



Pavement Assessment Study County of San Benito



Prepared by Pavement Engineering Inc.
August, 2016





PRESENTATION GOALS

- Pavement 101
- Pavement preservation
- Pavement treatments
- Assessment findings
- Budget funding, limitations and impacts
- Future pavement strategies



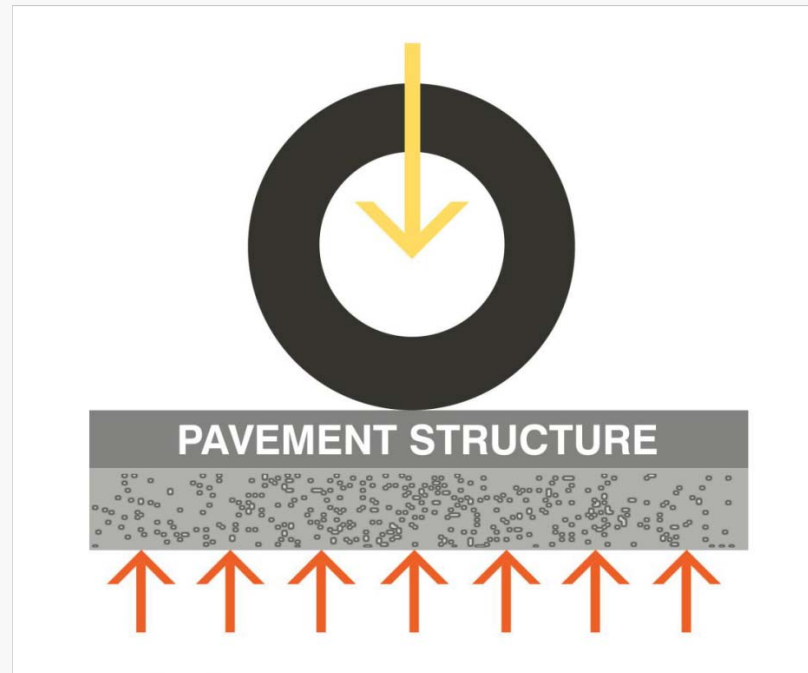


PAVEMENT 101



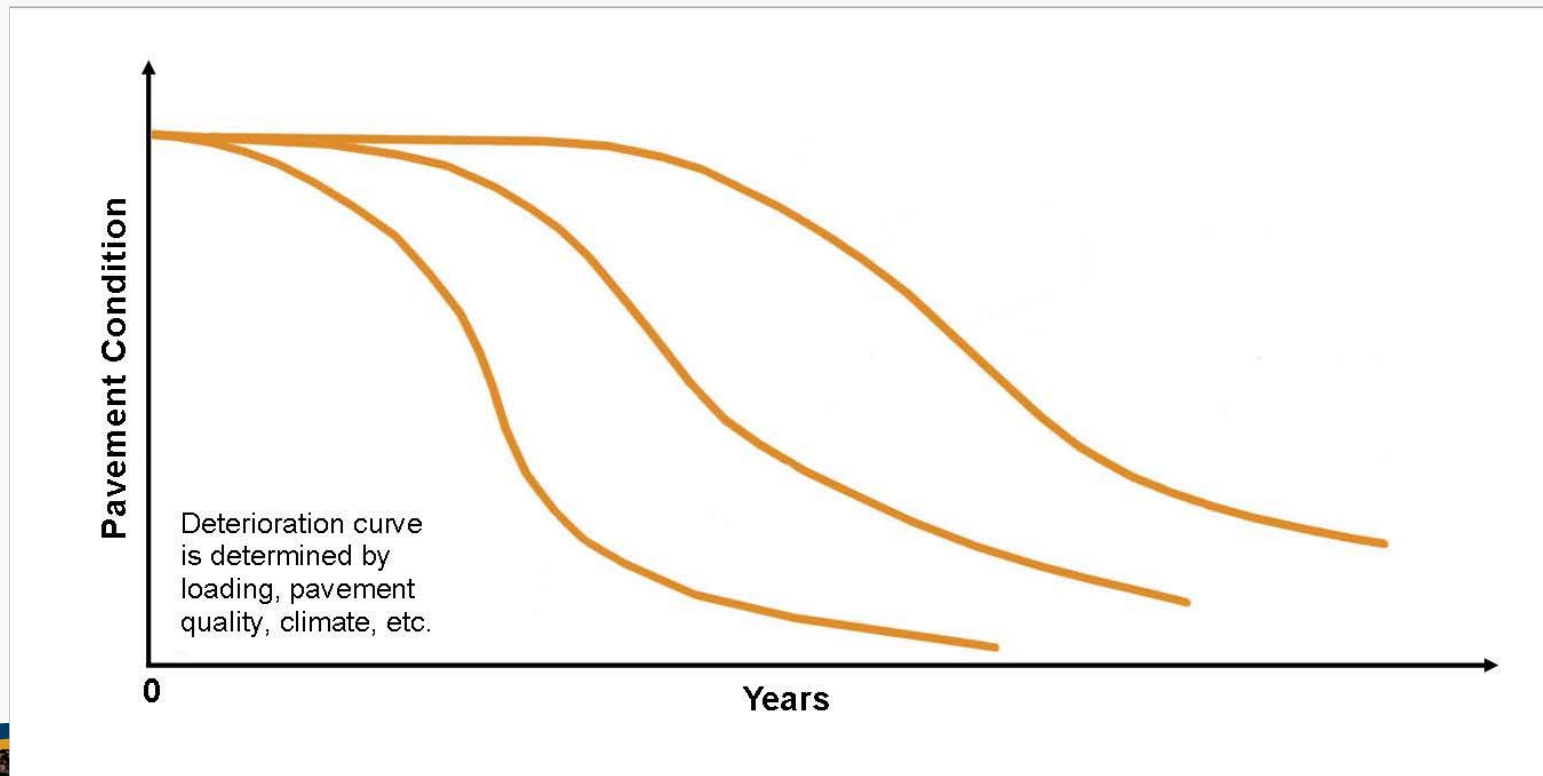


Pavement Design





Pavement Deterioration Cycle





Pavement Deterioration

Asphalt concrete deteriorates in two ways:



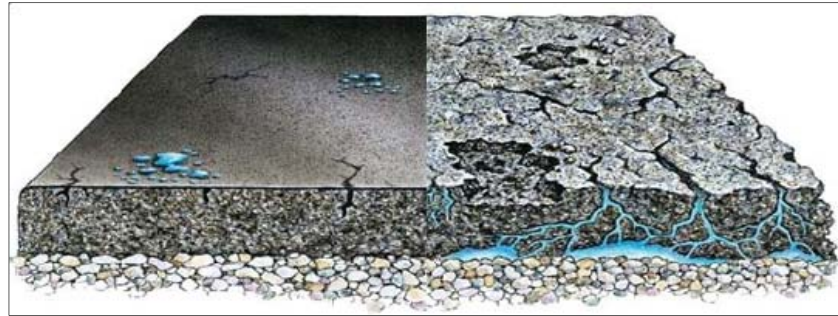
Oxidizing effects of
sun and water



Fatigue from heavy
wheel loads

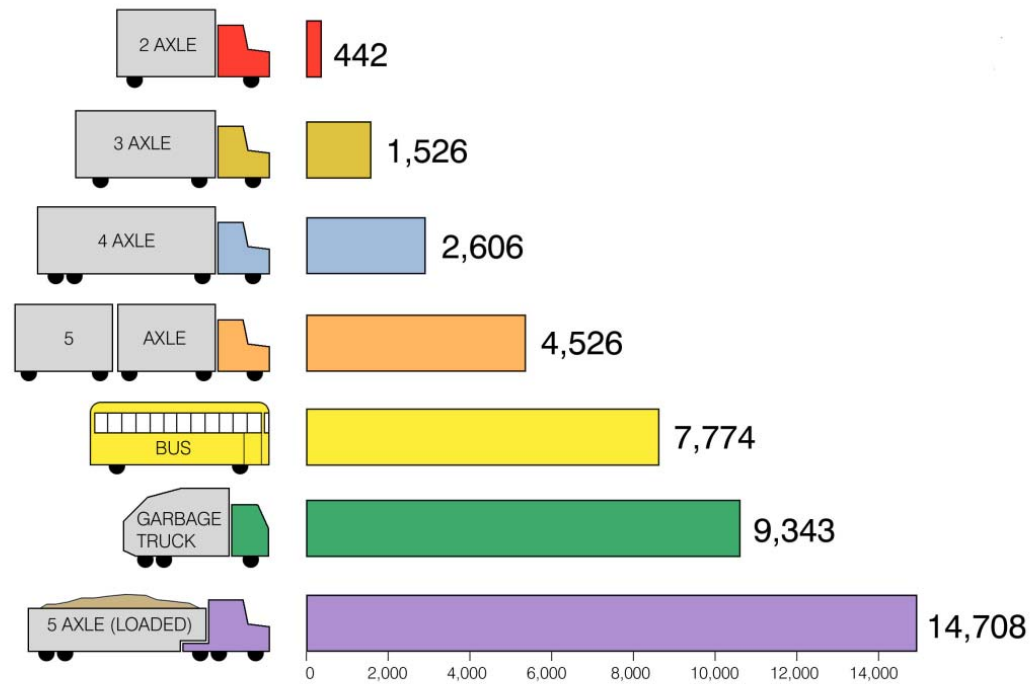


The Impact of Sun and Water





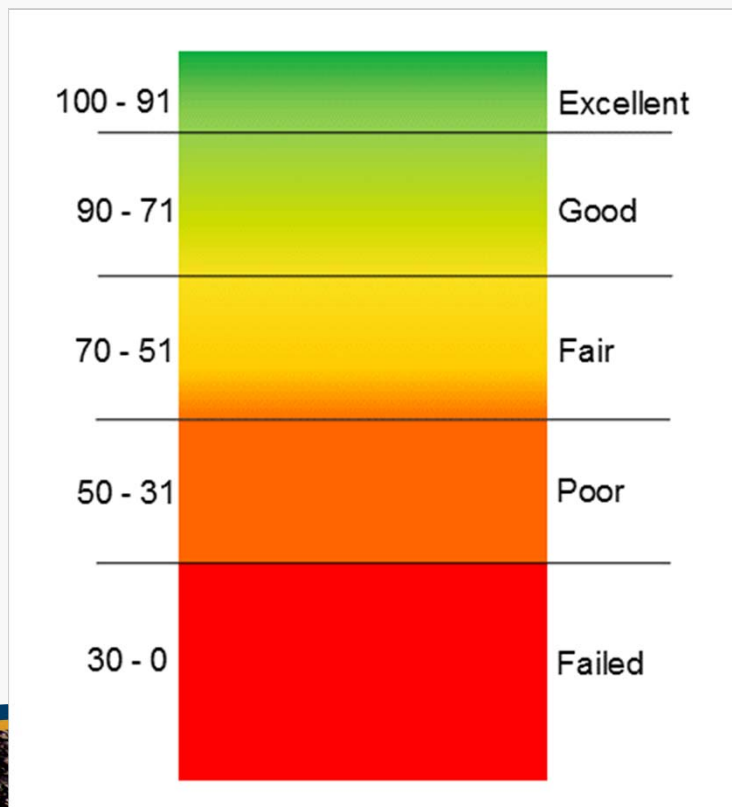
The Impact of Heavy Loads



COMPARATIVE VEHICLE PAVEMENT STRESS
(S-10 BLAZER = 1 VEHICLE UNIT)



Evaluating Pavement: the PCI



Developed by the U. S. Army Corp of Engineers during World War II and standardized by ASTM, the Pavement Condition Index (PCI) is an objective and rational basis for determining pavement condition and establishing maintenance priorities.



