2019 STATE OF THE REGION

DCHC
Metropolitan Planning Organization
Planning Tomorrow Today

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TC

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WHAT IS THE STATE OF THE REGION?

The State of the Region report is a snapshot of the Durham-Chapel-Hill-Carrboro (DCHC) Metropolitan Planning Organization (MPO) region's transportation system and the issues, trends, opportunities, and challenges faced in providing effective and efficient transportation for all users. The State of the Region is a function of population and economic growth patterns and transportation system investments. These patterns affect mobility and safety outcomes. Those outcomes guide continued investment. This report tells that story through five topical chapters.

FOCUS AREAS

POPULATION & DEMOGRAPHICS

REGIONAL STRUCTURE

ECONOMY

MOBILITY

SAFETY

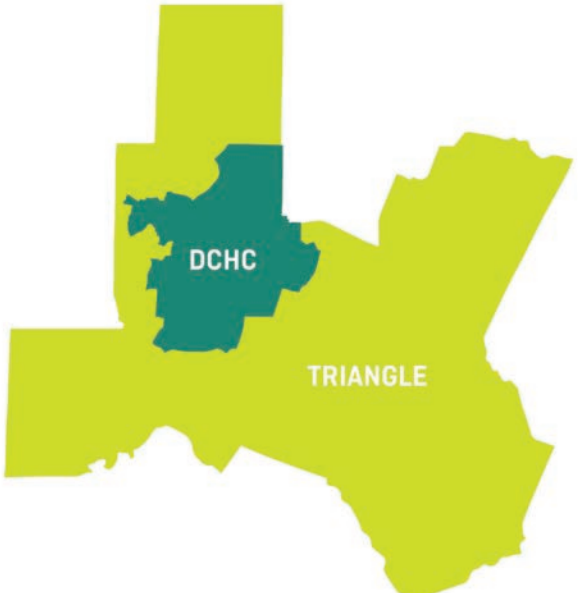
WHY DOES IT MATTER?

This report sheds light on how the transportation system supports DCHC's goals of providing great quality of life, economic viability, and promoting environmental sustainability through transportation investments. A robust, data-focused evaluation of the issues that affect - and are affected by - transportation is critical to meeting those goals.

The State of the Region report provides insights into how each part of the transportation system is performing relative to these goals.

The DCHC REGION is home to 3 major universities including North Carolina Central University (NCCU), The University of North Carolina at Chapel Hill (UNC), and Duke University.

RESEARCH TRIANGLE PARK (RTP) is a national hub of innovation and entrepreneurship and is home to 200 companies and 50,000 jobs



THE REGION

The MPO region includes the larger municipalities of Durham and Chapel Hill; the growing small towns of Hillsborough and Carrboro; all of Durham County; and portions of Orange and Chatham Counties. Member agencies include the North Carolina Department of Transportation (NCDOT) and Triangle Transit. Collectively, the

region is one of the strongest, fastest growing economies in the United States. This growth has improved quality of life for many residents and continues to attract new residents.

PEOPLE

Between 2016 and 2017, the Durham-Chapel Hill metro area grew by approximately 22 people every day. The larger Triangle area (which includes DCHC and Raleigh metro areas) grew by 100 people per day in that same period. The Triangle area is attractive to residents of all ages – from millennials to seniors. It is critical that a wide range of transportation options are provided to meet a variety of needs. By 2040, the MPO region is expected to add over 230,000 new residents. Twenty percent of Triangle residents will be 65 or older in 2030, compared to ten percent in 2000.

There are **300,865** PEOPLE in
There are **199,670** JOBS in **DURHAM COUNTY**

There are **68,364** PEOPLE in
There are **15,581** JOBS in **CHATHAM COUNTY**

There are **141,812** PEOPLE in
There are **70,563** JOBS in **ORANGE COUNTY**

There are **2,126,278** PEOPLE in the
There are **1,069,228** JOBS in the **TRIANGLE REGION**

"The State of the Region report provides insights into how each part of the transportation system is performing relative to goals."

JOBS

The Durham-Chapel Hill metro area, and greater Triangle metro area, consistently rank as areas in the United States with high job growth and excellent quality of life. In 2016, the DCHC region hosted approximately 297,000 jobs - a 14 percent increase from 2010. Jobs in the larger Triangle region have grown by 17 percent since 2010.

TRAVEL

From 2010 to 2016, the regional population increased by roughly 48,000 (or 10 percent). Approximately two thirds of that growth occurred in the region's five cities and towns. Population growth contributes, in part, to increased vehicle travel. However, daily vehicle miles traveled (VMT) in the region increased by approximately 2,900 VMT (or 19 percent). VMT is therefore growing almost twice as fast as population. This increase could be attributed to a rise in employment within the three counties or continued recovery from the Great Recession, but also demonstrates the auto-dependency of residents in the region. The MPO anticipates that VMT will increase by two-thirds between 2010 and 2040.

WHAT ARE THE KEY FINDINGS?

POPULATION & DEMOGRAPHICS

- The region is growing rapidly
- The region remains diverse
- There are spatial disparities in educational attainment, income, and race characteristics across the region

ECONOMY

- Education and healthcare are the region's largest industries, and education is the fastest-growing industry
- Housing affordability varies by job type and nearly a quarter of the region's workers are likely to face housing and transportation cost burdens
- Regional home values are higher than the statewide average and vary by county

REGIONAL STRUCTURE

- Commuter flows reveal strong regional interdependence
- Research Triangle Park drives regional travel patterns
- There are growing mismatches between population growth, jobs, affordable housing, and accessibility
- Regional centrality and multimodal options are critical to limiting total vehicular travel

SAFETY

- Reported crashes steadily increased throughout the region
- Fatalities within the MPO must be reduced to meet safety targets
- Pedestrian crashes increased steadily in Durham from 2013 to 2017
- Bicycle crashes fluctuate slightly from year to year

MOBILITY

- Regional traffic volume is rising
- LOS is decreasing on several major corridors
- Drivers experience more unexpected delays
- There are more pedestrian and bicycle facilities across the region
- Transit ridership is stable
- Passenger growth at RDU continues
- Freight movement will increase; truck traffic remains highest on interstate roadways

HOW DOES THE REGION COMPARE?

Peer comparisons highlight similarities and differences in selected metrics for the DCHC region compared to peer regions across the country. Peer regions (metropolitan statistical areas or MSA) were selected based on a variety of factors including relative similarity to the DCHC region. Factors considered include demographic growth trends and characteristics, economic trends and characteristics, and population trends and characteristics. Peer regions are introduced here along with the rationale for their selection. Chapters 1 and 2 provide additional information about similarities and differences to the selected peer regions.

DURHAM-CHAPEL HILL-CARRBORO MPO

Population: 428,693

Median Age: 37.2

Median Income: $62,111

CHARLOTTE-CONCORD-GASTONIA, NC MSA

Population: 2,056,392

Median Age: 37.5

Median Income: $58,459

Selected based on: Proximity and aspirational characteristics..

FAYETTEVILLE-SPRINGDALE-ROGERS, AR-MO MSA

Population: 514,166

Median Age: 33.9

Median Income: $53,207

Selected based on: Shared demographic and industry characteristics.

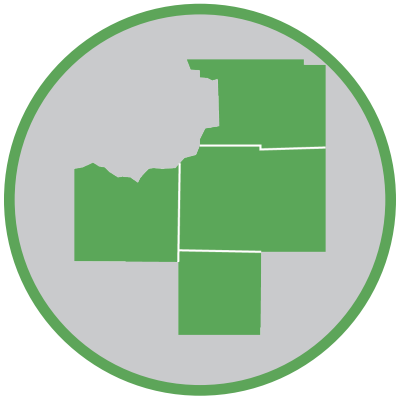
HUNTSVILLE, AL MSA

Population: 444,908

Median Age: 38.4

Median Income: $59,583

Selected based on: Shared demographic and industry characteristics.



MADISON, WI MSA

Population: 640,072

Median Age: 35.9

Median Income: $66,609

Selected based on: Shared demographic and industry characteristics..

RALEIGH, NC MSA

Population: 1,273,985

Median Age: 36.6

Median Income: $68,870

Selected based on: Proximity and shared demographic and industry characteristics..

SEATTLE, WA MSA

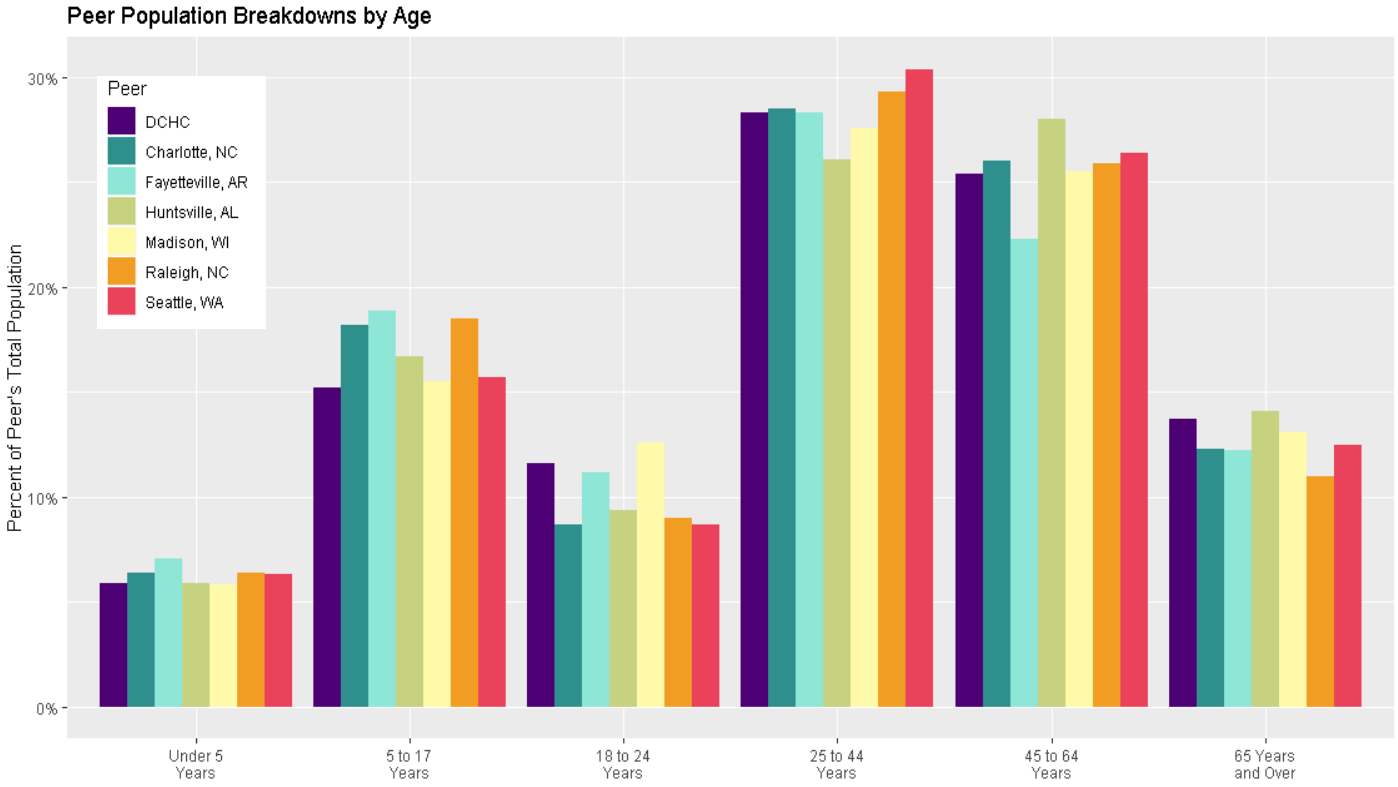
Population: 3,735,216

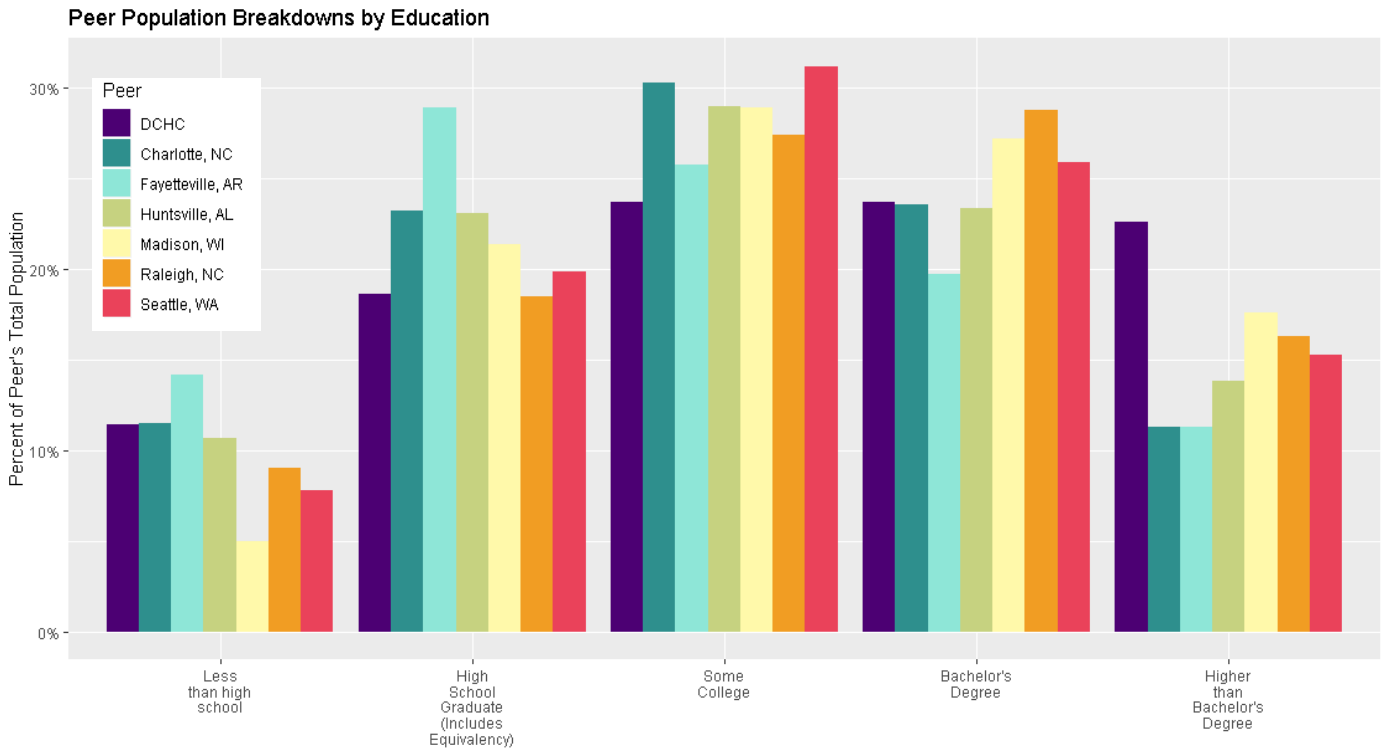
Median Age: 37.1

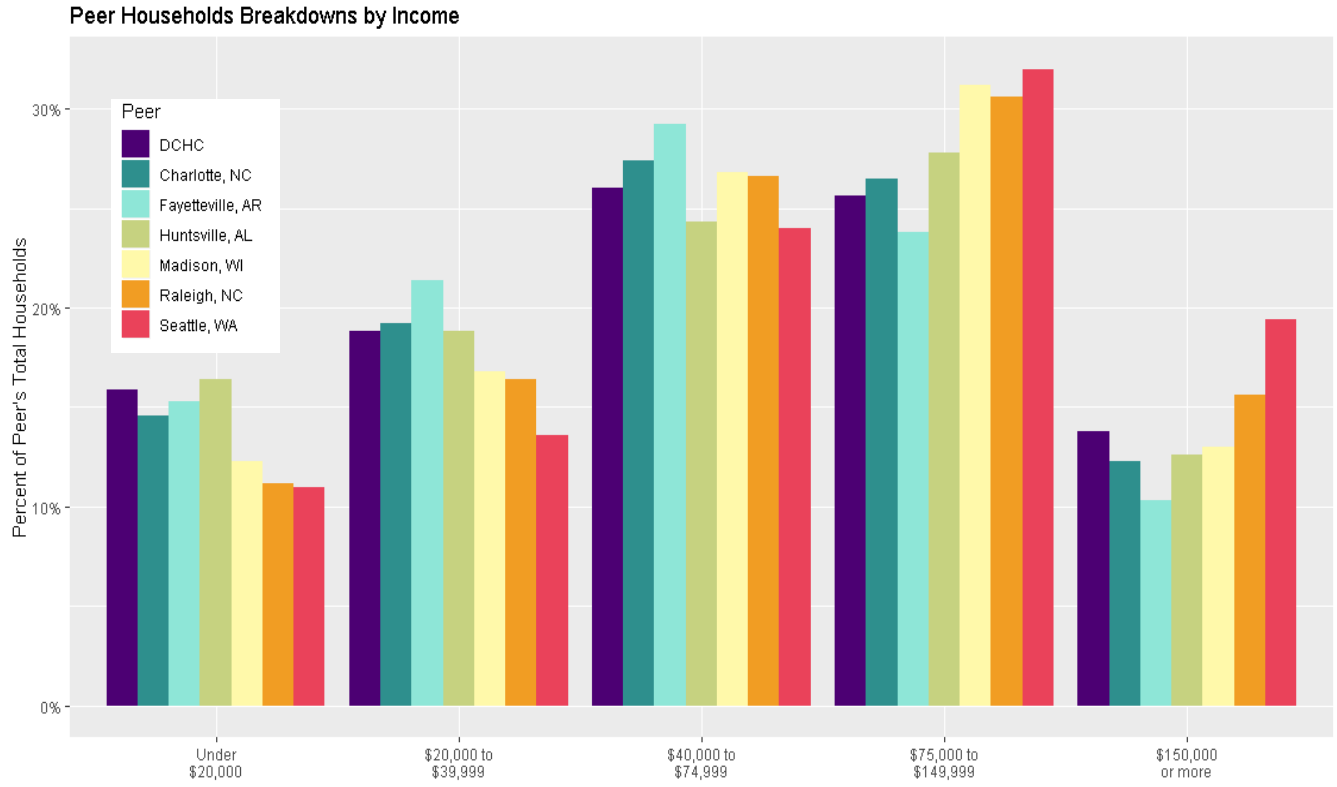
Median Income: $77,269

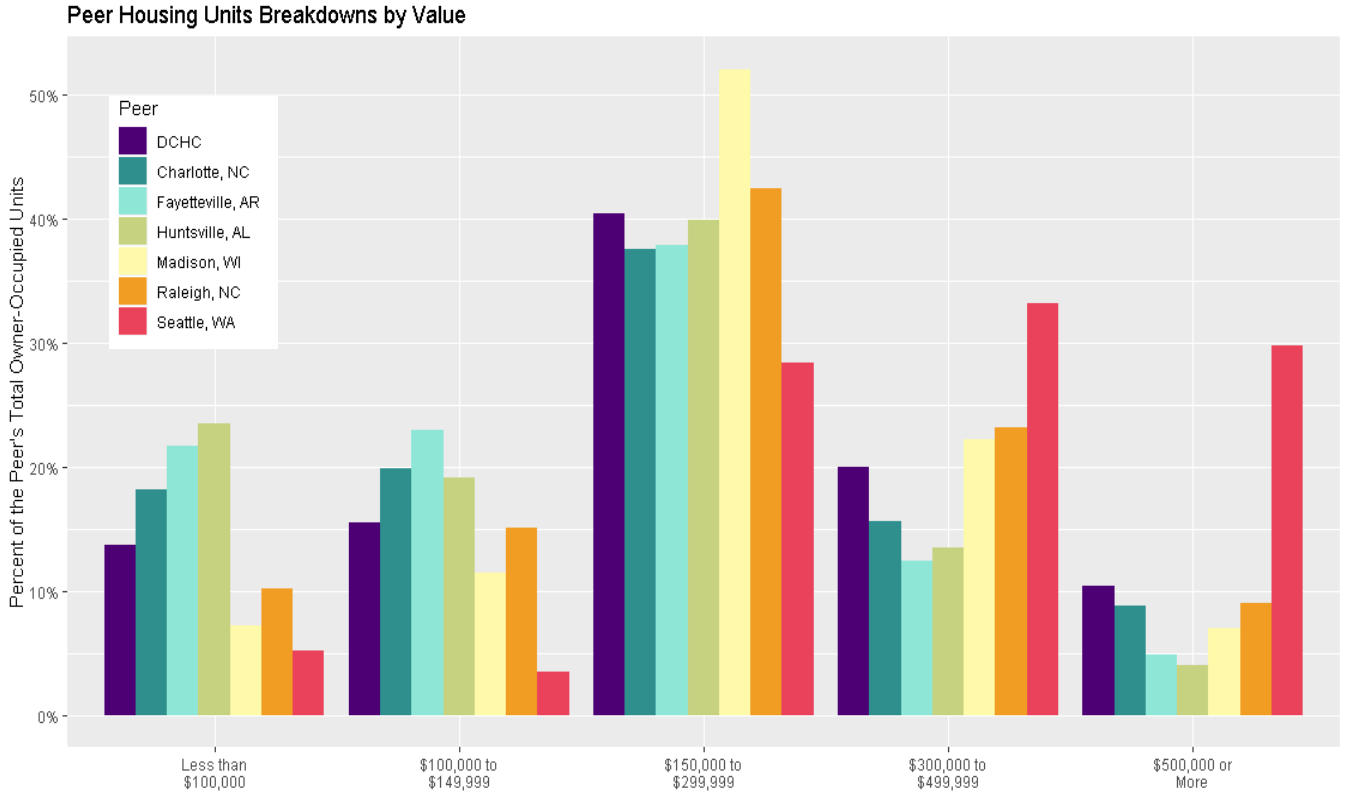
Selected based on: Aspirational characteristics.

SELECTED PEER CHARACTERISTICS






Peer Households Breakdowns by Income
Peer
DCHC
Charlotte, NC
Fayetteville, AR
Huntsville, AL
Madison, WI
Raleigh, NC
Seattle, WA
Percent of Peer's Total Households
30%
20%
10%
0%
Under $20,000
$20,000 to $39,999
$40,000 to $74,999
$75,000 to $149,999
$150,000 or more


Peer Housing Units Breakdowns by Value
Peer
DCHC
Charlotte, NC
Fayetteville, AR
Huntsville, AL
Madison, WI
Raleigh, NC
Seattle, WA
Percent of the Peer's Total Owner-Occupied Units
50%
40%
30%
20%
10%
0%
Less than $100,000
$100,000 to $149,999
$150,000 to $299,999
$300,000 to $499,999
$500,000 or More

HOW CAN THIS REPORT BE USED?

The State of the Region report contains six chapters, each covering a specific topic relevant to understanding transportation and growth dynamics in the region. These chapters are:

- Introduction
- Population & Demographics
- Economy
- Regional Structure
- Mobility
- Safety.

Each chapter contains an introductory section, describing its topic's relevance to the State of the Region. Several key findings for each topic are introduced and discussed including supporting data, maps, and graphics. At the end of each chapter are a series of metrics that help understand the dynamics of the chapter's topic. Each metric has indicators telling the story of the state of the region. For example, Education is a metric examined within Chapter 1: Population and Demographics. To understand this metric, data is included for Educational Attainment by County; Change in Educational Attainment by County; and Percentage of Population Earning a Bachelor's Degree or Higher. Key findings illuminated by indicators are highlighted for each metric.

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POPULATION & DEMOGRAPHICS

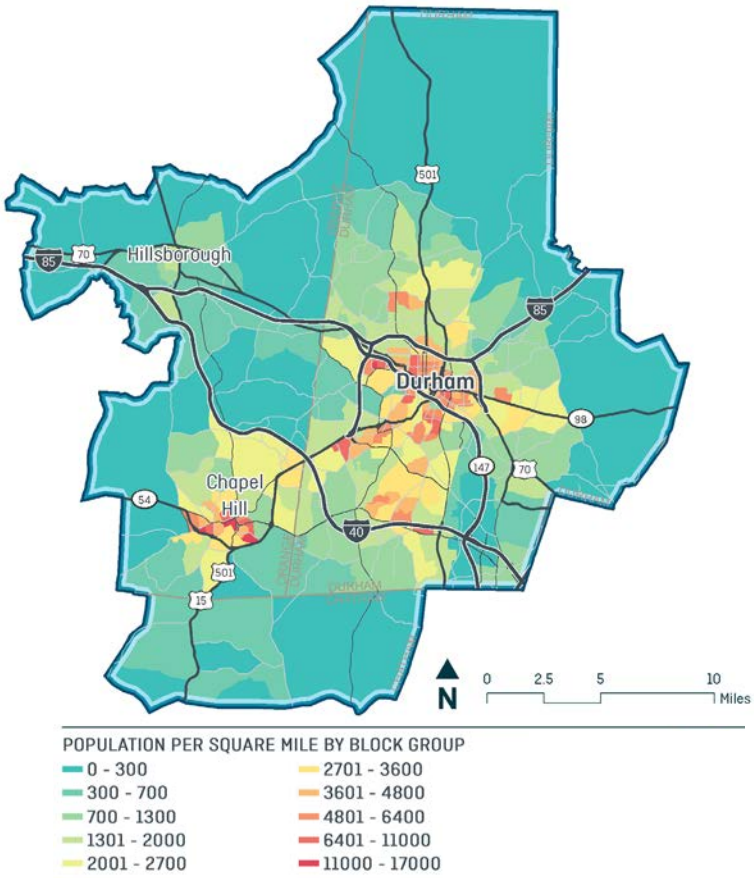
KEY FINDINGS

- The region is growing rapidly
- The region remains diverse
- There are spatial disparities in educational attainment, income, and race characteristics across the region

Demographic and geographic characteristics of the population shape the demand placed on the region's transportation network. Factors including age, income, and education impact the varying travel needs of individuals and households and, at the regional level, changes in these characteristics can shift demand on the transportation network. Understanding demographic and spatial trends helps anticipate future transportation service and infrastructure needs and where key investments may be needed. Chapter One explores regional population and demographic trends, reports on the possible implications of these findings, and considers how these factors impact the transportation planning and investment decisions made by DCHC.

