

Future Scenario: Smart Mobility Hubs (MHUB)

PURPOSE

Plan for developing smart mobility hubs to serve first- and last-mile trips

LAND USE AND TRANSPORTATION PLANNING ASSUMPTIONS¹

- > Identified thirteen potential smart mobility hub locations around the edges of the region
- > Assumed 50 percent additional growth in household, office and retail uses within one and half-mile band of each MHUB location
- > Adjusted projected growth in non-station and non-MHUB areas to stay within the 2045 socio-economic forecasts
- > Assumed high frequency premium transit service to connect MHUBs with downtown Raleigh and the RTP

OUTLOOK AND PERFORMANCE MEASURES²

- > Supports travel behavior shifts due to advent of Transportation Network Companies (TNCs), Connected and Autonomous Vehicles (CAVs) and shared mobility trends
- > Improves traffic congestion for the major commuter corridors in the region
- > Shows positive results on several Benefit-Cost Analysis (BCA) measures including vehicle operating costs, surface water, safety, physical activity, and accessibility
- > Estimated to require additional transit investments in the range of \$5-\$10 million per year
- > Will require planning to define scope, scale and character of each MHUB in the region
- > Will require deployment of smart technology systems for safety, security, and real-time traveler information

PERFORMANCE MEASURES FOR MHUB SCENARIO

● POSITIVE CHANGE ● NEGATIVE CHANGE ● NEUTRAL/MIXED CHANGE

TRAFFIC CONGESTION: Max VOC³ is expected to remain mostly below 1.3 for major commuter corridors, with exceptions as illustrated on the corridors map above

TRAVEL SPEED: Freeway travel condition is expected to remain the same at 51.8 mph. However, arterial travel condition is expected to improve slightly by 0.1%, from 35.6 mph to 35.7 mph

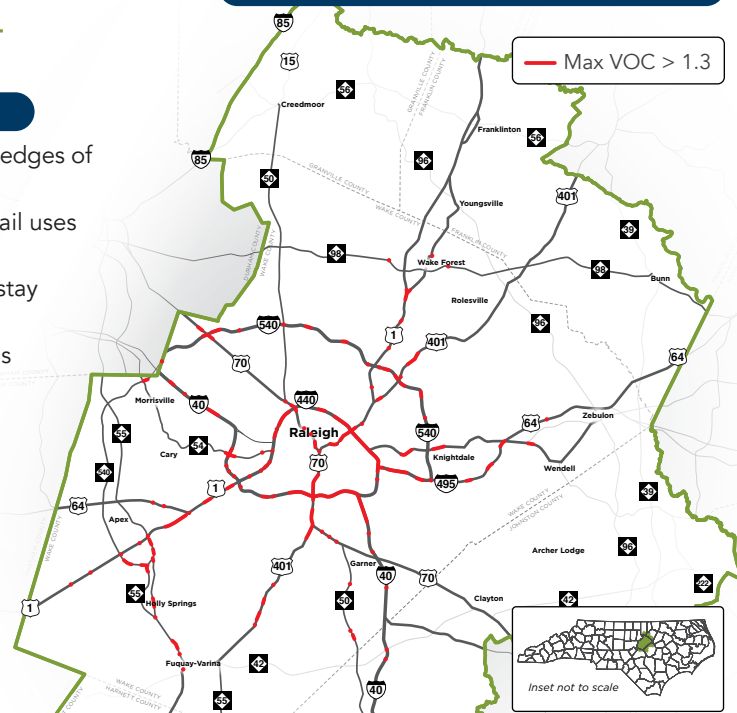
MODE SHARE: Drive Alone trips is anticipated to reduce slightly by 0.1%, or 5,000 less car trips every weekday

TRANSIT RIDERSHIP: Ridership is expected to increase by 2%, or 4,700 new riders every weekday

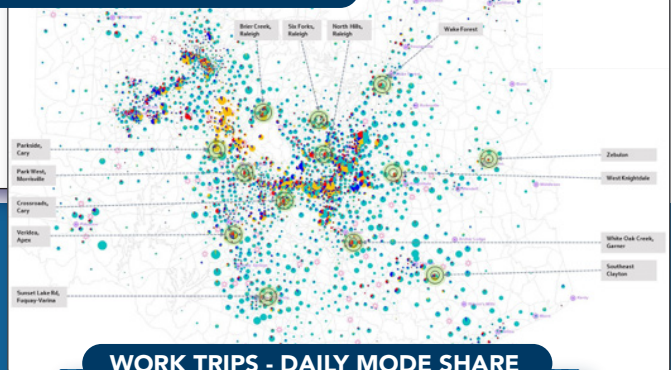
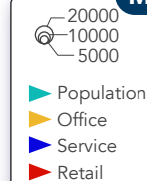
TRAVEL TIME AND RELIABILITY: Expected to remain mostly neutral for the region, but somewhat worsens for the Southeast Wake and Northwest Johnston County areas

