Florida Department of Transportation

Transportation Asset Management Plan

June 28, 2019

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FDOT

Florida Department of Transportation

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KEVIN J. THIBAULT, P.E.
SECRETARY

June 28, 2019

The Honorable Elaine L. Chao
Secretary
U.S. Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590

Dear Secretary Chao,

I approve this Transportation Asset Management Plan (TAMP), which outlines our processes used to improve or preserve the condition and performance of the National Highway System (NHS) pavement and bridge assets. The plan demonstrates the linkages between maintenance and planning and programming efforts, includes financial planning and investment strategies to support progress toward achievement of the State targets for asset condition and performance, and identifies potential risks that our agency faces related to pavement and bridge condition and how we mitigate those risks. The plan also discusses life-cycle planning for our pavement and bridge assets.

Florida has a well-established history of maintaining and preserving our highways and bridges in a state of good repair. Florida consistently ranks at or near the top in state rankings for infrastructure condition. In 2018, ninety-one percent of the pavements on the State Highway System (SHS), which contains the majority of the NHS, were in Good or Excellent condition. Less than one percent of the State's total bridges had posted weight restrictions.

The Department remains committed to providing a transportation system that meets customer expectations for safe and reliable travel and to support the state's quality of life and economic competitiveness. Our emphasis on preservation and maintenance is a major part of that commitment. The statutory guidance to maintain pavement and bridge condition, along with the use of analytical tools and formal policies, allows the state to support investment decisions and continue to meet targets for performance and infrastructure condition.

Sincerely,

Kevin J. Thibault, P.E.
Secretary

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Consistency Determination Checklist

Required Elements	Indicators the TAMP Meets Element Requirements in 23 U.S.C. 119(e) and 23 CFR Part 515	Requirement Met (Yes/No)	Location: Chapter/Page number
TAMP approved by head of State DOT (23 CFR 515.9(k)	Does the TAMP bear the signature of the head of the State DOT?	Yes	After cover page.
State DOT has developed its TAMP using certified processes (23 CFR 515.13(b))	Do the process descriptions align with the FHWA-certified processes for the State DOT? [If the process descriptions do not align with the FHWA-certified processes, the State DOT must request recertification of the new processes as amendments unless the changes are minor technical corrections or revisions with no foreseeable material impact on the accuracy and validity of the processes, analyses, or investment strategies. State DOTs must request recertification of TAMP development processes at least 30 days prior to the deadline for the next FHWA TAMP consistency determination as provided in 23 CFR 515.13(c).]	Yes	Chapter 5: Financial Plan and Investment Strategies Pg. 5-4 Chapter 6: Performance Gap Analysis Pg. 6-1 Data from other NHS Owners Pg. 6-3 Chapter 7: Risk Management Pg. 7-1 Chapter 8: Life-Cycle Planning Pg. 8-1
	Do the TAMP analyses appear to have been prepared using the certified processes?	Yes	See above.
TAMP includes the required content as described in 23 CFR 515.9(a)-(g) (23 CFR 515.13(b))	Does the TAMP include a summary listing of NHS pavement and bridge assets, regardless of ownership?	Yes	Chapter 4 Pg. 4-1, 4-6
	Does the TAMP include a discussion of State DOT asset management objectives that meets requirements?	Yes	Chapter 2 Pg. 2-1
	Does the TAMP include a discussion of State DOT measures and targets for asset condition, including those established pursuant to 23 U.S.C. 150, for NHS pavements and bridges, that meets requirements?	Yes	Chapter 3 Pg. 3-1 thru 3-5

Required Elements	Indicators the TAMP Meets Element Requirements in 23 U.S.C. 119(e) and 23 CFR Part 515	Requirement Met (Yes/No)	Location: Chapter/Page number
TAMP includes the required content as described in 23 CFR 515.9(a)-(g) (23 CFR 515.13(b)) (continued)	Does the TAMP include a summary description of the condition of NHS pavements and bridges, regardless of ownership, that meets requirements?	Yes	Chapter 4 Pg. 4-4, 4-8
	Does the TAMP identify and discuss performance gaps?	Yes	Chapter 6 Pg. 6-1 to 6-3
	Does the TAMP include a discussion of the life-cycle planning that meets requirements, including results?	Yes	Chapter 8 Pg. 8-5, 8-11 Chapter 5 Pg. 5-5
	Does the TAMP include a discussion of the risk management analysis that meets requirements?	Yes	Chapter 7 Pg. 7-8 thru 7-19
	Does the TAMP include the results of the evaluations of NHS pavements and bridges pursuant to 23 CFR part 667?	Yes	Chapter 7 Pg. 7-20 to 7-21
	Does the TAMP include a discussion of a 10-year Financial Plan to fund improvements to NHS pavements and bridges?	Yes	Chapter 5 Pg. 5-5
	Does the TAMP identify and discuss investment strategies the State intends to use for their NHS pavements and bridges?	Yes	Chapter 5 Pg. 5-10 to 5-13
	Does the TAMP include a discussion as to how the investment strategies make or support progress toward achieving and sustaining a desired state of good repair over the life cycle of the assets?	Yes	Chapter 5 Pg. 5-10 to 5-13
	Does the TAMP include a discussion as to how the investment strategies make or support progress toward improving or preserving the condition of the assets and the performance of the NHS related to physical assets?	Yes	Chapter 5 Pg. 5-10 to 5-13

Required Elements	Indicators the TAMP Meets Element Requirements in 23 U.S.C. 119(e) and 23 CFR Part 515	Requirement Met (Yes/No)	Location: Chapter/Page number
TAMP includes the required content as described in 23 CFR 515.9(a)-(g) (23 CFR 515.13(b)) (continued)	Does the TAMP include a discussion as to how the investment strategies make or support progress toward achieving the State's targets for asset condition and performance of the NHS in accordance with 23 USC 150(d)?	Yes	Chapter 5 Pg. 5-10 to 5-13
	Does the TAMP include a discussion as to how the investment strategies make or support progress toward achieving the national goals identified in 23 USC 150(b)?	Yes	Chapter 5 Pg. 5-14 thru 5-15
	Does the TAMP include a discussion as to how the TAMP's life-cycle planning, performance gap analysis, and risk analysis support the State DOT's TAMP investment strategies?	Yes	Chapter 5 Pg. 5-13 to 5-14

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Chapter 1 Introduction

The Florida Department of Transportation (Department) has a long history of leadership in the field of transportation asset management. Many national surveys consistently rate Florida as having the nation's best pavements and bridges. This focus, and a legislative mandate to maintain consistently high ratings for pavements and bridges, sets a standard for all the Department's transportation asset management practices.

The Department's asset management practices are mission-driven and are incorporated in the agency's goals, operating policies, plans, and procedures. This business practice allows the Department to bring together a variety of disciplines and stakeholders (internal and external), to achieve a common understanding and commitment to maintain or improve performance. It also demonstrates the Department's commitment to sustainable asset stewardship, effective use of resources, and justifications for funding.

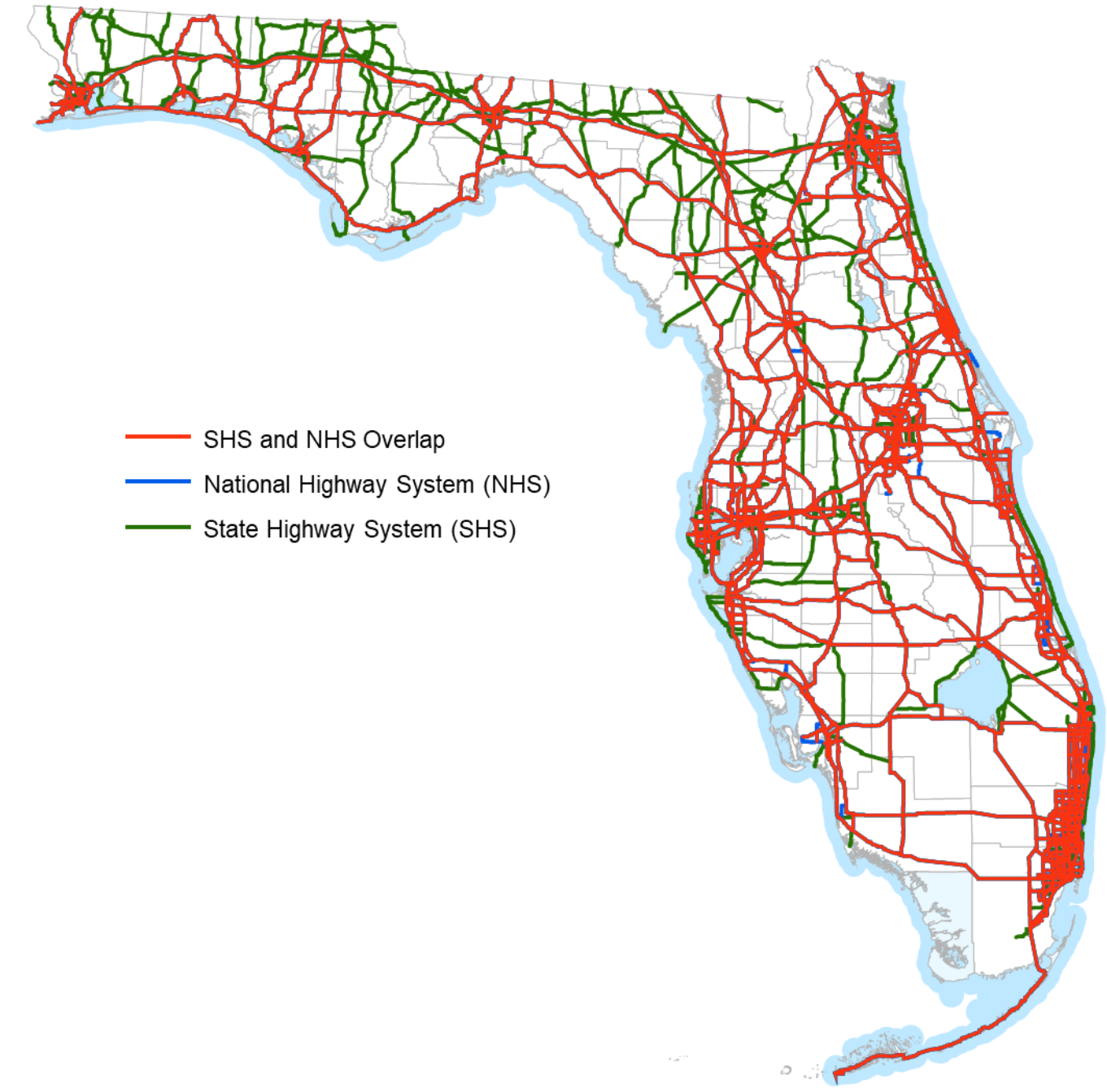
In December 2015, Congress enacted legislation titled Fixing America's Surface Transportation Act or FAST Act. This law requires that each State transportation agency develop a risk-based Transportation Asset Management Plan (TAMP) for all pavements and bridges on the National Highway System (NHS).

The Department's continuous record of high performing pavements and bridges on the State Highway System (SHS), which includes the majority of the NHS (see Figure 1) affirms the strength of the agency's long-standing, existing asset management approach. This TAMP describes those processes and clarifies how they meet the FAST Act.

The Department's iterative, system-wide approach to programming and prioritizing pavement and bridges, addresses risk, prevents gaps, and is built on strong financial planning and investment strategies to ensure the right needs are addressed at the right time.

Therefore, the Department will continue to use its long-standing, existing asset management approach to manage the SHS and establish performance targets for the Federal Highway Administration (FHWA) performance measures for NHS pavements and bridges. The Department will coordinate on performance, to the extent practicable, with other NHS owners. However, local agencies will continue to manage the portions of the NHS that are not on the SHS.

Figure 1: State and National Highway Systems



Source: FDOT, Transportation Data & Analytics Office (As of May 2019)

To help facilitate the understanding of the Department's asset management program and practices, the TAMP has been organized in the following chapters:

Chapter 2- Asset Management Planning and Programming

Chapter 3- Performance Measures and Targets

Chapter 4- Asset Inventory and Conditions

Chapter 5- Financial Plan and Investment Strategies

Chapter 6- Performance Gap Analysis

Chapter 7- Risk Management

Chapter 8- Life-Cycle Planning

Chapter 9- Implementation

Chapter 2 Asset Management Planning and Programming

The Department considers asset management a central tenet of its long-range planning process and has a well-established philosophy, supported by statutes, to preserve its assets before adding capacity to the transportation system. This approach sets the framework for all capacity enhancements and service additions to the transportation network. As such, this philosophy serves as a solid foundation to meet and build upon federally required asset management focused practices.

Currently, there is no central group within the Department that manages all assets, but there are several groups throughout the organization dedicated to managing their respective assets by collecting quality data on asset condition, applying best-practice analytical models for use in predicting condition trends given different budget scenarios, and prioritizing capital projects on state-owned assets as well as those owned by others.

The principal objectives of the Department's TAMP are:

- Ensure the safety and security of transportation customers;
- Minimize damage to infrastructure from vehicles;
- Achieve and maintain a state of good repair for transportation assets; and
- Reduce the vulnerability and increase the resilience of critical infrastructure to the impacts of extreme weather and events.

These objectives are the foundation for performance measures related to asset management.

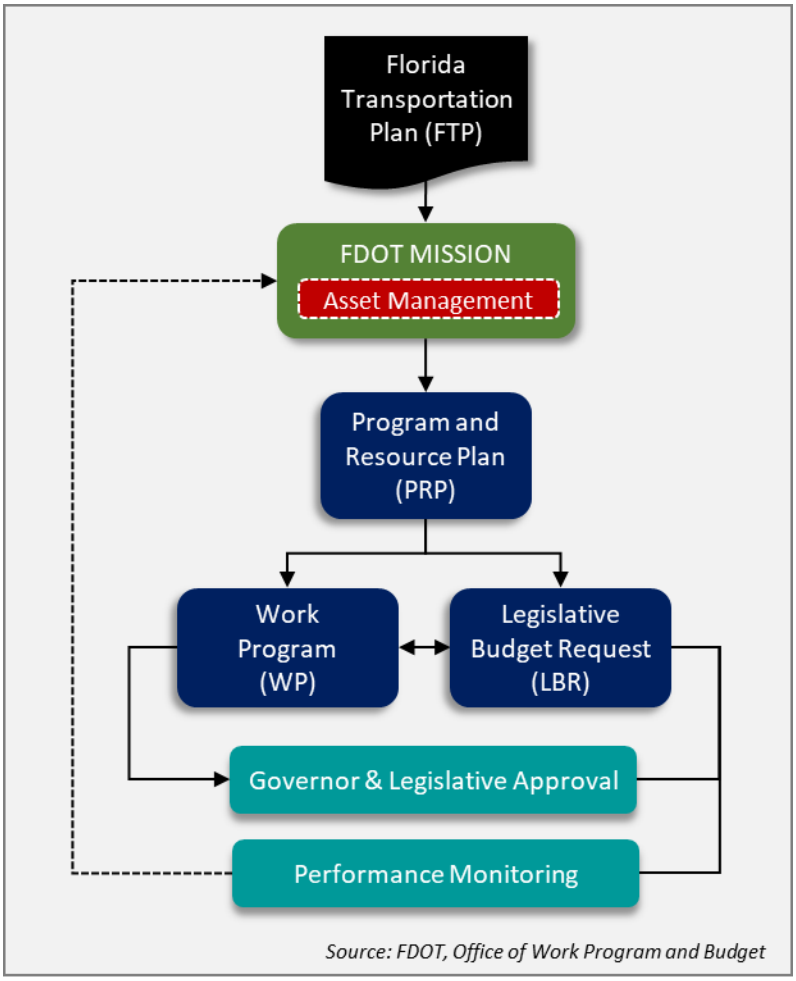
2.1 Relationship to Other Business Plans and Policies

Much of the Department's asset management story is told throughout existing policy statements and plans. These existing policy statements and plans guide the Department in its efforts to most effectively manage its transportation assets. The TAMP describes the interrelationship of these existing policy statements and plans. Figure 2 provides a graphical representation.

The **Florida Transportation Plan (FTP)** is the single overarching statewide plan that guides Florida's transportation future. It is a plan for all of Florida; providing policy direction to the Department and all organizations that are involved in planning, implementing and managing Florida's transportation system, including statewide, regional, and local partners.

The core component of the FTP is the Policy Element, which defines the goals, objectives, and strategies for Florida's transportation future over the next 25 years. It provides guidance to state, regional, and local transportation partners in making transportation decisions. The Policy Element also establishes the framework for expenditure of state and federal transportation funds flowing through the Department's Work Program.

Figure 2: FDOT Asset Management Process



Several of the goals in the Policy Element focus on the performance of Florida's Transportation System. These include:

- **Safety and security for residents, visitors and businesses.** This is one of Florida's longstanding priorities; to ensure the safety and security of transportation customers. This goal also addresses how transportation can support broader needs. For example, response to and recovery from extreme weather events.

- **Agile, resilient and quality infrastructure.** This goal not only addresses pavement and bridges, but the conditions for all modes and emphasizes responsiveness to changing technologies and market trends, resiliency to risks and customer service and other quality measures.

- **Efficient and reliable mobility for people and freight.** This goal shifts from a focus on reducing travel time and delay to making the entire transportation system more efficient and reliable, including all modes as well as supporting regulatory processes.

The goals and objectives of the FTP not only set the stage for performance reporting but also provide statewide policy guidance for accomplishing the Department's mission to protect the State's transportation infrastructure investment.

The **FDOT Mission** is to provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity and preserves the quality of our environment and communities. The FDOT Mission is informed by the goals and objectives of the FTP, is supported by statutes and is the beginning of the Department's transportation asset management approach.

The **Program and Resource Plan (PRP)** provides the link between the FTP, the FDOT Mission, and the Department's numerous programs (as reflected in the project specific Work Program) and the Department's Legislative Budget Request (LBR). It contains the specific long-range goals and objectives from the FTP, as well as selected operating policies and performance measures, which guide the development of each program in the Department.

The Department produces a PRP, which consists of a complete 10-year projected budget for all major agency functions and programs. The PRP is a summary document that contains the approved program alternatives and funding levels by fiscal year to accomplish program goals and objectives within expected revenue. The PRP combines the Department's operating budget, fixed capital outlay buildings and grounds budget, debt service budget and Work Program details into a summary document.

The document reports the Department's planned budget in several different ways including by product area, product support, operations and maintenance, administration, etc. It also provides summary information by funding source. The PRP serves as a link between the FTP, a planning document, and the Adopted and Tentative Work Programs, documents listing all Department projects and expected spending out to a five-year horizon. The PRP establishes the programming framework by which the Work Program is developed.

The **Work Program (WP)** is a five-year plan that provides details on when and where specific projects and services will be provided and how these projects and services will be funded using available revenue.

The **Legislative Budget Request (LBR)** is the Department's request to the Governor and Legislature for spending authority to do the work of the agency for the next fiscal year.

Performance Monitoring is conducted using measures to show progress towards the attainment of the Department's goals and objectives.

Chapter 3 Performance Measures and Targets

Florida has a long-established and highly effective approach to preservation and maintenance of its pavement and bridge assets. The current practices for asset management are rooted in the Department's strong adherence to performance targets and an organizational philosophy, supported by legislative mandate, to maintain the existing infrastructure before pursuing capacity projects.

The Department is mandated by statute, s. 334.046, to preserve the state's transportation infrastructure to specific standards. The standards for pavements, bridges and maintenance were derived over time, from the Department's use of output measures and engineering input, to evaluate the performance of the transportation system, long before outcome based measures were required. For the purposes of this TAMP, the Department defines the State of Good Repair (SOGR) to be the Department's performance measures and targets for pavements and bridges on the SHS.

The Department utilizes strong management tools for pavements and bridges, coupled with a thorough reporting and review process to ensure systemwide performance meets target levels.

3.1 Pavement Assets

For the Department's performance measurement reporting for the SHS, the performance measure and target for pavements on the SHS is:

- Ensure at least 80 percent of the pavement on the SHS meets the Department standard.

Pavement meeting Department standards is defined as pavement for which each of the three rating factors (ride quality, crack severity and rutting) are scored 6.5 or above on a ten-point scale. Figure 3 shows the Department's criteria for assessing pavement condition compared to the criteria used by FHWA.

Figure 3: FDOT and FHWA Pavement Condition Rating Criteria

	Non-Deficient	Deficient
Ride Rating	**≥ 6.5 (IRI ≤125 in/mile)**	**< 6.5 (IRI > 125)**
Crack Rating	**≥ 6.5**	**< 6.5**
Rut Rating	**≥ 6.5 (Rut < 3/8 in)**	**< 6.5 (Rut > 3/8 in)**

FDOT

Note: Pavement ratings are averaged along the entire segment which varies in length. The segment is considered Deficient if any one of the three ratings are deficient. Crack rating is a combination of lengths and severities and is not comparable to the FHWA Cracking Percent.

	Good	Fair	Poor
IRI (in/mile)	< 95	95 - 170	> 170
Cracking Percent	< 5	5 - 15 (JPCP) 5 - 20 (Asphalt)	> 15 (JPCP) > 20 (Asphalt)
Rutting (in)	< 0.2	0.2 - 0.4	> 0.4

FHWA

Note: Pavement metrics are measured in 0.1-mile intervals. All three metrics must be rated Good for the 0.1-mile segment to be considered Good. Two of the three metrics must be rated as Poor for the interval to be considered Poor.

For the FHWA performance measurement reporting for pavements on the entire NHS, the Department will ensure:

- Percentage of Interstate pavements in Good condition: ≥ 60.0 percent
- Percentage of Interstate pavements in Poor condition: ≤ 5.0 percent
- Percentage of non-Interstate NHS pavements in Good condition: ≥ 40.0 percent
- Percentage of non-Interstate NHS pavements in Poor condition: ≤ 5.0 percent

Per the FHWA Rule (23 CFR 490.315), the minimum condition for Interstate pavements is that no more than 5 percent should be in Poor condition. There are no minimum condition requirements for the non-Interstate NHS pavements.

The table below shows the FDOT and FHWA performance measures and targets for pavements.

Table 1: Pavement Targets

FDOT Performance Measures	FDOT Target	FHWA Performance Measures	2-Year Target	4-Year Target
% of lane miles on SHS with pavement condition rating of either Excellent or Good.	80%	% of Interstate pavements in Good condition	-	≥ 60.0%
		% of Interstate pavements in Poor condition	-	≤ 5.0%
		% of non-Interstate NHS pavements in Good condition	≥ 40.0%	≥ 40.0%
		% of non-Interstate NHS pavements in Poor condition	≤ 5.0%	≤ 5.0%

Source: FDOT, State Materials Office.

The targets for FHWA pavement condition performance measures were established after review and analysis of the last three years of the Department's Interstate and non-Interstate NHS pavement condition survey data.

In the analyses of the pavement data, the federal regulation utilizes methodologies to measure rut depth and cracking that represent a significant departure from those currently used by the Department. Further, the FHWA pavement metrics are summarized in 0.1-mile intervals. All three metrics (IRI, cracking percent and rutting/faulting) must be rated Good for the 0.1-mile segment to be considered Good. To be rated as Poor, two of the three metrics must be rated Poor.

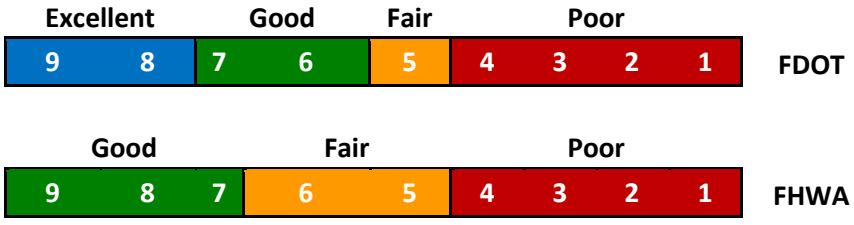
In contrast, the Department performs a visual estimate of the extent of cracking and measures rutting using three points along the roadway width (i.e., both wheel paths and the center of the roadway). In addition, these pavement measurements are averaged along the entire length of the segment which can vary in length. Pavement meeting the Department's standards is defined as pavement for which each of the three rating factors (ride quality, crack severity and rutting) are scored 6.5 or above on a ten-point scale. The segment is considered Deficient if any one of the three ratings are deficient. The Department's crack rating is a combination of lengths and severities as well as raveling and patching and is not comparable to the FHWA cracking percent which is the percentage of the area of the surface section exhibiting visible cracking attributed to fatigue cracking only.

The Department will collect the data to satisfy the federal requirements based on the required approaches and technologies in the regulations. The Department has not previously collected pavement condition data using these new methodologies. Therefore, in consideration of the differences in data collection requirements used by the Department and those mandated by the rule, as well as other unknowns and unfamiliarity associated with the new required processes, conservative 4-year targets for the Interstate and 2 and 4-year targets for the non-Interstate NHS pavement conditions were established. Once the Department has collected a sufficient amount of data using the methodologies and technologies required by the federal regulations, the Department may adjust its targets.

3.2 Bridge Assets

Florida uses the National Bridge Inventory (NBI) rating as its primary performance measure. NBI includes information on approximately 600,000 of the Nation's bridges located on public roads. It presents a state-by-state summary analysis of the number, location, and general condition of highway bridges within each state. The ratings are based upon inspection results on each of the bridge's primary elements: deck, superstructure, and substructure. Figure 4 shows the Department's criteria for assessing bridge condition and the criteria used by FHWA.

Figure 4: FDOT and FHWA National Bridge Inventory (NBI) Rating Criteria



For the Department's performance measurement reporting for bridges on the SHS, the performance measure and target using the Department's scale is:

- 90 percent of SHS bridges in "Excellent" or "Good" condition measured by number of bridges.

For FHWA performance measurement reporting for bridges on the entire NHS, the Department will ensure:

- Percentage of NHS bridges in Good condition measured by deck area: ≥ 50.0 percent
- Percentage of NHS bridges in Poor condition measured by deck area: ≤ 10.0 percent

Per the FHWA Rule (23 CFR 490.411), the minimum condition level for bridges is that only 10 percent or less of the total deck area of NHS bridges be classified as Structurally Deficient; in Poor condition.

The table below shows the FDOT and FHWA performance measures and targets for bridges.

Table 2: Bridge Targets

FDOT Performance Measures	FDOT Target	FHWA Performance Measures	2-Year Target	4-Year Target
% of bridges on SHS with condition rating of either Excellent or Good by number of bridges	90%	% of NHS bridges classified as in Good condition by deck area	≥ 50.0%	≥ 50.0%
		% of NHS bridges classified as in Poor condition by deck area	≤ 10.0%	≤ 10.0%

Source: FDOT, Office of Maintenance.

