

## 7.0 Financially Feasible Plan

The Memphis MPO used a performance-based approach to rank projects for Livability 2040 and incorporated state and local priorities to produce an overall prioritized list of projects to include in the Financially Feasible Plan. Section 7.1 describes this process for prioritizing projects. Section 7.2 summarizes the revenue projections used to financially constrain the Plan, Section 7.3 describes the cost estimation methods for projects, and Section 7.4 describes how those costed projects were funded within the bounds of the revenue projections.

### 7.1 Project Prioritization Methodology

The project evaluation and scoring process supports the performance framework developed for Livability 2040, which was designed to advance funding decisions that effectively reflect both regional mobility and local livability needs. While the transportation goals, objectives, and performance measures adopted for Livability 2040 RTP are broad-based and regional in nature, the performance framework defines a set of five specific investment context types to provide a sense of investment "scale" for refining the performance measurement and project evaluation process:

1. **Interregional** – Investments aligned with big-ticket capital or maintenance needs to ensure the region is well connected within the state and the nation to maintain regional economic competitiveness. Investments support interstate mobility, intermodal connections, and freight/logistics hubs.



2. **Regional Centers** – Investments support strategic connections between regional activity and economic centers through improved mobility and travel time reliability on corridor connections to key centers and last-mile connectivity to ensure effective access to a regional system.



3. **Town Centers** – Investments support economically viable and thriving community centers; specifically, redevelopment opportunities, multimodal connections and access to a mix of business, retail and residential uses



- 4. Neighborhood Communities** – Investments support healthy, thriving communities through improved system operations and multimodal access to community resources within primarily residential areas.



- 5. Undeveloped** – Investment strategies that protect and preserve undeveloped or environmentally sensitive areas.



Within each investment context, the project-level performance measures (project evaluation criteria) are weighted differently to reflect the level of significance of each measure within each context type. As an example, Delay Reduction is not as significant a factor in determining project benefits within Neighborhood Communities, as transportation needs within this context often focus on slower, safer, multimodal trips. This factor is of great significance (and therefore of greater weight) within the Interregional and Regional scales, as the efficient movement of people and goods is vital to the regional economy. The different weighting system allowed projects to be scored and ranked according to unique needs of each investment context, and followed the recommendations of the RTPAC and the ETC.

Over 270 roadway and transit capacity projects were considered in the project evaluation process for Livability 2040<sup>19</sup>. The sources of these projects are described in Section 5.0. The steps applied for project evaluation are:

#### **Step 1. Assign project to investment context type**

Each project was tagged to an investment context type based on a combination of the project's need and purpose, its location and proximity to regional, community or environmental assets, and its functional classification. This process was supported through guidance and review of the RTPAC and ETC. The investment context of the project was needed to apply the appropriate performance measure weights, enabling the significance of various evaluation criteria to vary given the geographic scale of each project and its role in the transportation system.

<sup>19</sup> Smaller scale bicycle/pedestrian, safety, and operations investments were not evaluated through this process. They will be reflected in the long-range transportation plan as lump sum funding set-asides as opposed to individual projects.

## Step 2. Evaluate performance impacts of projects

Within each investment context category, projects were evaluated relative to one another (regardless of project type) for each of the 10 project-level performance measures identified in the performance framework (see Section 3):

- Project is on corridor of safety concern and includes countermeasure(s) to address safety emphasis areas identified in Section 4;
- Project Addresses Security or Emergency Response Need;
- VMT reduction;
- Project requires minimal right of way or land acquisition;
- Project is in keeping with community priorities;
- Project supports community or corridor redevelopment;
- Truck Hours Delay Reduced, particularly for Freight Corridors or on connectors to Freight hubs / intermodal facilities;
- Project fills gap in, or expands, multimodal system, particularly for access to community resources and last mile connectivity for employment centers;
- Project enhances transit ridership; and
- Vehicles Hours Delay Reduced, particularly along corridor connections to employment centers.

Points were assigned for each criteria given the impact of the project. A few key points on project scoring include:

- The Memphis MPO's Travel Demand Model was used to measure vehicle miles travelled (VMT) and auto/truck delay reduction impacts for each project. For these measures, points were assigned (up to the maximum allowed for each criteria) based on the level of VMT or delay reduction.
- Additional auto delay reduction points were applied if the delay benefit was achieved on a corridor connection to a regional employment center.
- Additional truck delay reduction points were applied if the delay benefit was achieved on the freight network or on a corridor connection to regional freight hub.
- All other performance measures were evaluated qualitatively as "Yes" or "No" in terms of positive or negative impact for the criteria of interest. For these criteria, all points were assigned for "Yes", zero points for "No".

Weights were applied for each measure given the scale of project and points were summed across all 10 measures to produce individual project scores up to 100 points. Projects were then combined into one scored list, across the five scales, based on project score.

**Step 3. Rank projects**

Projects were assigned a rank tier based on a quartile distribution of project scores. The top 25 percent of projects, based on total score, were grouped into “rank 1”, for example. In total, 4 tiers were developed.

The ranking provides an assessment of relative performance impacts of proposed investments, in the context of regional goals. It was provided to the MPO, its committees, and local government stakeholders to help guide the funding discussions for Livability 2040.

The rankings from the process described were then adjusted based on TIP projects with incomplete funding, TDOT/MDOT priorities, and local priorities. This produced a prioritized list of projects that were funded in order during the fiscal constraint process described in Section 7.4.

## 7.2 Revenue Projections

Title 23 United States Code (U.S.C.) Section 134 requires that a long-range transportation plan contain a financial plan that demonstrates how the adopted plan can be implemented, indicate resources from public and private sources that are reasonably expected to be made available to carry out the plan, and recommend any additional financing strategies for needed projects and programs. The purpose of the financial plan is to demonstrate fiscal constraint, which ensures that the transportation plan reflects realistic assumptions about future revenues for investment.

Revenue forecasts are based on current Federal, state, and local funding programs that support highway and transit-related investments. The historical funding sources that have been utilized (or programmed) by the Memphis MPO between FY 2008 and FY 2017 are described in the following sections. Revenue forecasts are presented in three programming tiers: 2018-2020, 2021-2030, and 2031-2040. Revenue projections for the FY 2014-2017 TIP are included in Table 7.7. The Tennessee Department of Transportation, the Mississippi Department of Transportation, and MATA, the public transit operator, were all included in the cooperative development of funding estimates for the financial plan.

### 7.2.1 Capital Revenue

Federal funds are the main source of capital revenue for projects in the MPO region. Based on historical funds expended between FY 2008 and FY 2014, Federal funds accounted for close to 70 percent of highway capital funds from Tennessee and Mississippi, and accounted for close to 80 percent of transit capital funds. These Federal funds are available through various programs administered by the States for roadway construction and other multimodal projects including, but not limited to, pedestrian, bicycle, and transit facilities and major planning and/or environmental studies. Local agencies and state DOTs provide the local matching funds for the Federal funding programs, when required.

