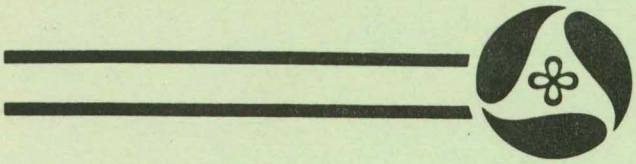
A Summary of Iowa DOT Attendee Comments from the Transportation Research Board Annual Meeting

January 11-14, 1988



Iowa Department of Transportation

TRB Summary
January 1988

BUREAU OF TRANSPORTATION SAFETY

OFFICE: Transportation Safety
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 52-Safety Issues Concerning Aged Driver Response to Traffic Control Devices

COMMENTS: There were four papers presented at this session. For the most part, they concentrated on testing the capability of drivers with emphasis on older individuals. Included were lab techniques in conducting research. The conclusions were that younger drivers less than 25 years of age and older drivers greater than 65 years of age were more prone to have accidents than those in the middle range from 25 to 65. I did not obtain any papers from this session, but a cassette tape is available if anyone is interested in hearing the presentations.

FOLLOW UP NAME: Dwight Stevens/Harold Schiel, Maintenance/Transportation Safety

OFFICE: Transportation Safety
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 65-Traffic Accident Analysis

COMMENTS: A paper presented at this session was entitled, "Estimation of Wet Pavement Exposure from Available Weather Records". I obtained a copy of this paper and it may be of help in determining wet accident rates in managing our skid accident reduction program.

Another paper presented at this session was entitled, "Accident Data as a Tool for Highway Risk Management". This was a very good presentation by Daniel S. Turner of the University of Alabama. I obtained a copy of the paper which contains a very comprehensive description of the elements in a risk management program. It should be of help to us in minimizing the effect of tort claims against the state.

FOLLOW UP NAME: Harold Schiel, Transportation Safety

OFFICE: Transportation Safety
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 93-Roadside Safety Features, Part 1

COMMENTS: This was a very informative session with five papers presented. I obtained copies of three of those papers for further evaluation. They were (1) Full Scale Vehicle Crash Tests on Guardrail/Bridgerail Transition Designs With Special Post Spacing, (2) Full Scale Vehicle Crash Tests on a Nebraska Rural Mail Box Design and (3) Impact Attenuators--A Current Engineering Evaluation. All three of these papers contained information which may be of help to Road Design and Maintenance in improving safety of roadside features.

Another paper presented at this session was "Crash Tests on a Strong Beam Guardrail/Bridgerail Transition". It described crash tests on a 'W' beam supplemented with tubular sections behind to increase the strength of the rail. For these tests, the last post next to the bridge was omitted because of a drainage basin. For the first test, the guardrail section failed because of excessive deflection. For the second test, wood posts were placed inside the tubular supports to increase strength. With this method, the performance was satisfactory.

Another paper presented at this session covered the new Federal Outdoor Laboratory for Evaluating Roadside Safety Hardware. It was an interesting presentation on the tests which are being conducted at this facility. Those demonstrated included breezeway features of pole bases.

FOLLOW UP NAME: Roger Bierbaum/Will Zitterich, Road Design/Maintenance

HIGHWAYS

OFFICE: Road Design
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 112-Performance of Concrete 4R Projects

COMMENTS: A speaker from Concrete Reinforcing Steel Institute reported on 29 miles of 8" C.R.C. over a.c. that's 12 to 17 years old in Oregon. It's on I-5. It's still in good condition, with little maintenance. They placed all reinforcing on chairs!

A Penn DOT engineer reviewed their experience. They have a Pavement Management group; they compare ESAL and PSI and make rehabilitation decisions accordingly. They use group evaluation to consider alternatives.

Another speaker, in discussing p.c.c. pavement recycling, gave Iowa credit for our pioneer work in this area in 1976. He feels concrete made with less than desirable aggregate durability can be improved by recycling.

The FHWA speaker reviewed their experience with 8 states' CPR (pavement restoration) projects. His conclusion - if more than 5% patching per lane is required, CPR is not recommended; if less than 2% patching, CPR is okay (cost effective).

A speaker discussed a field evaluation of dowel placement on I-45 in Texas. They looked at basket assemblies vs dowel inserting machinery; baskets performed worse in both vertical misalignment and depth!