The targets for FHWA NHS bridge condition performance measures were established after review and analysis of the last five years of the Department's bridge data collected through the annual bridge inventory process.

The federal regulation criteria consider bridges to be in Good condition if the NBI rating is 7, 8, or 9 and to be in Poor condition if the NBI rating is 4 or less. The percentage of bridges in Good and Poor condition will be reported to FHWA as a percentage of deck area for all bridges on the NHS. In contrast, the Department considers bridges to be in Excellent condition if the NBI rating is 9 or 8; Good condition if the NBI rating is 6 or 7; Fair condition if the NBI rating is 5; and Poor condition if the NBI rating is 4 or less. The Department's internal process is to have no more than 10 percent of its bridges in Poor condition. The Department does not program any significant bridge work for bridges with a NBI rating of 5, 6, 7, 8 or 9, but does actively perform routine maintenance and repairs.

An evaluation of historical bridge data over the last few years show the condition of bridges on the NHS are slowly moving from Good condition to Fair condition (NBI 5 or 6 per FHWA definition), which is to be expected as the Department's bridge inventory is slowly growing older. However, the Department programs bridges for repair or replacement work to begin within 6 years of reaching deficient status (NBI 4) or becoming posted.

Recently the Department has formed a Bridge Performance Group consisting of FDOT Personnel and Industry to consider how data at the element level can be used to track bridge condition and the effectiveness of element level repairs over time. The goal is to determine when repairs are needed and which repairs are the most effective to extend the bridge service life. This will be an on-going effort to develop, monitor, and draw conclusions. It is anticipated that as data is collected, deterioration models will be refined, which should lead to long term cost savings and longer lasting bridges over time.

The Department identifies bridge maintenance needs during bridge inspections, and programs bridge maintenance and repair work to address these needs. The Department programs bridges for rehabilitation or replacement to begin within 6-years of being identified as being in Poor condition. The Department plans to continue with these internal processes, meet targets as established herein per FHWA criteria, and use the same targets for the 2 and 4-year cycle. At some point in the future, the Department may adjust its targets if the way the Department currently programs bridge work leads to consistent reporting results per FHWA criteria.

Chapter 4 Asset Inventory and Conditions

The practice of developing an inventory and condition assessment sets the stage for all other phases of asset management. Therefore, to manage transportation assets effectively, two fundamental questions need to be addressed. First, what facilities does the Department own and manage? Second, what condition are those assets in?

4.1 Pavement Assets

4.1.1 Inventory

The table below provides an inventory of the pavement assets by state (on-system) and local (off-system) ownership. The information is presented in centerline and lane miles for the SHS, NHS, Interstate and Non-Interstate NHS. Centerline miles represent the length of the road, while lane miles represent the length and lane count for a road. As previously stated, the SHS includes the majority of the NHS.

Table 3: Inventory Summary of Pavements

	SHS		NHS		Interstate		Non-Interstate NHS	
	Centerline Miles	Lane Miles	Centerline Miles	Lane Miles	Centerline Miles	Lane Miles	Centerline Miles	Lane Miles
On-System	12,103	44,424	8,208	34,474	1,495	8,495	6,713	25,979
Off-System			571	2,454			571	2,454
Total	**12,103**	**44,424**	**8,779**	**36,929**	**1,495**	**8,495**	**7,284**	**28,433**

Note: Due to rounding, totals in table may not agree.
Source: FDOT, Transportation Data & Analytics Office (As of December 2018).

For the off-system NHS, the table below shows the number of centerline and lane miles of pavement located within the Metropolitan Planning Organization (MPO). If the off-system mileage is not located within the MPO, the County is identified.

Table 4: Off-System Non-Interstate NHS Pavements

FDOT District	MPO/County	Non-Interstate NHS	
		Centerline Miles	Lane Miles
1	Charlotte County-Punta Gorda MPO	0.999	4.05
	Collier MPO	13.564	79.42
	Heartland Regional TPO	1.647	3.30
	Lee County MPO	27.144	125.79
	Polk TPO	0.636	1.42
	Sarasota/Manatee County MPO	16.439	77.48

FDOT District	MPO/County	Non-Interstate NHS	
		Centerline Miles	Lane Miles
2	Bradford County	3.766	7.53
	Columbia County	0.969	2.02
	North Florida TPO	11.847	34.02
3	Bay County TPO	2.881	5.86
	Capital Region TPA	2.779	6.73
	Florida-Alabama TPO	0.903	2.65
	Okaloosa-Walton TPO	0.488	0.98
4	Broward MPO	61.218	322.64
	Indian River County MPO	28.614	90.98
	Martin MPO	5.289	15.46
	Palm Beach TPA	73.697	422.43
	St Lucie TPO	36.790	137.69
5	MetroPlan Orlando	84.781	363.93
	Ocala/Marion County TPO	8.220	32.87
	River to Sea TPO	50.143	152.85
	Space Coast TPO	56.137	207.48
6	Miami-Dade TPO	25.993	113.22
7	Forward Pinellas	40.104	200.52
	Hernando/Citrus MPO	4.447	9.12
	Hillsborough MPO	6.531	17.07
	Pasco County MPO	4.689	17.19
	Total	**571**	**2,455**

Note: Due to rounding, totals in table may not agree.
Source: FDOT, Transportation Data & Analytics Office (As of December 2018).

The Department collects inventory and condition data for all roads functionally classified above local regardless of ownership. Internal Quality Assurance (QA) checks are performed daily by the Districts to ensure the integrity of the data. The entry of data into the Department's Roadway Characteristics Inventory (RCI) database is limited to twice a year, in June and December. This also safe guards the quality of the data for reporting purposes.

The Department reports annually on the data to FHWA through the Highway Performance Monitoring System (HPMS). The HPMS is used for assessing and reporting highway system performance under FHWA's strategic planning process. Roads that are part of the NHS also have additional data reporting requirements over the rest of the federal-aid highway system.

Therefore, depending on the update cycle, QA checks or when information is extracted from the Department's database, the data will vary over time.

4.1.2 State Highway System (SHS) Condition Based on FDOT Performance Measures

The Department conducts annual Pavement Condition Surveys (PCS) to monitor and report on the performance and condition of pavements on the SHS per Florida Statutes 334.24, 334.046 and 335.07 as well as the Federal Highway Administration (FHWA)/FDOT Federal Aid Partnership Agreement No. 700-000-005-a.

Ride Quality Rating:
The Department quantifies the pavement Ride Quality or Smoothness using the International Roughness Index (IRI). This index is derived from a pavement surface longitudinal profile as measured using vehicle-based equipment operating at highway speed. IRI is also the rating system required by FHWA in annual highway inventory summaries. It is generated using a standard algorithm (ASTM E1926) and varies from zero, indicating pavement in virtually perfect condition, to infinity. Higher scores indicate worse ride quality. Ranges of IRI are converted to a rating system with a scale from zero to ten (RR_{10}) with ten indicating a pavement in perfect condition.

Rut Rating:
The same vehicle based equipment used for Ride Quality measurements also measures rutting for flexible pavements in 1/8-inch increments of depth. Each rut depth increment deducts one point from a perfect total of 10. The overall rutting score for the road segment is equal to the average of the scores for each wheel path.

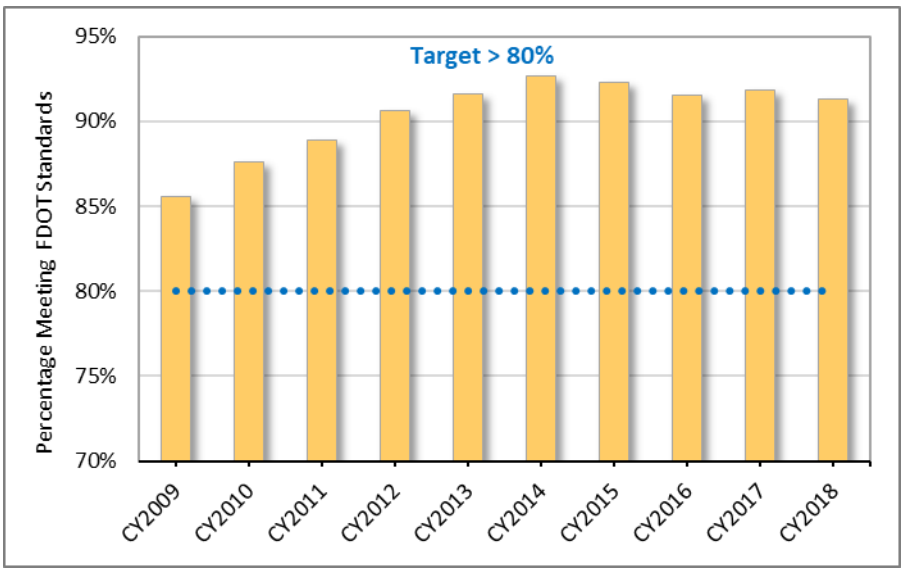
Crack and Defect Rating:
Due to the physical differences between flexible and rigid pavements, defect metrics differ. For flexible pavement, the defect is measured considering its type, severity and the extent, in percent, to which the road surface is affected by the defect.

The defect-predominate type is then used to establish a score based on its severity and extent for the areas inside and outside of wheel paths. These scores are added together and subtracted from ten to calculate the Crack Rating (CR). Higher values of CR indicate better condition.

For rigid pavement, the Department defines ten defect metrics: surface deterioration, spalling, patching, transverse cracking, longitudinal cracking, corner cracking, shattered slab, faulting, pumping, and joint quality. These metrics reflect both the natural deterioration of the concrete surface and structural components unique to concrete slabs, such as faulting (vertical displacement of joints) and joint quality. The metrics are weighted according to both standard and segment-specific priorities, and the result is deducted from 100 and divided by 10 to calculate the Crack/Defect Rating on a 10 scale.

<u>2018 Pavement Condition Survey (PCS) Results</u>
Pavement on the SHS is in Good condition. As shown in Figure 5, over 90 percent of the SHS pavements meet Department standards in calendar year (CY) 2018. Over the past ten years, performance has improved dramatically. A combination of factors, including enhanced design approaches, better selection of materials and improved construction practices as well as preventive maintenance efforts are responsible for this increase.

Figure 5: SHS Pavements Meeting FDOT Standards



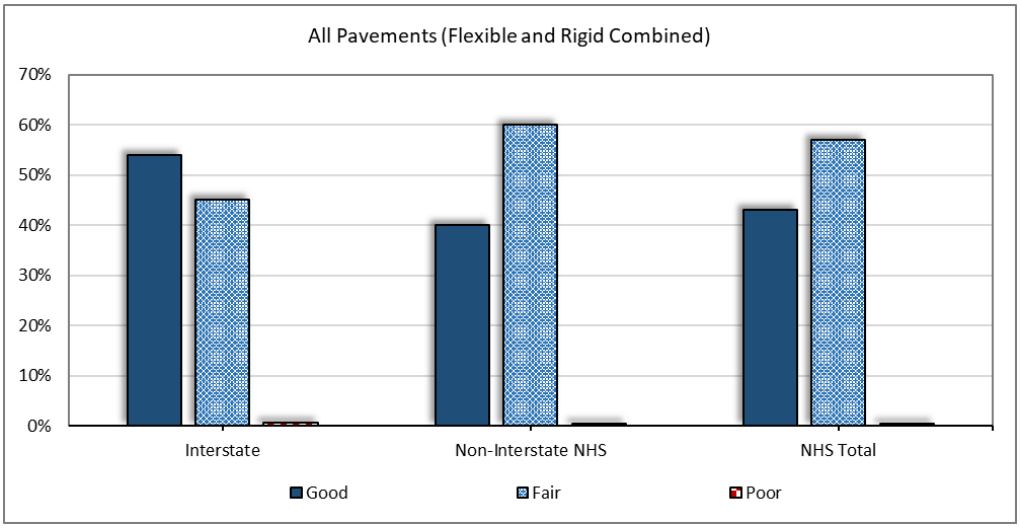
Currently, 91.3 percent of pavements on the SHS exceed FDOT standards.

Source: FDOT, State Materials Office.

4.1.3 National Highway System (NHS) Condition Based on FHWA Performance Measures

Figures 6 through 8 present the condition of the entire NHS pavements based on the FHWA performance measures. Data collected in CY2018, using the approaches and technologies mandated in the regulations, was used to generate the values. Off-system data was collected October through December 2018. Overall, the pavement on the NHS is in Good and Fair condition with relatively few lane miles in Poor condition. *Note: Approximately 5.9 percent of Interstate and 3.2 percent of Non-Interstate NHS lane miles were under construction; therefore, were not included.*

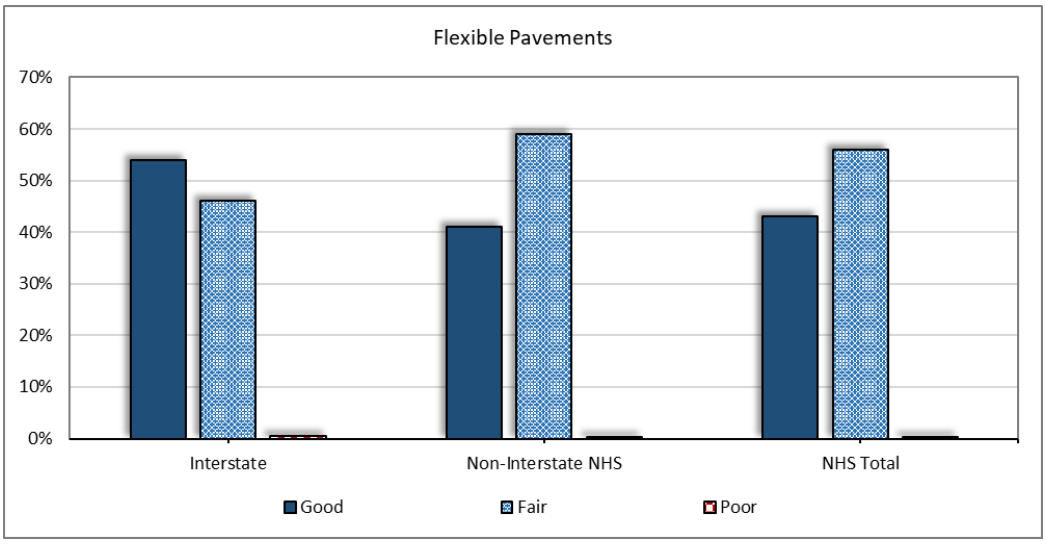
Figure 6: All Pavements (Flexible and Rigid Combined)



0.6 percent of all pavements on the Interstate are in Poor condition.

Source: FDOT, State Materials Office.

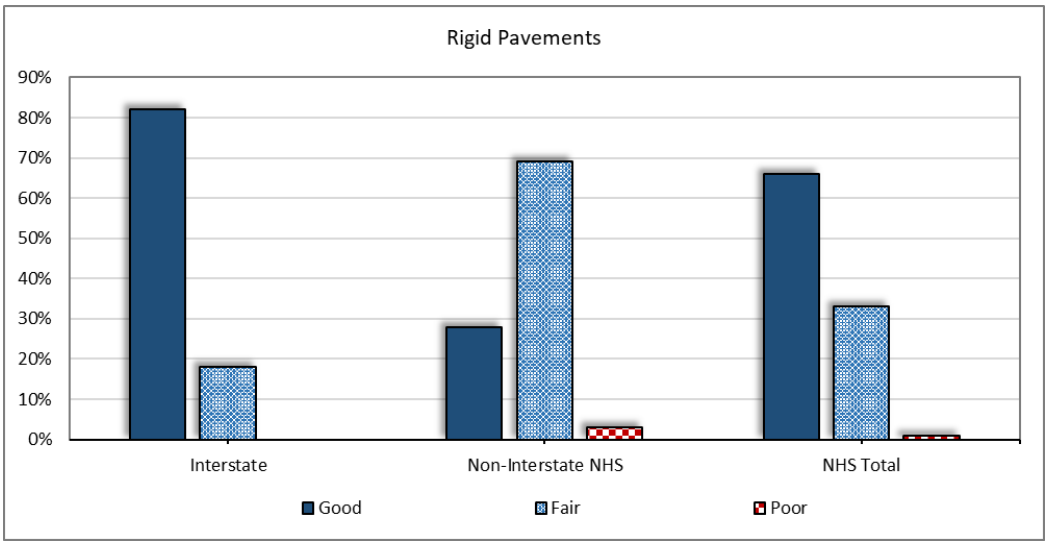
Figure 7: Flexible Pavements



0.6 percent of the flexible pavements on the Interstate are in Poor condition.

Source: FDOT, State Materials Office.

Figure 8: Rigid Pavements



None of the rigid pavements on the Interstate are in Poor condition.

Source: FDOT, State Materials Office.

4.2 Bridge Assets

4.2.1 Inventory

Bridges per federal definition have a clear opening of greater than 20 feet along the direction of the roadway between abutments, spring lines of arches, extreme ends of openings for multiple boxes, or extreme ends of openings for multiple pipes. The table below provides an inventory of the state and local bridges.

Table 5: Inventory Summary of Bridges

	Number of Bridges		Number of Bridges
State Owned Total	7,009	State Owned NHS	5,499
Locally Owned Total	5,531	Locally Owned NHS	159
Florida NBI Total	12,540	**NHS Total**	**5,658**

Source: FDOT, Office of Maintenance (As of May 2019).

For the locally owned NHS bridges, the table below shows the number of structures and corresponding deck area located within the Metropolitan Planning Organization (MPO). If the bridge is not located within the MPO, the County is identified.

Table 6: Off-System NHS Bridges

FDOT District	MPO/County	Number of NHS Bridge Structures	NHS Bridge Deck Area (Sq. Ft.)
1	Lee County MPO	5	617,436.00
	Sarasota/Manatee MPO	5	29,160.89
2	North Florida MPO	2	197,873.20
3	Capital Region TPA	2	3,709.05
	Florida-Alabama TPO	1	534.00
	Okaloosa-Walton TPO	3	29,879.60
4	Broward MPO	13	106,132.66
	Indian River County MPO	10	58,947.81
	Palm Beach County	1	4,779.00
	Palm Beach TPA	25	245,099.25
	St. Lucie TPO	10	105,621.63
5	Flagler County	2	11,268.10
	MetroPlan Orlando	21	211,957.44
	Ocala/Marion County TPO	2	10,344.00
	Orange County	4	49,450.76

FDOT District	MPO/County	Number of NHS Bridge Structures	NHS Bridge Deck Area (Sq. Ft.)
5	Osceola County	8	453,805.07
	River to Sea TPO	3	18,839.31
	Space Coast TPO	4	61,863.18
6	Miami-Dade TPO	7	694,914.05
7	Forward Pinellas	19	1,670,727.77
	Hillsborough MPO	1	35,352.80
	Total	**148**	**4,607,352**

Note: Due to rounding, totals in table may not agree.
Source: FDOT, Office of Maintenance (As of January 2019).

The Department collects inventory and condition data for the locally owned assets through the Department's bridge inspection program. Updates to the data occurs daily as a result of bridge inspections. The Districts also perform Quality Assurance (QA) reviews to ensure the integrity of the data and QAs for bridge inspection are performed yearly for each District by the Central Office.

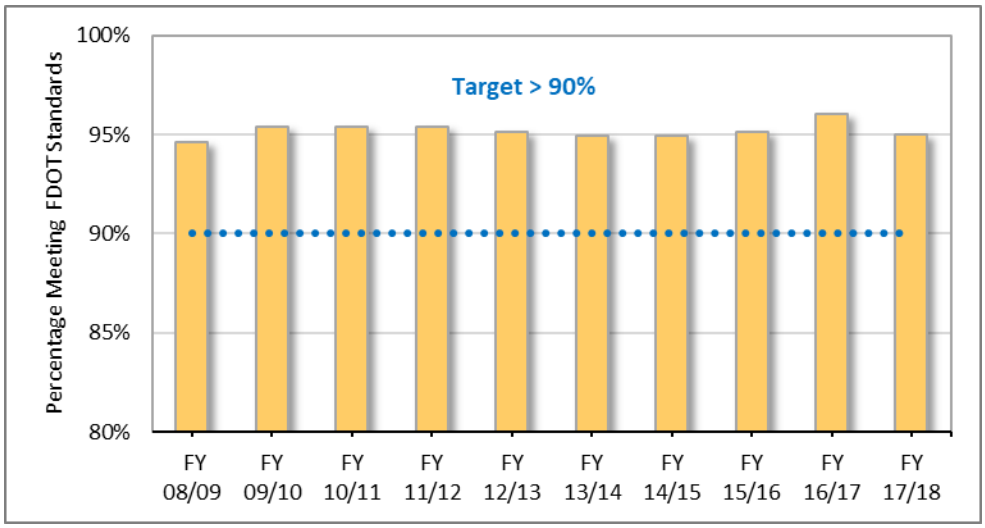
Therefore, depending on the inspection cycles and QA checks, data from the Department's bridge management system database will vary over time.

4.2.2 State Highway System (SHS) Condition Based on FDOT Performance Measures

As shown in Figure 9, for the past decade over 90 percent of the State's bridges have met the Department's performance measures and targets. This established history demonstrates the state's bridges are in a state of good repair and do not exhibit signs of structural deterioration. In fact, less than 1 percent of the state's total bridges are posted with weight restrictions.

As of FY2017/18, 95.0 percent of state maintained bridges are in Good or Excellent condition.

Figure 9: SHS Bridges Meeting FDOT Standards



Source: FDOT, Office of Maintenance 2018 Annual Bridge Inventory Report.

4.2.3 National Highway System (NHS) Condition Based on FHWA Performance Measures

Table 7 shows the percentage of NHS bridge deck area in Good and Poor condition as defined by the FHWA scale. For state owned NHS bridges, 66 percent of the total NHS deck area is in Good condition and less than 2 percent is in Poor condition. For locally owned bridges, 69 percent of the total NHS deck area is in Good condition and none are in Poor condition.

Table 7: Percentage of NHS Bridge Deck Area in Good and Poor Condition

	Deck Area (ft^2)	Good Area (ft^2)	Percentage of Area in Good Condition	Poor Area (ft^2)	Percentage of Area in Poor Condition
State Owned NHS	127,238,250	84,142,970	66.1%	1,579,416	1.2%
Locally Owned NHS	4,450,844	3,081,681	69.2%	0	0%
NHS Total	**131,689,094**	**87,224,651**	**66.2%**	**1,579,416**	**1.2%**

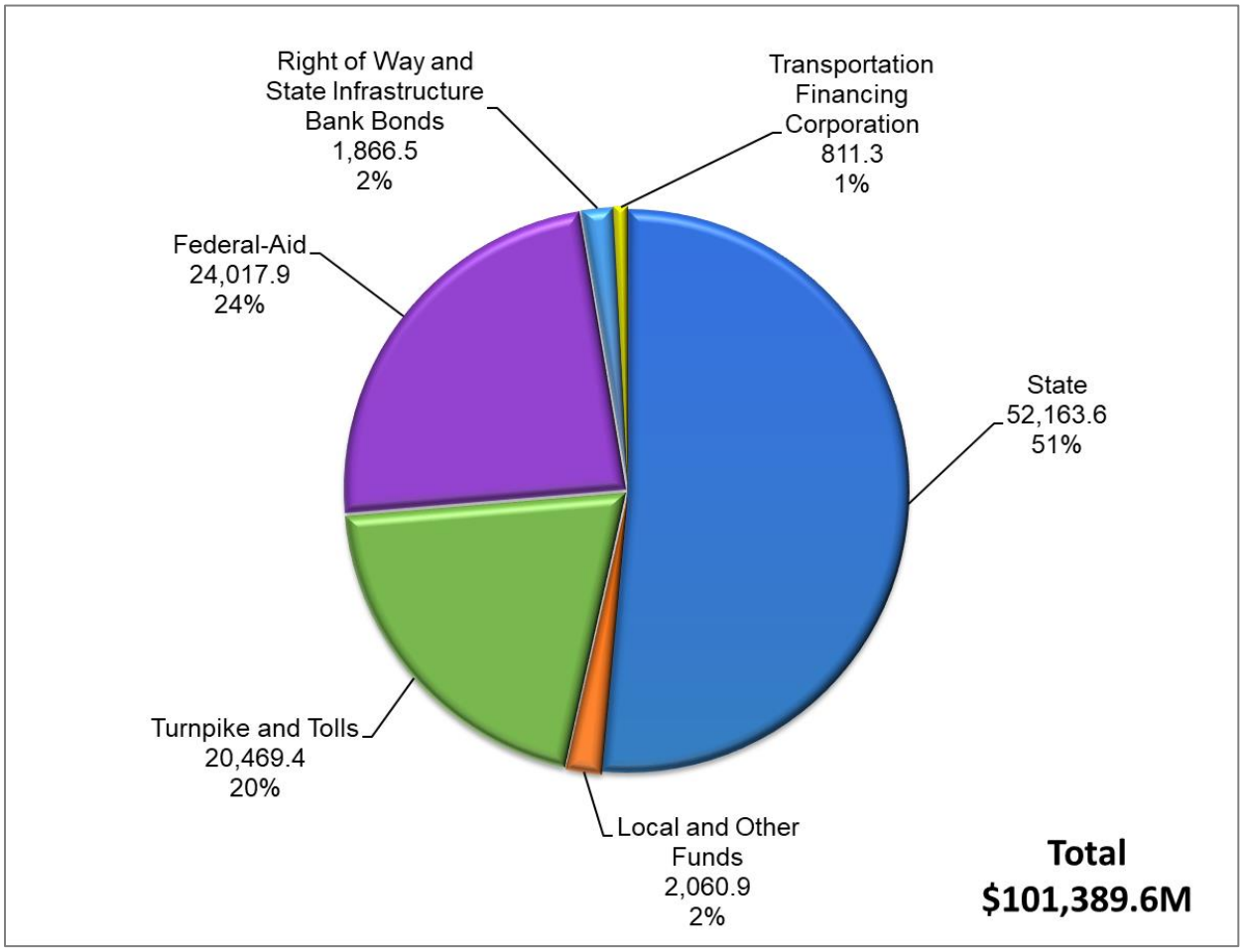
Source: FDOT, Office of Maintenance (As of May 2019).

As noted previously, depending on when information is extracted from the Department's bridge management system, the data will vary over time because it's continuously updated.

