

## HMA Recycling Expert Task Group Meeting

April 22 & 23, 2009  
Manchester, NH

The purpose of this ETG is to coordinate, develop, and improve national guidance and recommendations for the asphalt pavement recycling program. This group will provide feedback as well as encourage correct utilization of recycling technologies and address construction problems with current state-of-the-practice solutions.

### Wednesday, April 22

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|------------------|---|
| 8:00 – 8:30 am   | Welcome (Huber and Kvasnak) <ul style="list-style-type: none"><li>• Approval of minutes</li><li>• Follow-up about existing high RAP projects</li></ul>  |
| 8:30 – 9:00 am   | Best Practices (Copeland) <ul style="list-style-type: none"><li>• Review best practices document developed by FHWA</li><li>• <i>Goals:</i> Determine format for best practices, identify additional information to add</li></ul>  |
| 9:00 – 10:00 am  | Update RAP Obstacles (West) <ul style="list-style-type: none"><li>• <i>Goals:</i> Identify addressed obstacles and new obstacles, outline a research needs statement for NCHRP, volunteers for writing research needs statement.</li></ul>  |
| 10:00 – 10:15 am | Break   |
| 10:15 – 11:45 pm | Discussion of Binder for RAP Mixes (Bahia) <ul style="list-style-type: none"><li>• Forum discussion of information concerning virgin binders selection, use of polymer binders, and evaluating blended binder</li><li>• <i>Goals:</i> Identify whether current AASHTO method is appropriate or needs to be revisited; identify methods for selecting virgin binders and limitations to binder selection; and identify methods for evaluating blended binders.</li></ul> |
| 11:45 – 1:15 pm  | Lunch   |
| 1:15 – 2:45 pm   | Discussion of RAP Aggregate Extraction (Hajj) <ul style="list-style-type: none"><li>• Forum discussion of information concerning extraction of RAP aggregates</li><li>• Discuss ARC Progress Report and ARC-NCAT Aggregate Extraction Study</li><li>• <i>Goals:</i> Identify methods and solvents available, identify issues associated with each method, identify the best method for extracting aggregates</li></ul>  |
| 2:45 – 3:00 pm   | Break   |
| 3:00 – 3:30 pm   | Summary of RAP Survey (Jones)   |

- 3:30 – 4:30 pm Discussion of Increasing RAP Information (Kvasnak)
- Forum discussion of information needed to increase RAP usage in the states with low or no RAP
  - Discuss RAP Brochure and NCHRP 09-33 Manual (Ch. 9)
  - *Goals:* Establish goal of trips, identify target agencies, identify material available for states to review, identify material that needs to be developed.

4:30 – 5:15 pm Illinois Tollway RAP Research (Bentson)

Thursday, April 23

8:00 – 8:15 am Morning welcome (Huber)

8:15 – 9:15 am RAP Usage in NH Now and the Future (NH DOT)

- Presentation on NH usage followed by discussion with ETG members on obstacles in NH
- *Goals:* Identify obstacles that NH has, identify solutions to obstacles

9:15 – 11:00 am Discussion of RAP Percentage Based on Binder (Sines)

- Forum discussion of basing RAP percentage on binder contribution in lieu of total RAP
- *Goals:* Identify states that use this method, identify obstacles to method, identify solutions or research needs to overcome obstacles, identify if RAP ETG supports method in lieu of total RAP contribution

11:00 – 12:00 pm Review of Goals (Huber)

- Summarize goals accomplished
- Identify goals for next meeting
- Schedule next meeting

# **RAP ETG Minutes**

**April 22-23, 2009**

## *April 22, 2009 Minutes*

### **Opening of Meeting – Gerry Huber**

Gerry Huber welcomed members and friends to the meeting. The minutes from the previous meeting were approved. Gerry Huber reminded members that information about existing and new high RAP pavements is needed. The information should include construction information, available laboratory data, and available field performance.

Jon Epps suggested collecting performance information of the 80% high RAP pavements constructed in Nevada in the 1970s. John D'Angelo commented that FHWA documented over 30 RAP projects that were constructed in the 1970s as part of Demonstration Project 39. Audrey Copeland will locate the reports and have them digitized to be dispersed amongst the RAP ETG members. Mr. Rawson said there was a 35% RAP project constructed in 1989 in NH. Jack Weigel and Gerry Reinke commented that 70% RAP mixes have been placed in Wisconsin. Randy West noted that NCAT is currently compiling SPS5 LTPP site information and summary of data processing thus far is available on the RAP ETG website. Elie Hajj mentioned that Louisiana constructed several RAP pavements in 1996 and it is documented in an AAPTTP 05-06 Report(<http://www.aaptt.us/Report.Final.05-06.pdf>).

