6.0 Implementation & Monitoring

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6.1 Ongoing Engagement and Planning

The Regional Transportation Plan represents 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, GNRC 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.

Recommended Planning Activities

To further refine the Plan’s proposed strategies for implementation, GNRC and its transportation planning partners will conduct additional studies and perform ongoing research and analysis related to congestion management, asset management, freight and goods movement, downtown mobility and parking, transportation demand management strategies, transportation revenue/ funding options, managed lanes and dynamic pricing strategies, and regional corridor management strategies. The following is a list of specific efforts being recommended for funding through the Unified Planning Work Program.

- **Traffic Shed/Impact Fee Analysis** – GNRC will conduct a regional traffic shed/impact fee analysis to implement recommendations from the Regional Transportation Plan by identifying transportation revenue options and growth management help local communities manage future growth and development.

- **Tier 2 “Environmental Analysis”** – Build off the project-level environmental analysis conducted for the 2045 RTP to identify a set of projects that would benefit from additional environmental analysis in order to support them through environmental review and permitting processes.

- **Project Development Support** – GNRC staff will increase its participation in the project development process and utilize its project-level staff analysis and documentation to ensure considerations for safety, congestion, environment, safety, active transportation, and equity are adequately considered through the development process.

- **Ongoing Coordination with other Regional Planning Documents** – Align the Regional Transportation Plan with other regional planning initiatives and products developed by GNRC including the federally required documents like the Comprehensive Economic Development Strategy and Area Plan for Aging and Disability Services, as well as products of regional interest related to environmental quality and resource conservation, solid waste management, social equity, housing affordability, and workforce development.

- **Congestion Monitoring and Reporting** – Continue to explore and analysis observed travel speed data to monitor congestion trends in the region. Participate in future data collection pilot for active transportation users to expand reporting capabilities of bicycle and pedestrian usage. Maintain and enhance public-facing data dashboards and online mapping tools to share congestion analysis with transportation stakeholders and members of the public.

- **CMP Coordination** – Continue monthly meeting among GNRC, TDOT, WeGo Public Transit, and FHWA to maintain coordination on data, needs and issues, and strategies to address congestion. Consider broadening participation to include other relevant entities critical to solving Middle Tennessee’s congestion challenges.

- **Ongoing Safety Planning** – GNRC staff will increase its participation in Road Safety Audits (RSA) led by TDOT to identify locations with high crash frequencies, review those areas, and priority safety improvement projects to address safety needs.
### 6.2 Project Development and Delivery

#### Short-Term Scheduling and Programming

Any federally-funded transportation improvement listed in the Regional Transportation Plan is required to be programmed into the region’s Transportation Improvement Program (TIP) and obligated by the federal government prior to implementation. This short-term programming requirement ensures that the metropolitan area has accounted for recently authorized federal funding levels appropriated by Congress and provides additional opportunities 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 Transportation Policy Board has adopted the following policies to provide guidance for the development and maintenance of the regional work program, and to assist in the effective administration of federal grant funds suballocated to the metropolitan planning area.

| Policy 1. Compliance with Regional Plan | 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). |
| Policy 2. Compliance with Air Quality Standards | 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. |
| Policy 3. Compliance with State Transportation Work Program | 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. |
| Policy 4. Fiscal Constraint Limitations | 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). |
| Policy 5. Illustrative Priorities | 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. |
| Policy 6. Eligibility for MPO-Managed Federal Grant Funds | 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).

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.

Policy 7. MPO Commitment to Projects

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.

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).

Policy 8. Project Sponsor Commitment to Projects

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.

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).

Policy 9. Construction Funding

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.

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.

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.

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
| Policy 10. Dormant or Inactive Projects | 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).

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. |
| Policy 11. Inflation Adjustments | 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). |
| Policy 12. Cost Increases/ Cost Over-Runs | 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).