Evaluating Common Pavement Distresses

- Alligator cracking
- Block cracking
- Distortions
- Longitudinal / transverse cracking
- Patches / utility cuts
- Rutting / depressions
- Raveling
- Weathering



Common Pavement Distresses



Weathering
or Raveling



Transverse or
Longitudinal
Cracking



Block
Cracking



Alligator
Cracking



PCI = 100
Excellent 100-91



PAVEMENT 101





PCI = 85
Good 90-71





PCI = 70

Fair 70-51



PAVEMENT 101





PCI = 60

Fair 70-51



PAVEMENT 101





PCI = 51

Fair 70-51



PAVEMENT 101





PCI = 38

Poor 50-31



PAVEMENT 101





PCI = 28
Failed 30-0



PAVEMENT 101





PCI = ?



PAVEMENT 101





PAVEMENT PRESERVATION





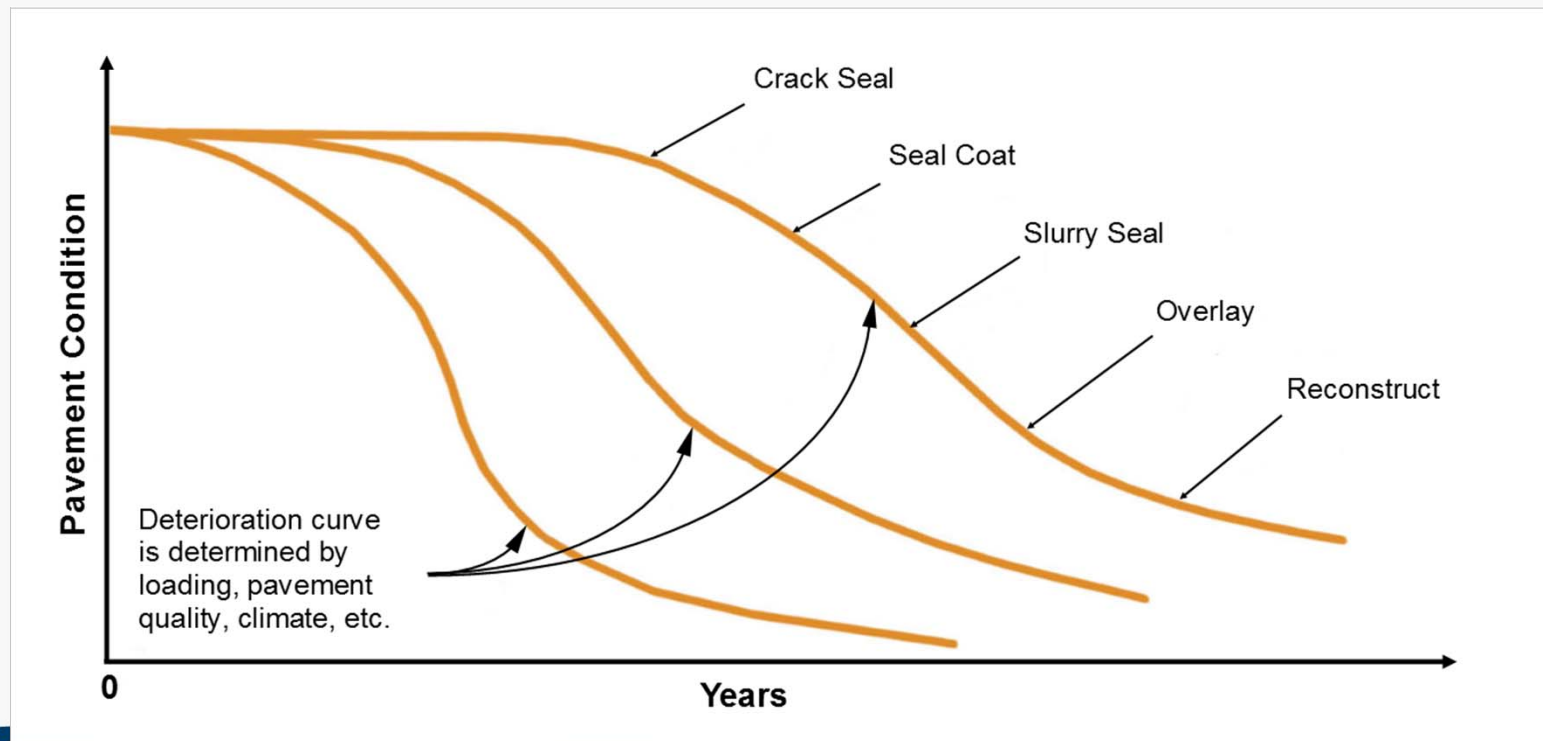
Applying the **RIGHT TREATMENT**
to the **RIGHT PAVEMENT**
at the **RIGHT TIME**
using the **RIGHT MATERIALS**

