



WSDOT Chip Seal Program

2016 County Engineer's Workshop

Manistee, Michigan

Presented By:

Tim Moomaw, WSDOT Construction Trainer



WSDOT Chip Seal Program

Presentation Overview

This presentation will review the past, present and future use of Chip Seals in Washington State.

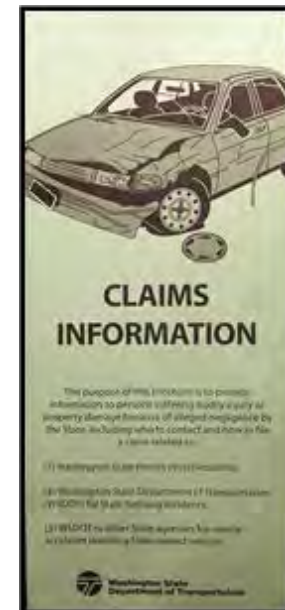
In 2014, WSDOT received SHRP 2 Implementation funds to assess the use of Chip Seals for high traffic volume routes. Review of this project for Q & A.

WSDOT Chip Seal Program

Negative Perceptions

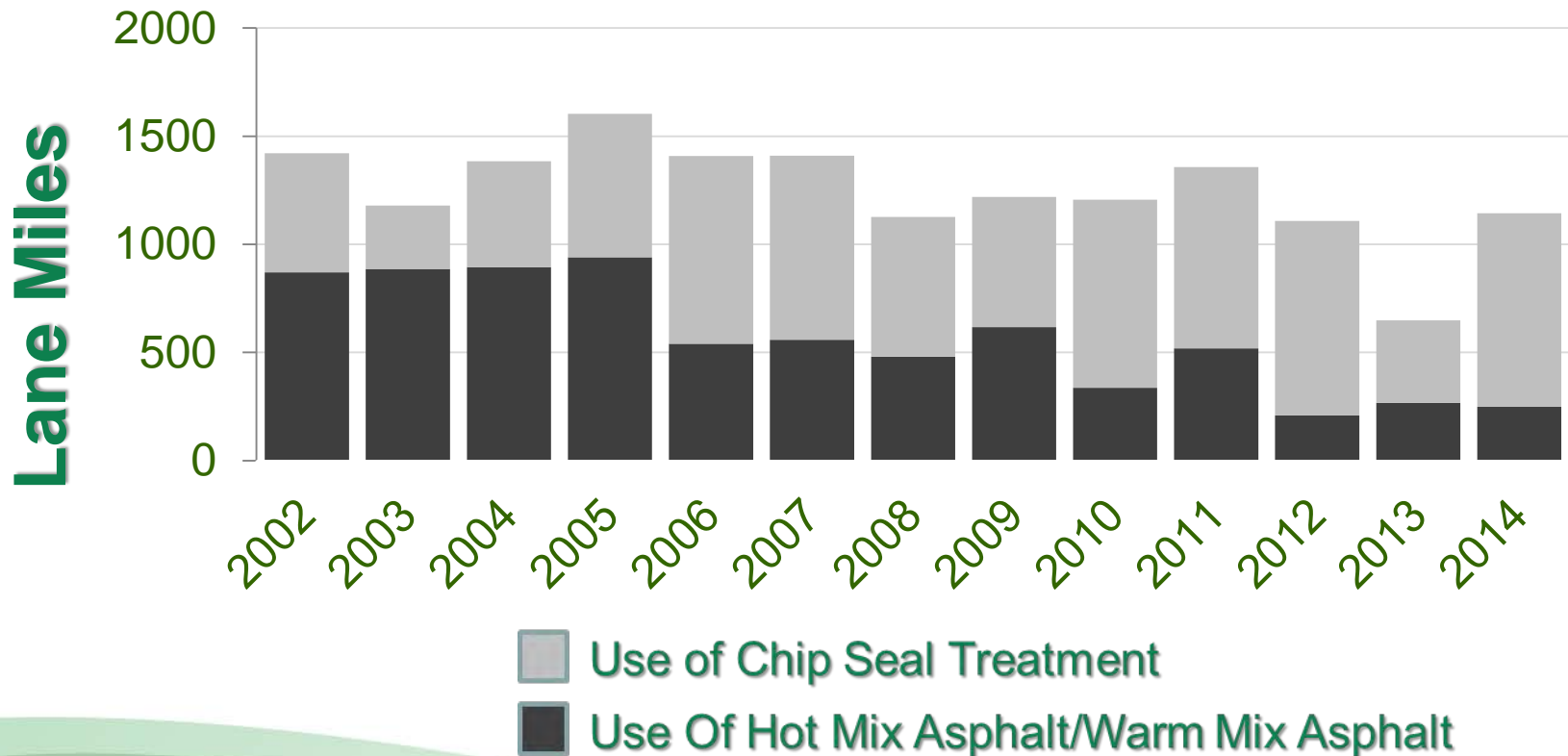
Chip Seals “*can’t / shouldn’t*” be done

- Too high of traffic levels
- Won’t improve the road
- Breaks windshields
- Not for bicycles



WSDOT Chip Seal Program

Preservation Projects





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Presentation Overview

WSDOT Pavement Preservation Strategies

- ❑ WA State Senate requests information on business practices in 2010.

