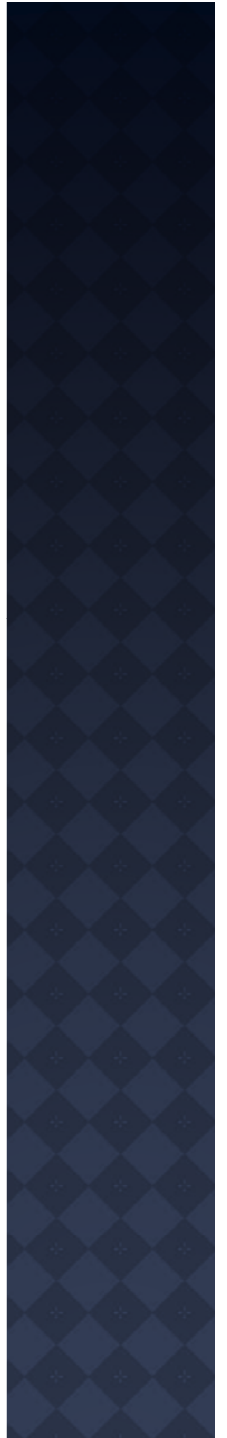


# A STRATEGY FOR ENCOURAGING MORE RAP USAGE BY CERTAIN AGENCIES

RAP ETG Meeting  
Seattle, WA  
Dec 2009

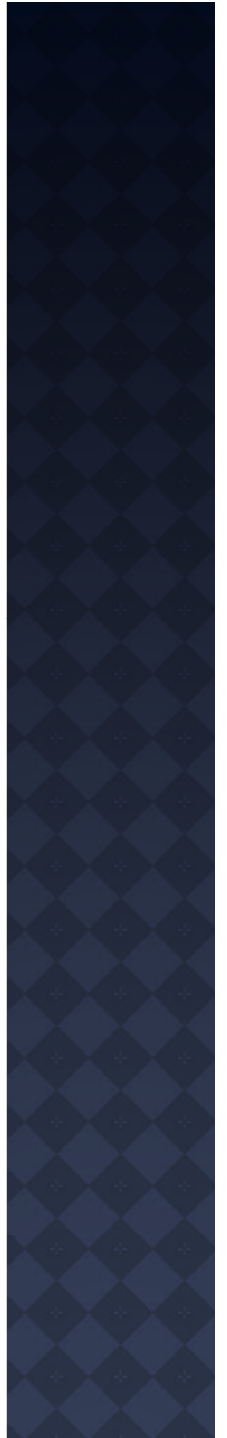
# SUBCOMMITTEE

- ◎ Cecil Jones
- ◎ Jim Musselman
- ◎ Ron Sines
- ◎ Randy West



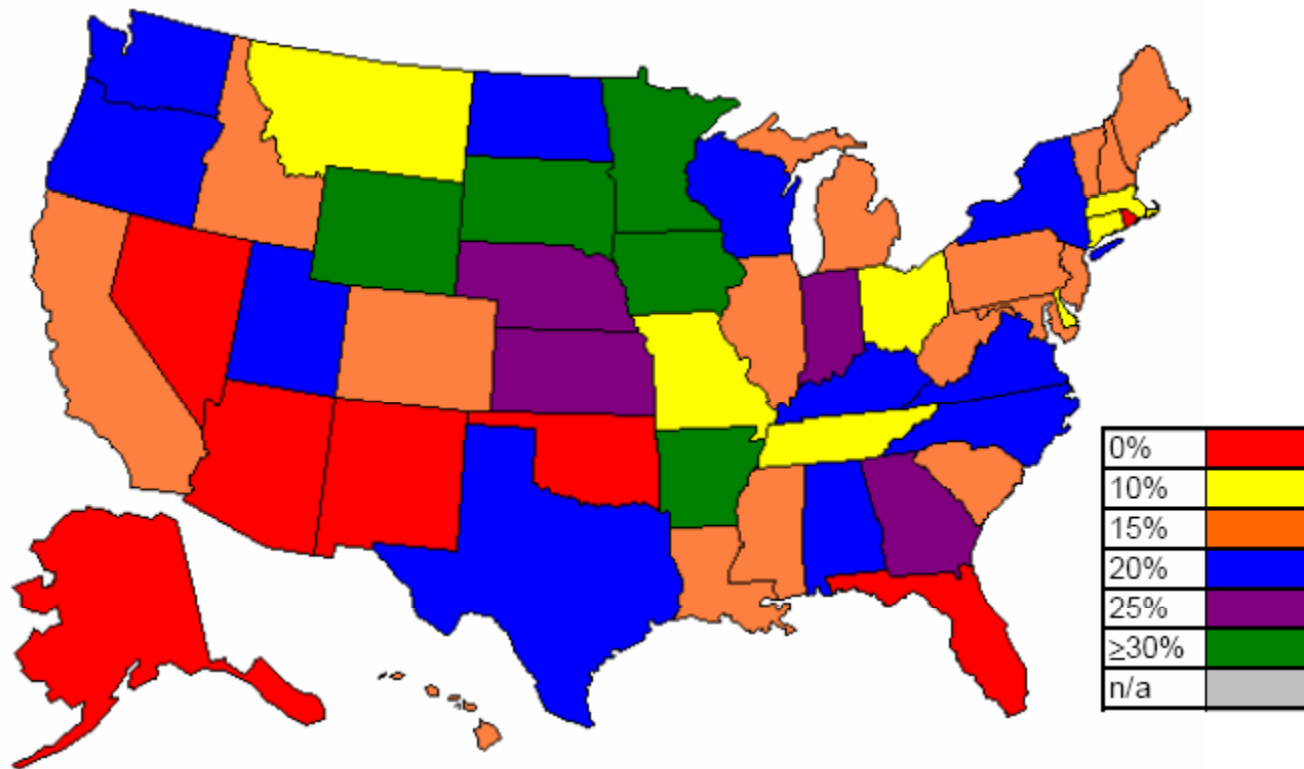
# WORKING STRATEGY

- ⦿ Identify Target Agencies
- ⦿ Identify Each Agency's Specific Barriers
- ⦿ Assemble Persuasive Information
- ⦿ Meet with Agency to Provide the Information and Discuss Barriers
- ⦿ Follow Up





