



Pavement Management

How the City of Palm Springs fixes your streets

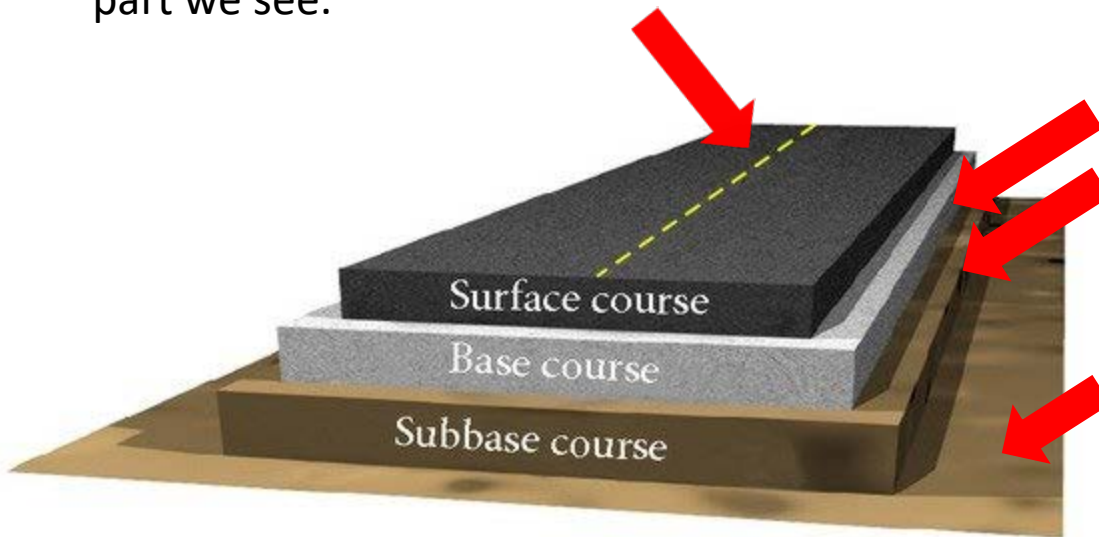
ONE-PS Brown Bag Lunch Session March 21, 2019

What streets are made of?

Streets are built in layers:

Surface course: usually made of asphalt (black) or concrete (gray). Takes on the wear and tear of vehicles. It's the part exposed to weather. This is the part we see.

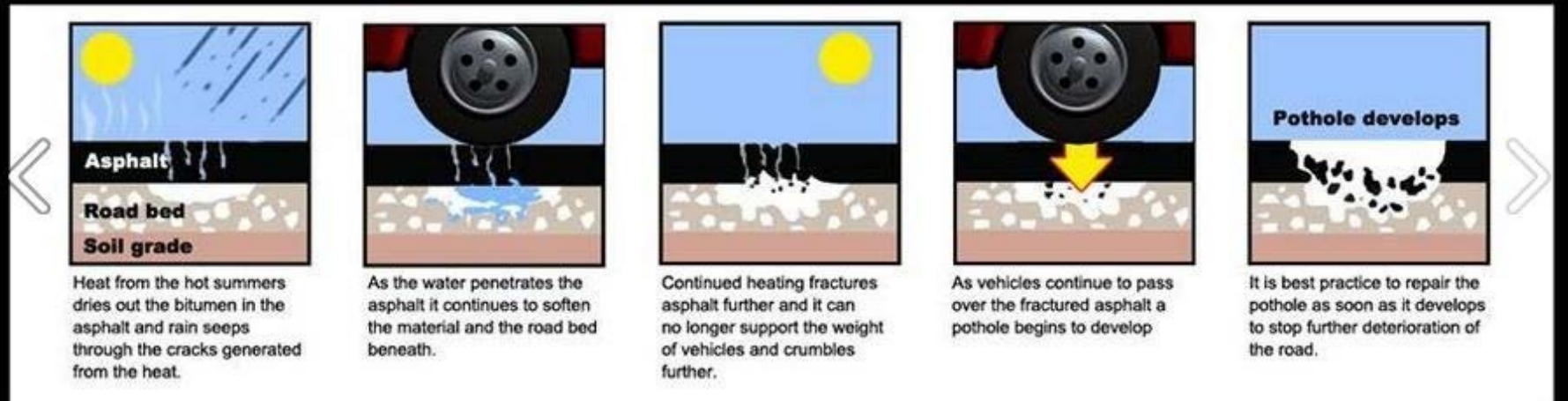
Base course & Subbase Course : usually made of an engineered recipe (mix) of different sized crushed rocks. This is the main load-bearing layer that spreads the weight evenly over the subgrade



Subgrade: the native materials (soil, rock, sand) under a road. It is usually compacted before a road is built on it.

