October 8, 2024

WORKING GROUP MEETING

AGENDA

Please direct complaints to: Angelina@thisisnotarealemailaddress.com

BUILDING BETTER ROADS San Diego County

AGENDA

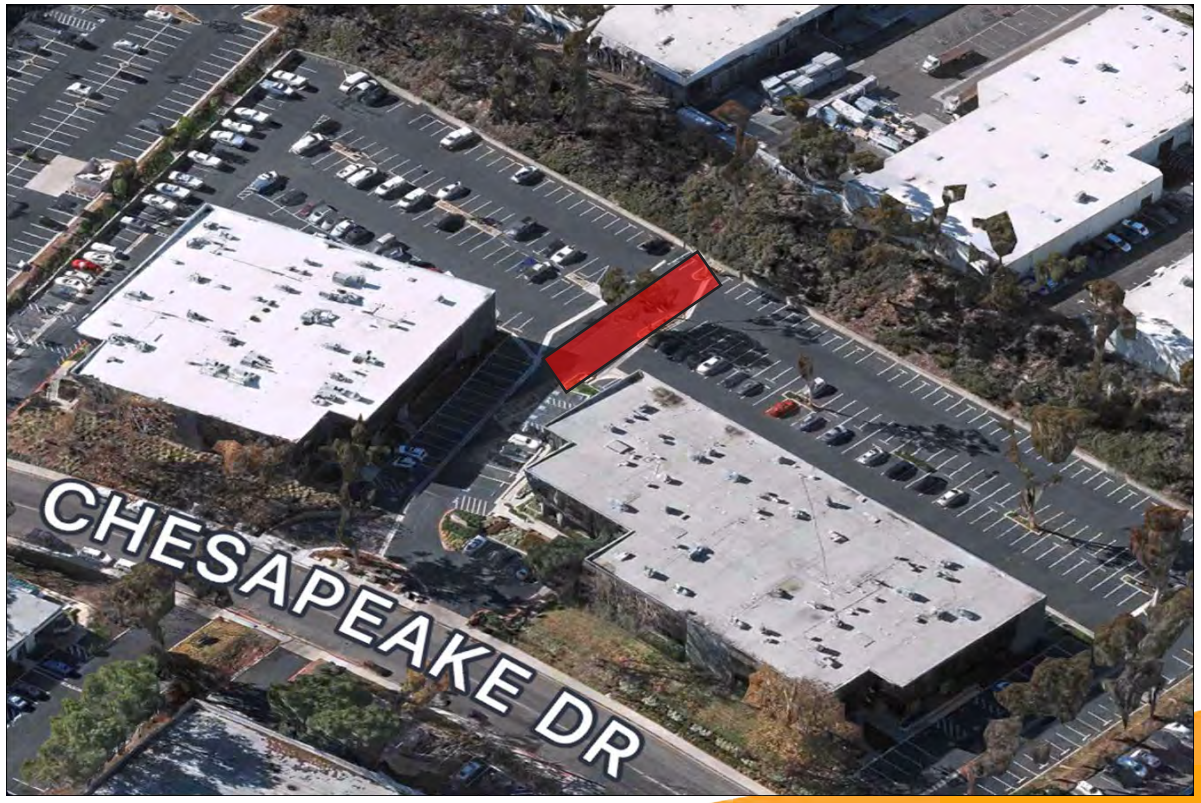
- 1) Sign-In /Meeting Overview
- 2) Public Comments
- 3) Welcome Message
- 4) Industry/Organization Updates
- 5) 2024 BBR Recap
- 6) 2023 Subcommittee Wrap Up Presentations
- 7) 2024 Subcommittee Updates
- 8) Next Working Group Meeting / Close

www.sandiegocounty.gov/BBR

BUILDING BETTER ROADS San Diego County

BUILDING LOGISTICS AND SAFETY

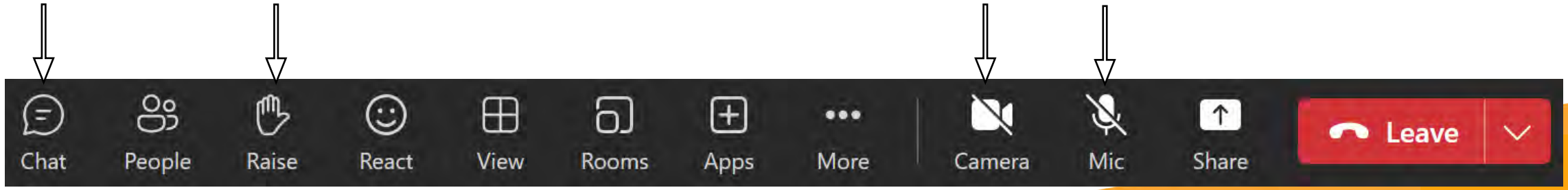
- Room and Building Exits
- Restroom Location
- Evacuation Plan



San Diego County
BUILDING
BETTER ROADS

TEAMS MEETING ETIQUETTE/ SIGN IN

- Mute Microphone unless presenting
- Turn Camera off unless presenting
- Use Chat window or Raise Hand for questions
- Please enter your Name, Company/Agency, E-mail in Chat



BUILDING BETTER ROADS San Diego County

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BUILDING BETTER ROADS San Diego County

AGC

Building Better Roads
October 2024

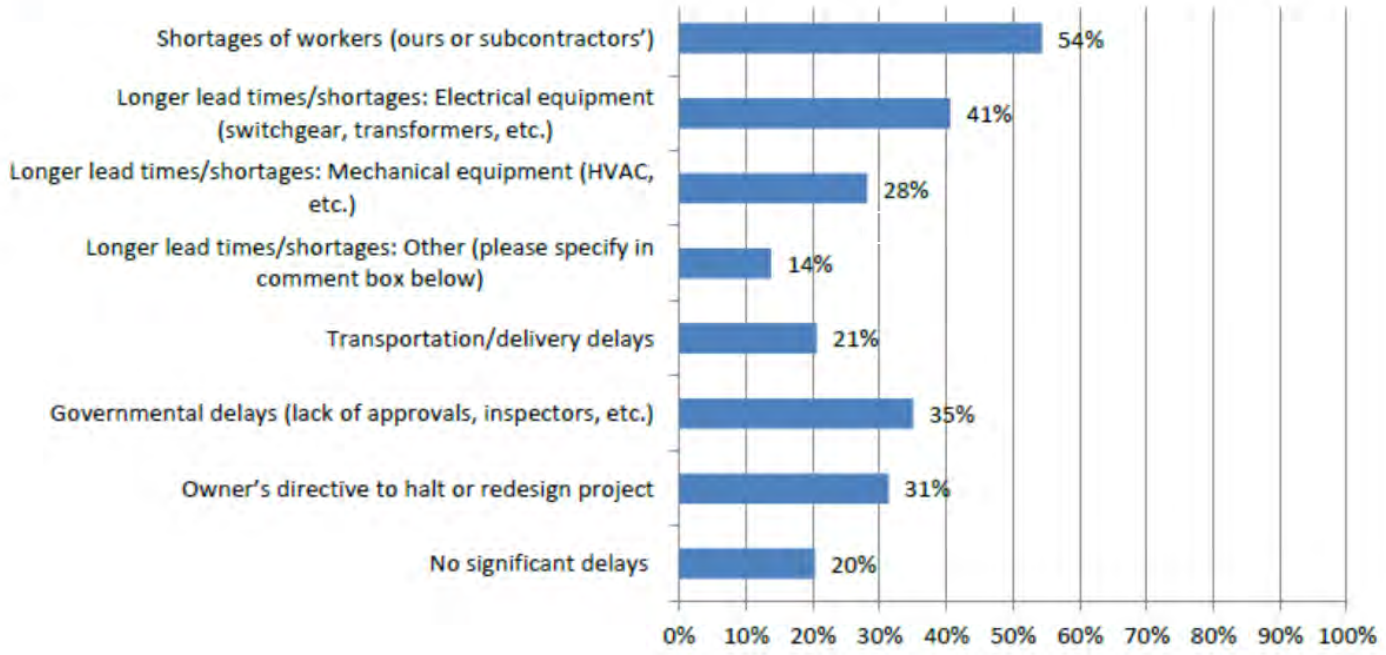
CONSTRUCTION TRENDS / OUTLOOK

San Diego County BUILDING BETTER ROADS

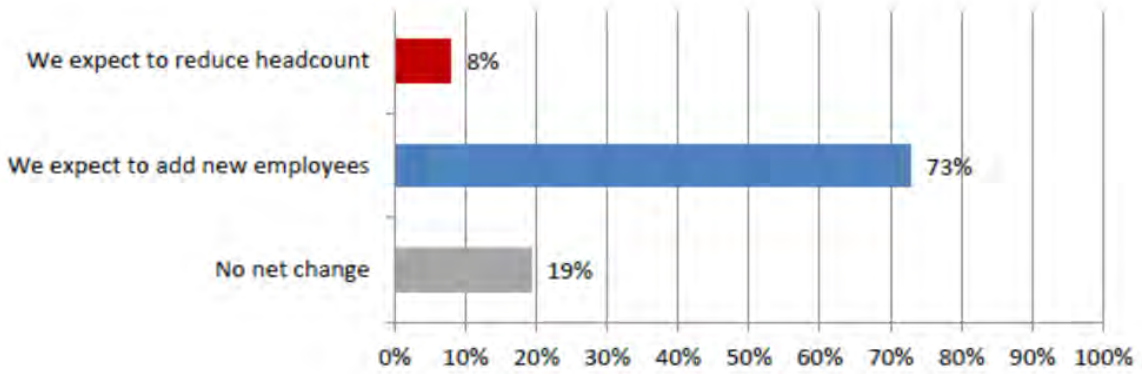
% of Respondents who listed as major concern 2024:

Do you presently have vacant salaried or craft worker positions?

