

9. Critical Factors and Emphasis Areas in the Planning Process

Our transportation investments influence more than just our ability to get from one place to another. How and where we develop roads, transit lines and other transportation services impact other things we value. The health and well-being of the natural environment, our neighborhoods, and those who live in them are vital to maintaining the quality of life our region is known for. Federal law recognizes these important considerations by requiring that Metropolitan Transportation Plans specifically address thirteen planning factors:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the safety of the transportation system for motorized and nonmotorized users.
- Increase the security of the transportation system for motorized and nonmotorized users.
- Increase accessibility and mobility for people and freight.
- Protect and enhance the environment.
- Promote energy conservation.
- Improve quality of life for the community.
- Promote consistency between transportation improvements and planned State and local growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system for all modes.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation
- Enhance travel and tourism

The matrix on the next page summarizes the extent to which the particular MTP Goals support the critical factors. The MTP Goals are presented in section 4.3 of this report along with the objectives and performance measures that correspond to each Goal. An examination of the objectives under a particular Goal helps to further define that Goal and explain how it supports a critical factor. In the matrix, if a Goal directly supports a critical factor, then a completely filled circle ● is shown. If the Goal supports a critical factor but in a less direct manner, then a half-filled circle ◐ is shown. When little relationship exists, no circle is shown.

In addition to a review of the link between MTP Goals and critical factors, this chapter highlights three topics in greater detail:

- *Air quality and climate change*: demonstrating that transportation plans will further clean air goals, meet air pollutant standards and minimize climate change emissions;
- *Environmental Justice*: showing how transportation plans relate to communities that have been historically underserved or disproportionately impacted by transportation investments; and
- *Safety and Security*: addressing how the transportation plans and the organizations that implement them promote safer and more secure travel choices.

Connect People & Places	Promote & Expand Multimodal & Affordable Travel Choices	Manage Congestion & System Reliability	Stimulate Inclusive Economic Vitality & Opportunity	Ensure Equity and Participation	Improve Infrastructure Condition & Resilience	Protect the Human & Natural Environment and Minimize Climate Change	Promote Safety, Health & Wellbeing
	Ensure All People Have Access to Multimodal & Affordable Travel Choices						
Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency							
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Increase the safety of the transportation system for motorized and nonmotorized users							
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Increase the security of the transportation system for motorized and nonmotorized users							
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Increase accessibility and mobility for people and freight							
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Protect and enhance the environment							
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Promote energy conservation							
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Improve quality of life for the community							
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Promote consistency between transportation improvements and planned State and local growth and economic development patterns							
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Enhance the integration and connectivity of the transportation system for all modes							
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Promote efficient system management and operation							
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Emphasize the preservation of the existing transportation system							
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Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation							
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Enhance travel and tourism							
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Additional Environmental Justice Measures. There are four additional Environmental Justice measures that do not have an equivalent federal critical factor. In the same manner as the previous matrix, the matrix below evaluates the extent to which the MTP Goals support these Environmental Justice measures.

Connect People & Places	Promote & Expand Multimodal & Affordable Travel Choices	Manage Congestion & System Reliability	Stimulate Inclusive Economic Vitality & Opportunity	Ensure Equity and Participation	Improve Infrastructure Condition & Resilience	Protect the Human & Natural Environment and Minimize Climate Change	Promote Safety, Health & Wellbeing
	Ensure All People Have Access to Multimodal & Affordable Travel Choices						
Equity							
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Social Cohesion or Disruption							
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Aesthetics							
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Displacement							
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Planning Emphasis Areas. In addition to the 13 critical planning factors, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) issued [guidance](#) identifying eight planning emphasis areas which NCDOT and MPOs are encouraged to use in crafting their annual Unified Planning Work Programs and Statewide Planning and Research Programs – these two programs are foundations for advancing project designs and mobility strategies.

The table below shows the results of a review of how these planning emphasis areas align with three prominent outcomes of the *Connect2050* Plan: (i) the vision, goals, objectives and engagement efforts that served as the foundation of the plan, (ii) the projects and strategies that implement the plan, and (iii) the studies that will hone the details of both current and future projects and strategies. As in the previous tables, a full circle indicates full alignment, a half-circle indicates partial alignment, and a blank cell indicates little alignment.

Tackling the Climate Crisis	Equity & Justice in Transportation Planning	Complete Streets	Public Involvement	Strategic Highway Network	Federal Land Management	Planning & Environment Linkages (PEL)	Transportation Planning Data
Vision, Goals, Objectives & Engagement (Chapters 4 and 5)							
Projects & Strategies (Chapter 7, Sections 1 through 11)							
Plans, Studies & Performance Tracking (Chapter 7, Section 12)							

As the DCHC MPO and CAMPO work with NCDOT, FHWA and FTA in implementing this Metropolitan Transportation Plan, the planning emphasis areas will be key drivers of project scopes and processes.

9.1 Sustainability and Resiliency: Critical Environmental Resources

The Capital Area MPO and DCHC MPO evaluated the 2050 MTP's impact on the sustainability and resiliency of critical environmental factors. The MPOs recognize that the MTP is one of the first steps in developing viable transportation projects that meet state and federal laws and regulation designed to protect public health and safeguard natural resources. In addition, the MPOs recognize the impact that transportation projects have on land development patterns. The transportation network and land use regulations must be complimentary and work together to protect critical environmental resources.

This environmental evaluation at the long-range planning phase is the beginning of more extensive review. The NCDOT uses the Merger process to more effectively implement Section 404 of the Clean Water Act during the NEPA/SEPA decision-making phase of transportation projects. The MERGER process is supported by USACE, NCDENR, FHWA, stakeholder agencies and local units of government to more effectively mitigate environmental impacts such as those from storm water runoff.

The MPOs' environmental analysis was a voluntary effort coordinated with representatives from environmental and cultural resource agencies. At the Metropolitan Plan state, a comprehensive analysis of the impact each project may have on the environment isn't possible and does not substitute for the more thorough project-level analysis that is required as part of the National Environmental Protection Act. The analysis below was intended to identify and flag early in the process projects that might have significant impacts on the environment and that might require costly and disruptive mitigation measures.