How are potholes formed?

How Potholes form in hot climates



Did you ever get a flat tire from a pothole? Have you ever wondered why it always seem to be exactly where you drive on the road?

Since car tires generally roll over the same location as it travels down the lane, each car that drives over that weakened spot, will slowly make small cracks that get bigger and bigger, until it crumbles and eventually turns into a pothole.

City of Palm Springs

Road Network Information

Functional Classification	Total Number of Street Sections	Center Line Miles of Streets	Total Lane Miles	Percentage of Total Network
Arterials	146	43.16	154.86	17.6%
Collector	198	44.60	96.88	18.2%
Residential/Local	1081	157.69	315.37	64.2%
Total	1425	245.45	567.1	100%

- **Arterials** are major roads that are expected to carry large volumes of traffic.
- **Collectors** are roads that collect traffic from local roads and distribute it to arterials.
- **Local roads** usually have the lowest speed limit and carry low volumes of traffic.

What is Pavement Management Program (PMP) ?

Pavement Management Program (PMP) is:

“Computer Assisted Method of Organizing and Analyzing Information about Pavement Conditions”

- ✓ Organizes, Stores, and Retrieves Data
- ✓ Makes Quick Analysis and Calculations
- ✓ Provides Cost Effective Maintenance Strategies

Rating the Pavement

The following information is collected in the field and entered into the pavement management program

- Distress Type: 8 Common Distresses used in PMPs



Alligator Cracking



Block Cracking



Distortions



Weathering



Patching and
Utility Cuts



Rutting and
Depressions



Longitudinal and
Transverse Cracking



Raveling

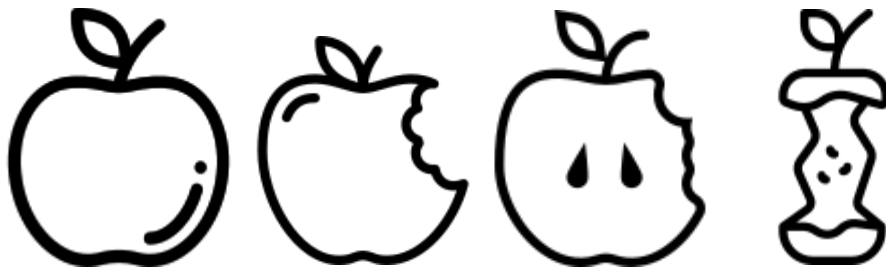
- Distress Severity: Low/Medium/High
- Distress Quantity: Measurement

The City hires an outside engineering firm who collects this data for each street

Pavement Condition Index (PCI)

- The **Pavement Condition Index (PCI)** is a numerical index between 0 and 100 which is used to indicate the general condition of a pavement

Grade	Condition	PCI Range
A	Good	86-100
B	Satisfactory	71-85
C	Fair	56-70
D	Poor	41-55
F	Very Poor	0-40



The PCI score helps compare the various streets on an apples to apples basis

PCI 86-100 (Good)

Example of PCI 100



- The pavement is in good condition.
- The street likely had a maintenance treatment like a slurry seal or rehab treatment like a pulverize and pave in past few years.
- Since the pavement will remain in good condition for a few more years, (without the need for any maintenance) a treatment is not recommended at this time.

PCI 71-85(Satisfactory)

Example of PCI 83



- The pavement is in satisfactory condition.
- The street has experienced some weathering and minor cracks due to heat in the summer months and cooler nights in the winter months.
- For preventative maintenance, a crack seal will prevent water from getting under the pavement, and then micro-milling the top surface followed by a slurry seal will provide a layer of protection and extend the life of the roadway.
- Doing this preventative maintenance extends the overall life of the pavement and it will take longer to deteriorate into the fair category.

