



**BUILDING** *San Diego County*  
**BETTER ROADS**



**JUNE 30, 2026  
WORKING GROUP MEETING**

# AGENDA

- 1) Introduction/ Sign-In/ Meeting Overview
- 2) Public Comments
- 3) The Road to 70 Update
- 4) Featured Presentation- FDR
- 5) Industry Updates
- 6) BBR Updates
- 7) Next Meeting / Close



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



# MEETING LOGISTICS

- Sign In
- Brown Act Requirements
- Safety Message (Exits) / Restrooms
- Teams Meeting Etiquette
  - Mute Microphone  / Turn off Camera 
  - Use Chat window or Raise Hand for questions



# AGENDA

- 1) Introduction/ Sign-In /Meeting Overview
- 2) Public Comments**
- 3) The Road to 70 Update
- 4) Featured Presentation- FDR
- 5) Industry Updates
- 6) BBR Updates
- 7) Next Meeting / Close



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



# AGENDA

- 1) Introduction Sign-In /Meeting Overview
- 2) Public Comments
- 3) **The Road to 70 Update**
- 4) Featured Presentation- FDR
- 5) Industry Updates
- 6) BBR Updates
- 7) Next Meeting / Close



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



# Road To 70

An Overview of the County's Efforts to Improve the Network Pavement Condition Index



# Road to 70

## THE FUNDING CRISIS



TRADITIONAL FUEL  
TAXES FAILED TO  
KEEP PACE

## INFRASTRUCTURE DETERIORATION



RIISING COSTS AND  
REGULATIONS  
CAUSED ROADS TO  
FAIL FASTER THAN  
THEY COULD BE  
REPAIRED

## LEGISLATION PURPOSE



FIXES LONG-TERM  
INFRASTRUCTURE  
FUNDING GAP

## STRATEGIC SHIFT



FROM A "WORST-  
FIRST" APPROACH  
TO PREVENTATIVE  
MAINTENANCE  
MODEL

## PREDICTABLE PLANNING



ALLOW FOR  
RELIABLE, MULTI-  
YEAR PAVEMENT  
MANAGEMENT  
PLANS

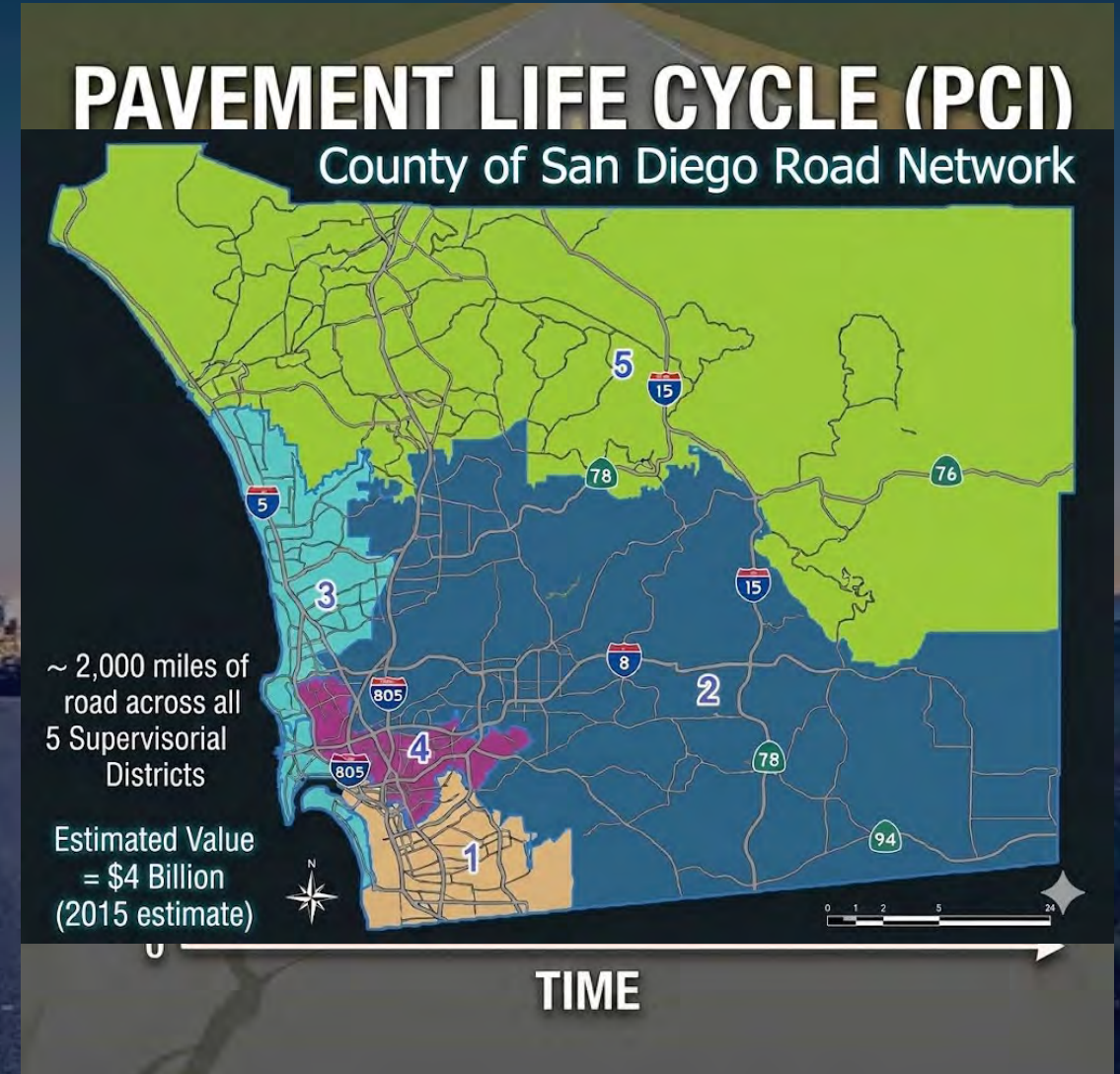
# THE JOURNEY



# Road to 70

## 2017 – The Starting Point

-  **Large Road Network:** ~2,000 miles
-  **Top Capital Asset:** \$4 Billion Replacement Cost
-  **Network PCI:** 60 (30% roads poor/very poor)
-  **Resurfacing Program:** Single staff



## STRATEGIC ROADMAP

### DATA-DRIVEN SHIFT



- Board approved plan to PCI=70.

### OPERATIONAL SCALING



- Managed 10x funding increase.



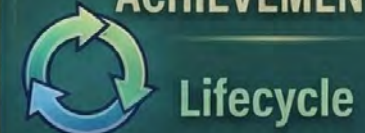
- Expanded staff and rigorous workflows.

### MAINTAINING PROJECT CONTINUITY



- Strategic management amidst COVID-19 and supply chain.

### LIFECYCLE OPTIMIZATION & ACHIEVEMENT



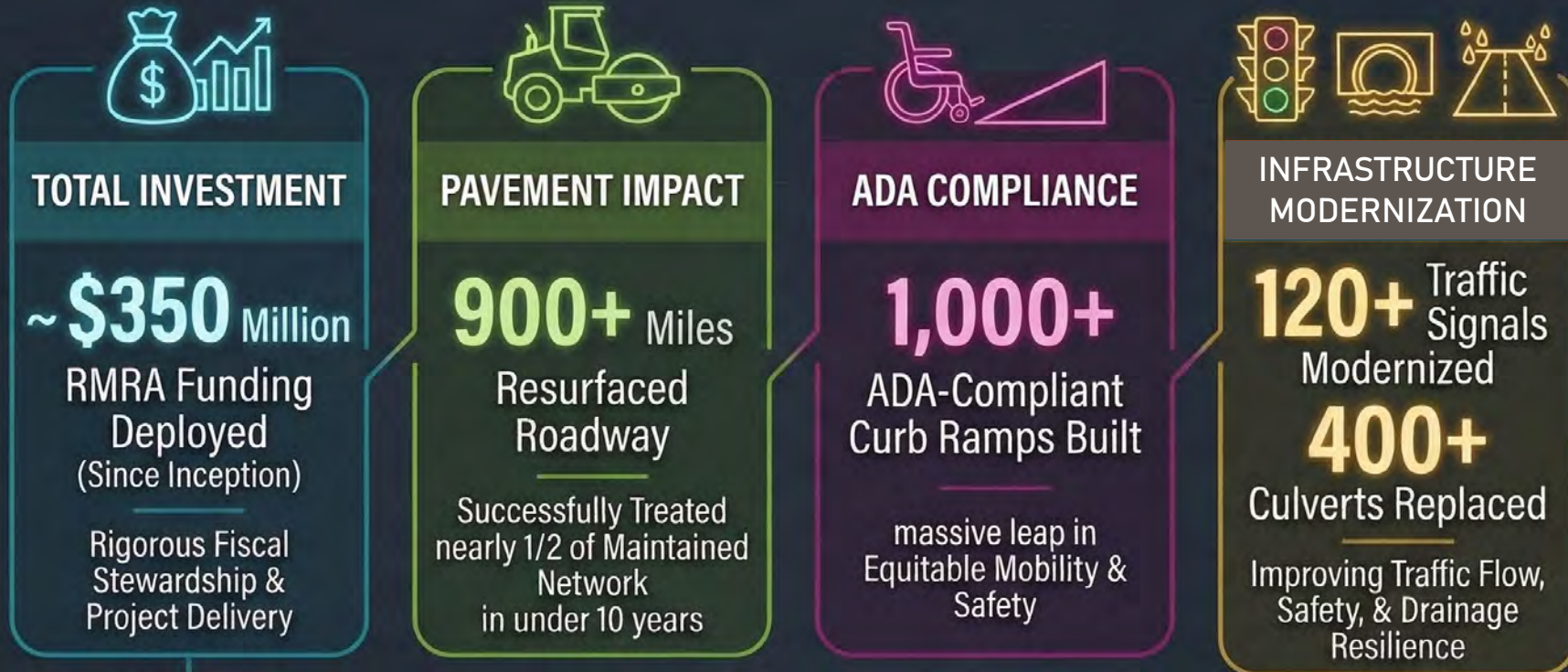
- Aggressive lifecycle achievement.

# PCI=70

- Aggressive resource allocation.

# Road to 70

## PROGRAM SUCCESS: San Diego County 'Road to 70' (Since 2018)



PCI

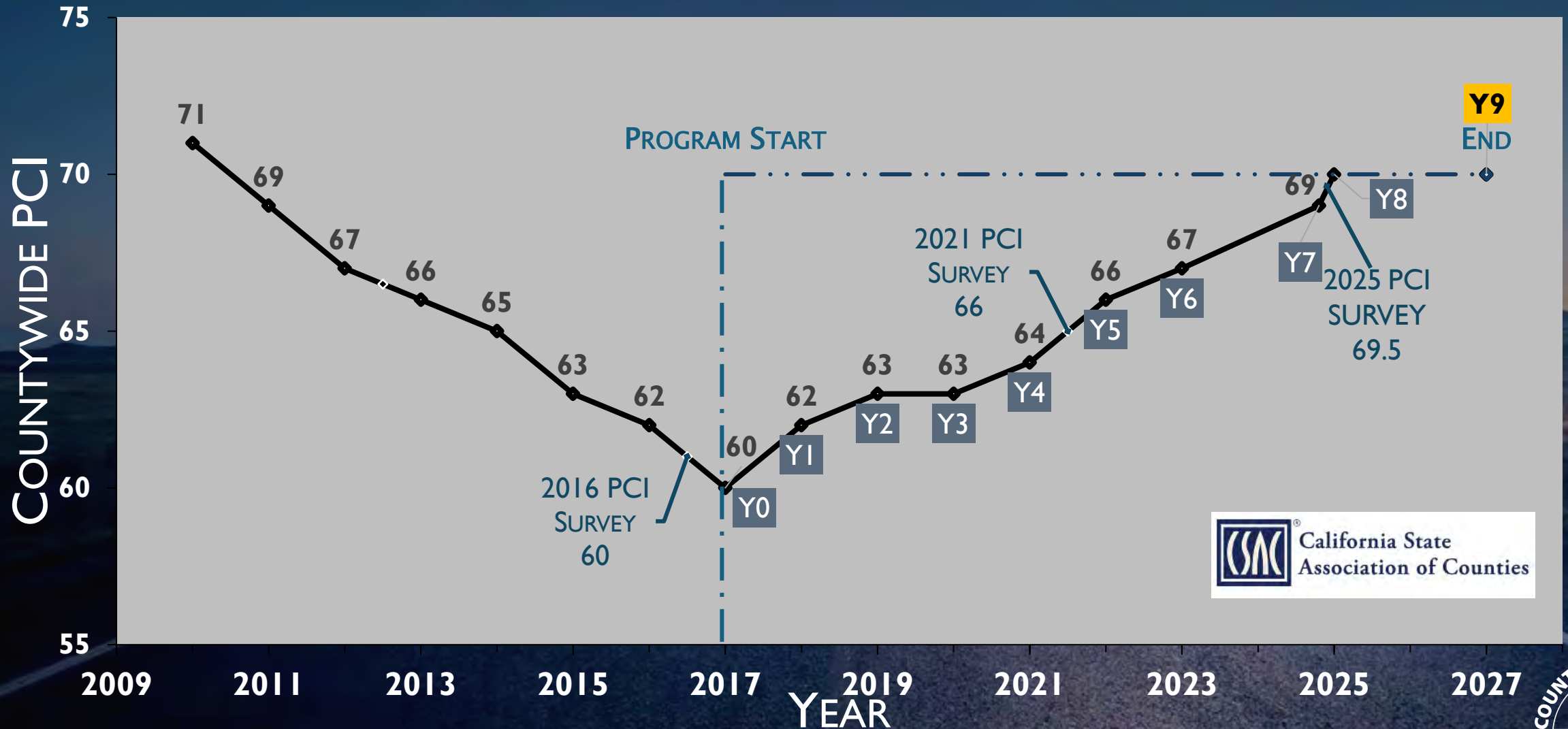


70

Optimizing Lifecycle, addressing Deferred Maintenance to reach target PCI 70

# Road to 70

*2026 CSAC Best Pavement Management Practices Winner!*



# Road to 70



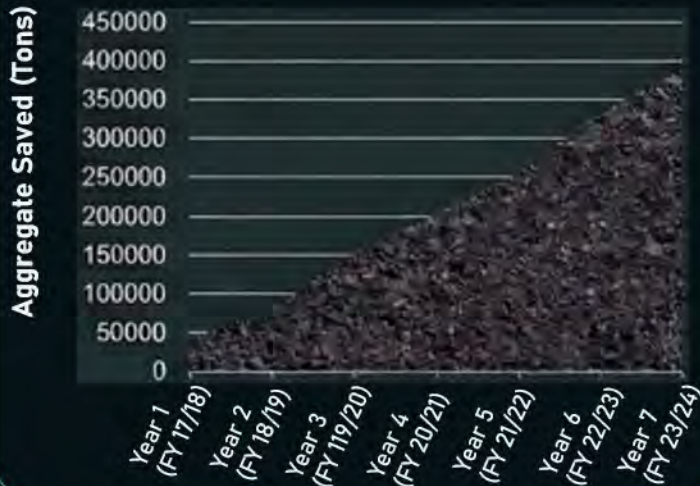
## REPORT CARD JUNE 2026



### RAP USAGE

Use of Reclaimed Asphalt Pavement (RAP) material has led to cost saving and increased environmental sustainability

