



Florida Department of
TRANSPORTATION

State of the Industry



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My Contact Information



State of Florida
Department of Transportation

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Florida Department of Transportation

State Highway System

- 44,424 lane miles
 - 8,495 interstate lane miles (19%)
 - 33,665 arterial lane miles (76%)
 - 2,264 Turnpike lane miles (5%)
- 97.4% of pavement is asphalt
- 2.6% of pavement is concrete
- 1.6% of the system lane miles are bridges



Asphalt Surfaces

- 50.2% of asphalt surfaces are dense graded
- 49.8% of asphalt surfaces are open graded



Asphalt Producers for Florida

	In-State	Out-of-State
Asphalt Plants	92	2
Asphalt Contractors	37	2
Asphalt Binder Terminals	15	9
Asphalt Emulsion Terminals	6	8



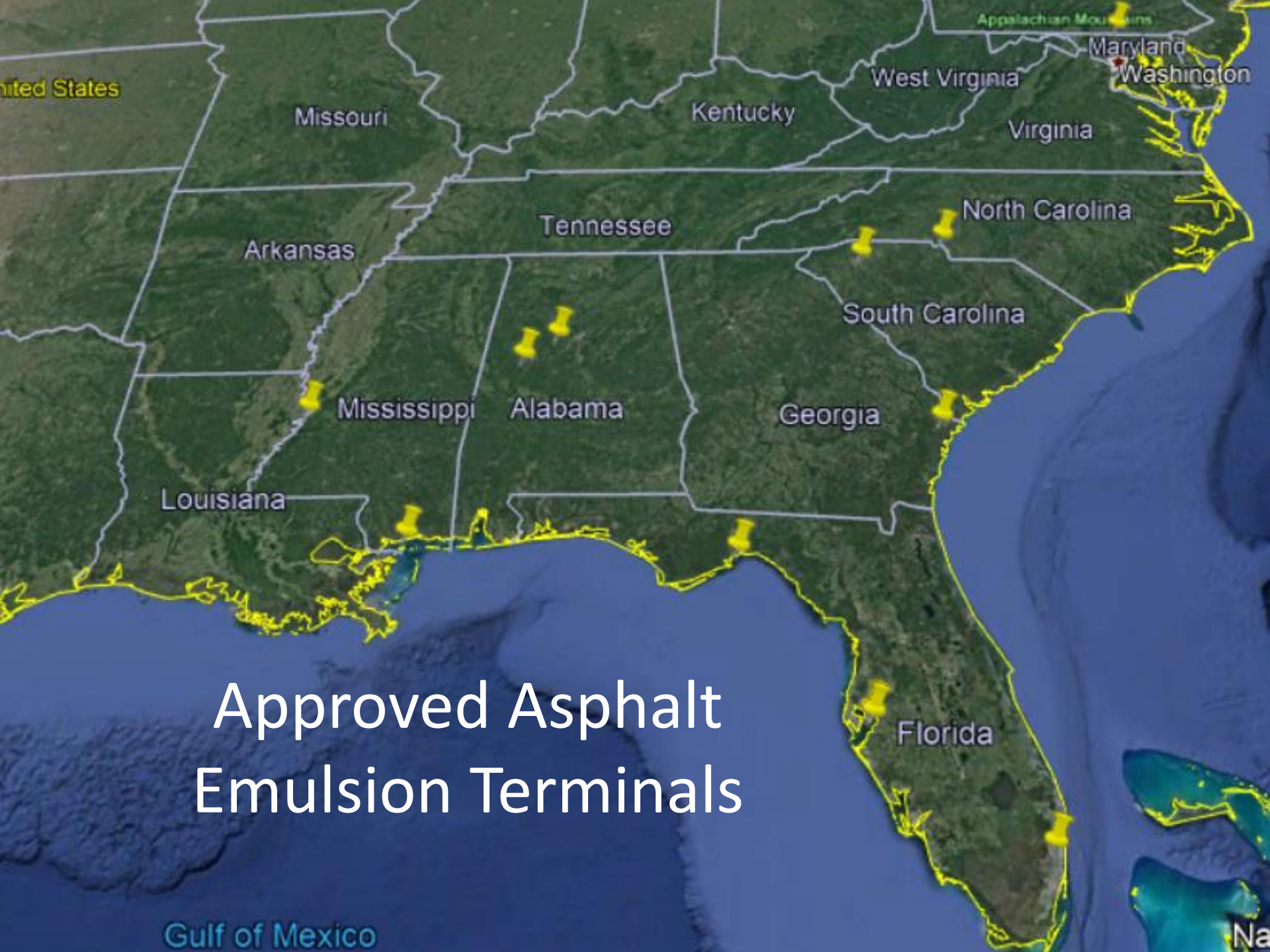
Approved Asphalt Plants





Approved Asphalt Binder Terminals

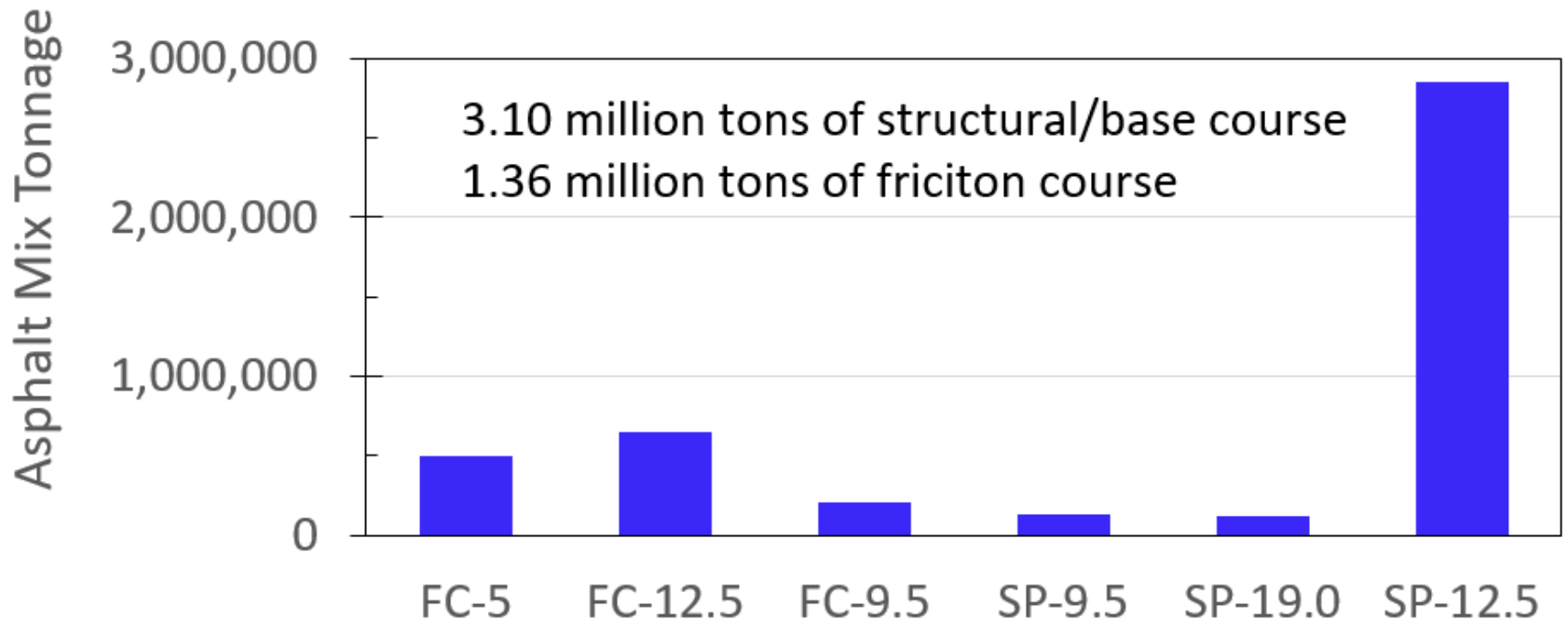
Gulf of Mexico



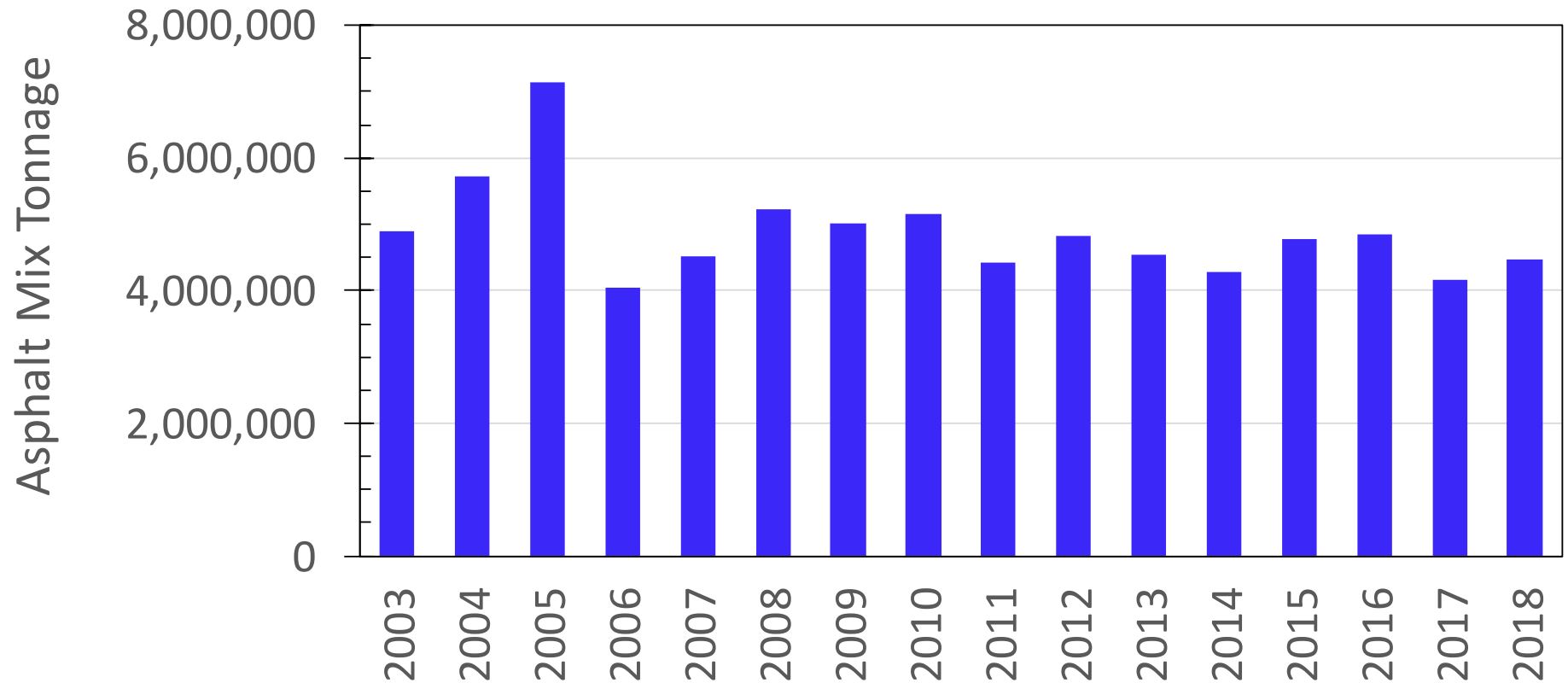
Approved Asphalt Emulsion Terminals

Asphalt Mix Tonnage (FY 18/19)

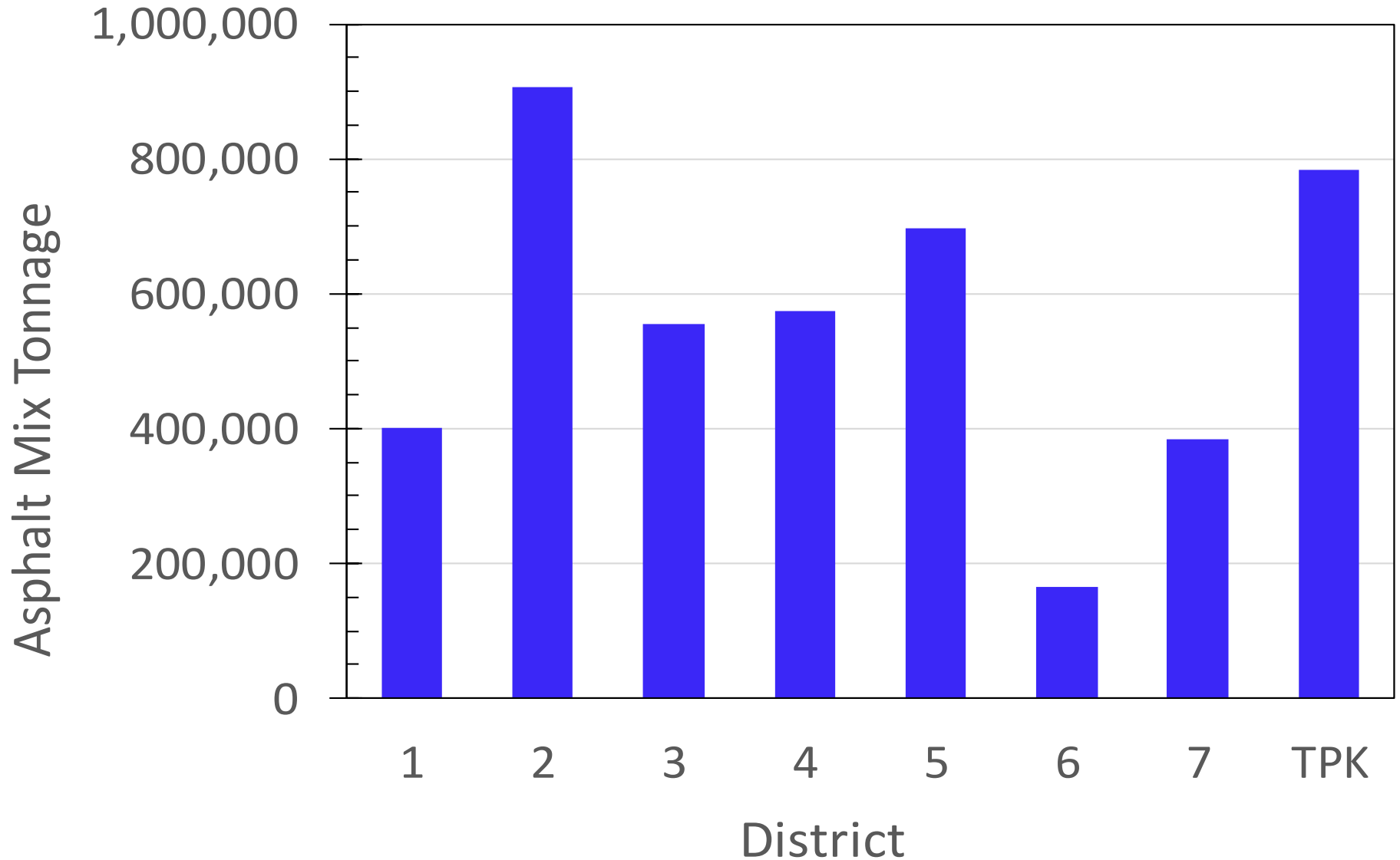
Friction			Structural			Total
FC-5	FC-12.5	FC-9.5	SP-9.5	SP-19.0	SP-12.5	
502,486	654,027	208,026	125,554	124,699	2,849,898	4,464,690



