

A long, straight asphalt road stretches into the distance under a cloudy sky, with mountains in the background. The road has a yellow center line and white edge lines. The landscape is arid with sparse vegetation and a prominent mountain peak in the distance.

The “WHY” of Pavement Preservation

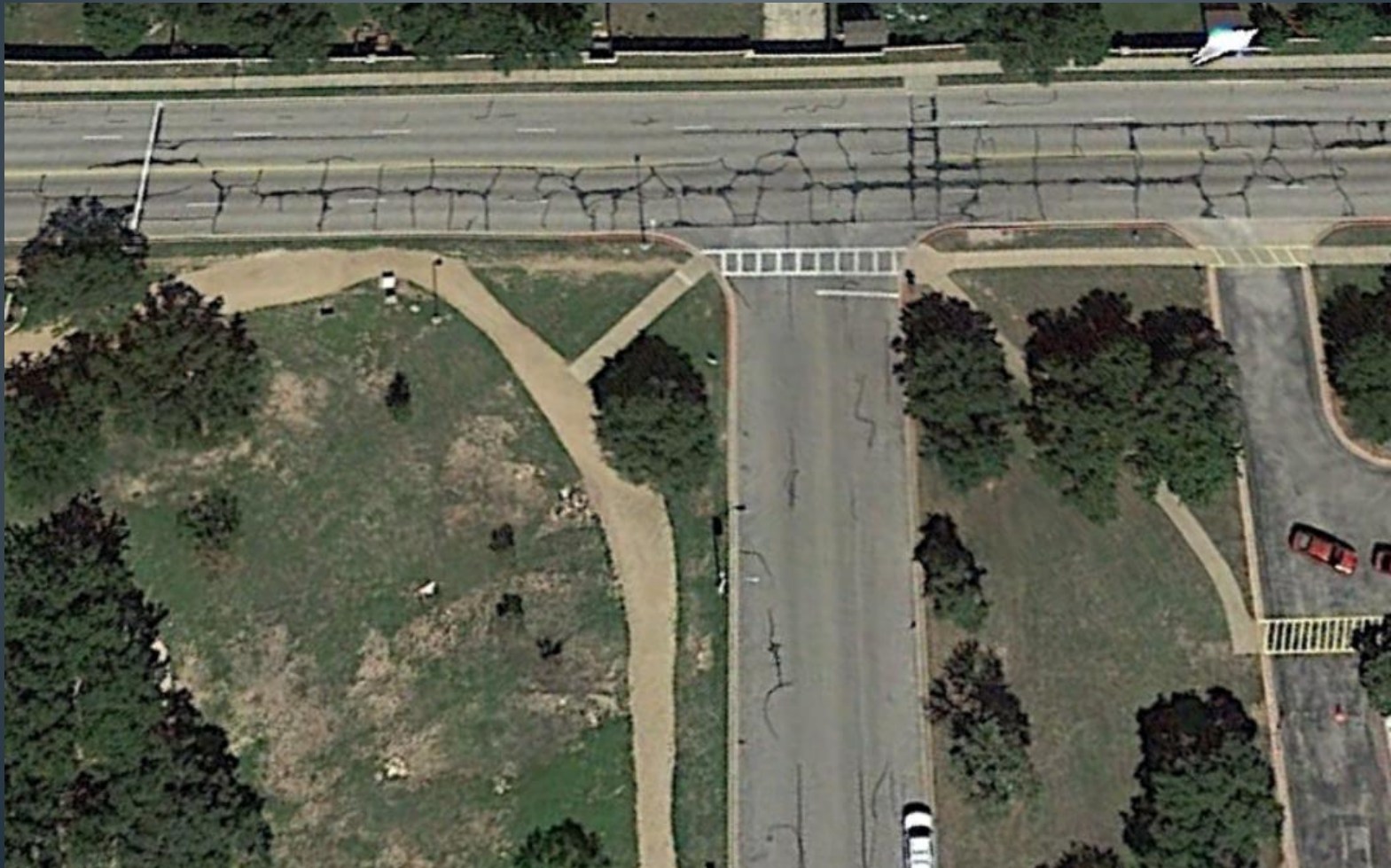
**Presented by
Don Ward, P.E.**

Our “Expected Pavement Condition”





“Undesirable” Pavement Condition





WHY PAVEMENT PRESERVATION?