For this analysis, the MPOs looked at all of the projects in the Comprehensive Transportation Plan project lists to ensure that a comprehensive record of all of the potential future projects was being evaluated. Many of the CTP projects are not in the final adopted 2050 MTP, and are considered to be beyond the 2050 time horizon of the plan. The MPOs created maps of the CTP projects overlaid on several environmental and cultural GIS files. The maps are grouped in the following themes with the following datasets:

- **Biodiversity and Wildlife Habitat**
 - NC Conservation Planning Tool – Biodiversity and Wildlife Habitat Assessment – this dataset classifies areas from 1 to 10 based on several metrics
 - Managed Areas
 - Conservation Tax Credit Properties
- **Development**
 - Hospitals
 - Schools (Public and Private) Colleges or Universities
 - Airports
 - Water and Sewer Service Boundaries
- **Farmland**
 - NC Conservation Planning Tool – Farmland Assessment – this dataset classifies areas from 1 to 10 based on several metrics
 - Voluntary Agricultural Districts
- **Forest**
 - NC Conservation Planning Tool – Forestry Lands Assessment – this dataset classifies areas from 1 to 10 based on several metrics
- **Gamelands, Hunting Buffers, and Smoke**
 - Gamelands
 - Gameland Hunting Buffers
 - Smoke Awareness Areas

- Hazards
 - Hazardous Waste Sites
 - Animal Operation Facilities
 - Active Permitted Landfills
 - Hazardous Substance Disposal Site
- Historic Sites
 - Local Landmarks
 - Local Historic Districts
 - National Register Historic Sites
 - National Register Historic Districts
- Jurisdictions
 - Jurisdictional Boundaries – This map is designed to identify the local jurisdiction that has planning and zoning authority in the vicinity of a project. Since each jurisdiction has different zoning classifications and methodologies, a comprehensive zoning map could not be developed for the entire region.
- Parks and Recreation
 - Open Space and Conservation Lands
 - Boat Access Ramps
 - Trails
 - Greenways
 - Local and State Parks
- Water Resources
 - Impaired Streams
 - Outstanding Resource Management Zones
 - Ecosystem Enhancement Program
 - Target Local Watersheds
- Water Supply
 - Public Water Supply Sources
 - National Pollutant Discharge Elimination System (NPDES) Permitted Sites
 - Surface Water Intake
 - Water Supply Watersheds
 - Nutrient Sensitive Waters
- Wetlands and Floodplains
 - Floodplain Mapping Information Systems (FMIS)
 - Floodplains Wetlands

In addition, the DCHC MPO also sent GIS shape files to resource agencies during the public review process. The agencies contacted were:

- United States Army Corps of Engineers
- NC Department of Natural Resources
- NC Wildlife Resources Commission
- United States Environmental Protection Agency
- United States Fish and Wildlife Service
- NC Department of Cultural Resources
- NC Department of Commerce
- NC Department of Environment and Natural Resources

The maps are shown in Appendix 12. Larger versions of the maps are posted on the MPOs' websites.

9.2 Transportation, Air Quality and Climate Change

Transportation-air quality conformity ("conformity") is a way to ensure that Federal funding and approval goes to transportation activities that are consistent with air quality goals. Conformity applies to metropolitan transportation plans—such as this one, to transportation improvement programs (TIPs), and to projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) in areas that do not meet -- or have recently not met -- air quality standards for ozone, carbon monoxide, particulate matter, or nitrogen dioxide. These areas are known as "non-attainment areas" or "maintenance areas," respectively.

A conformity determination demonstrates that the total emissions projected for a plan or program are within the emissions limits ("budgets") established by the State Implementation Plan (SIP) for air quality, and that transportation control measures (TCMs) – specific projects or programs enumerated in the SIP that are designed to improve air quality – are implemented in a timely fashion. The MPOs no longer need to conduct a regional emissions analysis to demonstrate air quality conformity, but are still required to prepare a Conformity Determination Report to demonstrate continued adherence to federal standards and processes.

Although the region is no longer required to calculate emissions for air quality conformity, both MPOs are committed to protecting air quality and health through transportation investments, for example, by continuing to operate a robust regional Transportation Demand Management program to encourage travelers to use lower polluting forms of transportation such as transit, ridesharing, cycling and walking. The MPOs recognize that good air quality is a key component of the region's quality of life and that continued effort is needed to accommodate rapid growth in ways that won't harm air quality. Appendix 7 has results from the air quality evaluation conducted on the land use pattern and transportation projects in the 2050 MTP.

Air Quality Analysis

Although not required, the two MPOs calculate the regional emissions that would be produced by the highway and transit usage predicted in this transportation plan, using the latest EPA air quality model, MOVES. The projected emissions for the plan are compared to the emissions limits (or "budgets") that were last established by the air quality State Implementation Plan (SIP). Appendix 7 reports those emissions so that the region can continue to understand and respond to air quality conditions. The MPOs undertake this voluntary analysis to recognize the importance of clean air to our region.

Climate Change Emissions

Reducing greenhouse gas emissions and transitioning the region's transportation sector to a clean energy, resilient future are hallmarks of the *Connect2050* Plan. From electrification of transit vehicles fleets, to implementing alternative fuel corridors along the region's interstates, to pursuing land use and pricing strategies that influence travel behavior, the MPOs are committed to projects and strategies that will reduce the region's climate impact and increase the region's resilience to climate change.

Addressing Climate Change *a resilient, clean energy future*

FHWA and FTA seek to ensure that transportation plans and infrastructure investments help achieve the national greenhouse gas reduction goals of 50-52% below 2005 levels by 2030, and net-zero emissions by 2050, and increase resilience to extreme weather events and other disasters resulting from the effects of climate change.

The MPOs will leverage the following orders and tools in their efforts to combat and adapt to climate change:

- *EO 14008 on "Tackling the Climate Crisis at Home and Abroad."*
- *EO 13990 on "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis."*
- *EO 14030 on "Climate-Related Financial Risk."*
- *FHWA Order 5520 "Transportation System Preparedness and Resilience to Extreme Weather Events."*
- *FTA's "Hazard Mitigation Cost Effectiveness Tool."*

9.3 Environmental Justice

Environmental justice adds an important focus to the 2050 MTP analysis by specifically evaluating environmental issues through a diversity, equity and inclusion lens. The intent of environmental justice is to avoid, minimize, or mitigate disproportionately high and adverse effects on minority and low-income populations; and ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

Environmental justice addresses fairness toward the disadvantaged and often addresses the possible exclusion of racial and ethnic minorities, low-income people, the elderly, and persons with disabilities or communication barriers from decision-making. The federal government has identified environmental justice as an important goal in transportation, and local and regional governments must incorporate environmental justice into transportation planning. Capital Area MPO and DCHC MPO have multiple goals that directly support this endeavor including: Protecting the Human and Natural Environment; Ensure Equity and Participation; Ensure that All People Have Access to Multimodal and Affordable Transportation; and, Stimulate Inclusive Economic Vitality.