PAVEMENT PRESERVATION





Pavement Preservation Timing



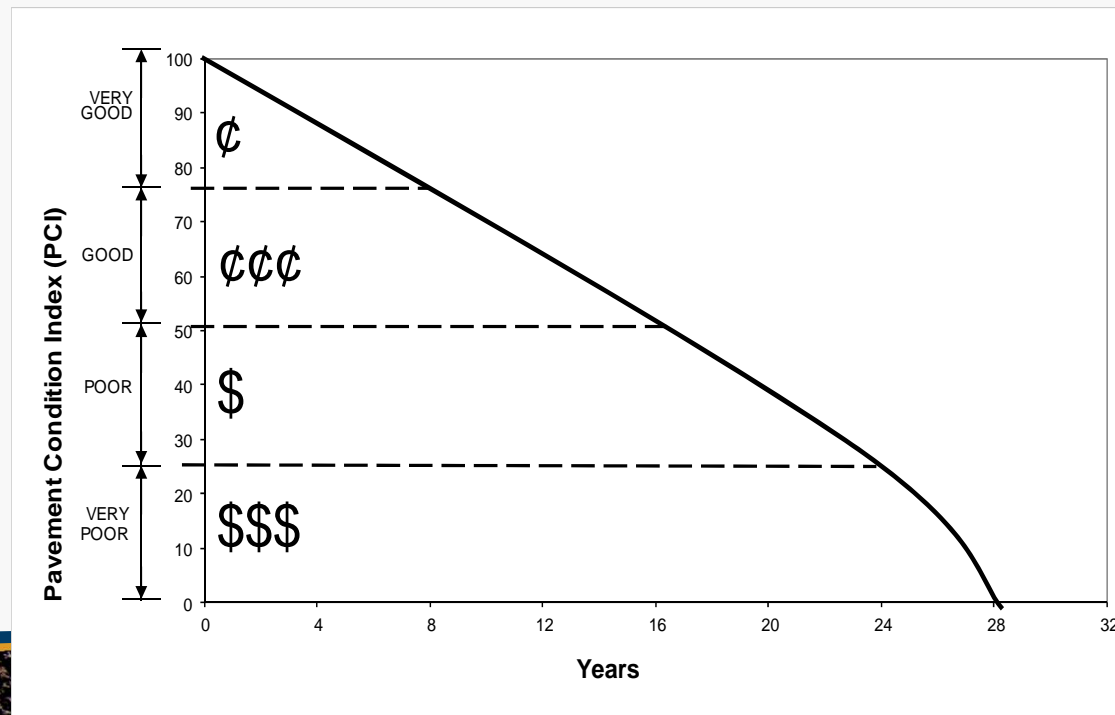


Good Pavement Management

- **Best-First “Top Down” Management:** focuses maintenance and rehabilitation on the best streets in the system. Interim procedure.
- **Worst-First “Bottom Up” Management:** focuses maintenance and rehabilitation on the worst streets in the system. Interim procedure.
- **Critical-Point Management:** focuses maintenance and rehabilitation on streets above rather than below a critical PCI. Most economical in the long run.