#### Federal Funding - Federal Highway Administration

On July 6, 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law. This new transportation bill, effective on October 1st, 2012, replaced the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which was passed in 2005, and eliminated earmarks and most discretionary programs. The new core formula programs include:

- National Highway Performance Program (NHPP),
- Surface Transportation Program (STP),

- Congestion Mitigation and Air Quality Improvement Program (CMAQ),
- Highway Safety Improvement Program (HSIP),
- Railway-Highway Crossings (set-aside from HSIP),
- Metropolitan Planning (core formula funds) and State Planning and Research (2% set-aside funds), and
- Transportation Alternatives.

The following list summarizes the historical Federal funding programs utilized in the region between FY 2008 and FY 2014 and programmed for FY 2014-2017, under the MAP-21 transportation bill funding program structure:

**National Highway Performance Program (NHPP)** – Under MAP-21, the enhanced NHS includes the Interstate System, all principal arterials (including some not previously designated as part of the NHS) and border crossings on those routes, highways that provide motor vehicle access between the NHS and major intermodal transportation facilities, and the network of highways important to U.S. strategic defense (STRAHNET) and its connectors to major military installations. The new NHPP combined the functions of the former NHS, Interstate Maintenance (IM), Bridge Programs (on-system bridge, i.e., a bridge on a public highway eligible for assistance other than a highway functionally classified as a local road or rural minor collector, no more than 85% of total Bridge Program funds), and Appalachian Development Highway System (ADHS).

**Surface Transportation Program (STP)** – MAP-21 continues the STP and this program provides States and localities funding for projects to preserve or improve conditions and performance on any Federal-aid highway, bridge projects on any public road, facilities for nonmotorized transportation, transit capital projects and public bus terminals and facilities. STP combined the functions of the former STP, Bridge Programs (off-system bridge, i.e., a highway bridge located on a public road not on a Federal-aid highway, no less than 15% of total Bridge Program funds), and ADHS (ADHS routes, including local access roads). The Memphis MPO receives a sub-allocation of these funds.

**Highway Safety Improvement Program (HSIP)** – Safety throughout all transportation programs remains DOT's number one priority. The purpose of HSIP is to achieve a significant reduction in fatalities and serious injuries on all public roads, including non-state-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. The funding level for HSIP under MAP-21 has significantly increased from the past. HSIP maintains the same structure as existed under prior legislation that has been historically utilized in the Region.

**Railway-Highways Crossing Program** – MAP-21 continues this program as a set-aside from HSIP apportionment. Funds are eligible for projects at all public crossings including roadways, bike trails and pedestrian paths. Fifty percent of a State's apportionment is dedicated for the installation of protective devices at crossings. The remainder of the funds apportionment can be used for any hazard elimination project, including protective devices.

**Congestion Mitigation and Air Quality Improvement Program (CMAQ)** – The CMAQ program provides a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. The flexibility of the funds means eligible transportation projects can be from various modes, and can be infrastructure, operations, or policy oriented, as long as they can reduce air emissions. Generally, projects eligible under the former CMAQ program remain eligible with the new authorization. While eligibilities are continued, there is some modification with new language placing considerable emphasis on select project types including electric and natural gas vehicle infrastructure and diesel retrofits.

**Transportation Alternatives Program (TAP)** – MAP-21 establishes a new program to provide for a variety of alternative transportation projects that were previously eligible activities under separately funded programs. The TAP replaces

the funding from pre-MAP-21 programs including Transportation Enhancements, Recreational Trails, Safe Routes to School, and other programs, wrapping them into a single funding source. This program is funded at a level equal to two percent of the total of all MAP-21 authorized Federal-aid highway and highway research funds, with the amount for each State set aside from the State's formula apportionments. Fifty-percent of TAP funds are distributed to areas based on population (suballocated), similar to the STP, with the remaining 50% available for use in any area of the State. The Memphis MPO receives a sub-allocation of these funds.

**Discretionary funding** – The MPO Region has historically received discretionary grants to support planning and research activities, provide for transportation project development, and to repair Federal-aid highways or roads that have been seriously damaged by natural disasters or by catastrophic failures from an external cause. Discretionary Federal funds historically utilized in the region include: Demonstration (DEMO); National Corridor Infrastructure Improvement Program (NCIIP); Transportation, Community, and System Preservation (TCSP); Delta; and Congressional Earmark Special Appropriations (CESA). These sources are not considered stable transportation funding sources; however, the funds historically received from these programs, together with the funds received from repealed SAFETEA-LU programs (e.g., High Priority Projects Program, and Highway Infrastructure Program), were combined into a single group to develop a conservative forecast of discretionary funding given that many of the eligibilities of the eliminated programs are covered in other programs. Funding from the American Recovery and Reinvestment Act of 2009 (ARRA, C230) were excluded as these are considered one-time funding sources.

### Federal Funding - Federal Transit Administration

MAP-21 also restructured core transit grant programs from its predecessor, SAFETEA-LU. The new act provided significant authority to strengthen the safety of public transportation systems and gave emphasis on restoring and replacing the aging public transportation infrastructure by establishing new needs-based formula programs and new asset management requirements. The new core formula programs include:

- Urbanized Areas (Section 5307);
- State of Good Repair (Section 5337);
- Bus and Bus Facilities (Section 5339);
- Enhanced Mobility of Seniors and Individual with Disabilities (Section 5310); and
- Rural Areas (section 5311).

The following list summarizes the historical Federal funding programs utilized in the MPO region between FY 2008 and FY 2014 and programmed for the FY 2014-2017 period, under the MAP-21 transportation bill funding program structure:

**Urbanized Areas (5307)** – Section 5307 is a formula grant program for urbanized areas providing capital, operating, and planning assistance for mass transportation. Funds are apportioned to urbanized areas utilizing a formula based on population, population density, and other factors associated with transit service and ridership. MAP-21 expands 5307 to include the former Jobs Access and Reverse Commute (JARC) program.

**State of Good Repair Program (SGR) (5337)** – MAP-21 establishes a new grant program to maintain public transportation systems in a state of good repair. This program replaces the Fixed Guideway Modernization Program (Section 5309). Funding is limited to fixed guideway systems (including rail, bus rapid transit, and passenger ferries) and high intensity bus (high intensity bus refers to buses operating in high occupancy vehicle (HOV) lanes). Projects are limited to replacement and rehabilitation, or capital projects required to maintain public transportation systems in

a state of good repair. Projects must be included in a transit asset management plan to receive funding. The new formula comprises: (1) the former fixed guideway modernization formula; (2) a new service-based formula; and (3) a new formula for buses on HOV lanes. SGR replaces the functions of the former 5309 Fixed Guideway Modernization Program that has been historically utilized in the Region.

**Bus and Bus Facilities Program (5339)** – A new formula grant program is established under Section 5339, replacing the previous Section 5309 discretionary Bus and Bus Facilities program that has been historically utilized in the Region. This capital program provides funding to replace, rehabilitate, and purchase buses and related equipment, and to construct bus-related facilities.

