

# The Future of Our Infrastructure, A Caltrans Perspective for ACI Fall 2017 Convention

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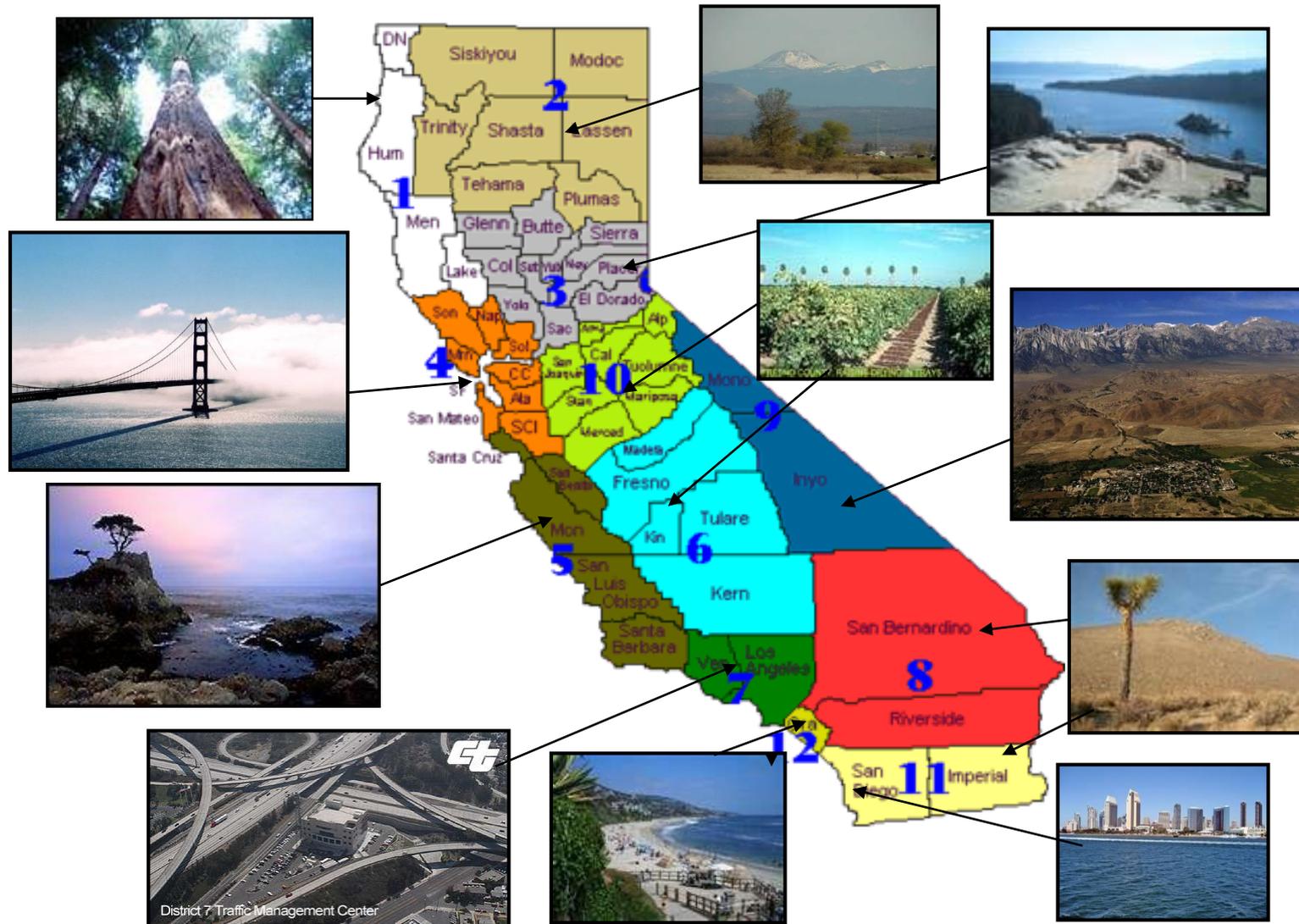
October, 2017