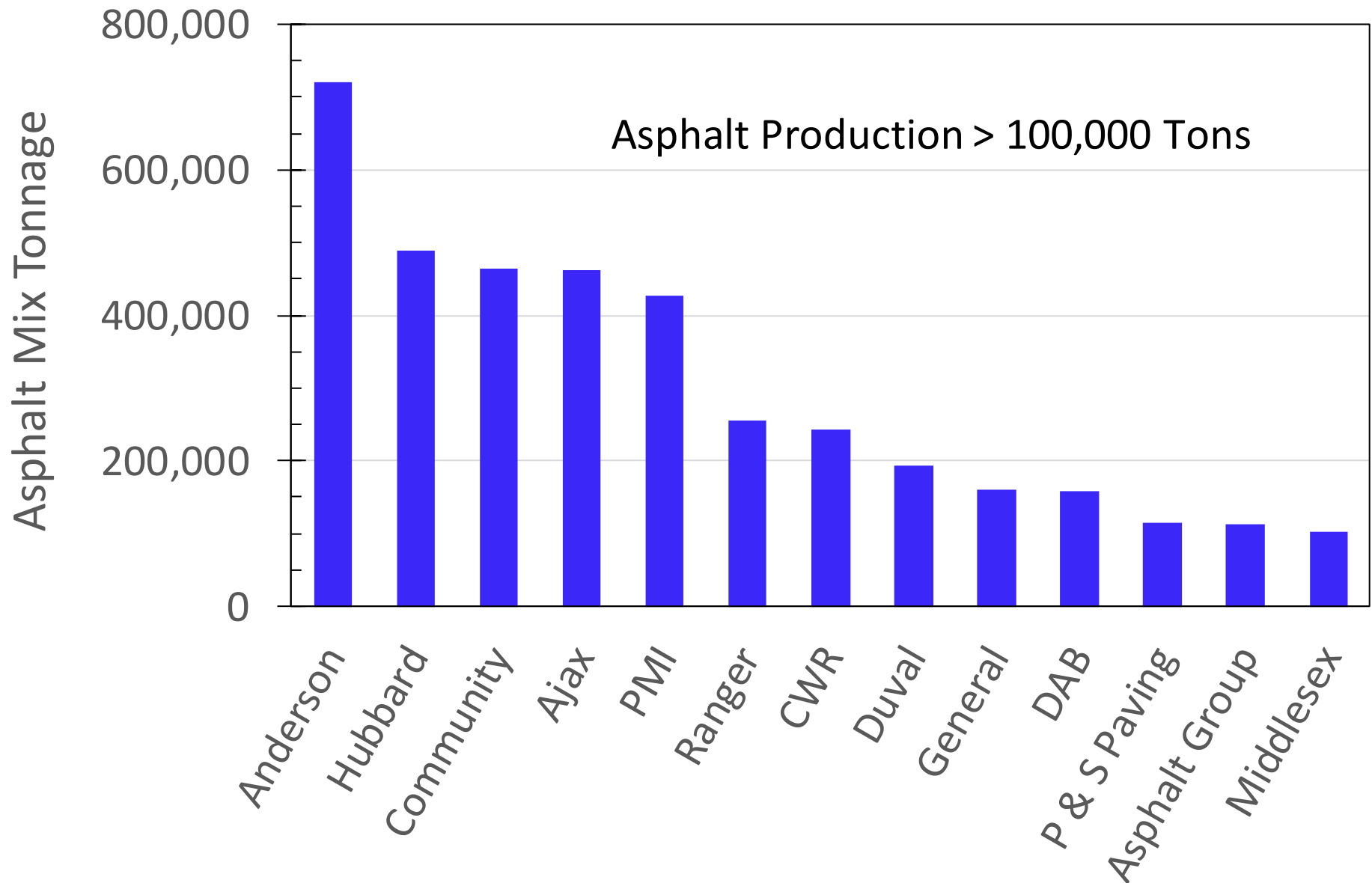
Historical FDOT Asphalt Tonnage



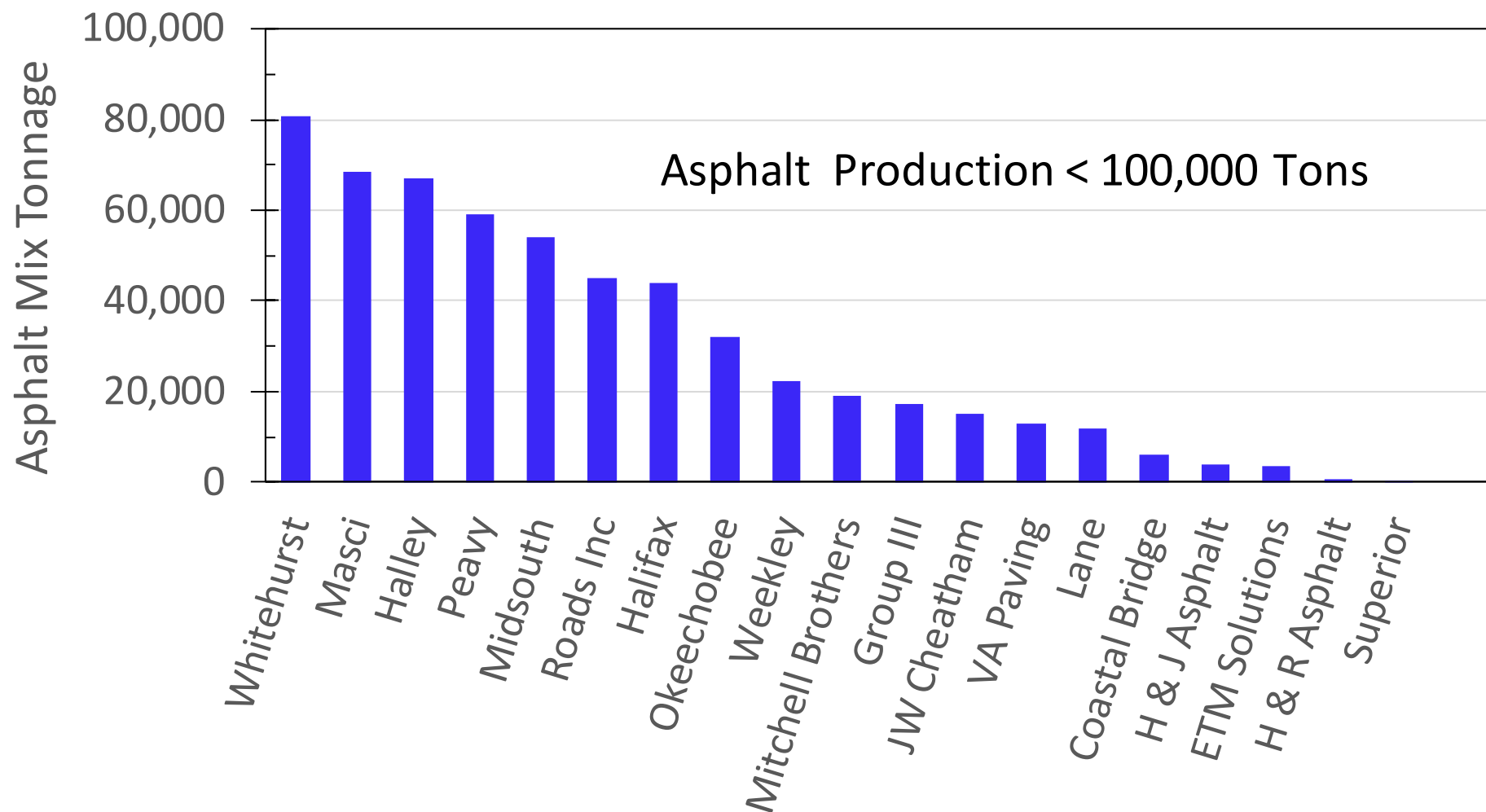
Asphalt Tonnage By District (FY 18/19)



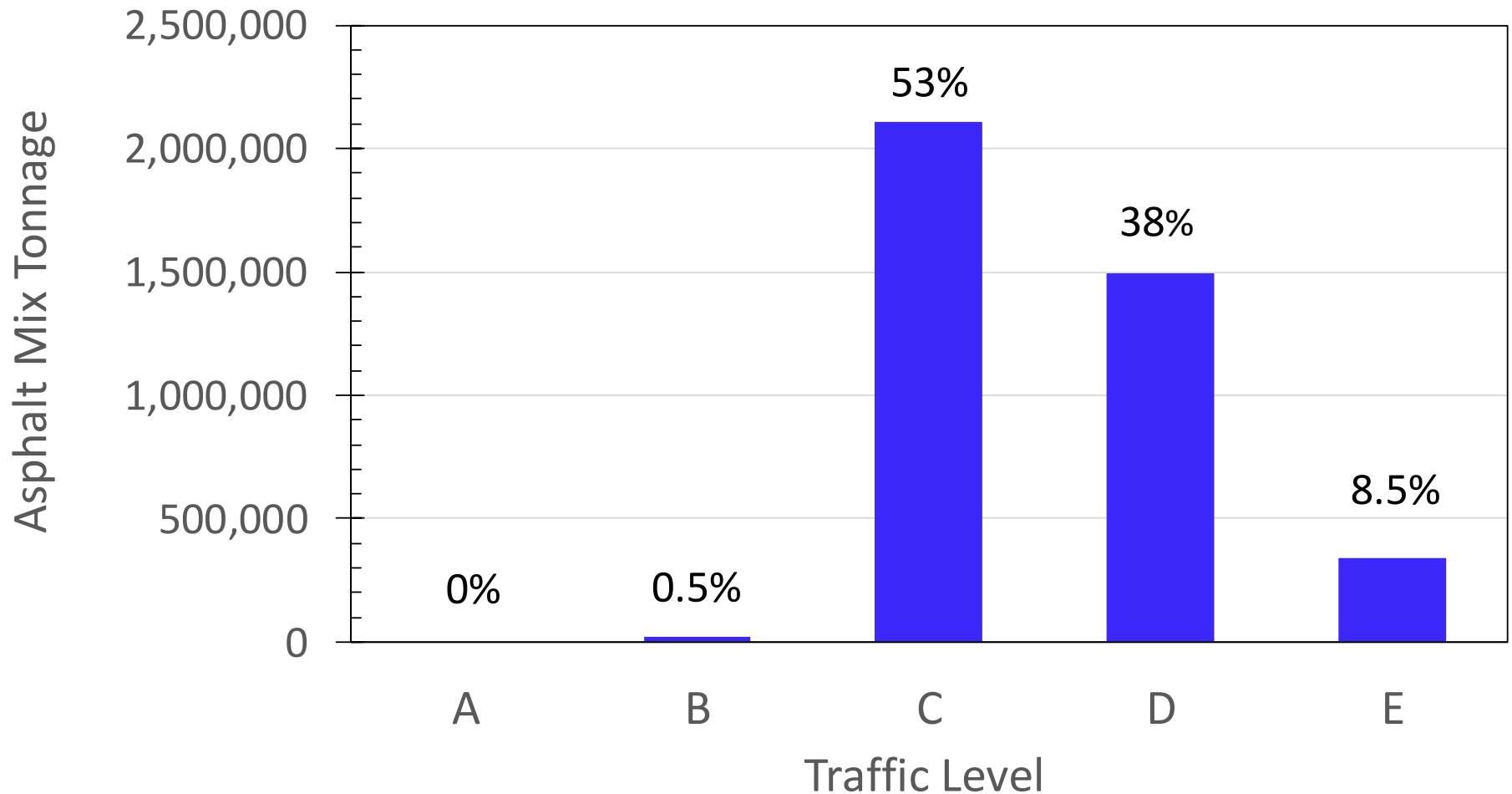
Asphalt Tonnage By Producer (FY 18/19)



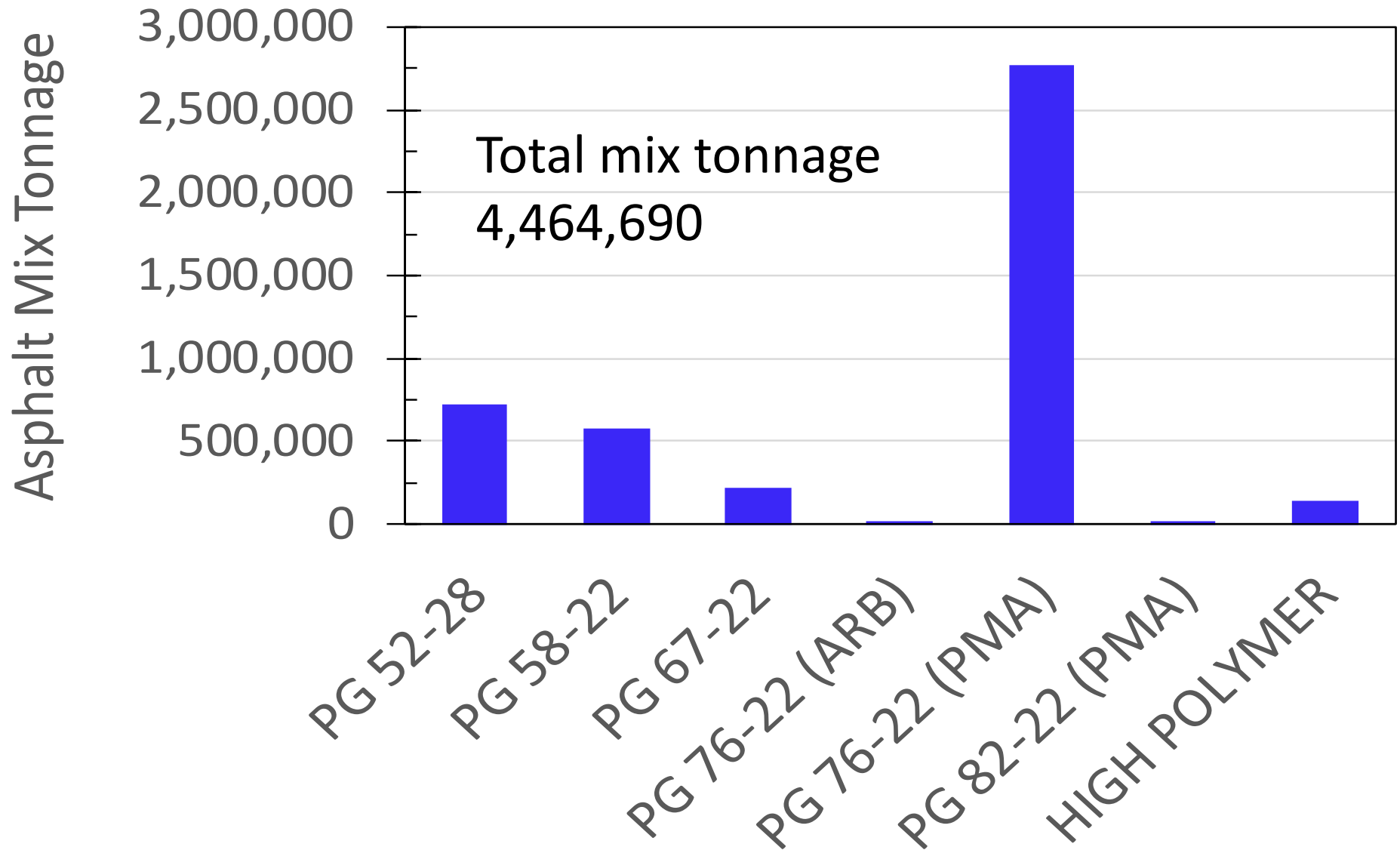
Asphalt Tonnage By Producer (FY 18/19)