There are several high RAP pavements planned or in the process of being constructed. The Illinois tollway is constructing several sections of RAP mixes and it is being well documented and evaluated. Part of ARC work will include field monitoring of a high RAP project in Manitoba with 70% RAP (up to 80% RAP), using conventional, old drum hot plant. FHWA Mobile Asphalt Trailer continues to be concentrating on aiding State DOTs with high RAP and WMA projects. There are additional upcoming projects in NM (2009) and NH (2010).

### **Best Practices – Audrey Copeland**

The FHWA State-of-the-Practice and best practices document was distributed. All members are expected to review and provide comments by May 29, 2009. In particular, Dave Newcomb will review Chapter 1, Kent Hansen and Randy West will review the plant productions and placement best practices, and Jim Musselman will distribute to FL area contractors for input.

### **RAP obstacles – Randy West**

The top 10 RAP needs developed at the first RAP ETG was revisited. The group decided to keep the list as is but planned for certain items to be removed by the next RAP ETG. It is anticipated that the best practices document will be removed from the list due to the progress that has been made on developing the document. The group agreed that low temperature binder grade changes need to be accounted for in a RAP mix design. Work by Ray Bonaquist and Becky McDaniel could be a start to answering low temperature

binder issues along with finding and evaluating SPS 9 sites. Binder blending and fractionation continue to be issues that should be researched. WRI has conducted work that evaluated binder blending. Binder blending appears to vary from plant to plant based on recent evaluations. Recommendations for determining the appropriate virgin binder are needed. Recommendations for determining  $G_{sb}$  is also needed. Recommendations on land space and equipment when upgrading a plant for high RAP usage is also needed.

The availability of RAP and cost of virgin pavement materials will be main factors in determining if contractors will use RAP. Solvent extractions for high RAP mixes is still seen as an issue by contractors. Lack of millings in non-urban areas can limit the available RAP. State agencies and contractors still need to be encouraged to use more RAP in some areas (See Cecil Jones's survey on RAP usage to identify areas that need encouragement). These agencies and contractors can meet with RAP ETG members. It was also agreed that in some cases high RAP may not be appropriate due to the local materials or plant limitations.

A small team working on the best practices document should also identify states, agencies, federal lands with low usage, then assemble information to help state to get to norm, then making visit. The team consists of Ron Sines, Cecil Jones, Jim Musselman, and Randy West. Cecil Jones will be the leader and the goals will be: (1) identify agencies, (2) identify restrictions (feedback from industry), and (3) assemble information for target agencies, etc.

### **Discussion on Binder for RAP Mixes – Lead by Hussain Bahia**

Hussain Bahia led a discussion on binder for RAP mixes. He presented the Asphalt Research Consortium's (ARC) work on grading binder without extraction/recovery. The evaluation consists of producing a RAP mix and testing the material in the BBR at 0°C. The results of the RAP mastic are then compared to PAV binder BBR results. John D'Angelo commented that the high temperature (180°C) used to produce the BBR RAP specimens may not be practical and induce excessive hardening of the asphalt. Gerald Reinke expressed a concern that the process seems cumbersome and it might be better to use actual mix like what is being done at the University of Minnesota. University of Minnesota is using the BBR to determine the stiffness of beam slivers cut from cores. When validating the work, low RAP percentages along with high should be considered. Becky McDaniel suggested mixing unaged virgin binder with the RAP and then PAV aging the material. UNR is evaluating the draft protocol. Hussain Bahia would like NCAT to also review the protocol.

The use of polymer modified virgin asphalt was also discussed. Hussain Bahia plans on evaluating a PG 78-22 using the BBR method developed at University of Wisconsin. John D'Angelo commented that work on RAP aging and polymer networks is underway at LSU. Jon Epps mentioned that asphalt rubber and RAP mixes should be considered and that some work was completed in the 80s/90s on it. John D'Angelo commented that there is a concern with using asphalt rubber in cold climates and that rubber may absorb the light oils yielding a stiffer mix. Ross Bentson mentioned that the Illinois tollway will use ground tire rubber (terminal blend) in surface a surface mix. Jim Musselman commented that Florida uses ground tire rubber in upper lifts.