**Enhanced Mobility of Seniors and Individuals with Disabilities (5310)** – This program provides formula funding to increase the mobility of seniors and persons with disabilities. Funds are apportioned based on each State's share of the targeted populations and are now apportioned to both States (for all areas under 200,000) and large urbanized areas (over 200,000). The former New Freedom program (5317) is folded into this program. Activities eligible under New Freedom are now eligible under the Enhanced Mobility of Seniors and Individuals with Disabilities program. At least 55% of program funds must be spent on the types of capital projects eligible under the former section 5310 -- public transportation projects planned, designed, and carried out to meet the special needs of seniors and individuals with disabilities when public transportation is insufficient, inappropriate, or unavailable. The remaining 45% may be used for: public transportation projects that exceed the requirements of the ADA; public transportation projects that improve access to fixed-route service and decrease reliance by individuals with disabilities on complementary paratransit; or, alternatives to public transportation that assist seniors and individuals with disabilities. Using these funds for operating expenses requires a 50% local match while using these funds for capital expenses (including acquisition of public transportation services) requires a 20% local match. Enhanced Mobility of Seniors and Individuals with Disabilities Program combined the functions of the former New Freedom Program and Transportation for Elderly or Persons with Disability Program (5310) has been historically utilized in the Region.

## 7.2.2 Operations and Maintenance (O&M) Revenue

The maintenance and operations of non-transit facilities within the MPO region is currently funded through a combination of state funds and local funds. Local governments provide funding for the facilities that are not state or Federal routes, such as local streets, and some bicycle and pedestrian facilities. State DOTs provide funding to operate and maintain state and Federal facilities such as state highways and the interstate system. O&M revenue activities include:

- Paving;
- Signs and painting;
- Right-of-way maintenance;
- Traffic Signal maintenance;
- Surveillance and Inspection;
- Street Lighting; and
- Others (e.g., weight stations, bridge maintenance).

### 7.2.3 Revenue Forecast Methodology

This section describes the process used to generate the transportation revenue projections for the Memphis Urban Area MPO. The methodology, including the inflation rates and year of expenditure dollars, were developed cooperatively by the MPO, MDOT, TDOT and MATA, the public transit operator.

**Step 1: Federal funding programs restructured and base revenues redistributed to be in line with MAP-21.** Historic expenditures, previously programmed under SAFETEA-LU funding programs, were redistributed to MAP-21 funding programs based on **Table 7.1** for highways and **Table 7.2** for transit.

**Table 7.1 Consolidation of Highway Programs**

MAP-21	SAFETEA-LU
STP	BRR-L
NHPP	IM, NHS, BRR-S
HSIP	HSIP
TAP	ENH, SRTS
CMAQ	CMAQ

**Table 7.2 Consolidation of Transit Programs**

MAP-21	SAFETEA-LU
5307	5307, 5316
5337	5309 (Fixed guideway)
5339	5309 (Bus and bus related)
5310	5310, 5317

**Step 2. Ten-year historic average Federal revenues calculated (in nominal dollars).** The ten-year Federal revenues for each program between FY 2008 and FY 2017 were calculated and used as the base revenues for forecasting (i.e., year 2015). A conservative forecast was developed for discretionary funds given the uncertainty of these sources. Historical data shows that discretionary funds have ranged between 8 and 13 percent of the Tennessee annual funding and from 6 to 19 percent in Mississippi. Eight percent was assumed for Tennessee and 6 percent was assumed for Mississippi.

**Step 3. Annual growth rates estimated.** The short- and long-term trend of FHWA obligations to the State of Tennessee and Mississippi were assessed to determine what could reasonably be expected over the life of the plan. FHWA obligations to Tennessee and Mississippi increased from FY 2000 to FY 2008 at an average annual rate of 1.9 percent. Obligations to both states declined from FY 2008 to FY 2014 at an average annual rate of 0.3 percent.

Over the long-term, the Congressional Budget Office (CBO) estimates that revenues of the Highway Trust Fund (HTF) will remain relatively flat, increasing at an average annual rate of less than 1 percent through 2025.



Combining the short- and long-term historical trend obligated to both states along with the foreseeable future of Federal transportation funding, three annual growth rates were used to estimate future revenues:

- FY 2016 and FY 2017 – An annual growth rate of 0.5 percent was applied to the Federal funding program base revenues;
- FY 2018 to FY 2025 – A growth rate of 1 percent was assumed, consistent with CBO's projection of the annual revenues of the HTF; and
- FY 2026 to FY 2040 – A growth rate of 2.3 percent was assumed, consistent with the average annual inflation rate as measured by the consumer-price index for the southern U.S.

**Step 4. State and local match estimated.** The Federal share of transportation expenditures is generally 80 percent for all programs. For interstate projects, Federal share is 90 percent. For CMAQ funds in Tennessee, the historical data show that, on average, the Federal share is 87 percent, with state and locals providing the 13 percent match. A 50%/50% split between state and local contributions for the CMAQ match is assumed for projections. For CMAQ funds in Mississippi, the state provides 100 percent of the 20 percent local match. Required match estimates were calculated assuming these share allocations and were applied to Federal revenue estimates, by program, to calculate state and local match revenues.

**Step 5. Debt service obligations and net transportation revenue estimated.** In addition to Federal funds, the state of Mississippi uses bond proceeds to finance transportation projects in Desoto and Marshall counties. The outstanding Grant Anticipation Revenue Vehicles (GARVEE bonds) issued by MDOT are being paid from Federal grant revenues and state revenue sources. The outstanding debt service estimates were provided by MDOT to refine revenue projections. Currently, debt service payments extend through FY 2040. It is assumed that no additional bonds are issued during the time frame of the plan and that the state share is 30 percent. Debt service obligations were subtracted from gross revenue projections for the final (net) financially constrained forecast to reflect debt repayment needs as a priority, before additional transportation investments are considered. Debt service is not incurred in Tennessee and is not reflected in revenue projections.

**Step 6. State and local O&M revenues estimated.** The local share for O&M expenditures were collected from the FY 2014-2017 TIP. The state shares for O&M were provided by TDOT and MDOT. A constant annual growth rate of 2.3 percent was assumed, consistent with the average annual inflation rate as measured by the consumer-price index for the southern U.S.

Tables 7.3 through 7.4 present the resulting Federal, state, and local revenues projected for the Memphis Urban Area MPO from 2018 to 2040 for surface transportation investments.

**Table 7.3 Revenue Forecast – Tennessee**  
*Millions*

Funding Programs	2018-2020	2021-2030	2031-2040	Total
NHPP	\$210.2	\$762.9	\$946.3	\$1,919.39
STP - State	\$21.0	\$76.3	\$94.6	\$191.94
STP - Urban	\$54.1	\$196.3	\$243.5	\$493.96
HSIP	\$6.2	\$22.4	\$27.8	\$56.45
CMAQ	\$22.3	\$80.8	\$100.2	\$203.23
TAP	\$4.6	\$16.8	\$20.9	\$42.34
Discretionary Funding	\$31.8	\$115.6	\$143.3	\$290.73
State Sources <sup>a</sup>	\$380.9	\$1,269.6	\$1,269.6	\$2,920.02
Local Sources	\$189.1	\$726.9	\$911.3	\$1,827.27
FTA-Fed	\$83.9	\$304.9	\$378.5	\$767.27
FTA-State	\$11.1	\$40.2	\$49.9	\$101.19
FTA-Local	\$21.5	\$70.0	\$87.1	\$178.65
<b>Total</b>	<b>\$1,036.6</b>	<b>\$3,682.7</b>	<b>\$4,273.1</b>	<b>\$8,992.50</b>

<sup>a</sup> Includes the state match for Federal funding and state revenues (e.g., motor fuel taxes) allocated to the region for O&M and capital expenditures.