# This Presentation...

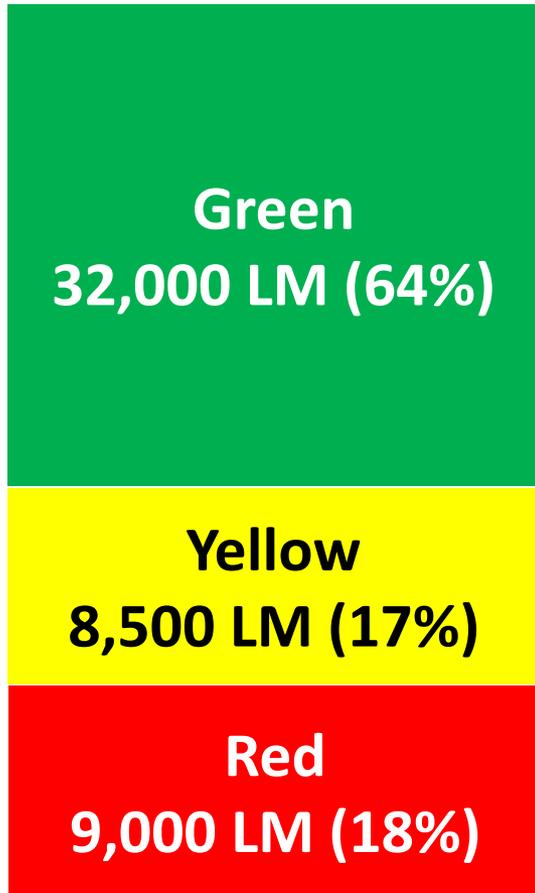
1. The 10-year Pavement Condition Goal
2. Caltrans concrete project spending predictions for the near future
3. Fast repair strategies
4. 100-year pavement designs
5. Cement is important to recycling

# 12 Caltrans Districts with Varying Needs

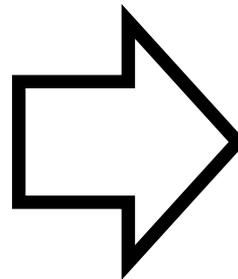
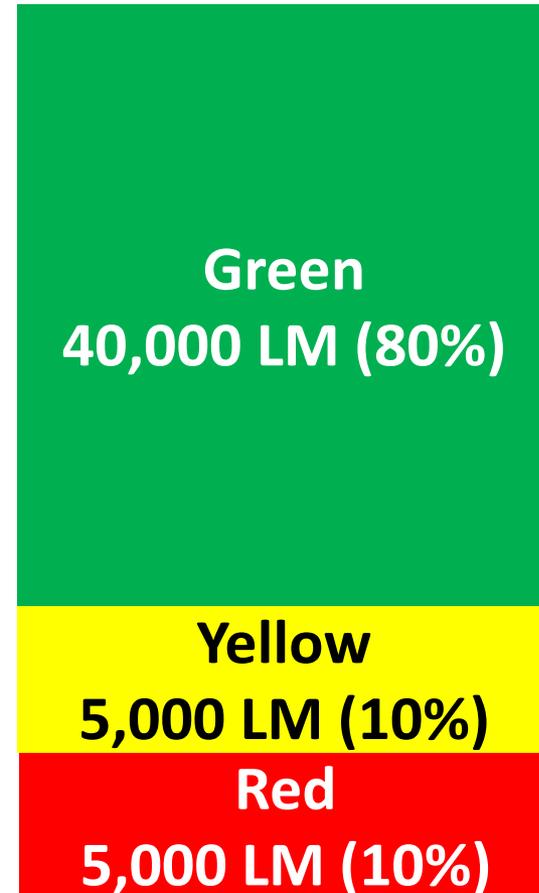