Pavement Condition vs. Maintenance / Rehabilitation Cost

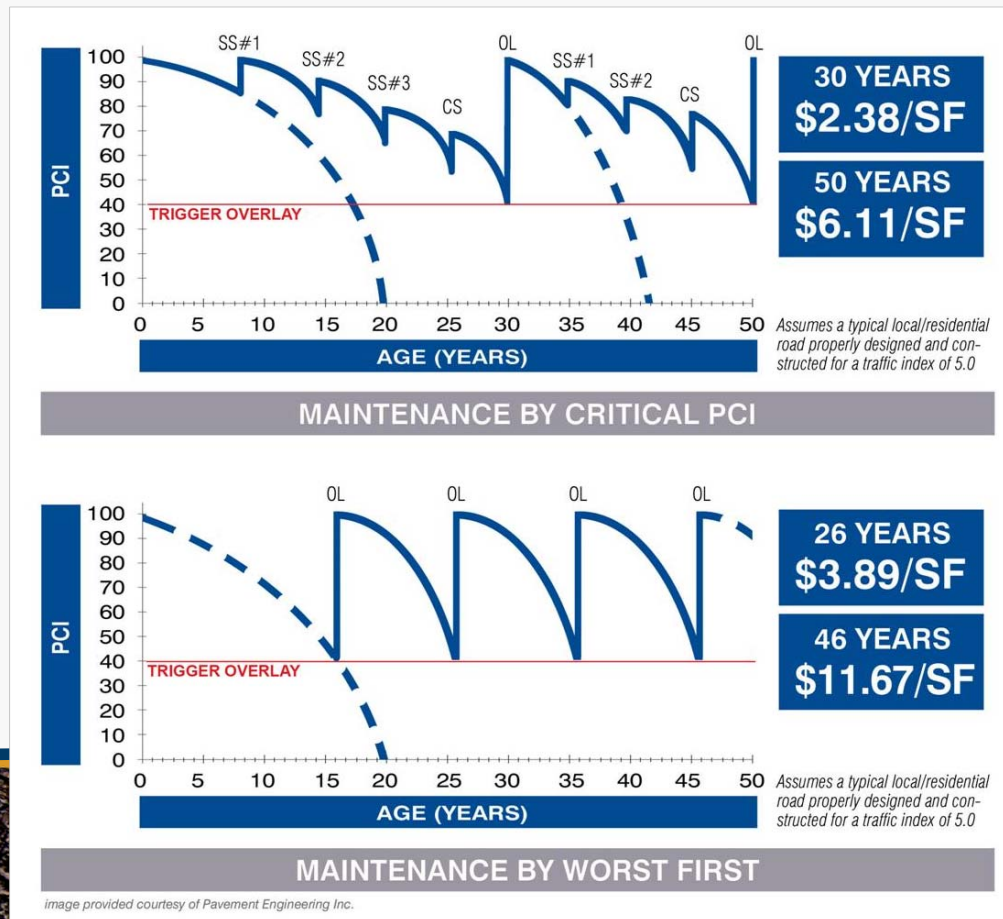


PAVEMENT PRESERVATION





Pavement Condition vs. Maintenance / Rehabilitation Cost



PAVEMENT PRESERVATION



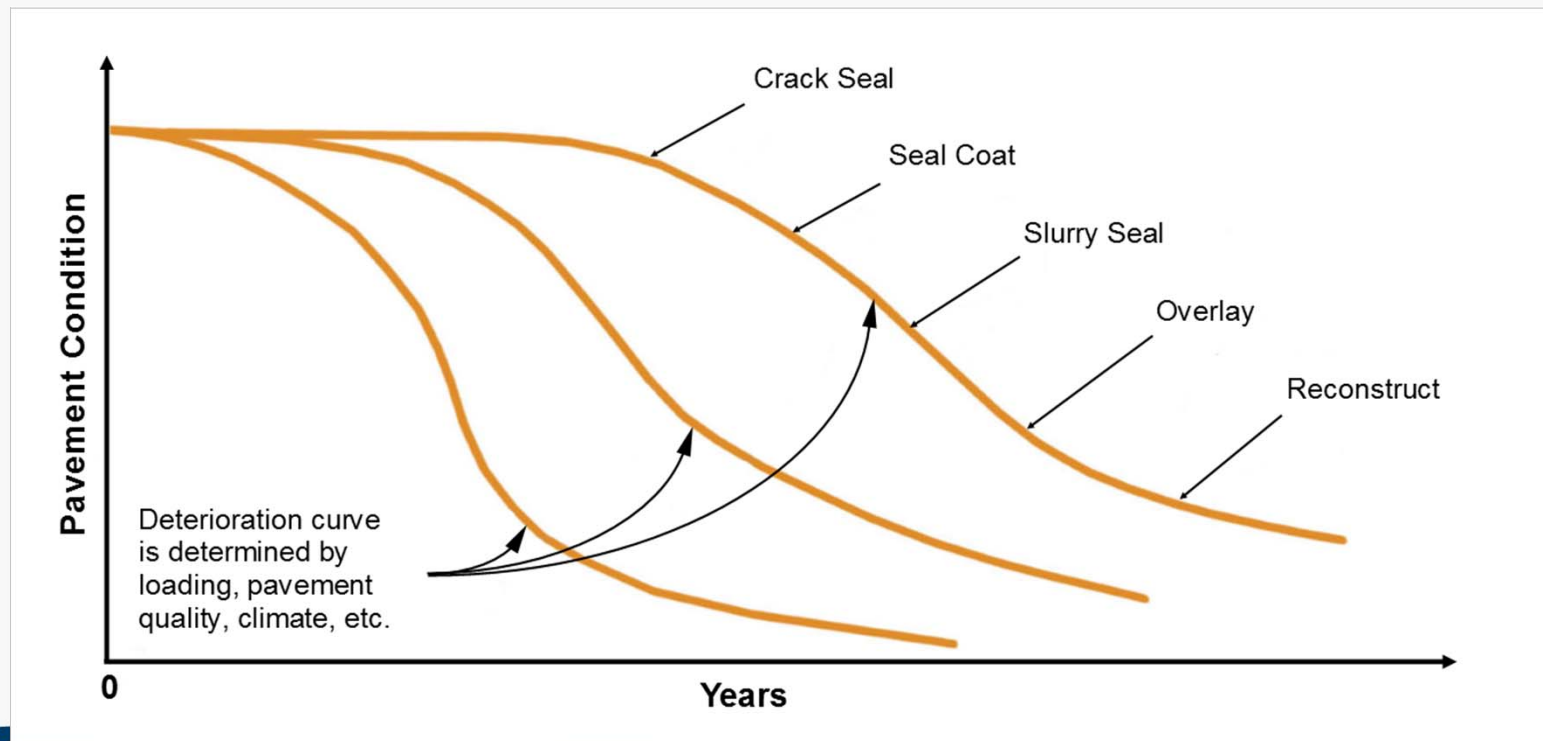


PAVEMENT TREATMENTS





Pavement Treatments



PAVEMENT TREATMENTS





Crack Sealing Treatment

- The right treatment for block or transverse cracking.
- Inexpensive.
- Prevents water from seeping beneath the asphalt to the subgrade where structural damage occurs.





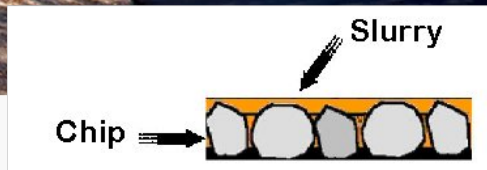
Slurry Seal Treatment



- The right treatment for raveled pavement in traffic areas with speed limits above 15 mph.
- Skid resistant.
- Fills in minor cracks, creates a uniform finish and provides a weather- and water-tight surface.



Cape Seal Treatment



- Combines a chip (aggregate) layer followed within a few weeks by a slurry seal for durability.
- Prevents water damage to the road bed and provides a new wear surface.
- Significantly extends pavement life when combined with crack sealing and surface patching.



Digout and Patching Treatment



- The right treatment to prevent damage to the subgrade.
- Requires precise excavating of damaged areas that are then filled with a new asphalt mix.
- Applied on a localized basis.



Overlay Treatment

- The right treatment for severely deteriorated pavement.
- Overlays existing pavement with a new layer of bituminous asphalt.
- Thickness depends on existing pavement condition and traffic.
- Strengthens overall pavement structure and improves ride.





Mill & Fill Treatment

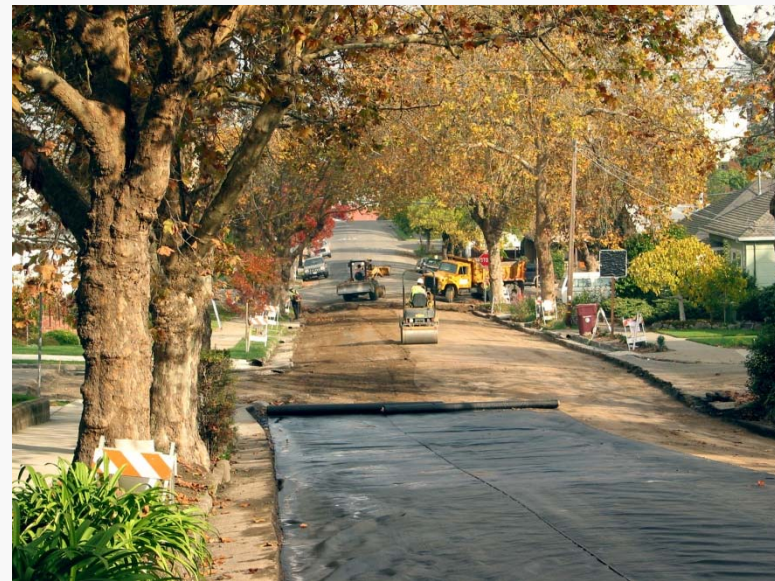
- Removes existing asphalt to a predetermined depth and replaces with new HMA.
- Extends the life of existing roads.
- Creates a smooth ride by eliminating the effects of tire ruts and any asphalt movement that may occur.





