6. Analyzing Our Choices

This section explains what we did to better understand the choices facing our region, develop population and employment growth forecasts that reflect market trends and community plans, create and test alternative transportation scenarios, and compare these alternatives to one another and to performance measures that reflect the MPO's adopted goals and objectives.

6.1 Land Use Plans and Policies

Each community in the Triangle develops a comprehensive plan to outline its vision for the future and set policies for how it will guide future development to support that vision. So an important starting point for transportation plans is to understand these plans and reflect them in the future growth forecasts used to analyze transportation choices.

Local planners from communities throughout the region, along with experts in fields such as real estate development and utility provision, were brought together to translate community plans and market trends into the parameters used by the region's transportation model to generate travel forecasts: population and jobs by industry (see Section 5.3 for a more detailed explanation of the transportation model). To make sure the forecasts were consistent, transparent and based on the best available evidence, the region used sophisticated growth allocation software, called CommunityViz, to guide the forecasting effort.

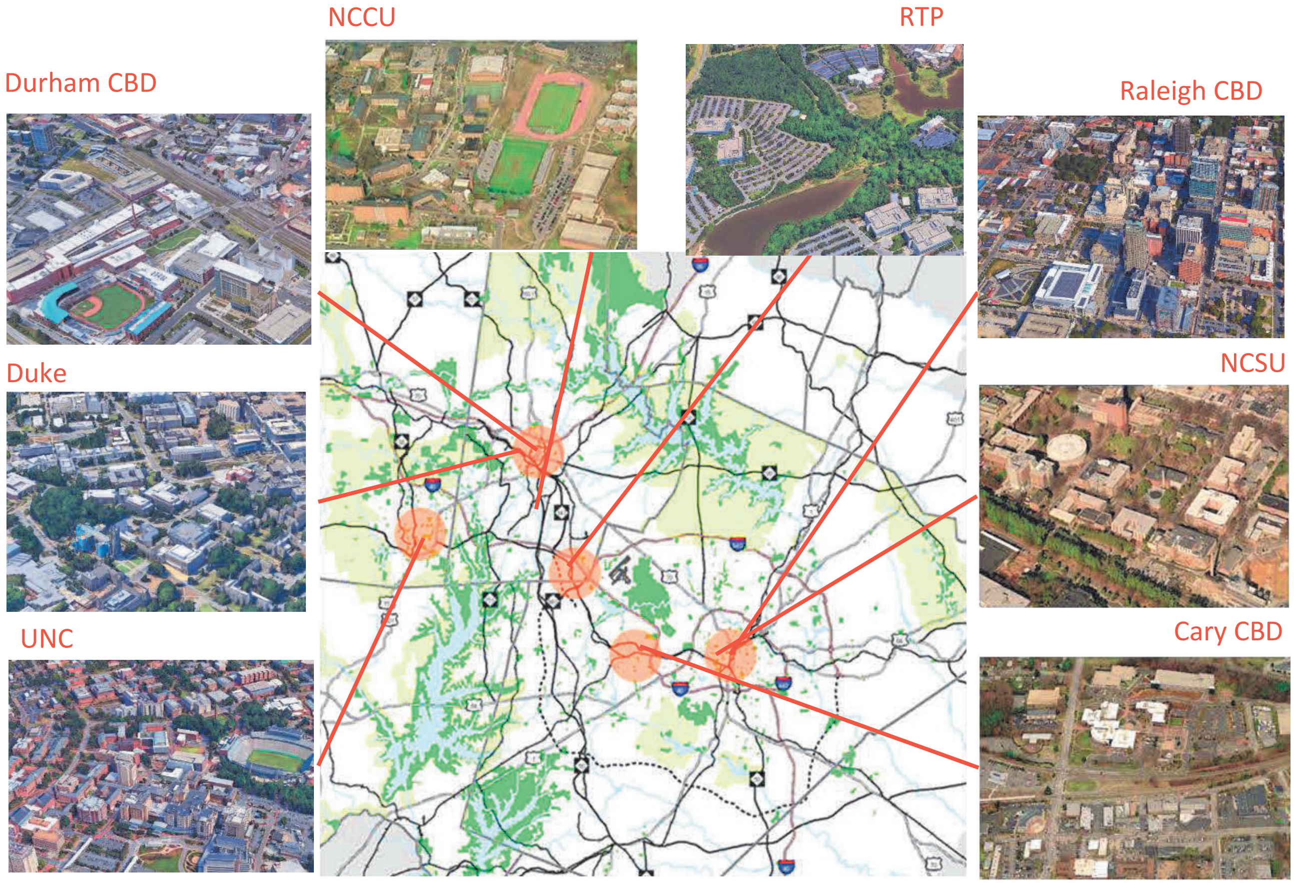
The land use plans revealed that five regional-scale centers, depicted in Figure 6.1.1 are expected to contain large concentrations of employment and/or intense mixes of homes, workplaces, shops, medical centers, higher education institutions, visitor destinations and entertainment venues:

- Central Raleigh, including NC State University;
- Central Durham, including Duke University, North Carolina Central University and the Duke and Veterans Administration medical complexes;
- Central Chapel Hill & Carrboro, including UNC-Chapel Hill and UNC Hospitals;
- The Research Triangle Park; and
- Central Cary.

Linking these regional centers to one another, and connecting them with communities throughout the region by a variety of travel modes can afford expanded opportunities for people to have choices about where they live, work, learn and play.

In some cases, such as in central Cary, Durham and Chapel Hill & Carrboro, existing plans and the ordinances that implement the plans promote increased development of the activity centers. In addition, the Research Triangle Park recently adopted a new master plan that is designed to lead to more compact, mixed use development in selected locations, including a new Park Center in the heart of the RTP.

In addition to these regional centers, the review of community plans identified areas of the region that are most environmentally sensitive, including water supply watersheds, and places where existing neighborhoods warrant protection. Understanding the unique roles that different areas and different communities will play in the region as it grows established the framework for forecasting growth and designing transportation choices to serve this growth.



6.2 Socio-economic Forecasts

One of the initial critical steps in developing a Metropolitan Transportation Plan is to forecast the amount, type and location of population and jobs for the time frame of the plan. Based on community plans and data from local planning departments, the Office of State Budget and Management, the US Census Bureau and independent forecasters, estimates of “base year” (2013) and “plan year” (2045) population and jobs were developed by local planners for each of the 2,800 small zones (called Traffic Analysis Zones or TAZs) that make up the area covered by the region’s transportation model, called the Forecast Area.

Both to track and document the socioeconomic forecasts, and to permit analysis of different development scenarios, a robust land use mapping and analysis tool was used to account for the more than 700,000 individual parcels of land in the region. Using software called “CommunityViz,” each parcel was assigned one of 37 “place types” by local planners reflecting the kind of development anticipated by community plans, such as office building, retail center, mixed use development, single family home or apartment complex. In addition, each parcel was assigned a development status to indicate whether it was vacant, already fully developed, or partially developed or redevelopable. Depending on both the place type and the specific jurisdiction in which a parcel is located, average residential and employment densities were applied to determine the supply available to accept additional residential or commercial development.

Any constraints to development, such as water bodies, floodplains, stream buffers, or conservation easements were assigned to applicable parcels. The combination of place type, development status and development constraints established the “supply” side of the CommunityViz growth allocation model. Special attention was given to anchor institutions, such as the major universities and the RDU Airport. Future growth in these areas was based on meetings with and data from the people at these institutions involved in facility planning and construction.

Panels of experts were convened to help determine the principal influences on where future development would occur, and to develop quantitative measures, called "suitability factors," that could be applied to the parcels based on these influences. Examples of factors that influence development include availability of sewer service, proximity to highway interchanges or transit stations, and distances to major economic centers like the region's universities.

