

9.0 Implementation & Monitoring

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9.1 Short-Range Programming

All projects included in the 2040 RTP that will be implemented with federal funding are required to be formally programmed into the region's Transportation Improvement Program (TIP) prior to obligation and expenditure of funds. This short-term programming requirement ensures that the state and MPO have accounted for recently authorized federal funding levels appropriated by Congress and provides additional opportunity for the public and interested stakeholders to have input on the projects that are to be implemented over the next few years.

Programming Policies

The MPO has identified the following policies to provide guidance for the development and maintenance of the regional work program, and to assist in the effective administration of MPO-managed federal grant funds.

<i>Policy 1. Compliance with Regional Plan</i>	For a project to be eligible for the TIP, it first must be included in the adopted regional transportation plan. Large capital projects, roadway capacity, and/or general purpose roadway projects must be individually listed or clearly part of a larger project included in the fiscally-constrained component of the plan. Certain projects seeking to improve safety, increase multi-modal opportunities, or enhance the existing transportation system may be programmed in the TIP without individual identification in the regional plan, so long as they are consistent with the established goals and objectives of the plan, are funded with revenue identified by the plan, and are included in the assumptions of the air quality conformity determination (if required).
<i>Policy 2. Compliance with Air Quality Standards</i>	Prior to the adoption of a TIP or the approval of any subsequent amendment or modification to the TIP, the MPO shall ensure that the collection of projects comprising the work program conform to applicable air quality standards and/ or meet state and federal air quality regulations or requirements. Such regulations or requirements may necessitate that members of the MPO submit to the MPO detailed information about any project that adds vehicular capacity to the major roadway system -- whether funded with federal grants or not.
<i>Policy 3. Compliance with State Transportation Work Program</i>	No TIP project may assume the receipt of state revenues or state-managed federal grant funds unless those funds are included in the state's three-year work program presented annually to the Tennessee General Assembly, or unless otherwise authorized in writing by the Tennessee Commissioner of Transportation. Valid contractual agreements between the State of Tennessee and a local grant recipient may serve as sufficient proof of the State's commitment.
<i>Policy 4. Fiscal Constraint Limitations</i>	The MPO shall not program in the TIP any MPO-managed federal grant funds for which funding cannot be identified, either as part of unobligated amounts appropriated by Congress in the current or previous federal fiscal years, or as part of the MPO's adopted financial forecast for the corresponding TIP year(s).
<i>Policy 5. Illustrative Priorities</i>	Upon adoption of the TIP and in each year thereafter, the MPO shall endorse or reaffirm its commitment to seeking resources for regional priority projects not funded by grants provided by the TIP. The endorsed list of priorities shall be used to identify next-in-line projects to receive additional funding available to the MPO, either through higher-than-expected appropriations or new federal grant programs, or from funding that is returned to the MPO general fund from any project not able to use its award. The list also shall be used to communicate the region's top priorities for other funding opportunities to TDOT, state legislators, the U.S. Congressional delegation, and other interested parties.
<i>Policy 6. Eligibility for MPO-Managed Federal Grant Funds</i>	<p>At minimum, any proposed project to improve the safety, capacity, operations, or physical condition of roadways identified on the MPO's federal-aid network are eligible for MPO-managed federal grant funds. In addition, projects that improve safety or multi-modal opportunities on routes not identified on the federal-aid system (e.g., sidewalks on local roads, greenways, transit routes, etc.) also are eligible as long as they meet any applicable federal codes and regulations. Certain MPO-managed federal grant funds may require additional conditions be met in order to be considered eligible (e.g., CMAQ funds require an air quality benefit).</p> <p>In general, MPO-managed federal grant funds should be awarded to projects that serve locations contained within the geographic area of the associated grant program (e.g., urbanized area Surface Transportation Program funds), but exceptions may be granted in cases where an MPO priority project located outside of the area is shown to have benefit to the region as a whole, and where that project has no other opportunity for funding within the desired implementation schedule.</p>

<i>Policy 7. MPO Commitment to Projects</i>	<p>With the adoption of the TIP, or its subsequent amendment, the MPO formally commits to ensuring that MPO-managed federal grant funds identified for a project are provided as programmed unless such funding is not available due to changes in law or federal regulations, or if funding is not appropriated at anticipated levels, or is lost to the periodic rescission of unobligated balances. Should MPO-managed federal grant funding be removed from a project as a result of a decrease in funding levels, that project shall remain a top priority for funding once revenues are identified or restored.</p> <p>Any project programmed in the TIP with MPO-managed federal grant funds, which continues to meet all eligibility requirements while maintaining the proper support of the project sponsor, shall continue to be a priority for the MPO as the region develops a new TIP. Projects with federal funding already obligated shall automatically have unobligated programmed funds carried forward to the new TIP, along with the appropriate increase in funding to cover inflation (see Policy 11) unless that project is proven to have a fatal flaw, loses support from the project sponsor, or is estimated to cost more than 10% beyond previous cost estimates provided to the MPO (see Policy 12).</p>
<i>Policy 8. Project Sponsor Commitment to Projects</i>	<p>Project sponsors hold ultimate responsibility for ensuring that project information contained in the TIP is correct, that it accurately represents the scope of work being performed, and the amount of funding being requested. The sponsor is responsible for providing to the MPO an honest accounting of project details including: costs, implementation schedules, and local matching fund sources, at the time of the application for federal funds and anytime such details change, or at the request of the MPO.</p> <p>For a project funded with MPO-managed federal funds to remain eligible for those funds, the project's sponsor must provide proof of stated local matching funds at least 3-months prior to the beginning of the federal fiscal year for which the funds are programmed for use. Should a sponsor fail to satisfy the requirement, the project may be allowed a one-year grace period (see Policy 10).</p>
<i>Policy 9. Construction Funding</i>	<p>To facilitate the timely delivery of projects and to prevent the lapse of obligation authority provided by Congress to the state and MPO, the construction phase of projects shall not be formally programmed with MPO-managed federal grant funds until all preliminary engineering (PE) work is completed. This approach assists in the management of federal funds by providing a realistic construction cost estimate and implementation schedule, thus preventing large amounts of funding from being held up on delayed projects.</p> <p>In order to ensure the availability of MPO-managed federal grant funds for projects ready for construction, the MPO will reserve at least 80% of the amount of funding needed for construction on projects programmed in the TIP (which have not completed PE) as unprogrammed funds. Funding will be programmed on projects in the TIP after the completion of the PE phase on a first-come, first-serve basis as funding is made available.</p> <p>In order to be eligible for MPO-managed federal grant funds for a construction phase, the project sponsor must submit a construction cost estimate at the time of the MPO's call-for-projects associated with the development of a new TIP. If the project is selected for funding, the MPO's federal share of construction costs will be shown as "illustrative," until the PE phase has been completed.</p> <p>Should the construction cost estimate identified after the completion of PE exceed the original estimate by 10% or more, the project sponsor must find an alternative source of revenue, make a special request to the MPO Executive Board for additional funding, or compete for the additional funding as part of the MPO's next call-for-projects. In such competition, priority will be given to viable projects previously programmed in the TIP (see Policy 7).</p>
<i>Policy 10. Dormant or Inactive Projects</i>	<p>Project sponsors are given a one-year grace period to obligate funding on projects beyond the originally programmed year of work. Failure to do so may cause federal funds to be returned to the MPO general fund and re-programmed to the next highest eligible MPO priority as identified by the MPO's annual list of priorities (see Policy 5).</p> <p>Project phases which have been obligated, but have not realized any activity within a 12-month timeframe, may be subject to de-obligation and grant funds returned to the MPO general fund. Returned funds will be re-programmed to the next-highest eligible MPO priority, as identified by the MPO's annual list of priorities.</p>
<i>Policy 11. Inflation Adjustments</i>	<p>Whenever a project is deferred or carried over from one TIP to another, the MPO shall automatically increase the project award by 5% and up to 10%, unless evidence suggests that such adjustment is not necessary. Should evidence show that project cost estimates have increased by more than 10% on a project in a previous TIP, the project sponsor must compete for the additional funding. In such competition, priority will be given to viable projects previously programmed in the TIP (see Policy 7).</p>