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). |
| Policy 13. Changes in the Scope of Work | 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. |
| Policy 14. Project Tracking | 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. |
| Policy 15. TIP Amendment Cycles | 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. |
## Project Design and Delivery

One a project is programmed in the Transportation Improvement Program, the implementing agency will begin work on designing and delivering the proposed improvement. 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 transportation projects.

| **Continued Planning and Detailed Studies** | 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. |
| **Programming and Funding Obligation** | Once a project has been identified in the Regional Transportation Plan, it must then be programmed in the Transportation Improvement Program as a way of establishing the project as a short-term funding priority. The programming of a project also authorizes it for funding from federal grants once they are appropriated by Congress. When a project is ready to move forward towards implementation, those federal funds are obligated in the federal system, which constitutes the federal government’s commitment to reimburse the state or project sponsors for eligible expenses. |
| **Preliminary Engineering** | After programmed funds are obligated, most projects then proceed through an engineering process. This early work includes an environmental assessment of the various build options, and results in an initial design that is used to inform project sponsors of the right-of-way needs and construction cost estimates. |
| **Right-of-Way Acquisition** | Depending on the project, additional land, or ROW, is 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. |
| **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. |
| **Construction or Implementation** | The construction of major projects may take multiple years depending on their size and complexity. “Implementation” typically refers to the administration of projects not requiring physical changes to the landscape, including education and outreach programs, public transit services, etc. |
| **Purchase or Acquisition** | Some projects are intended to fund the procurement of transportation equipment such as public transit vehicles, or important assets like software or vendor services. |
| **Operations & Maintenance** | All transportation infrastructure will need to be operated and maintained for its useful life. This cost is typically borne by the owner or administrator of the asset, product, or service. |
6.3 Minimizing Disruption of Proposed Projects

Understanding the distribution of the region’s natural and sociocultural resources is critical to assessing the potential threats to those resources caused by the transportation planning and project development process over an extended timeframe. The following section documents GNRC’s inventory of the region’s key resources and their current conditions and trends. This characterization is utilized by staff to assess how proposed transportation investments overlap with environmental assets in order to identify alternatives and potential mitigation strategies for consideration.

Environmentally Sensitive Areas

In cooperation with environmental resource agencies, GNRC has identified locations across the metropolitan planning area that are considered to be environmentally sensitive. These Environmentally Sensitive Areas, or ESAs, are intended to represent natural or sociocultural assets or resources that could be negatively impacted by a transportation project. In total, the environmental factors that comprise the ESA cover approximately 2,430 square miles, or 62%, of the 7-county metropolitan area.

The components of the ESA are categorized into two groups depending on the anticipated impact. The first group, called “Environmental Challenges,” are those features that may increase the cost or complexity to implement a transportation project. For example, a highway segment may need to cross a stream even after other alignment alternatives are considered. This stream crossing will require that the implementing agency spend additional attention to the design and engineering to avoid impacts to regulatory floodplains and existing habitat. Environmental regulators will need additional project documentation to approve the project, and construction crews will need to take additional steps to protect the environmental quality of the stream during construction.
The second group, called “Environmental Conflicts,” are those features that may be directly or indirectly threatened by a proposed transportation project. For example, the same highway segment described above that crosses a stream may result in increased stormwater runoff that is discharged to the stream. That runoff could carry suspended solids that cause a negative impact on water quality within the stream. The quantity of water could also affect aquatic habitat or flood risk downstream of the project site.

In addition to Environmental Challenges and Conflicts, GNRC worked with stakeholders to identify additional environmental factors that experts view as important secondary considerations that should be taken into account as specific transportation projects move through the project development process.

**Figure 6-2. List of Environmentally Sensitive Features**

<table>
<thead>
<tr>
<th>Environmental Asset/Resource</th>
<th>Environmental Challenge</th>
<th>Environmental Conflict</th>
<th>Additional Environmental Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime Agricultural Farmlands</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Historic Sites &amp; Districts</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>100-Year Floodplain</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>500-Year Floodplain</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Steep Slopes (Hillsides with a slope &gt;15%)</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Priority Habitat Areas</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Protected Lands &amp; Conservation Areas</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Surface Waters &amp; Wetlands</td>
<td></td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Climate Resilient Lands</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Critical Habitat</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Rare &amp; Endangered Species</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Impaired &amp; Threatened Waters</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Scenic Rivers</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Century Farms</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Likely Agricultural Operations</td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>

**Figure 6-3. Map of Environmental Sensitive Areas**

The transportation project delivery process can take advantage of a number of strategies to help minimize the impacts a specific project or parts of the transportation system have on natural and sociocultural resources. Avoidance strategies prevent negative environmental impacts before they happen by implementing projects in places or with features that minimize environmental conflicts or challenges. Mitigation strategies recognize that an environmental conflict may be unavoidable and therefore attempt to compensate for that impact by investing in resource conservation or restoration within the project vicinity or elsewhere in the region.
While some sort of avoidance or 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 strategies 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.

