

North Central Superpave Center News

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NCSC Vision and Mission:

To be an industry-recognized source of Superpave expertise and to lead further development and implementation of Superpave technology by providing services to its customers, through excellence in research, training, and communication.



NCAUPG to Meet in Indy

The next meeting of the North Central Asphalt User Producer Group will be held in Downtown Indianapolis January 16-18, 2001. The meeting starts, as usual, with a Technician Workshop. The NCSC Steering Committee will be held immediately after the NCAUPG Annual Meeting.

The meeting will be held at the Omni Severin Hotel, 40 West Jackson Place. If you hurry to make your reservation by December 17, 2000, you can secure the conference rate of \$94 single or double. Call 317/634-6664 and refer to the North Central Asphalt User Producer Group Meeting. Indy Couriers provides a shuttle from the Ground Transportation Center at the airport for \$8 per person. Taxi fare from the airport is about \$15.

The Technician Workshop begins at 1:00 p.m. on Tuesday, January 16, and concludes at noon on Wednesday, the 17th. Topics for discussion include mix design, construction, general materials, test standardization and quality control. The workshop will be an open forum giving participants the opportunity to exchange information with each other.

Regional and national speakers will address the Annual Meeting of the NCAUPG, beginning at 1:00 p.m. on the 17th. Joe Mickes, Chair of the TRB Superpave Implementation Committee, will report on the activities of this new committee. John D'Angelo, FHWA, will provide an update on Superpave from a national perspective and Jan Olek, NCSC, will bring the group up to date on Center activities. Gerald Huber, Heritage Research, plans a briefing on binder-related issues. Ray Brown, NCAT Director, will report on the performance of Superpave projects nationwide. A survey on asphalt issues has been sent to chief engineers and industry; Firooz Zandi, INDOT, and Dan Brown, Phend and Brown, Inc., will summarize the results. To conclude Wednesday's program, Shongtao Dai will report on the performance of MinnDOT's Superpave projects.

The program continues Thursday with a report on the development of new Superpave models by Ramon Bonaquist, Advanced Asphalt Technologies, and an overview of the Superpave Gyrotory Compactor Validation Kit by Tom Harmon, FHWA. John Volker, WisDOT, and Chuck Van Deusen, consultant, will offer agency and industry perspectives on warranties. This will be followed by a panel discussion of incentives, compaction and density with contractors representing the states in the North Central region. Erv Dukatz, Mathy Construction, will summarize the discussions at the Technician Workshop, and David Law, of FHWA, will report on the Kansas round robin comparison of lightweight profilometers. The meeting will conclude with a group discussion of the future direction of the NCAUPG.

The NCSC Steering Committee will meet from noon until 4:00 p.m. on Thursday, January 18th. Guests are welcome to attend, but are asked to register with the NCSC if they plan to sit in on the meeting.

To register for the Annual Meeting or Technician Workshop, see the NCSC website for the registration form and other information. The Asphalt Pavement Association of Indiana is coordinating the meeting. They can be reached at 317/632-2441.

Wisconsin Promotes Careers in Transportation

It's becoming a common theme – recruiting and keeping qualified people is a growing problem in the construction industry. With the lure of making a killing on a dot-com business and other more glamorous high tech industries, construction is having an image problem. At the same time, Superpave, regulations requiring qualified technicians and other advances in the industry are demanding more knowledgeable, versatile personnel.

How do we, as an industry, turn people on to the idea of a career in transportation? Those of us who do this for a living know how rewarding it can be. Now, we need to convey that to young people before they commit to another path. We also need to help convince kids to stay in school and get the background in math, science and language that will serve them well in a future career.

The Wisconsin DOT has teamed with partners in industry, labor, community organizations and government to expose young people to the transportation industry, highway construction and skilled trades. One initiative is a one-week summer Career Awareness Project for fifth, sixth and seventh graders from various parts of Wisconsin. This program is in cooperation with the FHWA Garrett A. Morgan Technology and Transportation Futures Program (<http://www.fhwa.gov/education/>).

The first WisDOT Project was held in August 1999. Over one hundred youth partici-

pated in the first program. One hundred more students participated in the second year of the program. Half the participants have been girls and half boys. They come from central cities and rural communities and represent broad racial and ethnic backgrounds.

The program is so successful that about 45% of the participants want to return the next year. That presents a challenge to the DOT to offer an advanced program for the returning students, adding to the costs and the benefits of the program.



Participants visited a project to observe paving in action.

The program offers a diverse and fun set of hands-on activities to help get the participants excited and involved. Participants build bridges, assemble crystal radio kits, try their hands at surveying, and build and launch rockets. The students also go on field trips to see in practice the range of career opportunities available. Site visits include construction projects,

airports, the Air and Army National Guards, Coast Guard and more. While visiting the sites, students get to see professionals at work, use some tools of the industry and watch construction machinery in action.

