

PAVEMENT PRESERVATION TERMINOLOGY

Contributing Authors: Tom Wood and Sheue Torng Lee
 WSB Pavement Specialists

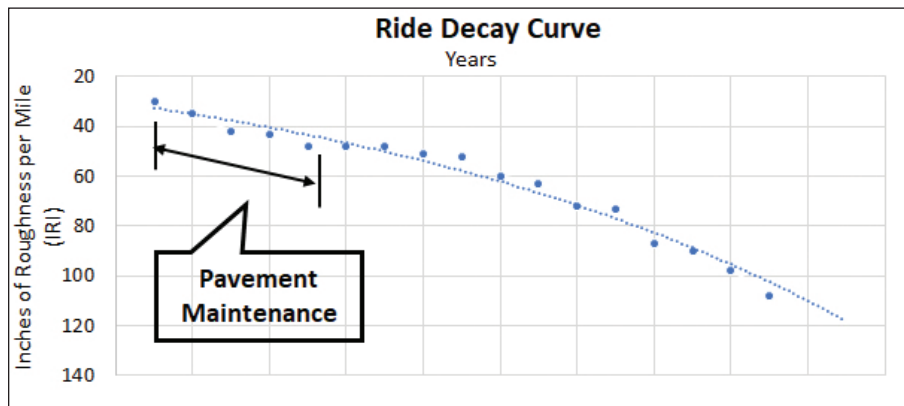
“Communication is critical for an agency to have a successful pavement preservation program. Often we assume that everyone we are working with understands the jargon we use. This document contains definitions for some of the treatments and measures used to establish a successful pavement preservation program. Clear communication and clearly defined terminology are keys to building a successful team.”

– Dale C. Heglund, NDLTAP Program Director

International Roughness Index (IRI). A method to measure the ride quality of a roadway. Data is reported in inches of roughness per mile (in/mi). The higher the number, the rougher the roadway. New asphalt pavement should be in the 40 in/mi to 60 in/mi range. IRIs ranging from 96 in/mi to 170 in/mi indicate an “average” asphalt ride and anything over 170 in/mi indicates a poor asphalt ride. A smooth gravel roadway has an IRI of approximately 200 in/mi.

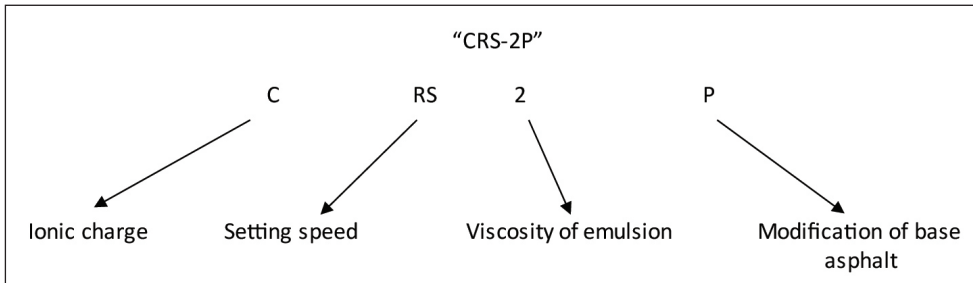
Pavement Management. A systematic measurement of the elements of pavement condition used to evaluate the performance of the pavement. The data are used for project planning and budgeting. This data allows the owner to determine the health of their system.

Pavement Preservation. A system of treatments with the goal of delaying reconstruction as long as possible.



Preventive Maintenance. An activity performed on a pavement to delay or prevent aging of the pavement. Preventive maintenance is analogous to an “oil change” for your roadway. This effort needs to start as soon as the roadway is paved.

Emulsion Nomenclature.



Ionic Charge

C = cationic or positively charged

No first letter in front of setting speed = anionic or negatively charged

HF = high float

Setting Speed

SS = slow set MS = medium set

QS = quick set RS = rapid set

Viscosity of Emulsion

1 or 2 = represent viscosity of the emulsion 1 being lower than 2

Modification of Base Asphalt

h = hardness of the base asphalt

P, L, or M = modification of base asphalt which could be polymer, latex, or other modifications.

Low Cost/Low Impact Preservation

Crack Sealing. A process of sealing cracks in asphalt pavement to keep water out of the subgrade. Crack sealing involves preparing a reservoir to hold the sealant. The normal method is to rout the cracks and then clean them with compressed air. Next, the reservoir is conditioned with heat lance and then filled with hot pour crack sealant that can stretch to accommodate movement in the pavement.



Crack Sealing

Crack Filling. A process of filling cracks in asphalt pavement with minimal preparation of the cracks. Normally, the cracks are cleaned with compressed air and then filled with a crack filler. The crack filler can be hot pour or cold pour asphalt filler. Other names for the process are "clean and fill," or "blow and go." Cracks filled in this way can be expected to open during cold weather and reseal during the warmer weather.



Crack Filling

Mastic. A hot asphalt crack leveling material that is normally a hot pour sealant modified with a polymer. Aggregates are typically mixed into the mastic. Mastics are used to level cupped cracks, fill wide cracks, fill spalled areas, and to adjust man-hole, and water valves.