<i>Policy 12. Cost Increases/ Cost Over-Runs</i>	<p>In cases where a project that is awarded MPO-managed federal grant funds does not have sufficient funding to fulfill the scope of the project as originally programmed, the project sponsor may be granted the flexibility to shift funding across phases and/or years (pending the availability of funding) to cover increased cost estimates for the affected phase. Should additional funding be required to implement the phase, the project sponsor will be responsible for securing that additional funding from an alternative source of revenue or compete for additional funds at the next available MPO call-for-projects. In such competition, priority will be given to viable projects previously programmed in the TIP (see Policy 7).</p> <p>The responsibility for any cost over-run on a project already under contract shall be determined by the prevailing contractual agreement between TDOT and the project sponsor. Such contractual agreement shall not bind the MPO to pay for cost-overruns with MPO-managed federal grant funds. The project sponsor may shift funding across phases and/or years (pending the availability of funding) to cover increased costs, however, should additional funding be required to conduct the programmed phase, the project sponsor will be responsible for securing that additional funding from an alternative source of revenue or compete for additional funds at the next available MPO call-for-projects. In such competition, priority will be given to viable projects previously programmed in the TIP (see Policy 7).</p>
<i>Policy 13. Changes in the Scope of Work</i>	<p>All changes to the scope of work for projects programmed in the TIP with MPO-managed federal grant funds must first be approved by the MPO. Projects are evaluated, scored, ranked, and prioritized, and selected based on the benefits and costs of the project as proposed at the time the TIP is developed. Any changes that significantly depart from the original scope may require that project to compete for federal funds during the next MPO call-for-projects.</p>
<i>Policy 14. Project Tracking</i>	<p>In order to facilitate the implementation of the TIP policies, the MPO will work with TDOT and project sponsors to present to MPO members, at least quarterly, a full accounting of the funds obligated for each project and any changes in the status of those projects.</p>
<i>Policy 15. TIP Amendment Cycles</i>	<p>MPO will consider amendments to the TIP on a quarterly basis. The annual schedule of amendment cycles shall be adopted by the MPO prior to the beginning of each federal fiscal year (October 1). Any project sponsor requesting an amendment not deemed to be an emergency must wait for the next amendment cycle or reimburse the MPO for the direct costs incurred to pay for the required public noticing.</p>

9.2 Project Development Process

Once a project has been identified in an MPO regional transportation plan, several steps remain. The project development process can take several years, and the average federally-funded roadway project in the U.S. takes about 12 years to implement once the engineering phase begins. The following steps are common to most projects before they reach the construction phase.

1. **Planning and Detailed Study:** The first step of any project is the planning phase. This phase is only ever completed once a project begins the engineering process. Until then, the project's need is continuously evaluated as the landscape changes. A project is first identified through a long-range planning or visioning process which identifies the general need, conceptual design, and rough cost estimate. Major investments typically also go through detailed planning studies which evaluate alternative design options and produce higher grade cost and benefit analysis.
2. **Preliminary Engineering and Design and Environmental Assessment:** After initial funding for a project is programmed in the TIP or short-term capital budget, it begins the engineering process. This early engineering work involves an environmental assessment of the design options and produces a 30 percent design for the project which identifies right-of-way needs and provides updated cost estimates for construction.
3. **Right-of-Way Planning and Acquisition:** Depending on the project, additional ROW is then identified and acquired to accommodate the project's design. ROW can be acquired through donation, market purchase, or through eminent domain. Eminent domain is an option of last resort and still requires land holders to be compensated according to prevailing market prices. If necessary, other public or private utilities are relocated during this phase.
4. **Final Design and Construction Plans:** Once ROW, utility, and environmental needs have been addressed and a final construction budget is determined, the design is finalized and construction plans are developed.

Figure 9-1 Typical Project Development Process and Timelines



9.3 Mitigating Social and Environmental Impacts

Social Equity and Vulnerable Populations

Title VI of the Civil Rights Act of 1964 and the 1994 President's Executive Order on Environmental Justice (#12898) are intended to ensure that federally-funded projects or programs do not discriminate. Each federal agency is required to identify any disproportionately high and adverse health or environmental effects of its programs on minority and low-income populations.

- **Title VI of the Civil Rights Act of 1964** – No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.
- **Executive Order 12898, Environmental Justice** – Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

As such, MPO is charged with evaluating regional plans and programs for their effect on vulnerable populations and to ensure its process is free of discrimination as required by federal law.

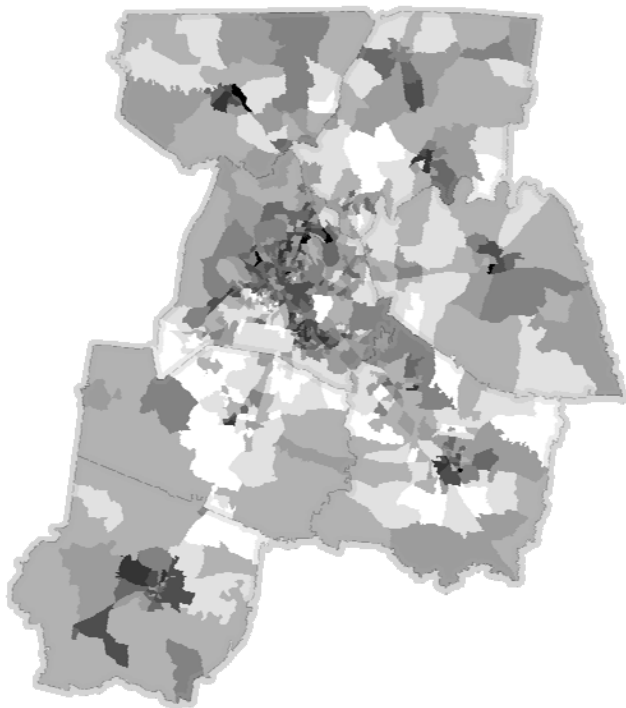
Identifying Vulnerable Populations

This section summarizes the methods used by the MPO to identify vulnerable populations across the region. While not perfect, it does provide an indication of where transportation projects impacts could be magnified. Specifically, EJ analysis is concerned with the impacts of disparate funding and disparate services on defined minority and low-income groups. The MPO currently assesses the following population groups: non-Hispanic minorities, carless households, households in poverty, persons with physical disabilities, female head of household with child, elderly, Hispanic persons, and limited

English proficiency. Each population group has specific planning-related challenges. Using U.S. Census data for the year 2010, these groups are identified and located at the census tract or block group level.