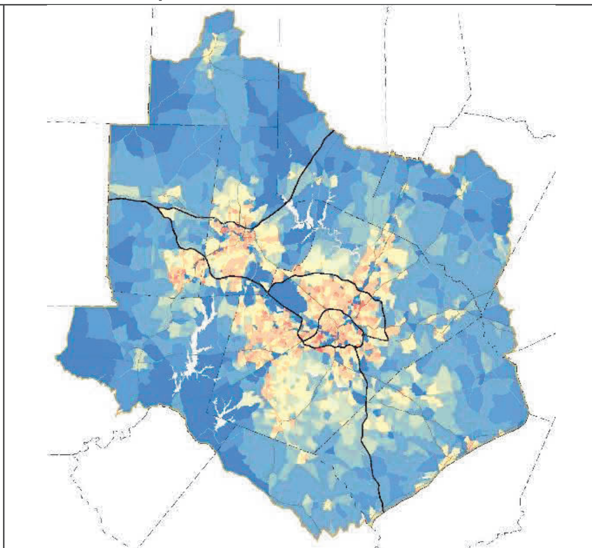
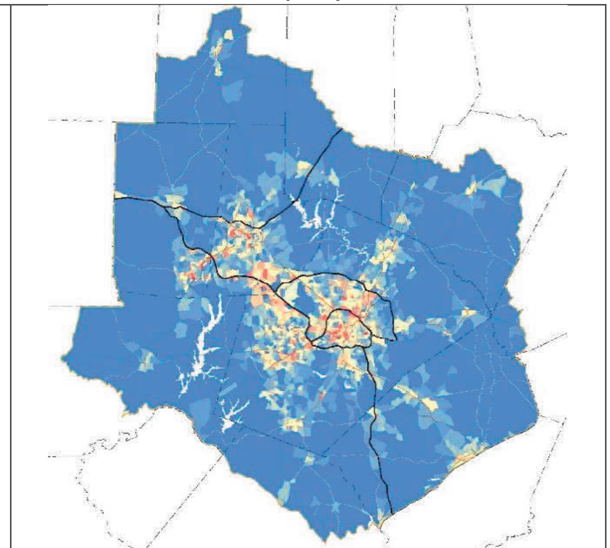
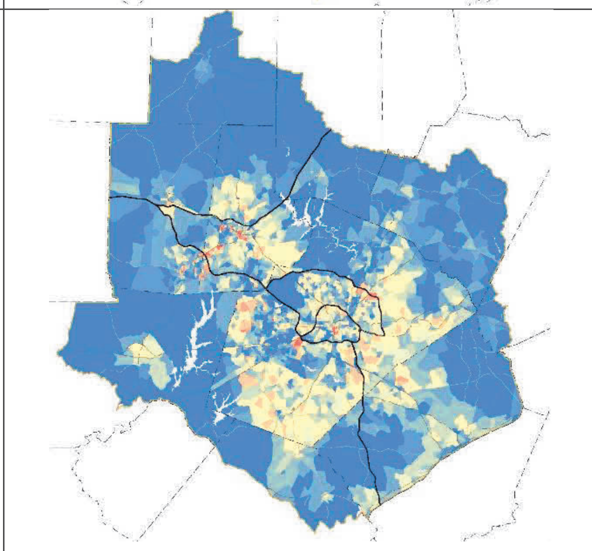
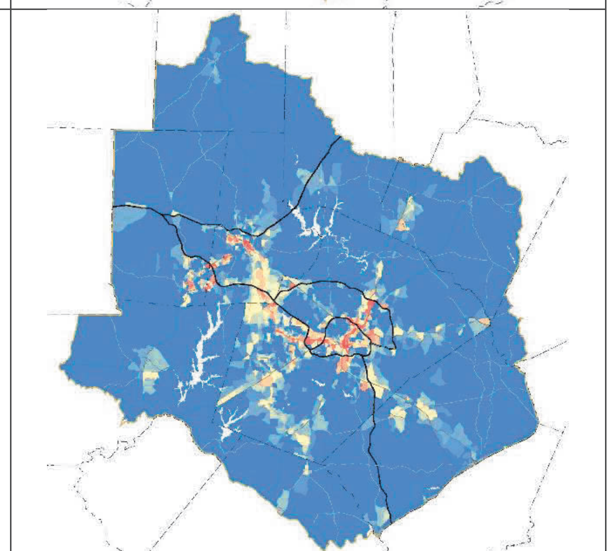
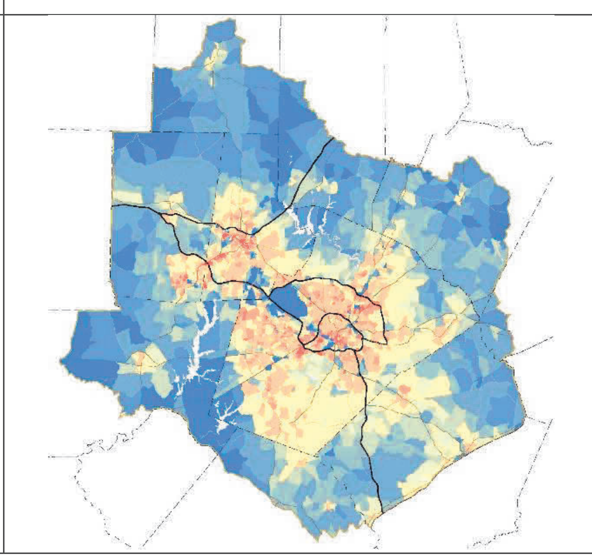
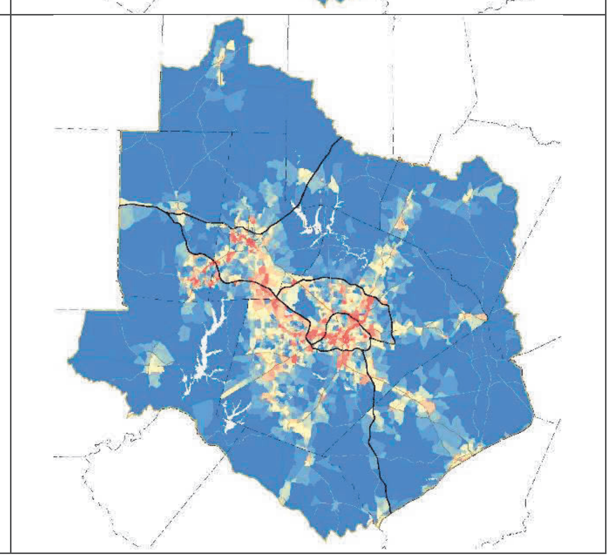
Finally, a set of population and job control totals were developed from state and national demographic sources to establish the "demand side" of the model. These guide totals are available online at this link: http://bit.ly/2AN8Qri. CommunityViz was used to allocate single family housing units, multi-family housing units and jobs based on the available supply and the attractiveness of each parcel based on the suitability factors.

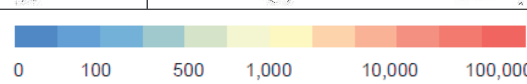
Figure 6.2.1 summarizes the major elements of the socioeconomic forecasts for different portions of the Forecast Area covered by the region's transportation model, both the areas within the MPO boundaries and areas beyond the MPO boundaries (refer to Figure 2.2.3 for a map of the MPOs and the modeled area). More detailed information on a range of socioeconomic data for each TAZ is available from the Capital Area MPO and the Durham-Chapel Hill-Carrboro MPO and in documents available from the Triangle J Council of Governments describing the application of the CommunityViz model and its 2045 MTP results.

