

Addendum #1: Performance Measures

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TPO Technical Committee on June 12, 2018

The TPO Executive Board on June 26, 2018

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The TPO Executive Board on October 24, 2018

FY 2017-2020 TIP ADDENDUM #1

Performance Measures

TIP ADDENDUM PURPOSE

The Knoxville TPO is required to develop and regularly update the Transportation Improvement Program (TIP) for the TPO planning area in cooperation with the Tennessee Department of Transportation (TDOT) and any affected public transportation operators. The TIP serves as a four-year implementation plan of federally funded and regionally significant projects derived from the longer-term Mobility Plan for the region. The primary requirements of the TIP are:

- It shall cover a period of no less than four years, updated at least every four years, and approved by the MPO, Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and Governor.
- It shall provide all interested parties with a reasonable opportunity to comment on the proposed TIP through formal public meeting and public review via electronic accessible formats such as the World Wide Web.
- It shall include capital and non-capital surface transportation projects for funding that are consistent with the adopted long-range transportation plan.
- It shall include a financial plan demonstrating how the projects in the plan can be fiscally implemented.
- It shall include all regionally significant projects.

The current TIP, covering the federal fiscal years 2017-2020, was initially adopted by the TPO Executive Board on October 26, 2016. A Phase 2 Amendment to the TIP was approved by the TPO Executive Board on April 26, 2017. This addendum serves to supplement the existing document with regard to Performance Measures regulations and guidance that have been finalized since the time of approval.

Performance and outcome-based planning was first emphasized in the 2012 transportation funding authorization bill, Moving Ahead for Progress in the 21st Century (MAP-21), and is continued through the current Fixing America's Surface Transportation Act (FAST Act). The bills direct the use of a performance-based planning and programming (PBPP) process to inform strategic transportation investment decisions with a focus on achieving performance outcomes. A PBPP process can serve to encourage progress toward the Region's desired multimodal transportation system in addition to its link to national goals. Through data collection and monitoring of the transportation system's performance, transportation agencies can strategically allocate resources to critical need areas. Investing in projects based on their ability to meet established goals is a key element of a PBPP process.

Congress established seven "National Goals" to guide the planning process and federal investments toward the following areas:

- Safety: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads;
- Infrastructure condition: To maintain the highway infrastructure asset system in a state of good repair;
- Congestion reduction: To achieve a significant reduction in congestion on the National Highway System (NHS);
- System reliability: To improve the efficiency of the surface transportation system;

- Freight movement and economic vitality: To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development;
- Environmental sustainability: To enhance the performance of the transportation system while protecting and enhancing the natural environment; and,
- Reduced project delivery delays: To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

To monitor the performance of the transportation system, and the effectiveness of programs and projects as they relate to the National Goals, a series of performance measures were established in the areas of safety (PM1), infrastructure condition (PM2), and system performance (PM3). These measures are outlined in 49 USC 625 and 23 CFR 490.

Table 1: Federal Highway Performance Measures: See 23 CFR 490

Rulemaking	National Goal	Performance Area	Performance Measures
PM1	Safety	Injuries & Fatalities	<ul style="list-style-type: none"> • Number of fatalities • Fatality rate (per 100 million vehicle-miles traveled) • Number of serious injuries • Serious injury rate (per 100 million vehicle-miles traveled) • Number of non-motorized fatalities and non-motorized serious injuries
PM2	Infrastructure Condition	Pavement Condition	<ul style="list-style-type: none"> • Percentage of pavements on the Interstate System in good condition • Percentage of pavements on the Interstate System in poor condition • Percentage of pavements on the non-Interstate NHS in good condition • Percentage of pavements on the non-Interstate NHS in poor condition
		Bridge Condition	<ul style="list-style-type: none"> • Percentage of NHS bridges classified as in good condition • Percentage of NHS bridges classified as in poor condition
PM3	System Reliability	System Performance: Performance of the National Highway System	<ul style="list-style-type: none"> • Percentage of person-miles traveled on the Interstate System that are reliable • Percent of person-miles traveled on the non-Interstate NHS that are reliable
	Freight Movement and Economic Vitality	System Performance: Freight Movement of the Interstate System	Truck Travel Time Reliability Index
	Congestion Reduction	System Performance: Traffic Congestion	<ul style="list-style-type: none"> • Annual hours of peak hour excessive delay per capita • Percent of non-single-occupant vehicle travel
	Environmental Sustainability	System Performance: Congestion Mitigation and Air Quality Program	Total emissions reductions

