the Triangle region. The extent to which improved access increases productivity varies by industry, depending on the relative importance of specialized skills to the corresponding occupations. For instance, as REMI notes, improving accessibility between specialized workers in the medical field and jobs significantly improves productivity, because these workers offer differentiated skills.

Value of Labor Force Access in the Triangle, 2050

As a result of increased labor force access for employees and employers through the Commuter Rail, the Triangle will experience an additional:

**\$430 million
personal income, cumulative over 2031-2050**

**\$660 million
gross regional product (GRP), cumulative over 2031-2050**

This impact reflects the increased connectivity to the region's employment hubs.

HOUSEHOLDS WITH LIMITED CAR ACCESS

The projected labor force access effect likely undercounts the benefits the Commuter Rail will offer for workers that can not or choose not to own a personal vehicle. For instance, the transit model does not account for stresses that may be placed on 1-car households in terms of sharing the vehicle. In the model, if a household owns a car, it assumes it is available for use. This is not always the case when multiple household members have competing needs and schedules.

The Triangle Region has approximately 40,000 households where the number of workers exceeds the number of vehicles available. The Commuter Rail could improve the mobility of households with limited vehicle ownership beyond what is reflected in this analysis.

Vehicle Ownership in the Triangle

40,280

Triangle households where the number of workers exceeds the number of vehicles available

28,200

Triangle households with incomes below average vehicle cost (~\$5,000 - \$10,000)

62%

Millennials interested in living and working in areas that offer shorter commutes, walkable environments, and mixed-use communities, according to the *2017 National Community and Transportation Preference Survey*

FOSTERING UPWARD MOBILITY

In conversations with leaders in the local workforce development ecosystem, the Commuter Rail was cited as an equalizer for both students and workers in the region. The commuter rail is viewed as an asset that would not only improve accessibility to employment and skills training but also do so in a way that would help close disproportionate gaps in upward mobility. Currently, higher income individuals who can afford their own vehicle have the ability to take advantage of these opportunities more than lower-income individuals that have limited or no access to vehicles. The Commuter Rail was described by every entity interviewed as a tool that could level this playing field in the future.

Students increasingly need to obtain work experience while still in school and this is viewed as an essential step towards securing skilled employment after graduation. The Commuter Rail could help provide more mobility options between campuses and employment hubs in the region so that students could more easily work a skilled job part-time while in school. Workers also increasingly need advanced degrees to move up in their careers. The Commuter Rail will help improve access between existing employment hubs and the community colleges and university campuses in the region so workers can seek out education, skills training, advanced certification programs, and more.

Source: Stakeholder interviews conducted by HR&A

Select Workforce Interview Quotes

"Transit is a huge issue for students. [...] Commuter Rail will be a gateway for additional students to pursue a degree or certification"

- Triangle Region Community College

"If you don't have a car, your [employment] options are very limited. [...] The more access individuals have to RTP and Johnston County, the better for them."

- Triangle Workforce Development Provider

ENABLING QUALITY CAREERS

Representatives from community colleges, universities, and employers alike were enthusiastic about the prospect of the Commuter Rail better integrating hubs in the region where accessible, high-wage jobs are poised for significant growth. The advanced manufacturing and industrial job cluster in Johnston County was cited as a key opportunity for the region that is currently challenging for many residents and workers to take advantage of given the lack of access. Better integrating Johnston County with Wake and Durham Counties would allow more people to benefit from this growing hub. Community colleges as far away as NCCU and Wake Tech thought their programs could funnel more students to skilled internship and career opportunities in Johnston County if accessibility improved.

Employers noted that the Commuter Rail could expand the geography from which they could recruit from – particularly for lower-income jobs. Unfilled positions at these levels often reflect the limited size of these labor pools which are constrained because workers at these levels are more transit-dependent. A fast, dependable regional transit solution could allow workers at these levels to seek out jobs in more locations throughout the region, taking advantage of more opportunities that are further away from their places of residence.

Source: Stakeholder interviews conducted by HR&A

Select Workforce Interview Quotes

"Infrastructure development is the golden fleece - it provides an opportunity for short-term skill building and opens window of opportunity for individuals to get back into the workforce with good paying jobs and pathways to stable careers."

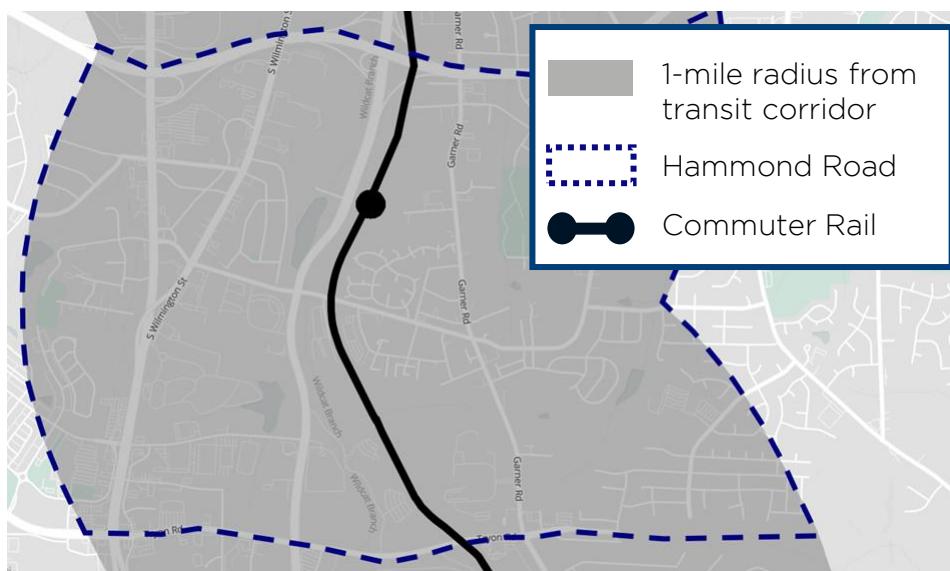
"If you're living in Central Durham and trying to get to RTP with public transportation, it's not going to happen right now."

- Triangle Region City Representative

COMMUTER RAIL REGIONAL IMPACT | EMPLOYMENT CONNECTIVITY TRANSIT-ORIENTED COMMUNITIES

HRA

Located just outside of Raleigh's I-40 Beltline, the Hammond Road station area contains a mix of auto-oriented residential communities. The neighborhood serves a diverse cross-section of Raleigh's population and includes communities like Biltmore Hills, one of Raleigh's historically Black neighborhoods. Biltmore Hills' legacy dates back to the segregated, post-WWII era when the neighborhood was one of the only communities built for and accessible to African Americans. Today, the area offers a mix of affordable housing options including naturally-occurring affordable single-family subdivisions along Cross Link Road, affordability-restricted multifamily apartments along Garner Road, and a large mobile home park. The proposed Commuter Rail station would be located at the intersection of Hammond Road and Hammond Center Drive near a handful of small commercial strips. Given its proximity to the city center but relative affordability, the neighborhood caters to moderate-income service employees and other essential workers like teachers, firefighters, and restaurant workers.