Cumulative Aggregate Saved (Tons)



### WORKING GROUP MEETINGS

**22** Meetings Held (11/2018-6/2026) **1** Meetings Planned (10/2026)

### SUBCOMMITTEE MEETINGS

**19** Meetings Held (5/2022-11/2024)



### SUBCOMMITTEES



**Sustainability**- Pavement Management topics related to preserving our natural resources and minimizing the impact on the environment



**Innovation**- New ideas and improvement to existing pavement management solutions

### TRAINING OPPORTUNITIES



**4**

Plant/ Site Tours



**8**

Training Workshops



**9**

Shared External Training Opportunities

### GUIDANCE DOCUMENTS



Identified



Internal Review



Drafted



Completed

### PILOT STUDIES



#### COMPLETED

**Delayed Contract Start** ( 2018/2019)  
Improves Bids, Lowers cost

**Increase RAP Use (up to 25%)** ( 2018/2019)  
Supports aggregate sustainability



#### IN PROGRESS

**Fiber Reinforced Asphalt** ( 2020/2026)  
Improves Durability/Performance

**RAP Pavement Seal** ( 2022/2026)  
Supports aggregate sustainability

**Delta Mist Rejuvenating Seal** (2025-2028)  
Restores life to asphalt



## COUNTY OF SAN DIEGO: 2026 PAVING & MAINTENANCE FORECAST

|  PROJECT/ CONTRACT                         |  SCOPE OF WORK      |  CURRENT STATUS & KEY DATES |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  FY 24/25 AC Overlay Contract (Year 8)     | Resurfacing ~85 centerline miles across all 5 supervisorial districts (Consolidated region contract) | Bids Opened April 2026, Est Construction Start August 2026                                                     |
|  FY 25/26 Pavement Seal Contract (Year 9) | ~16 miles of preventative chip and slurry seal treatments                                            | Bids opened April 2026, Est Construction Start July 2026                                                       |
|  FY 25/26 AC Overlay Contract (Year 9)   | Resurfacing ~ 83 centerline miles across all 5 supervisorial districts                               | In Design Est Advertisement October 2026, Est Construction Start March 2027                                    |

# AGENDA

- 1) Introduction/Sign-In /Meeting Overview
- 2) Public Comments
- 3) The Road to 70 Update
- 4) Featured Presentation- FDR**
- 5) Industry Updates
- 6) BBR Updates
- 7) Next Meeting / Close



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



# Implementation of Full-Depth Recycling (FDR) in California



Marco A. Estrada

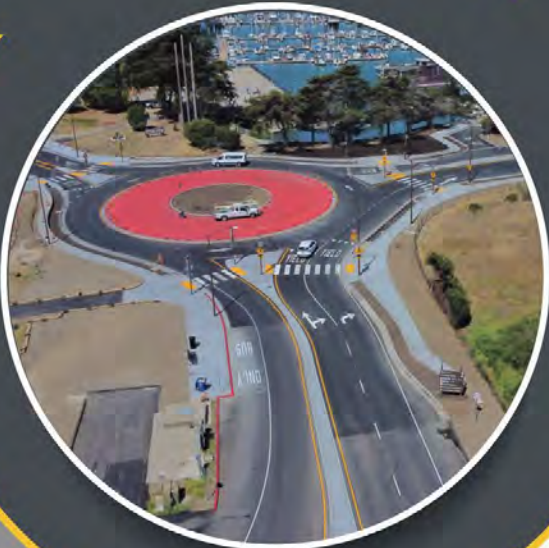


# Statewide

- Industry association comprised of like-minded contractors, material suppliers, engineering firms, equipment manufacturers, academia, and agencies focused on advancing Cold Recycling and Soil Stabilization through educational outreach
- Represents Industry in Caltrans Pavement Materials & Partnering Committee (PMPC) developing specifications and laboratory test methods
- Caltrans established the Office of Pavement Recycling and JOC
- Represents Industry in the SSPWC (Greenbook) committees working on Cold Recycling and Soil Stabilization specifications
- Provides technical support and educational workshops for agencies and engineering firms, as well as specification and project development
- Over 200 agencies using Sustainable Pavement Engineering Strategies



# 2023 Pavement Report Card



California Statewide Local Streets  
and Roads Needs Assessment  
Final Report  
April 2023



501 Canal Boulevard, Suite 1  
Point Richmond, CA 94804  
Phone: 510.215.3620

Sponsored by



RTPA  
RCTF

Rural Counties Task Force  
Regional Transportation Planning Agencies

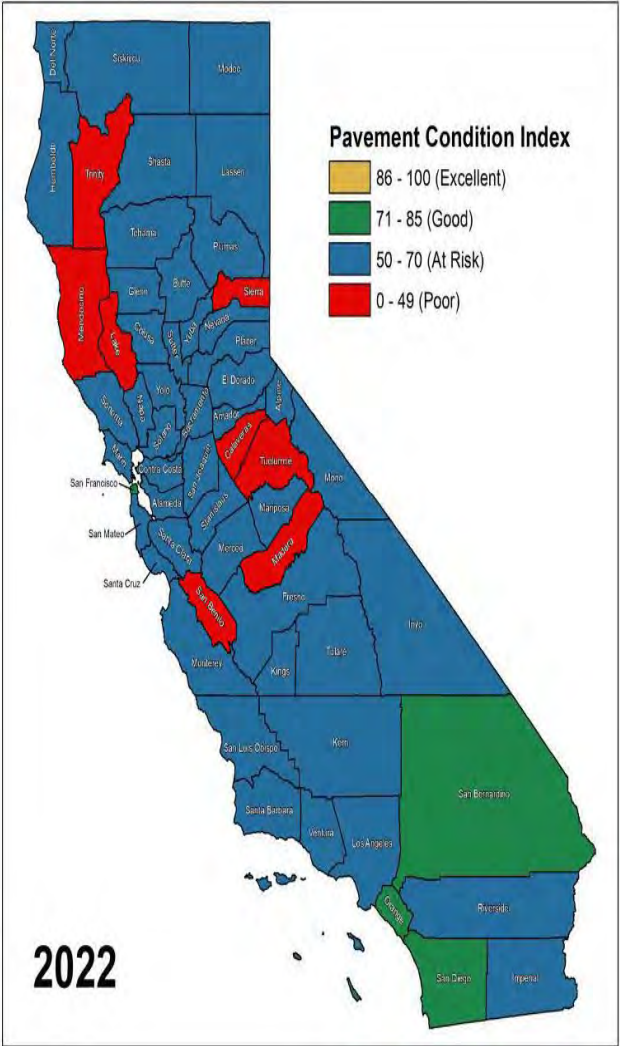
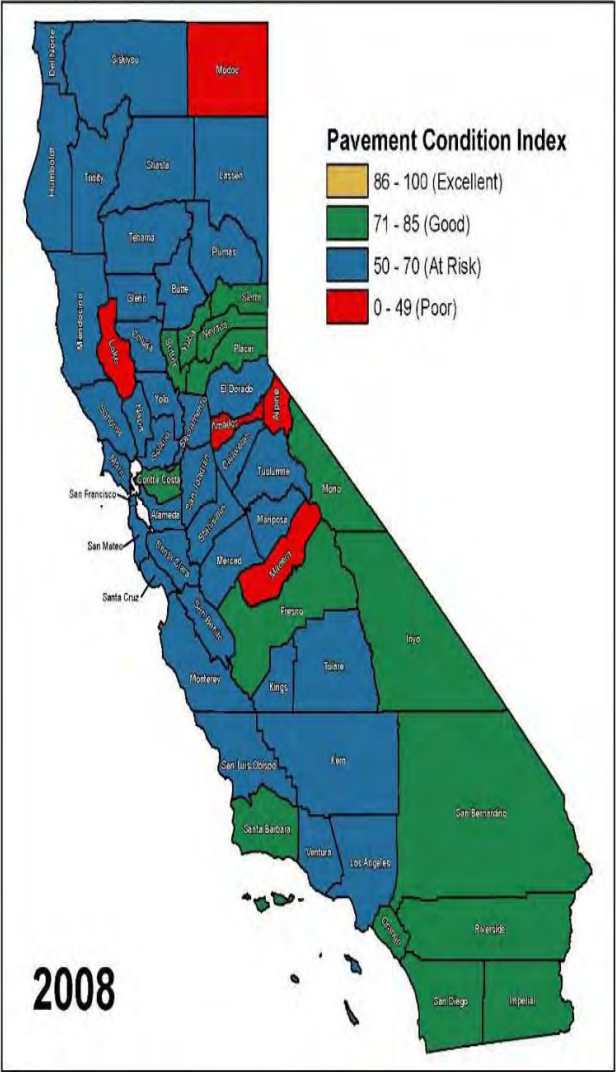


Figure 2.8 Average PCI by County for 2008 and 2022

LOCAL NEWS

# Report says San Diego drivers face \$3.4k yearly cost from poor road condition

San Diego drivers incur nearly \$3,400 yearly due to poor road conditions and traffic congestion, according to TRIP.



8

News

Weather

Sports

CBS8+

WEATHER  
IMPACT









#urbanquarry

Asphalt

Aggregate Base

Subgrade

Estimated 2  
**BILLION TONS** of  
Aggregate in CA  
Roadways

# Sustainable Pavement Engineering Strategies

Such as Full-Depth Recycling (FDR), Cold-In-place Recycling (CIR), and Cold Central Plant Recycling (CCPR) are engineering construction processes founded on the principle that asphalt, base, and soil can be recycled and engineered to provide structural and economic benefits over alternative “removal and replacement” pavement construction processes





Partial Depth Recycling  
(PDR)/Cold In-place  
Recycling (CIR)

Full Depth  
Recycling (FDR)

Cold Central Plant  
Recycling (CCPR)

# Sustainability – Truck Trip Reduction

## 40:1 Trucking Replacement

- Improves Safety
  - Reduces Costs
- Lowers GHG Emissions



# Los Angeles County Sustainable Pavement Treatments - Benefits



ENERGY USAGE, GREENHOUSE GAS EMISSIONS, LANDFILL REDUCTION, AND COST SAVINGS FOR SUSTAINABLE PAVEMENT TREATMENTS <sup>(1)</sup>

| SINCE 2009                                                   | COLD IN-PLACE<br>RECYCLING | COLD CENTRAL<br>PLANT<br>RECYCLING | SUBGRADE<br>STABILIZATION | PAVEMENT<br>PRESERVATION | TOTAL         | TOTAL QUANTITY     |
|--------------------------------------------------------------|----------------------------|------------------------------------|---------------------------|--------------------------|---------------|--------------------|
| NUMBER OF PROJECTS COMPLETED                                 | 30 Projects                | 17 Projects                        | 22 Projects               | 131 Projects             | 200 Projects  |                    |
| REDUCTION IN ENERGY CONSUMPTION (% or kWh) <sup>(2)</sup>    | 77%                        | 77%                                | 97%                       | 79%                      | 79%           | 226,542,000 kWh    |
| REDUCTION IN GHG EMISSIONS (% or metric tons) <sup>(2)</sup> | 79%                        | 79%                                | 96%                       | 84%                      | 83%           | 65,700 metric tons |
| LANDFILL REDUCTION (CY)                                      | 85,000                     | 52,000                             | 323,000                   | 487,000                  | 947,000       |                    |
| COST SAVINGS (%)                                             | 35%                        | 19%                                | 77%                       | 42%                      | 46%           |                    |
| COST SAVINGS (\$)                                            | \$11,955,000               | \$3,122,000                        | \$38,026,000              | \$67,284,000             | \$120,387,000 |                    |

## 2.3 Sustainable Pavement Practices

Sustainability is a growing consideration for many local agencies, particularly if it saves costs. Cities and counties were asked for information on any sustainable pavement practices employed and any associated cost savings. The types of sustainable practices that were mentioned included:

- Cold central plant recycling
- Cold-in-place recycling (CIR)
- Full depth reclamation (FDR)
- Hot-in-place recycling (HIR)
- Pavement preservation strategies
- Permeable/pervious pavements
- Reclaimed asphalt pavement (RAP)
- Rubberized hot mix asphalt (RHMA)
- Warm mix asphalt (WMA)

**Some sustainable pavement strategies may save up to 40 percent over conventional methods.**

Sustainable practices have generally increased in use: 339 agencies provided information about the types of sustainable practices they used. Table 2.5 summarizes sustainable pavement strategies, the number of agencies that listed each strategy, the number of agencies that reported either savings or

**Table 2.5 Summary of Sustainable Pavement Strategies**

| Sustainable Pavement Strategy | No. of Agencies  |         |             | Average % Savings | Average % Additional costs |
|-------------------------------|------------------|---------|-------------|-------------------|----------------------------|
|                               | No. of Responses | Savings | Add'l Costs |                   |                            |
| Reclaimed AC Pavement (RAP)   | 212              | 45      | 11          | 11%               | 12%                        |
| Cold in Place Recycling (CIR) | 118              | 33      | 6           | 28%               | 57%                        |
| Hot in Place Recycling (HIPR) | 15               | -       | -           | -                 | -                          |
| Cold Central Plant Recycling  | 32               | 5       | 3           | 28%               | 20%                        |
| Warm mix AC                   | 91               | 2       | 9           | 10%               | 21%                        |
| Permeable/Pervious            | 35               | -       | 8           | -                 | 40%                        |
| Full Depth Reclamation (FDR)  | 216              | 38      | 18          | 26%               | 43%                        |
| Subgrade Stabilization        | 107              | 6       | 16          | 33%               | 16%                        |
| Rubberized AC (RAC)           | 255              | 7       | 73          | 29%               | 23%                        |
| Pavement Preservation         | 429              | 78      | 24          | 41%               | 31%                        |

Recycling and pavement preservation strategies were reported to have the highest cost savings compared to conventional treatments. Other sustainable treatments incurred additional costs, particularly rubber hot mix asphalt (RHMA), which cost 23 percent more than did conventional treatments. The responses for warm mix asphalt and permeable/pervious pavements were insufficient to draw any conclusions, however, we note that the additional cost of porous/pervious pavements may be offset by savings in stormwater costs.

