



We know life's a bear... We are here to help.



# Pavement Preservation and Bonded Wearing Course

Presented by:

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Representative



# Pavement Preservation– What it is NOT



# Pavement Preservation - What it IS

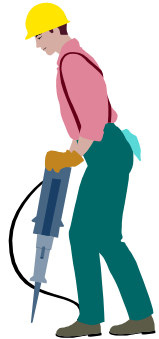
Chip Seal

Fog Seal



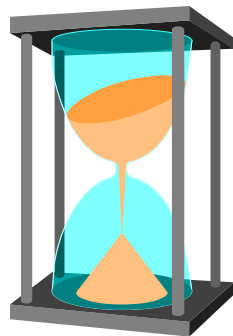
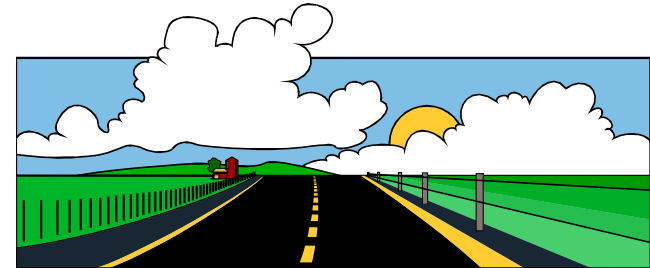
Keep the good roads good.

# PAVEMENT PRESERVATION Philosophy



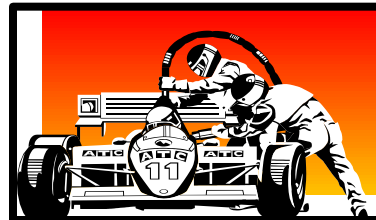
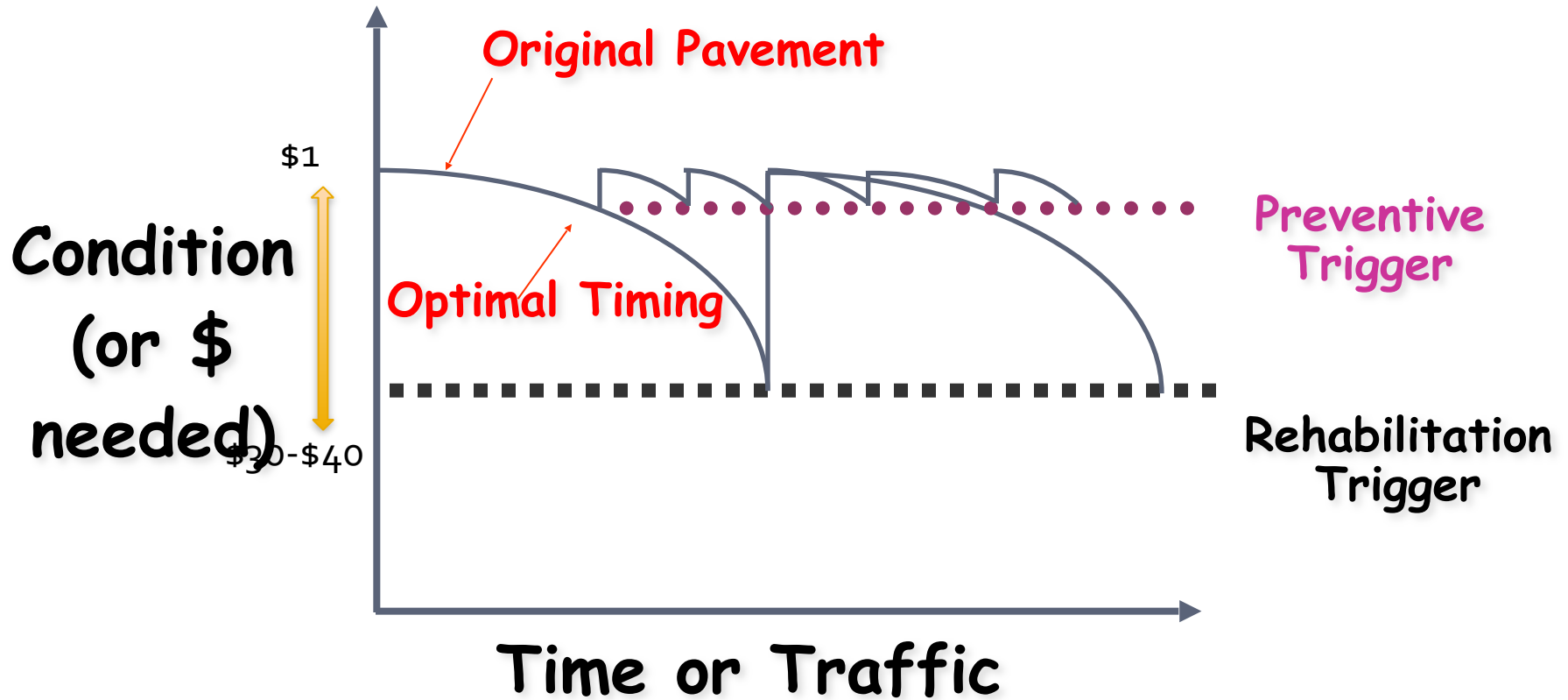
**Right Treatment**

