North Central Superpave Center (NCSC)
Steering Committee Meeting 2004 Minutes
Jan 28, 2004 7 – 9:45 a.m.

Members and Guests attending:

Dave Andrewski, INDOT (for Mark Miller)
Lloyd Bandy, Asphalt Pavement Association of Indiana
Mark Blow, Asphalt Institute
Wade Culwell, Kansas Asphalt Pavement Association
Allan Forde, Fred Carlson Co.
Lee Gallivan, FHWA
John Garrity, MinnDOT (guest of Curt Turgeon)
Mike Heitzman, Iowa DOT and NCSC Chairman
Ray Hogrefe, Jebro
Wayne Jones, Asphalt Institute
Becky McDaniel, NCSC
Dick McReynolds, Kansas DOT
Jan Olek, NCSC
Curt Turgeon, MinnDOT
John Volker, Wis DOT
Lynn Warble, NCSC
Laird Weishahn, NDOR

During introductions, Mark Blow mentioned that he is now with the Asphalt Institute in Sioux Falls, having come from the SDDOT. Wayne Jones, also of the Asphalt Institute, told the Steering Committee that the two of them cover 18 states and need a point of contact for each state. They would like to play a bigger role in the User Producer groups. Blow mentioned that he was going to host a breakfast in the morning to create contacts and would like an announcement during the meeting this afternoon.

Mike Heitzman, NCSC Steering Committee chairman, officially opened the meeting at 7:30 a.m. and thanked the NCSC for putting the meeting together. He reminded everyone there is a buffet luncheon between Noon and 1 p.m. today. The Annual Meeting starts this afternoon at 1 p.m. Laird Weishahn mentioned that Nebraska brought a lot of technicians to the meeting this year. Ray Hogrefe was welcomed back by the committee. He told everyone he is feeling great. Lee Gallivan reported that FHWA's funding is severely limited due to the lack of reauthorization.

NCSC Update - Rebecca McDaniel

Becky McDaniel gave an update on last year's activities at the NCSC. A copy of the presentation is in Appendix A.

Research

Identification of Laboratory Techniques to Optimize Superpave HMA Surface Friction Characteristics is a research project funded by Iowa, Indiana and the Institute for Safe, Quiet and Durable Highways (SQDH). This research is looking at how to optimize the two major

components to friction - microtexure from the aggregate and macrotexture in the HMA. Mixtures are being tested, not just aggregates. Phase I is completed and the report is online at http://widget.ecn.purdue.edu/~sqdh/. Phase II is underway now.

A Dynamic Friction Tester has been ordered from Japan. Inside the housing is a disc spinning 80 kilometers/hour. When released it drops the disc onto the pavement to measure wet friction. The companion device is a Circular Texture Meter. This is run first on dry pavement. A laser swings on an arm and measures the fine surface texture in the same path as the friction testing. The results are used to get an International Friction Index. NCAT lent the NCSC their equipment to complete some field work last fall. NCSC's equipment won't be received until February or March. The NCSC is building a slab polisher based on designs received from NCAT to accelerate the polishing of mix samples. The slabs are 20 inches square.

This friction equipment will be useful for research, measuring noise and surface texture, doing pavement forensics, selecting materials and studying variation in surface texture.

A *Field Evaluation of Porous Asphalt Pavement* is another study funded by SQDH. Noise was compared on three different surfaces, PFC, SMA and conventional HMA. INDOT and Heritage Research have been an enormous help, as well as NCAT, who brought up their noise trailer.

NCAT and NCSC are currently collaborating on several topics, including noise. The two groups are also working with SQDH. Together, the NCSC and NCAT are teaching the SQDH about pavements, and SQDH is teaching the NCSC and NCAT about noise.

Sideline Noise Measurements. NCAT's close proximity trailer has microphones inside the trailer near the tires and it measures the noise at the tire/ pavement interface. Sideline measurement is another way to collect noise data at the edge of the pavement. Current FHWA policy does not allow pavement type to be used as noise mitigation. However, FHWA has allowed Arizona a four decibel credit for using rubber open graded friction course because they have data to show the benefits. McDaniel reported that Larry Scofield told her that for each decibel reduction in noise they can reduce wall heights by two feet.