In evaluating projects for potential environmental impacts, GNRC calculated the geographic overlap between a proposed project and the ESA and also identified the specific environmental factors that were implicated in the overlap. For example, a project may overlap the ESA because it crosses a river, floodplain and wetland feature. A different project may only overlap one environmental factor— for example just a floodplain or just a historic district listed on the National Register of Historic Places. For projects that overlap the ESA, GNRC identified potential opportunities the project applicant can consider that may help avoid or minimize environmental conflicts or minimize environmental challenges. In some cases, where a project scope was large or a project was expected to trigger or accelerate land use changes on nearby properties, GNRC’s evaluation included a recommendation for a more thorough analysis of direct and indirect environmental impacts that may be caused by the project. Documentation of this staff analysis is provided in Appendix E.

**Vulnerable Populations**

GNRC is required to consider equity in transportation planning decisions. Executive Orders 12898 and 13166, the Americans with Disabilities Act (ADA), and the Civil Rights Act of 1964 prohibit discrimination based on race, color, gender, national origin, or disability and require agencies to examine and provide access to the services they offer. GNRC considered these federal regulations and guidelines as well as other populations that face physical, economic, educational, and other challenges that disproportionately affect their quality of life to identify nine traditionally under-served or vulnerable populations. The nine population groups considered in the development of the Regional Transportation Plan, include: seniors (those aged 65 years or older), racial and ethnic minorities, people with disabilities, single mother households, carless households, limited English-speaking households, families below the poverty level, and the unemployed labor force.

**Identifying Vulnerable Populations**

This following section summarizes the methods used by GNRC 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. Each population group has specific planning-related challenges. Using U.S. Census Bureau’s American Community Survey (ACS) 5-year estimates for 2014-2018 at the block group level, which is currently the most up to date and finest scale of demographic data available, GNRC gathered population group data across the seven counties within the metropolitan planning area. 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. Based on the analysis, GNRC further examined the vulnerable populations by degrees of vulnerability and highly vulnerable areas.

- **Vulnerable Area:** To determine areas where vulnerable areas are located in the region, GNRC staff identified block groups that exceed the regional average for each of the nine population groups. For example, seniors account for 12.4% of the region’s population, so vulnerable areas for seniors are block groups where more than 12.4% of the block group’s population are seniors.

- **Degrees of Vulnerability:** To determine areas where there is greater overlap of the nine vulnerable population groups, GNRC employs the Degrees of Vulnerability (DOV) index. A Degree of Vulnerability is identified for a population group if the census block group exceeds the regional average for that population group. Degrees of vulnerability can range from zero to nine, based on the number of nine population groups above the regional average within each census block group.
Highly Vulnerable Area: To highlight the areas with higher degrees of vulnerability, GNRC classified block groups with six more degrees of vulnerability. Of the region’s 916 block groups, 179, approximately 20%, were defined as highly vulnerable. The 179 highly vulnerable block groups were clustered into 21 Highly Vulnerable Areas (HVAs) based on their geography within the region and classified by city or neighborhood. Approximately 17% (291,953) of the region’s total population resides in these areas. The map below shows the 21 HVAs and where they are located in the region.

Figure 6-4. Map of Vulnerable Communities

The maps to the left show the vulnerable areas, or block groups with a higher than average proportion of the population, in orange. The raw value of the population, or density of the population rather than proportion, is shown in the blue dots. The final map is a composite of all of the orange areas, or vulnerable areas, and shows how they rank from having zero to nine high concentrations of vulnerable populations.

A list of proposed projects that overlap with areas that contain higher than average rates of the nine vulnerable populations is provided in Appendix F.
6.4 Performance Monitoring

The 2045 RTP invests $10 Billion in federal transportation grants and matching funds over the next 25 years to make progress toward the goals and objectives outlines in the policy framework. Regional goals, described in Chapter 4, provide the framework for RTP evaluation criteria used in the process for selecting projects for funding. These criteria are utilized to identify which projects advance the region’s goals. The nature of the plan is long-term, and therefore performance of the plan must be measured by how individual projects are expected to change the overall system’s performance as it relates to the goals, objectives, and performance measures in the policy framework.

