Transcript of PPA Workshop Discussion

Moderator James Scherocman opened the floor for questions and comments following the panel discussion. The panel members were Bob McGennis, Holly Asphalt; Dan Simpson, Arizona DOT; Chris Abadie, Louisiana DOTD/LTRC; Judie Ryan, Wisconsin DOT, and Gerald Reinke, MTE Services.

Moderator James Sherocman: We have time now for discussion and questions to the six panel members. If you are going to ask a question, please take the microphone, identify yourself as to who you are and identify which of the six panel people you want to ask your question to. So, the panel is open for questions.

From the Audience, John D'Angelo, FHWA: I'll start off. There has been a lot of talk the past day and a half about PPA modification and that it probably should be limited to rather small amounts, maybe one grade bump or even less than that in some cases because of issues. And basically, for the agencies there your specs allow the acid but what is actually in your specs, do you think, that keeps you from having someone trying to do too much acid where there have been so many indications that there could be significant distress issues and failure issues?

From Panel Member Chris Abadie: Speaking for Louisiana, I really rely on the moisture susceptibility testing that we do on all of the mixtures, which includes the Lottman and the Hamburg. I believe in this particular case it would catch too much. I'm always concerned that I know I'm not always right and always looking for improvement to that. That is where we stand.

From Panel Member Judie Ryan: I would say that in our state, the closest thing we have is really the fact that we are guided by [AASHTO M] 320 and the PG plus specification. However, John, I think that due to the recent dialog and all the information that is there I think probably the next place to go is to look at criteria versus just the exclusionary type specification changes. And probably bring [in] more of the arrows going up and to the right by way of other torture testing.

From the Audience, Randy Mountcastle, Alabama DOT: Do any of you all use limestone aggregate and do you have any PPA concerns with the limestone?

From Panel Member Chris Abadie: Yes and no. [Laughter]

From Panel Member Gerald Reinke: Wisconsin, or at least southwestern Wisconsin and southeastern Minnesota, is replete with limestone and some of it is not very good quality limestone either for that matter. That was one of our concerns initially when we looked at using acid in conjunction with polymer and by itself. We began running the Lottman test and didn't seem to have any problems there. And we've run Hamburg on many of these mixes over

the years. In some cases, we've seen some difficulties and we've had to adjust using the phosphate ester anti-strip. As has been said many times, you need to do some sort of moisture sensitivity testing on these mixes and if you don't, you are probably going to have some problems.

From the Audience, John Bartoszek, Payne and Dolan, Wisconsin: Question for Gaylon or Gerry or both. With warm mix being ever so prevalent … obviously with the warm mix technologies, there are a lot of chemical packages out there that are not readily identified as to what they are. Are there any concerns running some of those projects, pushing to field tests right away with not a lot of lab testing? What concerns are there on that end with some of the different grades and if they are acid modified and reactions with some of the warm mix technologies?

From Panel Member Gerald Reinke: We have done ourselves or been involved in two projects that involved polymer with acid in it. One we constructed ourselves and one was constructed at MnROAD last year. And we are using technologies that don't use amine additives and that don't use water. That's what we have gone to to solve that problem. And when we looked at using amine surfactant chemistry, at least in the laboratory, we had issues with that. So just like with the anti-strips, if you are going to use a chemistry that has amines in it, I think you are going to have difficulties. So, you need to choose wisely is what it comes down to.

From Panel Member Gaylon Baumgardner: I will just agree with Gerry. One of the issues we were concerned about was also that – what are the effects of some of the water containing systems in the reaction with amine and PPA? Because we knew there would be binders with PPA in them. But we have done several projects – in fact we just completed one – that have a combination of amine and PPA in warm mix and the performance was as expected. It was basically the typical binder that was sold for that particular state.

From the Audience, Mark Blow, Asphalt Institute: Years ago I spent the whole winter pounding out samples and doing anti-stripping testing for DOT. One thing we quickly found out when we were experimenting with different liquid anti-strips. Those applications were all constituent dependent – what type of aggregate, what type of crude oil, dosage levels and so forth. And if you didn't have the right combination, you could get in trouble real quick. We seem to have sorted those out over the last eons and we don't use the things that don't work. Is that situation that I experienced any different with acid? We know there are certain things you shouldn't do just off the bat.

