

I. Introduction: Factors Affecting the 2018 Recommended Highway Plan

The Kentucky Transportation Cabinet's (KYTC) mission is to provide a safe, efficient, environmentally sound, and fiscally responsible transportation system that delivers economic opportunity and enhances the quality of life in Kentucky. In developing Kentucky's *2018 Recommended Highway Plan* (Plan), KYTC adopted a "Safety First" approach, prioritizing asset management funding across the Commonwealth. In recognizing the growing backlog of pavement and bridge needs, "Safety First" emphasizes allocating funds to address the critical backlog of infrastructure repairs. Addressing roads and bridges in need of repair will allow for continued economic growth and commerce throughout Kentucky.

KYTC is responsible for managing and maintaining over 27,500 miles of roadway and more than 14,000 bridges. Kentucky has the eighth largest state road system and the seventh largest inventory of state-maintained bridges in the United States. This Plan helps ensure that available funding addresses critical needs and extends the useful life of assets.

A. KYTC Bridge Asset Management

KYTC is responsible for inventorying and inspecting 14,272 bridges located throughout the Commonwealth, with 9,056 being state-owned and 5,216 being locally owned structures. As part of this responsibility, KYTC evaluates the condition of the structures and determines the appropriate load rating (safe vehicle weight).

Deteriorated bridges: KYTC has identified more than 1,000 bridges in need of repairs or replacement due to deteriorating conditions. This impedes the movement of freight and school buses across the Commonwealth. Due to inadequate state and local funding, more than 150 bridges are added to the backlog each year. Kentucky currently has 60 bridges in 37 counties that are closed due to deteriorating condition.

The Plan increases annual funding to address the backlog of deteriorated bridges from \$122 million annually to \$179 million annually – a near 50 percent increase in funding. The Plan includes over 340 bridge projects identified throughout the Commonwealth to be addressed within the FY 2018 – FY 2020 Biennium. However, over 660 bridges remain on backlog.

KYTC is proposing a plan to address deteriorating bridges within the term of the six-year plan. The 2018 – 2020 Biennium identifies roughly one-third of these bridges for repair or replacement, with the remainder to be addressed in subsequent highway plans. Addressing these needs will benefit Kentuckians by improving safety and promoting economic development, along with allowing more direct access for school buses, fire trucks, ambulances, and enhancing the overall mobility of people and goods throughout the Commonwealth. Almost 300 of these bridges are on Critical Rural Freight Corridors and serve as the primary, and often sole, link to a rural area or community.

In review of the current bridge data, approximately one-third of the deteriorating bridges are candidates for rehabilitation, extending the useful life 15 to 20 years without having to replace the structure. The replacement of the remaining deficient bridges will be scheduled and prioritized in order to minimize detours and inconveniences to the public. The current cost estimate to address the backlog is approximately \$700 million.

Depending upon the project financing, the delivery of these bridges to construction would employ a variety of methods, including conventional design-bid-build projects and design-build projects. Currently, KRS 176.431 limits KYTC to five (5) design-build contracts each year and the

construction cost of each design-build project to \$30 million. KYTC recommends that the Kentucky General Assembly remove the limit of 5 design-build contracts and the \$30 million construction contract limit. This would provide KYTC opportunities to explore cost-saving measures using the design-build process to expedite delivery of highway projects.

B. KYTC Pavement Asset Management

The pavement asset management plan addresses the operation and maintenance of more than 27,500 miles of state maintained roadways in Kentucky. The plan has identified \$1 billion of pavement backlog in need of repair. Currently, 3,700 miles of roadway is in deteriorated condition. Absent an increase in additional funding to address the pavement needs, the backlog will grow to approximately 6,000 miles in the next six years.

These pavement conditions pose safety problems, worsen traffic delays due to frequent repair work, and increase maintenance costs. The Plan increases annual funding to address the backlog of pavement needs from \$175 million to \$324 million annually. This represents an 85 percent increase in funding to address pavement needs. The Plan contains over 200 pavement projects identified throughout the Commonwealth.

C. The KYTC Strategic Highway Investment Formula for Tomorrow (SHIFT)

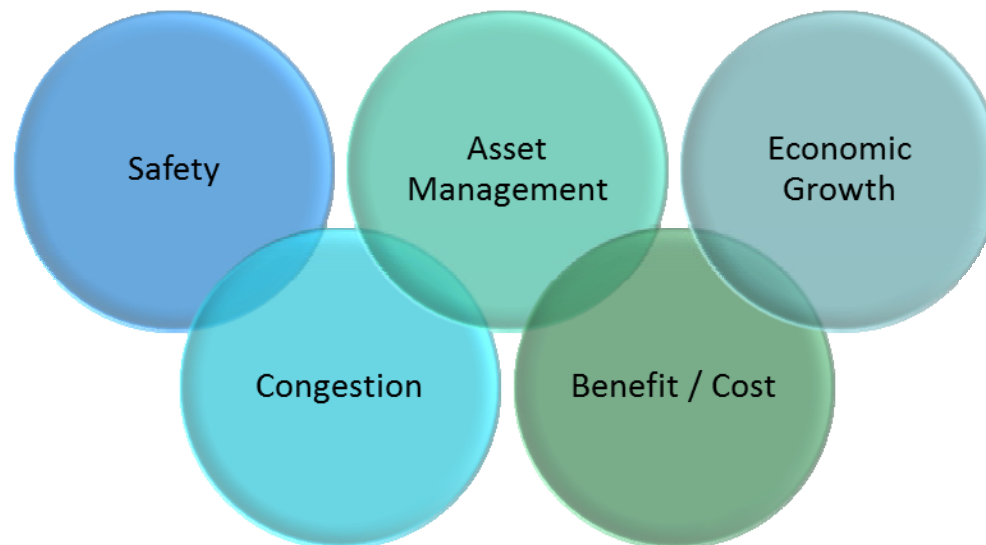
The KYTC Strategic Highway Investment Formula for Tomorrow (SHIFT) prioritization process is a data-driven, objective, and collaborative approach to determine priority needs and to prioritize transportation funding.