The region is growing rapidly

The population of the DCHC region continues to grow, attracting individuals and employers from across the nation and the world. It is important for the MPO to know not only how much growth is occurring but also where that growth is taking place. Population per square mile in 2012 and 2016 were compared using census block data from the American Community Survey to identify high growth areas. Contrary to what might be expected, some of the largest increases in growth are occurring in the region's more rural and suburban areas. Two of the largest increases in population density are in southeast Durham County and northwest Chatham County. Urban areas are also experiencing growth, but at a relatively slower rate than areas outside the region's city centers.



Population density is higher in city centers and along transportation corridors. Blue shows lower and red higher population density.

Changes in the demographic characteristics of the region's growing population must also be considered. Notably, there has been significant growth in the region's share of older residents. Between 2012 and 2016, all three of the region's counties (Durham, Orange, and Chatham) experienced increases in their shares of residents older than 65.[1] Older populations tend to be concentrated in the far northern and southern parts of the region. Chatham County experienced the largest growth in older residents, with five (5) percent of its population now falling into this age bracket.

Increases in population density and age of residents have been accompanied by increases in educational attainment and income. A slight but notable increase in the share of population with higher levels of educational attainment was observed during the time period examined, particularly that portion holding a post-graduate degree. Households earning more than $125,000 annually increased in all three counties as well. Higher earning households are generally located in the region's northern and southwestern areas but there is a significant cluster in and around Chapel Hill's urban core. Although there has been an overall regional decrease in households earning less than $25,000 (the lowest reported income bracket), the incidence of extremely low-income households is increasing on the region's fringes, particularly in northern and eastern Durham County.

Population and demographic trends impact the region's transportation services and systems. Overall population growth implies greater demand placed on the transportation network. Population characteristics signal likely travel choices that need to be anticipated. Higher earning, more educated households are more likely to use private vehicles increasing the

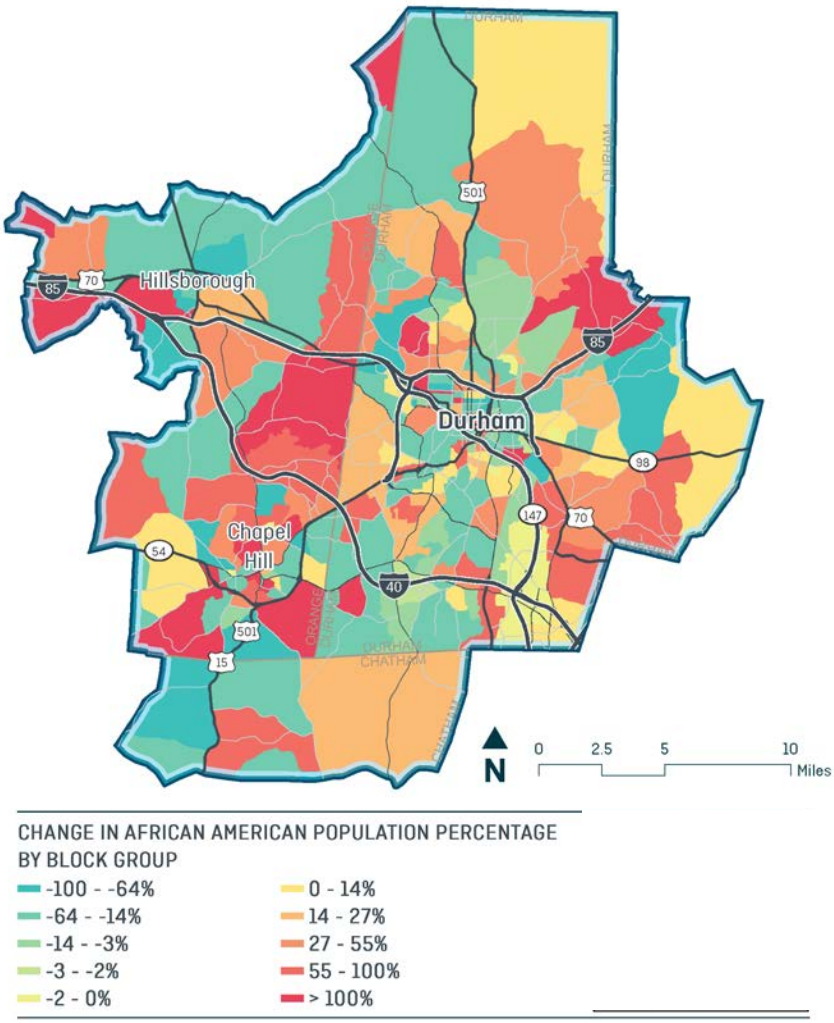
[1] A note on data sources: Unless otherwise indicated, data labelled 2012 is derived from the U.S. Census American Community Survey (ACS) 5-year estimate for 2008-2012. Likewise, data labelled 2016 is the ACS 5-year estimate for years 2012-2016.

number of cars and congestion on the region's roadways. Population growth away from urban centers, accompanied by an increase in extremely low-income households and an aging population in these same areas, suggests an increase in transit-dependent households located farther from transit-rich areas. It is important to anticipate these challenges and develop plans for directing resources to bridge transit service gaps. This might include strategies such as investing in additional demand-response vehicles or investigating the feasibility of expanded transit coverage to better serve these growing, transit-dependent areas of the region.

The region remains diverse

The DCHC region is extremely diverse, attracting residents from across the country and globe, and retaining families and individuals who have been in the region for generations. Comparatively, the region is more diverse than the state with a larger percentage of Black or African American residents, Asian residents, and residents identifying as other races. Data suggest no recent significant shifts in the composition of the region's racial diversity and the region continues to track closely with state level trends. These include an increase in the Asian population and individuals identifying as two or more races. Unlike the state, the DCHC region experienced a small increase in individuals identifying as white.

Durham County has the largest regional share of African American residents, particularly in the City of Durham and in northern portions of the county. Concentrations of Asian residents are found near Chapel Hill and in the southern portion of Durham County, approaching Cary. The region's Hispanic population is concentrated mainly within the City of Durham, with a noticeably higher share east of the city. Data indicates that many of the region's minority populations reside outside of the region's urban centers. For example, there has been significant growth in the African American population in Orange County north of Chapel Hill and I-85 and I-40. There has been no-



Blue shows a decrease and red an increase in African American populations. African American populations are unevenly distributed in the region. Notably, downtown Durham has seen a decrease in African American population.

table growth in Hispanic residents in this same area and to the north and east of Hillsborough.

Like low income and aging residents, high concentrations of minority populations tend to coincide with areas of relatively higher transit dependency. For minority populations residing outside of urban centers a lack of transit options keeps these communities disconnected from jobs, education, services, and economic opportunity. As the region's population continues to grow, and as concentrations of minority populations become more spatially diffuse, transit service delivery and investment and operations strategies may need to be recalibrated.

There are spatial disparities in educational attainment, income, and race characteristics across the region

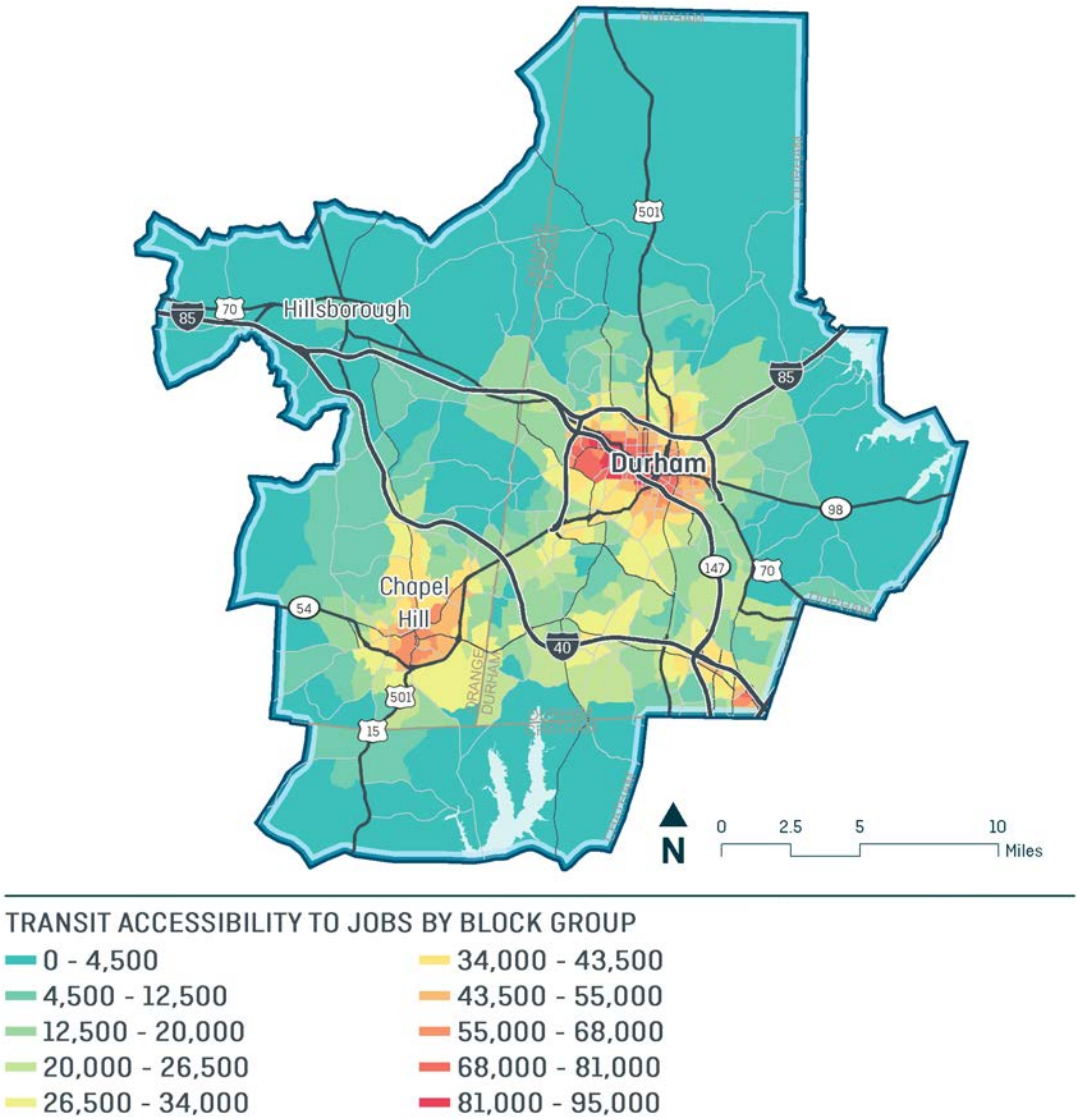
There are significant demographic trends not just within municipalities but also among the region's constituent communities. Data suggest movement of lower income, minority populations to the region's outer edges and less urban areas. There are also notable pockets of affluence throughout the region, specifically the highest earning households concentrated in the Chapel Hill area and populations with the highest educational attainment located in and near Chapel Hill and southwest of the City of Durham.

Concentrations of minority populations are found in several areas including outlying areas of Hillsborough and Orange County, east Durham, and southeast Durham County. Specifically, more residents identifying as Black/African American live in and around the city of Durham. Hispanic populations are concentrated around the City of Durham (particularly on the east side), north of Hillsborough, and in northwest Chatham. These concentrations are particularly notable when compared with relatively less diverse areas such as Chapel Hill.

There are spatial disparities at the county level in earnings and income. Orange County has significantly more households and individuals in the highest income bracket, compared to Durham and Chatham Counties. Orange County also experienced notable decreases in the percent of the population earning less than $25,000 and a comparatively high increase in "middle income" residents and households (those earning $45,000-74,999 per year).

Wealth disparities also exist between the region's urban and rural areas. Block groups in northern Durham County, the outer edges of Chapel Hill, and southwest Durham (on either side of I-40) tend to have the highest median incomes. Block groups with the lowest median incomes are located primarily in and around the City of Durham's urban core, particularly on the City's east side.

However, Durham's city center (along with several block groups in Chapel Hill and south Durham) has the highest number of households earning greater than $125,000 per square mile, by block group. The core urban areas of Durham and Chapel Hill also have the most households earning less than $25,000 per



Transit accessibility to jobs is highest in areas located nearest to city centers, showed here in red/ orange. Rural parts of the region have lower transit accessibility (blue/green).

square mile, by block group. This apparent contradiction is actual a strong indicator of significant income disparity. This income disparity is exacerbated by trends indicating an increase in higher income households and increasing home values in areas where housing has historically remained attainable for the region's lowest earning families including east Durham and parts of south Durham.

Spatial disparities in educational attainment, income, and race characteristics may contribute to inequities in transit service and investment if they are not considered during operations and systems planning. Low-income, minority, and individuals with lower levels of educational attainment tend to rely more on public transit than higher earning, more educated households. Increases in home values and other economic drivers are shifting vulnerable populations to the region's fringe - areas that have less transit service and that are farther from jobs, services, and other opportunities. Lower earning households with personal vehicles will incur higher transportation costs if they relocate to areas further from jobs and resources, even if housing costs are more affordable. Future transportation investments in the region must consider the spatial patterns of system users and work to ensure equitable access, especially for cost-burdened households.

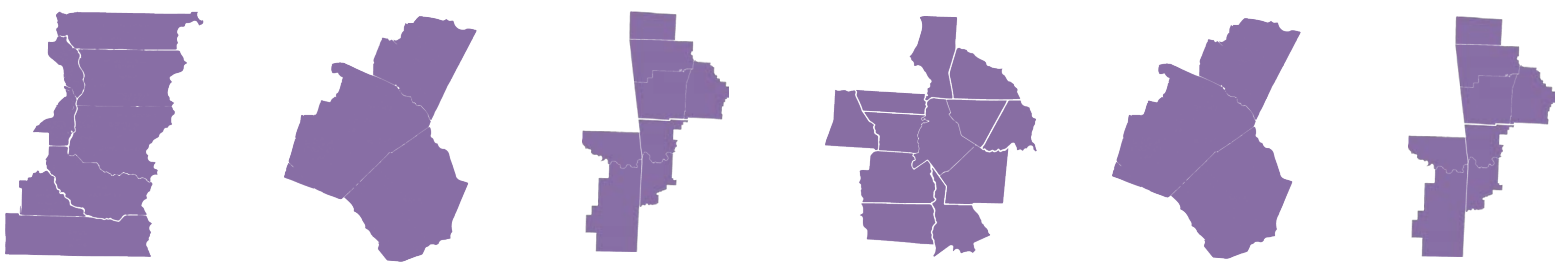
How does the region compare to its peers?

The DCHC region has experienced an increase in households earning $125,000 or more and a decrease in those earning less than $25,000. This is most like Raleigh. While these trends track closely with Seattle, that city saw a more significant increase in earners in the highest income categories between 2012 and 2016.

Diversity trends in the DCHC region are most like Fayetteville, AR. Both have experienced increases in Asian residents and residents identifying as two or more races.

The educational attainment of residents in the DCHC region is most like Raleigh. The percentages of population with bachelor's and post-graduate degrees has increased in both regions.

Age-related trends in the DCHC region are similar to most of the peer regions, many of which have experienced decreases in younger age groups and increases in residents aged 65 and over. Seattle and Charlotte deviate from this trend; both have experienced population increases in younger age groups (18 to 34 and 35 to 64, respectively).



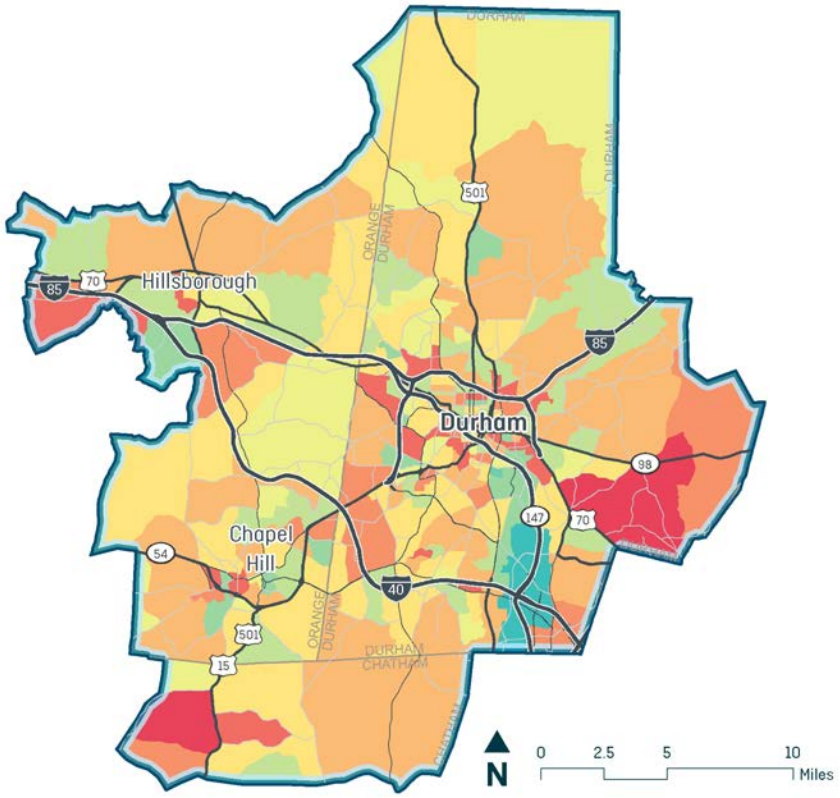
METRICS

Population Density

» Between 2012 and 2016, the southeastern portion of Durham County experienced one of the largest increases in density in the region—more than 100 percent.

» Urban centers have grown slower than non-urban areas and several block groups in Chapel Hill, Durham, and Hillsborough have experienced population declines.

POPULATION DENSITY CHANGE BY BLOCK GROUP 2012-2016

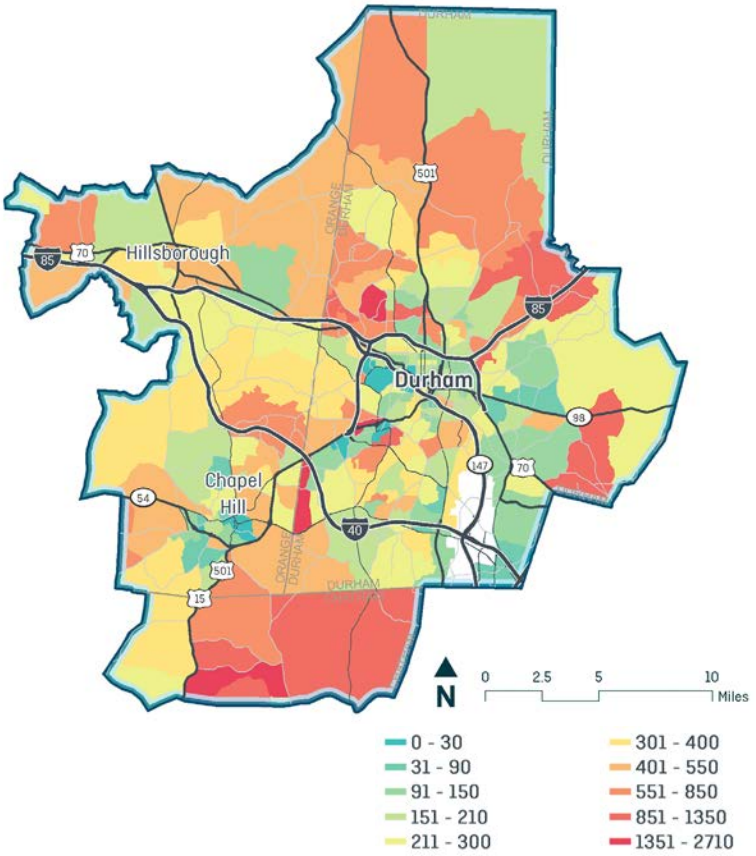


POPULATION DENSITY CHANGE BY BLOCK GROUP

-100%	0 - 11%
-100 - -50%	11 - 33%
-50 - -24%	33 - 48%
-24 - -8%	48 - 100%
-8 - 0%	> 100%

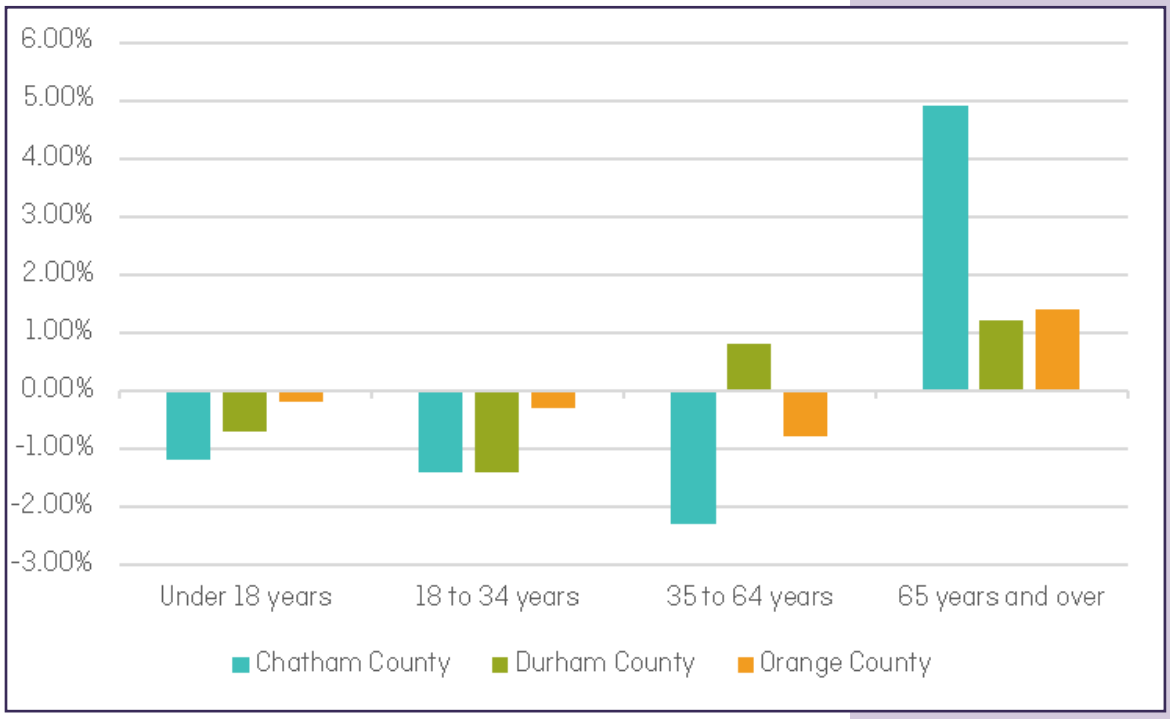
Age

RESIDENTS OVER AGE 65 BY BLOCK GROUP 2012-2016



- All three counties experienced increases in the 65+ age group. This mirrors trends in both North Carolina and in peer regions.
- Chatham County experienced the largest growth in residents aged 65+ (nearly 5 percent). One quarter of the county's population is now aged 65 years or older.