A speaker from Georgia DOT mentioned they have 5 grinding machines (for faulted joints). They stopped installing edge drains in 1979. They've resealed all p.c.c.p. joints with silicon since 1977; they inspect all joints annually.

FOLLOW UP NAME: Jim Grove, Materials

OFFICE: Road Design
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 164-Utilities in Highway Design and Construction

COMMENTS: I was only able to attend the last part of this session in which a panel was discussing the clear zone within existing right of way. Two subjects being covered were breakaway power poles and a unique device called a "cam" placed at the base of a power pole to prevent head-on collisions. The principal of the device was to deflect the vehicle so it would miss the power pole.

There were no papers available from any of these sessions, however, a cassette tape is available if anyone is interested in hearing the presentations.

FOLLOW UP NAME: Roger Bierbaum/Will Zitterich, Road Design/Maintenance

OFFICE: Construction
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 157-Traffic Control in Work Zones

COMMENTS: One paper in this session was "A Comparative Study of Short and Long Term Urban Freeway Work Zones". It concluded that accidents were linear with respect to exposure and length of the work area.

Another paper presented at this session was on safety where pavement edges and drop-offs exist. I was unable to obtain a copy of this paper because they were out. The conclusion was that even with a 2 inch drop-off, there was danger of vehicles over correcting and coming across the road resulting in head-on or sideswipe collisions. For drop-offs in the 4-6 inch range the result was that the vehicle usually went out of control.

I did obtain copies of two other papers presented at this session. They were (1) Speed Control Through Freeway Work Zones: Techniques Evaluation and (2) Safety Effects of Two Lane, Two Way Segment Lengths Through Work Zones on Normally Four Lane Divided Highways. For the former, they used four techniques to control speed. They were flagging described in the MUTCD, innovative flagging motioning traffic to slow, stationary police and an enforcement officer standing adjacent to a regulatory speed limit sign. Using these methods, there was a reduction in speed. On the latter paper, it was concluded that there was no correlation between the length of the two way zone and safety or speed.

FOLLOW UP NAME: Harold Dowden/Dwight Stevens, Construction/Maintenance

OFFICE: Construction
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 44-The Harold J. Halem International Symposium on Concrete Pavement Construction

COMMENTS: A speaker from South Africa discussed their p.c.c. roads and problems. They have very few miles of p.c.c.p. They do have a $1 to $2 million/year (operating cost) load simulator to apply many thousands of wheel loads to a pavement.

The West German speaker shared the following: Their first p.c.c.p. was placed in 1888; they've used 9" thickness for the last 50 years; they allow single axle loads from 22,000 to 26,000 lb.; 16' joint spacing, 14' wide lanes, coated 1" dowels in all joints; 540 to 590 lb/cy of cement with w/c ratios of 0.42 to 0.48; 4 1/2% entrained air; concrete is tested hourly, and the paving train is completely covered. On rehabilitation projects, they crack to 2' pieces, cover with mortar, and place 9 inches ± of p.c.c.p.

Spain allows 28,000 lb. single and 56,000 lb. tandem axle loads. Their typical section is 6" cement treated subbase, 8" lean concrete, and 10" to 11" p.c.c.p. They've used roller compacted concrete (RCC) since 1970. They place an a.c. surface over a plastic grid (to prevent reflective cracking). NOTE: Will need to investigate to get details of performance of plastic grid.

Japan uses a 6" cement treated granular base under their high type p.c.c.p. (placed with a German a.c. paver). They use dowel baskets at all joints, 33' spacing; use wire mesh and two layer paving 12" thick. They use German paving equipment; all curing is under tent! They use sponge mats for 1 week. They use only formed paving because they have bridges every 300 to 500 yards! Their legal axle loading is 22,000 lb. but experience many illegal loads, up to 40,000 lb. by coal trucks, thus the 12" thickness.

FOLLOW UP NAME: Jim Grove, Materials

OFFICE: Construction
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 192-Flexible Pavement Construction

COMMENTS: An Egyptian speaker gave an extremely interesting and enlightening presentation relative to preventing construction - caused cracks in a.c. pavement. He described a new concept in compaction equipment after proving that drum rollers always produce underlying cracks in any material (soil or asphalt). The equipment he described will be sent to approximately 20 dealers/contractors in the U.S. in 1988 for evaluation purposes.

