Pavement Preservation 101

Purdue Road School

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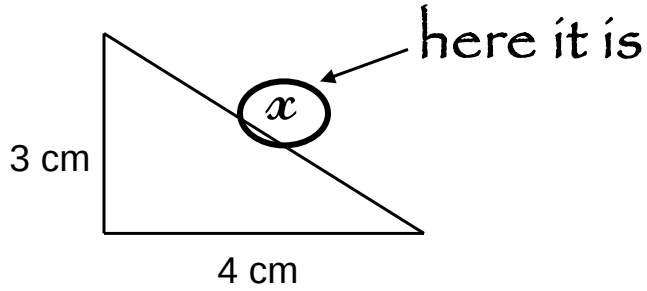
March 7, 2007

Question:

Find x



The Program:

- Definitions
- INDOT's Pavement Management System, and how it can benefit you
- Network Evaluation Strategy
- Safety Edge Update

- Free Stuff!!!!
  - Asphalt Preservation Guidelines brochure
  - FHWA Pavement Preservation Toolbox CD

Definition:

Pavement Preservation is "a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations."

Source: FHWA Pavement Preservation Expert Task Group

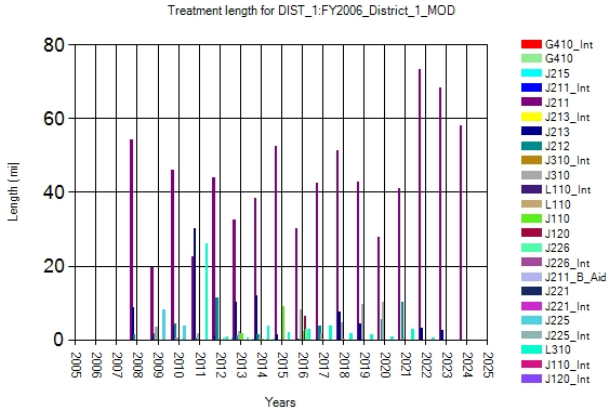
Pavement Preservation is –

- "Applying the Right Treatment to the Right Road at the Right Time"
- Pavement Preservation Treatments, by definition, do not add structural strength

Pavement Preservation Guidelines

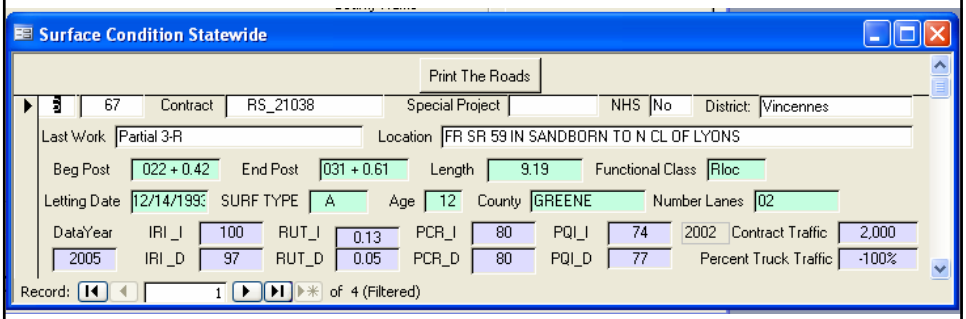
	Type of Activity	Increase Capacity	Increase Strength	Reduce Aging	Restore Serviceability
	New Construction	X	X	X	X
	Reconstruction	X	X	X	X
	Major (Heavy) Rehabilitation		X	X	X
	Structural Overlay		X	X	X
Pavement Preservation	Minor (Light) Rehabilitation			X	X
	Preventive Maintenance			X	X
	Routine Maintenance				X
	Corrective (Reactive) Maintenance				X
	Catastrophic Maintenance				X

- Pavement Management System
  - DTIMS



- Pavement management system contains data on
  - Surface Condition
  - Contract work
  - Does NOT include maintenance activities
    - Pavement Management and Work Management Systems were too incompatible
    - The new WMS will be tied into PMS