CHANGE IN AGE GROUPS BY COUNTY 2012-2016

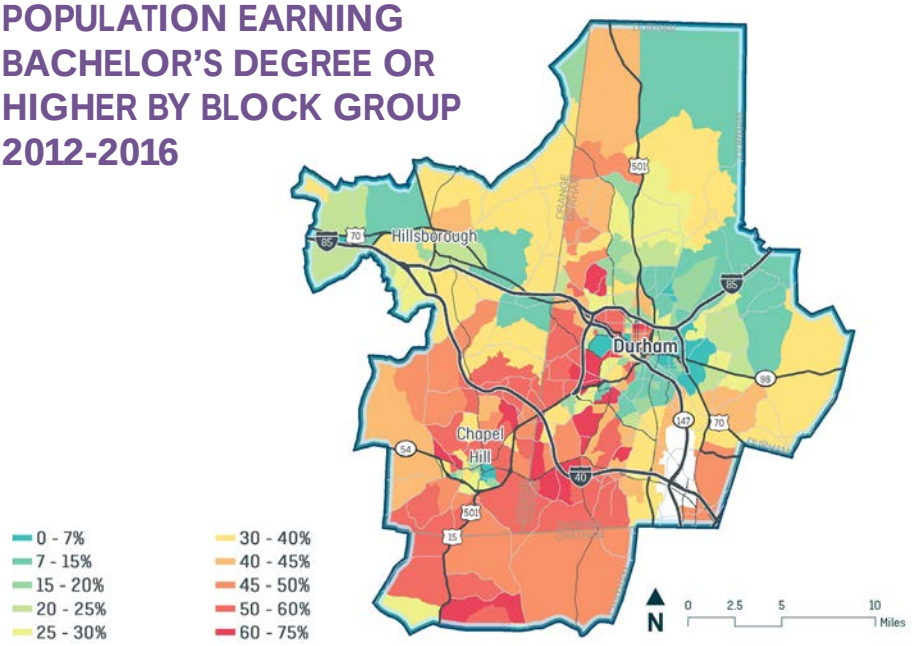


Education

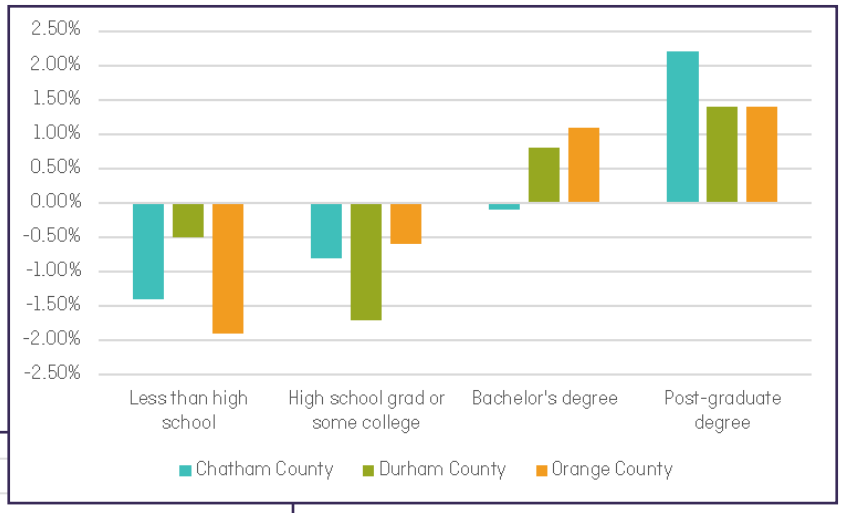
» Between 2012 and 2016, Chatham, Durham, and Orange counties all saw increases in residents with a post-graduate degree.

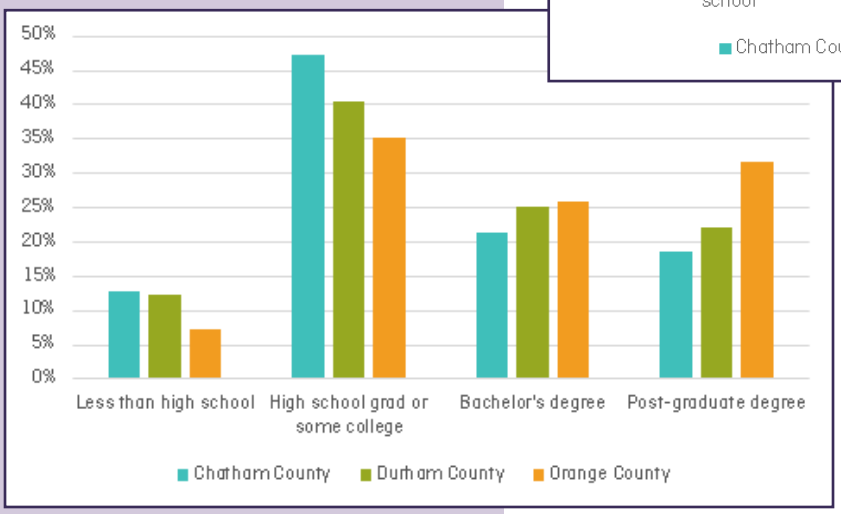
» Chatham County experienced the largest increase in population with a post-graduate degree (2%).

PERCENTAGE OF POPULATION EARNING BACHELOR'S DEGREE OR HIGHER BY BLOCK GROUP 2012-2016



CHANGE IN EDUCATIONAL ATTAINMENT BY COUNTY 2012-2016



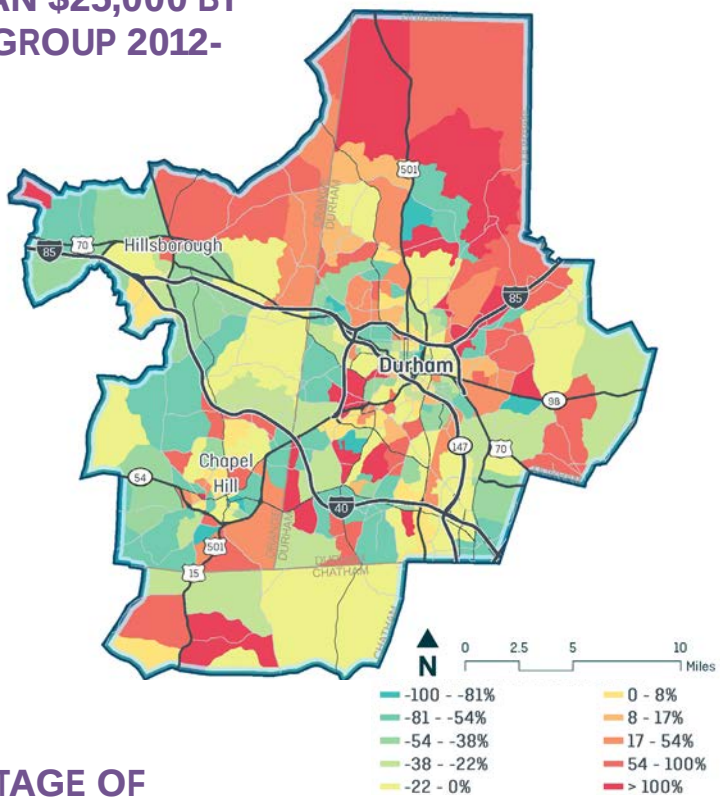


EDUCATIONAL ATTAINMENT BY COUNTY 2016

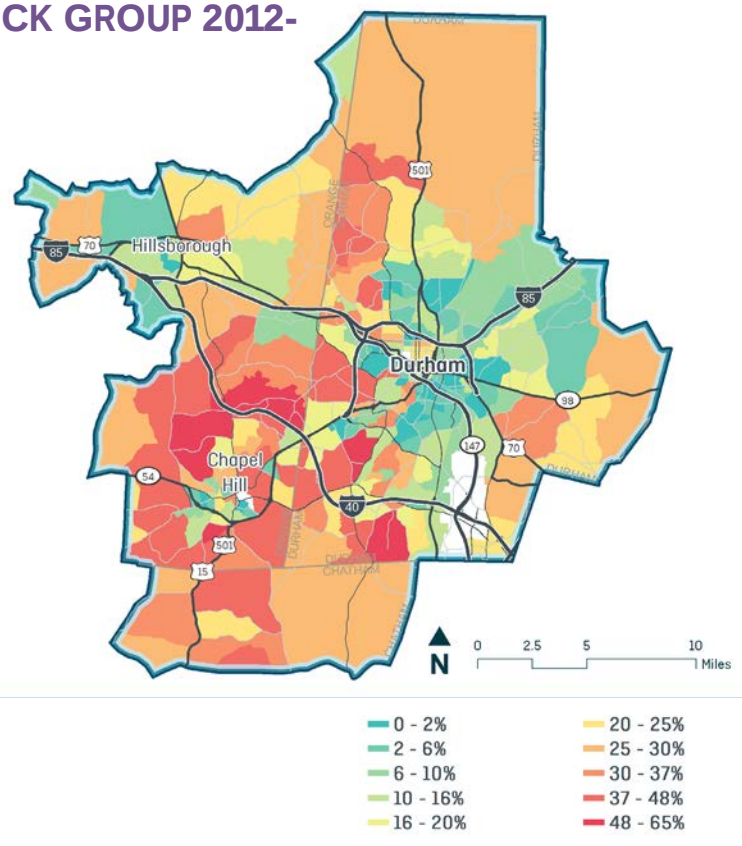
Income

- All three counties experienced increases in the number of households earning $125,000 or more. Chatham had the most notable growth in the highest earning households (nearly 4% percent).
- Over the same four-year period, Chatham was also the only county to experience a slight increase in the percentage of households earning less than $25,000 and a decrease in the percentage of households earning between $75,000 and $124,999.

CHANGE IN NUMBER OF HOUSEHOLDS EARNING LESS THAN $25,000 BY BLOCK GROUP 2012-2016



PERCENTAGE OF HOUSEHOLDS EARNING GREATER THAN $125,000 BY BLOCK GROUP 2012-2016



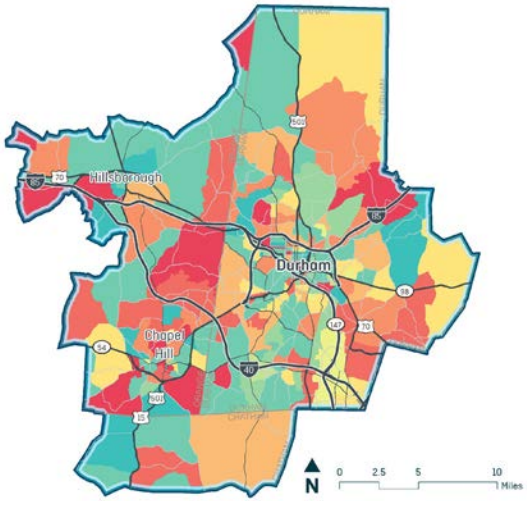
Race

» Areas beyond the region's urban cores (block groups northeast, southeast, and southwest of Chapel Hill; and block groups northeast of the City of Durham and near Hillsborough) have experienced a 100 percent (or more) increase in residents identifying as Black/African American.

» The Asian population is growing throughout the region, notably doubling in some areas of Chapel Hill.

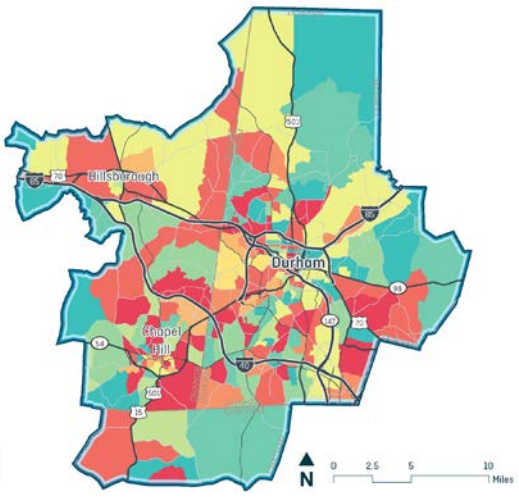
» Northern and central Orange County have seen significant growth in Hispanic populations; the percentage has doubled in some areas.

CHANGE IN AFRICAN AMERICAN POPULATION BY BLOCK GROUP 2012-2016



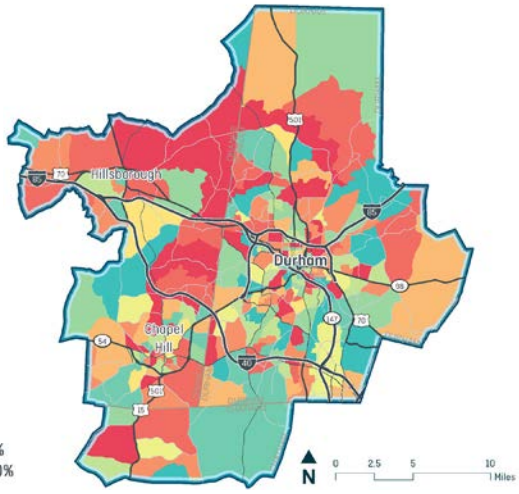
-100 - -64%
-64 - -14%
-14 - -3%
-3 - -2%
-2 - 0%
0 - 14%
14 - 27%
27 - 55%
55 - 100%
> 100%

CHANGE IN ASIAN POPULATION BY BLOCK GROUP 2012-2016



-100 - -86%
-86 - -59%
-59 - -36%
-36 - -10%
-10 - 0%
0 - 8%
8 - 38%
38 - 76%
76 - 100%
> 100%

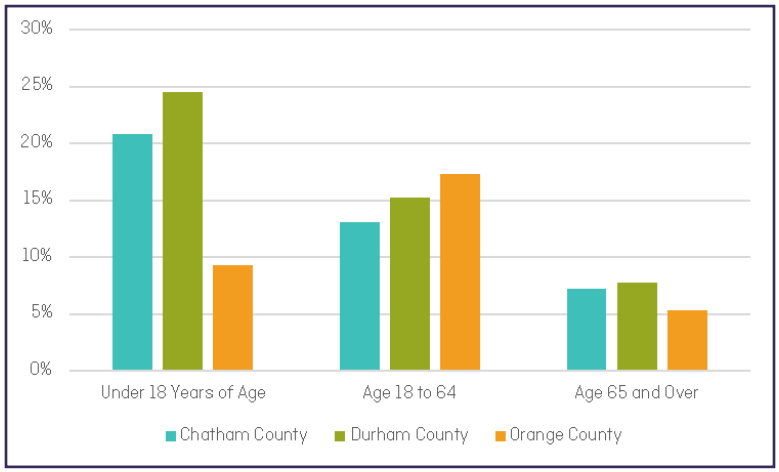
CHANGE IN HISPANIC POPULATION BY BLOCK GROUP 2012-2016



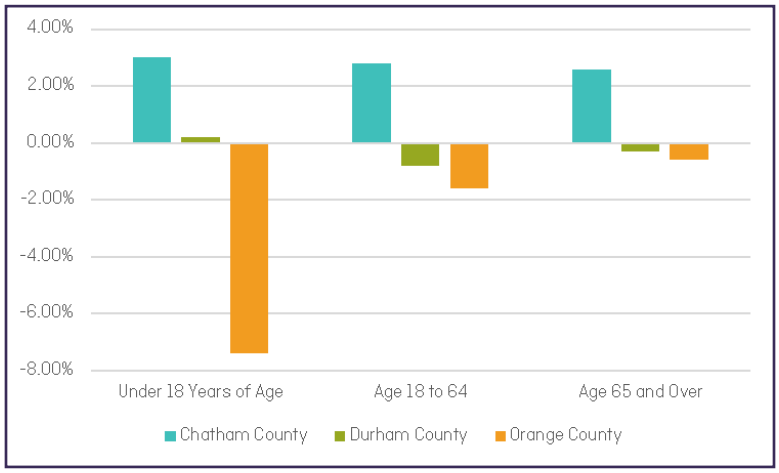
-100 - -80%
-80 - -50%
-50 - -25%
-25 - -5%
-5 - 0%
0 - 15%
15 - 50%
50 - 100%
100 - 200%
> 200%

Poverty

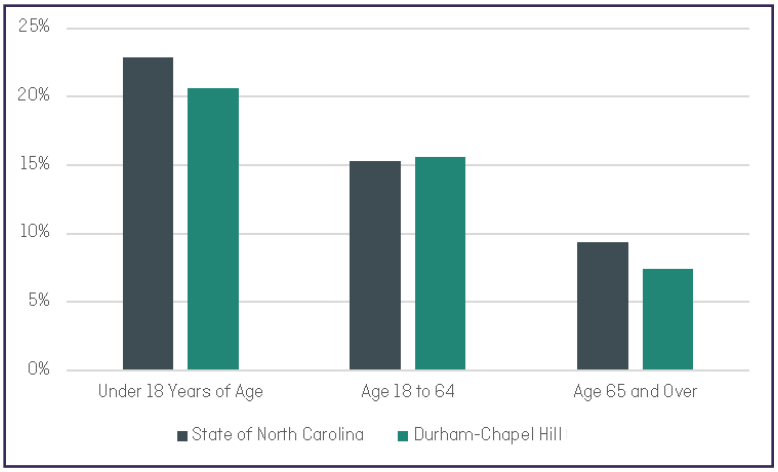
PERCENT OF POPULATION UNDER POVERTY LEVEL BY COUNTY, 2016



CHANGE IN POPULATION UNDER POVERTY LEVEL BY COUNTY 2012-2016



PERCENT OF POPULATION UNDER POVERTY LEVEL IN STATE AND DURHAM-CHAPEL HILL MSA, 2016



- Between 2012 and 2016, the share of residents 18 and under experiencing poverty decreased.
- Only Orange County experienced significant decreases in percentages of the population that are below the federal poverty level.
- Chatham County experienced increases in the population under the poverty level for all age groups between 2012-2016

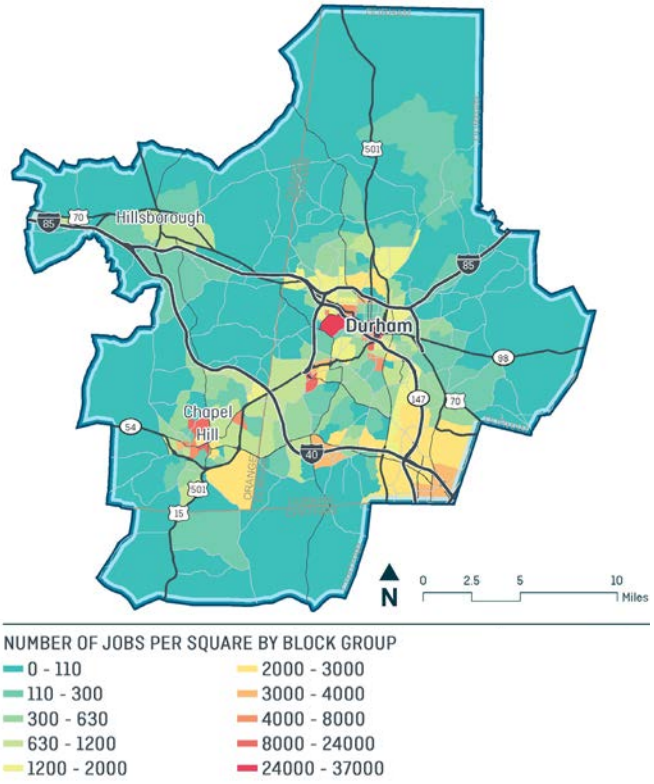
2 ECONOMY

KEY FINDINGS

- **Education and healthcare are the region's largest industries, and education is the fastest-growing industry**
- **Housing affordability varies by job type and nearly a quarter of the region's workers are likely to face housing and transportation cost burdens.**
- **Regional home values are higher than the statewide average and vary by county**

The economy impacts the transportation system in many ways. For example, a higher density of jobs usually results in higher daily demand placed on the surrounding transportation infrastructure. Average wages, and the compatibility of wages and available jobs with the housing market, also affect the transportation network. When wages and jobs are not aligned with home values, one of two situations arises. Workers must either spend a higher share of earnings on housing, leaving less left over for transportation costs or they seek cheaper housing located further away and spend more on transportation. In both cases, the transportation system is impacted. For the worker who spends more of their earnings on housing, they may become more reliant on public transportation options such as transit. The individual who seeks affordable housing further away increases their vehicle miles traveled and the cost of transportation increases. Both scenarios increase cost of living for those least able to absorb additional cost burdens. Economic dynamics including wages, job growth, employment density, housing costs, and housing affordability inform transportation system and operations planning. Understanding these factors and anticipating trends and major shifts helps target improvements and investments to the most appropriate areas and system elements.

Education and healthcare are the region's largest industries and education is the fastest growing industry



Job density is higher (red/orange) near urban centers and along key transportation corridors, with hot spots in and around Research Triangle Park.

The educational services industry accounts for 19 percent of the jobs in the region, the highest share of any industry and twice the share of jobs that this industry represents at the state level. In Orange County, nearly one-third of jobs are in educational services. The health care and social assistance industry generates a similar share of jobs in the region (nearly 19 percent), also higher than its state level share (14 percent), even though it is the highest-employing industry in the state. Regionally, these two industries generate nearly twice the share of jobs as the region's third highest employing industry – professional, scientific, and technical services (ten percent).

Educational services also experienced the largest increase in job market share from 2016 to 2017, growing from nearly 16 percent to just over 18.7 percent of the market share. During the same period, the share of health care and social services jobs decreased by almost the same amount as educational services increased, from 21.4 percent in 2016 to 18.2 percent in 2017; wages decreased slightly from $59,196 to $58,107.

The prominence of these two industries is likely connected to the presence of several major universities generating many jobs in both industries. Average annual wages for educational services employment is much higher in the region ($70,371) than at the statewide level ($44,658). This is likely because jobs in higher education tend to offer higher wages than K-12 education jobs. Regional average annual wages for health care and social assistance jobs are also slightly higher ($58,107) than at the statewide average for these industries ($51,387).

Patterns of employment density reflect the regional impact of these industries. Jobs are concentrated near higher education and research facilities, particularly around the Duke Hospital campus, the UNC Chapel Hill campus, and Research Triangle Park (RTP).

Jobs are also densely concentrated in downtown Durham, which is expected as physical development is denser. It is notable that the region's higher education and research facilities are generating levels of job density on par with a downtown core despite more sprawling patterns of development and less urban locations (particularly RTP).

The region's campuses and research facilities will continue as major job centers, generating higher traffic demand and commuter flows. Targeted in-

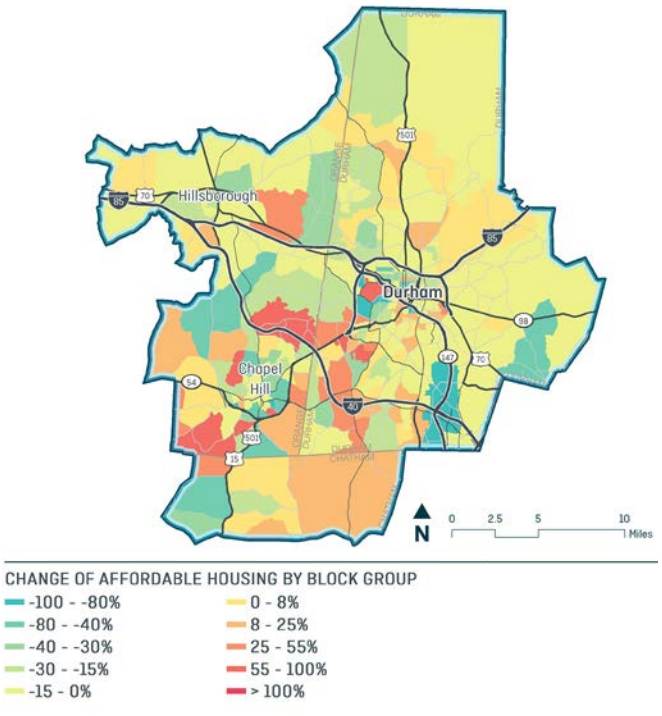
vestments are required to maintain adequate levels of service on the transportation facilities serving these job centers. Strategic transit improvements can also help alleviate congestion and ensure that employees in these industries earning below-average wages are not unfairly impacted because automobile transportation is not an option for them.

Housing affordability varies by job type and nearly a quarter of the region's workers are likely to face housing and transportation cost burdens.

With average annual salaries in the educational services; health care and social assistance; and professional, scientific and technical services industries ranging from $58,107 to $96,402, a worker earning the average annual salary can comfortably afford a home valued at or near the regional median ($212,400).

But there are industry sectors where average earnings are not high enough to support the purchase of a home priced at or near the regional median value. Even using a calculation assuming a $0 down payment, there are industries for which the average earnings are not enough to support homeownership in the region. These include the retail trade; accommodation and food services; administrative and support and waste management; transportation and warehousing; and arts, entertainment, and recreation. Employees working in these industries (that make up nearly one-quarter of regional jobs) are more likely to be housing and transportation cost-burdened.

Workers who hold jobs in lower paying industries and who live in areas where wages are not aligned with the cost of living may need to move farther from job centers to find housing that is affordable, based on their income. This results in longer commute times, higher VMT, and increased transportation costs. Investment in affordable and dependable regional transit is an option that may need to be considered as housing prices continue to rise in historically affordable areas and average wages remain stagnant, pushing more residents and employees out to the region's fringes.

