Pavement Preservation for Highways, Roads & Airports

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Alaska Asphalt Pavement Summit

Larry Galehouse, P.E., P.S.
Director, National Center for Pavement Preservation

Protecting Our Investment Cost Effectively

Where We Spend Our Money

- Cable television bills have nearly tripled in the past 10 years
- Individual cell phone bill increased 31% since 2009
- Internet bills have risen 2.6 times faster than cost of living

Consumer Purchase	Average Monthly Bill
Cable Television	$ 123
Cell Phone	$ 71
Internet	$ 50
Road Taxes	$ 21

- Nationwide average tax on gasoline is $0.49½ per gallon
- Average annual miles per vehicle 12,334 miles per year
- National average fuel economy is 24 mpg.

Preservation Treatments Applied to HMA Pavements

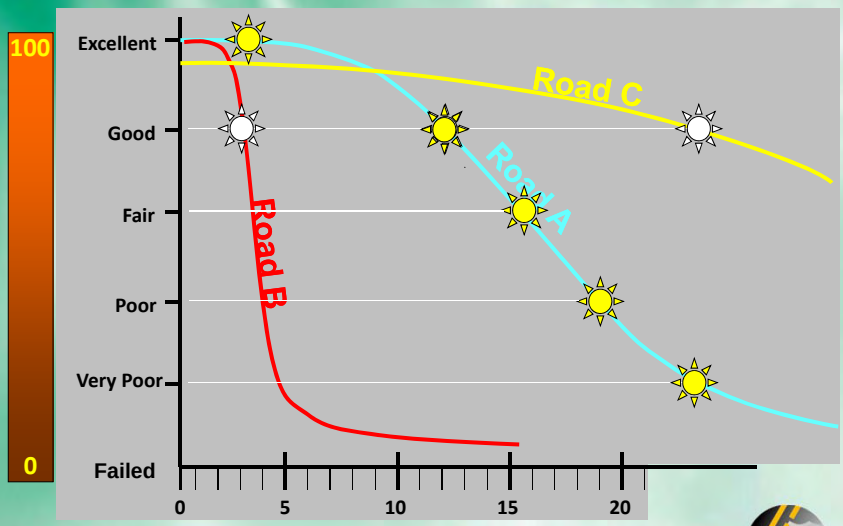
Treatment	Treatment Life (yr.)	Life Extension (yr.)
Rejuvenator*	NA	3 - 6
Surface Sealer	0 - 1	2 - 4
Crack Sealing	3 - 8	2 - 4
Crack Filling	2 - 4	1 - 3
Slurry Seal	4 - 5	3 - 5
Micro Surfacing - Single	3 – 6	3 - 5
Micro Surfacing - Double	4 - 7	4 - 6
Chip Seal - Single	3 – 7	5 - 6
Chip Seal - Double	5 – 10	8 - 10
Ultra-thin Bonded Wearing	7 – 12	NA
Dense Graded Thin HMA	5 - 12	NA
Open Graded Thin HMA	6 - 12	NA
Hot In-place Recycling	6 - 10	NA
Cold In-place Recycling	6 - 10	NA

* Only certain rejuventors were considered

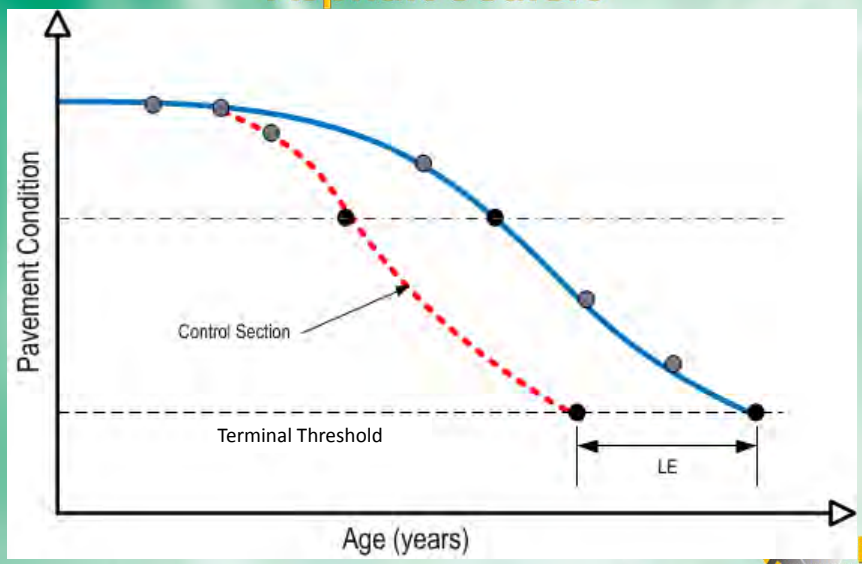
Typical Life Extensions
(Years)