Even though the term “environmental justice” is not in federal legislation, the concept and its application have been developed through a succession of court cases, transportation regulations, agency memoranda, and Executive Orders. Much of the legal application is based on Title VI of the Civil Rights Act of 1964 that provides protection from discriminatory actions or results from federal, or federally assisted or approved, actions. In terms of transportation planning, environmental justice seeks to ensure that the disadvantaged:

1. Have access to the decision-making process;
2. Realize benefits from investments that are commensurate with the population as a whole;
3. Do not shoulder a disproportionate share of the negative effects and burden resulting from the implementation of transportation projects; and,
4. Do not incur a disproportionate share of the financial cost.

The Capital Area MPO and DCHC MPO have carried out a comprehensive and thorough set of activities to ensure that disadvantaged persons, as characterized in federal regulations, do not suffer discrimination in the transportation planning and implementation process. These activities have been in the area of both public participation and plan analysis. The following sections describe the environmental justice activities that occurred as part of the 2050 MTP.

Access to the Decision-making Process

The Capital Area MPO and DCHC MPO ensured that all individuals, regardless of race, ethnicity, income, age, or disability, had access to the planning process. The MPO began conducting public outreach for the 2050 MTP in June 2020 with the development of the MTP Goals and continued through early 2022 with the review of alternatives, the preferred plan and the adopted plan.

In June 2020, the MPOs developed a joint *2050 MTP Development Public Engagement Plan*; an electronic copy can be found here: <https://bit.ly/3zoYVrH>. The key features of the Engagement Plan include:

- Public engagement goals that include access for low-income, minority and other communities that have often not been involved, and an active effort to engage these communities.
- Multiple ways to review materials and provide feedback including workshops, surveys and focus groups.
- Accessible documents including infographics, short videos, interactive maps, and e-newsletters.

Section 5.2 of this report presents a summary of the MPOs' public engagement activities and demonstrates the activities and effort to engage people from communities of concern. Key elements include:

- Four focus groups of minority, low-income, elderly and youth to receive input on the preferred option.
- Social media advertising that was focused on communities of concern;
- Public engagement notices in Hispanic and African-American newspapers.
- Documents in Spanish;
- Community events or pop-up events located outside traditional meeting places, in transit accessible locations, and at various times of day and days of the week.

Plan Benefits

Transportation infrastructure investments in the 2050 MTP will benefit the MPO's population in many ways, including increased mobility, safety, time savings, economic development, and leisure opportunities. The investments in transit and bicycle and pedestrian infrastructure in particular will benefit low-income populations that do not have access to personal vehicles and person with disabilities who may not be able to operate vehicles. Currently, tens of thousands of households in the Triangle do not have personal vehicles.

The 2050 MTP is noteworthy for the unusually high level of investment in modes that are important to communities of concern, i.e., transit, bicycle and pedestrian. The DCHC MPO plans to invest 37% and 17% in transit and bicycle/pedestrian projects, respectively. CAMPO has similar levels of investments in these modes. The transit, bicycle and pedestrian network assumed in the 2050 MTP is a compilation of the local government and transit system plans. These plans typically included intensive public engagement practices, such as focus groups and targeted in-person workshops, to engage people from the communities of concern.

The 2050 MTP process has been concerned with measuring plan benefits in relation to communities of concern. The MPOs developed a set of performance measures that align with the MTP Goals and Objectives. See section 6.5 Performance Evaluation Measures in this report. A significant number of the performance measures are related to equitable benefit of the transportation investments, including:

- Percentage of work and non-work trips by transit less than 40 minutes for the entire MPO area and for low-income, minority and zero-car households.
- Percentage of work and non-work trips by automobile less than 20 minutes for the entire MPO area and for low-income, minority and zero-car households.
- Number of non-motorized fatalities and serious injuries for the entire MPO area and for low-income, minority and zero-car households.
- Daily minutes of delay per capita for the entire MPO area and for low-income, minority and zero-car households.
- The percentage of environmental justice population that lives within an accessible distance (e.g., ¼ mile for bus transit) of transit.

Negative Project Impacts

The investments in transportation infrastructure included in the 2050 MTP will also have some negative impacts to some of the MPOs' population. While road widening projects may increase overall mobility, the residents near the project may be impacted negatively. Some of the negative impacts to nearby residents include increased traffic through their neighborhoods, increased vehicle speeds, land acquisition for necessary right-of-way, relocations of homes and businesses, and a change in neighborhood character and land uses. A project's net impact is not always clear and may be perceived differently by different residents. A project that increases property values, mobility, and economic development may also increase traffic, relocate homes and businesses, and change neighborhood character. Although it is difficult at this stage of project development to conclusively assess the overall impact of the highway projects included in the 2050 MTP, the two MPOs did complete several analyses of the potential negative impacts the projects may have on environmental justice communities.

During the development of the 2050 MTP, MPO staff often qualitatively evaluated individual projects for potential negative impacts and often eliminated projects that had significant potential negative impacts. Staff eliminated some projects based on factors such as limited right-of-way, neighborhood and community characteristics, and the historical impact of urban renewal.

The two MPOs analyzed the potential impact of the 2050 MTP highway projects and transit corridors to ascertain whether the potential negative project impacts might be disproportionately impacting environmental justice communities and whether benefits appeared to be equitably distributed. This analysis was completed for the plan as a whole. Individual projects in the 2050 MTP will be studied in more depth during the project development and design stage to better understand the negative impacts and positive benefits of that particular project. The negative impacts can often be mitigated by context sensitive design.

Determining A Community of Concern (CofC)

The MPOs explored different methods to get at the fundamental question, “What is a community of concern?” Three principles guided the analysis:

1. If everyone is special, no one is special; we do not want to set the threshold too low or it could mask real and important differences between locations,
2. Be as inclusive as possible in light of the above; we do not want to leave areas out that could sustain meaningful negative impacts from the decisions we make, and
3. The final analysis should yield a pattern that allows for targeted outreach and a meaningful analysis of overall transportation investments.

The MPOs gave careful consideration to the data values and sources used for the protected classes we evaluated:

1. Use of Census Block Groups as the geographic unit. This is because block groups are updated each year and some socioeconomic data are not available at a smaller scale. It also helps compare urban, suburban, and rural areas in an “apples-to-apples” way.
2. Choice of which metric we use. By choosing to use the “median” as our measure, it gets around any extremes, such as income, that may exist within the block group. By using a median, the primary makeup of the block group is reflected because extremes will not have much impact.
3. Measuring each item we evaluate as a percentage. This also helps to create an “apples-to-apples” comparison for urban, suburban, and rural parts of the region.