HAMMOND ROAD STATISTICS

9,696 Residents

3,058 Households

\$47,262 Median Income, compared to \$67,266 in Raleigh

12.8% Unemployed Residents, compared to 5.2% in Raleigh

52% Black Residents, compared to 28% in Raleigh

29% Latinx Residents, compared to 11% in Raleigh

35% Residents 25+ with at least a Bachelor's Degree, compared to 51% in Raleigh

Source: Esri Business Analyst, ArcGIS; Note: Final station locations must be approved and are subject to change.

TRANSIT-ORIENTED COMMUNITIES

Hammond Road currently lacks a diversity of transit options which is particularly challenging for households with multiple workers where residents may be competing for access to the same vehicle and/or limiting their work schedules or locations to juggle this dependency.

Although 72% of households in the study area have dual earners, only 54% have access to multiple vehicles. Implementation of the Commuter Rail and bus rapid transit would expand the range of transit modes available to these residents and the universe of employment opportunities they may consider. More jobs within a resident's access shed means a better chance of finding a job that matches their skill set, and subsequently improves their ability to take advantage of optimal career progression opportunities.

Notably, since 1 in 8 adults in the Hammond Road station area are employed in health care, the Commuter Rail would offer a more efficient means of commuting to medical hubs across the region including those further away in Durham. For example, if a hospital employee living near Hammond Road commuted to a job at Duke Hospital using public transit, this trip would take 125 minutes using current bus transfers, but 52 minutes via commuter rail. As the Commuter Rail improves connectivity between Hammond Road and employment destinations, the range of employment options that residents may consider will expand. This increased connectivity could also help address a nursing shortage throughout the region that was cited by university representatives.

Access to Jobs

72%

Hammond Road
Households with multiple
earners

54%

Hammond Road
Households with multiple
vehicles

33%

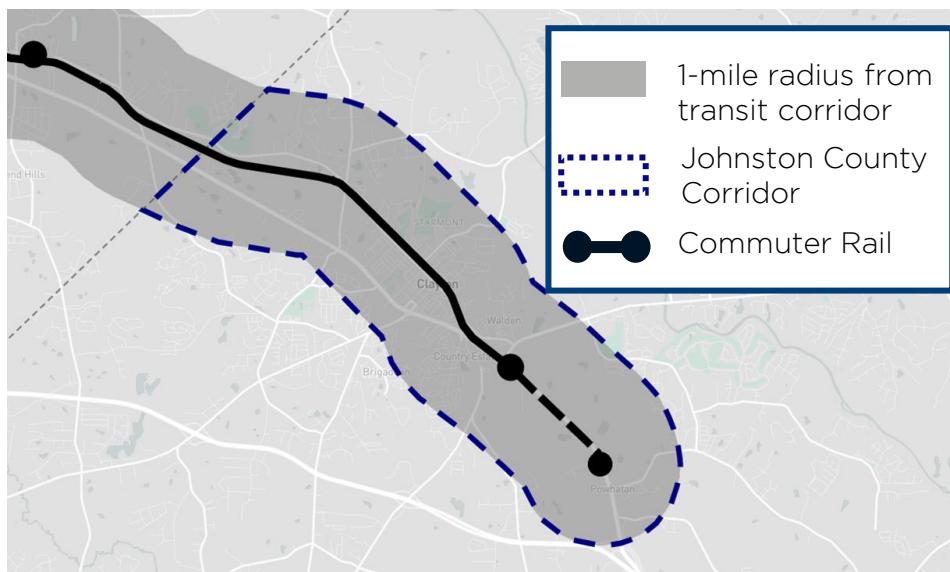
Of Hammond Road
workers with a 30+ minute
commute

COMMUTER RAIL REGIONAL IMPACT | EMPLOYMENT CONNECTIVITY

JOHNSTON COUNTY INDUSTRIAL HUB

HRA

The Johnston County pharmaceutical manufacturing cluster is home to many of the county's major industrial employers, positioned in the northwest part of the county between Clayton and Wilsons Mills. The largest employers include Grifols Therapeutics, Novo Nordisk Pharmaceutical, and Caterpillar. Johnston Community College is another economic asset of the county, offering occupational, technical, and continuing education opportunities including in biotechnology and other life sciences. The college is moving forward with purchasing land in Clayton for a campus that would be located near Novo Nordisk. The new campus would include a manufacturing center and training program that capitalizes on the strengths of nearby employers and creates additional workforce development opportunities. The proposed Commuter Rail station is in Clayton at the intersection of N.C. Highway 42 and U.S. Route 70, approximately two miles northwest from the center of the County's growing pharmaceutical cluster.



JOHNSTON COUNTY STATISTICS

- 213,725** Residents
- 59,000** Jobs, with 22% growth since 2010
- \$52,000** Average job earnings
- 3,800** Businesses
- 2.3 million** SF of office space
- 17** Businesses in pharmaceutical and machinery manufacturing industries
- 13,000** JCC students annually enrolled in credit and non-credit programs

Source: Esri Business Analyst, ArcGIS; Note: Final station locations must be approved and are subject to change.

JOHNSTON COUNTY INDUSTRIAL HUB

Commuter Rail will help Johnston County become a more accessible employment destination for residents living in Wake and Durham Counties who do not want to or cannot afford to commute via car each day. For those who live in these counties without access to a vehicle, there are currently no public transit options to get to Clayton. While the drive from many parts of these counties to Clayton is under an hour, some potential employees who do have access to a car will likely prefer commuting using commuter rail for convenience or cost savings benefits.

Commuter Rail will help Johnston's County's leading pharmaceutical and manufacturing employers attract and retain talented employees from around the region. Increased labor force access will in turn enhance their growth prospects and help Johnston County become more competitive for other large employers.

The area around the proposed Clayton station will require additional last-mile bus or shuttle services to bring riders to and from the main employment clusters and JCC's current campuses. The timetables for these last-mile services should consider timing of manufacturing shifts and evening JCC classes.

Commuter Rail and last-mile connections will also enhance connectivity to JCC's Workforce Development Center, which focuses on life sciences programming and workforce development in biotechnology and other sciences. The increased accessibility provided by the Commuter Rail will enhance the reach of this important resource for the region, particularly for students who rely on affordable transportation options.