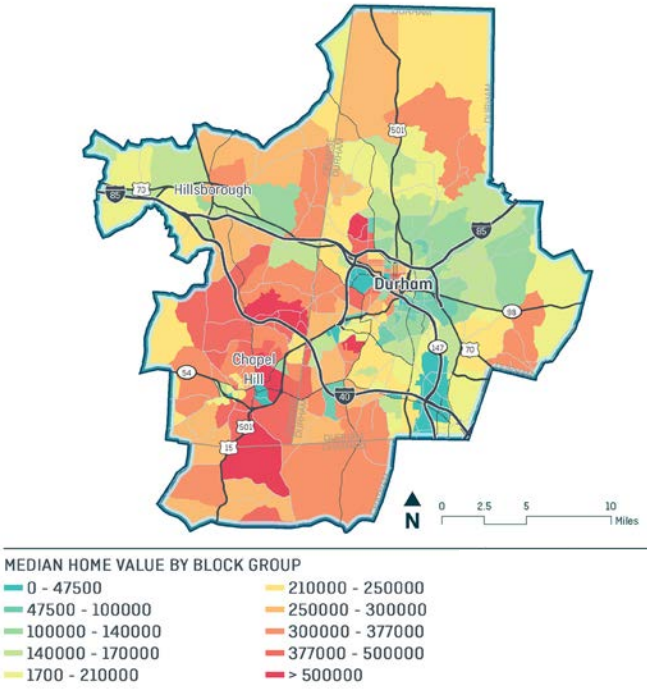


Affordable housing is decreasing, represented here in blues, greens, and yellows. The orange and red colors indicate an increase in affordable housing. Affordable areas are largely located outside of urban centers.

Regional home values are higher than the statewide average and vary by county

The region's median home value is $212,400, 31.9 percent higher than the state's median home value ($161,000). Using area median income (AMI) and current interest rates, the value of an "affordable" home for the region can be calculated. This calculation assumes a 30-year fixed rate mortgage, no down payment, and capping housing costs at 25 percent of income. This method indicates that, for an individual earning regional AMI, an affordable home in the region is approximately $250,000 (if housing costs are limited to 25% of earning); for the state, an affordable home is around $220,000. This affordability value can then be compared to actual home values to determine how much of the regional housing stock is affordable to households earning AMI. In the DCHC region, slightly under 30 percent of the existing housing stock can be claimed to be affordable to a resident earning at or near AMI. For the state, nearly 50 percent of homes are affordable.

Orange County has the highest median home value of the three counties in the region ($283,000), followed by Chatham County ($251,600), and then Durham County ($195,900). Median values reflect the relative affordability of the housing stock in each county. Durham County has a higher share of affordable and potentially affordable homes; Orange County has the highest share of homes that are not affordable and the lowest share of affordable homes. Chatham and Durham counties have a comparable proportion of affordable homes as a share of total housing stock.



The highest median home values are in the southwestern corner of the region (red/orange). Eastern Durham shows lower median home values in blue/green.

Most housing falling into the "affordable" range is developing in the area between I-40 and US 15-501 between Chapel Hill and Durham, south of NC-54 and west of US 15-501 near Chapel Hill, east of Hillsborough, and in the southern part of Durham County.

Higher housing values in Orange County suggest that workers in lower-wage industries likely travel into that county for work. This increases commuter strain on corridors connecting Orange County and other parts of the region where housing remains attainable for low-wage workers. Corridors connecting affordable housing growth areas to job centers will likely see an increase in traffic driven by development growth outside of the region's urban cores.

How does the region compare to its peers?

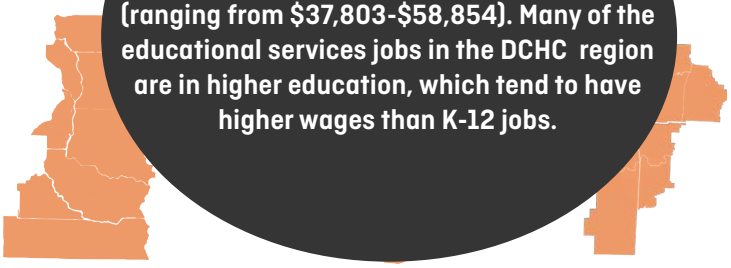
Madison, Wisconsin's job market is most like the DCHC region. The tech services sector has a slightly higher share of jobs in the DCHC region; Madison has a slightly higher share of public administration jobs (likely due to the state capital). Like the DCHC region, Madison has many jobs in higher education.

Fayetteville has the lowest median home value ($161,100); Seattle has the highest ($365,400). DCHC is in the middle with a median home value of $212,400, This is most like Raleigh ($224,800) and Madison ($230,200) .

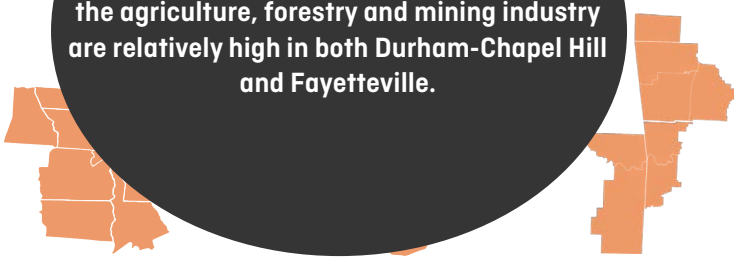
Fayetteville has the highest proportion of affordable homes as a share of overall housing stock. Seattle and Durham have comparable shares of housing that can be considered "not affordable" (around 30% of total housing stock).

Average annual earnings in the retail trade and information industries are twice as high in Seattle ($69,231 and $194,541, respectively) compared to Durham-Chapel Hill ($31,590 and $87,759, respectively). Huntsville and Fayetteville have lower average wages but also have lower costs of living.

The DCHC region reports a higher average annual income for educational services professionals ($70,371) compared to peer regions (ranging from $37,803-$58,854). Many of the educational services jobs in the DCHC region are in higher education, which tend to have higher wages than K-12 jobs.

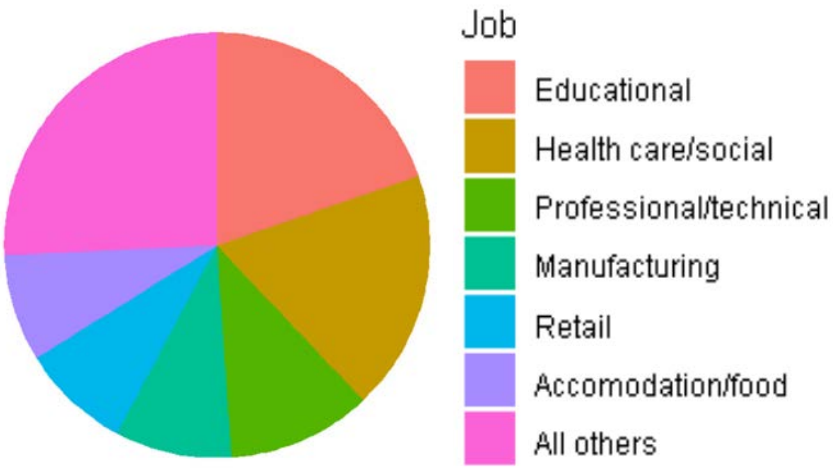


Charlotte has the highest wages for the finance and insurance industry and the arts, entertainment, and recreation industry. Annual wages for the agriculture, forestry and mining industry are relatively high in both Durham-Chapel Hill and Fayetteville.

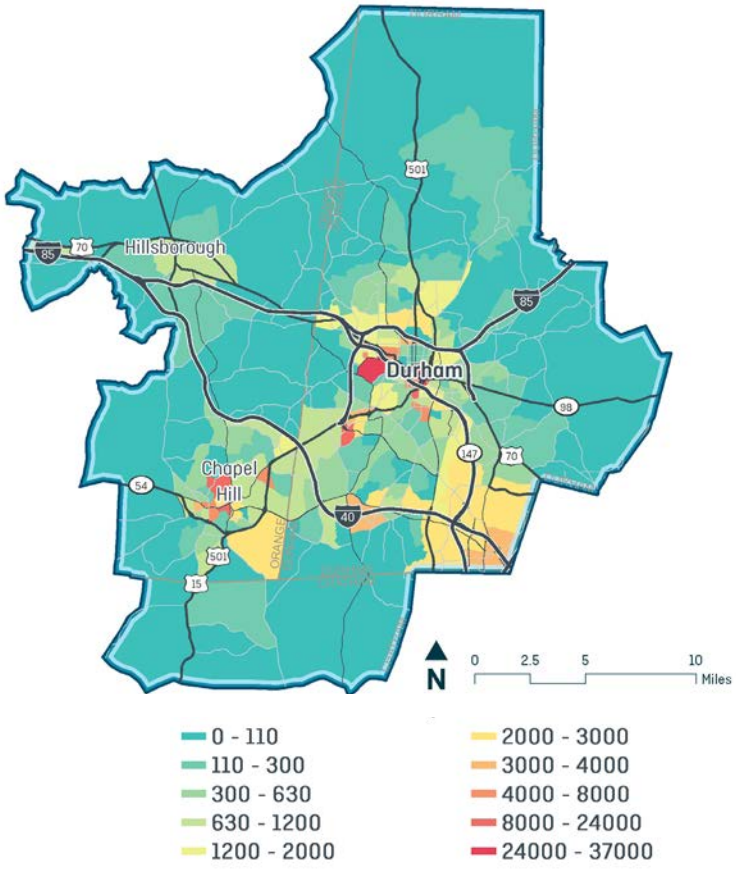


Jobs

MIX OF JOBS BY INDUSTRY FOR THE DCHC REGION (2017)



NUMBER OF JOBS PER SQUARE MILE BY BLOCK GROUP, 2016



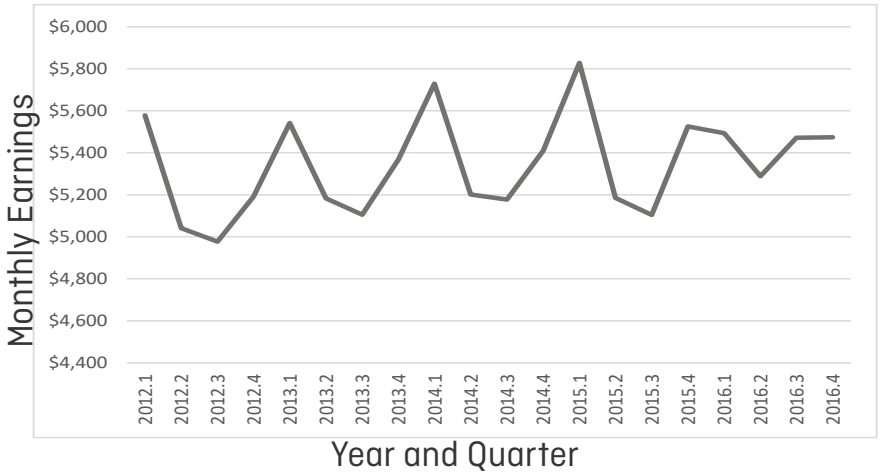
- The educational services sector accounts for nearly one in five jobs in the region and grew more than any other sector between 2016 and 2017.
- The health care/social services industry accounts for a similar share of jobs (about 20 percent) but experienced a decline between 2016-2017.
- Job density reflects the importance of higher education and healthcare to the region's economy. The highest densities are near university campuses, research facilities, and healthcare institutions associated with universities.

METRICS

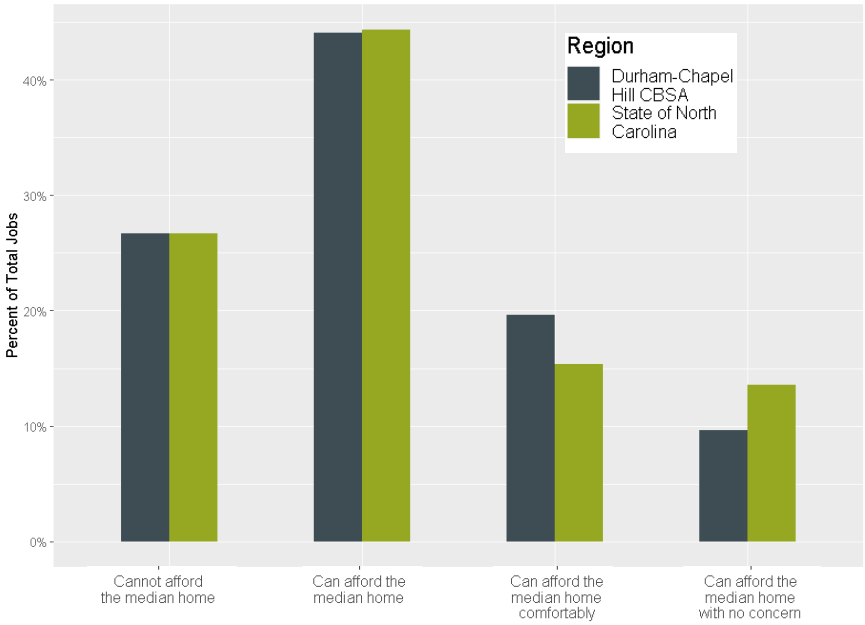
Wages

- Wages for most industries increased from 2016 to 2017.
- Industries experiencing wage decline include agriculture, forestry, fishing and hunting; finance and insurance; health care and social assistance; professional, scientific, and technical services; real estate; and transportation and warehousing.
- About a quarter of the region's jobs do not pay wages adequate for workers to afford a home priced at or near the region's median home value.

AVERAGE MONTHLY EARNINGS FOR ALL INDUSTRIES 2012-2016



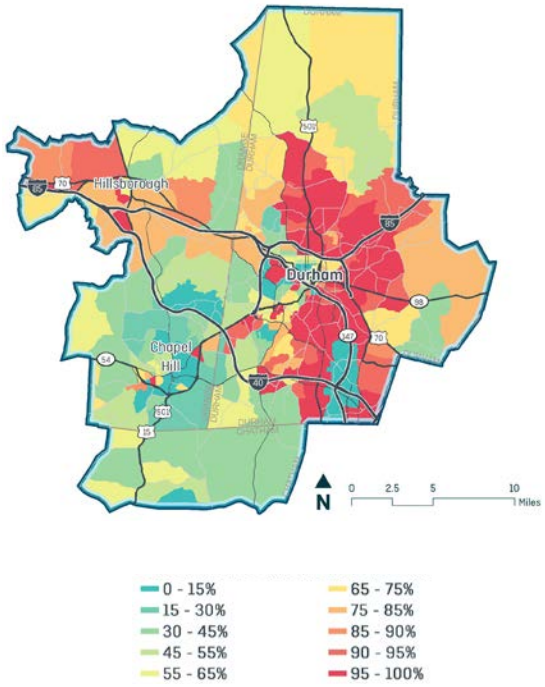
WAGES COMPARED TO RELATIVE HOME AFFORDABILITY, 2016



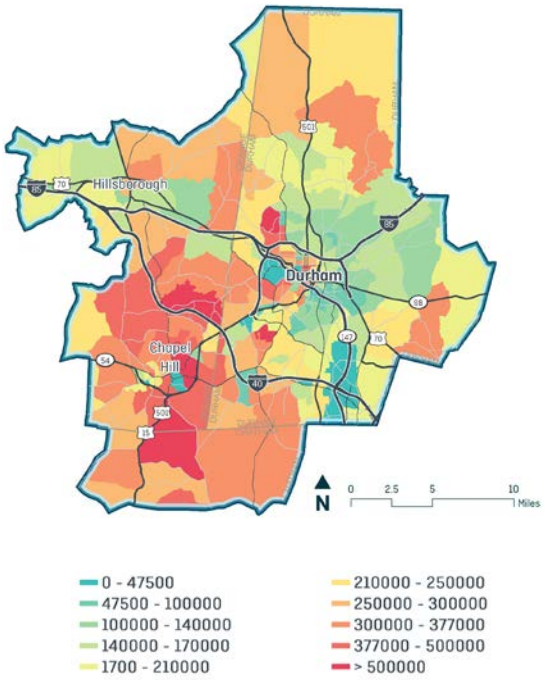
In the CBSA, the median home value is $212,400. The qualifying income is $48,615.
In the State, the median home value is $161,000. The qualifying income is $36,850.

Home Values

AFFORDABLE HOUSING BY BLOCK GROUP 2016



MEDIAN HOME VALUE BY BLOCK GROUP 2016

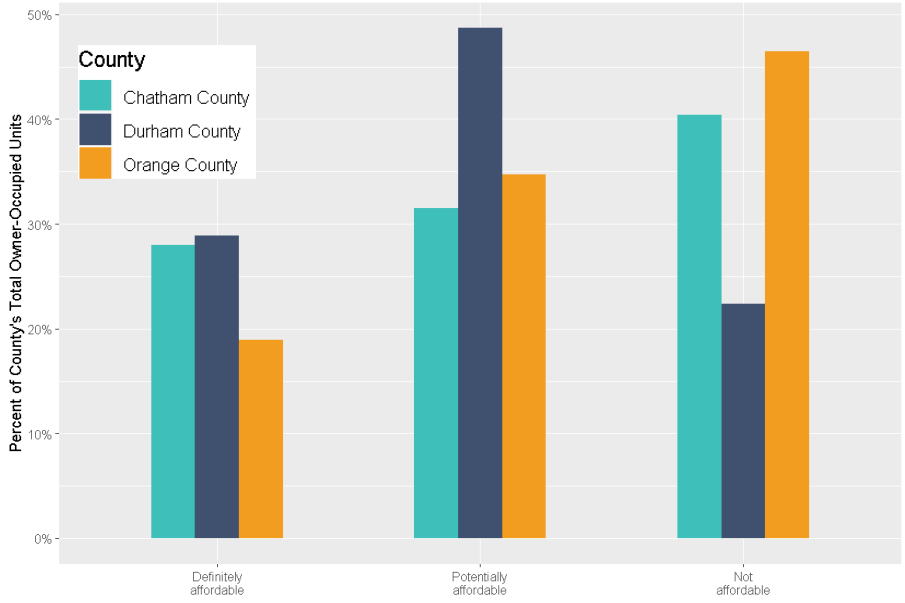


- Orange County has the highest median home value of the three counties in the region ($283,000), followed by Chatham County ($251,600), and then Durham County ($195,900).
- Most housing falling into the "affordable" range is developing in the area between I-40 and US 15-501 between Chapel Hill and Durham, south of NC-54 and west of US 15-501 near Chapel Hill, east of Hillsborough, and in the southern part of Durham County.
- Higher housing values in Orange County suggest that workers in lower-wage industries likely travel to the county for work. This increases commuter strain on corridors connecting Orange County and other parts of the region where housing remains attainable for low-wage workers.

Affordability

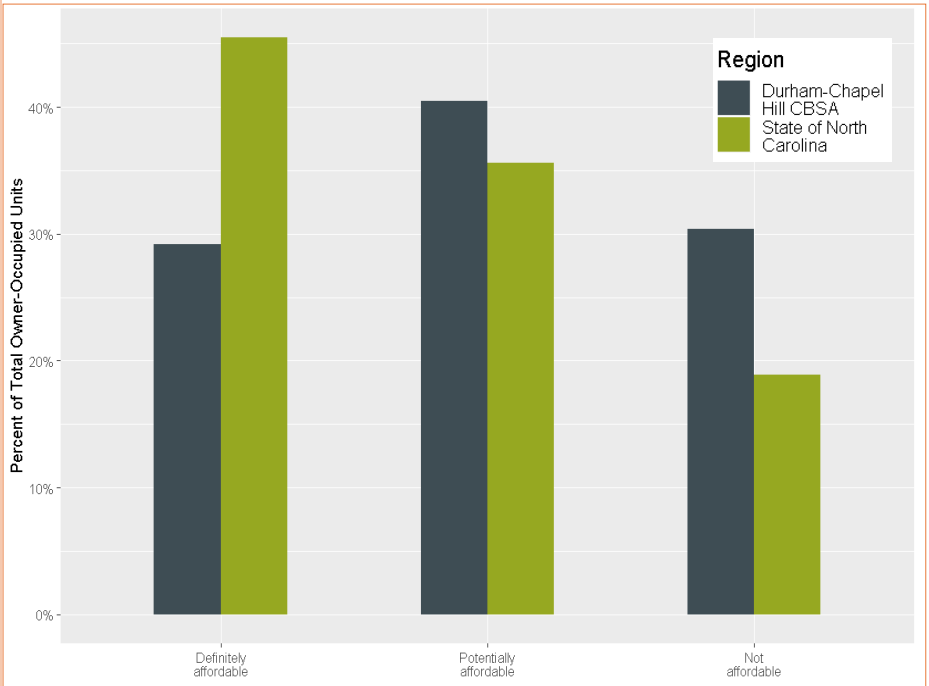
- The majority of housing in Orange and Chatham Counties is not affordable to a worker earning area median income (AMI).
- Most housing in Durham is potentially affordable to a worker earning AMI.
- Less than 20 percent of housing in Orange County is definitely affordable to a worker earning AMI.
- Less than 30 percent of housing is "definitely affordable" to a worker earning AMI in Chatham and Durham Counties.
- Compared to the state, the DCHC region has less housing that is definitely affordable to a worker earning AMI.

HOUSING AFFORDABILITY BY COUNTY 2016



In Chatham County, the median home value is $251,600. The affordable value is $260,762.
In Durham County, the median home value is $195,900. The affordable value is $246,384.
In Orange County, the median home value is $283,000. The affordable value is $286,269.

HOUSING AFFORDABILITY STATE VS CBSA, 2016



In the CBSA, the median home value is $212,400. The affordable value is $251,657.
In the State, the median home value is $161,000. The affordable value is $219,851.

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3 REGIONAL STRUCTURE

KEY FINDINGS

- **Commuter flows reveal strong regional interdependence**
- **Research Triangle Park drives regional travel patterns.**
- **There are growing mismatches between population growth, jobs, affordable housing, and accessibility.**
- **Regional centrality and multimodal options are critical to limiting total vehicular travel.**

The relative location of homes, schools, jobs, retail centers, and more impact route and travel mode choices. People go to work, school, and the store, moving throughout the region in ways that reflect the efficiency, characteristics, and elements of the transportation network. When considered together, these factors constitute regional structure – the nature and pattern of travel throughout the DCHC area. Regional structure is identified and assessed primarily by considering commuter flows, multimodal access to jobs (existing and future), and the location of jobs relative to the location of housing growth and housing affordability. Understanding the nature and evolution of regional structure is critical to ensuring equitable growth for the DCHC region as growth and development introduce opportunities to influence regional structure, supporting more efficient land use and travel patterns and improved multimodal access.

Commuter flows reveal strong regional interdependence

Commuter flows illustrate the dynamics of travel between home and work that are central to understanding regional structure. Analysis of these flows suggest highly fluid boundaries between jurisdictions and strong regional interdependencies in the DCHC area.

Downtown Durham and Chapel Hill are key destinations for commuters. Within the DCHC area, most workers traveling from northern Durham, east Durham, southwest Durham (Southpoint), and Chapel Hill are headed to downtown Durham. Commutes into Chapel Hill largely originate in Carrboro, downtown Durham, and the southwest Durham/Southpoint area.

Regionally, many workers commute from Wake County to Research Triangle Park (RTP), downtown Durham, and Chapel Hill. Most commuters leaving the DCHC area travel to Wake County. However, more commuters travel into the DCHC area each day than commuters leaving the area to work elsewhere.

Data indicates that commuters primarily use regional corridors including I-40, US 70, NC 147, NC 54, and NC 98 to reach employment destinations; personal vehicles are the primary mode of travel to work.

RTP drives regional travel patterns

Accessibility measures the relative number of destinations (like employment opportunities) that can be reached given the existing transportation network and land use patterns. At the regional level, accessibility analysis also reveals an area's "center" from a jobs and transportation network perspective. RTP's relatively high accessibility scores reflect its status as a jobs-rich center and highlight its regional impact on travel patterns to and from Durham, Chapel Hill, Carrboro, and other Triangle communities.

RTP's area of influence extends beyond the park's borders, west and northwest along NC 147, US 70, and I-40 and east into Wake County. Workers who travel near and beyond RTP benefit from RTP's relatively high accessibility resulting in shorter drive times to other regional job centers including downtown Durham, Duke University, southwest Durham/Southpoint, and Chapel Hill.

There are growing mismatches between population growth, jobs, affordable housing, and accessibility

Population increases between 2012 and 2016 are notably higher in census block groups in the Brier Creek area and between US 70 and NC 98. These increases may be explained by relatively higher access to jobs but access to more opportunities comes with a cost. Homes in these areas and others like southeast Durham County have shorter trips for work and higher accessibility often correlates with lower affordability.

More affordable areas (discussed in Chapters 1 and 2) overlap with areas of lower accessibility, meaning vulnerable populations face higher transportation costs and limited alternatives to driving. Auto and transit accessibility are generally low across the relatively more affordable northern parts of the DCHC region. Despite a surge in job growth in northeast Durham County between 2012 and 2016 (upwards of 55 percent in some areas), job density still remains relatively low compared to more established job centers in the southeast part of the DCHC area, like RTP. Residents in northern Durham County face longer commute times to reach employment opportunities clustered to the south and established regional job centers remain out of reach to transit-dependent residents.