Recipients of public transit funds are required to establish performance targets, develop transit asset management and safety plans, and report on their progress toward achieving targets. Public transportation operators are directed to share information with MPOs and states so that all plans and performance reports are coordinated.

Table 2: Federal Transit Performance Measures: See 49 USC 625

National Goal	Performance Area	Performance Measures
Infrastructure Condition	Equipment	Percentage of vehicles that have met or exceeded their Useful Life Benchmark
	Rolling Stock	Percentage of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark
	Infrastructure	Percentage of track segments with performance restrictions
	Facilities	Percentage of facilities within an asset class rated below 3.0 on the FTA Transit Economic Requirements Model scale.

TPO RESPONSIBILITIES

For each roadway performance measure, the TPO is required to establish a Regional performance target or adopt TDOT’s target and therefore agree to plan and program projects that contribute toward meeting the targets. PM1 targets are updated annually. PM2 and PM3 are based on a 4-year "Performance Period", the first of which is from 2018 to 2021. Separate 2-year and 4-year targets are established for various particular measures under PM2 and PM3, as applicable under 23 CFR part 490. Transit performance measures require the TPO to establish performance targets not less than 180 days from the establishment of the transit provider TAM targets or standards established under 23 CFR part 490, and 49 U.S.C. 5326(c).

MPOs will have one year from the establishment of the transit agency safety targets to establish performance targets that address the performance measures or standards established under 23 CFR part 490, and 49 U.S.C. 5329(d).

TPO reporting responsibilities must be integrated into the Mobility Plan and TIP. The Mobility Plan must describe the performance measures and targets used to assess system performance, evaluate the performance of the transportation system with respect to the performance targets, and report on progress made. The TIP must link investment priorities to the targets in the Mobility Plan and describe, to the maximum extent practicable, the anticipated effect of the program toward achieving established targets.

This addendum serves to address these requirements for the established safety performance measure targets across each of the required measures.

Safety Performance Measures (PM1)

The FHWA published the Highway Safety Improvement Program and Safety Performance Management Measures (PM1) Final Rules in the Federal Register on March 15, 2016, with an effective date of April 14, 2016. The Tennessee Department of Transportation (TDOT) established statewide safety performance targets and the TPO adopted those targets at the December 20, 2017 Executive Board meeting.

Table 3: TDOT and TPO Safety Targets

Performance Measures	5 Year Rolling Averages	
	Baseline	Target
	2012-2016	2014-2018
Number Fatalities	995.6	1,021.4
Fatality Rate	1.358	1.337
Number of Serious Injuries	7,319.4	7,630.8
Serious Injury Rate	9.976	9.982
Number of Non-motorized Fatalities and Serious Injuries	434.6	493.2

Pavement and Bridge Infrastructure Condition Performance Measures (PM2)

The FHWA published the Pavement and Bridge Condition Measures (PM2) Final Rules in the Federal Register on January 18, 2017, with an effective date of May 20, 2017. The Tennessee Department of Transportation (TDOT) established statewide pavement and bridge condition targets by the May 20, 2018 deadline. The TPO adopted the required 4-year targets at the October 24, 2018 Executive Board meeting.