The most reasons most commonly given for using sustainable practices were:

- Cost savings or cost-effectiveness;
- Environmental benefits (e.g., produces fewer greenhouse gas emissions, reduces energy consumption, uses fewer natural resources, reduces waste sent to landfills, reuses existing pavement materials, recycles tires, etc.)<sup>7,8</sup>;
- Utilizing recycled materials;
- Creating less waste material;
- Better ride quality/finished surface, including quieter pavements;
- Reduced excavation depths;
- Extended pavement life;

**Every lane-mile that is recycled in-place is equivalent to taking 11 cars off the road for a year.**

# Sampling of Agencies Using Sustainable Engineering Strategies



- Caltrans
- County of Sacramento
- County of Yolo
- County of Sonoma
- County of Stanislaus
- County of Colusa
- County of Butte
- County of Mendocino
- County of Fresno
- County of Monterey
- County of Los Angeles
- County of Ventura
- County of Riverside
- County of San Bernardino
- County of San Diego
- City of Davis
- City of Rancho Cordova
- City of Elk Grove
- City of Chico
- City of Oroville
- City of Lincoln
- City of Tulare
- City of Turlock
- City of Hanford
- City of Davis
- City of Inglewood
- City of Long Beach
- City of Huntington Beach
- City of La Mirada
- City of Manhattan Beach
- City of Garden Grove
- City of Fullerton
- City of San Dimas
- City of Hemet
- City of Menifee
- City of Westminster
- City of Redlands
- City of Highlands
- City of Moreno Valley
- City of Riverside
- City of Pomona
- City of Murrieta
- City of Palm Dessert
- City of Palm Springs
- City of Rancho Mirage
- City of Chino
- City of Hesperia
- City of Santa Ana
- City of San Diego
- City of La Mesa
- City of Chula Vista
- City of Oceanside
- City of Aliso Viejo
- City of Dana Point

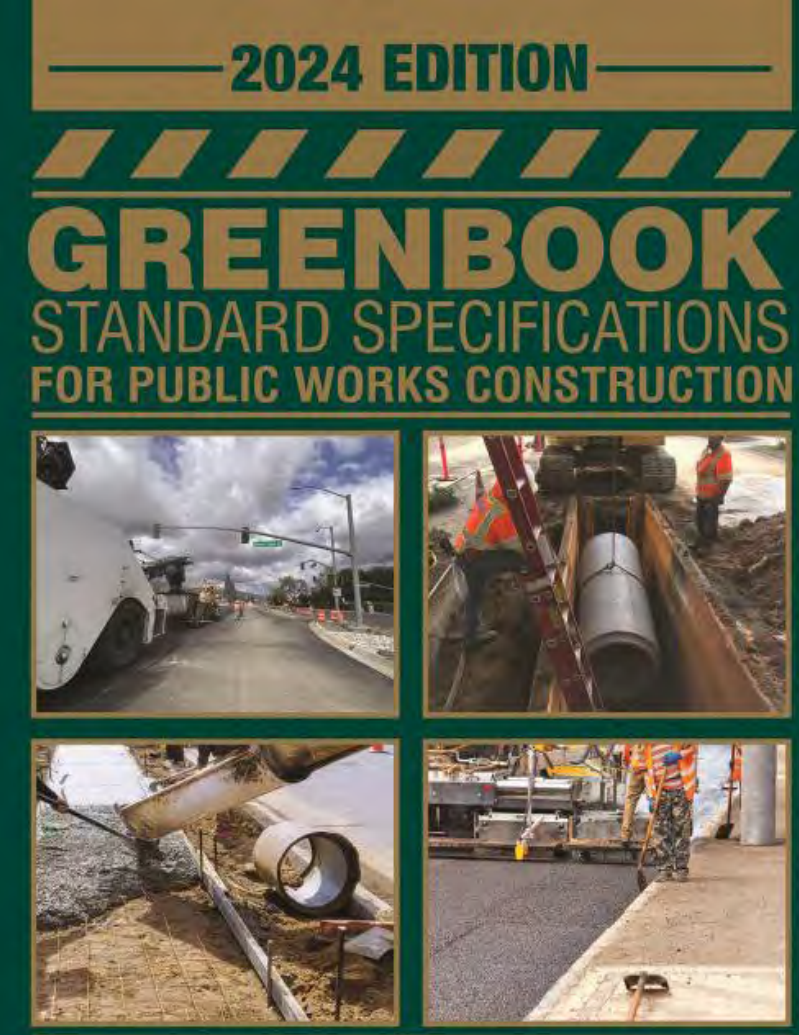


# Full Depth Recycling (FDR)

In-place recycling of existing asphalt and base as part of structural pavement design (Mix Design required)

Section 30-3 Full Depth Recycling – Foamed Asphalt

Section 30-4 Full Depth Recycling – Cement



Section 301-3.4 Cement Stabilized Pulverized Base (CSPB)  
Section 301-6: Lime Stabilized Pulverized Base (LSPB)

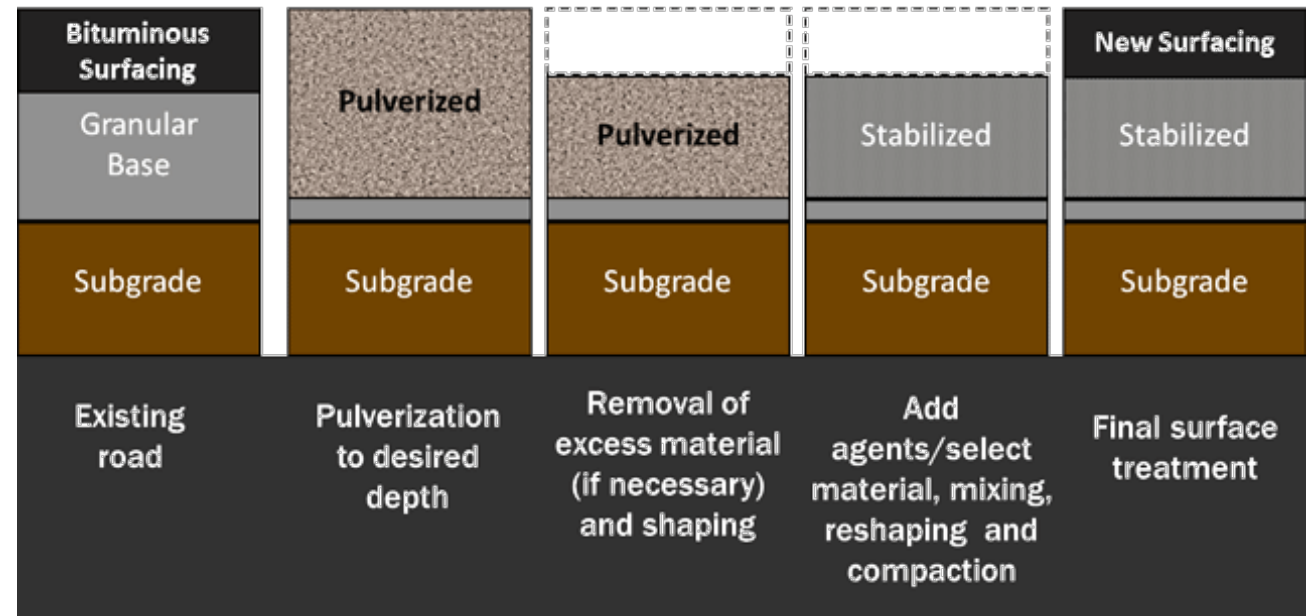
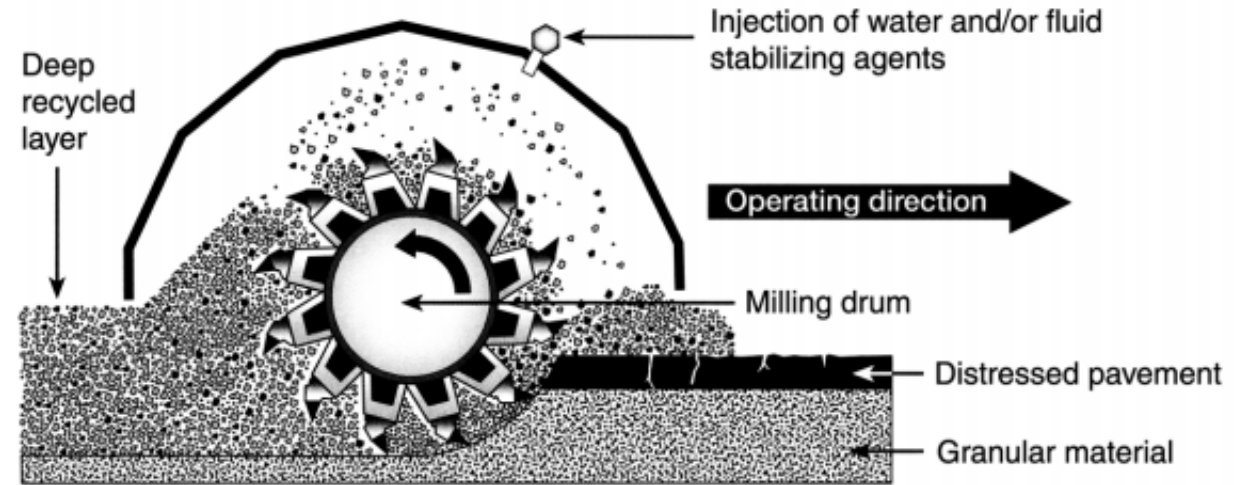
For use in City and  
County pavement  
reconstruction

# FDR: Founded on Asphalt Pulverization & Chemical Soil Stabilization



# Concept of FDR

- **Milling**
- **Pulverize**
- **Initial Grade and Compact**
- **Apply Reagent (Cement, Lime, etc.)**
  - **Mixed & Hydrated**
- **Final Grading and Compaction**
- **Maintain Moisture and Curing**
- **Micro-Cracking, if applicable**
- **AC Surface Course**





# Benefits of FDR

- Improves Safety Footprint
- Reduces Construction Time by up to 50%
- Reduce Costs by up to 70%
- Reduces GHG Emissions by up to 80%
- Reduces Landfill Disposal by up to 100%
- Reduced Truck Traffic on Surrounding Roads by 96%

# Benefits of FDR: Safety/Community Impacts

- Example: 175,000 sf (8" sections)
- 8" Excavate & Export: 4,343 cy (414 truck loads)
- 8" Import: 7,914 tons of base (440 trucks loads)
- 8" FDR w/ 5% Cement) 366 tons of Cement (14 truck loads)
- **Eliminated 840 truck loads from the neighborhood (61:1 ratio)**



# Cost Benefits: FDR vs. Remove & Replace



- Example project: 175,000 square feet residential streets

| <u>Item</u>                              | <u>Remove &amp; Replace</u> | <u>Cement Stabilize</u> |
|------------------------------------------|-----------------------------|-------------------------|
| Excavation (8-inch)                      | \$0.80                      | ----                    |
| Subgrade Preparation                     | \$0.15                      | ---                     |
| Aggregate Base (8-inch)                  | \$1.20                      | ---                     |
| Cement Treat (8-inch), Fine Grade & Cure | ----                        | \$0.95                  |
| Micro-Cracking                           | ----                        | \$0.05                  |
| Excess Material Removal<br>Approx. 0.15' | ----                        | \$0.18                  |
| Total per Sq. Ft.                        | \$2.15                      | \$1.18                  |



# When do you use FDR?

Base and/or Subgrade Defects (rutting, potholes)

Cracking (fatigue, block, transverse, reflective)

Greater than 15 to 20 percent “digouts”

Other defects within depth upper 18-24 inches of the pavement section

Mitigate/Bridge subgrade instability

Deficient structural section/ Increase loading bearing

Limited Funding



**FDR can be successfully utilized for:**

- Rural, Suburban and Urban Areas
- Airfields, parking lots, school yards, & more
- Day and Night Construction





**FDR Foam & Cement:  
Caltrans (Class 2 & 3 Roads)**

# FDR Phasing & Planning

Maintains Business and Public Access

FDR production:

Urban ~40K – 50K SF/shift

Rural ~75K – 100K SF/shift

Allows for cross-traffic or driveway access as necessary with minor delays

Residential Streets & 2-lane roads: open to traffic at end of shift

Arterials: generally constructed with phased lane closures

2-lane roads constructed with temporary lane closures and pilot cars

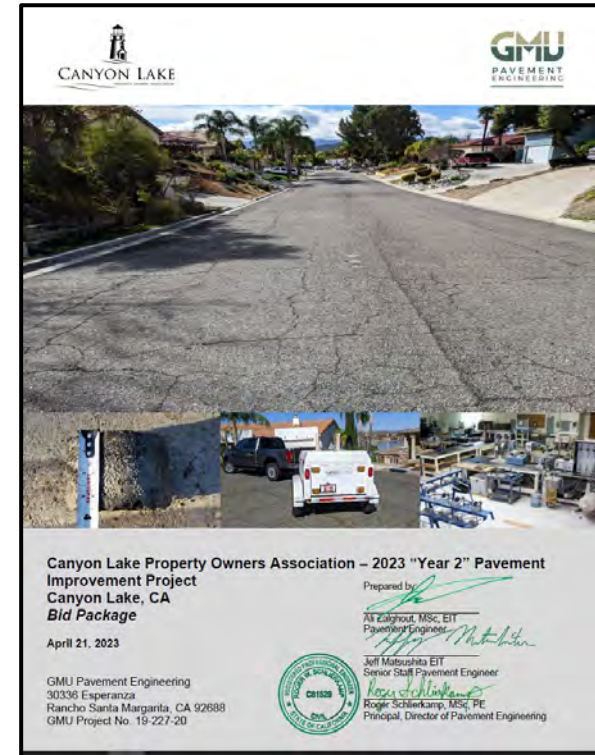




# Arterial Street FDR: Ramping for Community Access

# FDR Key Design, Plan, & Specification Considerations

- Pavement Investigation: core & DCP data, AC/AB thickness, fabrics, grids, cobbles, subgrade variability, etc.
- Project Selection....pavement reconstruction
- Potholing for utilities
- Subgrade instability may control treatment depth & application rate
- Conduct representative sampling & mix design(s)
- Cement as a separate line item in bid schedule
- Bid line item for FDR removals
- Compaction requirement (90, 92, 95%) based on soil type
- Quality Control Plan