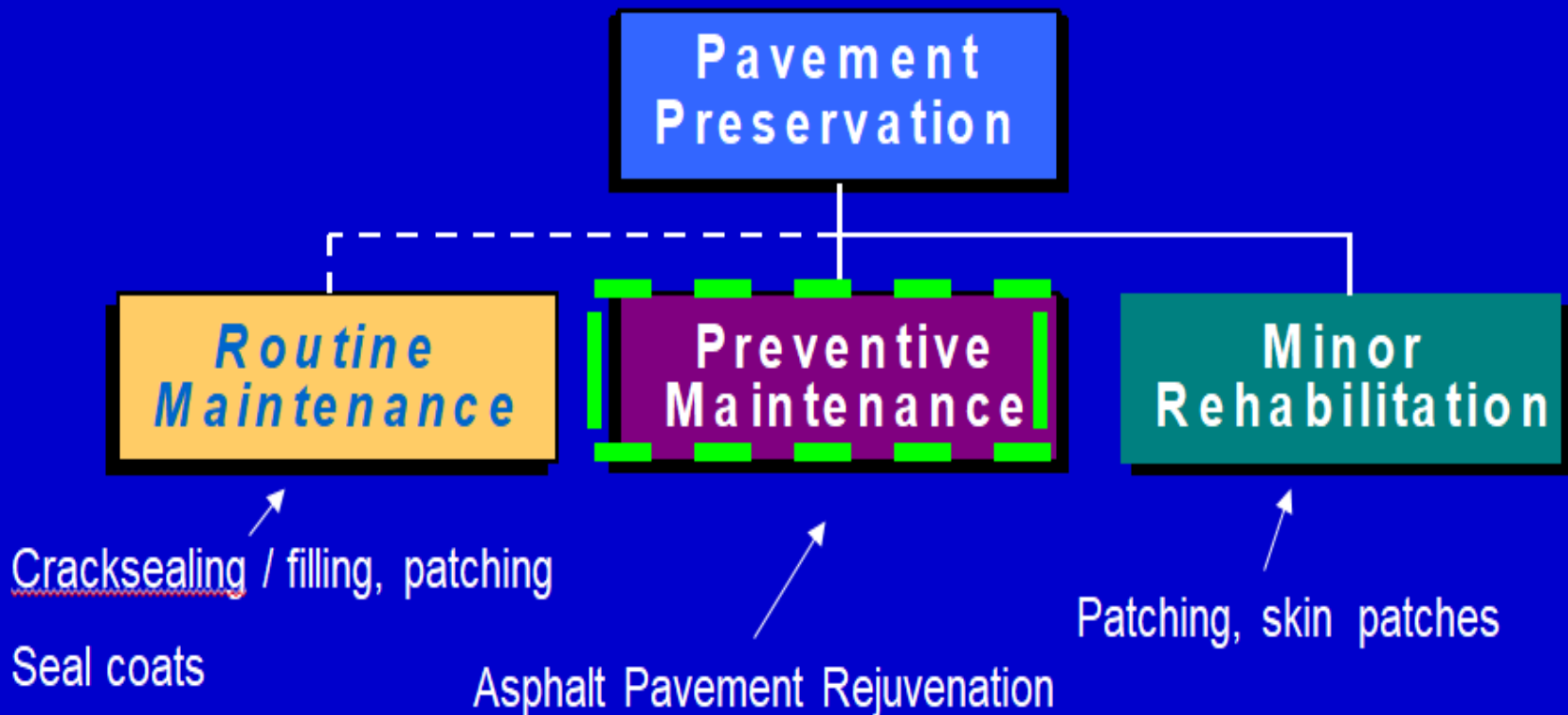
- It is a cost effective and greener approach to getting the longest life out of your roadways
- It extends the taxpayer's dollars
- It produces fewer greenhouse gas emissions and the application consumes less energy
- It provides faster application times than alternative conventional roadway maintenance methods

Objectives of a Pavement Preservation Program;

- Prevention of Oxidation of Pavement Surface
- Decrease in Viscosity of Asphalt Binder
- Increase in Flexibility of Asphalt Binder
- Prevent the Formation of Cracks in Surface
- Prevent the Loss of Fines, Raveling and Pitting of the Pavement Surface