From Panel Member Gaylon Baumgardner: I may not address that in particular but something very similar which was an issue, long before PPA, dealing with certain states and QPLs [Qualified Product Lists] and certain anti-strips. We shipped a binder (neat binder before

Superpave) to the state. The additive we had was on the QPL. They added it and when they tested the binder, it was failing the viscosity spec. That was kind of strange. So, the first thing we did was look at the anti-strip agent that we were using. We saw that that was the issue, so we switched from an amine based anti-strip to a phosphate ester because of the high acid value in this particular asphalt. What I am trying to say is that what it boils down to is this; you can have the same issues with anti-strips that we see with PPA. It is a formulation thing. That is why we have been stressing that maybe we need to look at the total performance of the system and also look at the binders with the additives rather than just the binders as neat binders. I think that's what you were getting to, Mark. It is very similar to the problem we have had with anti-strips; that is why we need to continue to investigate that as we do with liquid anti-strip.

From the Audience, Gerry Peterson, TxDOT: Bob, you indicated there was a TRB paper that indicated there were some environmental concerns with PPA. I wondered if anyone can elaborate on that and say what the outcome might be.

From Panel Member Bob McGennis: There was actually no follow-up study that was done on that. One of the co-authors of Susanna Ho's paper cited or did some calculations that there will be several – I think between one and two – tons of free acid that could potentially leach out of the pavement into ground water. I think during the discussion, I'll attribute it to Gerry, it was pointed out that anyone who has used cationic emulsions knows that hydrochloric acid is one of the constituents of those. And so, if it is a problem, probably it is a bigger problem than we thought. As far as I know, there was no follow-up that was done really to look into that.

From the Audience, Jean-Valery Martin, Innophos: I can comment on that. We have been doing a test called TCLP, and we touched on that during the Peterson Conference and we shared information. We were above and beyond the typical usage of PPA at 3%. We've got a lot of binder content on the coarse aggregate and are doing the test in water. We have not detected any phosphorous in the leaching water. I think Federal Highways is going to do some additional work on that matter, and I think there are already some additional work as well on MnROAD. Some of the water has been collected, is that right, Darrell?

From the Audience, Darrell Fee, ICL: I think what Tim Clyne was saying was that the detection limit for phosphate runoff from the MnROAD Section 78, which was Elvaloy, was less than 20 parts per billion. So there is not phosphate runoff.

From Panel Member Gaylon Baumgardner: I was at both of the conferences that you were mentioning. In fact, I got up and made a comment at the end of one of the presentations; talking about the hazards of runoff and polyphosphoric acid or phosphoric acid. Remember what I presented yesterday, talking about the hydrolysis of polyphosphoric acid to ortho acid

and basically phosphoric acid? Do you drink soft drinks? Coca Cola, Pepsi, Sprite, 7Up, or any of those? Anyone who is drinking one should look at your label. This talk we've had today about "We didn't know what was in there" – one of the ingredients of soft drinks is phosphoric acid. If it is going to be an issue with groundwater…. [Laughter] I guarantee you, we probably drink more soft drinks than water. We are all dehydrating ourselves. Phosphoric acid is commonly used as a food preservative. A lot of the frozen foods [contain it]. Phosphates and phosphoric acid type materials are in a lot of things that we ingest daily.

From the Audience, Hussain Bahia, University of Wisconsin Madison: I want to start by thanking the organizers. This is an excellent, excellent workshop. [Applause.] I think I respect a lot the idea that we have blind specification. I think what I heard from Gerry and directly from the discussion today, that it looks like we need to be careful about using so blind a specification. Looks like we need to know what's in some of the materials we are producing. My specific question is will the industry and the DOTs be willing to accept an idea where we ask the suppliers just in a way to specify what is in the asphalt that is being shipped if we need to deal with these ingredients?

From the Audience, John D'Angelo: Just let me add one thing to that – something that is bothering me too about that and it builds directly on what Hussain is saying. You talk about mix testing. Well, in the real world, you don't do that. A contractor will start with one asphalt and they'll do all the testing with that. If something happens, they will buy it from somebody else. They are not going to re-test everything. It just doesn't happen. And most times the DOT won't even know it. The supplier is short for some reason so the supplier will buy from someone else and ship it. It still comes from the supplier but it is a different source. So, we just don't know some of these things. I think it builds on what Hussain was saying. Are we going to have to find data on what's actually in there?