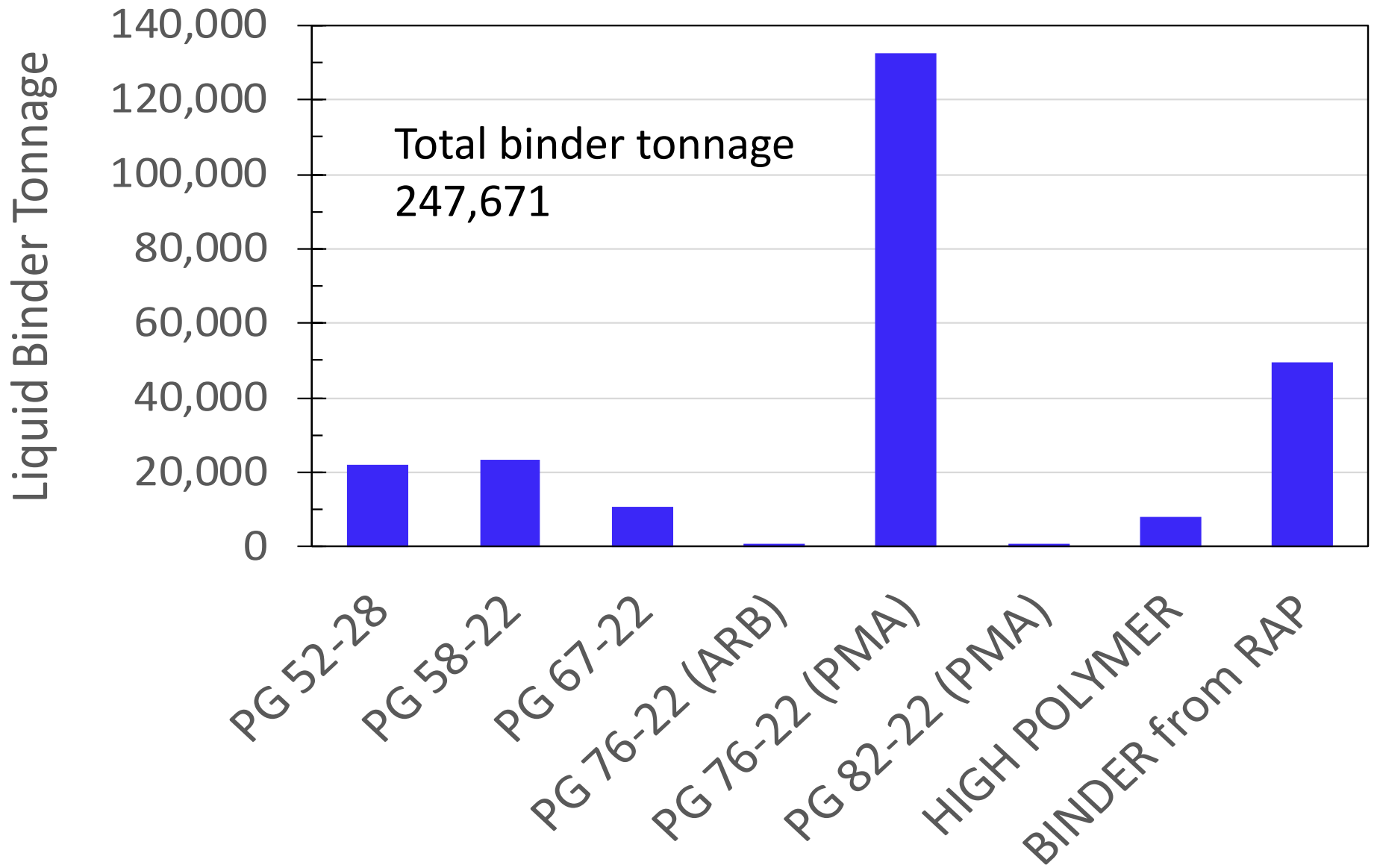
Mix Tonnage By Traffic Level (FY 18/19)



Mix Tonnage By Binder Type (FY 18/19)



Binder Tonnage (FY 18/19)



RAP Usage

A large, conical pile of dark, granular material, likely Recycled Asphalt Pavement (RAP), dominates the foreground. In the background, a metal conveyor belt system is visible, transporting material across a series of supports. The sky is clear and blue.

- 765,000 Tons of RAP
- 49,700 Tons of Binder from RAP
- 715,300 Tons of Aggregate from RAP

RAP Usage

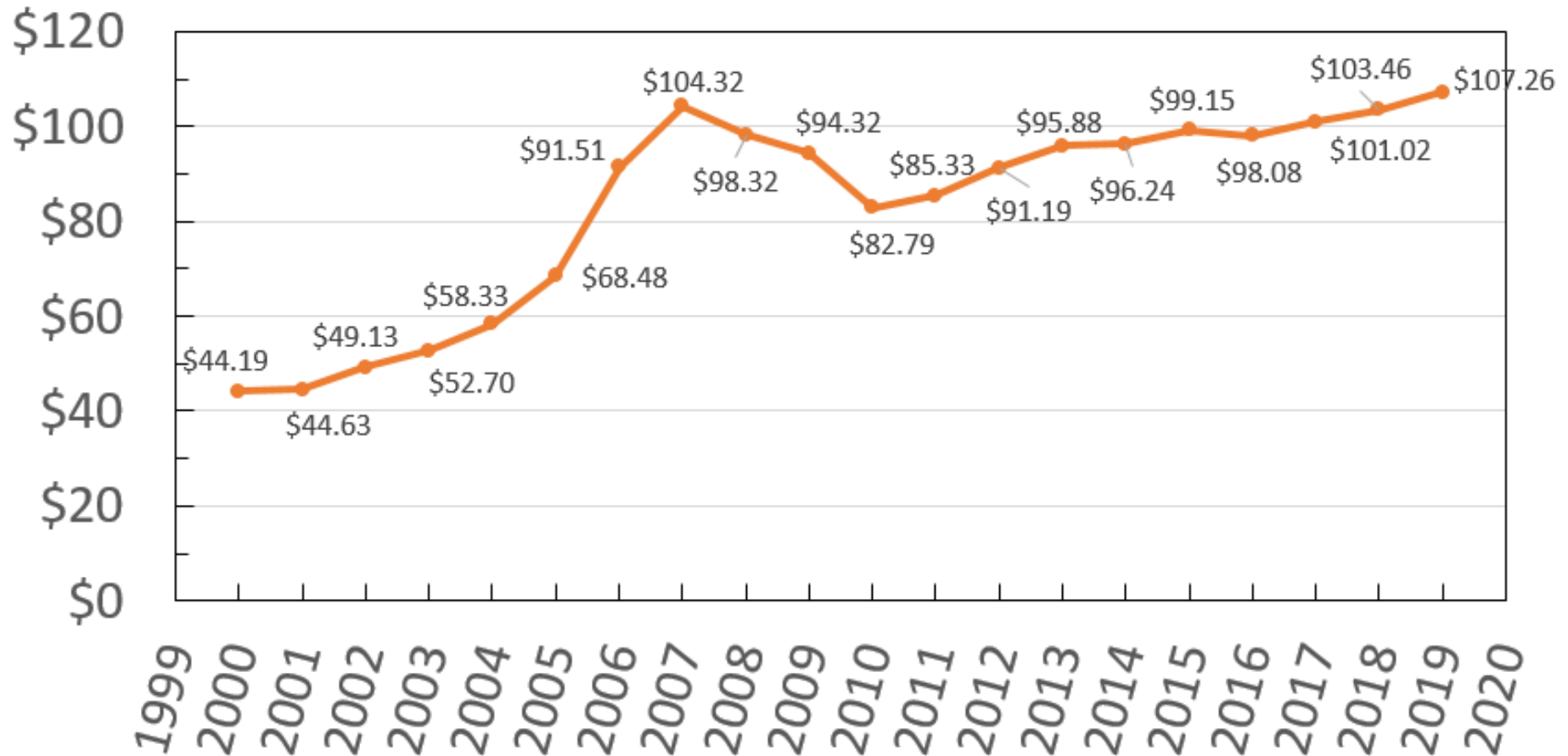
Condition	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19
Unrestricted (no limit)									
Average	25%	26%	25%	29%	24%	29%	27%	24%	25%
Maximum	40%	38%	39%	45%	50%	50%	50%	50%	50%
Restricted (Max 20%)									
Average	17%	18%	16%	19%	20%	20%	19%	19%	19%
Maximum	20%	20%	20%	20%	20%	20%	20%	20%	20%



Asphalt Mix Cost



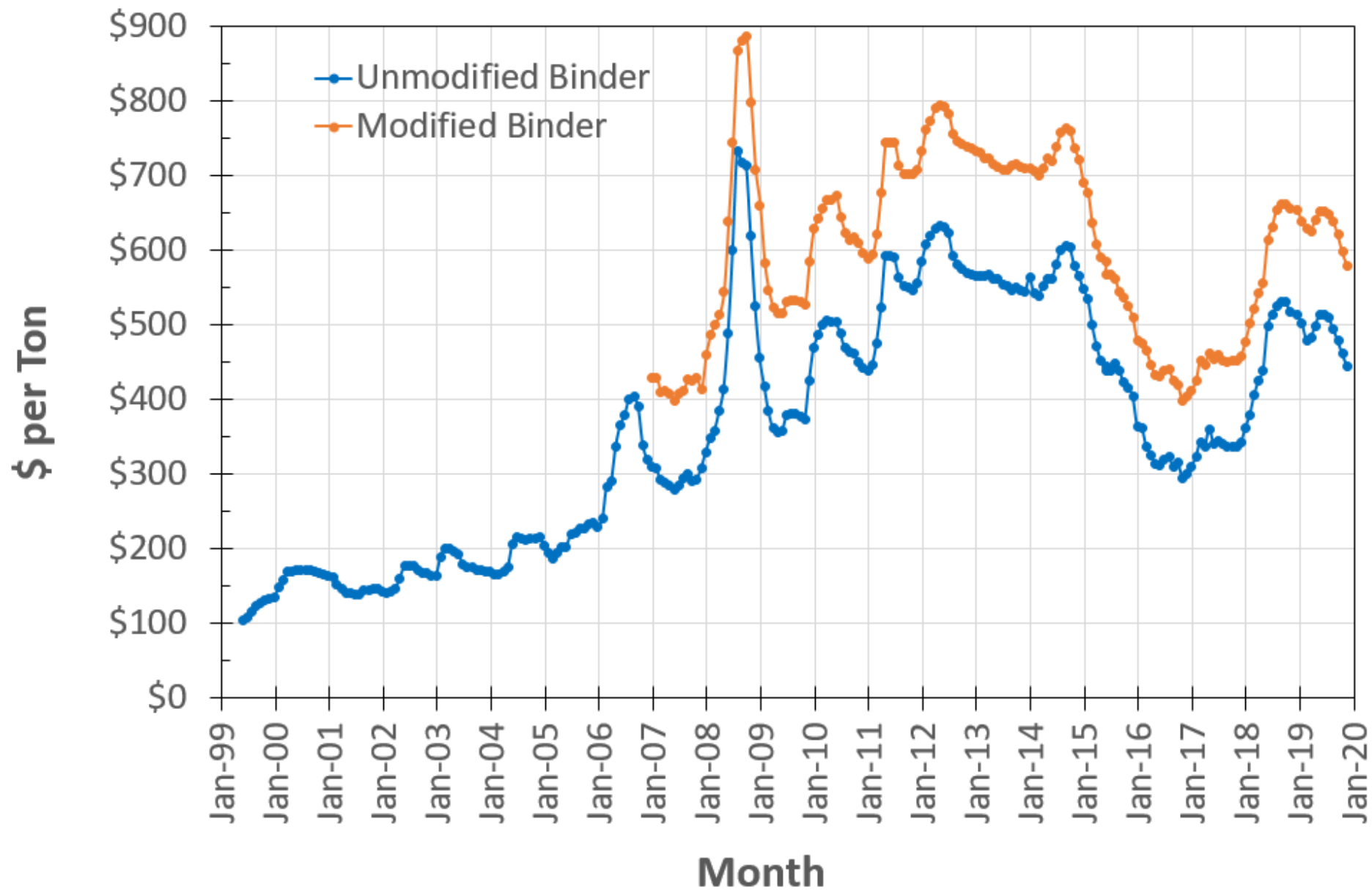
Asphalt Mix Weighted Average Cost (\$/ton)



Asphalt Binder Cost



Asphalt Price Index



Pay Factor Data



Composite Pay Factor (CPF) Data

- Statewide Average CPF
 - **FY 18/19: 1.016**
 - FY 17/18: 1.016
 - FY 16/17: 1.013
 - FY 15/16: 1.009
 - FY 14/15: 1.018
 - FY 13/14: 1.019
 - FY 12/13: 1.011
 - FY 11/12: 1.015



Composite Pay Factor (CPF) Data

- Dense Graded Pay Factor Data

FY	Density	AC	Air Voids	#8 Sieve	#200 Sieve	CPF
18/19	0.992	1.025	1.021	1.001	1.028	1.015
17/18	0.999	1.032	1.023	1.002	1.027	1.016
16/17	0.992	1.031	1.024	0.997	1.025	1.013
15/16	0.994	1.023	1.013	1.003	1.019	1.009
14/15	1.004	1.029	1.024	0.998	1.031	1.018
13/14	1.003	1.031	1.026	1.011	1.030	1.020

Composite Pay Factor (CPF) Data

- Open Graded Pay Factor Data

FY	AC	3/8" Sieve	#4 Sieve	#8 Sieve	CPF
18/19	1.007	1.021	1.019	1.011	1.018
17/18	1.012	1.017	1.013	1.013	1.014
16/17	1.011	1.012	1.015	1.018	1.014
15/16	1.004	1.005	1.002	1.013	1.004
14/15	1.019	1.021	1.018	1.026	1.019
13/14	1.015	1.007	1.009	1.032	1.014



FY 18/19 Top Producer CPF (>100,000 tons)

- **#1 Atlantic Coast Asphalt (1.032)**
- **#2 Asphalt Group (1.028)**
- **#3 General Asphalt (1.026)**



FY 18/19 Top Producer CPF (25,000-100,000 tons)

- **#1 Lynch Paving (1.028)**
- **#2 Roads Inc (1.026)**
- **#3 Halley Engineering (1.018)**



FY 18/19 District Top Producer CPF (>25,000 tons)

- District 1: PMI (1.031)
- District 2: PMI (1.043)
- District 3: Roads Inc (1.026)
- District 4: General Asphalt (1.030)
- District 5: CW Roberts (1.030)
- District 6: Community Asphalt (1.034)
- District 7: CW Roberts (1.032)
- Turnpike: DAB (1.030)



High Polymer Binder

- Completed 17 projects with high polymer binder
- Placed over 280,000 tons of high polymer mix in Florida
- First two demonstration projects were built in 2015
- Contractors have averaged a bonus on all projects except one.
- Smoothness data has been good
 - Average IRI for completed projects has ranged from 33 to 47 at acceptance.