PCI 56-70 (Fair)

Example of PCI 70



- The pavement is in fair condition.
- The pavement surface has experienced weathering for a while
- There are some utility cuts, and the cracks in the road are increasing due to traffic.
- There may be some wide cracks and block cracking which looks like large squares on the surface of the street.
- The cycles of extreme heat and cooler winter months is causing the pavement to expand, contract, and ultimately crack in the block pattern.
- While it is still easy to drive on it, the quality has dropped by about 40% and the road will continue to deteriorate over time.
- The appropriate treatment would be to pulverize the existing roadway and mix it with the dirt beneath to provide a strong base and repave the road.

PCI 41-55 (Poor)

Example of PCI 50



- The pavement is in poor condition.
- The surface has experienced more weathering
- There are usually several utility cuts, there are usually patched potholes and the cracks are increasing to the point they look like the back of an alligator (alligator cracking).
- Water from when it rains is getting under the pavement, deteriorating the ground that supports the roadway.
- Traffic driving over it is adding to the cracks.
- It is still acceptable to drive on it but the pavement only has 5 - 8 more years of useful life.
- The appropriate treatment would be to pulverize the existing roadway and mix it with the dirt beneath to provide a strong base and repave the road.

PCI 0-40 (Very Poor)

Example of PCI 25



- The pavement is in very poor condition.
- The pavement surface usually has many potholes and/or utility cuts.
- There are cracks that are wide and the surface is rough.
- Water has gotten under the pavement and the ground that supports the roadway will need replacement in a few years.
- It is still acceptable to drive on it but the pavement only has a few more years of useful life.
- The appropriate treatment would be to check to see if the existing dirt is acceptable or needs removal, then create a strong base and finally repave the road.

Palm Springs's PCI Condition

Functional Classification	2014 Average PCI			2018 Average PCI		
Arterials	76	B	Satisfactory	79	B	Satisfactory
Collectors	71	B	Satisfactory	73	B	Satisfactory
Residential	65	C	Fair	71	B	Satisfactory
Total Network	69	C	Fair	73	B	Satisfactory

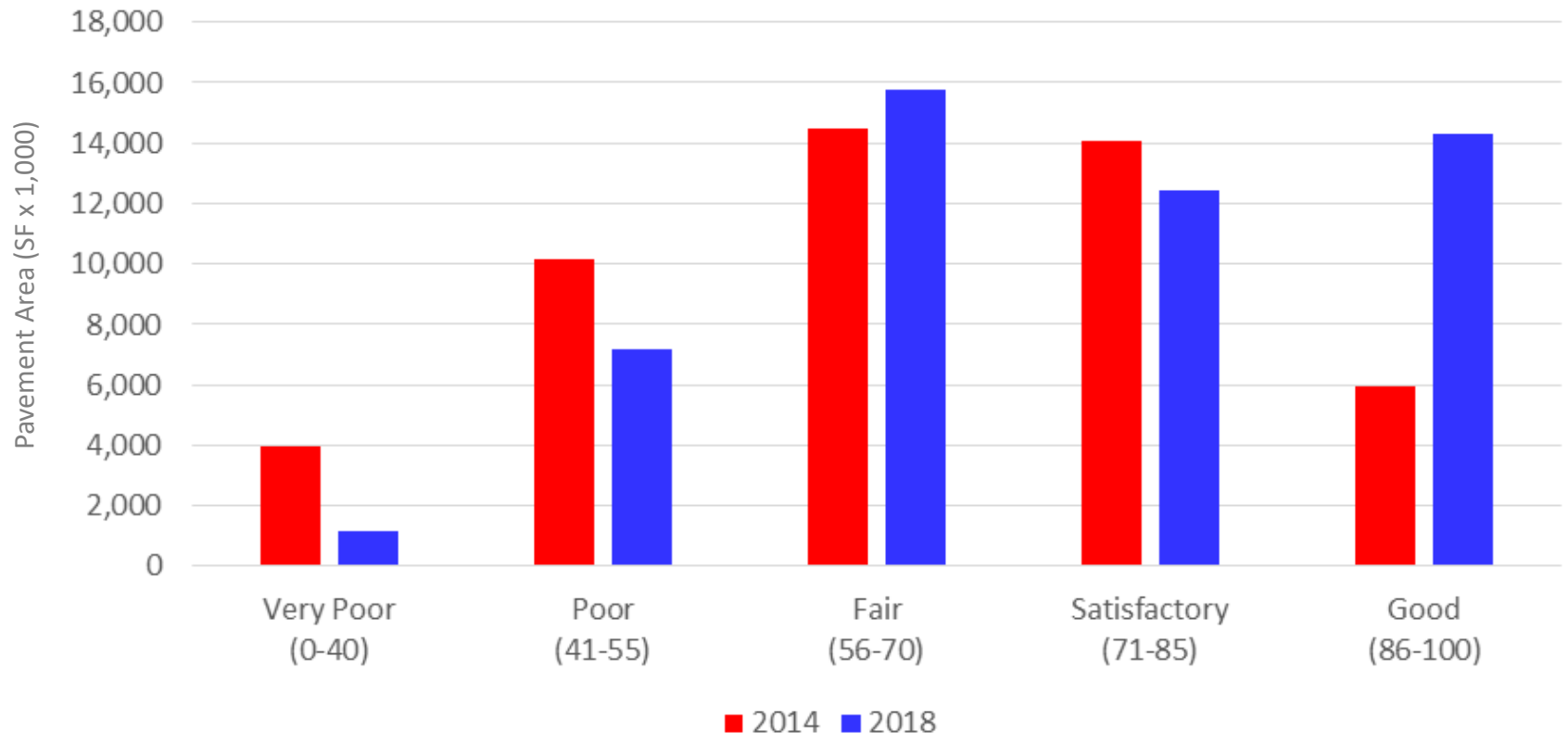
Streets were evaluated in 2014 and again in 2018.