# Caltrans Pavement Goal

**2016**



**2027**



If no work, over 65,000 lane miles need to be repaired

**SB1 adds \$17 billion to get there**

# Many Truck Routes and Urban Areas are Concrete



**This route is 30 years old!**

# Urban Areas

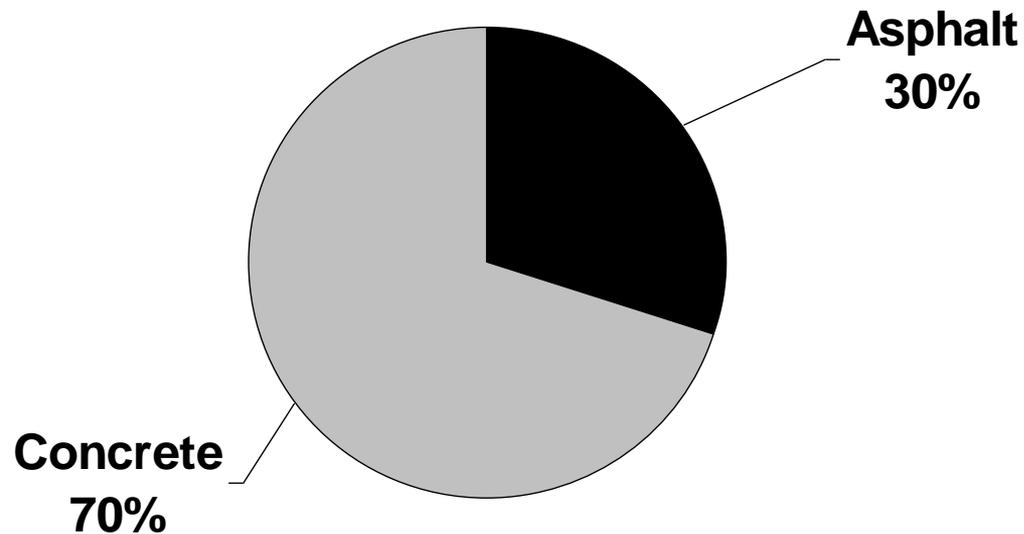
**Concrete**



**Asphalt**



**versus**



# Most Rural Roads are Asphalt



# Rural Areas

Concrete

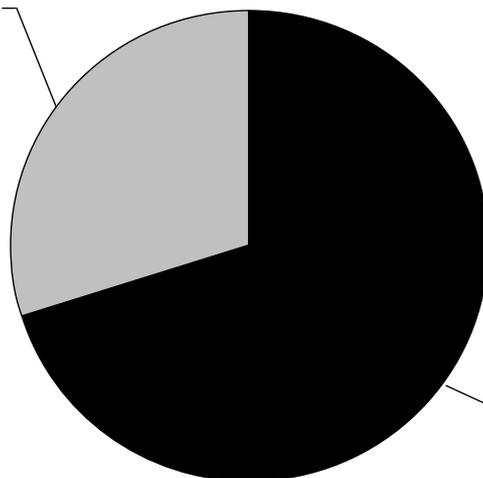


Asphalt



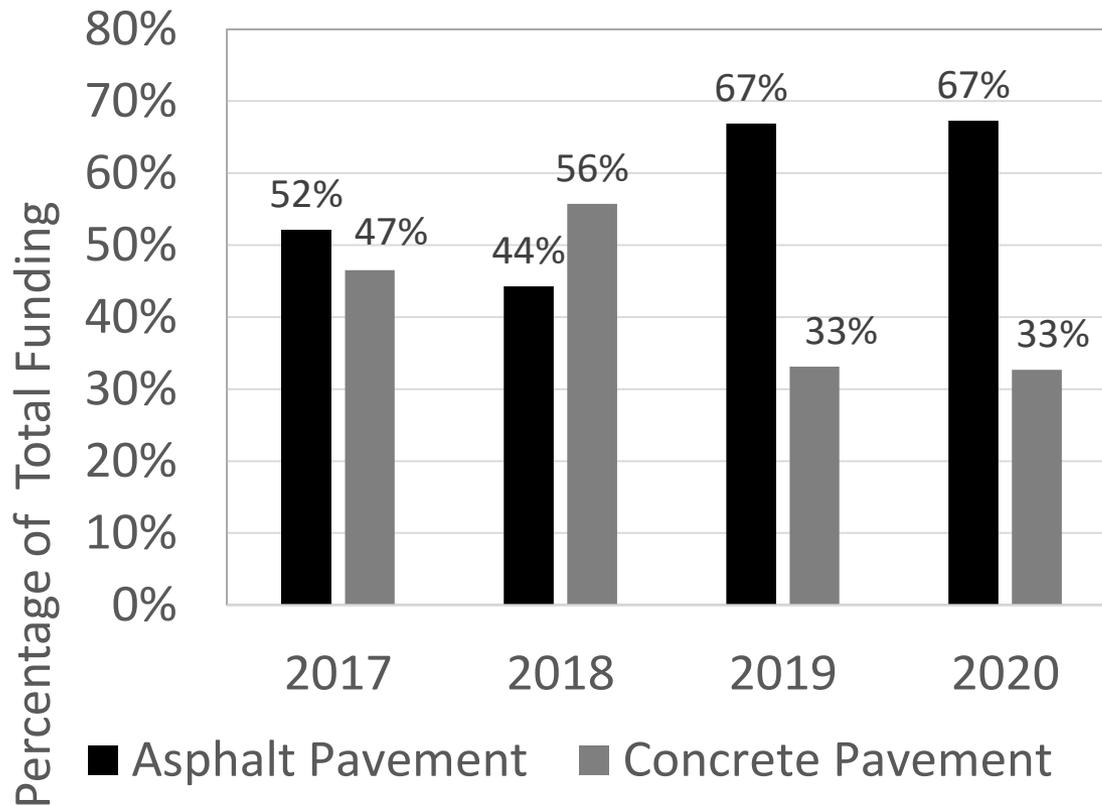
versus

Concrete  
30%



Asphalt  
70%

# Pavement Spending



# Concrete Pavement Spending

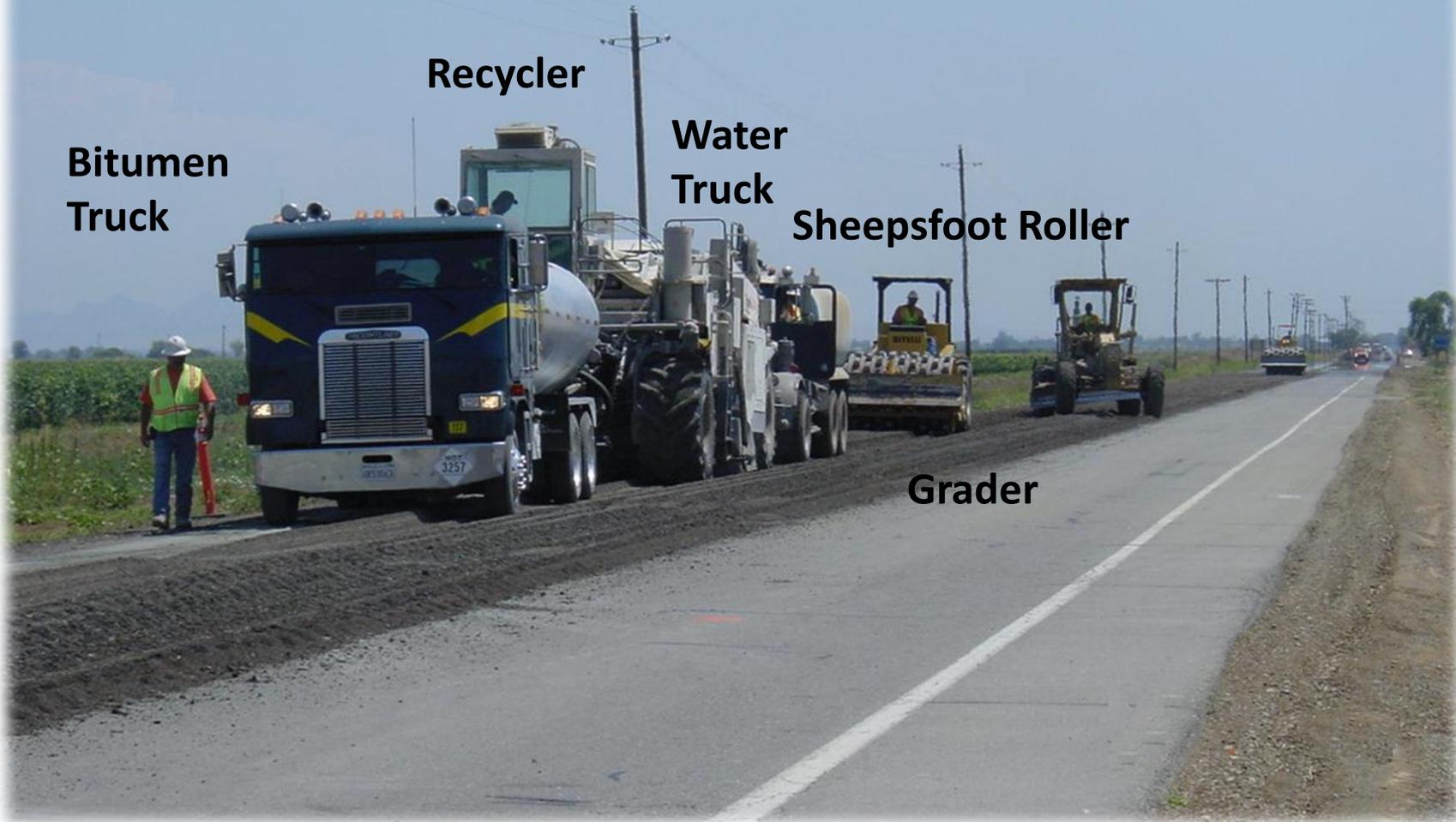
Treatment	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
<b>TOTAL Pavement Spending for Asphalt:</b>											<b>53%</b>
Joint Sealing		0.4									0.4
Grind PCC for Smoothness - CAPM					10.3						10.3
Grind/Replace slabs - CAPM				175.1	225.0	72.1	95.5	59.3	111.6		738.6
Grinding - Preventive						6.0					6.0
Slab Replacement - Corrective						2.4					2.4
Slab Replacement - Preventive			0.4		6.5	12.9					19.8
Slab Replacement with Asphalt						3.1					3.1
PCC Lane Replacement	108.9			48.0	268.1	245.5	345.2	329.0	163.4	360.4	1,868.5
PCC overlay	248.0				1.2			122.7			371.9
CRCP Lane Replacement		52.3		15.9	217.7	199.4	35.1	102.6	42.5		665.7
Slab Replacement - CAPM			68.9	34.1	57.8	1.0	3.7				165.5
<b>TOTAL Pavement Spending for Concrete:</b>											<b>47%</b>
<b>TOTAL Pavement Spending:</b>	<b>357</b>	<b>95</b>	<b>148</b>	<b>801</b>	<b>1,437</b>	<b>1,177</b>	<b>1,026</b>	<b>1,101</b>	<b>959</b>	<b>1,102</b>	<b>8,204</b>

\*Amount in million dollars.