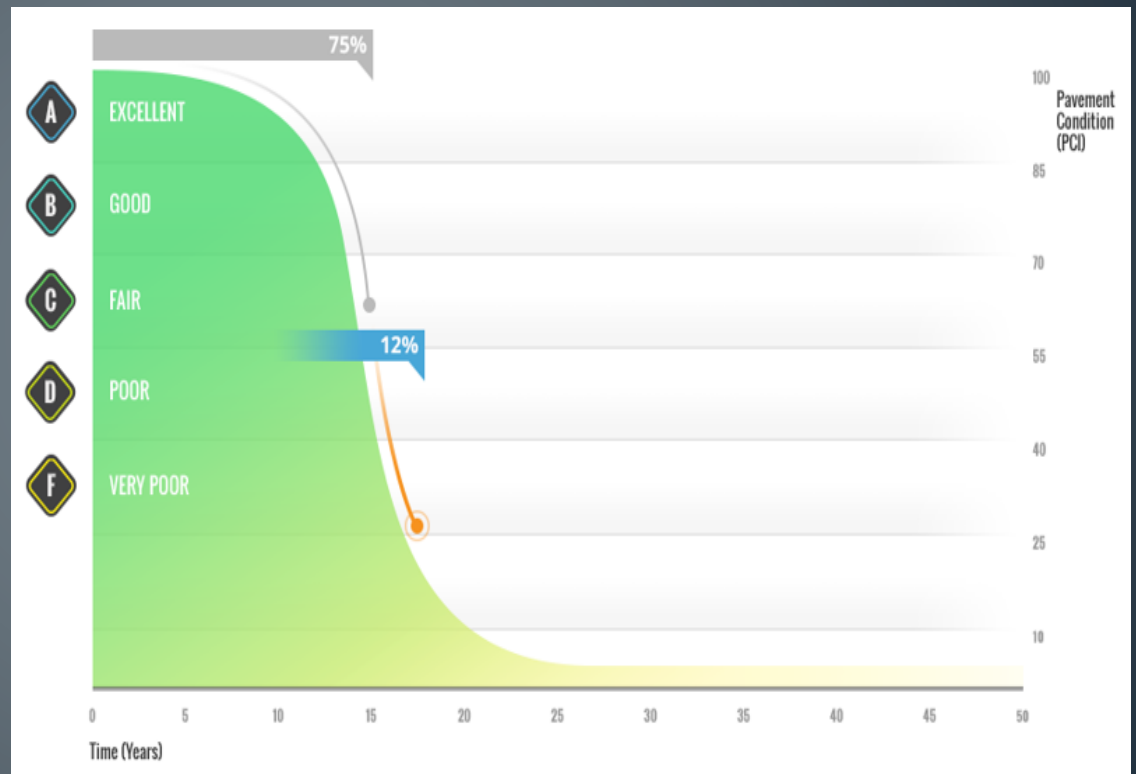
Components of Pavement Preservation Program



STAY AHEAD OF THE CURVE

FOR A 20 YR PAVEMENT LIFE:

- The first 15 YEARS, pavement condition drops 40% in quality
- The next 5 YEARS, pavement condition drops ANOTHER 40% in quality



* Info provided by Pavement Preservation and Recycling Alliance.

Entity Involvement/Opportunities

- **Pavement Management Studies**
- **Development of Pavement Preservation Program**
- **Engineered Improvement of Roadway Systems**
- **Extending the “Value” of the Infrastructure for Residents/Tax Payer**
- **Saving the “Tax Payer Dollar”**



ASPHALT PAVEMENT



94%
Sand & Stone



6%
Asphalt Cement
(liquid)

The Value of Your Entity's Roadway System

- **Statistics of Roadway Value**
 - New 2-Lane Rural Roadway – **\$2M to \$3M per mile**
 - New 2-Lane Urban Roadway - **\$3M to \$5M per mile**



The Value of Your Entity's Roadway System

- **Statistics of Roadway Value**
 - New Rural Interstate Freeway - **\$7M to \$8M per mile**
 - New Urban Interstate Freeway - **\$11M to \$???** per mile



Pavement Maintenance Options

- **Chip-Seal**
- **Micro-Surface**
- **Overlay**
- **Hot In-Place Recycling**
- **Full Reconstruction**
- **Rejuvenation Seals**



Cost of Maintenance Processes

- **Chip-Seal - \$2 to \$4 per SY**
- **Micro-Surface - \$3 to \$4 per SY**
- **Thin Overlay - \$8 to \$10 per SY**