Surface Condition Report



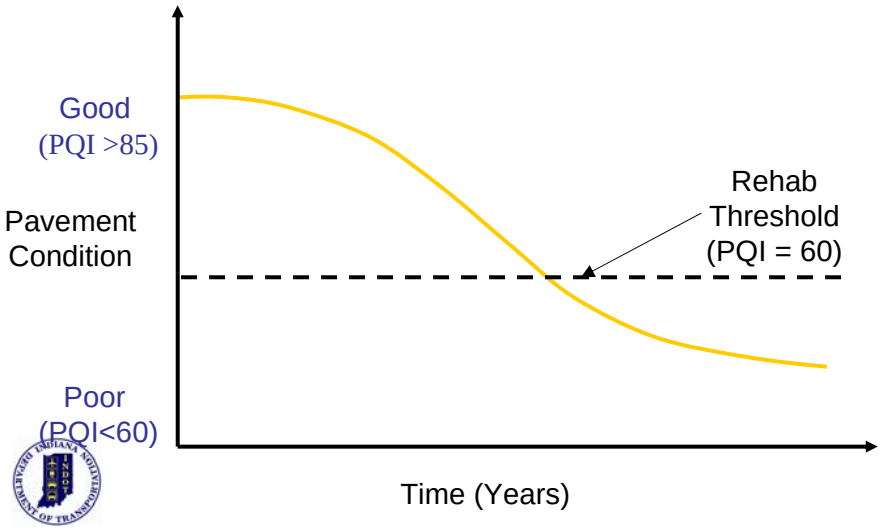
- Surface Condition Report
  Contains condition data
  - Rut
    - >1/4" = Severe
  - Roughness (IRI)
    - 0-80 = Excellent
    - 80-115 = Good
    - 115-150 = Fair
    - >150 = Poor
  - Pavement Condition Rating (PCR)
    - 0-100 Scale
    - 100-90 = Excellent
    - 90-80 = Good
    - 80-70 = Fair
    - <70 = Poor

- Rut, IRI, and PCR are combined into a composite index: Pavement Quality Index (PQI)
  - 0 – 100 Scale
  - 100-85 = Good
  - 85-60 = Fair
  - <60 = Poor
- Also Contains limits and scope of last contract work
  - Valuable tool to use when determining pavement age

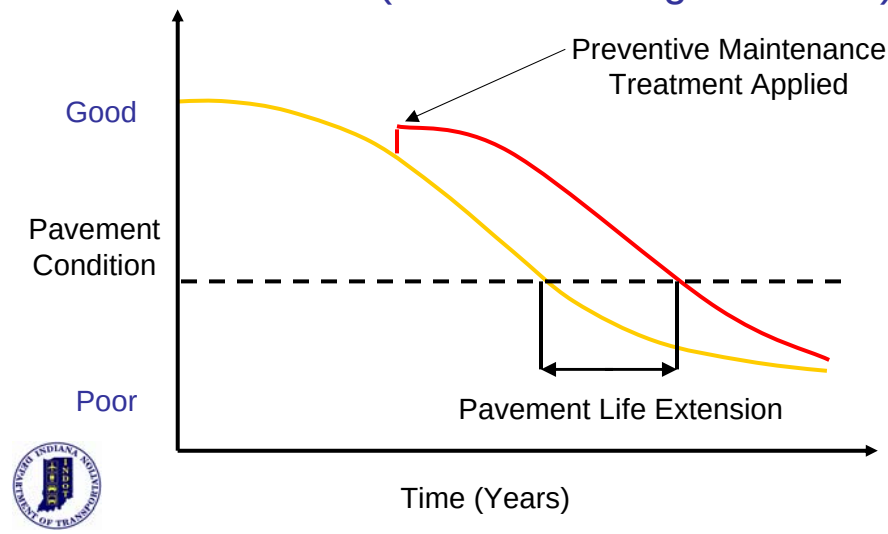
BE CAREFUL! This is a tool, and not meant to take the place of "kicking the pavement"