The Seaman Nuclear Corporation gave a presentation on their nuclear gauge that's mounted on compaction equipment and can give a.c. density readings on the move.

FOLLOW UP NAME: Rod Monroe, Materials

OFFICE: Maintenance
ATTENDEE: R. Steffes
SESSION NO. & TITLE: 26-Performance Criteria and Specifications for Repair Materials: Status and Needs

COMMENTS: The system presented appeared to provide a good seal for the bridge deck, however, the sealing procedure is a major operation. Steps in the sealing operation were:

1. Cover the bridge with a canopy
2. Make saw cuts 3/4" wide, 1 1/2" deep, 3" apart
3. Fill sawed grooves with Penetrating Polymer Sealer
4. Heat deck to impregnate and cure sealer at 230°F
5. Fill sawed grooves with latex modified mortar.

Estimated cost was $\$13/ft^2$.

FOLLOW UP NAME: John Risch, Maintenance

OFFICE: Maintenance
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 138-Timing Maintenance Activities

COMMENTS: An Arizona speaker reviewed performance of several commercial partial depth patching products. All cost more than p.c.c. with Type III cement; some have bond problems.

A U.S. Army speaker felt that rejuvenators reduce cracking in a.c. pavements. They also reduce friction member approximately 10%, but the numbers come back in 2 to 3 years! He felt crack sealing should be done every 3 to 4 years.

FOLLOW UP NAME: Dwight Rorholm, Maintenance

OFFICE: Maintenance
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 158-Deicing Chemicals

COMMENTS: A Canadian speaker felt negative effects of deicing salts can be adequately dealt with by using inhibitors. He wouldn't name, or describe, the inhibitor!

A speaker from DOW Chemical spoke on wetting salt and sand stockpiles with CaCl(2). He gave Iowa credit for first wetting salt. He recommended to use only the 42% liquor (to wet piles) at a rate of 8 gallons per ton. Best results if materials at 85°F. They also reported on a laboratory (only) study of the melting ability between rock salt (NaCl) and CaCl(2) (calcium chloride). Not conclusive.

A consultant indicated that CMA (calcium magnesium acetate) has adverse effects on metal, highway paints, and p.c.c. pavements, but less than rock salt.

DOW people reported that CMA performed worse than rock salt, considering melt volumes and ice penetration, as indicated by their laboratory testing. NOTE: DOW has a vested interest in rock salt.

FOLLOW UP NAME: Walley Rippie, Materials

OFFICE: Maintenance
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 7-Traffic Control Signs and Markings

COMMENTS: One paper presented at this session was entitled "Traffic Control and Accidents at Rural High Speed Intersections". It was a study of 65 rural intersections in Kentucky to determine what types of control and other parameters increase safety at rural intersections. This may be of help in deciding how to control traffic at locations such as US 30 and Dayton Road.

Another paper presented at this session was entitled "Evaluation of Wide Edgelines for Two Lane Rural Roads". This paper was to determine if there was any beneficial effect to using 8 inch edgelines as opposed to conventional 4 inch edgelines. The conclusion was that it had no effect on ran-off-the-road accidents. Other results were mixed and inconclusive. Since there is no significant effect, they did not recommend use of wide edgelines.

FOLLOW UP NAME: Leland Smithson/Dwight Stevens, Maintenance

OFFICE: Maintenance
ATTENDEE: D. Stevens
SESSION NO. & TITLE: A3A02-Traffic Control Devices Committee

COMMENTS: This meeting was to discuss Committee business on traffic control devices. Reports were given on liaison with other related committees. Also, one technical report was given on "An Introduction to Expert Systems Technology". This is a new concept which we may be hearing more about in the future. Essentially, it is an effort to place a wealth of technical information from an expert on any particular subject into a computer program which can be used to retrieve the information at some future date.

FOLLOW UP NAME: Dwight Stevens, Maintenance

OFFICE: Maintenance
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 113-Traffic Information Systems and Driver Performance

COMMENTS: I obtained two papers from this session. They were (1) A Study of Driver Noncompliance With Traffic Signals and (2) Driver's Decision Making at Signalized Intersections.