# Problems Pavement Foundation

## “Subgrade Instability”



**DESIGN CONSIDERATION: Subgrade instability**

| 2026 ROAD REHAB - E. 20TH STREET PROJECT                        |                           |                                               |      |          |            |       |
|-----------------------------------------------------------------|---------------------------|-----------------------------------------------|------|----------|------------|-------|
| E. 20TH STREET - FROM NB HWY 99 ON/OFF-RAMPS TO NOTRE DAME BLVD |                           |                                               |      |          |            |       |
| BID ITEM LIST                                                   |                           |                                               |      |          |            |       |
| Item No.                                                        | Caltrans Std Spec Chapter | Item Description                              | Unit | Quantity | Unit Price | Total |
| 1                                                               | 9-1                       | Mobilization                                  | LS   | 1        |            |       |
| 2                                                               | 12-3                      | Portable Changeable Message Signs             | EA   | 8        |            |       |
| 3                                                               | 12-3                      | Construction Area Signs                       | EA   | 20       |            |       |
| 4                                                               | 12-3                      | Construction Funding Signs                    | EA   | 2        |            |       |
| 5                                                               | 12-4                      | Temporary Traffic Control                     | LS   | 1        |            |       |
| 6                                                               | 13                        | Water Pollution Control                       | LS   | 1        |            |       |
| 7                                                               | 13-4                      | Job Site Management                           | LS   | 1        |            |       |
| 8                                                               | 13                        | Temporary Drainage Inlet Protection           | EA   | 23       |            |       |
| 9                                                               | 15                        | Remove Signal Loops and Handholes             | EA   | 3        |            |       |
| 10                                                              | 15                        | Remove Concrete (Curb and Gutter)             | LF   | 229      |            |       |
| 11                                                              | 15                        | Remove Concrete Retaining Wall                | LF   | 27       |            |       |
| 12                                                              | 15                        | Remove Concrete (Curb)                        | LF   | 561      |            |       |
| 13                                                              | 15                        | Remove Concrete (Median)                      | LF   | 108      |            |       |
| 14                                                              | 15                        | Remove Concrete (Sidewalk/Curb Ramp/Driveway) | SQFT | 3,400    |            |       |
| 15                                                              | 15                        | Remove Grouted Cobble Rock (Median)           | SQFT | 62       |            |       |
| 16                                                              | 15                        | Remove Detectable Warning Surface             | SQFT | 15       |            |       |
| 17                                                              | 15                        | Remove Stormdrain Pipe                        | LF   | 8        |            |       |
| 18                                                              | 17-2                      | Clearing and Grubbing                         | LS   | 1        |            |       |
| 19                                                              | 19                        | Roadway Excavation                            | CY   | 5,700    |            |       |
| 20                                                              | 19                        | Roadway Excavation (Unsuitable Material)      | CY   | 258      |            |       |
| 21                                                              | 26                        | Class 2 Aggregate Base                        | CY   | 80       |            |       |
| 22                                                              | 30                        | FDR-Cement (12")                              | SQFT | 242,000  |            |       |
| 23                                                              | 30                        | Cement (3%)                                   | TON  | 770      |            |       |
| 24                                                              | 39                        | HMA (Type A)                                  | TON  | 10,100   |            |       |
| 25                                                              | 39                        | Cold Plane AC Pavement                        | SQFT | 2,644    |            |       |

#### SCHEDULE OF BID PRICES

All Bid items, including lump sums, unit prices and alternates (if any), must be filled in completely. Bid items are described in Section 01 1100 (Summary of Work). Quote in figures only unless words are specifically requested.

| ITEM | DESCRIPTION                                                            | QUANTITY | UNIT | UNIT PRICE | TOTAL |
|------|------------------------------------------------------------------------|----------|------|------------|-------|
| 1    | Mobilization, Demobilization, and Final Cleanup                        | 1        | LS   |            |       |
| 2    | Traffic Control System                                                 | 1        | LS   |            |       |
| 3    | Water Pollution Control Program (SWPPP)                                | 1        | LS   |            |       |
| 4    | Cleaning and Grubbing                                                  | 1        | LS   |            |       |
| 5    | Remove Tree                                                            | 5        | EA   |            |       |
| 6    | Remove Existing Striping, Markings, and Raised Pavement Markers        | 1        | LS   |            |       |
| 7    | Adjust Monument Box to Grade and Preserve Monument                     | 119      | EA   |            |       |
| 8    | Adjust Storm Drain Manhole Frame and Cover to Grade                    | 14       | EA   |            |       |
| 9    | Adjust Sanitary Sewer Manhole Frame and Cover to Grade                 | 70       | EA   |            |       |
| 10   | Adjust Water Valve Box to Grade                                        | 143      | EA   |            |       |
| 11   | Remove and Replace Drainage Structure Frame and Grate, Adjust to Grade | 4        | EA   |            |       |
| 12   | Adjust Rodding Inlet Box to Grade                                      | 24       | EA   |            |       |
| 13   | Replace Survey Monument                                                | 7        | EA   |            |       |
| 14   | Crack Sealing                                                          | 1        | LS   |            |       |
| 15   | Type II Micro Surfacing                                                | 8,660    | SY   |            |       |
| 16   | 3-Layer Treatment                                                      | 46,000   | SY   |            |       |
| 17   | Base Failure Repair – 3"                                               | 4,890    | SF   |            |       |
| 18   | Base Failure Repair – 3.5"                                             | 5,600    | SF   |            |       |
| 19   | Base Failure Repair – 6"                                               | 3,390    | SF   |            |       |
| 20   | Unsuitable Material Stabilization Allowance (Revocable Item)           | 700      | SF   |            |       |
| 21   | Cold Plane Asphalt Concrete Pavement – 2.5"                            | 32,800   | SY   |            |       |
| 22   | Cold Plane Asphalt Concrete Pavement – 3"                              | 5,300    | SY   |            |       |
| 23   | 4' Wide Wedge Grind                                                    | 25,800   | LF   |            |       |
| 24   | Full Depth Reclamation (FDR-C)                                         | 10,600   | SY   |            |       |
| 25   | Roadway Excavation – FDR-C                                             | 1,660    | CY   |            |       |
| 26   | Cement (Full Depth Reclamation)                                        | 220      | TON  |            |       |
| 27   | Hot Mix Asphalt (1/2" Type A)                                          | 7,120    | TON  |            |       |
| 28   | Hot Mix Asphalt (3/4" Type A)                                          | 1,830    | TON  |            |       |
| 29   | Remove and Replace Curb & Gutter Type "A"                              | 90       | LF   |            |       |
| 30   | Construct Case C Curb Ramp                                             | 1,730    | SF   |            |       |
| 31   | Install Detectable Warning Surface                                     | 8        | EA   |            |       |
| 32   | Remove and Replace Valley Gutter                                       | 650      | SF   |            |       |
| 33   | Traffic Line – Detail 2                                                | 2,600    | LF   |            |       |
| 34   | Traffic Line – Detail 22                                               | 13,483   | LF   |            |       |
| 35   | Traffic Line – Detail 27B                                              | 18,730   | LF   |            |       |
| 36   | Traffic Line – Detail 39                                               | 8,060    | LF   |            |       |
| 37   | Traffic Line – Detail 39a                                              | 100      | LF   |            |       |



# FDR Key Construction Considerations

- Just-in-time training (JITT)
- Coordinated Construction Operations
- Planning work around utilities
- Grading
  - Bulking / Volume Increase of Treated Material
  - Detail/Edge work
- Quality Control/Specification Enforcement
  - Compaction within the time frame
  - Micro-cracking
  - Moisture curing
  - Maintaining the FDR surface
- Contingency Plans



# Plan Operations Around Utilities



# Modified Means & Methods

## Utility Considerations



# Contingency Plans

- Utilities in the FDR section
- Striking utilities
- Soft Subgrade post-treatment
- Compaction Non-Compliance
- Raveling/Spalling FDR surface



# Recently Bid Sustainable Pavement Engineering

| Bid Date | Agency             | Project                  | Quantity   | Item           |
|----------|--------------------|--------------------------|------------|----------------|
| 4/23     | Napa County        | North GA Ramp            | 39,800 SY  | Lime Treatment |
| 4/23     | Sparks, NV         | 2026 Street Rehab        | 147,754 SF | FDR            |
| 4/28     | Butte County       | Concow Rd Reconst.       | 90,000 SY  | FDR            |
| 4/28     | RTC Washoe County  | Prater Way Rehab         | 180,611 SF | FDR            |
| 4/28     | Reno/Tahoe Airport | Taxiway Alpha            | 29,700 SY  | FDR            |
| 4/30     | Solano County      | NE Hangar Taxiway        | 12,310 SY  | Lime Treatment |
| 5/1      | City of Chico      | Fair Street Rehab        | 15,344 SY  | FDR            |
| 5/5      | Lake County        | Lampson Field Airport    | 10,034 SY  | Lime Treatment |
| 5/7      | FHA                | Angeles Bear Divide      | 469,000 SF | FDR            |
| 5/8      | City of Turlock    | Roads Program #1         | 23,051 SY  | FDR            |
| 5/11     | FHA                | Placerville Road Repairs | 84,800 SY  | FDR            |



## **Street Reconstruction Group 1801 PJR024037 Gold Coast Drive & Parkdale Avenue**



- 8,299 CY
- Severe block cracking
- Modified CSPB/FDR procedures for subgrade
  - Reduced compaction requirements
  - Blended excess on-site RAP in
  - Mixing table for slurry-encasement
- FDR: 6-8- inches of 6% to 8% Cement



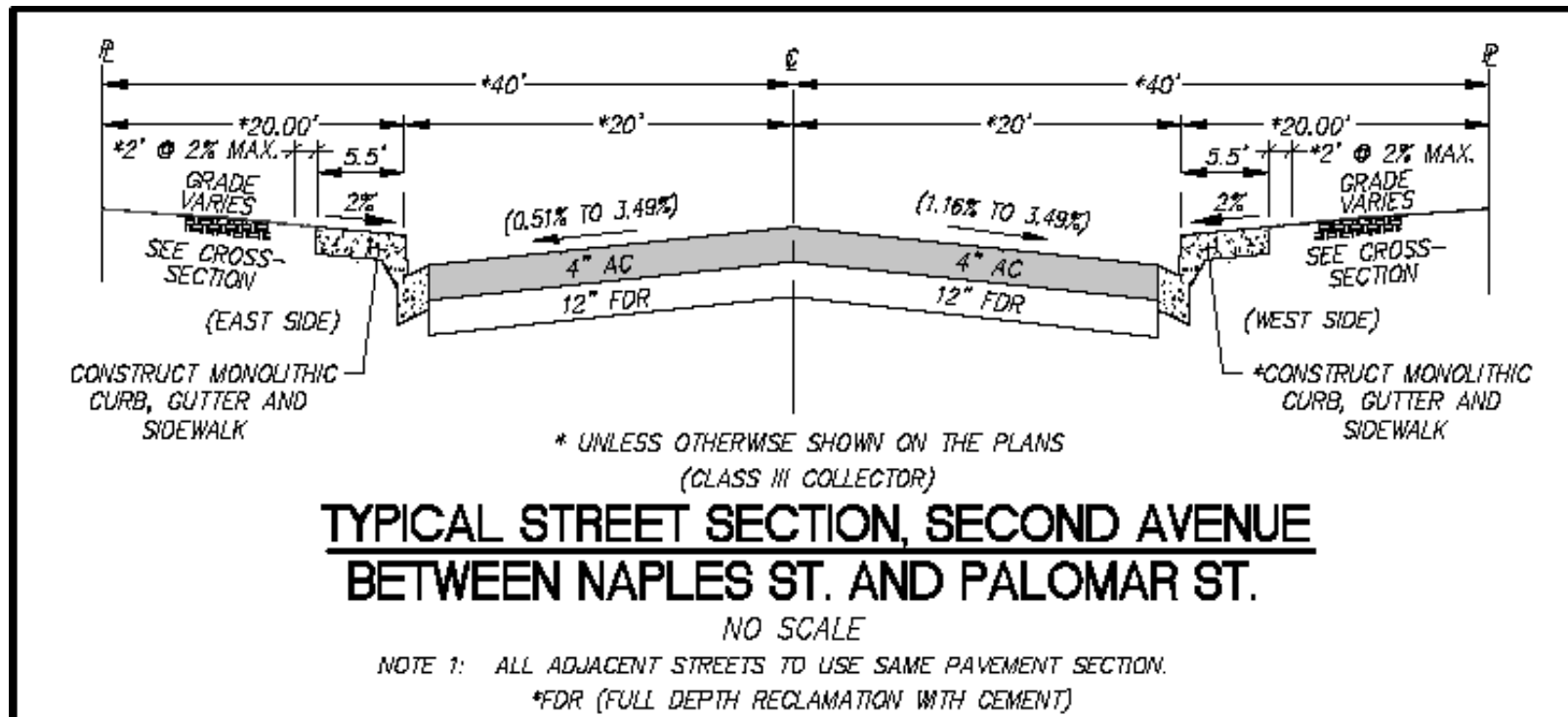
**Water & Sewer Group 1024 PJR 024920: CSPB/FDR for local street reconstruction to address unstable subgrade and replace original structural aggregate base design section**



