

Appendix D

Performance Measures

Performance management is a strategic approach to connect investment and policy decisions to achieve performance goals. Performance goals are achieved through establishing performance measures and targets adopted in the TPA's Long Range Transportation Plan (LRTP). The TPA's aim is to provide a process that uses data-driven, quantitative criteria to set and analyze achievable targets. Using a performance-based method ensures the most efficient investment of federal transportation funds by increasing accountability, transparency, and providing for better investment decisions that focus on key outcomes.

The FHWA and FTA have established performance measures and reporting requirements for DOTs, MPOs, and transit agencies through five Planning Rules. In response, the Palm Beach TPA and FDOT have adopted performance measures and targets based on the national goals enacted by Congress in Moving Ahead for Progress in the 21st Century (MAP-21). The Planning Rules specify the requirements to implement a performance-based approach to planning and programming. In total, there are three FHWA performance measure (PM) rules and two FTA rules for transit-transit asset management and transit safety.

The various performance measures within the Planning Rules assess:

- Roadway Safety (PM1)
- Pavement and Bridge Condition (PM2)
- System Performance and Freight Movement (PM3)
- Transit Asset Management (TAM)
- Transit Safety

The Planning Rules and associated performance measures also specify how the TPA should set targets, report performance, and integrate performance management into the Long-Range Transportation Plans (LRTP) and Transportation Improvement Programs (TIP).

To coordinate between agencies, the FDOT and the Metropolitan Planning Organization Advisory Council (MPOAC) developed the Transportation Performance Management (TPM) Consensus Planning Document to describe the processes through which FDOT, the TPA, and the providers of public transportation in the TPA planning area will cooperatively develop and share information related to transportation performance management and target setting. The Consensus Planning Document can be found after the performance measures. The adopted FDOT/TPA performance measures and targets are listed in the table below.

Federal Performance Measures and Targets

Category	Performance Measure	TPA Target
Safety	Fatalities	Zero (2022)
	Serious Injuries	Zero
	Rate of Serious Injuries per 100M vehicle miles travelled (VMT)	Zero
	Rate of Fatalities per 100M VMT	Zero
	Nonmotorized Fatalities and Serious Injuries	Zero
System Performance	Percent of reliable person-miles traveled on the Interstate	≥ 85% (2022)
	Percent of reliable person-miles traveled on the non-Interstate NHS	≥ 93%
	Truck travel time reliability ratio (TTTR) on the Interstate	≤ 1.75
Bridges	Percent of NHS bridges classified as in Good condition by deck area	≥ 50% (2022)
	Percent of NHS bridges classified as in Poor condition by deck area	≤ 5%
Pavement	Percent of Interstate pavements in Good condition	≥ 60% (2022)
	Percent of Interstate pavements in Poor condition	≤ 5%
	Percent of non-Interstate NHS pavements in Good condition	≥ 40%
	Percent of non-Interstate NHS pavements in Poor condition	≤ 5%
Transit (Palm Tran) <i>Vehicles</i>	Percent of Vehicles exceeding useful life	(2022)
	Vehicles – Articulated Bus	≤ 10%
	Vehicles – Fixed Route Bus	≤ 10%
	Vehicles – Paratransit Bus	≤ 10%
	Vehicles – Paratransit Van	≤ 10%
<i>Equipment</i>	Percent of Equipment exceeding useful life	
	Equipment – Automobiles	≤ 0%
	Equipment - Trucks	≤ 0%
<i>Facilities</i>	Percent of Facilities exceeding useful life	≤ 0%
	Transit (SFRTA) <i>Equipment</i>	
<i>Rolling Stock</i>	Support & Maintenance Vehicles older than 8yrs	≤ 55.6%
	Other vehicles scoring lower than 2.5 (1-5 scale)	≤ 5%
	Locomotives, Coach cars, self-propelled cars older than 39 yrs.	≤ 25%
	Bus (Cutaway) older than 10 yrs.	≤ 25%
	Rail fixed-guideway track with performance restrictions	≤ 3.5%
<i>Infrastructure Facilities</i>	Passenger terminals scoring lower than 2.5 (1-5 scale)	≤ 5%
	Maintenance facilities scoring lower than 2.5 (1-5 scale)	≤ 5%
	Administrative offices scoring lower than 2.5 (1-5 scale)	≤ 5%
	Transit Safety (Palm Tran)	
Fixed Route / Paratransit	Fatalities	Fixed Route/Paratransit Zero/Zero (2022)
	Fatality Rate per 100k vehicle revenue miles (VRM)	Zero/Zero
	Injuries	63/34
	Injury Rate per 100k VRM	0.9/0.4
	Safety Events	43/32
	Safety Event Rate per 100k VRM	0.6/0.3
	System Reliability (VRM per failure)	14,000/7,700