**Right Pavement**



**Right Time**

# Pavement Preservation - Concept



# If that doesn't convince you, this should...

## ASSUMPTION:

- You own 300 lane miles of road &
- Have a budget of \$1.5M for:
  - pavement reconstruction
  - rehab
  - maintenance
- Typical Breakdown
  - \$1M for reconstruction and rehab = “worst first” scenario &
  - \$500K for maintenance



# What You Get for \$1.5M

- Reconstruction ~ \$25.00 per yd<sup>2</sup>
  - (6" mill and fill with HMA @ \$75/ton)
  - $\$1\text{M} \div \$25/\text{yd}^2 = 40\text{K yd}^2$  or 5.7 LM
- Cost of maintenance ~ \$4 per yd<sup>2</sup>
  - $\$500\text{K} \div \$4/\text{yd}^2 = 125\text{K yd}^2$  or 17.8 LN

Total LN Mi repaired is 23.5

For 300 lane miles, road cycle will be ~13 years



# What If You Flop the Budget Around: \$1M for Maintenance and \$500K for Reconstruct and Rehab

- Costs of reconstruction ~ \$25.00 per yd<sup>2</sup>
- $\$500\text{K} \div \$25/\text{yd}^2 = 20\text{K yd}^2 = 2.8 \text{ LN Mi}$
  
- Cost of maintenance ~ \$4.00 per yd<sup>2</sup>
- $\$1\text{M} \div \$4/\text{yd}^2 = 250\text{K yd}^2 = 35.5 \text{ LN Mi}$
  
- Total LN Mi repaired ~ 38
- For 300 lane miles, road cycle will be ~ 8 years

# Keys to Success

- Management Support
- Public understanding and acceptance
- Dedicated & Continuous Funding
- Good products and workmanship
- Contractor relationship
- In house training

Pavement Condition Index (PCI) for Bay Area Jurisdictions, 2006–2010 (continued)

Jurisdiction	County	Total Lane Miles	3-Year Moving Average			
			2006	2007	2009 <sup>1</sup>	2010 <sup>2</sup>
San Rafael	Marin	331	63	66	70	75
Santa Clara County	Santa Clara	1485	75	77	75	74
San Ramon	Contra Costa	398	74	73	74	74
American Canyon	Napa	102	76	76	75	74
Hercules	Contra Costa	128	75	74	73	73
Windsor	Sonoma	168	74	75	74	73
Novato	Marin	318	65	67	71	73*
Portola Valley	San Mateo	71	64	63	67	73
San Mateo	San Mateo	409	61	67	70	73*
Palo Alto	Santa Clara	470	N/A	N/A	72	73
Danville	Contra Costa	301	74	73	72	73
Walnut Creek	Contra Costa	436	72	74	73	73*
South San Francisco	San Mateo	296	67	71	72	73*
Fairfield	Solano	709	77	75	73	73
Alameda County	Alameda	997	69	71	72	72
Lafayette	Contra Costa	202	64	70	71	72
Corte Madera	Marin	64	73	73	73	72*
Cloverdale	Sonoma	64	69	71	72	71*
Saratoga	Santa Clara	281	70	71	72	71**
Hillsborough	San Mateo	164	64	66	69	71
Piedmont	Alameda	78	67	67	69	70
Cupertino	Santa Clara	303	69	70	70	70