Figure 6.2.1 Estimated 2013 and Forecast 2045 Jobs, Population and Households (1)	2013			2045		
	Population	Households	Jobs	Population	Households	Jobs
Capital Area MPO	**1,117,162**	**435,008**	**537,515**	**2,033,698**	**778,320**	**1,003,486**
Franklin County (part)	40,320	15,275	6,575	70,414	26,935	15,582
Granville County (part)	19,555	7,408	3,416	31,800	11,904	4,936
Harnett County (part)	19,141	7,205	3,012	36,545	13,516	5,336
Johnston County (part)	97,380	35,170	18,546	179,180	64,636	38,151
Wake County	940,766	369,950	505,966	1,715,759	661,329	939,481
Durham-Chapel Hill-Carrboro MPO	**402,552**	**170,239**	**257,750**	**615,716**	**253,919**	**450,110**
Chatham County (part)	20,732	9,147	3,644	27,988	11,938	3,820
Durham County	269,916	114,685	192,877	430,782	176,943	343,082
Orange County (part)	111,904	46,407	61,229	156,946	65,038	103,208
Areas outside MPO boundaries	**159,949**	**63,337**	**55,303**	**308,235**	**117,215**	**77,341**
Chatham County (part)	21,250	8,806	5,695	58,259	23,562	14,106
Franklin County (part)	11,912	4,919	6,418	14,802	6,119	6,868
Granville County (part)	10,646	4,118	4,957	13,931	5,331	7,101
Harnett County (part)	15,888	6,113	2,677	24,608	9,127	4,291
Johnston County (part)	47,731	18,168	22,294	137,006	49,156	29,021
Nash County (part)	4,075	1,531	300	5,784	2,164	409
Orange County (part)	16,508	6,699	2,983	19,130	7,706	3,865
Person County (part)	31,939	12,983	9,979	34,715	14,050	11,680
Total for forecast area	**1,679,663**	**668,584**	**850,568**	**2,957,649**	**1,149,454**	**1,530,937**

(1) These totals represent the values within the regional travel model's traffic analysis zones, and may differ from values derived using other sources and methods; note that population includes people who are not in households, such as university dormitory residents.

The maps below show the distribution of population and jobs within the Forecast Area for the 2013 "base year," the 2045 "horizon year" and for the growth from 2013 to 2045. Larger versions are available from the MPOs.

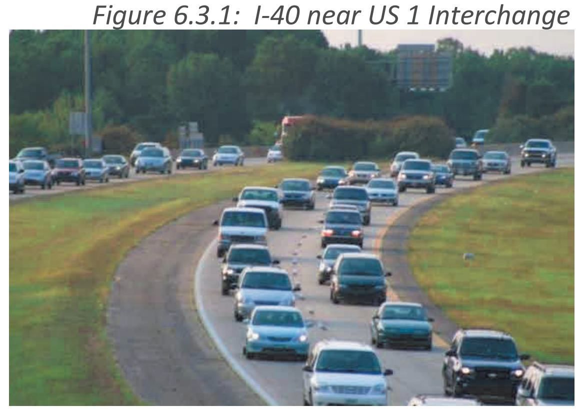
	Population	Employment
2013		
2013 to 2045 growth		
2045		

Population or Employment per square mile: 

6.3 Trends, Deficiencies, and Needs

With the large increases in people and jobs expected in the region over the 32-year period between 2013 and 2045, the amount of travel -- often measured in Vehicle Miles Traveled (VMT) -- in the Triangle is expected to similarly grow by over 80 percent. Future stress on the regional transportation network is exemplified by the levels of congestion predicted in 2045.

Figure 6.3.1: I-40 near US 1 Interchange



The congestion maps on the next page show the average volumes during the afternoon peak hour as predicted by the Triangle Regional Model. The 2013 "base year" Congestion Levels map indicates travel conditions in the year 2013, whereas the 2045 Deficiencies Map, or "Existing plus Committed" (E+C), forecasts travel conditions in the year 2045 using the current highway, transit and other transportation facilities and any facilities that are well on their way to being completed. This deficiencies network is often called the "no build" scenario, since it typically is the result of past decisions, not ones that still need to be made. This worst case scenario is not intended to represent an actual possible outcome. Rather, comparing E+C to the 2045 MTP network illustrates the inability of our committed transportation improvements to meet the growth in anticipated travel demand that is forecasted to occur during the useful life of these investments. In reality, as congestion and travel delay began to reach unacceptable levels, other contributing factors would begin to shift. Additionally, commute patterns will change as people begin to make different travel decisions.

The third map is the 2045 MTP congestion map, showing levels of congestion if we provide all the transportation facilities and services included in the Metropolitan Transportation Plans.

The maps presented on the following pages provide a picture of the challenge we face in developing realistic transportation investments that meet the diverse needs of our communities. Larger versions of these maps are available on the MPOs' web sites. In addition, the MPO web sites have many other maps and tables that present the results of the Deficiency Analysis.

