

Applying and Inspecting Chip Seals

2015 NWPMA Conference

Vancouver, Washington

Presented By:

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Applying and Inspecting Chip Seals

Presentation Overview

- I. **WSDOT's past use of Chip Seals...**
- II. **WSDOT current use of Chip Seals....**
- III. **WSDOT future use of Chip Seals...**



Applying and Inspecting Chip Seals

State Legislature Request

Pavement Preservation 2010 Report for SB 6381

WSDOT Strategies
Regarding Preservation of
the State Road Network

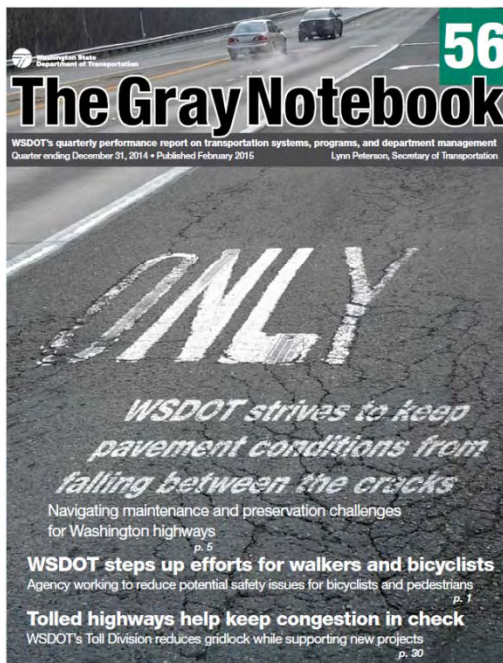
WSDOT STRATEGIES REGARDING
PRESERVATION OF THE STATE ROAD NETWORK

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

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

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Communication Plan



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

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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
- Doesn’t work....

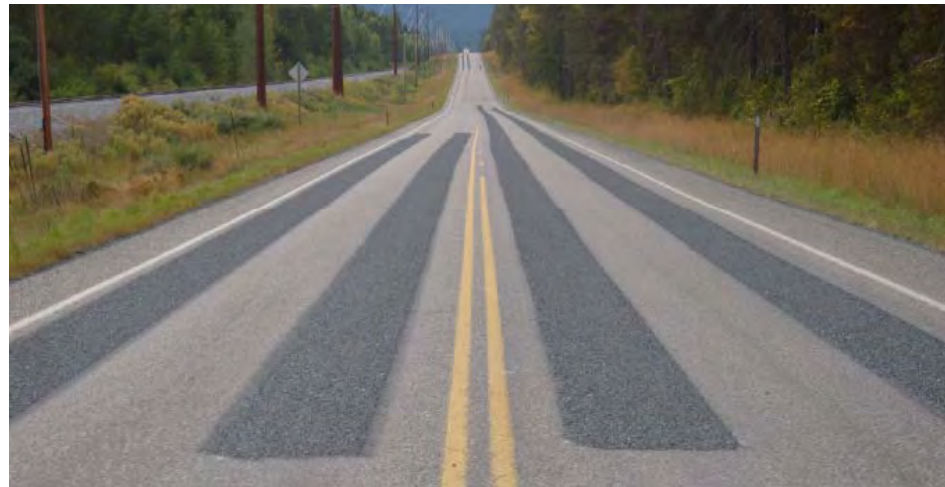


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Triage... “ band aid fixes ”

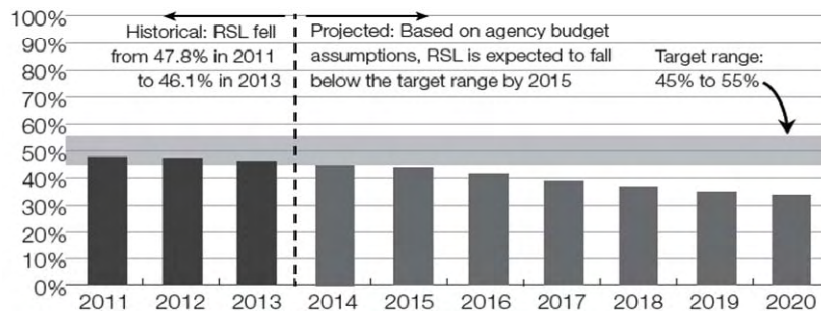
Using Innovative solutions for pavement preservation in times of declining funding.

***Isolated and
immediate repair
of small areas.***



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Liability Forecast



\$391 million
needed to address WSDOT's
pavement backlog in 2013,
a \$48 million increase from 2012

Lower cost solutions to produce best return on investment that meet performance criteria.

Deferred Preservation for Capital Projects

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Pavement Preservation

WSDOT chip seal conversions avoid costs

Calendar years 2010 through 2016; Lane miles converted or planned for conversion; Actual and projected cumulative savings

860 lane miles converted between 2010-2012 = **\$20.3 M** cumulative cost avoidance between 2010-2012

650 lane miles completed or programmed for 2013-2014 = **\$52.7 M** projected cumulative cost avoidance since 2010 by end of 2014

760 lane miles have been identified for conversion in 2015-2016 = **\$102.7 M** projected cumulative cost avoidance since 2010 by end of 2016