Y:\Div.program Development\SURFACE CONDITION REPORT

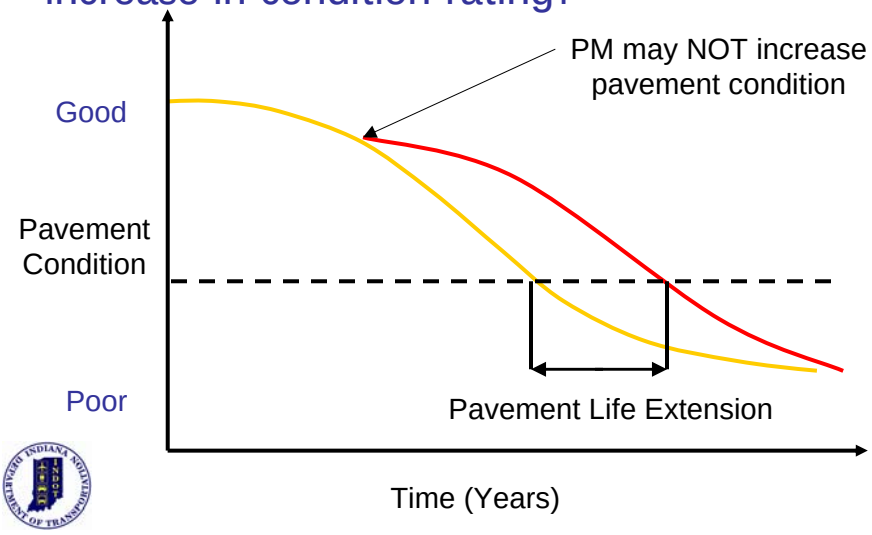
Typical Pavement Deterioration Curve



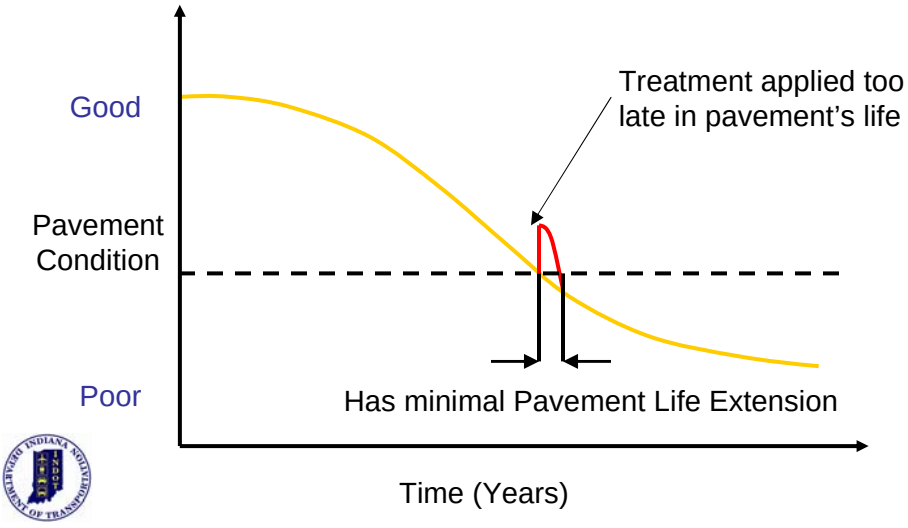
With Preservation (condition rating increased)



Can we do a preservation treatment with no increase in condition rating?



Remember, “the right time”



Rule of Thumb:

- For every $1 spent on preventive maintenance
- You save $10 over the life of the pavement

