Thank you for the opportunity to share some information about products coming from the Strategic Highway Research Program (SHRP).

Implementation of SHRP technology is a key step in continuing the excellent, cooperative effort that was initiated with SHRP. Because of the other subjects included in the new products technical session, the subjects of asphalt and concrete will be covered only briefly, with more focus being given to products for maintenance operations.

**Technical Areas**

SHRP is focused on four major technical areas: asphalt, long-term pavement performance, highway operations, concrete and structures. Some 96 separate products are being developed.

Asphalt and long-term pavement performance study areas are the big dollar items and will produce new specifications and test procedures. It is the highway operations side of SHRP that will be producing most of the new equipment or equipment modifications. Many of these are in the areas of pavement maintenance, work zone safety, and snow/ice control.

The two major products of the asphalt program will be (1) a performance-based specification for asphalt binders and (2) a performance-based specification for asphalt-aggregate mixtures.

The most obvious feature of such specifications is that they are performance-based. But what does this term mean? Simply, that the specifications will enable engineers to accurately estimate the present...

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and future performance of the pavement under the traffic loads and environmental conditions expected during its planned service life. The June 1991 issue of FOCUS describes the new binder specification. This is the fifth version of the specification so we are getting close to a final product.

The other big part of SHRP from a cost viewpoint is the long-term pavement performance program. One product has been produced that may be of assistance to local government highway organizations and that is the Distress Identification Manual. It is a useful tool for any organization that is operating a pavement management program.

Product Alert Number 2 gives a brief description of the manual. It is a tool or guide for obtaining, consistent, repeatable, quantification of data about pavement distress. No special equipment is needed to use the manual. If you are not familiar with the name “Product Alert,” let me explain. Product Alert is the name given to the new publication to announce SHRP products as they are finalized.

**PAVEMENT MAINTENANCE**

A key study in the pavement maintenance area is to compare maintenance treatments to non-treatments. The treatments being studied include chip seals, slurry seals, crack and joint sealing, thin asphalt concrete overlays, crack and joint sealing and undersealing of portland cement concrete pavements.

The objective is **not** to compare one treatment to another or materials comparisons. That is the subject of another study.

**Pavement Maintenance Equipment**

New automated equipment is being developed to survey at the network level and project level, and to do crack and joint repair and perform pothole repair. The objective is to reduce the time of lane closure and get maintenance workers away from traffic exposure. Many work crews will be reduced from approximately six to two and no one will need to be routinely on the ground next to traffic.

**Innovative Materials**

This is a study being done throughout the states and Canada to complete an unbiased comparison of the various materials compared to a control standard.
Work Zone Safety

Work zone safety studies are aimed at the development of new equipment to protect workers in open highway work situations of short-term duration. Safety to the traveling public is also an objective. An international contest was run to identify potential devices to make the work zone safer. At the same time, a study of work zone accidents was completed. Safety for workers on foot and drivers of shadow vehicles and snow and ice control vehicles were identified as workers in greatest need of protection.

Seven Categories
• Barriers
• Warning Devices
• Rumble Strips
• Delineation Devices
• Lighting Devices
• Signs
• Robotics

Twenty-five devices have been tested on a closed track. These are grouped into the above-named categories.

Devices Nearing Completion
• Portable Sign Support
• Worker Warning Device
• Stop/Slow Paddle
• TMA for Salt Truck
• Flagger Gate
• Portable Speed Bump
• Remote Vehicle

Certain items were crash-tested. Closed-track tests included a drive-through evaluation by unfamiliar drivers in an instrumented vehicle. The above-named items are now being given open highway evaluation. Some involve potential changes to the Manual on Uniform Traffic Control Devices.

States participating in the first wave of tests include Delaware, Iowa, New York, and Washington.
SNOW/ICE RESEARCH

Deicing Chemicals Test Book:

The report on evaluation of chemicals has been prepared describing all standard tests (50 from ASTM and EPA) for evaluating chemicals along with a dozen new tests. The objective is to present a set of tests in one manual that can be used to select or compare the effectiveness of chemicals for deicing. The tests are now in the final review status being evaluated by states and industry.

Displacement Plow:

This study objective is to develop a plow that minimizes the energy needed to throw snow clear of the roadway.

Early lab studies and analysis show that the vertical blade most effective for scraping ice from the pavement causes snow to be pushed in front and compacted before it flows up the mold board. It was estimated that the compacting action requires about 20 percent of the fuel cost. A device appropriately called a "snow scoop" was added to allow the steel cutting blade to remain near vertical as the scoop moves the snow up the board without the compaction and related energy costs. The 20-percent figure was confirmed in West Yellowstone tests this past winter.

ROAD WEATHER INFORMATION SYSTEMS

The United States and Canada spend over $2 billion annually on snow and ice control. SHRP estimates that 10 percent of these costs can be saved through more extensive use of road weather information and communication systems.

Some of the greatest savings can be obtained by the elimination of unnecessary call-outs and better scheduling of crews, based on knowledge of the probable extent and severity of winter storms.

Tools and procedures identified to be of greatest value in accomplishing effective snow and ice control include: (1) pavement temperature sensors and ice detectors, (2) atmospheric sensors that measure various meteorological conditions, and (3) thermal mapping of pavements.

In brief, these pieces of equipment along with computer analysis will allow a highway agency to localize general weather information to more accurately predict or detect what the weather is in a specific location.
The call-outs will be more timely. A few hours reduction of unnecessary mobilization will pay for a lot of equipment. Advice to the public also is improved.

**MODERN SNOW FENCES**

An average of available data shows that storing snow with a snow fence costs three cents a ton over the 25-year life of the fence, compared to $3.00 a ton for moving it. A *Snow Fence Guide* and a video titled "Effective Snow Fences" have just been released by SHRP.

**CONCRETE AND STRUCTURES**

Many new tests and procedures are underway for use in construction of more durable concrete. The structures portion of SHRP is pointed toward new tools to detect the presence of corrosion in the reinforcement and methods of correction and/or prevention. One product in the concrete area that is ready for use is the Alkali-Silica Reactivity field test. This was the subject of *Product Alert Number One*.

**SUMMARY**

Preliminary estimates indicate that SHRP has the potential of returning $500 million per year to the highway organizations of the United States. This is from a program that cost a total $150 million. Of course, you must add the contributions by the individual states helping with the work. Kentucky has continually had an active part with many field-test operations. Much appreciation is expressed for the help that has come from the Blue Grass State and for the opportunity to be a part of this session on new products.