Safety Performance Measures (PM1)

Safety is the first national goal identified in the FAST Act and is also the first goal of the Florida Transportation Plan (FTP), the state’s long-range transportation plan, and the emphasis of Florida’s Strategic Highway Safety Plan (SHSP). On August 31, 2021, FDOT established statewide performance targets for calendar year 2022 of zero fatalities and serious injuries. The SHSP, published in March 2021, reaffirms the goal of zero traffic deaths and serious injuries and embraces Vision Zero/Target Zero. The updated SHSP calls on Florida to think more broadly and inclusively by addressing four additional topics, which could be referred to as the 4Is: information intelligence, innovation, insight into communities, and investments and policies. The SHSP development process includes review of safety-related goals, objectives, and strategies in MPO plans. The SHSP guides FDOT, MPOs, and other safety partners in addressing safety and defines a framework for implementation activities to be carried out throughout the state. The Palm Beach TPA also adopted the target of zero from 2018-2022 and reaffirmed those targets for 2022. The TPA plans and programs projects in the TIP that, once implemented, are anticipated to make progress toward achieving the targets. Safety performance measure targets are required to be adopted on an annual basis.

Baseline Conditions

Safety Performance Measures are evaluated using a five-year rolling average of crash data and Vehicle Miles Traveled (VMT). The table below presents the Baseline Safety Performance Measures 2016-2020 five-year rolling average for Florida and the Palm Beach TPA.

Baseline Safety Performance Measure Targets

Performance Measure	Florida 2016-2020	Palm Beach TPA 2016-2020	Statewide Targets (2022)	Palm Beach TPA Targets (2022)
Number of Fatalities	3,189	176	0	0
Number of Serious Injuries	18,992	1,076	0	0
Fatality Rate per 100 million VMT	1.453	1.241	0	0
Serious Injury Rate per 100 million VMT	8.641	7.591	0	0
Number of non-motorized Fatalities & serious injuries	3,192.4	206.8	0	0

**VMT= Vehicle Miles Traveled*

Source: FDOT 2019 FHWA Performance Measures per MPO

Trends Analysis

The TPA tracks fatalities and serious injuries in Palm Beach County in order to analyze past trends and identify regional safety issues. Tracking these measures helps estimate the effectiveness of TPA transportation investment, as reflected in the TIP. The table below shows the changes in Safety Performance Measures rolling averages for Palm Beach County from 2011 through 2020.

Trends of Palm Beach Safety Performance Measures 2011-2020

Performance Measure	2011-2015	2012-2016	2013-2017	2014-2018	2015-2019	2016-2020
Number of Fatalities	139.6	152.8	157.8	167.6	176.0	175.6
Number of Serious Injuries	1,027.2	1,055.2	1,080.6	1,088.2	1,093.0	1076.2
Fatality Rate per 100 million VMT*	1.099	1.181	1.188	1.227	1,243	1.241
Serious Injury Rate per 100 million VMT	8.112	8.203	8.162	7.975	7.712	7.591
Number of non-motorized Fatalities and serious injuries	200.8	203.0	203.8	203.2	207.8	206.8
100 million VMT (vehicle miles traveled)	126.82	128.83	132.63	136.44	142.20	132.57

*VMT= Vehicle Miles Traveled

Source: FDOT 2020 FHWA Performance Measures per MPO

Safety Programs in the TIP

Safety is a primary focus of the Palm Beach TPA's Vision of a "Safe, Efficient, and Connected Multimodal Transportation System". The TPA adopted a Vision Zero Action Plan in April 2019 and an updated version in October 2021 to establish safety priorities and identify achievable strategies with the best potential to reduce, and ultimately eliminate, fatalities and serious injuries for all roadway users. The Vision Zero Action Plan specifically addresses the five safety performance measures in PM1.