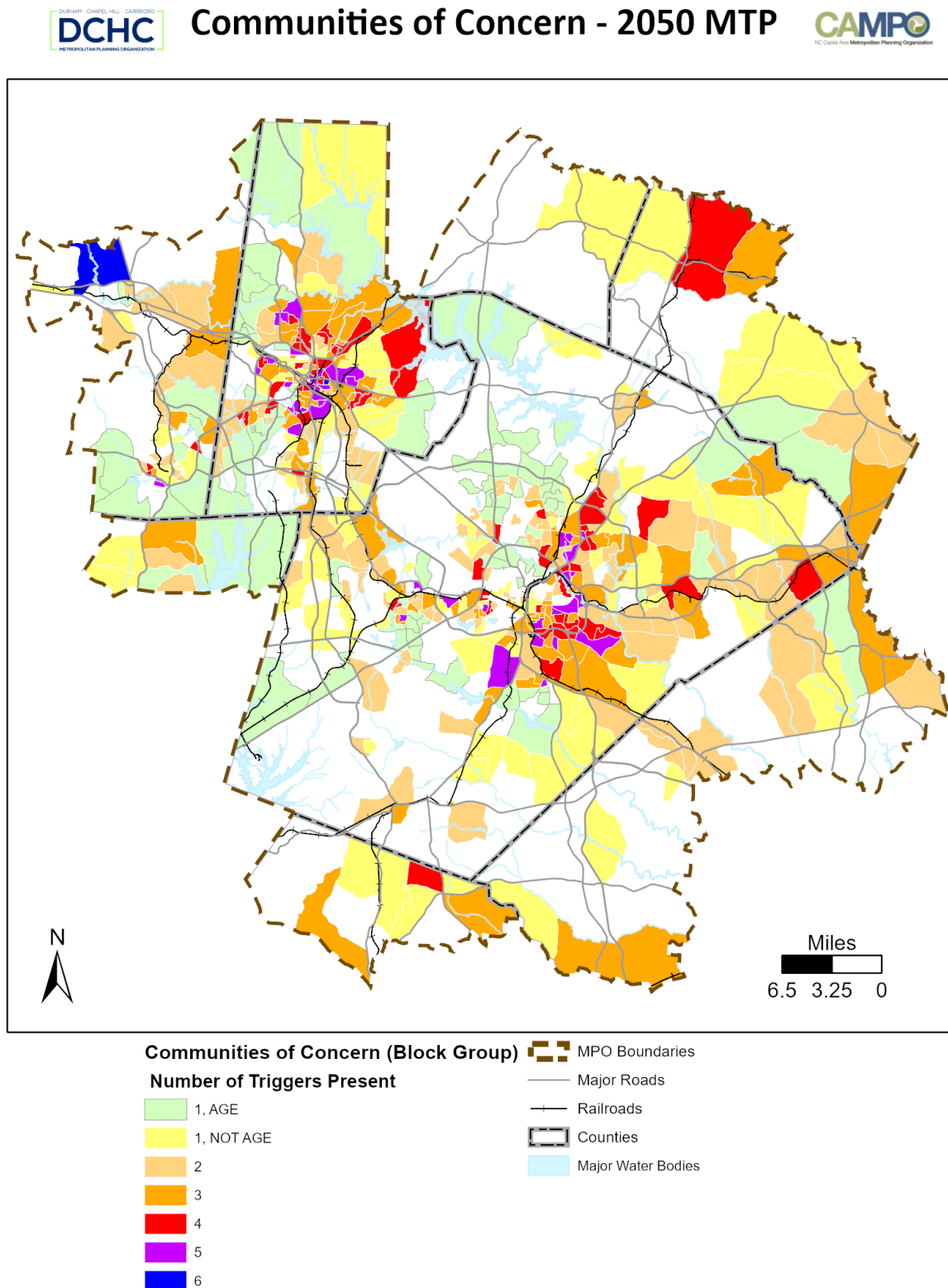
The MPOs also tried to match the data that are available to the protected classes under the Title VI Program Coverage umbrella. In 2017, the MPOs worked closely with the Triangle J Council of Governments, the NCDOT Community Studies and Office of Civil Rights staffs and FHWA to review methodologies and determine data thresholds. Given the even distribution of men and women and disabilities, gender and disability were not protected classes that were used in this analysis. Zero-car households was included because it is a group that is greatly affected by transportation investments.

Using a composite “minority” measure may miss some key groups. As an example, a block group that might be included for “Black alone” only needs around 32% of the block group to identify as Black. In a single minority measure, the threshold is around 57%, and if no other minorities are present this might miss too many people that need to be included. The final selection of how to measure led to using “Non-white Race” and “Hispanic/Latino Origin” as separate variables. Some block groups with Asian minority presence that may not meet the combined race threshold for minority trigger under “Linguistic Isolation” and are included.

It is important to understand that these are regional-scale, planning level proxies for actual EJ communities. When working with individual projects or specific outreach efforts, this analysis is just a guidance or screening tool to begin the identification of the actual communities.

The results of this selection process are depicted in *Figure 9.3.1*. An online, interactive map that displays the communities of concern and the highway, bus transit and regional transit projects can be viewed [here](#).

Figure 9.3.1



The two MPOs determined the percent of total 2050 MTP highway project length and the percent of total 2050 MTP cost by project type that were in any block group with the presence of any protected class in the top quartile (top 25%). The results of this analysis are shown in *Figure 9.3.2*. Transit investment corridors were also analyzed for length, but not cost since they are not project-specific.

Figure 9.3.2 Project Portfolio Impact on Communities of Concern

Region CofC = Community of Concern	Total Miles	Miles in CofC	Percent in CofC	Total Investment	Total Investment in CofC	Percent in CofC
New Location Highway	329	193	59%	6,469,482,993	3,830,341,563	59%
All Other Highway	404	236	58%	4,792,839,402	2,561,212,120	53%
Existing Highway Widening	1,090	567	52%	18,029,755,489	9,316,896,576	52%
Transit Corridors	1,956	1,381	71%	Cost Not Reported-Corridor not Project		

CAMPO	Total Miles	Miles in CofC	Percent in CofC	Total Investment	Total Investment in CofC	Percent in CofC
New Location Highway	307	173	56%	\$6,225,161,993	\$3,672,312,058	59%
All Other Highway	313	161	52%	\$4,345,470,402	\$2,137,433,311	49%
Existing Highway Widening	1,062	550	52%	\$17,711,928,489	\$9,123,674,281	52%
Transit Corridors	1,151	740	64%	Cost Not Reported-Corridor not Project		

DCHC MPO	Total Miles	Miles in CofC	Percent in CofC	Total Investment	Total Investment in CofC	Percent in CofC
New Location Highway	21	20	91%	\$244,321,000	\$158,029,505	65%
All Other Highway	92	75	82%	\$447,369,000	\$423,778,810	95%
Existing Highway Widening	28	17	61%	\$317,827,000	\$193,222,296	61%
Transit Corridors	805	641	80%	Cost Not Reported-Corridor not Project		

Project Portfolio

Table 9.3.2 above, shows the investment in terms of miles and cost for the 2050 MTP highway and transit projects in the region, CAMPO, and DCHC MPO. Overall, the percent of highway investment in the region and CAMPO in communities of concern is slightly greater than one-half, i.e., 52% to 58%. The same investment in the DCHC MPO is much higher, ranging from 61% to 95%, in communities of concern. This higher percentage level results from the DCHC MPO having much more area in communities of concern such as low-income and minority populations.