# Strategy #1

## COLD FOAM EQUIPMENT TRAIN

### 5% cement added



Bitumen  
Truck

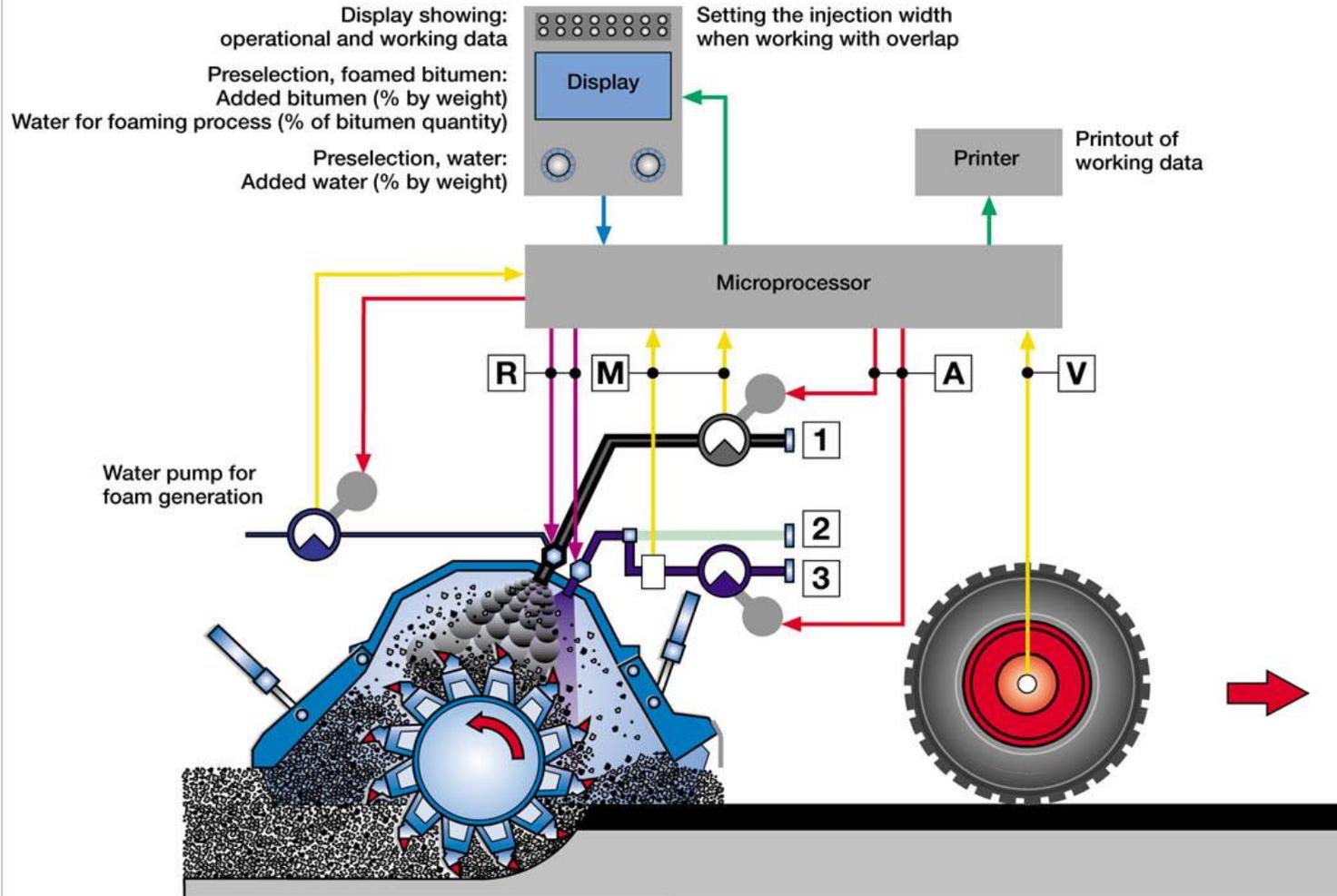
Recycler

Water  
Truck

Sheepsfoot Roller

Grader

# How Does It Work?



**M** Measurement of the added bitumen and water

**R** Control of the pulsed nozzle cleaning function

**A** Control of the pumps for bitumen and water

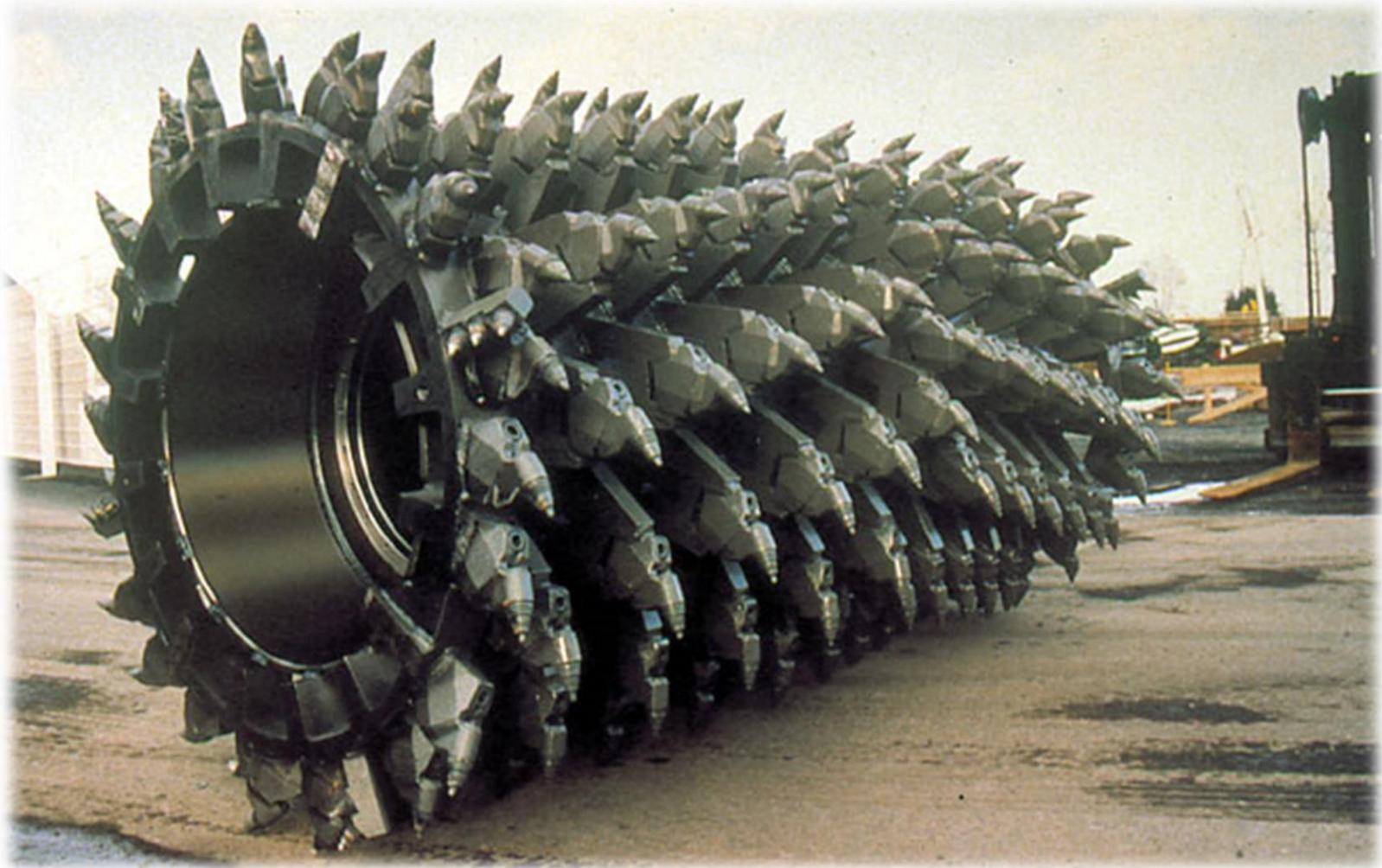
**V** Measurement of the rate of advance

**1** Supply of hot bitumen or emulsion, if required

**2** Infeed of water-and-cement slurry

**3** Supply of water (to achieve optimum compaction)

# Typical Recycler





# Cement in Front of Recycler

# Foamed Recycled Material



No Dust

Relatively Quiet

# Lessons Learned



Need to provide adequate signage, traffic management plan for travelers to remind them they are riding on an unpaved surface and to keep speeds down.

A photograph of a construction site at night. A large yellow crane is lifting a long, rectangular precast concrete slab into a trench. Several workers in high-visibility vests and hard hats are positioned around the slab, some holding ropes attached to the crane. The ground is covered with a white plastic tarp. In the background, there are orange traffic barrels and streetlights.

## Strategy # 2 PRECAST SLAB REPLACEMENT

More effective the projects are,  
the easier to compete and  
obtain statewide funds to build.