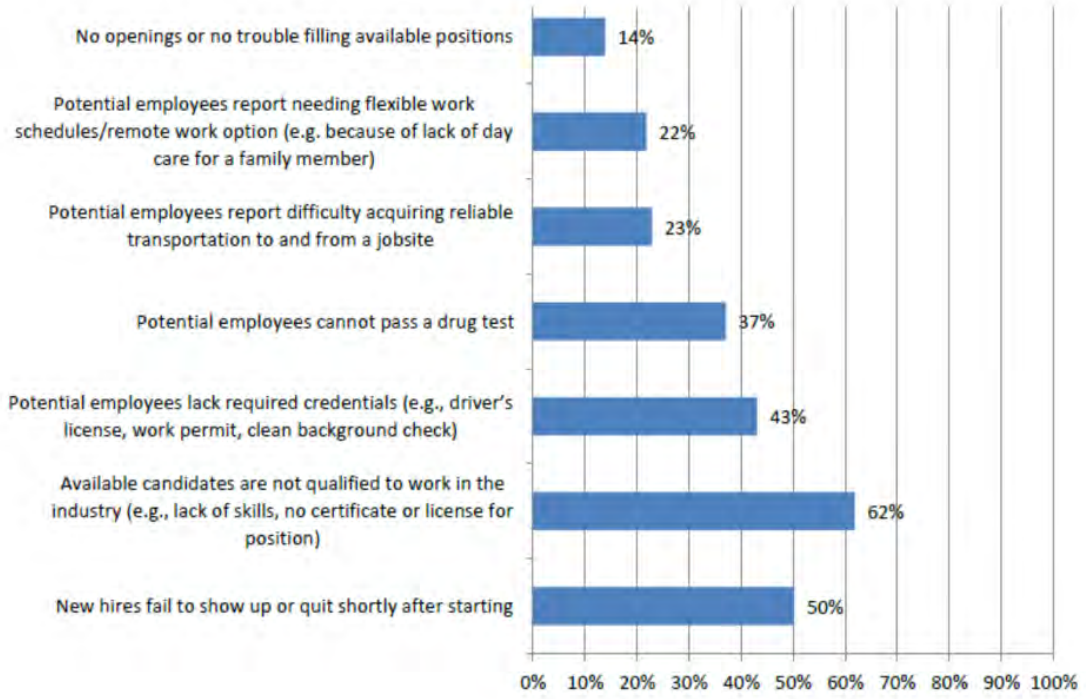
Is your firm experiencing project delays due to any of the following?



Do you expect to add to your firm's headcount in next 12 months?



What are the reasons you are having difficulty filling positions?



ECONOMIC IMPACT OF CONSTRUCTION

U.S. Gross Domestic Product (GDP) $28 Trillion

- Construction Contribution $1.3 Trillion (4.5%)

California GDP $3.9 Trillion

- Construction Industry Contribution $155 Billion (3.9%)

937,000 Construction Establishments in the U.S.

- 94,000 in California

CONSTRUCTION EMPLOYMENT

U.S. Construction employment

- 8.2 Million workers as of April 2024
- Up by 258,000 workers from April 2023 (3.2%)
- Up by 7.9% from February 2020 (Pre-Pandemic)

California Construction Employment

- 920,500 Workers as of April 2024
- An Increase of 15,100 (1.7%) workers over April 2023
- An Increase of 11,800 (1.3%)workers over February 2020 (Pre-Pandemic)

SAN DIEGO / CARLSBAD CONSTRUCTION EMPLOYMENT

Year	Month	Construction Jobs
2014	August	65,400
2015	August	72,700
2016	August	78,300
2017	August	80,800
2018	August	85,000
2019	August	85,700
2020	August	81,800
2024	August	93,000

Construction is Booming....For Now

SAN DIEGO UNEMPLOYMENT AND JOBS

Unemployment Rates

- National 4.2% (3.5% April)
- California 5.3% (5.3%)
- County 5.0% (4.3%)

Month of July in San Diego

- Construction Industry Added 400 Jobs

Total Construction Workforce in San Diego

- 93,000
- Highest Level in 15 years

SAN DIEGO REGION EXPECTATIONS

Tight Labor Market

- Fewer Bidders in some markets
- Possible Project Delays
- Overbooking of some Sub-Contractors and workers
- Government mandated PLA's –out of town workers

Upward Price Pressures Have Mostly Eased

- Increased Compensation for Worker Retention
- Materials Costs Mostly leveled out (Concrete and Construction Aggregates)
- Equipment—CARB Regulations

AC, Aggregates and Concrete Supply vs. Demand—Delays small batches

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BUILDING BETTER ROADS San Diego County

The California Asphalt Pavement Association

Asphalt Industry Update

October 8, 2024
Building Better Roads Working Group Meeting

Specification Updates

- 2023 Caltrans Standards Available Online
  - 2024 expected publish date in October
  - New book published ANNUALLY
- 2024 Greenbook Available to Order
- City and County Pavement Improvement Center (CCPIC):

Caltrans – Standard Spec Changes

- Post-Plant Gradation
  - Mix gradation ACCEPTANCE based on gradation of aggregates retained from the ignition furnace asphalt content sample.
  - Cold Feed samples are not used to determine mix aggregate gradation acceptance.
  - Included in 2024 Standard Specifications.
- Fog Seals
  - Caltrans includes fog seals as a pavement preservation strategy.
  - Specification language now available in Standard Specifications.
- Partial Depth Recycling
  - Updated specifications

Caltrans – Environmental Product Declarations (EPDs)

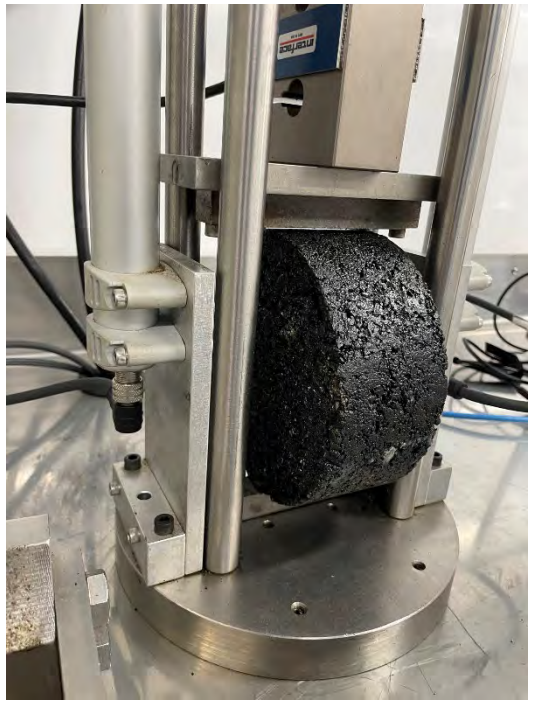
- EPDs provide information on the environmental impact of various products.
- Global Warming Potential (GWP)

- FHWA website:

- February 2025 – Caltrans will require contractors to submit an EPD for HMA-A.
  - Projects > $1 million
  - Working Days > 175
  - Bid Item > 2,250 tons

Caltrans – Emerging Initiatives

- Balanced Mix Design
  - Working Group formed
  - Multi-year workplan
  - Design mixes to meet project mix criteria for rutting and cracking potential.
  - New Test methods and requirements



- Continuing Efforts:
  - PWL for all projects
  - High RAP Usage in mixes
  - 100% RAP in slurry seals and chip seals

CalAPA®

FHWA – Low-Carbon Transportation Funding

- Program goals include, but are not limited to:
  - Increase the use of LCTM.
  - Facilitate the use of LCTMs.
  - Promote technology transfer and enhance workforce development to increase the adoption of environmental quantification techniques used in decision making by transportation agencies.
  - Encourage eligible recipients to begin LCTM activities and build successful LCTM identification frameworks.

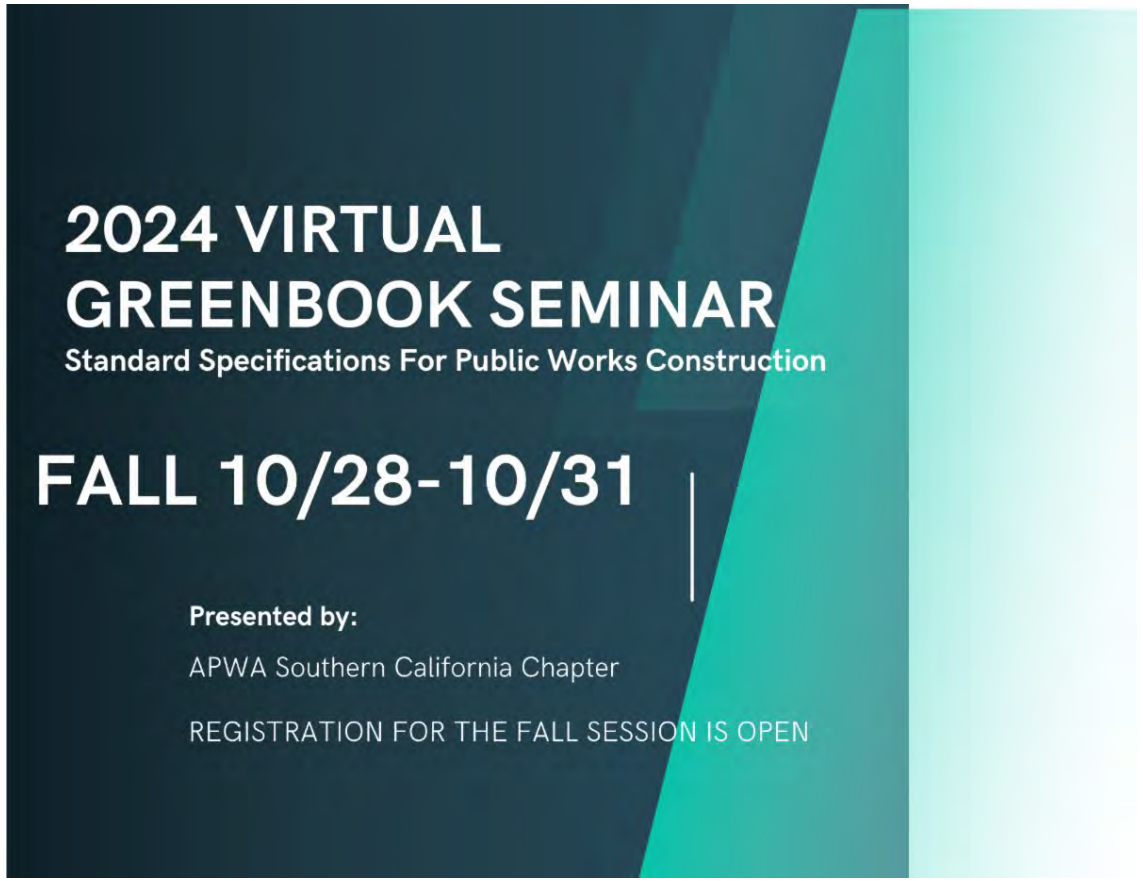
- LCTM Program
  - Information:

- Grant Program
  - Total pool = $800 million
  - Grant Information:

Greenbook Asphalt Task Force

- 1:00pm 1st Wednesday of the month
- Specification development efforts:
  - Emulsions specification updates
  - Fiber use in HMA
  - WMA – Contractor Option
  - HMA mix design with gyratory compactor
  - RAP content verification in HMA

Greenbook Seminar



- October 28-31
- Virtual event
- Costs:
  - $25 per day
  - $100 for 5-day full registration
- APWA – Southern California

CalAPA Training and Networking Events

- CalAPA Training Courses
  - AP101
  - Quality Asphalt Paving
  - Asphalt Forensics
- Session Schedule
  - In-Person:
    - November 2024 - Sacramento
    - December 2024 – Alameda
    - January 22-23 – San Diego
    - February 24-26 – Pomona
  - Online Sessions:
    - March 2025
- CalAPA Spring Conference
  - February 24-26 Pomona

www.calapa.net

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BUILDING BETTER ROADS San Diego County

Building Better Roads

CalCIMA Updates

Suzanne Seivright

October 8th, 2024
County of San Diego Operations Center

CALCIMA
California Construction and Industrial Materials Association

Major Updates

- Tony Limas Retirement
- Requesting lab participation in Balanced Mix Design Interlaboratory Study (BMD-ILS)
- Non-Statistical Pay Factor for project < 2,250 tons at an impasse
- Cameron Richardson added to Caltrans JTCP task force and Asphalt Subtask Group Chair
- Evaluating lime marination alternatives as GWP reduction strategy

BUILDING BETTER ROADS San Diego County

CARB ACF UPDATE

- *Upcoming compliance timelines*
- *Compliance checklists available*
- *Enforcement*
- *EPA waiver*
- *Litigation*
- *Funding*

CalCIMA Events

2024 Education Conference
Meritage Resort and Spa – Napa, CA

October 28th-31st

https://www.calcimaconference.org/

2025 Spring Thaws **Registration opens soon*

DoubleTree by Hilton Ontario Airport - February 12th

Hilton Sacramento Arden West - February 26th

Contact: Abi Hague ahague@calcima.org

Contact Information

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279-400-9255

BUILDING BETTER ROADS San Diego County

CALCIMA
California Construction and Industrial Materials Association

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BUILDING BETTER ROADS San Diego County

REPORT CARD

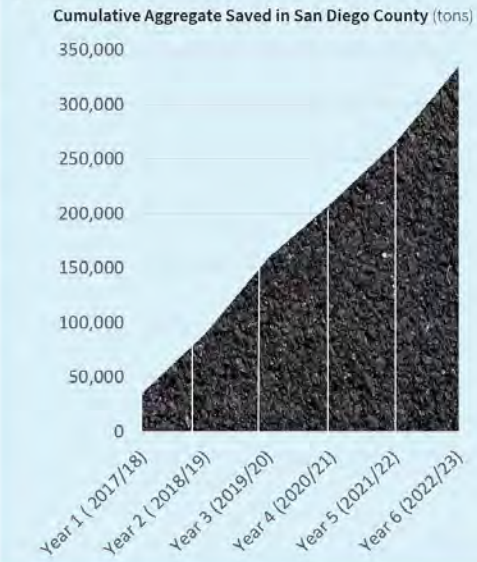
BUILDING BETTER ROADS San Diego County

REPORT CARD
October 2024

NACo 2022 ACHIEVEMENT AWARD Winner

RAP USAGE

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



WORKING GROUP MEETINGS

17 Meetings Held (11/2018 - 10/2024) **1** Meetings Planned (2025)

SUBCOMMITTEE MEETINGS

17 Meetings Held (5/2023 - 11/2023)

SUBCOMMITEES

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

Current Selected Topics:
(1) Recycled Asphalt Shingle Use in HMA
(2)High RAP HMA Pilot Project

Innovation- New ideas and improvements to existing pavement management solutions

Current Selected Topics:
(1) HMA Modifiers
(2) 100% RAP Cold Mix

TRAINING OPPORTUNITIES

4 Plant/Site Tours

6 Training Workshops

9 Shared External Training Opportunities

GUIDANCE DOCUMENTS

15 Identified

2 Internal Review

3 Drafted

6 Completed

PILOT TESTS

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 Use (2019/2020)
Improves durability

RAP Seal Use (2020/2021)
Supports aggregate sustainability

PLANNED

Increase RAP Use (40%) (2024/2025)
Supports aggregate sustainability

Rejuvenating Seals (2025/26)
Restores beneficial binder properties

BUILDING BETTER ROADS San Diego County

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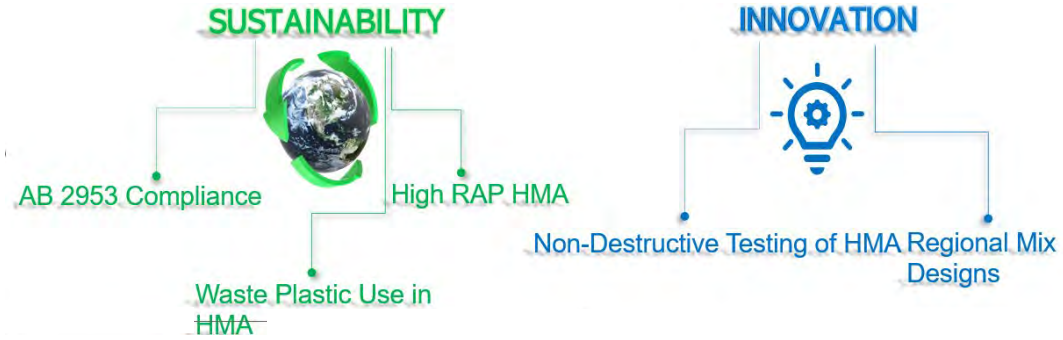
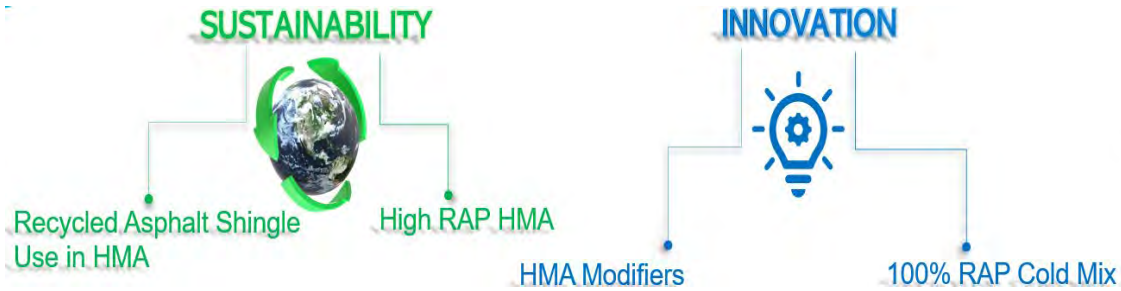
San Diego County
BUILDING BETTER ROADS

BBR SUBCOMMITTEES

2023



2024



https://www.sandiegocounty.gov/BBR

BUILDING BETTER ROADS San Diego County

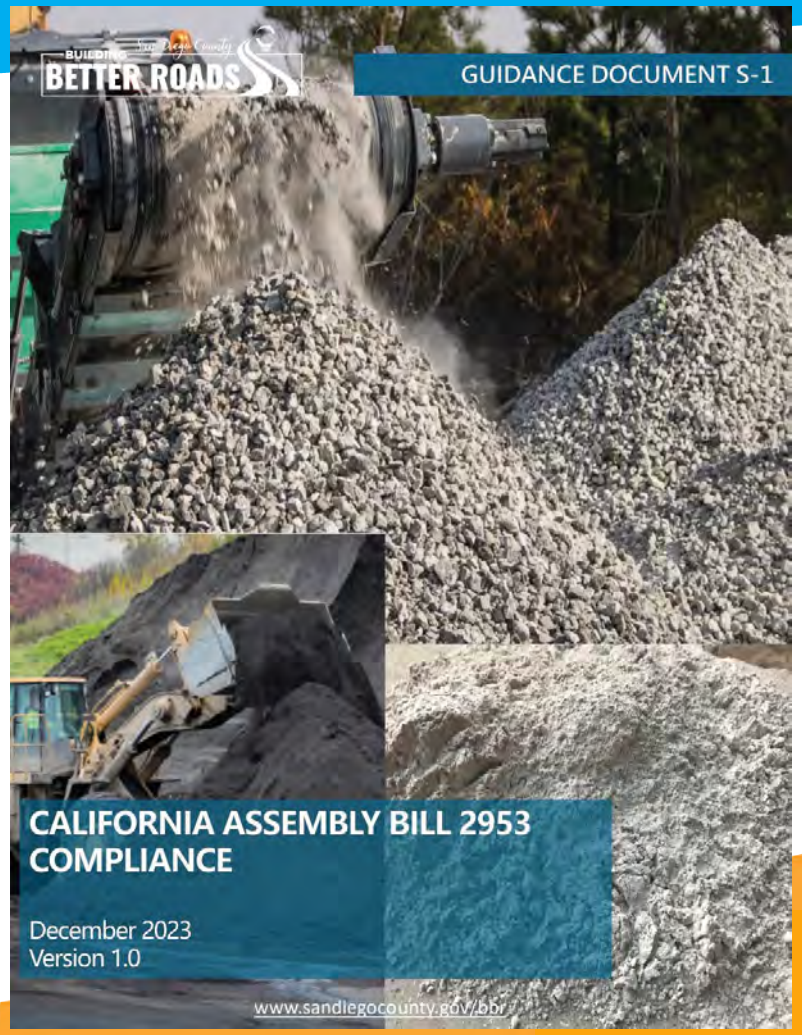
2023 SUBCOMITTEE SUMMARY: AB2953

Need:

- AB2953 Approved 9/2022 Went into Effect 1/1/24
- Requires local agencies to allow recycled material use at or above state specification levels
- Confusion on Compliance Requirements
- Penalties include reduction of SB-1 funding