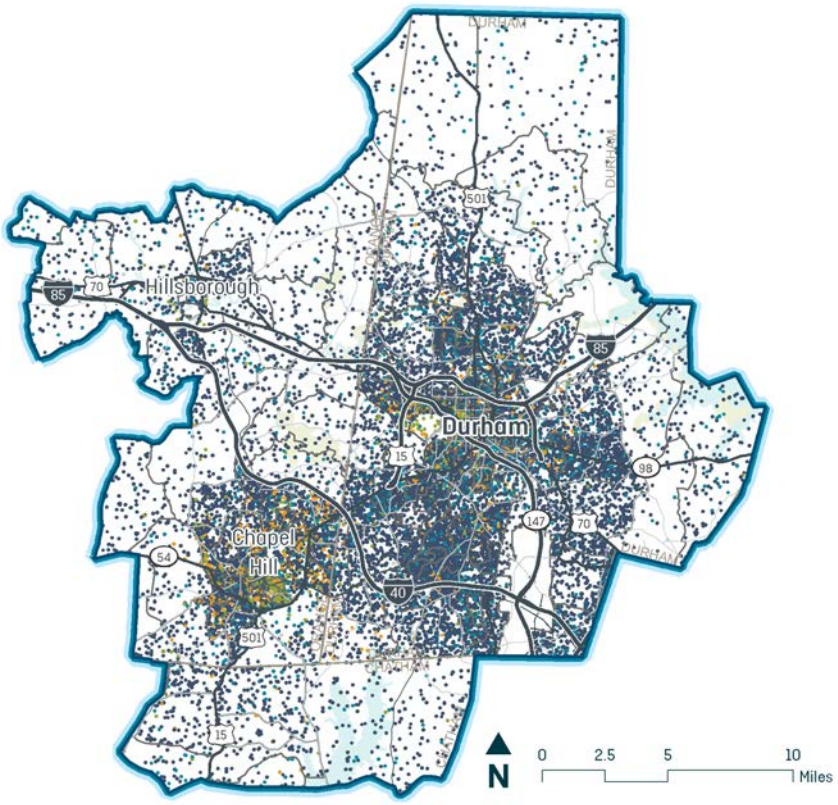
Transit accessibility analysis provides additional insights into regional structure. Transit accessibility can reflect regional job distribution patterns, but it is typically more a reflection of service and network design. Transit accessibility, therefore, tends to be highest where service exists - primarily in downtown centers. Meanwhile, job centers on the urban periphery like RTP remain out of reach to regional transit-dependent populations.

Downtown Durham, Duke University, and Chapel Hill stand out as having relatively high transit accessibility. Other regional employment centers like South Square, North Carolina Central University, Duke Regional Hospital, and Southpoint have mid-range accessibility. In Chapel Hill, areas with mid-range accessibility are along NC-86, around the Blue Hill District, and near Meadowmont. North Chatham and Hillsborough have very low transit accessibility. As noted, these areas of low transit accessibility typically correlate with low employment density and more affordable housing. This means residents in these areas face longer commute times to regional job centers with no practical alternative to commuting via automobile.

Regional centrality and multimodal options are critical to limiting total vehicular travel

Travel mode shares (vehicle, transit, etc.) correspond with accessibility and, to a lesser extent, travel times. In the DCHC area, most commuters travel alone, by car. Areas with higher mode shares are generally the region's urban centers including downtown Durham, Chapel Hill, and Carrboro. The areas with the highest number of cyclists, walkers, and transit riders are near Duke University and the University of North Carolina, and downtown Chapel Hill.

Average travel times are shortest around employments hubs in downtown Durham, Chapel Hill, and Southpoint. These areas are generally the same areas where accessibility is highest. Travel times diverge from accessibility (longer travel time despite higher accessibility) in some areas including east Durham and several census block groups around RTP. Longer commutes in areas of relatively high accessibility indicate commuters are traveling to other parts of the region for work despite the presence of closer employment options.



COMMUTE MODE SHARES 2014-2018

Trips by mode

1 Dot = 10

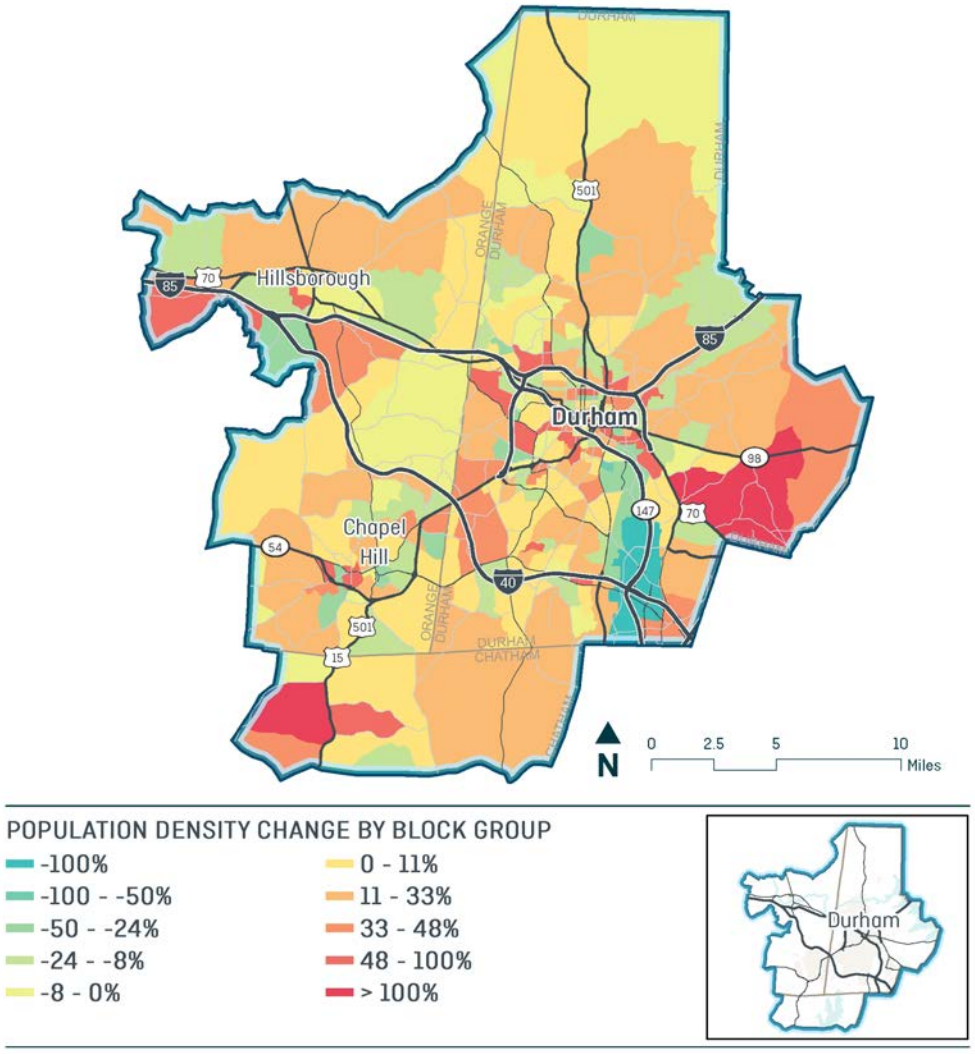
- Single-Occupancy Vehicle
- High Occupancy Vehicle
- Transit
- Nonmotorized
- Other

City centers generally have higher commute mode shares. This is shown by a higher density of colored dots.

Transit accessibility analysis indicates an imbalance in regional structure. Residents living in downtown Durham and Chapel Hill, or near smaller job centers like South Square, Southpoint, or Blue Hill, may be able to use transit to reach jobs. But reaching job

centers in downtown Durham and RTP most likely requires a car, which means lower income households are burdened with higher transportation costs due to a lack of viable transportation alternatives. Likewise, affordable housing tends to be in areas with low-to-moderate auto accessibility and low transit accessibility, meaning residents face longer commutes with limited alternatives to driving.

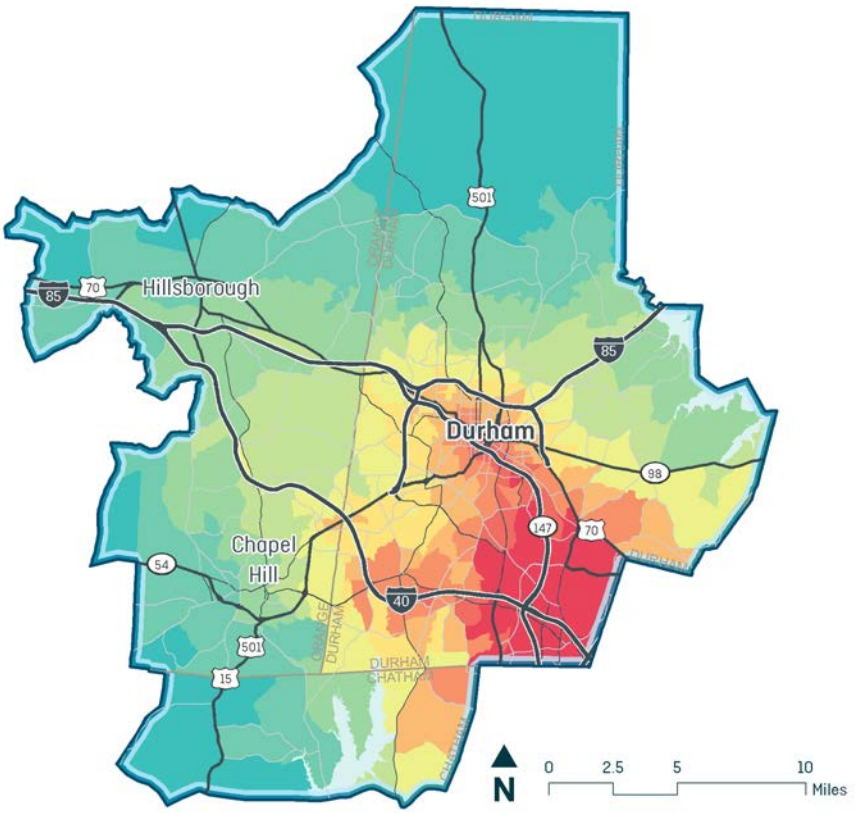
These trends, combined with a growing population, indicate likely strains on the transportation network in the future. They also underscore the need to support regional transit options to link emerging population centers to existing and emerging job centers. Regional structure must evolve, to connect people more efficiently to the places they need to go. Increasing transit-accessible and affordable housing options near growing job centers is one way to alleviate strain on the network.



An increase in population density is shown in red and orange while decreases are shown in blues and greens

Auto Accessibility

AUTO ACCESSIBILITY TO JOBS 2016



Total number of jobs available to residents within a reasonable commute time.

- 40,000 - 180,000
- 180,000 - 230,000
- 230,000 - 280,000
- 280,000 - 310,000
- 310,000 - 350,000
- 350,000 - 370,000
- 370,000 - 390,000
- 390,000 - 420,000
- 420,000 - 440,000
- 440,000 - 560,000

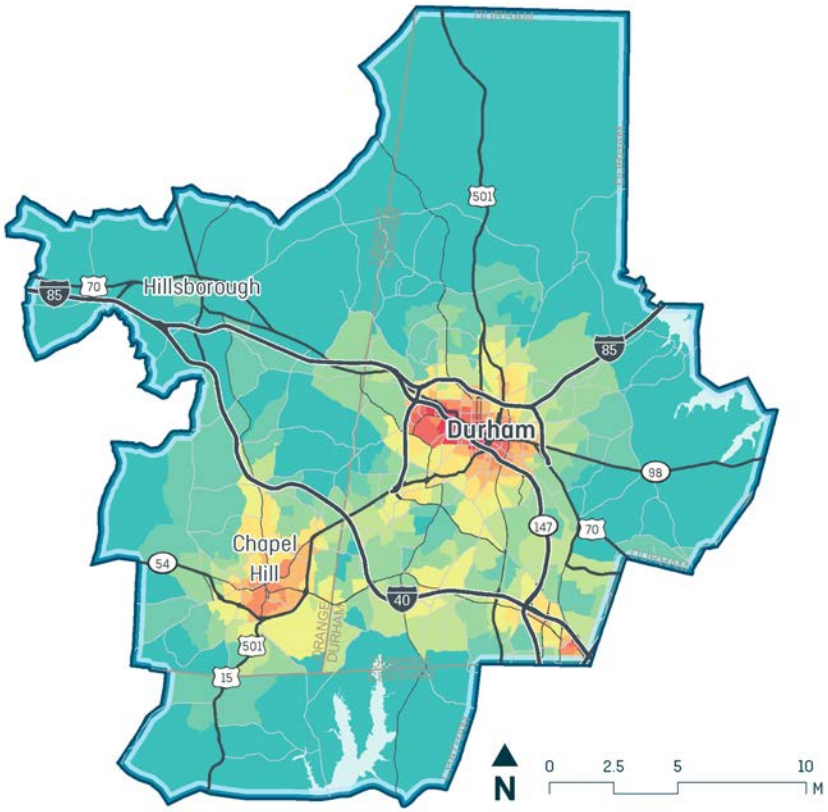
- Accessibility is highest in southeast Durham County and along major highways in this area
- RTP emerges as a major center in the region and shapes regional accessibility
- Accessibility is lower in northern part of the region, which correlates with lower job densities

METRICS

Transit Accessibility

- Transit accessibility is highly reflective of current service availability in the region.
- Neighborhoods in and around urban centers have greater transit accessibility.
- A lack of transit service to areas outside urban centers is clearly reflected, with areas of lower transit accessibility spanning the region's suburban and rural areas.

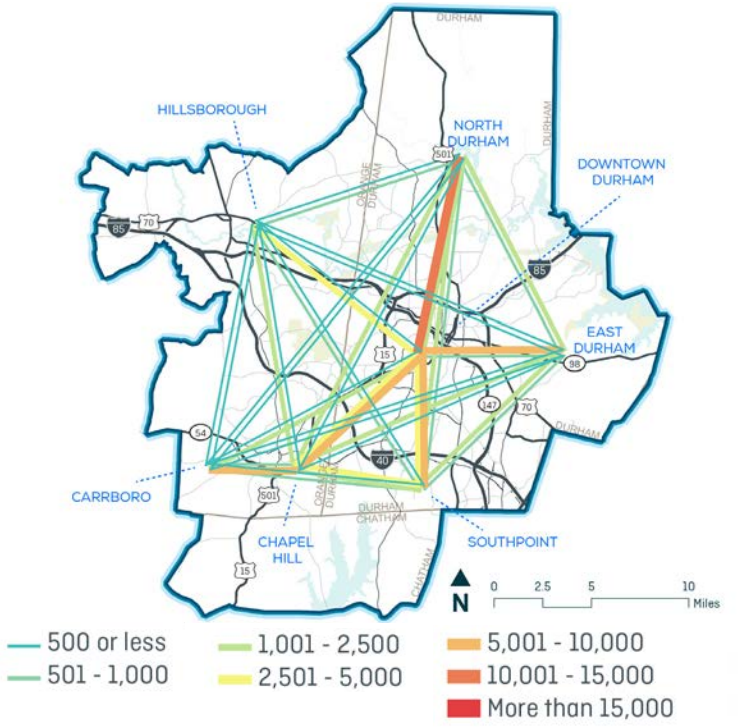
TRANSIT ACCESSIBILITY TO JOBS 2016



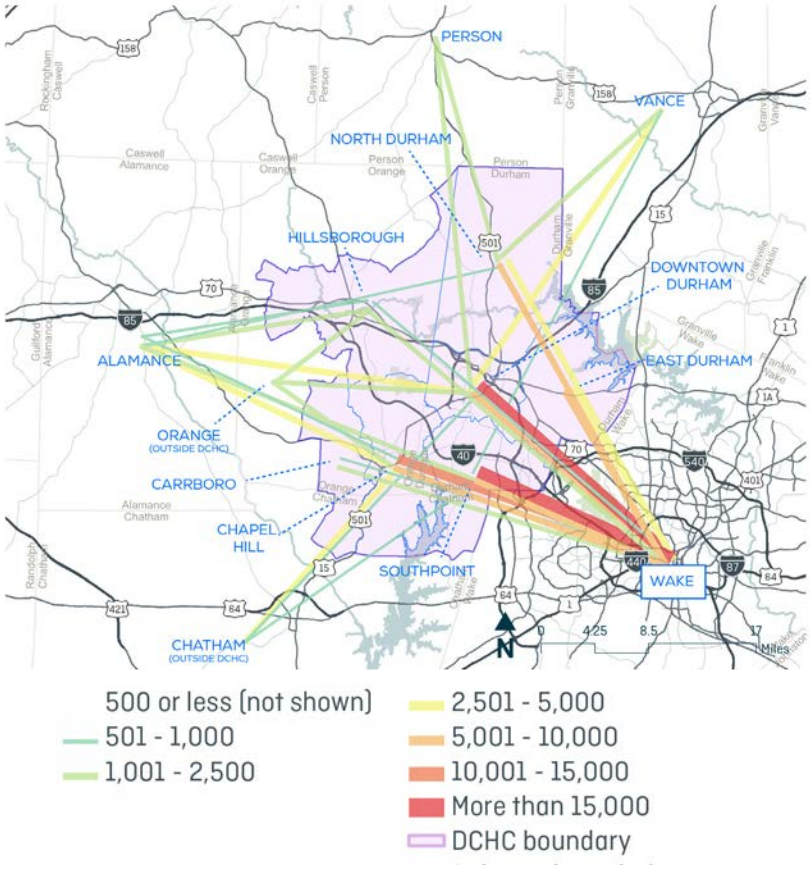
- 0 - 4,500
- 4,500 - 12,500
- 12,500 - 20,000
- 20,000 - 26,500
- 26,500 - 34,000
- 34,000 - 43,500
- 43,500 - 55,000
- 55,000 - 68,000
- 68,000 - 81,000
- 81,000 - 95,000

Commuter Flows

DCHC COMMUTER FLOWS 2016



REGIONAL COMMUTER FLOWS 2016

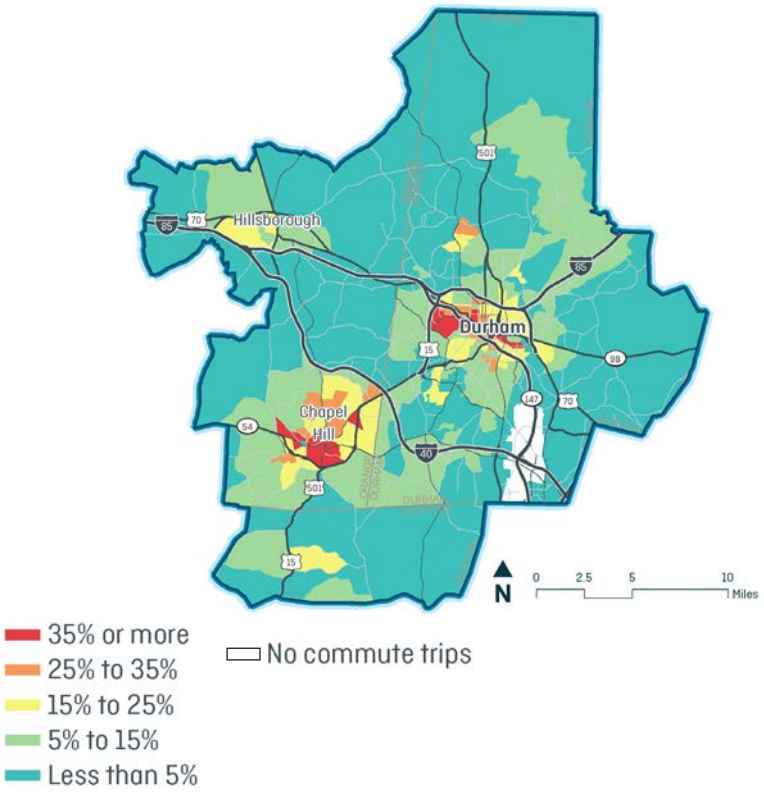


- Downtown Durham is a key regional destination, particularly for commuter flows to/from northern Durham
- Significant flows exist between east Durham, southwest Durham (Southpoint), and Chapel Hill
- Regional flows provide a broader context; significant commuting occurs between the DCHC area and Wake County, with *more* people traveling <u>from</u> the DCHC area <u>to</u> Wake County than vice versa.

Mode Share

- Transit, walking, and biking are most common in urban centers, where the network and service options make them viable alternatives.
- Automobiles remain the most common mode choice.

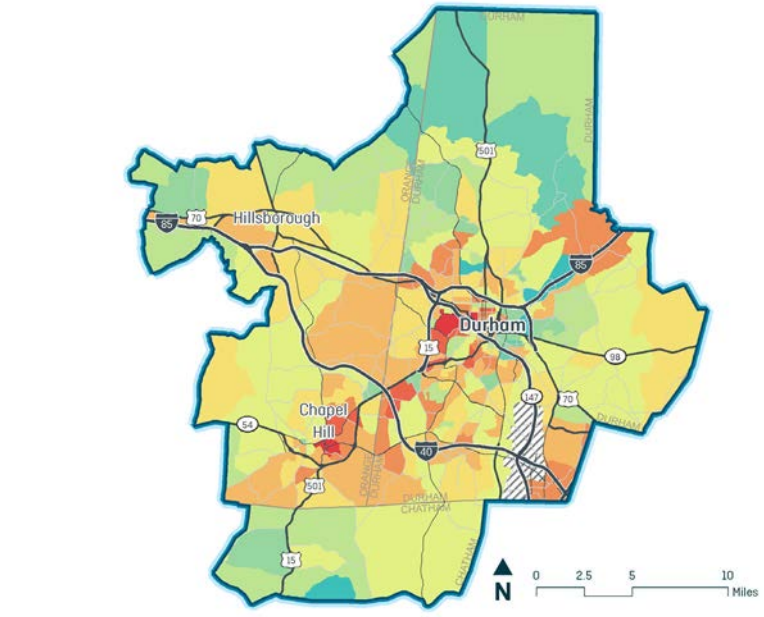
NON-AUTO MODE SHARE 2016



Travel Time

- Urban centers are highly productive, with commute times as short as 15 minutes or less.
- Commute times from out-lying neighborhoods and more distant suburbs stretch to more than 35 minutes.

AVERAGE COMMUTE TIME BY BLOCK GROUP 2016



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4 MOBILITY

KEY FINDINGS

- Regional traffic volume is rising, increasing demand on the region's roadways
- LOS is decreasing on several major corridors
- Drivers experience more unexpected delays
- There are more pedestrian and bicycle facilities across the region
- Transit ridership is stable
- Passenger growth at RDU continues
- Freight movement will increase; truck traffic remains highest on interstate roadways

Assessments of traffic volume, roadway congestion, intersection delay, bicycle and pedestrian facility mileage, transit ridership, freight activity, and air travel provide important insights into the overall performance of the transportation network. Level of service (LOS) and travel time are both important indicators of personal automobile travel performance. LOS for roadway segments and intersections is evaluated using an A-F grading scale and calculated using the road's volume-to-capacity ratio (v/c) (an indicator of congestion) or using observed delays (for intersections). Vehicle travel time measures how long it takes to get from point A to point B as well as how consistent (and thus predictable) that travel time is. Travel time indicates how traffic congestion and incidents limit mobility, affecting the transportation network's performance. The availability and location of pedestrian and bicycle facilities impact non-motorized modes of travel and transit service impacts the overall accessibility of destinations. Understanding the performance of transportation system components helps the MPO identify and target investments and improvements.

Regional traffic volume is increasing

In 2009, the MPO conducted traffic counts at 1,240 pneumatic tube units in various locations and calculated an Annual Average Daily Traffic (AADT) volume of 11,780,090.[1] In 2017, traffic counts were conducted at the same number of stations and the calculated AADT was 15,067,130, indicating a 28% increase in traffic volume, likely driven by regional population growth during the same time period. This increase in traffic volume negatively affects LOS by increasing the roadway's volume-to-capacity ratio. As the region continues to grow, roadway interventions may be needed to meet adequate levels of service.

LOS is decreasing on several major corridors

Regionally, roadway LOS (as measured by volume-to-capacity ratio) remains adequate. Eighty-five percent of the roads in the region operate at LOS D or better; 65 percent operate at LOS A. This indicates that most roads have not met maximum design capacity and experience little congestion.

There are several major corridors with roadway segments operating at LOS F. These include I-40, US 15-501, I-85, NC 54 and US 70. Each provides access to major employment centers including Research Triangle Park (RTP), downtown Durham, Duke University, and the University of North Carolina-Chapel Hill. This trend is likely driven by regional growth, economic opportunity, and people moving to the area for jobs. And as opportunities continue to attract people to the Triangle Region, roadway demand will also continue to increase.

As demand pushes roadways to their capacity, there are two ways to maintain levels of service: increase roadway capacity or decrease traffic demand (by providing alternate routes or by shifting demand to other modes of transportation). Absent any interventions, LOS on roadways providing access to major job centers will continue to decline as growth continues to increase.