The *2016 Highway Plan* contained more than \$6 billion in unfunded projects. The cost of these projects were ten times greater than available state funds. As a result, the citizens of the Commonwealth of Kentucky could not depend on the Plan as a reliable guide for investments.

Governor Bevin charged KYTC to develop a data-driven process to prioritize and program federal and state-funded highway improvement projects. A 22-member, multidisciplinary work group was formed. This group met regularly throughout 2016 to brainstorm possibilities, evaluate potential criteria, and develop SHIFT scoring formulas. The work group examined processes used in other states and collaborated with planning partners via meetings with Area Development Districts and Metropolitan Planning Organization personnel.

In developing the SHIFT prioritization model, KYTC evaluated different factors and made adjustments for aspects unique to Kentucky's transportation system considering data availability, Kentucky-specific processes, and accepted local economic indices. As a result, the following five (5) components were identified for use in the data-driven formula scoring process:

Formula Components



KYTC turned to the Area Development Districts, Metropolitan Planning Organizations, and KYTC districts for local input. A total of 1,200 projects were sponsored by these entities and scored using SHIFT.

Project types considered for the SHIFT process included safety improvements, road widening, reconstruction, construction of new routes, and interchange improvements. Projects outside of SHIFT included rural and secondary road and bridge projects, maintenance projects, and a variety of projects scheduled to use federally dedicated funds.

The 18 month process to develop and implement SHIFT included:

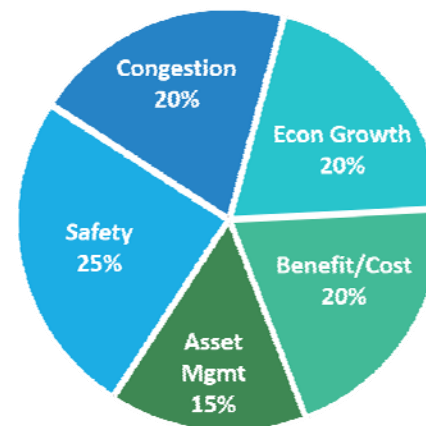
- Development of SHIFT process and scoring formulas
- Project sponsorship
- Data verification
- Statewide prioritization
- Regional prioritization
- Finalization of project selection

The results of this process were used to determine priority needs. The SHIFT priority needs were categorized by statewide project scoring and regional project scoring.

The statewide project scoring methods were developed for sponsored projects on the National Highway System (NHS), statewide safety and mobility projects, and statewide economic development projects.

Proposed **Statewide** Funding Formula

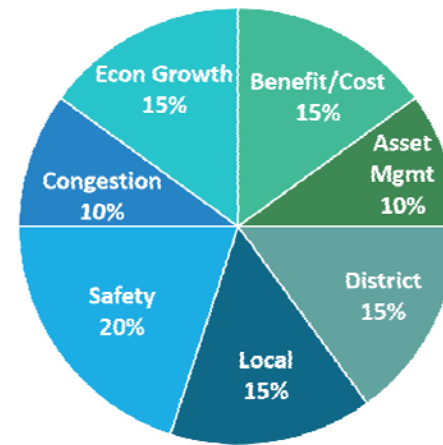
Priority	Score
Improve Safety	25%
Reduce Congestion	20%
Fuel Economic Growth	20%
Spend Tax Dollars Wisely (Benefit /Cost)	20%
Preserve Infrastructure (Asset Management)	15%
TOTAL	100%



Regional scoring and project selection is 70 percent data driven and 30 percent subjective, based on district and local priorities. KYTC districts coordinated with Metropolitan Planning Organizations, Area Development Districts, and local and state officials to ensure priorities were understood and considered. Safety scores are primarily driven by crash history, but also by roadway characteristics. Congestion scores are based on hourly volume, as well as volume to capacity ratio. The economic growth score considers accessibility and connectivity needs based on improvement type, county economic indicators, and average daily traffic. The benefit-cost ratio uses benefits derived from travel-time and crash reduction savings divided by the project cost. The asset management component considers bridge and pavement needs within the project limits that could be addressed by the proposed project, resulting in an added benefit.