Goal:

- Guidance Document detailing compliance requirements

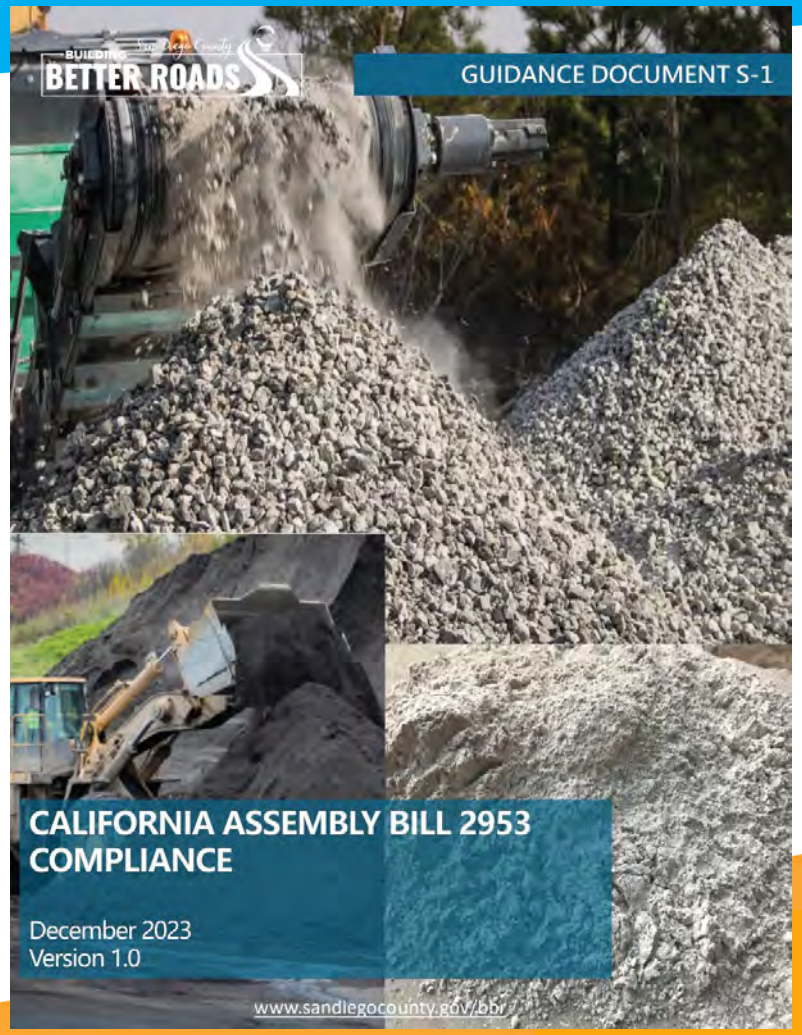


BUILDING BETTER ROADS San Diego County

2023 SUBCOMITTEE SUMMARY: AB2953

Process
- Document Review/ Analysis
- Focus Group Meetings
- Draft Document Production
- Document Review
- Final Document Posted to Website

Document Contents
- Bill summary
- Applicability
- Outline of Step Agencies should take
- Based on base standard specification



BUILDING BETTER ROADS San Diego County

San Diego County

BUILDING BETTER ROADS

Regional Mix Designs

GOAL

- Develop regional mix designs for use by local agencies to improve pavements and availability of mixes in the San Diego region. These mixes would also be in compliance with AB 2953.
- Currently most Local Agencies do to verify mixes they use and tend to use small quantities. During peak paving periods with several local agencies using different mixes this limits producers being able these mixes readily available.

BENEFITS

- Mixes would be in Compliance with AB 2953
- Rapid project start-up due to mixes having been verified with savings on overall project time and impacts on public.
- Potential cost savings
- Potential increase in quality

PROCESS

- **Meetings were held with members from Local Agencies, material suppliers and industry organizations. In these meetings it was discussed if a universal mix could be developed and adopted by local agencies for use.**
- **Also discussed was a proposal to use mixes using section 39 mixes verified by the County of San Diego and Caltrans. The County of San Diego shared their experience of reduced material disputes and compaction failures.**
- **There was no consensus on the adoption of a universal mix for use localy.**

Process

- The next phase was to determine the specifications currently used by local agencies. The results were that the majority of local agency use the Greenbook except for the County of San Diego which use Caltrans Section 39, and the City of San Diego has developed their own specification.
- Since we could not develop a regional mix, the group discussed the what the next phase would be. The group proposed the posting of accepted mixes on the BBR web page. The group was asked to provide verified mixes which meet AB2953 for posting. Both Caltrans and the County of San Diego have submitted Section 39 mixes to post on the BBR Web Page, there were no Greenbook mixes have submitted to date.

PROCESS

- **The BBR Leadership Team determined that verified mixes would be posted to the BBR Web page, which at this point excludes Greenbook mixes.**

CONCLUSION

- **Verified JMF's will be posted on the BBR web page for use by local agencies. When the Greenbook develops a verification process or a local agencies develops their own verification process, mixes verified with these process will be posted also.**
- **The JMF's will be posted and after 6-months we will evaluate if they have been used and then evaluate if this page will be maintained or removed.**

Questions?

NONDESTRUCTIVE TESTING (NDT) OF IN PLACE HMA

James Watkins – 10/8/24

BACKGROUND

- Open house at Caltrans Southern Regional Lab office in Fontana in February 2023
- FHWA'S Mobile Asphalt Technology Center (MATC)
- MATC has several pieces of equipment
- Dielectric Profiling System (DPS) seemed more applicable for County resurfacing work.
- Became an Innovation Subcommittee topic

NONDESTRUCTIVE TESTING (NDT) OF IN PLACE HMA

- **Goal:** Develop Guidance Document that compares current HMA testing practices to proposed NDT methods and discusses a potential pilot study of the proposed methods.

Process:

- ❖ Research NDT methods – particularly the Dielectric Profiling System (DPS)
- ❖ Compare and contrast current methods with DPS
- ❖ Create Guidance Document
- ❖ Produce a work plan for a future pilot study

CURRENT APPROACH – DENSITY CORING

- Density coring is done per Caltrans Section 39.
- Many cores are needed for the QA/QC process, which leads to time consuming testing timelines and could potentially create weakened areas in the road if the cored areas are not backfilled properly.

NUCLEAR GAUGE TESTING

- Has been used for County projects

Advantages:

- Only one operator needed
- Produces quick and accurate results

Disadvantages:

- Device is non-destructive, but cores are needed to calibrate
- Radioactive material
  - Training and certifications
  - Storage
  - Transporting
  - Disposal

DIELECTRIC PROFILING SYSTEM (DPS)

Advantages:

- Non-destructive to pavement
- Only one operator needed
- Accurate linear measurements
- Meets AASHTO PP 98 technological standards
- Equipment rental comes with training and technical support
- Not nuclear powered

CONCERNS WITH DPS

- Availability for rent at time of construction
- Time and resources
- Very similar to other devices and methods already in use
- Little to no documented experience with device in California
- Coring would not go away – needed for verifying data

PROGRESS AND NEXT STEPS ON TOPIC

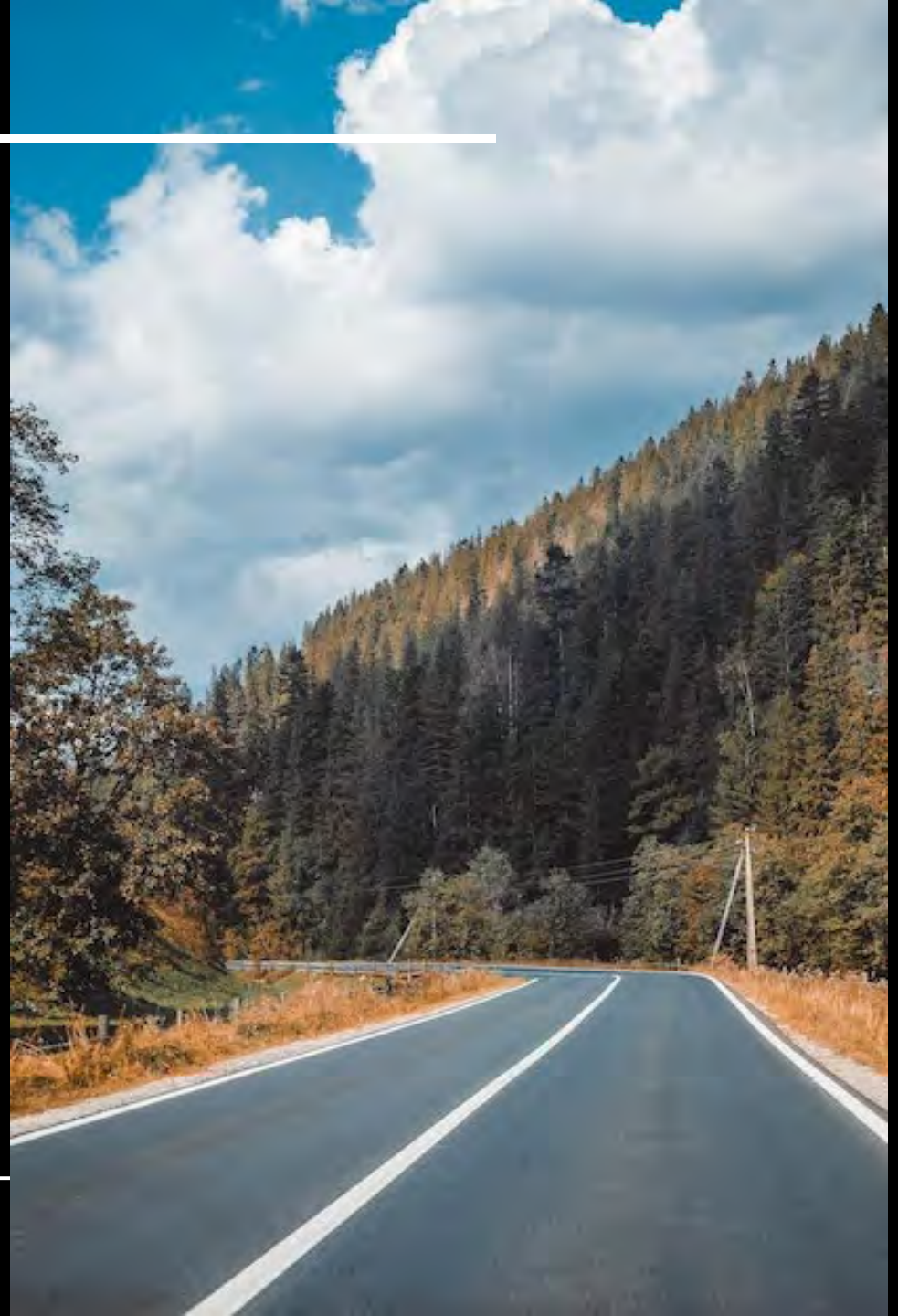
- Still working on Guidance Document
- Two reviews have been done and revisions need to be made from second review.
- Potential discussions with Materials Lab for more specifics on current methods before finalizing
- May not perform pilot study at this time due to mentioned concerns

QUESTIONS??