The curriculum also includes materials developed by Scholastic, Inc., and the Associated General Contractors of America to encourage the development a background in science and math. These materials cover unifying scientific concepts and processes, motion and forces, technological design, computation and estimation, measurement and geometry. The course also offers participants simulated project experience through activities like plan reading and team building.

Industry partners and the DOT provide staff to plan and organize the program, lead hands-on activities and chaperone. Wisconsin school district teachers, teaching assistants and safety aides are also recruited to staff the

program. Over 30 stakeholders contributed in excess of 800 personnel hours serving as committee members, instructors or chaperones. Jackson Practitioner Group, Inc., coordinated the 1999 and 2000 programs and is currently working on 2001.

The Wisconsin DOT has at least 400 jobs available each year. Related industries have even more job openings. As the program brochure states, "If you earn a diploma from high school, vocational school, college or university, there is a job for you." This program helps to make the prospects of a job in the industry more appealing to young people.

Other groups are also working to promote careers in transportation. In Texas, a job fair attracts some 15,000 kids a year, showing them a wide range of construction-related job opportunities. The Women in Engineering Program at Purdue University is planning a series of after-school programs to expose young girls to a variety of engineering fields, include transportation.

Through programs like these to build awareness and interest in young people, we may be able to show kids that a career in transportation is as attractive, challenging and rewarding as one in Silicon Valley. Maybe they will eventually choose a DOT over a dot-com.



Students also toured an aggregate quarry.

Kansas Holds Annual Asphalt Conference

Presentations by national, regional and local speakers highlighted the 44th Annual Kansas Asphalt Paving Conference in November. Associate Professor **Steve Cross** welcomed about 300 people to the one-day conference at the University of Kansas in Lawrence.

Professor **Carl Monismith**, University of California – Berkeley, updated the group on some of the findings at WesTrack, particularly in regards to fatigue and rutting.

The structural cross section of WesTrack was designed such that fatigue cracking was expected to appear, and it did. Samples of the paving materials were evaluated in the lab using a strain-controlled beam fatigue test. The results were then compared to the observed cracking on the various test sections.

Rutting was predicted based on laboratory shear testing in the Superpave shear tester, using the repeated shear at constant height test at 40, 50 and 60°C.

Monismith stressed that compaction in the field is critically important to good fatigue performance. The high air void mixes at WesTrack cracked sooner than mixes at lower air void levels. The amount of traffic that caused a certain fixed level of rutting decreased as the air void content increased and as asphalt content increased. In other words, it will take less traffic to cause rutting when the air void content of the mix, or the asphalt content, is higher. Monismith noted proper compaction is particularly important with coarse mixes. Good communication between everyone involved in the production and placement will help to achieve proper rolling patterns and good density.

Greater uniformity also lead to improved performance. For example, fatigue life increased when the air void content variability decreased. The ramifications of good construction are far reaching; for example, increased smoothness resulted in substantial fuel savings.

Monismith also commented that the performance at WesTrack underscores the need for a simple performance test. Volumetric mix design alone did not capture the difference in high temperature performance of the coarse and fine mixes.

The next speaker, **Tom Deddens** of the Asphalt Institute, also stressed the importance of good construction practices. Deddens addressed the need to handle asphalt intersections differently from the mainline pavement. Slow moving

loads and increased turning stresses in intersections intensify the damage in those areas.

In rehabilitating an intersection, it is important to replace *all* of the deformed layers. Merely removing and replacing the surface may not solve the problem if underlying layers are weak. High stiffness binders and high quality aggregates are also essential. Good construction practices include thoroughly cleaning milled areas of all dust, avoiding segregation, constructing joints properly and achieving the target density.

Deddens summarized the construction of a high volume intersection in Olathe, Kansas, a Kansas City suburb. This intersection had experienced severe rutting in the past. A Superpave mix with high quality aggregates and a PG 82-22 was chosen for the rehabilitation in 1999. The Kansas Asphalt Pavement Association footed the bill for the increased cost of a Superpave mixture to demonstrate that asphalt could perform in a high stress intersection. Performance to date has been good.

Becky McDaniel then summarized the findings of NCHRP 9-12. This research should open the door to increased use of RAP with Superpave. See the related article in this newsletter for more details.

Lon Ingram, Chief of Materials and Research, Kansas DOT (KDOT), then summarized experiences with quality control and quality assurance with Superpave. Over 60 projects have now been completed with the new specifications. Following a hot summer, performance overall has been good.