Palm Springs's Streets by Condition 2014 vs 2018

Average Network PCI

2018: 73 Satisfactory

2014: 69 Fair



Palm Springs Repair Treatments

Slurry Seal
w/ micromill & crack seal

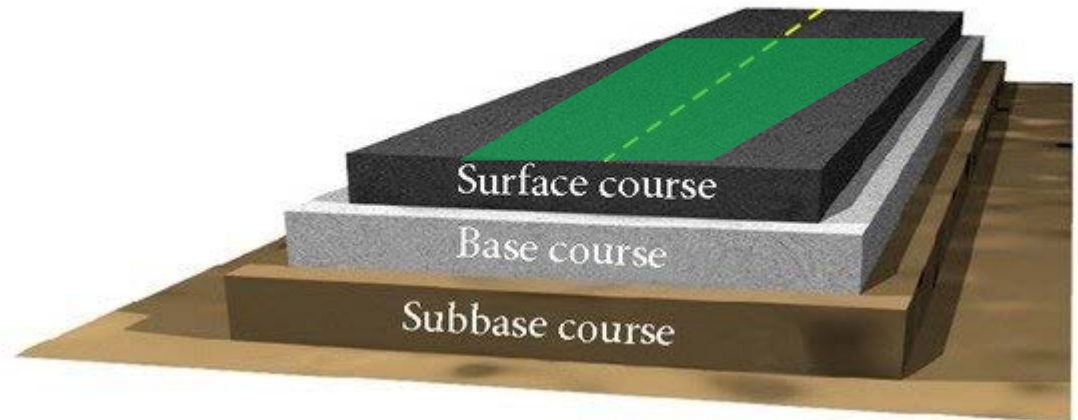


Considered Maintenance

- Cracks are filled with a sealant
- Grinder will lightly scratch the surface
- Even coat of asphalt slurry is applied.