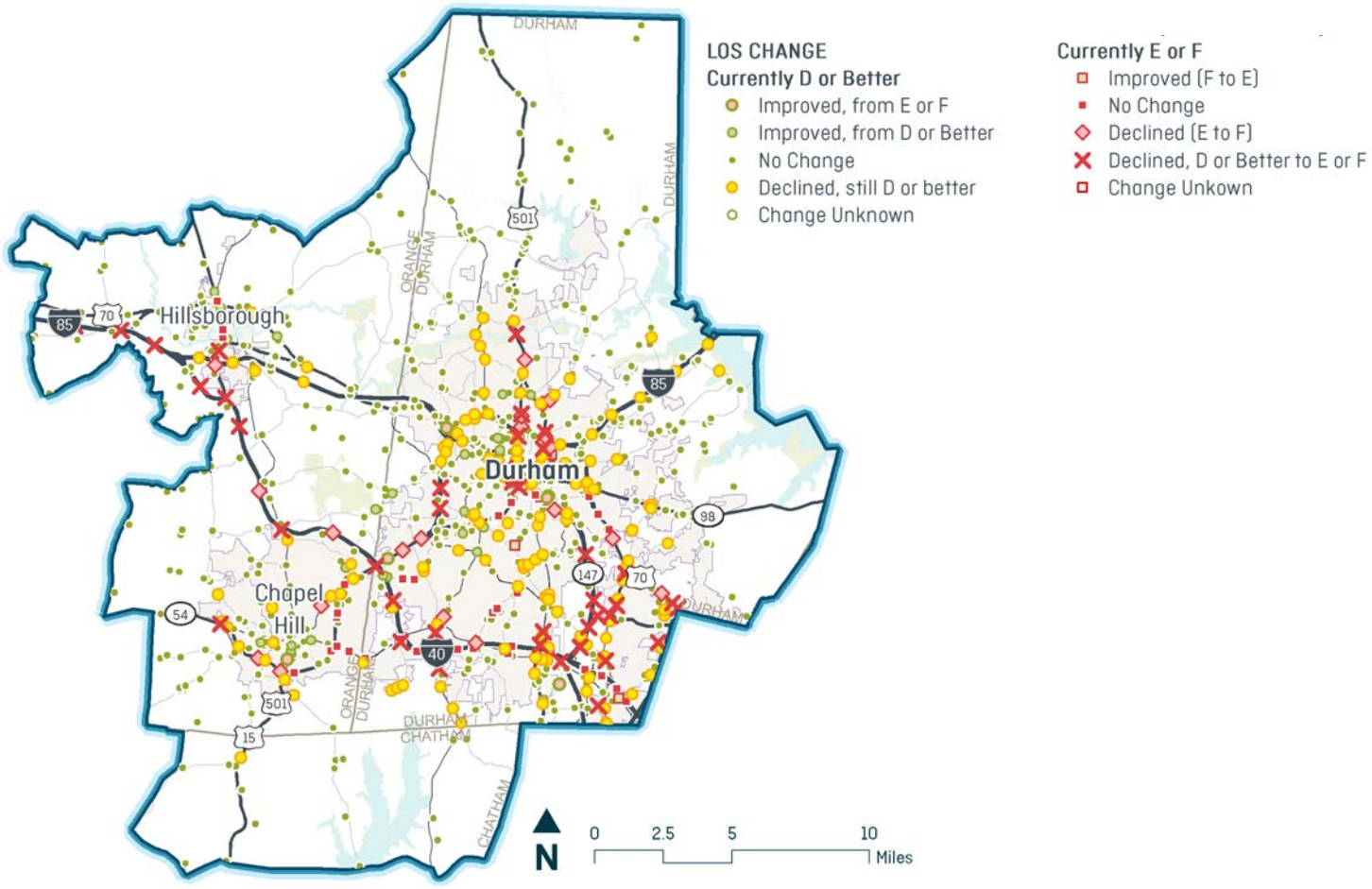
[1] The MPO conducts traffic counts by placing pneumatic tube units on roadways throughout the area to detect traffic moving at or near the posted speed limit. These counts are conducted over a 48-hour period and the average volume for this two-day period is extrapolated into a demand figure representative of the entire year, called Annual Average Daily Traffic (AADT), using appropriate seasonal factors developed by NCDOT.

Drivers experience more unexpected delays

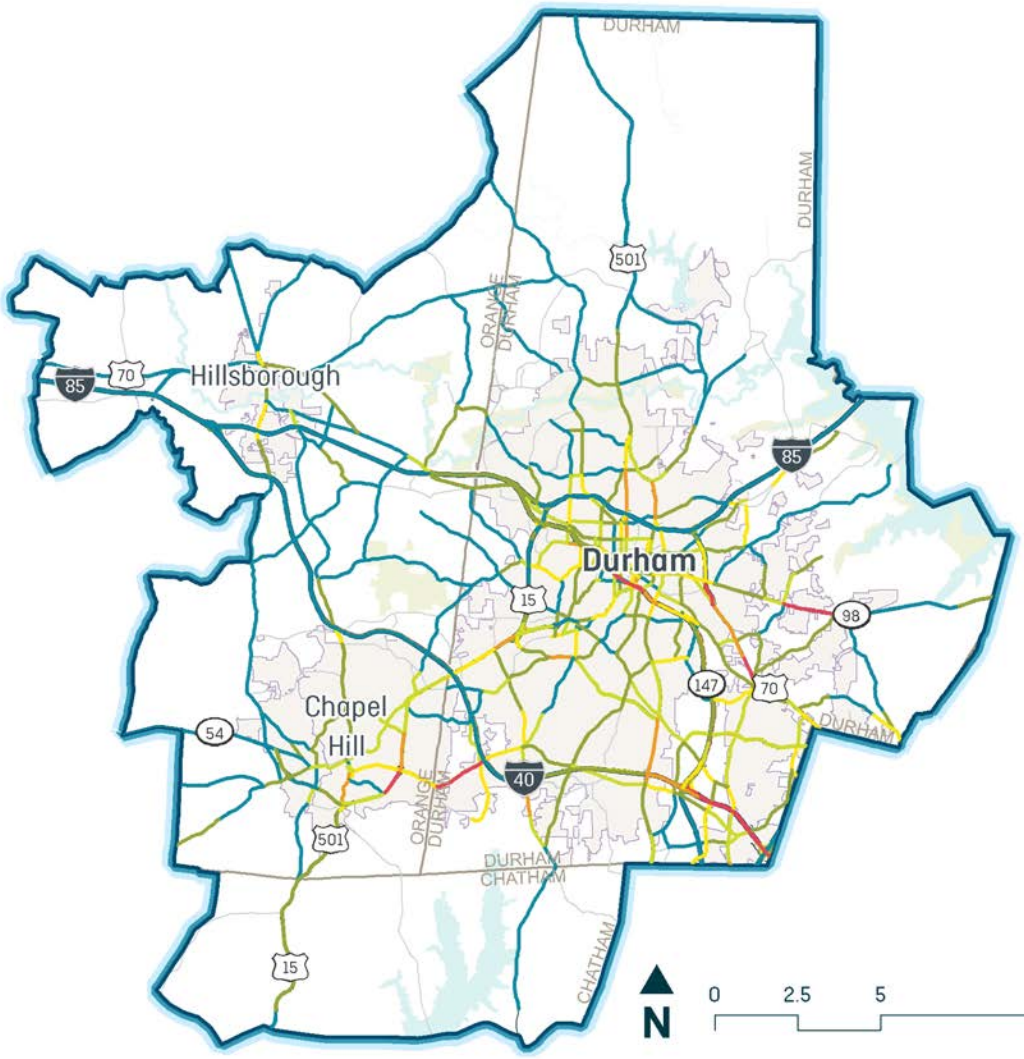
Drivers allot a certain amount of travel time to get from point A to point B. Estimates are typically rooted in experience and assumptions about travel speed, but unexpected delays increase the travel time needed to complete a trip. Unexpected delays may indicate a need for improvements. For example, if repetitive delays occur on a roadway due to frequent left turn crashes at a specific intersection, left turn lane improvements may be needed to alleviate this conflict point and ease delays.

Level of travel time reliability (LOTTR) (the ratio of the 80th percentile travel time to the median travel time) is a measure assessing the frequency of unexpected delays. The closer these two numbers are, the more consistent the travel time. This holds true even if the delay is substantial – roadway users can build in time for delays if the delays are expected.

In the DCHC area, the percentage of person-miles traveled on roadways with LOTTR greater than 1.5 increased from 2014-2018. This indicates that people in the region today face more unexpected delays than in years past. Alleviating delays depends upon the cause of delay for each corridor, which varies. Like increasing traffic volume and the downward trend in LOS on major corridors, these delays are likely related to overall regional growth.



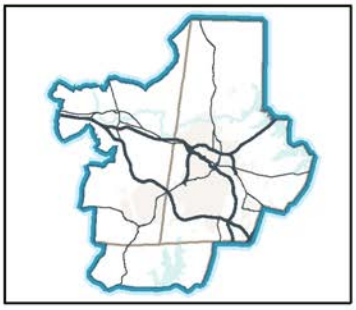
LOS is declining across the region, as shown by a yellow circle, red diamond, or a red X. This may be related to overall regional growth and increases in VMT.



TRAVEL TIME RELIABILITY IN 2017

Level of Travel Time Reliability (PM Peak Period)

- 1.05 or less
- 1.06 - 1.10
- 1.11 - 1.15
- 1.16 - 1.25
- 1.26 - 1.50
- Greater than 1.50

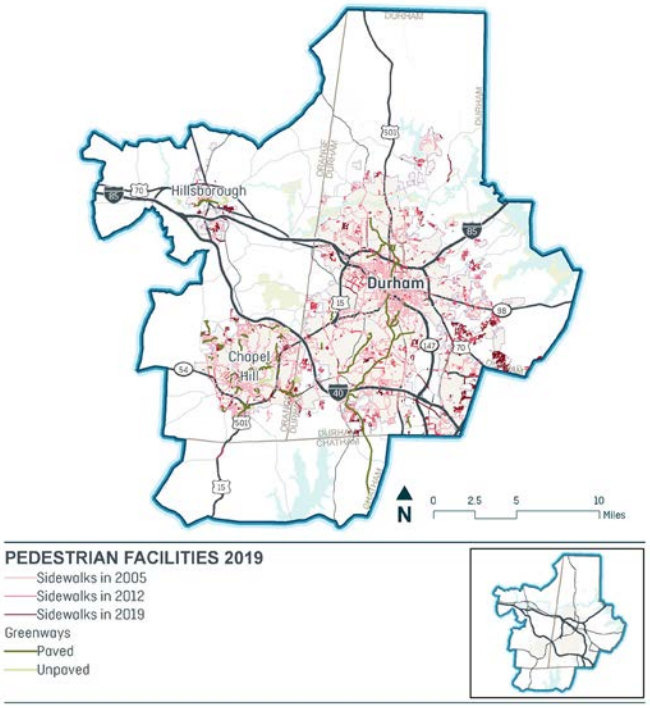


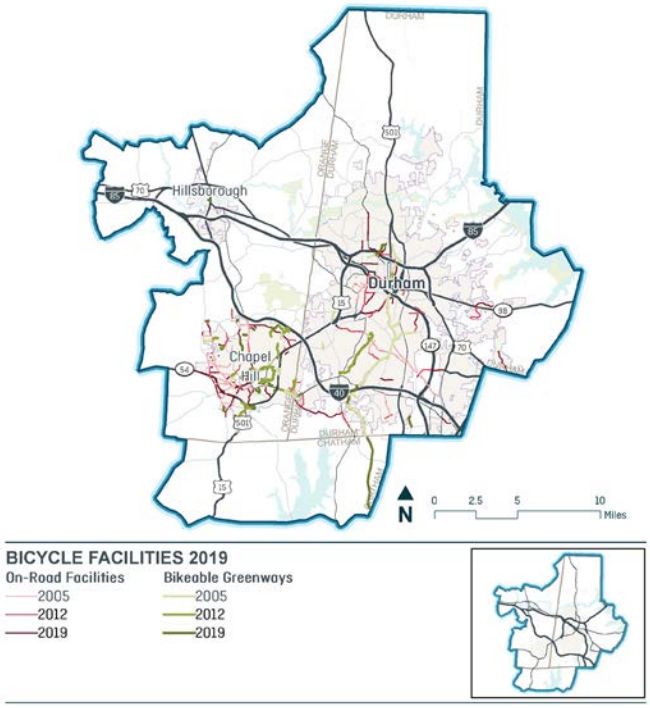
Road segments with LOTTR greater than 1.5 (shown in red) indicates that travelers on these roadways face more unexpected delays.

There are more pedestrian and bicycle facilities across the region

Pedestrian facilities include sidewalks and greenways, while bicycle facilities include on-road facilities (bicycle lanes, paved shoulders, and sharrows) and bikeable greenways. Sidewalk mileage increased 18.5 percent from 721.5 miles in 2012 to 855.2 miles in 2019. On-road bicycle facility mileage increased 149.6 percent from 71.0 miles in 2012 to 177.2 miles in 2019. Data for overall greenway increase was not available, but bikeable greenways alone increased 15.1 percent from 44.5 miles in 2012 to 51.2 miles in 2019.

A comparison of pedestrian and bicycle counts from 2014 and 2017 suggests that pedestrian activity is increasing and cycling activity is decreasing. However, the counts were conducted over 16 non-consecutive days at different times of the year. Temporal inconsistencies likely affect the recorded pedestrian and bicycle activity and trends in these activities cannot accurately be assessed.





Between 2005 and 2019 pedestrian and bicycle facilities in the region have expanded. Lighter colors indicate older facilities; darker colors show newer facilities including sidewalks and greenways.

Transit ridership is stable

Chapel Hill Transit, Duke Transit, GoDurham, GoTriangle, and Orange County Public Transportation (OPT) provide transit service in the DCHC area. For the agencies for which data was available, fixed-route ridership remained mostly stable from 2014 to 2018, except for Chapel Hill Transit, which experienced a significant decrease in ridership over the five-year period (approximately one million trips). GoDurham experienced a decrease of 368,585 (6 percent) from 2015 to 2016, but ultimately experienced a 5 percent increase in the 2014-2018 period.

Demand-response ridership for GoTriangle increased significantly from 33,768 trips in 2014 to 64,805 in 2018 (92 percent increase). This suggests that more riders use GoTriangle to reach destinations not currently served by fixed routes.

Both vehicle revenue hours and vehicle revenue miles showed a steady upward trend between 2014 and 2018. When considered alongside steady ridership rates, an increase in both hours and miles indicate that fixed routes may have been adjusted to serve more areas, particularly as development increased in areas peripheral to major job centers.

Passenger growth at RDU continues

Raleigh-Durham International Airport (RDU) is an important destination and connecting point for commercial passenger air travel as well as air cargo movement. In 2018, boardings and alightings at RDU totaled nearly 12.5 million, a 39 percent increase since 2009 and the most of all years examined. Boardings and alightings have increased overall, during the ten-year period, with the only annual decrease occurring in 2013.

In the past five years, RDU has started carrying flights from Alaska Airlines, Allegiant, and Spirit. Outside of now defunct airlines (either shut down or merged with others), the airport has lost no major airlines over this time. Sixty-two destinations can be reached from RDU via non-stop flight by at least one airline. This includes 55 destinations in the US, along with San Juan, Montreal, Toronto, Cancun, Punta Cana, London, and Paris.

Intermodal connections serving the airport will be more important as RDU continues to grow and serve more destinations. Passengers are increasingly accessing the airport via transit and rideshare, indicating a growing role for shared curb space and, perhaps, less demand on airport infrastructure such as parking.

Freight movement will increase; truck traffic remains highest on interstate roadways

Truck traffic remained heaviest on the region's interstates (I-40 and I-85) in 2016, 2017, and 2018. As these limited access, high-capacity roadways continue to be main freight corridors, it is important to balance the needs of both freight traffic and personal automobiles. The transportation network also needs to support both local freight traffic and freight traffic moving through the area. The relatively higher concentration of truck traffic on interstates suggests goods are both moving through - and in - the region.

Projections for freight tonnage in the Raleigh-Durham area show exports decreasing between 2017 and 2020 and imports leveling out over the same time period, likely due to external geopolitical forces. After 2020, the projections for both imports and exports resume a steady rate of increase, slightly steeper in the 2030-2040 period than the 2020-2030 period. Overall, the rate of projected increase in tonnage of imports from 2015 to 2040 is roughly 8.3 percent and the rate of projected increase in tonnage of exports from 2015 to 2040 is about 11 percent.

Freight value is projected to increase at much higher rates than freight tonnage. The overall value of imports is forecast to increase from nearly $70 billion in 2015 to nearly $130 billion in 2040 and the overall value of exports is expected to increase from just below $80 billion in 2015 to just below $160 billion in 2040 – a nearly 100 percent increase.

Taken together, the projections indicate that while the overall amount of freight (as measured in weight) will not change significantly, the value of that freight will increase dramatically. This is welcome news for the transportation system, since it means that a higher value of freight can be moved through the network without having to make extensive increases to capacity to accommodate more tonnage.

Single unit truck AADT was heaviest on the region's interstates and several other larger arterial roads in 2016, 2017, and 2018.

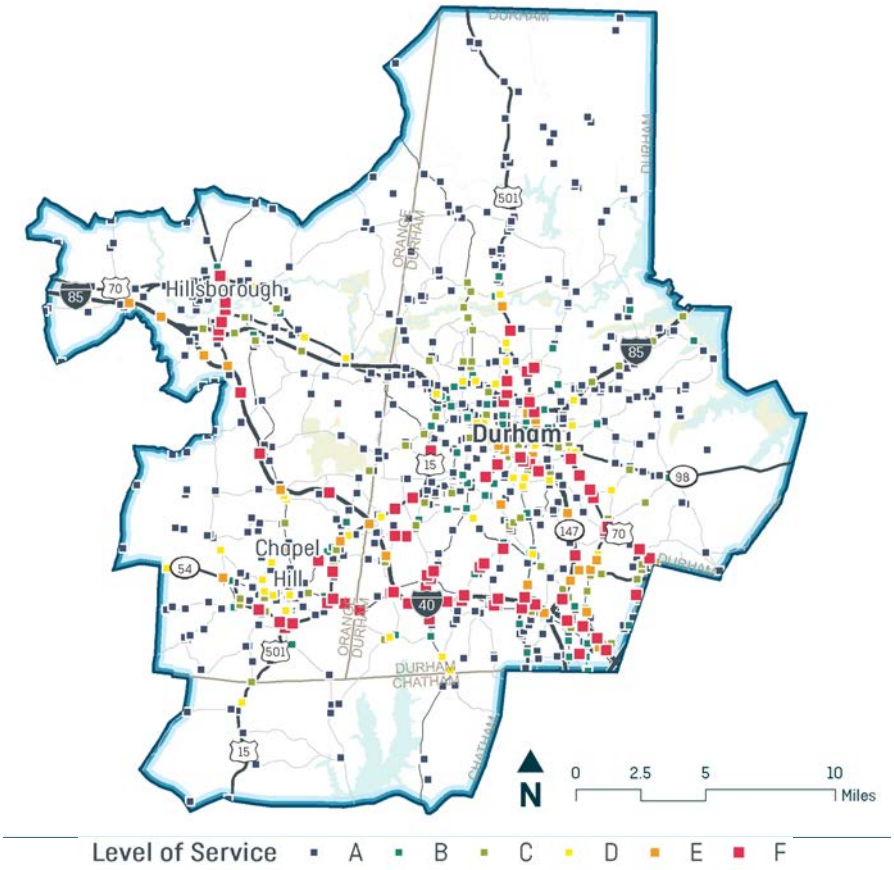
Multi-unit truck AADT mirrors single unit truck traffic with a higher concentration of traffic on interstates shown here in red. This suggests goods are moving through and beyond the region.

METRICS

Level of Service

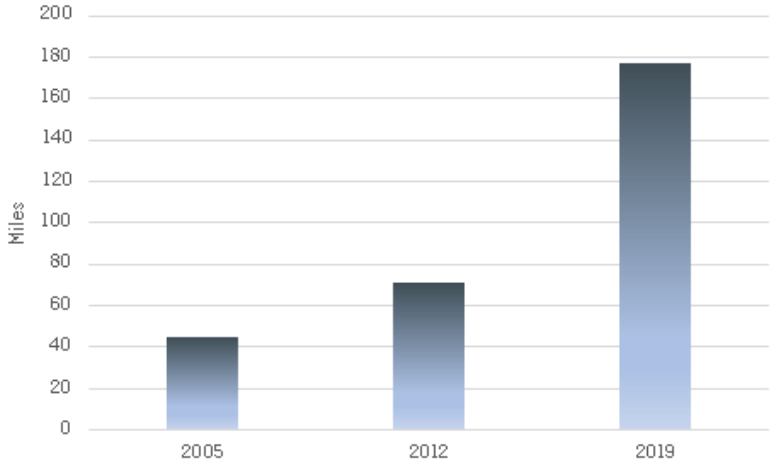
- In 2017, LOS declined on 58.6 percent of roads measured within DCHC jurisdiction. In Durham County, 81 percent of roads measured showed declining LOS.
- Overall, LOS in the DCHC area remains adequate:
  - 65 percent of roads operate at LOS A
  - 17 percent of roads operate at LOS C or B
  - 6 percent of roads operate at LOS F
- Major corridors experiencing a downward trend in LOS include:
  - I-40
  - US 70
  - NC 54
  - US 15-501
  - I-85

VEHICULAR LEVEL OF SERVICE 2017

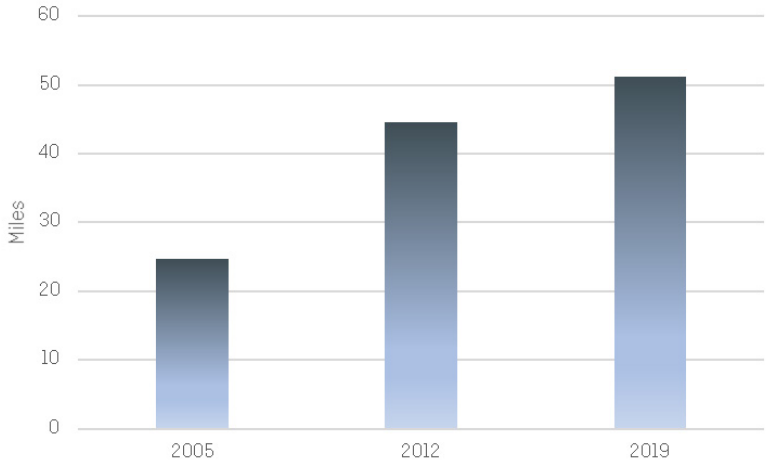


Active Transportation

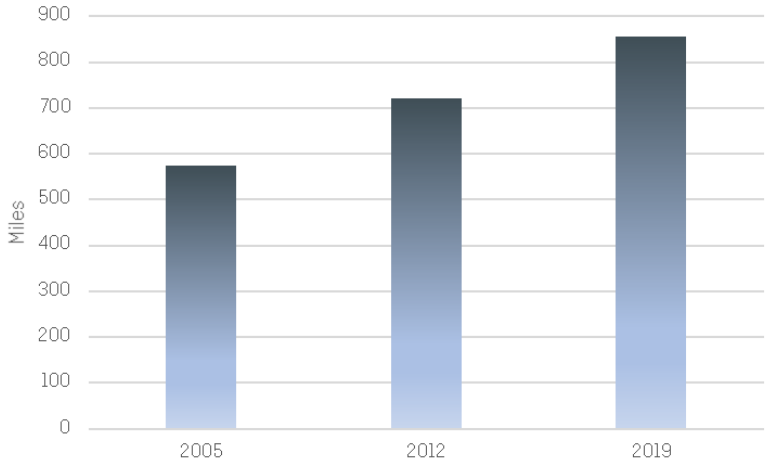
PAVED BIKE FACILITIES: DCHC REGION 2005-2019



GREENWAYS: DCHC REGION 2005-2019



PEDESTRIAN FACILITIES: DCHC REGION 2005-2019

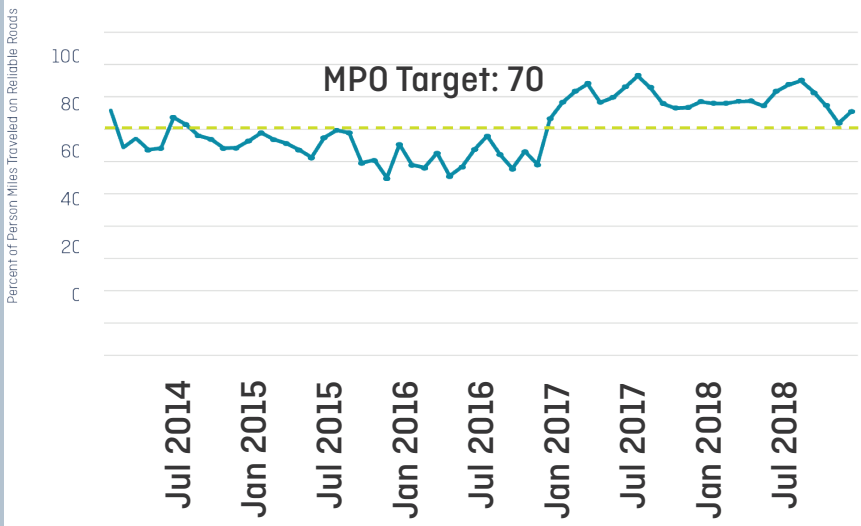


- Between 2005 and 2019, all types of active transportation facilities have increased in the DCHC region.
- There are a total of 855.2 miles of sidewalk in the DCHC area as of 2019, which is an 18.5 percent increase from 721.5 miles in 2012.
- There are 69.6 miles of greenways in the DCHC area, including 56.6 miles that are paved and 13.0 miles that are unpaved.
- There are 183.55 miles of on-road bicycle facilities in the DCHC area, a 158.53 percent increase from 70.97 miles in 2012.
- On-road bicycle facility mileage grew from 2012-2019 at more than twice the rate that it did from 2005-2012.