Data is gathered at the regional level, combining populations from each of the seven counties that overlap with the MPO planning area, for either individuals or households, depending on the indicator. From there, the total number of persons in each demographic group is divided by the appropriate universe (either population or households) for the seven county region, providing a regional average for that population group.

Figure 9-2 Indicators of Vulnerability and Areas of Concern

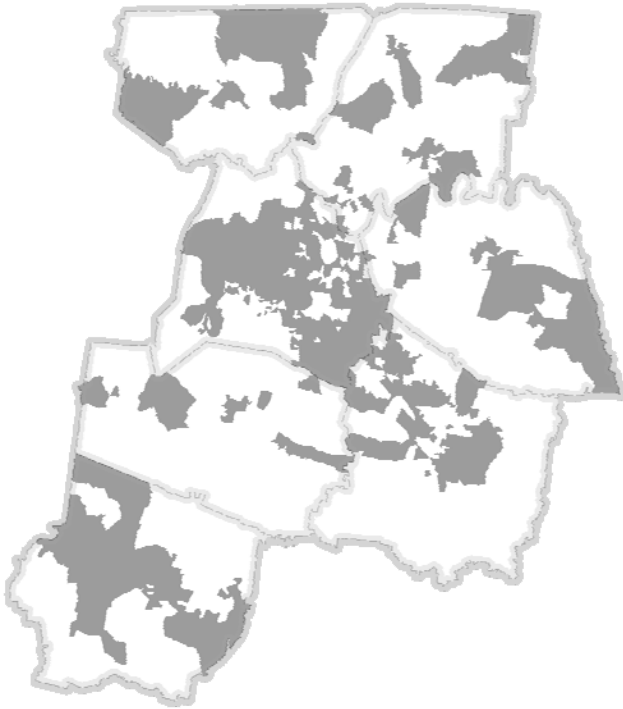


A census tract or block group that includes a segment of population considered vulnerable at a rate equal to or higher than the regional average is considered an EJ-sensitive tract. The following series of maps depict Census tracts with a higher rate of occurrence for each of the EJ population segments including:

- Household in Poverty
- Non-Hispanic Minority
- Hispanic Minority
- Limited English-Proficiency
- Seniors
- Disabled Persons
- Carless Households
- Single-Mother Households

The number of vulnerable populations present in any one Census tract or blockgroup at higher than average rates is referred to as the degree of vulnerability.

A list of proposed projects that overlap with areas that contain higher than average rates of at least three vulnerable populations is provided in Appendix C.

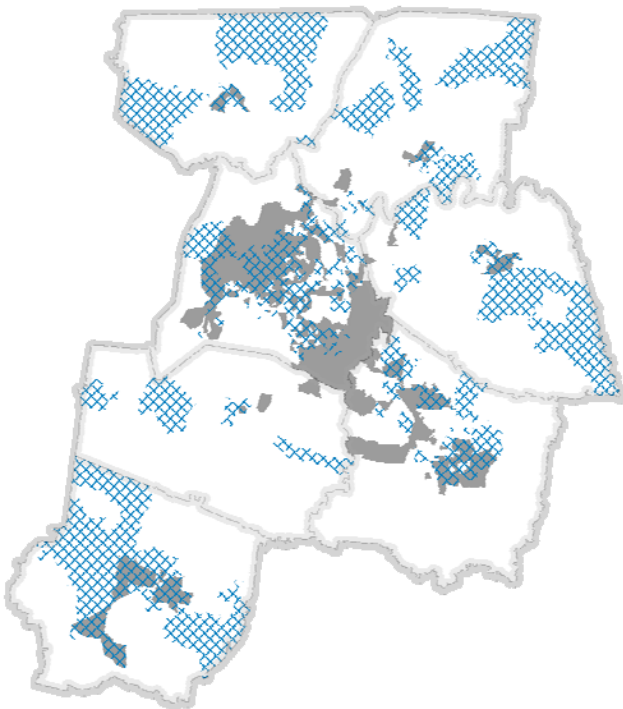


Households in Poverty

Regional Total: 48,492 Households | Regional Threshold: 10.2 percent

Poverty, or low income, is defined as personal or household income at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines, established as a relationship between income and the size of the family unit. These poverty guidelines are updated annually and are used as eligibility criteria for federal programs, such as Community Service Block Grants.

Areas with a higher than average rate of poverty are shown in the map to the left in solid gray, and then again in each of the following maps with a hatched pattern.



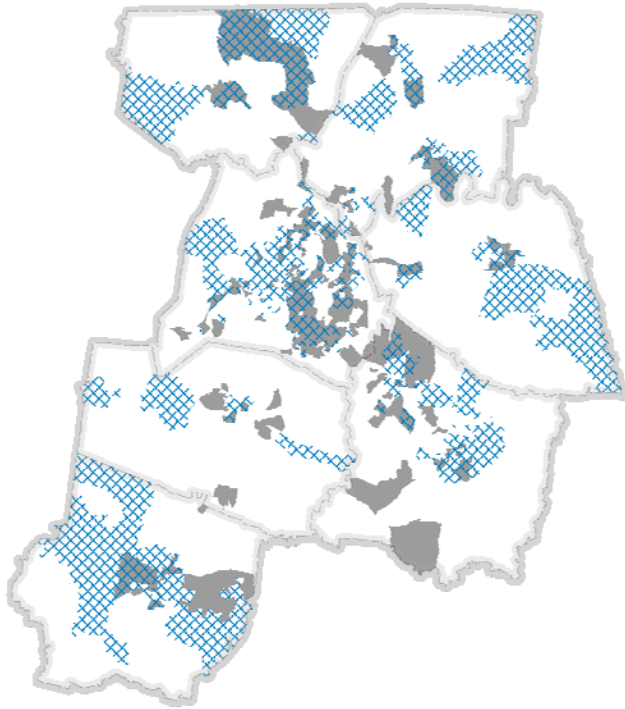
Non-Hispanic Minority Population

Regional Total: 238,525 People | Regional Threshold: 19.5 percent

The U.S. Department of Transportation Order 5610.2(a) on Environmental Justice defines "Minority" as:

- Black: a person having origins in any of the black racial groups of Africa
- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands
- American Indian and Alaskan Native: a person having origins in any of the original people of North America who maintain cultural identification through tribal affiliation or community recognition