Moderate Impact and inconvenience
to the neighborhood

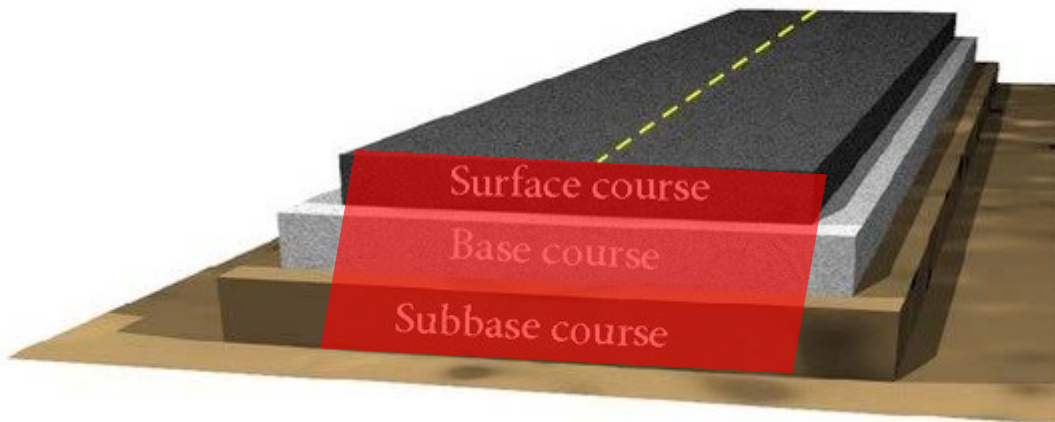
Like taking your car in for a 15,000 mile
service



Palm Springs Repair Treatments

High impact to the neighborhood. Residents will need advanced notification so they are able to plan around the inconvenience.

Like taking your car in for a full engine replacement.