Treatment	Good Condition (PCI=80)	Fair Condition (PCI=60)	Poor Condition (PCI=40)
Crack Fill	1 - 3	0 - 2	0
Crack Seal	2 - 4	1 - 3	0
Fog Seal	2 - 4	0 - 1	0
Chip Seal	5 - 6	3 - 5	0 - 3
Micro-Surfacing	4 – 6	3 - 5	1 - 4
Thin HMA	4 - 10	3 - 7	2 - 4

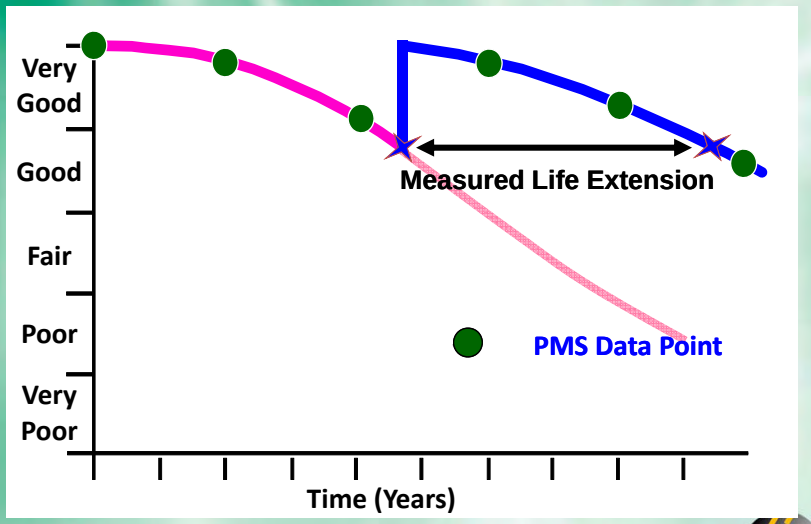
Pavement Condition Index (PCI)



Life Extension of Rejuvenators & Asphalt Sealers



Life Extension



Framework for Treatment Selection

Simply stated it is the:

"right" treatment on the
"right" road at the
"right" time by the
"right" people

Framework for Treatment Selection

- Other potential criteria
  - Availability of qualified contractors
  - Availability of materials
  - Time (of year) of construction
  - Pavement noise
  - Facility downtime
  - Surface friction

Asphalt Treatments

Rejuvenator Selection

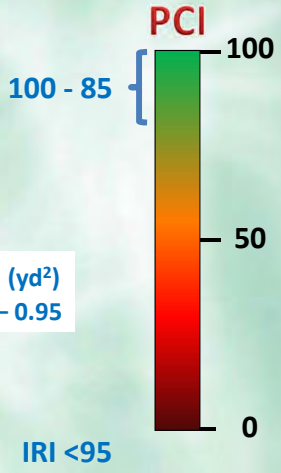
Rejuvenator Selection

Conditions Addressed

- Oxidation
- Maltine Replenishment
- Moisture Infiltration

Limitations

- Initial Low Skid



Costs (yd^2)
$0.80 – 0.95

Asphalt Sealer Selection

Asphalt Sealer Selection

Conditions Addressed

- Oxidation
- Asphalt Film Thickness
- Initial Raveling
- Moisture Infiltration

Limitations

- Initial Low Skid

PCI

100

95 - 75

50

0

IRI <95

Costs (yd^2)
$0.25 – 0.45

Crack Sealing Selection

Crack Sealing Selection

Conditions Addressed

- Water Infiltration
- Incompressibles

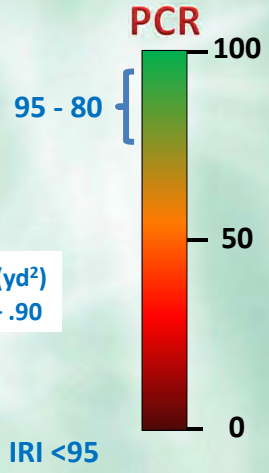
Primary Working Cracks

- Transverse cracking
- Reflective cracking

Limitations

- Must have Clean & Dry Reservoir

Costs (yd²)
$0.55 – .90



Crack Filling Selection

Crack Filling Selection

Conditions Addressed

- Water Infiltration
- Incompressibles

Non-Working Cracks

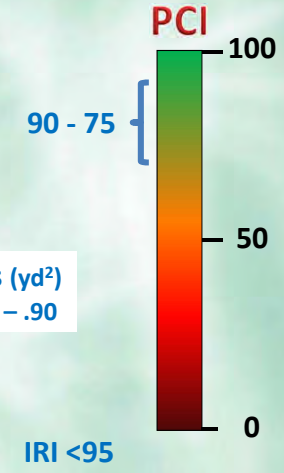
Secondary Cracks

- Longitudinal cracking
- Minor block cracking

Limitations

- Potential Hot Weather Tracking

Costs (yd²)
$0.55 – .90



Slurry Seal Selection

Slurry Seal Selection

Conditions Addressed

- Moisture Infiltration
- Longitudinal cracking
- Transverse cracking
- Raveling
- Friction Loss