Severe Rutting



Bottom Up (Alligator) Cracking



Raveling (FC-5)



US 90 Midway Project

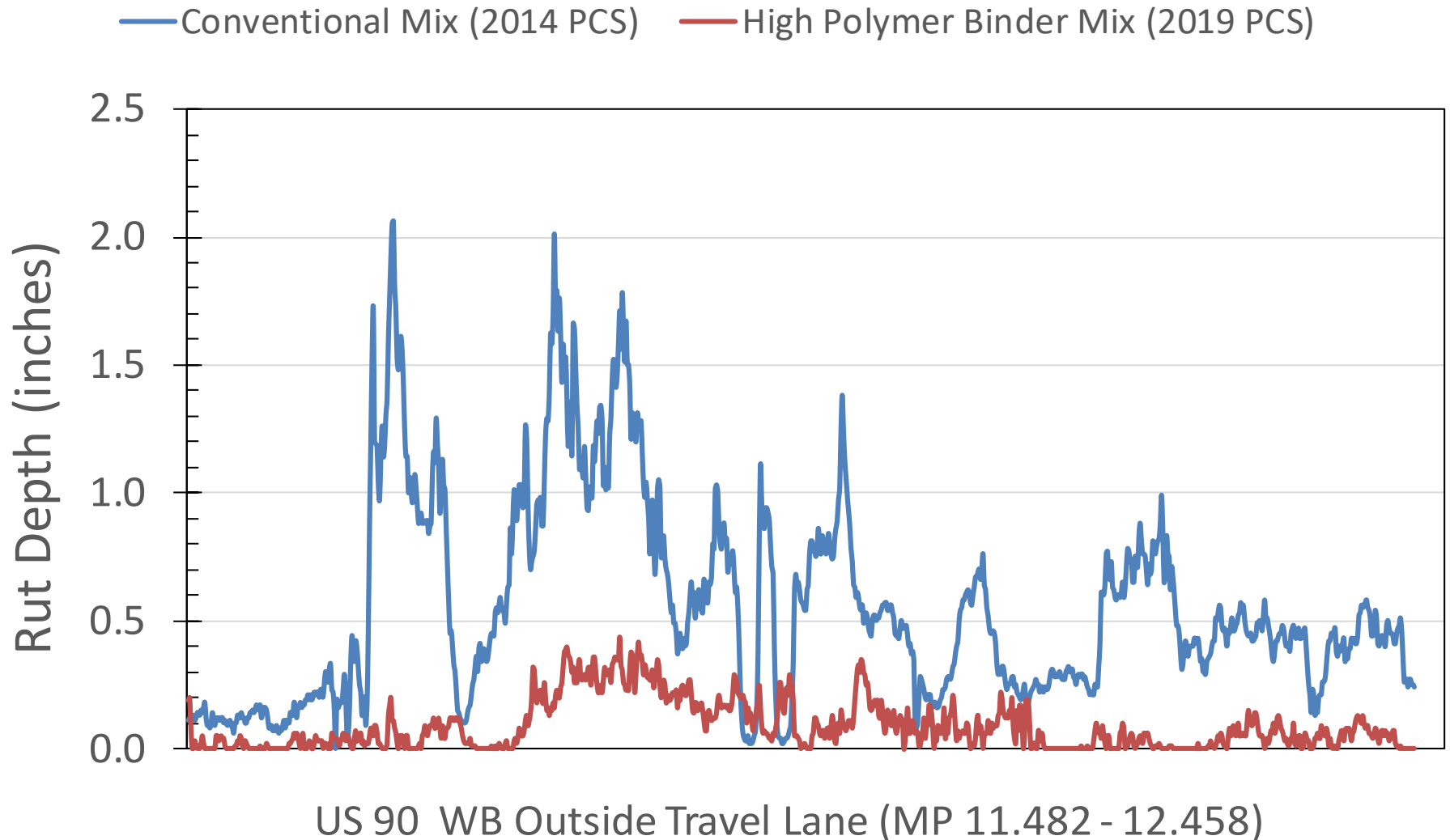
- US 90 pilot project was paved in August 2015
- Westbound travel lanes at the I-10 interchange
 - Between two truck stops
 - Rutting over two inches in places
- Maintenance project that was programmed to be reconstructed with concrete pavement
- Resurfaced top 2.5” with a single lift of FC-12.5 containing high polymer binder
- Concrete reconstruction delayed

US 90 Midway Project



US 90 Project Rut Data

US 90 High Polymer Test Section Rut Data



2020 High Polymer Binder Forecast

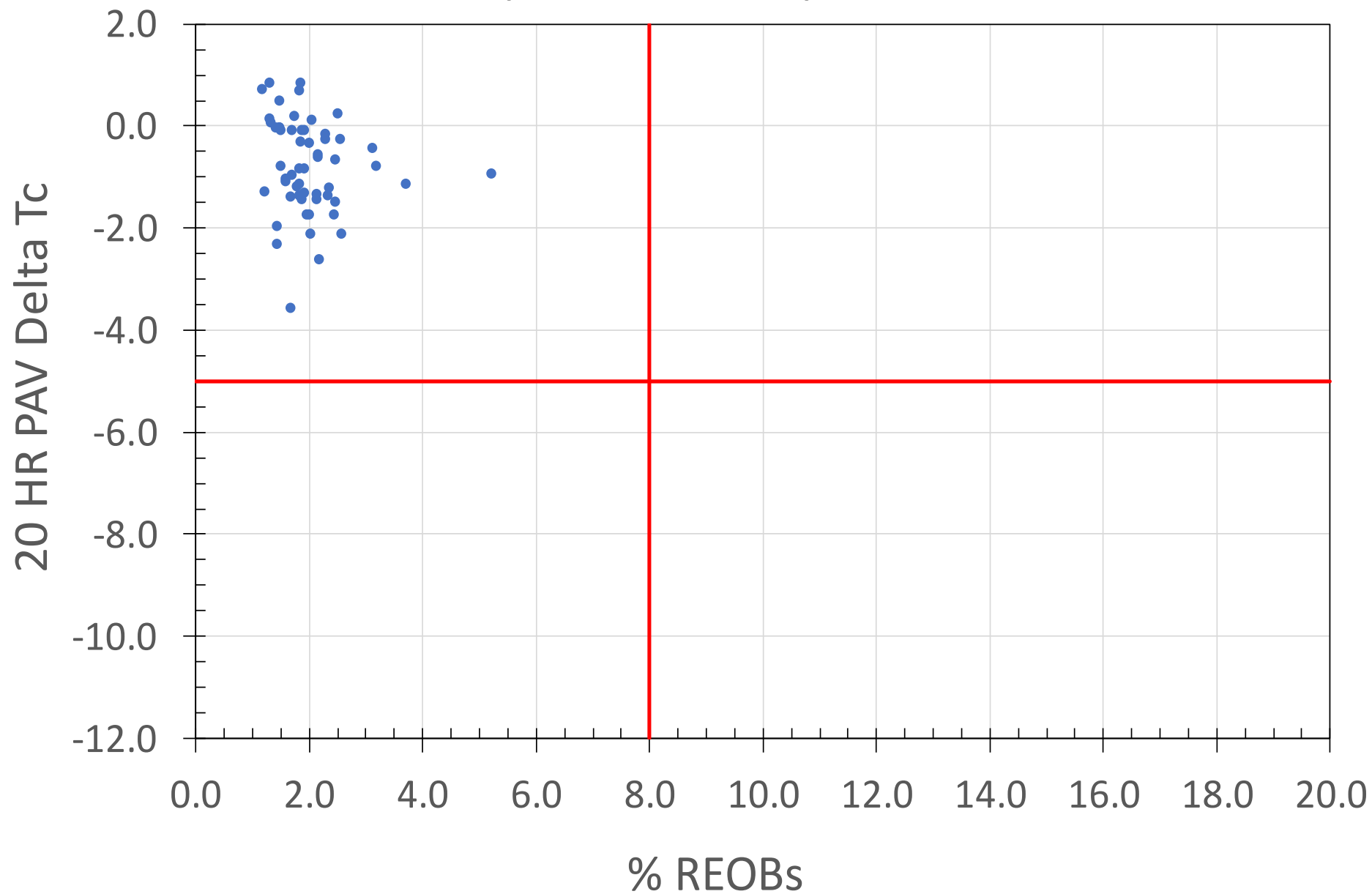
Dist.	County	FIN	Description	Let Date	Est HP Mix Tonnage
3	Jackson	439722-1	SR 75 (US 231) from SR 73 to CR 162	12/4/19	959
5	Marion	435660-2	SR 326 from RXR Crossing to CR 25A	12/4/19	630
4	Palm Beach	439843-1	SR 15 from Morgan Road to Shirley Drive	1/3/20	16,213
7	Pinellas	440245-1	SR 693 from SR 688 to 138th Avenue	4/8/20	6,079
5	Lake	439139-1	SR 25 from Arlington Ridge Blvd to CR 33	5/20/20	895
2	Suwannee	441337-1	I-10 from the Madison C/L to US 90 (Ag. stations)	7/29/20	4,248
2	Taylor	441059-1	SR 55 (US 19/27A/98) MP 7.8 to Fenholloway River	8/26/20	40,000
1	Highlands	439434-1	SR 25 (US 27) from Cloverleaf Road to SR 66	8/27/20	13,301
5	Marion	441136-1	US 301/441 from CR 25A to US 301/441 Interchange	10/28/20	65,000
2	Duval	437319-1	US 90 from Edgewood Avenue to McDuff Avenue	12/2/20	5,300
5	Osceola	439487-1	SR 15/US 441 from Okeechobee C/L to SR 60	12/2/20	12,712
				Total	165,337

2019 Delta Tc / REOB Testing

- 56 binder sources
- 9 Suppliers / 7 grades
 - PG 52-28
 - PG 58-22
 - PG 67-22
 - PG 76-22 (PMA)
 - PG 76-22 (ARB)
 - PG 82-22 (PMA)
 - High Polymer Binder



% REOBs vs. 20 HR PAV Delta Tc
After Specification Implementation



Pavement Performance



Resurfacing Program

- Statutory Requirement
 - Ensure 80% of pavement on the State Highway System meets Department standards.
- Internal Objective
 - Ensure 90% of interstates and the turnpike meet Department standards.
 - Ensure 85% of pavement on the SHS meets Department standards.
- Resurface enough lane miles annually to maintain these two requirements.

Statewide Pavement Performance

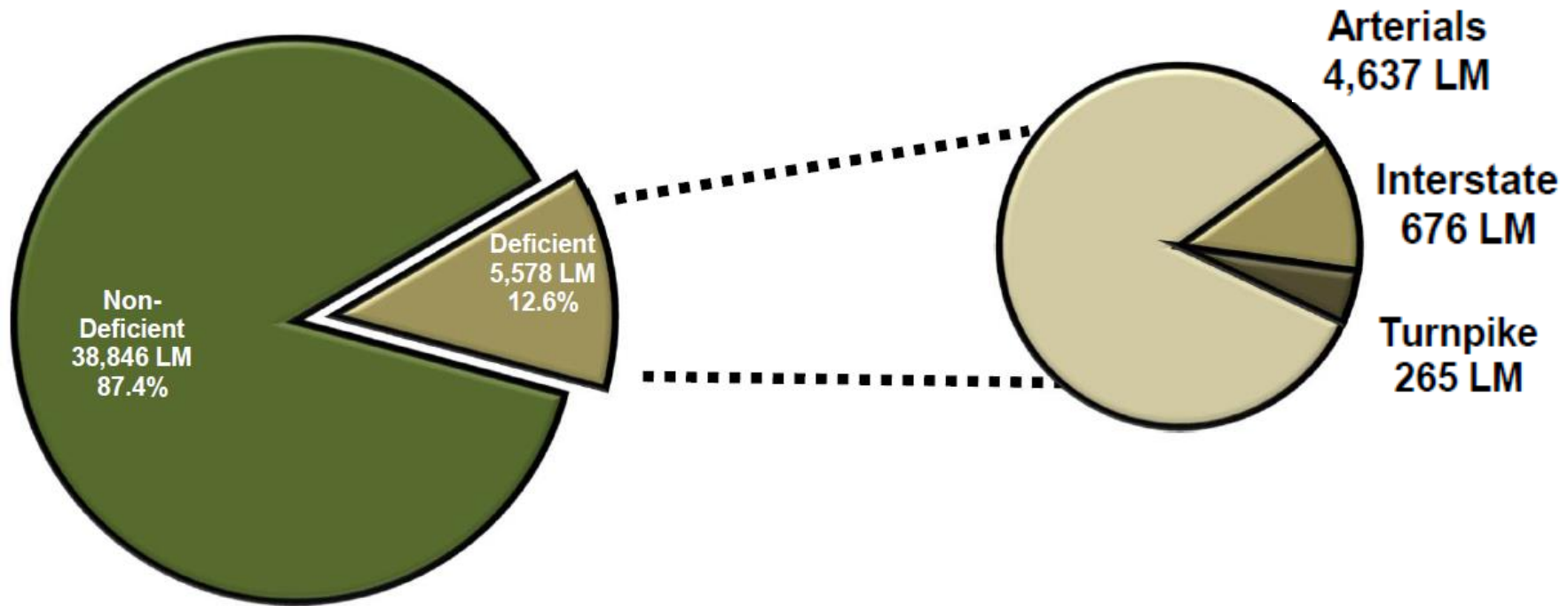
Deficient Pavements (%)											
Criteria	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Overall	14.4	12.4	11.1	9.4	8.4	7.3	7.7	8.5	8.2	8.7	12.6
Ride	2.6	2.6	2.6	1.9	2.1	1.7	2.0	1.3	1.2	1.1	1.4
Crack	13.0	10.9	9.7	7.9	6.8	6.0	6.4	7.3	7.1	7.7	11.4
Rut	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.3	0.3



