Panelists Presentations

Polk County – Austin Potts

FACERS

2022 ANNUAL MEETING

Pavement Management Program Overview

for Polk County, FL

Austin W. Potts, PE
Pavement Manager

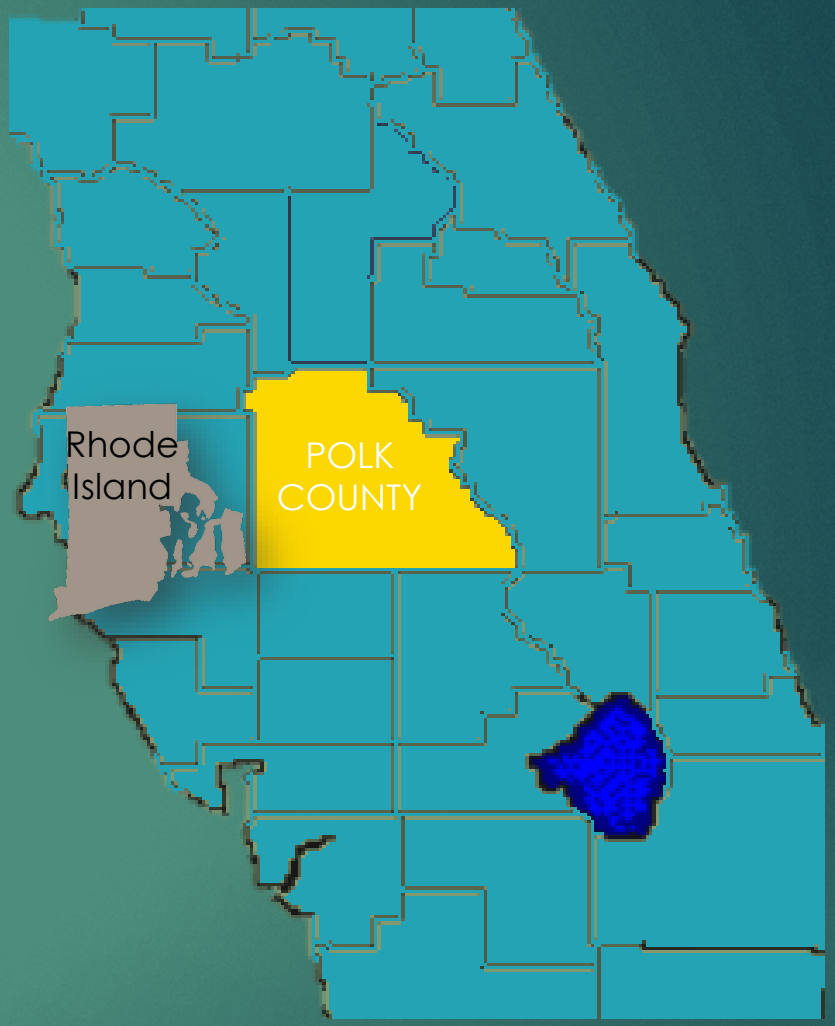
POLK COUNTY

Presentation Overview:

- Introduction to Polk County's Road Network
- Historical Resurfacing Approach
  - Worst-First Approach with limited Treatment Options
- Current Resurfacing Approach
  - Implementation of Preservation Treatments & Agile Assets
  - Updated Pavement Condition Rating Method
- Current Issues
  - Increased Unit Costs
  - Material Shortages
- Looking Forward – Plans for the Future
- Closing Thoughts

Polk County, FL

Florida's Crossroads of Opportunity



- Falls within the I-4 Corridor between Tampa and Orlando
- Fourth largest County by Area in the State of Florida
- Today, Polk County manages 2,535 centerline miles of paved roads

Polk County's Road Network Distribution

by Functional Classification

Local Residential	**50%**
Rural Collectors	**25%**
Urban Collectors	**22%**
Arterials	1%
Local Commercial	2%

- Nearly a 50/50 split between Residential segments and Collectors

Polk County's Resurfacing Approach

Prior to 2015

Approach Methodology:	Worst-first
Treatments Used:	Mill & Pave or Overlay for all functional classifications including Local Residential and Local Commercial segments.
Total Miles Treated: (2010 – 2014)	360 miles ≈ 72 miles/year
Notable Disadvantages:	Use of more intensive treatments on Local segments that constrained the total number of miles that could be treated annually within the defined resurfacing budget.

Polk County's Resurfacing Approach

From 2018 to Present

Approach Methodology:	**Optimized via AgileAssets**
Treatments Used:	**Preservation and Reconstruction added. Refer to next slide.**
Total Miles Treated: (2018 – 2022)	**648 miles** **≈ 130 miles/year**
Notable Advantages:	• **Addition of a wider range of resurfacing treatments, an increased annual resurfacing budget vastly increased avg. miles treated/year.** • **Better ability to select the right treatment for the right segment at the right time.** • **Increased focus on Local Residential and Local Commercial segments**

Current Resurfacing Treatments in Use

Since 2018

Extends Pavement Life by **4-6 years**

Rejuvenation

Extends Pavement Life by **3-4 years**

Patching/Crack Sealing

Extends Pavement Life by **6-10 years**

Chip & Cape Seals

Microsurfacing

Extends Pavement Life by **5-8 years**

Fog & Scrub Seals

Extends Pavement Life by **2-5 years**

CIR and FDR

Extends Pavement Life by **10+ years**

Miles Treated by Treatment Type & Category

From 2018 to Present

Treatment Category	Treatment Type	Miles Treated	Total Miles Treated
Preservation	Rejuvenation:	150	258
	Microsurfacing:	80	
	Chip Seal	2	
	Cape Seal	26	
Rehabilitation	Mill & Pave	280	373
	Overlay	93	
Reconstruction	Full Depth Reclamation	16	17
	Cold In-Place Recycling	1	

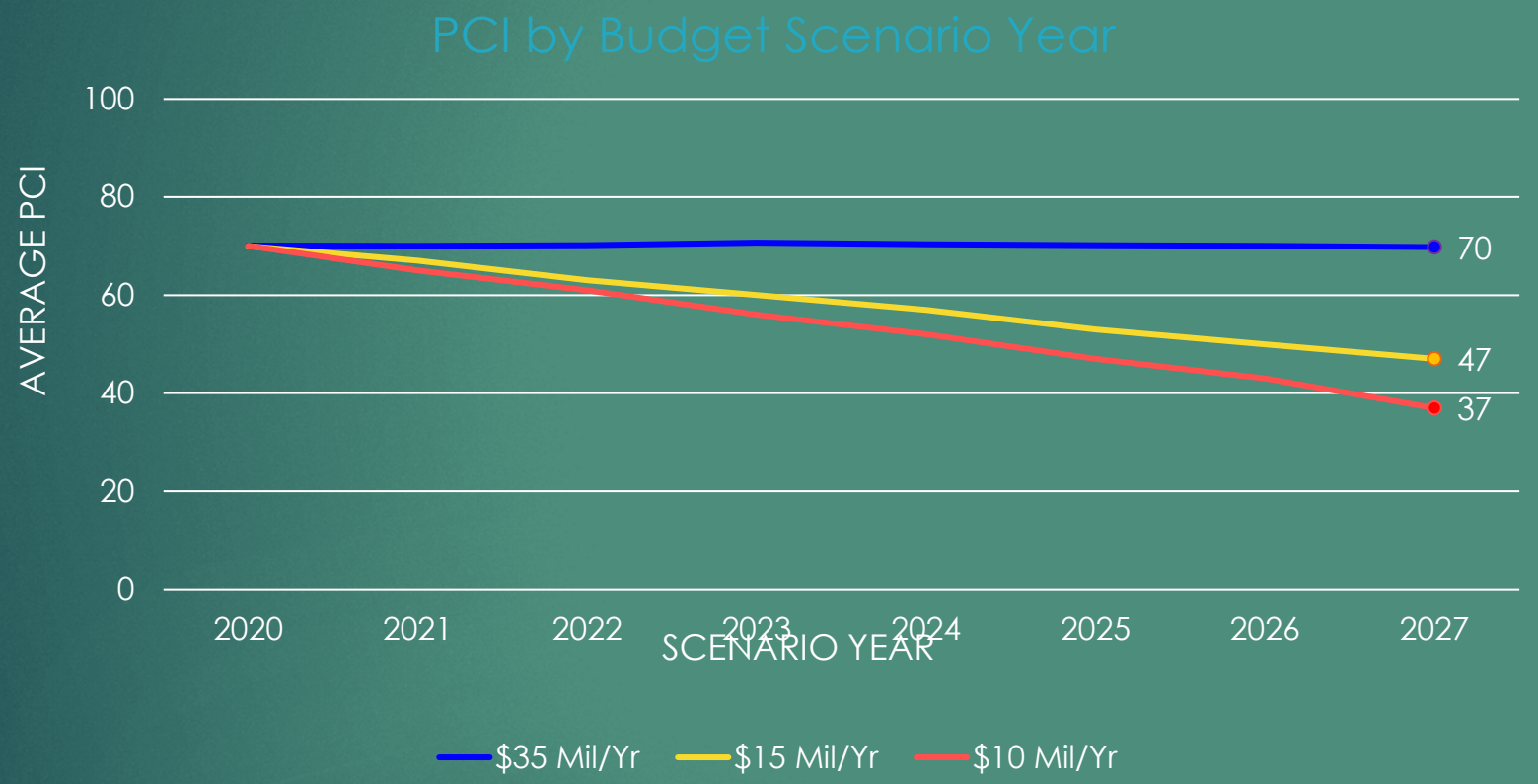
Annual Resurfacing Budget History

From 2010 to Present

Fiscal Year	Resurfacing Budget	Increase from Prior Year
2010 / 2011	$10 million	---
2011 / 2012	$10 million	---
2012 / 2013	$12 million	$2 million (20%)
2013 / 2014	$12 million	---
2014 / 2015	$12 million	---
2016 / 2017	$15 million	$3 million (25%)
2017 / 2018	$15 million	---
2018 / 2019	$18 million	$3 million (20%)
2019 / 2020	$18 million	---
2020 / 2021	$18 million	---
2021 / 2022	$18 million	---
2022 / 2023	$25 million (proposed)	$7 million (39%)