Chapter 5 Financial Plan and Investment Strategies

The largest source of funding for Florida's asset management activities is state-generated revenues. Other major sources, as shown in Figure 10, come from federal-aid, tolls, right of way bonds, state infrastructure bank, local and other, and transportation financing corporation.

Figure 10: Total Funding by Source (FY2018-2027)



Source: FDOT, Office of Work Program and Budget.

Transportation revenue receipts from fuel taxes make up over 50 percent of the revenue portfolio; state fuel taxes are indexed to offset the impacts of inflation each January. Based on movement in the Consumer Price Index (CPI), Florida's State Highway Fuel Sales Tax and the State Comprehensive Enhanced Transportation System (SCETS) Tax are adjusted annually. The other major fuel tax sources are not adjusted annually, however, and their buying power diminishes over time.

The remaining revenue portfolio is comprised of motor vehicle registration fees, tag and title fees, documentary stamp taxes, and Turnpike and other Department owned toll facilities.

5.1 Systemwide Valuation

Pursuant to the Governmental Accounting Standards Board Statement No. 34 (GASB-34)[1], Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Governments, the state has adopted an alternative process to account for its roadways, bridges and other infrastructure assets included in the SHS. Under this alternative method, the Department has made the commitment to maintain these assets at levels established by the Department and approved by the Florida Legislature.

In order to utilize this method, the state is required to:

- Maintain an asset management system that includes an up-to-date inventory of eligible infrastructure assets.
- Perform condition assessments of eligible assets and summarize the results using a measurement scale.
- Estimate each year the annual amount to maintain and preserve the assets at the condition level established and disclosed by the state.
- Document that the assets are being preserved approximately at, or above, the established condition level.

The state does expense certain maintenance and preservation costs. However, no depreciation expense is reported for these assets, nor are amounts capitalized in connection with improvements that lengthen the lives of these assets, unless the improvements also increase their service potential.

As required, the Department maintains an inventory of these assets and performs periodic condition assessments to establish that the predetermined condition level is being maintained. In addition, the Department makes annual estimates of the amounts that must be expended to maintain these assets at the predetermined condition levels.

5.1.1 State (On-System) Assets

The table below shows the value of the SHS (which contains the majority of the NHS) infrastructure assets for roadways and bridges and the turnpike.

Table 8: Value of State (On-System) Assets

	Value	Work in Progress	Right of Way	Total
Roadways & Bridges	$49,939,441,710	$2,699,656,141	$14,044,103,250	$66,683,201,101
Turnpike	$9,614,944,000	$1,790,327,000	$1,159,158,000	$12,564,429,000
				$79,247,630,101

Source: FDOT, Office of the Comptroller (As of June 30, 2018).

[1] This statement establishes new financial reporting requirements for state and local governments throughout the United States. For the first time, governments' audited financial statements contain information about the full cost of providing public services, including infrastructure.

5.1.2 Local (Off-System) Assets

For consistency and to align with the Department's methodology, the value of the off-system pavements and bridges was determined as follows.

Using the Department's value for roadways and bridges in Table 8, average cost per centerline mile was determined. Note, the Department does not segregate its roadway and bridge values, so the number derived is the total average cost per centerline mile for on-system roadways and bridges. This average cost was then applied to the total off-system (local) centerline miles in order to determine the value of the off-system roadways and bridges. The value of the off-system right of way was estimated similarly.

Calculation of Average Costs

Roadway and Bridge Costs per CLM	**=**	(FDOT R&B) ÷ CLM
where: FDOT R&B	=	value of FDOT roadways and bridges
CLM[2]	=	number of on-system centerline miles
Roadway and Bridge Costs per CLM	=	**($49,939,441,710) ÷ (12,103 CLM)**
	=	**$4,126,203.56 cost per CLM**
Right of Way Costs per CLM	=	(FDOT ROW) ÷ CLM
where: FDOT ROW	=	value of FDOT right of way
CLM	=	number of on-system centerline miles
Right of Way Costs per CLM	=	**($14,044,103,250) ÷ (12,103 CLM)**
	=	**$1,160,381.99 cost per CLM**

Table 9: Value of Local (Off-System) Assets

	Off-System Centerline Miles	Cost per Centerline Mile	Total
Roadways and Bridges	571	$4,126,203.56	$2,356,062,234
Right of Way	571	$1,160,381.99	$662,578,117
			$3,018,640,351

Sources: FDOT, Office of the Comptroller and Transportation Data & Analytics Office.

[2] The number of CLM for the SHS, as of 6/30/2018, was 12,106. This number was used by the FDOT, Office of the Comptroller to derive values for the on-system assets. It differs from Table 3, which shows 12,103 CLM as of 12/31/2018.

5.2 Investment Priorities and Direction

To preserve transportation infrastructure investments, the Department resurfaces and rehabilitates roads; inspects, repairs, and replaces bridges; and conducts routine maintenance activities such as patching, mowing, litter removal, maintenance of pavement markers and sign replacement. Regular maintenance and preservation of the transportation system keeps it operating efficiently, extends its useful life, and postpones the need for costly reconstruction or replacement.

Included in Florida Statutes are requirements which must be considered as the Department plans and develops an integrated, balanced statewide transportation system. Preservation of the existing transportation infrastructure is of the upmost importance. Section 334.046(4), Florida Statutes, specifies that preserving the state's transportation infrastructure includes:

- Ensuring that 80 percent of the pavement on the State Highway System (SHS) meets Department standards;
- Ensuring that 90 percent of Department-maintained bridges meet Department standards; and
- Ensuring that the Department achieves 100 percent of the acceptable maintenance standard on the SHS.

To adhere to the statutory guidelines, the Department prioritizes funding allocations to ensure the investments made in the current transportation system are adequately preserved and maintained before funding is allocated for capacity improvements. Thus, the Department addresses both preservation and capacity needs systematically. This approach is specified in the FTP, as well as in Florida Statutes as noted above.

Every July 1, the Secretary of the Department adopts the Five-Year Work Program. While the Department implements the projects planned for the first year of the Adopted Work Program, it also starts developing the Work Program for the next cycle, which begins with the last four years of the Work Program just adopted with a new fifth year added. The process of developing the next Five-Year Work Program involves a series of Program Planning Workshops which are held in May and June of each year.

These annual workshops provide an opportunity for the Executive Team (i.e., FDOT Secretary, Assistant and District Secretaries) to set priorities, provide direction, and make funding decisions. The primary objective of these workshops is to determine the level of funding to be allocated over the next 5 to 10 years, which is documented in the 10-year PRP, to preserve the existing transportation system, covering maintenance, resurfacing, bridge repair and bridge replacement.

During the workshops, presentations are made which provide an assessment of prior years' performance, projection for future performance, and recommended funding levels which ensures all preservation related performance objectives will be met annually as outlined in the Five-Year Work Program and beyond. Executive direction on funding level and priority is also provided during the workshops.

After funding levels and allocations have been established, discussions on project selection and prioritization commences. Local projects are included in those discussions.

The state's 27 Metropolitan Planning Organizations (MPOs) develop their list of priority projects in coordination with the Department's District Offices. In non-metropolitan areas, the Department programs projects in cooperation with affected local officials and Regional Transportation Planning Organizations, where applicable.

The Department programs transportation projects into the Work Program based upon local priority, funding availability, and project schedules. The Department's assessment of needs includes an identification of highly congested roadways, safety and security considerations, access to business and industry, links to military facilities and improvements to major economic assets such as seaports, airports and rail facilities. Project needs are identified by the Departments District Offices in conjunction with local officials with responsibility for transportation. The Department also consults with non-MPO local officials to ensure consideration is given to the special needs of seniors and individuals with disabilities in meeting their transportation needs.

These project priorities serve as the basis for the district-wide prioritization process. The Department's Central Office reviews the District's programming of projects to ensure adherence to the Department's policies and procedures, established performance measures, and federal requirements. The final list of projects that result from the project selection and prioritization process becomes the Department's Five-Year Work Program.

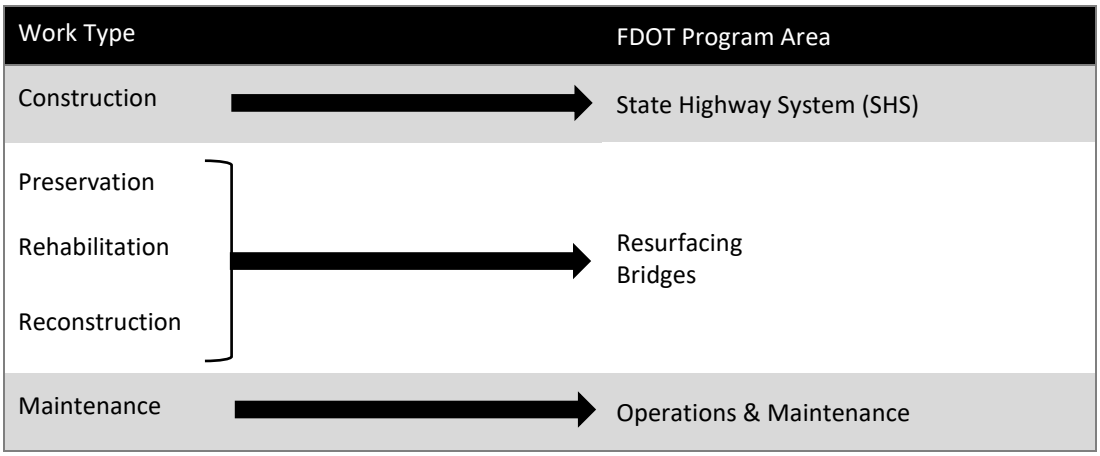
The Department has quantitative measures which describe the current condition of the system, such as the percentage of pavement that meets Department standards, the percentage of bridges which meet Department standards, and the maintenance condition rating (or percent of desired maintenance rating achieved).

5.3 National Highway System (NHS) Funding Allocations

The Department does not typically break-out funding allocations by work type; instead, financial investments are reported and organized by Program Area. This format (Program Area) matches the format used in the Department's Program and Resource Plan (see Appendix A) which contains the approved program alternatives and funding levels by fiscal year to accomplish program goals and objectives within expected revenue.

To assist with understanding of the Department's Program Areas, a cross-walk is provided (see Figure 11) to show which Program Area(s) corresponds to the work types.

Figure 11: Work Type Crosswalk



Source: FDOT, Office of Work Program and Budget.

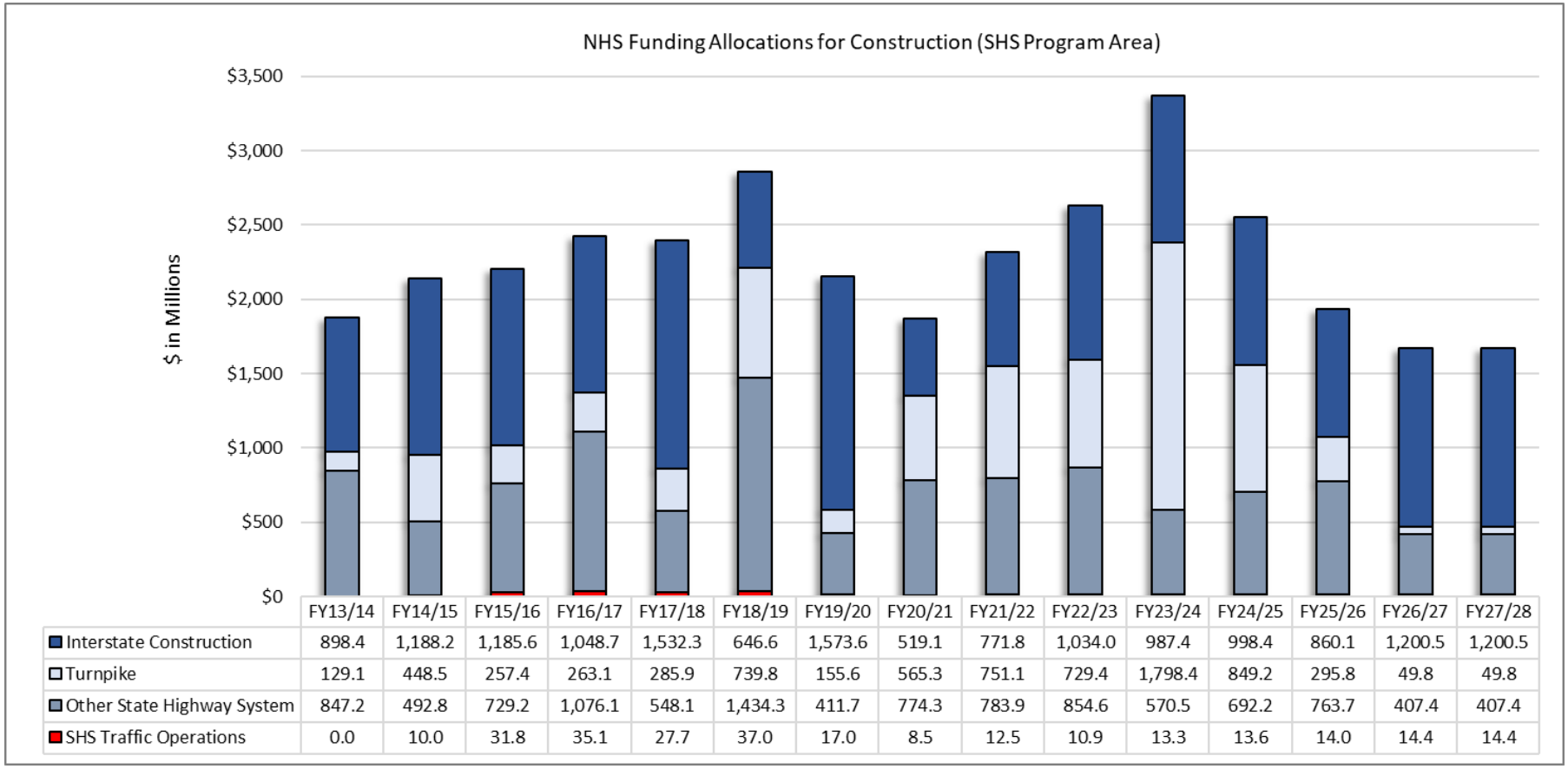
The Department's State Highway System (SHS) Program Area corresponds to the Construction work type. The scopes of work included in this area are the construction, addition or improvement of lanes, interchanges, entry/exit ramps, feeder roads, toll collection facilities and motorist service facilities which are on or planned to be on the SHS. Functionally obsolete bridges needing widening to meet standards or for capacity improvements within a transportation corridor are also included.

The Department's Resurfacing and Bridge Program Areas correspond to the Preservation, Rehabilitation and Reconstruction work types. The Resurfacing program provides for pavement resurfacing, rehabilitation, minor reconstruction, and pavement milling and recycling. These projects are intended to preserve the structural integrity of the highway pavements. The Bridge program policies direct the Department's resources to the repair or replacement of bridges with some degree of structural deterioration.

The Department's Operations and Maintenance Program Area corresponds to the maintenance work type. This program provides for highway repairs, roadside upkeep, drainage management and traffic services.

The NHS funding allocations for Construction, Preservation, Rehabilitation and Reconstruction work types were extracted from the SHS, Resurfacing and Bridge Program Areas (see Figures 12 through 14). For Maintenance, it is the policy of the Department to annually provide sufficient funding to ensure 100 percent of the maintenance standards on the SHS, which includes the majority of the NHS, are achieved. Maintenance activities are handled by in-house staff, as well as through consultant contracts. At this time, the specific Maintenance funding allocations for the NHS are not available. The Department plans to review the Operations and Maintenance Program Area to better accommodate the work type reporting requirements in future updates of the TAMP.

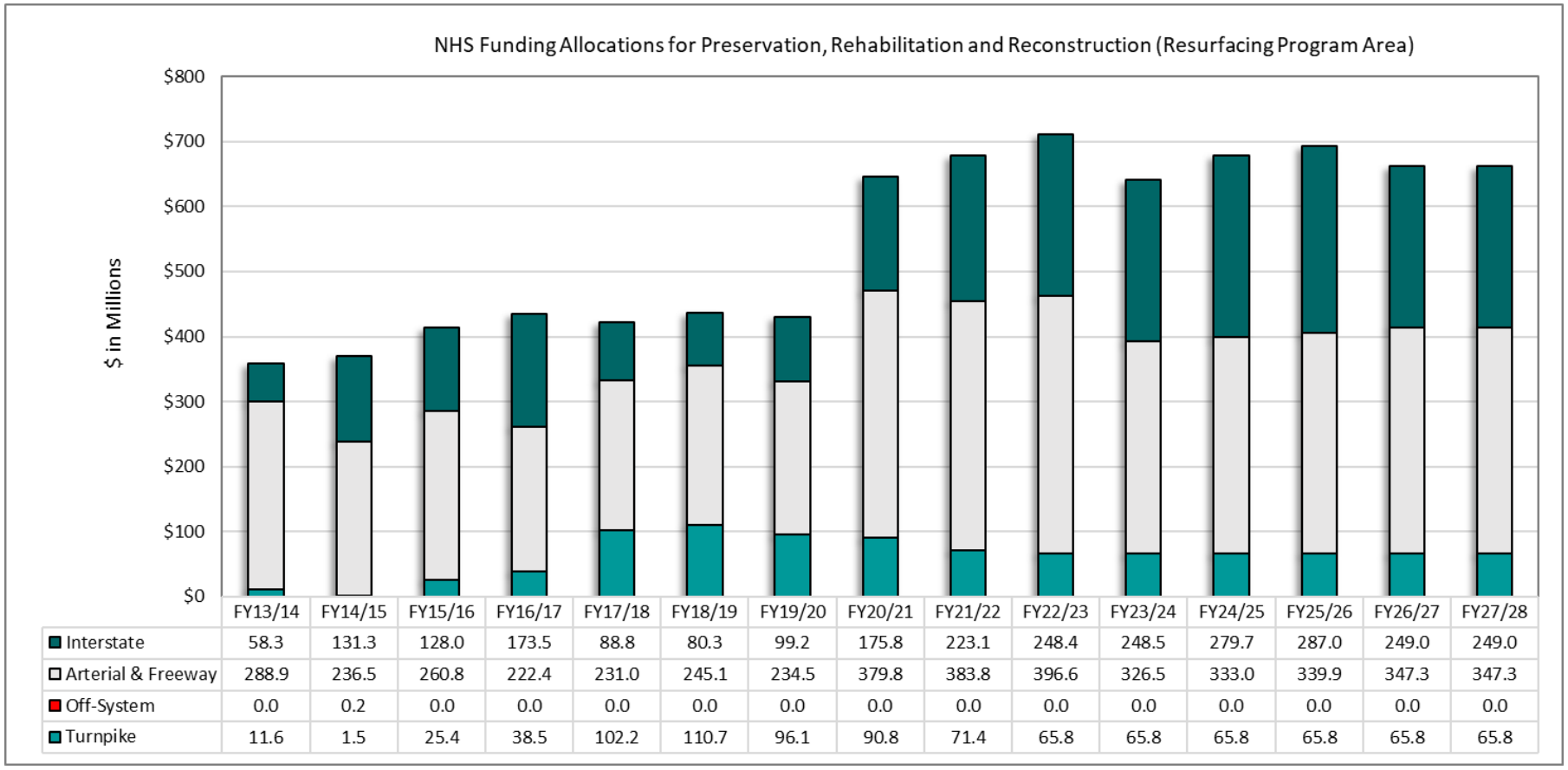
Figure 12: NHS Funding Allocations for Construction (SHS Program Area)



	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	FY26/27	FY27/28
Interstate Construction	898.4	1,188.2	1,185.6	1,048.7	1,532.3	646.6	1,573.6	519.1	771.8	1,034.0	987.4	998.4	860.1	1,200.5	1,200.5
Turnpike	129.1	448.5	257.4	263.1	285.9	739.8	155.6	565.3	751.1	729.4	1,798.4	849.2	295.8	49.8	49.8
Other State Highway System	847.2	492.8	729.2	1,076.1	548.1	1,434.3	411.7	774.3	783.9	854.6	570.5	692.2	763.7	407.4	407.4
SHS Traffic Operations	0.0	10.0	31.8	35.1	27.7	37.0	17.0	8.5	12.5	10.9	13.3	13.6	14.0	14.4	14.4

Source: FDOT, Office of Work Program and Budget.

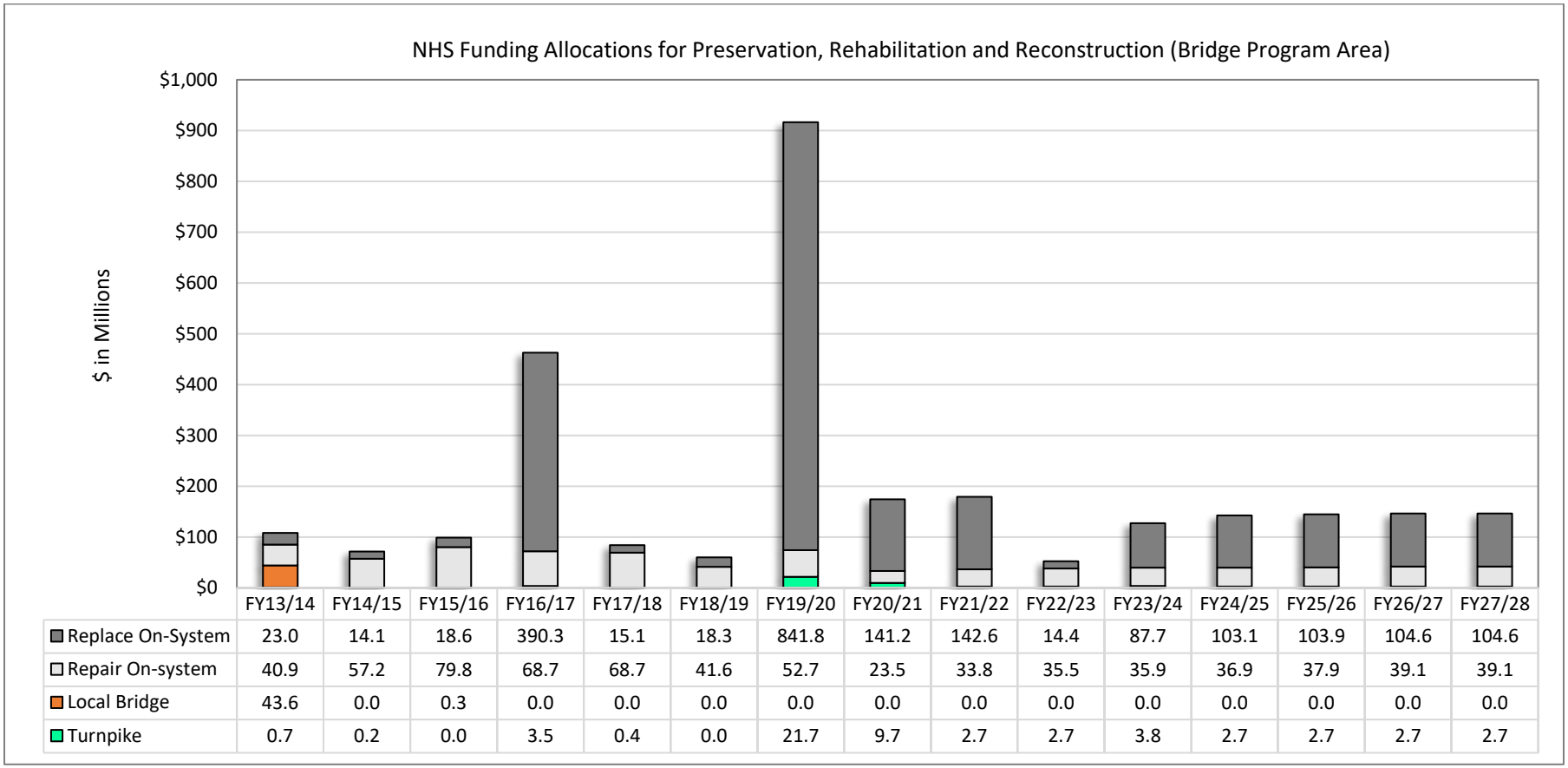
Figure 13: NHS Funding Allocations for Preservation, Rehabilitation and Reconstruction (Resurfacing Program Area)



	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	FY26/27	FY27/28
Interstate	58.3	131.3	128.0	173.5	88.8	80.3	99.2	175.8	223.1	248.4	248.5	279.7	287.0	249.0	249.0
Arterial & Freeway	288.9	236.5	260.8	222.4	231.0	245.1	234.5	379.8	383.8	396.6	326.5	333.0	339.9	347.3	347.3
Off-System	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turnpike	11.6	1.5	25.4	38.5	102.2	110.7	96.1	90.8	71.4	65.8	65.8	65.8	65.8	65.8	65.8

Source: FDOT, Office of Work Program and Budget.