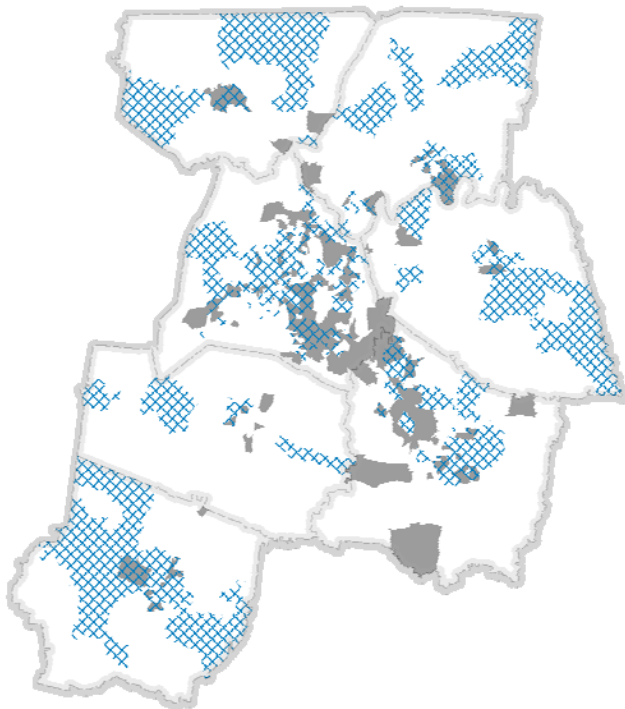
In addition to the groups mentioned above, the U.S. Census also recognizes two more racial categories: Some Other Race Alone and Two or More Races. All five racial categories have been included in this analysis. The U.S. Census also recognizes a difference between race and ethnicity, creating separate minority categories for Hispanic or Latino and race. The population group recognized in this category is non-Hispanic minorities. Hispanic ethnicity, regardless of race, is recognized as a separate category.



Hispanic Population

Regional Total: 40,585 people | Regional Threshold: 3.3 percent

Though often included in many minority definitions, Hispanic or Latino is an ethnicity, not a racial category. Hispanics are defined by the U.S. Census as “persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.” Persons in the 2010 U.S. Census were asked, “Is this person Spanish, Hispanic, Latino?” Thus, persons of Hispanic origin can be of any race. Hispanics should have indicated their origin in the Hispanic origin question, not in the race question, because in federal statistical systems ethnic origin is considered to be a separate concept from race. This interpretation is based on changes made by the Office of Management and Budget in October 1997, requiring all federal agencies that collect and report data on race and ethnicity to follow these new standards.

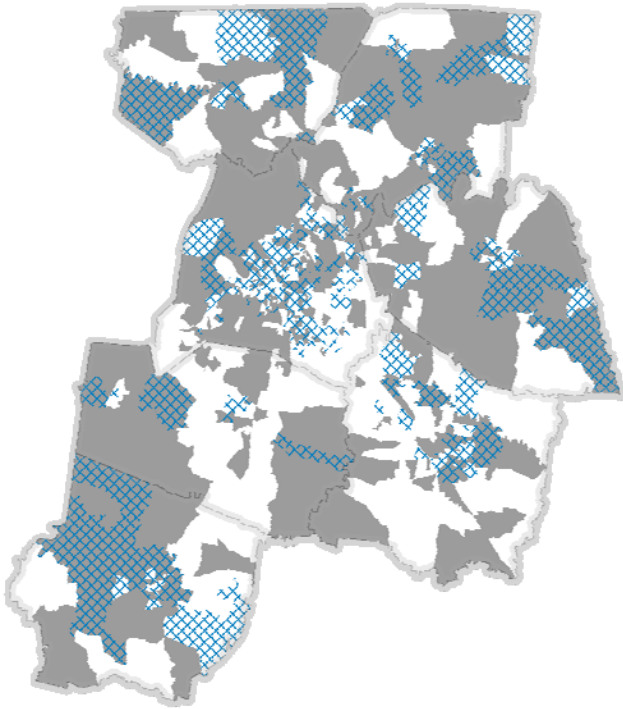


Limited English Language Proficiency Population

Regional Total: 20,858 people | Regional Threshold: 1.8 percent

Executive Order 13166 of 2000 on limited English proficiency (LEP) charges all federally funded agencies to make services more accessible to eligible persons who are not proficient in the English language. LEP is defined in the U.S. Census as “primary language spoken at home other than English and speak English not very well.” This captures the populations with a primary language other than English spoken at home, including Spanish, Asian and Pacific Island languages, Indo-European languages, and other languages. The Census universe for this category includes only the population aged five years and older.

It is assumed that an inability to speak English well can be a barrier to accessing goods and services, including transportation. In addition, identifying these populations and their locations is important to MPO’s outreach efforts, particularly in assessing the need to make the agency’s publications and written materials available in additional languages.

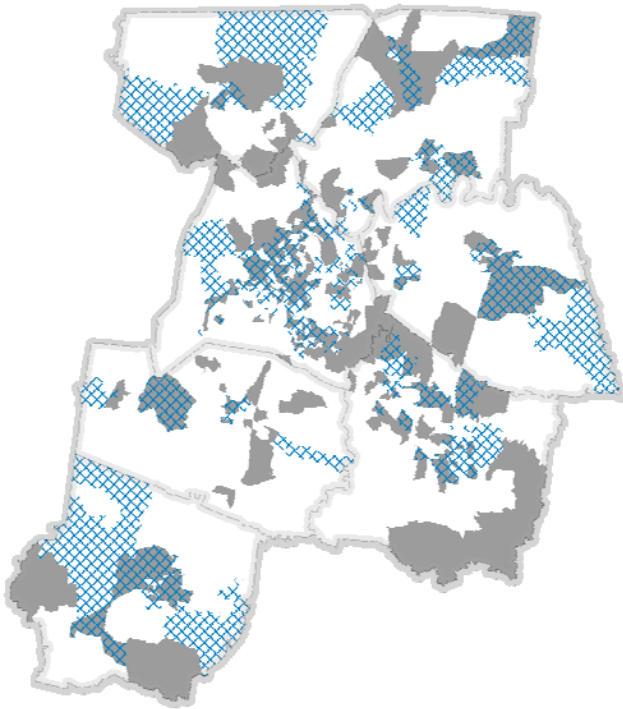


Senior Population

Regional Total: 123,749 People | Regional Threshold: 10.1 percent

Mobility barriers and age are linked together. Not every elderly individual has mobility challenges, but the likelihood of a challenge increases as an individual ages. Seniors aged 75 years qualify for most, if not all, mobility programs that have an age requirement.