Software Integration & Analytics

Optimized Budget Scenarios Projected thru 2027 w/AgileAssets



Average Network PCI in 2027:

$35 Million/Year Budget: 70

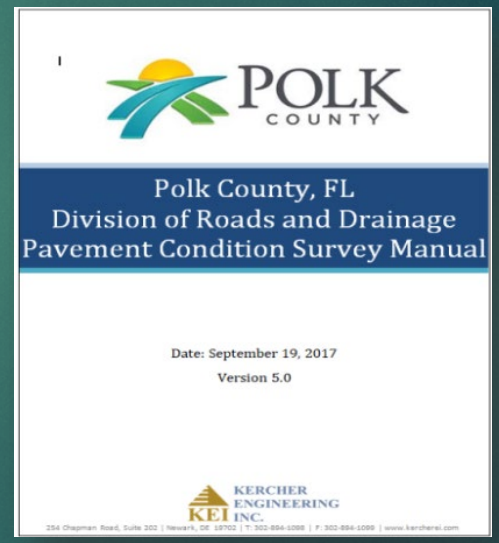
$15 Million / Year Budget: 47

$10 Million / Year Budget: 37

Pavement Condition Rating Methods

Changes Implemented in 2017

Prior to 2017	**Since 2017**
In 2004 the County began using PASER method (dev. Univ. of Wisconsin 1987).	Adopted new standardized rating method & PCI Manual specific for our network needs.
PCI - 1 – 10 scale indicative of overall roadway condition.	Use Composite Distress Indices (CDI) calculated based on combining similar failure modes (Structural, Environmental and Functional indices) for more detailed decision making.
Based on Rater's overall perception of different distresses and their level of severity.	PCI 1-100 scale will be calculated from CDI and used as general health Indicator of the road and network.
Inspections done in-house on 2-year cycle thru ArcGIS	



Evidence of Success

Based on Biennial Pavement Condition Inspection Data

Functional Classification (Year of Inspection Data)	"Poor" Condition	"Fair" Condition	"Good" Condition
	Miles		
Local Residential (2019)	**74**	**375**	**396**
Local Residential (2021)	**69** ↓	**378** ↑	**398** ↑
Local Commercial (2019)	**8**	**9**	**9**
Local Commercial (2021)	**6** ↓	**10** ↑	**10** ↑

Lessons Learned -1

for Implementing a new Pavement Management System

- Frustrations
  - Time Consuming
  - Costly
  - Ties up Staff
  - No Guarantee of Success!

- Proper Planning, Managing Change, and Minimizing Risk can make this a successful process.

Lessons Learned - 2

for Implementing a new Pavement Management System

Upper Management Support

Clear Objectives

Consultant Partnership

Dedicated Resources

Own the Process from beginning to end!

Current Challenges

for New Construction & Maintenance Projects

- Unit Cost Increases
  - Fuel Costs
  - Hourly Trucking Rates
  - Bituminous Materials

- Material Shortages
  - Aggregate
  - Cement
  - Signage & Lighting Materials

Resurfacing Specific Solutions

for Maintenance Projects

- Unit Cost Increases
  - Polk County had to rebid our Rehab treatments contract as no contractor could continue with a CPI adjustment to offset increase fuel costs and hourly trucking rates.
  - Offer bituminous adjustments similar to FDOT to help offset increased liquid costs.

- Material Shortages
  - Consider using more non-aggregate dependent treatments like rejuvenation, fog seal, and recycling.
  - Consider bulk orders of cement when possible.
  - Advanced procurement of lighting poles and signage posts through consultant support has been successful.

Closing Thoughts

What Worked for Polk County and Thoughts on the Future

SUCCESSES

- ✓ Added preservation and reconstruction treatments to our toolbox.
- ✓ Implemented the use of Agile Assets to improve analytic capabilities.
- ✓ Implemented an updated Pavement Condition Rating Method for use by inhouse inspection staff.
- ✓ The right climate to support the program included buy-in from all levels of County Management.

FUTURE THOUGHTS

- With three inspection data points now recorded since we began, we can start to adjust our performance models to actual conditions as we are tracking a bit less aggressive than originally predicted.
- Our next step is to set a target average network PCI and establish policy around maintaining that minimum condition rating.
- To meet the above stated PCI goal, an increased pavement management budget must be identified and presented to upper management for proper allocation.

Thank You!

Austin W. Potts, PE

AustinPotts@polk-county.net

Panelists Presentations

Ergon Asphalt and Emulsions Inc. – Larry Tomkins

Supplier's Perspective On Pavement Preservation

FACERS Annual Meeting
June 30, 2022

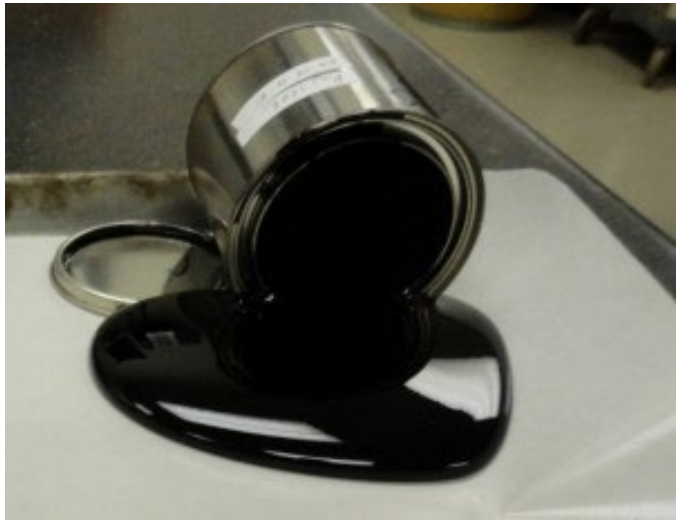
Pavement Preservation

pre·serve (pri-zērv’) verb

1. to keep in good condition
2. to keep safe from harm
3. to prevent decay
4. maintain

Source: Merriam Webster

The Basics



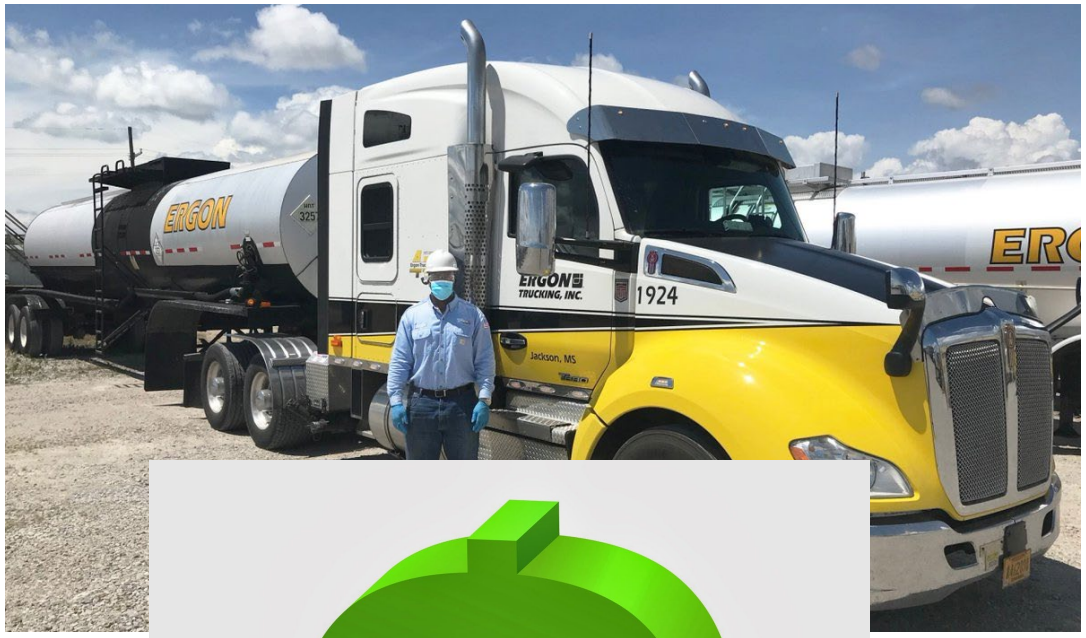
Test method	Test results	Specification
Flash point AASHTO T48	295	230 °C
Rotational viscosity @ 135 °C	0.32	3.0
Dynamic shear rheometer (DSR) AASHTO T315		
Test temperature °C	Min 1.00 kPa	G*/sinδ
64 °C		3.1 kPa
PAV AASHTO R28 @ 100 °C		
Dynamic shear rheometer (DSR) AASHTO T315		
Test temperature °C	Max 5000 kPa	G*.sinδ
25 °C		2950 kPa
Bending beam rheometer (BBR) AASHTO T313		
Test temperature °C	Stiffness MPa	Max 300 MPa	147 Mpa
-22 °C	m-value	Min 0.30	0.3299

Table 1—Requirements for Polymer-Modified Emulsified Asphalt Typically Used for Chip Seal Applications[a]

Type	Rapid-Setting								Medium-Setting			
	CRS-2hP		CRS-2P		CRS-2sP		CHFRS-2P		HFRS-2P		HFMS-2P	
Grade	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Tests on emulsified asphalt:												
Viscosity, Saybolt Furol at 50°C (122°F), s[b]	100	400	100	400	100	400	100	400	75	400	100	450
Or												
Viscosity, Rotational Paddle at 50°C (122°F), mPa.s	200	800	200	800	200	800	200	800	150	800	200	900
Storage stability test, 24 h, %[b,c]		1		1		1		1		1		1
Demulsibility:												
35 mL, 0.8% Sodium dioctyl sulfosuccinate, %[b]	40		40		40		40					
35 mL, 0.02 *N* $CaCl_2$, %[b]									50			
50 mL, 0.10 *N* $CaCl_2$, %[b]											40	
Particle charge test	Positive		Positive		Positive		Positive					
Sieve test, %[b,c]		0.10		0.10		0.10		0.10		0.10		0.10
Distillation:												
Oil distillate, by volume of emulsified asphalt, %										3		3
Residue, %[d]	65		65		65		65		65		65	
Tests on residue from distillation: [e]												
Penetration, 25°C (77°F), 100 g, 5 s, 0.1 mm	40	90	90	150	150	250	100	175	100	200	100	200
Elastic Recovery, 25°C (77°F), Straight Sided, 5 cm/min, 20 cm elongation, 5 min hold, %[f]	50		60		60		60		60		60	
Float test, 60°C (140°F), s							1800		1200		1200	
Ash content, %		1		1		1		1		1		1

[a] Refer to R 5 for typical applications.
[b] This test requirement and associated specification limits are waived for emulsified asphalt products following dilution.
[c] This test requirement on representative samples may be waived if successful applications of the material has been achieved in the field.