Cost of Maintenance Processes

- **In-place Recycling - \$10 to \$12 per SY**
- **Mill and Overlay - \$12 to \$15 per SY**
- **Reconstruction - \$20 to \$?? per SY**
- **Asphalt Maltene Rejuvenator - \$1.00 to \$1.20 per SY**



LIFE CYCLE COSTS

CONVENTIONAL PLAN (30,000 SY)				
Year	Treatment Type	Cost in Constant Dollars	Future Cost	Present Value
5	Bonded Wearing Course	6.98	8.91	7.87
10	Ultra Thin Lift HMA	5.77	9.40	7.34
15	Bonded Wearing Course	6.98	14.51	10.02
20	Major Mill & Fill	16.64	44.15	25.94
25	Bonded Wearing Course	6.98	23.64	12.75
	TOTAL	\$43.35	\$100.61	\$64.92

Total Life Cycle Cost: **\$1,947,600**

* Info provided by Pavement Preservation and Recycling Alliance.

LIFE CYCLE COSTS

OPTIMIZED PLAN (30,000 SY)				
Year	Treatment Type	Cost in Constant Dollars	Future Cost	Present Value
5	Rejuvenator	1.15	1.47	1.30
10	Rejuvenator	1.15	1.87	1.46
15	Rejuvenator	1.15	2.39	1.65
20	Rejuvenator	1.15	3.05	1.86
25	Rejuvenator	1.15	3.89	2.10
	TOTAL	\$5.75	\$12.67	\$8.37

Total Life Cycle Cost: **\$251,100**

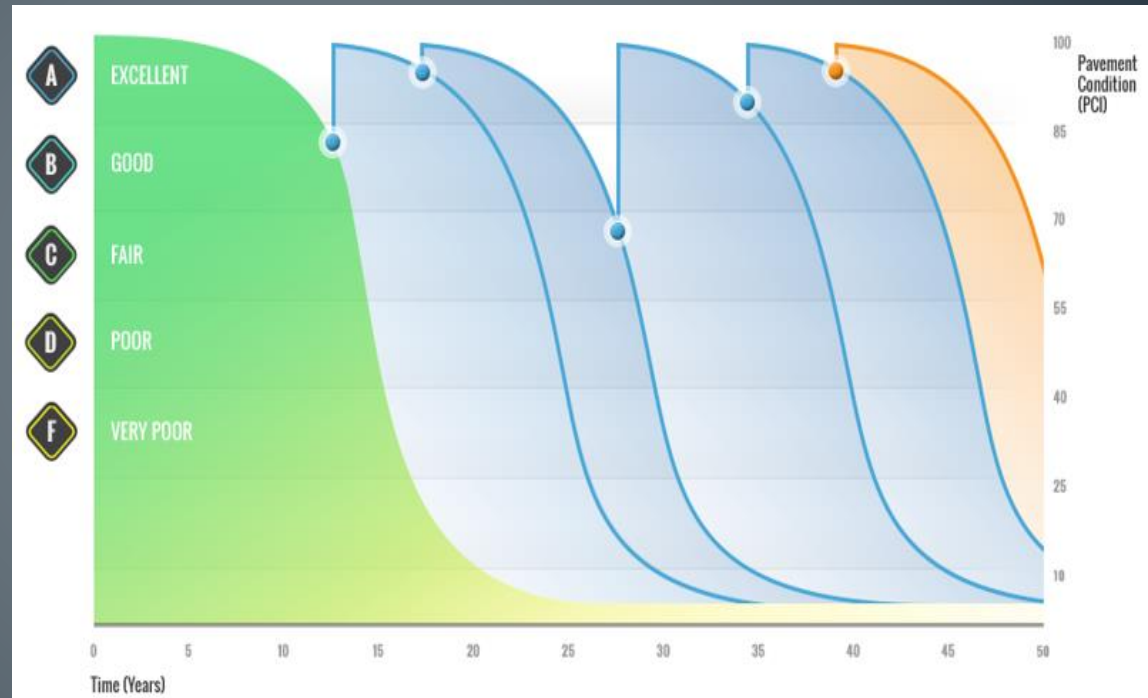
OPTIMIZED STRATEGY
TOTAL SAVINGS

\$1,696,500

* Info provided by Pavement Preservation and Recycling Alliance.

YOU STAYED AHEAD OF THE CURVE

By performing the right treatments over time, pavement owners can get 40 years or more of life from their roads.