Bandy said he'd seen numbers below the 80's. McDaniel replied that the data shown was from the close proximity trailer and the noise is higher right at the source. Jones added that the main thing to look at is the relationship since it is a logarithmic scale.

Preliminary findings from both types of noise testing show that PFC is significantly quieter than SMA or HMA.

Later in the meeting, Jones showed a 30 second video of cars and trucks driving on the porous friction course (PFC) and SMA in the rain. The reduction in splash and spray on the PFC was dramatic. The theory is that at a very high air voids (20%) semis will blow dirt from the pavement, preventing clogging of the pores. Florida found the surface flushes itself out over time. Andrewski suggested that perhaps the NCSC could monitor the performance to see if the pores do remain open. McDaniel replied that we are proposing to do just that.

The NCSC prepared curved slabs for noise testing in the Tire Pavement Test Apparatus (TPTA), and SQDH is analyzing the data. The goal is to correlate lab to field numbers. The TPTA is equipped with microphones in the same locations as the close proximity trailer. The NCSC made curved concrete molds and compacted asphalt into the trough. Rolling pins and brute force were used to compact the asphalt to a 1.5 or 3 inch depth. A report will be available in Feb. or March on the SQDH website.

McDaniel reported that the NCSC had worked with SQDH and NCAT to develop a proposal for a pooled fund study on noise. She said that Bob Bernhard, the SQDH Director, will be on a new European scanning tour, which may generate increased interest in noise issues in the U.S. The study proposal may be modified based on results of the scanning tour, then it will be sent to the states for possible funding. The NCSC is poised to act as soon as the scan is completed.

Other on-going projects include:

- *Performance Certification of Indiana Superpave Hot Asphalt Mixes:* This study is looking at performance parameters of typical Indiana HMA.

- *Superpave Simple Performance Testing:* Confined and unconfined dynamic modulus testing is being conducted as part of this study.

- *Effects of Hot Plant Fuel Characteristics and Combustion on Asphalt Concrete Quality (South Dakota):* This project looked at fuels. The final report will be available soon on the South Dakota DOT website.

- *Evaluation of Surface (Top Down) Longitudinal Wheel Path Cracking in Indiana.* The draft final report is imminent in this study with Terhi Pellinen and Geoff Rowe.

- *High Stiffness Hot Mix Asphalt:* Another study with Dr. Pellinen.

New studies:

- The NCSC is starting a new study, *Determining the Binder Content of Hot Mix Asphalt Containing Dolomitic Aggregates Using the Ignition Oven.* Research will focus on how to use the ignition oven with dolomites where the weight does not stabilize under current protocols.

- A mineral wool manufacturer from Indiana asked the NCSC to test their product for SMA's. This product may be used as an alternate to cellulose in AASHTO design. This may lead to additional research on performance of the material.

- Another proposal is out on using *Cement Kiln Dust as an Additive to HMA*.

McDaniel told the group that the NCSC is open to collaborations. The NCSC would be happy to partner with other universities or research organizations on state sponsored research.

Equipment/Protocol Evaluations

- The NCSC has nearly completed performance testing of ten mixes from around the region. The evaluation was funded by the FHWA. All the testing has been completed except for some confined testing which has been delayed due to an equipment problem. Ruggedness testing of the binder Direct Tension protocol was completed. Tests were done on over 600 samples under varied conditions.

- The NCSC worked with the Iowa DOT, FHWA and others on an evaluation of various performance tests. The FHWA trailer went to Iowa to do some testing on three different types of performance tests. Companion samples were also tested by Iowa State, NCSC and Mathy Construction. The results will be compared to look at the different tests and similar tests run in different labs.

Test Standardization

A survey was sent to the states in the region in October regarding AASHTO T166, Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface Dry Specimens. Responses were received from five states, one contractor and one province. The NCSC will follow up with those states that did not respond.

So far most of the differences between states seem to be minor. A student has been hired to help the NCSC with compiling and comparing the information. The differences will be summarized and a white paper will be prepared and available in March 2004.