The Basics



Costs

Treatment Alternative	Costs		Estimated Service Life (Years)	EAC ($/SY/Year)
	($/Lane-Mile) *	($/SY)		
Crack Seal	$ 3,520	$ .50	2	$0.25
Fog Seal	$ 7,040	$ 1.00	3	$0.33
Single Surface Treatment	$ 14,080	$ 2.00	5	$0.40
Double Surface Treatment	$ 29,920	$ 4.25	8	$0.53
Thin Overlays	$ 49,280	$ 7.00	10	$0.70
Mill-and-Fill	$ 84,480	$12.00	12	$1.00
Rehabilitation	$119,680	$17.00	15	$1.13
Reconstruction	$176,000	$25.00	20	$1.25

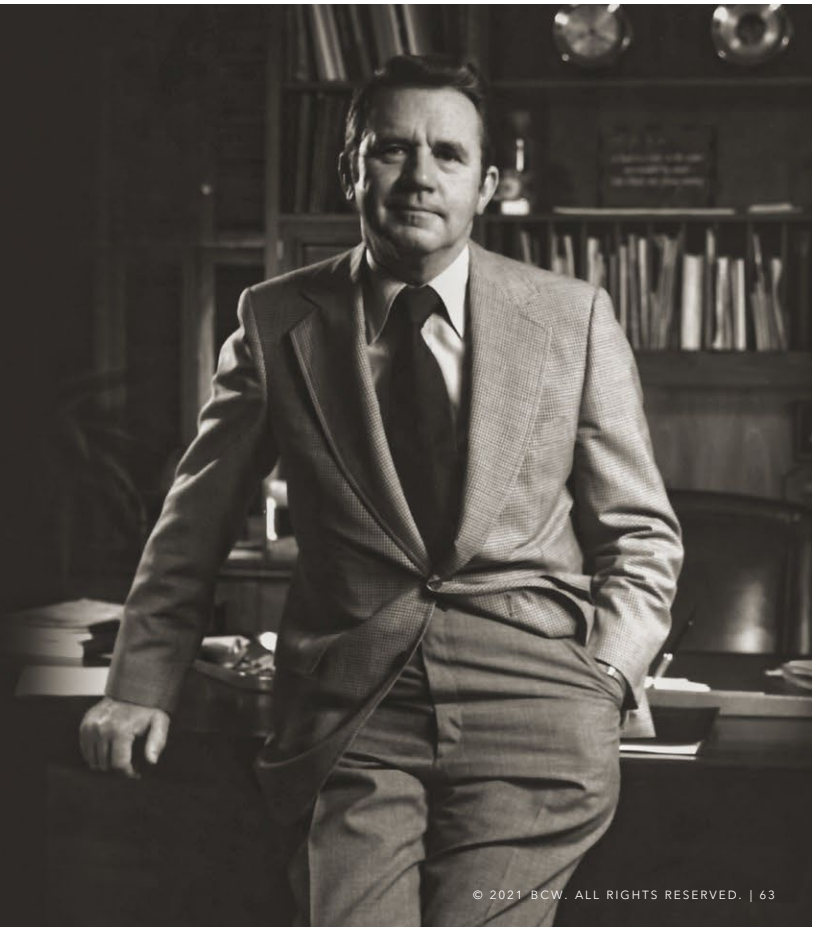
* Based on 12’ lane widths

The Why?

The Why?

The Why?

Ergon's success is based on our ability to clearly understand the needs of our customers, both today and in the future.



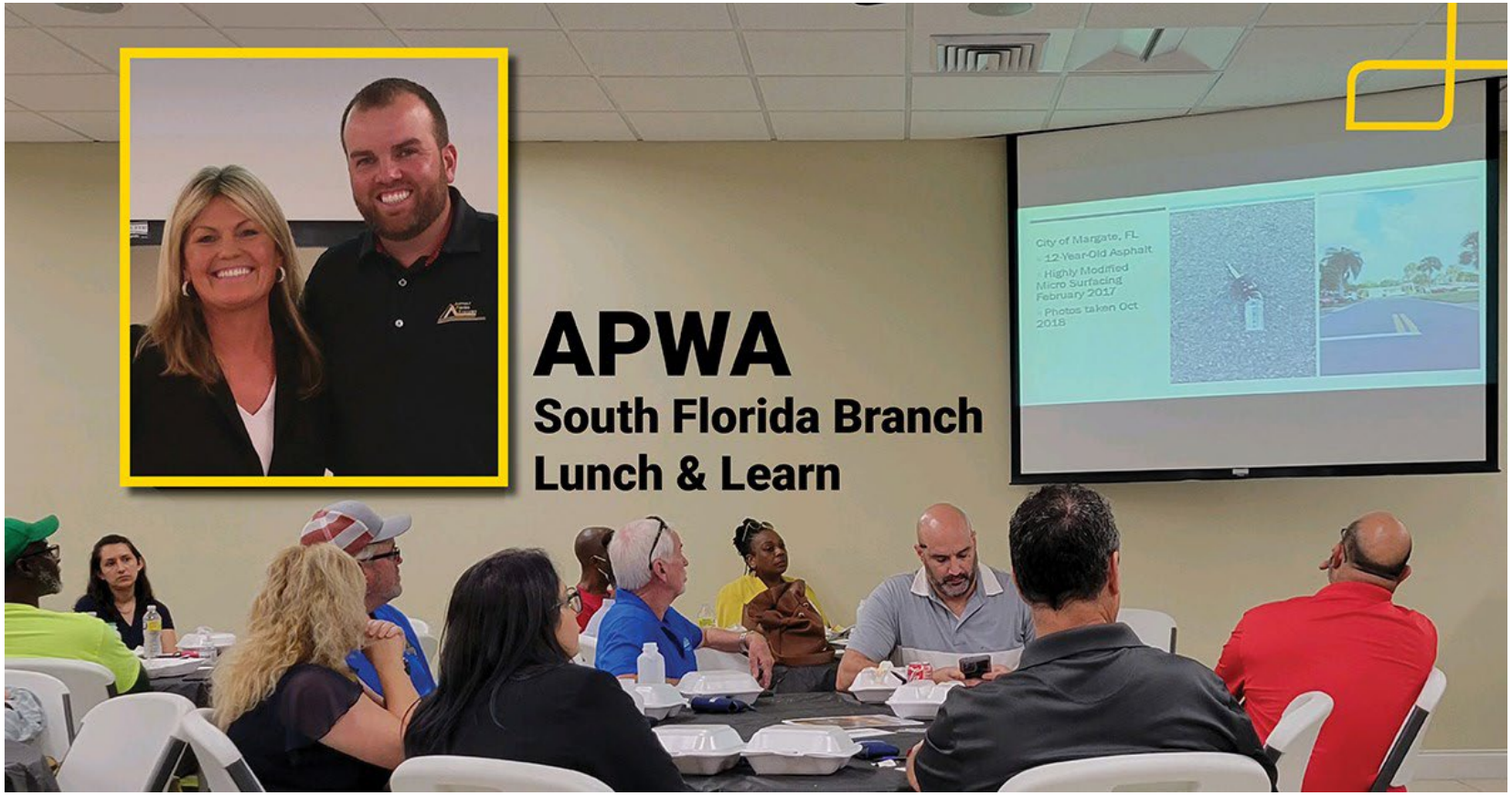
Beyond the Basics

Network vs. Individual Road

Employing a Network Mindset Allows Us To

- Measure progress
- Predict the effects of different strategies
- Affect funding considerations
- Plan for steady improvements

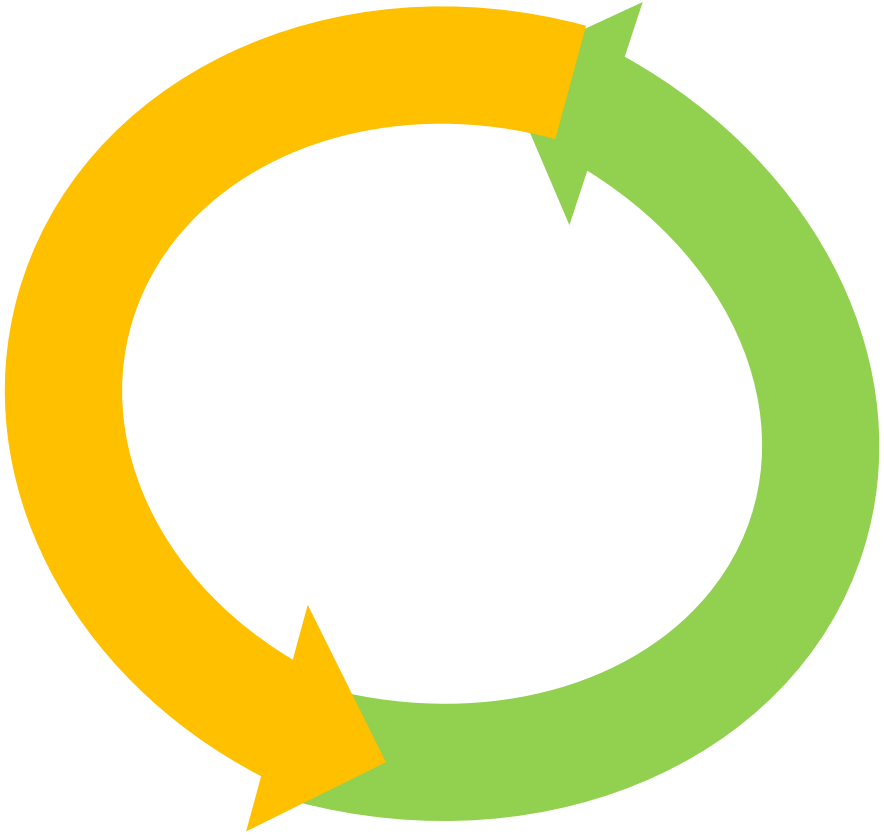
Education


APWA
South Florida Branch
Lunch & Learn
City of Margate, FL
12-Year-Old Asphalt
Highly Modified Micro Surfacing February 2017
Photos taken Oct 2018

Field Support/Troubleshoot

Industry Involvement

Relationships



WE MUST
WORK
TOGETHER

Parting Shot

The best materials can't overcome a bad contractor.