Reconstruction

- Required when pavement has failed or become functionally obsolete.
- Removes and replaces existing pavement structure.
- Uses either new or recycled paving materials or a combination of both.





Reconstruction: Pulverization



- Grinds the existing asphalt surface and mixes it with the aggregate base.
- Strengthens the existing base and forms a stronger foundation for reconstruction.
- Improves drainage.
- Eliminates bumps, humps and rutting.



Reconstruction: Lime Treatment

- Stabilizes the subgrade.
- Adds years to asphalt performance.





ASSESSMENT FINDINGS





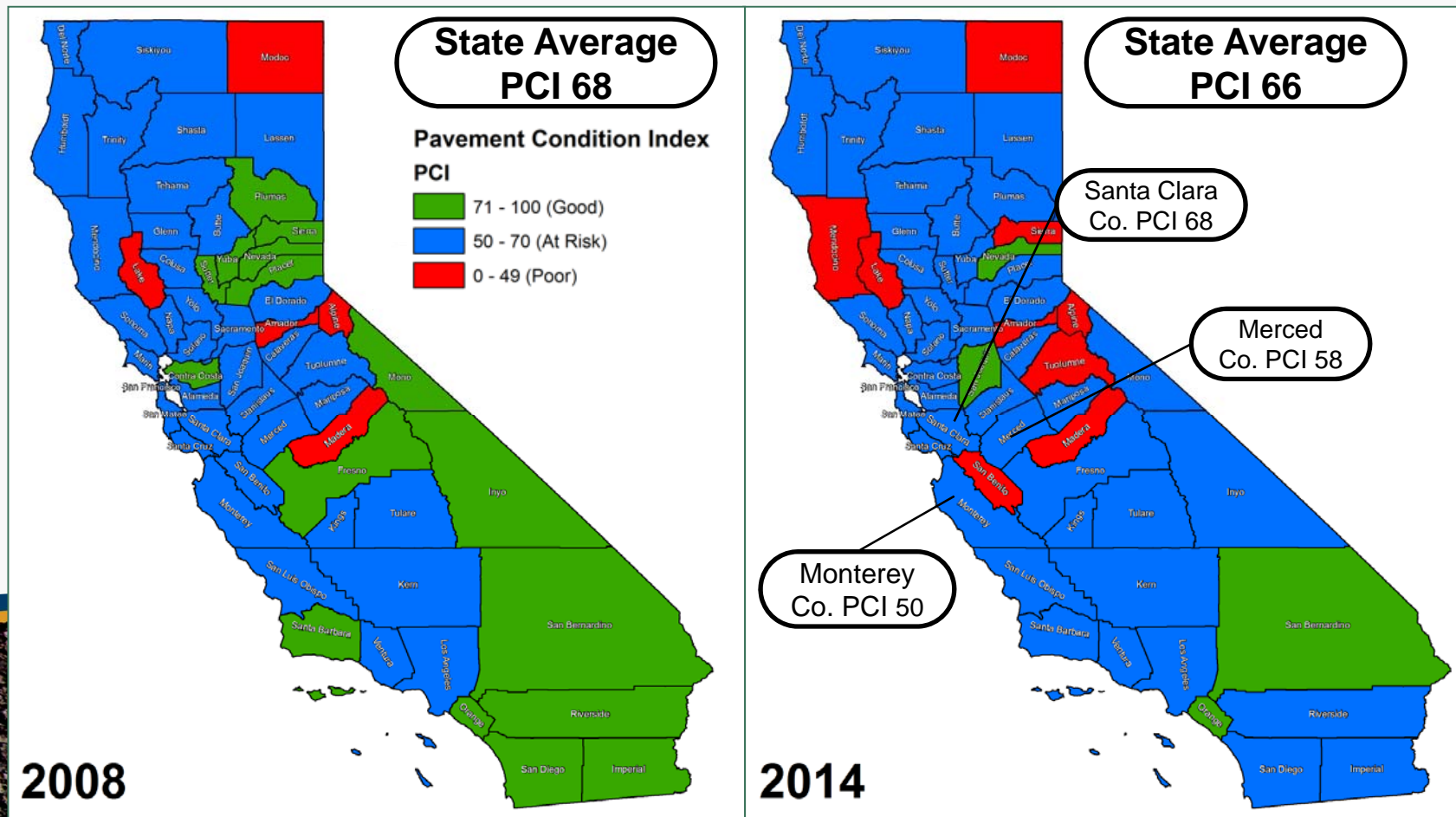
County of San Benito System Data

- System Size
 - ✓ 337.68 centerline miles
 - ✓ 675.26 lane miles
 - ✓ 39,315,883 square feet of pavement
- Network Replacement cost of \$389,002,000
- System wide average weighted PCI of 37
 - ✓ Industry Standard Goal PCI is 70
 - ✓ State wide needs assessment