Safety is integrated into the planning, selection, and prioritization of TPA projects, especially projects selected through the Local Initiatives (LI) and Transportation Alternatives (TA) grant programs. LI and TA are annual competitive grant programs for projects submitted by local planning partners. Both the LI and TA grant programs include safety within the scoring criteria, and the TA program includes scoring specific to the Vision Zero Action Plan. The scoring for both programs also includes measures to address priority bike and pedestrian network gaps identified in the TPA's Long Range Transportation Plan. A sample of projects in the TIP that are programmed to address safety are shown in the table below.

TIP Section	Project Location	Project Description
State Road Modifications (SRM)	SR 80 from SR 15 to CR 880	Street Lighting
	Boynton Beach Blvd from I-95 to US-1	Reconstruct: narrow vehicle lanes, construct 9' sidewalk on N, 15' shared use path on S, pedestrian lighting

TIP Section	Project Location	Project Description
Local Initiatives (LI)	36th St & bridge from Australian Ave to Poinsettia Ave in West Palm Beach	Construct buffered bike lanes, pedestrian enhancements and bridge
	Brant Bridge connector from Lindell Blvd to Brant Bridge	Construct sidewalks and separated bike lanes
	Germantown Rd from Old Germantown Rd to Congress Ave	Construct 6' separated bike lanes and 6-ft sidewalks
Transportation Alternatives (TA)	Burns Rd from Military Trail to Alt A1A	Construct 9.5' separated two-way bicycle track
	El Rio Trail from Glades Rd to Yamato Rd	Install lighting
	Various existing pedestrian crossings in Palm Beach Gardens	Install pedestrian activated flashers at 12 existing crossings

Pavement & Bridge Condition Performance Measures (PM2)

On May 18, 2018, FDOT established statewide performance targets for the pavement and bridge condition measures. The TPA adopted FDOT's statewide pavement and bridge performance targets on March 21, 2019 and subsequently set a more stringent local TPA target for National Highway System (NHS) bridges in poor condition at no more than 5%. The table below shows the Palm Beach TPA and statewide targets.

Statewide Pavement and Bridge Condition and Performance Targets

Performance Measure	2-year Statewide Target (2019)	4-year Statewide Target (2021)	Current Statewide Condition (2020)	2-year Palm Beach TPA Target (2019)	4-year Palm Beach TPA Target (2022)	Palm Beach TPA Condition (2020)
Percent of Interstate pavements in good condition	Not required	≥60%	68.8%	Not required	≥60%	53.2%
Percent of Interstate pavements in poor condition	Not required	≤5%	0.6%	Not required	≤5%	0.2%
Percent of non-Interstate NHS pavements in good condition (*2019 data. Data for 2020 not available)	≥40%	≥40%	*41%	≥40%	≥40%	*44.0%
Percent of non-Interstate NHS pavements in poor condition (*2019 data. Data for 2020 not available)	≤5%	≤5%	*0.2%	≤5%	≤5%	*0.1%
Percent of NHS bridges (by deck area) in good condition	≥50%	≥50%	65.46%	≥50%	≥50%	85.18%
Percent of NHS bridges (by deck area) in poor condition	≤10%	≤10%	.45%	≤5%	≤5%	1.0%

FDOT is mandated by Florida Statute 334.046 to preserve the state’s pavement and bridges to specific standards. To adhere to the statutory guidelines, FDOT prioritizes funding allocations to ensure the current transportation system is adequately preserved and maintained before funding is allocated for capacity improvements. These statutory guidelines cover the statewide federal targets that have been established for pavements and bridges.