Table 4: TDOT Pavement and Bridge Condition (PM2) Targets

Performance Measures	Baseline	2-Year Target	4-Year Target
Percentage of pavements on the Interstate System in good condition	75.6%	N/A	60.0%
Percentage of pavements on the Interstate System in poor condition	0.14%	N/A	1.0%
Percentage of pavements on the non-Interstate NHS in good condition	44.8%	42.0%	40.0%
Percentage of pavements on the non-Interstate NHS in poor condition	3.24%	4.0%	4.0%
Percentage of NHS bridges classified as in good condition	39.5%	36.0%	36.0%
Percentage of NHS bridges classified as in poor condition	4.9%	6.0%	6.0%

Note: Knoxville Regional TPO is only required to adopt 4-year targets. The TPO supports TDOT's 4-year targets.

System Performance Measures (PM3)

The FHWA published the Performance of the National Highway System, Freight Movement on the Interstate System and Congestion Mitigation and Air Quality Improvement Program Measures (PM3) Final Rules in the Federal Register on January 18, 2017, with an effective date of May 20, 2017. The Tennessee Department of Transportation (TDOT) established System Performance targets by the May 20, 2018 deadline. The TPO adopted the required 4-year targets at the October 24, 2018 Executive Board meeting.

Table 5: TDOT System Performance (PM3) Targets

Performance Measures	Baseline	2-Year Target	4-Year Target
Subpart E - Interstate Reliability (Percent of person-miles traveled on the Interstate System that are reliable)	87.7%	85.3%	83.0%
Subpart E - Non-Interstate NHS Reliability (Percent of person-miles traveled on the non-Interstate NHS that are reliable)	89.7%	N/A	87.5%
Subpart F – Freight Reliability (Truck Travel Time Reliability Index)	1.35	1.35	1.33
Subpart G – Traffic Congestion (Peak Hour Excessive Delay per Capita)	8.54	N/A	N/A
Subpart G – Traffic Congestion (Percent of Non-Single Occupancy Vehicle Travel)	16.6%	16.5%	16.5%
Total emissions reductions	VOC = 230.025 CO = 530.282 NO _x = 363.399 PM2.5 = 2.897	VOC = 30.698 CO = 75.000 NO _x = 62.840 PM2.5 = 0.120	VOC = 61.396 CO = 150.000 NO _x = 125.680 PM2.5 = 0.240

Note: Knoxville Regional TPO is only required to adopt 4-year targets and is only subject to Performance Measures under Subpart E, F and H for the first performance period, and only subject to emissions reductions targets for the pollutants of VOC, NO_x and PM2.5 as indicated by the shading above.

Transit Asset Management (TAM) and Transit Safety

The Federal Transit Administration (FTA) requires recipients of FTA funds to maintain and document minimum Transit Asset Management (TAM) standards. The purpose of these standards is to create a strategic and systematic practice of procuring, operating, inspecting, maintaining, and replacing transit capital assets and to manage their performance, risks, and costs over their life cycles, for the purpose of providing safe, cost effective, and reliable public transportation. The State of Good Repair (SGR) is defined as the condition at which the capital asset is able to operate at a full level of performance and does not pose unacceptable safety risks for users. FTA requires SGR performance measures be set for the urban area. Performance Measures required are set by asset category, which includes Rolling Stock, Equipment (both maintenance equipment or non-revenue vehicles), and Facilities. Assets are measured against Useful Life Benchmarks (ULB), which are the expected life cycle (period of time) of the asset for a particular operating environment.

Local transit agencies have adopted TAM targets and submitted TAM Plans to the TPO. The TPO adopted Urban Area TAM performance targets at the June 26, 2018 Executive Board meeting.

