	1. Does your State/Agency DOT use crumb rubber mixes exclusively?	1.a. If not, what percentage requires crumb rubber in lieu of polymer, if any?	2. Does your State/Agency DOT uses "high content crumb rubber" via the wet process/Arizona Method exclusively?	2.a. If not exclusively, are there facility types that you do require it for, e.g., freeways and interstates, routes with ADT under or over "XYZ"?	3. Does your State/Agency DOT have experience with high content rubber HMA mixes combined with SAMIs (Stress Absorbing Membrane Interlayers)?	3.a. If yes, please share if any consideration was given to the SAMI having a structural value in the pavement design and the service life experienced.	4. What performance/lessons learned steered your State/Agency DOT toward or from high content wet method HMA pavements?	5. If your State /Agency DOT requires, or required, crumb rubber in lieu of polymer additives in HMA, in general, what was the initial cost increase, if any?	5.a. If there was a cost increase, did it reduce over time?	6. Please share any words of caution/wisdom regarding your State/Agency DOT's experience with high content/wet method crumb rubber mix production, laydown and performance.
Alabama	NO	None	No	No	No	* see #6	N/A	N/A	N/A	* We placed a crumb rubber pilot project in SE Alabama some time ago. The project was scheduled for 500 tons but there were issues pumping from the tanker truck, so only 250 tons were placed. NCAT was our partner on this field demo project. They monitored the project and produced a report for us (will send if we can locate a copy). The project has performed well but due to economics, crumb rubber isn't really a viable option for us to pursue. However, a trial project is currently being considered but will be a specialized mix (similar to highMod) that we would only use in certain applications. The pilot project was terminally blended (wet method) by Blacklidge. Since that time the Blacklidge terminal is no longer set up to mass produce but can provide a blending unit to mix on site. We are not proponents of mixing on site. We understand that Georgia does not have these same concerns since they use the dry method and add the rubber like an aggregate at the plant site.
Alaska										
Arizona	No. Crumb rubber binders are used primarily in the final wearing surface which is a nominal ½" (on asphalt pavements) to 1" (on concrete pavements). These mixes are open graded friction courses with typical binder contents of 9.5% by weight of total mix (generally not free draining because of the high binder content). We are increasingly using what we call terminal blend asphalt rubber binders (PG graded, minimum 8% crumb rubber, minimum 2% SBS and plus specifications for solubility, softening point, elastic recovery, and phase angle).	Except for our friction courses we generally just specify a PG binder with no specific requirements for rubber or polymer. In 2017, on all our paving projects, approximately 74% of the binder we used was PG that did not have any specific rubber or polymer requirements, 3% was terminal blend (rubber and polymer), and 23% was wet process crumb rubber asphalt (minimum 20% crumb rubber by weight of base asphalt binder).	No	ADOT uses wet process asphalt rubber binder extensively in our friction courses. The use of a friction course is pretty standard as the final wearing course on all except our lowest volume or remote highways. We do not have a specific decision criteria for which roadways we do not use asphalt rubber friction course on. We do not consider our friction courses to have structural value in pavement design. We used to routinely use a 2" gap graded asphalt rubber (ARAC) mix structural layer beneath the friction course on our interstates and highest volume highways. 10-15 years ago we had one season during which we had 6 significant failures of newly constructed ARAC related to moisture damage. We revised our specifications to make them an end product specification, but did not feel we had resolved the issue. As a result, the use of ARAC is currently very rare.	Yes	We have used SAMIs in the distant past, but did not feel that their cost – benefit justified their regular use.	Briefly, our original use of asphalt rubber friction courses was driven by a desire to reduce cracking, reduce aging of binders, increase durability of surface course (driven by the high binder contents in these mixes), and to reduce surface splash and spray. We have seen excellent performance of these mixes and their use has been expanded to use as a noise reducing surface in our urban areas. It is important to note that ADOT performs the mix design for all of our friction courses and also that ADOT pays separately for mix, so we do not see a tendency for contractors to reduce binder contents to reduce their mix costs. (See 2 for discussion of challenges we had with our gap graded asphalt rubber mixes that has led us to substantially eliminate their use.)	I only have data easily available since 2000, but in that time period the cost per ton of our crumb rubber asphalt (CRA) binders and standard PG binders are similar, ranging from the CRA being $100 per ton less to $40 per ton greater that PG binders (average price in a season with no asphalt escalator/de-escalator considered). Terminal blend asphalt rubber binders have historically been almost twice the cost per ton of CRA or PG binders (probably related to limited number of suppliers and low volume utilized). When you consider the total mix cost, mixes containing CRA binders will always be more costly because they contain higher binder contents (in the range from 2-3%) compared to mixes containing PG binders (modified or unmodified).	N/C	Based on ADOT's experience, friction courses containing CRA give use 2-3 years longer performance that friction course using standard PG asphalt (typically without polymer modification). These mixes present greater challenges in construction, for example they are hard to hand work, much more finicky with respect to temperature conditions (both on the cool side and the hot side, we typically do not pave these mixes during the heat of the summer in Phoenix unless traffic can be kept off for a day or more), not always the best choice in locations with high turning movements or in locations where they will not have much traffic (for example in the on street parking areas of a town). In short, these mixes are a very good tool when used in the right place, but they are not perfect and are not a miracle pavement.