Florida Department of Transportation

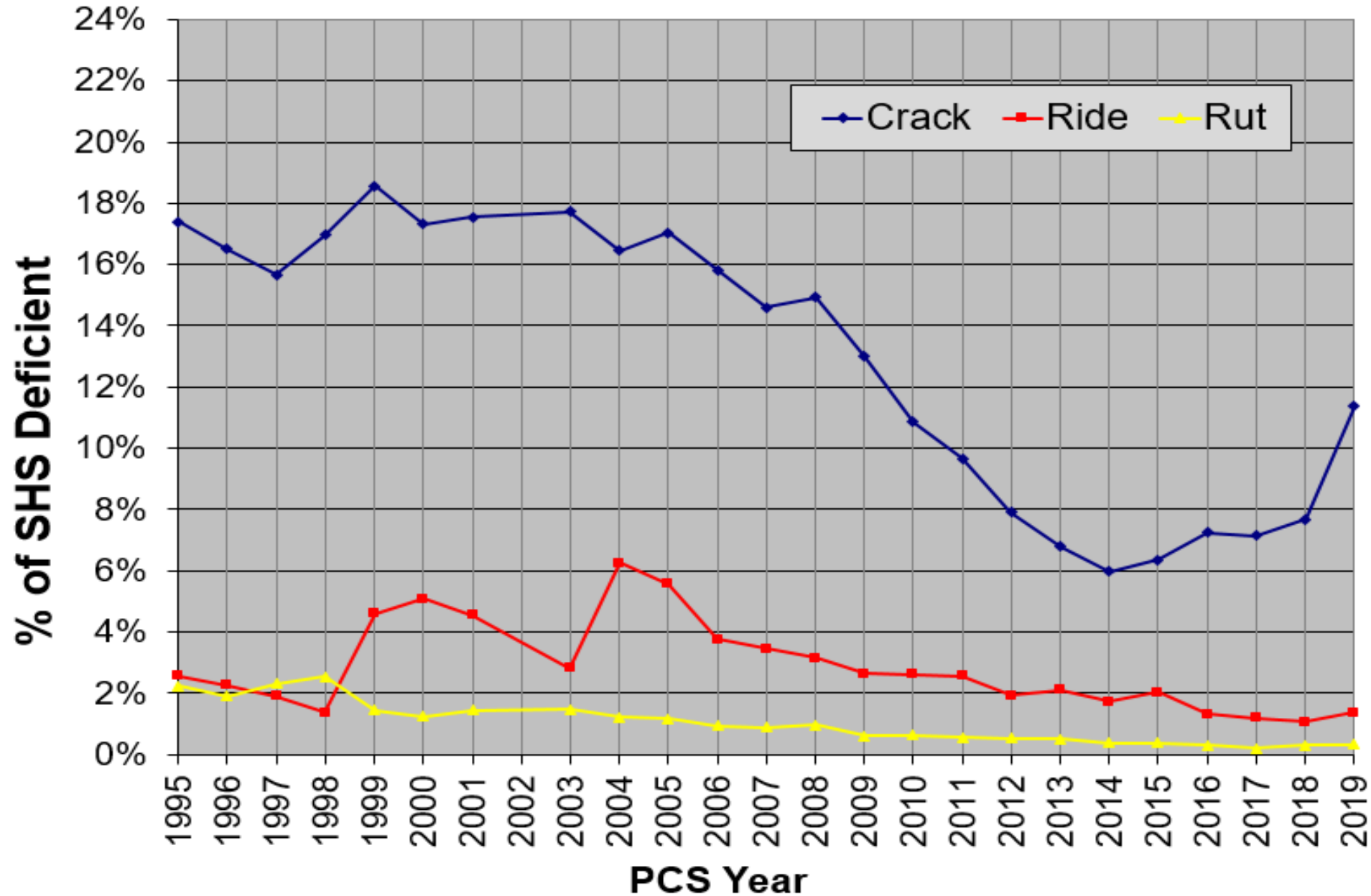
DEFICIENT PAVEMENTS BY FACILITY TYPE

Based on 2019 Pavement Condition Survey

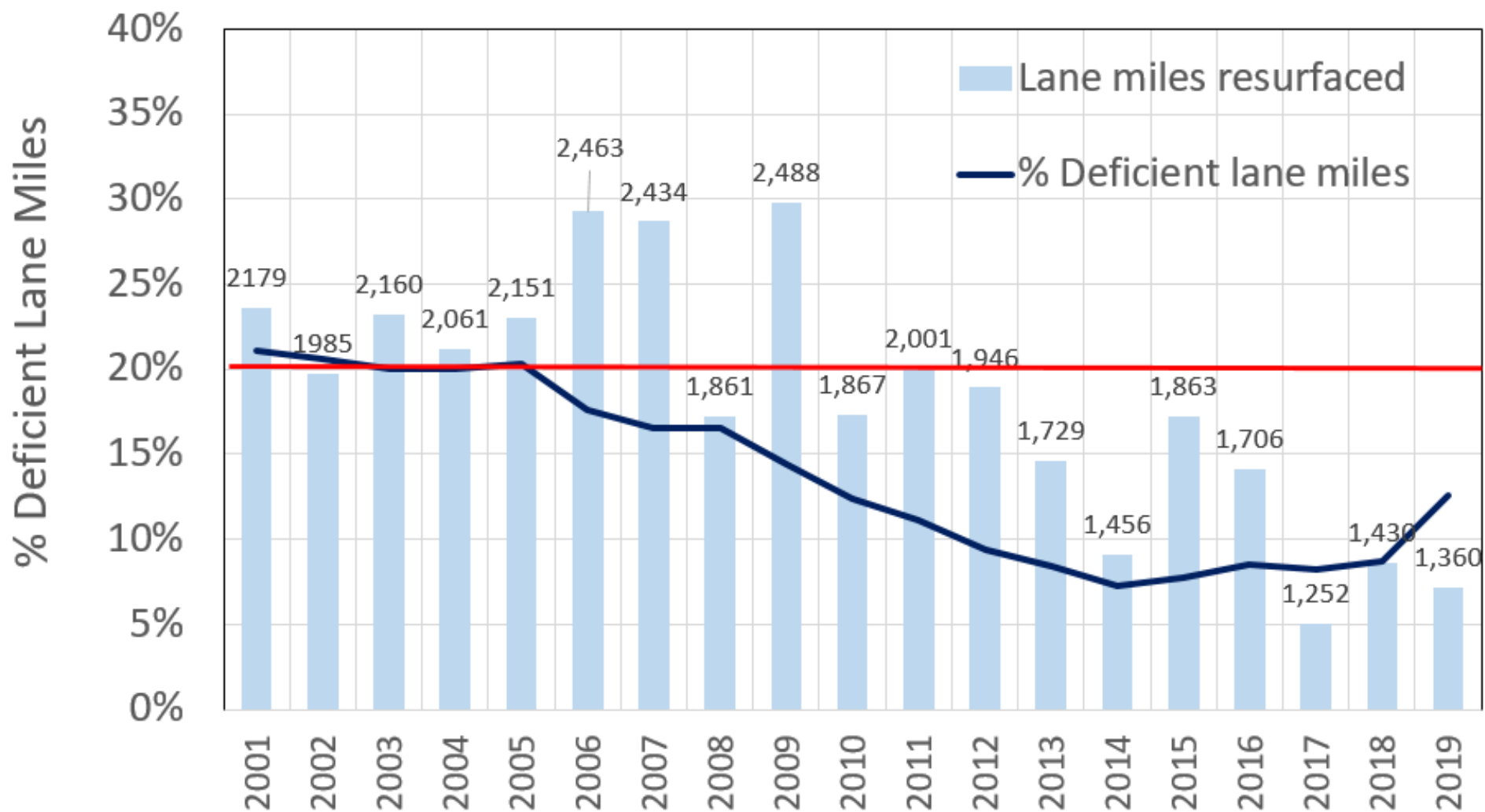


Roadway	Interstate	Arterials	Turnpike
Lane Miles	8,495	33,665	2,264
Deficient Lane Miles	676	4,637	265
% Lane Miles Deficient	8.0%	13.8%	11.7%

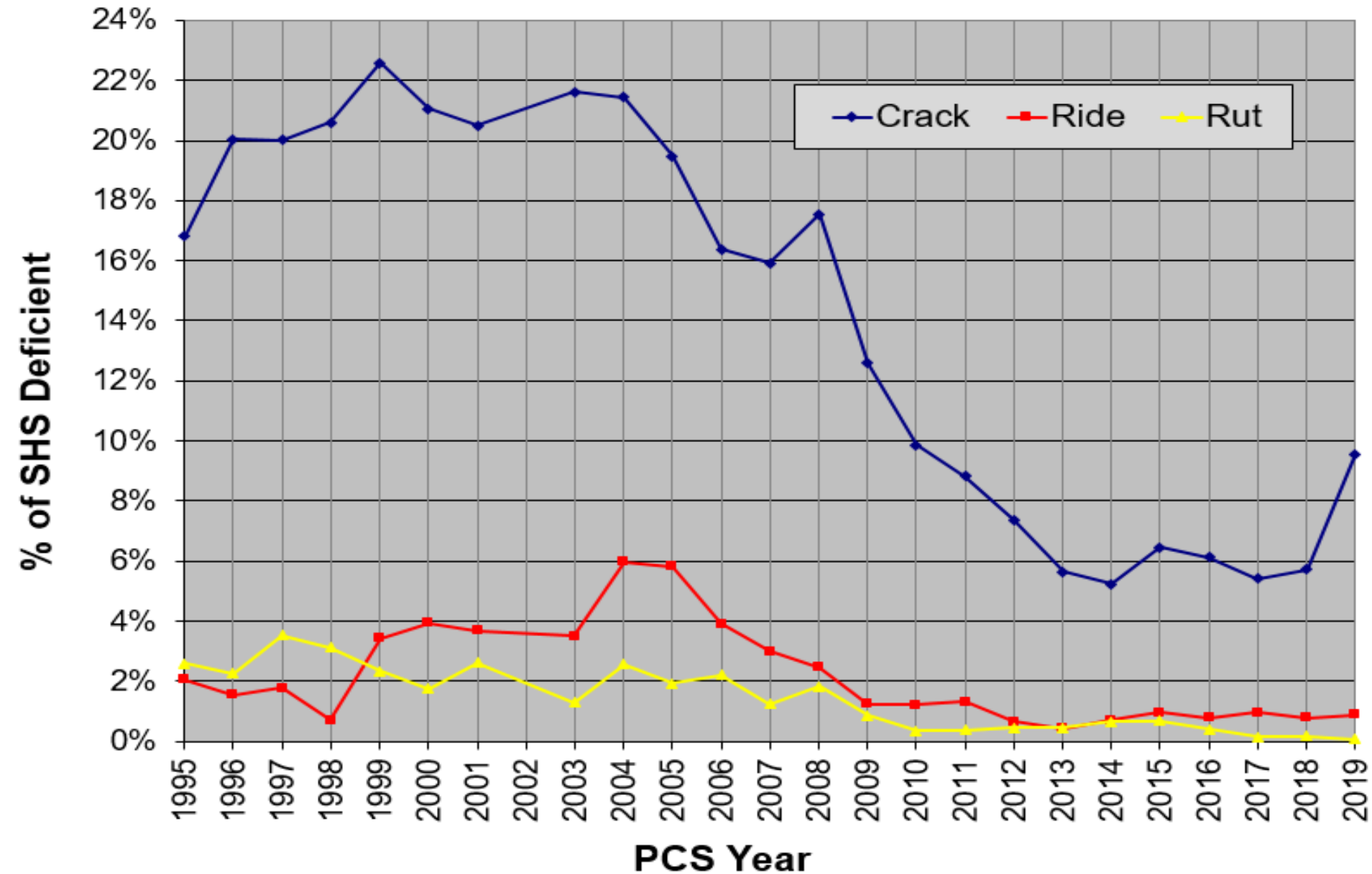
Historical Statewide Performance



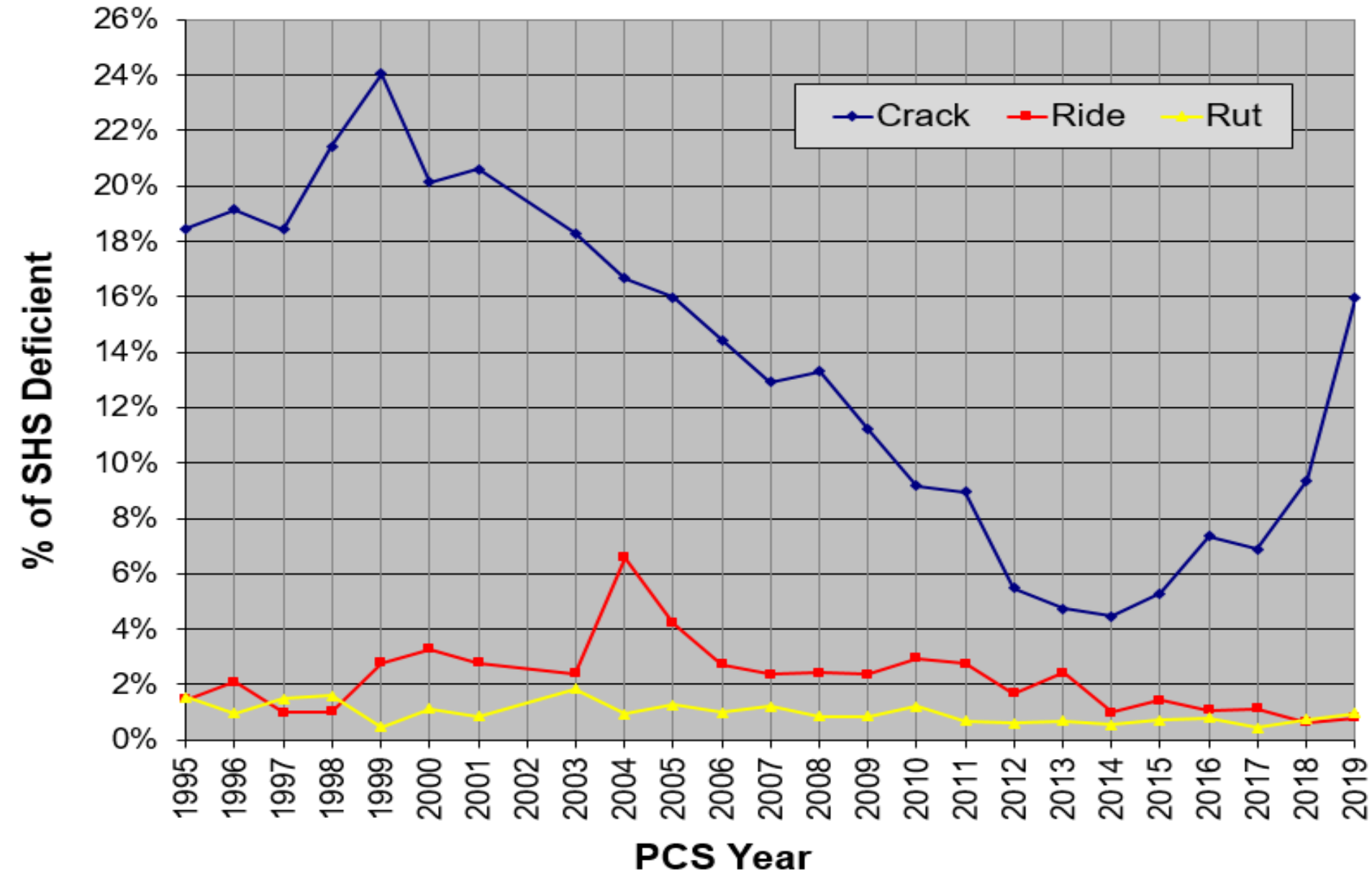
Lane Miles Resurfaced and Deficient Lane Miles