Annual List of Obligated Funding

Each December, GNRC 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 Transportation Policy Board and included in the RTP and TIP prior to their obligation by the federal government.

Performance Measure Tracking

Federal Performance Based Planning Requirements

Pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21) Act enacted in 2012 and the FAST Act enacted in 2015, states and metropolitan areas must adhere to a performance management approach in carrying out their federally-required transportation planning and programming activities. The process requires the establishment and use of a coordinated performance-based approach to transportation decision-making to support national goals for the federal-aid highway and public transportation programs. As a result, State DOTs, Transit Providers, and regional transportation planning organizations are required to periodically set performance targets for achieving seven national transportation goals.

Transportation Policy Boards for metropolitan areas have three options for setting their annual performance targets:

- Option A - Concur with State DOT targets
- Option B - Establish targets for their respective metropolitan planning area
- Option C - Concur with State DOT targets and establish targets for the metropolitan planning area

While FHWA will determine whether a State DOT has met or made significant progress toward meeting these targets, it will not directly assess progress toward meeting targets at the regional level. GNRC will continue to review these performance measures and will update these targets on the required annual, two-year, and four-year cycles, following updates completed by the state.

Safety Performance Measures Targets

The final rule on safety performance measures target setting was the first of a series of rules related to target setting, effective April 14, 2016. Annual safety targets are required of state departments of transportation and metropolitan planning organizations for five performance measures, and are based on a five-year rolling average and apply to all public roads within the MPO region. GNRC is required to establish safety targets within 180 days of TDOT establishing its targets. Safety performance measures regulations in support of the Highway Safety Improvement Program (HSIP) require States and metropolitan areas to assess the following on all public roads covered by HSIP:

- **Number of Fatalities**: The total number of persons suffering fatal injuries in a motor vehicle crash during a calendar year.
- **Rate of Fatalities**: The ratio of total number of fatalities to the number of vehicle miles traveled (VMT, in 100 Million VMT) in a calendar year.
- **Number of Serious Injuries**: The total number of persons suffering at least one serious injury in a motor vehicle crash during a calendar year.
- **Rate of Serious Injuries**: The ratio of total number of serious injuries to the number of VMT (in 100 Million VMT) in a calendar year.
- **Number of Non-motorized Fatalities and Non-motorized Serious Injuries**: The combined total number of non-motorized fatalities and non-motorized serious injuries involving a motor vehicle during a calendar year.

On February 19, 2020, the Transportation Policy Board voted to support the state targets, thereby fulfilling the aforementioned requirements related to safety performance measure target setting established under MAP-21 and the FAST Act.

In the development of the Regional Transportation Plan, the Transportation Policy Board is pursuing regional safety targets of a one percent annual reduction in safety performance measures out to 2045. The Transportation Policy Board is scheduled to adopt regional safety targets on February 17, 2021.

### Figure 6-5. Established Safety Performance Targets

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURES</th>
<th>BASELINE</th>
<th>TARGET</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2014-2018</td>
<td>2016-2020</td>
</tr>
<tr>
<td>Number of Fatalities</td>
<td>1,005.4</td>
<td>1043.4</td>
</tr>
<tr>
<td>Fatality Rate (per 100 Million VMT)</td>
<td>1.282</td>
<td>1.256</td>
</tr>
<tr>
<td>Number of Serious Injuries</td>
<td>6,988.4</td>
<td>6,352.4</td>
</tr>
<tr>
<td>Serious Injury Rate (per 100 Million VMT)</td>
<td>8.948</td>
<td>7.690</td>
</tr>
<tr>
<td>Number of Non-motorized Fatalities and Serious Injuries</td>
<td>498.0</td>
<td>527.2</td>
</tr>
</tbody>
</table>

### Tracking Safety Progress

Safety performance measures are the critical link between the RTP project list and the safety goals and objectives outlined in the policy framework. They are also an essential tool GNRC uses to comprehensively evaluate projects, identify and prioritize meaningful solutions, and better implement and coordinate programs toward the targets set out in each of the five safety performance measures. The following strategies and tools will be used and explored by GNRC to meet the safety performance targets decided upon by the TPB.