Access to Industrial Jobs

0

Current public transportation options from Wake or Durham County to Clayton

30 min

Commuter Rail ride from West Raleigh to Clayton

4,500

Johnston County jobs in pharmaceutical and machinery manufacturing industries

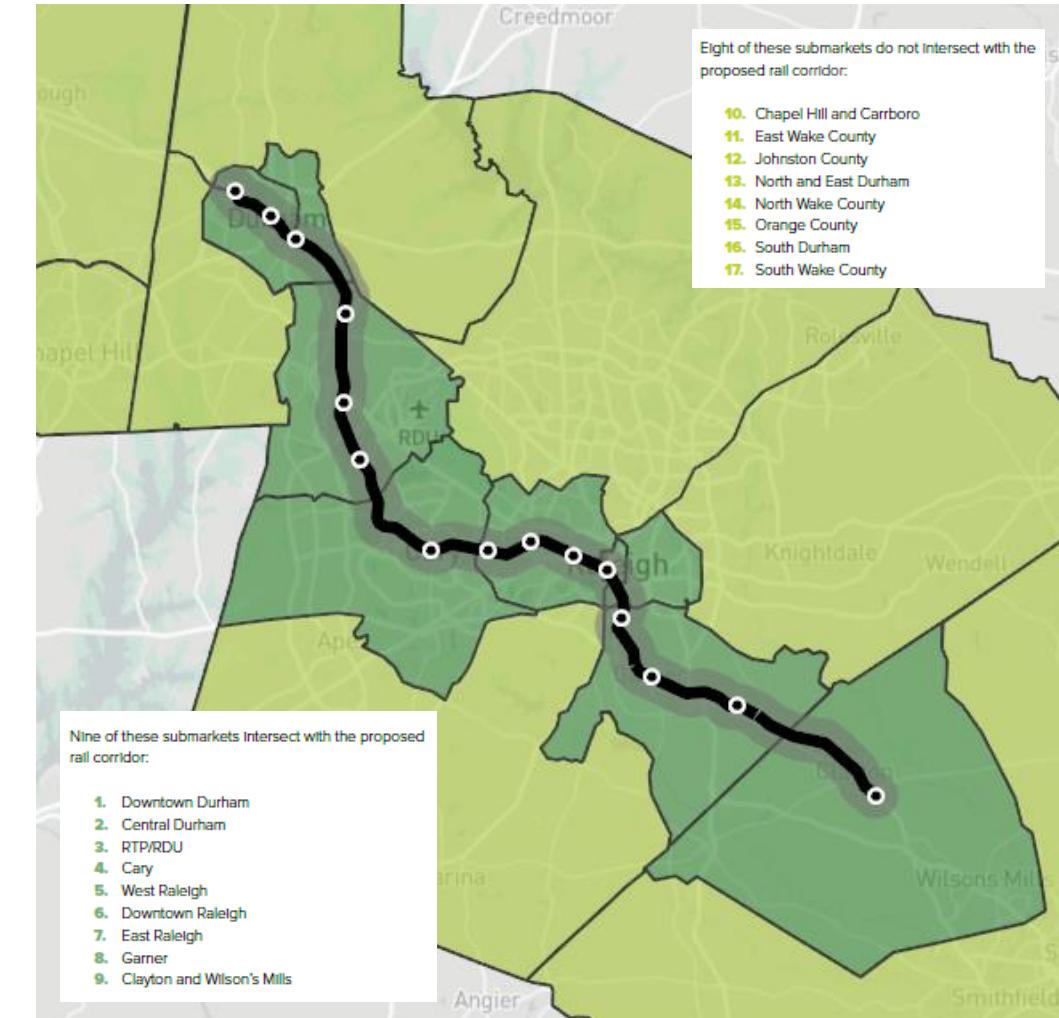
REGIONAL IMPACTS: SMART DEVELOPMENT



COMMUTER RAIL REGIONAL IMPACT | SMART DEVELOPMENT REAL ESTATE MARKET ANALYSIS

In order to understand the impacts of future transit-oriented development on the Triangle, HR&A conducted a real estate market analysis. HR&A first established real estate projections by use for the region over the next 30 years under both the No Build and Build scenarios. HR&A assumes the overall level of real estate growth remains the same with the Commuter Rail, but that the region will experience shifts in where this growth occurs. For the purpose of this analysis, HR&A defined 17 distinct submarkets within Orange, Durham, Wake and Johnston Counties, nine of which intersect with the proposed rail corridor. To develop these regional and submarket growth projections, HR&A relied on the adopted MTP 2050 population and employment projections, historical population and job ratios, market inventory and growth data, a national literature review, and an online survey of local real estate market practitioners.

Based on this market analysis, HR&A determined that some submarkets—Downtown Raleigh, Downtown Durham, Clayton and Wilsons Mills, and RTP/RDU—would capture additional office growth from transit-oriented development, while others would capture the same or slightly less in the Build scenario.



PROJECTED REAL ESTATE GROWTH

The Triangle's real estate market has been resilient through the COVID-19 pandemic and significant growth is anticipated over the next 30 years, regardless of Commuter Rail.

- **Multifamily and condo** outlook continues to look strong following a historic decade of growth.
- **Office** will continue to grow, though slightly reduced as a result of the pandemic.
- **Industrial** will double its inventory by 2050 due to the Triangle's central location and increased demand from the pandemic.
- **Retail** growth is expected to slow, impacted by both the shift towards e-commerce and the COVID-19 pandemic.
- **Hotel** growth will continue at a steady rate, dampened slightly by potential reduced business travel.

PROJECTED GROWTH IN THE TRIANGLE BY 2050



+165,000 multifamily units (*+89% increase*)



+78 million office SF (*+76% increase*)



+89 million industrial SF (*+101% increase*)



+16 million retail SF (*+19% increase*)



+23,000 hotel rooms (*+77% increase*)

IMPLEMENTING TOD IN THE TRIANGLE

The Commuter Rail can help anchor this new growth, curbing sprawling development patterns and serving as a magnet for vibrant, transit-oriented development.

Transit increases the attractiveness of living and working near stations. This demand can foster developer interest in TOD and help anchor new growth leading to compact, walkable neighborhoods with shops and services nearby. Transit investments across the country have become magnets for new development and led to higher average utilization of a sites' potential capacity.

Smart development around transit also often requires less parking. This reduces the construction costs of development and leads to more pedestrian-oriented areas with relatively lower traffic impacts and environmental footprints.

TOD vs. Non-TOD, *Raleigh Equitable Transit-Oriented Development Guidebook*

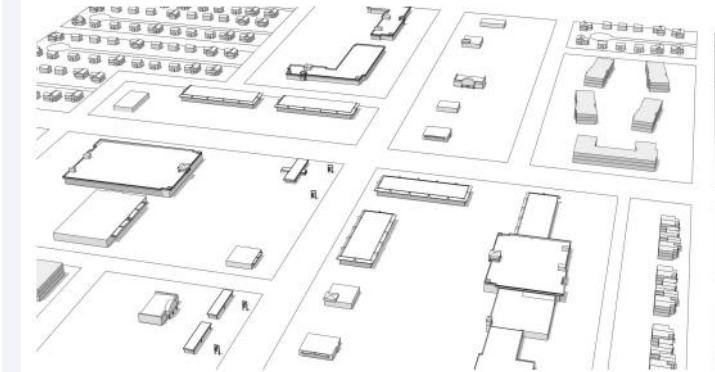
Non TOD: Street with underutilized properties and a lack of active uses.



TOD: Repurposed existing building stock to include active ground floor uses and mixed upper floor uses.