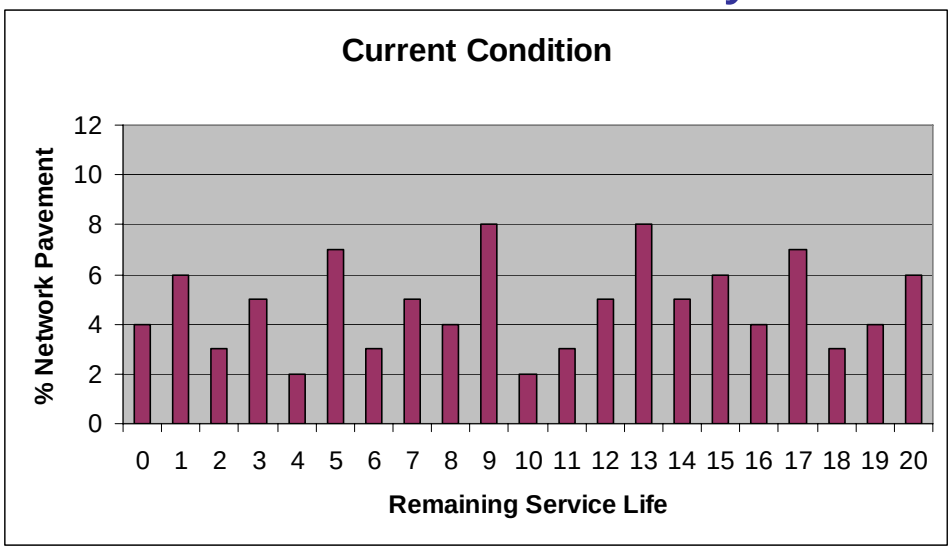
IF you perform

- “the Right Treatment on the Right Road at the Right Time”

Remaining Service Life Concept

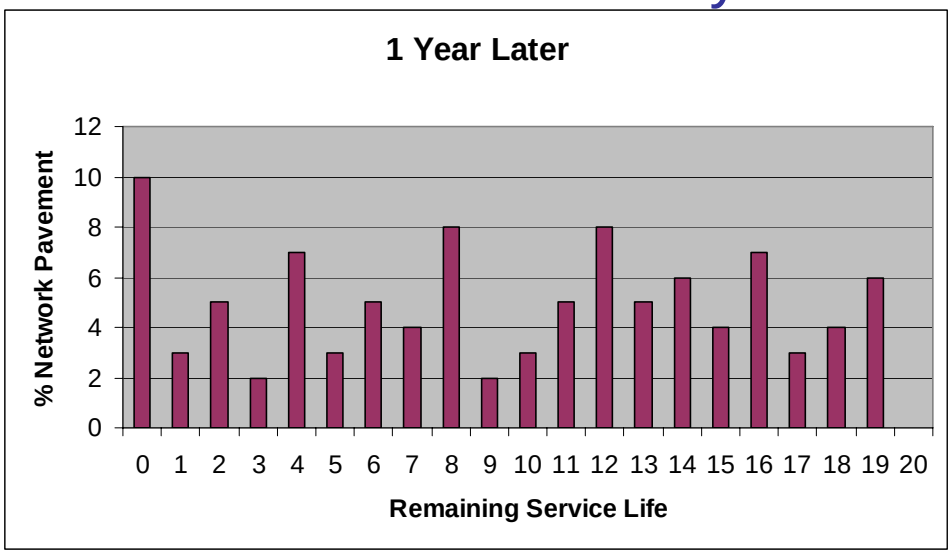
- Every road has a life
- A “new” road will have a life of at least 20 years

INDOT's Network Today



- Every year, every road AGES 1 year
- Or, the life of our roads DECREASES by 1 year

INDOT's Network in 1 year



- Remember, we have to maintain 27,742 lane miles
- Every year, those 27,742 miles age 1 year
- Or, put another way, we LOSE 27,742 lane mile years each year
- Therefore, our construction and maintenance program has to GAIN 27,742 lane mile years to keep the network in its current condition

Lets look at an example:

- Assumptions:
  - Our District Pavement budget is $120,000,000 per year.
  - This is enough to resurface 1,200 miles per year.
  - Our Major Preservation budget is $200,000,000 per year.
  - This is enough to reconstruct/rehabilitate about 215 lane miles per year

Construction Only

Activity	Budget	Cost / Ln Mi	Life Extension	Ln Mi per Year	Ln Mi Yrs
Resurface	$120,000,000.00	$100,000.00	10.0	1,200.0	12,000.0
Rehabilitation (Urban)	$100,000,000.00	$2,000,000.00	20.0	50.0	1,000.0
Rehabilitation (Rural)	$100,000,000.00	$600,000.00	20.0	166.7	3,333.3

Total	16,333.3
INDOT Network	27,742.0
Difference	**-11,408.7**

Now, add a little Maintenance!