Training

There are three courses scheduled for the 2004 season. Binder, Feb 10-12; Mix Design Fundamentals, Feb 17-20; and Mix Design for Experienced Marshall Designers, Feb 26-27. There are also customized courses available upon request.

Minnesota DOT awarded the NCSC a small contract, *Development of Superpave Mix Design Guidelines for Local Governments*. Training materials, written guidelines, flow charts and summaries of how to implement gyratory mix designs for Minnesota are being created and should be completed by the end of February. The guidelines will be available in one package using a CD or DVD format.

Communications

The binder Direct Tension Testing video has been completed and has been posted to the website. DSR, BBR and RV videos are already finished. The SGC and DAV are the next topics to be considered. The NCSC worked with Fugro-Bre to market the results of the NCHRP 9-12 project. NCHRP will be making hundreds of DVDs for distribution by either NAPA or TRB, and copies will be sent to every state. The video shows how to use RAP in Superpave. When it is available the information will be included in the newsletter. Permission has been received to post the video to the NCSC website. The video is currently being prepared for viewing on the web.

Lloyd Bandy thought it was good to have information in our newsletter to publicize the video. He also gave us permission to put the local agency information APAI created on the NCSC website. Warble will follow-up to get this done.

The Northeast Superpave Center, NECEPT, has gone through personnel changes and in doing so ended up dropping out of the National Newsletter project that NCSC publishes three times per year. However, Jack Stevens at UConn is working with NECEPT and is interested in resurrecting the newsletter for that region. The NCSC is working with Don Watson in the Southeast area, now that Allen Cooley has left. Over 4000 people get the newsletter and if the Northeast comes back it will be sent to 6000 people.

The NCSC continually makes changes to the website and searchable database. This past summer staff worked diligently to update the searchable database. Many citations were filled in more completely, and new information was added as well. The database is more useful now. There was one person plus a graduate student working on it most of the summer.

NCSC staff did a lot of traveling and made a lot of presentations this year. Presentations were made to:

- Western Cooperative Test Group
- Ohio Transportation Engineering Conference
- Kansas Asphalt Paving Conference
- Minnesota Association of Asphalt Paving Technologists
- Rocky Mountain User Producer Group
- AAPT
- TRB Committee on General Issues in Asphalt Technology
- An ASTM Symposium on Performance Testing in Tampa

Staffing

The NCSC's core group is Jan Olek, Director; Rebecca McDaniel, Technical Director; Lynn Warble, Communications Specialist; and Ayesha Shah, Research Engineer. James Esler was a mechanical engineer who was a great help on the website and with the binder direct tension testing. He left in April for a career mechanical engineering position. This past summer a couple of grad students were available to help on some projects. Rolando Garcia worked on the Searchable Database update, and Will Thornton worked on the Porous Asphalt project.

Future Plans

INDOT is building a 14,000 square foot lab addition. The NCSC will be moving the NCSC lab to the new addition as early as April. At that time equipment will be recalibrated. INDOT plans to remodel the existing lab and office space into a suite of offices. Also, the NCSC has been included on the sign out front, indicating its planned permanence.

Dave Andrewski asked what the other Superpave Centers are doing. McDaniel responded that nobody has heard much from the University of Nevada - Reno. Peter Sebaaly might argue the center exists in name but the NCSC has been called to Oregon and New Mexico to do training, so it would seem they are not heavily involved as a Center. When the Center at Texas moved to College Station they lost their momentum. The Texas Center has little money and staff. Joe

Button is the Director. However, they are working on simple performance testing. The Pennsylvania Center, NECEPT, is continuing, but Dave Anderson has retired and Anne Stonex left a couple years ago. The most active centers are the NCSC, the Southeast Superpave Center at NCAT and NECEPT at Penn State.

Bandy suggested that although it may be premature, the NCSC may want to look at how to fill voids created by the lack of Centers in the West and South through LTAP Centers or the DOTs. McDaniel replied that we do send our newsletter to people all over country and travel there for presentations and training when asked. Bandy said we could maximize our exposure by approaching states without an active center.

Financial Report - Jan Olek

Jan Olek provided a summary of the financial status of the NCSC. A copy of his presentation and the summary sheets are in Appendix B.