Figure 14: NHS Funding Allocations for Preservation, Rehabilitation and Reconstruction (Bridge Program Area)



	FY13/14	FY14/15	FY15/16	FY16/17	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	FY26/27	FY27/28
Replace On-System	23.0	14.1	18.6	390.3	15.1	18.3	841.8	141.2	142.6	14.4	87.7	103.1	103.9	104.6	104.6
Repair On-system	40.9	57.2	79.8	68.7	68.7	41.6	52.7	23.5	33.8	35.5	35.9	36.9	37.9	39.1	39.1
Local Bridge	43.6	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turnpike	0.7	0.2	0.0	3.5	0.4	0.0	21.7	9.7	2.7	2.7	3.8	2.7	2.7	2.7	2.7

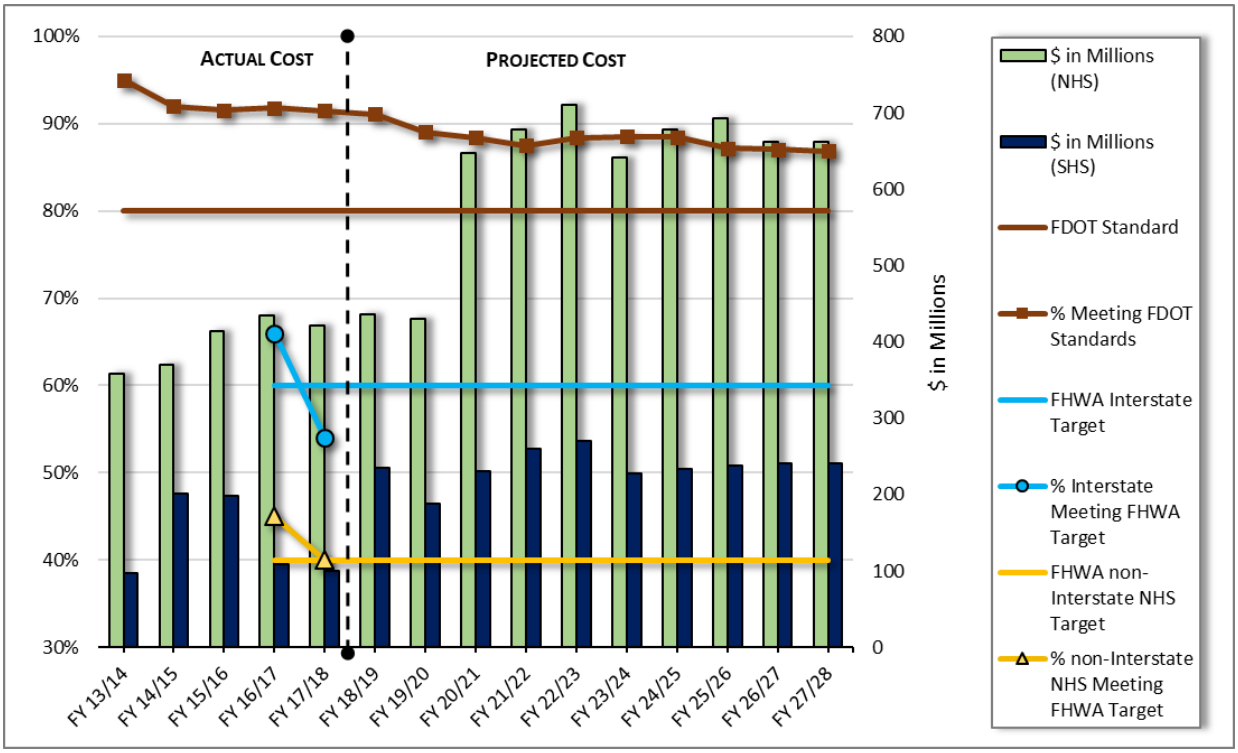
Source: FDOT, Office of Work Program and Budget.

5.3.1 Pavement Allocation

The Department allocates funds to ensure at least 80 percent of pavement on the SHS, which includes the majority of the NHS, meets Department standards (the SOGR). The amount of funding allocated is informed by the Department's top priority risks and the analysis conducted using the Department's Pavement Management System (PMS, Chapter 8). The PMS uses current inventory as well as system growth projections to aid in forecasting future deficient lane mile levels for budgeting purposes.

As shown in Figure 15, over 90 percent of the SHS has met Department standards over the past five years and over 80 percent of the SHS is projected to meet Department standards through FY2028. The funding in FY2018 is "locked". Generally, the allocations for the Interstate and Turnpike are not adjusted, unless the condition changes. For Arterials, FY2019 and 2020 are also "locked" however FY2021 and 2022 can be adjusted; meaning the amount that goes to each FDOT District may change but generally not the total allocation amount. These investment strategies allow the Department to meet the SHS pavement condition standards by balancing resurfacing needs with SHS pavement deterioration rates. These strategies also help support progress towards achieving the established Interstate and non-Interstate NHS pavement targets, since the SHS includes the majority of the NHS. As more data and information is collected and analyzed using the required approaches and technologies mandated in the federal regulations (which is a significant departure from those currently used by the Department) the Department expects to have better insight into performance of the NHS that will help inform future funding estimates to meet the established targets.

Figure 15: Pavement Projected to Meet Standards and Targets & Amount of Funding Planned



Note: Funding shown includes local (off-system) roads. Sources: FDOT, Office of Work Program and Budget, PRP for July 1, 2018 Adopted, Resurfacing Program Area and State Materials Office.

While the Department is very proud of how well the pavement has been performing over the years, it is important to consider the impact of improved materials, design and construction practices on pavement life and manage the investment accordingly and appropriately. During the annual program planning workshops a few years ago, the actual pavement condition was near 95 percent. During that time, the Department reduced the amount of funding set aside for resurfacing for a couple of years, then began ramping it back up beginning in FY2021.

Over $800 million per year has been set aside for resurfacing work to begin in FY2021. Of course, the pavement condition is evaluated every year and projections are made for future conditions. Resurfacing funds will be adjusted appropriately to ensure the statutory requirements and progress towards achievement of the established Interstate and non-Interstate NHS pavement targets are met and that all pavement on the SHS, which includes the majority of the NHS, are safe for travel.

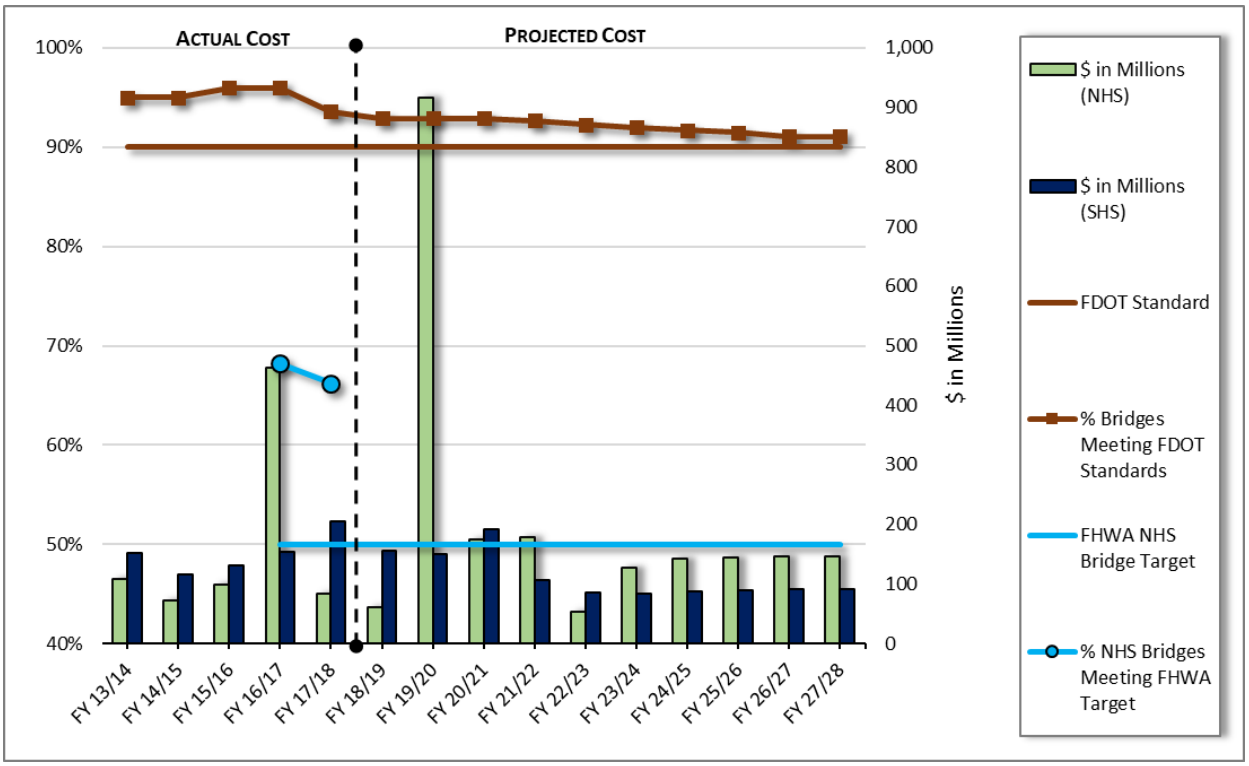
5.3.2 Bridge Allocation

The Department allocates funds to ensure at least 90 percent of Department maintained bridges meet Department standards (the SOGR) and that all bridges which are open to the public are safe for travel. The amount of funding allocated is informed by the Department's top priority risks and bridge management system, AASHTOWare™ Bridge Management Software (BrM, Chapter 8). The BrM contains historical data. It also stores and processes bridge inventory and condition data for on and off-system assets that is collected during each inspection event and after construction that results in changes to the inventory. This information aids in forecasting future funding estimates based on current inventory and condition data.

As shown in Figure 16 below, the Department's investment strategies have kept bridges in a SOGR over the past five years and bridge conditions are projected to remain above the 90 percent standard in the future. Bridges are inspected at least once every two years. Bridges in poor condition are inspected more frequently. Funds are set aside for both bridge repairs and replacements. Routine repairs help extend the life of the Department's bridges. Each year the five-year allocation of bridge repair funding is evaluated to ensure all the needed repairs can be accomplished with the funding provided. In addition, the Department has a policy that a structure is programmed for corrective action within six years of being identified as structurally deficient or weight restricted.

The cost of replacing bridges varies significantly. Some bridges can exceed $500 million and require significant planning and coordination with the impacted residents and governments. Funding for bridge replacement is "locked" for all years except for the new 5th year. The Department adds any bridge which needs to be replaced to the new 5th year when developing the Work Program. Over $150 million has been set aside each year for bridge repair and replacement. Funding is then added to the new 5th year as needed to address bridges which need to be replaced.

Figure 16: Bridges Projected to Meet Standards and Targets & Amount of Funding Planned



Note: Funding shown includes local (off-system) bridges. The spike in FY17 is for the $423 million Pensacola Bay Bridge that was let to contract. The spike in FY20 reflects the planned replacement of the northbound span of the Howard Frankland Bridge in Tampa, which is estimated to cost $730 million. Sources: FDOT, Office of Work Program and Budget PRP for July 1, 2018 Adopted, Bridge Program Area and State Materials Office.

These investment strategies allow the Department to keep bridges in a SOGR and support progress towards achieving the established NHS bridge targets. As more information is collected and analyzed using the approach mandated in the federal regulations, the Department expects to have better insight into performance of NHS bridges that will aid future funding estimates to meet the established targets.

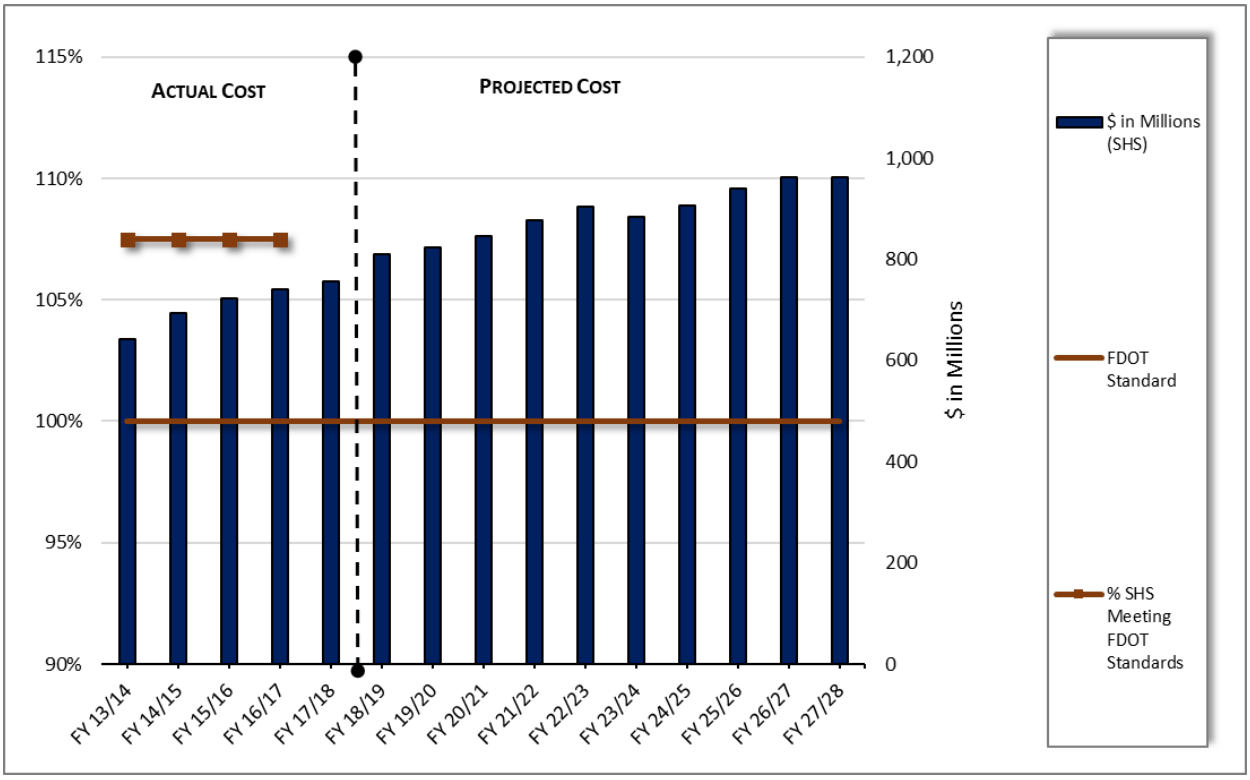
5.3.3 Maintenance Allocation

The Department is proud of the way the SHS, which includes the majority of the NHS, is maintained. The Maintenance Rating Program uses visual and mechanical evaluation of routine highway maintenance conditions to rate maintenance levels on the SHS.

The Department allocates funds to ensure 100 percent of the maintenance standard (the SOGR) is achieved. Funding allocations are adjusted each year to ensure this goal is reached. The acceptable maintenance standard is based on the Department's evaluation of its performance using the Maintenance Rating Program (MRP). This system grades five broad highway components (roadway, roadside, vegetation/aesthetics, traffic services, and drainage) and arrives at a maintenance rating of 0 to 100. The Department's standard is to achieve and maintain an overall maintenance rating of 80.

While the maintenance standard has been exceeded over the last five years, the objective is to continue to meet the standard. The Department projects the funding allocated for maintenance will be sufficient to achieve 100 percent of the standard in the future.

Figure 17: Maintenance Standard Projected to be Achieved & Amount of Funding Planned



Note: The Department does not project future maintenance conditions. Sufficient funding is provided annually to achieve 100 percent of the maintenance standards. Source: FDOT, Office of Work Program and Budget PRP for July 1, 2018 Adopted, Operations & Maintenance Program Area.

5.4 Investment Strategies and Risks

The Department continuously engages in efforts of identification and response to top priority risks at the Agency, Program and Asset Levels to ensure pavements and bridges on the SHS, which includes the majority of NHS, are in a SOGR (see Chapter 7). These risks are considered and incorporated in the Department's financial plan and investment strategies.

Risks at the Agency Level affect the mission, vision and overall results of the asset management program. Risks involving impacts and uncertainty of revenue were identified as the top priority. As mandated by statute, the Department allocates funding directly "off the top" to keep the existing transportation system safe and to standards. If the Department were to experience impacts and uncertainty of revenue, capacity projects would be reprioritized and/or deferred. This would minimize the financial and budget risks associated with maintaining the SOGR for the SHS, which includes the majority of the NHS.

Risks at the Program Level affect the Department's ability to deliver projects and meet targets within a program. These risks include organizational and systematic issues, including revenue and economic uncertainties that cause projects to be delayed. Any impacts to funding, whether due to construction cost increases, supply chain disruptions, unfunded Federal mandates, directed investments or changes in priority would be mediated the same as described at the Agency Level; capacity projects would be deferred and other adjustments made, as necessary, to preserve the existing transportation system to standards. In addition to the "off the top" funding allocations, the Department monitors trends in construction cost indicators and indexes the costs of fuel and bituminous. Those changes are incorporated into estimates to allow time to prepare for possible increases/decreases in costs. This information is used in conjunction with the PMS and BrM system analyses to inform funding projections.

Risks at the Asset Level affect the condition of specific assets. Those identified as top priority involved hurricanes and other water-related damages. To address these risks, the Department first utilizes any available cash balances until reimbursements are received. If those balances are not sufficient to cover the short-term needs, the Department mitigates the risks as described at the Agency Level; capacity projects are deferred and other adjustments made, as necessary, to preserve the existing transportation system. Over the years, this has proven to be a very effective strategy. The Department would also seek reimbursement from the federal government for costs incurred by the weather-related events. The Department also periodically reviews and if necessary updates its design standards to enhance resiliency of the transportation system infrastructure. These enhancements are accounted for in the PMS and BrM systems which utilize cost information, inflation factors and other data when conducting analyses.

5.5 Summary

The primary source of funding for Florida's asset management activities comes from state-generated revenues. Approximately twenty-five percent of funding comes from federal sources. As mandated by statute, the Department allocates funding directly "off the top" to ensure investments made in the current transportation system are adequately preserved and maintained before funding is allocated for capacity improvements.

The amount of funding allocated is informed by the analyses conducted using the Department's pavement and bridge management systems which utilize historical data, current inventory and condition data, past funding allocations, performance history and other data as input to help optimize project selection for decision-makers. These systems ensure there is no gap between the existing conditions and SOGR of pavements and bridges on the SHS, which includes the majority of the NHS.

The Department's top priority risks at the Agency, Program and Asset Levels are also considered and incorporated into the financial plan and investment strategies. Any impacts to funding, whether due to construction cost increases, supply chain disruptions, unfunded Federal mandates, directed investments or changes in priority are mediated by reprioritizing or deferring capital projects and making other adjustments as necessary to preserve the existing transportation system to standards.

To date, Florida has achieved an envious state of being able to maintain performance on highways and bridges above Department standards. Even with planned modifications to the maintenance and resurfacing programs, the Department will continue to meet its objectives and performance standards for the SHS. This helps to support progress towards achievement of the established targets for the Interstate

pavements, non-Interstate NHS pavements and NHS bridges.

In doing so, the Department will continue to provide a safe transportation system that ensures the mobility of people and goods, enhances economic prosperity and preserves the quality of Florida's environment and communities. That is the mission of the Department, which reflects the national goals for the federal-aid highway program.

National Goals:

- **Safety**: to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure Conditions**: to maintain the highway infrastructure asset system in a state of good repair.
- **Congestion Reduction**: to achieve a significant reduction in congestion on the NHS.
- **System Reliability**: to improve the efficiency of the surface transportation system.
- **Freight Movement and Economic Vitality**: to improve the National Highway 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.
- **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.

Chapter 6 Performance Gap Analysis

One of the Department's main responsibilities is to keep the SHS in a State of Good Repair (SOGR). The system currently is in excellent condition, based on many national surveys which consistently rate Florida as having the nation's best pavements and bridges. This is a direct result of the Department inspecting and maintaining the pavement and bridge assets to Department standards, which helps support progress towards achieving the established targets for asset condition and performance of the NHS, since the SHS includes the majority of the NHS.

6.1 Funding Gap

There is no gap between the existing and required funding levels to maintain pavements and bridges on the SHS, which includes the majority of the NHS, to standards.

As discussed previously, the Department's SHS measures and standards for pavements and bridges are mandated by Florida Statute. Through these statutory provisions, Florida has established a well-recognized approach to first preserve existing assets and protect the public's investment in its highways and bridges. The strong mandated measures and standards, coupled with the Department's commitment to adopting innovative approaches for meeting these condition standards, allow the Department to ensure a well-established and strong approach to maintenance and preservation activities.

The Department allocates funds "off the top" to ensure the Department's pavement and bridge standards are met, which supports progress towards meeting the established targets for FHWA performance measures for the NHS, since the SHS includes the majority of the NHS. Therefore, the financial and budget risks associated with maintaining a SOGR for pavements and bridges are minimized.

If funding shortages were to develop the Department will follow its established process of funding preservation activities ahead of capacity projects. That is, the priority will be to use available state funds for preservation activities on the SHS, which includes the majority of the NHS.

6.2 Pavement Condition Gap

There is no gap between the existing condition and SOGR of pavements on the SHS, which includes the majority of the NHS.

The Department's Pavement Management System (PMS) and practices ensures there is no gap between the existing conditions and SOGR conditions. The Florida Analysis System for Targets (FAST) which is the engine of the PMS is a key component to that success. FAST takes historical and current data, including system growth projections and uses customized regression equations to forecast future performance of the pavement. This information along with other data allows the Department to maintain pavements in the SOGR. This helps support progress towards achieving the targets established for FHWA performance measures for NHS pavements since the SHS includes the majority of the NHS. More detailed information on the Department's PMS is provided in Chapter 8.

The Department will ensure continued high levels of performance for pavement condition through strategies such as:

- Balance the programming of resurfacing projects in relation to needs and optimize the timing of projects through the pavement management system.

- Coordinate with the Department's Motor Carrier Size and Weight Office and the Florida Highway Patrol's Office of Commercial Vehicle Enforcement to minimize the illegal operation of overweight commercial motor vehicles on Florida's public roads and bridges. Facilitate training and technical assistance to support local governments in conducting pavement condition surveys and ratings.

- Identify and where practicable, implement practices which reduce the time and cost of preserving the SHS.

- Promote research, development, and deployment of state-of-the-art materials, technology, and methodologies for transportation infrastructure design, construction, maintenance, and operations.

- Incorporate the risks of extreme weather and other environmental conditions into planning, project development, design, and operations.

- Through the TAMP, coordinate the Department performance metrics with the FHWA performance metrics to ensure the FHWA performance target metrics are achieved.

6.3 Bridge Condition Gap

There is no gap between the existing condition and SOGR of bridges on the SHS, which includes the majority of the NHS.

The Department's bridge management system, AASHTOWare™ Bridge Management Software (BrM), ensures there is no gap between the existing conditions and SOGR conditions. Bridge inventory and condition data for both on and off-system assets is collected during each inspection event and after construction that results in changes to the inventory. This information is stored and processed in the BrM database. This data along with other research was used to develop the Department's current bridge deterioration curves. These curves are integral in helping the Department maintain bridges in the SOGR, which helps support progress towards achieving the targets established for FHWA performance measures for NHS bridges. More detailed information on the Department's BrM system is provided in Chapter 8.

For bridges, the Department will ensure continued progress to maintain its core measures of bridge condition through strategies such as:

- Program priority repair projects for all Department-maintained bridges in the Work Program.

- Program the replacement or repair of all structurally deficient Department-maintained bridges and those bridges posted for weight restriction within six years of deficiency identification.

- Program the replacement of all other Department-maintained bridges designated for economy replacement within nine years of identification.

- Coordinate with the Department's Motor Carrier Size and Weight Office and Florida Highway Patrol's Office of Commercial Vehicle Enforcement to reduce the illegal operation of overweight commercial motor vehicles on Florida's public roads and bridges.

- Continue to monitor bridges scheduled to be replaced and make interim repairs, as necessary, to safeguard the traveling public.

- Pursue research, development, and deployment of state-of-the-art materials, technology, and methodologies for transportation infrastructure design, construction, maintenance, and operations.

- Incorporate the risks of extreme weather and other environmental conditions into planning, project development, design, and operations.

- Through the TAMP, coordinate the Department performance metrics with the FHWA performance metrics to ensure the FHWA performance target metrics are achieved.

6.4 State Highway System (SHS) vs. National Highway System (NHS)

There is a small percentage of off-system (locally owned) pavement and bridge assets that are part of the NHS but are under the jurisdiction of the local governments and located within the boundaries of the Metropolitan Planning Organizations (MPOs). For pavement, it's approximately 6.5 percent of the total NHS centerline miles and for bridges, it's approximately 2.8 percent of the total NHS bridges and 3.4 percent of the total NHS bridge deck area.

The Department collects data for the locally owned assets through its pavement and bridge management systems. This information is used to inform the list of local priority projects, which are developed by the MPOs in coordination with the Department's District Offices. These project priorities serve as the basis for the districtwide prioritization process, which feeds into the development of the statewide Work Program.

This helps to ensure the Department is adequately addressing the needs of the entire NHS (both on-system and off-system). State and/or federal funds are used by the Department to supplement local agencies' efforts for managing and maintaining their assets. So, even if the off-system assets were to fall below standards, the risk associated with not meeting the FHWA performance measures and targets would be minimal.

Chapter 7 Risk Management

Different industries use many different definitions of risk and risk management. Many consider risks to include both possible threats and possible opportunities for mitigation. The International Organization for Standardization defines risk as "the effect of uncertainty on objectives" and notes that uncertainty could be positive or negative. Other definitions equate risk to variability or to the chance that desired outcomes won't be achieved.

The Department defines risk as the probability of certain outcomes related to rare, but expected outside influences. The Department is committed to considering risk as an integral part of its asset management program. Therefore, Risk Management as used in the Department is a continuous process whereby data is collected and evaluated with relation to established goals and objectives. In fact, the FTP recommends that the Department incorporate the risk of service interruption into its priority-setting process.

So, risks will be identified at the agency, program and asset levels. Agency level risks are risks that affect the mission, vision and overall results of the asset management program. For example, legislative actions or economic changes. Program level risks are risks that affect the Department's ability to deliver projects and meet targets within a program. For example, construction cost variations, materials price volatility or data quality. Asset level risks are risks that affect the scope, cost, schedule, quality of projects or the condition of specific assets. They relate to specific projects. For example, cost overruns, material and workmanship deficiencies, or climatic events.

7.1 Risk Identification

In preparation for the Asset Management Plan final rule, the Department hired a consultant team in 2014 to conduct a literature review of previously published information from the Department and FHWA to refine and confirm the risks to be included and presented in the TAMP. These included, among others:

- *Development of Risk Models for Florida's Bridge Management System (Sobanjo and Thompson, 2013);*
- *Unknown Foundation Bridges Pilot Study (2010);*
- *Risk-Based Management Guidelines for Scour at Bridges with Unknown Foundations, NCHRP Document 107 (2006);*
- *Federal Highway Administration, Executive Strategies for Risk Management by State Departments of Transportation – Executive Summary (2011);*
- *Federal Highway Administration, Risk-Based Transportation Asset Management Literature Review (2012);*
- *Life-Cycle Engineering, Accounting for Risk in Your Asset Management Strategy (2013);*

- *Federal Highway Administration, Risk-Based Transportation Asset Management Report 1: Evaluating Threats, Capitalizing on Opportunities (2012);*

- *Federal Highway Administration, Risk-Based Transportation Asset Management Report 2: Examining Risk-Based Approached to Transportation Asset Management (2012);*

- *Federal Highway Administration, Risk-Based Transportation Asset Management Report 3: Achieving Policy Objectives by Managing Risks (2012);*

- *Federal Highway Administration, Risk-Based Transportation Asset Management Report 4: Managing Risks to Critical Assets (2013); and*

- *Federal Highway Administration, Risk-Based Transportation Asset Management Report 5: Managing External Threats through Risk-Based Asset Management (2014).*

After extracting information from this literature, telephone conversations were held with representatives from the pavement, bridge, maintenance, and financial group in April 2014. The consultant team reviewed a draft list of risks, and developed a preliminary risk register with representatives from the pavement and bridge sections of the Department in May 2014.