Pulverize & Pave



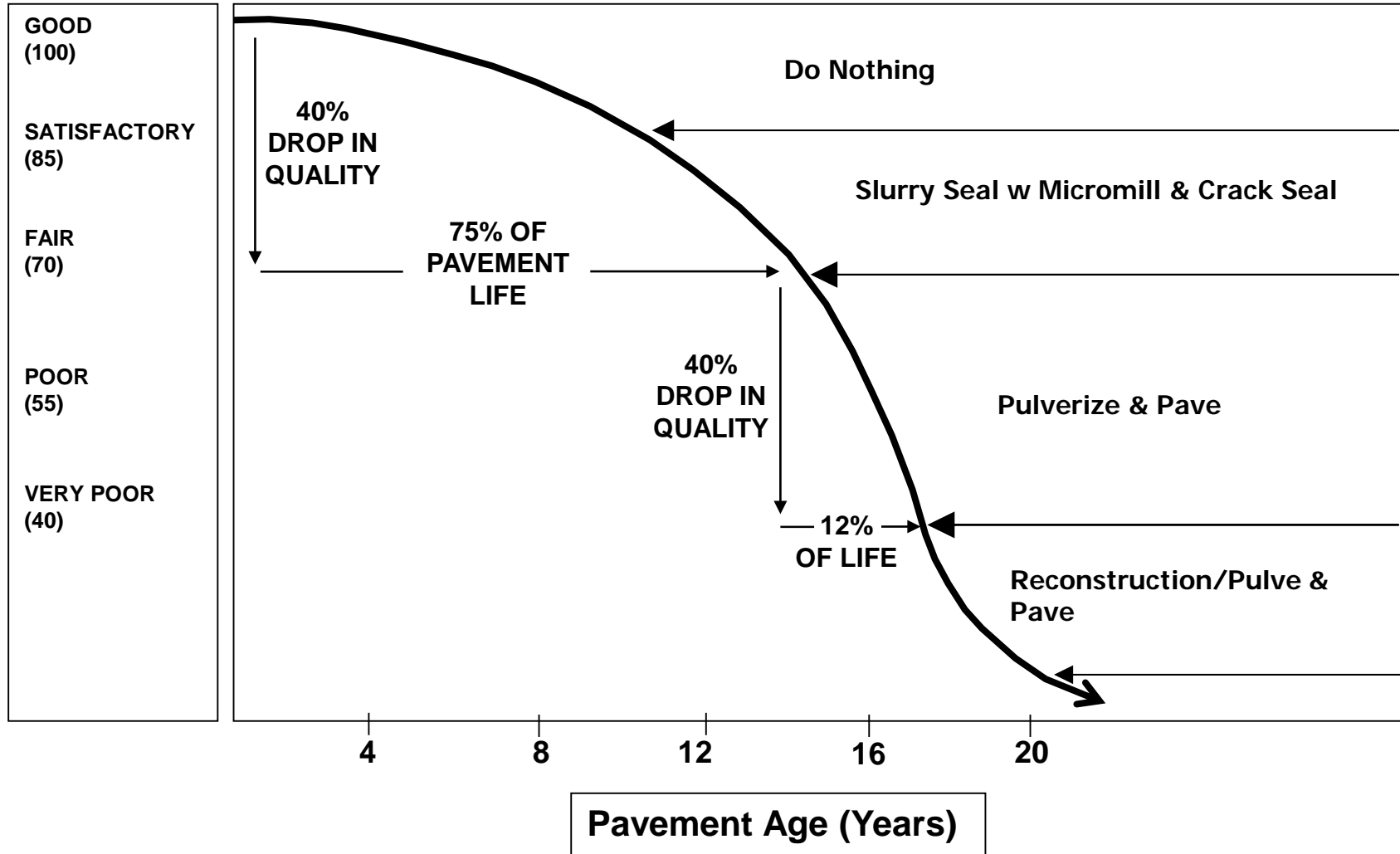
Considered Rehabilitation

- Grind off some of the surface course, recycle
- Grinds the rest of the surface course and mixes with subbase to create a stronger base