Fog Seal. A uniform light application of asphalt emulsion, bio sealers, or rejuvenating materials. Fog seals seal the surface of hot mix asphalt (HMA) pavements. The materials used are formulated to penetrate the HMA. Care must be taken as fresh fog seals can lower the friction characteristics of the pavement. This can be mitigated by applying a light layer of sand.

Moderate Cost/Moderate Impact Preservation



Sand Seal

<http://rahabitumen.com/bitmen-emulsion-sand-seal/>

Sand Seal. A heavy fog seal in which the cover aggregate is clean sand or screenings. The cover aggregate reduces the chance of having low-friction characteristics.



Scrub Seal

<http://dpw.lacounty.gov/gmed/lacroads/TreatmentScrubSeal.aspx>

Chip Seal. A surface treatment constructed by placing a heavy asphalt membrane over the roadway surface followed by a single layer of aggregate normally called a chip. Chip seals are used to protect the underlying pavement from environmental damage and can increase friction characteristics.

Double Chip Seal. A double chip seal is a combination of two layers of chip seal applied during the same construction season. The bottom layer chip is typically about twice as big as the top layer chip. Double chip seals are used on pavements with a large number of cracks.

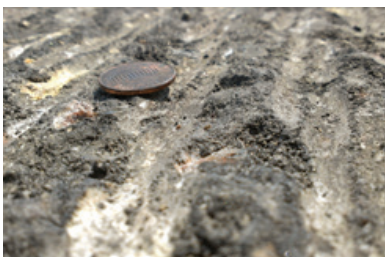
Scrub Seal. A modified chip seal where a special rejuvenating asphalt emulsion is sprayed on the surface. The rejuvenating emulsion is then scrubbed into the cracks by brooms pulled behind the asphalt distributor. This process is then followed by an application of cover aggregate that is similar to a chip seal. Scrub seals are used on pavements with a large number of cracks and serve the same purpose as double chip seal.



Micro Surfacing

Slurry Seal. A mixture of high-quality crushed aggregates, special asphalt emulsion, mineral filler, and water. It is mixed at room temperature and air dries from the top to the bottom. Slurry seals are used as a surface treatment only. The process was developed in the 1920s.

Micro Surfacing. A second generation of slurries. It also uses a mixture of high-quality crushed aggregates, a special polymer-modified asphalt emulsion, mineral filler, and water. There are two differences between micro surfacing slurry seals: 1) Micro surfacing is a chemical cure that forces the water out from the bottom to the top. This allows the micro surfacing to be placed in thicker lifts. 2) In micro surfacing, the asphalt emulsion is always polymer modified. It was developed in the 1970s for rut filling. Micro surfacing can be used to restore cross slope, improve friction, and protect the surface from environmental aging.



Micro Milling

Cape Seal. A combination of a chip seal followed by a layer of slurry seal or micro surfacing. This process was originally developed to allow chip sealing on high-volume high-speed roadways. The idea was that the slurry locked down the chips of the chip seal, reducing the risk of vehicle damage. Cape seals are now most commonly used on pavements that have numerous cracks and some rutting or cross slope issues. The chip seal does an excellent job of sealing the cracks and the micro surfacing does an excellent job of filling the ruts and fixing cross slope issues.

Micro Milling. Milling done with a special cutting head that has 3 times more cutting teeth than a traditional milling head. The resulting smooth surface can be covered with a surface treatment such as micro surfacing or chip seal.

Texas Under-Seal. A method to reduce reflective cracking on HMA overlays or mill and overlays. The process involves applying a chip seal on the existing surface or milled surface prior to the placement of an asphalt overlay.



Texas Under Seal

Highest Cost/Highest Impact Preservation

Full Depth Reclamation (FDR). A process of grinding up 100 percent of the HMA pavement with a defined amount of the underlying base material. These materials are shaped and compacted to form a new base for paving. FDR completely breaks up the existing crack pattern and allows cross slope corrections.



Full Depth Reclamation

Stabilized Full Depth Reclamation (SFDR). A process of adding stabilizing agent to the reclaimed material to enhance the performance characteristics. This enhancement increases the structural value of the reclaimed material, which allows the pavement structure to perform better. The most common additives are asphalt emulsion, foamed asphalt, cement, lime, and fly ash. The concept is to build strength down into the pavement structure.



Cold-in-Place Recycling

Cold in Place Recycling (CIR). A recycling method that only recycles part of the pavement structure. Normally the maximum thickness of the recycled layer is 4 inches. CIR does a good job of reducing reflective cracks from reappearing. CIR uses similar additives to SFDR, with asphalt-based emulsions being the most common additive used.

Hot in-Place Recycling (HIR). A method of partial depth recycling involving use of a pavement heater to increase the temperature of the in-place HMA to allow the material to be remixed with either new HMA or a rejuvenating agent. HIR corrects surface distresses.



Hot-in-Place Recycling

Resources

For Pavement Preservation (FP2)
National Center for Pavement Preservation (NCP)
North Dakota Local Technical Assistance Program (NDLTAP)