Arkansas	No - not at all	N/A	No - not at all	N/A	No	N/A	N/A	N/A	N/A	
California	Yes, our rubberized mixes (RHMA-G and RHMA-O) used asphalt rubber binder-wet process. (Public Resources Code 42703 requires Caltrans to use 11.58 pounds of crumb rubber modifier (CRM) per metric ton of total asphalt paving materials placed.)	N/A	Yes, RHMA-G and RHMA-O used asphalt rubber binder-wet process. (CRM requirements, a minimum of 18% to max of 22% by weight of a total asphalt cement)	n/a	Yes	The SAMI is not assigned any structural value. The SAMI is assigned increased service life against crack retardation (ie. Thickness of RHMA-G can be reduced with SAMI).	RHMA-G is "softer" than dense graded mix but highly effective against crack retardation. CT limit RHMA-G to the top 0.2 foot of pavement surface. Quieter pavement, improves fatigue and rutting performance as well.	CT uses crumb rubber in lieu of polymer additives in our PG-TR binder. There is no initial cost increase for PG-TR binder versus PG-PM binder (due to program in place that incentivized crumb rubber usage?). Please note that PG-TR is terminal blend binder as opposed to asphalt rubber binder which wet process. PG-TR was used in dense graded mixes and asphalt rubber binder is used in gap graded mixes. The PG-TR and PG-PM binder has merged to PG-M binder where modification using polymer and/or crumb rubber are allowed.	N/A	RHMA mixes are stiffer than conventional dense graded mixes. Mix production and laydown are normally higher. CT is satisfied with their performance. Since CRM mixes are stiffer need more control environment such as high temp for mixing and compaction, higher surface temperature for paving etc.
Colorado	No	0%	N/A	N/A	N/A	N/A	We still require PG+ testing, the AC Binders have a hard time passing our specifications when they contain crumb rubber.	N/A	N/A	N/A
Connecticut										
Delaware	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR
District of Columbia	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Florida	no	None. The use of rubber or polymer modifiers in PG 76-22 binder is a market driven decision made by the contractor	No. FDOT specs allow the use of rubber modified PG 76-22 binders (minimum of 7% GTR), but it is not required.	No. Rubber modified binders are no longer required by FDOT specs. It is optional, but must meet a PG 76-22 grade.	No	N/A	FDOT once required open graded friction courses to be mixed with asphalt rubber binder containing 12% GTR. However, this binder was replaced with polymer or rubber modified (7% GTR minimum) binder that grades to a PG 76-22. Superior performance of the PG 76-22 binder was the reason for the decision.	Varies	In all but a few instances, rubber mixes are more expensive than polymer mixes. It varies by friction course type and by traffic level as to whether that cost difference has increased or decreased.	If these type of mixes/modified binders are used, I recommend having a field test (with a upper and lower limits) to verify the binder meets the specifications. Several years ago, FDOT required daily viscosity tests with hand held viscometers when asphalt rubber binders were required (prior to PG 76-22 binders).