The best contractor can't perform using bad materials.

Parting Shot

Poor Specifications will defeat good intentions of the best contractors and the best material suppliers.

Parting Shot

A treatment applied by the best contractor using the best materials and a good specification will not perform if the site selection is poor.

Parting Shot

The best contractor using the best materials and a great specification on the perfect candidate won't get the job if it is known that the agency doesn't participate.

Thank You!!!

Larry Tomkins, P.E.

Ergon Asphalt & Emulsions, Inc.

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Panelists Presentations

Asphalt Paving Systems – Kris Shane

ASPHALT PAVING SYSTEMS

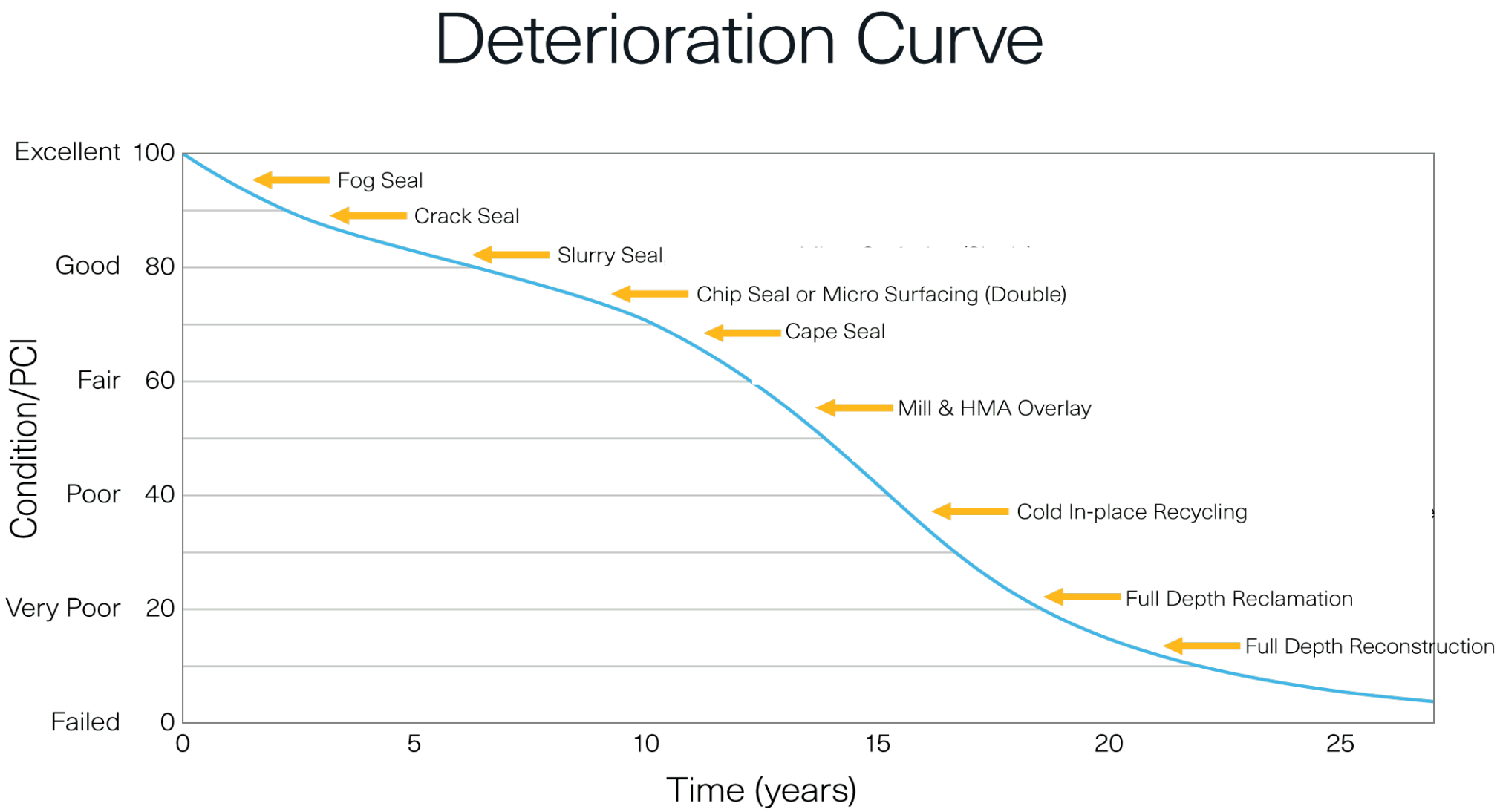
- Full service: Pavement Preservation, Mill/Resurface, and In-Place Reconstruction
- Asphalt Plant in Pasco County (Zephyrhills)
- Largest Micro Surfacing Contractor on the East Coast
- Started in Florida in 2009
- Mother Company in New Jersey
- Offices in FL, GA, PA, CT, TN & WI

ASPHALT PAVING SYSTEMS

"Making Roads Last Longer"

Kris Shane
Asphalt Paving Systems

EFFECTIVE PAVEMENT MANAGEMENT:
"RIGHT ROAD, RIGHT TREATMENT, RIGHT TIME"



WHAT IS MICRO SURFACING

- Micro Surfacing is a new thin lift overlay, that is applied over existing asphalt or Chip Seal to protect underlying surface and act as a new wearing surface.
- Polymer Modified Asphalt Emulsion with a granite aggregate.
- Double Micro Surfacing the total thickness is roughly 3/8” (30-34 lbs/SY).

NEVER SAY NEVER

- There has never been a better time to get back into Pavement Preservation (Micro Surfacing)

- A bad experience from 15-20 years ago shouldn't keep you from getting back into Pavement Preservation
- Technology advancing
- Improved Specifications and QC
- Warranty and safeguards
- Rising Cost on Traditional Paving Methods
- FDOT

Asphalt Paving Systems
"Making Roads Last Longer"

WHAT IF THE PAVEMENT PRESERVATION TREATMENT FAILS???

- Micro Surfacing

GETTING BACK INTO MICRO SURFACING

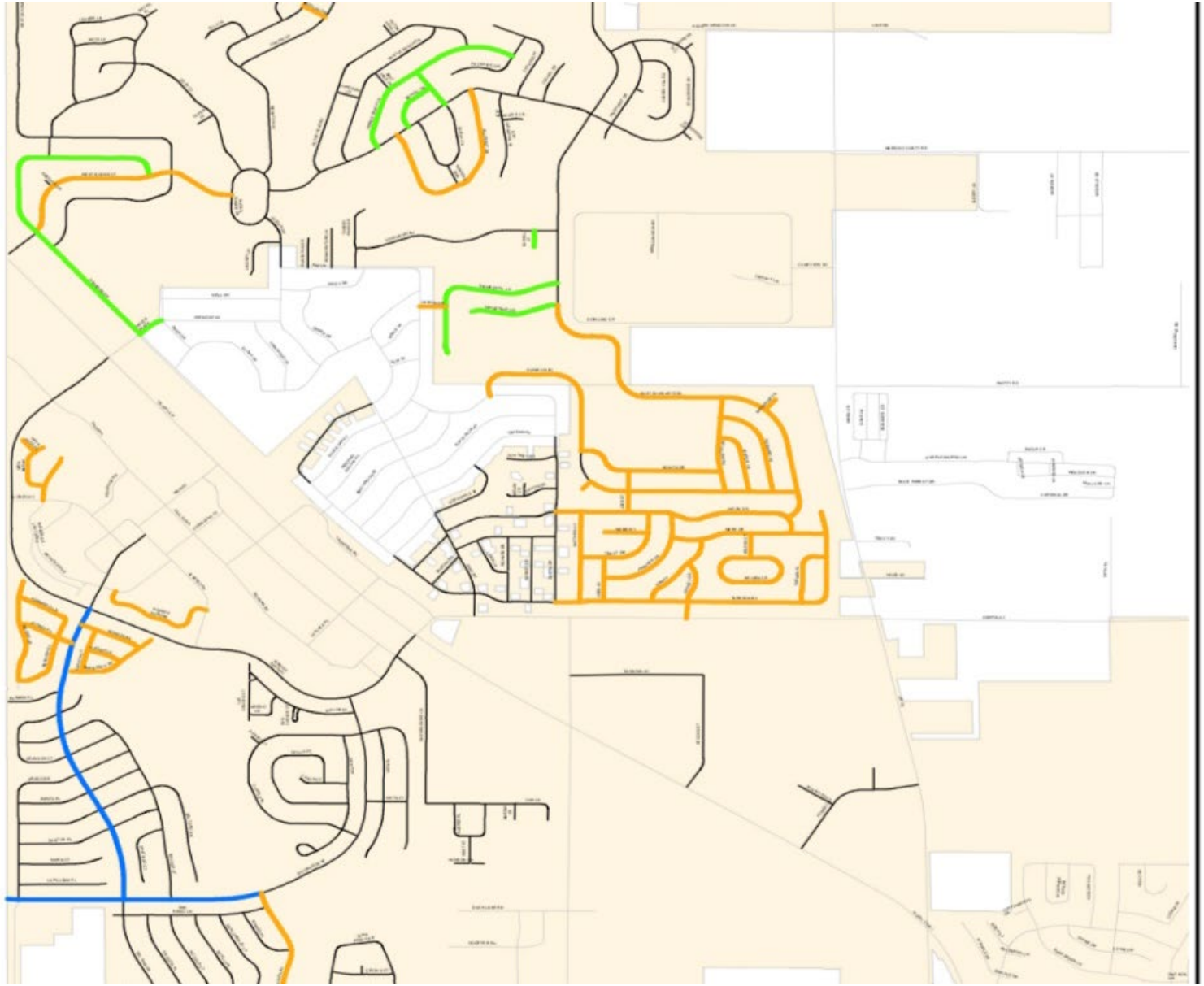
- Start Small
- Limited Exposure
- Manage Expectations
- CANDIDATE SELECTION