### **Variability of RAP Presentation – Randy West**

Randy West discussed RAP variability. John D'Angelo commented that the overall stockpile should be looked at and then RAP is not more variable; however, there is a chance to have more segregation leading to more variability. Gerry Huber reminded the group that poor stockpiling practices can lead to more variability in the RAP which is also true for virgin aggregate.

The variability of the asphalt was discussed. John D'Angelo has seen RAP asphalt content standard deviation as low as 0.1 while Jon Epps has seen typical ranges between 0.2 to 0.25%. It was agreed that an acceptable standard deviation of RAP asphalt contents should be established and should be included in the best practices document or a stand alone document. Randy West will publish documentation, on the NCAT website. He needs help from the other ETG members in collecting stockpile data. Jon Epps suggested that Adam Hand be contacted to obtain information from the WesTrack reports. Ron Sines said that Old New England has quarry data.

### **Discussion of RAP Aggregate Extraction – Elie Hajj**

Elie Hajj gave a presentation on a cooperative research project between FHWA, University of Nevada Reno, and NCAT that evaluated two solvent extraction methods and the ignition oven method for extracting aggregates. The study evaluated virgin aggregate properties and extracted aggregate properties from laboratory produced RAP. John D'Angelo commented that you need to look at the single values and not the average values. The evaluation should include comparing the measured results to estimated results such as the  $G_{mm}$  method for estimating the  $G_{sb}$ . John D'Angelo commented that mixing without asphalt leads to more abrasion, this may overstate effect of mixing, statistically may be negligible for significant differences in methods. Dean Maurer asked how is the use of chlorinated solvents affecting results as compared to other solvents? Andrea Kvasnak showed the graphs that illustrated the differences in VMA due to measured  $G_{sb}$  differences. D'Angelo commented that the Watsonville granite is not really granite, but gneiss; therefore, the centrifuge will tear it apart, so results for centrifuge (differing from reflux and ignition) makes sense. Jon Epps said the Handley aggregate included in the study is more degradable than the Watsonville aggregate. Becky McDaniel was concerned about dolomite aggregates; the ignition oven changes the aggregate chemically but does not affect the volume, does not pick up gradation change. The group suggested that the properties that should be considered most important when recommending an extraction method are  $G_{sb}$ , absorption, and asphalt content. The aggregate properties that are of secondary interest are coarse and fine aggregate angularity and LA abrasion. Jon Epps commented that evaluating sand equivalent, cleanness, and durability is not needed. Elie Hajj and Andrea Kvasnak will send report out to RAP ETG members before the next meeting and the ETG can decide which extraction method is best and make a final decision on the aggregate properties that are most important.

### **Update on RAP survey – Cecil Jones**

Cecil Jones gave a presentation on an updated RAP survey sent to state agencies. Not all of the states have responded and Cecil Jones plans on contacting the states that have not

replied. Several members commented that responses for some states were not correct (e.g. CA, NV, and others). Jim Musselman commented that since the last survey, Florida has increased its allowable RAP usage in the surface from none to 15%. Andrea Kvasnak commented that it would be good to highlight such states as Florida that have increased RAP usage by including a symbol in the maps to represent an increase in RAP usage. John D'Angelo indicated that a question has arisen regarding mandating RAP use in unbound material - does anyone pay for trucking material certain distance? It was also asked if federal participation could be part of trucking RAP to a specific location?

Jon Epps commented that we should show the percentage of HMA produced with RAP and the average percent for surface courses. He said that the information could be used to convert to energy savings and sustainability. Dave Newcomb commented that about 60-70 million tons of RAP out of 100 million goes into HMA based on a NAPA survey.

John D'Angelo commented that the concrete industry says that the BTU energy that asphalt uses has to be accounted for. Dave Newcomb noted that concrete industry says that energy embodied in asphalt should be accounted against it. That energy is carbon that is not being burned but is being sequestered in material and not released into atmosphere.

Audrey Copeland commented that a question about shingle usage should be included in subsequent surveys. Dave Newcomb commented that we could just use the results from the survey sent out by the shingle organization. He also commented that someone from the group should contact the shingle organization to obtain the information. Jon Epps commented that the shingle recycling forum will be in November 2009.

John D'Angelo said we need to have a discussion on basing RAP percentages not on total weight of the mix but on the percent of RAP binder.

Cecil Jones expects to complete survey in the next month (by the end of June). He will send the finalized results of the survey to Andrea Kvasnak to post on the RAP ETG website as soon as possible.