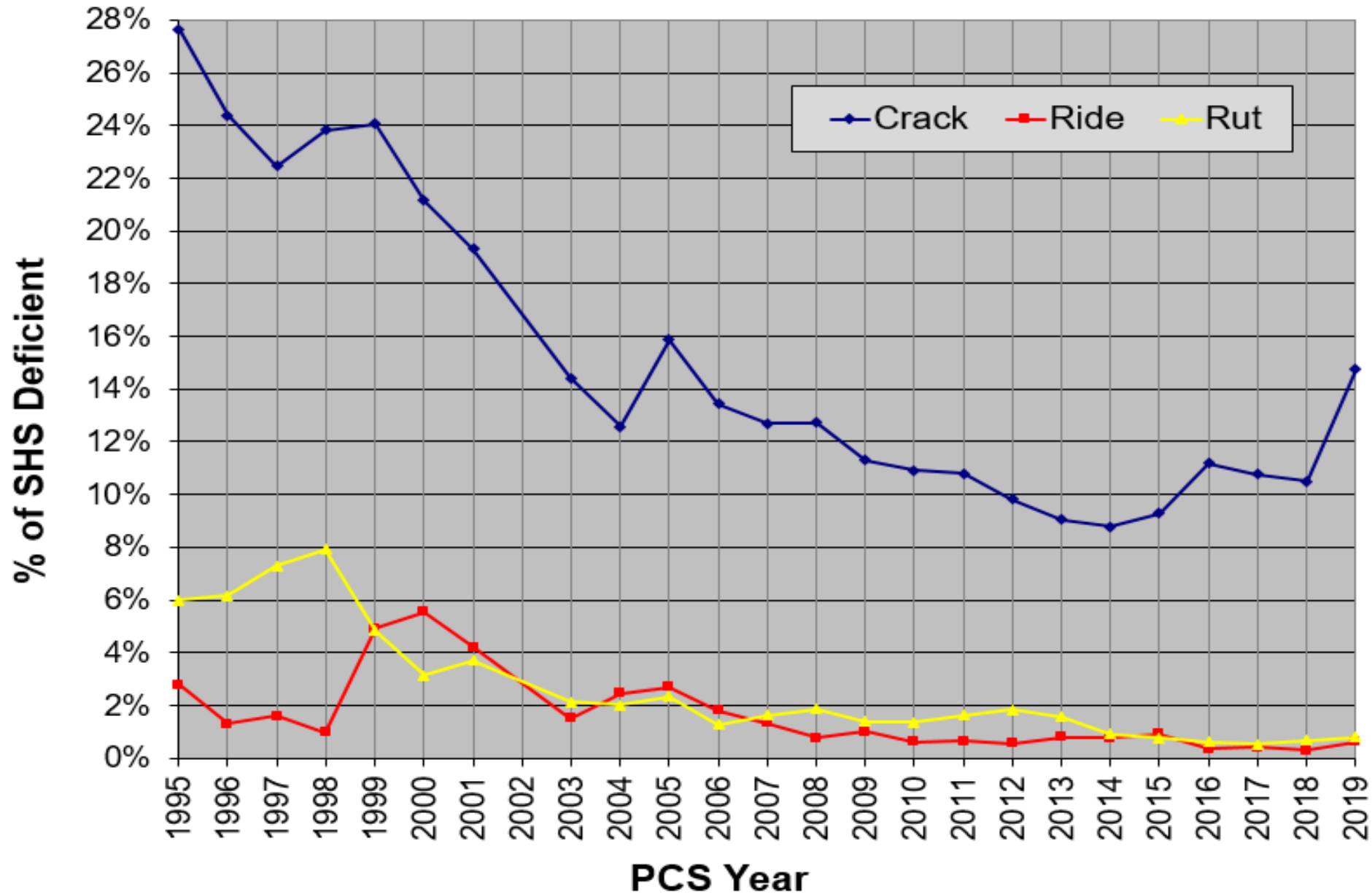
District 1 Historical Performance



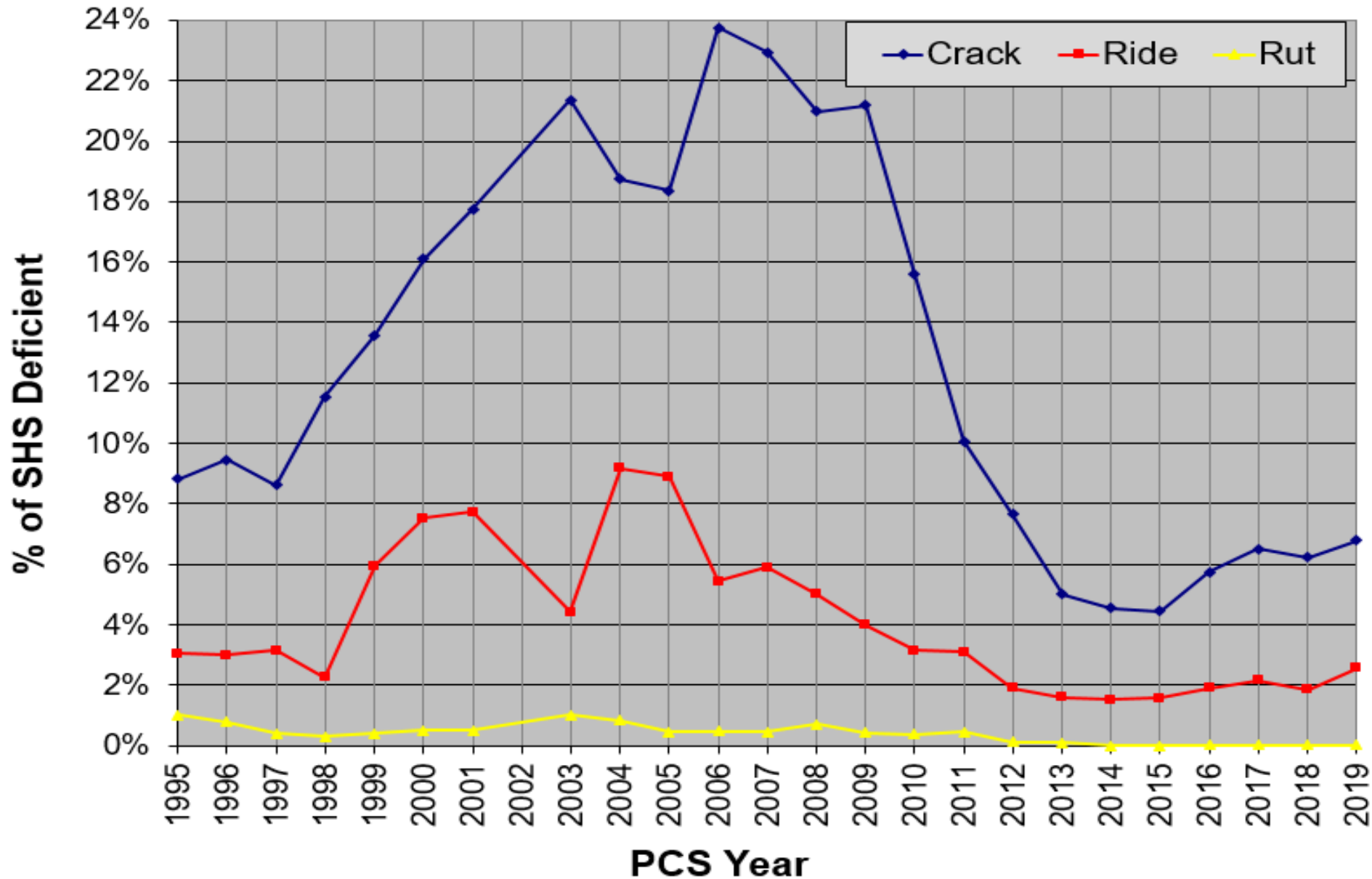
District 2 Historical Performance



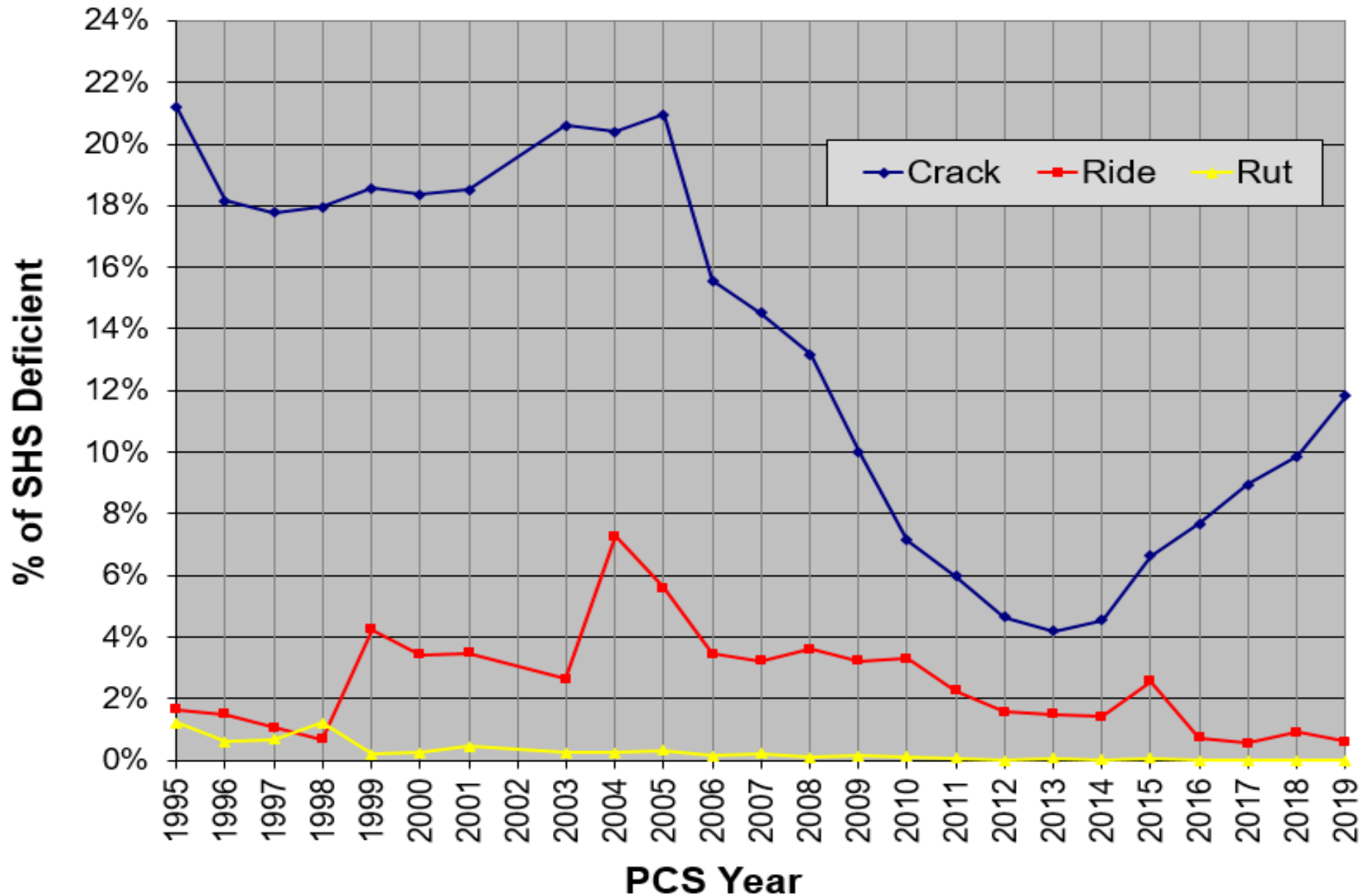
District 3 Historical Performance



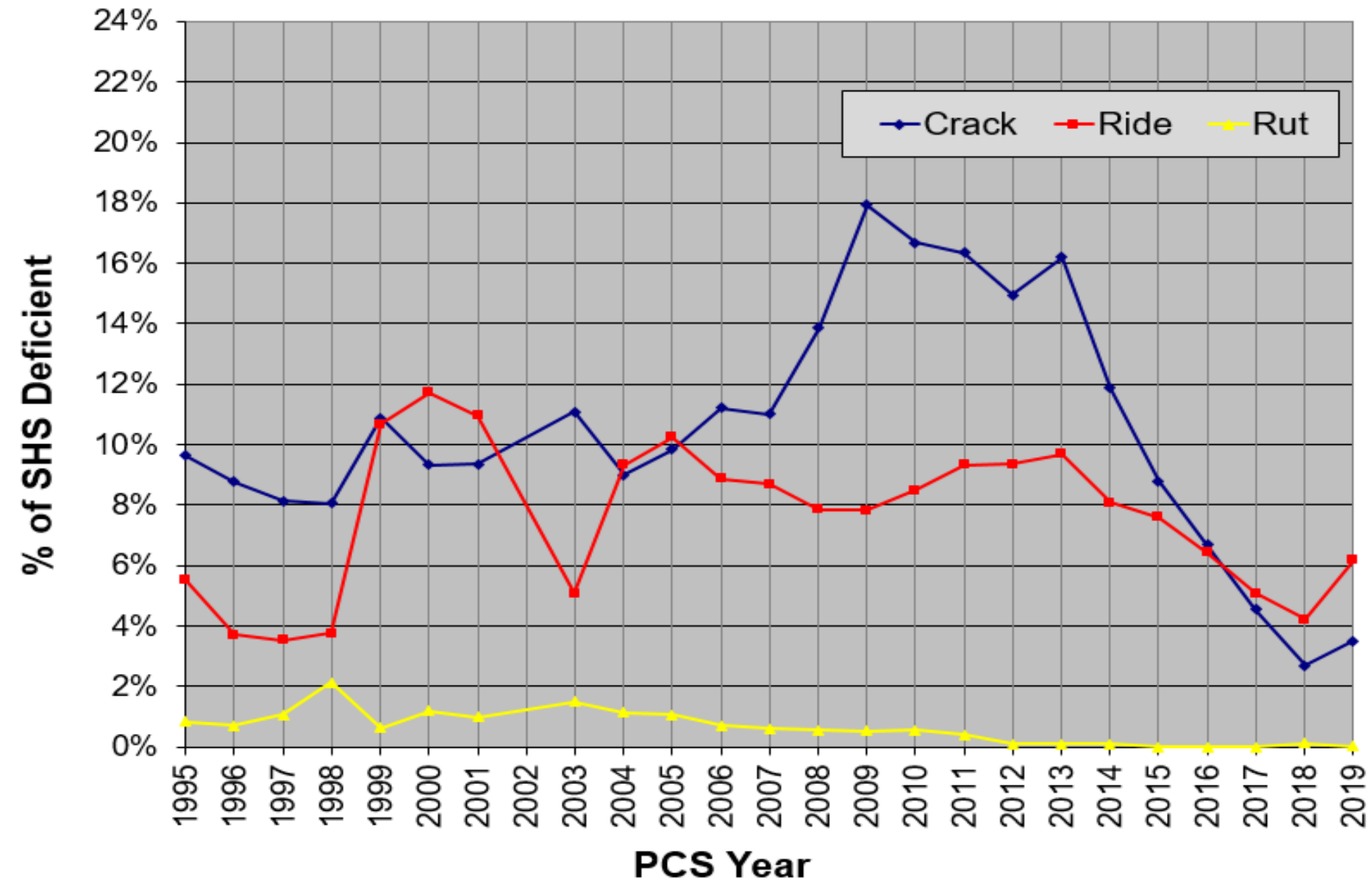
District 4 Historical Performance



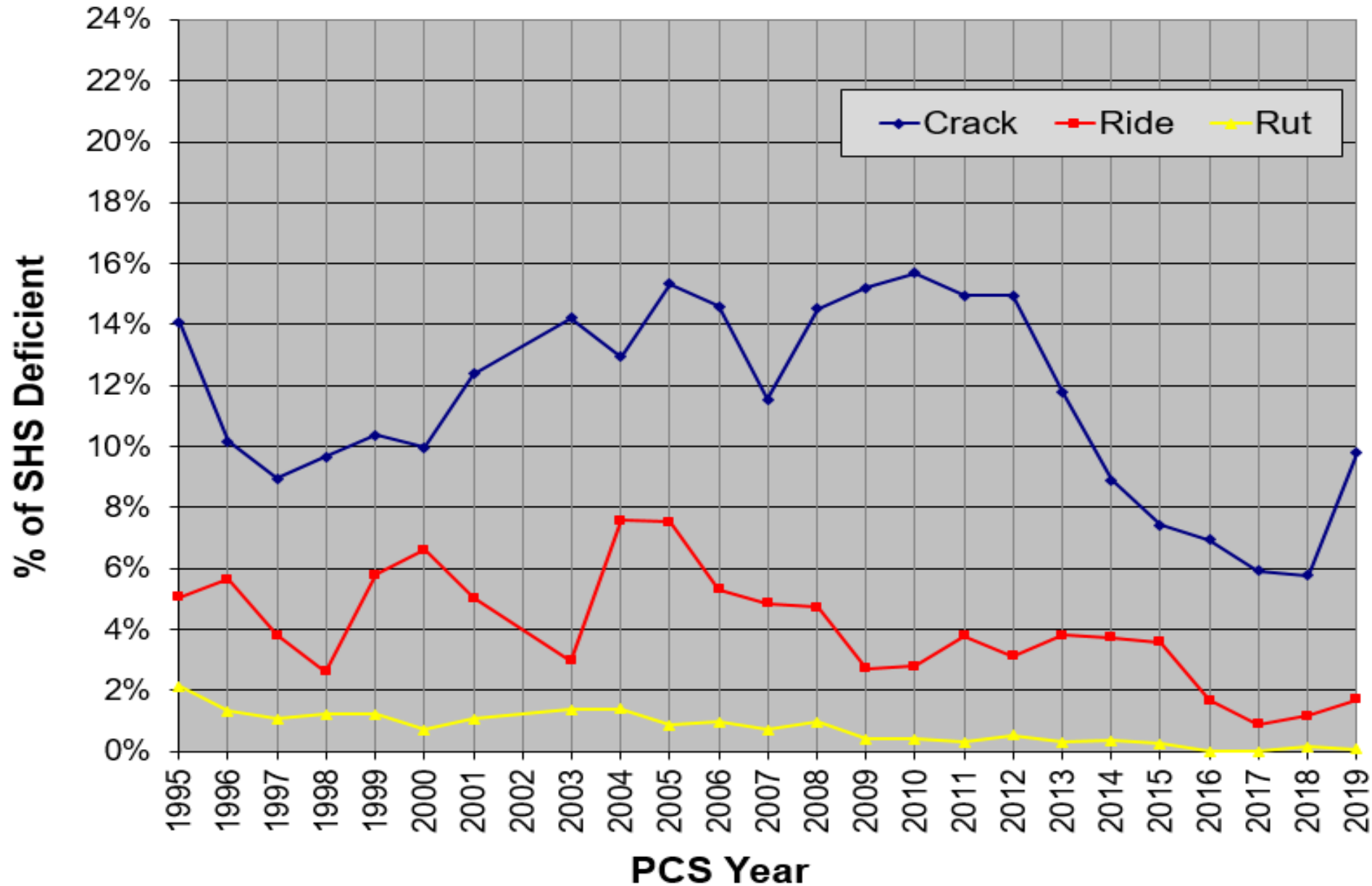