- PCI score between 65-85
- Starting to crack due to age and/or weather (not load associated)
- Starting to ravel
- Good profile
- No base issues
- No water issues- water pumping up from base
- Micro over roads previously Micro Surfaced

Asphalt Paving Systems
"Making Roads Last Longer"

STICK TO THE PLAN

- Pavement Preservation (Micro Surfacing) not a permanent fix, no such thing
- 8-12 Year Paving Cycle

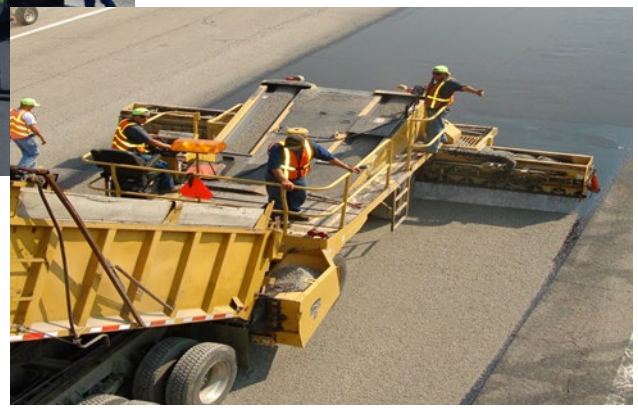


WHY PAVEMENT PRESERVATION WHEN BUDGETS GET CUT

- **Cost-** Agencies can extend their budgets and maximize tax dollars by extending the life cycle of the pavement
- **Treat more Roadways-** Agencies will be able to treat 30-60% more roadways with the same budget by using Pavement Preservation.
- **Less Complaints-** By treating your roadways before they reach the complaint line you are limiting the number of complaints because you are maintaining your network at a higher level of service.

The “Why” (or why not)

Two reasons

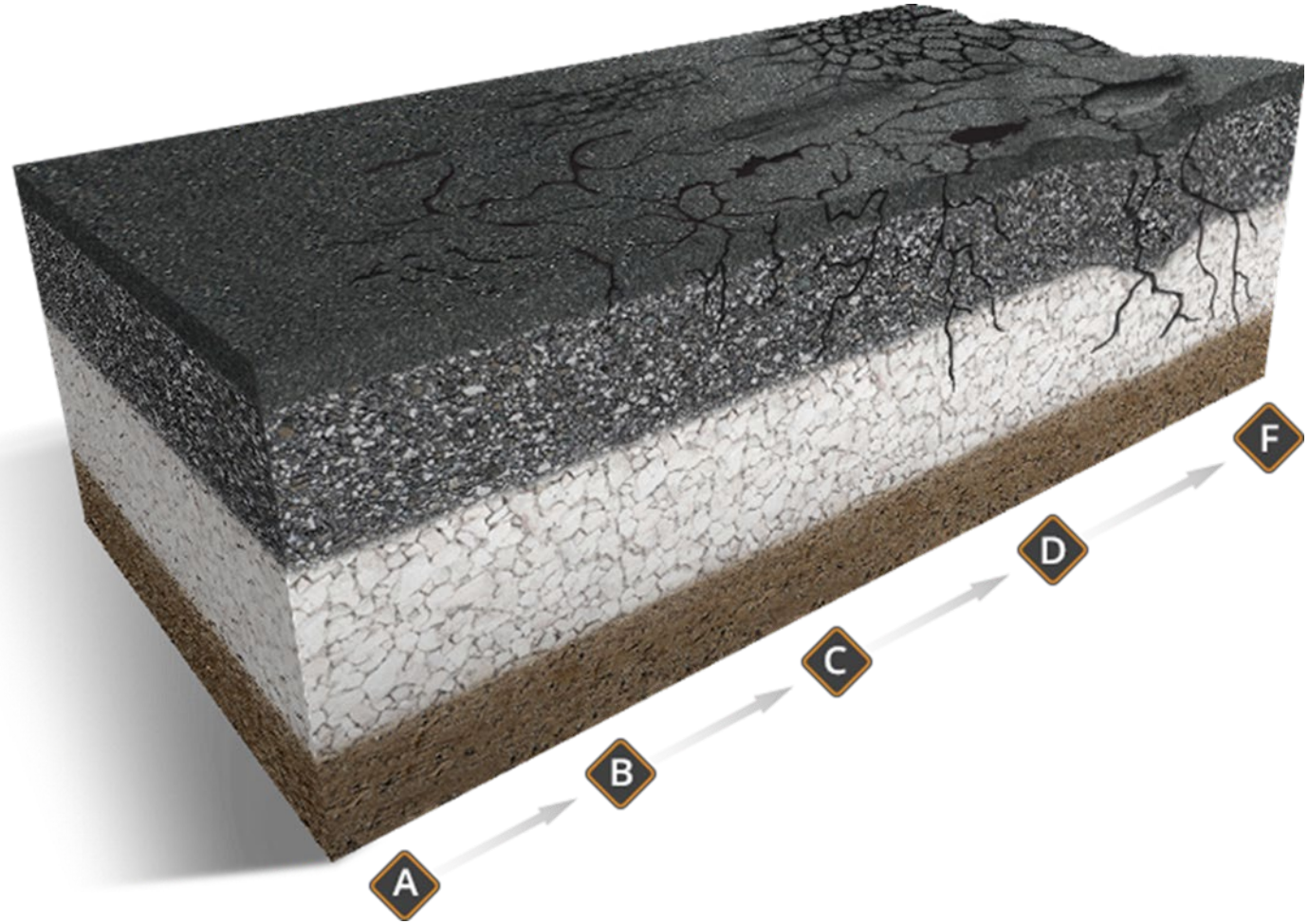


There are only two reasons people don't use Pavement Preservation

1. You don't have any money, like $0
2. You don't think it will work for your agency

Which one is it for you?

Spending money at the top



Pavement Preservation keeps the good roads good

The saying goes…

Good roads cost money bad roads cost more!

Your pavement leaves signs

Proper interpretation of the signs your roads leave, will enable the proper selection of treatments

Not all signs are clear, some can be quite confusing…

Distresses are symptoms

Much like a Dr., we collect data which points to the illness in the road

Symptoms point to the root cause and specific effective treatments.

Would you trust a Surgeon with only one surgical tool?

*hint, don't wait

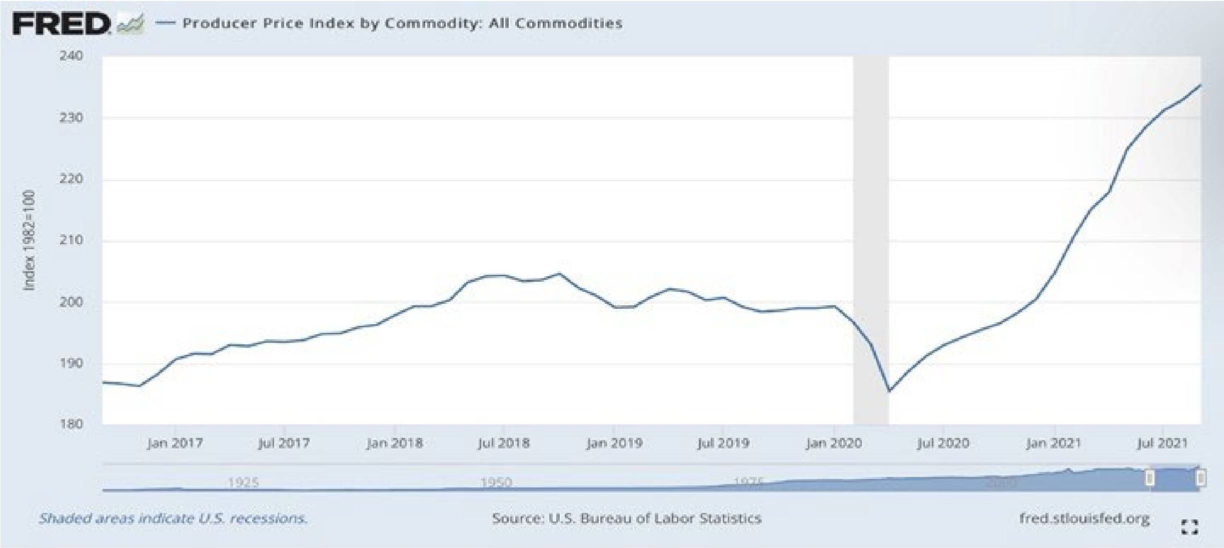
till you need one!