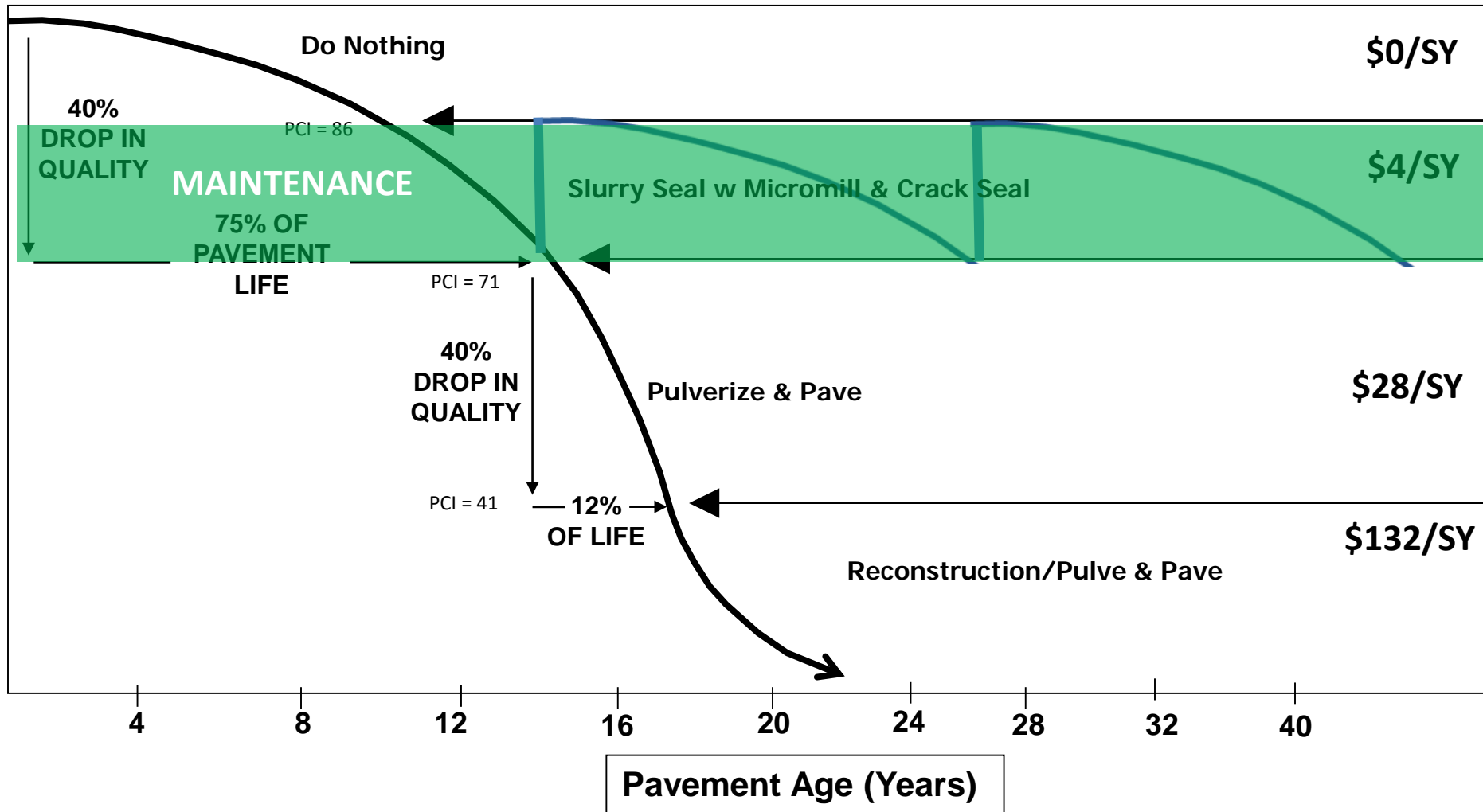
Typical Pavement Life Cycle

PAVEMENT CONDITION
(Approx. PCI)