THE CITY OF SAN DIEGO

# Standard Plans FDR

Design Section 4" AC/12" FDR  
VS.  
Conventional 5" AC/14" Aggregate Base

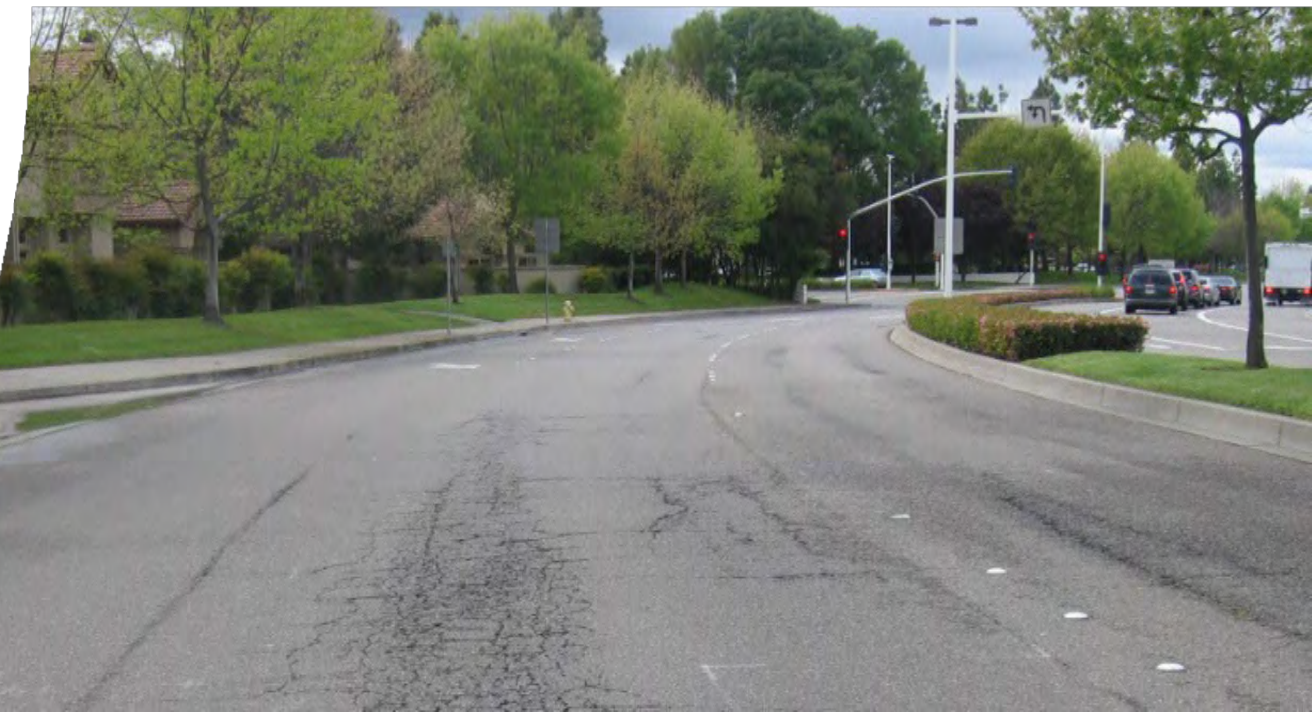


| MELLMANOR DR – AMARILLO AVE TO CUL-DE-SAC (9275.07) |                                                                                                                                                                                       |     |        |             |               |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------|-------------|---------------|
|                                                     | SURFACE IMPROVEMENTS                                                                                                                                                                  |     |        |             |               |
| 59                                                  | PAVEMENT PREPARATION – INCLUDES ALL PRIME / TACK COATS                                                                                                                                | SF  | 60,000 | \$ 0.02     | \$ 1,200.00   |
| 60                                                  | FULL DEPTH RECLAMATION TO PULVERIZE TO A DEPTH OF 12"; COLD MILL TO REMOVE THE TOP 3" (ITEM #65) PRIOR TO STABILIZING; CEMENT TREAT, TRIM, GRADE TO RESTORE CROWN AND COMPACT TO 95%. | SF  | 60,000 | \$ 1.70     | \$ 102,000.00 |
| 61                                                  | COLD MILL AND DISPOSAL OF EXISTING ASPHALT PAVEMENT, FULL WIDTH, DEPTH=3"                                                                                                             | SF  | 60,000 | \$ 0.60     | \$ 36,000.00  |
| 62                                                  | INSTALL TRMAC OVERLAY CAP, 3" DEPTH (1/2" TRMAC-GG)                                                                                                                                   | TON | 1,090  | \$ 118.00   | \$ 128,620.00 |
| 63                                                  | FURNISH AND INSTALL TYPE A CURB RAMP (SDRSD G-28)                                                                                                                                     | EA  | 2      | \$ 4,200.00 | \$ 8,400.00   |
|                                                     | <b>SIGNAGE AND STRIPING</b>                                                                                                                                                           |     |        |             |               |
| 64                                                  | FURNISH AND INSTALL THERMOPLASTIC LIMIT LINE (DETAIL A24E)                                                                                                                            | LF  | 80     | \$ 14.40    | \$ 1,152.00   |
| 65                                                  | FURNISH AND INSTALL THERMOPLASTIC STOP MARKINGS (DETAIL A24B)                                                                                                                         | EA  | 3      | \$ 605.00   | \$ 1,815.00   |

**2019 FDR:** Amarillo Ave - 12" Depth 5% / 32,737 SF Dalhart Ave - 12" Depth 5% / 31,537 SF  
Mellmanor Dr- 12" Depth 5% / 57,969 SF Lemon Ave- 12" Depth 5% / 47,288 SF



- Foothill Drive, Bancroft Avenue, San Leandro
- 2-lane Major Collector, 136,000 square feet
- 4" AC over 12" FDR using 5% cement
- \$7.36/sf. – Remove/Replace Pavement Cost
- \$4.05/sf. - FDR Cost (*45% COST SAVINGS*)





## Overlay Project CIP #19-00013 Sept 2020

- 1 Residential Street & 1 Residential Collector Street
- 141,850 SF
  - Pulverize 0.75'
  - Cement Treat 0.5' @ 3%
- 195,200 SF
  - Pulverize 1.25'
  - Cement Treat 0.67' @ 3%
- Remove excess pulverized material ...5,850 cy





## SR-223 Contract #06-1C0604 (On-going)

- High Volume 2-Lane Traffic
- 2 Lane Rural Highway Connecting I-5 and I-99 in Kern County
- 125,000 SY (about 9 miles)
- Pulverize & Blend: 1.0'
- Cement Treat: 0.80'
- Mix Design:
  - 2.0% Cement
  - 7-day strength: 300-450 psi
- Open to traffic at end of shift
- Maintained with Fog Seal & Sand
- Paved in 3 to 6 days





## Annual Roadway Resurfacing (CIP #1352)

- FDR Pilot Project (June 2026)
- 3-Residential Streets
- 68,577 SF
- Shallow utilities
- Subgrade Instability
  - Expansive/Plastic Clays
- 8-12 inches of 6% Cement
  - 7-day strength 3000 psi



# City of La Mirada Valley View Blvd



- Major Arterial
- 4 lanes with turn-pockets
- 33,197 SY
- 8-inches
- Mix Design:
  - 3.5% Type IL Cement
  - 7-day strength 380 psi



# City of Hemet

**Designer: Inland Foundation**

- CIP # 5761 Auto Mall Parkway
- CIP # 5749
- CIP # 2406
- CIP # 2407

**Jilleen Ferris, P.E.**

**Assistant City Engineer**

- Budget \$2/sf less than R & R
- Thinner Pavement sections;  
less impact on utilities
- Reduced construction traffic

“Less haul off and import and cost less than R & R...dusty during curing, but positives significantly outweigh the negatives”





## Completed 14 CSPB Arterial Street Projects

- Hamilton
- Warner
- Slater.....truck route

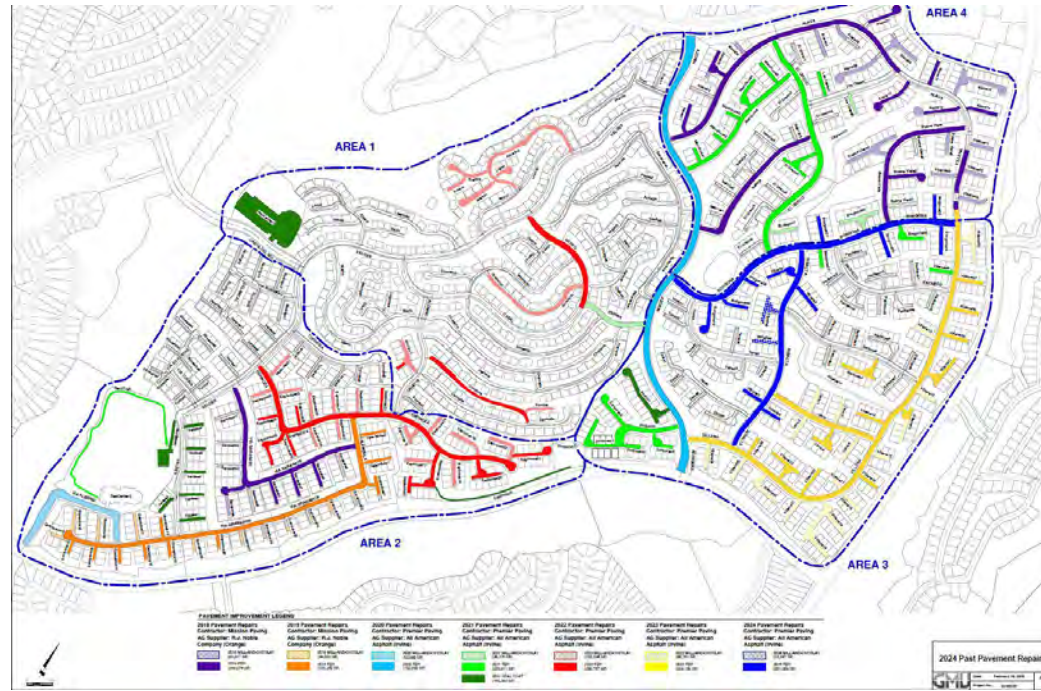
### Joe Fuentes, DPW Engineer

“\$1 Million Project becomes \$600K Project”

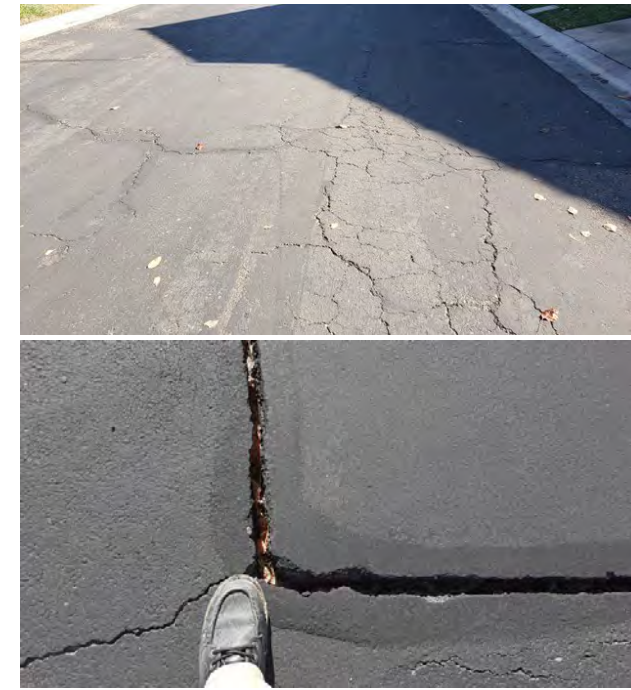
“ FDR/CSPB strategies provide for longer design life at lower costs and reduced construction schedule versus remove and replace reconstruction.”



# Study I: Casta Del Sol HOA (Orange County)



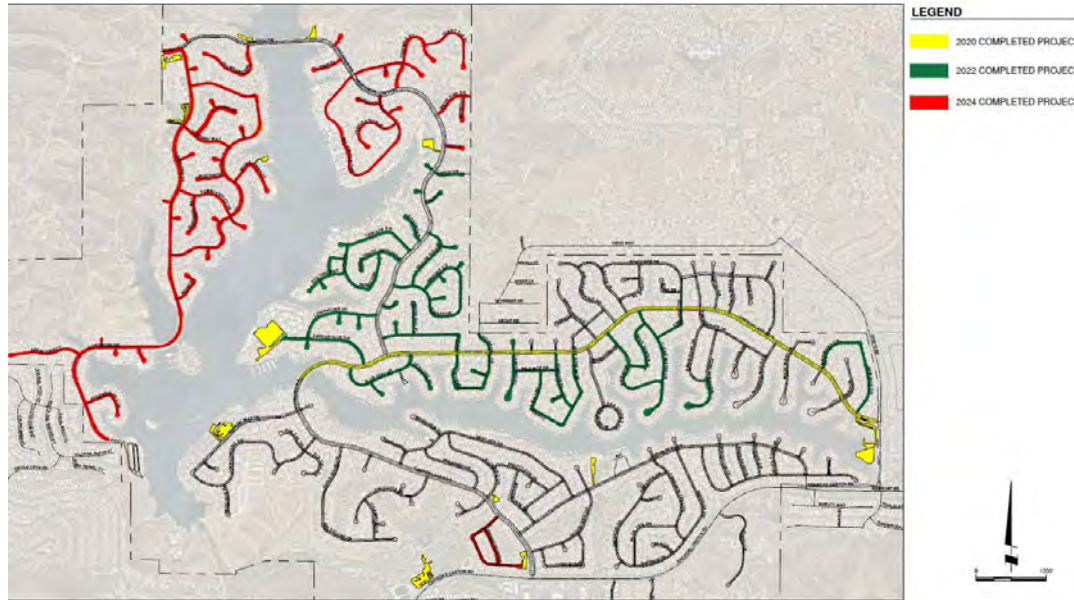
**FDR of 1.5M Square Feet**



## Unique Challenges:

- Shallow internet utility
- Older Community
- Sinkhole
- Vibration monitoring
- Limited access