Overall, about 50% of NCSC's operating costs are generated by research and other activities of the NCSC. The other 50% is through base funding.

The budgets presented are not hard numbers except for fiscal year 02/03, which ended June 30, 2003. Fiscal year 03/04 began July 1, 2003, and will end June 30, 2004, so some of the expenses and income have been projected for the current fiscal year.

> The 02/03 income was $513,932, which includes $93,153 carryover from 01/02. Expenses totaled $438,407, which left a balance of $75,525 to carry to 2003/2004.
>
> The projected income for 03/04 is $584,208**,** which includes $75,525 from 02/03. Projected expenses are $511,275 leaving a balance of $72,933 to carry to 2004/2005.
>
> The projected income for 04/05 is $529,933, which includes $72,933 from 03/04. Projected expenses are $468,124, leaving a balance of $61,809, which will carry over to 05/06.

Heitzman asked if we knew which of the potential new research items listed were going to happen for sure. Olek replied that the Cement Kiln Dust project is not firm yet. McDaniel also indicated that the Pavement Texture project was only in the beginning stages of being proposed.

The projections for FY 2005 assume that base funding will continue at same level as year 2004, which is $25,000. Many states have already committed this money but some states commit yearly so haven't yet committed the 2005 money. An e-mail will be forthcoming to those states that have not already committed for the second year of the Base Four funding, which is 2004-2005.

Wade Culwell asked if the states would find it easier to commit $50,000 every other year. Dick McReynolds stated it is a cash flow problem. Olek said we are trying to be good stewards of the base funding money. He added that he hoped the NCSC could operate for another year or two if states decided not to commit to Base Funding again before the Center would have to close.

John Volker asked if everything goes ahead with Congress would FHWA have the 100% funds for center. Gallivan replied that it should be available, but only the final outcome will tell.

Olek said that in November the NCSC was asked to bid on an NCHRP proposal for noise related issues. Olek submitted a large proposal but due to a glitch with printing and junior faculty it didn't arrive in time. If NCHRP is not satisfied with the submissions they received they may go out to bid again at which point the proposal will be resubmitted. Opportunities for additional funding do come up, and the NCSC is always watching for them as ways to earn more money for the Center.

Bandy suggested that there are various transportation opportunities for research. He wondered if someone could monitor and summarize the federal bills relative to research in the hot mix/ aggregate area. Olek was not aware of who would receive that information. Gallivan said that somebody at FHWA receives word on the final products, and he will pass that along. Bandy will forward to NCSC any information he receives, as well. The NCSC will also check and see if there is information posted on a website.

Heitzman mentioned that from the base funding perspective most states are using Federal SPR funds. He feels we rely heavily on base funding and need to continue efforts to build research opportunities. He added that base funding will not disappear, but there is always competition for SPR funds, and the NCSC will need to be able to market and demonstrate the Center's role.

Volker said that what Olek and McDaniel have shown gives him good ammunition to justify Wisconsin's $25,000/year contribution. The NCSC has shown that the goals are being addressed, and the product is out the door after many years of setup and working towards it. Seeing some products in use helps the states justify the base funding money. Volker is impressed with what the NCSC is doing. It is an easier task for him if he can show what he is getting for the money.

Olek said that the NCSC has been around for awhile now and has national visibility. Their research is of national importance. NCSC has allied themselves with NCAT and others. The Center has aligned itself well to continue with operations. Volker complimented the NCSC that it is doing a good job representing the State's interests at meetings. Important information is brought back to the states through the NCSC, which is valuable to Volker.

Heitzman asked if anyone had made use of the "benefits statement" that was created this past year. It also should be on NCSC website. Warble will add it.

McDaniel asked the Steering Committee members to keep the NCSC in mind when putting together state research programs. She reminded the members that the NCSC is available to assist with projects in house or by local universities. The NCSC can help give the states data on friction testing, noise testing, materials testing etc.

New initiatives – Jan Olek and Becky McDaniel

Several topics to pursue were suggested by the Steering Committee at the last meeting, including DAV, Corelok and APA. The NCSC would like to review those with the Steering Committee, as well as suggest some additional potential topics. A copy of the presentation is included in Appendix C.