**Table 7.4 Revenue Forecast – Mississippi**  
*Millions*

Funding Programs	2018-2020	2021-2030	2031-2040	Total
National Highway Performance Program	\$3.9	\$22.0	\$109.2	\$135.12
Surface Transportation Program - State	\$2.5	\$13.8	\$68.3	\$84.47
Surface Transportation Program - Urban	\$1.3	\$7.3	\$36.5	\$45.12
HSIP	\$0.2	\$1.1	\$5.6	\$6.87
CMAQ	\$0.2	\$1.3	\$6.6	\$8.22
TAP	\$0.1	\$0.3	\$1.7	\$2.12
Discretionary Funds	\$0.5	\$2.8	\$13.7	\$16.92
State Sources	\$134.2	\$499.8	\$184.4	\$818.38
Local Sources	\$24.4	\$93.8	\$117.5	\$235.72
<b>Total</b>	<b>\$167.3</b>	<b>\$642.2</b>	<b>\$543.4</b>	<b>\$1,352.90</b>

Note: Debt payments are already subtracted from revenues to provide these net transportation revenues available for projects.

## 7.3 Project Costs

Planning level cost estimates were developed for all new projects identified using available TDOT and MDOT methodologies. Estimated costs include (as appropriate) preliminary engineering, right-of-way, construction, and operation and maintenance costs. Unit costs for implementation of the transportation improvements accounted for build area type, terrain, and type of improvement.

Current (2015) project costs were forecast to the appropriate year of expenditure as required by Federal regulations<sup>20</sup> for preliminary engineering, right-of-way, and construction. Based on the historic change in construction cost experienced by the TDOT, an annual inflation rate of 3.6 percent was used on both the Tennessee and Mississippi side of the MPO to forecast year of expenditure costs. MDOT agreed that this inflation rate from TDOT was reasonable for Mississippi as well.

### 7.3.1 Roadway Projects

Planning-level cost estimates for new roadway projects in the Tennessee portion of the MPO were developed using TDOT's typical per-mile unit costs for interstates, state routes and local routes.

The base unit cost for right-of-way from TDOT's Long Range Planning Division is currently \$1,233,000 per mile. Factors are then applied to adjust that base cost depending on the intensity of adjacent development:

- Central Business District (CBD);
- CBD Urbanized;
- Heavy Commercial (High Rise, Large Building);
- Strip Commercial;
- Fringe (Mixed, Residential/Commercial);
- Industries (Factories, Warehouse);
- Light Residential (1/4- Acres);
- Medium Residential (Acres+);
- Heavy Residential (Apartments);
- Public Use (Parks, School); and
- Rural.

<sup>20</sup> 23 CFR 450.322 (f)(10)(iv).

Current base unit costs for construction are \$5,980,000 per mile for local roads and \$7,793,000 per mile for state and interstate routes. This represents assumed construction costs for building a new two-lane road in flat terrain. An adjustment factor is applied if portions of the new road will traverse more rolling terrain. Adjustment factors are also applied based on the type of improvement, such as route on new alignment, reconstruction, and median type. When included in the project, the additional costs associated with major river crossings, tunnels, and interchanges were added to the construction cost. In accordance with TDOT's planning-level cost estimating methodology, preliminary engineering was estimated at 10 percent of the construction cost and a 15 percent contingency was added.

Planning-level cost estimates for roadway projects in the Mississippi portion of the MPO were developed and furnished by MDOT. MDOT's experienced engineers have a standardized methodology and set of tools for project cost estimation that they use throughout the State.

### **7.3.2 Transit Projects**

Planning-level capital cost estimates for proposed new and expanded transit service are based on the estimated number of vehicles needed for the new/expanded service, given the specified route length, headways, and hours of service. Calculations include a spare ratio of 0.2 and the cost of establishing stops (spaced between one-quarter and one-eighth of a mile for local bus service). Since DeSoto County does not currently operate any fixed-route transit service, the construction of new bus storage and maintenance facilities was also added to the capital costs.

Assumed unit costs were \$450,000 per vehicle, with the associated costs of stops/shelters, etc. estimated as 0.5 percent of total vehicle costs in the case of express routes, and as 2 percent of total vehicle costs in the case of local service.

### **7.3.3 Multimodal (Bicycle, Pedestrian and Complete Streets)**

Planning-level cost estimates for the general line items for future bicycle and pedestrian investment are based on typical per-mile costs that assume sidewalks on one side of the roadway, 10-foot wide asphalt mixed-use trails, and the development of bike lanes through restriping of existing roadway.

Cost estimates for proposed Complete Streets projects were based on typical per-mile costs (\$3 million to \$3.3 million) provided by the City of Memphis Engineering Department from recent project-level studies. The same unit cost was used on both the TN and MS side of the MPO.

### **7.3.4 Operations and Maintenance Costs**

The additional maintenance costs associated with the re-surfacing *new-lane miles* were estimated and included in the total project cost of widening and new roadway projects. Resurfacing unit costs of \$180,000 per lane-mile for interstate facilities and \$63,000 per lane-mile for other roadways were used based on the TDOT Long Range Planning Division cost estimation tool. The same unit costs were used on both the TN and MS side of the MPO. These costs were inflated to the appropriate year of re-surfacing for each project based on a 3.6 percent inflation rate recommended by TDOT and used elsewhere in this Plan for capital cost inflation. Based on an FHWA report,<sup>21</sup> it was assumed that re-surfacing will occur every 12 years and reconstruction will occur every 24 years. Since the Plan spans only 25 years, reconstruction costs were not included for any new project.

<sup>21</sup> <https://www.fhwa.dot.gov/pavement/preservation/ppc0609.cfm>.

Note that operations and maintenance costs for *existing transportation facilities* was addressed through a separate systems preservation analysis documented in Section 4.1. **Table 7.5** shows historic annual average operations and maintenance costs applied by Memphis MPO jurisdictions (municipalities plus TDOT, MDOT, and MATA) for routine operations and maintenance of the existing system. The costs incurred by local jurisdictions to maintain transportation infrastructure equate to approximately \$84 million per year. In the past, these historic expenditures were carried forward to estimate operations and maintenance costs for the existing system over the life of the Plan horizon. As documented in Section 4.1, however, these historic expenditures will not keep pace with growing maintenance needs. Total annual operations and maintenance costs for the existing system were therefore greatly increased in the Livability 2040 RTP to approximately \$140 million per year (2015 dollars). This level of set-aside funding equates to a doubling of system preservation funding over the life of the Plan from the previous Direction 2040 RTP. Table 7.6 shows the estimated revenues and expenditures for operation and maintenance activities for both non-transit (pavement and bridge) and transit over the life of the plan.