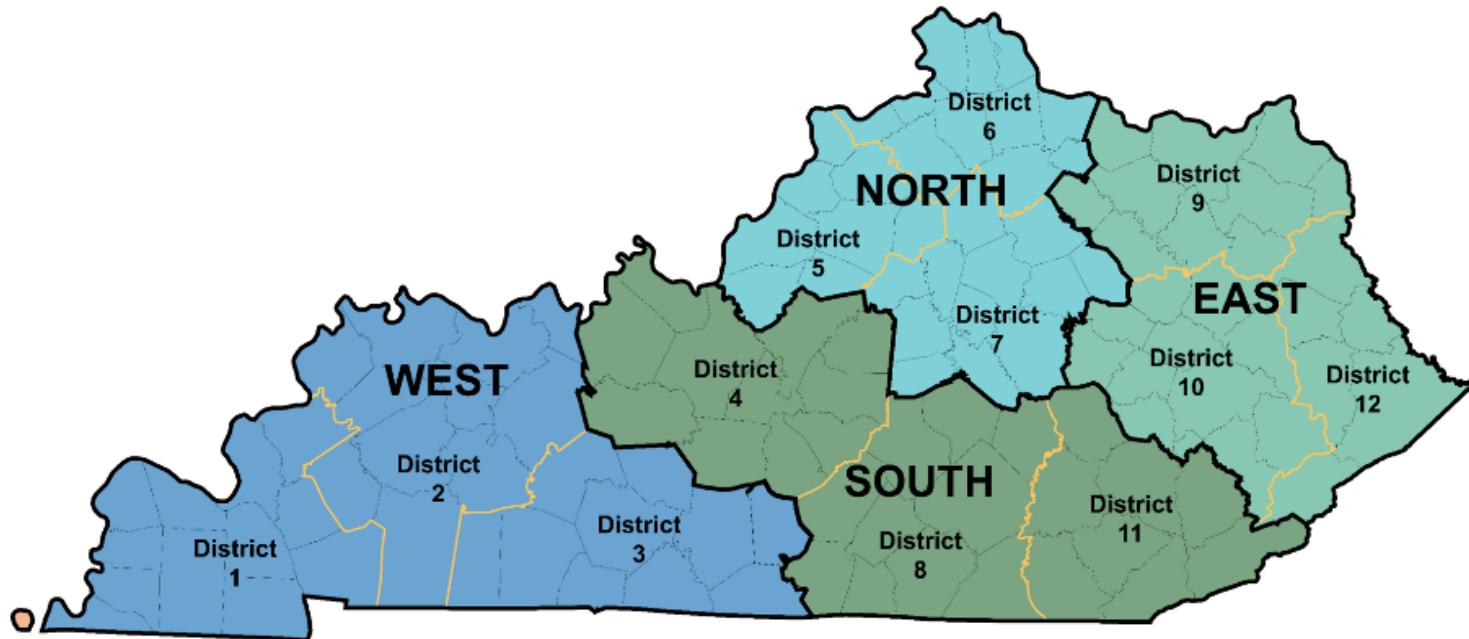
Proposed Regional Funding Formula

Priority	Score
Improve Safety	20%
Reduce Congestion	10%
Fuel Economic Growth	15%
Spend Tax Dollars Wisely (Benefit/Cost)	15%
Preserve Infrastructure (Asset Management)	10%
SUBTOTAL	70%
District Priorities (KYTC)	15%
Local Priorities (ADD/MPOs)	15%
TOTAL	100%



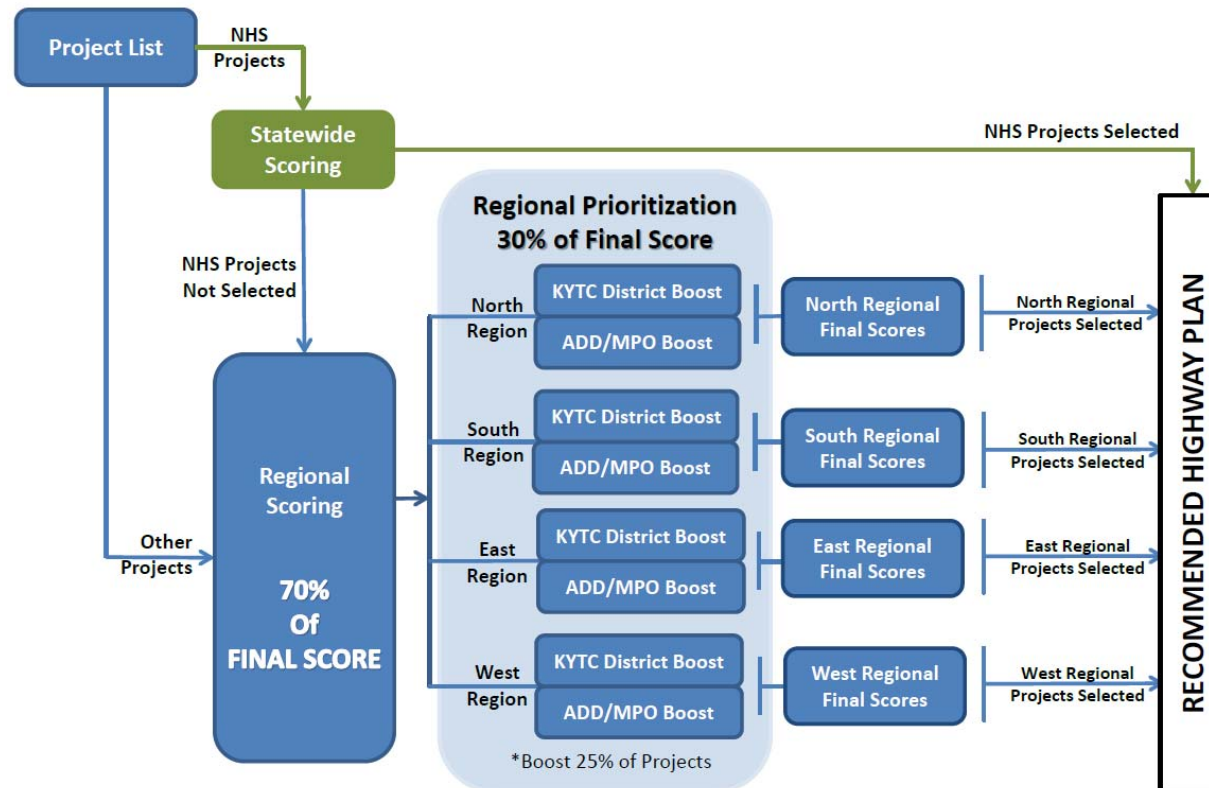
The SHIFT prioritization process divided Kentucky into four (4) regions, each made up of three (3) KYTC districts. The four (4) regions were grouped for regional scoring and are shown on the following map. The KYTC District boundaries are maintained within the regions, and the regions combine contiguous KYTC districts with similar characteristics such as mountainous terrain, urban areas, highway mileage, population, etc.