There are a few values in the table that are worth noting and explaining. The miles of new location highway are 91% in the DCHC MPO. These new location highways are exclusively extensions of existing local collector roads and one two-lane boulevard (i.e., Northern Durham Parkway) that are intended to provide access to the neighborhoods and do not bring the noise, pollution, land encroachment, and safety concerns associated with multilane arterials roads. Also, the total investment of all other highway in the DCHC MPO is 95%. These roadways are exclusively modernization projects that are considered friendly to neighborhoods and communities. Roadway modernizations do not add additional roadway lanes but do add bicycle, pedestrian and transit facilities, and improve intersections for all modes.

The percentage of miles of transit projects for communities of concern are considerably higher than the percentage for roadway projects – 64% in CAMPO and 80% in DCHC MPO. Transit service is higher in the denser urbanized areas where the communities of concern are concentrated. It is also higher, of course, where potential ridership is concentrated, which includes areas of prevalent low-income and minority populations. In the 2050 MTP, the transit service is highest in these communities of concern by design. It should be noted that the 2050 MTP includes improved demand-responsive service that serves the rural areas and those without fixed-route transit. The demand-responsive service cannot be accurately mapped and thus is not part of this environmental justice analysis.

For the most part, the bicycle and pedestrian projects are not identified as projects or mapped in the 2050 MTP. The MTP sets a budget for investing in these projects and references the many local government plans that identify bicycle and pedestrian projects in a detail.

Potential Benefits, Burdens and Mitigation Strategies

It is difficult to assess overall benefits and burdens at a regional scale. As each transportation project moves into the development and design stage, the benefits and burdens can be more accurately assessed and identified. Nonetheless, at the regional planning stage we can generally identify potential benefits and burdens for different types of projects to provide a template for planners, engineers, residents and elected officials to evaluate projects. The series of tables below provides a template that lists the general benefits, burdens and mitigation strategies (for the indicated burden) for different types of transportation projects.

Bicycle and Pedestrian		
Potential Benefits	Potential Burdens	Mitigation Strategy Examples
Reduced emissions	Impact to motor vehicle capacity	Use ITS to make timing of ped crossing and roadway signals as efficient as possible for all users
Reduced parking need	Impact to motor vehicle travel times	Grade separate bike and pedestrian crossings where feasible
Community health improvements	Additional conflicts at intersections	Add pedestrian crossing time to signal; add safety features in design, e.g., bike boxes, shorter vehicle turning radius
Increased cyclist and pedestrian safety	Need for additional right-of-way	Reduce vehicular lane width--has added benefit of slowing motor vehicle speeds around bike and ped facility users
Access for households without vehicles	Need for additional structures/other construction concerns	Fund and build roadway and bike/ped facilities through single integrated project, i.e., Complete Streets

Roadway Operational Improvements		
Potential Benefits	Potential Burdens	Mitigation Strategy Examples
Reduced crashes and/or serious crashes	Increased congestion and reduced access to adjacent land during construction	Re-route traffic to major roads where possible; limit construction closures to nights and weekends
Better bicycle, pedestrian and transit travel	Additional shoulder or other changes can increase corridor width	Use curb and gutter instead of open swale to reduce footprint
Reduced travel time	Adjustment period for user behavior (roundabouts, DDIs, often confusing at first)	Education and outreach campaign prior to opening of new traffic pattern

New Location Roadway		
Potential Benefits	Potential Burdens	Mitigation Strategy Examples
Increased connectivity and mobility	Induced Demand--Add VMT	Construct new facilities as variable rate tolled facilities that can have dynamic pricing based on peak hour demand; include bike and ped facilities to encourage short trips to not use motor vehicles
Increased operational efficiency and network redundancy	Noise and emissions impacts to existing land uses & neighborhoods	Construct noise walls where warranted; reduce speeds and minimize signalized intersections for idle reduction
Economic impacts-freight efficiency, catalyst for land use changes	New traffic patterns can push congestion to new locations	Find those locations in the model and plan for them accordingly in the MTP
Reduced travel time	For freeways --benefits only to motor vehicle users; transit benefits only to express bus service	Include bike & ped provisions as part of roadway project; provide for BRT stops along access limited corridor

Transit Corridors		
Potential Benefits	Potential Burdens	Mitigation Strategy Examples
Improves mobility for people without access to vehicles	Diesel buses are noisy and emit noxious fumes	Convert bus fleets to electric, hybrid or natural gas propulsion
Increased travel capacity by adding service instead of increasing the physical footprint of the facility	Bus stops in the travel lanes reduce overall roadway capacity and create a negative image of bus transit	Get enabling legislation to require motorists yield to left-signaling buses; work with transit agencies to incorporate bus lane pull outs into roadway projects
Reduction in vehicle miles traveled (VMT)	Transit trips are not time-competitive	Add bus-only lanes, signal queue jump, etc.; increase headways and service hours; add cross town routes
Net reduction in traffic congestion	Fixed route transit does not serve the entire region	Work with on-demand service providers and human service agencies to fill service gaps where fixed routes are not feasible financially or operationally

EJ and Project Maps

Readers can view an interactive, online map of the Environmental Justice Communities of Concern with the 2050 MTP highway and transit projects as an overlay to view the distribution of the MTP investments. The online map is available on the 2050 MTP web page for both CAMPO and DCHC MPO, and can be found at the following link at the publication time of this report, i.e., February 2022. Readers can also view regional-scale copies of these maps in Appendix 12 of this report.

Financial Impact

Finally, environmental justice also requires that the disadvantaged population not bear a disproportionate share of the financial cost of the plan. The 2050 MTP is financed by both traditional and new revenue sources. The 2050 MTP does not include changes to traditional funding sources, which are mostly state and

federal gas taxes, vehicle registration fees, highway use taxes, and some general funding (e.g., individual and business taxes). Given the ongoing status of these revenue sources, this environmental justice discussion does not address the traditional sources.

The 2050 MTP is reliant on new sources of revenue:

1. Sales tax increase for public transit;
2. Car registration fee increase;
3. Toll roads and managed lanes; and,
4. Sales tax equivalent increase for transit, roadways and bicycle and pedestrian facilities.