BBR SUSTAINABILITY SUBCOMMITTEE:

RECYCLED PLASTIC ASPHALT ADDITIVES

TOPIC LEAD: ADAM R. BARBER



GOAL:

FORMULATE GUIDANCE DOCUMENTS

- Construct guidance documents detailing the current state of the practice
  - Explain the need for sustainable innovation, and RPAs specifically
  - Detail similarities and differences in the manufacturing and introduction of RPAs
  - Identify common traits and benefits of RPAs when it comes to both sustainability and performance

ACKNOWLEDGEMENTS

- KEITH KEZER, AL OCHOA, ORLAND MOTT – BBR
- ALEX KOTROTSIOS – PACIFIC GEOSOURCE
- CHRIS & REBECA SPARKS – THE SPARKS CO/ MACREBUR SOCAL

RECYCLED PLASTIC ASPHALT ADDITIVES

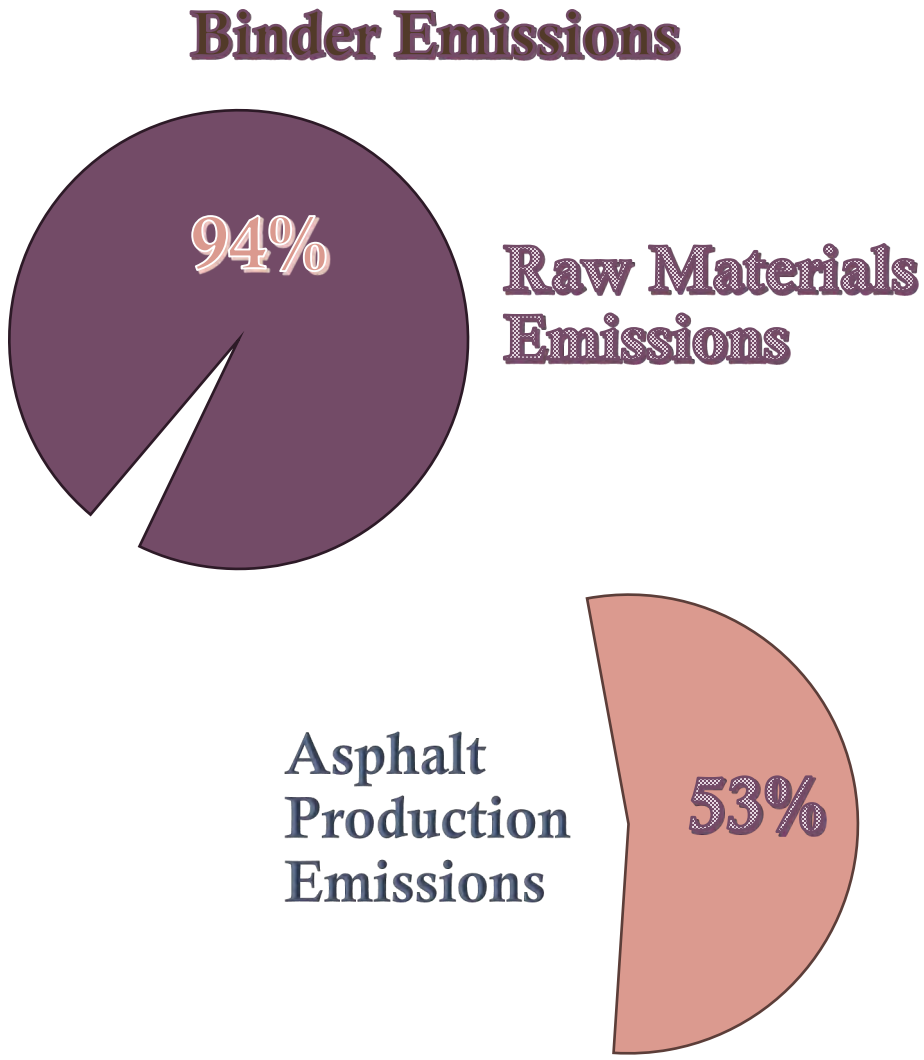
WHY DO WE NEED RECYCLED PLASTIC ASPHALT ADDITIVES?

- In 2019…

  421.9 M tons of AC

  = **21.7 M** metric tonnes of CO2

  = **1.3%** of all industrial emissions



OVERVIEW

- Undesirable and difficult-to-recycle plastics
- Binder extender/ partial substitute – WILL NEVER FULLY REPLACE VIRGIN BINDER
- 3-15% replacement of virgin binder by weight
- Can save between 744 kg of CO2 up to 3,720 kg of CO2 per 100 Tons of asphalt produced, depending on % replacement

- San Diego County Projects over the past 6 years
  - Approximately 400,000 Tons paved
  - 17,040 Metric Tons of CO2 would have been saved @ 5% replacement
  - Offset the carbon footprint of San Diego County's entire public works department, plus some

INTRODUCTION METHODS

Wet Process	vs.	Dry Process
☐	Usability	☑
☐	Storage	☑
☐	Sustainability	☑
▬	Performance	▬

COMMON TRAITS & BENEFITS

REJUVENATIVE PROPERTIES & INCREASED RAP ALLOWANCE

Table 1. Hamburg Wheel Rut Results with & without MR8

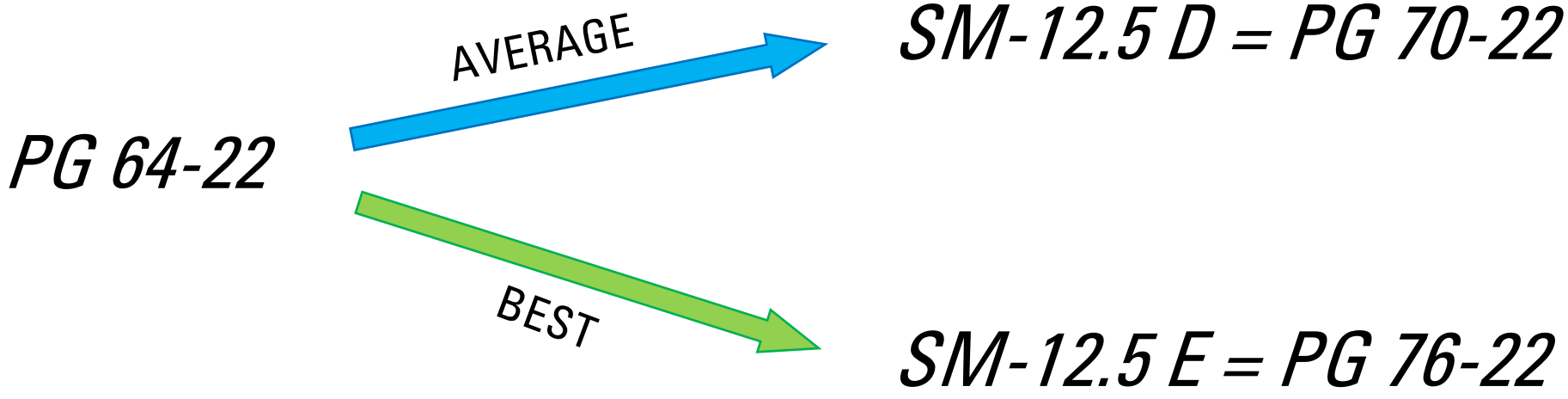
Quarry	RAP %	# of Cycles without MR8	# of Cycles with MR8	% Improvement
West San Antonio	30	7,934[1]	20,000[2]	152%
North San Antonio	20	8,500[1]	11,000	29%
North San Antonio	40	14,171	20,000[2]	41%

Note 1: These mixes failed to meet the minimum design requirement of 10,000 passes for a PG 64-22 on the Hamburg without MR8.

Note 2: These mixes not only exceeded the design requirement of 10,000 passes for a PG 64-22, they actually met the design requirement for a mix with PG 76-22, which is a maximum rut depth of 12.5 mm after 20,000 passes of a Hamburg Wheel Rut Test. Also note that the test stops running after 20,000 passes.