Ingram noted that the implementation of bonuses and the increased attention by contractors has lead to improved smoothness. Contractors are also being quite successful in meeting the target density, currently averaging about 60 to 70% of the maximum possible bonus. In general, there is good agreement between contractors and the state on in-place density and air void measurements.

Changing to a percent within limit approach for density and air voids may change the incentives and disincentives. Some may be higher than currently awarded and others will be lower.

A panel of contractors then shared their perceptions of the QC/QA process. **Doug Shilling**, Shilling Construction Co., commented that there is no “silver bullet” for bidding due to too many variables. It is risky to bid a job without doing the lab work.

Ron Wagoner, of Venture Corp., said changes in the density specifications will make it much more difficult to achieve density, but increasing surface lifts will help. Using fewer binder grades on the same job will help to lower costs. Wagoner also noted that economic and environmental benefits justify the use of the maximum amount of RAP.

Bob Stivers, of Shears Construction, also commented on the requirements calling for 93% density or better for 100% pay. That will mean big rollers hitting the mix while it is hot. He also noted it may be necessary to haul high quality fine aggregates 100 miles or more, adding that is expensive, but worth it.

Don Popejoy, Ritchie Paving, Inc., concluded that there has been a tremendous change in the asphalt industry in Kansas since 1991. The contractors have learned an enormous amount. Back then he did not think there was a chance that Kansas would be 100% Superpave in 2001, but “we’re there.” The most important thing to ensure continued success is to work together.

Phil Blankenship, from Koch Materials, then reviewed wheel tracking devices for practical performance testing of hot mix asphalt. One advantage of wheel trackers, according to Blankenship, is their ability to physically show the differences in mixtures. “Seeing is believing,” he maintains. This is in marked contrast to the esoteric, anything-but-obvious results of Superpave shear testing. Koch uses both shear testing and rut testers when evaluating mixes for their various projects.

Blankenship reminded the audience that Steve Cross tested the KDOT mixes placed in the 2000 construction season to see how they would perform. Wagoner had earlier commented that this testing helped confirm that these mixes would work.

The conference concluded with a rousing talk by **Chuck Deahl** on compaction. Deahl, of Compaction America, Inc., has extensive experience troubleshooting compaction problems. He agreed with earlier speakers that communication is critical to getting good compaction.

Temperature is also critical. The minimum laydown temperature is a function of the lift thickness and base temperature. He recommends putting temperature sensors on the rollers to help guide rolling operations. The zones for rolling also depend on the mat temperature.

Other suggestions from Deahl include using the right roller train for the job and the right types of rollers. To achieve 93% density under percent within limit specifications, you will need a three-roller train at least. The lift thickness should be three to four times the nominal maximum aggregate size.

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The National and Regional Superpave Newsletters are published three times a year and are coordinated by the North Central Superpave Center. The NCSC is one of five Superpave Regional Centers established to assist with implementation of the Superpave performance-based system for designing asphalt pavements. The NCSC is a joint effort of Purdue University, the Indiana Department of Transportation, and the Federal Highway Administration and is administered by the Joint Transportation Research Program at Purdue University.

Calendar of Events

- Jan 7-11, 2001 **Transportation Research Board Annual Meeting**
Washington, DC
Contact: TRB (202) 334-3214
website: <http://www.nationalacademies.org/trb/>
- Jan 16-18 **North Central Asphalt User Producer Group Annual Meeting, Technician Workshop and NCSC Steering Committee Meeting**
Omni Hotel, Indianapolis, IN Contact: NCSC
- Feb 4-7 **World of Asphalt™ 2001 Show**
Wyndham Palace Resort Orlando, Florida
Website: <http://www.worldofasphalt.com/index.asp>
- March 11-14 **Fourth Annual Asphalt Conference & Expo**
Atlanta, GA
Contact: Wendy Cantwell, (816) 246-7711 Fax: (816) 254-7446
- March 18-21 **Meeting of the Association of Asphalt Paving Technologists**
Hilton Hotel Clearwater, FL
Contact: AAPT, (651) 293-9188
Website: <http://www.asphalttechnology.org/>

Superpave Training

Superpave Binder \$600

January 31 - February 2, 2001 • Indianapolis
March 26 - 28, 2001 • Indianapolis

Superpave Volumetric Mix Design Refresher (for Experienced Marshall Designers) \$400

February 12 - 13, 2001 • Indianapolis

Superpave Volumetric Mix Design Fundamentals (Four Day Intensive Course for Those Unfamiliar with Mix Design or Testing) \$750

February 27 - March 2, 2001 • Indianapolis

See the NCSC website at <http://bridge.ecn.purdue.edu/~spave> for more information



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