



Above: As the years increase, the PCI rating (measurement of the structural integrity and surface condition of a road) decreases dramatically and the cost of maintenance/rehabilitation increases.

Pavement Management: The Seven Big Questions

A concise explanation of pavement management and its benefits.

We've all been hearing a lot about this one. In fact, it's one of the latest and hottest highway topics across the nation. It's being talked about in small rural towns, large metropolitan cities, state DOT's, and FHWA. Everybody's talking, listening and reading about Pavement Management. But what is it? How does it work? What exactly is being managed? Why is it so popular? Who benefits? There are many questions to be answered. Let's look at some of them individually.

(1) What is Pavement Management? — It is an answer to a continually growing problem. In most towns and cities the individual responsible for the roads is running in leaps and bounds from one fire to another. He is trying desperately to maintain good roads, recondition some that are falling apart and others which may have failed. He is further frustrated by not being able to get what he believes is the necessary financing to properly approach the problem. Pavement Management is one approach to addressing these problems. It is a method for maintaining roads by systematically analyzing pavement life cycles, determining when to do maintenance, determining the best and most cost effective software, and then budgeting accordingly to prevent any major road deterioration.

(2) How does it work? — Pavement Management works like any other business operation. It's the development and implementation of a sound plan and it starts by analyzing the current position. If you

don't know where you stand, it's very hard to get to where you want to go. Just picture yourself in the woods with a map showing many pathways, but there's no mark on the map to show you where you are. It may be impossible to find a pathway out within your survival time. The same holds true with Pavement Management.

The first step is to inventory all roads to enable a systematic assessment of the road system's condition and any potential structural or material deterioration. This tells us where we are. The second step is to analyze all the information gathered and determine the best and most cost effective alternatives for meeting the maintenance and rehabilitation needs for each road. This tells us the different pathways we need to travel to reach our final goal (i.e. to maintain a road system within which all roads are in good condition). The third step is to prioritize when things are to be done by assessing the maintenance and rehabilitation needs along with costs and potential benefits. This shows us how the planning pathways will link together as we go from one project to another to reach our goal. The fourth step is to set up a 5-10 year LRBP (Long Range Business Plan) outlining budget and funding requirements. After modification and approval, this becomes the final "road map", or strategy, to our objective. The work then begins and the process starts over.

(3) What does it cost? — The most startling costs come from our new awareness. Pavement Management practices will enable us to review the present condition

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Avoid Icy Litigation

17 points to consider in preparation of a snow and ice control policy.

More and more law suits are being filed against our cities and towns. One way to provide a good defense is to have written policies. Listed below are 17 points to consider in writing a snow and ice control policy.

(1) Write it down: A written snow and ice control policy will be easier to use in defense of a municipality's actions than an unwritten policy.

(2) Put together a manual: If the policy or level of service is to be implemented by an operations manual, the manual should be referred to in the policy and made a part of it by reference.

(3) Document what is happening: A record system should be established by which the municipality can document that it complied with its level of service and the time that each component of the policy was completed.

(4) Your new policy should supersede all others: A written policy should state that it supersedes all previously issued documents and unwritten policies, on the subject.

(5) What you don't do is also policy: If a municipality does no snow or ice removal, salting, or sanding, that in itself is a policy and it should be formalized by resolution of the town or city governing body.

(6) Specify the timing of the policy: The written policy should state the specific time the policy is in effect and under what circumstances.

(7) State who should be notified of problems: The municipality should stipulate that the public works department or legal department or both are to receive accident reports and that there be coordination between the police, public works department, and legal department on actions taken to rectify snow and ice problems at problem locations.

(8) Spell out all exceptions: If the policy states under what circumstances the normal policy is superseded, all the relevant circumstances should be included in the statement.

(9) Develop decision making board: If the normal policy is superseded by a decision-making process, the decision should be made by agreement of as many people as practicable who are responsible for snow and ice removal functions, e.g., mayor/city (town) manager, police chief, public works director, etc.

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Standard Definitions For Seal Coats

Seven definitions outlining the construction procedures and materials used in seal coats.

It's always nice to talk the same language. It helps us communicate and share our thoughts and experiences. One thing which assists in this process is to maintain standard definitions. Among other things, they can be used to assist in discussing road surface maintenance treatments with individuals who may be less familiar with road terminology than we are.

■ **Seal Coat**— A thin liquified asphalt surface treatment used to waterproof and give it the texture of an asphalt wearing surface. Depending on the purpose, seal coats may or may not be covered with aggregate. The main types of seals are sand seals, slurry seals, fog seals, and aggregate seals, (the latter are sometimes referred to as chip seals or armor coats).