Georgia	no	allowed/not required	no	no	no	N/A	no experience	N/A	n/a	N/A
Hawaii										
Idaho	Nope - not allowed	Nope - not allowed	Nope - not allowed	Nope - not allowed	Nope - not allowed	Nope - not allowed	Nope - not allowed	Nope - not allowed	Nope - not allowed	Nope - not allowed
Illinois (DOT)	No	Illinois does not require GTR modified mixes	Illinois allows a GTR modified asphalt binder (terminal blended with 10 - 14% rubber) by a limited use special provision in lieu of SBS PG70-22 polymer (i.e. PG64-22 plus 10-14% GTR wet process to = PG70-22). (not much interest from industry)	Illinois does not require GTR	no	N/A	Illinois has had very good performance with a project that used the McDonald Method (patented wet process back in the early 1990's) back in 1992 but the 100% cost increase was prohibitive.	n/a	Cost increase with non-patented processes is usually due to higher asphalt content associated with rubber modified mixes.	(no comment provided)
Indiana	No	N/A	No	N/A	No	N/A	N/A	N/A		
Iowa										
Kansas	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	From 1990 to 1995 a total of 13 projects were constructed using crumb tire rubber. These projects were built in responses to a legislature request to evaluate the feasibility of the use of crumb tire rubber in highway construction. Six projects were changed ordered and seven were administrated through normal bid procedures. High-density mixes, recycle mixes, and the open graded mixes were employed in the experiment. Five were the modified dry process and eight were of the wet process. A total of approximately 2637 tons or crumb tire rubber were used in all of the 13 projects. A rating system was established to evaluate the effectiveness of each project. Almost all of the crumb tire rubber came from outside of the state and very little was used from Kansas generated sources. The report concluded that the use of crumb tire rubber in hot mix asphalt was possible but not economically feasible. Therefore, if the use of crumb tire rubber is mandated in the state of Kansas, it is recommended that another use be tried such as asphalt-rubber seals or burning the tires as a fuel source.
Kentucky	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR
Louisiana										
Maine	We do not exclusively use crumb rubber mixes, we do not allow the use of crumb rubber in lieu of polymer modification.	N/A	no	We do not use the wet process exclusively, but have used it on very high profile Interstate projects in the past – we produced the asphalt-rubber gap-graded mixture (ARGG).	no	N/A	We find the project in which we used the ARGG mixture via the wet process to be among the very best performing pavements we have, surpassing the performance of our polymer-modified mixtures.	The project were we used ARGG was more expensive (~20%) than typical mixtures, but we do not have a lot of experience.		The ARGG mixture was relatively easy to compact in the field. The mix design is a key step to performance as is the set-up of the blending unit used at the plant.
Maryland										

Massachusetts	No. MassDOT uses unmodified asphalt mixtures, polymer modified asphalt mixtures, and gap graded or open graded mixtures containing ground tire rubber (ASTM D6114).	MassDOT specifies ASTM D6114 Asphalt Rubber binder for - Open Graded Friction Course (OGFC) and a Gap Graded Asphalt Rubber mixture (ARGG). Asphalt Rubber mixtures constitute less than 10% of the mixtures places statewide.	No. MassDOT uses unmodified asphalt mixtures, polymer modified asphalt mixtures, and gap graded or open graded mixtures containing ground tire rubber (ASTM D6114).	MassDOT specifies ASTM D6114 Asphalt Rubber binder for two specific pavement types - Open Graded Friction Course (OGFC) and a Gap Graded Asphalt Rubber mixture (ARGG) that are specified for most interstates and many limited access highways.	No. While SAMI's have been a standard specification utilized by MassDOT for over 30 year, they have never combined with an asphalt rubber HMA mixtures. MassDOT's use of SAMI's is limited to low/medium volume roadways and the asphalt rubber mixtures are typically specified on high volume roadways.	We wouldn't typically assign a structural value to a SAMI when combined with a new HMA overlay, but if there was a SAMI layer in the existing cross section, it would be assigned a structural coefficient equal to the asphalt beneath.	MassDOT's usage with Asphalt rubber began with an OGFC experiment in the mid-1990's that lasted approximately 16 years. The use of Asphalt rubber was resurrected in 2007 with some gap graded mixtures and bonded thin overlays. We're now in our 11'th year driving on the "second generation" asphalt rubber mixtures and have placed them in some of the most challenging locations (eg. I-90 Turnpike toll plaza going into Boston, I-95 Waltham) with traffic volumes approaching 200K with no performance issues. Approximately 12 years ago, MassDOT placed a SAMI demonstration project with 4 sections – Asphalt Rubber SAMI w/ 1.5" HMA overlay, Asphalt Rubber SAMI w/ Bonded Thin Overlay, Fiber reinforced chip seal SAMI with 1.5" HMA overlay, and Fiber reinforced chip seal with Bonded thin overlay. The transverse cracks came through the HMA & SAMI roadway more quickly than the Thin Bonder Overlay & SAMI roadway. The SAMI performed better with the pliable bonded thin overlay than with the conventional HMA.	