# **Pavement Preservation Treatments**



# Typical Treatments

- Fog & Rejuvenating Seals

- Chip Seals

- Cold Applied-
  - PMCRS-2h
  - PMRE
- Hot Applied –
  - Asphalt Rubber
  - Terminal Blends

- Slurry Seals

- Micro-Surfacing

- Cape Seals

- Bonded Wearing Course

# Bonded Wearing Course



# What is Bonded Wearing Course



## Maintenance Technique that combines the best of two technologies

### ■ Part Chip Seal

- Application of .14-.25 gal/SY of a polymer modified emulsion for adhesion

### ■ Part HMA Overlay

- Use of gap or open graded, polymer or rubberized HMA to finish the process



## ■ From the chip seal

- Spray application that seals the existing roadway
- Bonding of the new surface to the old surface
- Quick process – up to 50,000 SY per day

## ■ From the HMA overlay

- Improved ride quality
- Quick return to traffic
- No sweeping or fog seal needed

# BWC Materials

- Polymer Modified Asphalt Emulsion Tack Coat
- Polymer Modified Asphalt Binder
- Gap or Open Graded Aggregate Gradation



# The Process

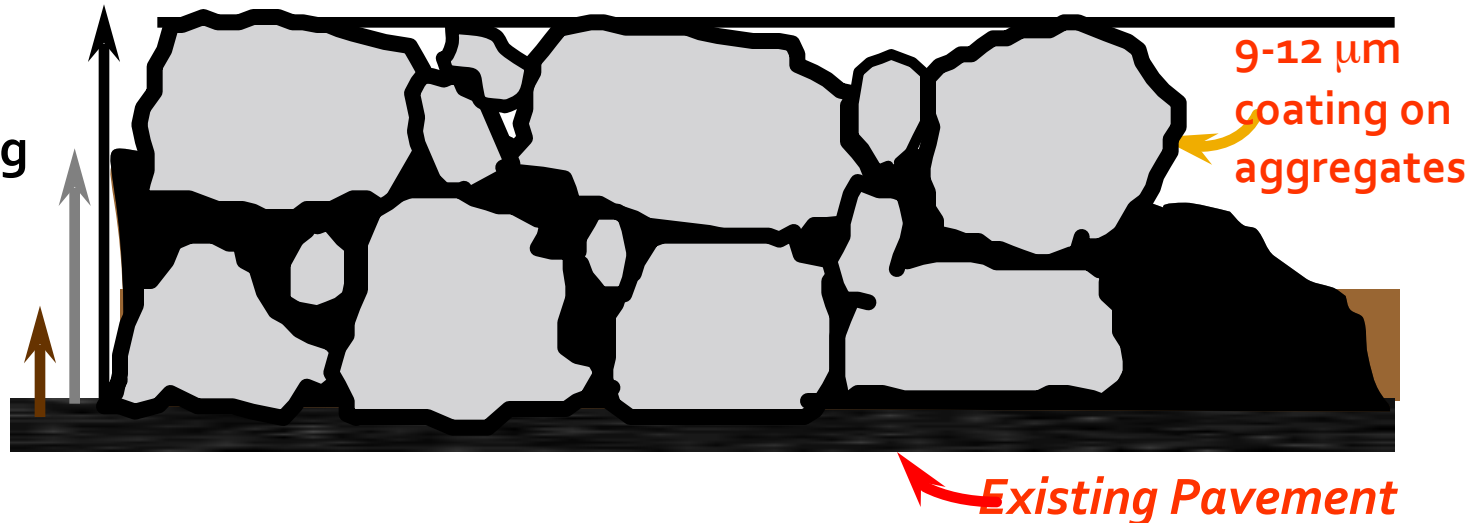
*The emulsion membrane “wicks up” around the HMA aggregates*