In addition, MAP-21 requires FDOT to develop a Transportation Asset Management Plan (TAMP) for all NHS pavements and bridges within the state. The TAMP must include investment strategies leading to a program of projects that would make progress toward achievement of the state DOT targets for asset condition and performance of the NHS. FDOT’s TAMP was updated to reflect MAP-21 requirements in 2018.

The TPA TIP reflects investment priorities established in the 2045 Long Range Transportation Plan. The focus of the TPA’s investments in bridge and pavement condition include the short list of projects below. Most of the bridge and pavement projects that address PM2 are in the Major Maintenance section of the full TIP document.

TIP Section	Project Location	Project Description
Major Maintenance (NHS)	US-1 from Belvedere Rd to Lakeview Ave	Resurfacing
	A1A from N of Ibis Way to S of Southern Blvd	Resurfacing
	S Dixie Highway E from RCA Blvd to N of Donald Ross Road	Resurfacing
	Congress Ave Over PBC Lat 2 Canal (934251)	Bridge Rehabilitation
	Bridge from 6th Ave S to Lake Worth Rd	Bridge Replacement

Through the annual competitive grant program administered by the TPA, scoring criteria are in place to address infrastructure deficiencies including infrastructure in poor or unacceptable conditions that is approaching the end of its service life. In addition to infrastructure condition for pavement and bridges, scoring is also in place to address the provision of non-motorized facilities on bridges as well as interchanges, and railroad crossings. In summary, all the performance measure targets set for PM 2 for pavement and bridge condition have been met or exceeded.

System Performance - Performance Measures (PM3)

Travel time reliability provides a way to measure the unexpected congestion drivers experience over normal travel flow during specific parts of the day. On May 18, 2018, FDOT established statewide performance targets for the system performance measures that assess the performance of the Interstate and National Highway System (NHS) and freight movement on the Interstate System. On September 19, 2019, the Palm Beach TPA adopted FDOT’s statewide system performance targets for truck travel time reliability and set TPA local targets for reliability on the Interstate and the non-Interstate NHS. The table below presents the statewide and TPA targets.

Statewide System Performance and Freight Targets and Current Conditions

Performance Measure	2-year Statewide Target (2019)	4-year Statewide Target (2021)	Current Statewide Conditions	2-year Palm Beach TPA Target (2019)	4-year Palm Beach TPA Target (2022)	Palm Beach TPA Conditions (2021)
Percent of person-miles on the Interstate system that are reliable (Interstate LOTTR)	75%	70%	82%	85%	85%	83%
Percent of person-miles on the non-Interstate NHS that are reliable (Non-Interstate NHS LOTTR)	Not Required*	50%	84%	93%	93%	97%
Truck travel time reliability (TTTR)	1.75	2.00	1.43	1.75	1.75	1.78

* Beginning with the second performance period covering January 1, 2022 to December 31, 2025, two year targets will be required in addition to four-year targets for the percent of person-miles on the non-Interstate NHS that are reliable measure.

LOTTR Measures (Level of Travel Time Reliability)

The LOTTR performance measures assesses the percent of person-miles traveled on the Interstate or the non-Interstate NHS that are reliable. LOTTR is defined as the ratio of longer travel times (80th percentile) to a normal travel time (50th percentile) of all applicable roads, across four time periods between the hours of 6 a.m. and 8 p.m. each day. The measure is expressed as the percent of person-miles traveled on the Interstate or Non-Interstate NHS system that are reliable. Person-miles assumes a people per vehicle estimate.

TTTR Measure (Truck Travel Time Reliability)

The TTTR performance measure assesses the reliability index for trucks traveling on the interstate. A TTTR ratio divides the 95th percentile truck travel time by a normal travel time (50th percentile) for each segment of the Interstate system over specific time periods throughout weekdays and weekends. This is averaged across the length of all Interstate segments in the state or metropolitan planning organization (MPO) planning area to determine the TTTR index.

The Palm Beach TPA's TIP reflects the investment priorities established in the Palm Beach LRTP 2045 and are consistent with the FDOT's Five Year Work Program. The focus of the TPA's investments that address system performance and freight include a wide range of projects. A brief list of projects is listed below, and a complete list is provided in the sections that follow.