Non TOD: Dispersed auto-oriented urban form.



TOD: Transit-oriented density distribution with highest density near the station.



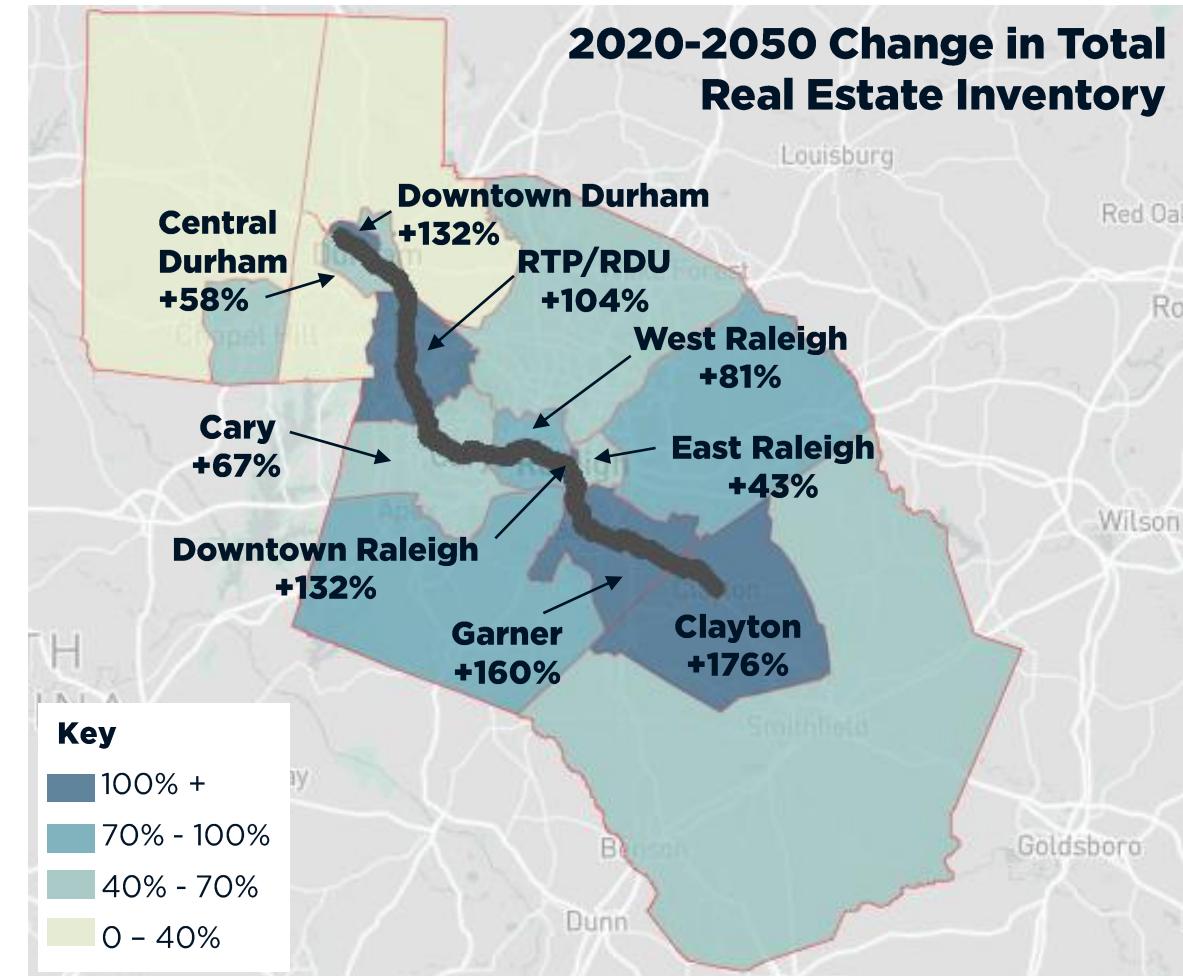
COMMUTER RAIL IMPACT ON DEVELOPMENT

Commuter Rail can help accommodate the expected population growth and development in submarkets that intersect with the proposed alignment, fostering more compact, walkable, and mixed-used communities.

Growth hubs include **Downtown Raleigh** and **Downtown Durham**, which are major employment nodes that will experience significant growth through 2050 and capture increased development as a result of the Commuter Rail.

RTP/RDU will also experience increased transit-oriented development as the Commuter Rail reinforces the HUB RTP Master Plan to increase density and mixed-use. The increased connectivity to the rest of the region will drive competitiveness in attracting future employers.

Clayton and Wilson's Mills will experience significant growth as a result of being better connected to the broader region. While industrial development will be a primary driver in this area, Commuter Rail will also help anchor mixed-use development as more people and offices seek to locate around the station area.