DAV – It had been suggested previously that the NCSC could offer a service to help with angle calibration. There was also some interest in a pooled fund study. McDaniel added that there are current developments to consider. For example, the angle that is measured depends on stiffness of the mix. Manufacturers including TestQuip and Pine have been developing mix-less DAV's. These look promising and are being calibrated to a known standard, so it looks like the way to go. McDaniel asked if the NCSC should continue to pursue this topic. She asked if the NCSC should develop a proposal for a pooled fund project, and ask Pine and TestQuip to lend us equipment or go out for bid and buy one. Should the NCSC invite participation within the region or beyond? Would this lead to a service the NCSC should provide or would it merely give states or industry data on whether they should purchase their own equipment?

The industry people concurred that there is no need for the service as they would buy their own equipment and have their own personnel do the calibrations.

McDaniel asked for the Steering Committee members thoughts. Gallivan said there is a hot mix asphalt simulator which doesn't use mix but can use existing hardware so HMS looks pretty good. Andrewski added that John D'Angelo of FHWA is working with NCAT on comparing angle verifiers and felt there is a big need for this service. He added Indiana is setting gyratories at 1.16º internal angle. There is a lack of available service so that many contractors cannot get calibrated until after the season is over.

Heitzman said there is a need to do verification of the angles. He suggested McDaniel determine whether there is a viable national study. The mix-less method is not approved yet. If there is no study being done nationally, then the NCSC should put a proposal together to share with states to see if a pooled fund study could be started. Bandy said McDaniel is in the best position to determine what is going on with this topic. If there is a void that is not being investigated, the NCSC could fill that void. Volker added that there is a real future need. Iowa and Indiana both bought kits and need the expertise to use them. Heitzman said that Iowa would use their own technicians.

Blow would like to see the information put on the website. Heitzman would like to see a service for calibrating. Bandy would rather see emphasis on the equipment itself. McDaniel will follow up with NCAT to see where the need lies.

Corelok – There was an NCAT report in November 2002 that recommended Corelok. Within the North Central region, Illinois evaluated it on 300 cores. The problem they saw is that it raises the bar and specifications may need to be changed for density. McReynolds noted that Kansas implemented the Corelok as its standard method for bulk specific gravity instead of paraffin-coated. Missouri investigated it. Minnesota recommended it as a replacement for D1188. Andrewski said that Indiana uses it for open graded mixes but not for evaluating dense graded mixes. In review of current protocols should the NCSC review and recommend a

standardized method? The Steering Committee agreed that no other research appears to be needed.

Heitzman mentioned there is a good training opportunity on maximum and bulk specific gravities. The NCSC could produce a video. Ali Regimand of Instrotek could be contacted to help. Weishahn said that Nebraska was looking at using the Corelok for running stripping tests.

APA –Gene Skok did a report for Mn/DOT that recommended the APA. The report is available on the web. Missouri uses it. INDOT has the Purwheel. The FHWA position is that there are numerous problems with this equipment.

McDaniel said there are many different devices, and it would be a high capital equipment cost for NCSC to purchase this equipment for evaluation. McDaniel offered that the NCSC could perform testing on Purdue's Purwheel for evaluation of wet or dry mixes if any states are interested.

Heitzman added that Iowa wouldn't necessarily benefit from a regional study on the APA if it isn't the test of choice for a lot of things. The best value would be for the NCSC to provide testing as additional data for states. Andrewski added that a lot of data is coming out of the NCAT test track. McReynolds said that Kansas is making a piece of equipment like the Hamburg for a lot less money.

McReynolds says this should be worked on by individual states. Gallivan asked if the NCSC could pigeonhole some web page sources for information such as NCAT, Skok's report and FHWA. Gallivan can help track the FHWA summary report down. Frank Fee also has a report that could be used. McDaniel agreed to provide information on the web.

The conclusion was that the NCSC can stay informed and report on this topic.

Direct Tension Ruggedness Testing. McDaniel stated that Kentucky and New York are apparently the only states currently using MP1a. If states want to look at this, the NCSC has a lot of experience running Direct Tension and can work with states on it.