## Surface Mixes -- Allowed



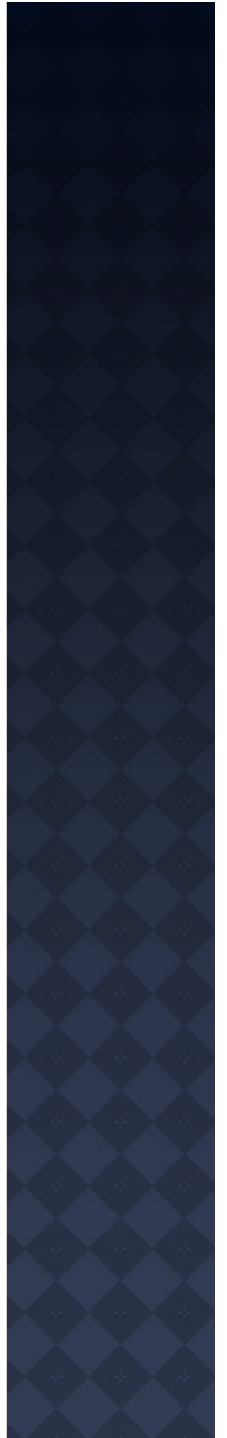
# TARGET AGENCIES

- ⦿ Agencies that do not allow RAP in Surface Mixes
  - Alaska
  - Nevada
  - New Mexico
  - Oklahoma
  - Rhode Island
  - Federal Lands?
- ⦿ Agencies that limit RAP to 10% in Surface Mixes
  - Montana
  - Tennessee
  - Delaware
  - Massachusetts

# SUBCOMMITTEE ASSIGNMENTS

## ◎ Identify Barriers

- Agency
  - Cecil Jones
  - Jim Musselman
- Contractors
  - Ron Sines
- State Asphalt Pavement Association
  - Randy West