Kentucky Regions



The following flowchart outlines the statewide and regional processes. An opportunity for a total of 30 additional points is available if both the district and local boosts are applied to a project.

SHIFT Statewide and Regional Processes



The boost for regional scoring gives an opportunity to apply more points to projects that have needs that cannot be identified through scoring algorithms, such as for local economic development and associated traffic increases not captured by the rest of the scoring process. The process is transparent and encourages collaboration and coordination between the state and local officials. Local knowledge is gained during the process that can be applied for a better informed prioritization.

The total cost of all projects identified by SHIFT was \$14.6 billion. The SHIFT process, through the assistance of Area Development Districts, Metropolitan Planning Organizations, local officials, and KYTC districts, reduced the overall list of projects into a list of priority projects, having a total cost of \$8.6 billion.

The SHIFT prioritization process acknowledges current highway funding shortfalls, and offers a reliable, balanced approach to project prioritization, selection, and scheduling to use the anticipated \$2.6 billion of state and federal funding. It is important to recognize that in transitioning to a data-driven process, other factors were considered along with SHIFT scoring. These considerations include investments to date and associated impacts to communities, fulfillment of previous commitments, and completion of significant corridors.

D. The KYTC SHIFT Unfunded Priority Needs

The KYTC SHIFT prioritization process identified \$8.6 billion of capital projects. However, the anticipated combined available state and available federal funding for FY 2018 thru FY 2014 is \$2.6 billion. The Plan is a transition from an over-programmed highway plan containing a list of unfunded projects to a balanced highway Plan containing \$2.6 billion of priority transportation projects.

Using the projected \$2.6 billion of available state and federal funding for the FY 2018 through FY 2024 time period, \$6 billion of priority projects is unfunded. Outlined in Appendix A of the Plan is the list of \$6 billion unfunded projects with the corresponding SHIFT score. KYTC has determined that approximately \$490 million each year of additional state road fund revenue is required to address the entire \$8.6 billion of priority projects. Addressing these needs is critical to continue to move the Commonwealth forward.

E. Environmental Update

Recent changes in 401 KAR 10:030 Antidegradation Policy Implementation Methodology require that developing projects address protection of water resources. The regulation recognizes the General Assembly's authority for approval of projects in the highway plan. Projects are included in the highway plan only after a measured decision that the project enhances the quality of life, vitality of the Commonwealth and promotes the public good. The provisions of the amended regulation specify that inclusion of a project in the highway plan satisfies the requirements for conducting an antidegradation socioeconomic benefit demonstration. Inclusion of a project is an indication of the General Assembly's conclusion that the reduction in water quality that may occur as a result of the project is acceptable given the socioeconomic benefits to be derived. Citizens who may be concerned about the potential of a project to affect water quality should provide information to their legislator for consideration when evaluating projects for inclusion in the highway plan.

II. Revenue Estimates and Assumptions

The *2018 Recommended Highway Plan* is based on a total revenue of \$6.6 billion, consisting of \$2.3 billion to address the backlog of pavement and bridge needs, \$1.1 billion in federally dedicated funds, and another \$0.6 billion for federal GARVEE debt service payments. Beyond these obligations, there is \$2.6 billion left for SHIFT funding through FY 2024. The Plan consists of projects to address bridge and pavement needs, as well as critical roadway safety improvements, road widening, reconstruction, construction of new routes, and interchange improvements. SHIFT scoring resulted in a reduction of priority projects from \$14.6 billion to \$8.6 billion in identified priority projects.