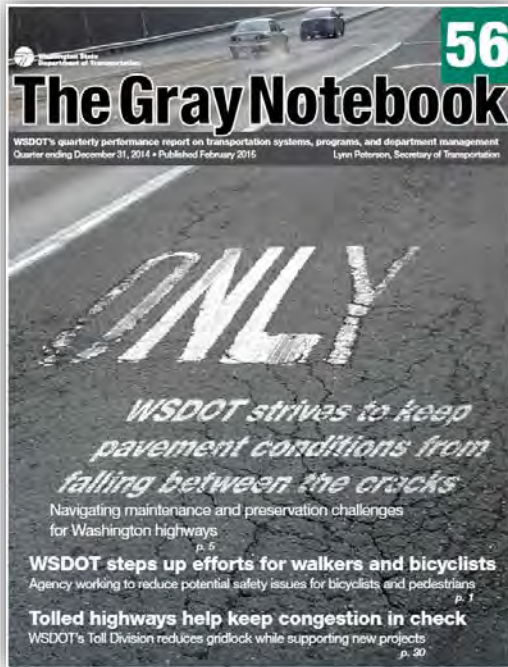
WSDOT STRATEGIES REGARDING
PRESERVATION OF THE STATE ROAD NETWORK

*A Report to the State Legislature
in Response to SB 6381*

Prepared by:
Washington State Department of Transportation
State Materials Laboratory
September 1, 2010

WSDOT Chip Seal Program

Communication Plan



- Commitment to Transparency
- Quarterly Performance Report
- March 2015 Edition

WSDOT Chip Seal Program

Communication Plan

City of Shoreline, WA

Promo Video



www.youtube.com/watch?v=wzN-kqQI9s4

www.youtube.com/watch?v=DiQ2YsbwvTg





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Connecting Washington

Transportation Package

- ❑ \$16 billion package
 - 11.9-cent gas tax increase (62¢/Gal)
 - \$1.4 billion for preservation (16 yrs)

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Geographic Challenges

- ❑ Dry & Arid Eastern Washington
- ❑ Mild Coastal Region
- ❑ Mountain Passes



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Optimal Timing

Dependent on the existing pavement structure, each pavement condition will have a corresponding corrective action.

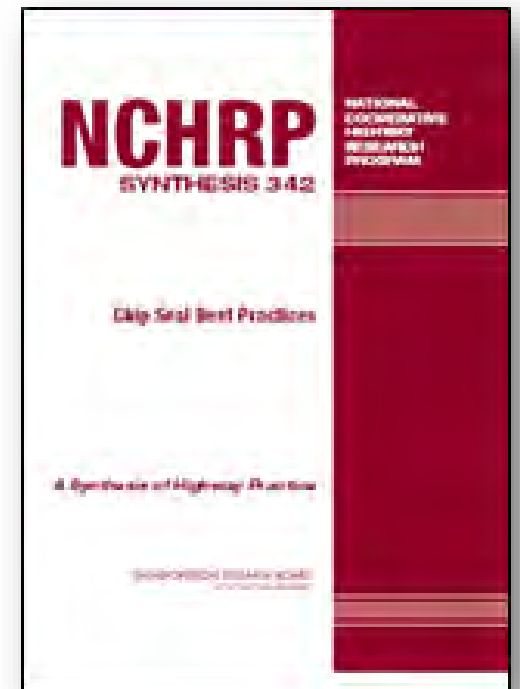


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Chip Seal Best Practices

Chip Seal Best Practices

- ❑ NCHRP Synthesis 342
- ❑ Highlighted QA/QC Measures
- ❑ 40 best practices identified
- ❑ Racked-in-Seal described



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Chip Seals Systems

Systems Selection



- Type of binder
- Gradation of aggregate
- Number of “courses”
- Types of “courses”
- Type of existing surface



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Chip Seal Systems

System Selection

- Cationic Rapid Set... Single Size & Uniform
- Asphalt Cement.... Single Size, Dry & Pre-Coated
- High Float.... Dense graded, Crushed Cover Stone
- Cutbacks... Dense graded, Crushed Cover Stone

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Past Use of Chip Seals

Bituminous Macadam Construction

- Gravel Road Conversion
- New Construction
- Cushion Course



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Past Use of Chip Seals

Seal Coats

- Capital Projects
- Maintenance

Major change from
current philosophy....



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Past use of Chip Seals

Compatible Materials

- Asphalt Emulsion
- Aggregate

All Asphalt Emulsions are not created equal.





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Past Chip Seal Practice

Chip Seal System Selection

Many failures occurred with the various chip seal systems used.

This attributed to poor public opinion.