These two papers cover observance of traffic signals and basic considerations on yellow and all red clearance intervals as they relate to the "Dilemma Zone".

FOLLOW UP NAME: Dwight Stevens, Maintenance

OFFICE: Maintenance
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 138-Timing Maintenance Activities

COMMENTS: I obtained a copy of one paper from this session entitled, "Concrete Pavement Spall Repair". This may be of interest to the Maintenance staff in evaluating procedures for repairing spalled areas in concrete pavement.

The gist of two other papers at this session was not to let maintenance activities be deferred too long because it greatly increases the cost of ultimately making the repairs.

Another paper at this session dealt with preventative maintenance levels for ACC pavements. It talked about use of rejuvenators to reduce oxidation, reduce raveling, improve skid resistance and fill voids in the surface. Also discussed was crack sealing. The message here was do not use too much material because the excess may cause problems with future overlays. They also discussed surface treatment to seal cracks and improve skid resistance. They indicated that slurry seals need to be rolled and should not be used on high volume roads.

FOLLOW UP NAME: Leland Smithson/Dwight Rorholm, Maintenance

OFFICE: Maintenance
ATTENDEE: D. Stevens
SESSION NO. & TITLE: 181-Urban Traffic Control and Signal Networks

COMMENTS: Presentations made at this session were very technical discussions on computer software and statistical jargon on timing signal networks. It was very research oriented and did not contain much of practical value or application for our use on the state highway system.

FOLLOW UP NAME: Dwight Stevens, Maintenance

OFFICE: Materials
ATTENDEE: R. Steffes
SESSION NO. & TITLE: 86-Early Age Properties of Concrete

COMMENTS: "Lone Star" presented their "Pyrament" for a concrete system with a 0.5 hr or a 2.0 hr setting time. Pyrament contains about 60% portland cement (Type I or III), Pozzolan and admixtures. Water/cement ratios are around 0.22 to 0.26. Full set and compressive strength can be reached in 2 to 4 hrs. Current cost is $185.00/ton FOB.

FOLLOW UP NAME: John Risch, Maintenance

OFFICE: Materials
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 2-Concrete Pavement Rideability, Part 1: History and Measurement

COMMENTS: Woodstrom (Caltran) discussed California's development of smoothness measuring equipment. California's new p.c.c. pavement specification is now 7 in/mile (25' profilograph); contractor must grind to meet 7 in/mile! On rehabilitation projects the DOT runs profile just before letting and gives information to bidding contractors. Specification is 12 in/mile on p.c.c. rehabilitation projects. California does not use or specify profile index on a.c. pavements. They use 12" diameter tires at each end of their 25 ft. profilograph. They agreed to send me photos and their plans.

Gendell (FHWA) advised rideability specifications are necessary for, 1) extended pavement life, 2) dealing with public opinion and 3) to promote construction quality. He mentioned AASHTO has a guide smoothness specification for 1988, using California profilograph only, of 15 in/mile; any correction would be to 10 in/mile. (He used Iowa DOT slide of profilometer calibration.)

A profilograph manufacturer (McCracken Machinery of Sioux City, Iowa) described, in detail, the machine and assembly. He made several complimentary remarks about Iowa DOT's (Charles Potter) training for profilograph operators. A competing equipment manufacturer - Rainhart Co. - described their machine. It's trailer towed to the job; requires only a 5 minute set-up time. Uses twelve averaging wheels throughout its length (vs 6 at each end of our machines).

Randall Riley (ex-Iowa DOT Materials employee) gave a presentation on the profilograph trace reduction. Very informative and gave considerable credit to Iowa's training course and Charles Potter's office for information.

FOLLOW UP NAME: Charles Potter, Materials

OFFICE: Materials
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 20-Concrete Pavement Rideability, Part 2: Construction Techniques and Tips, Getting the Ride, Incentives

COMMENTS: An Iowa contractor (Colin Jensen) commented on their initial objection and now complete support of smoothness specifications. They now own four (4) profilometers. They review project smoothness after each job with their personnel. Has plotted pad line condition vs profile index and concluded there's a definite relationship. Their experience indicates 1) 1" to 4" per mile better smoothness on straight grades vs vertical curves, and 2) coarser mixes have an adverse effect on profile index.