## Case Study 2: Canyon Lake HOA



**2.2M Square Feet of FDR**

### Unique Challenges:

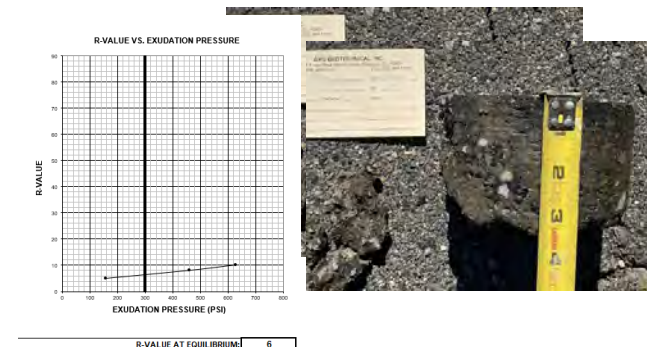
- Shallow internet utility
- Older Community
- Limited access
- Thin Pavement
- Subgrade Issue

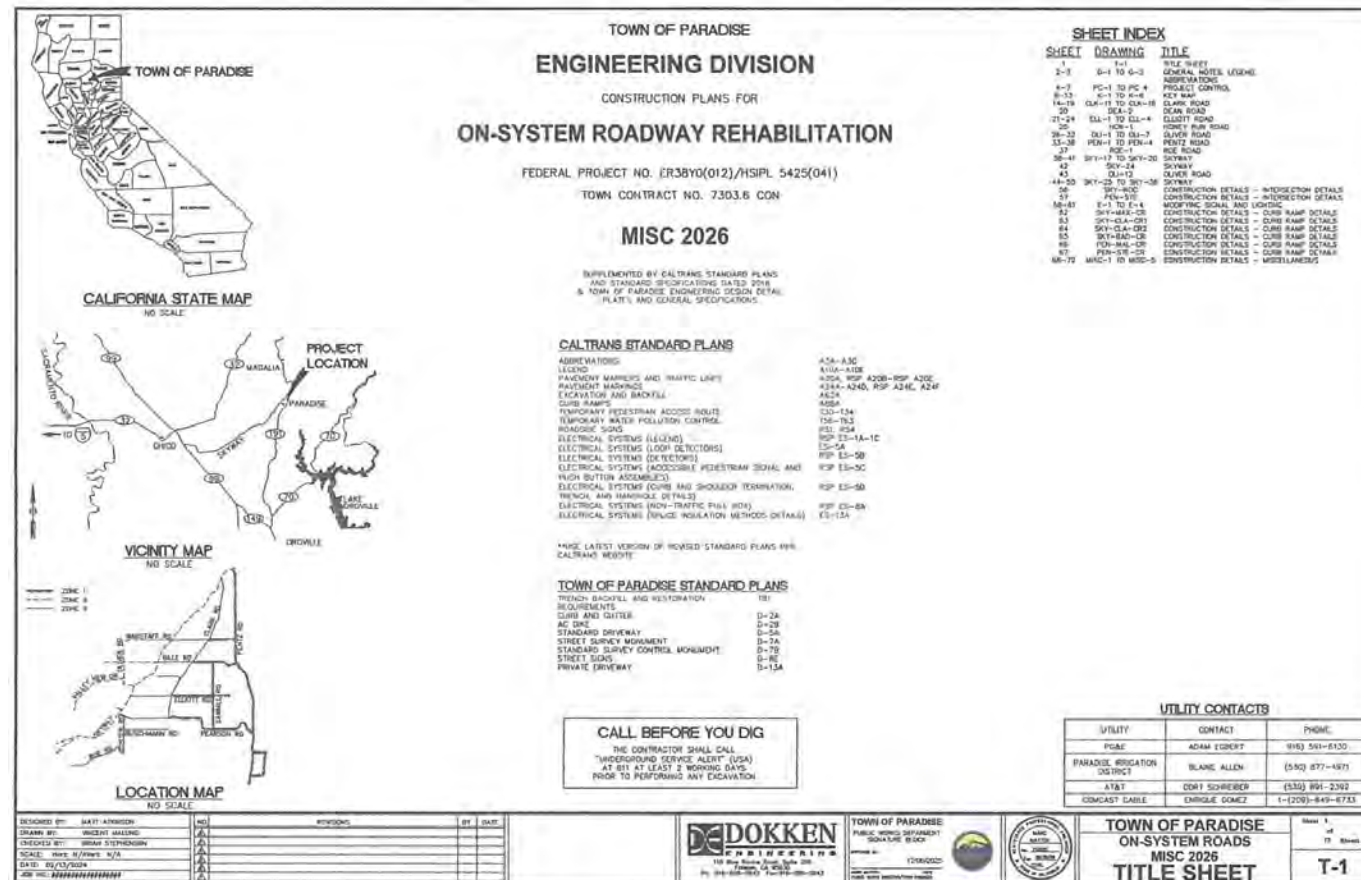
### Cost Comparison:

- 6" Full Depth AC: \$7.25/SF
- 4" AC over 8" CSPB: \$6.25/SF



**\$2M LESS IN CONSTRUCTION COST**





|    |                                                    |     |      |         |
|----|----------------------------------------------------|-----|------|---------|
| 18 | ASPHALTIC EMULSION (PULVERIZED ROADBED)            | 30A | SQYD | 1,017   |
| 19 | FULL-DEPTH RECLAMATION-CEMENT                      | 30B | SQYD | 104,373 |
| 20 | CEMENT (FULL-DEPTH RECLAMATION-CEMENT)             | 30B | TON  | 2,957   |
| 21 | ASPHALTIC EMULSION (FULL-DEPTH RECLAMATION-CEMENT) | 30B | SQYD | 104,373 |
| 22 | MIX DESIGN (FULL-DEPTH RECLAMATION-CEMENT)         | 30B | EA   | 7       |



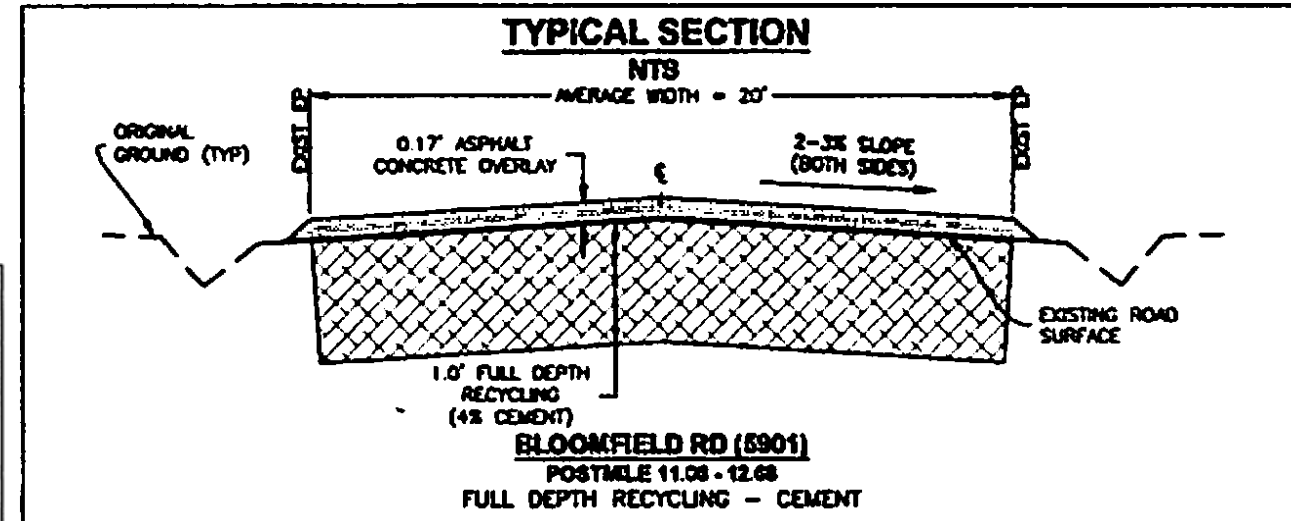
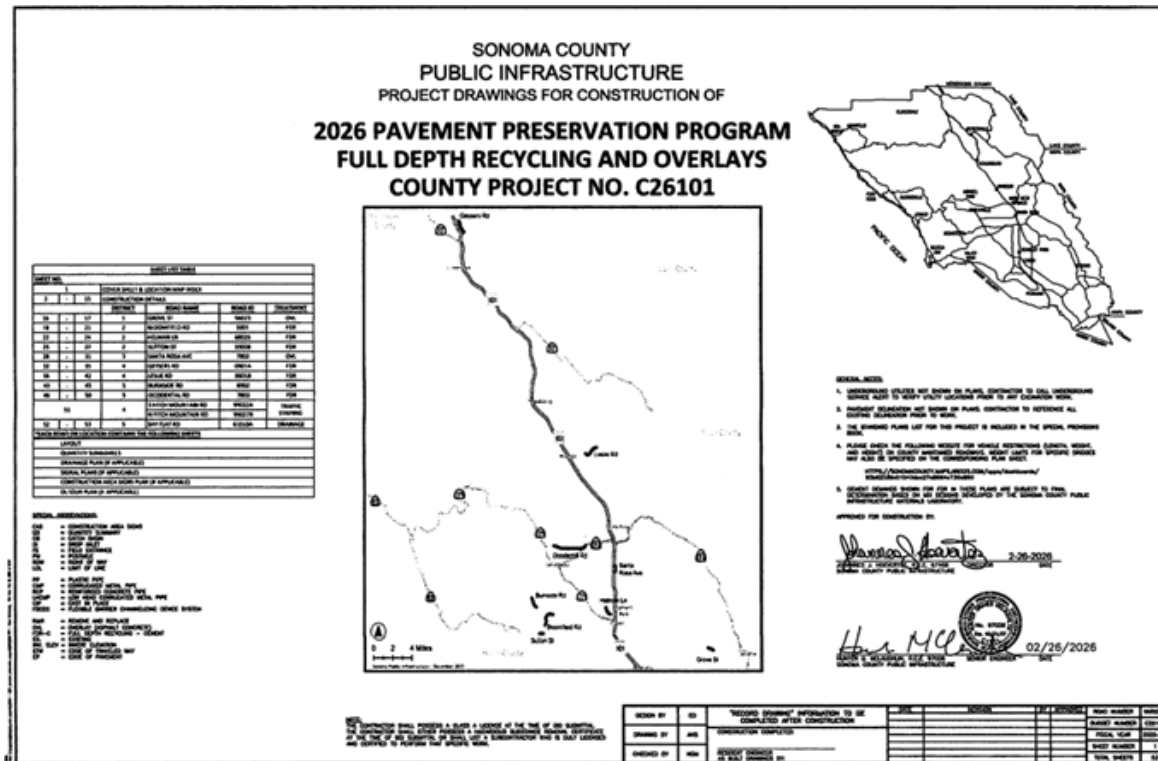
## El Sobrante Road

- High Volume 2- Lane Traffic
- Night-time work
- 74,798 SY
- 12-inches
- Mix Design:
  - 3.0% Type IL Cement
  - 7-day strength: 475 psi





# 2026 Pavement Preservation Project (PPP)



|    |        |                                       |    |           |  |  |
|----|--------|---------------------------------------|----|-----------|--|--|
| 33 | 304000 | FULL-DEPTH RECLAMATION-CEMENT (FDR-C) | SY | 123,644.0 |  |  |
| 34 | 304100 | CEMENT (FDR-C)                        | TN | 2,676.0   |  |  |

## COMPLETING 16 LANE-MILES OF FULL-DEPTH RECLAMATION FOR FIRE-DAMAGED ROADWAY IN CALAVERAS COUNTY, CALIFORNIA

This feature published as "After the Fire" in February 2022 issue

CHRISTOPHER ABEL / FEBRUARY 02, 2022 / 4 MINUTE READ

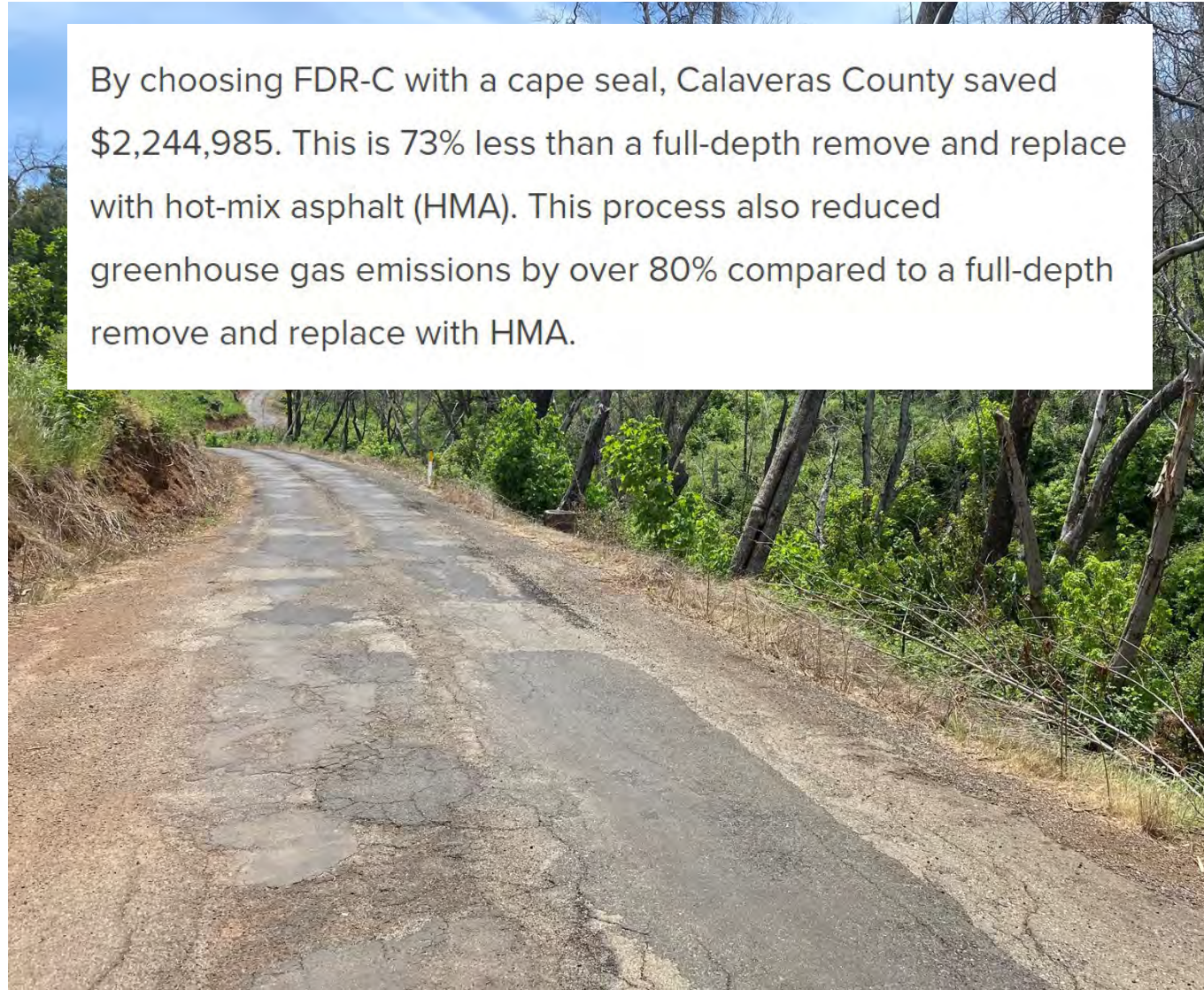


Jesus Maria Road is a 13-mile stretch of roadway starting from Highway 26 and ending at Rail Road Flat in Calaveras County, California.