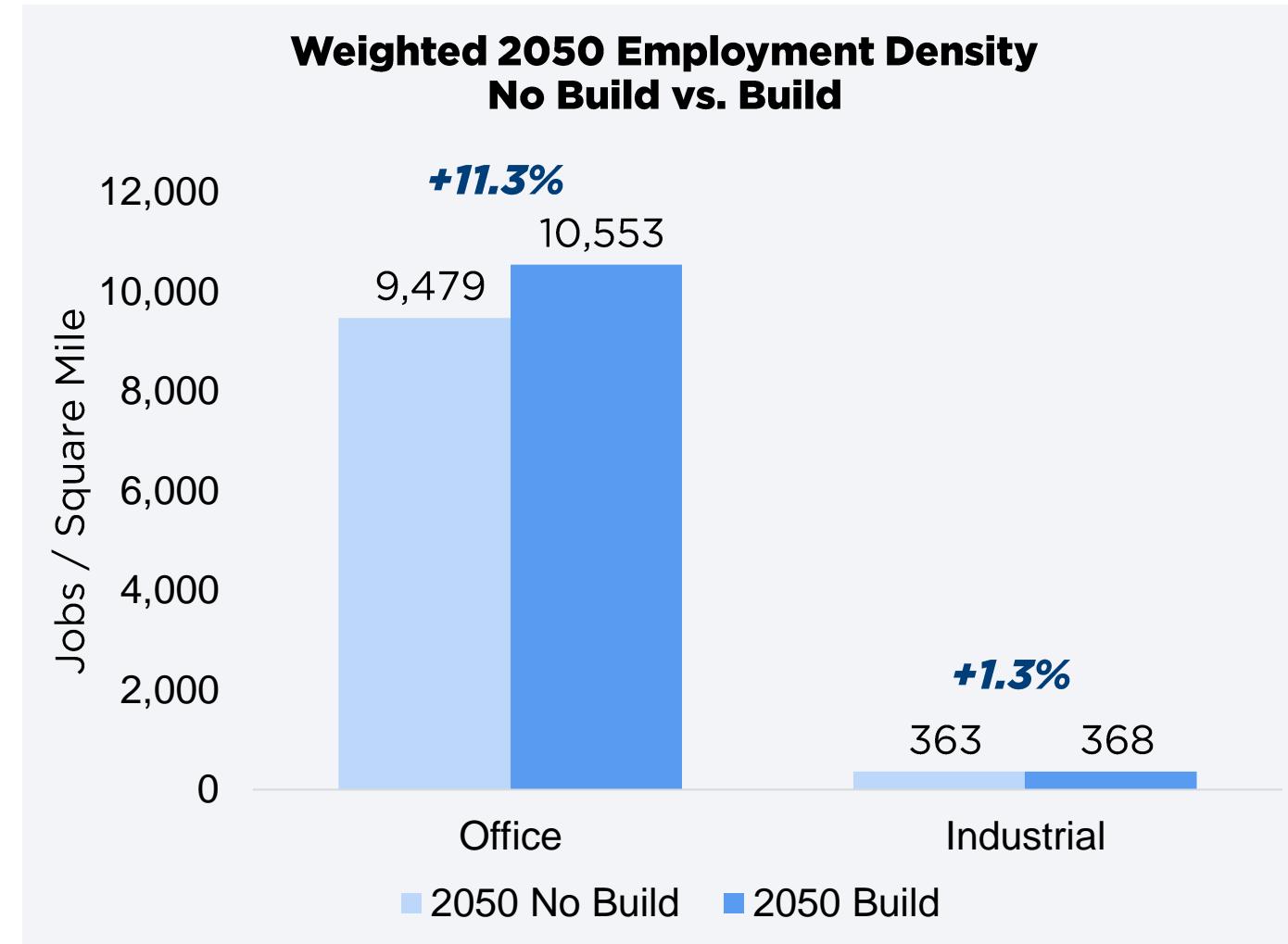


INCREASING EMPLOYMENT DENSITY

By helping to attract new development, the Commuter Rail will enhance employment density in the Triangle. As employers collocate around Commuter Rail station areas and vibrant hubs of mixed-use activity, the concentration of jobs in certain industries will increase.

By 2050, office employment density within the Triangle will increase by an additional 11.3% in the Build scenario compared to the No Build scenario. The increase is driven primarily by expected office growth and concentration in Downtown Durham, Downtown Raleigh, and RTP.

By 2050, industrial employment density within the Triangle will be 1.3% higher in the Build scenario than in the No Build scenario. This increase is driven primarily by expected industrial concentration in Clayton/Wilsons Mills.



BOOSTING LABOR FORCE PRODUCTIVITY

Denser employment hubs promote innovation, knowledge spillovers, and economies of scale which lead to an increase in labor force productivity. This convergence is known as agglomeration economies - an academic term used to describe the effects of increased proximity and connectivity between firms and workers. A comprehensive literature review of the studies that have analyzed this phenomenon found that doubling density (a 100% increase) is correlated with a 4% increase in a region's labor force productivity.

Therefore, as a result of the estimated 11.3% density increase in office-using industries and 1.3% density increase in industrial-using industries in 2050, **these industries will experience a .45% and .05% increase in productivity, respectively, in the Build scenario compared to No Build.**



ECONOMIC VALUE OF EMPLOYMENT DENSITY

Labor force productivity has significant impacts on the economy of the region.

Smart development patterns contribute to Triangle's economy by making firms more innovative and productive through closer proximity to other firms. For example, the office density increases projected in RTP/RDU means more science and technology firms, government agencies, and academic institutions working in proximity, which can spur additional research partnerships and knowledge spillovers.

The ongoing impacts of increased labor force productivity would result in an additional \$3.1 billion in personal income for Triangle employees and \$4.1 billion GRP for the region by 2050.

Value of Labor Force Productivity in the Triangle, 2050

As a result of increased labor force productivity for employers from the Commuter Rail's transit-oriented development, the Triangle will experience an additional:

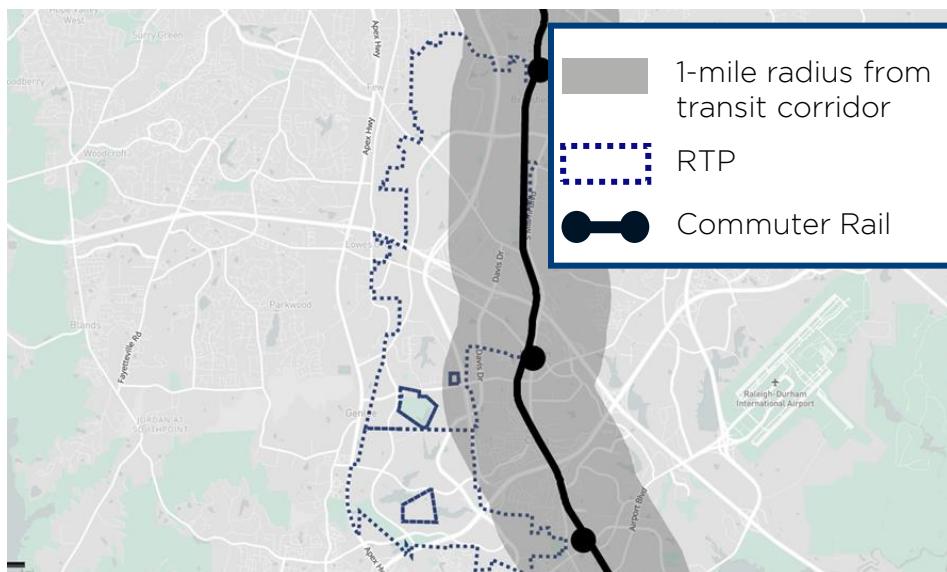
**\$3.1 billion
personal income, cumulative over 2031-2050**

**\$4.1 billion
gross regional product (GRP), cumulative over 2031-2050**

This impact reflects the innovation and economies of scale created when employers locate in denser, mixed-use communities.

RESEARCH TRIANGLE PARK

Research Triangle Park (RTP) has been a primary employment anchor for the region since shortly after its creation in 1959. RTP is a magnet for science and technology companies, especially those in biotechnology and life sciences. RTP's largest employers include IBM, Cisco Systems, Fidelity Investments, and Credit Suisse. In September 2020, a virtual groundbreaking was held for the Hub, a master-planned project that will integrate new residential, retail, and hotel uses into the campus. Leaders at the Research Triangle Foundation (RTF) have indicated that projects like the Hub that offer a more urban, mixed-use working environment will be key to talent recruitment in the coming decades. Many of the region's research universities and community college also maintain a physical and programmatic presence in the park. RTP will be served by three proposed commuter rail stations: Ellis Road, RTP, and Morrisville.



RESEARCH TRIANGLE PARK STATISTICS

55,000 employees

19% job growth since 2010

250+ companies

40% of companies in biotechnology and life sciences

15% of companies in information technology

22 million SF of office space

7,000 acres of land

RESEARCH TRIANGLE PARK

In the past decade, the RTP/RDU submarket captured 21% of the region's total office growth and 23% of its industrial growth. Respondents to HR&A's survey of ULI Triangle members expected the submarket to be the third-largest recipient of future development out of 17 submarkets in the region. With the implementation of Commuter Rail, growth is expected to accelerate and survey respondents anticipated that the RTP/RDU submarket would be the largest beneficiary of Commuter Rail investment, ranking it first out of the nine submarkets intersecting with the rail corridor. HR&A projects that future real estate development will increase with the implementation of Commuter Rail.