Another Iowa contractor (Mack Capper) commented that his company has identified 52 factors that affect ride. They feel that 43% of any roughness comes from the smallest "bumps"; only 2% from the 1/2 inch "bumps". So, they concentrate their efforts on the smallest. He listed several primary causes of roughness:

1. stop and start operations
2. wet vs dry batches
3. staking interval (no more than 25 ft.)
4. structural strength of extrusion meter
5. length and width of paver track
6. dowel basket joint assemblies
7. not maintaining a uniform head in front of paver
8. improper adjustment in sensors and reaction times

A Minnesota paver discussed incentives. He felt they provide motivation to provide better pavements. He sends (and complimented) his people to Iowa DOT's profilometer school annually. His company shares any ride (smoothness) incentive with <u>all</u> their employees.

A Kansas DOT engineer said they are considering a South Dakota profilograph. They use a Mays meter for pavement management. They pay 5% incentive on profile index of 4 or better.

A contractor felt that rideability is the result of proper <u>design</u> and <u>construction</u>, i.e., "if grade is hard, ride is good". His best point was, without incentive a contractor will creep back toward upper specification limit. Strongly feels an automatic, computerized device to take out, and put back, crown

would greatly improve the ride through curves and should be readily available.

FOLLOW UP NAME: Jim Grove/Charles Potter, Materials

OFFICE: Materials
ATTENDEE: J. Bergren
SESSION NO. & TITLE: 98-Highway Agencies - Problems With Hazardous Wastes

COMMENTS: Session overview comments indicated that NCHRP project 20-22 is working on a guidance manual. Also, Michigan DOT has an environmental scientist in each District Office.

An attorney reviewed the liability exposure of transportation agencies. He recommends a site assessment on all properties prior to purchase. This would then be used by appraisers in setting value of property, etc.

Minnesota shared their experience to date in dealing with hazardous wastes. (Their paper is being provided to Iowa DOT Task Force on Environmental Concerns.)

A consultant reviewed what might be involved when a soils crew accidentally finds a hazardous waste site. He mentioned such things as employee exposure, accidentally contaminating ground water by our drilling activities, etc. He referred often to OSHA regulation 1910.120 dealing with hazardous waste operations. He advised that in order for employees to know what to do, and how and when to do it, the agency must have someone with oversight capability.

FOLLOW UP NAME: Jerry Bergren, Materials

PLANNING & RESEARCH

OFFICE: Transportation Research
ATTENDEE: R. Steffes
SESSION NO. & TITLE: 185-Weigh-in-Motion and Vehicle Sensor Systems

COMMENTS: This presentation from South Africa indicated that they had gone through many of their developmental pains 10 years ago and are now using and collecting traffic data routinely. They seemed to have more years of experience in WIM operations than Iowa has, and they may have good information available for the asking.

FOLLOW UP NAME: Bill McCall, Transportation Research

OFFICE: Transportation Research
ATTENDEE: R. Steffes
SESSION NO. & TITLE: 185-Weigh-in-Motion and Vehicle Sensor Systems

COMMENTS: The Bar Code Plate on the vehicle is to be read by laser, while the vehicle is in motion. The bar code would identify vehicle registration, license, permits, cargo, etc. I would anticipate many problems in this system. The bar codes may need to be updated with each cargo. They may be unreadable when covered by road dirt and they could possibly be tampered with. A bar code would be needed for each truck tractor and each trailer unit. The total objective is to get weight by a WIM unit and to get other information through the bar code laser reader system and all while the truck is in motion.

FOLLOW UP NAME: Bill McCall, Transportation Research

PLANNING & RESEARCH

OFFICE: Advance Planning
ATTENDEE: B. McCall
SESSION NO. & TITLE: 9-Freight Transportation in 2008, Part I

COMMENTS: Charles Lounsbury, Leaseway Transportation Corp., discussed trends that will take place in coming years in the trucking industry. Trucking companies will move toward more accurate corporate forecasting, improved equipment, reducing costs, and improving productivity in service to support just-in-time philosophies. Mr. Lounsbury indicated that freight transportation will become a more completely integrated enterprise and the mode of shipment will become transparent to the supplier and service will be specified as opposed to mode. Bill Romack, Norfolk Southern, predicted that Class I railroads will become part of a multi-modal transportation service. Small regional railroads will flourish and some will combine to form Class I. Rail mileage will continue to fall. Rail will not surpass truck service until technology supports road-rail and automated systems. The railroad management structure will become smaller, fewer people, fewer levels of management. Productivity and economics will be the driving force for all transportation. Bob Haggestead, Harmon Industries, predicted electronic identification be on all units including tractor-trailer containers. Voice and daily information will be exchanged between control units and mobiles in order to increase productivity and ensure service expectations are met.