The “Safety First” approach increases the yearly allocation of state and federal funding for bridge asset management from \$122 million to \$179 million, and increases the yearly allocation of state and federal funding for pavement asset management from \$175 million to \$324 million. This is an increase of \$206 million each year allocated to bridges and pavement projects. The funding for bridge projects is listed in the Plan as “BR” funding, and the funding for the pavement projects is listed as “PM” funding.

FEDERAL AND STATE HIGHWAY FUNDING LEVELS AVAILABLE FOR OBLIGATION FROM 2018 THRU 2024
(As estimated by the Kentucky Transportation Cabinet)

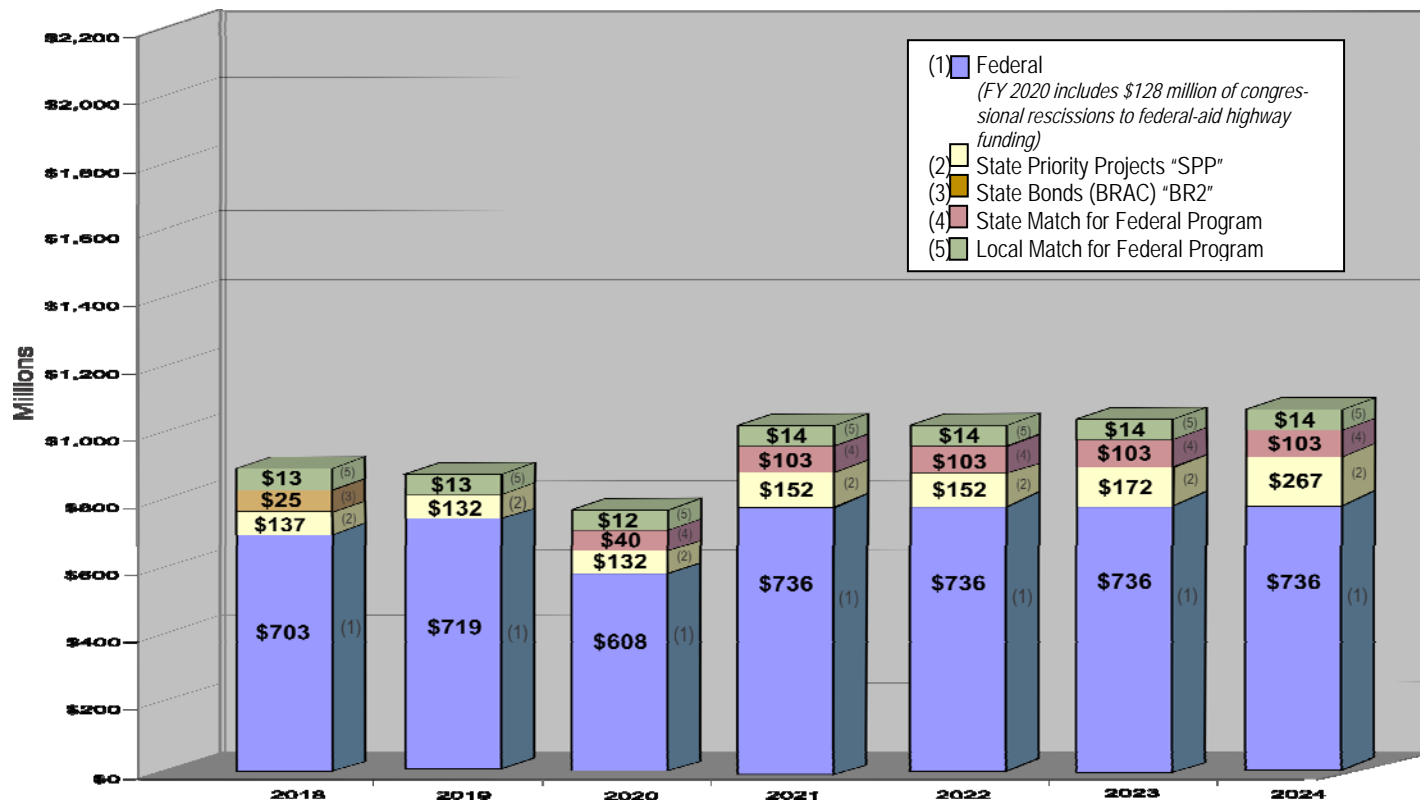


FIGURE 1

In preparing the Plan, both federal and state revenue sources have been considered and the funding projections are based on the most reliable financial information available. The projected state and federal-aid highway funds made available to KYTC for major highway projects are displayed in **Figure 1**. Consistent with past trends and current forecasts, this edition of the *Recommended Highway Plan* is being developed on the basis of the most recent federal transportation authorization, the FAST Act, and state revenue estimates consistent with projections made by the Consensus Forecast Group (CFG). The CFG is a committee of specially designated experts whose revenue forecasts are used by the Executive Branch and the General Assembly to craft the biennial state budget.

It is important to note that the ability of the Cabinet to undertake major state-funded projects is a function of available road fund cash and the careful management of road fund expenses. The Cabinet is committed to maintaining cash to a “floor” of \$100 million. The cash management process (as described in “Section II, Part B”) currently yields daily cash balances for internal use and provides information for monthly meetings where estimated future cash outlays can be updated and project funding decisions can be refreshed. As KYTC has gained experience with this process, our confidence has grown in both the methodology and the resulting cash flow decisions.