■ **Prime Coat**— A fairly heavy application (quantity wise) of a dilute or thin liquid asphalt of low viscosity to an unbound granular base like gravel. The objective being to penetrate the gravel an inch or two in depth thus water-proofing it and enhancing its structural strength properties. It also saturates the surface so asphalt in a subsequent liquid asphalt treatment will not be absorbed into the gravel. Rates vary (.30 to .50 gal/yd²) depending on the tightness of a gravel base or its capacity to absorb the asphalt.

■ **Fog Seal**— A light application of slow-setting emulsified asphalt diluted with water. It is used to renew old asphalt surfaces and seal small cracks and surface voids on open graded pavements. It must be applied with extreme caution so as not to create a slippery surface (its usage is rare in the northeast where dense, tight pavement surfaces are the most prevalent types). Application rates are light (0.10 to 0.15 gal/yd²) and sand blotter is recommended. It is intended to fill very small cracks and voids and adds little as a surface improvement.

■ **Sand Seal**— An application of a low viscosity or moderately diluted asphalt covered with fine, (sand gradation) aggregate. The low viscosity and sand combination is designed to fill many fine cracks on the existing surface. Application rates

are in the order of 0.18 to 0.25 gal/yd² with 18 to 25 lbs. of sand cover. This amounts to a new layer about 3/16 of an inch thick and is intended for lower volume roads.

■ **Slurry Seal**— A mixture of slow setting emulsified asphalt (cut-backs are never used), fine aggregate, mineral filler, and water. It is used to fill cracks in old pavements, restore a uniform surface texture and seal the surface to prevent moisture and air intrusion into the pavement. A single slurry seal applies 10-15 lbs/yd² of asphalt and aggregate for about 1/8". A double slurry seal yields about 25 lbs/yd² or a layer 3/16" to 1/4" in thickness.

■ **Single Surface Treatment**— A single application of liquified asphalt to any unpaved road surface followed by a single layer of aggregate of a uniform size as practicable. The thickness of the treatment is about the same as the maximum size of the aggregate particles. A single surface treatment is used as a wearing and waterproofing course. When it is applied to an existing paved surface it should technically be called an **AGGREGATE SEAL**. Since the stone size aggregate looks like chips this kind of treatment is commonly called a **CHIP SEAL**. While 3/8" to 1/2" size stone is the most common used and yields about 35-45 lbs/yd² or 3/8 of an inch in thickness, some lighter applications using 3/16 to 5/16 size aggregates are used occasionally. The yield would, accordingly, be much less.

■ **Multiple Surface Treatment**— Two or more surface treatments placed one on the other. In its most common form, the maximum aggregate size of each successive treatment is usually one half that of the previous one. The total thickness is about the same as the nominal maximum size of aggregate particles of the first course. A double surface treatment (chip seal), ranges from 1/2" to 3/4" in thickness depending on the size of stone chosen. Total application coverage would be in the order of .40 to .65 gallons of asphalt and 45 to 75 lbs/yd² of aggregate.

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(10) **Notify your public:** The policy should be communicated to local newspapers and radio and television stations so they may in turn inform the public about the level of service the municipality is applying.

(11) **Outline special practices:** If a municipality has followed practices such as not salting new concrete streets for one or two winters, or not removing snow piles at intersections or on medians until all snow routes have been completed, these practices should be spelled out in the policy.

(12) **Treat bridges specifically:** A municipality should consider including in its policy specific bridge deck frost and ice control procedures.

(13) **Set road clearing priorities:** A municipality should consider a policy based on road clearing priorities rather than tying the policy to specific time periods or specific snow depths that may or may not be meaningful in certain circumstances. This is best amplified in an Operations Manual.

(14) **Determine a means to verify events:** If a municipality adopts a level of service which is triggered by a natural event(s), a means of measuring, documenting, and recording that event should be established. As a suggestion, municipalities can use records published in local newspapers or broadcast by local TV or radio stations to establish or verify the weather conditions.

(15) **Be realistic:** A municipality should not adopt a policy which is so unrealistic it can't comply with that policy because of unusual circumstances.

(16) **Include complaint procedures:** A snow and ice control policy should include a standard complaint procedure, especially if complaints will result in a deviation from the normal policy. As a policy matter, it is desirable to identify who should receive complaints, the circumstances under which complaints call for deviation from the normal policy, and means for verifying complaints.

(17) **Document and spell out parking ordinances:** If a municipality has a specific restrictive parking ordinance to facilitate snow and ice removal which is initiated by an official announcement, the wording should be clear and concise, and an official record should be kept of its implementation and termination.

The above material was presented at the 1986 annual NHPWA meeting by L. David Minsk of the Cold Regions Research and Engineering Laboratory. ■