FOLLOW UP NAME: Don Ward, Advance Planning

OFFICE: Advance Planning
ATTENDEE: B. McCall
SESSION NO. & TITLE: -Charting Future Highway Transportation

COMMENTS: Tagge Karlsson, Volvo - Sweden, presented the PROMETHEUS project. The project is a European research program. PROMETHEUS is an acronym for "Program for European Traffic With Highest Efficiency and Unprecedented Safety". Fourteen major European automotive companies are working with European governments. The project is managed by an international steering committee composed of 11 representatives from participating automotive companies. The research is split into three sub-projects. PRO-CAR is to look into driver assistance by electronic systems like sensing and actuating systems, structures, man-machine relations as well as safety and dependability. PRO-NET is working with two vehicle communications studying the interaction between vehicles in different situations like overtaking, merging, and computer-assisted vehicle trains. PRO-ROAD studies the communications between vehicles and the environment, route guidance, navigation, local electronic yellow pages, traffic management including traffic signs, electronic or regular type fall under this study as do advanced mobile telephone communications systems and fleet management systems. The aim of the project is to increase the efficiency and safety by utilizing computer-assisted driving and traffic management without using an automated highway concept. Hiroyuki Okamoto, Japan Traffic Management Technology Association, presented the Advanced Mobile Traffic Information and Communications System (AMTICS). AMTICS is an integrated traffic information navigation system. The system will display screens in each car, providing traffic information gathered by the police at traffic control and surveillance in 74 cities. The major benefit of this system will be its ability to display in real-time, not only the car's current position in route, but also information on traffic congestion, regulations, road construction and detours and parking.

FOLLOW UP NAME: Don Ward, Advance Planning

OFFICE: Advance Planning
ATTENDEE: B. McCall
SESSION NO. & TITLE: 109-Information Technology and Freight Transportation

COMMENTS: Dr. Alan Kornhauser, Professor and Director of Transportation Research Program, Princeton University, discussed expert systems in support of real-time management of freight movement. Dr. Kornhauser suggested that expert systems will be used to manage fleet operations in terms of route scheduling, LTL management, truckload dispatch, intermodal schedules, locomotive distribution systems, and rail-car management. Michael J. Breslin, Senior Vice-President, Geostar Corporation, presented, "Operation Productivity Using Satellite Technology". He stated that 1 1/2 to 3 percent of operating costs would be saved using satellite supported communications. A payback of 7 to 17 months is projected. A subscriber cost of $145 per month per one transmission per hour with 2¢ per minute additional costs for more than one transmission per hour. Purchase price is $3,000 for the equipment and $45 per month for service. Geostar is licensed not only in the United States but in Europe and Australia. Currently, 11 customers (four are owner-operators) are using Geostar service. Gerry Thompson, President, Thompson Transport, presented "Trucking Industry Perspective on Wide Area Vehicle Monitoring". Mr. Thompson is a medium to large operator in Canada with 1,000 units. He focuses on providing just-in-time services. He stated that when the truck leaves the shipping terminal the driver is in complete control of service and cost. The shipper expects the trucking company to be on time within a 15 to 30 minute window at the destination. Shifts in terminal arrival can be tolerated if the trucking company notifies the receiving terminal of the delay. The shipping company needs communications with the driver to control the driver and the unit. The trucking companies must gain control of their production element of the trucking industry. Therefore, wide-area communications will be a major advancement and resource.