A. Federal Revenue Projections

The FY 2018 - 2024 federal revenue forecasts are based on expected allocations from the FAST Act through FY 2020 and straight-line projections for FY 2021 thru FY 2024. The straight-line projections for FY 2021 thru FY 2024 is an approved methodology by FHWA for years outside the current law. State-specific levels of federal-aid highway funding were broken down into individual program funding categories, as outlined by the FAST Act’s Federal Highway Trust Fund formulas for each year.

Figure 2 shows the anticipated federal fund target amounts used to fiscally balance the Plan. According to these estimates of category-by-category funding expectations, the anticipated total federal-aid dollars and matching funding available to fund projects scheduled in the Plan for FY 2018 through FY 2024 is expected to be about \$5.4 billion.

Kentucky’s federal highway program will be largely matched with toll credits through FY 2020. These credits are attributed to Kentucky by federal highway law in accordance with calculations that consider past levels of state fund investments (such as state-sponsored toll roads) in the federal highway system. Toll credits do not generate cash and cannot be counted as real cash. They do, however, permit KYTC the flexibility to use 100% federal funding on federal-aid projects.

Currently, KYTC anticipates all of the available toll credits will be used by the end of FY 2020. Thus, beginning in FY 2021, the required matching funds for federal-aid highway funding each fiscal year will be approximately \$103 million of state road funds. Please keep in mind that the \$103 million of state road funds will be used as the required matching funds, and will be part of the overall project budget to cover project expenditures. Also, the required state matching funds will be included within the state cash management process as described in “Section II, Part B”, thus spreading out the matching funds over the life of project expenditures.

Of particular concern on the federal program side is the application of “fiscal constraint” to the federal-aid highway element of the highway plan. The federal portion of the Plan is required by federal law to be fiscally balanced. Immediately upon completion of the state legislative process, KYTC begins preparing the new Statewide Transportation Improvement Program (STIP). The new STIP will incorporate the federal projects from the 2018 Highway Plan into the new STIP, which will be submitted to the Federal Highway Administration (FHWA) for approval. Fis-

cal constraint for federal-aid highway funding is an important consideration for federal agencies, and the STIP is the document through which fiscal constraint is measured. Any state legislative efforts that results in over-programming of the federal element of the highway plan cannot be accommodated by the federal rules governing the STIP process. Failure to gain FHWA approval would result in the suspension of the annual federal-aid program and its approximate \$704 million annual budget to Kentucky.

FAST Act Federal Funding Category	PERCENT OF REQUIRED MATCHING FUNDS	FY-2018 COMBINED FEDERAL AND MATCHING FUNDS	FY-2019 COMBINED FEDERAL AND MATCHING FUNDS	FY-2020 COMBINED FEDERAL AND MATCHING FUNDS	FY-2021 COMBINED FEDERAL AND MATCHING FUNDS	FY-2022 COMBINED FEDERAL AND MATCHING FUNDS	FY-2023 COMBINED FEDERAL AND MATCHING FUNDS	FY-2024 COMBINED FEDERAL AND MATCHING FUNDS	2018-2024 COMBINED FEDERAL AND MATCHING FUNDS
GARVEE BOND DEBT SERVICE									
GARVEE BOND DEBT SERVICE PAYMENTS (NH)	10%	88	88	72	72	72	51	51	
GARVEE BOND DEBT SERVICE PAYMENTS (STP)	20%	9	9	9	9	9	21	21	
COMBINED TOTAL GARVEE BOND DEBT SERVICE PAYMENTS		97	97	81	81	81	72	72	581
National Highway Performance Program									
• National Highways (NH)	20%	163.8	174.8	113.6	268.2	268.2	289.2	289.2	1,567
Surface Transportation Program									
• Surface Transportation (STP)	20%	65.0	67.7	37.8	105.6	105.6	93.6	93.6	569.0
Bridge Asset Management Program									
• Bridge Asset Management BR funding from NH Program	20%	62.7	62.7	62.7	62.7	62.7	62.7	62.7	
• Bridge Asset Management BR funding from STP Program	20%	44.8	44.8	44.8	44.8	44.8	44.8	44.8	
Combined Total Bridge Asset Management Funding (BR)		107.5	107.5	107.5	107.5	107.5	107.5	107.5	752.5
Preventive Pavement Management Program									
• Preventive Pavement Management PM funding from NH Program		119.4	119.4	119.4	119.4	119.4	119.4	119.4	
• Preventive Pavement Management PM funding from STP Program		39.8	39.8	39.8	39.8	39.8	39.8	39.8	
Combined Total Preventive Pavement Management Funding (PM)		159.2	159.2	159.2	159.2	159.2	159.2	159.2	1,114.4
Surface Transportation Program Dedicated Funding to MPO Areas									
• STP-Henderson (SHN)	20%	0.7	0.8	0.8	0.8	0.8	0.8	0.8	5.8
• STP-Louisville (SLO)	20%	22.4	23.0	23.5	23.5	23.5	23.5	23.5	163.1
• STP-Lexington (SLX)	20%	7.8	8.0	8.2	8.2	8.2	8.2	8.2	56.6
• STP-Northern Kentucky (SNK)	20%	8.9	9.1	9.2	9.2	9.2	9.2	9.2	64.2
• STP-Huntington/Ashland (SAH)	20%	1.6	1.6	1.6	1.6	1.6	1.6	1.6	10.9
Highway Safety Improvement Program and Railroad Safety									
• Highway Safety/High Risk Rural Road (SAF)	10%	41.6	42.3	43.2	47.5	47.5	47.5	47.5	317.0
• Rail Protective Devices (RRP)	10%	1.9	1.9	2.0	2.2	2.2	2.2	2.2	14.6
• Rail Separation (RRS)	10%	1.9	1.9	2.0	2.2	2.2	2.2	2.2	14.6
Other									
• Transportation Enhancement (TE)	20%	14.5	14.5	11.5	14.5	14.5	14.5	14.5	98.7
• Congestion Mitigation (CMAQ)	20%	17.1	17.4	14.1	17.7	17.7	17.7	17.7	119.4
• Forest Highways (FH)	20%	8.1	0.0	0.0	0.0	1.6	1.6	1.6	13.0
• Recreational Trails	20%	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
• Metropolitan Planning	20%	3.1	3.2	3.4	3.4	3.4	3.4	3.4	
• High Priority Projects (HPP)	20%	10.3	0.0	0.0	0.0	0.0	0.0	0.0	10.3
• Kentucky Appropriations Earmarks (KYD)	20%	2.3	0.0	0.0	0.0	0.0	0.0	0.0	2.3
Fiscal Year Summary Totals		\$736.3	\$731.7	\$620.3	\$854.1	\$855.7	\$855.7	\$855.7	\$5,474.2