- **RTP Project Prioritization**: Through the RTP process, the Transportation Policy Board weighted goals in order of importance, with improving safety for the traveling public as the region’s top priority among the six main goals identified in the policy framework. A staff member was dedicated to evaluating each project based on how the project addressed safety, while also identifying opportunities to enhance each project in relation to safety. Staff also evaluated projects based on how they addressed safety specifically for non-motorized users, and recommended improvements for projects that did not address non-motorized users. These evaluations helped identify projects that were more likely to address safety performance by scoring those projects higher.

- **Active Transportation Program (ATP)**: The Active Transportation Program targets at least 15 percent of available Surface Transportation Block Program (STBG) resources for walking, bicycling, or transit-supportive projects that may not have otherwise received funding through more traditional revenue streams. These projects are evaluated by staff and reviewed by the Bicycle and Pedestrian Advisory Committee (BPAC), particularly on how they address non-motorized safety. Through the implementation of these projects, the ATP funds improvements that will ultimately aid in meeting the TPB’s established safety performance targets.
• **Road Safety Audits (RSA):** A Road Safety Audit is the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users. GNRC is committed to collaborating with TDOT and local governments during the Road Safety Audit process and intends to be more involved in this process going forward. Involvement in this process will help identify safety improvements that will help achieve the TPB’s established safety performance targets.

• **Regional Bicycle and Pedestrian Safety Action Plan:** Through data analysis and collaboration with TDOT and local stakeholders, GNRC hopes to further prioritize safety improvements and programs through the development of a Regional Bicycle and Pedestrian Safety Action Plan. This process will not only identify high-crash locations, but will create a coordinated guide for planners, law enforcement, educators, and all other stakeholders to achieve a reduction in non-motorized crashes and improve safety for all users. This plan will be in coordination with existing and planned bike-ped planning efforts throughout the region, such as Metro Nashville’s Vision Zero strategy, as well as existing and planned bike-ped infrastructure improvements.

**Infrastructure Condition Performance Measures Targets**

The final rule on pavement and bridge condition performance measures target setting was the second of a series of rules related to target setting, effective May 20, 2017. Pavement and bridge condition performance measures require States and metropolitan areas assess the following on the NHS to carry out the National Highway Performance Program (NHPP):

- **Percent of Interstate Pavement in Good Condition:** Pavement condition shall be calculated in accordance with the HPMS Field Manual and based on three condition ratings of Good, Fair, and Poor calculated for each pavement section. Good condition suggests no major investment is needed.

- **Percent of Interstate Pavement in Poor Condition:** Pavement condition shall be calculated in accordance with the HPMS Field Manual and based on three condition ratings of Good, Fair, and Poor calculated for each pavement section. Poor condition suggests major reconstruction investment is needed.

- **Percent of Non-Interstate NHS Pavement in Good Condition:** Pavement condition shall be calculated in accordance with the HPMS Field Manual and based on three condition ratings of Good, Fair, and Poor calculated for each pavement section. Good condition suggests no major investment is needed.

- **Percent of Non-Interstate NHS Pavement in Poor Condition:** Pavement condition shall be calculated in accordance with the HPMS Field Manual and based on three condition ratings of Good, Fair, and Poor calculated for each pavement section. Poor condition suggests major reconstruction investment is needed.

- **Percent of NHS Bridge by Deck Area in Good Condition:** Measures are based on deck area. Deck area is computed using National Bridge Inventory (NBI) data. Classification is based on NBI condition ratings for deck, superstructure, substructure, and culvert. Condition is determined by lowest rating of these. If the lowest rating is greater than or equal to 7, the bridge is classified as good.

- **Percent of NHS Bridges by Deck Area in Poor Condition:** Measures are based on deck area. Deck area is computed using National Bridge Inventory (NBI) data. Classification is based on NBI condition ratings for deck, superstructure, substructure, and culvert. Condition is determined by lowest rating of these. If the lowest rating is less than or equal to 4, the bridge is classified as poor.

On October 17, 2018, the Transportation Policy Board voted to support the Tennessee Department of Transportation’s individual four-year infrastructure condition performance measure targets by planning and programming projects so they contribute to the accomplishment of the statewide targets, thereby fulfilling the aforementioned requirements related to infrastructure condition performance measure target setting established under MAP-21 and the FAST Act.