Sales taxes are generally considered regressive. Lower income households pay a higher percentage of their income in sales taxes than do higher income households. Higher income households pay more in *actual* dollars in sales tax than lower income households, but these payments represent a smaller *proportion* of the total income of higher income households. Current transit sales taxes mitigate the “who pays” side of the equation by excluding many necessities from the sales tax, including food, medicine, utilities and shelter. By excluding these items, a typical household in the lowest 20% income group would pay about \$3 per month for the ½ cent transit tax, based on analysis by the North Carolina Budget & Tax Center. Households in the top 1% income bracket would average \$57 per month and those rounding out the top 5% income bracket would average \$17 per month. Also, one financial analysis showed that the impact of a one-dollar increase in the price of a gallon of gasoline is about ten times worse for low-income households than the impact of a ½ cent sales tax. Both CAMPO and DCHC MPO propose a one-cent sales tax increase in the 2050 MTP.

Looking at who pays is only part of the story; who benefits is equally important. Transit service is disproportionately used by people with lower incomes and by zero-car households. Currently, tens of thousands of households in the Research Triangle Region report having no vehicle available. Our region’s travel forecasts estimate that the majority of transit trips after we invest in rail service and greatly expanded bus service will be made by people from households without cars and low-income households with cars. So looking at the whole equation, a sales tax that is spent entirely on transit would provide a net benefit to households that are most dependent on transit service to reach jobs and educational opportunities.

Toll roads, such as the I-40 managed lanes project in CAMPO, would require the payment of tolls to use the express lanes. Low-income populations will still have the option to use the facility by using the existing general purpose lanes free of charge. In addition, public transit vehicles will be able to use the managed lanes, which operate at faster speeds during congested periods, free of charge. High-occupancy vehicles might also be able to use the new managed lanes free of charge but that determination would not be made until the project financial plan is completed.

Toll roads and managed lanes projects will require a detailed environmental justice review during project development. The MPOs will advocate for mitigation measures if there are significant negative impacts for communities of concern. The *Triangle Strategic Tolling Study* (October 2019) identified some potential mitigation measures and further discusses this issue.

The 2050 MTP financial plan also identifies a new revenue stream as a sales tax equivalent. Given that there is already a ½ cent sales tax in Wake, Durham and Orange counties that is dedicated to transit, this language is used to provide readers the sense of scale the new revenue stream might have in terms of revenue and economic impact. This report cannot assess the financial impacts to the communities of concern because the new revenue vehicle is unknown at this time. The revenue vehicle could be an increase in property, gas or sales taxes, or implementation of a local income tax. And, the property and income taxes could have progressive provisions that exclude or advantage lower-income households, thereby nullifying any financial impacts to that group.

9.4 Safety and Security

Metropolitan Planning Organizations are being encouraged to effectively address safety and security issues in accordance with policies outlined in the Fixing America's Surface Transportation (FAST) Act.

Federal requirements maintain the existing core program called the “Highway Safety Improvement Program” (HSIP). This program is structured and funded to make significant progress in reducing fatalities on highways as well as other modes that use highway, railroads, and other conduits within the transportation network. The HSIP increases the funds for infrastructure safety and requires strategic highway safety planning focused on measurable results. Other programs target specific areas of concern such as work zones and older drivers. Pedestrians, including children walking to school, are also a focus area for the program.

Both the Capital Area MPO and Durham-Chapel Hill-Carrboro MPO have been proactive in addressing safety and security as a component of our overall transportation processes by pursuing the following actions:

- Vision Zero, a new approach to traffic safety, maintains that the loss of even one life or serious injury on our roads is not an acceptable price to pay for mobility. Designers and users of the roads share responsibility for the safety of all road users under the Vision Zero approach. Vision Zero views human error on roadways as inevitable, and advocates for roadway and vehicle design that accounts for human mistakes. Vision Zero uses the “5 E Strategy” – education, encouragement, enforcement, engineering, and evaluation – to achieve zero fatalities and severe injuries on roadways. First implemented in Sweden in the 1990s, Vision Zero has achieved great success in Europe and continues to gain momentum internationally and throughout the US.

The North Carolina Department of Transportation (NCDOT) adopted a Vision Zero program, NC Vision Zero, in 2016. NC Vision Zero serves as an umbrella organization for Vision Zero programs throughout the state. NC Vision Zero provides data, research, and other resources to support Vision Zero programs throughout North Carolina. NC Vision Zero has also assembled a statewide Vision Zero stakeholder group in order to facilitate communication between traffic safety stakeholders.

On September 18, 2017, the Durham City Council adopted the Vision Zero Durham Resolution making Durham the first city in North Carolina, and the first among its peer cities nationally, to officially adopt a Vision Zero program. The Vision Zero Durham Resolution affirms the Durham’s commitment to eliminating traffic deaths and serious injuries on Durham roadways, and provides a framework for City departments and community stakeholders to work together to achieve this goal. The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) passed a resolution in support of Vision Zero Durham on August 9, 2017. At the time of the 2050 MTP adoption, several other DCHC jurisdictions have begun to take action to adopt and implement Vision Zero programs.

- Video surveillance. The transit agencies in both MPOs (i.e. GoRaleigh, GoDurham, Chapel Hill Transit, GoCary, GoTriangle, and area human service providers) have or are in the process of providing on-board video surveillance cameras and transit station camera detection as a deterrent to crime; as well as providing Mobile Data Computers/Automatic Vehicle Locators on their vehicles. GoCary’s paratransit vehicles have automated vehicle locator systems as well as video surveillance via DriveCam.
- Safe Routes to Schools (SRTS). The Capital Area MPO has created a regional Safe Routes to School program that is designed to coordinate SRTS activities throughout the MPO as well as provide policy leadership and technical assistance to local agencies and schools. Agencies within the Capital Area MPO are continuing to develop and implement SRTS activities that will benefit elementary schools and their adjacent neighborhoods throughout the community. Many local communities also have Safe Routes to Schools initiatives.