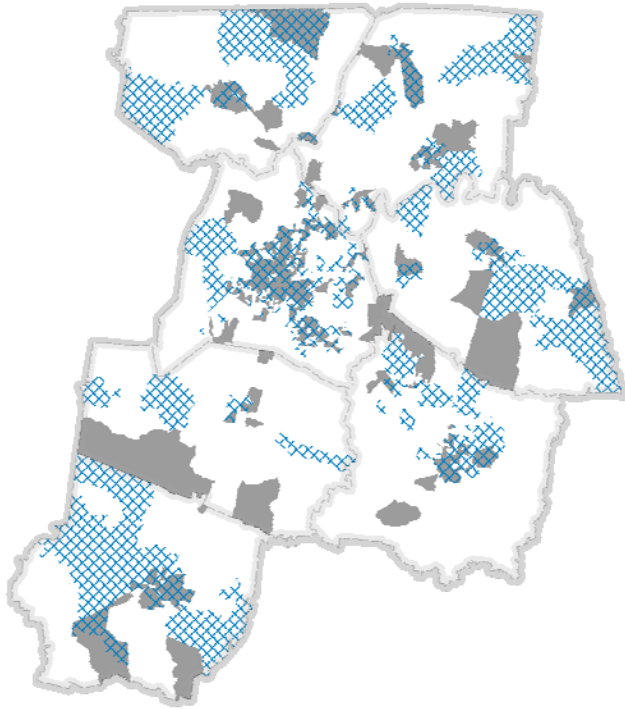
In 1900, seniors aged 65 years and older accounted for less than five percent of the total population of the United States. Now numbering over 35 million, seniors currently account for over 12 percent of the nation's population. By 2030, the senior population will double to more than 70 million, or 20 percent of the U.S. population.



Single Mother Households

Regional Total: 35,175 Households | Regional Threshold: 7.4 percent

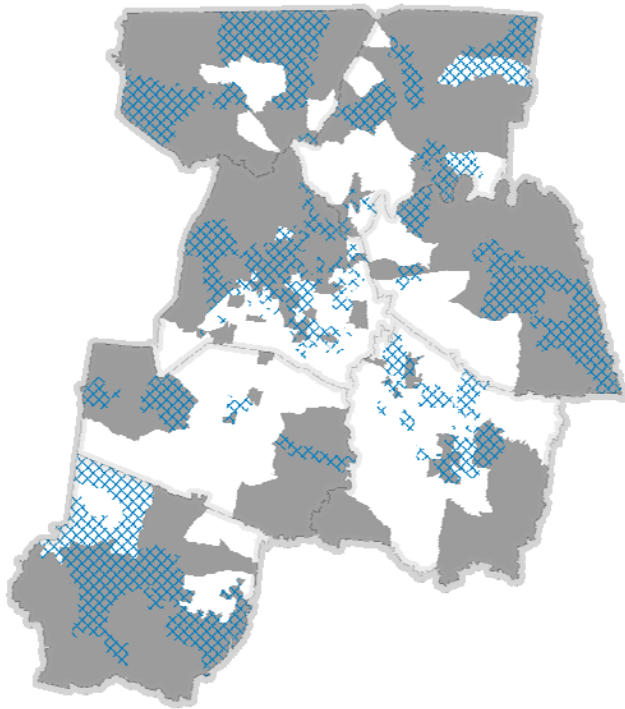
"Female head of household with child" is defined in the 2010 U.S. Census as a "female maintaining a household with no husband present, and with at least one child under 18 years old who is a son or daughter by birth, marriage (a stepchild), or adoption, residing in the home." This factor was chosen to add gender and children into the analysis, as well as to acknowledge the strong correlation between female heads of household with child and poverty status. In addition, this group exhibits different travel patterns and needs.



Carless Households

Regional Total: 31,341 Households | Regional Threshold: 6.6 percent

Carless households are defined in the U.S. Census as having zero vehicle availability. This population is often referred to as “transit dependent,” i.e., those who must rely on public transit for their daily travel needs and who have limited mobility. It is recognized that not owning a personal automobile may be a lifestyle choice for some, but for others automobile ownership is unattainable due to various constraints, including income or disability. Additionally, many carless individuals may take transit to one destination, and then continue their trip as a pedestrian.



Physically Disabled Population

Regional Total: 91,802 People | Regional Threshold: 8.2 percent

Definitions for “people with disabilities” vary from agency to agency. The U.S. Census identifies six disability categories: sensory, physical, mental, going outside of the home, self-care, and employment. The Americans with Disabilities Act (ADA) provides comprehensive civil rights protection for “qualified individuals with disabilities.” An individual with a disability, according to the ADA, is a person who has: (A) a physical or mental impairment that substantially limits one or more of the major life activities of such individual; (B) a record of such impairment; or (C) being regarded as having such impairment.

The MPO has decided to identify persons with a physical disability for the disability indicator, but recognizes that each disability type has specific challenges. This analysis of the distribution of persons with physical disabilities relies on data from the U.S. Census, which defines a physical disability as “a condition that substantially limits one or more basic physical activities, such as walking, climbing stairs, reaching, lifting, or carrying.” The Census universe for this category includes only the population five years and older.

Accommodations for the Disabled

The *Americans with Disabilities Act* (ADA) is a federal law that was signed on July 26, 1990. The ADA prohibits discrimination on the basis of disability and mandates that all disabled persons be provided full access to all public facilities in the country. Designing and constructing public facilities that are not usable by people with disabilities is a violation of the ADA.

Current ADA standards, which are contained in the 2002 edition of the *Americans with Disabilities Act Accessibility Guidelines* (ADAAG), thoroughly outline requirements for building design. However, ADAAG provides little guidance regarding the design of facilities in public right-of-way. The U.S. Access Board is the federal agency that is responsible for the development of minimum accessibility guidelines to assist the Department of Transportation (DOT) and the Department of Justice (DOJ) in establishing design standards for the ADA. This board released a draft update of the ADA guidelines on June 17, 2002. The draft update was revised on November 23, 2005 and is entitled *Accessible Public Rights-of-Way Planning and Designing for Alterations*. This document provides more specific guidance for public right-of-way and includes provisions for sidewalks, sidewalk ramps, street crossings, and related pedestrian facilities. Although these guidelines have not yet been adopted, the Federal Highway Administration (FHWA) and the U.S. Access Board encourage their use since they offer the most authoritative guidance available regarding accessible design in public right-of-way.

The current and proposed ADA guidelines provide minimum design standards for ensuring accessibility. Alternate standards may be applied provided that the alternate standards meet or exceed the minimum ADA guidelines. The recommendations presented in the pedestrian facilities design guidelines section are consistent with, and in some cases exceed, the standards presented in *Accessible Public Rights-of-Way Planning and Designing for Alterations* (refer to the US Access Board's website – <http://www.access-board.gov/prowac/> for the most up to date ADA accessibility guidelines).

Environmental Assessment and Mitigation

The National Environmental Policy Act of 1969 (NEPA) established a national policy to promote the protection of the environment in the actions and programs of federal agencies. The FHWA and FTA act as lead Federal agencies, and are responsible for implementing the NEPA process and working with state and local project sponsors during transportation project development. The FHWA and FTA NEPA process is designed to assist transportation officials in making project decisions that balance engineering and transportation needs with the consideration of social, economic and environmental factors. This process allows for involvement and input from the public, interest groups, resource agencies and local governments. The FHWA and FTA NEPA process is used as an "umbrella" for compliance with over 40 environmental laws, regulations, and executive orders and provides an integrated approach to addressing impacts to the human and natural environment from transportation projects.