*The emulsion cures, bonding the mix & pavement*

3/4” minimum  
Depth of Mix

3/8”  
Nominal Ag  
Size

.14-.25  
Emulsion  
membrane  
depth



# Integrated Spray Paver & MTV

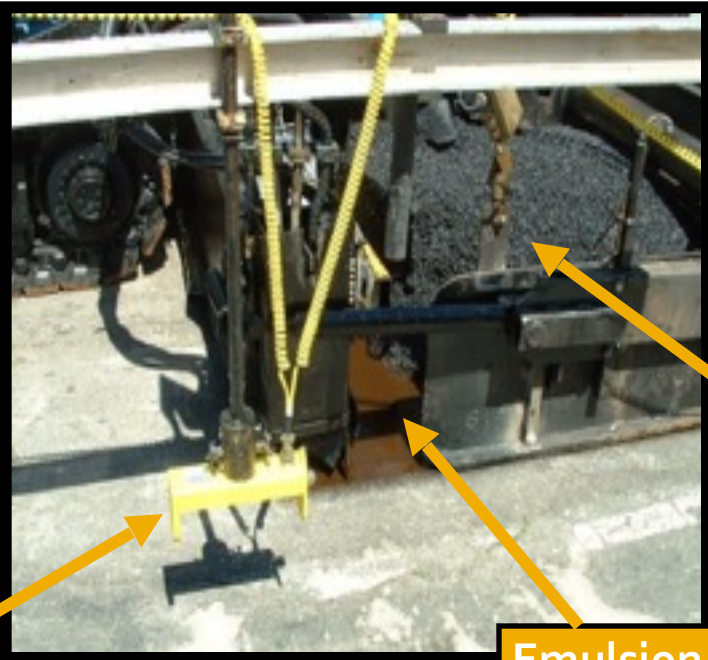




# Integrated Spray Paver



# Application



HMA

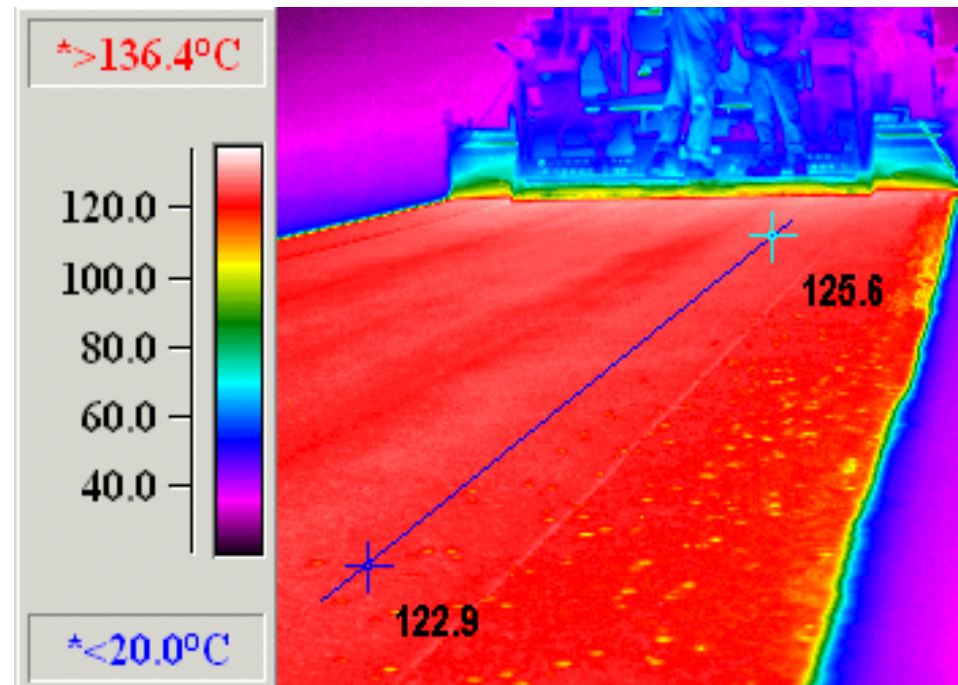
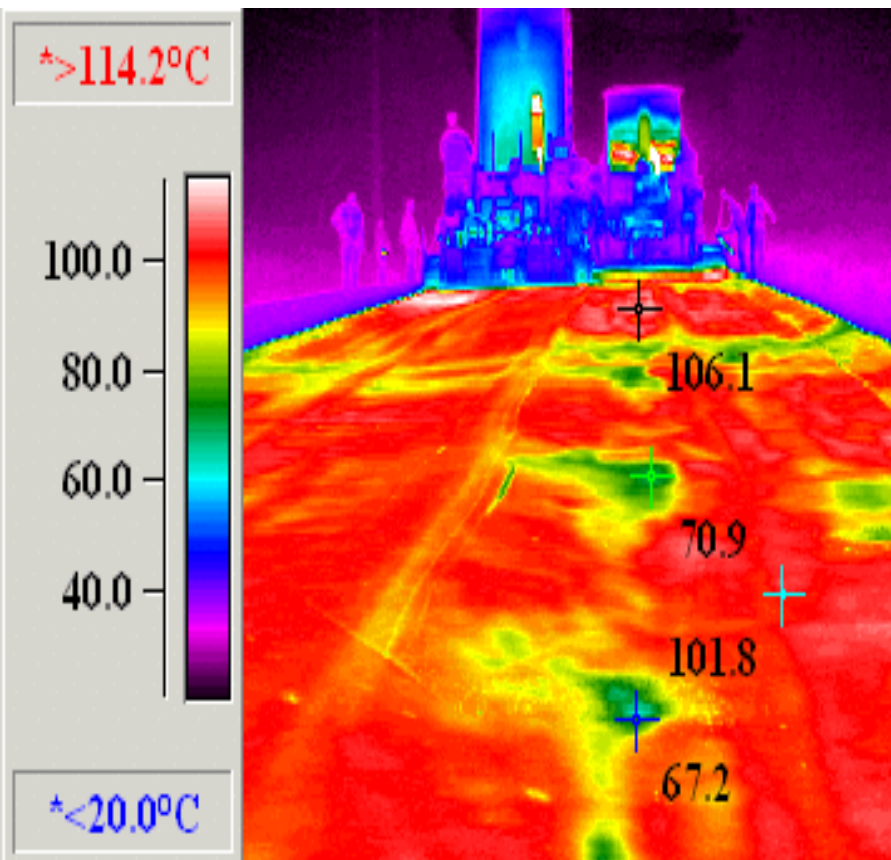
Emulsion