7.2 Risks and Risk Rating Scale

Agency-Level risks identified included:

- State and Federal funding are significantly reduced across the board for transportation.
- State funding is reduced to the Department due to poor public perception of the agency.
- Flexibility with Federal funding is reduced due to failure to meet regulatory standards.
- Funds are not sufficient for capital and maintenance projects due to inflation in construction costs.
- Funds are not sufficient for capital and maintenance projects due to failure to accurately predict funding.
- Funds are not sufficient for capital and maintenance projects due to failure to accurately predict costs.
- Asset management at the Department is inefficient or ineffective due to a lack of communication with staff.

Program-Level risks identified included:

- The Department's ability to efficiently deliver programs is undermined due to unfunded Federal mandates.
- The Department's ability to efficiently deliver programs is undermined due to diversion of funds to high-profile projects.
- The Department's ability to efficiently deliver programs is undermined due to staff turnover and loss of expertise/experience.
- The Department's ability to efficiently deliver programs is undermined due to poor data management systems and strategies.

- The Department's ability to efficiently deliver programs is undermined due to poor management.
- The Department's ability to deliver programs is impacted by a new statute requiring capacity-related investment.
- FDOT's ability to efficiently deliver programs is undermined due unpredicted variation in construction costs.

Other program-level risks include: failure to manage their physical assets for the long-term as official policy; legislative mandates such as "worst first" that could detract from sound asset management; or internal bureaucratic resistance to asset management that can be addressed only by senior leadership.

Asset-Level risks identified included:

- Assets are damaged or destroyed due to flooding (often associated with hurricanes).
- Assets are damaged or destroyed due to tornadoes.
- Assets are damaged or destroyed due to wildfires.
- Assets are damaged or destroyed due to vehicle impacts and/or hazardous materials spill.
- Assets are damaged or destroyed due to retaining wall failure or landslides.
- Bridges are damaged or destroyed due to scour.
- Assets are damaged or destroyed due to failure of ITS and traffic safety equipment.
- Bridges fail for reasons other than impacts and scour.
- Culverts and other drainage facilities fail (blockages or overtopping) unexpectedly
- Sinkholes emerge under or near roadway sections compromising foundation
- The Department's ability to construct/maintain assets is compromised due to unanticipated increase of project scope.

Other potential asset-level risks include: premature asset failures caused by faulty construction or materials; chance failures caused by unpredicted events such as barges or roadway vehicles striking bridges or truck fires weakening bridges; abrupt failures caused by climatic or seismic events such as flooding, landslides, hurricanes or tornados; failures caused by inadequate maintenance; decision failures caused by inaccurate data or models; operational failures caused by process breakdowns; or demand failures caused by unanticipated vehicle loadings.

Although the concept of risk management sometimes is viewed as obscure, tools to identify and evaluate risks can be very simple. A risk register can serve as a tool for evaluation and analysis of risk management elements. The register is a simple excel spreadsheet that lists the risks that have been considered, including their rankings. Risks can be scored using a risk rating scale as shown in Table 10 where 5 is high and 1 is low. The risks are scored in terms of consequence, where 5 is catastrophic and 1 is negligible.

Table 10: Risk Rating Scale

		Consequence (Level/Descriptor)				
Likelihood		1	2	3	4	5
Level	Descriptor	Negligible	Minor	Major	Critical	Catastrophic
1	Low	1	2	3	4	5
2	Medium Low	2	4	6	8	10
3	Medium	3	6	9	12	15
4	Medium High	4	8	12	16	20
5	High*	5	10	15	20	25

Following the May 2014 meeting, a project team conversation in June 2014 identified a need for a risk survey to develop consensus Department scores for ranking risk priorities. Prior to the distribution of the risk survey, the consultant team held a teleconference with the Department project managers to identify and introduce the risk survey. The risk survey was distributed to over 70 Department managers and executives in August 2014.

7.3 Risk Survey Information and Results

The purpose of the risk survey was to solicit broad input to the creation of a risk register and identify high-scoring risks. The survey was distributed via email and was completed on a Qualtrics platform with each of the 26 identified risks available for scoring across likelihood and severity rankings of 1 through 5.

Thirty responses were received in August 2014. The consensus scores were determined by using the mode (most popular single response) when possible. When a mode was not easily identifiable, the research team applied professional judgment using the following criteria:

- If 3 and 4 were equally popular, 3 was taken as consensus
- If 2 was more popular than 5;
- If 3 and 5 were equally popular, consensus was 4; and
- If 1, 3, and 5 were equally popular, consensus was 3.

The results are presented in the risk register shown in Table 11.

Table 11: Risk Register

	Event/Occurrence	Likelihood	Consequence Score				Other Considerations					Risk Score
			Safety	Mobility	Asset Damage	Other Financial Impact	Funding	Insurance	Regulatory	Political	Reputation	
Agency Risks												
A	State and Federal funding are significantly reduced across the board for transportation.	2	3	4	3	4	√		√	√		8
B	State funding is reduced to FDOT due to poor public perception of the agency.	1	2	4	1	3	√		√	√	√	3
C	Flexibility with Federal funding is reduced due to failure to meet regulatory standards.	1	2	2	2	2	√		√	√	√	2
D	Funds are not sufficient for capital and maintenance projects due to inflation in construction costs.	2	2	4	3	4	√	√	√	√	√	7
E	Funds are not sufficient for capital and maintenance projects due to failure to accurately predict funding.	2	2	4	3	3	√			√	√	7
F	Funds are not sufficient for capital and maintenance projects due to failure to accurately predict costs.	1	2	4	3	3		√		√	√	3
G	Asset management at FDOT is inefficient or ineffective due to a lack of communication with staff.	1	2	1	1	1	√			√	√	1
Program Risks												
H	FDOT's ability to efficiently deliver programs is undermined due to unfunded Federal mandates.	2	3	4	2	3	√		√		√	7
I	FDOT's ability to efficiently deliver programs is undermined due to diversion of funds to high-profile projects.	1	3	3	3	3	√	√		√	√	4
J	FDOT's ability to efficiently deliver programs is undermined due to staff turnover and loss of expertise/experience.	3	3	3	2	3				√	√	9
K	FDOT's ability to efficiently deliver programs is undermined due to poor data management systems and strategies.	1	3	3	3	3						3
L	FDOT's ability to efficiently deliver programs is undermined due to poor management.	2	3	3	3	3			√		√	7
M	FDOT's ability to deliver programs is impacted by a new statute requiring capacity-related investment.	2	3	3	2	3	√	√		√	√	6
N	FDOT's ability to efficiently deliver programs is undermined due to unpredicted variation in construction costs.	2	3	3	2	3	√	√			√	6

	Event/Occurrence	Likelihood	Consequence Score				Other Considerations					Risk Score
			Safety	Mobility	Asset Damage	Other Financial Impact	Funding	Insurance	Regulatory	Political	Reputation	
Asset Risks												
O	Assets are damaged or destroyed due to hurricanes.	4	4	4	4	4		√		√	√	18
P	Assets are damaged or destroyed due to flooding (often associated with hurricanes).	4	4	4	4	4		√		√	√	18
Q	Assets are damaged or destroyed due to tornadoes.	2	1	2	3	2		√			√	5
R	Assets are damaged or destroyed due to wildfires.	2	2	2	3	1	√	√		√	√	5
S	Assets are damaged or destroyed due to vehicle impacts and/or hazardous materials spill.	3	2	2	3	2	√	√			√	8
T	Assets are damaged or destroyed due to retaining wall failure, landslides, or rockfalls.	1	1	2	2	1		√	√		√	2
U	Bridges are damaged or destroyed due to scour.	2	2	3	4	3	√	√			√	7
V	Assets are damaged or destroyed due to failure of ITS and traffic safety equipment.	1	2	2	1	1		√			√	2
W	Bridges fail for reasons other than impacts and scour.	1	3	3	4	2	√	√		√	√	4
X	Culverts and other drainage facilities fail (blockages or overtopping) unexpectedly.	3	2	3	4	2	√	√			√	9
Y	Sinkholes emerge under or near roadway sections compromising foundation.	3	3	3	3	2				√	√	9
Z	FDOT'S ability to construct/maintain assets is compromised due to unanticipated increase of project scope.	2	1	2	1	3	√	√			√	4

Based on the survey findings, the highest scored risks were hurricane related at the asset level, involving wind and flooding damage. Respondents considered these risks both very likely and very damaging. Less severe asset-level risks included vehicle impacts, bridge scour, culvert failures, and sinkholes (flooding related).

At the agency level, risks involving uncertainty of funding and cost prediction scored highest. At the program level, risks were generally consistently scored as approximately equally severe, however, loss of expertise was considered more likely than others due to retirements, attrition, or other factors.

7.4 Risk Workshop

A Risk Workshop was held in Tallahassee, Florida on August 27, 2014 to finalize the risk register and identify priority items for further consideration in the context of the TAMP. The objectives of the Risk Workshop were to:

- Orient participants to the risk-based elements of the TAMP;
- Identify and assess the threats and possible opportunities that affect delivery of the Department's activities;
- Prioritize risks;
- Understand possible risk treatments (mitigations); and
- Finalize the Risk Register.

The August 2014 Risk Workshop was attended by representatives from the pavement, bridge, planning, and executive management levels. The research team used audience response systems to ensure that the scores represent a consensus value for prioritization of risks. Slides were presented with the risk register and the participants were asked to rank the risk items at the agency, program, and asset levels.

During the conversation, three other potential risks were identified that should receive detailed attention in the final TAMP. These were:

1. Workforce issues as they relate to labor and management conflicts. This risk is particularly important in the transit industry, as a mostly union workforce is present.
2. Additional and near continual rainfall that does not cause flooding can affect pavement conditions. This risk was discussed in relationship to above average rainfalls and saturation conditions.
3. Limited natural resources (such as lime rock and other aggregates) due to construction demand or supply chain disruptions can causes increases in cost of materials/construction.

While these risks were not included in the initial risk register, workshop participants think they are an important consideration in the context of the TAMP. As the TAMP is designed to be revisited regularly, the risk registers and prioritizations also should be viewed as snapshots in time. Workshop participants also discussed some potential mitigation efforts to address key risk items. For example, to address staff turnover, FDOT uses an intentional knowledge management approach of pairing seasoned veteran staff with younger, new staff. This approach allows for some knowledge transfer prior to retirements.

At the workshop, the following risks were prioritized as most important for inclusion in the TAMP. The risks are presented in priority order in each classification.

Agency Level
1. State and Federal funding are significantly reduced across the board for transportation.
2. Funds are not sufficient for capital and maintenance projects due to inflation in construction costs.
3. Funds are not sufficient for capital and maintenance projects due to failure to accurately predict funding.

Program Level
1. Unpredicted variation in construction costs.
2. Unfunded Federal mandates.
3. Staff turnover and loss of experience/expertise.
4. Poor management.
5. New infrastructure initiatives.

Asset Level
1. Hurricane Damage.
2. Damage or Destruction due to Flooding.
3. Bridges are damaged or destroyed due to scour.
4. Culverts and other drainage facilities fail (blockages or overtopping) unexpectedly.
5. Sinkholes emerge under or near roadway sections compromising foundation.
6. Assets are damaged or destroyed due to vehicle impacts and/or hazardous materials spill.

7.5 Next Steps

Since the list of prioritized risks were developed prior to the rule being finalized, the Steering Committee will review the information with representatives from the pavement, bridge, planning, and executive management levels to determine if any changes are needed. Once the review has been completed, each risk will be discussed in greater detail and a basic approach for addressing the risk will be presented in the final TAMP. To develop these mitigation strategies, the Steering Committee will work with the various offices within the Department to outline high-level response approaches.

The risk register and prioritization effort will be revisited periodically, likely every two years, to update and verify risk planning efforts. By regularly revising the risks, the Department will be well positioned to address emerging issues that impact its ability to provide continuity of service.

7.6 Risk Review and Assessment

In early 2019, the risks and related scores were reviewed by select subject matter experts. In some cases, the scores changed; in other cases, the scores did not change. In one instance, a new risk was identified. Also, some risks were re-stated to clarify meaning or were combined with other risks that were similar.

The results of the review are shown in the Revised Risk Register presented in Table 12.

Table 12: Revised Risk Register

	Event/Occurrence	Likelihood	Consequence Score				Other Considerations					Risk Score
			Safety	Mobility	Asset Damage	Other Financial Impact	Funding	Insurance	Regulatory	Political	Reputation	
Agency Risks												
A	State and Federal funding are significantly reduced across the board for transportation.	2	3	4	3	4	√		√	√		8
B	State funding is reduced to FDOT due to poor public perception of the agency.	1	2	4	1	3	√		√	√	√	3
C	Flexibility with Federal funding is reduced due to failure to meet regulatory standards.	1	2	2	2	2	√		√	√	√	2
D	Funds are not sufficient for capital and maintenance projects due rising costs.	2	2	4	3	4	√	√	√	√	√	8
E	Revenue is not sufficient for capital and maintenance projects due to failure to accurately predict funding.	2	2	4	3	3	√			√	√	7
F	Funds are not sufficient for capital and maintenance projects due to failure to accurately predict costs.	1	2	4	3	3		√		√	√	3
G	Asset management at FDOT is inefficient or ineffective due to a lack of communication with staff.	1	2	1	1	1	√			√	√	1
new	FDOT incurs extensive short-term operating and maintenance costs after extreme weather events.	4	3	3	3	3	√			√	√	14
Program Risks												
H	FDOT's ability to efficiently deliver programs is undermined due to unfunded Federal mandates.	2	3	4	2	3	√		√		√	7
I	FDOT's ability to efficiently deliver programs is undermined due to diversion of funds to high-profile projects.	3	3	3	3	3	√	√		√	√	11
J	FDOT's ability to efficiently deliver programs is undermined due to workforce issues in the transportation industry.	4	4	4	2	3				√	√	14
K	FDOT's ability to efficiently deliver programs is undermined due to poor data management systems and strategies.	1	3	3	3	3						3
L	FDOT's ability to efficiently deliver programs is undermined due to poor management.	2	3	3	3	3			√		√	7
M	FDOT's ability to efficiently deliver programs is impacted by a change in investments or priorities (i.e., preservation).	3	3	3	2	3	√	√		√	√	10
N	FDOT's ability to efficiently deliver programs is undermined due to construction costs or supply chain disruption.	3	3	3	2	3	√	√			√	9

	Event/Occurrence	Likelihood	Consequence Score				Other Considerations					Risk Score
			Safety	Mobility	Asset Damage	Other Financial Impact	Funding	Insurance	Regulatory	Political	Reputation	
Asset Risks												
O	Assets are damaged or destroyed due to hurricanes.	4	4	4	5	4	√	√		√	√	20
P	Assets are damaged or destroyed due to flooding, sea level rise and wet weather events.	4	4	4	5	4	√	√		√	√	20
Q	Assets are damaged or destroyed due to tornadoes.	2	1	2	3	2		√			√	5
R	Assets are damaged or destroyed due to wildfires.	2	2	2	3	1	√	√		√	√	5
S	Assets are damaged or destroyed due to vehicle impacts and/or hazardous materials spill.	3	2	2	3	2	√	√			√	8
T	Assets are damaged or destroyed due to retaining wall failure, landslides, or rockfalls.	1	1	2	2	1		√	√		√	2
U	Bridges are damaged or destroyed due to scour.	2	2	3	4	3	√	√			√	7
V	Assets are damaged or destroyed due to failure of ITS and traffic safety equipment.	1	2	2	1	1		√			√	2
W	Bridges fail for reasons other than impacts and scour.	1	3	3	4	2	√	√		√	√	4
X	Culverts and other drainage facilities fail (blockages or overtopping) unexpectedly.	3	2	3	4	2	√	√			√	9
Y	Sinkholes emerge under or near roadway sections compromising foundation.	3	3	3	3	2				√	√	9
Z	FDOT'S ability to construct/maintain assets is compromised due to unanticipated increase of project scope.	2	1	2	1	3	√	√			√	4

The Risk Score in the Revised Risk Register does not necessarily correlate with the priority order of the risk in each category. Risks were prioritized based on discussions, subject matter expertise and experience. The prioritized lists were presented to and approved by Executive Management. The prioritized risks are shown below by category and include an explanation of each risk as well as the Department's mitigation strategies to address the risks.

7.6.1 Agency Level Risks

The agency level risks affect the mission, vision and overall results of the asset management program. In total, eight risks were identified; four involving uncertainty of revenue had high risk scores. Based on discussions and experience, the four high scoring risks were prioritized as follows.

1. **State and Federal funding are significantly reduced across the board for transportation.**
   Mitigation Strategy:
   It is the Department's mission to provide a safe statewide transportation system that ensures the mobility of people and goods, enhances economic prosperity, and preserves the quality of the environment and communities. Safety is the highest priority and is a primary consideration in everything the Department does. Section 334.046, Florida Statutes, specifies prevailing principles which must be considered as the Department plans and develops a safe statewide transportation system. Highest among the prevailing principles is preservation of the existing transportation infrastructure. The statutes also provide quantitative performance measures which must be met concerning pavement condition, bridge condition and maintenance condition. The Department is required to preserve the state's transportation infrastructure to these specific standards. These priorities are ingrained into the Department's mission and business processes. As a result, funding is taken "off the top" to ensure pavement, bridge and maintenance targets are met first before any capacity projects are undertaken. Therefore, if revenues were negatively impacted due to reductions in state or federal funding, the Department would make every effort to honor the capacity projects already in the queue; however, capacity projects that have not been started would be deferred and other adjustments made, as necessary, to preserve the existing transportation system.

2. **Funds are not sufficient for capital and maintenance projects due to rising costs.**
   Mitigation Strategy:
   As stated above, the Department is required to preserve the state's transportation infrastructure to these specific standards. Inflation in construction costs would increase the budgetary load of projects and reduce the number of projects that the State could afford. So, projects would be deferred and other adjustments made, as necessary, to ensure the existing transportation system is preserved to required standards.

3. **Revenue is not sufficient for capital and maintenance projects due to failure to accurately predict funding.**
   Mitigation Strategy:
   The State's Revenue Estimating Conference (REC) typically meets three times a year to consider the forecast of revenues flowing into the State Transportation Trust Fund (STFF). Predictions of revenue are very conservative and actual collections are constantly evaluated in relation to the projections so that adjustments can be made. The largest source of funding for the asset management activities is

state-generated revenues, which rely on fuel tax. The state fuel tax is indexed to the Consumer Price Index (CPI) so it grows as the economy improves. The state also has a robust toll system that helps significantly with revenues. Federal funds account for about 25 percent of revenues and is tied to the most current federal legislation (the FAST Act) through FY2020. Following the FAST Act, beginning in FY2021, the Department predicts the amount of federal revenue by taking the amount of funding in the last year of the FAST Act (FY2020), holding it flat into the future (no inflation factors applied). Therefore, if revenues were negatively impacted due to failures to accurately predict the amount of funding available, the Department would employ the same tactics used for the other risks identified in this section (including weather and reduced allocations); capacity projects would be reprioritized and possibly deferred and other adjustments made, as necessary, to keep the existing transportation system safe and in a State of Good Repair (SOGR).

4. **FDOT incurs extensive short-term operating and maintenance costs after extreme weather events.**
   Mitigation Strategy:
   While the department may be reimbursed for emergency response and recovery efforts, the Department first utilizes any available cash balances until reimbursements are received. If the projected available cash does not appear to be sufficient to cover these short-term funding needs, the Department would begin deferring capacity related projects. Dealing with the emergency event and restoring roads and bridges as quickly and safely as possible to the first responders and travelling public becomes the top priority in the area where damage has occurred. Resources are reallocated to ensure operating and maintenance costs associated with the event are covered.

7.6.2 Program Level Risks

Risks at the program level affect the Department's ability to deliver projects and meet targets within a program. The risks include organizational and systematic issues as well as revenue and economic uncertainties that in general cause projects to be delayed. These causes are not related to any specific project. In total, seven risks were identified. However, based on discussions and subject matter expertise, only four were determined to be of significance and prioritized as follows.

1. **FDOT's ability to efficiently deliver programs is undermined due to construction costs or supply chain disruptions.**
   Mitigation Strategy:
   Any impacts to funding at the Program level, whether due to construction cost increases or supply chain disruptions would be mediated as described above at the Agency level; capacity projects would be deferred and other adjustments made, as necessary, to preserve the existing transportation system. The Department also monitors trends in construction cost indicators and incorporates changes into its estimates to allow time to prepare for possible future increases or decreases in costs. These construction cost indicators are discussed quarterly at the Executive Performance Review Meetings. The Department also recognizes that the costs of certain materials frequently increase and decrease causing uncertainty in the calculation of project bids which may result in higher construction costs. To address this uncertainty, the Department provides stability by indexing the costs of fuel and bituminous. The details of this process are addressed in the Standard Specifications for Road and Bridge Construction. Also, at times, the Department has explored procuring contracts for the supply and stockpiling of construction materials to ensure ongoing availability of materials for its projects

during supply disruptions. If a need arises, the Department may contract for the supply and stockpile of materials.

2. **FDOT's ability to efficiently deliver programs is undermined due to workforce issues in the transportation industry.**
   Mitigation Strategy:
   The Department recognizes that its people are its most important resource so staff recruitment and retention are critical elements for the Department to meet its Mission and Vision and achieve a SOGR. The Department has an established Mentoring Program which is managed by the Organizational Development Office. In addition, each office practices knowledge management through succession planning and the documentation of desk procedures and processes. The Department also has an informal cross training process to allow individuals to fill a role in another office for a period to support knowledge retention and succession planning. The Department recognizes that it must rely on the success of its partners in the transportation industry in order for the Department to meet its Mission and Vision and achieve a SOGR. To assist its partners, the Department actively coordinates and participates in Construction Career Days throughout the state to educate high school students on career opportunities in the transportation industry. The Department is committed to encouraging small businesses and disadvantaged businesses through its Small Business Enterprise and Disadvantage Business Initiative programs.

3. **FDOT's ability to efficiently deliver programs is undermined due to unfunded Federal mandates.**
   Mitigation Strategy:
   Unfunded mandates put a strain on state budgets by imposing sanctions if money is not diverted to cover them. Any impacts to funding, including unfunded mandates would be mediated as described above at the Agency level; capacity projects would be deferred and other adjustments made, as necessary, to ensure the existing transportation system is preserved to standards first before addressing the unfunded mandates.

4. **FDOT's ability to efficiently deliver programs is impacted by a change in investments or priorities (i.e., preservation).**
   Mitigation Strategy:
   A sudden mandate for specific investments would divert funds planned for other elements of the Work Program to the designated investment; likewise, any change in the Department's priorities from the current priorities of safety, preservation and capacity could affect future project selection. Any impacts to funding, including a change in investments or priorities would be mediated as described above at the Agency level; capacity projects would be deferred and other adjustments made, as necessary, to ensure the existing transportation system is preserved to standards first before addressing any changes in investments or priorities.

7.6.3 Asset Level Risks

Risks at the asset level relate to specific projects. These risks affect the scope, cost, schedule or the condition of the specific assets. In total, twelve risks were identified; six involving hurricanes and other water-related damages had high risk scores. Based on discussions, subject matter expertise and experience the six were prioritized as follows.

1. **Assets are damaged or destroyed due to hurricanes.**
   Mitigation Strategy:
   To maintain the system in a SOGR, the Departments engages in the continuous effort of identification and response to areas of risk involving the state's pavement and bridge assets. Hurricanes and other water-related damages are of particular concern. Hurricanes damage with high winds, rainfall and flooding. Although hurricanes and other intense storm events are endemic to Florida and cannot be prevented, the Department manages the impacts of flooding and other extreme weather risks on the Department assets—particularly those deemed most critical to mobility, economy, evacuation, etc. To address the risks associated with these occurrences, the Department has developed and implemented the following mitigation strategies.

   - **Protect/Harden.** Enhance the resilience of infrastructure by developing or enhancing natural (e.g., wetlands) buffers; building engineered protection (e.g., levees); or updating design standards (e.g., higher capacity drainage, greater freeboard requirements, etc.). The Department regularly considers hurricane probability in bridge design and this could be incorporated in its pavement selection processes as well.

     - **Hurricane and Tornado Wind Loads.** In 2004, Hurricane Charley moved through southwest Florida. Because of the high wind speeds many of the sign structures, signal lights, and other ancillary structures in the path of the storm experienced massive failure. In response, the Department developed new design criteria for ancillary structures based on updated wind loads. Changes included redefining the wind load boundary map, and depth and size of foundations. The ancillary structure design standards were also updated to reflect the new design criteria.

     - **Wave Vulnerability.** In September of 2004, Hurricane Ivan struck the western panhandle of Florida and destroyed a large portion of the I-10 Bridge over Escambia Bay. In August 2005 Hurricane Katrina struck the Gulf Coast and destroyed bridges in Mississippi and Louisiana. The cause of this bridge destruction was determined to be wave uplift and horizontal forces due to wave action. Shortly after the destruction of the I-10 Bridge over Escambia Bay, the Department began research to determine the magnitude of forces capable of destroying bridges due to wave action, and conditions under which these forces can be generated. Research into the I-10 bridge collapse and two independent studies of wave action in the Keys and in Tampa Bay, allowed researchers to predict the climatic and bathometric conditions under which bridge destroying waves can be generated. Some of the factors that affect storm surge are bay bathymetry, storm direction, storm duration, fetch, tides, current, horizontal channel restrictions, etc. Storm surge will vary depending upon these parameters. A study of bridges in Tampa Bay determined that depending upon storm surge, wave height and current speed, many bridges in Florida could be destroyed by wave action, and there is no practical way to strengthen them. Subsequent to these studies, the Department determined the location of all wave vulnerable state bridges in Florida, and developed Emergency Response Plans (ERP). ERPs plan for possible damage to or loss of bridges and include detour plans, emergency contacts, utility disruption, boat landings, ferry slips, airport locations, resource availability, etc. New bridges are designed to clear storm surge or to resist wave action forces.

- **Manage/Maintain.** The Department will continue to prioritize operations and maintenance activities that contribute to risk mitigation (e.g., culvert maintenance) and develop emergency response plans that emphasize active monitoring and management (e.g., bridge scour monitoring) before, during, and after flooding events. The 2013 State of Florida Enhanced Hazard Mitigation Plan addresses the prioritization of operations in the event of a hurricane.

- **Develop redundancy.** The Department will continue to prepare for intermittent loss of service by developing alternate routes or services through system expansion and/or by instituting emergency detour plans and support infrastructure (such as ITS). In most current infrastructure development planning efforts, redundancy is considered.

