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# PIMA COUNTY

## **Green Asphalt Pilot Option and Preliminary Assessment**

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## Today's Topics

- Overview of Proposed Green Asphalt Pilot
- PASER Observation Assessment
- Analysis Constraints
- Preliminary Findings Summary
- Questions

## Proposed Green Asphalt Pilot

- Tucson Asphalt approached Pima County about use of green asphalt overlay on failed condition roads.
  - Asserts 1" green overlay can be used in lieu of standard 2" mill and fill repair
  - Claims cost is 40% to 60% lower than conventional asphalt application
- County Administrator requested cost estimates for Sabino Town and Country and Moondance subdivisions

## Proposed Green Asphalt Pilot

- Sabino Town and Country
  - \$215,554 – Pima County 2” mill & fill
  - \$126,721 – Tucson Asphalt 1” green overlay
- Moondance
  - \$124,595 – Pima County 2” mill & fill
  - \$71,689 – Tucson Asphalt 1” green overlay
- Tucson Asphalt quotes for initial application are roughly 40% less than County mill & fill estimate
- No data on performance or maintenance costs over time

# 1" Green Asphalt PASER Observations

| Location                    | Treatment     | Date   | Cost <sup>1</sup> | Condition  | PASER                | PASER/Time <sup>2</sup> |
|-----------------------------|---------------|--------|-------------------|--|----------------------|-------------------------|
| Haciendas Catalinas del Rey | 1" GA overlay | 2013   | \$0.84/SF         | Significant crack reflection over ¼"               | 5 / 4 on side street | 1.10                    |
| Lambert Acres               | 1" GA overlay | 2014   | \$0.84/SF         | Reflecting cracking required surface seals in 2017 | 6                    | 1.0                     |
| Edgebrook                   | 1" GA overlay | 9/2015 | \$0.84/SF         | 1/8" to 3/16" cracks                               | 7                    | 1.0                     |
| Sporting Chance Parking Lot | 1" GA overlay | 5/2017 | \$0.84/SF         | Minor reflective cracks                            | 8                    | 2.0                     |
| Silverbell Terrace          | 1" GA overlay | 8/2017 | \$0.84/SF         | 1/16" cracks                                       | 8                    | 2.0                     |

<sup>2</sup> PASER/Time: Measures degradation from PASER 10 to current PASER divided by time in years (0.3 used for no degradation).

## 2" Overlay PASER Observations

| Location                      | Treatment        | Date | Cost <sup>1</sup> | Condition                                     | PASER | PASER/Time <sup>2</sup> |
|-------------------------------|------------------|------|-------------------|---|-------|-------------------------|
| Belair Ranch sub              | 2" PAG 2 overlay | 2012 | \$1.18/SF         | 1/8" cracks                                   | 7     | 0.5                     |
| 49ers sub                     | 2" PAG 2 overlay | 2013 | \$1.18/SF         | 1/16" cracks                                  | 8     | 0.4                     |
| Alvernon-Los Reales to Hughes | 2" PAG 2 overlay | 2014 | \$1.18/SF         | Few transverse cracks                         | 7     | 0.75                    |
| El Moraga-Goret to Sweetwater | 2" PAG 2 overlay | 2015 | \$1.18/SF         | No visible cracking                           | 8     | 0.67                    |
| Anklam                        | 2" PAG 2 overlay | 2015 | \$1.18/SF         | 1/8" transverse and 3/16" reflective cracking | 7     | 1.0                     |

<sup>2</sup> PASER/Time: Measures degradation from PASER 10 to current PASER divided by time in years (0.3 used for no degradation).