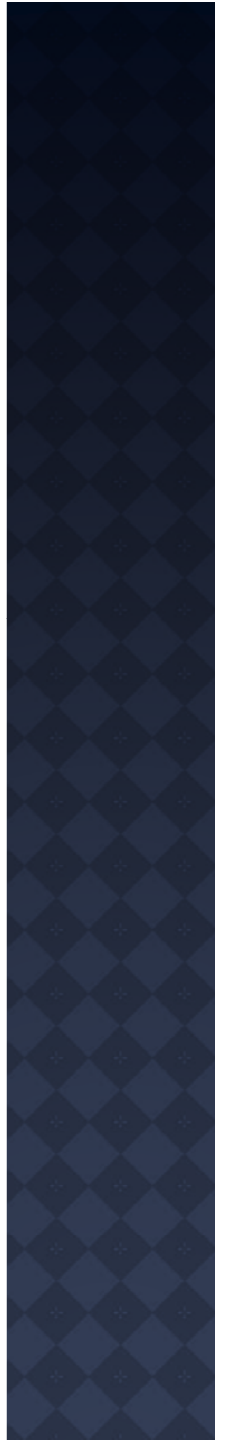


# ALASKA



- ⦿ ADOT: Michael San Angelo/Newt Bingham
- ⦿ RAP use a Regional decision
  - Some allow RAP in wearing courses; some don't
  - Permitted in lower layers
- ⦿ Industry and Agency not overly familiar with RAP; lack of experience an issue
- ⦿ Previously: Minimal interest in its use
- ⦿ Currently: Looking at changing RAP policies in the near future based on increase in Industry's interest.

# PERSUASIVE INFORMATION NEEDED ALASKA



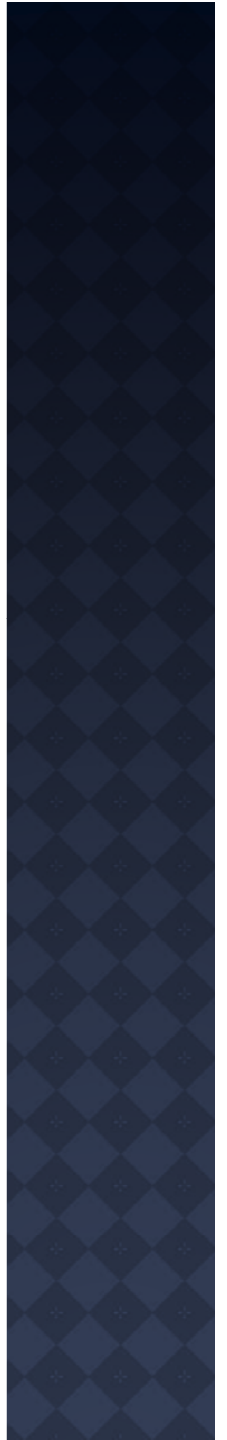




# NEVADA

- ◎ NDOT: Darren Tedford
- ◎ Don't use RAP in any mixes
  - Will try an experimental project w/10-15% RAP in the Spring of 2010
- ◎ Concerned with reduced binder quality
  - Use SBS modification in all mixes (64-28NV)
- ◎ Don't want to reduce life expectancy of pavements
  - Typically mill and overlay ~2" generally one lift
- ◎ Concerned with reduced fatigue resistance
  - Based on beam fatigue data