TIP Section	System Performance Type	Project Location	Project Description
State Road Modifications	Corridor Improvement	Atlantic Ave from SR-7 to E of Lyons Rd	Widen from 2 to 4 lanes
	Transit – Mode Shift	Tri Rail: West Palm Beach to Jupiter	Extend commuter rail service onto the FEC corridor via the Northwood Crossover and construct 5 new stations.
	Corridor Improvement	Atlantic Ave from W of Lyons Rd to Jog Rd	Widen from 4 to 6 lanes, including buffered bike lanes and 6-ft sidewalks
	Transit – ITS	Okeechobee Blvd from SR 7 to US-1; SR-7 from Forest Hill Blvd to Okeechobee Blvd	Implement Transit Signal Prioritization for entire corridor
	Transit – ITS	US-1 from Northlake Blvd to Palmetto Park Rd	Implement Transit Signal Prioritization
SIS Capacity	Corridor Improvement	Beeline Hwy from Northlake Blvd to Blue Heron Blvd	Widen from 4 to 6 lanes
Other FDOT & Local Projects	Corridor Improvement	Congress Ave from Northlake Blvd to Alt A1A	Construct new 2 and 3 lane roadway

The projects included in the TIP are consistent with FDOT's Five Year Work Program, and therefore to FDOT's approach to prioritize funding to address performance goals and targets. Given the significant resources devoted in the TIP to programs that address system performance and freight, the TPA anticipates that once implemented, the TIP will contribute to progress towards achieving the statewide reliability performance targets.

Transit Asset Management (TAM)

On July 26, 2016, FTA published the final Transit Asset Management rule. This rule applies to all recipients and subrecipients of Federal transit funding that own, operate, or manage public transportation capital assets. The rule defines the term "state of good repair," requires that public transportation providers develop and implement transit asset management (TAM) plans and establishes state of good repair standards and performance measures for four asset categories: equipment, rolling stock, transit infrastructure, and facilities. The rule became effective on October 1, 2018. The table below identifies performance measures outlined in the final rule for Transit Asset Management (TAM).

FTA TAM Performance Measures

Asset Category	Performance Measure
Equipment	Percentage of non-revenue, support-service and maintenance vehicles that have met or exceeded their Useful Life Benchmark
Rolling Stock	Percentage of revenue vehicles within a particular asset class that have either 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 condition 3 on the TERM scale

Within the TPA planning area, there are two Tier 1 providers, Palm Tran operated by Palm Beach County and Tri-Rail operated by the South Florida Transportation Authority. Tier 1 providers, defined by the TAM Rule, are those that operate rail service or more than 100 vehicles in all fixed route modes, or more than 100 vehicles or more in one non-fixed route mode.

Useful Life Benchmark (ULB)

For equipment and rolling stock classes, useful life benchmark (ULB) is defined as the expected lifecycle of a capital asset, or the acceptable period of use in service, for a particular transit provider's operating environment. ULB considers a provider's unique operating environment such as geography, service frequency, etc. and is not the same as an asset's useful life.

On September 19, 2019, the Palm Beach TPA incorporated transit asset targets that reflect the targets established by Palm Tran and SFRTA through their TAM Plans. The targets for the TPA planning area are shown in the table that follows. The Palm Beach TPA TIP is developed and managed in coordination with Palm Tran and SFRTA and reflects investment priorities established in the 2045 LRTP.

Palm Tran and the South Florida Regional Transportation Authority (SFRTA) established transit asset targets as part of their Transit Asset Management (TAM) Plans in September 2018. The transit asset management targets are based on the condition of existing transit assets and planned investments in equipment, infrastructure, rolling stock, and facilities. The targets reflect the most recent data available on the number, age, and condition of transit assets, and capital investment plans for improving these assets. The tables below summarize the asset conditions and targets by asset class for each transit provider.