## 2" Mill & Fill PASER Observations

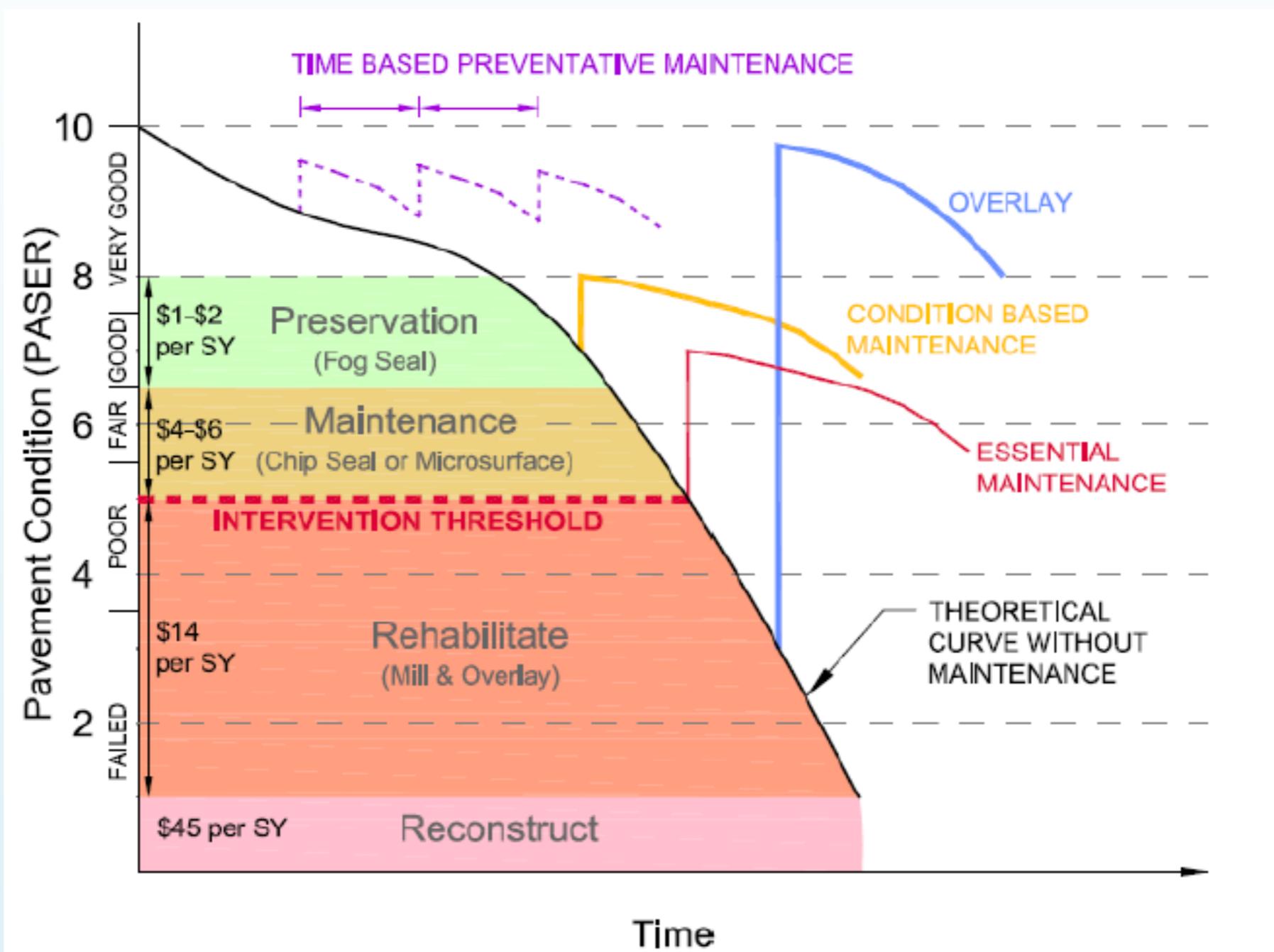
| Location                            | Treatment          | Date | Cost <sup>1</sup> | Condition                              | PASER | PASER/Time <sup>2</sup> |
|-------------------------------------|--------------------|------|-------------------|--|-------|-------------------------|
| Flair sub                           | 2" PAG 2 mill/fill | 2013 | \$1.40/SF         | ¼" transverse cracks                   | 7     | 0.6                     |
| Tucson Mountain Village sub         | 2" PAG 2 mill/fill | 2014 | \$1.40/SF         | 1/16" cracks                           | 6     | 1.0                     |
| Kain Ruthrauff to Curtis            | 2" PAG 2 mill/fill | 2014 | \$1.40/SF         | 1/8" longitudinal and transvers cracks | 7     | 0.75                    |
| Silverbell Goret to Ina             | 2" PAG 2 mill/fill | 2015 | \$1.40/SF         | Minor transvers cracks                 | 8     | 0.67                    |
| Ironwood Hills Cmo Oeste to Shannon | 2" PAG 2 mill/fill | 2017 | \$1.40/SF         | No visible cracking                    | 10    | 0.3                     |

<sup>2</sup> PASER/Time: Measures degradation from PASER 10 to current PASER divided by time in years (0.3 used for no degradation).

## Summary of PASER Performance

- Average PASER decline for 2" mill and fill – 0.47 / year
  - ❑ Mill and fill treated road would decline to PASER 4 (failed) in 12 years
- Average PASER decline for 2" overlay – 0.47 / year
  - ❑ 2" overlay treated road would decline to PASER 4 (failed) in 12 years
- Average PASER decline for 1" green overlay – 1.42 / year
  - ❑ 1" green overlay treated road would decline to PASER 4 (failed) in 4 years

# Typical Pavement Condition Curve



## Analysis Limitations

- Limited data available to evaluate performance
- Small sample size
  - Only more recent green overlay examples looked at since product mix has evolved from earlier applications
- Not controlled for traffic volumes or vehicle weight
- No verification of pavement condition or sub-grade prior to green asphalt treatment application
- Comprehensive analysis alternative methods requires more time

## Preliminary Performance Summary

- Mill & fill
  - Consistent with expectations for removing and replacing damaged structurally unsound pavement
- 2" standard overlay
  - Consistent with providing a semi-structural layer over existing moderately damaged but structurally sound pavement
- 1" green overlay
  - Inconsistent with fixing structurally failed pavement; likely performs well as a seal treatment to preserve surface
- Recommend waiting on DOT materials testing and evaluation project; expected results this July

# **Questions, Discussion, Direction**

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