Depending on the project size, we assume polymer will add 5-10% over a conventional asphalt with no change in binder content. The Asphalt Rubber mixtures we specify are slightly more costly than mixtures with unmodified asphalts – an estimated 10-20%; though this may be at least partially attributed to a 30%+ increase in binder content (7.7% minimum binder content with Gap Graded Asphalt Rubber mixtures vs 5.5% binder content with typical 12.5mm Superpave Mixtures)..	Yes, Having plants with permanent rubber blenders and other contractors providing mobile blending operations has kept pricing competitive. Also, using asphalt rubber mixtures on larger projects keeps mobilization costs minimal. We don't typically consider asphalt rubber mixtures on projects where quantities are less than 10,000 tons unless there is a compelling reason.	MassDOT first utilized warm mix with the asphalt rubber to in 2008, observing that compaction could be achieved more easily and noting a corresponding reduction in visible plant emissions. In 2011, all asphalt rubber mixtures were required to use a warm mix additive and reduce production temperatures (not reaction temperatures). Make sure the rollers have dish soap or a similar lubricant available to avoid sticking to the drums. Ensure the contractor has a good QC plan that ensures adequate reaction time for the asphalt rubber binder. Verify that AR binder's viscosity is per ASTM 6114D and ensure the plant's binder pumping system has adequate capacity to push the highly viscous asphalt rubber binder. Calibrate the plants pumps with the asphalt rubber binder. Make sure the ignition ovens used to determine binder content at the plant have clean exhausts – burns to determine binder content can generate erroneous results if clogged. Correction factor for ignition ovens will be different from conventional HMA, so ignition ovens should be calibrated to the asphalt rubber mixture. Also, be cautions if running plant air void volumetrics for acceptance– specimens can swell (doughboy in the middles) of they are extracted from the gyratory molds at too high a temperature.
Michigan	No	allowed/not required	if GTR must be wet process	no	no	N/A	A pilot project altered/waived some of the binder testing. Project showed early cracking and didn't equal performance of the control section. Based on that we moved to permissive but all testing must be met.	Not enough experience to establish cost comparisons.	see preceeding answer	Based on our experience we would be cautious with changing any testing /acceptance protocol
Minnesota	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mississippi										
Missouri	No	allowed/not required	if GTR must be wet process	no	no	N/A	It is not uncommon for our binders to have around 8% GRT, along with TOR, the linking agent. We have not noted a performance problem with this. I understand that years ago there was a high demand for polymer and the price was high. The use of GTR was found to be an acceptable alternative and helped to stabilize the cost of the higher grade binders.	N/A	N/A	It is important that the GTR stay in suspension which requires agitation, we have seen issues with separation in the combined tanks.
Montana										
Nebraska										
Nevada										
New Hampshire	No	very small & variable	No	full range	No	N/A	N/A	(info not provided , however following comments indicate a cost increase)	Not mainstream, so costs have not recovered	Our specification did not originally include WMA technologies. The reluctance of the contractors to reduce mix temperatures had a large impact on their crews due to fumes. Getting the mix below 300 F is critical. It is now included in our spec. The Highways for Life project installed 3.5 miles of ARRG and 3.5 miles of PG76-34 Kraton HIMA mix in each barrel. Performance is similar. The AARG has fewer cracks in one direction after five years, and the HIMA has fewer cracks in the other direction.
New Jersey										
New Mexico	No	N/A	NO CR in HMA/WMA	only OGFC	N/A	N/A	20-30 yrs ago - not good experience	N/A	N/A	In 1984, the NMDOT constructed the first project near Chama, NM using Coarse Rubber as a fraction of the fine aggregate in HMA according to the dry process. A 9-month evaluation report for this project indicated that the pavement structure performed well during cold weather (winter months). However, the pavement lost structural capacity and failed during the hot weather (summer monhts0; it "literally came apart" during the first summer experienced by this pavement. In 1985, the NMDOT constructed a second project on State Highway NM 206 near Lovington, NM that included an asphalt rubber overlay. The binder was modified with fine crumb rubber and prepared with the wet process. The pavement surface showed excessive premature cracking within the first year following construction. After these two unsuccessful projects, NMDOT did not use crumb rubber in Asphalt Pavements. The technology, procedures and specifications have improved significantly since those days, but NMDOT doesn't want to take a risk for trying it again. NMDOT's experience with Rubberized Open Graded Friction Course (ROGFC) is good. The performance of the ROGFC projects was reported as better than that of the conventional OGFC pavements in New Mexico. The cost of ROGFC projects was estimated to be 20 to 30% higher than that of conventional OGFC projects.