- Safety Metrics. Both MPOs include “Accident/Safety” metrics when determining the technical scoring and prioritization of roadway projects for their Transportation Improvement Programs.
- “Four Es” for Biking and Walking. Both MPOs have adopted bicycle and pedestrian plans that include four significant pillars to strengthen the role of bicycle and pedestrian facilities in overall transportation planning. The “Four-Es” (i.e. education, engineering, enforcement, and encouragement) bring attention to the importance of safety through various public service announcements in the local media focused attention to these key areas of transportation network development. Furthermore, both MPOs continue to remain active in promoting bicycle and pedestrian activities through events such as Bike to Work Week. These programs impact the region’s overall transportation culture by promoting bicycle and pedestrian traffic and travel as a valuable mode of movement through the region.
- Watch for Me NC Campaign. Both MPOs have incorporated within those adopted bicycle and pedestrian plans expansion of bicycle accommodations and walkway infrastructure through both on-road and off-road facilities. The presence of walkway infrastructure will have a significant impact in the reduction of pedestrian crashes (particularly an 88 percent reduction in “walking along road” pedestrian crashes). The concern about pedestrian safety in the state of North Carolina (currently recognized by FHWA as a “Pedestrian Emphasis” state) has encouraged NCDOT to host pedestrian safety classes. These classes have been taken by staff from both MPOs. Both MPOs, in cooperation with the North Carolina Highway Safety Research Center (HSRC) and NCDOT are participating in the initial “Watch for Me NC” campaign. This campaign is intended to improve pedestrian safety through educational messages directed at pedestrians and drivers as well as encouraging police enforcement of current pedestrian laws. The MPOs, along with NCDOT and HSRC, continue to build off of the initial campaign in Raleigh, Durham, Chapel Hill, and Carrboro. Both MPOs continue work to extended the campaign to the region’s other communities in future years.
- Incident Management. Both MPOs have funded an Incident Management Plan, which includes strategies for improving:
 - Responder safety
 - Safe, quick clearance activities
 - Prompt, reliable, interoperable communications

The program directly addresses eight of the twelve strategies aimed at improving responder safety and safe, quick clearance of incidents; particularly along I-40, and other Interstate/freeway candidate facilities in the region. Both MPOs have been active with Incident Management Planning. Working on a project to improve the Traffic Incident Management Program in the Triangle, the two MPO pursued goals that involved reducing incident clearance time, increasing responder safety, reducing secondary incidents, and education of the public. The accomplishments included the following:

Incident Management Activities

Starting in 2013, various service agencies have been involved in creating a coordinated traffic incident management program. Studies indicate that 70 percent of all drivers do not know the state has fender bender and move over laws; therefore an effort is being made to make the public aware of those laws.

Establishment of the Incident Management Subcommittee

An Incident Management Subcommittee was created to develop a MOU for CAMPO and to develop a public education campaign for motorists. The MOU has been endorsed by the emergency response agencies throughout the region. It is a non-binding statement of principles but all agree that the

MOU is important. Roles at incident scenes have been agreed upon by various responder agencies. This was taken to local police and fire associations with agreement from both groups.

Media Buys using Radio/TV, Online, Billboards

NCDOT worked in cooperation with the MPOs to purchase billboards to advertise a “Move Over and Fender Bender Laws Ad Campaign”. NCDOT staff also worked to host a news conference that included the Secretary of NCDOT; as well as the leaders of the Incident Management Subcommittee to address the Move Over and Fender Bender Public Service Announcements (PSAs). Furthermore, NCDOT’s Dynamic Messaging Signs (DMS) have been used to display the Move Over and Fender Bender PSAs; along with radio ads for a brief period of time. Finally, the NCDOT Communications staff has used social media to broadcast information concerning the laws.

Traffic Incident Management Memorandum of Understanding

The final draft of the MOU was presented and endorsed by both the Incident Management Subcommittee Meeting and the Congestion Management Process (CMP) Stakeholders Group meeting. The MOU was circulated throughout the region for review and adoption by local government boards.

- Safety Audits. Both MPOs receive Traffic Engineering Accident Analysis (TEAAS) data from NCDOT’s Transportation Mobility & Safety Division. The aforementioned division uses the data for Road Safety Audits for state maintained roads. Both MPOs will continue to work with NCDOT’s Transportation Mobility & Safety Division to utilize data from future road safety audits to prioritize and fund future road projects.
- Safety Countermeasures. Additional safety countermeasures that are utilized by both state and local agencies within both MPOs include:
 - buffers or planting strips,
 - marked crosswalks,
 - “road diets” (narrowing or eliminating travel lanes on roadways)
 - traffic calming/traffic control devices
 - Roundabouts and 4-way stop control intersections

Both MPOs will support safety countermeasures on roads, and at signalized and unsignalized intersections where needed to ensure safety for the travelling public.

- ITS safety. Both MPOs were a part of the most recent Triangle Regional ITS Strategic Deployment Plan Update that was finalized in 2020. The MPOs have created a joint ITS working group to prioritize and implement recommendations from the Plan. One of the goals of the ITS Strategic Deployment Plan is to “*Advance safe and efficient movement of people and goods throughout the region*”. The three objectives associated with the goal include:
 - *Clear 90% of incidents in 60 minutes or less on the principle arterial network,*
 - *Reduce the number of crashes per 100 million vehicle miles by 10% over a three-year floating average on the principle arterial network, and*
 - *Decrease secondary incidents by 10% on the principle arterial network*

9.5 The Fixing America's Surface Transportation (FAST) Act and the 2050 Metropolitan Transportation Plan

The FAST Act initiated new planning rules in *23 CFR 450* that are relevant to the MPOs' transportation plans. The new rules (paraphrased in italics) and a discussion of how the MPOs have responded are presented below.

1. *New Planning Factors –306 (b)(9)(10)*

A. *Improve resiliency and reliability of the transportation system and reduce or mitigate storm water impacts of surface transportation*

The resiliency and reliability of the transportation system has improved under the 2050 MTP because the investment in highway maintenance has substantially increased. In the 2040 MTP, highway maintenance expenditures were 30% of the total non-transit budget. That figure is approaching 50 percent for both MPOs in the 2050 MTP.

In terms of storm water impacts, the local planning departments and NCDOT and the many resource agencies have taken an aggressive approach in implementing the state and federal regulations to limit the impacts from private structures and surface transportation. NCDOT continues to use the Merger process, which is supported by USACE, NCDENR, FHWA, stakeholder agencies and local units of government, to effectively implement Section 404 of the Clean Water Act during the NEPA/SEPA decision-making phase of transportation projects.

B. *Enhance travel and tourism*

The Triangle is not considered a travel or tourism destination. Nonetheless, the location of major universities draws travel to the area for university related special events, and some roadways such as I-40 serve as principal travel corridors for those traveling to the mountains or beaches. The 2050 MTP has a substantial investment in the roadways and public transportation that provide access to the major universities because the land use and travel modeling processes identify those areas as employment and education centers. Those centers and the subsequent forecasted congestion attract needed roadway improvements and transit services. For example, fixed guideway transit such as commuter rail or bus rapid transit provides access to all of the four major universities in the Triangle. Major roadway improvements are planned for those campuses, as well. In terms of tourism travel that passes through the Triangle, those travel corridors such as I-40 and the future I-87 will receive major capacity improvements.

