Pavement Preservation Preserving Our Infrastructure

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The U.S. Highway Infrastructure is currently valued at

\$1.75 Trillion



Driving on Poor Roads Cost \$\$\$

- \$49 billion per year in extra vehicle repairs and operation costs
- \$255 per motorist

Information provided by TRIP





WE LOVE HOT MIX

- It is what we know
- It is effective
- We know when it needs to be replaced
- Public satisfaction is high
- Industry is well developed
- Specifications are in place
- Improvements continue



Where is the Money

Real funding down 55% since the 50s

Inflation up 33% since 1983

No political will for a gas tax



It just isn't there

- Funding is stagnant at best
- Less miles traveled = less \$\$\$\$
- Material Costs have increased – Concrete, Asphalt, Fuel
- 10 year paving cycle
 Overlaying 10 % of the network to stay even
- 25-30 year cycles are more realistic



Alternate Funding

- Stimulus Package(s)
- Bonds

Both are one time shots of cash Both lead to big influxes of work Both leave big voids when gone



Pavement Preservation is a proven system to help get more "bang for the buck"

PAVEMENT PRESERVATION

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.

FHWA Pavement Preservation Expert Task Group



Pavement Preservation Includes

Minor Rehabilitation

Routine Maintenance

Preventive Maintenance

Minor Rehabilitation

Non-structural enhancements to existing pavement sections to eliminate age related, top-down surface cracking.

AASHTO Highway Subcommittee on Maintenance

Mill and Fill

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Routine Maintenance

Consists of work that is planned and performed on a routine basis to maintain and preserve the condition of the highway system or respond to specific conditions and events that restore the highway system to an adequate level of service.

AASHTO Highway Subcommittee on Highways



Routine Maintenance

- Clearing ditches and structures
- Pothole patching
- Crack "filling"
- Isolated overlays

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Preventive Maintenance

A planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system (without significantly increasing the structural capacity)

AASHTO Standing Committee on Highways

Concept

It is generally accepted that preventive maintenance treatments can extend the service life of a pavement several years, delaying the need for more costly rehabilitation A roadway that is severely deteriorated costs very little to maintain as compared to reconstruction. Using this deferred funding on Pavement Preservation improves the network as a whole.



The Concept of Preventive Maintenance





Pavement Preservation Philosophy

Applying the right treatment

... to the right road





... at the right time

Attitude Adjustment

The "Worst First" approach to roadway maintenance neglects roads in the good and fair categories. These roads drop into the poor category at an increasing annual rate while maintenance funds remain stagnate. The overall roadway system continues to decline until this cycle is broken.

Preservation Techniques For Asphalt Roadways

- Fog Seal
- Crack Seal
- Chip Seal
- Cape Seal
- Slurry Seal
- Micro Surfacing

- Thin Lift Overlay
- Traditional Overlay
- HIR
- CIR
- Combinations
- more

Preventive Maintenance Treatment Characteristics

- Cost effective
- Preserve the system
- Retard future deterioration
- Maintain or improve the functional condition of the system
- Provide no additional structural strength



Major Benefits

- Improved pavement condition
- Safer roads
- Lower life cycle costs
- Reduced congestion
- Customer satisfaction
- More cost effective use of funds



Strategy Comparison

- Worst First:
 - Overlay
 Typical Cost: \$200,000
 Expected Life: 10 years
- Annualized cost \$20,000/year

Strategy Comparison

 Preventive Maintenance: Overlay followed by a Chip Seal in year 8

- Typical Cost: \$200,000 + \$77,500
- Expected Life: 15 years
- Annualized Cost- \$18,500/year



A Quick Check of Your

Highway Network Health

Jim Sorenson, FHWA Larry Galehouse, NCPP



Example:

Agency Highway Network 4,356 lane miles Budget of \$37,323,132

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Each year the network will lose 4,356 lane mile years of remaining service life







Reconstruction Evaluation

<u>Project</u>	<u>Lane</u> <u>Miles</u>	<u>Design</u> <u>Life</u>	<u>Lane</u> <u>Mile</u> <u>Years</u>	<u>Lane Mile</u> <u>Costs</u>	<u>Total</u> <u>Cost</u>
#1	22	25 yrs	550	\$463,425	\$10,195,350
#2	18	30 yrs	540	\$556,110	\$10,009,980
	Total	=	1,090		\$20,205,330