## **Discussion on Increasing RAP Information – Lead by Andrea Kvasnak**

At previous meetings the RAP ETG has expressed an interest in developing information that can be sent to agencies with low or no RAP usage. The initial plan had been to develop “SWAT” teams to go to states with low RAP usage.

Dave Newcomb discussed the brochure that Ron Sines and he had prepared titled How to Increase RAP Usage and Ensure Pavement Performance (document sent to ETG members prior to meeting for review). The goal of the brochure is to “get foot in the door” with States with low or no RAP usage and then follow up with best practices document developed by RAP ETG members. Sines commented that the initial document needs to be easy to understand by someone without much experience with RAP and needs to emphasize financial benefits of using RAP. John D'Angelo felt that it should be more technical if it is being put out by the RAP ETG. Dave Newcomb commented that a decision making level person may ask why we don't use RAP now and that is the group of people Ron Sines and he were targeting. He also commented that the last thing want to do is come up with something that may cause legislative mandate of RAP.

## **Performance of Recycled Pavements – Randy West**

Randy West gave a presentation on the performance of the LTPP high RAP sections. The performance of these sections was summarized as part of a research project by Jenna Michael, a graduate student at Auburn University. John D'Angelo commented that an evaluation comparing the milled sections to sections without milling should be compared and used to promote milling. He also commented that using percentage of sections with cracking is not the best way to present data and a better way would be to present the extent of cracking. Becky McDaniel agreed that some of the data needs to be presented better. Jim Musselman said that if the information is to be used as a sales pitch, just show numbers in little box or use as diagnostic tool to identify performance issues with RAP that we should be aware of.

John D'Angelo commented that we need to convince NH to have Jo Daniel to evaluate section they are replacing that is 35% RAP and is 20 years old. Becky McDaniel said that some LTPP sections were built before PG grading so with 30% RAP we don't know what we have therefore it is critical to get mix design information from LTPP tech support. Randy West commented that we do not have the mix design information; it is not included in the database.

Randy West commented that the LTPP sections were constructed in 1995 to 1999. This data shows that overall we are getting equal performance from RAP mixes. Jon Epps said rutting does not look significant, fatigue cracking does not look significant, transverse cracking appears to be the only one that may have significant difference based on engineering judgment.

Randy West said he plans to do statistical t-test to compare virgin and RAP sections. Gerry Huber suggested plotting the data as a CDF and evaluate how close the lines are. John D'Angelo suggested using frequencies instead of percentages. Jon Epps suggested obtaining photographs of sections that were taken as part of the LTPP study. Gerry Huber also suggested plotting charts per geographical area.

## **Discussion of NCHRP 9-33 Recommendations – Led by Andrea Kvasnak**

The goal of the discussion was to provide comments from the RAP ETG to Ed Harrigan. Gerry Huber and John D'Angelo commented that flat and elongated should not be listed as a property of concern for RAP. Becky McDaniel disagreed. Jon Epps commented that some regions like the SW require a grade bump at 15%. Kvasnak commented that this could be amended by adding a caveat that regional materials should be considered. Jim Musselman commented that the quality of aggregate in RAP may limit max amount of RAP. Gerry Huber commented that the flow chart on page 9-5, split at 15%, reads like a textbook and is not practical. Gerry Huber said that contractors could use Bahia's approach to characterize RAP about once/year, but not for every design.

Becky McDaniel stated that an asterisk should be added to the 15% "or more as determined by agency". Jack Weigel commented that recommendations should not be too stringent because it may discourage RAP usage.

Gerry Huber/Dave Newcomb said that even with areas that use a variety of grades, you still get consistent RAP and can't tell difference within RAP stockpiles. Gerry Huber said that IL used to require extraction/recovery and Heritage's results were

incredibly uniform. John D'Angelo looked at PAV data and stiffness values of binder and found that it does not change; however m-value changes significantly.

The group discussed the amount of sampling needed. Randy West commented that samples should be taken from a RAP stockpile as it is built. The current sampling frequency tends to vary between states. Many of the members agreed that as the RAP percentage increases, contractors are going to need to be willing to sample and test more. John D'Angelo suggested that RAP sampling be based on RAP variability. Gerry Huber stated that NCHRP 09-33 is a good research report but it is not a practical mix design manual and cannot possibly address all variables. It was decided that NCHRP 09-46 should include some of the recommendations from the RAP ETG which would address some of the issues with NCHRP 09-33.