- **Abandon/Relocate.** In accordance with federal rulemaking, the Department will develop a policy to address the most vulnerable infrastructure, including the possibility of relocating roadways, bridges, or other assets to lower risk areas.

    - **"Florida Scenic Highways" and "National Scenic Byways" Designated Routes** – It must be noted that the majority, if not all, of Florida's most vulnerable pavements have been designated as a "Florida Scenic Highway". The Florida Scenic Highways Program was established to showcase the outstanding intrinsic resources (cultural, historic, archaeological, recreational, natural and scenic) that can be found along Florida's highway system. There are 26 Florida Scenic Highways. Of these, 5 are further designated at a federal level as National Scenic Byways, and 1 is designated as an All-American Road. These roads will never be closed nor relocated as they are too important to the tenets which warrant their designations. As such, they will also be given re-building priority when damage occurs due to hurricanes, flooding or other wet-weather events.

        - US 98/SR 30 – Big Bend Scenic Highway; *American Byway*
        - US 90/SR 30 – Pensacola Scenic Bluffs Highway
        - US 1/A1A – Historical Coastal Byway, and Scenic Highway; *American Byway*
        - US 1/A1A – Florida Keys Scenic Highway; *American Byway; All-American Road*

2. **Assets are damaged or destroyed due to flooding, sea level rise and wet weather events.**
   Mitigation Strategy:
   Flooding, sea level rise and other wet weather events can undermine roadways and bridges, can increase scour on bridge piers and can carry debris which causes impact damage to assets. The Department's mitigation strategy is explained above.

3. **Bridges are damaged or destroyed due to scour.**
   Mitigation Strategy:
   Scour is the wearing and erosion of soil around bridge piers through the movement of water. In the early 1990's the FHWA mandated that all states evaluate all bridges over water for scour susceptibility. A subsequent letter from the FHWA dated January 9, 2008 mandated all bridges with insufficient foundation data, identified as an Unknown foundation, must also be resolved. Bridges with foundations in water bodies have been evaluated with HEC 18 (Evaluating Scour at Bridges) where sufficient foundation data is available. Where sufficient foundation data is not available, bridges with foundations in water bodies have been evaluated with a special evaluation methodology

developed for the Department and documented in Procedural Manual (discussed in detail in the "Unknown Foundations" paragraph below): Reclassify Unknown Foundation Bridges. Foundations found to be unstable through evaluation were identified as scour critical. For each scour critical bridge, a flood/scour event mitigation Plan of Action is developed, including either a monitoring plan or installation of scour countermeasures as warranted.

- **Unknown Foundations.** Due to historical events involving the failure of bridges over water due to scouring of the foundations, the FHWA mandated that all states evaluate all foundations located in a water body for scour. This includes those foundations where necessary data for a standard evaluation is not available, otherwise known as an unknown foundation. To address the unknown foundation bridges, a special evaluation program was implemented involving the "Risk Based Management Guidelines for Scour at Bridges with Unknown Foundations" (NCHRP Web Only Document 107) risk of failure methodology to classify bridges based on probabilistic cost. In addition, other risk based methodologies were used to determine pile embedment and pile capacity including: Historical pile driving data; artificial neural network analysis; and reverse engineering. The Department developed Action Plans for all Unknown Foundation and Scour Critical Bridges to be able to respond to the possible loss of these structures.

4. **Culverts and other drainage facilities fail (blockages or overtopping) unexpectedly.**
   Mitigation Strategy:
   Severe blockages or immense rainfall can cause failures. In addition, the potential for collapse due to loading or structural failure can impact roadway networks. Culverts and other drainage facilities fail (blockages or overtopping) unexpectedly. Severe blockages or immense rainfall can cause failures in pavement. In addition, the potential for collapse due to loading or structural failure can impact roadway networks. Although the Department cannot prevent the intense precipitation events that may instigate culvert failure, the agency does manage its culverts to mitigate the risk of failure, including:

   - **Maintenance.** Even when properly sized, culverts may fail if they are clogged with silt or debris.

   - **Drainage Design Guidelines.** Particularly for higher functional classification facilities, design guidelines will be modified for the installation of drainage infrastructure intended to handle more significant (lower recurrence interval) flooding events and/or for the substitution of more resilient designs (such as box culverts or bridges in place of cylindrical culverts). Upgrades could be performed during the normal asset renewal cycle, or, for example, as a component of projects to enhance fish passage.

     - One external risk that has been identified is that FEMA funding will only replace drainage structures "in kind". This often leads to the Department only repairing or replacing damaged structures back to their original condition due to the race to get the facility back open to traffic as fast as possible.

5. **Sinkholes emerge under or near roadway sections compromising foundation.**
   Mitigation Strategy:
   Sinkholes, either naturally occurring or due to infrastructure issues (water pipe seepage) compromise pavement integrity and are potentially catastrophic events. Failures occur rapidly. Sinkholes emerge

under or near roadway sections compromising foundations. Depending on whether sinkholes are natural or artificial in origin, the Department will employ various strategies to help manage risk. Options differ depending on whether sinkholes are natural or artificial:

- **Natural Sinkholes.** Natural sinkholes form most commonly where karst geology is present—typically associated with soluble rocks such as limestone or gypsum. Soluble subsurface rocks can, over time, erode due to percolation of surface water or underground flows. The Department will mitigate natural sinkhole risk by monitoring conditions where assets sit atop karst geology (and, presumably, where sinkholes have appeared in the past)—although this strategy is likely only sustainable for a select few critical assets. The Department will continue to work with other partners such as the Florida Geological Survey to identify possible strategies to minimize risks associated with sinkholes.

- **Artificial Sinkholes.** Artificial sinkholes occur most frequently in urbanized areas due to sewer or water pipe leaks, which erode subsurface stabilizing materials, or when large diameter pipes fail structurally. Over time, the Department manages these risks by developing additional information on the subsurface elements. Communities with subsurface water and wastewater pipes can be encouraged to develop a robust inventory of subsurface infrastructure, with information on age and condition, that—with knowledge of typical deterioration curves—could help identify high risk facilities. Large diameter pipes beneath critical infrastructure may be monitored remotely, by camera, and major new pipes could feature fiber optics or other Nano-sensing technology to alert the Department of significant leaks or imminent structural failures.

6. **Assets are damaged or destroyed due to vehicle impacts, fire, deterioration and/or hazardous materials spill**.
   Mitigation Strategy:
   Vehicle impacts to bridges can cause serious damage. Damage can also be caused by water borne vessels such as cargo ships if they hit a bridge.

   - **Over-Height and Overweight Vehicles.** Over-height vehicles impact bridges causing damage. Overweight vehicles have the potential to damage the bridge by exceeding the safe load carrying capacity of the bridge. Some over-height and overweight vehicles travel without obtaining a permit or exceed the allowable dimensions or weight limits of the permit, thereby increasing the possibility of damage to the transportation system. Florida Statute 316.550 grants the Department the authority to issue permits for over-dimensional and overweight vehicles on the state and national networks. Florida Administrative Code 14-26.00411 requires haulers to survey routes to determine that their over-dimensional vehicles (for height, width and/or length) can safely traverse their permitted route, and requires haulers to carry a copy of the Survey Letter onboard for vehicle heights greater than 15 feet and for vehicle widths greater than 16 feet. Over-dimensional and overweight vehicles are processed through the Department's Permit Application System (PAS). For overweight vehicle blanket and trip permits, PAS automatically determines which of the Departments' 6 bridge restriction maps is appropriate. Trip permits with heavier overweight vehicles that exceed map weight parameters are processed using the Department's Automated System for Approximate Bridge Evaluation program to determine an appropriate route and operational parameters. On rare occasions, the Department will use refined analysis to determine parameters under which an overweight vehicle can safely pass. Over-dimensional

vehicles that exceed 16 feet width require District input to make sure there are no maintenance operations, construction operations or other events scheduled that could limit the width of the roadway prior to granting the permit. Enforcement for over-dimensional and overweight vehicles is provided through the Department's Motor Carrier Size and Weight Office that operates the weigh-in-motion scale facilities, and through the Florida Highway Patrol's (FHP) Commercial Vehicle Enforcement Unit. Bridges impacted by vehicles are repaired and third-party reimbursement is sought.

- **Ship Impact.** On May 9, 1980, a cargo ship struck the Sunshine Skyway Bridge (I-275 over Tampa Bay). The impact caused a collapse of the I-275 southbound lane across the ship channel span and an adjacent pier, which resulted in the deaths of 35 people. This tragedy brought focus to the safety of bridges that cross navigable waterways. The replacement for the Sunshine Skyway Bridge was designed to be capable of resisting forces caused by predicted ship impact. Simultaneous with the replacement effort for the old Skyway Bridge, the Department began research to develop design criteria that will enable a bridge to absorb impact from the largest tonnage vessel utilizing the waterway. The resulting design criteria determines the tonnage in conjunction with the statistical possibility of a vessel impacting a bridge during its lifetime that would cause a bridge to collapse. The criteria that was developed includes lower magnitude loads for portions of the bridge farther away from channel spans, based on statistics, and design criteria that allows bridge damage without causing a collapse. The outcome was that all bridges built over navigable waterways since the collapse of the old Sunshine Skyway bridge have been designed to resist ship impact. The design criteria developed by the Department was the basis of the American Association of State Highway and Transportation Officials (AASHTO's) current ship impact design criteria. Due to the magnitude of ship impacts in Tampa Bay, protective dolphins were used to prevent ships from striking the channel piers for the new Sunshine Skyway Bridge.

Hazardous materials can include both those which are explosive or combustible as well as those which are corrosive. The corrosive materials can cause permanent damage to the pavement surface.

- **Fire.** Fires can occur in several areas around a bridge and there are various possible causes of these fires. The common areas where fires occur are: on the deck; under the deck; around columns; and movable bridge control houses. Causes of fires can be: overturned tanker trucks; tanker trucks colliding with bridge elements; and combustion of flammable materials stored around the bridge. The prevention of fires around the control house is handled with fire suppression systems and safe operating practices. The mitigation of fire due to stored materials has been addressed by effective policies and practices reducing or eliminating the possibility of fire. The overturning and impact of tanker trucks around a bridge are random events that are addressed by placement of crash tested barriers around vulnerable bridge elements, and by the quick and effective response to an event through performance based asset maintenance contracts. When a bridge is damaged by a fire, the Department uses its emergency contracting process to expedite the restoration of normal traffic flows.

- **Deterioration.** Deterioration occurs to bridges as they age. Most of deterioration is due to corrosion due to chlorides causing the corrosion of steel members or steel reinforcement. During routine inspection defects are identified, repairs are recommended and action is taken. Some repairs (e.g. repair of leaking joints) prevent or delay the start of corrosion. Addressing protective

systems to ensure that they are effective will also minimize deterioration. In addition, repairing small deteriorated areas prevents the need for costlier repairs that would occur later. The Department seeks to prevent or minimize deterioration through improved design. These include increased concrete cover in aggressive environments, the use of denser concrete and using corrosion proof or corrosion resistant reinforcement for reinforced concrete and prestressed concrete elements.

The Department can exert control over aspects of the HAZMAT transportation process, including:

- **Endorsements.** The Florida Department of Highway Safety and Motor Vehicles (DHSMV) already has a process in place for providing HAZMAT endorsements to CDL holders. If warranted, this process will be reevaluated and made more stringent.

- **Registration.** Currently, under the Hazardous Materials Transportation Authorization Act (HMTAA), anyone who transports a highway-route controlled quantity of hazardous materials must register with the FDOT. The Department (the Secretary, specifically) has the discretionary power to require anyone transporting any quantity of hazardous materials to register with FDOT, meaning that the Department can, in principle, lower the hazardous materials quantity thresholds to reduce spill risks.

- **National Hazardous Materials Route Registry (NHMRR).** Currently, routes designated for the transport of hazardous materials are available from the National Hazardous Materials Route Registry (created by the Federal Motor Carrier Safety Administration). The Department could further restrict routes, selecting a subset of the NHMRR—potentially with different routes for different types of materials—that reduce risk and exposure.

- **Penalties.** Currently, fines for violating the HMTAA are limited to $55,000 per day, and imprisonment is limited to 5 years in the instance that a violation results in bodily injury (10 years if it results in death). The Department could explore options for increasing the maximum allowable fine and/or recategorizing the associated criminal penalties to permit longer sentences.

- **Enforcement.** The Department could work with local, state, and federal law enforcement to more aggressively identify and prosecute violators, with particular emphasis on protecting critical facilities and/or high population areas.

7.7 Periodic Evaluation of Facilities Repeatedly Requiring Repair and Reconstruction Due to Emergency Events (23 CFR Part 667)

Pursuant to 23 CFR Part 667, the Department identified and conducted statewide evaluations to determine if there were reasonable alternatives to NHS roads, highways and bridges that required repair and reconstruction activities on two or more occasions due to emergency events. The evaluations covered the period January 1, 1997 through December 31, 2017 and excluded tribally owned and federally owned roads, highways and bridges.

For NHS roads and highways, SR-5/US-1 (Overseas Highway) in Monroe County sustained washouts and developed sinkholes from hurricanes (Table 13).

Table 13: Permanent Repairs on NHS Roads & Highways (2 or more Occurrences)

FDOT District	County	Route Name	Event	Landfall Date
6	Monroe	SR-5/US-1	Hurricane Wilma	10/24/2005
			Hurricane Irma	09/09/2017

Although the entire stretch of the Overseas Highway in the Florida Keys is susceptible to storm damage, the District identified the stretch of roadway around mile marker (MM) 75 as the most critical segment for hurricane damage. This area is known as the Sea Oats Beach/The Fills area.

The embankment for the Overseas Highway is built over sandy and organic soft soil which is classified as extremely weak embankment strength. There is also a high-water clearance issue for this state road throughout the Florida Keys (high-water fluctuates with the ocean tides). This is a contributing factor to the recurring damage.

A permanent solution could include a combination of a pavement design that includes a geotechnical component along with the raising of the Overseas Highway. A conservative pavement design restricted to asphalt base only (B-12.5) would help mitigate the design high water issue, increasing the clearance between the base and the water table, with facilitation of maintenance of traffic and constructability as secondary benefits.

The geotechnical component could consist of soil reinforcement with biaxial geogrid compatible with asphalt base to prevent differential settlements and future roadway washouts in hurricane conditions. The optimal pavement design with soil reinforcement, would have an estimated construction cost of approximately $ 832,270 /per mile.

Ultimately, the District recognizes the permanent way to address future sea level rise and hurricane damage to the pavement is to raise the Overseas Highway. In order to plan for this effort, the District is currently undertaking an evaluation of sea level rise in Monroe County to determine what the future Design High Water (DHW) could be along the Overseas Highway. The District has also programmed a project (FM: 443307-2) to address the design of the project to raise the Overseas Highway along MM 75. This project, once construction funds are programmed, could let in early 2026.

In the meantime, a project is currently being designed to add enhanced erosion protection along the Sea Oats Beach/Fills area as an interim improvement until the raising of the road is realized. This project is expected to let in May 2020.

For NHS bridges, none of Florida's NHS bridges were found to have sustained permanent repairs on two or more occasions due to an emergency event. The Department did flag projects with permanent repairs occurring only once to assist with future updates to 23 CFR Part 667.

7.8 Summary

The Department continuously engages in efforts of identification and response to top priority risks at the Agency, Program and Asset Levels to ensure pavements and bridges on the SHS, which includes the majority of NHS, are in a SOGR.

If the Department were to experience impacts and uncertainty of revenue, capacity projects would be reprioritized and/or deferred to minimize the financial and budget risks. The Department also monitors trends in construction cost indicators to allow for better estimates, indexes the cost of fuel and bituminous and periodically reviews and updates design standards to enhance the resiliency of the transportation infrastructure.

These strategies are included in the Life-Cycle Planning for the pavement and bridge assets to help inform funding projections.

Chapter 8 Life-Cycle Planning

The overriding principle in project selection is meeting established performance standards. The Department has a well-established philosophy, codified in statute, to direct funding and to maintain performance standards. The life cycle approaches described here supplement that decision making process, ensuring that Florida's pavements and bridges remain at or above established standards, which also helps support progress towards achieving the targets established for asset condition and performance of the NHS, since the SHS includes the majority of the NHS.

8.1 Pavement Assets

The Department uses an in-house-developed Pavement Management System (PMS) to manage its pavement assets. As explained in Chapter 4, every year pavement condition surveys are conducted to monitor and collect the performance and condition of the entire SHS, which includes the majority of the NHS, in support of the Department's pavement management program. The pavement data is processed and stored in the PMS which contains more than 40 years of historic pavement condition data.

The Department also collects data for state and locally owned assets through the Highway Performance Monitoring System (HPMS). This data is used for assessing and reporting highway system performance under FHWA's strategic planning process and is provided to the local owners upon request.

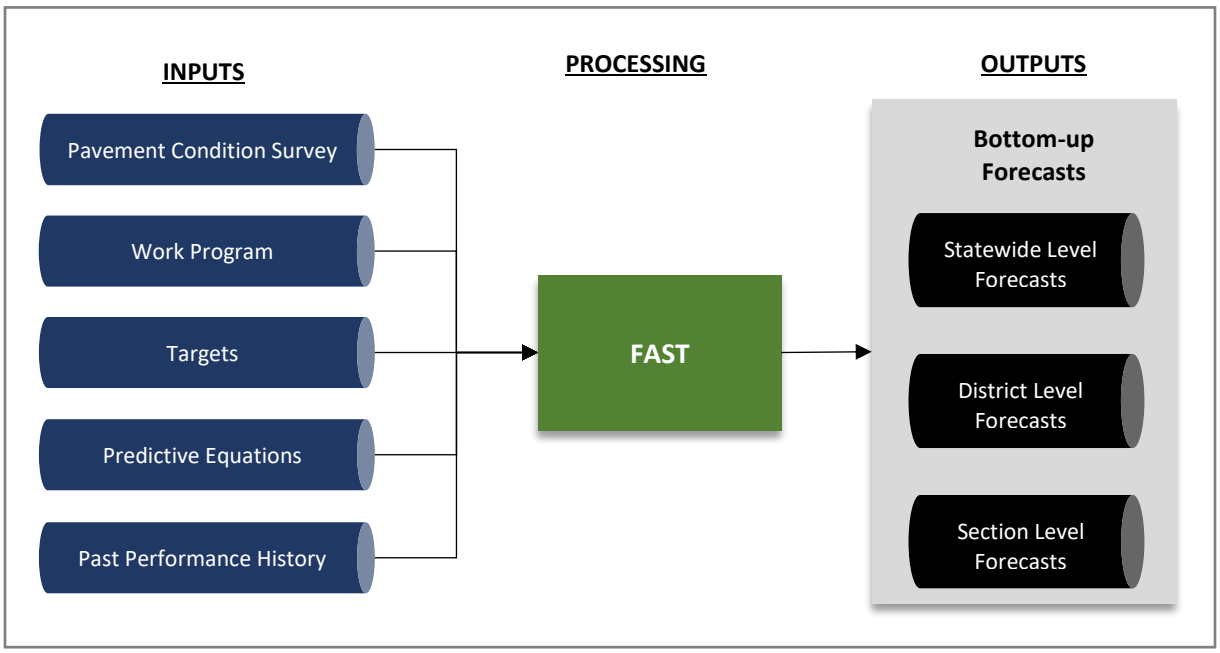
With such robust historic information, the Department has a very good understanding of how its pavements deteriorate. So, the rate of deterioration is balanced by the rate of resurfacing. Projects are chosen in accordance with the criteria of safety, preservation of the system, ride and other metrics as needed to maintain the integrity of the SHS, which includes the majority of the NHS.

Prior to 2009, the Department used a formulaic approach to pavement resurfacing project selection (target setting). Based on average pavement life, this approach dictated that approximately 5.3 percent of the statewide lane-miles be resurfaced based on deficiencies.

The Florida Analysis System for Targets (FAST) was created to provide a stronger analytic approach to the resurfacing program to meet the 80 percent non-deficient statewide standard. FAST is the predictive engine of the Department's PMS. One of the inputs to FAST is the Work Program, which includes projects from all the modal offices as well as the Metropolitan Planning Organizations (MPOs). This allows FAST to better prioritize pavement projects in conjunction with planned projects from the other offices.

Based on historical performance information in each district, FAST relies upon customized regression equations to forecast performance. Crack ratings and other predictive indicators are also used to estimate the optimal allocations. This allows for a more detailed forecast analysis, allowing pavement management staff to run a variety of funding scenarios with a Benefit-to-Cost algorithm, to help optimize project selection for decision-makers. FAST also provides the ability to calculate future resurfacing allocations based on current inventory, top priority risks, forecasted conditions including system growth projections, impact analysis for the funding scenarios, and has improved section level condition forecasts across the SHS, which includes the majority of the NHS.

Figure 18: Florida Analysis System for Targets (FAST)



Source: Source: FDOT, Pavement Management Office.

The Department currently designs pavements with a standard design life of 20 years. This allows for statewide consistency in pavement life, although there have been expected differences between pavements in the various regions of the State.

For economic valuation, the Department assumes the following:

- A discount rate of 3.5 percent on all pavement treatments.
- A construction cost inflation rate as shown in Table 14 below. The construction cost inflation factors may be adjusted due to site-specific factors.
- No depreciation expense is reported for Florida infrastructure assets, nor are amounts capitalized relating to improvements that lengthen the lives of such assets, unless the improvements also increase their service potential.

The Department tracks the capital costs of pavement projects as well as the costs to maintain pavement to a specific level of service. However, reliable cost data for maintenance, subsequent stages of construction, or corrective work and salvage value are not always available.

The Department selects pavement materials based on life cycle costs. The selection of pavement type is a process in which the highway engineer or administrator makes a judgment on many factors such as traffic, soils, weather, materials, construction, economic costs, maintenance, and environment. The pavement type selection may be dictated by an overriding consideration for one or more of these factors.

Table 14: FDOT Work Program Highway Construction Cost Inflation Factors, 2017-2037

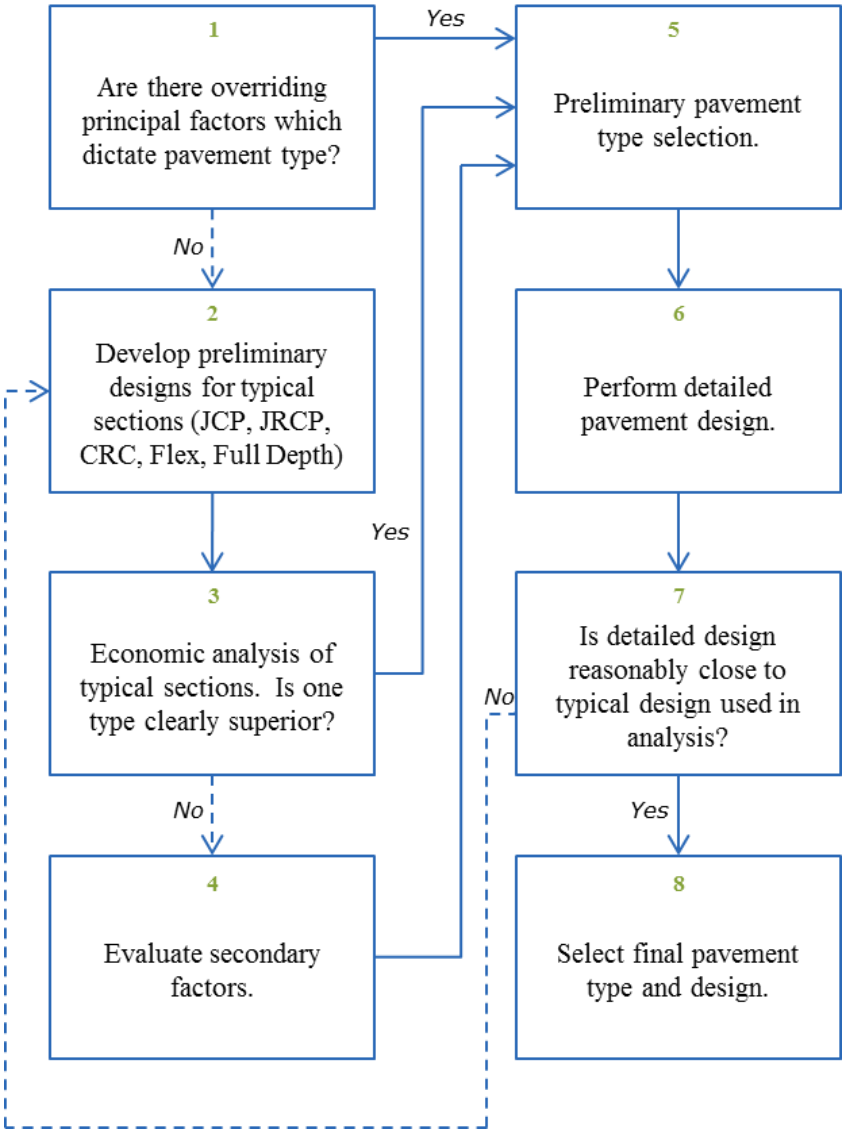
Year	Inflation Factor	Present Day Cost (PDC) Multiplier	Year	Inflation Factor	Present Day Cost (PDC) Multiplier
2019	Base	1.000	**2030**	3.3%	1.381
2020	2.6%	1.026	**2031**	3.3%	1.427
2021	2.6%	1.053	**2032**	3.3%	1.474
2022	2.7%	1.081	**2033**	3.3%	1.523
2023	2.8%	1.111	**2034**	3.3%	1.573
2024	2.9%	1.144	**2035**	3.3%	1.625
2025	3.0%	1.178	**2036**	3.3%	1.679
2026	3.1%	1.214	**2037**	3.3%	1.734
2027	3.2%	1.253	**2038**	3.3%	1.791
2028	3.3%	1.295	**2039**	3.3%	1.850
2029	3.3%	1.337			

Source: FDOT, Office of Work Program and Budget and Office of Policy Planning (Fiscal Year 2019 is July 1, 2018 to June 30, 2019) as of April 24, 2019.

Where there are no overriding factors and several alternate pavement treatments or types would serve satisfactorily, the Department uses cost comparison to assist in determining pavement type. These comparisons include the initial cost of the pavement and the cost to maintain the service level desired. It should be recognized that such procedures are not precise since reliable cost data for maintenance, subsequent stages of construction, or corrective work and salvage value are not always available, and costs often need to be projected to some future point in time.

Figure 19 below, shows the typical approach for pavement selection decision making within the Department. In stage three of the process, the economic costs are considered, including the maintenance cost component. User costs are not considered in this analysis. Costs are compared based on the net present value incorporating the construction cost inflation and discount rate.