# PERSUASIVE INFORMATION NEEDED NEVADA

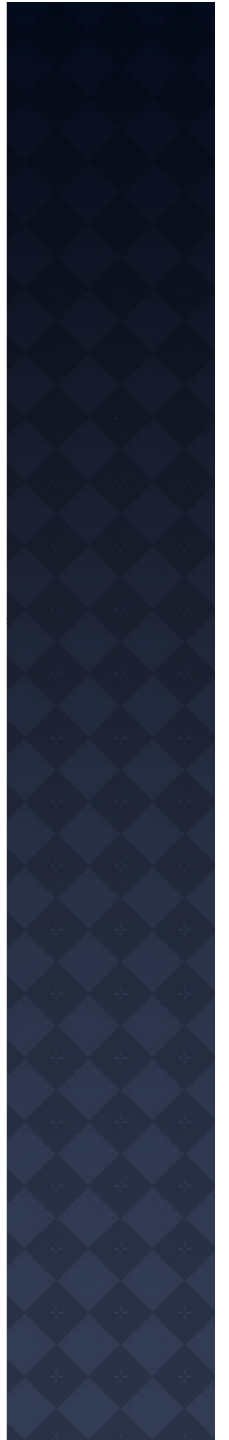


# NEW MEXICO



- ◎ NMDOT: Bryce Simons
- ◎ Allow <15% RAP in final structural layer\*
  - \* Decision made by Project Manager, not Central Office, so it depends
- ◎ ≤ 30% lower layers
- ◎ Do not allow RAP in OGFC
- ◎ Concerns with:
  - RAP variability
  - Stockpiling practices
  - Accurate binder content determination

# PERSUASIVE INFORMATION NEEDED NEW MEXICO





# OKLAHOMA

- ODOT: Danny Gierhart (former ODOT employee)
- All RAP used must be “fractionated” for any application
- <0.3 million ESALs, and other limited applications, allow up to 25% RAP in surface course
- Internal agency issues; reluctance to use RAP due to:
  - Fear of contaminants in RAP
  - Oversized particles (+2”) not breaking down
  - Specifications written to take very restrictive view of “undocumented” RAP
- Fractionation - new requirement (not really how we may define fractionation)



# OKLAHOMA (CONT'D)

## ⦿ Intermediate Layers:

- Temporary detours - max 35% RAP
- Max 25% RAP w/ 64-22 binder
- Max 15% RAP with polymer (70-28, 76-28)

## ⦿ OAPA:

- ODOT does not allow RAP in the surface course. Their reasoning is due to some past failures and poor performance with RAP due to contamination of RAP piles. Some of the continued thinking on ODOT's part is perceived, not actual.

# PERSUASIVE INFORMATION NEEDED OKLAHOMA

- ⦿ Explanation of the benefits of using RAP
  - DOT continues to view RAP as a waste material
  - Question if RAP resources are being used to best value when used in maintenance applications (ownership retained by ODOT in many cases)
  - Turnpike specifications seen as even more restrictive, not allow the use of RAP in surface mixes, even if they are overlaid with surface treatment or OGFC
- ⦿ Perception is the key barrier to movement, current perception being driven at the Top Levels of the organization
- ⦿ Need to address RAP stockpile management, and testing
- ⦿ DOT requires fractionating RAP, contractors getting around requirement by over processing RAP to finer fraction

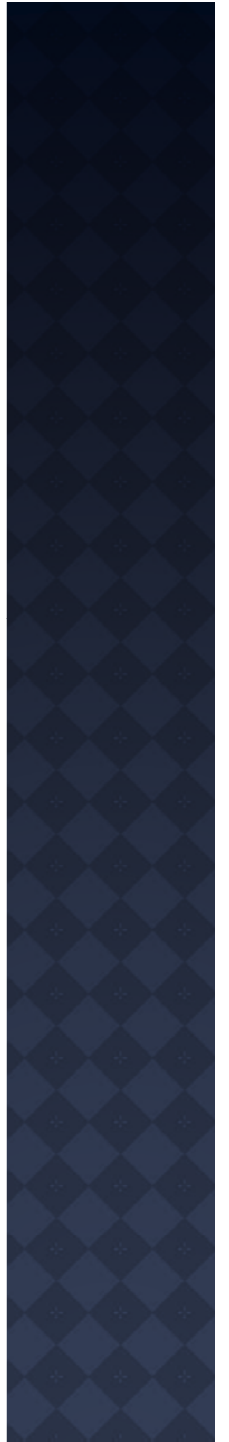


# RHODE ISLAND

- ◉ RIDOT: Mike Byrne
- ◉ Routinely use ~25% RAP in base & intermediate layers
  - None in surface layers
- ◉ Concerns w/fatigue cracking and dust
  - Surface mixes would age more quickly
- ◉ Recent trials w/surface mixes - higher cost
- ◉ Upcoming research project to evaluate fatigue cracking
- ◉ Contractors reluctant to properly manage stockpiles