* Info provided by Pavement Preservation and Recycling Alliance.

Pavement Management Processes

- **Visual Pavement Survey**



Pavement Management Processes

- **Digital Imaging Pavement Survey**



Case Study – Travis County

A PUBLICATION OF THE FOUNDATION FOR PAVEMENT PRESERVATION

pavement preservation journal

FALL
2008



**CONCRETE
PAVEMENT
PRESERVATION:
A BETTER Way
of Doing Business**

Rejuvenator Seal Extends
Life of Austin, Travis
County, Tex. Roads

New NCHRP Report
Links 'Nuts and Bolts'
of Preservation with
GASB 34 Rules

Rejuvenator Seal Extends Life of Austin, Travis County, Tex. Roads

By **Jim Brownridge**
Marketing Manager
Tricor Refining, LLC, Bakersfield, Calif.

Texas' dynamic capital of Austin is located within Travis County, and a great majority of the road network encompasses Austin.

This road system is a blend of moderate and highly traveled residential curb and gutter and lower volume rural areas. Texas uses a gradation numbering system consisting of Type A and B, which are coarse and fine base course mixes; Type C and D being coarse and fine hot mix; and Type F being a fine-graded, high asphalted hot mix used for thin overlays.

Travis County Director of Road Maintenance and Fleet Services Don Ward inherited the maintenance challenge of how to preserve 125 two-lane miles of F mix roadway. Originally F mix was used in residential curb and gutter subdivisions to provide a smooth, appealing surface. But it became evident within four to five years that this mix was prone to weathering and intrusion of moisture, while the high asphalt percent was causing premature oxidation and brittleness in the binder as the lighter oils oxidized from the binder. The county needed a solution to prolong the life of a considerable F mix inventory.

MALTENE-BASED REJUVENATOR STUDIED

In 2005, Travis County looked at the use of a maltene-based rejuvenator that has had over 40 years of use in North America.

Rob Wiggins, president of Pavement Restoration, Inc., Boerne,



Pavement Restoration, Inc., Boerne, Tex., applies Reclamite rejuvenator to pavement in Travis County, Tex.

Tex., reviewed the road inventory with Don Ward and along with Tricor, the manufacturer, provided factual data incorporating many years of experience of how a rejuvenator could extend the county's pavement life cycles.

About that time Travis County executives realized that they needed to be proactive regarding road maintenance. The county Commissioners Court approved this rejuvenation process with an eye to extending pavement life an additional five to eight

years, and hopefully beyond with subsequent applications.

The county placed several full road-width test sections of the rejuvenation agent. They saw excellent absorption and penetration into the binder. Testing done by APART, Inc. (Asphalt Pavement and Recycling Technologies, Inc., Shafter, Calif.) revealed to Travis County that the rejuvenator was fluxing with the binder, and results showed a decrease in microviscosity of the binder in the range of 60 to 300

Case Study – Travis County

- **Forecasted Road & Bridge Budget Shortfall by 30% to 40%, and rising Oil Prices**
- **Implemented “Digital Imaging Pavement Survey”**
- **Mandated Pavement Condition Requirements for Travis County**



Case Study – Travis County

- **Annual Maintenance Mileage Reductions:**
 - **90 miles Chipseal to 50 miles - 44%**
 - **55 miles Overlay to 30 miles – 45%**
 - **15 miles Full Reconstruction to 5 miles – 67%**



Research Solution/Trials

- **Conducted Research for Preservation Products**
- **Performed Trials on Products**



Research Solution/Trials

- Found Success with Asphalt Maltene Rejuvenators
- Initiated Annual Pavement Rejuvenation Program