While FHWA will determine whether a State DOT has met or made significant progress toward meeting these targets, it will not directly assess progress toward meeting targets at the regional level. GNRC will continue to review these performance measures and will update these targets on a two-year cycle, following updates completed by the state.
System Performance - Performance Measures Target-Setting

The final rule on system performance target setting was the third of a series of rules related to target setting, effective May 20, 2017. System Performance measures require State DOTs assess the following on the NHS to carry out the National Highway Performance Program (NHPP). The Nashville metropolitan area is only subject to the first three travel time reliability measures.

- **Interstate Travel Time Reliability**
- **Non-Interstate NHS travel Time Reliability**
- **Interstate Truck Travel Time Reliability**
- Total Emissions Reductions
- Annual Hours of Peak Hour Excessive Delay Per Capita
- Percent of Non-Single Occupancy Vehicle Travel

**Interstate Travel Time Reliability**: This is not level of congestion. This is a single number describing the predictability of travel times combined for all the Interstates. In cities that are congested people can plan for ‘normal’ delays, so 100% is the desired number. Lower numbers show higher unpredictability. Travel time reliability measures the extent of unexpected delay. A formal definition for travel time reliability is: the percentage of people (not vehicles) who have travel that has consistent travel times. It can be used to compare across days and across different times of day: Monday through Friday (morning peak (6-10 a.m.), midday (10 a.m.-4 p.m.) and afternoon peak (4-8 p.m.). This measure also looks at weekends (6 a.m.-8 p.m.). Data are collected in 15-minute periods between 6 a.m. and 8 p.m. local time. Using person-miles and not vehicle miles of travel takes into account the travelers on buses, and carpooling in automobiles, and trucks.

**Non-Interstate NHS travel Time Reliability**: This is the same measure as above, except for highways designated as part of the National Highway System that are not Interstates. Again, it is not level of congestion, is the predictability of travel time using person-miles and not vehicle miles of travel. Using person-miles instead of vehicle miles helps account for the number of people on buses, and carpooling in automobiles, and trucks.

**Interstate Truck Travel Time Reliability (TTTR)**: Freight movement is assessed using the TTTR Index. Reporting is divided into the same periods described above, with the addition of an overnight time period. The five periods used for Truck Travel Time are Mondays through Fridays: morning peak (6-10 a.m.), midday (10 a.m.-4 p.m.); afternoon peak (4-8 p.m.); and overnights (8 p.m.-6 a.m.). Weekends (6 a.m.-8 p.m.) are measured as above. The TTTR ratio is determined by dividing the time it takes 95 percent of trucks to travel a given segment by the ‘average’ time (50 percent of trucks) for each segment. Specifically, the Level of Travel Time Reliability (LTTR) is the ratio of unexpectedly delayed travel (95% of the trucks travelling on a given stretch of road take less time to travel that segment) divided by the average (half the trucks travelling on that segment take less time), using approved data from FHWA’s National Performance Management Research Data Set (NPMRDS) or equivalent. The TTTR Index...
requires multiplying each segment’s largest ratio of the five periods by its length, then dividing the sum of all length-weighted segments by the total length of Interstate. The desire is a number as close to 1.0 as possible.

On October 17, 2018, the Transportation Policy Board voted to support the Tennessee Department of Transportation’s individual four-year system performance targets by planning and programming projects so they contribute to the accomplishment of the overall statewide targets, thereby fulfilling the aforementioned requirements related to system performance measure target setting established under MAP-21 and the FAST Act.

While FHWA will determine whether a State DOT has met or made significant progress toward meeting these targets, it will not directly assess progress toward meeting targets at the regional level. GNRC will continue to review these performance measures and will update these targets on a two-year cycle, following updates completed by the state.