New York										
North Carolina										
North Dakota	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR	We do not use CR
Ohio	No	allowed/not required	no	N/A	NO	N/A	We did 9 pilot projects with the McDonald- Arizona process in the mid 1990s. The expense was not sustainable. Prices were over 130% higher (average) than conventional mix and were far higher than any polymer mix types.	SEE 4	We only did pilots. Certainly prices would come down but would never be competitive. The process is time and energy intensive and equipment highly specialized.	1. The Ohio DOT GTR specification (702.01, SS887) allowing the terminal blend wet process (sometimes known as the Seneca process) is a low cost, but legitimate GTR wet method. It, however, is not cost competitive with SBS polymer binders so we do not see many projects with it. It is close too competing but not quite there.
Oklahoma	No	None at present time but field trials begin this summer using the dry process	no	N/A	no	N/A	Moved away due to availability and ease of introduction into mix	N/A	N/A	Has been several years since ODOT used wet method and only then as field trial events. Some pavements still exist and while showing some distress are still performing.
Oregon										
Pennsylvania	no - we are piloting 10 project that include both gap and open graded mix designs	again - piloting 10 projects	yes for the pilots	For PennDOT's 4 Asphalt Rubber (ASTM D6114) Gap-Graded mixture pilot projects, the projects were large quantity projects (typically minimum 15,000 tons of mixture). These larger projects make it economical to mobilize a wet process mobile blending unit for blending the crumb rubber modifier with the asphalt binder at the asphalt mixture plant. For PennDOT's 6 hybrid PG 76-22 dense-graded pilot projects, these were much smaller projects and they were not on freeways or interstates, but the use of this mixture could have been piloted on freeways or interstates. We would likely use the hybrid PG 76-22 (SB/SBS & fine mesh crumb rubber modifier) as an alternate for projects that would normally use polymer modified PG 76-22 binder (typically >10 million ESALs over 20-year design period).	PennDOT constructed experimental construction projects in the late 1970's and early 1980's using crumb rubber modified asphalt binder as a SAMI prior to placing a HMA overlay (no rubber in the HMA). These worked well, but Contractors who were equipped or experienced in spraying hot asphalt binder containing crumb rubber modifier were not readily available.	no structural value given or recommended for SAMIs	From our past experimental construction projects using wet process and dry process crumb rubber modified dense-graded mixtures, PennDOT learned that mixtures need space to add high content rubber in the mixture. At that time, we did not have any gap-graded mixtures and open-graded mixtures were not a recommended mixture type for our winters as these mixtures require different anti-skid and anti-icing procedures. Based on Massachusetts' and New Jersey's recent efforts and success with asphalt rubber (ASTM D6114) gap-graded mixtures, we (PennDOT) wanted to evaluate it for our own use since we have many freeze/thaw cycles each year. Also, based upon available literature, we were interested in use of rubber modified asphalt due to its increased resistance to cracking, rutting and environmental benefits of wet process. And to be honest, there were tire recycling companies using political pressure to get PennDOT to use crumb rubber in asphalt mixtures. The initial performance of the asphalt rubber (ASTM D6114) gap-graded mixtures has been good.	The Asphalt Rubber Gap-Graded (AR-GG) pilot projects indicated on one project a 30% premium (30% more expensive) to produce than a non-rubberized mix – primarily due to the additional cost of mobilization and utilization of the special equipment needed for the production and not from the crumb rubber material itself. We do not have the Crumb Rubber Modified Asphalt Binder (CRMAB - used in a dense-graded mixture) cost difference when compared to traditional polymer modified PG 76-22 material at this time. It will be available soon.	It is too early to make that observation but with a possible increase in the number of projects the cost is speculated to reduce.	There weren't any issues faced during paving but it was found that if the mix is sticking to the roller while compacting, fabric softeners solved the problem. AR-GG pilot projects seem to be performing better than the control section consisting of a polymer modified PG 76-22 dense-graded mixture. The hybrid PG 76-22 (CRMAB) dense-graded mixture projects are still being monitored since they are more recently constructed (late 2015 and 2016).