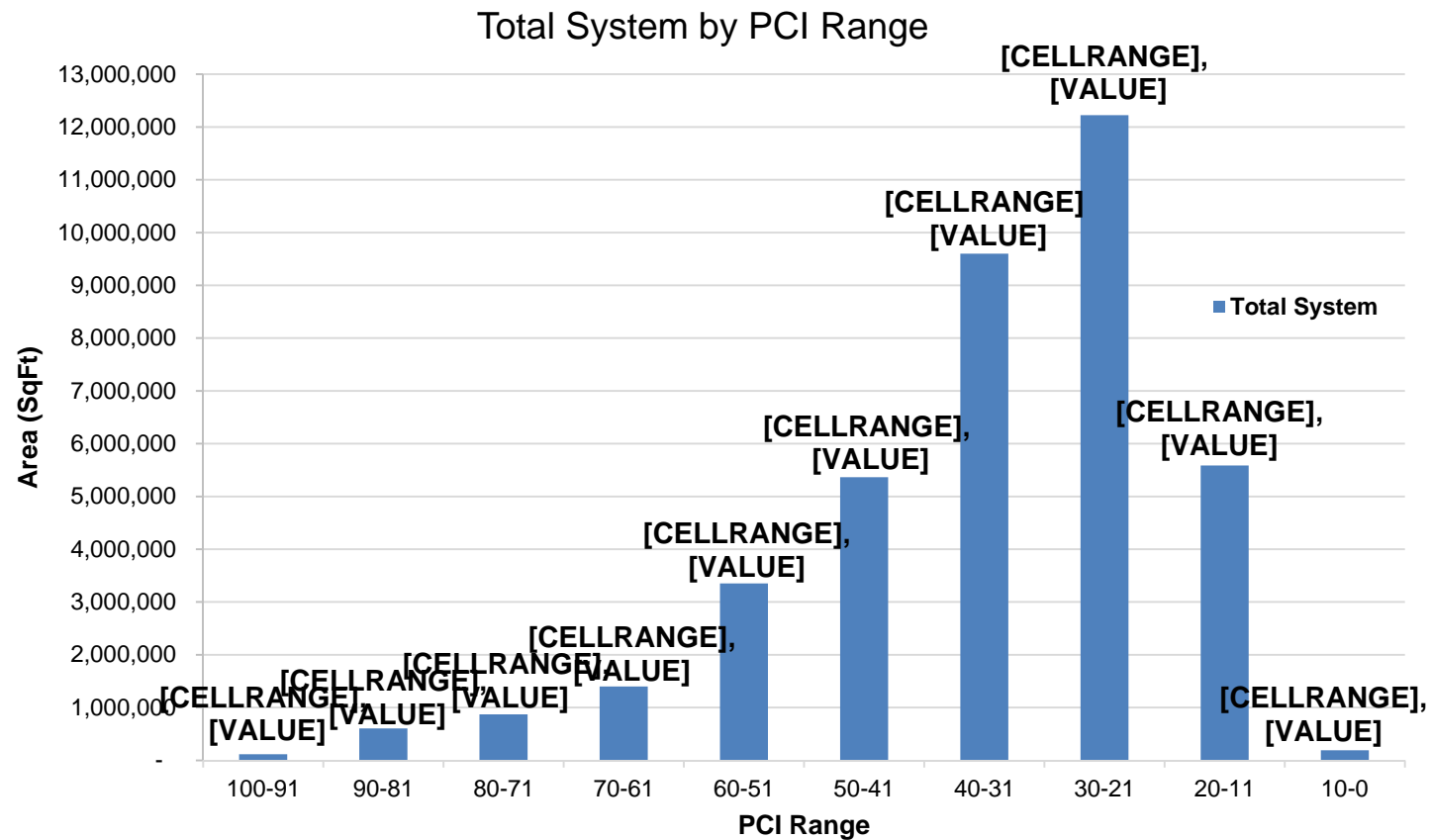
STATE WIDE NEEDS ASSESSMENT

PCI Trends





Current PCI Breakdown



ASSESSMENT FINDINGS





Maintained Road System

Functional Classification	Replacement Cost	Centerline Miles	Lane Miles	Area (Square Feet)	Percent of System	Average PCI
Arterial	\$ 92,592,000	42.86	85.73	6,719,299	17.09%	46
Collector	\$ 234,328,000	230.06	460.13	25,769,240	65.54%	33
Local	\$ 62,082,000	64.71	129.41	6,827,344	17.37%	33
Total	\$ 389,002,000	337.63	675.27	39,315,883	100.00%	37