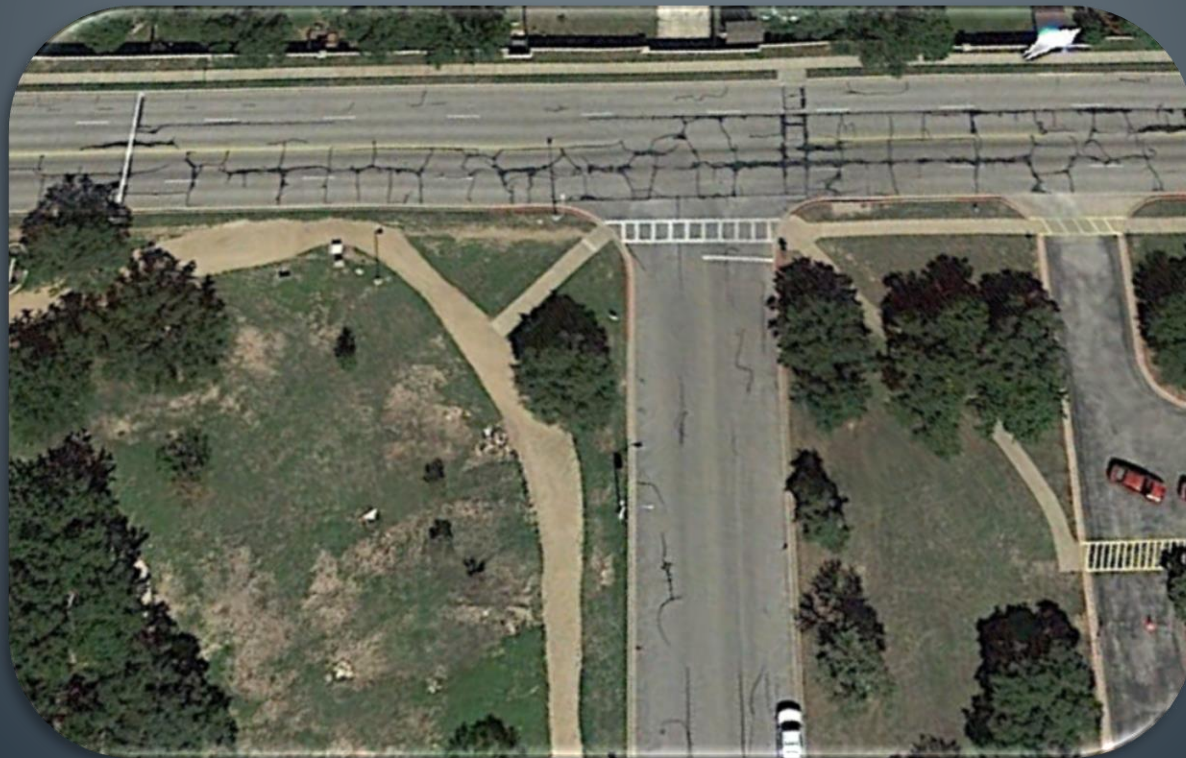
Results

- After 15 Years with a Rejuvenation Program



Results

- After 11 Years without a Rejuvenation Program



Results

- Initial Year of Application – 28 Miles
- Year 2-15 Application 28 to 100 miles
- 2015 Pavement Condition Digital Imaging Survey – Overall Pavement Condition Increased



Results

Benefits of an Asphalt Maltene Rejuvenator

- Renews hardened/brittle asphalt pavement
- Slows the aging and oxidation rate
- Seals and densifies the asphalt surface
- Reduces loss of fines and raveling



Results

Benefits of an Asphalt Maltene Rejuvenator

- Rejuvenates the binder within the structure
- Extends the Service Life of the roadway
- Inexpensive versus other maintenance or reconstruction costs





A PUBLICATION OF FP² INC.

SUMMER 2017

PAVEMENT PRESERVATION *JOURNAL*

“The maltene-based rejuvenator, which is the only true type of rejuvenator, is a blend of four maltene fractions with no black color to them, because it does not contain asphalt. Unlike asphalt emulsions, which protect and add binder to the surface, the maltene emulsion rejuvenator penetrates into the surface and combines with the weathered and oxidized asphalt binder holding the aggregates. It softens it or changes its viscosity and durability”

- Absorption Ring Tests to determine Application rates
- Audit of Asphalt / PCI





Before & After Core Samples taken 6 weeks after Application on Test Sites and sent off to Independent Laboratory for Result Validation in Penetration and Viscosity Values



Pavement Advantages using an Asphalt Maltene Rejuvenator;

- Restores the proper balance between the five Asphalt components.
- Restores flexibility and ductility to the top portion of old, brittle pavement.
- Stops Raveling and Stripping of the Aggregate.
- Seals the surface against intrusion of air and water elements.



Your ENTITY'S Benefits

- Each application extends the service life of the pavement by **4-6 years**.
- **Higher Rate of Return** on Clients Investments.
- **Minimal disruption** to traffic/Residents.
- Cost effective **“Proactive”** maintenance.
- **No road marking expenses** or disruption.
- **Frees up Client's resources** for other priorities





Questions?



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