SAFETY, PHYSICAL ACTIVITY AND ACCESSIBILITY: Expected to have net BCA gains in safety, physical activity and accessibility measures region

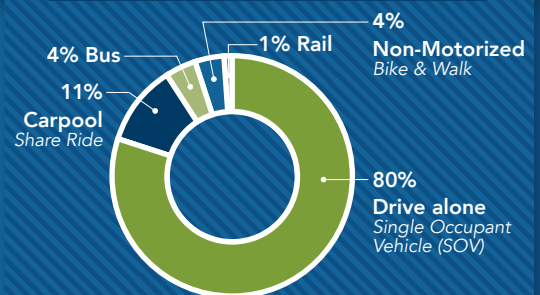
STUDY AREA COMMUTER CORRIDORS



MHUB GROWTH PROJECTIONS



WORK TRIPS - DAILY MODE SHARE



MHUB OUTCOME: This scenario was deemed realistic and feasible, and has the potential to curb future traffic congestion in the region.

ABOUT THE STUDY

The Commuter Corridors Study was initiated in December of 2018 by the Capital Area Metropolitan Planning Organization (CAMPO), in cooperation with the North Carolina Department of Transportation (NCDOT). The purpose of the study was to understand the underlying causes of traffic congestion along major commuter corridors in the region, explore the emerging growth and mobility trends, and test hypothetical future scenarios in terms of their impacts on mobility, safety, accessibility, and the environment.

As can be seen in the forecast map shown here, all interstates and highways in the region are projected to have some level of traffic congestion in the future. Traffic volumes are anticipated to exceed capacity for these roadways by year 2045. This congestion forecast is based on the region's growth projections of two million people, one million jobs, and nine million trips. These growth projections were adopted as part of the region's 2045 Metropolitan Transportation Plan (MTP). These commuter corridors serve as the economic backbone of the region as they connect the City of Raleigh's employment centers with the commercial centers, educational institutions, medical facilities, logistics centers, and suburban communities in Wake and several neighboring Counties (i.e., Durham, Chatham, Harnett, Johnston, Nash, Franklin, and Granville) as well as the Research Triangle Park (RTP). This observation led to the question:

Why is there so much red in the map despite approved plans¹ for significant roadway and transit investments?

This led to the launch of the **Commuter Corridors Study**.

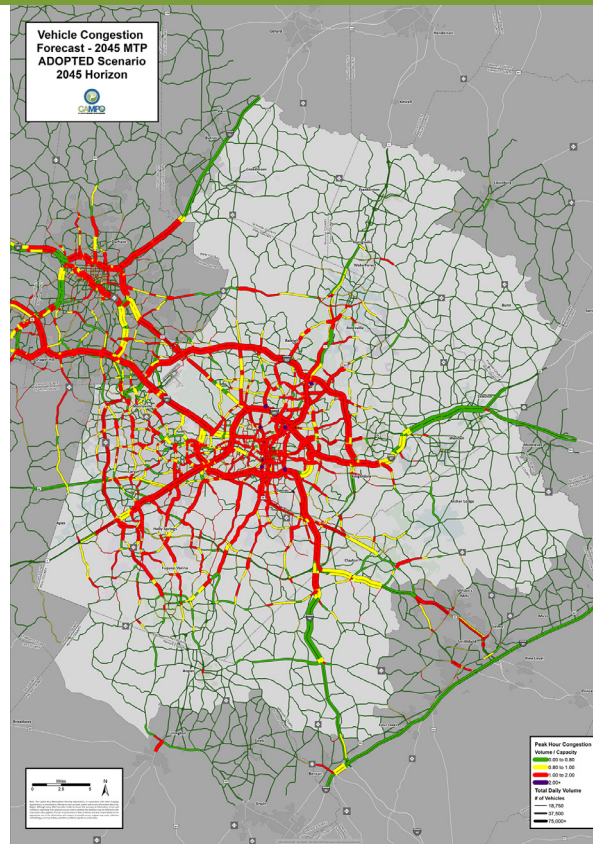
STUDY PROCESS AND SCOPE

The study involved a consultant team from Baseline Mobility Group and Resource Systems Group, and a technical steering committee that consisted of several CAMPO member and partner agencies. The technical steering committee guided the development and analysis of future scenarios. This included a broad-based scenario planning approach where realistic as well as unrealistic/hypothetical scenarios could be tested.