POLYMER MODIFIER

2021 VIRGINIA DOT



MICROPLASTICS & ENVIRONMENTAL CONCERNS

UPDATES & CURRENT STATUS

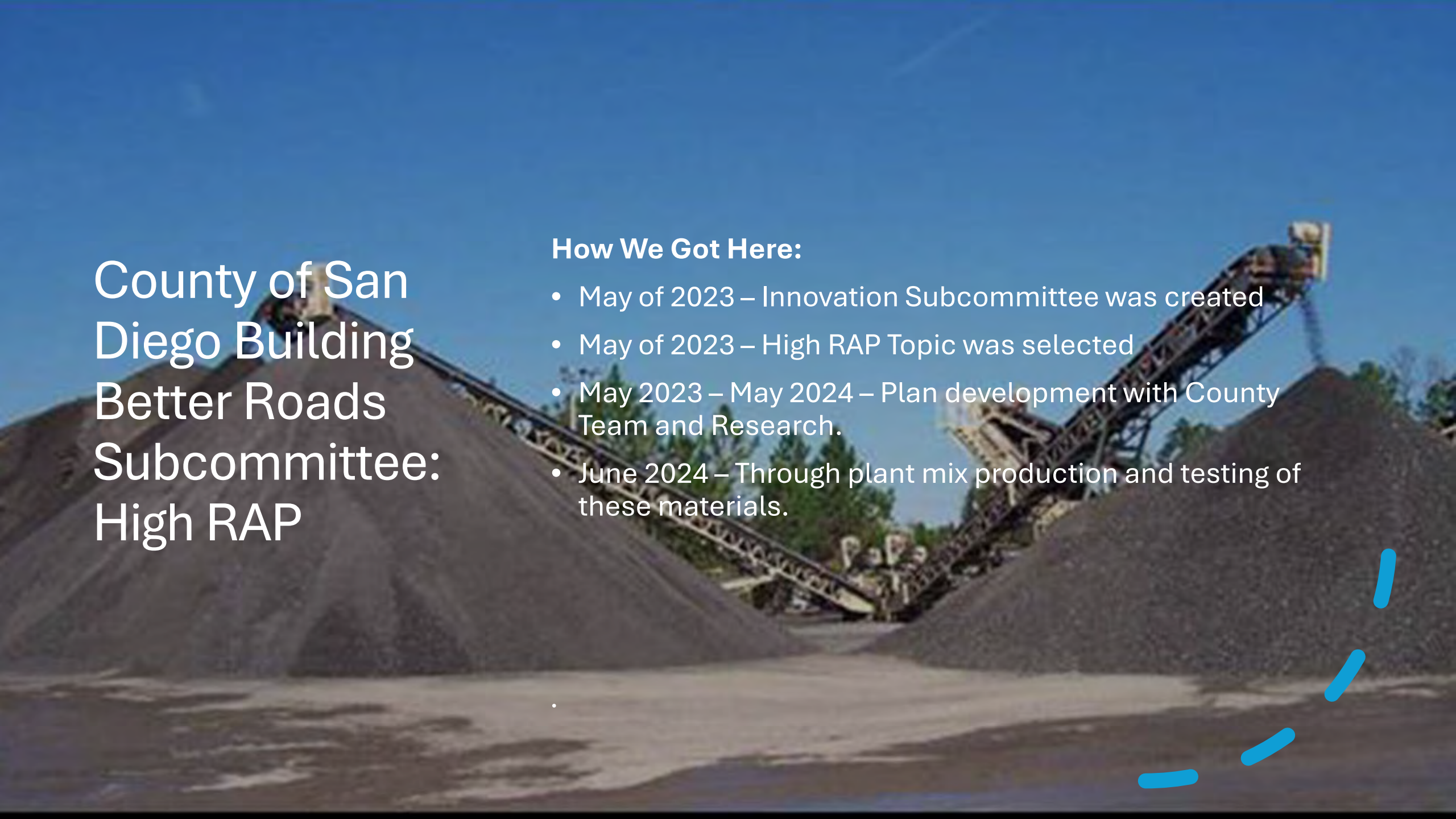
County of San Diego Building Better Roads Subcommittee: High RAP

County of San Diego Building Better Roads Subcommittee: High RAP

Why High RAP

- Environmental benefits: reducing greenhouse gas emissions and energy consumption.
- Less virgin aggregate consumption.
- Landfill space savings: reduce the amount of material entering landfills.
  - Currently only replacing 25% of the roads we “mill and fill”. Up to 75% not being utilized.
- It is very achievable. Vast amounts of research and documentation available for industry to reference and use.
- Technology is present and being used daily.

County of San Diego Building Better Roads Subcommittee: High RAP



How We Got Here:

- May of 2023 – Innovation Subcommittee was created
- May of 2023 – High RAP Topic was selected
- May 2023 – May 2024 – Plan development with County Team and Research.
- June 2024 – Through plant mix production and testing of these materials.

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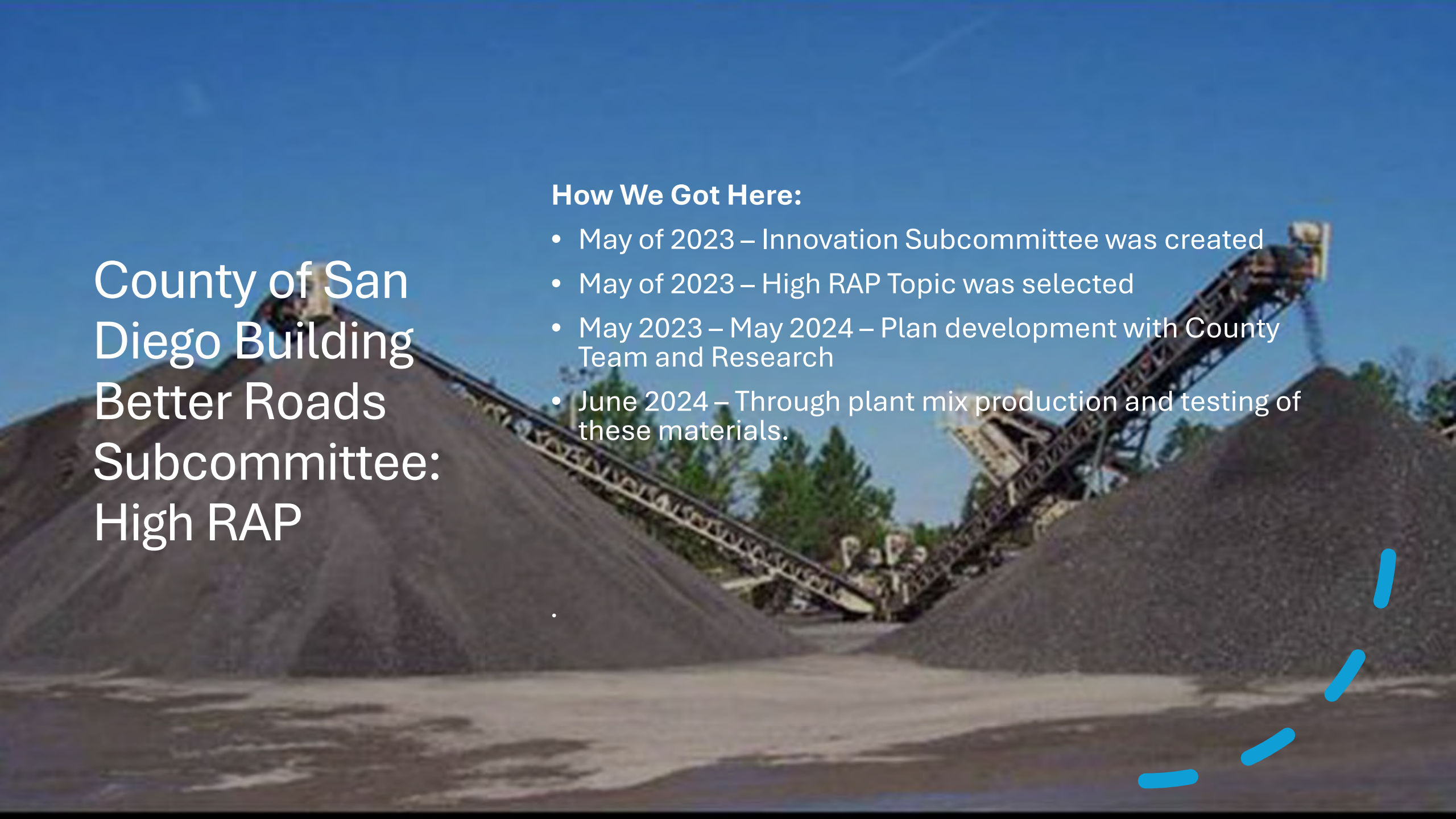
County of San Diego Building Better Roads Subcommittee: High RAP



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County of San Diego Building Better Roads Subcommittee: High RAP

- Mix was produced by using 40% RAP by aggregate replacement.
- One sample produced with rejuvenator added, one produced without.
- Mixes performed well and met current County Section 39 Standards set for Asphalt Quality.

Asphalt Content		
Target AC% (TWM)	5.0% TWM	Specification Range - 4.7 - 5.5% TWM
RAP AC% (TWM)	5.25% TWM	
AC% mix w/ recycling agent	5.03% TWM	
AC% mix w/o recycling agent	4.83% TWM	
Air Voids and Volumetrics		
Target Air Voids	4.0%	Specification Range - 2.5 - 5.5%
AV's w/ recycling agent	3.9%	
AV's w/o recycling agent	4.2%	
VMA w/ Recycling Agent	13.5%	Specification Range – 12.5 – 15.5
VMA w/o Recycling Agent	13.3%	

County of San Diego Building Better Roads Subcommittee: High RAP

Understanding Testing Parameters

- Binder grade testing is important.
- Evaluation criteria utilized amongst various DOT's: Delta Tc (ΔT_c).

Definition

Delta Tc is a thermal cracking test (TC). It simulates thermal stress. The delta T –c (ΔT_c) value is used to assess the performance and susceptibility of asphalt binders to thermal cracking. Binder is tested in a Pressure Aged Vessel (PAV) from 20-40 hours. Simulating "some time" of aging on the road.

Defined as the difference between the temperature at which the asphalt binder exhibits a certain stiffness (S value, typically measured in Megapascal MPa) and the temperature at which it reaches a certain relaxation time.

Lower Negative ΔT_c

Indicates larger difference between the two temperatures, suggesting that the binder has a greater discrepancy between stiffness and relaxation properties and is typically associated with poorer performance in resisting thermal cracking.

Higher Negative ΔT_c

Indicates a smaller difference between to two temperatures, suggesting that the binder's stiffness and relaxation properties are more balanced and is typically associated with better performance and resisting thermal cracking. Being closer to zero (0) suggest the binder is more capable of maintaining flexibility and resisting cracking at low temperatures.

Mix ID	53417195	
Mix Type	3/4" SP - 40% RAP (by total aggregate replacement)	
Base Binder	64-16	
Target Binder Grade	70-10	
ΔTc Testing	**Source: Recovered Binder - RAP**	**Specification**
PG Grade	82-10	N/A
True Grade	86.5-14.9	N/A
Stiffness, Mpa @ -6°C	340	300 Max
Critical Temperature, °C	-4.7	N/A
Bending Beam Rheometer	0.262	.300 Min
M-Value @ -6°C	-1.6	N/A
ΔTc	**-3.1**	N/A
ΔTc Testing	**Source: Recovered Binder - Mix w/o recycling agent**	**Specification**
PG Grade	76-16	N/A
True Grade	78.8-18.3	N/A
Stiffness, Mpa @ -6°C	228	300 Max
Critical Temperature	-8.9	N/A
Bending Beam Rheometer M-Value @ -6°C/@-12°C	0.284	.300 Min
Critical Temperature, °C	-4.3	N/A
ΔTc	**-4.6**	N/A
ΔTc Testing	**Source: Recovered Binder - Mix w/ recycling agent**	**Specification**
PG Grade	70-16	N/A
True Grade	71.2-21.1	N/A
Stiffness, Mpa @ -6°C	162	300 Max
Critical Temperature	-11.8	N/A
Bending Beam Rheometer M-Value @ -6°C	0.316	.300 Min
Critical Temperature, °C	-8.3	N/A
ΔTc	**-3.5**	N/A

County of San Diego Building Better Roads Subcommittee: High RAP

What is next?