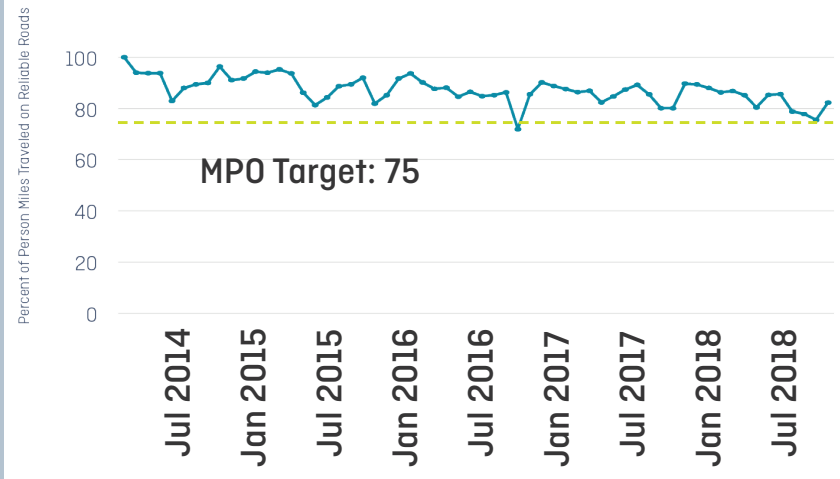
Level of Travel Time Reliability

- An LOTTR below 1.5 is considered reliable. Non-interstate National Highway System (NHS) travel time reliability for the DCHC MPO shows a stable downward trend; an apparent increase in 2017 was due to different data sources.
- The amount of person-miles traveled on reliable interstates has decreased since 2014. Today, about 80 percent of all person-miles traveled on interstate happens on reliable roads.

NON-INTERSTATE NHS TRAVEL TIME RELIABILITY MEASURE 2014-2018

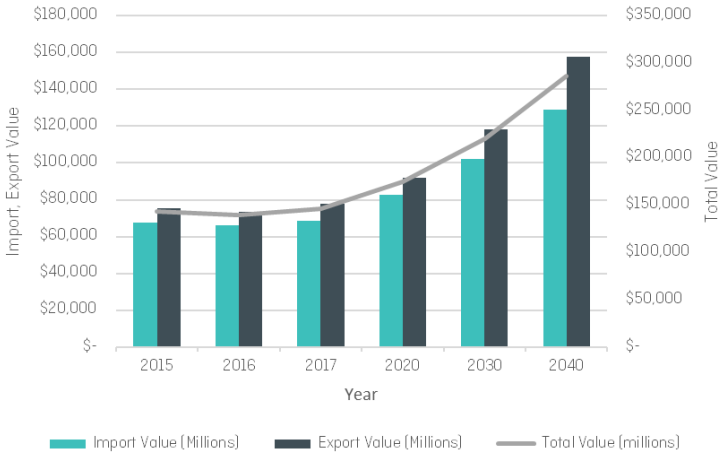


INTERSTATE NHS TRAVEL TIME RELIABILITY MEASURE 2014-2018



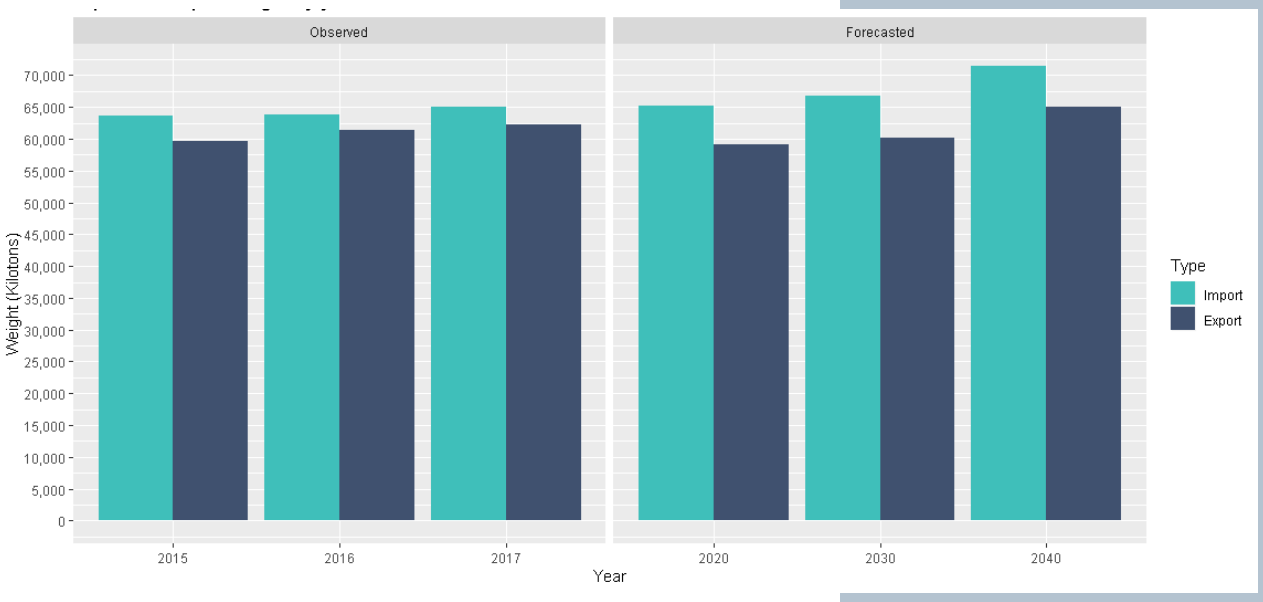
Freight

DCHC REGION FREIGHT VALUE 2015-2040



- The total value of freight moving in and out of the DCHC region has increased between 2005 and 2020 and is projected to significantly increase through at least 2040.
- The weight of freight moving in and out of the DCHC region has remained steady since 2005. This is significant because while value has increased, the demand on the region's roadways has not significantly increased.

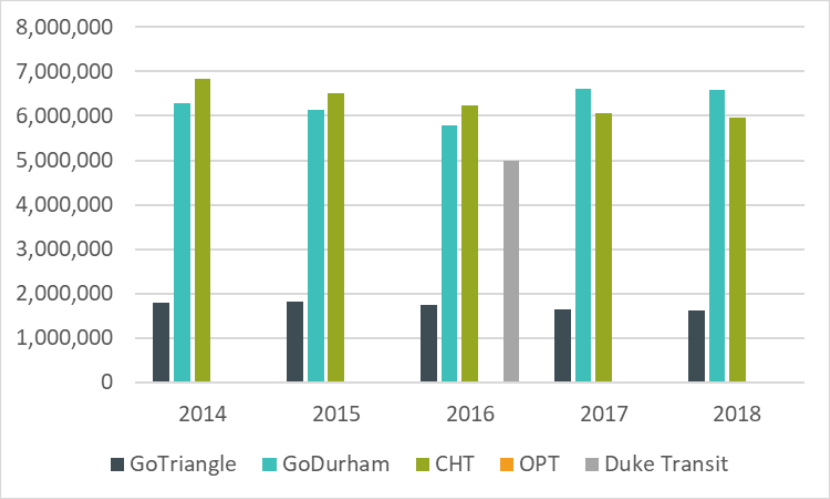
DCHC REGION FREIGHT IMPORT AND EXPORT WEIGHT 2015-2040



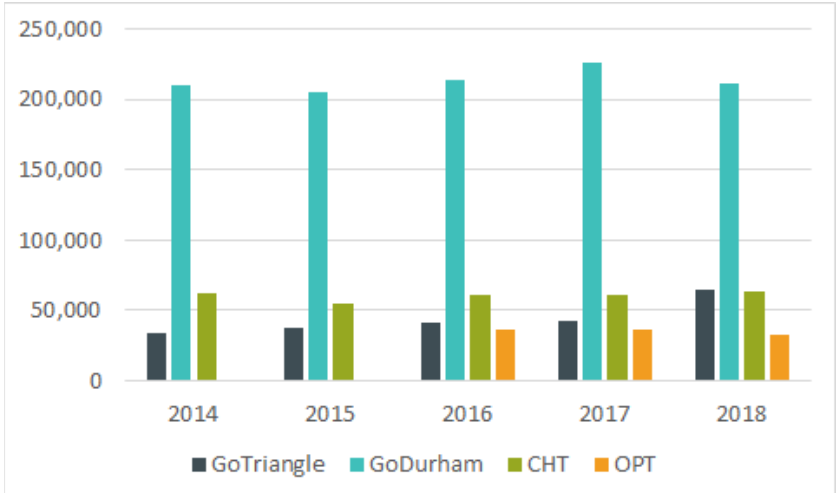
Transit Ridership

- Although a little over half of the fixed bus routes in the area offer some degree of weekend service, weekday ridership is ten times higher than weekend ridership (17.1 million compared to 1.7 million), suggesting that a high share of riders use transit services for commuting.
- Durham Station, which is co-located with the Amtrak train station and the Greyhound bus station, is the most utilized stop, with 125,540 boardings and 122,083 alightings. This stop is served by both GoDurham and GoTriangle.
- Ridership for Chapel Hill Transit has steadily decreased from 6.8 million in 2014 to 6 million in 2018.
- Demand-responsive service ridership for GoTriangle increased by more than 50 percent from 2017 to 2018.

TRANSIT RIDERSHIP: FIXED ROUTE

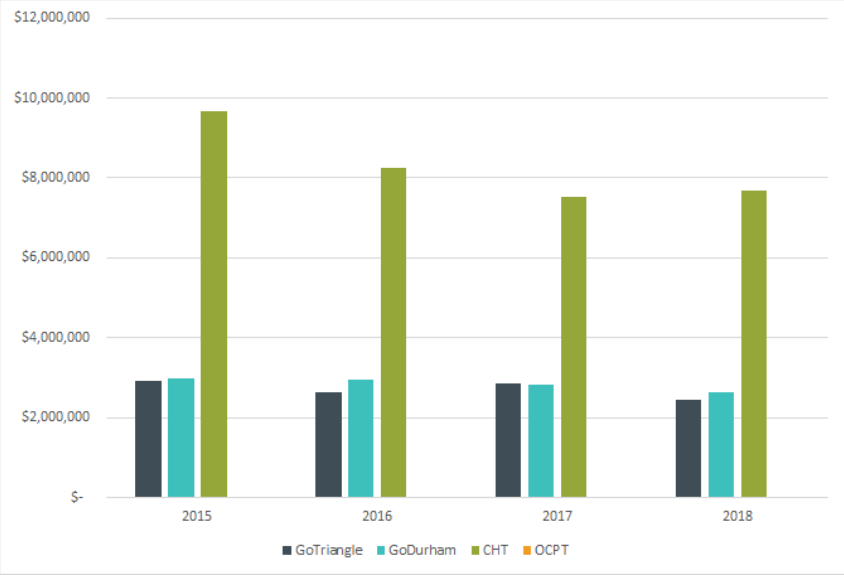


TRANSIT RIDERSHIP: ON DEMAND

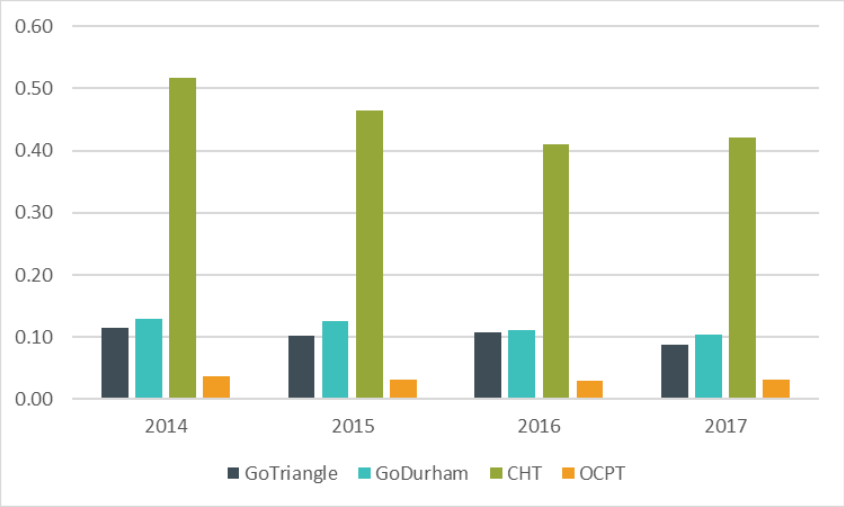


Transit Revenue

TRANSIT REVENUES BY AGENCY 2014-2017



FAREBOX RECOVERY RATIO BY AGENCY (2014-2017)

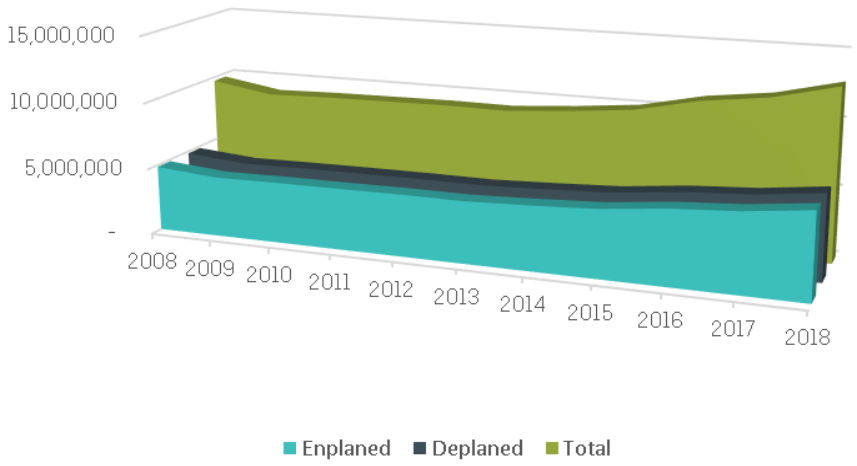


- GoDurham and GoTriangle provide the highest amount of revenue miles of transit service in the region. While they have similar amounts of revenue miles (around 4 million miles annually from 2014 to 2018), GoDurham has around 150,000 more revenue hours each year.
- Revenue hours and miles for all agencies have remained relatively stable since 2014. Revenue miles peaked for GoDurham in 2017 (4.5 million) and for GoTriangle in 2015 (4.3 million).
- Farebox recovery ratios decreased slightly between 2014-2017.

Air Travel

- In 2018, total passengers at RDU totaled nearly 12.5 million, a 39 percent increase since 2009 and the most of all years examined.
- Total passengers have increased during the ten-year period with the only annual decrease occurring in 2013.

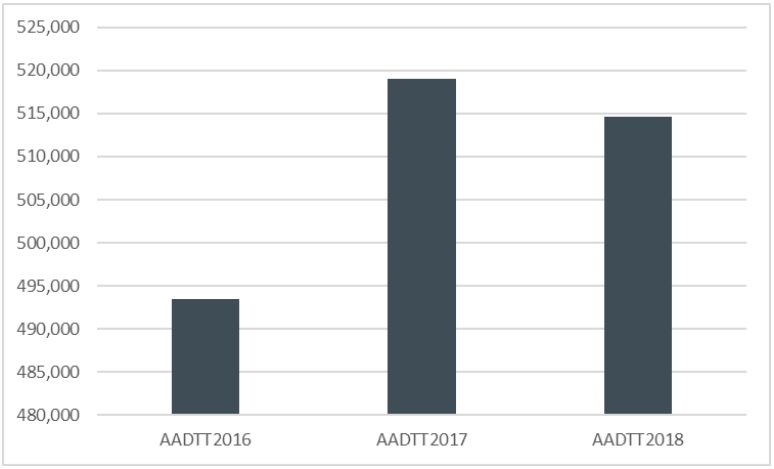
RDU AIR TRAVEL TRAFFIC 2008-2018



Average Annual Daily Truck Travel

- Truck traffic remained heaviest on the region's interstates (I-40 and I-85) in 2016, 2017, and 2018.
- A relatively higher concentration of truck traffic on interstates suggests goods are both moving through - and in - the region.

DCHC REGION AVERAGE ANNUAL DAILY TRUCK TRAVEL 2016-2018



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5 SAFETY

KEY FINDINGS

- Reported crashes steadily increased throughout the region
- Fatalities within the MPO must be reduced to meet safety targets
- Pedestrian crashes increased steadily from 2013 to 2017
- Bicycle crashes fluctuate slightly from year to year

Safety metrics such as crash totals and fatalities indicate how well the transportation network gets users to their destinations safely. Bicycle and pedestrian safety data are included in addition to motor vehicle crash data to present a full picture of the multimodal system. The following crash data include both total crashes and rates of crashes per miles of travel. Higher population areas naturally have higher numbers of crashes, although crash rates are often higher in more rural areas, particularly for fatalities and serious injuries where higher vehicle speeds increase crash severity. North Carolina Department of Transportation (NCDOT) annually releases data on reported crashes throughout the state in the form of "Crash Facts" reports. The following data come from the county and city crash data sections in the 2013-2017 reports. Crash totals for counties include crashes in incorporated cities, e.g., 8,193 crashes in Durham County in 2013 includes the 7,299 crashes within the portions of the City of Durham that lie within Durham County.

Reported crashes are increasing throughout the region

The total number of crashes increased 33.3 percent in Orange County (from 2,193 to 3,187), 29.9 percent in Carrboro (from 117 to 152), and 26 percent in the City of Durham (from 7,299 to 9,195) between 2013 and 2017. Crashes in Durham County increased 14.5 percent (from 8,193 to 9,378) in the same time period, driven largely by the increase in the City of Durham. The rate of increase in Durham County from 2013-2017 was the lowest of the seven jurisdictions in the region .

Hillsborough saw the greatest percent increase over the four-year period, a 49.7 percent increase from 153 crashes in 2013 to 229 crashes in 2017. Chatham County and Chapel Hill saw smaller increases over the five-year period (19.5 percent and 12.4% percent respectively), Increases in overall crashes are to be expected as population increase over time leads to more people on the roads in the region. Higher rates of increase outside of the urban center may be attributable to higher rates of growth in suburbanizing areas. This pattern highlights the importance of coordinating new development with proportional capital improvements – including improvements that increase safety in addition to overall mobility.

Each of the jurisdictions that fall at least partially within MPO boundaries experienced higher rates of increase in overall crashes than the rate of increase in vehicle miles traveled (VMT) within the MPO over the same period. From 2013 to 2017, total VMT increased only 12 percent from 5.0 billion to 5.6 billion. This suggests that crash increases may not be entirely attributable to increased travel and that crashes should still be examined for underlying causes that may be ameliorated with safety improvements to the transportation network.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
FATALITY	33	25	29	23	31	37	30	32	32	35
SEVERE INJURY	79	54	51	59	63	64	70	72	58	89
OTHER INJURY	2,661	2,572	2,446	2,562	2,823	2,790	2,769	3,161	3,363	3,469
NO/UNKNOWN	8,502	8,375	8,264	8,814	8,968	9,437	9,396	10,288	11,263	11,717
TOTAL	11,275	11,026	10,790	11,458	11,885	12,328	12,265	13,553	14,716	15,310

While crash-related fatalities and severe injuries have remained relatively steady since 2008, the overall number of injuries has increased in the DCHC region.

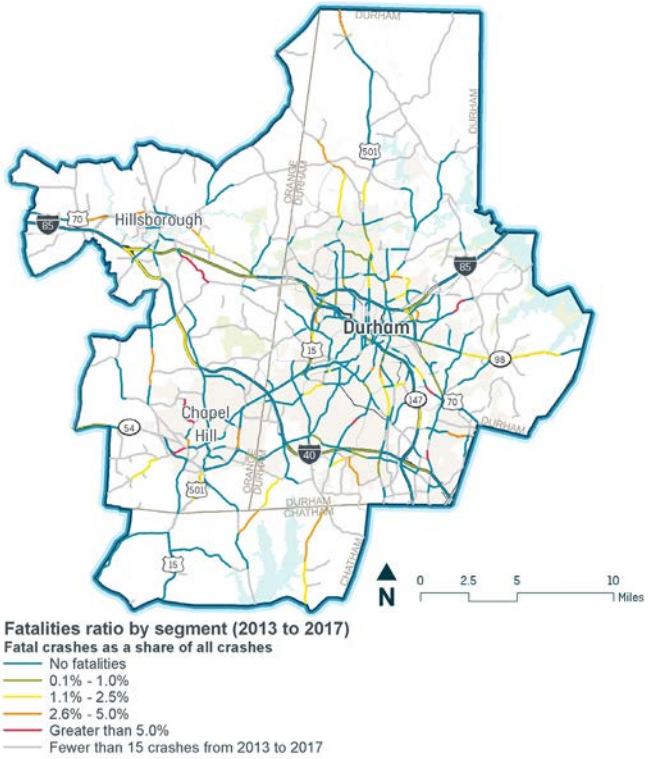
Fatalities within the MPO must be reduced to meet safety targets

Total vehicle fatalities in Durham County from 2013-2017 ranged from 22 to 29 incidents, with an average of 26. Chatham County vehicle fatalities ranged from 11 to 15 total and Orange County ranged only from 10 to 13. There was no discernible increasing or decreasing trend in any county over the five-year period.

Durham County had the highest number of pedestrian fatalities of any year with seven total in both 2013 and 2015. Pedestrian fatalities in Orange and Chatham counties did not exceed three total in any year from 2013 to 2017. The average annual number of pedestrian fatalities in all three counties combined for the same time period was two. Neither Chatham nor Orange County had any pedestrian fatalities in 2017.

Bicycle fatalities remained rare throughout the five-year period, with the yearly average for all three counties combined being 0.5 per year. Chatham County had only one bicycle fatality in 2016 and none in any other year. Orange and Durham counties both had a total of three for the whole five-year period.

Durham County had a total crash rate in 2017 of 376.56 per 100 million vehicle miles traveled (MVMT), ranking seventh-highest in the state (out of 100 counties) with a better performance in fatal crash rate at 94th in the state with a rate of 0.62 fatalities per 100 MVMT. Orange County had a comparable fatality rate of 0.64 but ranks much lower at 79th statewide for a total crash rate of 200.13 per 100 MVMT. Chatham County had the highest fatality rate of 1.34, though still ranked only 55th statewide; its total crash rate of 219.27 is comparable to that of Orange County.



Red, orange, and yellow lines indicate road segments with higher fatality ratios.

Within the MPO, the five-year average for fatalities was 36 and the fatality rate was 0.675 per 100 million vehicle miles traveled (MVMT), the highest of any five-year period beginning in 2008. These are increases over the 2012-2016 period which had an average of 34.4 fatalities per year and a fatality rate of 0.667.