The study area included four Interstates, seven U.S. Highways, and six N.C. highways for a total of 17 corridors, listed below.

- Interstates: I-40, I-440, I-87, I-540
- U.S. Highways: US 1, US 1 Alt., US 64 Bus, US 70, US 70 Bus, US 401
- NC Highways: NC 55, NC 55 Bypass, NC 540, NC 50, NC 54, and NC 98

A total of six scenarios were developed and analyzed by the consultant team using a combination of land use, travel demand and benefit-cost analysis models². All six scenarios were developed by pivoting from the socio-economic projections that are embedded in the 2045 MTP.



TECHNICAL STEERING COMMITTEE MEMBERS

NCDOT | City of Raleigh | GoRaleigh | GoTriangle
NCSU - Institute for Transportation Research and Education (ITRE)
Triangle J Council of Governments (TJCOG)
Town of Clayton | Durham-Chapel Hill-Carrboro (DCHC) MPO

FUTURE LAND USE-TRANSPORTATION SCENARIOS

HWYX – Highway Mega Expansion: This scenario hypothetically assumed doubling of the number of General-Purpose lanes along congested commuter corridor segments in the CAMPO region including I-40, I-440, I-540, US 1, US 64, US 70, and US 401. **> OUTCOME:** This scenario was deemed unrealistic and infeasible due to huge costs and community impacts, so it was excluded from the list of final scenarios modeled.

TOLL3 – Congestion Pricing - Dynamic Tolling: This scenario was intended to capture the emerging trend of applying tolls to ease traffic congestion in urban areas. The study assumed dynamic pricing, meaning the price fluctuates in real-time, during peak periods along the region's freeway corridors. It was also assumed that the peak toll pricing is only applicable to Single-Occupant Vehicles (SOVs) and trucks, but not to High-Occupancy Vehicles (HOVs) and buses.

> OUTCOME: This scenario was deemed feasible for some corridors such as I-40 and I-540 where we looked at tolling on managed lanes only, but was considered very difficult for the I-440 corridor where we looked at tolling all lanes of travel due to right-of-way restrictions and community impacts.

ETOD – Equitable Transit-Oriented Development: This scenario is a transit-emphasis scenario. It was assumed that more of the anticipated future growth can be redirected towards station areas through supportive zoning policies and other incentives. The study assumed 50 percent additional growth in affordable multi-family, office and retail uses within half-mile of each planned transit station in the region, and 100 percent increase in transit frequency for future transit routes in the region. **> OUTCOME:** This scenario was deemed realistic and feasible, and has the potential to curb future traffic congestion in the region.

RESY – Regional Resiliency: This scenario was intended to illustrate the importance of resiliency planning for traffic disruptions due to extreme weather events. The study assumed 50 percent reduction in the number of available lanes at several commuter corridor segments that were deemed to be vulnerable to flooding in an extreme weather event. **> OUTCOME:** This scenario was deemed necessary for resiliency planning. Potential negative impacts could worsen if adequate roadway connectivity is not built into the commuter corridors.

GIG – Gig Economy of Mobile Workers: This scenario was intended to capture the emerging socio-economic trend where an increasing number of people work from home due to the growth of mobile (telecommuting), part-time, and independent workers. Guided by national estimates, the study assumed 25 percent reduction in work-related commute trips for medium-income and high-income households. **> OUTCOME:** This scenario was deemed realistic based on current trend. It has the potential to curb freeway traffic congestion during regular commuting hours, but may cause negative impacts to off-peak travel conditions or on local arterials.

MHUB – Smart Mobility Hubs: This scenario was intended to capture the new mobility trend of using shared ride services for first-mile and last-mile trips. The study identified 13 future mixed-use center locations around the edges of the region as hypothetical future smart mobility hubs. This scenario also assumed 50 percent additional growth in household, office and retail uses within one and one half-mile band of each of the identified mobility hubs, along with high frequency premium transit service during commuting hours to connect each mobility hub with downtown Raleigh and the Research Triangle Park (RTP).

> OUTCOME: This scenario was deemed realistic and feasible based on current trends, and has the potential to curb future traffic congestion in the region.

¹Statewide Transportation Improvement Program (STIP); 2045 Metropolitan Transportation Improvement Program (MTIP) / ²The land use model used in the study is the region's CommunityViz model, the travel demand model used is the Triangle Regional Model (TRM), and the benefit cost model used is the FHWA's Benefit Cost Analysis (BCA) Tool.