## ***April 23, 2009***

### **IL Tollway presentation – Ross Bentson**

Ross Bentson gave a presentation on the usage of RAP in the recent construction for the Illinois Tollway. Several different types of mixes were placed as part of the reconstruction. Existing pavement was milled and material was used in new construction. 50% RAP bases were placed. An SMA was constructed that contained 15% RAP. 20% RAP was used in a surface mix. Ground tire rubber used in one mix. A WMA was also used on the project.

The University of Illinois Center for Transportation (ICT) is evaluating the mixes placed. The final report from the University of Illinois can be found at <http://ict.illinois.edu/Publications.asp>. ICT conducted beam fatigue, dynamic modulus, and indirect tensile strength testing. Andrea Kvasnak asked why cold temperature testing was not conducted and Ross Bentson stated that it will be looked at next. Bentson also commented that Sam Carpenter will also compare the differences between binders and RAP sources. Jon Epps suggested that the researchers look not just at the slope the Nf-strain line but at the endurance limit when evaluating the fatigue data.

The presentation states that there was \$10 million in savings. The cost savings were estimated based on bid prices from similar mixes that were 100% virgin materials. Ron Sines cautioned against using just the bid prices since the time of bidding will impact the price. He wanted to know if the bidding occurred during the economic downturn. He stated that the numbers are encouraging but that a brief should be written quantifying the savings.

### **NH's Recycled HMA Specification – Dennis Boisvert**

The New Hampshire DOT is in the process of re-writing their RAP specification and Dennis Boisvert gave a presentation on the changes. The previous specification did not allow for RAS (tear-offs and manufactured waste) and the new specification does. NH DOT also loosened restrictions on RAP stockpiles and are looking at total recovered binder (TRB) in lieu of total weight of RAP. NH DOT established three TRB levels. As the TRB increases so do the testing requirements. The traditional binder bumping is not seen as necessary, in cases of high TRB a binder bump may be used for the low temperature end of a PG. NH DOT is also requiring covered stockpiles. Andrea Kvasnak asked how

the contractors are responding to the requirement to cover stockpiles. Dennis Boisvert said that some of the contractors were not pleased with the requirement.

### **Effect of Batching on the PG Grades of Virgin and RAP Mixes – Dennis Boisvert**

A study was conducted to look at the effects of using a batch plant on the PG grade of virgin and RAP mixes in NH. About 2/3 of the plants in NH are batch plants. The study goals were to determine the impact of batching on the low end of the virgin binder. Binders were recovered from plant produced mixes. The binder testing consisted of DSR, BBR, and DTT testing. They saw about a 2% temperature loss going from a virgin binder to recovered binder. There is no report yet of the study.

Jon Epps said these datasets are important for seeing how far we can go with RAP from a binder point of view. John D'Angelo said that it is going to be a regional thing.

### **RAP Percentage Based on RAP Binder Percentage – Ron Sines**

Ron Sines polled states to see if they use RAP binder percentage instead of total weight of mix to base the RAP percentage. 17 states replied to Ron's inquiry. Idaho has a draft specification that is moving towards using RAP binder percentage. Ohio has taken an approach where they require a minimum percentage of virgin binder in a surface course mix. They have an extended RAP specification that does not require a binder grade change between 26-40% RAP if a WMA is used. Alabama is also now allowing an increase in RAP if WMA used.

Missouri allows shingles up to 7%. If using shingles then 70% of binder must be virgin. Contractor in Missouri says that the last point does not come into play.

Tennessee requires a minimum virgin binder percentage when using recycled material. South Dakota does not allow RAP mixes except by special provision. The binder is paid for by a separate line item which means that they do not pay for the binder from the RAP. South Carolina is going to have different allowable amounts based on whether or not the RAP is fractionated. SC did define what they mean by fractionated. Michigan is changing the RAP spec. Wisconsin pays on the calculated amount of binder. Arizona pays for asphalt binder separately. That may change as they go forward.

Ron Sines, Randy West, and Gerry Huber said that some states are discouraging RAP usage because of the way the material is paid for. John D'Angelo said that that overall the overall project cost is less if RAP is used. It is a forced unbalanced bid which is illegal. John says that in a competitive world it levels out. Jon Epps says that the common perception is that contractors are giving binder that they are not getting any money for the binder.