Final project costs – reflecting preliminary engineering, right-of-way, construction, and operations and maintenance– are shown in the fiscally constrained (funded) project list in Table 8.2.

**Table 7.5 (Historic) Annual Average Operations and Maintenance (O&M) Costs**  
Current Year Dollars

Jurisdiction	Paving	Signs and Painting	ROW Maintenance	Traffic Signal Maintenance	Surveillance and Inspection	Street Lighting	Other	Total
Shelby County	\$3,000,000	\$450,000	\$1,200,000	\$55,000	\$400,000	–	\$150,000	\$5,255,000
Arlington	\$290,000	\$21,000	\$110,000	\$14,000	\$43,000	\$295,000	\$30,000	\$803,000
Bartlett	\$1,925,000	\$120,000	\$495,000	\$30,000	\$296,828	\$1,207,000	–	\$4,073,828
Collierville	\$907,000	\$23,000	\$204,000	\$34,000	\$50,000	\$1,233,000	\$137,000	\$2,588,000
Germantown	\$1,100,000	\$25,000	\$485,000	\$45,000	\$50,000	\$800,000	–	\$2,505,000
Lakeland	\$270,000	–	–	–	–	–	\$81,000	\$351,000
Memphis	\$12,600,000	\$2,644,000	\$2,500,000	\$3,050,000	\$1,250,000	\$12,000,000	–	\$34,044,000
Millington	\$67,500	\$6,750	\$243,000	\$67,500	\$135,000	\$202,500	\$20,250	\$742,500
<b>Subtotal</b>	<b>\$20,159,500</b>	<b>\$3,289,750</b>	<b>\$5,237,000</b>	<b>\$3,295,500</b>	<b>\$2,224,828</b>	<b>\$15,737,500</b>	<b>\$418,250</b>	<b>\$50,362,328</b>
Fayette County	–	–	–	–	–	–	\$465,000	\$465,000
Braden	\$18,225	–	–	–	–	–	\$9,450	\$27,675
Gallaway	\$30,645	–	–	–	–	–	\$15,390	\$46,035
Oakland	–	–	–	–	–	–	\$28,000	\$28,000
Piperton	\$45,000	\$1,500	\$10,000	\$500	–	\$4,000	–	\$61,000
Rossville	–	–	–	–	–	–	\$29,000	\$29,000
<b>Subtotal</b>	<b>\$93,870</b>	<b>\$1,500</b>	<b>\$10,000</b>	<b>\$500</b>	<b>–</b>	<b>\$4,000</b>	<b>\$489,840</b>	<b>\$656,710</b>
DeSoto County	\$1,226,347	\$62,775	–	\$67,500	\$371,250	–	\$221,128	\$1,949,000
Hernando	\$250,000	\$800	–	–	–	–	–	\$250,800
Horn Lake	\$250,000	\$10,000	\$40,000	\$45,000	\$30,000	\$160,000	\$40,000	\$575,000
Olive Branch	\$189,000	–	–	–	–	–	\$189,000	\$378,000
Southaven	\$1,990,000	\$56,000	\$400,000	\$15,000	\$120,000	\$720,000	\$270,000	\$3,571,000
Walls	–	–	–	–	–	–	\$51,000	\$51,000
<b>Subtotal</b>	<b>\$3,905,347</b>	<b>\$129,575</b>	<b>\$440,000</b>	<b>\$127,500</b>	<b>\$521,250</b>	<b>\$880,000</b>	<b>\$720,128</b>	<b>\$6,774,800</b>

Jurisdiction	Paving	Signs and Painting	ROW Maintenance	Traffic Signal Maintenance	Surveillance and Inspection	Street Lighting	Other	Total
Marshall County	–	–	–	–	–	–	\$55,000	\$55,000
Byhalia	–	–	–	–	–	–	\$450,000	\$450,000
<i>Subtotal</i>	–	–	–	–	–	–	\$505,000	\$505,000
Tennessee								
Department of Transportation	\$13,553,299	\$381,248	\$2,193,030	–	–	–	\$2,330,536	\$18,458,113
Mississippi								
Department of Transportation	\$780,000	\$445,000	\$3,132,700	\$85,000	\$107,000	\$22,000	\$2,117,000	\$6,688,700
Memphis Area Transit Authority	–	–	–	–	–	–	\$795,290	\$795,290
<i>Subtotal</i>	\$14,333,299	\$826,248	\$5,325,730	\$85,000	\$107,000	\$22,000	\$5,242,826	\$25,942,103
<b>Total MPO Area</b>	<b>\$38,492,016</b>	<b>\$4,247,073</b>	<b>\$11,012,730</b>	<b>\$3,508,500</b>	<b>\$2,853,078</b>	<b>\$16,643,500</b>	<b>\$7,376,044</b>	<b>\$84,240,941</b>

Notes: Annual cost data from FY 2014-2017 TIP; maintenance funds include paving, signs and painting, right-of-way maintenance, traffic signal maintenance, surveillance and inspection, street lighting, and other O&M costs; Maintenance funds also include those used for bicycle and pedestrian facilities; Previous plans have assumed an inflation factor of 3 percent for costs and revenues.

**Table 7.6 Balanced O&M Revenue and Costs (Year of Expenditure Dollars)**

	2014-2017			2018-2020			2021-2030			2031-2040		
	Cost	Revenue	Balance	Cost	Revenue	Balance	Cost	Revenue	Balance	Cost	Revenue	Balance
<b>Non-Transit</b>												
Tennessee	\$287,644,310	\$287,644,310	\$0	\$409,133,324	\$409,133,324	\$0	\$1,584,113,522	\$1,584,113,522	\$0	\$1,988,578,037	\$1,988,578,037	\$0
Mississippi	\$57,831,380	\$57,831,380	\$0	\$61,857,462	\$61,857,462	\$0	\$239,504,428	\$239,504,428	\$0	\$300,656,006	\$300,656,006	\$0
<b>Transit</b>												
Tennessee	\$75,319,603	\$75,319,603	\$0	\$108,331,969	\$108,331,969	\$0	\$390,156,900	\$390,156,900	\$0	\$515,496,683	\$515,496,683	\$0
Mississippi	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL MPO (Non-transit)</b>	<b>\$345,475,690</b>	<b>\$345,475,690</b>	<b>\$0</b>	<b>\$470,990,786</b>	<b>\$470,990,786</b>	<b>\$0</b>	<b>\$1,823,617,950</b>	<b>\$1,823,617,950</b>	<b>\$0</b>	<b>\$2,289,234,043</b>	<b>\$2,289,234,043</b>	<b>\$0</b>
<b>TOTAL MPO (Transit)</b>	<b>\$75,319,603</b>	<b>\$75,319,603</b>	<b>\$0</b>	<b>\$108,331,969</b>	<b>\$108,331,969</b>	<b>\$0</b>	<b>\$390,156,900</b>	<b>\$390,156,900</b>	<b>\$0</b>	<b>\$515,496,683</b>	<b>\$515,496,683</b>	<b>\$0</b>
<b>TOTAL MPO</b>	<b>\$420,795,293</b>	<b>\$420,795,293</b>	<b>\$0</b>	<b>\$579,322,755</b>	<b>\$579,322,755</b>	<b>\$0</b>	<b>\$2,213,774,850</b>	<b>\$2,213,774,850</b>	<b>\$0</b>	<b>\$2,804,730,726</b>	<b>\$2,804,730,726</b>	<b>\$0</b>





## 7.4 Fiscal Constraint

MAP-21 requires that the RTP be financially feasible and demonstrate fiscal constraint for all funded projects through the 25-year planning horizon. Implementation of transportation improvements is contingent on available funding and a plan is considered fiscally constrained when the project costs do not exceed the projected revenues. The RTP must demonstrate reasonably expected sources of funds and project revenues available to projects and programs identified in the plan as well as identify any additional financial strategies used to implement the plan.