The Future

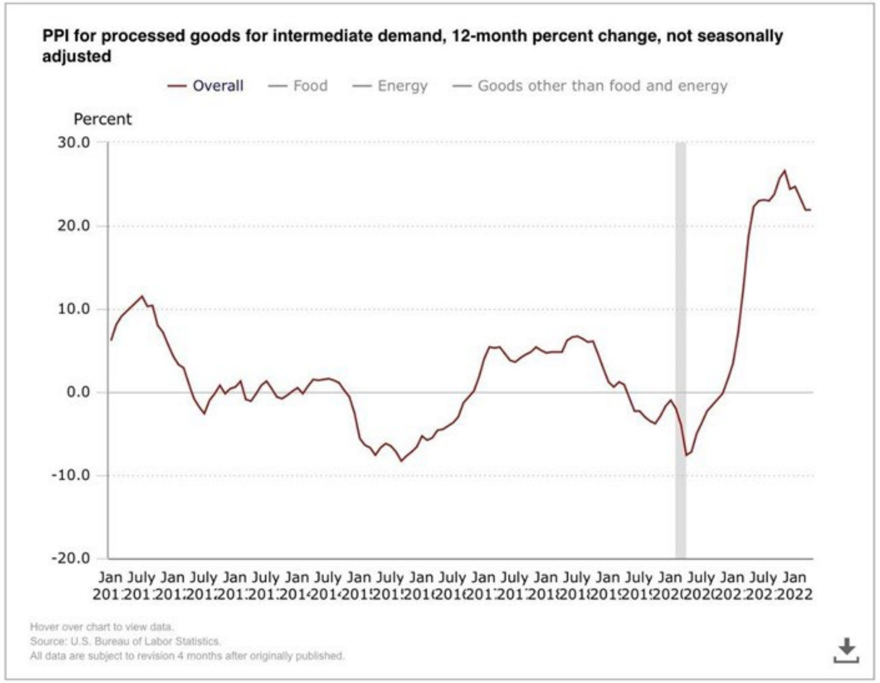
The Future costs more!

Construction Inflation

Producer Price Index 2017-2021 www.fred.stlouisfed.org

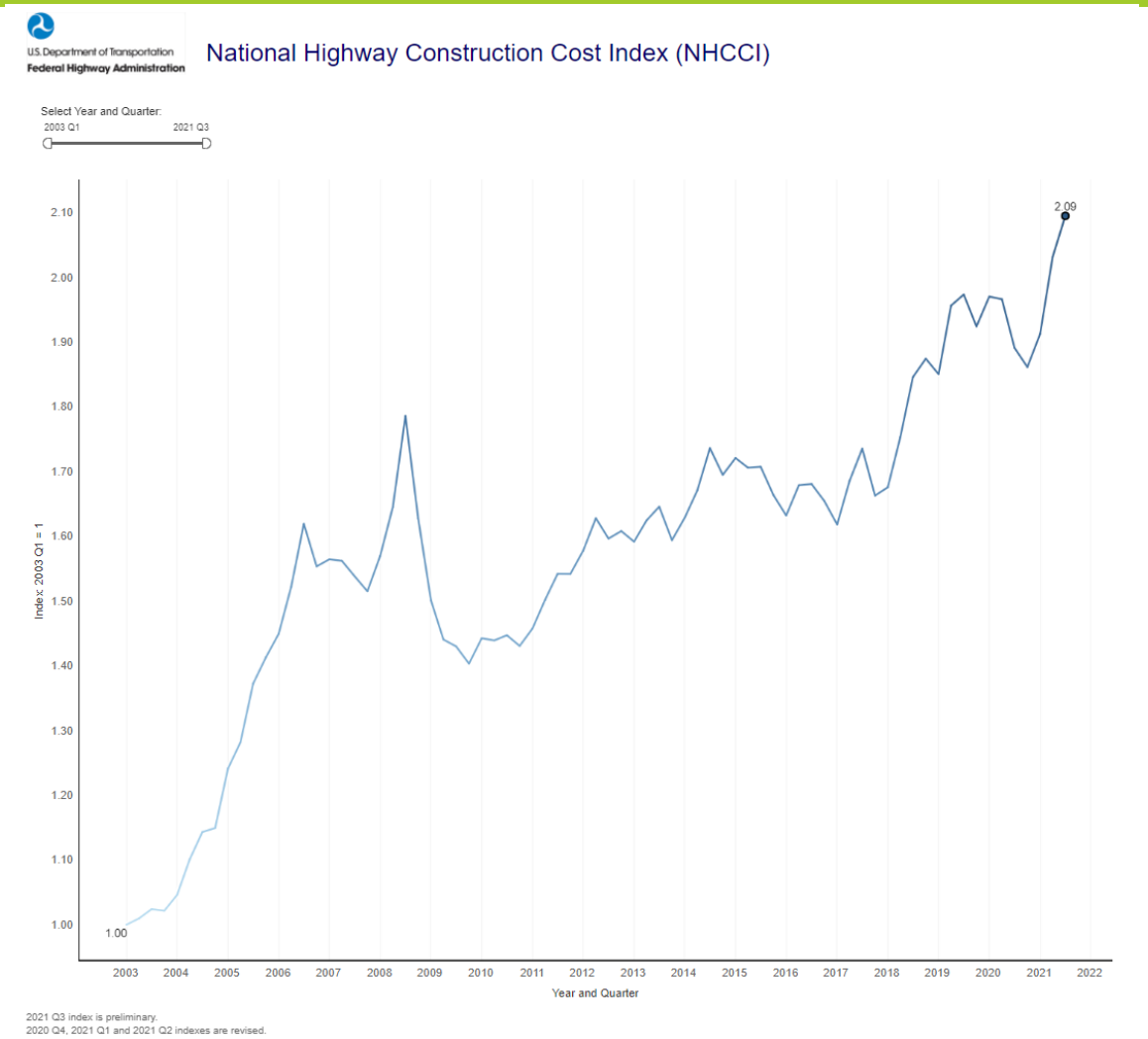


Monthly Yr/Yr Producer Price Index LTM www.statista.com



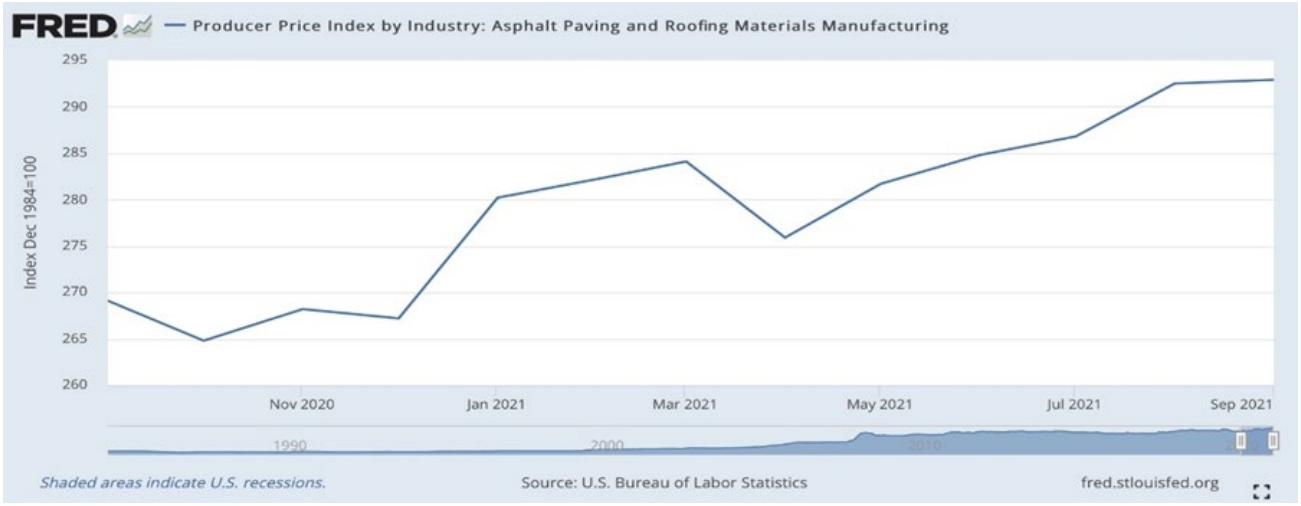
Construction Inflation

- **National Highway Construction Cost Index (USDOT)**
- **Over nearly the same twenty period that fuel efficiency improved 29% transportation costs more than doubled!**
- **We call this the dreaded double whammy.**

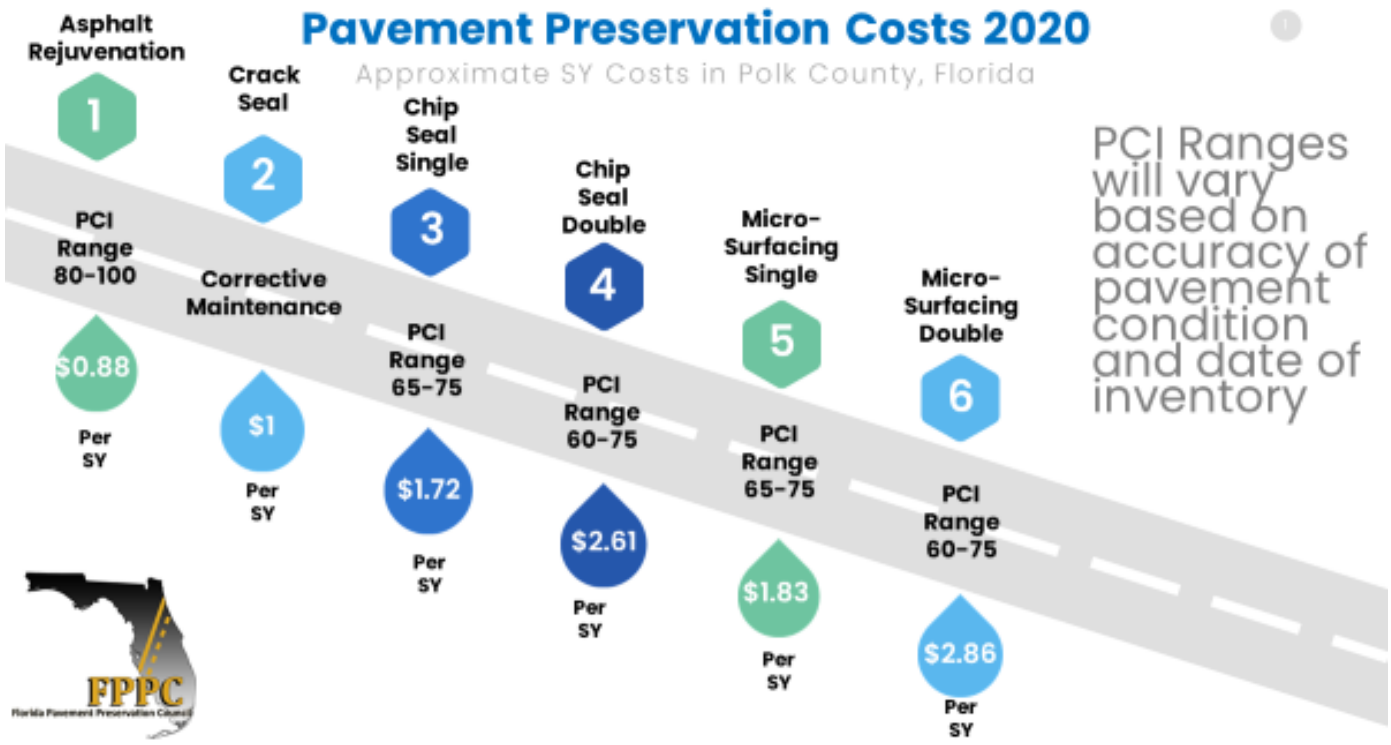


Construction Inflation

- The pace of inflation has increased, PPI for asphalt paving materials
- Materials are especially sensitive to price fluctuations
- Escalators can protect both the agency and contractor in times like this.