Transportation Curriculum Coordination Council (TCCC). The NCSC gets e-mail notices and minutes for this group from Chris Anderson at the Iowa DOT. The NCSC is web administrator of the MTRAC website, which incorporates most of the TCCC information and links. We will continue to follow this group's work looking for opportunities to help.

In-Place Density and Permeability. McDaniel asked if there is a concern about permeability from the states. There was a recent TRB committee presentation on air permeability which may be promising. Since no states indicated major concerns about permeability the NCSC will stay informed, but not propose any work at this time.

Performance Measures and Life Cycle Costs. Eric Harm has asked McDaniel if the investment in Superpave has paid off. Wisconsin and Indiana show longer life on warranty

projects. Heitzman cautioned to look at only one distress at a time due to state differences in measuring distress.

Culwell suggested life cycle cost analysis (LCCA) could use standardization. He asked if any states use the risk factor to analyze their choices. McDaniel asked if the NCSC should do a survey of how states compute LCCA? Bandy does not think the NCSC needs to have a role in this. The NCSC should let the state paving associations manage this topic because the variables are all different and there are too many of them. One adjustment or one opinion can change the outcome. Heitzman said that from the NCSC perspective this is a state by state issue and it can get heated.

Hogrefe asked if the committee wants the NCSC to investigate the use of modified binders. Is there an element the NCSC can investigate? It was determined there was not much benefit for the NCSC to get involved in this. Blow said that Ohio has something on the web for survivability curves from their Pavement Management System. Perhaps the NCSC could recommend how to set up survivability curves. McDaniel said that information is state specific.

Possible New Topics

- Micro Deval Testing of Aggregates as an alternative to LA abrasion. NCAT reported the results vary depending on the effect of mineralogy. Should the NCSC evaluate regional materials?
- Friction and Surface Texture. The DFT and CTM will be available in March and could be used for research and forensics. States could add their materials to the current study test matrix. McDaniel will be contacting the states for possible participation in the on-going study later this year after we have some data.
- Anti-stripping admixtures (CKD's). McDaniel chairs an NCHRP panel overseeing a project to develop screening test methods. Purdue has capability to do testing. Is there an interest in evaluating regional materials?
- Low-noise asphalt pavements. More work could build on our current project and testing capabilities.
- Regional assessments of long term performance of Superpave sections (LTTP data, SPS and other instrumented sections). There is a lot of LTPP data available now, but many states are not using it. Some states are setting up their own mini-LTPP's. A centralized databank could be established, if it is something that is deemed worthy. Connected to that idea, there could be virtual visits of Superpave sites in the region with clips on our website, so that users could actually see how Superpave is performing.
- Establishing a stronger partnership with supporting state agencies. The NCSC would like to establish a stronger link with base funding states. We could have an agency internship program to provide in house research experiences. If a DOT had a student or a new employee they were looking to train, the person could come to the NCSC for a month or so with the specific objective of training them in a topic such as Dynamic Modulus testing, Direct Tension testing, Angle Verification, etc. They would be paid a stipend to live for a month in Indiana to participate in the internship program.
- Coordination and Assistance with Technical Problem-Solving Initiatives. The NCSC could also help with technical problems states are experiencing. Indiana experience tells us that things come up that have to be solved immediately. A state could submit a short

proposal identifying the problem and objective. The NCSC could offer some expertise on how to find a solution and even offer a financial incentive for the state to solve it in house. NCSC would not do the research but could help develop a state research project on the problem and give the state start-up money.

- Proposed Regional Specifications Site. A site could be launched where links could be provided to the states specifications, making them easier to locate and compare.
- New training class. Should the NCSC develop a training class on the Superpave Performance Test or Dynamic Modulus? Is this a need for the states?

Heitzman provided comments on the initiatives. He felt there should be some discussion to define the activities on which to proceed, however the NCSC has the best feel for which ones might be most vital.

This list will need more review and consideration before establishing priorities. McDaniel mentioned to the Steering Committee members that another video conference this summer may be in order to discuss these new initiatives. NCSC will e-mail the Steering Committee members to discuss a potential video-conference.

Heitzman thanked the Steering Committee members for coming and concluded the meeting at 9:55 a.m.