This increase in development as a result of the Commuter Rail is projected to increase the submarket's office-using employment density by 3.3% and industrial-using employment density by 1.2%. The submarket's capture of other uses—residential, retail, and hotel—is also expected to increase as rail enhances the feasibility of mixed-use development. **With denser development, RTP will continue to evolve into a mixed-use innovation hub with a convergence of industries, employees, and companies leading to greater productivity** and potentially higher rates of business and patent creation, expanded research funding, and greater competitiveness as a national and regional employment center. Shifts in development and transit patterns catalyzed by the Commuter Rail will position RTP to continue to attract and retain talent, particularly younger generations of employees. Enhanced transit options will help ensure RTP companies do not lose employees to other transit-oriented employment centers, and that RTP itself does not lose companies catering to these employees as a result.

Transit-Oriented Development

+ 1,000 additional multifamily units

2020-2050 if Commuter Rail is implemented

+ 1.2 million additional SF office and 450k SF industrial

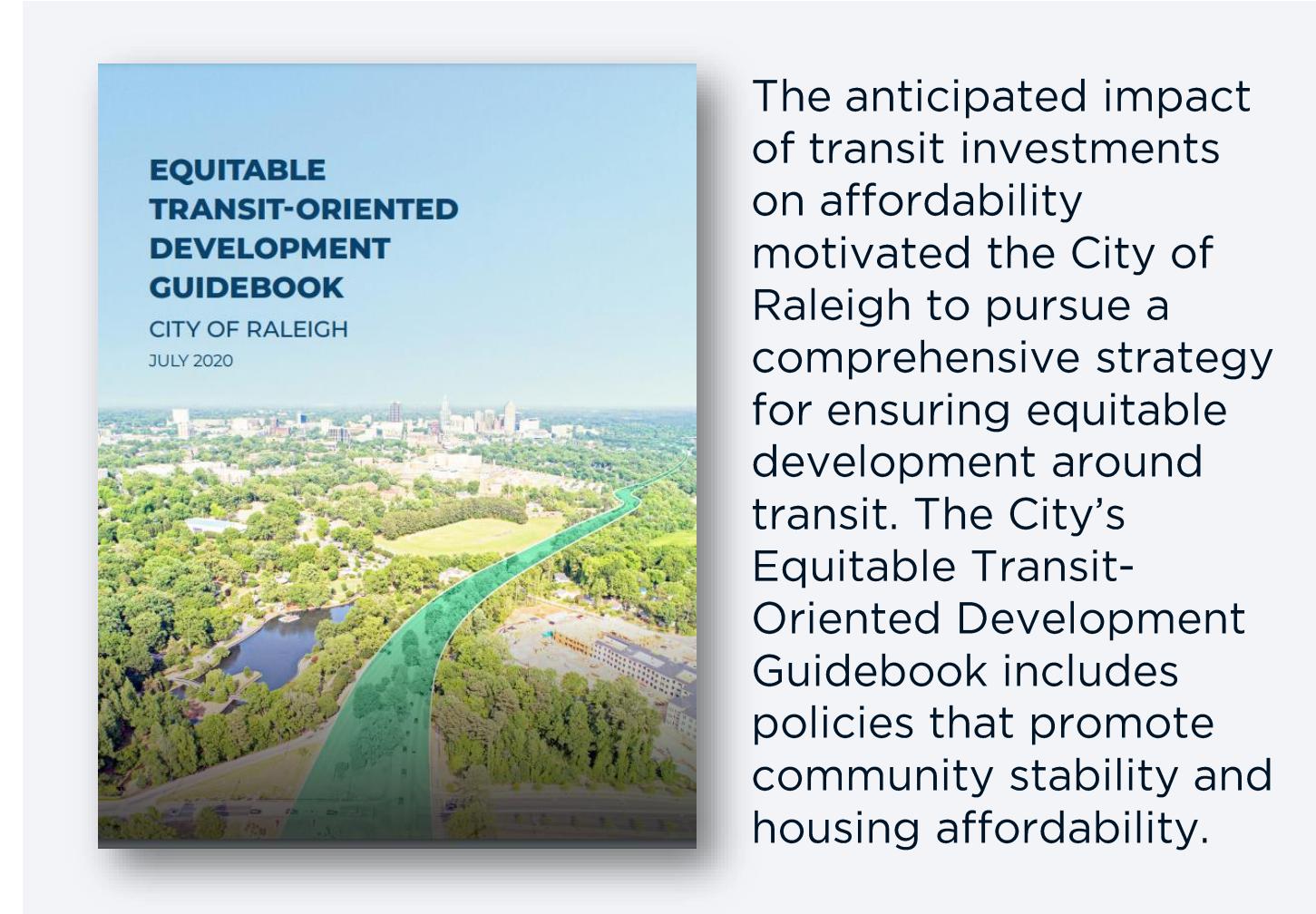
2020-2050 if Commuter Rail is implemented

3.3%

Projected increase in RTP average office employment density if Commuter Rail is implemented, 2050

PROACTIVE ANTI-DISPLACEMENT STRATEGIES

While transit can promote many positive development dynamics that benefit the region and its residents, it is essential to ensure proactive policies are in place to address the negative externalities of new growth. New transportation investments will amplify affordability pressures and displacement risks, hindering the ability of residents most in need of quality public transportation from being able to access it. The Cities of Raleigh and Durham both passed affordable housing bonds within the last two years, which can be initial sources of funding for affordable transit-oriented housing. However, these City funds (which are primarily used for land acquisition and gap financing) will need to be paired with additional funding sources to proactively preserve affordability over the long term.



The anticipated impact of transit investments on affordability motivated the City of Raleigh to pursue a comprehensive strategy for ensuring equitable development around transit. The City's Equitable Transit-Oriented Development Guidebook includes policies that promote community stability and housing affordability.