Joint Matching Device



# MTV – Shuttle Buggy

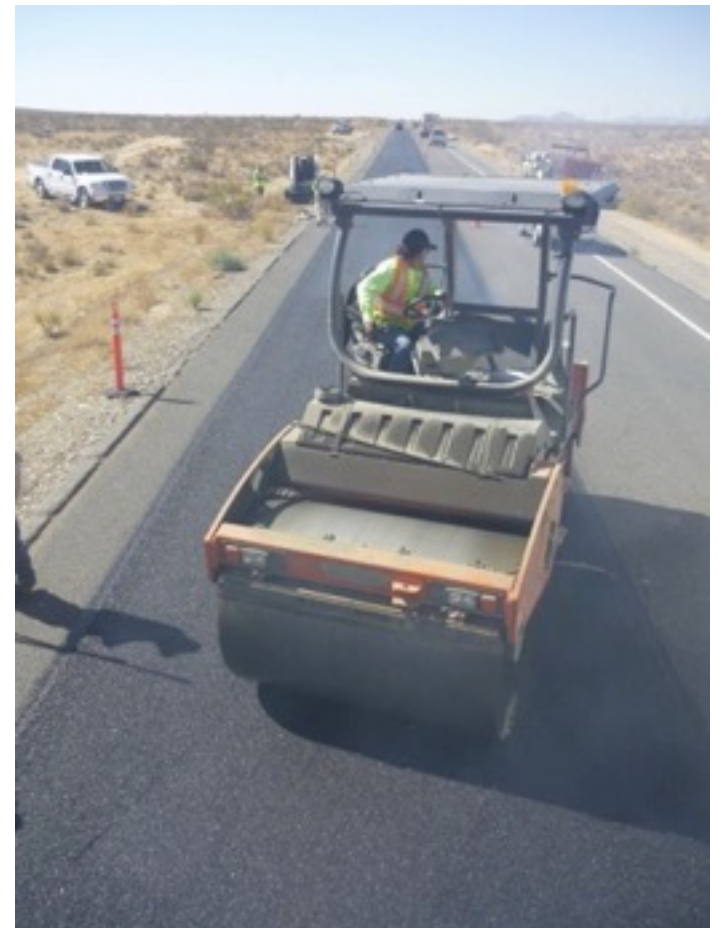




Machine is designed to reduce thermal and mechanical segregation

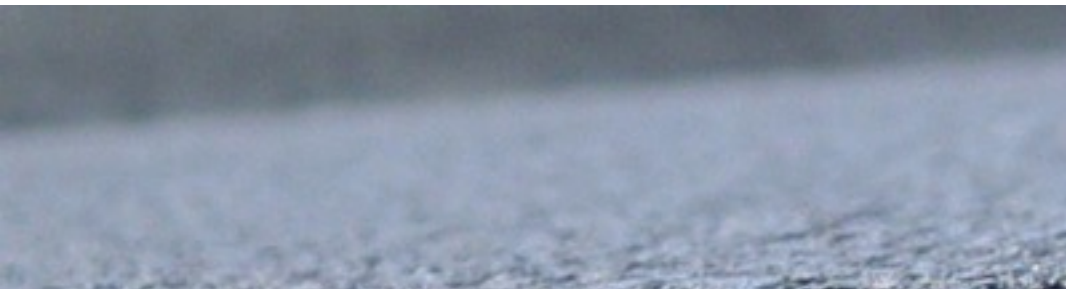
# BWC Construction

- Tack Coat Application Rate:
  - 0.14 – 0.25 gal/yd<sup>2</sup>
- Lift Thickness:
  - 0.06' – 0.1'
- Compaction:
  - Method – 2 coverages with a minimum of two rollers in static mode





# BWC – in place





# BWC ride quality improvement







15 10:45 AM



# Construction Speed and Quick Return to Traffic



15 10:17 AM



15 11:00 AM



15 11:02 AM



# Turning on the New BWC Surface







# BWC Candidates

- Roads that have a PCI of 55-60 or better
- Collectors
- Arterials
- Connectors
- Highways
- Residential
- Private

# Where has it been used and for how long?

- Since 1998 in California
  - First project – Lark Ellen Blvd, Los Angeles County
- Since 2002 for Caltrans
  - Hwy 50 over Echo Summit, Lake Tahoe