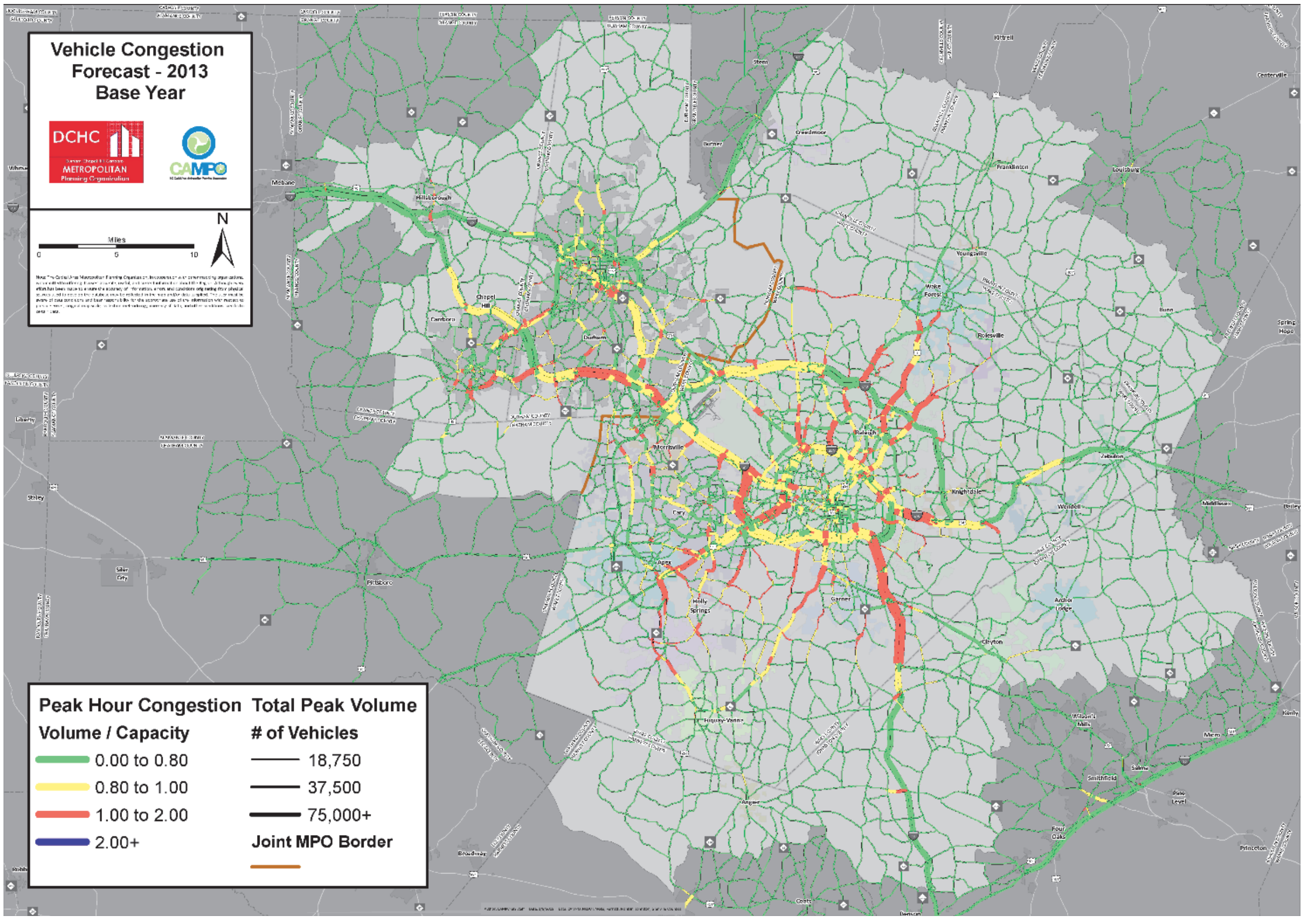
Trip Volumes and Capacity

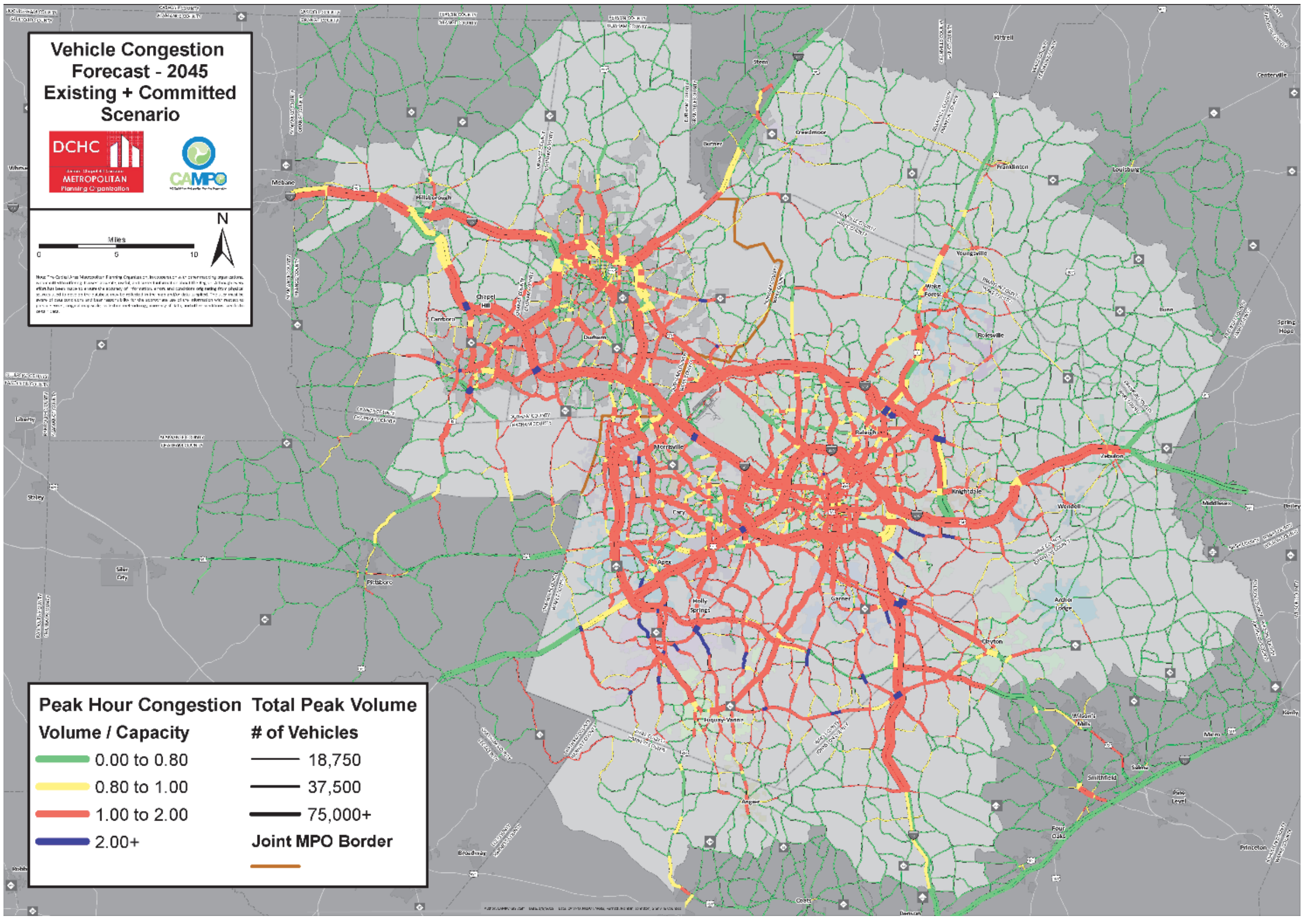
The roadway networks shown on the next page are simplified representations taken from the region's travel model. Thicker lines depict roadways with higher traffic volumes, thinner lines segments carrying lesser volumes. The colors correspond to Volume/Capacity ratios (this is the number of vehicles divided by the theoretical capacity of the road); greater Volume/Capacity ratios correspond with more congestion. A Volume/Capacity ratio below 0.8 (in **green**) is indicative of a relatively free flowing roadway with little or no congestion. Once the Volume/Capacity, or V/C ratio, rises towards 1.0, motorists will experience more periods of congestion. Volume/Capacity ratios greater than 1.0 (in **red**) represent roadways which are consistently congested throughout and beyond the peak hours of travel. The first map shows conditions in 2010. The 2045 E & C map shows that without significant new investments, chronic congestion will occur on major arterials and freeways throughout the region, and particularly within Wake County. The 2045 MTP map shows forecast conditions if we build and operate the facilities and services in this plan.