FY 2010 to 2016

2270 Lane miles converted from HMA to Chip Seal wearing course.

Approximate savings of \$12,000 per year for every lane mile





**Washington State
Department of Transportation**



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Connecting Washington

Feast or Famine

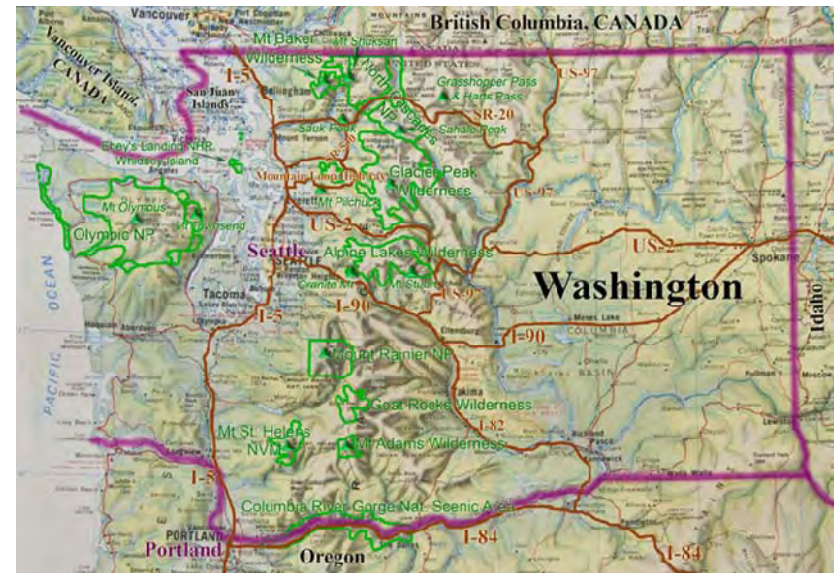
Connecting Washington Transportation Package

\$16 billion package that includes an 11.9-cent gas tax increase phased in over FY 2016 and FY 2017.

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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 Seals Systems

Systems Selection



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



WSDOT Chip Seal Program

Chip Seal Systems

System Selection

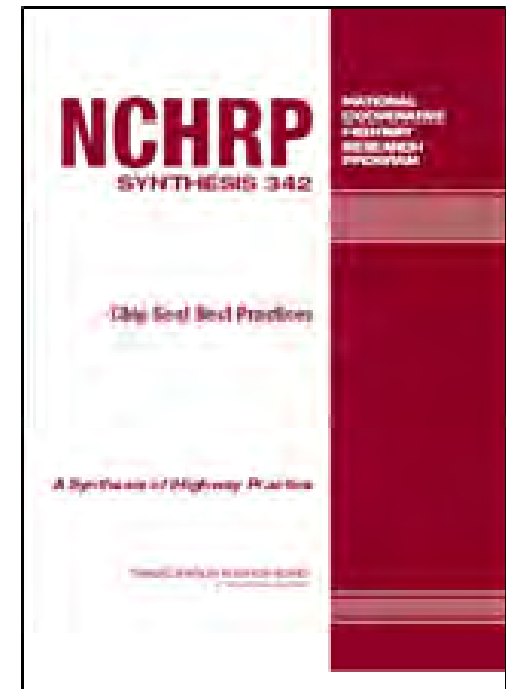
- Cationic Rapid Set... Single Size & Uniform
- Asphalt Cement.... Single Size, Dry & Pre-Coated
- High Float.... Dense graded, Crushed Cover Stone
- Cutbacks... Dense graded, Crushed Cover Stone

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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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Past Use of Chip Seals

Macadam

- New Construction
- Cutback Asphalts
- Multiple courses



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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

How we got here.....



Beginning in 2006, meetings were held which included WSDOT, Contractors, Suppliers and other Agencies.

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Current Chip Seal Practices

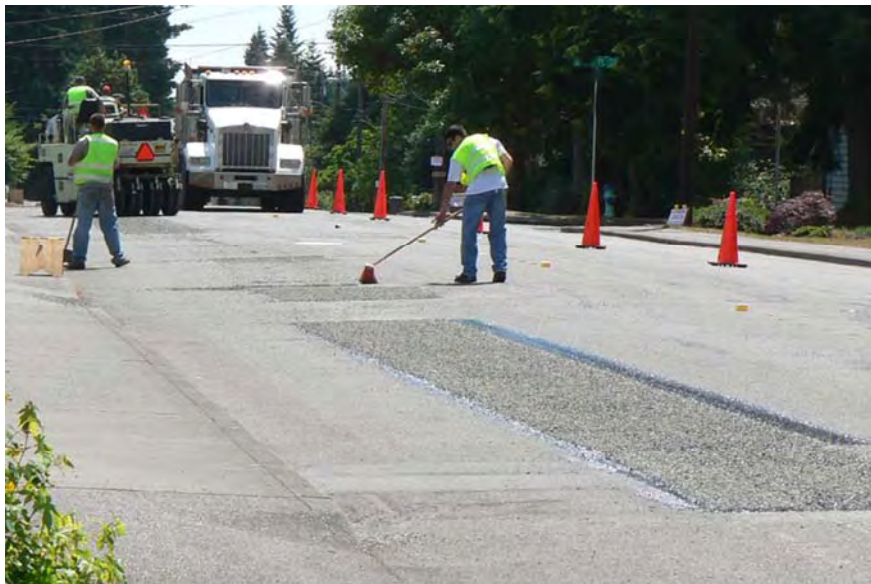
Specification Changes



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

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Current Chip Seal Practices



Corrective Chip Seal or HMA Pre-Level

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Current Chip Seal Practices

Bituminous Surface Treatments (BST)

- Crack Seal
- Chip Seal
- Fog Seal

WSDOT has begun employing an integrated approach to its preservation strategies.

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Current Chip Seal Practice

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

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

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

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



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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 in the Tool Box



- Asphalt Emulsion BST
 - CRS-2P

- Asphalt Cement HBST
 - AC-15P

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WSDOT, Construction Trainer



Washington State
Department of Transportation