**Figure 6-7. Established System Performance Targets**

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURES</th>
<th>BASELINE 2017</th>
<th>2-Year (2020)</th>
<th>4-Year (2022)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate Reliability</td>
<td>87.7%</td>
<td>85.3%</td>
<td>83.0%</td>
</tr>
<tr>
<td>Non-Interstate NHS Reliability</td>
<td>N/A</td>
<td>87.8%</td>
<td></td>
</tr>
<tr>
<td>Freight Reliability</td>
<td>1.35</td>
<td>1.35</td>
<td>1.33</td>
</tr>
</tbody>
</table>

**Transit Asset Management Performance Measures Targets**

The final rule on Transit Asset Management, effective October 1, 2016 requires transit providers and metropolitan areas to set state of good repair (SOGR) targets by class for the following assets:

- **Rolling Stock** – percent of revenue vehicles exceeding the useful life benchmark (ULB)
- **Equipment** – percent of nonrevenue service vehicles exceeding the useful life benchmark (ULB)
- **Facilities** – percent of facilities rates under 3.0 on the TERM scale
- **Infrastructure** – percent of track segments under performance restriction

On October 17, 2018, the Transportation Policy Board voted to adopt regionally-calculated transit asset management targets, thereby fulfilling the aforementioned requirements related to transit asset management performance measure target setting established under MAP-21 and the FAST Act. GNRC will continue to review these performance measures and will update these targets on a four-year cycle.

**Figure 6-8. Transit Asset Management Performance Targets**

<table>
<thead>
<tr>
<th>PERFORMANCE MEASURES</th>
<th>TARGET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling Stock</td>
<td>25%</td>
</tr>
<tr>
<td>Equipment</td>
<td>50%</td>
</tr>
<tr>
<td>Facilities</td>
<td>25%</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>13.5%</td>
</tr>
</tbody>
</table>

**Congestion Management Process**

Congestion management is the application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of congestion on the movement of people and goods. A congestion management process (CMP) is a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs.
Federal regulations (23 CFR 450.320) require that the transportation planning process carried out by GNRC across the Nashville metropolitan planning area – and all other U.S. metropolitan areas with a population exceeding 200,000 – incorporate a CMP using the following 8 steps:

1. Develop regional objectives for congestion management,
2. Define the CMP (transportation) network,
3. Develop multi-modal performance measures,
4. Collect data and monitor system performance,
5. Analyze congestion problems and needs,
6. Identify and assess strategies,
7. Program and implement strategies, and
8. Evaluate strategy effectiveness.

As the fourth step, or action, identified in the federally-required CMP, GNRC and its planning partners are committed to gathering data to monitor system performance as TDOT, transit agencies, and local governments work to manage and mitigate traffic congestion across the greater Nashville area.

Federal regulations (23 CFR 450.320(c)3) establish that the CMP include “a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. To the extent possible, this data collection program should be coordinated with existing data sources and coordinated with operations managers in the metropolitan area.”

In developing and carrying-out this requirement, the federal guidance recognizes that metropolitan areas across the nation approach obtaining data for the CMP in several ways depending on a number of factors. The Federal Highway Administration does not prescribe the datasets that should incorporate into its CMP, but it offers the following as examples of common types of data used by regional planning organizations:

- Traffic volume counts,
- Speed and travel time data,
- Archived ITS and Operations data,
- Other electronic traffic datasets such as cell phone data,
- Aerial photography-based congestion data,
- Transit data,
- Bicycle and pedestrian data,
- Crash data, and
- Travel survey data.

The data collection and monitoring framework for the Nashville metropolitan area CMP is developed through a coordinated effort among GNRC, TDOT, area transit agencies, and local public works and planning departments and is driven by the performance measures established to track progress toward achieving regional objectives related to congestion management.

The Policy Guidance outlined in Chapter 4 includes six Regional Goals. Goal #3 is to “Mitigate Congestion to Keep the Region Moving,” and includes the following objectives for congestion management.

- Objective 1 – Minimize travel delays
- Objective 2 – Improve corridor-level travel time reliability
- Objective 3 – Increase access to non-single occupant vehicles options
- Objective 4 – Reduce travel distances