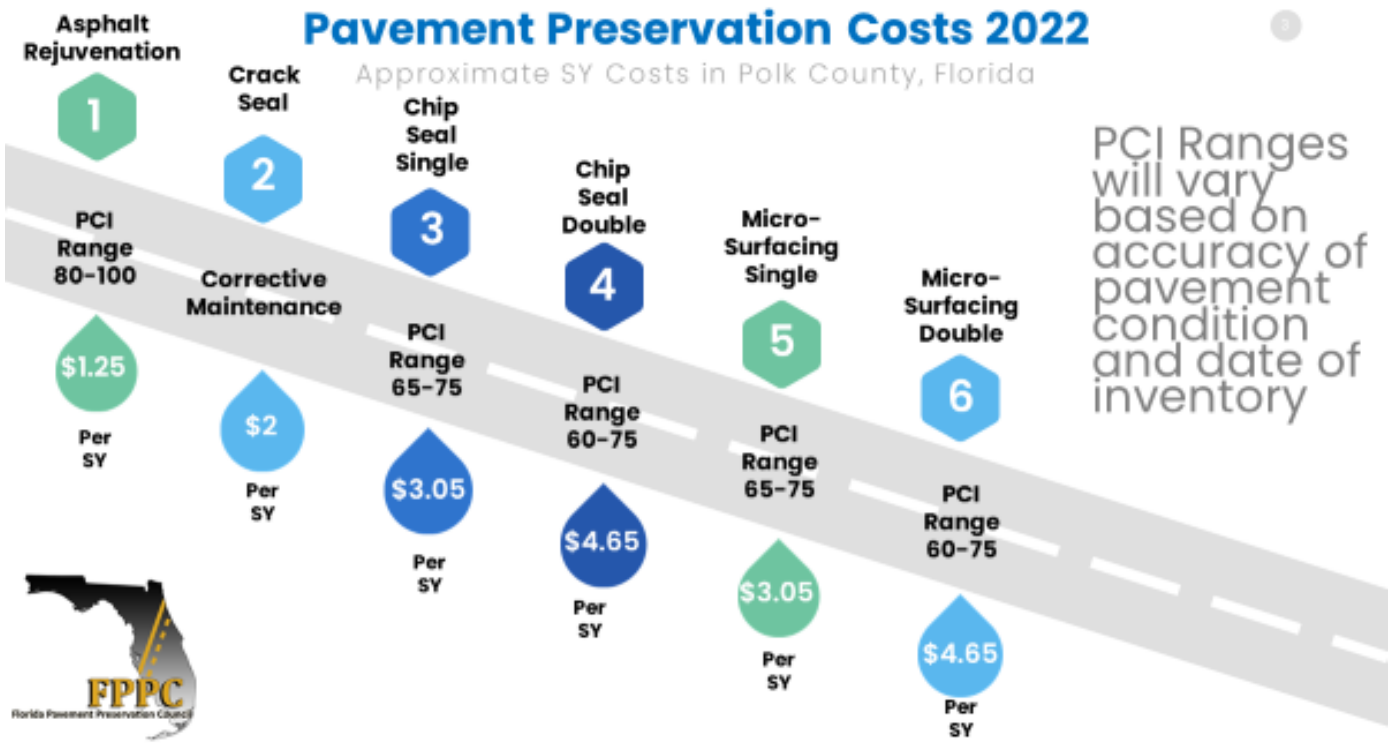
Effect of inflation in Polk County…



These costs come from the 2019 Polk County Pavement Preservation Contract

This was their 2nd Preservation contract with the original coming in 2016

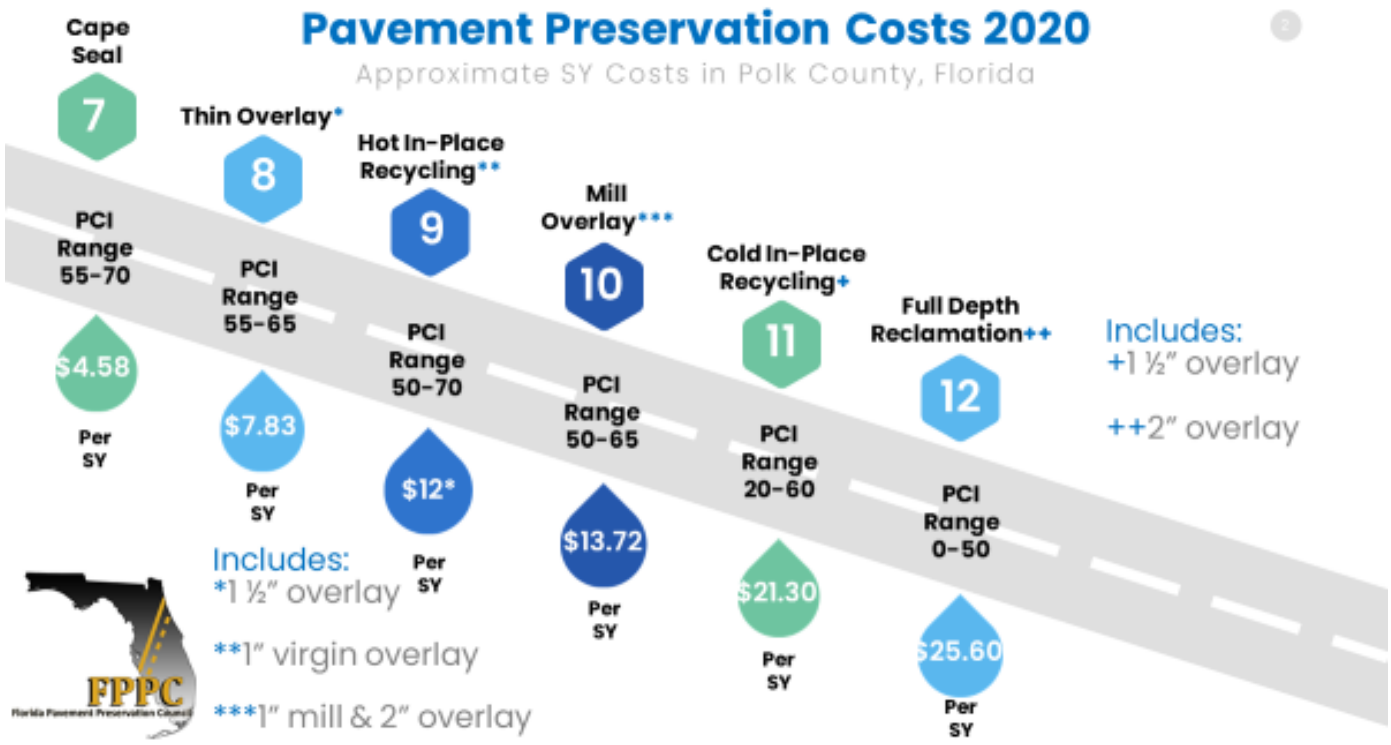
2022 costs went up 20% - 60%!