From Panel Member Gaylon Baumgardner: One of the main issues that I have with that as a supplier is, in a free market system, we have competitors. If we have to disclose then all of sudden disclosure…. I know for a fact that there are some things we do that our competitors don't. I wish some were in here because we discussed it. We discussed the fact that we look at the performance of our binder versus our competitor's binder at a normal review to make sure that we are doing the job the way we think we need to do it. Many of you have seen presentations from John [D'Angelo] where he has a binder, and he says I don't know what it is but the binder was supplied by Ergon. There are some things we do, additives that we use, not that we don't want the DOTs to know, [but that we don't want our competitor's to know]. In fact, some of them are put in there strictly as performance inhibitors for the mixture. They are designed not just to meet a binder spec. By disclosing that, we are telling the entire world how we accomplish that. You lose the competitive edge with doing that. As long as we could secure

the proprietary nature of some of the formulations, that is a possibility. That is what we prefer about the blind specs; the fact that we do not have to disclose everything that we are doing in manufacturing. It is not always just what you add to it, it is how you process it. John [D'Angelo] has a very good presentation where he shows the multi-stress creep recovery test and looking at the production of the binder to adjust the parameters. As we disclose these things, we actually put a lot of information out. I know it helps the industry, but it also helps the competition.

From Panel Member Chris Abadie: I share the same concerns, Hussain, as an agency and part of our specifying group. It is very difficult to rely strictly on the test. What you really need is open communication. That was part of my slide and part of my presentation. And what you are talking about is indeed formal open communication about what is going on. That is what I strive for, but knowing all of the other sides and listening to the suppliers and the DOT and ability to test; there are two sides of that and you cannot get there tomorrow. What you are suggesting is a place I will like to get us to where the suppliers fully disclose – on a general basis – what is being supplied and also work with us in research to figure out what they want to change that might affect the performance.

From Panel Member Judie Ryan: I would say also to Hussain that there might be some medium transition step to go through other than full disclosure as I might understand it. More of a certification that includes values that you are meeting with that particular product; maybe a way to look at going that direction. I do not think there will be many other states – there are many other states here [so] if you want to get a microphone and jump in I think it will be a good comment as well – but I do not think many of the states' highway associations would be opposed to heading that direction.

From the Audience, Kevin Van Frank, Utah DOT: In the spirit of other states jumping in, we are very concerned about quality control issues and the consistency of the material that we get. We understand that we do not control the refinery and that the refinery's diet changes. The terminal that produces the material does not control the material that they receive. We have an informal arrangement with the suppliers of the materials, of binders, if they have to change the formulation by more than half a percent on any particular piece of that. If their flux has to change by a half a percent, if their polymer load has to change by more than half a percent to meet our specifications, if they would at least inform us so that we can do the necessary performance testing on the material because these things may – we don't know that they do – change the performance of the mix.

From the Audience, Kai Tam, Ontario Ministry of Transport: I made a presentation yesterday, and I am very happy that we are going to talk about state and suppliers issues here. We, as an agency, want to know what is in our road. We have a right to know what is in there. In case of

any performance problem, we need to know what is in the road. As far as the proprietary issue, I think … we have a contract obligation with contractor. Contractors, suppliers work through that protocol so that we keep the line of confidentiality in place. That is what we are trying to do; we are trying to ask the suppliers to state what they have in the materials directly to the state rather than to anybody else in the industry. In that case, we can keep their formula secret, their proprietary secret, and we can work through that kind of arrangement without jeopardizing your production secret. I think that is the way to go to have a happy medium.

From the Audience, Tony Kucharek, McAsphalt: Just a problem from a supplier point of view, from a formulator point of view, and just to follow up on what Kai said. Obviously, it is very logical from an agency point of view to want to know what they put in the road. There is a very fine line to walk here from knowing what type of binder they are using to specifying recipes, because we see that across the United States and Canada. You shall have a minimum of 3% SBS. You shall have a minimum of this much anti-stripping agent or only this type of anti-stripping agent and so on. The main point to this is that it gives the agency a comfort feeling that we are doing something to assure that we are putting a good binder in the road, which is not true. A minimum 3% SBS does not translate necessarily into a good quality polymer modified binder. A minimum of 5% anti-stripping agent does not necessarily work. So this is a very fine line here; do not think that if you are specifying recipes that you are necessarily going to get a better quality binder if you do not have that relation of trust with your supplier and your formulator and you trust them to do all they can to give you a good quality binder. An experienced formulator can circumvent anything and sell you garbage.