Different types of transportation projects will have varying degrees of complexity and potential to affect the environment. Under NEPA, the required environmental document depends on the degree of impact. FHWA and FTA, in coordination with the project sponsor, prepare one or more of the following documents for a proposed project:

- **Notice of Intent (NOI)** - a notice that an environmental impact statement (EIS) will be prepared and considered.
- **Categorical Exclusions (CE)** - apply to projects that do not have a significant impact on the human and natural environment.
- **Environmental Assessments (EA)** - prepared for projects where it is not clearly known if there will be significant environmental impacts. If the analysis in the EA indicates the proposed project will have significant environmental impacts, an EIS is prepared.
- **Finding of No Significant Impact (FONSI)** - If there is not a significant impact, this conclusion to the EA is documented in a separate decision document, the FONSI.
- **Environmental Impact Statements (EIS)** - prepared for projects that have a significant impact on the human and natural environment. Draft EIS (DEIS) and Final EIS (FEIS) documents, with input from the public, provide a full description of the proposed project, the existing environment, and the analysis of the beneficial and adverse impacts of all reasonable alternatives.
- **Record of Decision (ROD)** - presents the selected transportation decision analyzed in an EIS, the basis for that decision, and the environmental commitments, if any, to mitigate for project impacts to the human and natural environment.

Environmental Mitigation

MAP-21 legislation requires that the Nashville Area MPO consult with Federal, State, and Tribal land management, wildlife, and regulatory agencies to develop a general discussion on possible environmental mitigation activities that should be incorporated into transportation projects identified in this plan.

As part of this requirement, TDOT established a consultation process with state and federal agencies responsible for environmental protection, land use management and natural resource and historic preservation. Through this process, the MPO was able to seek comment and compare available plans and maps with planned transportation improvements. A list of agencies with which the MPO consulted is included in Appendix D.

Since the transportation planning activities of the MPO are regional in scope, this environmental mitigation discussion does not focus on each individual project within the Regional Transportation Plan but rather offers a summary of the environmentally sensitive areas to be aware of regionwide, the projects that most likely will have an impact on these environmentally sensitive areas, and mitigation strategies that should be considered to reduce the impact of projects.

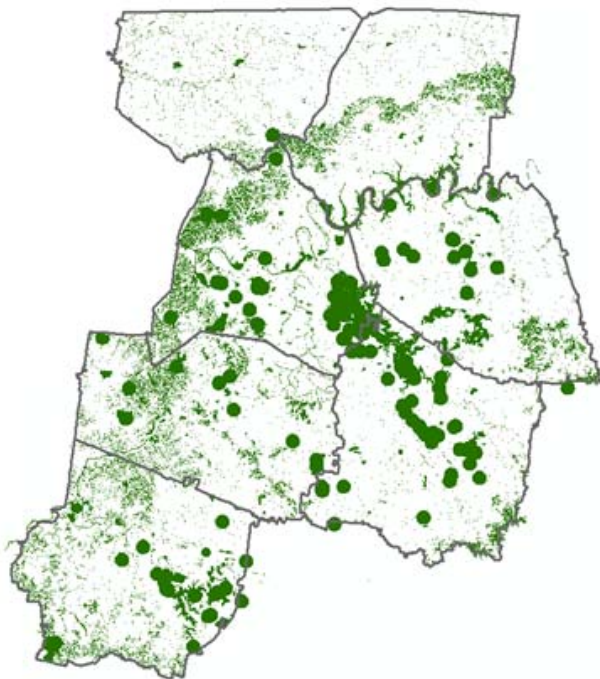
This environmental mitigation discussion was developed through a three step process. First, the MPO developed a list of environmentally sensitive areas that should be identified. A Geographic Information System (GIS) was used to map these areas. Second, the highway projects from the regional plan were overlaid. A query was performed to determine which projects would have an impact on an environmentally sensitive area. Finally, a discussion of general mitigation efforts that should be utilized is included to minimize the potential impacts any project in this plan has on an environmentally sensitive area.

Defining Environmentally Sensitive Areas

There are numerous environmentally sensitive areas found throughout the Nashville area. Many areas are too small or too numerous to map at a regional level and can only be clearly identified through a project level analysis. Some areas are yet to be identified and will only become known once a project level analysis is completed, such as caves, sinkholes, and wetlands. When a project is ready to move from the regional plan into construction phases, a complete analysis should be completed to determine the type and location of environmentally sensitive areas within the project study area. Typically, such analysis is part of the federally-required NEPA process.

In defining environmentally sensitive areas for the regional plan, the MPO identified two types of areas throughout the region where proposed improvements would either 1) pose a potential threat to the environment (areas of environmental conflict) or 2) potentially cost more to implement as a result of environmental features (areas of environmental challenge). The following environmentally sensitive areas are included in that analysis.

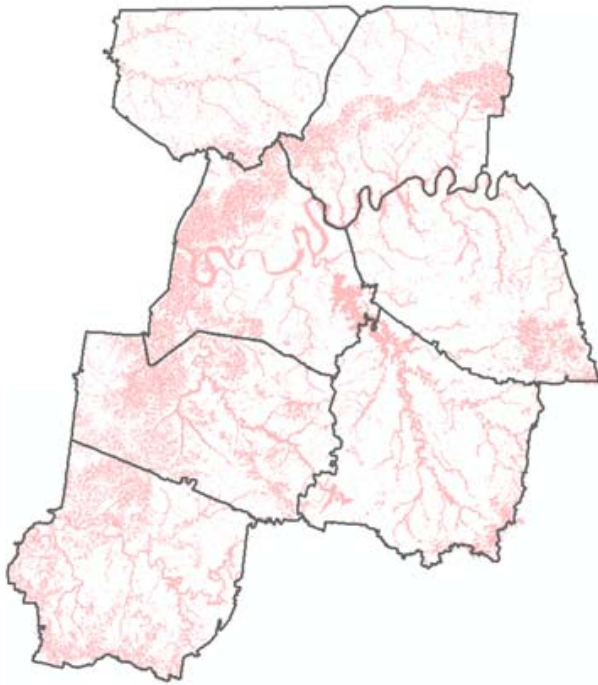
Figure 9-3 Areas of Environmental Sensitivity



Environmental Conflict

Includes things that could be harmed or threatened by the proposed improvement including:

- Water bodies,
- Wetlands,
- Floodways and floodplains,
- Hillsides with greater than a 25 percent slope,
- Protected lands, and
- Habitat of rare or endangered species.



Environmental Challenge

Includes things that could be harmed or threatened by the proposed improvement including:

- Water bodies,
- Wetlands,
- Floodways and floodplains,
- Hillsides with greater than a 15 percent slope,
- Sinkholes,
- Protected lands, and
- Habitat of rare or endangered species.

While some sort of mitigation effort should be included in every project that has an impact on an environmentally sensitive area, it is recognized that not every project will have the same level of impact and thus different levels and types of mitigation should be utilized. Some projects involve major construction with considerable earth disturbance, such as new roadways and roadway widening projects. Other projects involve minor construction and minimal, if any earth disturbance, such as traffic signal, street lighting, and resurfacing projects. The mitigation efforts used for a project should be dependent upon how severe the impact on environmentally sensitive areas is expected to be. In determining which mitigation strategies to utilize, each project identified as having an impact on an environmentally sensitive area should follow the three step mitigation planning process prior to construction:

- Identify all environmentally sensitive areas throughout the project study area;
- Determine how and to what extent the project will impact these environmentally sensitive areas; and,
- Develop appropriate mitigation strategies to lessen the impact these projects have on the environmentally sensitive areas.