FOLLOW UP NAME: Don Ward, Advance Planning

OFFICE: Transportation Inventory
ATTENDEE: B. McCall
SESSION NO. & TITLE: 31-Automated Data Collection Graphic Display & Analysis

COMMENTS: Bill Bryd, University of Wisconsin, discussed and demonstrated the Wisconsin development of highway alignment information from photolog data. David DeWolf, Rockwell International Corp., presented GPS positioning and its role in BOP mapping-inventory programs. Don Carlson, Wisconsin DOT, presented the integration of photolog data into graphic information systems. The presentations and general discussion presented two options in developing a highly integrated and user friendly highway information system. The first is to base the system on mile point reference and the second is to establish a geographical reference system. Over the long term it appeared that a geographical reference system may have more appeal to all states.

FOLLOW UP NAME: Pat Cain, Transportation Inventory

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: A2D01-Characteristics of Bituminous Materials

COMMENTS: Ulf Isacson of Sweden prior to the A2D01 meeting noted that a higher iron content in granites and other stones correlates with a lowered stripping problem. Ed Minter of the Kentucky Transportation Cabinet noted trolley track rutting in one year on a Kentucky roadway. Further analysis indicated that it was due to inadequate compaction. Rudy Jaminez noted that there had been 1 inch ruts on the New Jersey Turnpike and that one apparent reason for the problem was a hump in the grading curve. In addition to that, this was aggravated by truck tire pressures of up to 140 and 150 psi. He also noted that the contact pressure quite often is up to twice the tire inflation pressure. He further noted that moisture damage actually may happen and be reality prior to any visible stripping.

FOLLOW UP NAME: Rod Monroe, Materials

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: Monday-Strategic Highway Research Program

COMMENTS: Howard Newlon of the Virginia Transportation Research Council noted that in recent years Virginia had encountered problems with rapid deterioration of pier caps. In recent years, they have used cathodic protection on those pier caps.

FOLLOW UP NAME: Jim Grove, Materials

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: 28-Asphalt Chemistry

COMMENTS: C. G. Glover of Texas A & M University gave a presentation on "Asphalt Cement Chemical Characterization and Performance Related Properties". Within this presentation, he noted that first he does not propose to use the gel high pressure liquid chromotography to predict performance. He did, however, note a number of interesting things. He noted that the GPC did show difference between asphalts. He also noted that the GPC does correlate with asphalt tenderness. He also noted that normally you do not have one crude source, but quite often a blend is necessary to obtain the desired grade. This causes a definite problem in determining the quality of the asphalt cement. Chris A. Bell of Oregon State University noted that he could not correlate performance with chemical and physical properties because there were two many variables. From this session, I did come to the conclusion that the Iowa DOT should pursue the possibility of evaluating the resilient modulus of asphalt mixtures in regard to asphalt concrete performance.

FOLLOW UP NAME: Rod Monroe, Materials

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: A2E05-Chemical Additions and Admixtures for Concrete

COMMENTS: William Kirpatrick of Lone Star Industries Inc. presented an interesting presentation on Pyrament. He noted that an 8 sack mix without any chloride would set in 3-4 hours. He further noted that they had placed some Pyrament concrete at Colorado Springs at 28°F and had it set in 2 hours. The concrete reached a 14,000 psi compressive strength and 1,400 psi flexural strength with a water/cement ratio of 0.26.

FOLLOW UP NAME: Jim Grove, Materials

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: A2E05-Chemical Additions and Admixtures for Concrete

COMMENTS: Mark Berry of Master Builders gave a very interesting presentation in regard to their Delvo system to control setting time. This Delvo system admixture will hold concrete overnight in a plastic state without setting. This system is built on a zero waste concept. Mr. Berry claimed that the concrete produced is equal to or better than conventional concrete. It was developed in March 1987. Mr. Berry claimed that they could add the stabilizer to a highly cemented chlorided concrete and stop the hydration, hold this chlorided concrete in a plastic state and, by the amount of the material added, determine how long it would remain in a plastic state. At the predetermined time a deactivator added to the mix would again allow the concrete to hydrate and set.

FOLLOW UP NAME: Jim Grove, Materials

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: A2E05-Chemical Additions and Admixtures for Concrete

COMMENTS: Mark Berry, in an additional presentation, promoted the use of absorptivity for testing curing compounds. He proposed to test this by procedure ASTMP198. He claimed that our current test in regard to the loss of water was highly dependent on the location in the constant environment Blue M Chamber. He claimed that his testing in regard to absorptivity of the top versus the bottom correlated very well with the quality of curing obtained.