# The Calaveras County Story



By choosing FDR-C with a cape seal, Calaveras County saved \$2,244,985. This is 73% less than a full-depth remove and replace with hot-mix asphalt (HMA). This process also reduced greenhouse gas emissions by over 80% compared to a full-depth remove and replace with HMA.





## 2020 Countywide Pavement Rehabilitation & Overlay Project

- Approximately 26 miles of various segments of mill & overlay and FDR-Cement pavement rehabilitation
- Roadway including work on Robertson Boulevard, Road 16, and Avenue 9.
- Madera County awarded the approximately \$8.6 million project to Don Berry Construction out of nearby Selma.
- FDR with 4 to 5 percent cement to depths of 14 to 17 inches on structural section design
- FDR Daily production....8,000 to 9,000 sy





# Questions?

**Marco A. Estrada**  
**RSA Executive Director**  
**(951) 205-6000**  
**[mestrada@pavementrecycling.com](mailto:mestrada@pavementrecycling.com)**



# AGENDA

- 1) Introduction/Sign-In /Meeting Overview
- 2) Public Comments
- 3) The Road to 70 Update
- 4) Featured Presentation- FDR
- 5) Industry Updates
- 6) BBR Updates
- 7) Next Meeting / Close



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



# AGC UPDATE



June 2026

## US Construction Outlook: The Rest of '26 (and Beyond)?

Building Better Roads

©2026 The Associated General Contractors of America, Inc.



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



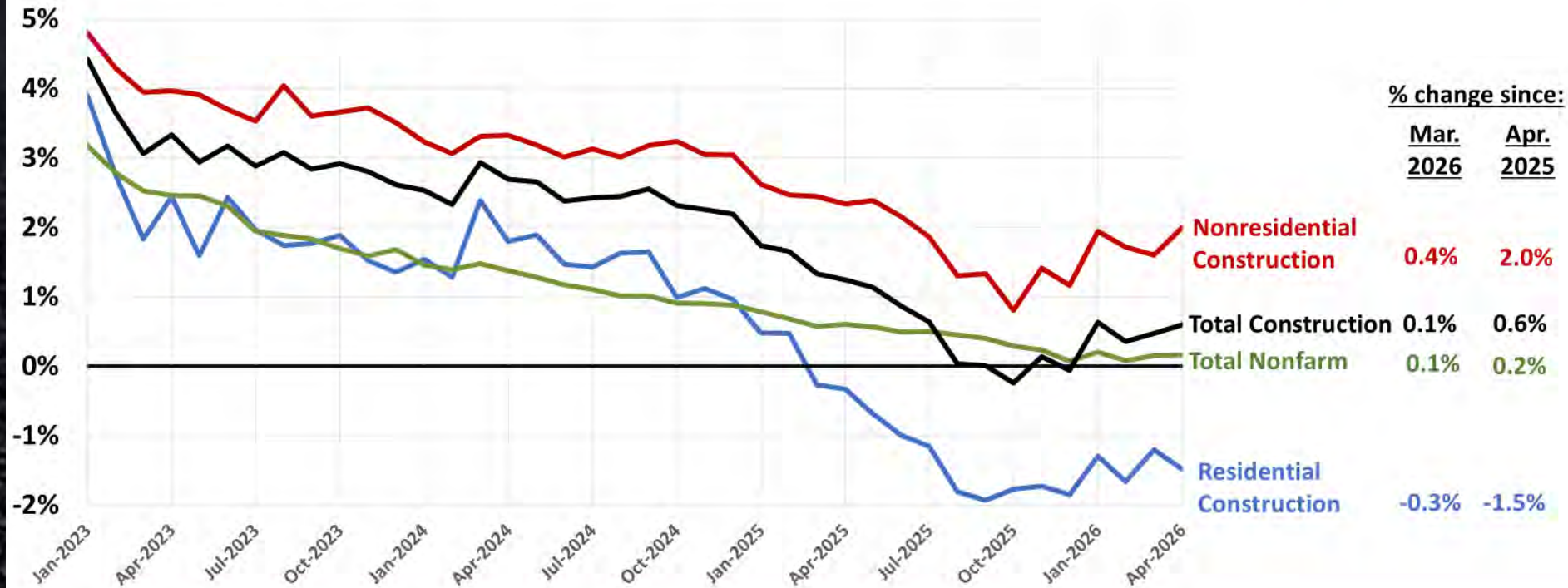
# AGC UPDATE

## Nonresidential jobs are increasing; residential employment is falling

Year-over-year % change in employment, Jan. 2023-Apr. 2026, seasonally adjusted



**AGC**  
THE CONSTRUCTION  
ASSOCIATION



2 | Source: BLS current employment statistics, <https://www.bls.gov/ces/>

©2026 The Associated General Contractors of America, Inc.



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



# AGC UPDATE

## Construction job growth is uneven across states

32 states & DC **up** & 15 states **down** & 3 state **unchanged** Apr. 2025-Apr. 2026 (U.S.: **up 0.6%**)

172 metros (48%) **up**, 149 (41%) **down**, 39 unchanged



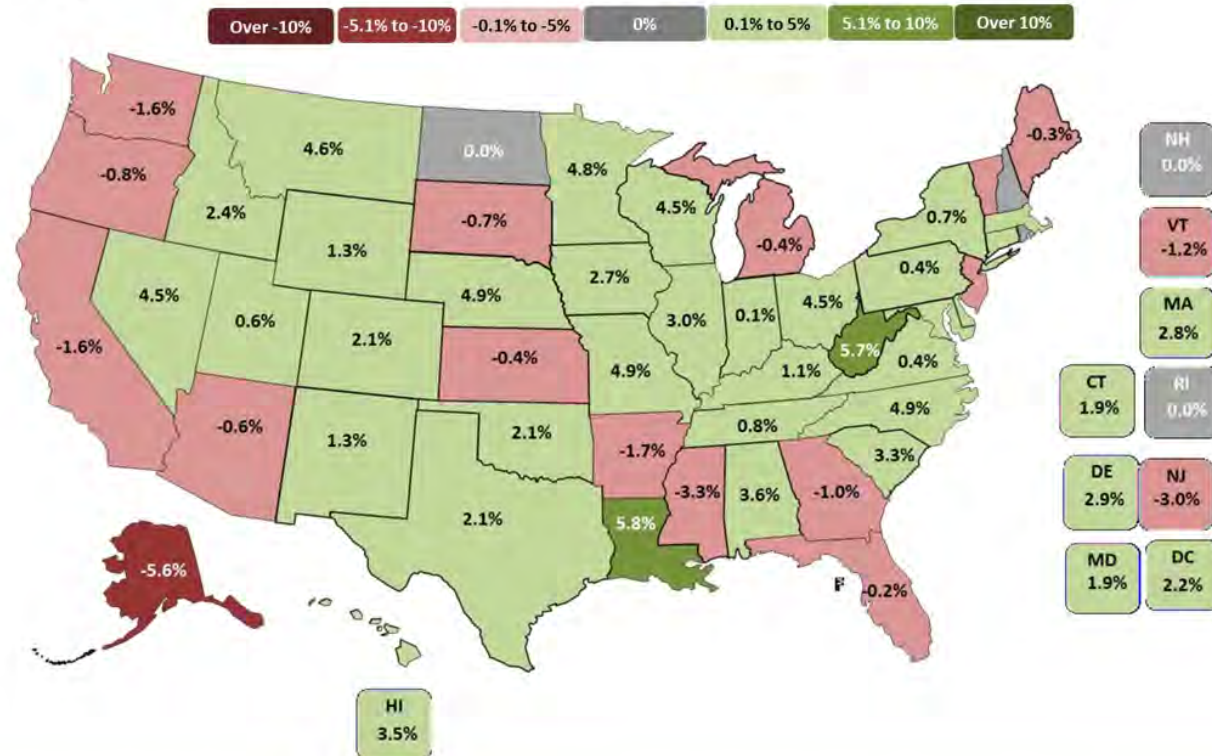
**AGC**  
THE CONSTRUCTION  
ASSOCIATION

### Top 5

|    |      |
|----|------|
| LA | 5.8% |
| WV | 5.7% |
| NC | 4.9% |
| NE | 4.9% |
| MO | 4.9% |

### Bottom 6

|        |       |
|--------|-------|
| AK     | -5.6% |
| MS     | -3.3% |
| NJ     | -3.0% |
| AR     | -1.7% |
| CA, WA | -1.6% |



3 | Source: Bureau of Labor Statistics, state and area employment, [www.bls.gov/sae](http://www.bls.gov/sae)

©2026 The Associated General Contractors of America, Inc.

# AGC UPDATE

## Spending trends: mix of increases and **decreases**

In Billions of dollars, Apr. 2025-Apr. 2026

Overall Industry \$2.17 Trillion

Nonresidential \$1.25 Trillion 0.3%

private -2%

public +4%

### Nonresidential segments

\$186B Mfg. -18%

\$168B Power 7% (electric 8%; oil/gas fields & pipelines -1%)

\$151B Highway and street 4% (pavement 3%; bridge 8%)

\$140B Educational 2%

\$122B Commercial 0.8% (warehouse -2%; retail 6%; farm -1%)

\$114B Office including data centers 7% (data centers 28%; other private office -5%; public office -3%)



# AGC UPDATE

**Tariffs are pushing up costs of construction materials, equipment**  
producer price indexes (PPIs), changes through Apr. 2026



**April 2026 change from:**  
**Mar. 2026   Apr. 2025   Feb. 2020**  
**(1 month) (12 months) (74 months)**

**Overall input costs are rising again and have outpaced the CPI since 2020**

PPI for inputs to new nonresidential construction

1.7%   6.6%   49%

Consumer price index (CPI)

0.9%   3.8%   29%

**...and domestic input prices for items competing with tariff-burdened imports soared**

Diesel fuel

14%   74%   158%

Steel mill products

3.8%   13%   84%

Aluminum mill shapes

4.2%   37%   95%

Copper and brass mill shapes

0.9%   21%   104%

Construction machinery and equipment

0.1%   4.0%   37%

5 | Source: Bureau of Labor Statistics, [www.bls.gov/ppi](https://www.bls.gov/ppi)

©2026 The Associated General Contractors of America, Inc.



[www.sandiegocounty.gov/BBR](https://www.sandiegocounty.gov/BBR)



# AGC UPDATE

## Construction pay increases continue to outpace the private sector

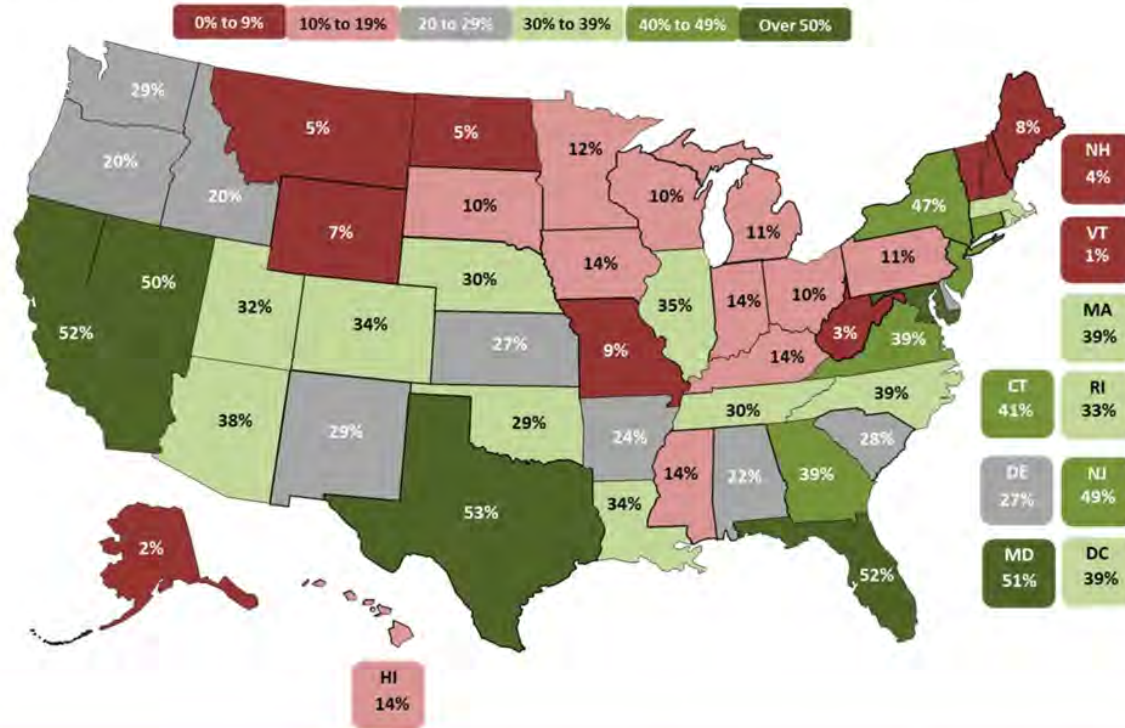


- [BLS](#): Average hourly earnings for production and nonsupervisory employees (Apr. 2025-Apr. 2026):  
Construction 4.8%      Private sector 3.7%
- [CLRC](#): First-year settlements for construction union contracts: 4.7% (2025)
- [PAS](#): Construction firm executive increases: 4.5% in 2025; 4.-4.5% anticipated in 2026 (Mar. 2026)

# AGC UPDATE

**Construction trades rely heavily on immigrants (35% vs. 18% for all workers)**

*Share of construction trade workers who are foreign born by state, 2024*



## Top 6

|        |     |
|--------|-----|
| TX     | 53% |
| CA, FL | 52% |
| MD     | 51% |
| NV     | 50% |
| NJ     | 49% |

## Bottom 6

|        |    |
|--------|----|
| VT     | 1% |
| AK     | 2% |
| WV     | 3% |
| NH     | 4% |
| MT, ND | 5% |

7 | Source: Harvard Joint Center for Housing Studies from Census Bureau, 2024 American Community Survey 1-Year Ests. ©2026 The Associated General Contractors of America, Inc.