District 5 Historical Performance



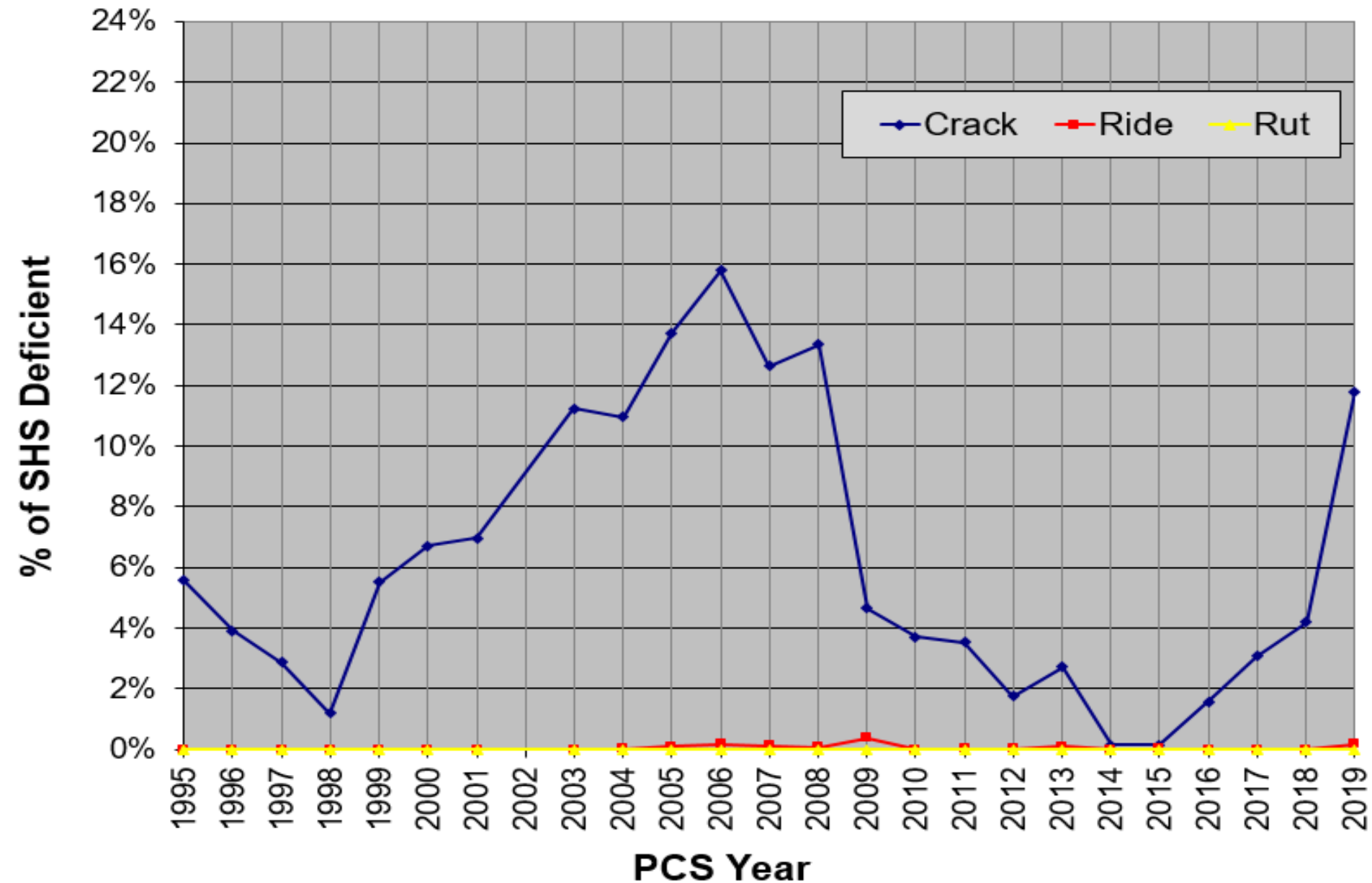
District 6 Historical Performance



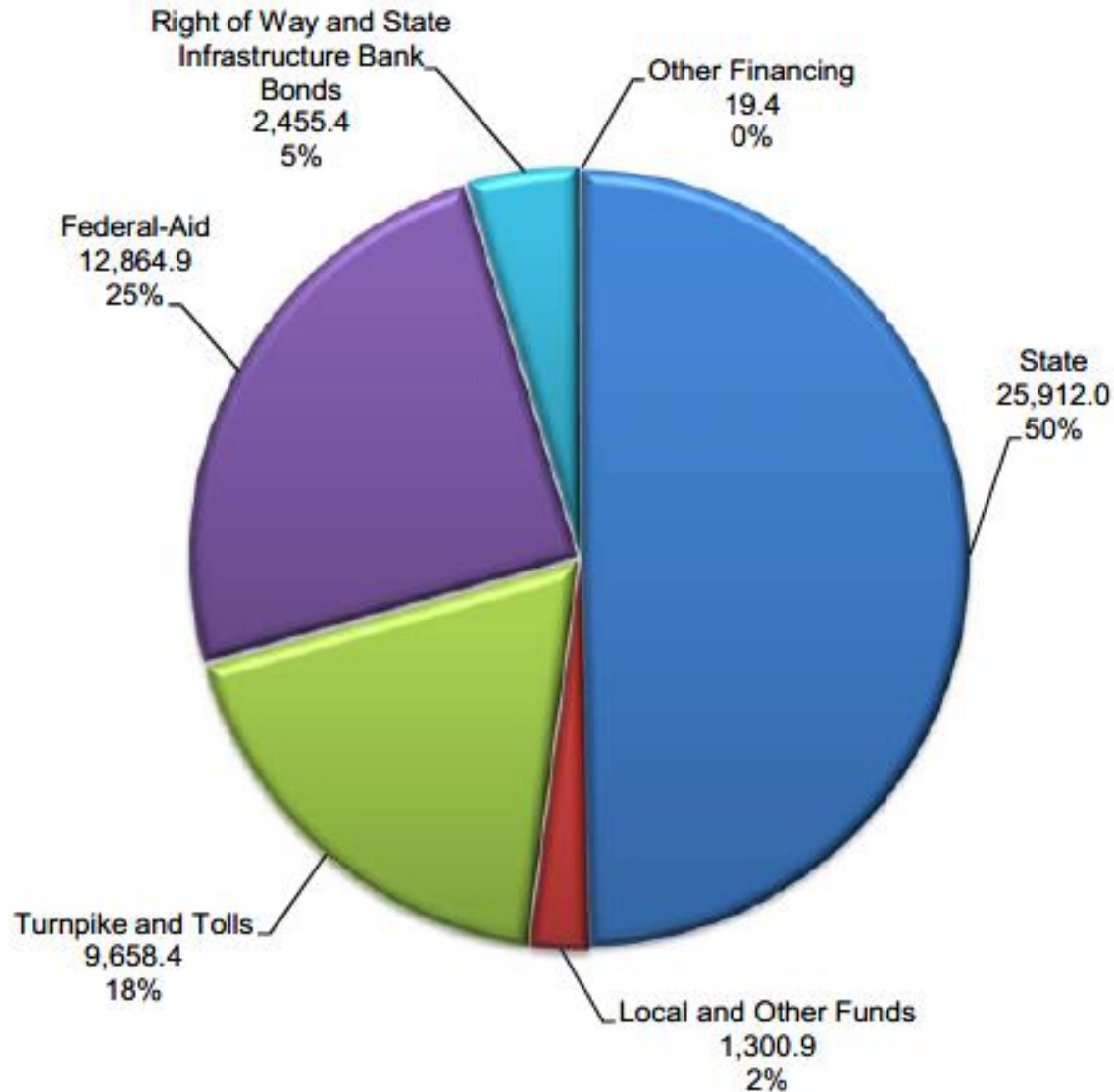
District 7 Historical Performance



Turnpike Historical Performance



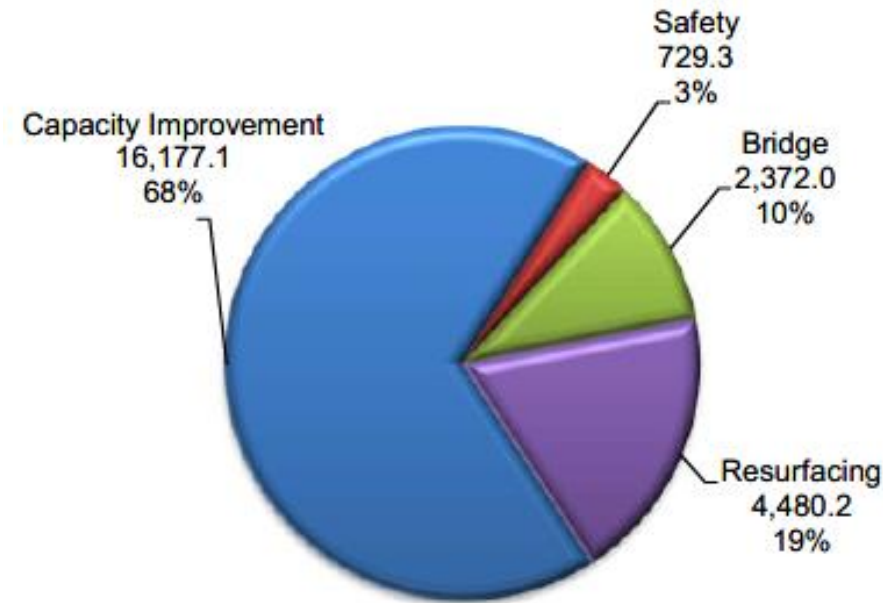
Work Program Funding by Source FY 2020-2024