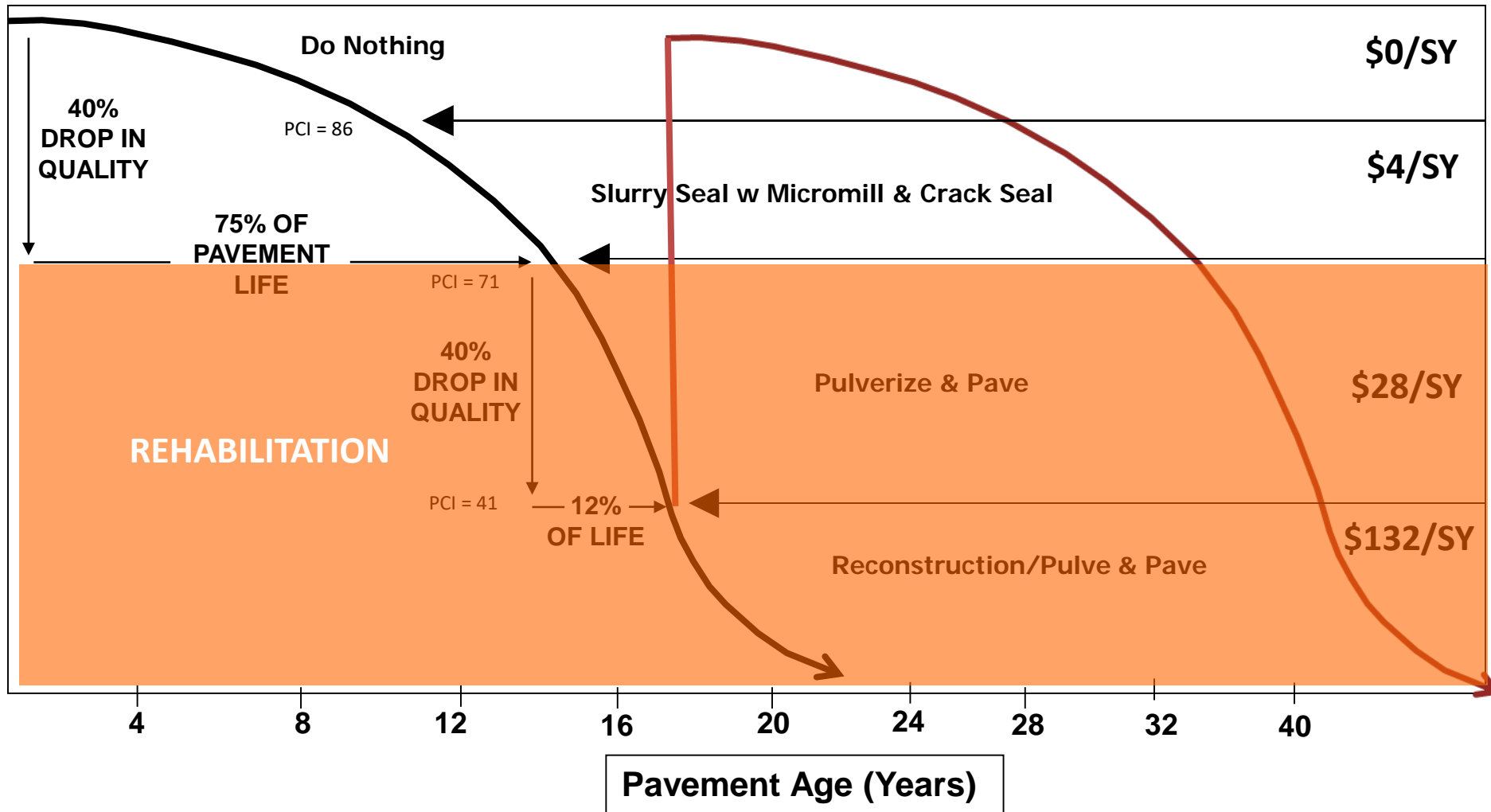
AGENCY'S RECOMMENDED TREATMENT



Pavement Life Costs



Pavement Life Costs



Impact of Maintenance

Maintenance Mileage by Centerline Miles						
Treatment Type/Year	2014	2015	2016	2017	2018	Grand Total
Overlay	3.91	18.07	14.52	10.56	6.12	53.18
PM - Surface Seal	6.27	14.96	0.99	12.66	8.93	43.82
Reconstruction	5.70	2.65	1.09	0.00	1.04	10.49
Grand Total	15.89	35.68	16.60	23.22	16.10	107.49

- Approximately 107 centerline miles of streets were treated since last distress survey in 2014
- 44% of network was treated since 2014

Condition by Neighborhood

Neighborhood	2014 PCI	2018 PCI	Letter Grade	Condition Category	Neighborhood	2014 PCI	2018 PCI	Letter Grade	Condition Category
Andreas Hills	84	72	B	Satisfactory	Movie Colony East	70	71	B	Satisfactory
Araby Commons	75	62	C	Fair	Oasis del Sol	N/A	61	C	Fair
Araby Cove	81	73	B	Satisfactory	Old Las Palmas	67	78	B	Satisfactory
Baristo	75	90	A	Good	Parkview Mobile	N/A	N/A	N/A	Private Roads
Canyon Corridor	57	73	B	Satisfactory	Racquet Club Estates	68	74	B	Satisfactory
Deepwell Estates	53	70	C	Fair	Racquet Club West	69	68	C	Fair
Demuth Park	58	72	B	Satisfactory	Ranch Club Estates	N/A	67	C	Fair
Desert Highland / Gateway	65	72	B	Satisfactory	Rimrock	N/A	73	B	Satisfactory
Desert Park Estates	68	59	C	Fair	Rogers Ranch	80	66	C	Fair
El Mirador	70	64	C	Fair	Sonora Sunrise	57	77	B	Satisfactory
El Rancho Vista Estates	70	71	B	Satisfactory	Sunmor	75	76	B	Satisfactory
Escena	N/A	N/A	N/A	Private Roads	Sunrise Park	58	69	B	Satisfactory
Four Seasons	N/A	N/A	N/A	Private Roads	Tahquitz Creek Golf	N/A	73	B	Satisfactory
Gateway	N/A	76	B	Satisfactory	Tahquitz River Estates	69	67	C	Fair
Gene Autry	N/A	54	C	Fair	The Mesa	67	78	B	Satisfactory
Historic Tennis Club	66	72	B	Satisfactory	The Movie Colony	75	73	B	Satisfactory
Indian Canyons	67	73	B	Satisfactory	Twin Palms	N/A	79	B	Satisfactory
Lawrence Crossley	N/A	70	C	Fair	Upper West Side	51	70	C	Fair
Little Beverly Hills	N/A	60	C	Fair	Vista Las Palmas	65	89	A	Good
Little Tuscany	N/A	71	C	Fair	Vista Norte	70	66	C	Fair
Los Compadres	53	75	B	Satisfactory	Warm Sands	72	66	C	Fair
Melody Ranch	N/A	84	A	Good	Whitewater Club	N/A	N/A	N/A	Private Roads
Midtown	79	70	B	Satisfactory	Not Assigned	73	74	B	Satisfactory
Mountain Gate	N/A	N/A	N/A	Private Roads					