Table 6: TPO 2018/2019 TAM Targets

Asset Class/Definition	Agency	Total Assets	2018 # Assets In Good Repair	2018 # Assets In SGR Backlog	2018 % Assets In SGR Backlog	2019 Target % Assets In SGR Backlog
Rolling Stock - All Revenue Vehicles % of revenue vehicles that have met or exceeded their Useful Life Benchmark (ULB)						
Bus & Rubber Tire Vintage Trolley – 14 Years	KAT	58	58	0	0.00%	< 10%
Cutaway – 10 Years	KAT, CAC,	90	187	3	3.33%	< 10%
Cutaway – Light Duty – 5 Years	ETHRA, NP	20	13	7	35.00%	< 10%
Minivan – 8 Years	CAC, VAT, NP	23	20	3	13.04%	< 10%
Automobile – 8 Years	CAC, VAT	15	13	2	13.33%	< 10%
Equipment - Non-Revenue Vehicles % of non-revenue vehicles that have met or exceeded their Useful Life Benchmark (ULB)						
Support Vehicle – 8 Years	KAT, CAC	18	10	8	44.44%	< 10%
Equipment – Over \$50,000/Owned % of equipment with a condition rating below 3.0 on FTA’s Transit Economic Requirements Model (TERM) Scale						
Equipment	KAT	16	10	6	37.50%	< 10%
Facilities - All Buildings or Structures % of facilities with a condition rating below 3.0 on FTA’s Transit Economic Requirements Model (TERM) Scale						
Facilities	KAT	5	5	0	0.00%	0.00%

KAT = Knoxville Area Transit, CAC = Knox County CAC Transit, VAT = Knoxville Knox County CAC Volunteer Assisted Transportation Program, ETHRA = East Tennessee Human Resource Agency, NP = Non-Profit agencies that purchased vehicles through Section 5310 – Enhanced Mobility for Seniors & Individuals with Disabilities

Transit Agency Deadline to establish Public Transit Agency Safety Plans (includes safety targets): Final Rule + 1 year

TPO Deadline to establish Transit Safety Performance targets: Final Rule + 1 year + 180 days

TPO PERFORMANCE BASED PLANNING

Leveraging Investments to Achieve Targets

Mobility Plan 2040 and FY 2017-2020 TIP project selection criteria prioritize projects that promote safety and security. Roadway projects safety benefits were evaluated by analyzing existing crash rates on a scale developed by a percentile ranking process relative to all projects. If a project was on a new route it was given only the minimum points possible unless it could be specifically tied to a parallel route that was being bypassed and its crash rate. Additional points were awarded if accommodations for alternative modes were provided. Security/ emergency response points were based on the functional class of the roadway. The selection criteria are presented in Table 1 on page 9 in the TIP and in Table 3-1 on page 81 in the Mobility Plan.

Safety for all users should be a top priority in transportation planning. Communication and collaboration among many agencies and the public is a vital part of safety planning. The TPO uses best available data to make funding decisions. Specifically, the TPO uses TDOT provided crash data for motor vehicles. For bicycle and pedestrian crashes, the TPO collects and analyzes crash data for crashes resulting in fatalities or serious (incapacitating) injuries. An interactive map can be found here: <https://maps.knoxmpc.org/MapSeries/bikepedcrash.html>. The TPO project selection criteria, ongoing interagency collaboration and continuing public education on safety issues collectively link the TIP program and broader TPO efforts to the national safety goal.

In the FY 2017-2020 TIP \$36.6 million of Highway Safety Improvement Program (HSIP) funds were programmed to projects that promote safety¹. In addition to the HSIP program, the broader program of projects is encouraged to incorporate safety elements that benefit all modes. For example, intersection projects may address geometric or sight distance concerns, while road widening/reconstruction projects can benefit active transportation by typically including bike facilities and sidewalks.

PROGRESS, MONITORING, AND NEXT STEPS

Updates to the Mobility Plan to reflect current Federal Planning Regulations where projects and/or fiscal constraint are not involved may be processed as administrative adjustments. A broader discussion of TIP impacts on established targets will be included in the FY 2020-2023 TIP, due in 2019, as comparisons to the baseline data can be made. This comparative data will serve to inform future Mobility Plan System Performance reporting, as required by 23 CFR 450.324 (f)(4). The next TPO Mobility Plan is due in 2021.

¹ HSIP figure as of the original addendum date.