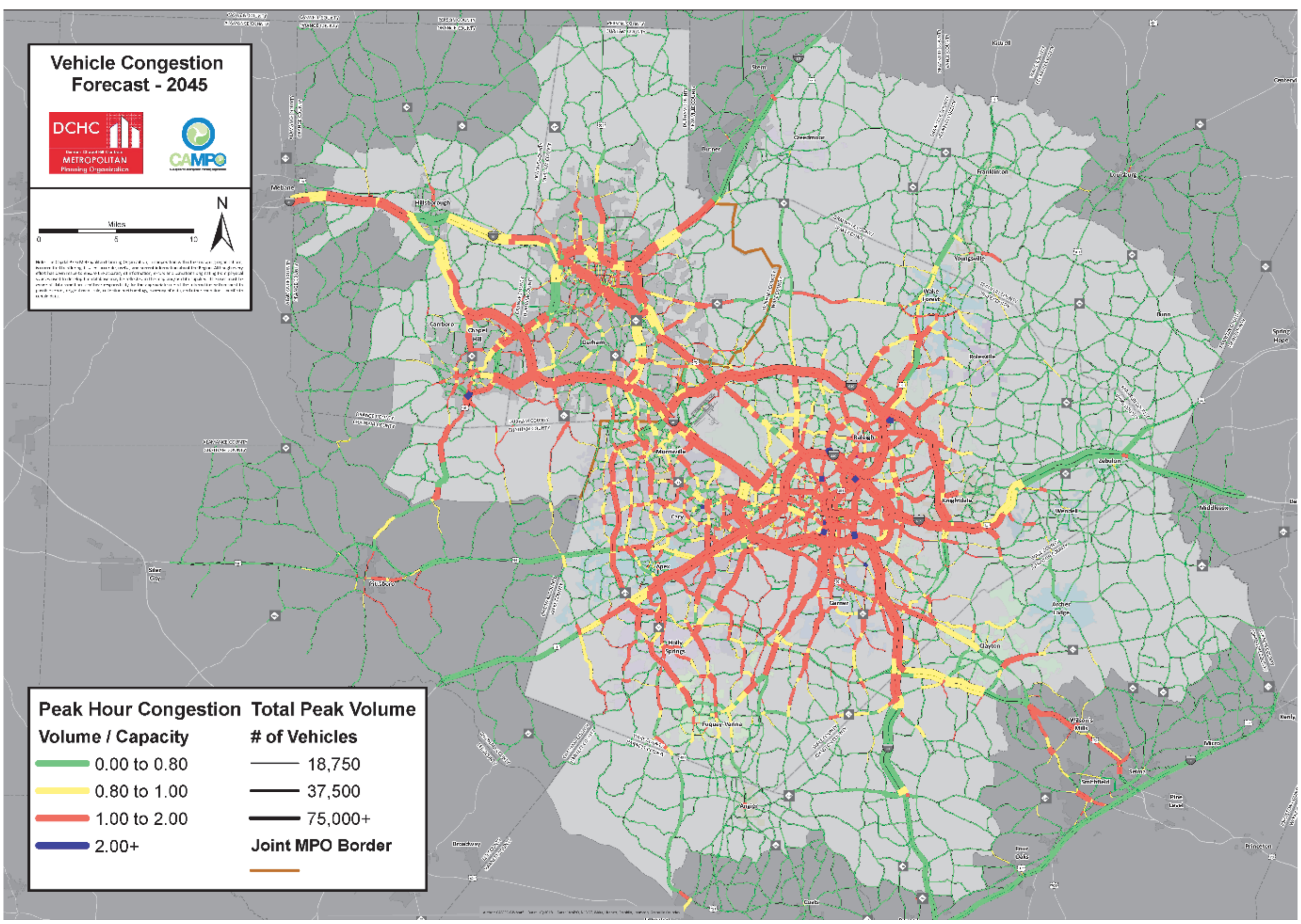
Travel Time

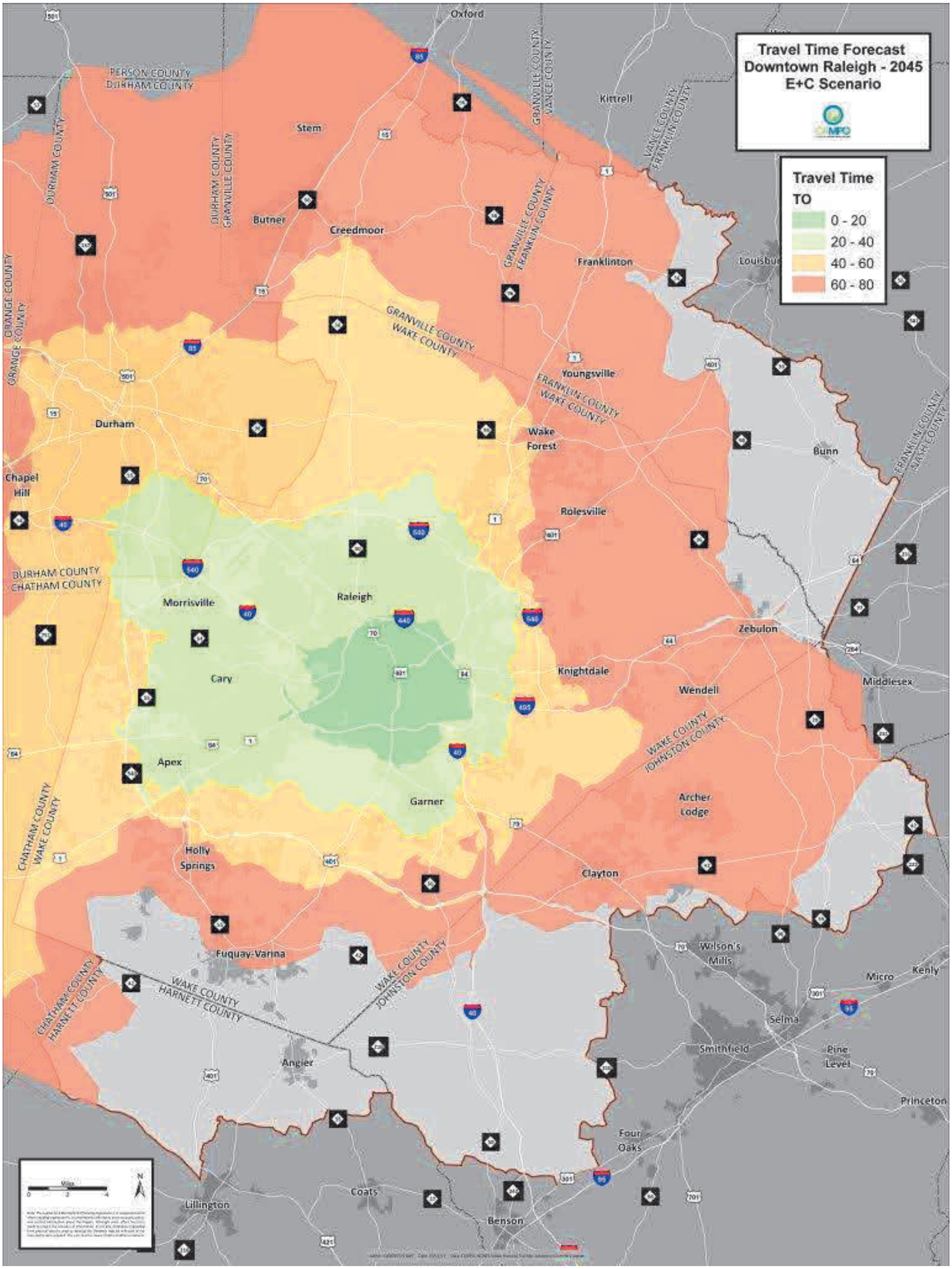
A more meaningful way to measure the effects of congestion to the average traveler is how it affects the time it takes to make a trip. Maps on the following pages illustrate these travel time effects in a number of ways.

The map at the lower right shows how average travel time in different zones changes between the road network that will be finished by 2013 and 2045 conditions. For example, if a zone has an average increase of four minutes, each trip in that zone in 2045 can expect to take an extra four minutes compared to today.




Vehicle Congestion Forecast - 2045 Existing + Committed Scenario
DCHC
METROPOLITAN
CAMPO
N
Miles
0
5
10
Peak Hour Congestion
Volume / Capacity
0.00 to 0.80
0.80 to 1.00
1.00 to 2.00
2.00+
Total Peak Volume
# of Vehicles
18,750
37,500
75,000+
Joint MPO Border


Vehicle Congestion Forecast - 2045
DCHC
METROPOLITAN
CAMPO
N
Miles
0
5
10
Peak Hour Congestion
Volume / Capacity
0.00 to 0.80
0.80 to 1.00
1.00 to 2.00
2.00+
Total Peak Volume
# of Vehicles
18,750
37,500
75,000+
Joint MPO Border