FOLLOW UP NAME: Jim Grove/John Lane, Materials

OFFICE: Road Design
ATTENDEE: V. Marks
SESSION NO. & TITLE: A2H03-Mineral Aggregates

COMMENTS: Joe Sudol of the Indiana Department of Transportation noted that Indiana was using two 1/4 inch stainless steel mesh screens on their Hydroway, geocomposite, longitudinal strip drains to prevent damage by mice. They were using one at the outlet from the strip drain and another on the outlet of the pipe on the foreslope.

FOLLOW UP NAME: Kermit Dirks, Road Design

OFFICE: Maintenance
ATTENDEE: V. Marks
SESSION NO. & TITLE: 97-Crack Sealing Techniques and Problems

COMMENTS: George J. Chong of the Ontario Ministry of Transportation and Communications gave a presentation in regard to improved preventive maintenance: "Sealing Cracks in Flexible Pavements in Cold Areas". Mr. Chong noted that the lack of maintenance develops into severe deterioration. Routing and sealing of these cracks extends service life by five years. He said cracks should be cleaned with compressed air and a heat lance. The success depends on the best performing sealants. He closed with promoting sealing before the crack deteriorates. Gary Hoffman of the Pennsylvania Department of Transportation also noted that the use of a hot lance to properly prepare the crack for sealing was highly advisable.

FOLLOW UP NAME: Rod Monroe/Dwight Rorholm, Materials/Maintenance

OFFICE: Bridge Design
ATTENDEE: V. Marks
SESSION NO. & TITLE: 131-Excessive Cracking in Concrete Bridge Decks

COMMENTS: Bernard Hopfinger of Howard, Needles, Tammen and Bergendoff gave a presentation in regard to post-construction study of deck construction. This presentation was in regard to what could have been done to prevent the transverse cracking on the Iowa DOT Keokuk bridge across the Mississippi River. Mr. Hopfinger's conclusions were: (1) we should have specified a multiple sequential pouring requirement on the bridge deck; (2) we further should have required a two-course construction with a dense concrete overlay topping; (3) we should further have required staggered top and bottom steel; and (4) because this bridge deck had concrete open to the air for 8-12 hours prior to the wet burlap curing, we should have required a liquid curing compound be applied immediately behind the finishing texturing operation.

FOLLOW UP NAME: Bill Lundquist/Jim Grove, Bridge Design/Materials

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: 158-Deicing Chemicals

COMMENTS: A presentation by David Slick of Daedalean Inc. noted that calcium magnesium acetate had little effect on adhesives or on auto paint.

FOLLOW UP NAME: Wallace Rippie, Materials

OFFICE: Construction
ATTENDEE: V. Marks
SESSION NO. & TITLE: 192-Flexible Pavement Construction

COMMENTS: Abd El Halim of Carlton University Canada gave a presentation in regard to "Extending the Service Life of Asphalt Pavements Through the Prevention of Construction Cracks". This presentation was totally based on promotion of a new type roller compactor called an AMIR roller. This new type of roller utilized a belting between the two rollers. Mr. Halim noted that the transverse cracks result from rolling because of the radius of the drum. His claim was that if you used the new type of roller you would not input a curvature into the asphalt mat during construction and, thereby, reduce the number of cracks that were incipient at time of construction.

FOLLOW UP NAME: Rod Monroe/John Smythe, Materials/Construction

OFFICE: Materials
ATTENDEE: V. Marks
SESSION NO. & TITLE: 192-Flexible Pavement Construction

COMMENTS: Eugene Drake of the Kentucky Transportation Cabinet gave a presentation in regard to breaking and seating portland cement concrete prior to bituminous overlay. Within that presentation, he noted that some Kentucky portland cement concrete pavements exhibited severe D-cracking. Some of this D-cracking was accelerated by salt action. Two maintenance areas overlapped where the maintenance trucks turned around and the deicing salt application was greater. A more rapid, more severe D-cracking occurred at this location. This finding correlates with work being conducted by the Iowa Department of Transportation in regard to the adverse effects of deicing salt. Vernon Marks has requested a sample of the aggregate used in this roadway that exhibits more severe D-cracking where the concentration of deicing salt is greater.

FOLLOW UP NAME: Wendell Dubberke, Materials