Limitations

- Opening to Traffic Dependent on Set-Time

PCI

100

85 - 70

50

0

Costs (yd²)
$1.75 – 2.50

IRI <95

Micro Surface Selection

Micro Surface Selection

Conditions Addressed

- Moisture Infiltration
- Longitudinal cracking
- Transverse cracking
- Raveling
- Friction Loss
- Bleeding
- Rutting

Limitations

- Mixture subject to reflective cracking

PCI

100

85 - 70

50

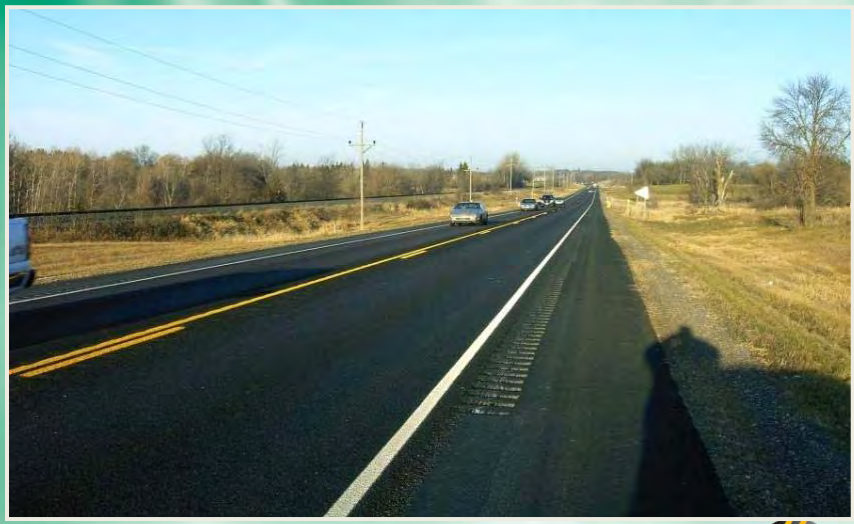
0

Costs (yd^2)
$2.00 – 5.00

IRI <95

Chip Seal Selection

Chip Seal - 5 months old



Chip Seal Selection

Conditions Addressed

- Moisture Infiltration
- Longitudinal cracking
- Transverse cracking
- Block cracking
- Friction Loss
- Bleeding

Limitations

- Longer set time

PCI

100

85 - 70

50

0

Costs (yd^2)
$1.50 – 2.50

IRI <95

Ultra-thin Bonded Wearing Course Selection

Ultra-thin Bonded Wearing Course Selection

Conditions Addressed

- Longitudinal cracking
- Transverse cracking
- Block cracking
- Raveling
- Friction Loss
- Bleeding
- Roughness

Limitations

- Cost

PCI

100

85 - 65

50

0

Costs (yd^2)
$10 – $14

IRI <95

Thin HMA Overlay Selection

Thin HMA Overlay Selection

Conditions Addressed

- Longitudinal cracking
- Transverse cracking
- Block cracking
- Raveling
- Friction Loss
- Bleeding
- Ride
- Splash/Spray (OGFC)

Limitations

- Cost

PCI

100

80 - 60

50

0

Costs (yd^2)
$6 – $8

IRI <120

Hot In-place Recycling Selection

Hot In-place Recycling Selection

Conditions Addressed

- Longitudinal cracking
- Transverse cracking
- Block cracking
- Raveling
- Friction Loss
- Bleeding
- Ride
- Corrugation

Requires Forensics of Existing Pavement

PCI

100

80 - 65

50

0

Costs (yd^2)
$1.60 – 2.60

IRI <170

Cold In-place Recycling Selection

Cold In-place Recycling Selection

Conditions Addressed

- Longitudinal cracking
- Transverse cracking
- Block cracking
- Raveling
- Friction Loss
- Bleeding
- Ride
- Corrugation
- Rutting

Requires Forensics of Existing Pavement

PCI

100

75 - 60

50

0

Costs (yd^2)
$8 – $14

IRI <190

Questions ?

MICHIGAN STATE
UNIVERSITY

Larry Galehouse, P.E., P.S.
Director
National Center for Pavement Preservation
2857 Jolly Road
Okemos, Michigan 48864
(517) 432-8220 • Fax: (517) 432-8223
email: galehou3@egr.msu.edu
www.pavementpreservation.org
www.tsp2.org

Please visit us on the web at www.pavementpreservation.org