From Panel Member Gerald Reinke: The comment I have is I wouldn't have a problem – and I am speaking only for myself now because obviously I can't commit the company to this – I would not have a problem with saying yes, there is polymer in here, there is acid in here, there is acid only in here without disclosing the exact formulation. I do not know if Hussain is looking for exact formulations or if he was looking for general composition. I think you could achieve the goals that you are talking about with general compositional information and the MSCR test. Between those two things, they are going to tell you the answer to whether or not the binder has the kind of performance characteristics that you are looking for. That still does not translate into the mix performance, which still needs to be accomplished, but general compositional information I don't see as being a big problem.

From Moderator Jim Scherocman: Before Bob gets up, I have a general question for the group. I thought the whole PG grading system was supposed to be blind to the modifier. Now we seem to have scrapped that whole thought. And when we get to warm mix, we scrap it even further because they are throwing all sorts of things in there at the asphalt plant. So I have a question. What the hell are we doing?

From the Audience, Jim McGraw, Mn/DOT: Minnesota along with Wisconsin, Iowa, both Dakotas and Nebraska are part of a Combined State Binder Group. Part of our certification document that says each supplier has to identify each modification technique with a unique identifier. Not necessarily tell us what the formulation is, but it has unique identifier. So, if there is an investigation, if we have problems with it, then we can go back and identify it.

From the Audience, Sandy Brown, Asphalt Institute: I just wanted to round out that conversation. I am with the Asphalt Institute of Ontario. I stand between Kai and Tony. [Laughter.] The point is how the system works in Ontario, just to explain it a little bit more clearly. We had a group that got together with industry to talk through this issue of how we are going to do this. There is a QC [Quality Control] plan that the supplier has to produce. In the QC plan, it typically says, "from this terminal, when I make this grade, I may have PPA added to it and if I do, it is going to be in the range of 0.5% - 1%". That leaves people the option of not giving away the precise formulation. You are not even saying it is going to be used because in Ontario what comes out of the pipeline the next day could be different and you have to do something different. It gives people the flexibility [they need] but it keeps the ministry informed. If there is a big change, they are supposed to tell them partway through that we are not going to be supplying that grade of whatever it is. It goes from the supplier to the ministry. It is a confidential document, and that's the way it is treated.

From the Audience, Zoab Zavary, New York State DOT: I just want you to know that until 2007 we never required PG binder suppliers to tell us anything about if the asphalt is neat or modified; but after 2007, we required every supplier to tell us if it is neat or modified. If it is modified, they have to let us know what they used. Is it polymer or PPA?

From Panel Member Bob McGennis: I guess this kind of gets back to the point Hussain brought up and that John was talking about. In both of the states that I work in, there actually are requirements that we do disclose in a general way. So by specification, this has already been covered. In every state I have worked in or been in I think there is a statement within the specification that says if the source changes that you are to disclose it. What happens in both the states that I work in is at that point the DOT can decide whether or not they need to redo the design. Typically, they will do a one point verification and typically they do the stripping test because they want to check the volumetrics and they want to make sure the asphalt will still stick to the rock. To me that is an issue that is much bigger than PPA. Now I do live in the real world. Do they always disclose that? I don't know. A lot of times that comes out in the first lot of production where nothing looks like it did during the design. I think this is an issue that is much bigger than even PPA. It happens every day.

From Moderator (Jim Scherocman): John D'Angelo is going to make a final wrap up comment or two.

John D' Angelo: I want to go over what we were really trying to accomplish here in this workshop. One of the primary things was to get actual data on the table so that people can actually look at it to make a decision on what they want to do with PPA. We have had quite a few presentations about how [PPA] works with asphalts and how it interacts with other materials other than just the asphalt. Jim asked a question, "I thought this is supposed to be blind." The binder specification is pretty much blind and it works well. You also have interactions with other components of the asphalt mixture, which is the rocks. The binder spec is a binder spec. You have to go the next step. That is the kind of thing we are trying to bring out in this workshop. You need to look at the whole material as it is going to be used on the road and provide that data.

We are going to put together a TRB circular. Hopefully we will get papers from everybody – I'm going to work on it. We'll get them published in a book so it is documented and people can go back and reference them. Also, we have been webcasting and recording it and hopefully Purdue will continue to have that available so people can go back and look at it. There were two presentations, Terry's and mine, that didn't make it due to technical difficulties. We are going to go back and try to re-record those so at least we'll have the presentations, but not the discussion. And I'm going to go to TRB to see if we can make that a part of an electronic circular and have it out to everybody.

Moderator Jim Scherocman: Let's thank the panel for their efforts and work. [Applause.] And remember, the most important specification is "black side up."