COMMUTER RAIL REGIONAL IMPACT | SMART DEVELOPMENT

DURHAM HOUSING AUTHORITY

HRA

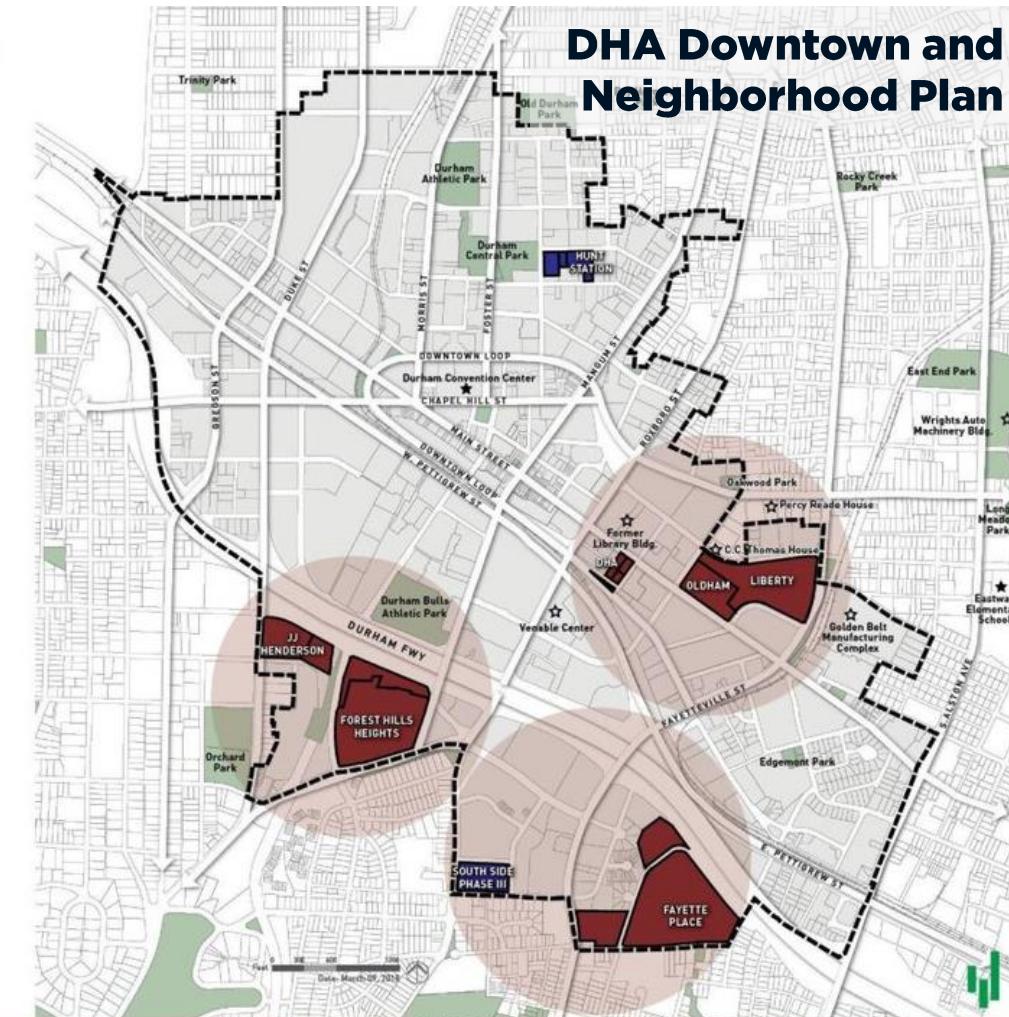
The Durham Housing Authority (DHA) is using existing public land, building assets, and partnerships to support new affordable housing near proposed Commuter Rail station areas. The DHA has undergone a planning process since 2017 to establish the Downtown and Neighborhood Plan, which will preserve and develop over 2,400 mixed-income units. Rehabilitation and development will be supported by the \$95 million housing bond, approved in the 2019 referendum.

The Plan builds off a partnership between the City of Durham, Durham County, and DHA and focuses on nearly 60 acres of publicly owned land in downtown Durham, as shown in the map to the right. These opportunity sites are within the proposed Commuter Rail corridor and will support additional affordable housing options near proposed station areas.

CONTEXT MAP

Community Workshop Focus around the Opportunity Sites

1. Oldham/Liberty/
DHA Office / Hunt
Street (**May 22**)
2. Fayette Place/
Southside Phase III
(**June 25**)
3. Forest Hill Heights/
J.J. Henderson
(**June 26**)



SUMMARY OF ECONOMIC IMPACTS



COMMUTER RAIL CONSTRUCTION

The Triangle would experience increased personal income and gross regional product from Commuter Rail construction.

These impacts represent the incremental impacts of the Commuter Rail Build scenario compared to the Baseline No Build scenario over the construction timeline of 2022-2030.

Value of Commuter Rail Construction in the Triangle, 2030

As a result of Commuter Rail construction, the Triangle will experience an additional:

\$1.3 billion

personal income, cumulative over 2022-2030

\$1.9 billion

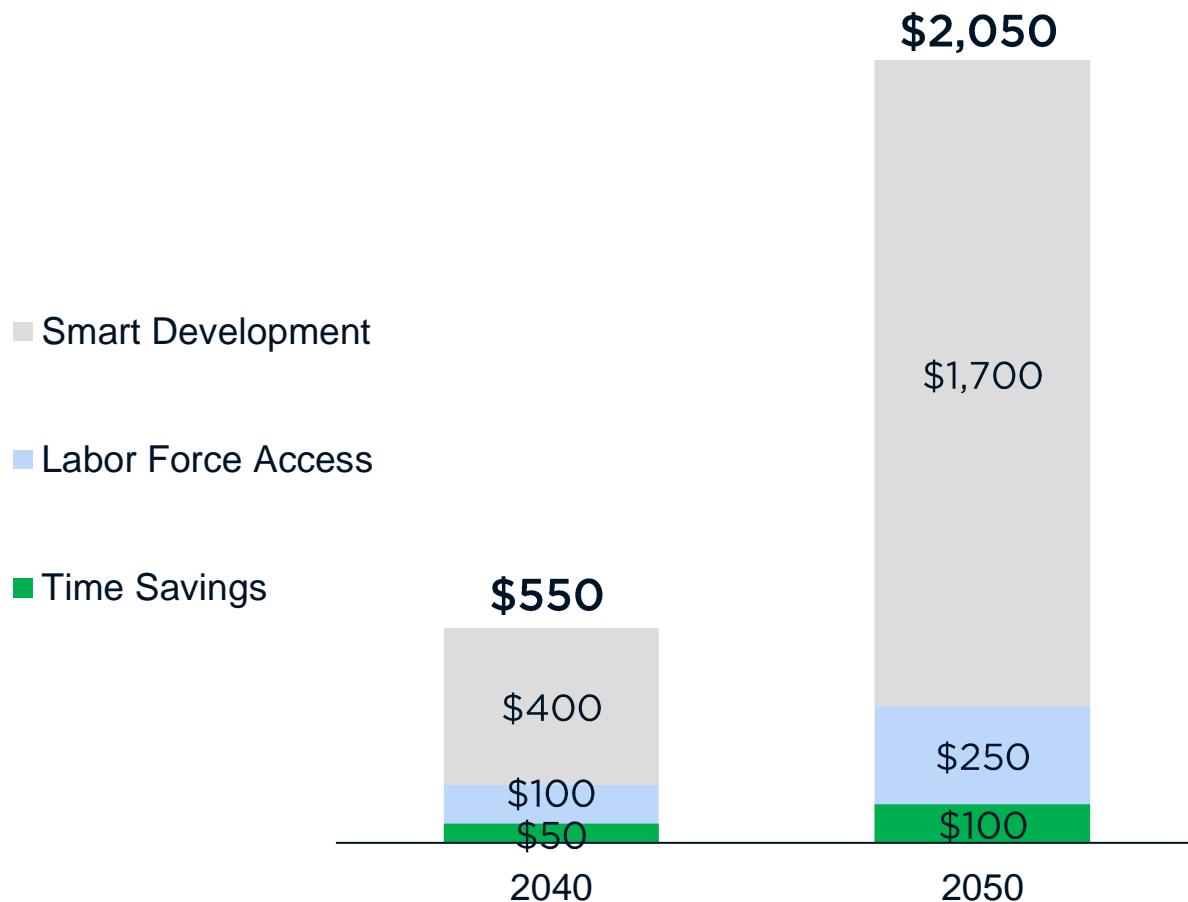
gross regional product (GRP), cumulative over 2022-2030