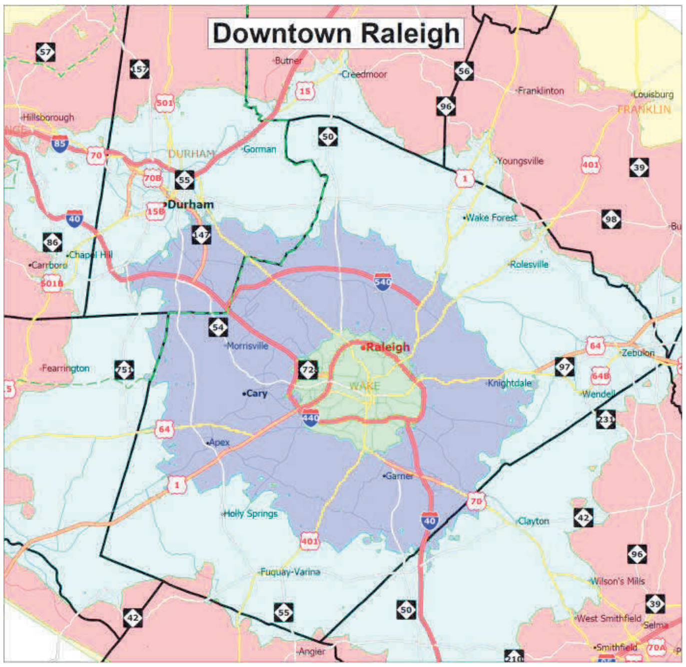

Travel Time Forecast
Downtown Raleigh - 2045
E+C Scenario
Travel Time
TO
0 - 20
20 - 40
40 - 60
60 - 80
Oxford
Stem
Kittrell
Butner
Creedmoor
Franklinton
Youngsville
Durham
Wake Forest
Chapel Hill
Rolesville
Morrisville
Raleigh
Zebulon
Cary
Knightdale
Wendell
Middlesex
Apex
Garner
Archer Lodge
Holly Springs
Clayton
Fuquay-Varina
Wilson's Mills
Micro
Kenly
Selma
Smithfield
Pine Level
Angier
Princeton
Four Oaks
Coats
Lillington
Benson
Bunn

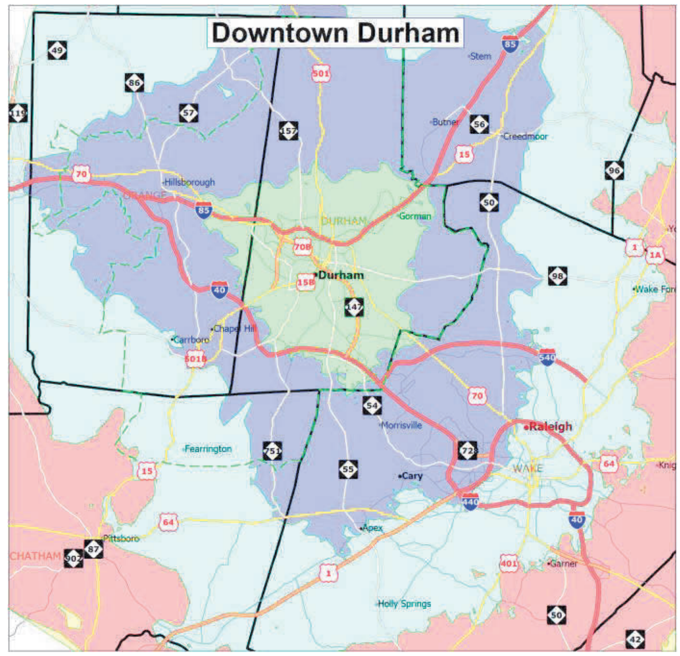
PM Peak Travel Time
(in Minutes)

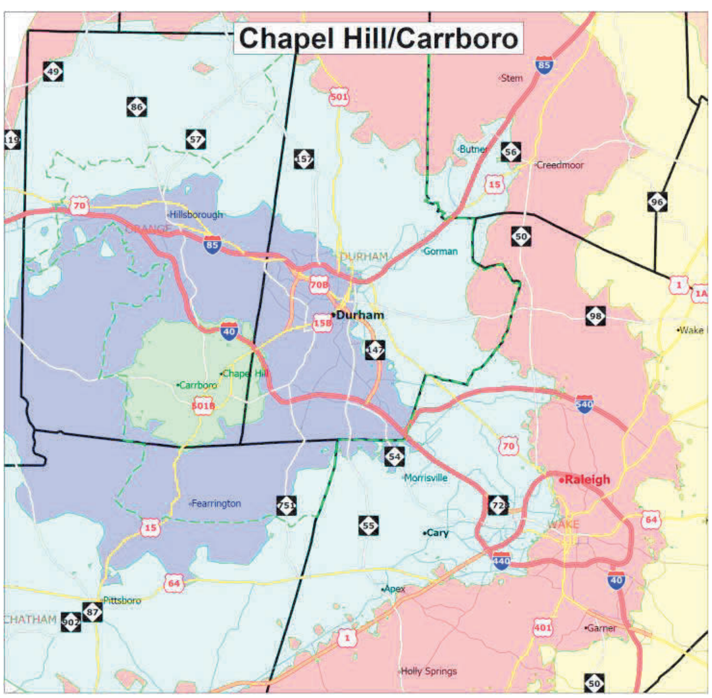
- 15
- 30
- 45
- 60
- 75
- 90

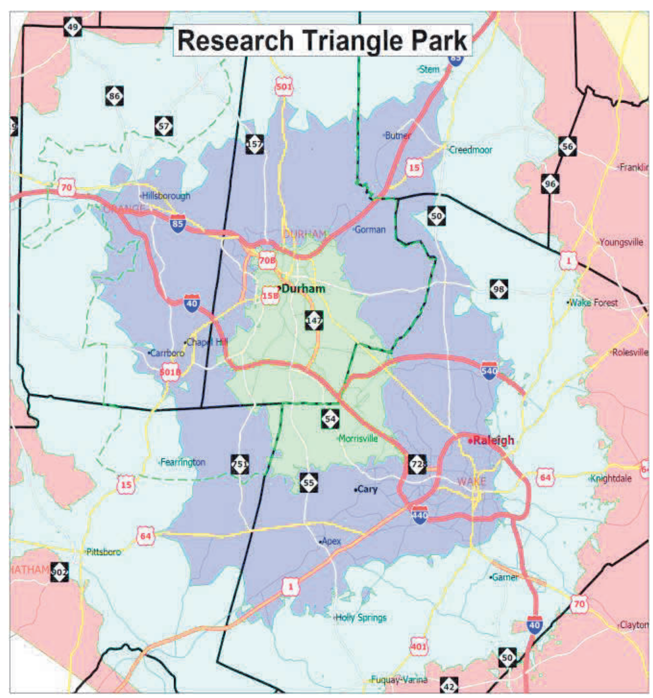
County Border

The maps below convey travel time impacts in a different way, showing how far a person could travel from a given location by motor vehicle in a given amount of time during a typical afternoon "rush hour" in the Year 2045. Each color band represents 15 minutes of travel time.









6.4 Alternatives Analysis

In order to address the expressed Goals and Objectives, CAMPO and DCHC MPO developed and evaluated several alternatives in the process to create the 2045 Metropolitan Transportation Plan (MTP). Each alternative was a combination of a transportation system, which includes a set of roadway, transit and other transportation improvements; and a land use scenario that distributes the forecasted population and employment for the Year 2045. These alternatives were run on the Triangle Regional Model (TRM) to produce a set of transportation performance measures that described how the transportation system will handle the travel demand generated by a particular population and employment distribution in the year 2045.

Performance measures, such as the level of roadway congestion, average travel time, and transit ridership, were used to evaluate and compare the various alternatives. No alternative in its entirety was advanced as the final adopted plan. The alternatives were designed to emphasize a particular mode in meeting the future travel demands so that the technical staff and public can understand how well that specific mode addresses travel demand and can choose various projects to create the final 2045 MTP. Figure 6.4.1 is a list of the combinations of transportation systems and land use that were used to create the Alternatives that were analyzed to develop the final 2045 MTP.