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Rehabilitation Evaluation

<u>Project</u>	<u>Lane</u> <u>Miles</u>	<u>Design</u> <u>Life</u>	<u>Lane</u> <u>Mile</u> <u>Years</u>	<u>Lane Mile</u> <u>Costs</u>	<u>Total</u> <u>Cost</u>
#3	22	18 yrs	396	\$263,268	\$5,791,896
#4	28	15 yrs	420	\$219,390	\$6,142,920
#5	32	12 yrs	384	\$115,848	\$3,707,136
	Total	=	1,200		\$15,641,952

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Pavement Preservation Evaluation

<u>Project</u>	<u>Lane</u> <u>Miles</u>	<u>Life</u> <u>Ext.</u>	<u>Lane</u> <u>Mile</u> <u>Years</u>	Lane <u>Mile</u> <u>Costs</u>	<u>Total</u> <u>Cost</u>
#101	12	2 yrs	24	\$2,562	\$30,744
#102	22	3 yrs	<mark>66</mark>	\$7,743	\$170,346
#103	26	5 yrs	130	\$13,980	\$363,480
#104	16	7 yrs	112	\$29,750	\$476,000
#105	8	10 yrs	80	\$54,410	\$435,280
	Total	=	412		\$1.475.850



Network Trend

Programmed Activity	<u>Lane Mile</u> <u>Years</u>	<u>Total Cost</u>
Reconstructio	1,090	\$20,205,330
Rehabilitation (82 lane miles)	1,200	\$15,641,952
Pavement Preservation (84 lane miles)	412	\$1,475,850
Total =	2,702	\$37,323,132

Required: 4,356 lane mile years



Network Needs Summary

Network Size <i>(needs)</i>	4,356 <i>(lane mile years)</i>
Programmed Activity	2,702 <i>(lane mile years)</i>
Deficit =	1,654 <i>(lane mile years)</i>

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Steps to Address *Minimal* **Needs**



Required: 4,356 lane mile years



Program Modification

Savings = \$ 6,101,940 Needs = 1,999 LMY

Preservation Treatment	Life Ext	Lane Miles	Lane Mile Years	Total Cost
Concrete Reseal	4 yrs	31	124	\$979,600
Thin HMA Overlay	10 yrs	16	160	\$870,560
Micro-surfacing	7 yrs	44	308	\$1,309,000
Chip Seal	5 yrs	79	395	\$1,104,420
Crack Seal	2 yrs	506	1,012	\$1,296,372
			1,999	\$5,559,952



Revised Network Strategy Required: 4,356 Jane mile years

Programmed Activity	Lane Mile Years
Reconstruction (31 Iane miles)	820
Rehabilitation (77 Iane miles)	1,125
Pavement Preservation (2,083 Iane miles)	2,411
Total =	4,356

Net Savings = \$ 541,988



Sounds Easy So What's The Problem?

Election Cycle Public Acceptance Strong Industry Lobby Dedicated Funding Education



Keys to Successful Preservation

- Know the available products
- Know the pros and cons of each
- Identify distress type and severity

 Get out of the truck
- Understand local concerns
 - Educate

Select, apply, monitor, document, update

Summary

- Must get away from a worst-first policy
- Preventive maintenance can extend pavement life and reduce costs
- Many available treatments for pavement preservation
- Network condition takes precedent over individual routes
- Site Selection is the one thing we can control

Why should AMAP support Pavement Preservation?

It's the right thing to do?

Better use of taxpayer funds?

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All techniques have forms requiring modification of the base asphalt

- -Polymer
- -Latex
- -Elastomer
- -Plastomer
- -GTR
- -Chemical

There is little reason we could not expect our asphalt pavements to last 30 years or longer with very little additional investment



Pavement Preservation makes it difficult for roadway designers to select any road building material other than ASPHALT



INFORMATION

www.ncpp.org www.fhwa.gov/preservation www.asphaltinstitute.org www.fp2.org www.slurry.org www.arra.org **State and Local Agencies Contractors and Suppliers**