NOTE:
1) Mandated GARVEE Bond Debt Service Payments of \$97 million in FY 2018; \$97 million in FY 2019; \$81 million in FY2020; \$81 million in FY 2021; \$81 million in FY 2022; \$72 million in FY 2023; and \$72 million in FY 2024; having a combined total of \$581 million.

FIGURE 2

B. State Project Funding Projections

A forecast of \$1.6 billion in state road fund cash is expected to be available to support new state-funded project obligations between 2018 and 2024, which includes approximately \$450 million for required matching funds on federal-aid highway funded projects. This amount is based on a number of assumptions about project cost payouts, revenues accruing to the Road Fund, non-Six-Year Plan costs, state bond debt service payments, unexpected cost increases, and project change orders. It would be too exhaustive to attempt to describe each of these issues in detail, and for the purposes of this document, it is important to underline that any state-funded obligation targets derived through this model are only targets. Actual decisions about when to obligate state project dollars and how much state project work can be afforded at any point will be made by the Secretary of Transportation and based on monthly cash management evaluations received from KYTC's Authorization Review Team (ART).

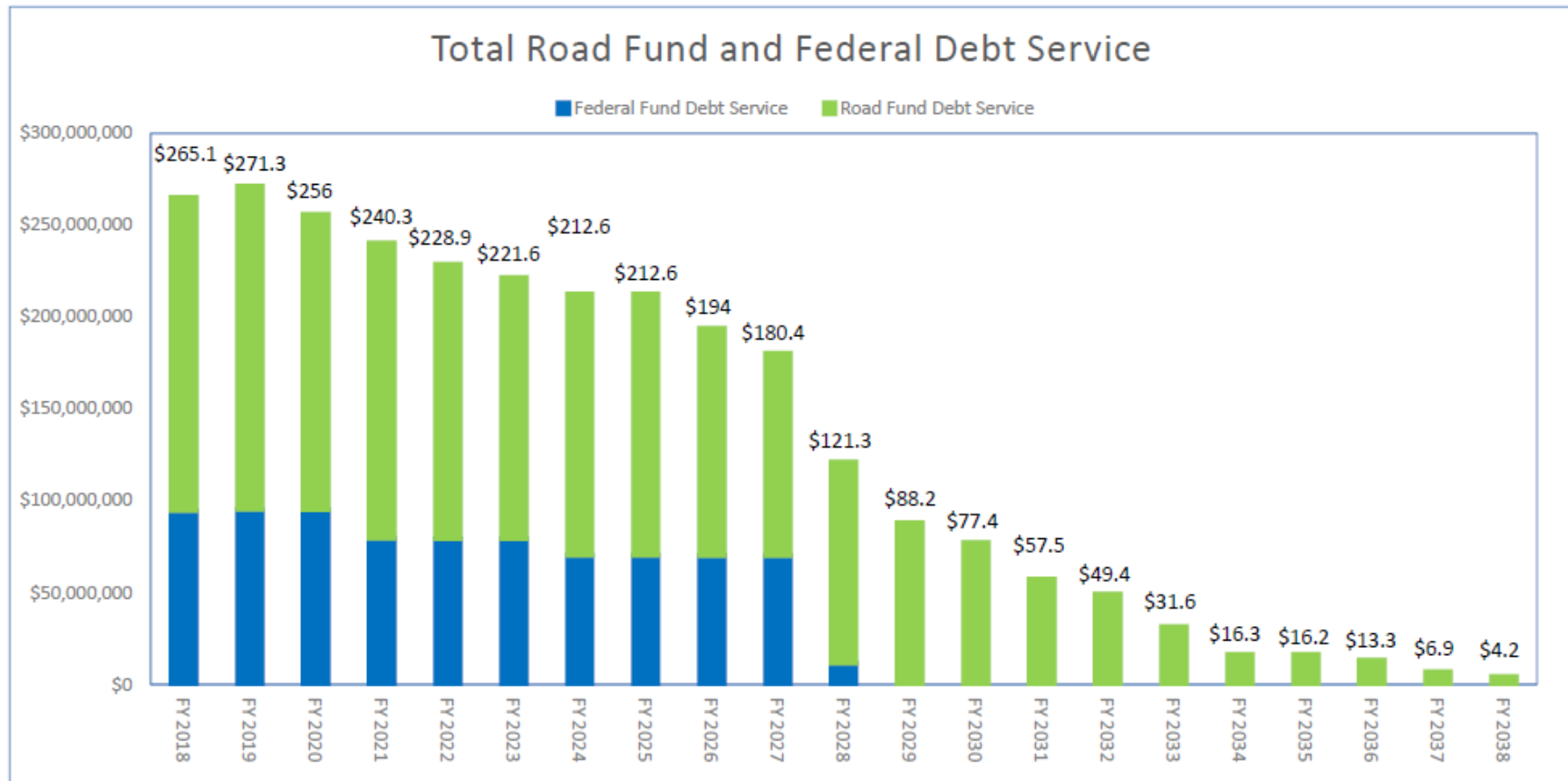
The ART consists of the Cabinet's Secretary, Deputy Secretary, the State Highway Engineer and his or her deputies, and the KYTC Budget Director. These individuals meet monthly to carefully evaluate actual expenditures for the prior month and planned expenditures for upcoming months relative to future fiscal capacity calculated from ongoing project and program cost projections. Every planned, state-funded project funding decision undergoes a rigorous two-part assessment in which the following questions are asked: (1) Is the project ready to move forward from the project development standpoint? (2) Can KYTC afford to move the project forward considering the cash flow implications of doing so? Only a satisfactory response to both questions permits a project to move forward in the funding process.

The ART provides approval for authorization of state and federal funding for preconstruction phases of projects, for awards of construction phases, system preservation activities, and other highway program activities. The ART is taking the necessary steps to assess all planned program outlays and manage cash flow.

In summary, KYTC's current projection of state road fund revenues available for state project obligations for the six-year highway Plan "SPP" projects and state matching funds for the federal-aid highway funding program will be as follows:

2018	\$137 million (carry forward)
2019	\$132 million
2020	\$172 million