Activity	Budget	Cost / Ln Mi	Life Extension	Ln Mi per Year	Ln Mi Yrs
Crack Seal			2.0	4,100.0	8,200.0
Chip Seal			5.0	400.0	2,000.0
Resurface	$120,000,000.00	$100,000.00	10.0	1,200.0	12,000.0
Rehabilitation (Urban)	$100,000,000.00	$2,000,000.00	20.0	50.0	1,000.0
Rehabilitation (Rural)	$100,000,000.00	$600,000.00	20.0	166.7	3,333.3

Total	26,533.3
INDOT Network	27,742.0
Difference	**-1,208.7**

Better, but still falling behind

Maybe a little more crack sealing?

Activity	Budget	Cost / Ln Mi	Life Extension	Ln Mi per Year	Ln Mi Yrs
Crack Seal			**2.0**	**4,700.0**	**9,400.0**
Chip Seal			5.0	400.0	2,000.0
Resurface	$120,000,000.00	$100,000.00	10.0	1,200.0	12,000.0
Rehabilitation (Urban)	$100,000,000.00	$2,000,000.00	20.0	50.0	1,000.0
Rehabilitation (Rural)	$100,000,000.00	$600,000.00	20.0	166.7	3,333.3

600 additional lane miles per year, or 100 per District.

This is the same as crack sealing 5 roads that would be resurfaced.

Total	27,733.3
INDOT Network	27,742.0
Difference	**-8.7**

Or Chip Seal?

Activity	Budget	Cost / Ln Mi	Life Extension	Ln Mi per Year	Ln Mi Yrs
Crack Seal			2.0	4,100.0	8,200.0
Chip Seal			**5.0**	**640.0**	**3,200.0**
Resurface	$120,000,000.00	$100,000.00	10.0	1,200.0	12,000.0
Rehabilitation (Urban)	$100,000,000.00	$2,000,000.00	20.0	50.0	1,000.0
Rehabilitation (Rural)	$100,000,000.00	$600,000.00	20.0	166.7	3,333.3

240 additional lane miles per year, or 40 per District.

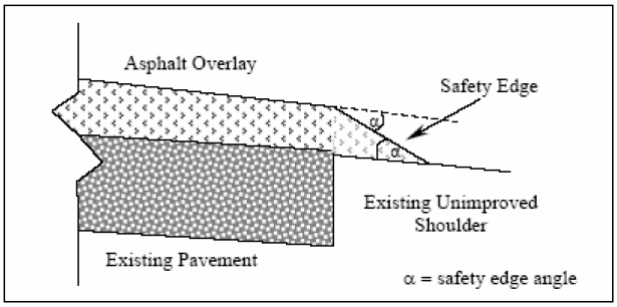
This is the same as chip sealing 2 roads that would be resurfaced.

Total	27,733.3
INDOT Network	27,742.0
Difference	**-8.7**

Network Evaluation Method

- This method is extremely simple
- Can be used at any level:
  - State
  - District
  - Subdistrict
  - Even Unit

Status of “Safety Edge” Study



Pavement Edge Dropoffs

The Solution?

- The “Safety Edge”

Safety Edge

- INDOT Constructed 9 Test sections in 2004/2005 (5 Districts).
  - Also identified “Reference” and “Control” segments for statistical comparison
    - Control = Roads with similar characteristic as Test Sections that were resurfaced at the same time.
    - Reference = Roads with similar characteristics that have not been resurfaced in several years
- Pooled fund study is for 5 Years.
  - “After” data collection for 3 years.
  - We are now in the second year of data collection.

- Data collection will occur each year
  - Accident review
    - Identify dropoff related accidents
    - Statistical model used to “extrapolate” expected accidents
  - Field Review
    - Dropoffs measured at test, control, and reference sites.

- Final report will be prepared at the end of the 3rd year of accident collection
- There was slightly inconsistent construction results
  - Can be fixed – Equipment related
- Can be used now, if conditions warrant
  - No shoulder
  - Dropoff problem

Questions???

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