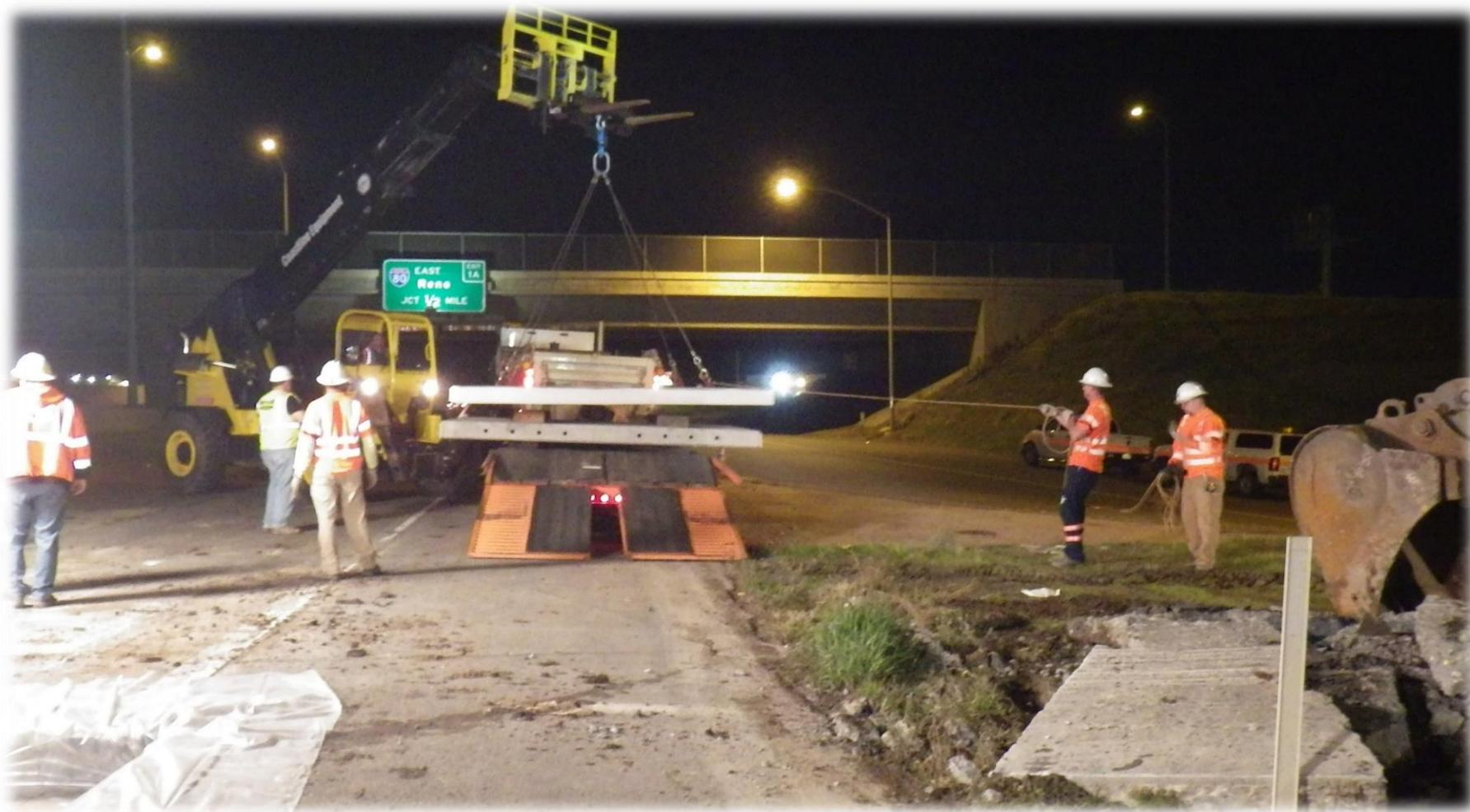
# Long Life Pavement Design

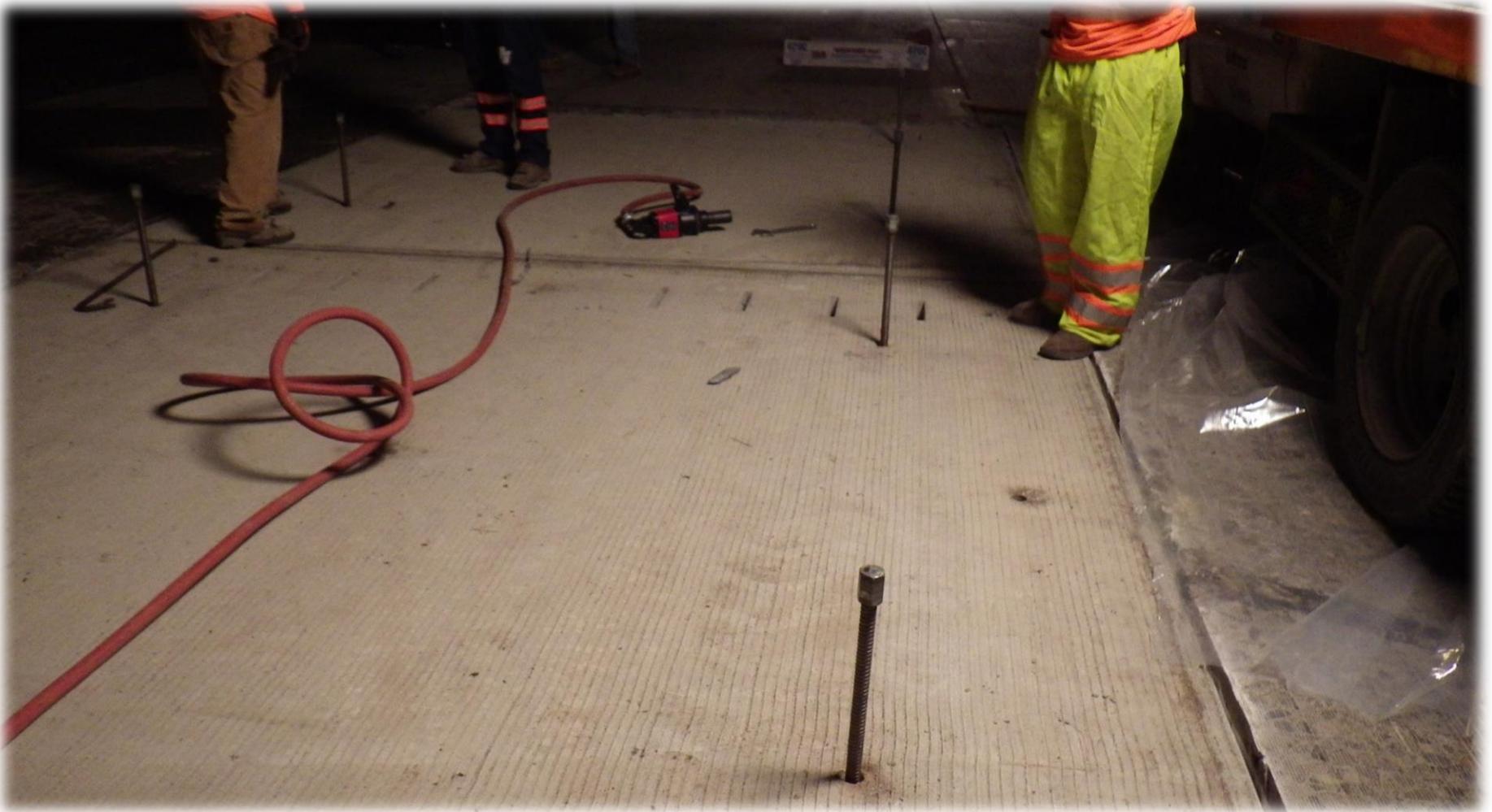


**Concrete pavements are being built with new technology to last for 100+ years!**

# Casted Dowel Bar Slots







# Strategy # 3

## Continuously Reinforced Concrete Pavement



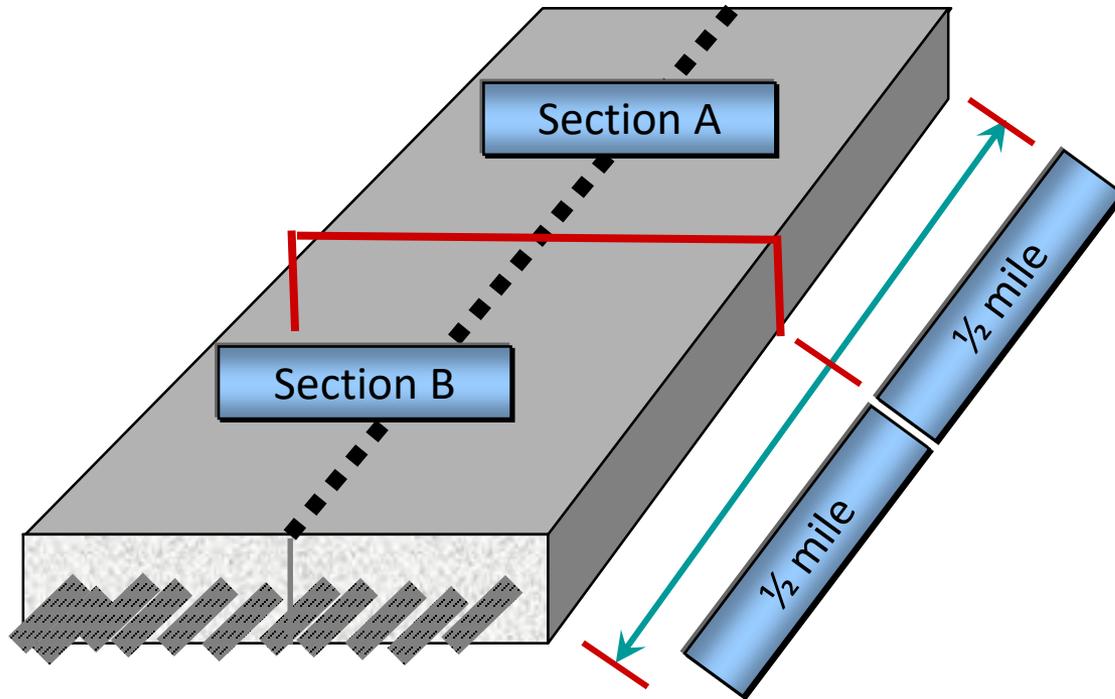
# Traditional Jointed Concrete



# Traditional Jointed concrete



# US-40/I-80 Section: Steel Design



## LONGITUDINAL STEEL

### Section A – lower grade

- 0.62 percent steel
- $\frac{1}{2}$ "  $\phi$  @ 4" c/c

### Section B – higher grade

- 0.5 percent
- $\frac{1}{2}$ "  $\phi$  @ 5" c/c

## TRANSVERSE STEEL

- $\frac{1}{2}$ "  $\phi$  @ 5-ft c/c

# Condition Prior to Overlay was “Excellent”



# Close Up Condition Showing “Excellent”



# CRCP...50-100 years



# Paving over steel



# In Conclusion

- **HIGH** Goals
- **MORE** Money
- **NEW** Strategies



**California needs more Contractors who  
are talented and capable!**