- We need to develop a specification. The thought is to use the draft Caltrans elevated RAP/RAS spec as a guide.
- Pilot project will be decided on and this material will be used in a “digout” application.
- Hoping to have this incorporated into project specifications as a “change order” for ACO South and full incorporation for Year 7 Overlays.
- Later this year Martin Marietta will be paving in one of our asphalt plant yards and will produce 40% RAP HMA to be sampled and tested by the County.
- Would like to approach other agencies interested in this concept, would like to place material in a similar capacity.

BBR – Modifiers for Asphalt Mixtures

Orland Mott

Ryan Merritt

Andrew Suarez

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HMA Modifiers

How do Project Owners identify the characteristics desired for the roadway? Are we making the right decisions for products on the specified roadway?

The BBR should evaluate all available Modified Asphalt Mixes incorporating modified asphalts and add-mixtures to achieve desired asphalt road characteristics.

Consideration should be paid to the cost / benefit analysis of Modified Asphalt Mixes, resulting lane miles, and the environmental impact of each.

HMA Modifiers

Pros & Cons of Asphalt & Modified Asphalt Mixes

Neat Binder standard mixes (includes RAP)

Current RAP Asphalt Concrete (up to 25% RAP)

Future RAP Asphalt Concrete (up to 50% RAP & all available additives)

Polymer Modified Asphalt Concrete (includes RAP)

Rubberized Asphalt Concrete (may include RAP)

Fiber Modified Asphalt Concrete (includes RAP)

Fiber Modified Polymer Asphalt Concrete (includes RAP)

Plastic Modified Asphalt Concrete (includes RAP)

Warm Mix Asphalt Concrete (includes RAP & all available additives)

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HMA Modifiers

Caltrans Section 92 definition of asphalt binders:
Asphalt binder and modified asphalt binder, as defined in Section 92, “Asphalt Binders,” of the *Standard Specifications,* are also referred to as asphalt or paving asphalt. Modified asphalt binder is asphalt binder that has been modified with polymers, crumb rubber, or both. Asphalt binder is used in hot mix asphalt, in asphalt-treated permeable base, as pre-coating for aggregate used in seal coats, and as a tack coat. Modified asphalt binder is used in rubberized hot mix asphalt. At normal ambient temperatures, asphalt is a solid and must be heated before it is mixed with aggregates or is applied as tack coat.
A contract’s special provisions may specify the type of asphalt to be used.
MS-22 Construction of Quality Asphalt Pavements and *MS-2 Asphalt Mix Design Methods*, both published by the Asphalt Institute, contain information on the uses of various types of asphalts and the design and production of hot mix asphalt.

NAPA defines as the following:
Polymers: These are the most common modifiers and include materials like styrene-butadiene-styrene (SBS) and styrene-butadiene rubber (SBR). Polymers enhance elasticity and improve the binder’s performance at various temperatures.
Rubbers: Ground Tire Rubber (GTR) is used to improve flexibility and resistance to cracking.
Plastics: Polyethylene and other plastic-based materials can increase stiffness and high-temperature resistance.
Chemical Additives: These can include anti-stripping agents, antioxidants, and other chemicals designed to improve specific properties of the binder.
Bio-polymers: These are environmentally friendly alternatives derived from biological sources, such as soybeans

San Diego County
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CERTAINTEED

RENUCORE RECYCLED ASPHALT PELLETS

SAINT-GOBAIN

THE CERTAINTEED & RENUCORE SOLUTION

Pre-Treatment of RAS

RAS IS GROUND

RAS is ground to industry standard 3/8 minus.

RECYCLING AGENT ADDED

Recycling agent added, pelletized and coated with a water-resistant shell to facilitate storage and transportation.

Stores/feeds like gravel.

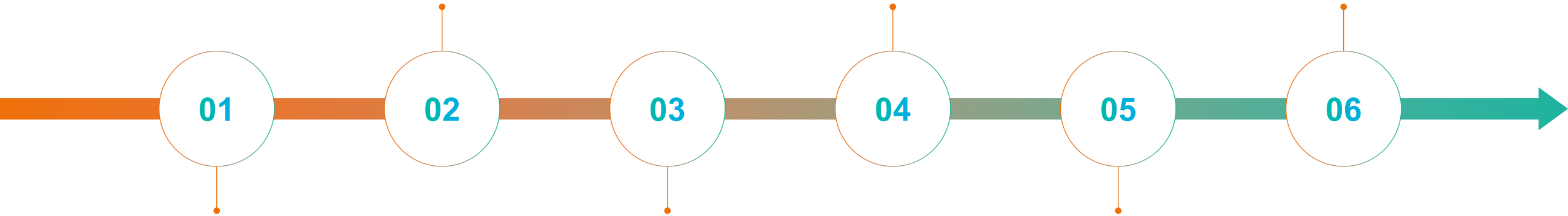
OXIDIZED ASPHALT IS SOFTENED

Softens oxidized asphalt to paving

PG grade.

QUALITY PRODUCT

RenuCore by CertainTeed RAS Pellets Contribute to a Quality Product



HIGH QUALITY BINDER

As confirmed by PG grading, pre-treated RAS pellets mix well in HMA and contribute to high quality binder.

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Fiberglass fibers in shingles contribute to reduced rutting.

REDUCED RUTTING

IMPROVED CRACK RESISTANCE

IDEAL CT testing showed improved resistance to cracking with the addition of RAS pellets.

No yield loss or separation of shingle materials within the process.

NO ADDED WASTE

NO HEAT OR SOLVENTS

Pretreatment process occurs without heat or solvents.

Hydrated lime and other additives within the proprietary formulation have been proven to increase asphalt performance.

ADDITIVE DELIVERY SYSTEM

PROJECT: RENUCORE PELLETIZING TECHNOLOGY – UNLOCKING EFFECTIVE RAS USE WHILE PRESERVING PAVEMENT QUALITY

2025 BBR Sustainability Project

PROJECT DEFINITION

- Provide Guidance Document on the use of up to 5% RAS pellets into HMA
- Demonstrate equitable performance of paving with 5% RenuCore pellets via Summer 2025 pilot paving project.

PROJECT TEAM

Dept of Public Works, Solid Waste Planning and Recycling
- Eric Wolff, April Andrews, Steve Weihe

CertainTeed
- Maure Creager, Kaley Laleker

TBD – External paving partner

PROJECT TIMELINE

- Guidance Document to BBR for initial review: Oct 2024
- Guidance Document published: March 2025
- Pilot Pave project selected: March 2025
- Pilot Pave: summer 2025

ENVIRONMENTAL & ECONOMIC DRIVERS

2025 BBR Sustainability Project

- Demand for increased recycled content in asphalt paving materials
- California is driver of lower carbon, higher recycled content materials, yet state and local specifications do not allow inclusion of RAS.
- County of San Diego landfill diversion goals
- Material cost savings

County of San Diego Climate Action Plan approved 9/11/2024

County Operations ZERO waste policy adopted to achieve zero waste by 2030

Update County's Strategic Plan to Reduce Waste to achieve 80% diversion by 2030 and 90% by 2045

Requirement to evaluate options to expand existing or identify new opportunities to manage hard to recycled materials.

PROJECT BENEFITS

ENVIRONMENTAL & ECONOMIC

- RenuCore pellet is 100% reclaimed material product
- HMA producers can increase recycled content, while maintaining RAP %
- C&D recyclers have a new value add product they can offer to the market
- Allows landfill diversion increase.
- Eliminates need for Shingle diversion exemption from C&D diversion requirements
- Provides SoCal region specific validation of product throughout the process, including: specification and guidance for use, laboratory quality testing and field testing
- Provides local roofers a recycling/diversion option to up sale their work; may see reduced tipping fees.
- HMA producers can save cost on virgin raw materials

THANK YOU

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Building Better Roads – SD County

Road Soup

Problems in the Industry

Why RoadSoup?

- The industry is currently going through an aggregate shortage and are running out of virgin materials
  - Discussions of trucking in Virgin aggregates out of state if trends continue
  - Using 100% RAP helps the industry save currently aggregate supply

- Landfills across the US entering a shortage of space
  - Instead of dumping at an end of lifecycle stage, RAP can now be reused in a larger capacity

- Environmental impacts are becoming more prevalent to agencies and they've begun internal discussions
  - Industry wide, conversations of Net Zero Emissions and Air Quality Impacts are becoming mainstream
  - Looking for ways to Reduce Carbon Emissions
  - Finding ways to reduce energy usage and consumption on projects
    - Cold Mixed / Cold Applied cuts Hot Box / Patch trucks energy consumptions and Asphalt Producers costs at the Plant

- Increasing Recycled Materials in mix designs are starting to become more mainstream, and agencies are looking for ways to push boundaries

- EPD's are becoming mandated in the coming years, and agencies need to have tested and tried solutions before they become required

Current Methods Being Used

How Agencies are currently performing asphalt repairs

- **Patch Truck / Hot Boxes for Patching Repairs with HMA**
  - Driving to and from plant daily to get 1-3 tons worth of material for patching
    - Typically getting more material than needed to keep HMA hot throughout the day
  - Using additional materials in this process to complete repair
    - Tact Coats, Soy based products for cleaning, Sand on top of repairs to open road for traffic
  - If leftover materials, need to dump at landfill or in yard to be picked up at later time/date
  - This is used for long term repairs until typically roads are repaved and/or sealer

- **Bulk Temporary Cold Mix**
  - Stockpiled material in the bunker at corporate yard
  - Used for "quick fix" repairs during inclement weather, weekends, and/or emergencies
  - Meant to be temporary, and when time allows, will come back to repair to remove and replace with HMA