Mark Blow said that it is hard to get rid of millings in a rural area because most of the contractors are not from South Dakota. Minnesota requires a minimum virgin binder for RAS and RAP. Dean Maurer said that PA started to look at minimum virgin binder. Jim Musselman said that we should be careful about criticizing because there are a lot of different politics and regional issues. Florida limits RAP percentage when a polymer is being used, first time used virgin minimum in Florida. Jim Musselman likes the direction of basing the RAP percentage on binder instead of overall weight. Randy West pointed out that by setting spec limits on percent of total mix, fractionated RAP materials could

be a problem because coarse RAP has such a low binder content compared to fine RAP. Becky McDaniel said that in hindsight it would have been good to base the percentage on binder percentage but fractionation was not common and RAS was also not considered a good thing back in the day. Jon Epps pointed out that it should not be based on volume because the specific gravity of the binders are all relatively close so you can do it based on weight. The group agreed that RAP percentages for binder adjustments should be based on binder contribution.

Dave Newcomb pointed out that we need to start looking at the performance testing because of the different binder contributions and RAP binder properties. He feels that we need to have a directed national effort to implement performance testing. Cecil Jones agrees that it is time to start. Newcomb pointed out that we need to get started on the performance testing criteria. We need to start somewhere even if it is as simple of rut testing. John D'Angelo agreed with Dave Newcomb. Dave Newcomb clarified that he was talking about performance testing during the design stage and not QC/QA. Gerry Reinke said that the easy answer is to look at extraction and recovery for QC. He said you do not need to worry about RAP percentage if you know what the binder properties are. Ron Sines said that if you get contractors to understand about binder replacement it will help them sort through a few things like the true cost savings. Ron Sines is an advocate of using blending charts instead of assuming a binder bump is needed.

Jon Epps feels that allowing the contractors to move forward with performance testing is one of the most important things that we can do. Randy West asked what do we want to recommend as the right proof test; blending charts or recovered asphalt from plant mix. John D'Angelo says it does not matter. Gerry Reinke said not a good idea to just do a blending chart for low temperature. Becky McDaniel thinks we do not want to require plant mix. John D'Angelo says use AMPT to check to make sure that the plants are getting good blending. **Gerry Huber said we should come up with a small group, develop white paper, review at next ETG, and submit it to AASHTO SOM. Jon Epps will report on energy at next ETG and present on asphalt physical properties at the next ETG.**

### ***Action Items***

- All members – Send information on existing and upcoming high RAP pavements to Andrea Kvasnak ([ank0004@auburn.edu](mailto:ank0004@auburn.edu))
- All members – Provide feedback to Audrey Copeland ([audrey.copeland@dot.gov](mailto:audrey.copeland@dot.gov)) about State-of-Practice document no later than May 29, 2009.
- Randy West, Cecil Jones, Jim Musselman, and Ron Sines – form small group to identify agencies with low or no RAP, identify what is restricting contractors from using more RAP if it is allowed in a state, and assemble information to provide to state agencies with low or no RAP.
- Hussain Bahia – send BBR mortar protocol to Andrea Kvasnak ([ank0004@auburn.edu](mailto:ank0004@auburn.edu))
- All members – Send RAP variability information to Randy West ([westran@auburn.edu](mailto:westran@auburn.edu))
- Randy West publish RAP variability document on NCAT website

- Elie Hajj and Andrea Kvasnak – Send completed RAP aggregate extraction report to members when it is completed
- Cecil Jones – Send finalized survey results to Andrea Kvasnak ([ank0004@auburn.edu](mailto:ank0004@auburn.edu)) to post to RAP ETG website
- Jon Epps – Present on “Green” RAP, energy savings at next ETG
- Jon Epps – Present on asphalt physical properties based on Granite’s records at next RAP ETG
- Audrey Copeland – Lead for developing recommendations for using RAP as a percentage of binder and adding to State-of-Practice document, final discussion at next ETG meeting. Task group includes Becky McDaniel, Andrea Kvasnak, Ron Sines, John D’Angelo, and Jim Musselman.
- Jo Daniel – Coordinate NH RAP study of existing old RAP pavements that are about to be replaced
- Jim Musselman – Pull high RAP information from Florida pavement management system
- Randy West (lead), Jon Epps, Jo Daniel, and Jim Musselman – Write report on high RAP performance from previous projects/field studies.
- All members – give feedback on RAP brochure by May 15, 2009
- Andrea Kvasnak – Present on RAP-WMA at next ETG
- Andrea Kvasnak – Send out webinar to ETG list