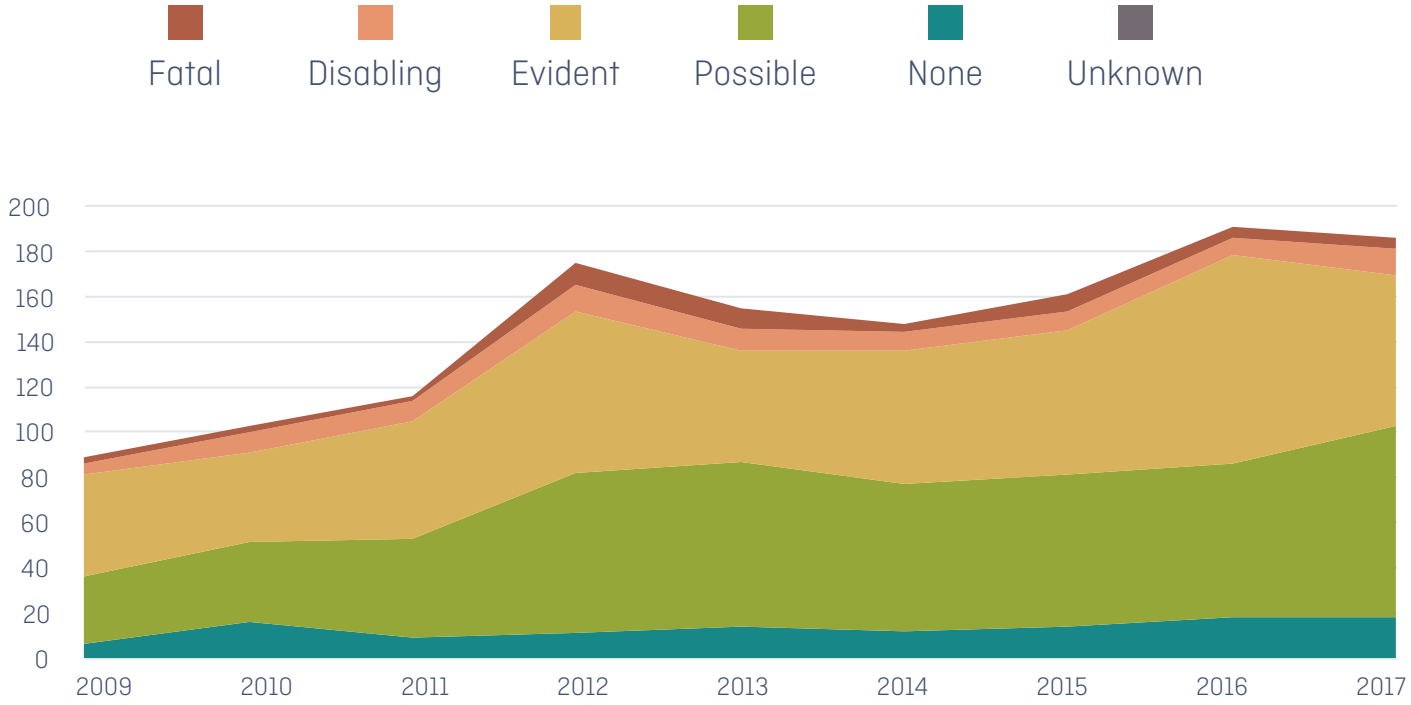
Based on the NCDOT's goal of reducing car crashes by 50 percent by 2030, the MPO has set safety targets for the year 2020 at 31 fatalities and a fatality rate of 0.579 per 100 MVMT. Achieving this target will require a substantial reduction in total fatalities. Fatal crashes should be investigated to establish countermeasures that will help achieve the MPO's safety targets.

Pedestrian crashes are increasing

The total number of pedestrian crashes in Durham County increased from 121 in 2013 to 147 in 2017 (a 21.5 percent increase), driven largely by an increase from 112 to 137 in the City of Durham during the same time period (a 22.3 percent increase). Orange County also saw a significant increase in the number of pedestrian crashes from 21 in 2013 to 32 in 2017, but the trend was inconsistent throughout the five-year period, increasing from 21 to 29, then decreasing to 22, then increasing to 38 and then decreasing again to 32. Chatham County and the towns of Carrboro and Hillsborough had single digit totals each year from 2013-2017, although Hillsborough had the largest range, from zero to seven. Total pedestrian crashes in Chapel Hill hovered between 19 and 22, except for 2015, which had a total of 13.

Pedestrian crash data indicate that pedestrian traffic is heaviest in the City of Durham and that possible safety improvements could be made in high-traffic areas. Inconsistent increase and decrease trends may indicate that special events that increase pedestrian traffic in less urbanized areas may contribute to pedestrian crash totals.

Pedestrian Crashes in the DCHC Region 2009-2017

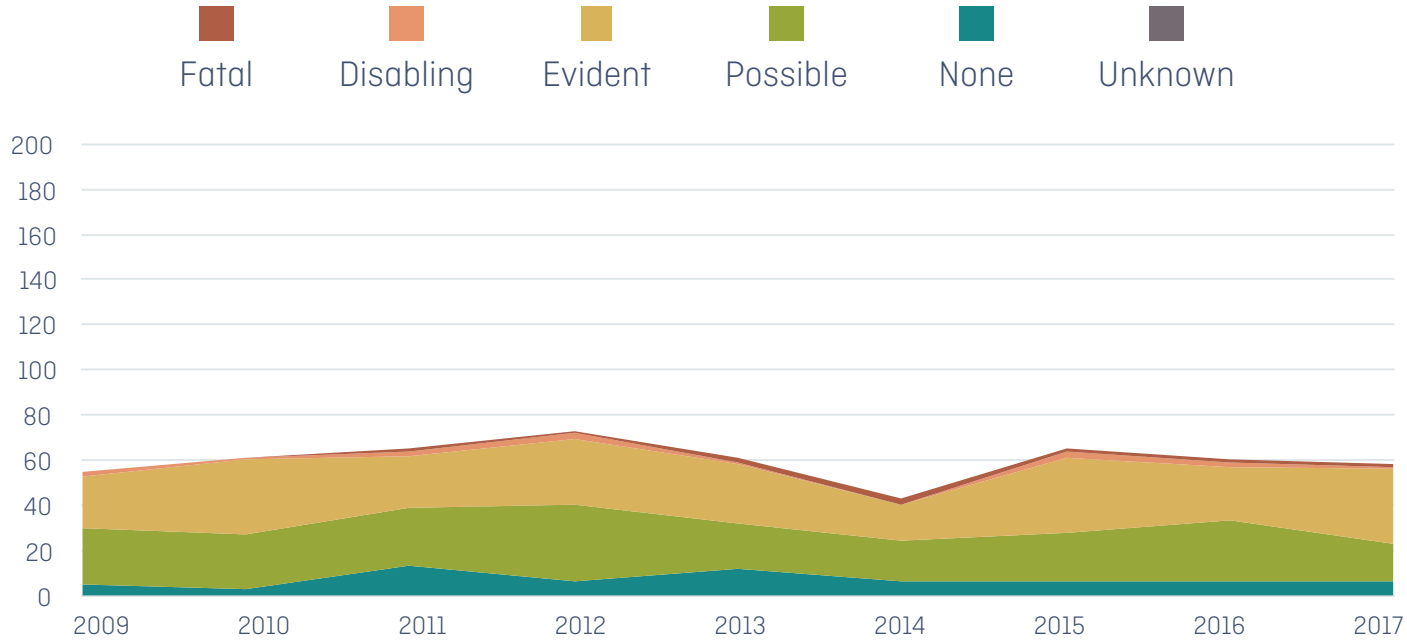


Pedestrian crashes in the DCHC region have been increasing over time. Crashes with "evident" or "possible" injuries make up the largest portion of pedestrian-related crashes between 2009 and 2017.

Bicycle crashes fluctuate slightly from year to year

Total bicycle crashes in Durham County generally ranged from 22 to 28, except for 2016 when they increased from 25 the previous year to a total of 40. Total annual bicycle crashes in Orange County fluctuated greatly from 2013 to 2017, ranging from nine in 2014 to 27 in 2017, but generally trended upward. Chatham County had single digit bicycle crash totals every year from 2013 to 2017. The Town of Hillsborough had zero crashes every year from 2013 to 2017 except for 2016, when the total was two. Fluctuations from year to year in bicycle crash totals indicate relatively isolated events that contribute to higher totals in certain years.

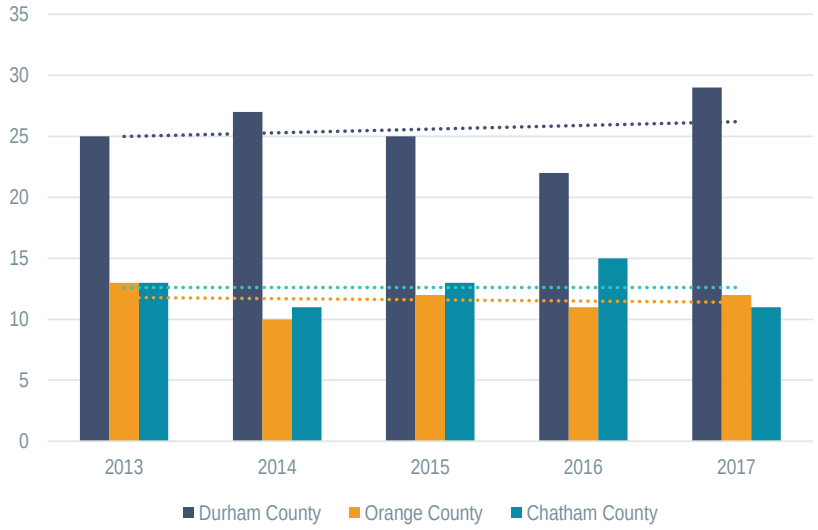
Bicycle Crashes in the DCHC Region 2009-2017



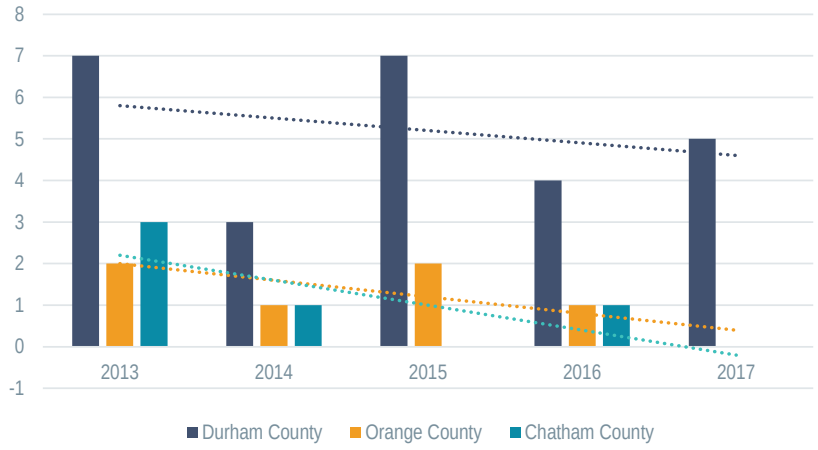
Relatively few bicycle crashes in the region result in fatalities or disabling injuries. Crashes resulting in "evident" or "possible" injuries make up the largest portion of regional bicycle crashes.

Fatalities

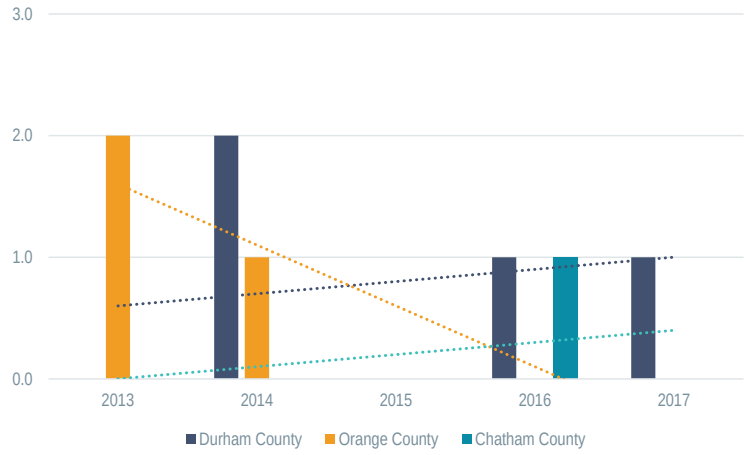
Total Vehicular Fatalities by County 2013-2017



Total Pedestrian Fatalities by County 2013-2017



Total Bicycle Fatalities by County 2013-2017



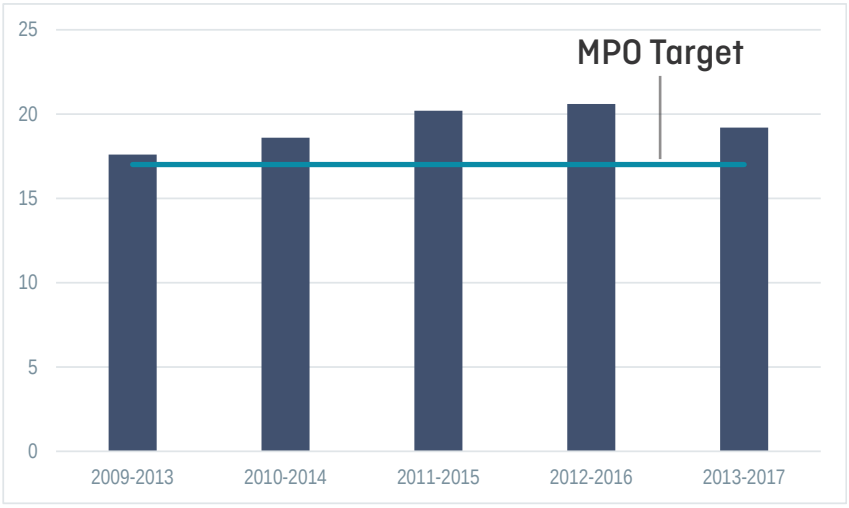
- Vehicular fatalities between 2013 to 2017 have generally remained steady in Orange and Chatham Counties but have increased in Durham County during the same time period.
- Pedestrian fatalities between 2013 to 2017 have been decreasing overall in all three counties.
- Bicycle fatalities decreased in Orange County between 2013 to 2017. Bicycle fatalities increased in both Durham and Chatham Counties during the same time period.

METRICS

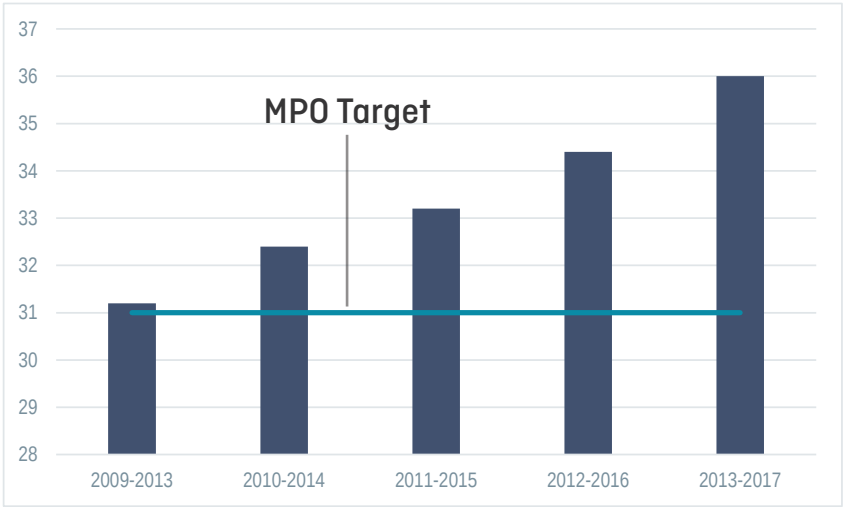
Fatalities and Serious Injuries

- The five-year averages for non-motorized fatalities and serious injuries in the DCHC region have remained fairly constant since 2009.
- Motorized fatalities and serious injuries have been increasing during the same time period for the DCHC region.

Non-motorized Fatalities and Serious Injuries (5-year averages)

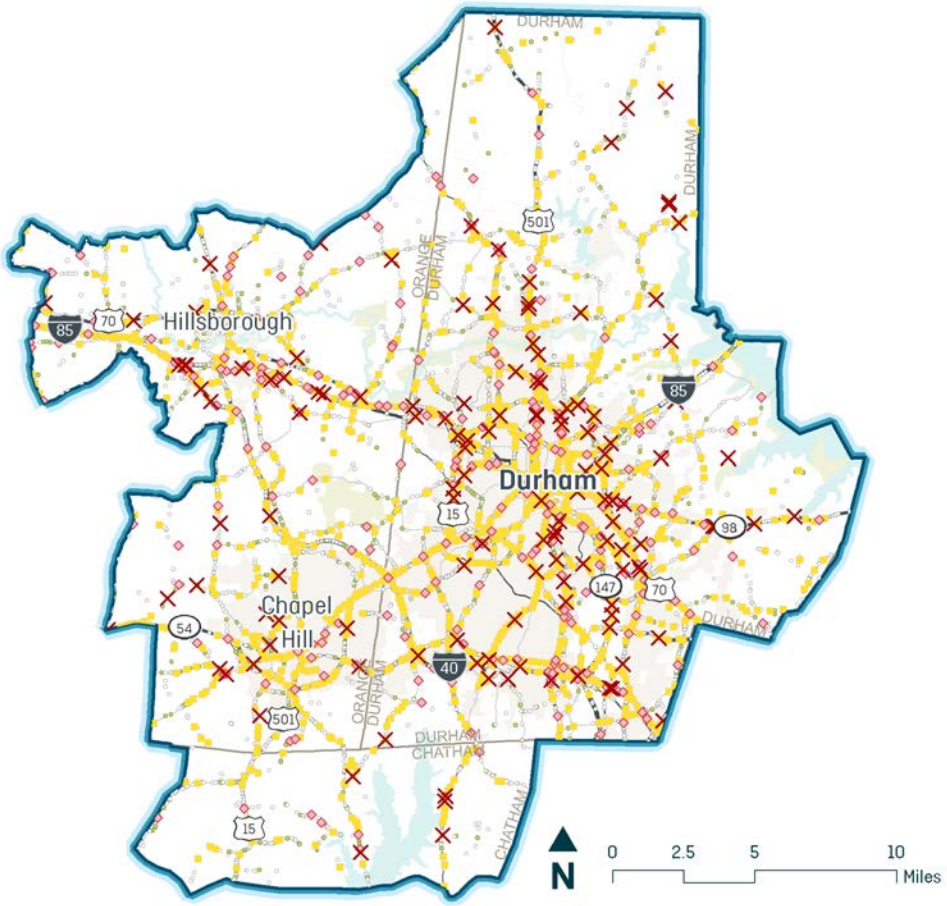


Motorized Fatalities and Serious Injuries (5-year averages)



Vehicular Crashes

Vehicular Crash Location and Severity in the DCHC Region 2013-2017



SAFETY

Crash Locations 2013 to 2017

Severity

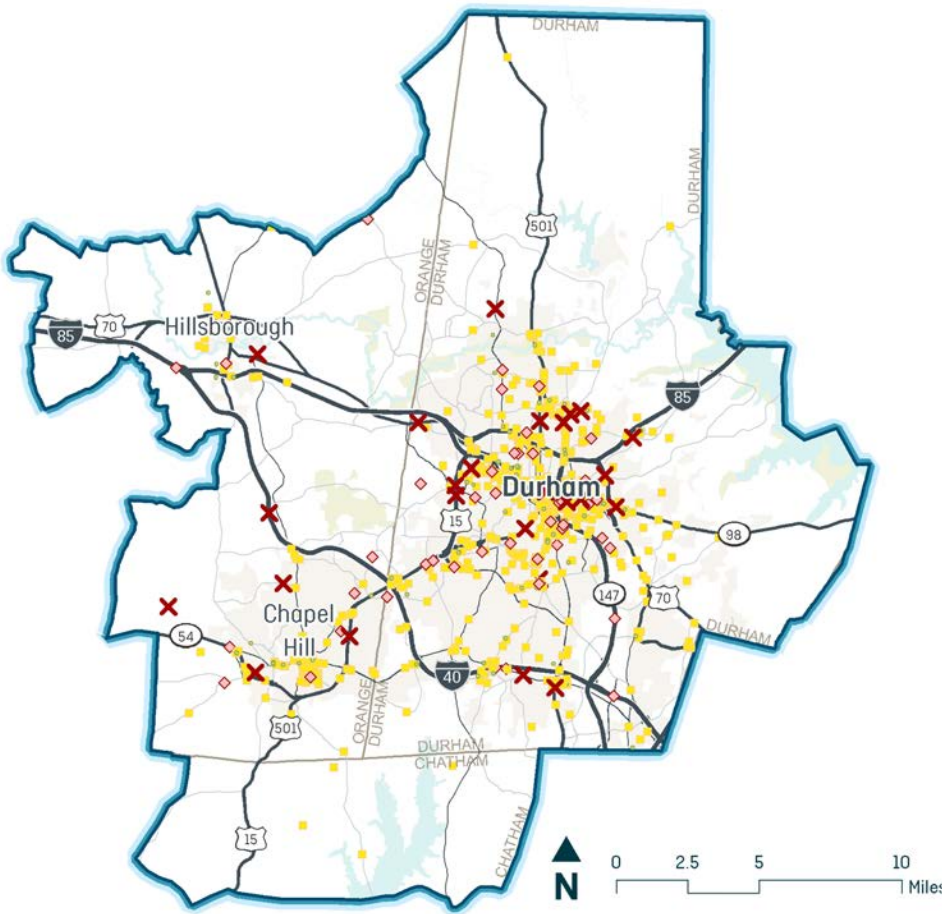
- Fatality
- Serious Injury
- Evident Injury
- Possible Injury
- Property Damage Only or Unknown

- 15,310 crashes occurred in the DCHC region in 2017.
- Nearly 80 percent resulted in no or unknown injuries.
- Crashes resulting in disabling injuries or death made up less than one percent.
- Roadways in downtown Durham had the highest rates of accidents per vehicle miles traveled.
- Fatal vehicular crashes in the DCHC region generally occur along the region's main arterials and interstates and surrounding the urban core. Allowed speed on these roadways is higher likely accounting for the increased likelihood of fatal injuries.

Pedestrian Crashes

- 841 pedestrian crashes occurred between 2013 and 2017.
- 734 crashes (87 percent) resulted in disabling injuries.
- 31 crashes (four percent) resulted in fatalities.
- Pedestrian crashes have increased since 2013; the number resulting in fatalities or disabling injuries has remained consistent.
- Pedestrian crashes tend to be less severe during the day than at night, on low speed limit roads than on high speed limit roads, and in paths without cars than shared with cars.
- Pedestrian and bicycle crashes are concentrated in Durham and Chapel Hill; this may be due to higher pedestrian and bicycle volumes in those areas.

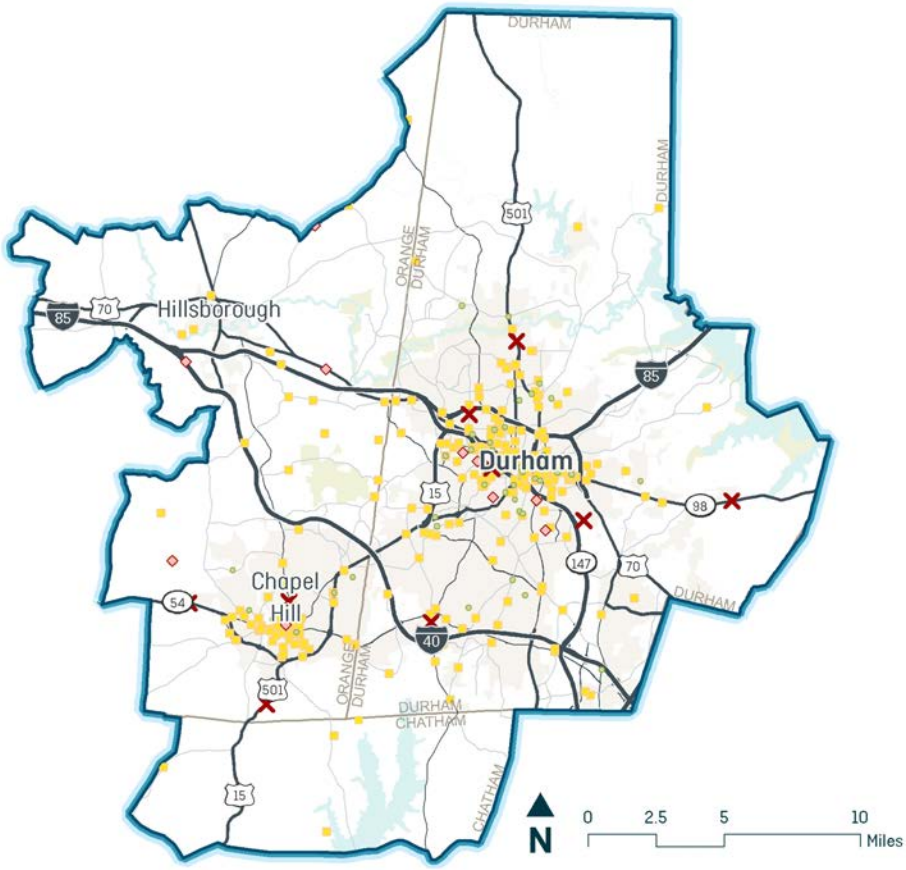
Pedestrian Crash Location and Severity in the DCHC Region 2013-2017



SAFETY
Pedestrian crashes (2013 - 2017)
Severity
- Fatality
- Serious Injury
- Other Injury
- No Injury

Bicycle Crashes

Bicycle Crash Location and Severity in the DCHC Region 2013-2017



SAFETY
Bicycle crashes (2013 - 2017)
Severity
- Fatality
- Serious Injury
- Other Injury
- No Injury

- 287 bicycle crashes occurred between 2013 and 2017.
- 243 crashes (85 percent resulted in injuries; seven (two percent) resulted in disabling injuries.
- Eight crashes (three percent) resulted in fatalities.
- Total bicycle crashes in the region have remained roughly constant since 2013 (except for a notable drop in 2014); the number resulting in fatalities or disabling injuries has stayed about the same as well.
- Pedestrian and bicycle crashes are concentrated in Durham and Chapel Hill; this may be due to higher pedestrian and bicycle volumes in those areas.
- Although 49 percent of bicycle crashes occurred in downtown Durham, that area had a relatively low share of crashes resulting in disabling injuries and fatalities.

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