- **Bagged Temporary Cold Mix**
  - Used during inclement weather, weekends, and/or emergencies for short term repairs
  - Typically for small potholes, utility cuts, and cracks
  - Meant to be temporary, and when time allows, will come back to repair to remove and replace with HMA

- **Paving Jobs –** Hot Mix Asphalt, Warm Mix Asphalt, Cold In Replace Recycling , Cold Central Plant Recycling

Industry Trends

Environmental impact and sustainability key imperatives

- **CA AB 2953** : Implemented January 1, 2024, with emphasis on using more recycled materials while using techniques that reduce Carbon Emissions
- **Advanced Clean Fleets Rule (ACF):** Starting January 1, 2024, affected fleets must purchase 50% EVs for their total vehicle purchases each year. By January 1, 2027, 100% of new vehicle purchases must be EVs. The main goal of the ACF rule is to significantly reduce nitrogen oxide emissions and greenhouse gases from the transportation sector, especially as heavy-duty vehicles are responsible for a disproportionate share of these pollutants.
- **Building Better Roads** : 5/6 Guidance Documents on BBR Website discuss Increasing RAP, Benefits of RAP, and Sustainability Initiatives on how to use more RAP. Throughout most meetings, the #1 discussed topic is RAP and how the industry is looking to use more in daily applications
- **High RAP Usage already being used**: High RAP usage is not new to the market. City of LA has been using 50% RAP in their mixes. Manhole Adjusting is starting to use 100% RAP HMA. CIR / CCPR – 100% Cold Mix capped with HMA layer on top.
- **Virgin Aggregate Shortages** : US is nearing (or already experiencing) virgin aggregate shortages
- **Asphalt Plants Being Shut down :** City of Irvine (AAA**),** Ajax Asphalt Plant (Flint, MI), Austin Industries (Dallas, TX), Bituminous Roadways (Minnesota, MN) - Overall, the pattern suggests a rise in community backlash against asphalt plants, particularly in areas with existing environmental stressors, and a growing movement toward stricter enforcement of air quality regulations across the country

Efficiency

Eliminates traditional 2-stage process whereby agencies (1) lay cold patch materials that are later (2) removed and replaced by HMA.

Cures almost immediately upon application, therefore reducing road construction delays

Durability

RoadSoup has lab and field testing to showcase the performance is comparable to Hot Mix Asphalt

Sustainability

Formula consists of 100% Recycled Asphalt Aggregates

Plus, full manufacturing and application processes are undertaken in cold conditions, allowing for significant emissions savings relative to HMA + improving compliance with “green” legislation

Convenience

Can be stored in bulk on-site (by the ton) for up to 6 mo. w/ no performance loss. No travel component (to or from Hot Asphalt plant)

Leftover material can be deposited right back into yard storage. No need to recycle / transport to landfill.

Time-Tested Product

Israeli RoadRenew has been applied to 1M Lane Miles since inception in 1986.

RoadSoup currently in advanced testing with U.S. Air Force and military facilities

RoadSoup currently in 7 U.S. States & Canada

Asset Value Protection

As RoadSoup is polymer-based, there is no need to leverage soy-based cleaning solvents on equipment - prolonging machinery life and reducing required downtime

Road Soup

Product Overview: Asphalt/Concrete Repair

Asphalt Repair

- For use in applications with Asphalt, concrete & dirt roads
- Premium asphalt and skin patch repair that rejuvenates the road's driving surface
- Pothole repair, Trench repair, Manhole & value surrounds, Utility Cuts , Dig-Outs
- Ability to Pave Roads as a true Surface layer
- Available in Bags and Bulk
- Virtually used as HMA with the convenience of time and cold material

Concrete Repair

- For use in applications for concrete sidewalks
- No Water or Mixing Required , Ready for Traffic Immediately
- Available in Bags and Bulk
- Premium concrete and sidewalk repair quickly fix cracks, bonds to concrete, sidewalks, and asphalt Cost-effective, faster to apply, and safer to use than epoxies and resins

Benefits

- **No water & mixing required**
- **Applicable in any weather rain or shine (hydrophobic)**
- **Polymer based vs. Emulsion**
- **Ready for us immediately after installation**
- **Non-sticky, easy to install**
- **Environmentally friendly**
- **Apply in any temperature (above -20 deg F)**
- **Made from 100 % recycled asphalt aggregates**
- **1 year shelf life in Bags**
- **Available in bulk**
- **Cold mixed and cold applied**

Road Soup

Environmental Benefits

Sustainability Benefits

- RoadSoup utilizes 100% Recycled Asphalt Aggregate's in the Mix Design (leading to the reduction of virgin aggregate usage)
- RoadSoup uses between 1.6 – 2.8% Binder in the mix (of which roughly 50% is PG Bitumen, leading to a reduction of Liquid Asphalt used by total weight)
- When mixing and applying RoadSoup, the process is at ambient temperature , leading to the reduction of Carbon Emissions while also lowering the amount of energy used during the manufacturing process.
- Our Polymer Binder contains 0 VOC's unlike most Cold Mix Materials on the market
- RoadSoup allows the flexibility on projects to mill a rural road, grind and crush RAP on site, and re-pave using 100% Millings onsite. This process can save tremendously on Fuel, Labor, Materials, and Trucking Costs to and from the job site

Convenience Benefits

- RoadSoup is Polymer based, meaning that the material is non-sticky and will not require heavy use of solvents to clean equipment after daily use
- When using RoadSoup, we do not require a tact coat, leading to quicker repairs and less overall cleaning at the end of the day
- Compared to HMA, RoadSoup can be stockpiled in the agencies yard or trucks overnight , eliminating the travel time & gas to and from the asphalt plant daily
- As RoadSoup has the capability of long-term shelf life, the material can be reused and thus does not require being sent to a landfill to dump wasted materials at the end of the day
- RoadSoup is a hydrophobic material and can be used directly in water/ wet areas, extending the calendar days for agencies to make repairs
- As RoadSoup does not need to be heated, it gives more flexibility on equipment needed to perform long term repairs for agencies that are smaller in crew size, patch trucks, etc.

Road Soup

BBR Next Steps

Step 1 - Develop Guidance Document***

1. Develop Guidance Document outlining the benefits of RoadSoup both in Sustainability and Performance
2. Work with local Agency's Engineering department to outline beneficial factors from an Agency's standpoint (in discussions with Encinitas currently, but happy to work with as many agencies that are interested)
3. Develop a comprehensive testing plan that showcases performance compared to Hot Mix Asphalt
4. Construct a "Go To Market Pilot Plan" that an Agency can adopt to put RoadSoup in the field to test and monitor.

Step 2 – Pilot Program for Surface Layer Grind-Outs

1. In working with a local Agency, identify troubled / failing areas where we can perform larger grind-out / dig-outs using RoadSoup instead of HMA patching.
2. Grind / Mill / Cut failing areas, remove and replace failing asphalt, sweep / clean the area, fill and compact with RoadSoup
    1. No tact coat, No HMA on top; RS is immediately ready for traffic upon compaction
    2. Depending on size, regular steel roller compactor is preferred
3. RoadSoup 100% RAP Cold Mix will be used as a surface layer and undergo testing procedures similar to HMA test plans
4. Monitor performance and perform tests laid out in Guidance Document / Predetermined Test Plan

Step 3 – 2" Mill and Overlay on Low Traffic Road

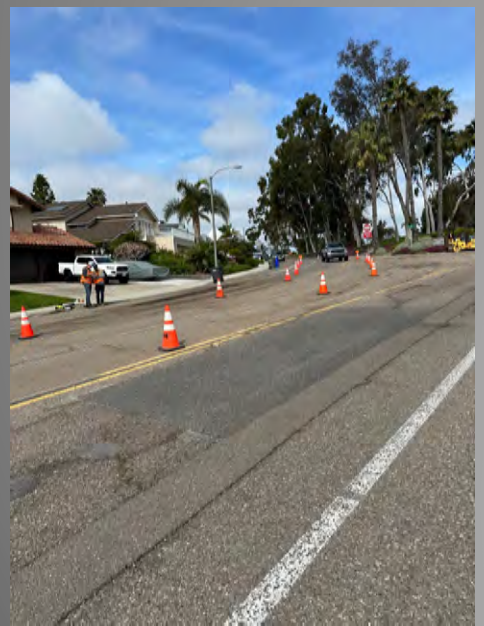
1. Perform Routine 2" Mill and Overlay paving pilot of "X" tonnage to showcase RoadSoup's ability to be an alternative to traditional Hot Mix Asphalt paving in a low-medium traffic road.
2. Monitor performance and perform tests laid out in Guidance Document / Predetermined Test Plan

Road Soup

MnROAD Paving Pilot

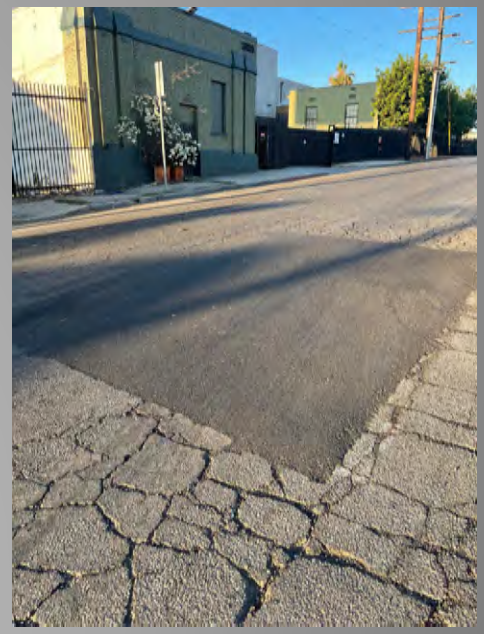
MnROAD Paving Pilot

Encinitas



City of Perris

LA County



Road Soup

AGENDA

- 1) Sign-In /Meeting Overview
- 2) Public Comments
- 3) Welcome Message
- 4) Industry/Organization Updates
- 5) 2024 BBR Recap
- 6) 2023 Subcommittee Wrap Up Presentations
- 7) 2024 Subcommittee Updates
- 8) Next Working Group Meeting / Close

BUILDING BETTER ROADS San Diego County

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Meeting Adjourned