Figure 19: Pavement Type Selection Process



Source: Adapted from Pavement Type Selection Manual, October 2013

The Department selects pavement type based on life cycle costs, with a few exceptions as described by AASHTO. Replacement or reconstruction is required when an asset has reached the end of its service life and can no longer be extended through resurfacing, repair, or rehabilitation. New resurfacing projects are programmed three years into the future and resurfacing dollars are allocated for the new 5th year of the Five-Year Work Program based on expected pavement condition ratings.

8.1.1 Pavement Results

Because most Florida pavements experience deterioration initiating near the surface (e.g. top-down cracking and raveling), it has been the Department's standard practice to mill and resurface. The pavement condition rating that "triggers" a resurfacing project for the Work Program is set such that the cracks have not propagated down to the base so water is not saturating the base layers by the time the pavement is resurfaced.

The Department has previously justified the policy of not performing "preventive maintenance" on the SHS, which contains the majority of the NHS, by life cycle cost analysis and lack of data quantifying the estimated life of all preventive maintenance treatments. The Department's average mill and resurfacings can be considered "thin overlays" and prior to FHWA changing their definition of "pavement preservation", the majority of the Department's mill and resurfacings qualified as such.

The mill and resurfacing policy has proven to be the best use of taxpayer dollars and provides the Department additional confidence that the forecasting models used in pavement management for budgeting purposes are as accurate as possible. See Chapter 5, section 5.3 for funding allocations for the NHS.

8.2 Bridge Assets

The Department uses AASHTOWare™ Bridge Management Software (BrM), formerly Pontis, to inform bridge management decision making. BrM 5.2.2 is the Department's current production version. It has the capability to collect inspection and inventory data, and with the Department's customization, produce inspection reports and other reports required by the Department. There is an updated version the software (BrM 5.3) that the Department is reviewing. It has additional features including performing various life cycle cost analysis and benefit cost analysis.

The Department collects inventory and condition data for state as well as locally owned assets through the Department's bridge inspection program. Data is provided to the local bridge owners upon request. The bridge inspection program plays an integral part in the asset management of the bridge inventory in that much of the data concerning bridge condition and performance is gathered from inspections. Also, bridge repair work and bridge replacements based on condition are initiated through the inspection process.

Inspectors use the Department's Bridge Inspection Field Guide to ensure bridges are inspected consistently and systematically. Bridges are inspected at least once every two years to assess their condition and to identify structures that require further maintenance, rehabilitation, or replacement. Bridges in Poor condition are inspected more frequently. The exception to this are a class of low risk bridges that will be inspected every four years. Special inspections are conducted after major weather events, such as floods and hurricanes.

The inventory and condition data collected is stored in the bridge management system database. The data is updated during each inspection event and after construction that results in changes to the inventory data. The Department processes the data using BrM, therefore each time the models are run, the results reflect the most current inventory. Customized bridge inspection, inventory and other frequently used

standard reports have been developed. In addition, the Department collects state specific data which is also stored in the database.

From 1998 through December 2016 the Department inspected bridges with the Commonly Recognized Elements (CoRe) for bridge inspections. This data and other research was used to develop the Department's bridge deterioration curves.

The Department recently moved to the new AASHTO Bridge Management Elements (BME) for bridge inspections. With this move, a research project was performed to create a starting point to predict deterioration of the BMEs. Once several cycles of element condition have been collected, the deterioration models will be updated. This will allow the Department to predict future deterioration of the bridges using BrM or other appropriate software.

In terms of benefit/cost, the Department does perform benefit cost analysis over the life cycle of the bridge assets. The analysis includes "no action" options and is conducted using the most suitable software based on the type of evaluation.

For example, for a system level analysis of a bridge (either District or Statewide) the objective is to coordinate the overall bridge inventory condition with the budgetary needs. The Office of Maintenance will periodically perform statewide system analysis to review overall system performance versus budgetary needs.

This includes looking at tradeoffs between funding and performance of the system or various subsets of the system. The District Structures Maintenance Offices in each District also periodically performs a districtwide system analysis to assist each District in managing its bridge inventory.

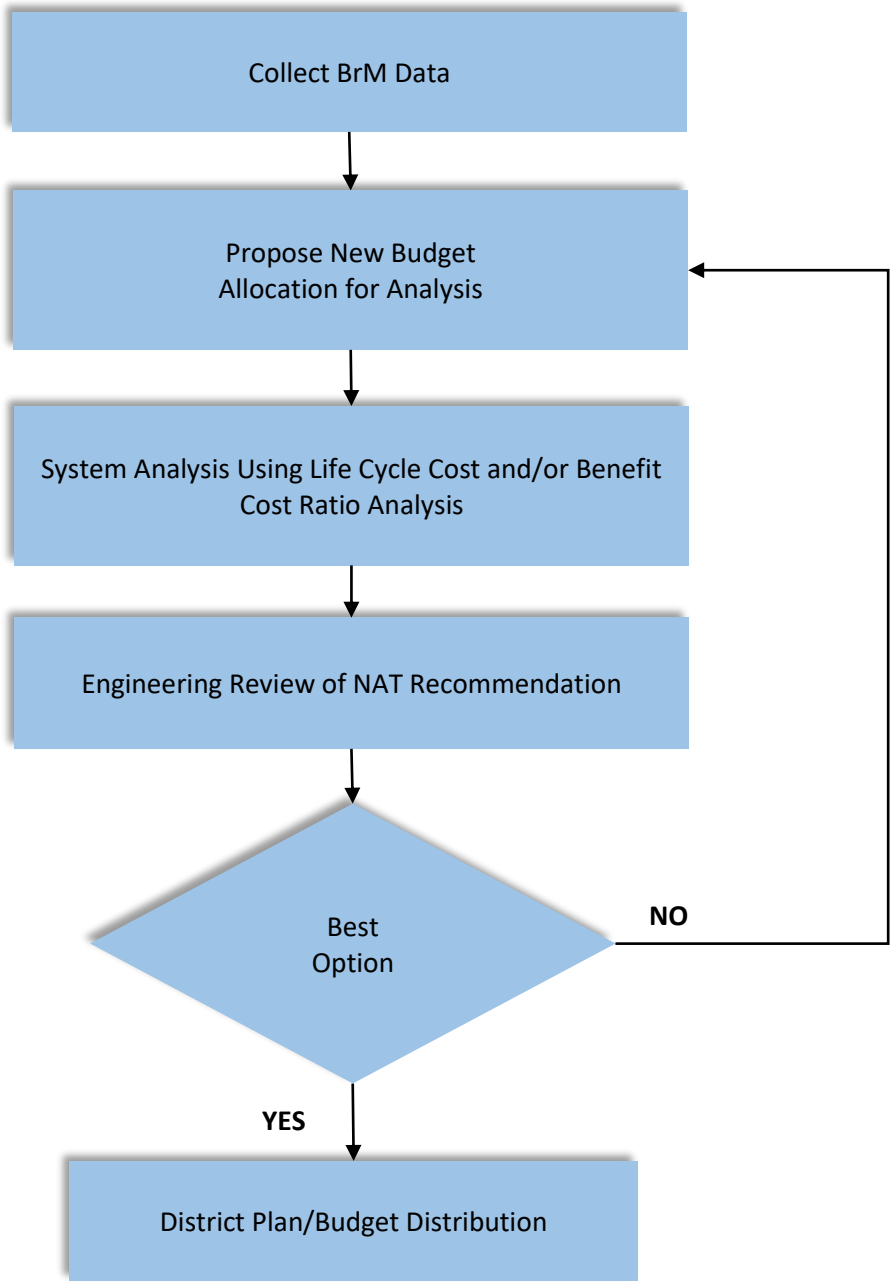
This level of analysis may also provide a general view of weaknesses and strengths in the inventory, and areas of work to emphasize to achieve maximum performance. The Department will evaluate the system analysis capabilities of the BrM Bridge Management System to determine if it meets the needs of the Department. The Department may also use the Network Analysis Tool (NAT) which is a decision support tool developed through Department sponsored research.

The NAT is an excel based application that combines the results of the Project Level Analysis Tool (PLAT) to provide a network level perspective on the tradeoffs between funding and performance of the entire bridge inventory or a specified portion of the inventory.

The inventory analyzed may be broken down by District, Functional Class, or Structure Type. Various performance measures may be analyzed such as percent Good/Excellent condition, health index, paint health index, or life cycle costs. In addition, the application allows for the use of specific budgets or desired performance levels.

A flow chart of the system level analysis process is shown in Figure 20.

Figure 20: Bridge - System Level Performance Analysis



Source: FDOT, Office of Maintenance.

Please refer to the next page for a description of the flowchart elements.

Flowchart Element Descriptions

Collect BrM Data – The data in BrM is collected as part of the bridge inspection process. This data is an input into analyses performed by various software.

Propose New Budget Allocation for Analysis – The analysis process uses an assumed budgetary value input into the system. Because of the analysis, the budget may change to support the performance objectives.

System Analysis Using Life Cycle Cost and/or Benefit Cost Ratio Analysis – The System Analysis may utilize one or both Life Cycle Cost Analysis or Benefit Cost Ratio Analysis to produce its conclusions. This process is run internally.

Engineering Review of Network Analysis Tool (NAT) Recommendations – District or Central Office personnel will consider the recommendations to objectives, priorities, and budgetary restraints. If the recommendations are acceptable, the program will proceed. If the recommendations are not acceptable, input parameters are modified and the analysis is rerun for new recommendations.

District Plan/Budget Distribution – Once the recommendations are accepted, a budget will be established and work need priorities will be established.

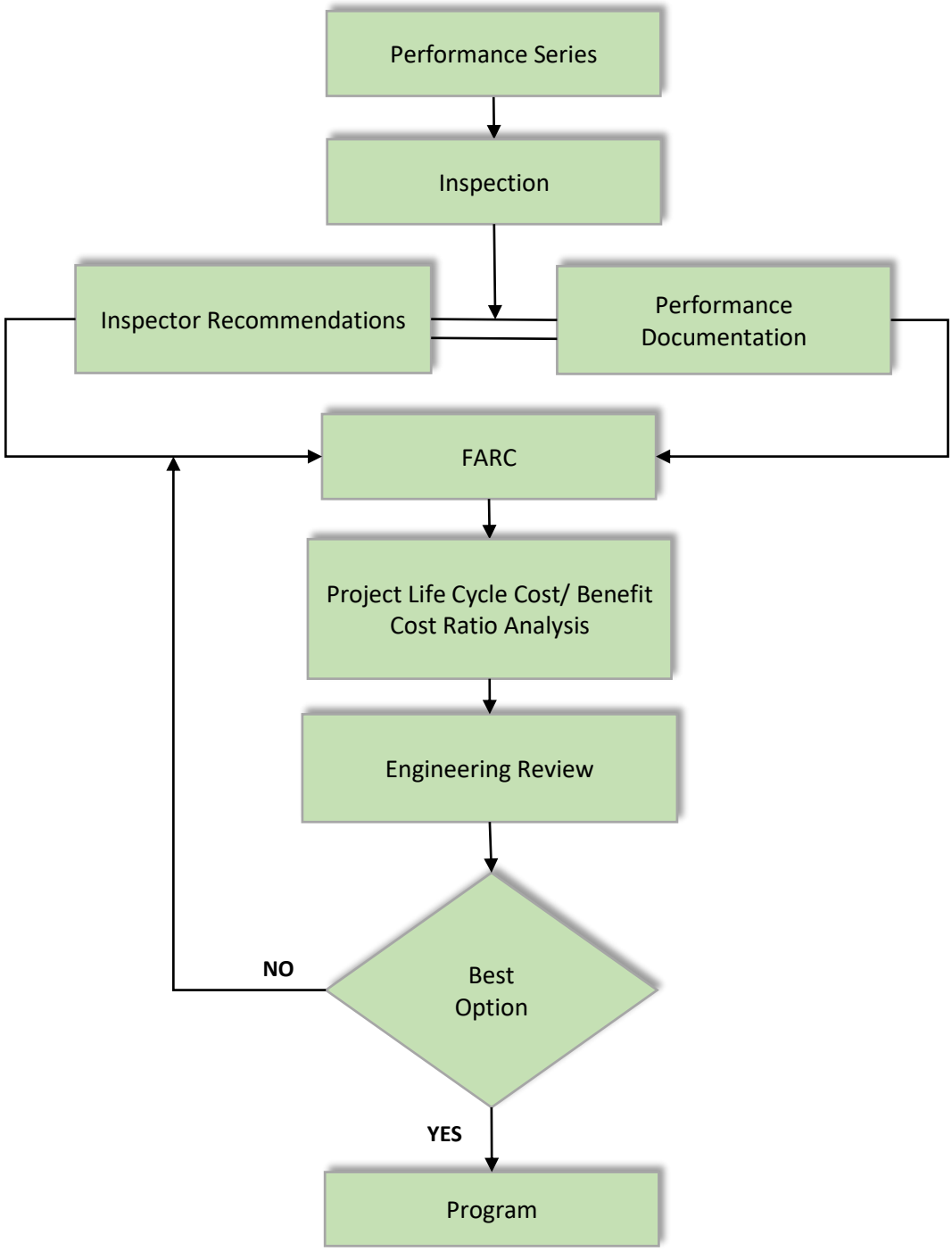
The Department uses the Project Level Analysis Tool (PLAT) to conduct bridge project level analysis. This is also an Excel based tool that was developed through Department sponsored research. It uses data from the BrM database and performs life cycle analysis at the bridge level. PLAT automatically analyzes three scenarios; do nothing, repair and replace.

Risks of natural and man-made hazards are quantified as social costs to the public and the Department. User costs due to functional deficiencies and delays are estimated. Benefits are determined by the reduction in social and user costs due to the actions performed. This is compared to the costs of the proposed project to determine a benefit cost ratio.

PLAT also allows the user to customize and evaluate the impact of the timing of projects. The user can place proposed projects in any year of a ten-year period and the tool will project the element level deterioration until the project is executed. The elements that are part of the project are assumed to return to Good condition (or state 1) and deterioration is assumed to begin again. This allows the user to observe the associated impacts of the project and adjust as necessary.

Figure 21 below illustrates the Department's project level analysis for bridges.

Figure 21: Bridge - Project Level Performance Analysis



Source: FDOT, Office of Maintenance.

Please refer to the next page for a description of the flowchart elements.

Flowchart Element Descriptions

Performance Series – The performance of the bridge as an entire system, or the individual bridge elements is measured against numerous external affects. A Performance Series is an incremental change in the bridge condition that can be measured, as a result of these external affects. These conditions can act slowly, such as with rusting steel, or they can act quickly, such as with wave impact from storm surge. The Series represents a chronological history of the system, sub-system or element performance based on condition or functionality. With regard to risk management, the Performance Series represents the fundamental unit of measure for establishing risk and Life-Cycle Costs.

Inspection – The bridge inspection process identifies changes in bridge element condition, performance of bridge preservation systems, and performance of the bridge system and bridge elements. Through the generated bridge inspection report the updated inspection information is recorded into the BrM system.

Inspector Recommendations - The Inspection Report lists work need recommendations based on the inspection observations. These work needs may involve either structural repairs or preservation needs.

Performance Documentation – Historical documentation relating to structural performance of the bridge elements for the specific bridge and related bridges will be accessed and used in the decision-making process.

FARC – The Feasible Action Review Committee (FARC) consists of District bridge maintenance personnel and, as necessary, asset maintenance personnel. The Committee's primary purpose is to identify, prioritize, and schedule bridge (and other ancillary structure) work needs. As part of the decision-making process the FARC will utilize input from various sources, including modal plans. The FARC will have responsibility for executing the final decisions concerning bridge work needs.

Project Life Cycle Cost and Benefit Cost Ratio Analysis – As part of the decision-making process the FARC will reference BrM and PLAT asset management programming concerning Life Cycle Cost and Benefit Cost Ratio Analysis. Results of the analyses will be recorded and referenced in the final decision process.

Engineering Review – The FARC will coordinate with District production and operations management during the Project Level decision-making process. Decisions will be modified as necessary to align with the goals and objectives of the District and the FTP. The FARC will record results of the coordination meetings.

Best Option – The FARC will consider input from: the inspectors; bridge element performance history; Life Cycle Cost and Benefit Cost Ratio Analysis; and District and State planning goals and objectives. The FARC will decide whether the work action sufficiently satisfies all inputs. If the work action sufficiently satisfies the requirements, the work action is prioritized and programmed. If the work action does not satisfy the requirements, the committee will consider an alternative course of action.

Program – The District Bridge Maintenance Office will assign the work action for disposition to the appropriate group: maintenance yard; internal personnel; consultant or asset maintenance contractor. A key component of the Department's bridge management system is the consideration of short and long-term budgeting needs for bridge repair and replacement. These needs are developed at the District level and are based on the bridge inspection process and NBI inspection data stored in the BrM system. Each District bridge maintenance office conducts periodic meetings to review inspector recommendations from inspection reports and to identify work needs. The work needs are then prioritized by District staff and candidate construction projects are created, including project budgets. The Department's Central Office collects all the District bridge work needs and creates a statewide Bridge Work Plan. That statement of needs is submitted to the Office of Work Program and Budget and is included for discussion at the Department's annual summer Program Planning Workshops for development of the Five-Year Work Program.

8.2.1 Bridge Results

To optimize project selection, the Department uses the NAT and PLAT in conjunction with the BrM 5.2.2 to analyze tradeoffs between funding and performance of the bridge inventory. For bridges, the Department defines the financial investment categories as follows.

- **Construction:** complete replacement of existing bridge structure.
- **Reconstruction:** major repairs of existing bridge structure based on the original design standards.
- **Rehabilitation:** major repairs of existing bridge structure based on the current design standards.
- **Preservation:** work performed to protect or extend the service life of the bridge structure, such as painting; crack sealing; joint repair or replacement; or scour countermeasures.
- **Maintenance:** minor repair or replacement of bridge components such as patching spalls; lubrication of moving parts; replacement of lost or damaged parts; or deck cleaning.

See Chapter 5, section 5.3 for funding allocations for the NHS.

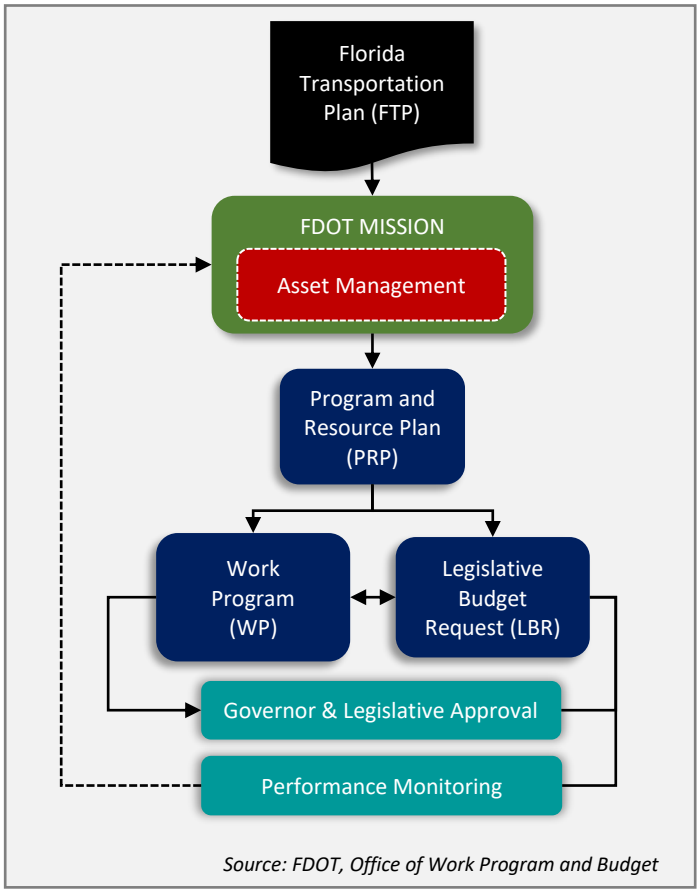
Chapter 9 Implementation

Implementation of the processes described in this TAMP are ongoing as they are the Department's current approach to asset management for the SHS, which includes the majority of the NHS. It's how the Department does business (see Figure 22).

To meet the Federal requirements for the risk-based asset management plan, the Department's leadership established a Steering Committee to facilitate the development and oversee the review and updating of the TAMP. The committee is co-championed by the Director, Office of Maintenance and the Department's Performance Coordinator and includes representatives from the following offices and organizations:

- Office of Work Program and Budget
- Public Transit Office
- Office of Policy Planning
- State Materials Office
- Bridge Office
- Office of Information Systems
- Pavement Management Office
- Office of Maintenance
- Safety Office
- Transportation Data and Analytics Office
- Metropolitan Planning Advisory Council (MPOAC)

Figure 22: FDOT Asset Management Process



Source: FDOT, Office of Work Program and Budget

The Department's Performance Management Policy (Topic No. 000-525-052-b) links performance measures to planning and programming decision making.

This helps to inform decisions and provides feedback on the transportation system performance, agency operations and program outcomes.

Performance management encompasses asset management and performance measurement reflecting the Department's priorities for accountability and stewardship of resources.

As stated in the policy, the Department will implement performance management agency-wide by:

- Regularly reporting on performance measures spanning the Department's operations including, but not limited to, transportation system performance measures, production measures and mission-related measures;

- Establishing and maintaining transportation system performance core measures that align with our mission, priorities, and long-term goals;

- Ensuring that our asset management efforts include useful measures of performance;

- Building performance measures into our plans and programs to advance performance-based planning and programming practices;

- Establishing and tracking future performance targets;

- Collaborating among Central Office and District Office staff, including a yearly performance measurement workshop to begin an annual cycle of performance report development;

- Collaborating with MPOs, transit operators and other stakeholders as appropriate for a coordinated approach to performance measurement; and

- Consistently reporting and communicating performance results to be used in informing planning and programming decision making.

Furthermore, because performance management depends on reliable data, Department program and office managers are responsible for coordinating the measures they use to achieve consistent reporting of measures.

In the long-term, the Steering Committee will meet as necessary to:

- Review the TAMP to ensure Department policies and processes are current; and
- Update and resubmit every 4 years per rule requirements for FHWA process certification/re-certification

This schedule will support continued improvement of the Department's asset management practices and enable the Department to continue to provide solid stewardship of Florida's transportation assets.

References

The Florida Department of Transportation Mission

The Florida Transportation Plan (FTP)

The Program and Resource Plan (PRP)

The Work Program (WP)

23 Part 667: Statewide Evaluations

FDOT Transportation Asset Management Plan (TAMP)

Appendix A: Program and Resource Plan Summary FY2018/19 to FY2026/27

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WORK PROGRAM
FILE: 1-July-2018
(Excludes Hurricanes)

FLORIDA DEPARTMENT OF TRANSPORTATION
2017/18 PROGRAM AND RESOURCE PLAN SUMMARY
FISCAL YEARS 2018/19 TO 2026/27
(MILLIONS OF $)