Figure 6.4.1 Alternatives Evaluated

#	Transportation System	Land Use Scenario
1	Constrained – Modest state and federal transit funding; current STI rail constraints remain; No increase in state or federal gas tax (declining revenues as efficiencies outpace growth); Wake County local option sales tax and funds per plan – additional projects beyond 10 years; STI-limited division tier road projects and ped-bike funding with no increase in historical local effort	By Right – Population and employment growth occurs based on current land use zoning or the equivalent.
2	Constrained – Modest state and federal transit funding; current STI rail constraints remain; No increase in state or federal gas tax (declining revenues as efficiencies outpace growth); Wake County local option sales tax and funds per plan – additional projects beyond 10 years; STI-limited division tier road projects and ped-bike funding with no increase in historical local effort	Community Plans – Population and employment growth occurs based on current land use plans.
3	Moderate – Restoration of original STI conditions with removal of rail constraints; No major change to state or federal gas tax or alternative, but assume FAST revenue trend; Wake County local option sales tax and funds per plan – additional projects beyond 10 years; Modest increase in local funding compared to historical trend	Community Plans – Population and employment growth occurs based on current land use plans.

#	Transportation System	Land Use Scenario
	Moderate – Restoration of original STI conditions with removal of rail constraints; No major change to state or federal gas tax or alternative, but assume FAST revenue trend; Wake County local option sales tax and funds per plan – additional projects beyond 10 years; Modest increase in local funding compared to historical trend	Anchor Institutions & Mainstays (AIM) - High – Population and employment growth based on current land use plans but incorporates development decisions of Anchor institutions (large "place-based" institutions with fixed locations that serve as major employment hubs and travel destinations) and Mainstays (key activity centers with the potential for significantly influencing mobility within the region).
4	Aspirational – More state/federal project success than local plans currently assume; Modest increase in federal or state revenues (e.g. based on higher investment states); STI refined to redefine statewide and regional projects for transit and remove constraints, while allowing more dollars for division tier roadways; Greater increase in local funding compared to historical record	Community Plans – Population and employment growth occurs based on current land use plans.
5	Aspirational – More state/federal project success than local plans currently assume; Modest increase in federal or state revenues (e.g. based on higher investment states); STI refined to redefine statewide and regional projects for transit and remove constraints, while allowing more dollars for division tier roadways; Greater increase in local funding compared to historical record	Anchor Institutions & Mainstays (AIM) - High – Population and employment growth based on current land use plans but incorporates development decisions of Anchor institutions (large "place-based" institutions with fixed locations that serve as major employment hubs and travel destinations) and Mainstays (key activity centers with the potential for significantly influencing mobility within the region).

The MPO staffs in conjunction with staff from the Triangle Regional Model Service Bureau worked together to create and run the model scenarios during the spring and summer of 2017. These options were further reduced to a “preferred option” that incorporated a road network, a bus transit network, and light rail and commuter rail transit investments. The resulting road, transit, and rail networks were approved by the Policy Boards of both MPOs, and modeled by the Triangle Regional Model Service Bureau.

The DCHC MPO developed a set of maps and tables to present the results of the Alternatives Analysis and posted them for easy access on the MPO web site.

CAMPO used the analysis results through an innovative method based on the return-on-investment within transportation corridors. Projects were identified for inclusion based on the results of input from local agency comprehensive and transportation plans as well as the recommendations from various special studies completed by CAMPO such as the Northeast Area Study and Southeast Area Study. These studies evaluated projects based on mobility and safety benefits as well as human and natural system impacts. From this "universe of projects", CAMPO evaluated over 600 roadway projects based on the benefits they would generate compared to their costs. This was used as a first draft of the plan, which was then refined via staff input from the MPO and member agencies as well as stakeholder groups and the public. The majority of projects remained funded in the order of payback, while others were modified based on factors outside of what could be calculated.

The purpose of this step in the alternatives analysis was to calculate the benefit of each of the 600 projects with just two scenarios: one with no projects and one with all projects. After these two scenarios were run the payback calculation used the results to determine how much impact each road project had.

These calculations were based on three basic concepts; delay; primary and secondary benefits; change in vehicle miles traveled. Delay calculations measured a project's impact by the hours of delay it saves travelers. This is defined as the difference between the time to travel in light traffic compared to actual traffic conditions. The more cars on the road, the slower they travel, and the more delay increases.

The second concept is the idea of primary and secondary benefits. If a congested road is widened, vehicles will be able to travel faster and save time. This is the primary benefit of the project. Additionally, that project may alleviate traffic problems on other roads, improving their travel time as well. That is a secondary benefit. Thus, for all projects, both the primary and secondary delay improvements must be calculated.

The third, and final, concept is Vehicle-Miles-Traveled (VMT). This is a measurement of how much a road is being used. It is similar to volume, but introduces a length component which allows overall use of a project to be calculated. If two projects are built next to each other, the one with higher VMT is being used more.

To determine the payback metric for each project, two model scenarios were run. The scenario with every project will have much less delay because many new roads have been built or widened. For each road in the model, the first determination is how much of the improvement is primary and secondary. Once this is calculated, the primary benefit is simply added up along the length of widening projects. The last part, secondary benefit, is divided among neighboring projects based on the increase in their use (VMT). A widening on a facility with little use will have little to no secondary benefit. Widening a road with a large increase in the VMT indicates vehicles being taken off nearby roads creating a lot of secondary benefit.

The primary and secondary benefits are added together and compared to the costs. The cost of the project divided by its annual delay benefit provides a number that describes the years required for a project to pay for itself. It's important to point out that this number is not the absolute, actual payback metric of the project for a number of reasons. For one, road widening projects have other benefits, like safety, which are not included in this calculation. Instead, this payback number is only good in comparing projects to each other in a relative sense. A project with a payback period of 1.5 years is a good indicator that the project could be a more cost-effective choice than another taking 10 years.

6.5 Performance Evaluation Measures

Evaluation measures provide a comparative set of metrics for statistical analyses between transportation systems and land use scenarios. Comparisons between transportation systems and land use scenarios can be performed in a number of variations. The comparisons as shown in each evaluation measure table on the next two pages also validate the usefulness of the Triangle Regional Model as a tool to perform travel forecasts and create output necessary for staff, elected officials, and the public to determine the best approach to invest limited financial resources in the regional transportation system.

Figure 6.5.1 compares the transportation network performance for the Capital Area MPO and Durham-Chapel Hill-Carrboro MPO planning areas for the Year 2013, Year 2045 Deficiency network, and the 2045 Metropolitan Transportation Plan network. The Year 2013 represents the current state of the system. The Year 2045 E+C (existing plus committed) network includes only those projects that will be operational in the next few years , but serving the forecast Year 2045 population and employment. The 2045 system represents the highway and transit networks from the 2045 MTP, serving the forecast Year 2045 population and employment.

The performance evaluation measures in this summary table are system-wide metrics and therefore do not provide performance information on specific roadways or travel corridors, or at the scale of a municipality or type of area (e.g., urban and suburban). The congestion maps (V/C maps), presented in Section 6.3, provide a more localized picture of transportation performance for individual roadways or roadway segments. The conclusions drawn from the performance evaluation measures (system-wide) and congestion maps (roadway specific) tend to be similar. For example, the 2045 Deficiency congestion map illustrates a high degree of regional congestion as compared to the 2013 congestion map. This is validated by comparing performance measure values for the 2045 Deficiency and 2045 MTP networks such as daily “Vehicle Hours Traveled” (VHT daily – Row 1.2). Vehicle Hours Traveled is highest for the 2045 Deficiency roadway network as compared to the 2013 base year and 2045 MTP networks.