All projects should minimize off site disturbance in sensitive areas and develop strategies to preserve air and water quality, limit tree removal, minimize grading and other earth disturbance, provide erosion and sediment control, and limit noise and vibration. Where feasible, alternative designs or alignments should be developed that would lessen the project's impact on environmentally sensitive areas. The three step mitigation planning process should solicit public input and offer alternative designs or alignments and mitigation strategies for comment by the MPO and local government.

For major construction projects, such as new roadways, or for projects that may have a regionwide environmental impact, a context sensitive solutions process should be utilized in which considerable public participation and alternative design solutions are used to lessen the impact of the project. A list of projects that are planned in areas with known environmental concerns is included in Appendix C.

Climate Change and Adaptation

Climate variability and change is one of the most serious threats to the U.S. transportation system. The transportation sector is the second largest emitter of greenhouse gas emissions (GHG) in the country after the electricity sector, accounting for 27 percent of GHG emissions in 2013. These GHG emissions have been directly linked to our changing climate, and the associated increased prevalence of extreme weather, more frequent flooding, and higher maintenance and construction costs due to extreme heat require mitigation and adaptation solutions to ensure the long-term viability of our transportation system.

While the transportation sector is a major contributor to climate change, it is also directly impacted by climate change itself, and adaptation strategies must be pursued to ensure the reliability and functionality of the region's transportation

network. Extreme weather affects every county in Middle Tennessee and across the state. In the past three decades, the state has incurred more than \$1 billion in damages from fifteen weather disasters, and the 2014 National Climate Assessment states that extreme weather events, especially heat waves and droughts, will worsen as the climate warms. Extreme heat is of particular concern for our region, because it is a threat the region already experiences, and the majority of climate models are confident in their projections of increasing temperatures. Prolonged and intense periods of extreme heat, such as the record high of 109F in the summer of 2012, are expected to increase in intensity and frequency in the future. Critical weather risks to our transportation infrastructure in this region include: extreme heat, high winds and thunderstorms, tornadoes, heavy precipitation and flooding, lightning, hail, drought, and winter storm events. All of these events have negative impacts on our infrastructure, people, and environment. Extreme weather disrupts our transportation system and travel mobility. It also has serious public health implications as well as economic, social, and ecological impacts.

Resilience to extreme weather is a high priority for the region's infrastructure, especially our roadways, bridges, and buildings. The region's transportation system is vital on many levels: the local economy depends on a safe, efficient system to transport goods and access markets, emergency services must be able to move quickly to address emergency situations, and people's quality of life is improved when their mobility is assured. Middle Tennessee's highways and interstates are also important nationally because the state is utilized as a major east-west and north-south corridor.

Climate Mitigation and Adaptation Solutions

In recognition of these climate risks, the U.S. DOT recommends that MPOs incorporate climate change considerations into planning activities and programs to improve the efficiency and cost-effectiveness of infrastructure protection and public safety. To this end, the Nashville Area MPO has developed a climate adaptation plan for the region, which includes analysis of the transportation system's vulnerability to climate change and recommends adaptation solutions.

The MPO is developing and considering various mitigation and adaptation solutions, including:

- Conducting transportation vulnerability assessments within the Nashville MPO region would allow the MPO to create an updated list of critical transportation assets as defined by stakeholders in our seven counties. This information could be used to inform short and long-term infrastructure plans and allow the MPO to incorporate climate change and extreme weather vulnerabilities into its analysis of proposed transportation projects.
- Embedding consideration of climate change impacts into the analysis of vehicle emissions, infrastructure materials, and public policies.
- Prioritizing projects that reduce emissions, such as active transportation (biking, walking), and technology solutions to improve efficiency of existing roadway network.
- Identifying potential bottlenecks, or "pinch points", in the transportation system that if damaged, would prevent adequate evacuation routes during extreme weather, human-caused disasters, or terrorism.
- Continuing research on climate adaptation solutions through the creation of a Regional Resilience Working Group.
- Making connections between climate risk and regional growth and development and land use decisions.
- Working with Cumberland Region Tomorrow to develop an ecosystem services-based open space plan that would identify key services that are at risk from growth and development.
- Incorporating high value natural resources into the environmental screening process for proposed transportation projects.
- Support FHWA and TDOT with ongoing climate change vulnerability and adaptation pilot projects.

9.4 Measure Performance and Progress

Annual Reporting

Annual Listing of Federally-Obligated Projects

Each December, the MPO publishes a complete list of all transportation projects that have had federal funds obligated during the preceding federal fiscal year. The obligation of funds is the federal government's promise to pay for all eligible expenses incurred by TDOT or the local implementing agency. Grant funds must be approved by the MPO and included in the RTP and TIP prior to their obligation by the federal government.

The annual list is available online at http://nashvillempo.org/transportation_projects/.

State of Transportation in Middle Tennessee

Each November or December, the MPO releases its annual report that includes general information about the MPO's organizational structure and operating budget, a list of major accomplishments for the year, an overview of emerging trends and issues, highlights from the adopted regional transportation plan, a summary of ongoing planning activities, and summary of how federal dollars were distributed in the preceding fiscal year.

The State of Transportation in Middle Tennessee is available online at http://nashvillempo.org/publications_docs/.

Nashville Region's Vital Signs

Each October, the Nashville Area Chamber of Commerce and MPO publish a major report to the region that tracks data points related to key issues affecting Middle Tennessee's economic well-being and quality of life in order to facilitate conversation about community-driven solutions to reinforce our strengths and address our weaknesses.

The report is available online at <http://www.nashvillechamber.com/vitalsigns>.

Performance Based Planning

Since the passage of MAP-21 in 2012, the MPO has begun working to expand its approach to performance-based planning. Specifically, the MPO is actively reviewing and commenting on federal rule-making that will shape future transportation planning requirements. In addition, the MPO is working with TDOT, FHWA, FTA, local partners, and consultant advisors to develop new performance measures for safety, state of good repair, mobility, and access to economic opportunity, environmental impact, and public health outcomes for use in evaluating land use scenarios and transportation projects that will be considered for future regional transportation plans. Those plans also will establish performance targets to help monitor progress towards federal, state, and regional transportation goals.

Congestion Management Process

One performance-based planning effort that has been underway for several years is the MPO's Congestion Management Process or CMP. The federal requirement for a CMP originated with the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) legislation in 1991, and was carried forward unchanged in its successor, the Transportation Equity Act for the 21st Century (TEA-21). With the passage of SAFETEA-LU in 2005, the Congestion Management System requirement was changed to a Congestion Management Process. Much of the language in the federal regulations remained the same between a CMS and a CMP, however, as the name suggests, there is more emphasis on making congestion management an ongoing process.

SAFETEA-LU, and its predecessor MAP-21, strengthens the tie between a CMP and the transportation plan, stating that the regulations reflect the goal that the CMP be an integral part of developing a long range transportation plan and TIP for MPOs. The primary purpose of the CMP is to provide for a more informed decision-making process that can be used to make the most effective use of limited resources to address congestion problems.