2021	\$255 million
2022	\$255 million
2023	\$275 million
2024	<u>\$370 million</u>
Total	\$1.6 billion

As shown in **Figure 3**, the current federal and road fund debt service totals approximately \$2.8 billion over the life of the bonds (2018 through 2038). This includes estimated road fund debt service for about \$62.5 million in authorized but unissued debt. Any significant additional bond authorizations could lead to potential bond rating downgrades.



Total Debt Service (principal and interest) totals approximately \$2.8 billion over the life of the Bonds.

*Includes estimated Road Fund debt service for about \$62.5 million in authorized but unissued debt.

FIGURE 3

C. KYTC Mega Projects

I-69 Ohio River Crossing Project

KYTC is working closely with Indiana to develop an approach to funding the new I-69 bridge over the Ohio River between Henderson and Evansville. The Plan includes funding of \$500,000 in FY 2019 to continue work on the design phase of the project, \$19 million of funding in FY 2021 for the right-of-way phase, and \$8 million of funding in FY 2022 for the utility phase of the project. It's expected that a combination of tolls, federal grants and state monies will be required to complete the project. In 2017 dollars, the current project estimate is near \$1 billion with KY's share of those costs being approximately \$600 million. Inflation, financing and interest will significantly increase these costs. The environmental process is scheduled for completion in the fall of 2019 making the project eligible for federal monies toward design, right of way activities and construction.

Brent Spence Bridge Project

KYTC completed the Brent Spence Bridge Strategic Corridor Study in December 2017 which concluded that the Brent Spence Bridge Project and improvements to the I-275 interchange with I-71/I-75 are needed to relieve critical congestion along the corridor. Currently, the Plan does not include funding for any phases of the project. Kentucky's share of the estimated cost of the Brent Spence Bridge Project is estimated at \$1.3 billion in current year dollars. The Plan does include funding for painting the existing Brent Spence Bridge in FY 2019.

In addition, the Brent Spence Bridge Strategic Corridor Study identified the need to continue the study the concept of eastern bypass alternative from an economic development perspective. The Plan includes \$2 million of funding to conduct a detailed study of alternatives.

D. Appendix

Outlined in **Appendix A** of the Plan is the list of unfunded priority projects. KYTC has determined that approximately \$490 million each year over a 10 year period is needed to address these needed projects.

Outlined in Appendix B is the historic construction awards from calendar years 1990 through 2017.