Rhode Island	Only for rubberized chipseal.	N/A	no	no	We have used 20% crumb rubber (wet method) in the SAMI chipseal.	We did not assign a structural value to the SAMI.	We allowed it several years ago in lieu of polymer modification. The increase in cracking over polymer was very noticeable after only a short time (less than two years).	There was a cost savings.		The OBC will need to be increased, workability suffers, and fatigue/reflective cracking increases dramatically.

South Carolina	No	allowed/not required	No	no	limited exp. & limited market	Limited experience. No structural value given to SAMI	early success drove spec for allowance. We let economics drive use by contractor	Its optional and cost drives use	N/A	We only require a minimum of 7% GTR to be used (similar to FL), this may require a small dosage of SBS or other polymer to be used to meet the MSCR requirements in our specification. We are concerned when the contractor uses too high of GTR content, that we may have tank storage issues, along with elevated production temperatures, and possible laydown quality issues. We have been successful in doing some OGFC mixtures and removing the stabilizing fibers that are usually needed to prevent drain-down of the asphalt binder. Right now the GTR modified binder is not being offered / available from our local asphalt terminals: This is likely b/c: a) SBS is currently less expensive to purchase, or easier to handle, or blend, or store. b) The customers are willing to purchase only what is made available by the terminals their region (SBS, etc.).
South Dakota										
Tennessee										
Texas	No	In terms of mixes (not seal coats or crack seal), it would constitute 1%-3% of all HMA placed each year.	When tire rubber mixes are specified these are always an Asphalt-Rubber mix, which is very similar to the wet process/Arizona method. We don't allow any dry process mixes.	N/A	Not specifically. We have used Asphalt-Rubber underseals, in cases where preventing water intrusion or reflective cracking was deemed a higher priority.	Underseals are not assigned structural values in pavement design.	Verifying the properties of the finished binder has always been the preferred direction for evaluating binders, which is not an option with the dry process. Lessons learned: Asphalt Rubber binders used with mixes such as SMA are quite good at crack resistance and have shown to be better noise-absorptive materials compared to binders that have polymers (such as SBS). Asphalt Rubber mixes are typically more expensive than without.	It varies, ~10% more expensive for asphalt rubber mixes.	Due to the infrequent use (and small quantity applications) there is variability in the cost difference over time. As a result, we have not seen a reduction in price.	With the increase in % binder it's vital that there's enough stiffness in the asphalt to prevent draindown, as a result we have requirements on testing the mix for draindown prior to production. Ensuring that there is adequate digestion of the tire rubber into the binder has led us to test the asphalt to ensure it is "smooth and homogenous" prior to being added into the mix.
Utah	No	allowed/not required	no	N/A	long ago - nothing current	N/A	The wet method has not been used by any of our contractors at the HMA plants because it is not allowed	N/A	N/A	We have no experience with the wet method really. We did try the Dry Method about 25 plus years ago in Region 3 on US 40 out by Starvation Reservoir. The rubber was a coarse size from what I remember. The HMA met compaction while hot. As it cooled the coarse crumb rubber rebounded to its normal shape and the HMA mat lost density and the pavement quickly failed. That experience ended our efforts in using crumb rubber with the Dry Method.
Vermont	No - not at this time	n/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Virginia	No	N/A	no	N/A	no	N/A	VDOT has no policy for or against crumb rubber	N/A	N/A	VDOT may be initiating some pilot projects in the future, but does not currently have any hard plans.
Washington	no	N/A	no	(mixed results) https://www.wsdot.wa.gov/research/reports/fullreports/268.1.pdf	(limited) https://www.wsdot.wa.gov/research/reports/fullreports/817.1.pdf	no structural value given	What steered WSDOT toward the high content wet method pavements was the potential benefit of noise reduction (Arizona's quieter pavement). What steered WSDOT from the high content wet method pavements was limited performance and cost. Pavement performance was no better and often worse than WSDOT standard practices.	https://www.wsdot.wa.gov/research/reports/fullreports/268.1.pdf	WSDOT did not enough crumb rubber to establish a comparison. Costs remained high for our experimental sections.	The general consensus in Washington is that these mixes were generally higher cost with the same or lower performance than WSDOT traditional mixes.
West Virginia	No - not at all	N/A	No - not at all	N/A	No	N/A	N/A	N/A	N/A	N/A
Wisconsin	WisDOT does not use rubber at this time, but we are running research on it. Research looking at dry or wet process. Rest of the questions are moot for us.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Wyoming										