ASSESSMENT FINDINGS



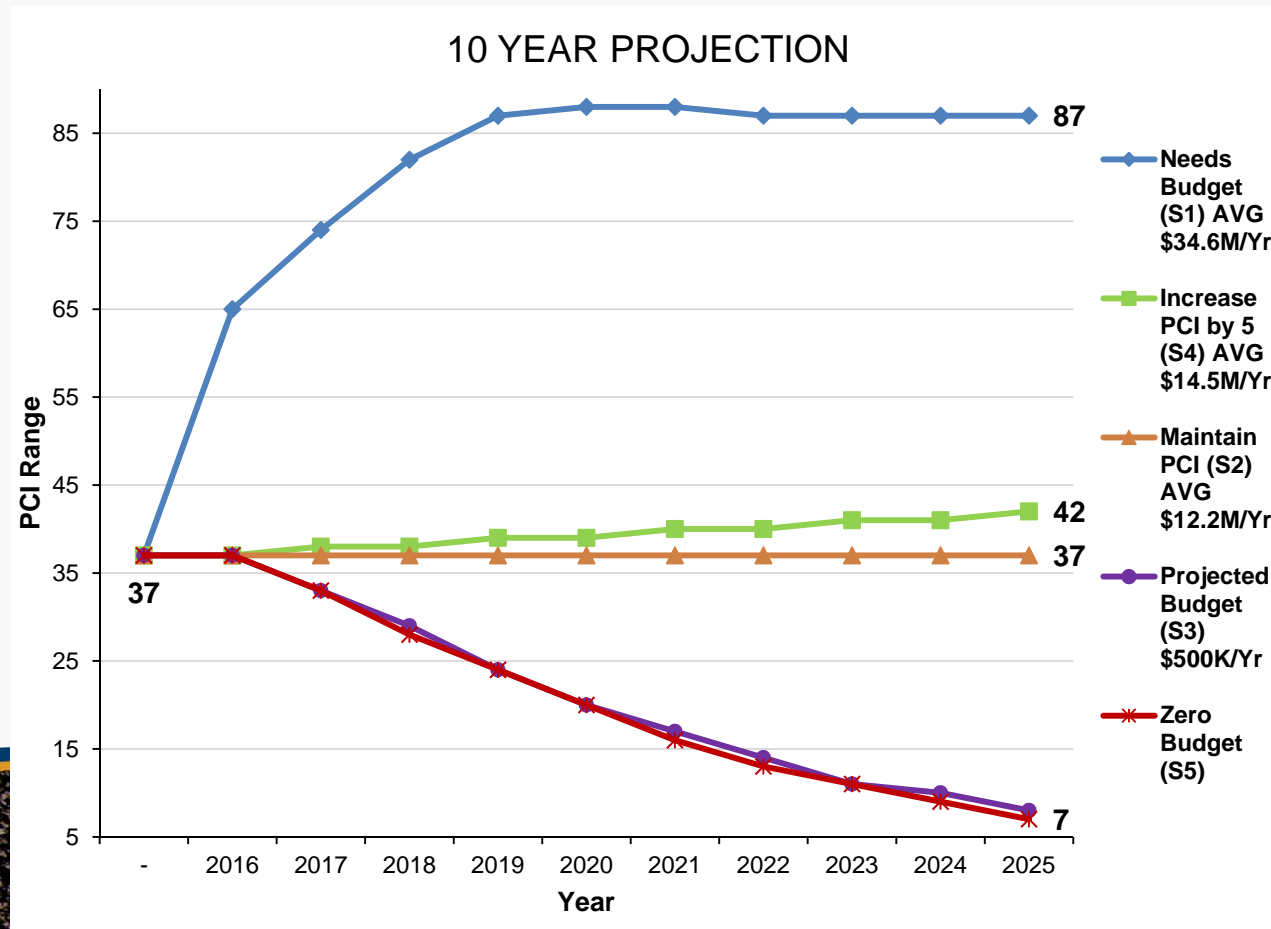


UNDERSTANDING BUDGET FUNDING, LIMITATIONS AND IMPACTS





10-Year PCI Trend

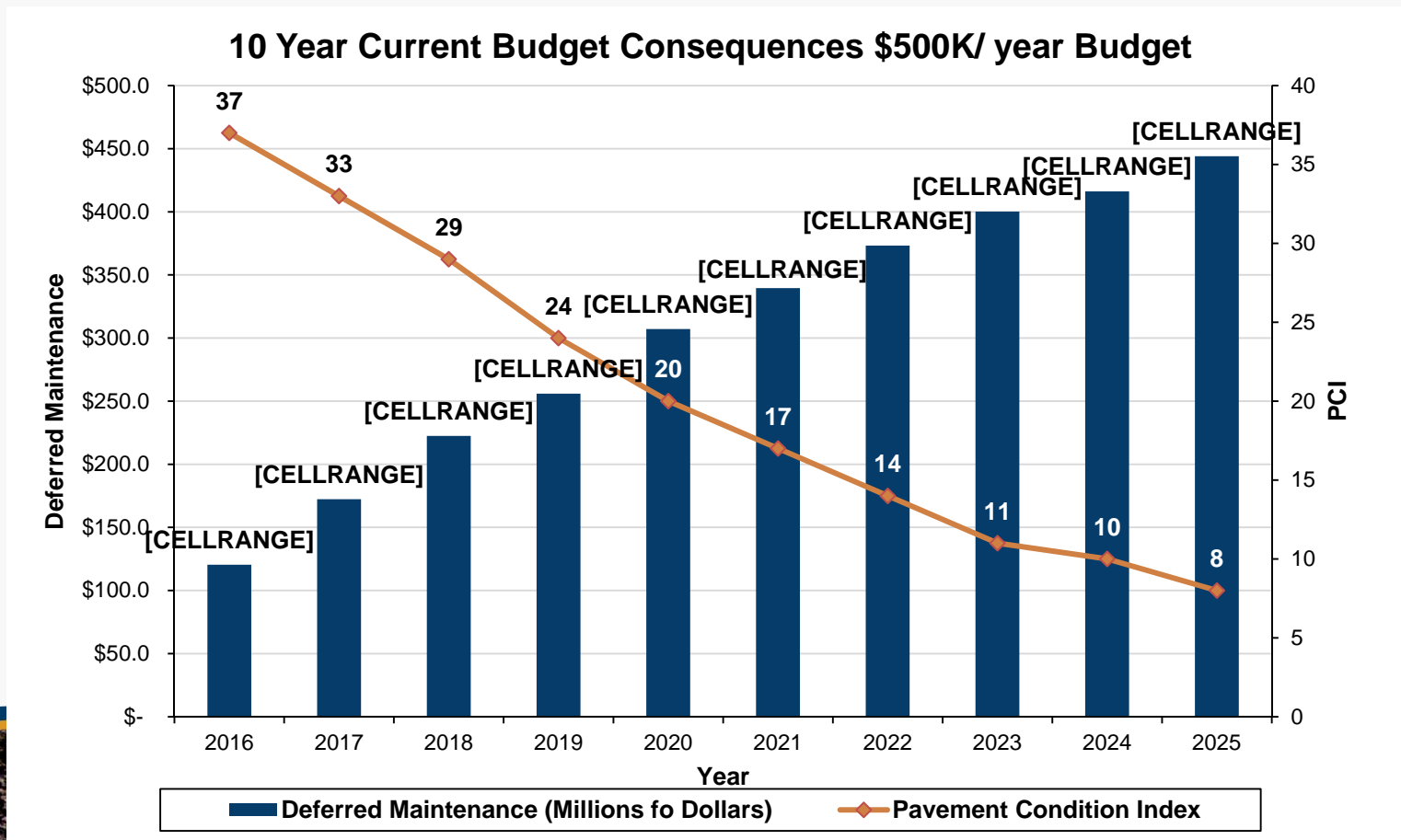


BUDGET FUNDING





Funded vs. Deferred Cost Comparison



BUDGET FUNDING





RECOMMENDED STRATEGIES FOR COUNTY-MAINTAINED PAVEMENTS





Recommendations

- Perform crack sealing.
- Expand pavement preservation treatments.
- Implement trench cut ordinance.
- Develop 5 year plan.
- Preserve critical assets.
- Prioritize streets by classification.
- Leverage limited funds with grants.
- Consider additional funding sources.



QUESTIONS?