# Does it work?



10 Years as of May, after picture taken last week

# City of Sacramento BWC 2012





# Sonoma County – BWC - 2013



# City of Vacaville – 2012&2014





# BWC – Far Niente Winery



# CALTRANS District 4 – HWY 37





# Highway 37



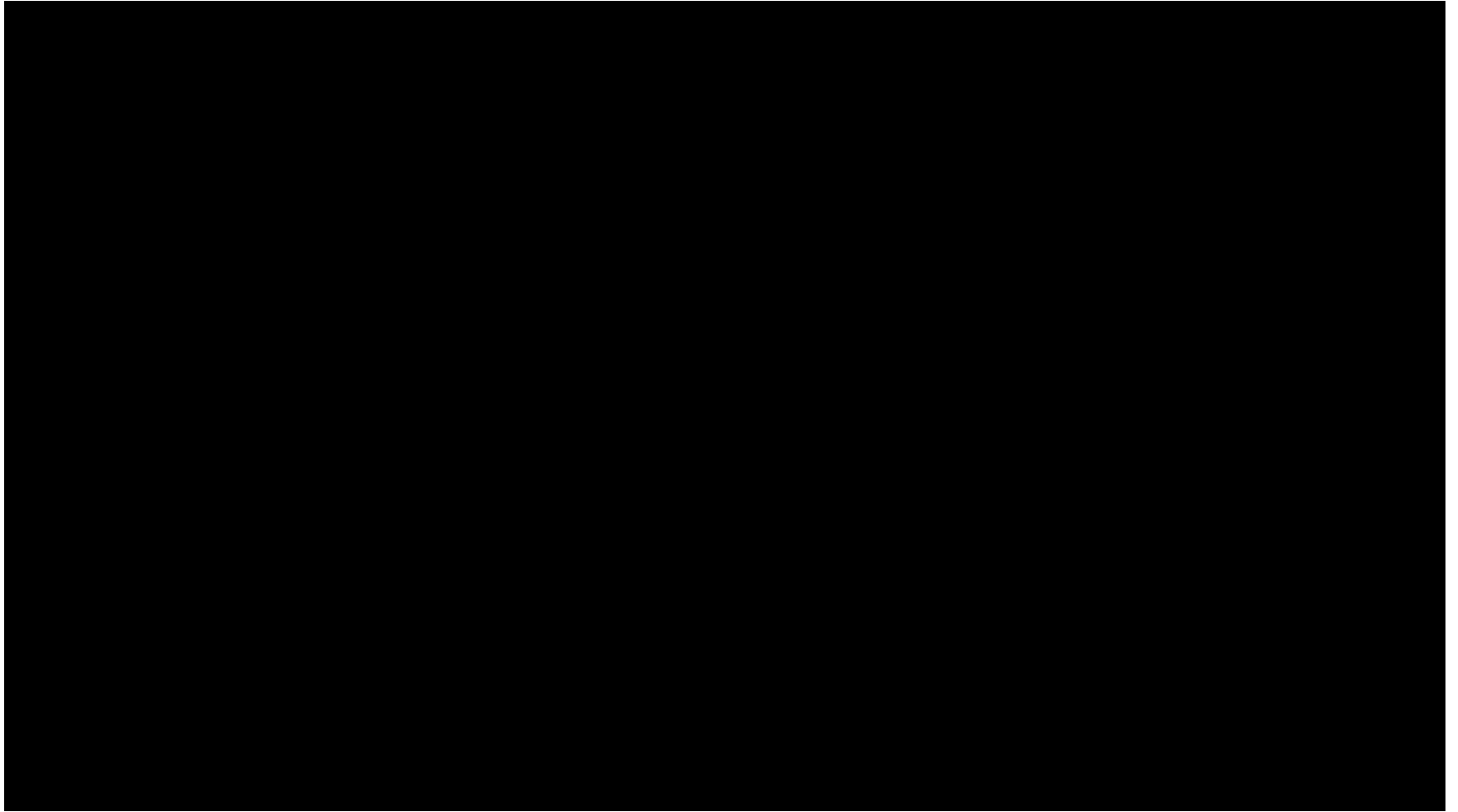
# Some other notable projects



## ■ I-8 (Right outside the hotel)

- 118 Near Ventura From Hwy 126 To Montero St. 07-Ven-118-0.5/15.7 (07-3Y8404)
- 168 Near Prather 06-Fre-168-T30.2/40.0 (06-0L7904)
- 101 Near Ventura 07-Ven-101-8.9/11.5 (07-3Y4504)
- 116 Near Jenner 04-Son-116-0.0/8.0 (04-1E8904)
- 80 Near Colfax 03-Pla-80-24.5/33.3 (03-4M0404)
- 128 Near Calistoga 04-Nap-128-R7.4/19.1 (04-2E1004)
- 1 in Marin Near Stinson Beach 04-Mrn-1-15.0/17.0 (04-4S5404)
- 80 Near Truckee 03-Nev-80-13.5/21.2 (03-3M8304)
- 29 in Lake County 01-Lak-29, 281-19.0/20.3, 14.0/17.0
- 50 in El Dorado County 03-Pla-50-39.7/57.6
- City of Huntington
- Salt Lake Airport

# BWC





It takes a team effort...



# So, does it work?

■ YES.

■ Thank you.

***TELFER***