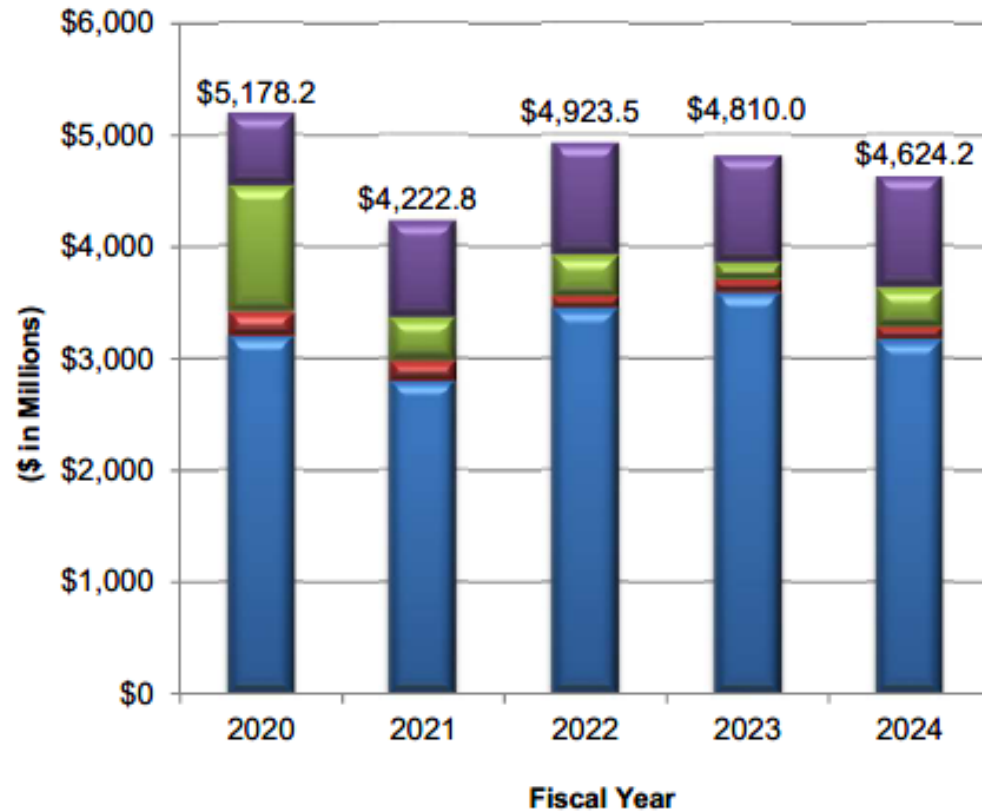
TOTAL 5-YEAR ADOPTED WORK PROGRAM \$52,211M

Work Program Total Construction FY 2020 - 2024

Five Year Summary

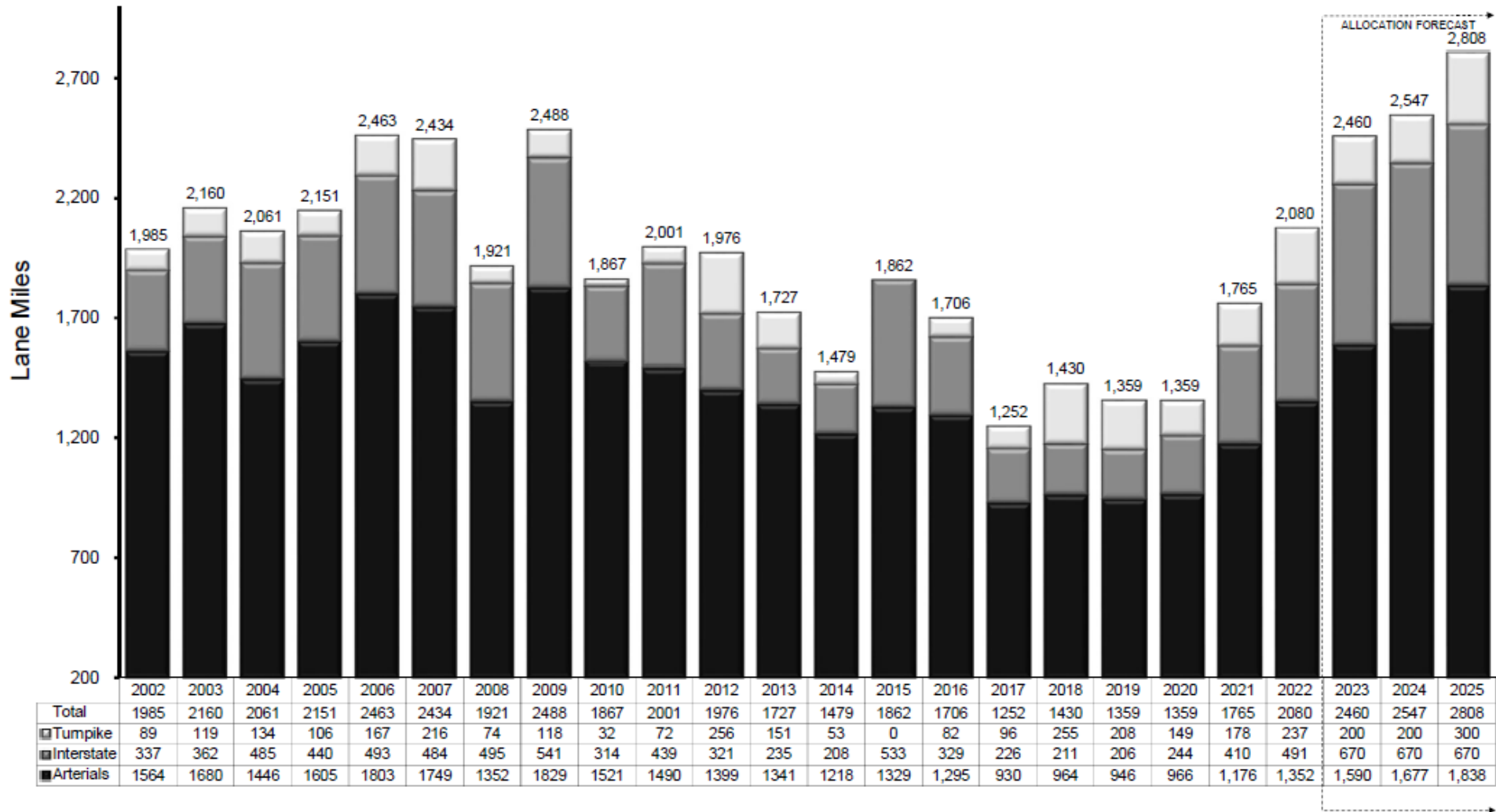


Annual Program Levels



Work Program - Resurfacing

Lane Miles to Be Resurfaced
Tentative Work Program as of March 6, 2019

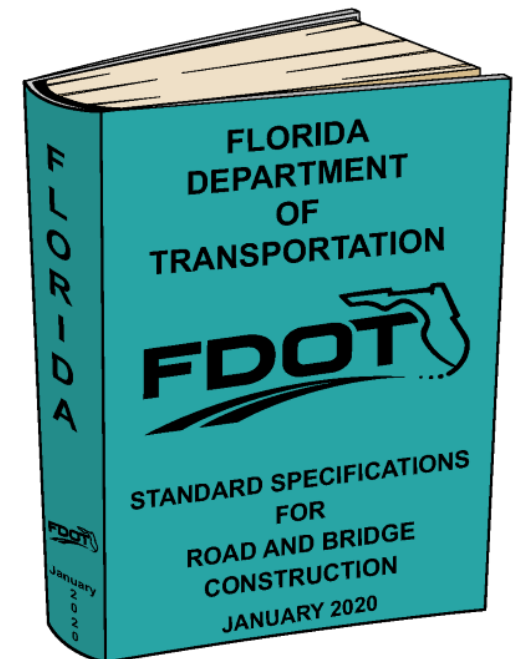
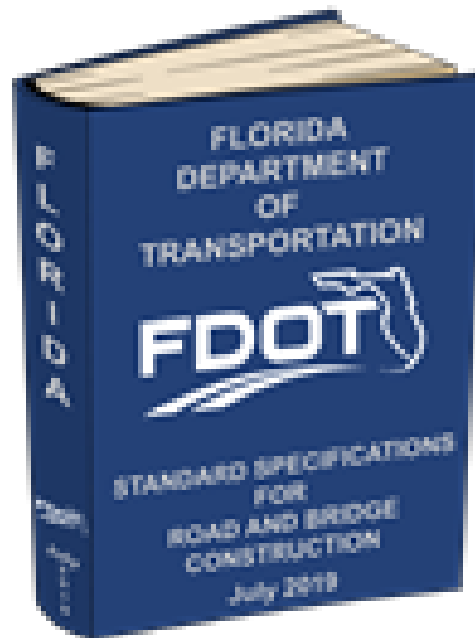
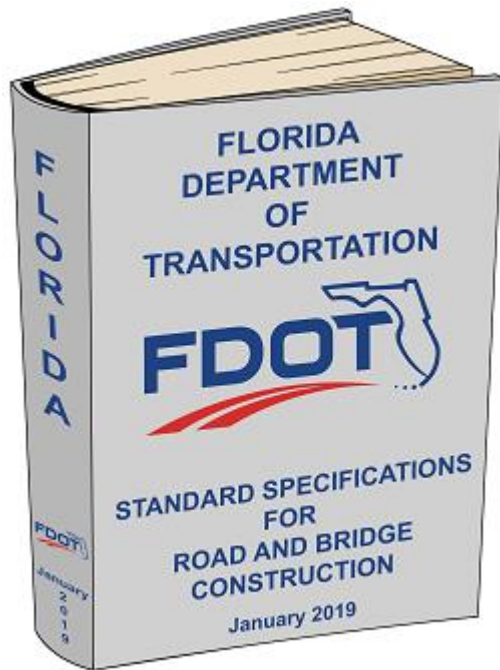


USA Today 2019 Infrastructure Report

- Florida scored the 2nd best overall in the report
 - The lowest percentage of roads in poor condition
 - 6th lowest percentage of deficient bridges
 - 22nd lowest in state highway spending / driver
 - 10th highest for average travel time to work



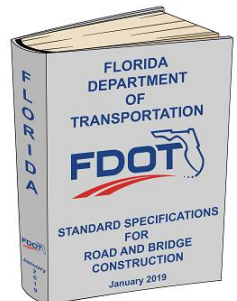
Recent Specification Changes



Florida Department of Transportation

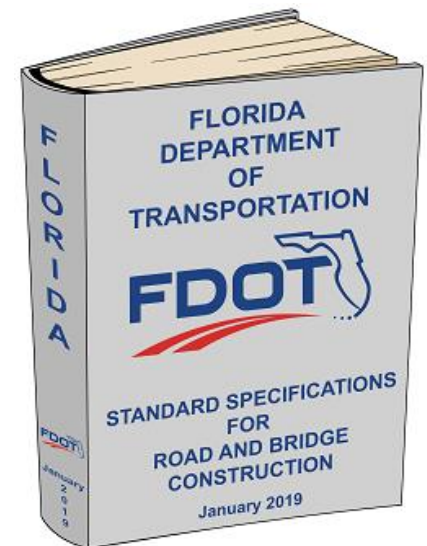
January 2019 Workbook

- Section 320 – Hot Mix Asphalt – Plant Methods and Equipment
 - FC-5 storage time increased to 1.5 hours when using cellulose fibers.
- Section 334 – Superpave Asphalt Concrete
 - SP-19.0 mixtures not allowed in the top layer of shoulders (clarification).
 - Anti-strip agents required in all mixtures.
 - Visual acceptance clarification. 2000 tons includes asphalt base.



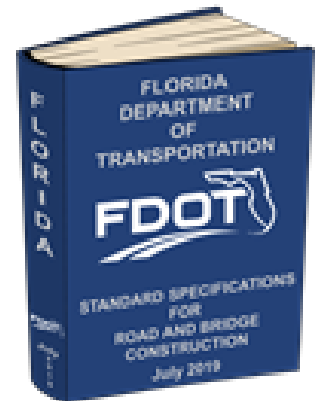
January 2019 Workbook

- Section 916 – Bituminous Materials
 - REOBs limited to 8% maximum.
 - $\Delta T_c \geq -5.0^{\circ}\text{C}$ (20 hours PAV)



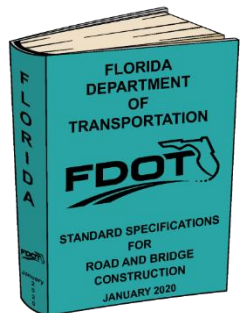
July 2019 Workbook

- Section 334 – Superpave Asphalt Concrete
 - Density pay factor weighting increased to 40%
 - Upper specification limits for density increased
- Section 337 – Asphalt Concrete Friction Courses
 - For FC-5, minus 200 material range changed, 2 – 5%



January 2020 Workbook

- Section 330 – Prime and Tack Coats
 - Distributor cleaning every year and as needed.
 - Target tack rate = 0.05 gal/yd² for dense mixtures on newly constructed asphalt layers.
 - Verify the distributor meter daily.
- Section 334 – Superpave Asphalt Concrete
 - Lot closure time extended to 90 days with approval.
- High polymer binder memo language added to Sections 334, 337, and 916 as appropriate.



Construction Career Days



Case Study - Old Roosevelt Road Project

- Old Roosevelt Road was reconstructed in 2012.
 - Located in Jacksonville
- Existing 4-lane concrete road was demolished and a new 2-lane asphalt road was built.
- The prime contractor proposed a CSI to use the demolished concrete as the new base.
- The CSI was accepted and the demolished concrete was successfully used for the base material.

Old Roosevelt Road Project



Crushed Concrete Base



Plate Bearing Tests



New Asphalt Roadway



Project Findings

- Crushed Concrete makes a good base material.
 - The contractor was consistently able to achieve acceptable gradations and adequate density.
 - Plate bearing tests were good and similar to limerock base.
 - LBR tests ranged from 151 to 309
 - LBR average on the project was 244

Additional Findings*

- There are 1,120 lane miles of concrete pavement in Florida.
- Assuming an average width of 12' and thickness of 10", this equates to 2.2 million cubic yards of available base material.
- Should there be a shortage of base material in the future, the Department has access to significant amounts of crushed concrete base material.

– *These findings do not represent the views of the Florida Department of Transportation, but are intended for the enjoyment of the Asphalt Conference Audience.

Additional Findings*

- The Old Roosevelt Project shows that two lanes of asphalt pavement are better than four lanes of concrete pavement.



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Thank You

Questions?