As documented in Section 7.2, the Memphis MPO prepared forecasts of Federal, state and local revenues over the 2040 plan horizon. Funding tiers were defined for 2018-2020, 2021-2030, and 2031-2040.<sup>22</sup> Costs were estimated at a high level for all projects from the sources described in Section 5, adjusted to reflect inflation in the future. The prioritized list of projects described in Section 7.1 were then matched to potential revenue given project eligibility (by fund source), availability of local match, and availability of funding within each funding tier of the Plan. Projects were funded in order based on their priority with higher priority projects funded in earlier funding tiers and lower priority projects funded in later funding tiers. This was an iterative process, requiring repeated balancing across fund sources and funding tier of the RTP (2020, 2030, or 2040). Projects that did not receive funding were placed in the Vision Plan (see **Table 8.3**).

**Table 7.7** summarizes total revenue and expenditures by fund source and Livability 2040 funding tier, demonstrating that Livability 2040 revenues and expenditures are balanced.<sup>23</sup> All expenditures are presented in year of expenditure (YOE) dollars. The FY 2014-2017 time period is also included in this for informational purposes to document balanced revenues and expenditures for the FY 2014-2017 TIP. Note that there are no Transportation Control Measures (TCMs) in the Memphis MPO region requiring priority funding or finance strategies. The Inspection and Maintenance (I/M) Program implemented in the City of Memphis was a tailpipe emissions test used to ensure vehicles complied with CO emission standards. In July 2013, the City of Memphis discontinued the I/M program. The Shelby County Health Department recently prepared and submitted a Maintenance Plan revision to EPA to address the City of Memphis' elimination of the vehicle Inspection and Maintenance (I/M) Program by removing the program. When the Maintenance Plan is approved by EPA, the I/M program will no longer be an enforceable control measure in the State Implementation Plan (SIP). There are no other current enforceable control measures identified in the SIP for the Memphis/Shelby County region.

There are no voluntary TCMs identified in the current SIP; however, there have been other ongoing efforts in the region:

- Implementation of projects identified in the MPO's Bicycle and Pedestrian Plan,
- Adoption of the Unified Development Code that contains growth and access management strategies, and
- Continuation of the Memphis Area Rideshare Program.

Detailed project tables for projects included in the fiscally constrained 2040 RTP are provided in Section 8.0 to include design concept, scope, descriptions, and funding source.<sup>24</sup>

<sup>22</sup> 23 CFR 450.322 (b).

<sup>23</sup> 23 CFR 450.322 (f)(10).

<sup>24</sup> 23 CFR 450.322 (f)(6).

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**Table 7.7 Balanced Revenue and Costs for Livability 2040 (Year of Expenditure Dollars)**