Figure 6.5.1: Performance Evaluation Measures By Scenario (Based on Triangle Regional Model)

		2013 Base Year		2045 Existing + Committed		2045 MTP	
		CAMPO	DCHC	CAMPO	DCHC	CAMPO	DCHC
1	**Performance Measures**						
1.1.1	Total Vehicle Miles Traveled (VMT-daily)	28,099,995	11,861,507	51,767,600	19,286,704	54,535,952	19,275,165
1.1.1a	Total Vehicle Miles Traveled (VMT-per capita)	25	28	24	29	27	30
1.2.1	Total Vehicle Hours Traveled (VHT-daily)	696,982	285,788	1,784,196	604,600	1,579,327	514,321
1.2.1a	Total Vehicle Minutes Traveled (VHT-per capita)	37	41	49	55	46	48
1.3	Average Speed by Facility (miles/hour)						
1.3.1	- Freeway	62	58	53	50	55	54
1.3.2	- Arterial	38	36	33	30	37	33
1.3.3	- All Facility	46	47	39	40	43	45
1.4	Peak Average Speed by Facility (miles/hour)						
1.4.1	- Freeway	60	57	47	47	52	52
1.4.2	- Arterial	37	35	30	28	36	31
1.4.3	- All Facility	45	46	36	38	41	43
1.5	Daily Average Travel Length - All Person Trips						
1.5.1	- Travel Time (minutes)	14	13	20	17	17	14
1.5.2	- Travel Distance (miles)	7.1	6.1	7.6	6.1	8	6
1.6	Daily Average Travel Length - Work Trips						
1.6.1	- Travel Time	22	20	33	24	27	21
1.6.2	- Travel Distance - Work Trips	12.9	10.9	13.7	10.2	14.1	10.5
1.7	Peak Average Travel Length - All Person Trips						
1.7.1	- Peak Travel Time	15	15	19	19	17	16
1.7.2	- Peak Travel Distance	7.2	7.1	7.0	7.0	7.0	6.9
1.8	Daily Avg. Travel Length - Commercial Vehicle Trips						
1.8.1	- Travel Time	10	10	12	11	11	10
1.8.2	- Travel Distance	7.2	6.7	6.8	6.5	7.2	6.9
1.9	Daily Average Travel Length - Truck Trips						
1.9.1	- Travel Time	12	11	14	13	13	12
1.9.2	- Travel Distance	8.5	7.9	8.2	7.6	8.6	8.1
1.10	Hours of Delay (daily)	67,957	25,300	577,595	165,151	339,957	86,529

		2013 Base Year		2045 Existing + Committed		2045 MTP	
		CAMPO	DCHC	CAMPO	DCHC	CAMPO	DCHC
1.10a	Minutes of Delay (daily) (per capita)	4	4	16	15	10	8
1.10.1	Truck Hours of Delay (daily)	2,442	1,206	16,980	8,457	10,382	4,732
1.10.1a	Truck Minutes of Delay (daily) (per trip)	1	1	5	6	3	3
1.11	Percent of Congested VMT (volume > capacity) - All Day						
1.11.1	- Freeway	1%	1%	18%	12%	15%	4%
1.11.2	- Arterial	3%	2%	17%	16%	10%	7%
1.11.3	- All Facility	2%	1%	16%	12%	10%	5%
1.12	Percent of Congested VMT (volume > capacity) - Peak						
1.12.1	- Freeway	2%	2%	32%	20%	25%	6%
1.12.2	- Arterial	5%	3%	28%	22%	15%	11%
1.12.3	- All Facility	3%	2%	27%	18%	17%	7%
1.12.4	- Designated truck routes	2%	3%	17%	20%	10%	9%
1.12.5	- Facilities w/bus routes	2%	3%	22%	18%	16%	6%
2	**Mode Share Measures**						
2.1	All Trips - Mode Share						
2.1.1b	- Drive alone (single occupant vehicle -SOV)	49%	46%	49%	45%	47%	44%
2.1.2b	- Carpool (Share ride)	43%	36%	42%	36%	42%	36%
2.1.3b	- Bus	1%	3%	1%	2%	1%	3%
2.1.4b	- Rail	N/A	N/A	N/A	N/A	0%	1%
2.1.5b	- Non-Motorized (Bike and Walk)	7%	15%	9%	16%	9%	17%
2.2a	Work Trips - Mode Share						
2.2.1b	- Drive alone (single occupant vehicle -SOV)	85%	80%	82%	79%	80%	77%
2.2.2b	- Carpool (Share ride)	11%	10%	10%	10%	11%	9%
2.2.3b	- Bus	2%	5%	1%	4%	4%	5%
2.2.4b	- Rail	N/A	N/A	N/A	N/A	1%	2%
2.2.5b	- Non-Motorized (Bike and Walk)	3%	5%	6%	7%	4%	7%
2.3a	Peak Trips - Mode Share						
2.3.1b	- Drive alone (single occupant vehicle -SOV)	48%	46%	47%	45%	45%	43%
2.3.2b	- Carpool (Share ride)	45%	39%	44%	38%	45%	39%
2.3.3b	- Bus	1%	3%	0%	2%	1%	3%
2.3.4b	- Rail	N/A	N/A	N/A	N/A	0%	1%

		2013 Base Year		2045 Existing + Committed		2045 MTP	
		CAMPO	DCHC	CAMPO	DCHC	CAMPO	DCHC
2.3.5b	- Non-Motorized (Bike and Walk)	7%	13%	9%	14%	8%	14%
3	**Transit Measures**						
3.1	Transit Ridership (regionwide)						
3.1.1	- GoTriangle (rail included in rail scenarios)	11,649		19,927		65,819	
3.1.2	- GoRaleigh	16,938		33,312		117,791	
3.1.3	- CHT	32,670		42,285		71,882	
3.1.4	- GoDurham	20,866		29,545		37,826	
3.1.5	- NCSU	17,820		22,728		16,693	
3.1.6	- DUKE	8,551		10,942		9,208	
3.1.7	- OPT	338		314		850	
3.1.8	- GoCary	1,869		3,194		6,670	
3.1.9	Total	110,699		162,247		326,735	
3.2	Total Rail Ridership	N/A		N/A		48,461	
4	**Other Measures**						
4.1	Total Daily Person Trips	4,705,474	1,907,904	8,260,218	3,022,162	8,878,617	3,022,820
4.1.1	Work Person Trips	710,791	238,603	1,215,124	379,742	1,299,322	374,656
4.2	Total Daily CV (commercial vehicle) Trips	306,988	121,623	533,629	199,019	559,006	199,405
4.2.1	Daily Truck Trips	128,046	50,122	223,043	82,975	233,985	83,979
4.3.1	Total Highway Lane Miles	6,532	2,533	6,987	2,632	9,496	2,904
4.3.2	Transit Service Miles	54,757		74,206		96,345	

Notes:

N/A = Not available

Travel time is in minutes, and travel distance is in miles.

CV = Commercial vehicles (which includes large and small trucks and vans).

Trucks = Subset of Commercial Vehicles that includes only large trucks.

Transit ridership is higher than transit trips because a trip involving a transfer counts as two riders in ridership numbers.

Average Speed (1.3 and 1.4), Percent of Congested VMT (1.11 and 1.12)and Hours of Delay (1.10) calculations do not include local streets or centroid connectors (which often represent local streets in modeling networks)

Key points from this section:

- The starting point for analyzing our choices is to understand how our communities' comprehensive plans envision guiding future growth.
- The next step is to make our best estimates of the types, locations and amounts of future population and job growth based on market conditions and trends and community plans.
- Based on these forecasts, we can look at future mobility trends and needs, and where our transportation system may become deficient in accommodating these trends and meeting these needs.
- Working with a variety of partners and based on public input, we then develop different transportation system alternatives and analyze their performance.
- We can compare the performance of system alternatives against one another and to performance targets derived from our goals and objectives.