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Past Use of Chip Seals

Collaboration with Industry

Beginning in 2006, meetings were held which included:

WSDOT, Contractors, Suppliers and other Local Agencies.





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Chip Seal Construction

Specification Changes



**Standard
Specifications**
for Road, Bridge, and
Municipal Construction
2016

M 41-10



- Standardization of Aggregate Size
- Inclusion of Choke Stone
- Use of Steel Wheel Rollers
- Measure and Pay for Aggregates by S.Y.
- Maximum Surface Temperature of 130° F



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Current Preservation Policy

Bituminous Surface Treatments (BST's)

- WSDOT has begun using an integrated approach to our preservation treatments.
 - Crack Seal
 - Chip Seal
 - Fog Seal

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Chip Seal Design

Chip Seal System Selection

- Rural
- Urban
- Snow Zones
- Traffic Volumes





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Current Chip Seal Practices

CRS2-P, Cationic Rapid Set w/ Polymer

- Racked-in-Seal
- 3/8 - #4 course aggregate Coverstone
- 0 - #4 Choke Stone
- Fog Seal 3-5 days after placement
- High Traffic Levels (up to 30,000 ADT)

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Current Chip Seal Practices

High Float Emulsion, HFE-150

- Lower Cost
- Slow cure time
- High fugitive dust
- Low volume routes



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Current Chip Seal Practices

AC15-P, Asphalt Cement w/Polymers

- High traffic volume
- Low fugitive dust
- Quick set time
- Striping same day



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Current Chip Seal Practices

Mountain Passes



Mountain Passes are challenging for a chip seal to be successful.



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Current Chip Seal Practices

Mountain Passes

Mobilization of crews and equipment can be challenging and a costly venture.





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Current Chip Seal Practices

Mountain Passes

A larger aggregate structure will produce a more tenacious wearing course to mitigate these obstacles.

Snow Plow Damage



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Current Chip Seal Practices

Mountain Passes

For routes with steep grades and super elevated curves, WSDOT has incorporated 24 hour piloted traffic.



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Current Chip Seal Practices

Mountain Passes

- CRS2-P, Cationic Rapid Set
- 1/2" – 1/4" Coverstone
- Choke Stone
- Fog Seal



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Current Chip Seal Practices

Major Arterial Intersections

- HMA Overlay
- Choke Stone
- Cape Seal



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Future Chip Seal Practices

Cape Seal

- Intersections
- Bike Routes



2015 Trial project SR 207



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Future Use of Chip Seals

Hot-Applied Chip Seal Systems



- ❑ Asphalt Cement
 - AC-15P
 - CRM blend



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Future Use of Chip Seals

2014 Trial Project

State Route 97A,
in the central part of
Washington State was
chosen to construct
WSDOT's first Asphalt
Cement chip seal.

Preservation Approaches for
High-Traffic-Volume Roadways

Asphalt Cement Chip Seal



Washington State
Department of Transportation



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Future Use of Chip Seals

AC-15P HBST Chip Seal System

- 3/8" - #8 Aggregate
- Pre-Coat Aggregate
 - PG 64-22
 - Stockpile (Dry)
 - Apply (Cold)



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Future Use of Chip Seals

Mountain Passes

- AC-15P HBST
- 3/8" – #4" Coverstone
- Choke Stone...
- Fog Seal...



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Future Use of Chip Seals

CRM HBST Chip Seal System

- ❑ 3/8" - #4 Aggregate
- ❑ Pre-Coat Aggregate
 - PG 64-22
 - Apply (Hot)



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Future Use of Chip Seals

CRM HBST Chip Seal System



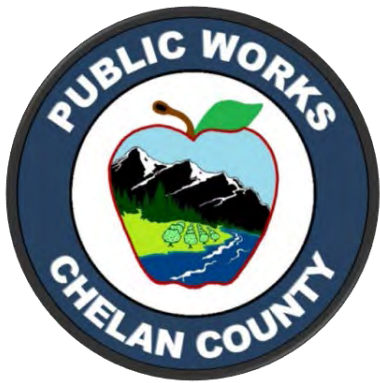
In 2015, Chelan County employed the use of Crumb Rubber Modified (CRM) chip seal.



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Future Use of Chip Seals

Options... (Prices may vary depending on factors applied)



- CRS-2P BST Chip Seal \$1.50/SY
- AC15-P HBST Chip Seal \$2.00/SY
- CRM HBST Chip Seal \$4.00/SY
- HMA Thin Lift Overlay \$10.00/SY

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Future Use of Chip Seals

Racked-in-Seal.....To Choke or not to Choke

- Asphalt Emulsion
Chip Seals...*
- Asphalt Cement
Chip Seals...*



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Future Use of Chip Seals

Fog Seal.... newly constructed Chip Seal

- Asphalt Emulsion Chip Seals...*
- Asphalt Cement Chip Seals...*



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Summary

Using the Right Tool



- Asphalt Emulsion BST
 - CRS-2P

- Asphalt Emulsion BST
 - HF-150

- Asphalt Cement HBST
 - AC-15P



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