Tiers	2014-2017			2018-2020			2021-2030			2031-2040			Total		
	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance
<b>Tennessee</b>															
National Highway Performance Program	\$301,600,000.00	\$301,600,000.00	-	\$210,193,543.36	\$210,117,026.62	\$76,516.74	\$762,892,383.62	\$762,892,383.62	-	\$946,307,137.73	\$946,234,663.12	\$72,474.62	\$1,919,393,064.72	\$1,919,244,073.36	\$148,991.36
Surface Transportation Program - State	\$16,560,000.00	\$16,560,000.00	-	\$21,019,354.34	\$20,997,002.29	\$22,352.04	\$76,289,238.36	\$76,289,238.36	-	\$94,630,713.77	\$92,118,706.55	\$2,512,007.22	\$191,939,306.47	\$189,404,947.20	\$2,534,359.27
Surface Transportation Program - Urban	\$128,416,829.00	\$127,023,116.00	\$1,393,713.00	\$54,093,926.60	\$54,091,398.97	\$2,527.63	\$196,332,598.73	\$196,332,598.73	-	\$243,534,925.15	\$221,127,191.01	\$22,407,734.14	\$493,961,450.48	\$471,551,188.71	\$22,410,261.77
HSIP	\$13,950,000.00	\$13,950,000.00	-	\$6,182,163.04	\$6,182,163.04	-	\$22,438,011.28	\$22,438,011.28	-	\$27,832,562.87	\$27,832,562.87	-	\$56,452,737.20	\$56,452,737.20	-
CMAQ	\$43,574,126.00	\$43,574,126.00	-	\$22,255,786.94	\$22,255,786.94	-	\$80,776,840.62	\$80,776,840.62	-	\$100,197,226.35	\$100,197,226.35	-	\$203,229,853.91	\$203,229,853.91	-
TAP	\$3,090,100.00	\$3,090,100.00	-	\$4,636,622.28	\$4,636,622.28	-	\$16,828,508.46	\$16,828,508.46	-	\$20,874,422.16	\$20,874,422.16	-	\$42,339,552.90	\$42,339,552.90	-
Discretionary Funds	\$55,286,392.00	\$55,286,392.00	-	\$31,838,139.66	-	\$31,838,139.66	\$115,555,758.11	\$65,712,587.22	\$49,843,170.89	\$143,337,698.80	-	\$143,337,698.80	\$290,731,596.57	\$65,712,587.22	\$225,019,009.35
State Sources	\$57,513,778.00	\$57,513,778.00	-	\$380,872,156.00	\$371,205,748.23	\$9,666,407.77	\$1,269,573,853.33	\$1,269,573,853.33	-	\$1,269,573,853.33	\$1,214,744,187.27	\$54,829,666.07	\$2,920,019,862.67	\$2,855,523,788.83	\$64,496,073.84
Local Sources	\$61,762,203.00	\$61,762,203.00	-	\$189,099,933.67	\$184,452,662.75	\$4,647,270.92	\$726,881,396.74	\$726,881,396.74	-	\$911,292,091.71	\$911,292,091.71	-	\$1,827,273,422.12	\$1,822,626,151.20	\$4,647,270.92
FIA-Fed	\$73,404,551.00	\$73,404,551.00	-	\$83,851,245.64	\$83,851,245.64	-	\$304,904,255.04	\$304,904,255.04	-	\$378,510,875.76	\$378,510,875.76	-	\$767,266,376.44	\$767,266,376.44	-
FIA-State	\$9,129,944.00	\$9,129,944.00	-	\$11,060,086.76	\$11,060,086.76	-	\$40,213,340.78	\$40,213,340.78	-	\$49,919,125.09	\$49,919,125.09	-	\$101,192,552.63	\$101,192,552.63	-
FIA-Local	\$9,784,944.00	\$9,784,944.00	-	\$21,544,410.67	\$21,544,410.67	-	\$70,039,304.44	\$70,039,304.44	-	\$87,066,682.39	\$87,066,682.39	-	\$178,650,397.50	\$178,650,397.50	-
<b>Total</b>	<b>\$774,072,867.00</b>	<b>\$772,679,154.00</b>	<b>\$1,393,713.00</b>	<b>\$1,036,647,368.97</b>	<b>\$990,394,154.20</b>	<b>\$46,253,214.76</b>	<b>\$3,682,725,489.51</b>	<b>\$3,632,882,318.62</b>	<b>\$49,843,170.89</b>	<b>\$4,273,077,315.13</b>	<b>\$4,049,917,734.28</b>	<b>\$223,159,580.85</b>	<b>\$8,992,450,173.60</b>	<b>\$8,673,194,207.10</b>	<b>\$319,255,966.50</b>
<b>Mississippi</b>															
National Highway Performance Program	\$33,900,000.00	\$33,900,000.00	-	\$3,933,606.10	\$3,117,609.53	\$815,996.57	\$22,006,695.61	\$11,866,066.44	\$10,140,629.17	\$109,180,586.76	\$109,180,586.76	-	\$135,120,888.46	\$124,164,262.72	\$10,956,625.74
Surface Transportation Program - State	\$56,013,977.00	\$56,013,977.00	-	\$2,459,159.70	\$2,456,044.16	\$3,115.55	\$13,757,854.17	\$11,507,542.30	\$2,250,311.87	\$68,256,071.58	\$68,256,071.58	-	\$84,473,085.45	\$82,219,658.03	\$2,253,427.42
Surface Transportation Program - Urban	\$25,285,444.00	\$21,975,989.00	\$3,309,455.00	\$1,313,534.09	\$1,283,190.84	\$30,343.25	\$7,348,612.01	\$7,340,121.33	\$8,490.68	\$36,458,257.29	\$36,458,257.29	-	\$45,120,403.40	\$45,081,569.46	\$38,833.93
HSIP	\$3,150,000.00	\$3,150,000.00	-	\$200,090.95	\$200,090.95	-	\$1,119,415.73	\$1,119,415.73	-	\$5,553,694.59	\$5,553,694.59	-	\$6,873,201.26	\$6,873,201.26	-
CMAQ	\$8,664,000.00	\$8,664,000.00	-	\$239,269.59	\$239,269.59	-	\$1,338,602.03	\$1,338,602.03	-	\$6,641,131.29	\$6,641,131.29	-	\$8,219,002.91	\$8,219,002.91	-
TAP	\$346,668.00	\$346,668.00	-	\$61,741.35	\$61,741.35	-	\$345,414.12	\$345,414.12	-	\$1,713,683.73	\$1,713,683.73	-	\$2,120,839.20	\$2,120,839.20	-
Discretionary Funds	\$7,609,600.00	\$7,609,600.00	-	\$492,444.11	-	\$492,444.11	\$2,754,995.62	-	\$2,754,995.62	\$13,668,205.51	\$1,887,377.54	\$11,780,827.97	\$16,915,645.24	\$1,887,377.54	\$15,028,267.70
State Sources	\$138,894,496.00	\$138,894,496.00	-	\$134,219,531.67	\$133,507,281.06	\$712,250.61	\$499,801,390.26	\$442,027,985.53	\$57,773,404.73	\$184,361,160.06	\$184,361,160.06	-	\$818,382,081.99	\$759,896,426.66	\$58,485,655.34
Local Sources	\$6,308,065.00	\$6,308,065.00	-	\$24,407,456.31	\$24,044,864.98	\$362,591.33	\$93,766,198.36	\$83,097,038.42	\$10,669,159.94	\$117,542,737.79	\$117,542,737.79	-	\$235,716,392.46	\$224,684,641.19	\$11,031,751.27
<b>Total</b>	<b>\$280,172,250.00</b>	<b>\$276,862,795.00</b>	<b>\$3,309,455.00</b>	<b>\$167,326,833.87</b>	<b>\$164,910,092.46</b>	<b>\$2,416,741.41</b>	<b>\$642,239,177.90</b>	<b>\$558,642,185.88</b>	<b>\$83,596,992.02</b>	<b>\$543,375,528.60</b>	<b>\$531,594,700.63</b>	<b>\$11,780,827.97</b>	<b>\$1,352,941,540.37</b>	<b>\$1,255,146,978.97</b>	<b>\$97,794,561.40</b>

Tiers	2014-2017			2018-2020			2021-2030			2031-2040			Total		
	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance	Revenues	Expenditures	Balance
<b>Total Tennessee and Mississippi</b>															
National Highway Performance Program	\$335,500,000.00	\$335,500,000.00	-	\$214,127,149.46	\$213,234,636.15	\$892,513.31	\$784,899,079.23	\$774,758,450.06	\$10,140,629.17	\$1,055,487,724.49	\$1,055,415,249.87	\$72,474.62	\$2,054,513,953.18	\$2,043,408,336.08	\$11,105,617.10
Surface Transportation Program - State	\$72,573,977.00	\$72,573,977.00	-	\$23,478,514.04	\$23,453,046.45	\$25,467.59	\$90,047,092.53	\$87,796,780.66	\$2,250,311.87	\$162,886,785.35	\$160,374,778.13	\$2,512,007.22	\$276,412,391.92	\$271,624,605.24	\$4,787,786.69
Surface Transportation Program - Urban	\$153,702,273.00	\$148,999,105.00	\$4,703,168.00	\$55,407,460.70	\$55,374,589.82	\$32,870.88	\$203,681,210.73	\$203,672,720.05	\$8,490.68	\$279,993,182.45	\$257,585,448.30	\$22,407,734.14	\$539,081,853.87	\$516,632,758.17	\$22,449,095.70
HSIP	\$17,100,000.00	\$17,100,000.00	-	\$6,382,253.99	\$6,382,253.99	-	\$23,557,427.01	\$23,557,427.01	-	\$33,386,257.46	\$33,386,257.46	-	\$63,325,938.46	\$63,325,938.46	-
CMAQ	\$52,238,126.00	\$52,238,126.00	-	\$22,495,056.54	\$22,495,056.54	-	\$82,115,442.65	\$82,115,442.65	-	\$106,838,357.64	\$106,838,357.64	-	\$211,448,856.82	\$211,448,856.82	-
TAP	\$3,436,768.00	\$3,436,768.00	-	\$4,698,363.63	\$4,698,363.63	-	\$17,173,922.58	\$17,173,922.58	-	\$22,588,105.89	\$22,588,105.89	-	\$44,460,392.10	\$44,460,392.10	-
Discretionary Funds	\$62,895,992.00	\$62,895,992.00	-	\$32,330,583.76	-	\$32,330,583.76	\$118,310,753.73	\$65,712,587.22	\$52,598,166.51	\$157,005,904.32	\$1,887,377.54	\$155,118,526.78	\$307,647,241.81	\$67,599,964.76	\$240,047,277.05
State Sources	\$196,408,274.00	\$196,408,274.00	-	\$515,091,687.67	\$504,713,029.29	\$10,378,658.38	\$1,769,375,243.59	\$1,711,601,838.86	\$57,773,404.73	\$1,453,935,013.39	\$1,399,105,347.33	\$54,829,666.07	\$3,738,401,944.66	\$3,615,420,215.48	\$122,981,729.18
Local Sources	\$68,070,268.00	\$68,070,268.00	-	\$213,507,389.98	\$208,497,527.73	\$5,009,862.25	\$820,647,595.10	\$809,978,435.16	\$10,669,159.94	\$1,028,834,829.50	\$1,028,834,829.50	-	\$2,062,989,814.58	\$2,047,310,792.39	\$15,679,022.19
Federal-Transit	\$73,404,551.00	\$73,404,551.00	-	\$83,851,245.64	\$83,851,245.64	-	\$304,904,255.04	\$304,904,255.04	-	\$378,510,875.76	\$378,510,875.76	-	\$767,266,376.44	\$767,266,376.44	-
State-Transit	\$9,129,944.00	\$9,129,944.00	-	\$11,060,086.76	\$11,060,086.76	-	\$40,213,340.78	\$40,213,340.78	-	\$49,919,125.09	\$49,919,125.09	-	\$101,192,552.63	\$101,192,552.63	-
Local-Transit	\$9,784,944.00	\$9,784,944.00	-	\$21,544,410.67	\$21,544,410.67	-	\$70,039,304.44	\$70,039,304.44	-	\$87,066,682.39	\$87,066,682.39	-	\$178,650,397.50	\$178,650,397.50	-
<b>Total</b>	<b>\$1,054,245,117.00</b>	<b>\$1,049,541,949.00</b>	<b>\$4,703,168.00</b>	<b>\$1,203,974,202.84</b>	<b>\$1,155,304,246.66</b>	<b>\$48,669,956.18</b>	<b>\$4,324,964,667.41</b>	<b>\$4,191,524,504.50</b>	<b>\$133,440,162.90</b>	<b>\$4,816,452,843.73</b>	<b>\$4,581,512,434.91</b>	<b>\$234,940,408.82</b>	<b>\$10,345,391,713.98</b>	<b>\$9,928,341,186.07</b>	<b>\$417,050,527.91</b>