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PROGRAM AREAS	ACTUAL 16/17	PLAN 17/18	First Five Years 18/19	19/20	20/21	21/22	22/23	TOTAL	Next Four Years 23/24	24/25	25/26	26/27	TOTAL	10 YR. TOTAL
I. PRODUCT	5,957.0	5,755.4	8,430.9	6,849.9	5,901.7	6,206.6	6,560.7	**33,949.8**	7,364.3	6,559.6	5,872.3	5,544.7	25,340.9	**65,046.1**
A. State Highway System (SHS)	3,023.9	3,075.0	3,868.6	2,984.1	2,720.8	3,226.5	3,667.6	16,467.7	4,432.7	3,519.6	2,787.6	2,419.8	13,159.7	32,702.3
B. Other Roads	303.2	336.0	547.8	360.2	308.6	266.8	266.6	1,750.0	323.1	328.2	333.7	339.4	1,324.4	3,410.4
C. Right of Way Land	440.5	358.4	1,094.2	550.8	469.0	409.3	322.1	2,845.3	275.2	290.0	279.1	277.0	1,121.3	4,325.0
D. Aviation	241.9	224.3	388.4	225.0	257.1	207.3	244.4	1,322.3	251.4	258.6	266.2	274.3	1,050.6	2,597.1
E. Transit	329.4	340.8	862.6	466.1	425.4	401.9	439.6	2,595.6	462.2	471.0	480.3	490.2	1,903.6	4,840.1
F. Rail	143.4	201.5	340.2	212.6	109.1	127.7	140.8	930.5	165.4	169.6	174.0	178.8	687.9	1,819.8
G. Intermodal Access	41.6	100.5	67.8	46.8	69.8	86.1	90.4	360.8	71.9	73.8	75.8	109.9	331.3	792.6
H. Seaports	138.4	163.2	174.3	129.5	132.6	116.5	117.1	670.1	132.4	135.9	139.7	143.7	551.8	1,385.0
I. Safety	135.5	144.4	201.0	191.4	166.6	139.4	154.1	852.5	170.5	170.5	171.2	171.6	683.8	1,680.7
J. Resurfacing	542.7	522.6	671.2	617.9	877.0	939.0	980.7	4,085.8	868.6	912.4	931.3	902.9	3,615.1	8,223.4
K. Bridge	616.4	288.8	214.9	1,065.4	365.7	286.1	137.2	2,069.3	210.8	230.0	233.5	237.1	911.4	3,269.5
II. PRODUCT SUPPORT	1,654.2	1,635.6	2,239.2	1,624.0	1,398.6	1,370.9	1,533.8	**8,166.5**	1,623.5	1,469.7	1,425.1	1,392.8	5,911.1	**15,713.1**
A. Preliminary Engineering	978.6	949.3	1,244.5	855.9	755.6	687.5	775.5	4,319.1	782.5	765.5	744.1	732.7	3,024.7	8,293.1
B. Construction Eng. Inspection	379.2	419.2	588.1	477.9	386.6	409.1	489.8	2,351.6	542.0	401.0	372.8	340.7	1,656.5	4,427.2
C. Right of Way Support	88.7	80.9	147.0	94.2	76.9	83.8	80.3	482.1	76.2	79.9	79.5	84.8	320.4	883.3
D. Environmental Mitigation	29.8	13.8	35.7	14.7	3.6	10.3	3.5	67.8	8.0	7.6	7.8	8.0	31.4	113.1
E. Material & Research	42.5	44.2	48.9	46.5	47.9	49.3	50.7	243.3	52.6	54.2	56.0	57.8	220.6	508.2
F. Planning & Environment	123.0	115.9	161.1	120.5	112.9	115.3	117.9	627.8	145.5	144.0	146.8	150.0	586.2	1,329.9
G. Public Transport. Ops.	12.4	12.3	13.8	14.3	14.9	15.5	16.1	74.7	16.8	17.5	18.2	18.9	71.3	158.3
III. OPER. & MAINTENANCE	1,203.8	1,248.2	1,407.2	1,398.9	1,446.6	1,474.4	1,493.0	**7,220.1**	1,483.4	1,588.3	1,559.9	1,673.7	6,305.4	**14,773.6**
A. Operations & Maintenance	741.7	756.1	809.3	823.4	846.7	876.2	903.3	4,258.9	884.4	905.3	939.1	962.1	3,690.9	8,705.9
B. Traffic Engineering & Opers.	169.4	187.3	231.9	215.9	239.7	236.5	229.7	1,153.6	231.2	236.7	242.5	248.7	959.1	2,300.0
C. Toll Operations	292.7	304.7	366.0	359.7	360.2	361.7	360.1	1,807.6	367.8	446.3	378.3	462.9	1,655.4	3,767.8
IV. ADMINISTRATION	144.3	151.9	154.5	177.9	183.8	189.9	196.3	**902.4**	199.7	207.1	214.8	222.9	844.5	**1,898.8**
A. Administration	87.0	89.8	91.3	94.1	97.5	101.0	104.7	488.6	108.5	112.5	116.6	120.9	458.5	1,036.9
B. Fixed Capital Outlay	8.2	3.2	2.3	20.4	20.4	20.4	20.3	83.8	17.0	17.5	18.0	18.6	71.2	158.1
C. Office Information Systems	49.1	59.0	60.9	63.4	65.9	68.5	71.3	330.0	74.1	77.1	80.2	83.4	314.8	703.8
TOTAL PROGRAM	8,959.2	8,791.1	12,231.8	10,050.6	8,930.7	9,241.8	9,783.9	**50,238.8**	10,670.8	9,824.7	9,072.1	8,834.1	38,401.8	**97,431.7**
V. OTHER	177.0	183.8	223.9	290.0	388.9	453.1	487.2	**1,843.1**	496.1	482.6	478.1	474.4	1,931.1	**3,958.0**
A. Local Govt. Reimbursement	1.3	2.6	17.8	0.0	8.7	0.0	11.9	38.4	5.1	5.2	5.3	9.4	25.1	66.1
B. Other	175.8	181.2	206.1	290.0	380.2	453.1	475.3	1,804.7	490.9	477.4	472.7	464.9	1,906.0	3,891.8
TOTAL BUDGET	9,136.3	8,974.9	12,455.7	10,340.6	9,319.6	9,694.9	10,271.1	**52,081.9**	11,166.9	10,307.3	9,550.2	9,308.5	40,332.8	**101,389.6**
HIGHLIGHTS:														
1. Construction	4,449.6	4,171.1	5,274.1	5,052.9	4,273.9	4,694.6	5,040.8	24,336.3	5,833.2	4,984.2	4,276.6	3,885.8	18,979.8	47,487.2
2. FLP (w/o TD Commission)	840.3	975.4	1,773.3	1,027.2	941.2	886.8	979.6	5,608.0	1,030.5	1,056.0	1,083.1	1,144.1	4,313.8	10,897.1
3. Product Support Consultant	1,277.8	1,284.6	1,760.2	1,255.9	1,051.1	1,005.4	1,163.0	6,235.7	1,219.3	1,056.9	1,002.7	956.4	4,235.3	11,755.7
a. Preliminary Engineering	873.4	845.1	1,143.2	750.5	646.0	573.5	656.9	3,770.0	659.1	637.3	610.7	593.9	2,501.0	7,116.1
b. Construction Eng. Inspection	379.2	419.2	588.1	477.9	386.6	409.1	489.8	2,351.6	542.0	401.0	372.8	340.7	1,656.5	4,427.2
c. Right of Way Support	25.3	20.4	28.9	27.6	18.5	22.8	16.3	114.1	18.2	18.7	19.2	21.8	77.8	212.3

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WORK PROGRAM
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I. PRODUCT	5,957.0	5,755.4	8,430.9	6,849.9	5,901.7	6,206.6	6,560.7	**33,949.8**	7,364.3	6,559.6	5,872.3	5,544.7	25,340.9	**65,046.1**
A. State Highway System (SHS)	3,023.9	3,075.0	3,868.6	2,984.1	2,720.8	3,226.5	3,667.6	**16,467.7**	4,432.7	3,519.6	2,787.6	2,419.8	13,159.7	**32,702.3**
1.Interstate Construction	1,102.5	1,658.7	864.4	1,914.0	992.7	1,072.0	1,436.2	6,279.3	1,371.4	1,386.7	1,194.7	1,667.5	5,620.3	13,558.3
2.Turnpike	293.6	447.9	807.4	182.8	666.9	885.3	859.7	3,402.0	2,119.5	1,000.9	348.6	58.6	3,527.7	7,377.6
3.Other State Highway System	1,529.2	892.6	2,101.0	830.9	1,007.6	1,215.0	1,324.6	6,479.1	884.3	1,073.0	1,183.7	631.5	3,772.5	11,144.2
4.SHS Traffic Operations	98.6	75.8	95.8	56.5	53.7	54.1	47.1	307.2	57.5	59.0	60.5	62.2	239.2	622.2
B. Other Roads	303.2	336.0	547.8	360.2	308.6	266.8	266.6	**1,750.0**	323.1	328.2	333.7	339.4	1,324.4	**3,410.4**
1.Other Traffic Operations	0.0	0.5	2.1	0.0	0.4	0.0	0.0	2.5	0.5	0.5	0.5	0.5	1.9	4.9
2.Construction	160.3	171.9	359.8	224.2	173.5	133.7	131.2	1,022.3	182.5	183.7	185.0	186.4	737.6	1,931.8
3.County Trans. Programs	142.8	138.6	185.9	136.0	134.6	133.2	135.4	725.2	140.1	144.0	148.2	152.6	584.9	1,448.7
4.Economic Development	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0
C. Right of Way Land	440.5	358.4	1,094.2	550.8	469.0	409.3	322.1	**2,845.3**	275.2	290.0	279.1	277.0	1,121.3	**4,325.0**
1.State Highway System	343.9	250.0	886.7	409.9	375.3	389.3	289.1	2,350.4	234.5	244.8	243.8	241.6	964.6	3,565.0
2.Other Roads	18.4	20.8	49.6	19.8	8.2	14.5	27.0	119.0	26.5	30.7	20.4	20.0	97.7	237.5
3.SHS Advance Corridor	78.2	87.4	157.9	121.1	85.5	5.4	6.0	375.9	14.2	14.5	14.9	15.3	59.0	522.3
4.Other Advance Corridor	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
D. Aviation	241.9	224.3	388.4	225.0	257.1	207.3	244.4	**1,322.3**	251.4	258.6	266.2	274.3	1,050.6	**2,597.1**
1.Airport Improvement	177.1	148.6	236.4	144.6	159.8	138.7	172.2	851.7	155.6	160.0	164.7	169.6	649.9	1,650.2
2.Land Acquisition	0.5	6.9	1.2	1.3	0.1	1.9	0.0	4.5	0.8	0.9	0.9	0.9	3.5	14.9
3.Planning	31.3	36.1	100.1	44.3	59.7	37.9	41.4	283.4	58.5	60.2	62.0	63.9	244.5	564.0
4.Discretionary Capacity	33.0	32.6	50.7	34.8	37.6	28.7	30.8	182.7	36.5	37.6	38.7	39.9	152.7	368.0
E. Transit	329.4	340.8	862.6	466.1	425.4	401.9	439.6	**2,595.6**	462.2	471.0	480.3	490.2	1,903.6	**4,840.1**
1.Transit Systems	129.5	121.8	304.5	191.5	153.0	112.1	140.6	901.8	158.2	160.8	163.6	166.6	649.3	1,672.8
2.Trans.Disad.-Department	19.4	16.5	46.5	24.5	24.3	25.0	25.8	146.0	27.1	27.2	27.3	27.4	109.1	271.7
3.Trans.Disad.-Commission	54.4	54.9	59.9	52.8	52.8	52.8	52.8	271.3	52.8	52.8	52.8	52.8	211.4	537.5
4.Other	13.9	15.0	44.5	33.6	45.8	54.7	55.2	233.8	46.1	47.1	48.1	49.2	190.6	439.4
5.Block Grants	92.8	95.4	99.9	103.3	108.3	114.4	119.6	545.6	108.9	112.1	115.4	119.0	455.5	1,096.5
6.New Starts Transit	19.4	37.2	307.3	60.4	41.1	42.8	45.6	497.2	69.0	70.9	72.9	75.0	287.7	822.2
F. Rail	143.4	201.5	340.2	212.6	109.1	127.7	140.8	**930.5**	165.4	169.6	174.0	178.8	687.9	**1,819.8**
1.High Speed Rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.Passenger Service	123.2	187.5	326.5	200.4	98.9	117.5	130.6	873.9	154.7	158.9	163.3	168.0	644.9	1,706.4
3.Rail/Highway Crossings	15.8	13.2	12.2	11.4	9.4	9.4	9.4	51.9	9.9	9.9	9.9	9.9	39.5	104.5
4.Rail Capital Imp./Rehab.	4.4	0.7	1.4	0.8	0.8	0.8	0.8	4.7	0.8	0.8	0.9	0.9	3.4	8.8
G. Intermodal Access	41.6	100.5	67.8	46.8	69.8	86.1	90.4	**360.8**	71.9	73.8	75.8	109.9	331.3	**792.6**
H. Seaport Development	138.4	163.2	174.3	129.5	132.6	116.5	117.1	**670.1**	132.4	135.9	139.7	143.7	551.8	**1,385.0**

19Adopt01
WORK PROGRAM
FILE: 1-July-2018
(Excludes Hurricanes)

FLORIDA DEPARTMENT OF TRANSPORTATION
2017/18 PROGRAM AND RESOURCE PLAN SUMMARY
FISCAL YEARS 2018/19 TO 2026/27
(MILLIONS OF $)

OWPB
5-July-2018
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PROGRAM AREAS	ACTUAL 16/17	PLAN 17/18	First Five Years 18/19	19/20	20/21	21/22	22/23	TOTAL	Next Four Years 23/24	24/25	25/26	26/27	TOTAL	10 YR. TOTAL
I. Safety	135.5	144.4	201.0	191.4	166.6	139.4	154.1	**852.5**	170.5	170.5	171.2	171.6	683.8	**1,680.7**
1.Highway Safety	106.3	112.4	157.5	161.3	136.4	109.4	124.2	688.8	138.1	138.1	138.7	139.1	554.0	1,355.2
2.Rail/Highway Crossings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.Grants	29.3	32.0	43.5	30.1	30.2	30.0	30.0	163.7	32.4	32.4	32.4	32.4	129.8	325.5
J. Resurfacing	542.7	522.6	671.2	617.9	877.0	939.0	980.7	**4,085.8**	868.6	912.4	931.3	902.9	3,615.1	**8,223.4**
1.Interstate	173.6	88.8	94.3	114.7	178.1	237.6	264.5	889.3	264.7	297.9	305.6	265.1	1,133.3	2,111.4
2.Arterial & Freeway	329.3	331.6	448.5	400.2	600.6	625.3	646.1	2,720.7	532.0	542.6	553.8	565.8	2,194.2	5,246.5
3.Off-System	1.2	0.0	7.0	1.0	1.0	0.0	0.0	9.1	1.8	1.8	1.8	1.8	7.3	16.3
4.Turnpike	38.5	102.2	121.3	102.0	97.2	76.1	70.1	466.6	70.1	70.1	70.1	70.1	280.4	849.3
K. Bridge	616.4	288.8	214.9	1,065.4	365.7	286.1	137.2	**2,069.3**	210.8	230.0	233.5	237.1	911.4	**3,269.5**
1.Repair-On System	125.1	91.9	118.2	104.0	80.2	81.7	85.9	469.9	86.7	89.1	91.7	94.4	361.9	923.7
2.Replace-On System	438.5	147.9	63.0	895.0	257.8	167.3	16.9	1,400.0	102.9	120.9	121.8	122.7	468.3	2,016.3
3.Local Bridge	49.3	48.5	32.3	41.4	14.8	33.9	31.2	153.6	16.8	16.8	16.8	16.8	67.1	269.2
4.Turnpike	3.5	0.4	1.5	25.0	12.9	3.2	3.2	45.8	4.5	3.2	3.2	3.2	14.1	60.3
II. PRODUCT SUPPORT	1,654.2	1,635.6	2,239.2	1,624.0	1,398.6	1,370.9	1,533.8	**8,166.5**	1,623.5	1,469.7	1,425.1	1,392.8	5,911.1	**15,713.1**
A.Preliminary Engineering	978.6	949.3	1,244.5	855.9	755.6	687.5	775.5	**4,319.1**	782.5	765.5	744.1	732.7	3,024.7	**8,293.1**
1.In-House	105.2	104.2	101.4	105.4	109.6	114.0	118.6	549.1	123.3	128.3	133.4	138.7	523.7	1,177.0
2.Consultant	873.4	845.1	1,143.2	750.5	646.0	573.5	656.9	3,770.0	659.1	637.3	610.7	593.9	2,501.0	7,116.1
B.Construction Eng. Inspection	379.2	419.2	588.1	477.9	386.6	409.1	489.8	**2,351.6**	542.0	401.0	372.8	340.7	1,656.5	**4,427.2**
1.In-House	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.Consultant	379.2	419.2	588.1	477.9	386.6	409.1	489.8	2,351.6	542.0	401.0	372.8	340.7	1,656.5	4,427.2
C.Right of Way Support	88.7	80.9	147.0	94.2	76.9	83.8	80.3	**482.1**	76.2	79.9	79.5	84.8	320.4	**883.3**
1.In-House	26.8	27.4	27.6	28.8	29.9	31.1	32.3	149.7	33.6	35.0	36.4	37.8	142.8	320.0
2.OPS	36.7	33.0	90.4	37.8	28.5	29.8	31.6	218.3	24.4	26.2	23.9	25.2	99.7	351.0
3.Consultant	25.3	20.4	28.9	27.6	18.5	22.8	16.3	114.1	18.2	18.7	19.2	21.8	77.8	212.3
D.Environmental Mitigation	29.8	13.8	35.7	14.7	3.6	10.3	3.5	**67.8**	8.0	7.6	7.8	8.0	31.4	**113.1**
E.Materials & Research	42.5	44.2	48.9	46.5	47.9	49.3	50.7	**243.3**	52.6	54.2	56.0	57.8	220.6	**508.2**
1.In-House	29.6	29.4	30.9	32.2	33.5	34.8	36.2	167.6	37.6	39.2	40.7	42.3	159.9	356.9
2.Applied Research	12.9	14.9	17.9	14.3	14.5	14.5	14.5	75.7	14.9	15.1	15.3	15.5	60.7	151.3
3.Consultants/Grants	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F.Planning & Environment	123.0	115.9	161.1	120.5	112.9	115.3	117.9	**627.8**	145.5	144.0	146.8	150.0	586.2	**1,329.9**
1.In-House	25.1	27.3	33.0	34.3	35.7	37.1	38.6	178.6	40.1	41.7	43.4	45.1	170.3	376.2
2.Consultants/Grants	97.9	88.5	128.2	86.2	77.2	78.2	79.4	449.2	105.3	102.3	103.4	104.9	415.9	953.6
G.Public Transport. Ops.	12.4	12.3	13.8	14.3	14.9	15.5	16.1	**74.7**	16.8	17.5	18.2	18.9	71.3	**158.3**

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WORK PROGRAM
FILE: 1-July-2018
(Excludes Hurricanes)

FLORIDA DEPARTMENT OF TRANSPORTATION
2017/18 PROGRAM AND RESOURCE PLAN SUMMARY
FISCAL YEARS 2018/19 TO 2026/27
(MILLIONS OF $)

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5-July-2018
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PROGRAM AREAS	ACTUAL 16/17	PLAN 17/18	First Five Years 18/19	19/20	20/21	21/22	22/23	TOTAL	Next Four Years 23/24	24/25	25/26	26/27	TOTAL	10 YR. TOTAL
III. OPER. & MAINTENANCE	1,203.8	1,248.2	1,407.2	1,398.9	1,446.6	1,474.4	1,493.0	**7,220.1**	1,483.4	1,588.3	1,559.9	1,673.7	6,305.4	**14,773.6**
A. Operations & Maintenance	741.7	756.1	809.3	823.4	846.7	876.2	903.3	**4,258.9**	884.4	905.3	939.1	962.1	3,690.9	**8,705.9**
1.In-House	229.0	232.7	229.2	238.3	247.9	257.8	268.1	1,241.3	278.8	290.0	301.6	313.6	1,184.0	2,658.1
2.M&O Contracts	489.0	495.1	543.1	556.2	571.5	589.5	607.7	2,868.1	577.5	592.4	608.6	624.8	2,403.3	5,766.5
3.Consultants/Contracts	23.7	28.3	37.0	28.8	27.4	28.9	27.4	149.5	28.0	22.9	28.9	23.7	103.6	281.3
B. Traffic Engineering & Opers.	169.4	187.3	231.9	215.9	239.7	236.5	229.7	**1,153.6**	231.2	236.7	242.5	248.7	959.1	**2,300.0**
1.In-House	24.6	25.0	24.9	25.9	26.9	28.0	29.1	134.9	30.3	31.5	32.8	34.1	128.7	288.6
2.Consultants/Grants	144.8	162.3	207.0	189.9	212.7	208.5	200.6	1,018.7	200.9	205.2	209.7	214.6	830.4	2,011.4
C. Toll Operations	292.7	304.7	366.0	359.7	360.2	361.7	360.1	**1,807.6**	367.8	446.3	378.3	462.9	1,655.4	**3,767.8**
1.In-House	34.7	32.4	31.5	32.8	34.1	35.5	36.9	170.8	38.4	39.9	41.5	43.1	162.9	366.1
2.Ops. Contracts/Transfers	178.6	202.0	243.0	245.6	248.8	252.9	255.9	1,246.3	256.3	257.3	259.3	261.3	1,034.2	2,482.5
3.Consultants/Contracts	79.4	70.4	91.5	81.3	77.2	73.3	67.3	390.5	73.1	149.1	77.6	158.5	458.3	919.2
IV. ADMINISTRATION	144.3	151.9	154.5	177.9	183.8	189.9	196.3	**902.4**	199.7	207.1	214.8	222.9	844.5	**1,898.8**
A. Administration	87.0	89.8	91.3	94.1	97.5	101.0	104.7	**488.6**	108.5	112.5	116.6	120.9	458.5	**1,036.9**
1.In-House	79.8	80.9	81.6	84.9	88.3	91.8	95.5	441.9	99.3	103.2	107.4	111.7	421.6	944.4
2.Contractual Services	7.2	8.9	9.7	9.2	9.2	9.2	9.2	46.7	9.2	9.2	9.2	9.2	36.9	92.5
B. Fixed Capital Outlay	8.2	3.2	2.3	20.4	20.4	20.4	20.3	**83.8**	17.0	17.5	18.0	18.6	71.2	**158.1**
1.Construction	7.4	2.2	1.7	19.9	19.9	19.9	19.9	81.2	16.5	17.0	17.5	18.0	69.0	152.4
2.Design Consultants	0.8	1.0	0.6	0.5	0.5	0.5	0.5	2.6	0.5	0.5	0.5	0.6	2.1	5.7
C. Office Information Systems	49.1	59.0	60.9	63.4	65.9	68.5	71.3	**330.0**	74.1	77.1	80.2	83.4	314.8	**703.8**
TOTAL PROGRAM	8,959.2	8,791.1	12,231.8	10,050.6	8,930.7	9,241.8	9,783.9	**50,238.8**	10,670.8	9,824.7	9,072.1	8,834.1	38,401.8	**97,431.7**
V. OTHER	177.0	183.8	223.9	290.0	388.9	453.1	487.2	**1,843.1**	496.1	482.6	478.1	474.4	1,931.1	**3,958.0**
A. Local Govt. Reimbursement	1.3	2.6	17.8	0.0	8.7	0.0	11.9	38.4	5.1	5.2	5.3	9.4	25.1	66.1
B. Central Mobile Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C. Miscellaneous	175.8	181.2	209.1	290.0	380.2	453.1	475.3	1,807.7	490.9	477.4	472.7	464.9	1,906.0	3,894.8
D. Offset-Administered Funds	0.0	0.0	(3.0)	0.0	0.0	0.0	0.0	(3.0)	0.0	0.0	0.0	0.0	0.0	(3.0)
TOTAL BUDGET	9,136.3	8,974.9	12,455.7	10,340.6	9,319.6	9,694.9	10,271.1	**52,081.9**	11,166.9	10,307.3	9,550.2	9,308.5	40,332.8	**101,389.6**

Appendix B: Historical Program and Resource Plans FY2008/09 to FY2017/18

18-HISTORY
PROGRAM PLAN HISTORY

PROGRAM AND RESOURCE PLAN SUMMARY
FISCAL YEARS 2008/09 TO 2017/18
($ IN MILLIONS)

PROGRAM AREAS	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
I. PRODUCT	3618.0	3475.0	3837.1	4484.6	4342.1	5691.4	5817.0	5746.5	5957.0	5755.4
A. Intrastate** - Exp.	***819.9***	***1080.1***	***1295.5***	***1217.0***	***2054.5***	***3134.0***				
B. Other Arterials** - Exp.	***729.3***	***647.6***	***471.6***	***747.2***	***239.0***	***395.0***				
A. State Highway System (SHS)							3,082.1	2,883.9	3023.9	3075.0
B. Other Roads							350.8	275.4	303.2	336.0
C. Right Of Way	378.1	206.6	148.1	240.1	253.1	342.1	385.8	421.3	440.5	358.4
D. Aviation	205.0	160.6	121.9	190.7	181.4	181.6	320.9	349.6	241.9	224.3
E. Transit	306.1	299.9	346.8	497.5	338.7	376.3	449.7	507.1	329.4	340.8
F. Rail	100.8	58.8	275.6	330.4	71.5	113.4	177.5	119.9	143.4	201.5
G. Intermodal Access	93.2	49.3	57.1	146.6	99.7	36.0	35.3	86.0	41.6	100.5
H. Ports	53.5	46.9	52.3	118.2	113.9	259.9	134.2	106.2	138.4	163.2
I. Safety	71.5	136.6	130.5	117.3	110.8	136.6	121.8	154.3	135.5	144.4
J. Resurfacing	608.0	545.4	581.7	523.8	525.9	455.8	570.8	612.7	542.7	522.6
K. Bridge	252.6	243.1	356.0	355.8	353.5	260.7	187.9	230.3	616.4	288.8
L. Trans. Outreach Prog.										
II. PRODUCT SUPPORT	1076.9	1031.4	1096.9	1327.3	1375.6	1360.0	1479.2	1640.5	1654.2	1635.6
A. Prel. Eng.	563.3	557.7	593.8	790.1	758.3	721.6	831.5	931.7	978.6	949.3
B. Const Eng Insp.	278.5	250.7	289.4	304.7	368.0	343.0	365.9	427.8	379.2	419.2
C. R/W Support	61.0	55.3	54.5	63.9	72.7	77.8	77.0	96.2	88.7	80.9
D. Environ. Mitigation	30.9	22.4	8.9	20.3	9.3	42.0	41.8	27.1	29.8	13.8
E. Material & Res.	37.6	42.5	43.9	41.0	39.3	43.8	40.1	42.0	42.5	44.2
F. Planning	94.7	91.6	94.1	97.1	116.3	119.1	110.6	103.7	123.0	115.9
G. Pub. Trans Oper./FLP	10.8	11.1	12.4	10.2	11.8	12.8	12.3	12.0	12.4	12.3
III. OPERAT.& MAINT.	875.8	1052.9	1046.7	890.8	970.3	942.2	1076.2	1133.8	1203.8	1248.2
A. Routine Maint.	571.5	655.8	676.1	610.0	636.4	641.2	694.6	723.3	741.7	756.1
B. Traffic Eng.	73.1	71.6	75.0	81.8	82.1	100.1	124.0	141.2	169.4	187.3
C. Toll/Turnpike Ops.	194.9	286.6	254.5	166.9	223.2	192.6	257.6	269.4	292.7	304.7
D. Motor Carr. Comp.	36.3	38.8	41.2	32.0	28.6	8.2				
IV. ADMINISTRATION	143.6	138.2	147.2	116.0	123.9	137.9	143.2	150.3	144.3	151.9
A. Admin.	105.8	105.4	96.2	78.3	80.4	81.9	85.3	86.0	87.0	89.8
B. Fixed Capital	7.9	8.1	9.4	2.1	5.6	16.3	16.5	18.2	8.2	3.2
C. Office Info Sys.	29.8	24.6	41.5	35.6	37.8	39.7	41.4	46.0	49.1	59.0
TOTAL PROGRAM	5714.2	5697.5	6127.9	6818.7	6811.8	8131.5	8515.6	8671.1	8959.2	8791.1
V. OTHER	200.2	207.2	203.0	206.1	200.5	177.6	172.8	178.4	177.0	183.8
A. Local Govt. Reimb.	64.3	49.3	45.1	22.4	39.2	12.0	0.8	1.0	1.3	2.6
B. Off Information Systems** - Exp.										
C. Other** - Exp.										
B. Other	135.8	157.9	157.9	183.7	161.3	165.6	172.0	177.4	175.8	181.2
TOTAL BUDGET	5914.3	5904.7	6330.9	7024.9	7012.3	8309.1	8688.4	8849.5	9136.3	8974.9
HIGHLIGHTS:										
1. Hwy & Br(incl R/W)	2859.5	2859.4	2983.4	3201.2	3536.8	4724.2	4699.3	4577.9	5062.2	4725.1
2. Construction	2342.8	2500.1	2720.5	2858.3	3171.0	4194.1	4129.6	3967.0	4449.6	4171.1
3. PTO Total (W/O TDC)	651.6	513.1	751.7	1181.3	696.9	855.6	1054.0	1117.8	840.3	975.4
4. Prod.Supt.Consult	755.4	722.2	794.2	1021.1	1040.8	984.0	1111.7	1281.9	1277.8	1284.6
5. Program less Trnpk.	5199.7	5232.7	5813.9	6264.5	5701.9	7378.8	7495.4	7782.7	8075.2	7679.0
6. Cash Balance	411.8	312.0	437.3	558.9	710.8	1167.9	677.8	630.4	347.7	462.8


FDOT