Transit Asset Management Performance Measures Targets

Percentage of assets that meet or exceeds useful life for	2021 Condition	2022 Target
Palm Tran		
Vehicles - Articulated Bus	0%	≤ 10%
Vehicles - Fixed Route Bus	17.6%	≤ 10%
Vehicles - Paratransit Bus	9.2%	≤ 10%
Vehicles - Paratransit Van	0%	≤ 0%
Equipment - Automobiles	34.6%	≤ 20%
Equipment - Trucks	27.9%	≤ 20%
Facilities	0%	≤ 0%
South Florida Regional Transportation Authority		
Rolling stock - locomotives, coach cars, self-propelled cars (>39 yrs old)	26%	≤ 25%
Rolling Stock - cutaway buses (>10 yrs old)	27%	≤ 25%
Equipment - Support & Maintenance Vehicles (>8 yrs old)	50%	≤ 56%
Equipment - Other vehicles (<2.5 on 1-5 scale)	50%	≤ 56%
Passenger Terminals (<2.5 on 1-5 scale)	5%	≤5%
Maintenance Facilities (<2.5 on 1-5 scale)	5%	≤5%
Administrative Offices (<2.5 on 1-5 scale)	5%	≤5%
Rail fixed-guideway track with performance restrictions	2.1%	≤3.5%

Transit asset condition and state of good repair is a consideration in the methodology the Palm Beach TPA and the transit agencies use to select projects for inclusion in the TIP. The Palm Beach TPA's TIP, once implemented, will make progress toward achieving these targets. The Transit – Operations and Maintenance section of the TIP provides the full list of capital and operating expenses to maintain the Palm Tran system. Below is a short list of transit projects directly prioritized and funded by the TIP to improve Transit assets.

TIP Section	Transit Agency	Project Location	Project Description
State Road Modifications	SFRTA	Tri-Rail Northern Layover Maintenance Facility	Maintenance facility north of Mangonia Park Tri-Rail Station
Local Initiatives	Palm Tran	Countywide	Construct and Replace Transit Shelters
		Electric Bus Transition Initiative	Purchase 3 Electric Transit Buses and Charging Stations
Operation & Maintenance - Transit	Palm Tran	Countywide (phased implementation)	Fixed Route Bus Replacement

Transit Safety Performance

The Federal Transit Administration (FTA) established transit safety performance management requirements in the Public Transportation Agency Safety Plan (PTASP) final rule published on July 19, 2018. The rule requires public transit agencies that receive federal funding under 49 U.S.C. Chapter 53 to develop and implement a PTASP. The PTASP must include the following performance measures with associated targets:

- Total number of reportable fatalities and rate per total vehicle revenue miles (VRM) by mode.
- Total number of reportable injuries and rate per total vehicle revenue miles (VRM) by mode.
- Total number of reportable safety events and rate per total vehicle revenue miles (VRM) by mode.
- System reliability – mean distance between major mechanical failures by mode.

Palm Tran adopted safety targets in their 2021 Public Transportation Agency Safety Plan. The Palm Beach TPA formally adopted Palm Tran’s targets on February 18, 2022. Although Palm Tran is required to set targets annually, the TPA’s re-adoption of targets is not required until an update of the next Long Range Transportation Plan (LRTP). Instead, the TPA is required to include Palm Tran’s annually adopted targets into this TIP. Palm Tran’s reported values for 2021 and new 2022 targets are indicated below.

Transit Safety Performance Measures and Targets

Performance Measure	Reported 2021	2022 Target
Palm Tran		
Fixed Route Bus		
Number of Fatalities	1	0
Fatality Rate per 100k VRM	0	0
Number of Injuries	34	63
Injury Rate per 100k VRM	0.5	0.9
Number of Safety Events	23	43
Safety Event Rate per 100k VRM	0.3	0.6
Mean distance between mechanical failures (miles)	12,719	14,000
Paratransit (Palm Tran Connection)		
Number of Fatalities	0	0
Fatality Rate per 100k VRM	0	0
Number of Injuries	17	34
Injury Rate per 100k VRM	0.2	0.4
Number of Safety Events	25	32
Safety Event Rate per 100k VRM	0.3	0.3
Mean distance between mechanical failures (miles)	15,581	7,700