The policy framework also identifies 64 individual performance measures. Thirty-three (33) of those are directly related to the CMP and the regional objectives for congestion management.
Figure 6-9. List of Congestion Management Performance Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miles of Federal-Aid routes with bicycle facility</td>
<td>Roadway volume to capacity ratio</td>
</tr>
<tr>
<td>Miles of Federal-Aid routes with sidewalks</td>
<td>Travel speed as a percentage of expected free flow</td>
</tr>
<tr>
<td>Number of transit revenue hours</td>
<td>Peak hour excessive delay</td>
</tr>
<tr>
<td>Frequency of transit service (headway)</td>
<td>Percent of VMT on congested routes</td>
</tr>
<tr>
<td>Percent of park-n-ride lots with transit service</td>
<td>Percent of Freight VMT on congested routes</td>
</tr>
<tr>
<td>Vehicle miles traveled (VMT)</td>
<td>Vehicle hours traveled (VHT)</td>
</tr>
<tr>
<td>Roadway volumes</td>
<td>Interstate reliability</td>
</tr>
<tr>
<td>Percent of roadway volume classified as freight</td>
<td>Non-Interstate NHS reliability</td>
</tr>
<tr>
<td>Number of transit boardings and alightings at stops</td>
<td>Public transit service reliability (on-time)</td>
</tr>
<tr>
<td>Number of transit trips (ridership)</td>
<td>Freight reliability on NHS</td>
</tr>
<tr>
<td>Number of transit passenger miles</td>
<td>Average commute travel distance and time</td>
</tr>
<tr>
<td>Percent of commute destinations within county of residence</td>
<td>Pedestrian level of service</td>
</tr>
<tr>
<td>Percent of trips made by non-single occupant vehicles</td>
<td>Bicycle level of service</td>
</tr>
<tr>
<td>Number of employers participating in transit pass programs</td>
<td>Percent of households within 1/4 miles of frequent transit service</td>
</tr>
<tr>
<td>Number of employers participating in other formal TDM programs</td>
<td>Percent of households within 2 miles of park-n-ride lot</td>
</tr>
<tr>
<td>Number of crashes (traffic incidents)</td>
<td>Percent of jobs within 1/4 miles of frequent transit service</td>
</tr>
<tr>
<td>Number of crashes involving freight</td>
<td></td>
</tr>
</tbody>
</table>

There are an increasing number of tools available to monitor performance of the system by geography, such as the system, subarea, or corridor level or by time of day, day of week, or year. GNRC has expanded its offering of tools through its Data Portal and recently launched online dashboards to provide greater access and visibility into the datasets used to monitor system performance. Some of the available tools include:

**Online Geographic Information Systems (GIS) Portal**

GNRC’s online GIS portal includes maps and geographic files related to the Congestion Management Process including a link to congested corridors and projected traffic volumes and travel speeds. Maps can be explored at GNRC.org/Maps.

**Online Data Dashboards**

GNRC has recently launched online data dashboards to provide greater access and visibility into the datasets used to monitor system performance. Each can be explored at GNRC.org/Dashboards.

- Middle Tennessee Traffic Congestion, 2016-2019
- Middle Tennessee Crashes, 2015-2019
- Middle Tennessee COVID-19 Tracking (including mobility trends)
- Middle Tennessee Migration Flows
- Middle Tennessee County to County Commuter Flows

**Partner Responsibilities**

GNRC relies on coordination with state agencies, regional transit operators, and local governments to gather the necessary data to monitor the performance of the system. As a convener of transportation agencies and governmental jurisdictions, GNRC is well-suited to leverage data sources to ensure congestion problems are
identified and analyzed, but it is not responsible for the management and operations of the transportation system or for the implementation of upgrades and physical improvements to area roadways or transit systems.

All transportation planning partners are strongly encouraged to coordinate their plans to collect data and to be willing to share data with GNRC and other partners in the Congestion Management Process.

**Planned Projects in Congested Corridors**

As part of the Call-for-Projects issued by the Transportation Policy Board on October 16, 2019, approximately 350 applications were submitted by agencies through an online application and project evaluation tool located at Apply.NashvilleMPO.org. While only a subset of those projects has been selected for funding made available through this Plan, each project was evaluated to determine how the proposed improvement could help address current or future traffic congestion. The results of that analysis is provided as part of Appendix E.

**6.5 Plan Revisions and Updates**

Under federal law, the Regional Transportation Plan shall be updated at least every five years. As such, the next major update is scheduled to be completed by February 2026. Until then, minor revisions to the adopted RTP will be carried out in the form of 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 Transportation Policy 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 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).

**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 Transportation Policy Board approval but will be communicated to the Board and posted to GNRC’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).

Any future revisions to the Regional Transportation Plan will follow the procedures outlined in the most recently adopted Public Participation Plan available on GNRC’s website at [www.GNRC.org](http://www.GNRC.org).