The project selection criteria for the RTP and the MPO's Transportation Improvement Program address the national goals of a CMP. The scoring system used provides a direct mechanism for CMP to be considered in the project selection process, which ultimately determines the projects that are to be implemented. Appendix B of this document provides the list of projects that propose improvements to congested corridors. The following provides an overview of the individual elements of the required CMP.

<i>Identify methods to monitor and evaluate the performance of the multimodal transportation system</i>	The MPO monitors, on some level, all facilities that are included in the travel demand forecasting model. While congestion is monitored on individual routes, analysis of congestion as it relates to regional mobility is typically performed at an aggregate level, looking at the system-level performance of parallel facilities within each of the major regional corridors. Each regional corridor is further divided into one of four distinct character areas (e.g., town center, urban, suburban, exurban/ rural) to allow for more appropriate definitions of congestion and to identify the most suitable solutions to manage that congestion.
<i>Identify Mechanism for Selection of Appropriate Performance Measures.</i>	This element involves the definition of parameters used to measure the extent of congestion based on locally determined thresholds for system performance. The primary performance measure for determining congestion in the Nashville region is the travel speed comparison between observed or modeled flows and the expected free flow, or ideal, speed for the facility. Free flow speed is based on the facility type and posted speed limit. Generally speaking, a roadway is considered congested if the observed or modeled travel speed is 70 percent or less of the expected free flow speed. In addition, third-party analysis provided by academia (e.g., Texas A & M's Texas Transportation Institute) and the private-sector (e.g., INRIX) are often monitored and cross-checked with local analysis. MPO forecasts for congestion are provided in section 4.3 of this plan.
<i>Establishment of Program for Data Collection and System Monitoring</i>	<p>This component includes the development of a data collection program that provides for adequate system monitoring in order to identify the causes of congestion. The MPO periodically collects travel time data on the system's roadways and has found that vehicle-based GPS units provide the most efficient and accurate means of travel time data collection. Other transportation data such as hourly traffic volume counts feed into the CMP and are provided by various agencies in the area. Using the data that is collected and performing technical analyses based on the performance measures that were identified above, the roadway corridors and segments that qualify as being congested can be identified.</p> <p>In addition to first-hand observation of traffic flows, the MPO also conducts periodic surveys of users (e.g., commuters, transit users, truck drivers, etc.) to measure vehicle occupancy levels, mode split, self-reported travel times and distances, and individual perceptions of levels of congestion.</p>
<i>Identification of Appropriate Congestion Mitigation Strategies</i>	There are several strategies that are available in the transportation planner's "toolbox" that can be used to reduce congestion. This component of the CMP attempts to identify the most appropriate mitigation strategy on a case-by-case basis. The intent of the CMP regulations is to first investigate mitigation strategies that focus on improving transportation operations and managing the existing system more efficiently, as well as reducing travel demand as a means to reduce congestion before resorting to new roadway construction or widening projects that serve only single occupant vehicles (SOV). The Nashville CMP identifies a menu of congestion mitigation strategies (described in Section 7.3 of this plan) that provide for methods of dealing with congestion other than the construction of additional roadway lanes. In fact, the three major policy initiatives that have shaped the 2040 Regional Transportation Plan – a bold new vision for mass transit, support for active transportation and walkable communities, and preservation and enhancement of strategic roadway corridors – each place a strong emphasis on providing multi-modal options and the use of operations and management techniques to make our roadway system more efficient.
<i>Identification of an Implementation Schedule</i>	One mechanism for implementing the mitigation strategies that are identified by the CMP is through the project selection process of the MPO's Regional Transportation Plan and Transportation Improvement Program. Projects that are identified in the planning process are given points based on how well they address the goals and objectives of the region, of which congestion is a major factor. Coordination with operations and management partners throughout the region is another mechanism being pursued by the MPO in order to identify congestion issues and solutions that can be implemented more quickly than a major construction project. A description of the evaluation criteria used to identify projects for implementation is presented in Section 8.4 and Appendix B of the plan.
<i>Implementation of a process for periodic assessment of the effectiveness of implemented strategies</i>	A process for periodic assessment of the efficiency and effectiveness of implemented strategies is a key component of a fully operational CMP, although it can prove very challenging. Since certain congestion mitigation strategies take long periods of time to fully implement and others may be taking place simultaneously, it can be difficult to measure the effectiveness of the specific measure that was taken. An example of this may be where a major interstate widening is occurring during the same time that an ITS project is being implemented through the same corridor. The MPO plans to continually update the CMP through regular data collection that should provide information about the change in conditions over time and whether the mitigation strategies that are being employed are keeping pace with the congestion.

9.5 Plan Revisions and Updates

Under current federal law, the 2040 RTP shall have a lifespan of no more than five years and is scheduled to be replaced at the end of calendar year 2020. Revisions to the adopted RTP will be carried out in the form of formal amendments or administrative adjustments. Amendments are intended to document major changes to the plan and require review by the public and state and federal partners prior to their adoption by the MPO Executive Board. The following list contains some typical examples of revisions that would require a formal amendment:

- The addition of major roadway projects that add vehicular capacity which were not included in the adopted RTP.
- The addition of a major roadway or transit project whose federal share of funding was not accounted for in the adopted RTP.
- Changes to the financial plan that are required due to significant differences in assumed revenue and actual appropriations.
- Any changes requiring a regional air quality conformity (not currently applicable).

All formal amendments to the RTP will follow the procedures outlined in the most recently adopted Public Participation Plan available on the MPO's website at www.NashvilleMPO.org.

Administrative adjustments can be used to document minor changes to the approved RTP. The following is a list of some typical changes that can be made through the adjustment process. Administrative adjustments do not require MPO Executive Board approval, but will be communicated to the Board and posted to the MPO's website along with the original or amended RTP document.

- Minor changes to project costs so long as the RTP remains fiscally constrained, nor require a formal amendment to the Transportation Improvement Program.
- Minor changes or clarification to the description of projects which do not affect air quality conformity (if applicable) or substantively impact the project's costs.
- Moving projects between horizons of the RTP as long as the plan remains fiscally-constrained and in compliance with any applicable air quality conformity requirements.
- Adjustments in revenue to match actual revenue receipts or federal, state, and local government appropriations.
- Additional text, data, or analysis that helps better communicate the goals and objectives of the RTP.
- Technical or clerical corrections that do not substantively alter the RTP's fiscal constraint or air quality conformity (if applicable).

9.6 Ongoing Public Involvement Opportunities

The regional transportation plans adopted by the MPO represent one of the earliest stages of any major transportation project. In most cases, the RTP offers only a conceptual proposal and best estimate of costs for transportation projects, especially those identified for the mid- and long-term horizons of the plan. To assist members of the public who are interested in following a project's progress towards implementation, the MPO has identified a sponsor or lead agency for each. The implementation of transportation projects can take several years and members of the public shall be afforded the opportunity to continue to ask questions and present concerns during each stage of the process including subsequent planning efforts, preliminary engineering and design work, and environmental review.