The 2022 Polk County Pavement Preservation Contract opened in April

The bid tab is coming out but expected to match the Kissimmee bid

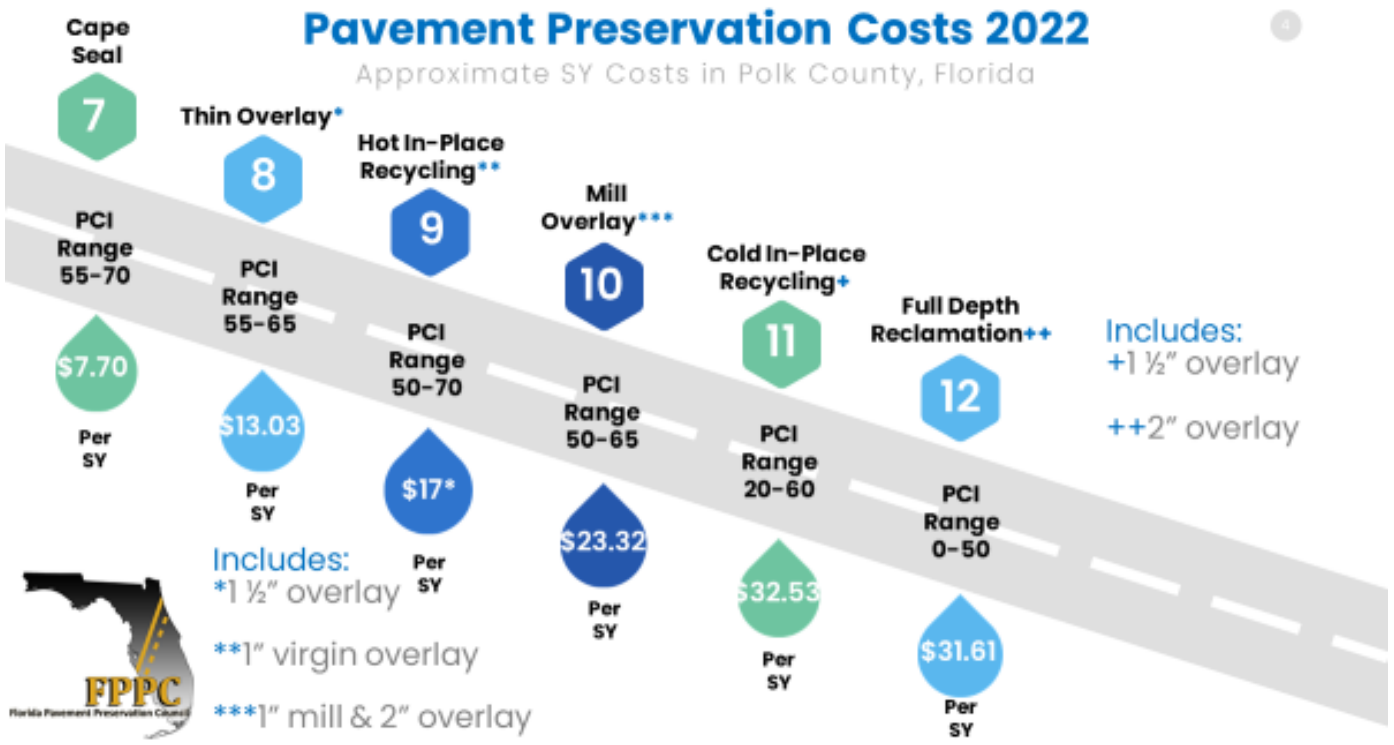
Percentage changes varied



Costs come from the 2019 Polk County Pavement Preservation Contract

Hot In-Place Recycling costs are estimates

May not be done yet



These costs come from the 2019 Polk County Pavement

Possible continued increases through the end of 2022

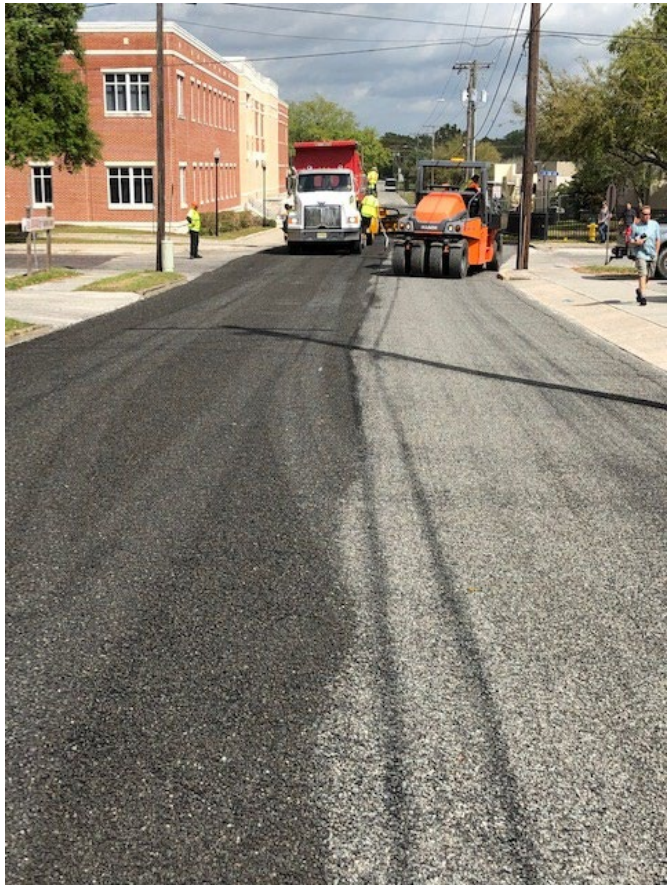
Possible recession could slow inflation

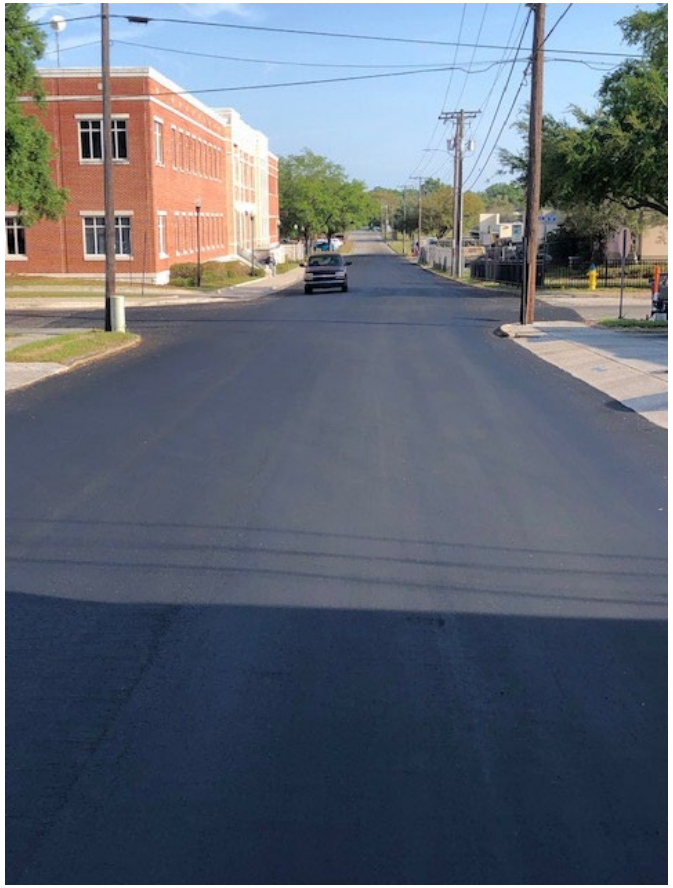
Pavement Preservation as a hedge

Higher construction costs are causing agencies to look for creative solutions

Deploying pavement preservation treatments can fill funding gaps created by rising costs

Pavement Preservation as a hedge





Using preservation treatments such as chip seals and cape seals to reduce costs

Can be effective even in less than ideal situations

Pavement Preservation as a hedge

More cities and counties are having success preservation, have contracts with all of the treatments

When paving costs skyrocket, the search for alternatives becomes vital

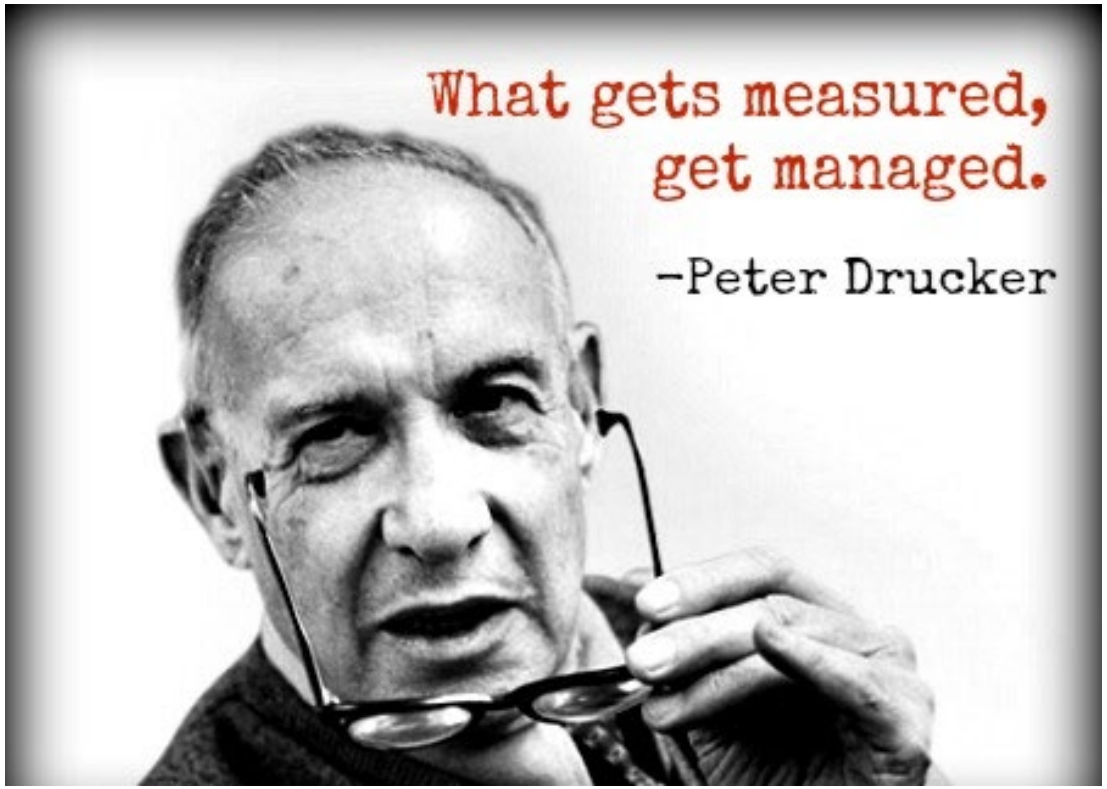
Higher the PCI, lower the price

Diversify pavement strategies to flip the inflation script

The longer your pavement lasts the less you'll have to purchase of the "expensive stuff"

The Burning Questions?

Measuring Success



Implement measures and set goals

1. Know your paving cycle
2. Know you network condition level at all times
3. Set a minimum network condition level target
4. Determine funding levels required to hit target

Steps to success

One of the most important steps to getting through inflationary challenges:

Make a change to a preservation first strategy!

Worst First = Worst Result

Questions, discussion

Panel final thoughts?

Best practice?

How to get started?

Questions & discussion?

PAVEMENT PRESERVATION

Wednesdays

Pavement Preservation Wednesdays!
Next PPW = 7/27/2022