## 7.5 Potential Alternative Funding Strategies

Current revenue sources fall short of funding the entire needs of the region. While the fiscally constrained plan presented in Section 8.0 is funded by the existing revenue streams identified in Section 7.4, there are other potential sources of revenue that could be explored in the future. Historically, public support for developer impact fees, higher gas taxes, and toll roads have received the highest level of community support.

Examples of different types of funding sources are identified below. Generally, a mix of funding strategies may be more palatable to the region as it does not focus the burden on one revenue source.

### 7.5.1 Fuel Tax Related

#### Example: Fuel tax

Nationally, the fuel tax is the standard transportation revenue source. The Federal excise tax on gasoline is 18.4 cents per gallon and 24.4 cents per gallon for diesel fuel. In Mississippi it's 18.79 and 18.4, and in Tennessee it's 21.4 and 18.4, cents per gallon for gasoline and diesel fuel, respectively. Usually the tax is a fixed value; however, fuel taxes can be indexed to the consumer price index or indexed to the price of fuel to allow the value to vary over the time in an equitable manner.

### 7.5.2 Vehicle and Driver Related

#### Example: Vehicle Registration Fees

A vehicle registration fee is a surcharge collected by the Division of Motor Vehicles at the time of vehicle registration and registration renewal within a defined jurisdiction. It is usually a fixed dollar amount. The fee can be levied on any combination of vehicle types (private, commercial, etc.). Currently, all vehicles in Shelby County are assessed a \$50 wheel tax when registered. The majority of this tax is used to fund nontransportation needs. Shelby County could consider reallocation of a portion of these funds to meet the needs for transportation projects. The surrounding counties also could consider this as a source of funding.

### 7.5.3 Tolling, Road Pricing, and Other User Fees

#### Example: Tolling

Nationwide, toll road revenues tend to be dedicated for use on the same roadway. When existing roads are tolled, the proceeds will sometimes be used for complementary transportation infrastructure or services within or affecting the same corridor.

Tolling existing interstates and other Federally funded roads and bridges is not allowed under current Federal law, except in cases of major reconstruction of a bridge or tunnel and as specifically authorized by Congress. Unless limited to state routes, tolling of highways would require a change in Federal law to execute. Tolling only makes sense on well-studied, high-traffic pieces of infrastructure.

Tennessee has studied tolling for the construction of several new facilities. Toll facilities allow agencies to design, construct, and operate projects while using the toll concessions to offset the cost of constructing and operating the facility.

### Example: Road Usage Fee (VMT Tax)

Road usage charges or VMT fees are per-mile charges for using all the roadways in a jurisdiction. They are generally intended as a replacement for fuel taxes. Instead of a per-gallon charge, road usage charges are based on the number of miles driven. Road usage charges have the advantage over fuel taxes in that they are resilient to increasing fuel economy, and apply equally regardless of engine type/technology. These two advantages would give Road Usage Charges greater stability than fuel taxes in the long run.

## 7.5.4 *General Taxes*

### Example: Local Option Sales Tax

Local governments may elect to adopt a general-purpose sales tax to fund transportation improvements. This, however, requires state legislative authority. For Shelby County, a ½ cent sales tax could potentially generate \$63 million per year (estimated based on similar sized counties and retail employees). This has been a popular option in many other communities across the country. The revenue stream should grow in proportion to population growth, and will keep pace with inflation because the tax is a set percentage of the price of goods sold.

## 7.5.5 *Specialized Taxes*

### Example: “Sin” Taxes

Often referred to as “sin” taxes, these taxes are applied to particular goods and activities, such as alcohol, tobacco, and gambling. These taxes are unique in that their amount is meant to be a disincentive to engaging in certain behavior, yet they have the potential to raise considerable revenue for states and local governments. While lottery proceeds have long been used to support education programs, some states with legalized gambling or a statewide lottery have designated revenues generated through these activities for public transportation services.

## 7.5.6 *Beneficiary Charges and Value Capture*

### Example: Impact Fees

Impact fees are a one-time charge to developers on new development. Revenues are used to pay for infrastructure improvements – such as schools, sewers, and roads – to support growth generated by development. These fees have been applied by municipalities and county governments. The revenue potential of impact fees is low, and since the fees are entirely dependent on new development, they are highly speculative, and not easily bondable.

## 7.5.7 *Freight-Related Taxes and Fees*

### Example: Container Fees

Container fees are a flat fee charged for all shipping containers transported into a port by any means (roadway, rail, or ship). Container fees are expressed in dollars per TEU, where one TEU is one Twenty-foot Equivalent Unit, equal to the size of the smallest intermodal shipping container.

States and port districts that impose container fees are constantly balancing the need for transportation infrastructure funding to keep the freight transportation system working properly, against the need to keep shipping rates and fees economically competitive with freight destinations and ports in other jurisdictions. This is particularly true if the ports handle a large percentage of discretionary cargo that could easily be transported through a competing port if the fees become too disadvantageous.