2. *The MPO shall set performance targets no later than 180 days after the State or Public Transportation Provider establishes performance targets – 306 (d)(3)*

The CAMPO and DCHC MPO have approved performance targets as required, and continue to update them on required schedules.

3. *The MPO and public transportation providers shall jointly agree upon and develop specific written provisions for developing and sharing information related to the following -- 314(h):*

- a. *Transportation performance data*
- b. *The selection of performance targets*
- c. *The reporting of performance targets*
- d. *The reporting of performance data to be used in tracking progress toward attainment of critical outcomes*
- e. *The collection of data for the State asset management plan for the NHS*

The MPOs and transit providers developed the agreements. CAMPO adopted an agreement on May 16, 2018 and the DCHC MPO incorporated written commitments into a TIP amendment on May 9, 2018.

4. *Documented Participation Plan shall include – 316(a):*
 - a. *Public ports* – There are not any ports in the MPO’s planning area.
 - b. *Private providers of intercity bus operators* – Local transit systems coordinate and share facilities with the private, intercity bus operations. For example, the Durham Central Transit Station, which provides access to local fixed-route and regional transit systems, also has access to Greyhound and Mega Bus services. The MPO Technical Committees (TC) have designated a member from these private providers but they do not attend the TC meetings. The MPOs will continue to coordinate with private providers by sending them participation information through public input processes.
 - c. *Employer based commuting programs* – The Triangle J Council of Governments (TJCOG) coordinates the Triangle TDM program for the entire Triangle Region. Chapter 7 of this report summarizes the TDM program. The following TDM Web page has program details that demonstrate the breadth and effectiveness of the program:
<http://www.tjcog.org/triangle-transportation-demand-management-program.aspx>
 - d. *Vanpool programs* – These programs are an integral and successful part of the Triangle TDM program. See subpart “c” above.
 - e. *Transit benefit programs* – These programs are an integral and successful part of the Triangle TDM program. See subpart “c” above.
 - f. *Parking cash-out programs* – Local government, transit agency and downtown organization planners have promoted parking cash-out programs to large residential developments, employment centers and universities. For example, local planners discuss unbundling “free” parking spaces from apartment rental fees with developers and property management firms. However, the MPOs are not aware of any bona fide parking cash-out programs in the region.
 - g. *Shuttle or telework programs* -- These programs are an integral and successful part of the Triangle TDM program. See subpart “c” above.
5. *The MPO shall consult with agencies and officials responsible for other planning activities within the MPA when developing the MTP and TIP MPO – 316(b)*
 - a. *Tourism* – The MPOs include the relevant Convention & Visitors Bureaus by providing participation information (both general efforts like the MTPs and TIPs and project-specific efforts like corridor studies and small area plans).
 - b. *Natural disaster risk reduction* – The MPOs participate in hazard mitigation plan updates and special studies like the 2018 Triangle Regional Resilience Assessment.
6. *MPO has option to conduct and include PEL process – 318(e)*

The MPOs have begun to be engaged by NCDOT in their Integrated Project Delivery initiative. This is envisioned by NCDOT to be NC’s collective approach to the PEL process.
7. *MPO shall have Congestion Management Process – 322*
 - a. *An MPO serving a TMA may develop a congestion management plan*

The MPOs have approved Congestion Management Process plans and have implemented the plans through completion of System Status Reports and other reports such as a Mobility Report Card.

- b. Consider employer-based travel demand reduction strategies: intercity bus, employer-based programs, carpool, vanpool, transit benefits, parking cash-out, telework, job access projects. The Triangle TDM program, which is summarized in chapter 7 of this report, makes use of these strategies. The following TDM Web page identifies the strategies and evaluates their effectiveness: <http://www.tjcog.org/triangle-transportation-demand-management-program.aspx>*

8. *MPO shall include the consideration of intercity bus service – 324 (f)(2)*

See the response to #4-c above.

9. *MPO shall have performance targets – 324(f)(3)(4)*

- a. MTP shall include a description of the performance measures and targets used in assessing the performance of the transportation system*
- b. A system performance report evaluating the condition and performance of the transportation system with respect to the performance targets including progress achieved by the MPO to reach performance targets*

The response in item number 2, addresses the CAMPO and DCHC MPO timeline for addressing the federal performance measures. In addition, as detailed in chapter 4 of this report, the MPOs have established a set of both MTP performance measures/ targets and federal performance measures that are aligned with the MPOs goals and objectives.

Related Performance Based Plans

There are several other plans maintained by transportation agencies that feed into performance management or include aspects of performance management. It is important that the goals and objectives of those plans are incorporated into the MPOs overall performance based planning efforts. The following plans contain applicable performance management components.

- NCDOT Strategic Highway Safety Plan (SHSP)
- Transportation Asset Management Plan (*for the National Highway System*)
- Congestion Management Process (CMP)
- Transit Asset Management (TAM) Plan
- Public Transportation Agency Safety Plan

10. *MPO may voluntarily elect to conduct scenario planning – 324(f)(4) (ii)*

As detailed in the land use plans and policies and Alternatives Analysis sections of chapter 5 of this report, the MPOs have made extensive use of scenario planning. Different land use plans are matched with different sets of transportation investments (e.g., large highway investments, large fixed-guideway investments) to create modeled outputs.

11. *TIP shall include to the maximum extent practicable – 326(d)*

- a. Description of the anticipated effect of the TIP toward achieving the performance targets identified in the MTP*
- b. Link investment priorities in the TIP to achievement of performance targets in the plans*

The MPOs will provide written text and analysis as the performance measures take effect and as the Transportation Improvement Programs (TIP) under the 2050 MTP are updated and implemented.

10. Post-2050 Vision: Comprehensive Transportation Plan Projects

Many worthy projects that would help ease congestion, improve access and provide travel choices are not able to be funded within the constraints of existing and reasonably anticipated revenue sources, and therefore are not included in the fiscally constrained 2050 Metropolitan Transportation Plan. These projects are typically included in each MPO's Comprehensive Transportation Plan (CTP). These unfunded projects are listed in the appendices with an implementation year beyond 2050.

The [Durham-Chapel Hill-Carrboro CTP](#) was adopted in May 2017 and was last amended in December 2020.

The Comprehensive Transportation Plan for CAMPO is a combination of the proposed projects that were not funded in the Metropolitan Transportation Plan (MTP) in Wake County, and adoption of the CAMPO portion of county-wide CTPs in Franklin, Granville, Harnett, and Johnston Counties. The CTPs for each county are an important input during the development of each MTP. CAMPO works to ensure the projects identified in the MTP and local CTPs match. The current status of Capital Area MPO CTP components can be viewed at:

<http://www.campo-nc.us/transportation-plan/comprehensive-transportation-plan>