COMMUTER RAIL OPERATION

The Triangle would experience increased annual personal income from Commuter Rail operations, reaching cumulative growth of nearly \$850 million by 2040 and \$3.7 billion by 2050. These impacts represent the incremental impacts of the Commuter Rail Build scenario compared to the Baseline No Build scenario for each year.

This cumulative growth translates to tangible gains for Triangle area employees. On average, the Commuter Rail will generate an equivalent of an additional \$567 per employee in 2040 and \$2,071 per employee in 2050.

Average Personal Income Generated by the Commuter Rail, 2040 and 2050



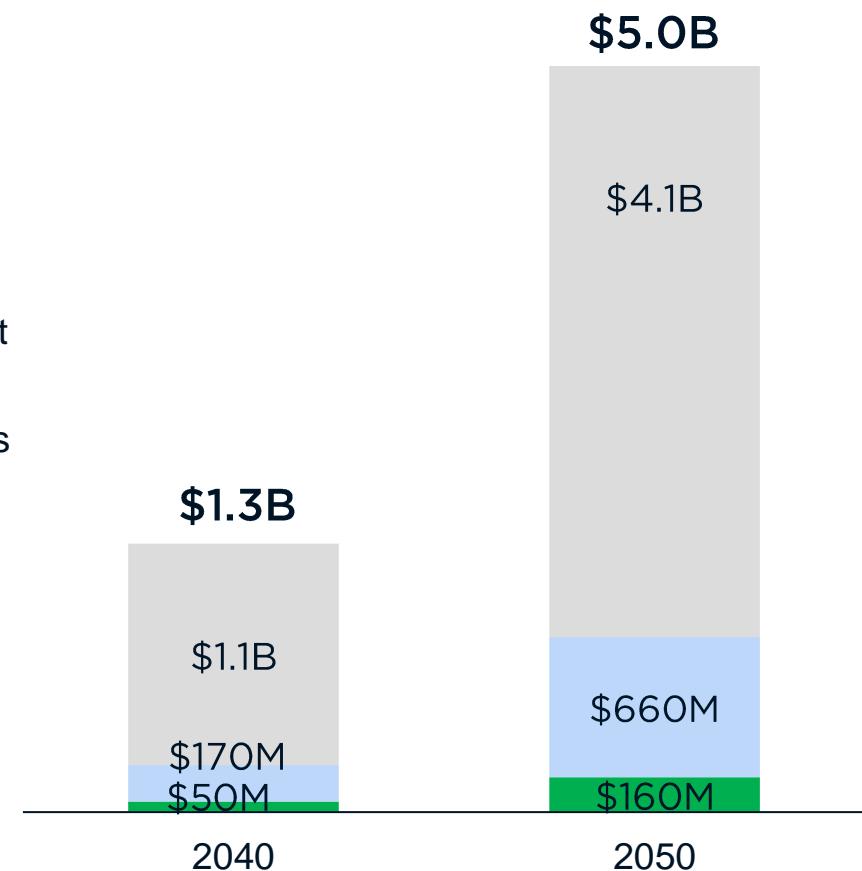
COMMUTER RAIL OPERATION

The total local and federal investment of up to \$2.1 billion would result in a cumulative growth in gross regional product of nearly \$5 billion over the first 20 years of Commuter Rail operation.

Nearly half of the total investment represents federal funds that would otherwise be allocated to other regions in the country.

This translates to an approximate return on investment of 2.4x by 2050.

Cumulative GRP Generated by the Commuter Rail, 2040 and 2050



APPENDIX



Impacts of Transit Investment:

Temporary Impacts from Construction, 2022-2030: Analysis Methodology

Construction Spending

The capital spending on new infrastructure associated with Commuter Rail construction

The required infrastructure components and associated capital cost estimates for construction of the Commuter Rail for the West Durham to Clayton route were derived from the *GTCR Phase I Feasibility Study*.

Permanent Impacts from Ongoing Operation, 2031-2050: Analysis Methodology

Time Savings

The time savings accruing to new Commuter Rail passengers who currently utilize longer bus routes or automobiles

Time savings estimates were calculated using STOPS transit modeling software. The associated dollar value of each hour of time saved was calculated using federal Department of Transit guidance.

Labor Force Access

The larger effective size of the labor force available to firms due to enhanced transit connectivity to employment locations that improves accessibility to a regional workforce

Labor force access was measured as the percent increase in total workers able to reach regional employment nodes within 60 minutes. This was calculated using STOPS transit modeling software.

Smart Development

The productivity benefits fostered by denser employment nodes which promote economies of scale and knowledge spillovers

Smart development impacts were calculated using HR&A's Real Estate Projections and the increase in office-using and industrial-using employment density per square mile. The associated impact on productivity was based on a ratio derived from a review of economic literature.

Impacts of Transit Investment:

HR&A used the REMI Policy Insight model to simulate the effects of the Commuter Rail on the Triangle's economy over time. HR&A calculated four industry standard measures of economic activity to highlight the regional economic outcomes catalyzed by the Commuter Rail. These regional outcomes are described further below.

Measured Regional Outcomes: Definitions

Jobs

The total full-time and part-time employment in the Triangle region. This signifies the region's ability to attract and retain jobs.

Jobs are reported in terms of "Additional Jobs" in the "Build" scenario compared to the "No Build" scenario.

Personal Income

All income received from wages and salaries, proprietor's income, rental income, interest/dividends, and other sources.

Personal income is reported in terms of "Cumulative Personal Income" in the "Build" scenario compared to the "No Build" scenario, calculated as the sum generated through a given year. "Average Additional Personal Income Per Employee" is calculated as the total additional personal income earned in the region divided by the total workers in the region.

Gross Regional Product (GRP)

The dollar value of all final goods and services produced in the regional economy excluding intermediate inputs.

GRP is reported in terms of "Cumulative GRP" in the "Build" scenario compared to the "No Build" scenario. This is calculated as the sum of incremental GRP generated by a given year. The ratio of GRP to project costs is the project's Return on Investment (ROI).

GREATER TRIANGLE COMMUTER RAIL REGIONAL ECONOMIC IMPACT ANALYSIS

Final Report
April 2022