# PERSUASIVE INFORMATION NEEDED RHODE ISLAND

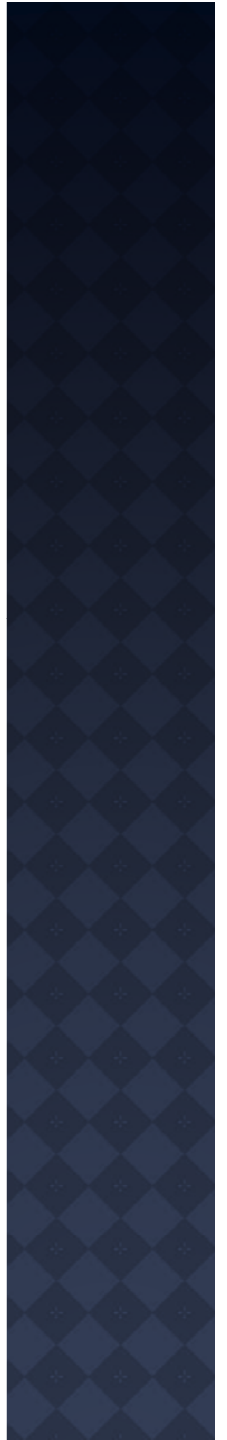




# FEDERAL LANDS

- Western Federal Lands: Brad Nietzke
- Current specs do not allow RAP in top lift;
  - However, current practice is to allow:
    - $\leq 20\%$  RAP in all layers with no binder change
    - 21 - 25% RAP requires binder change
    - Max 25% RAP
- Previously had issues with RAP variability
  - No longer believe that is an issue

# PERSUASIVE INFORMATION NEEDED FEDERAL LANDS





# TENNESSEE

- ⦿ Agency Contact: Mark Woods
- ⦿ 10% limit was changed 2 - 3 years ago through Supplemental Agreements
  - Allowed up to 15% RAP in wearing course if RAP was screened over 1/2" screen.
- ⦿ Feb 2009: Allow up to 20% RAP in the wearing course if RAP is fractionated.
  - Only for non-modified binders (64-22 & 67-22)
  - For modified binders, max allowed is 15%
- ⦿ Limits are based on concerns over reduced fatigue life

# TENNESSEE



## ◎ TRBA

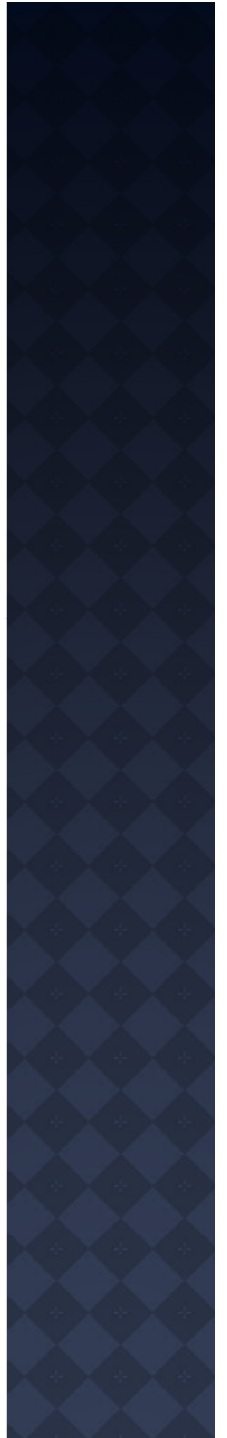
- TDOT specs changed a few years ago to allow RAP in surface mixes:
  - PG64 or 67-22: max 15% Processed RAP, 20% Processed & Fractionated
  - PG 70, 76, or 82-22: max 10% Processed RAP, 15% Processed & Fractionated
- Main concern from Materials Division with long-term performance
- Current spec is based on UT study that found up to 20% would not be detrimental
- New UT research looking at RAP & WMA combo

# PERSUASIVE INFORMATION NEEDED TENNESSEE

- ◎ Test data / performance history:
  - showing the fatigue performance of RAP mixes
  - showing the impact of RAP when used in mixes containing modified asphalts

# THE NEXT STEP

- ⦿ Assemble Persuasive Team
- ⦿ Request Meeting with Key Agency Personnel
  - Invite key contractors and asphalt association



# FUNDING

- ◉ Travel for Persuasive Team