# AGC UPDATE

## Medium-term outlook: slow growth, risk of stalling, higher prices



- Economic growth is unbalanced and vulnerable to war shock; inflation risk is high, recession less so
- Best bets for growth: data centers, power, airports, specialty health care
- Mfg. construction: canceled & deferred projects likely to outweigh new starts
- Materials costs: up 3-5%, much more if Middle East war lasts
- Supply chain: few problems so far except electrical gear; problems will grow if war continues
- Labor costs: up 4-5%; ICE actions make availability a challenge

# AGC UPDATE

## San Diego Centric Picture-Cautiously Optimistic



- Mega Projects a Big Help—CV Bayfront, \$3.8 B at Airport, University projects like Triton Center, \$3.5 billion RiverWalk Project
- Some Public Works is being affected by budget and priority issues—Water Authority has scaled back infrastructure construction (demand for water changed). City of SD PUD are re-looking at priorities and user rates (dams have become a new priority)
- Feels like we are plateauing
- Contractors trying to hold onto skilled labor—big sucking sound coming from east of here (Data Center Construction)
- Hiring is tough still—skilled labor availability---high cost of living
- Need \$1.40 to buy the same thing one dollar bought you 5 years ago



# Building Better Roads

## CalCIMA Updates

Cameron Richardson

June 30, 2026

County of San Diego Operations Center

**CAL**  
**CIMA**

California Construction And  
Industrial Materials Association

# CalCIMA Updates

**Thank you BBR for being a Partner**





# CalCIMA Updates

## Legislation & Regulation Updates:

- Federal: Build America 250 Act (Sept 30 deadline) *On Track* – Local Impact
- California: Senate Resolution 157 (Hoover) – SMARA 50<sup>th</sup> Anniversary – *Passed*
- California Air Resource Board – Advanced Clean Fleet – *Comments Provided*



# Specification Updates

## Caltrans 2026 Standard Specs updates - October 2026

- HMA PWL & Acceptance and Pay

### Pavement Materials Partnering Committee

#### (PMPC):

- High Rap Phase 2 – up to 40%
- Post Plant Gradation (2024) – ongoing



# CalCIMA Events

*2026 Education Conference*

*November 3-6, 2026*

*Hyatt Regency*

*Monterey, CA*

*\*Government Rates Available*



*Plant Tour – Holliday Rock Co. Inc.*

*August 26, 2026 – 10am*

*Southern California, CA*

*\*Government Rates Available*

Contact: Abi Hague [ahague@calcima.org](mailto:ahague@calcima.org)

# Contact Information

**Cameron Richardson**

[crichardson@calcima.org](mailto:crichardson@calcima.org)

**279-400-9255**





The California Asphalt Pavement Association  
**Asphalt Industry Update**

June 30, 2026  
Building Better Roads Working Group Meeting



# Specification Updates

- 2025 Caltrans Standards Available Online

- New book published ANNUALLY



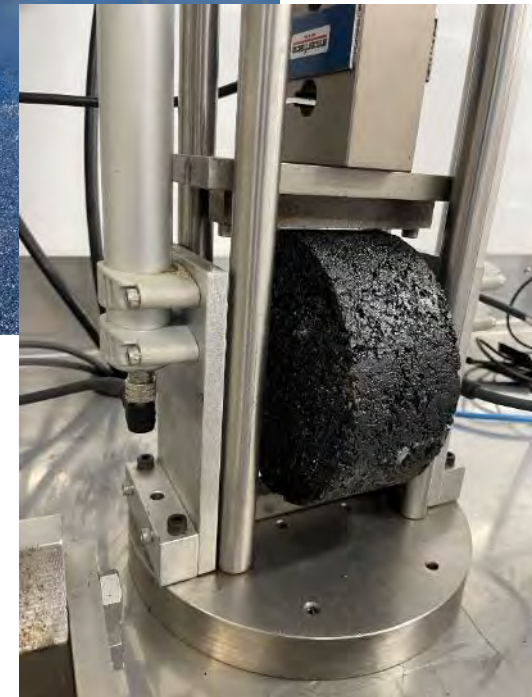
- 2024 Greenbook Available to Order

- City and County Pavement Improvement Center (CCPIC):



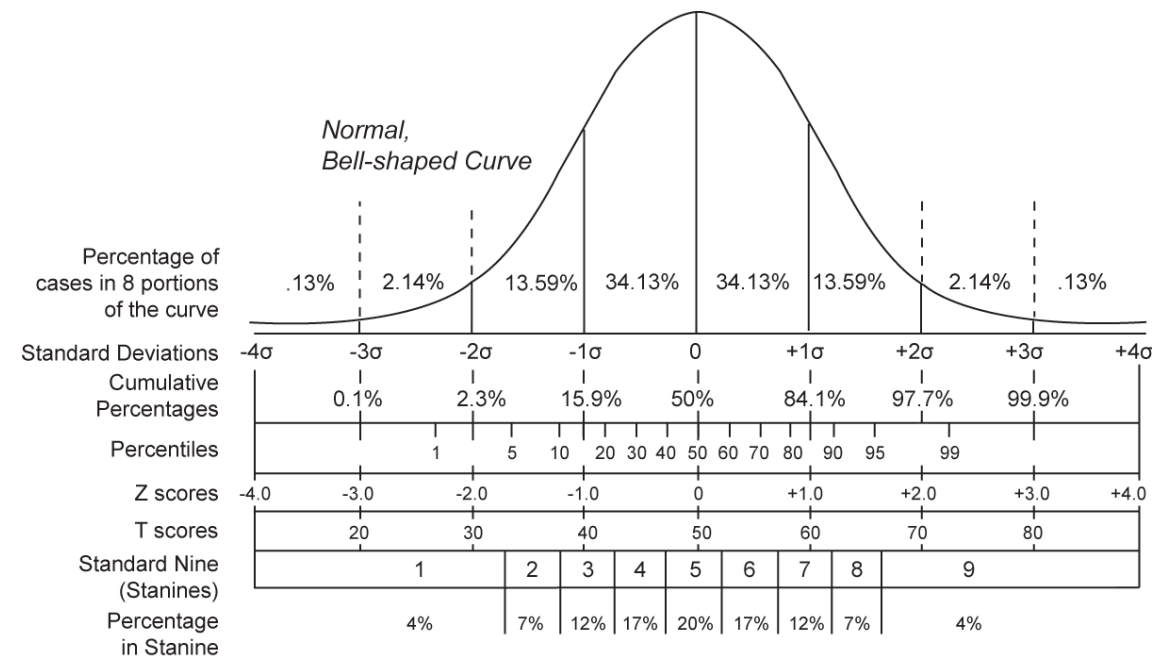
# Caltrans – Emerging Initiatives

- Balanced Mix Design
  - Design mixes to meet project mix criteria for rutting and cracking potential.
  - 2026 testing plan finalization
  - 2026-2027 Pilot Projects



# Caltrans – Emerging Initiatives

- Percent Within Limits (PWL)
  - 2027 target
  - All projects with > 2,250 tons asphalt mix
  - Acceptance based on what is produced with pay accordingly, using incentives and disincentives
  - Rewards material produced with consistent quality.
  - Quality Items:
    - Asphalt Content
    - Mix Air Voids
    - P200
    - P8
    - In-Place Density



# UCPRC: Use of RAP in Asphalt Rubber Mixes

## Use of Recycled Asphalt Pavement in Rubberized Hot Mix Asphalt—Gap-Graded

### AUTHORS

Angel Mateos, John Harvey, Rongzong Wu, Jeff Buscheck, Ali Butt, Irwin Guada, Michael Bowman, Mohammad Rahman, Julian Brotschi, and Justin Yu

Report No. UCPRC-TM-2023-09 | April 2024

Partnered Pavement Research Center (PPRC)  
Strategic Plan Element Number 4.76A: New RHMA Materials with RAP/RAS - Part A: for Structural Layers in Flexible Pavements (DRISI Task 3761)

### PREPARED FOR

California Department of Transportation  
Division of Research, Innovation and System Information  
Office of Materials and Infrastructure

### PREPARED BY

University of California Pavement Research Center  
UC Davis and UC Berkeley

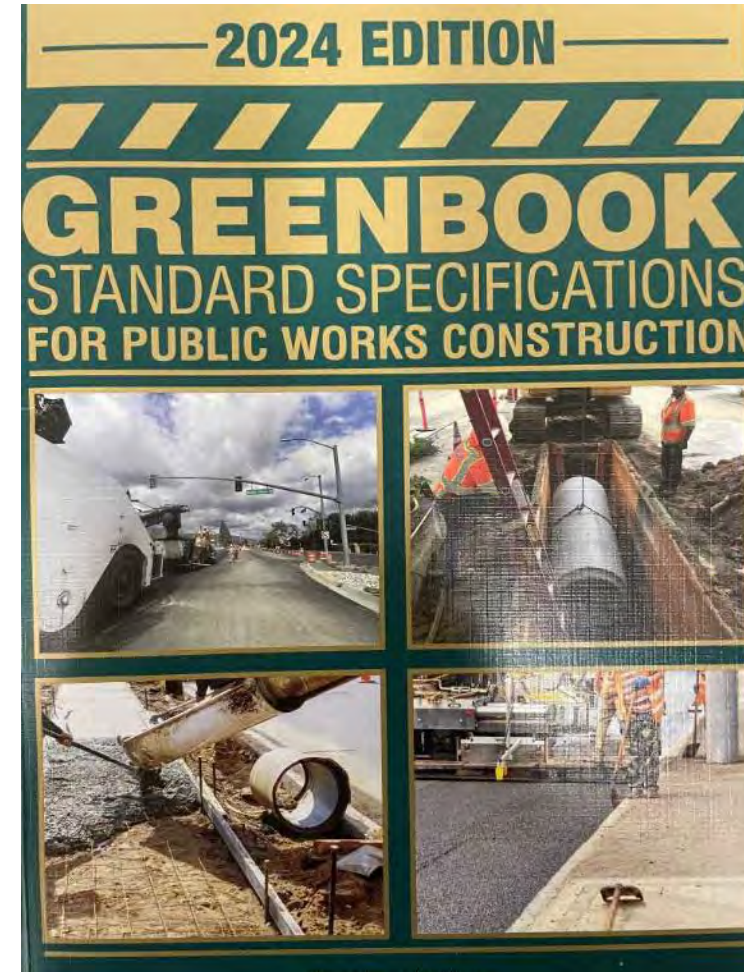


- Key Findings:
  - The cracking performance of the pavement, based on CalME modeling, was either negligible or comparable to project-to-project differences.
  - The RAP binder can be considered to contribute to the minimum 7.5%
  - The addition of 10% RAP to the RHMA-G,... resulted in GWP reductions of 5%.



# Greenbook Asphalt Task Force

- 1:00pm 1<sup>st</sup> Wednesday of the month
- Awaiting final approval for 2027:
  - Aramid Fiber Modified AC (AFMAC)
  - WMA – Contractor Option
  - ARHM Section Reorganization
  - Aggregate Fracture faces requirements for AC



# Greenbook ACTF: Gyratory Compactor

- Evaluating use of Gyratory Compactor for AC design
- Request for volunteer testing of AC mixes.
- Testing of FMLC samples compacted with Gyratory and Hveem
- Request testing:
  - % Air voids
  - Gmm
  - Gmb
- Optional testing:
  - HWTT
  - Hveem Stability
  - IDEAL-RT
  - IDEAL-CT

# CCPIC: Training Opportunities



- Pavement training courses available online and self-paced!
- Pavement Engineering and Management Certificate
  - Comprehensive curriculum of pavement management, design, construction, and sustainability

# CalAPA Training: AP101 & Asphalt Forensics



- 2027 - TBD
- San Diego, CA
- AP101
  - Roger Smith
  - General overview of asphalt pavement design, construction, and maintenance
- Asphalt Forensics
  - Tim Murphy
  - Troubleshooting asphalt pavement challenges



# AGENDA

- 1) Introduction/ Sign-In /Meeting Overview
- 2) Public Comments
- 3) The Road to 70 Update
- 4) Featured Presentation- FDR
- 5) Industry Updates
- 6) BBR Updates**
- 7) Next Meeting / Close



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)



# BBR TREATMENT INNOVATION UPDATE



## PILOT STUDIES



Aramid Fiber  
Reinforced HMA



RAP Pavement  
Seals



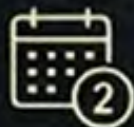
## REJUVENATOR DEMO PROJECTS



Delta Mist



BioRestore



Phase 2



## HI RAP HMA DEVELOPMENT

Focused technology  
development for sustainable  
pavement.

# AGENDA

- 1) Introduction/ Sign-In /Meeting Overview
- 2) Public Comments
- 3) The Road to 70 Update
- 4) Featured Presentation- FDR
- 5) Industry Updates
- 6) BBR Updates
- 7) Next Meeting / Close



[www.sandiegocounty.gov/BBR](http://www.sandiegocounty.gov/BBR)





# **BUILDING** *San Diego County* **BETTER ROADS**



San Diego  
COUNTY LINE

MEETING ADJOURNED