

Pavement Condition Rating

Foundation of your Pavement Management System

October 2018

Northwest Pavement Management Association (NWPMA) Conference

Today's Agenda

- Introductions
- Why rate your pavement?
- What you need to know
- Pavement rating methods
- Pavement rating exercise
- Pavement management systems
- Wrap-up

Why Rate Your Pavement?

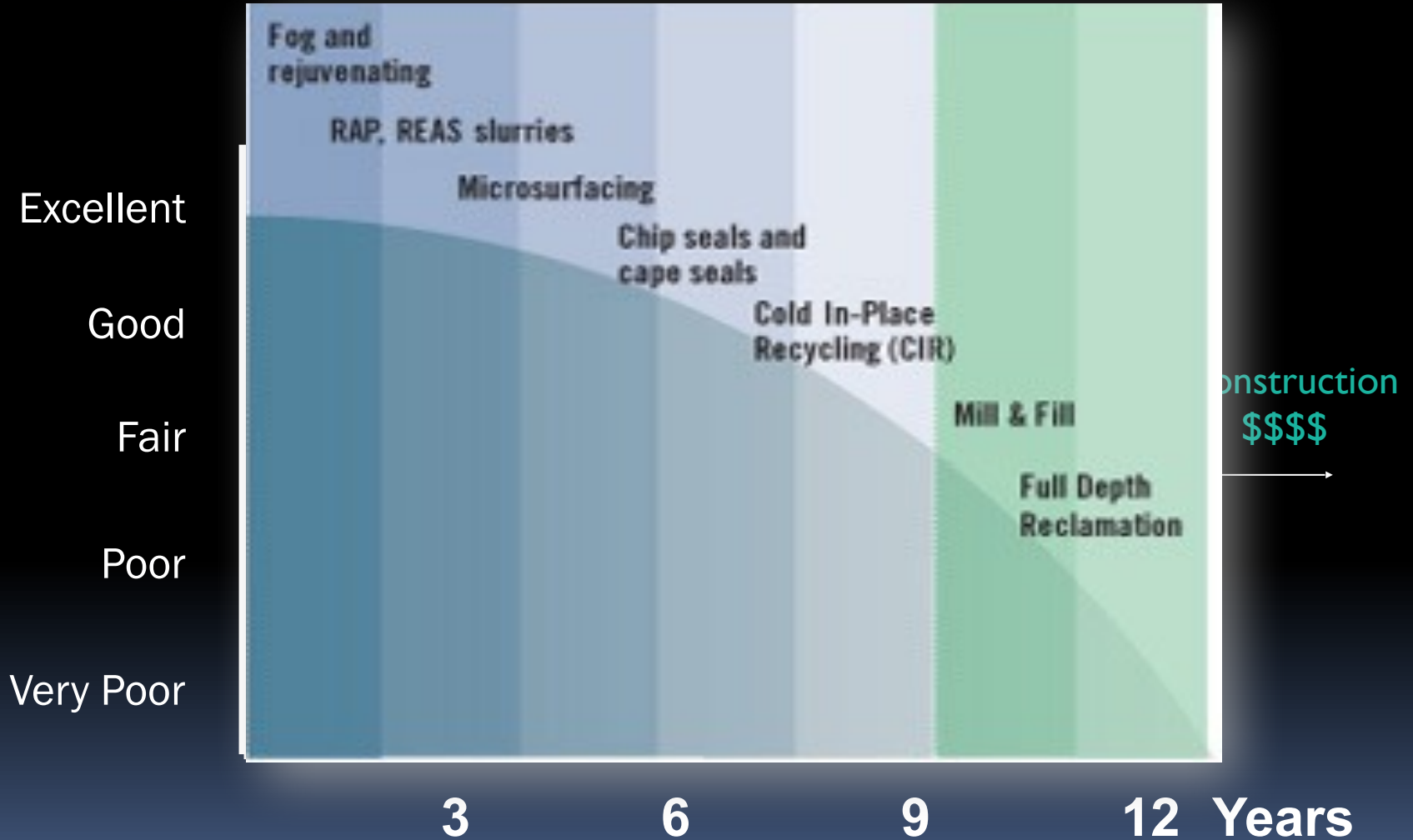
- Asset management



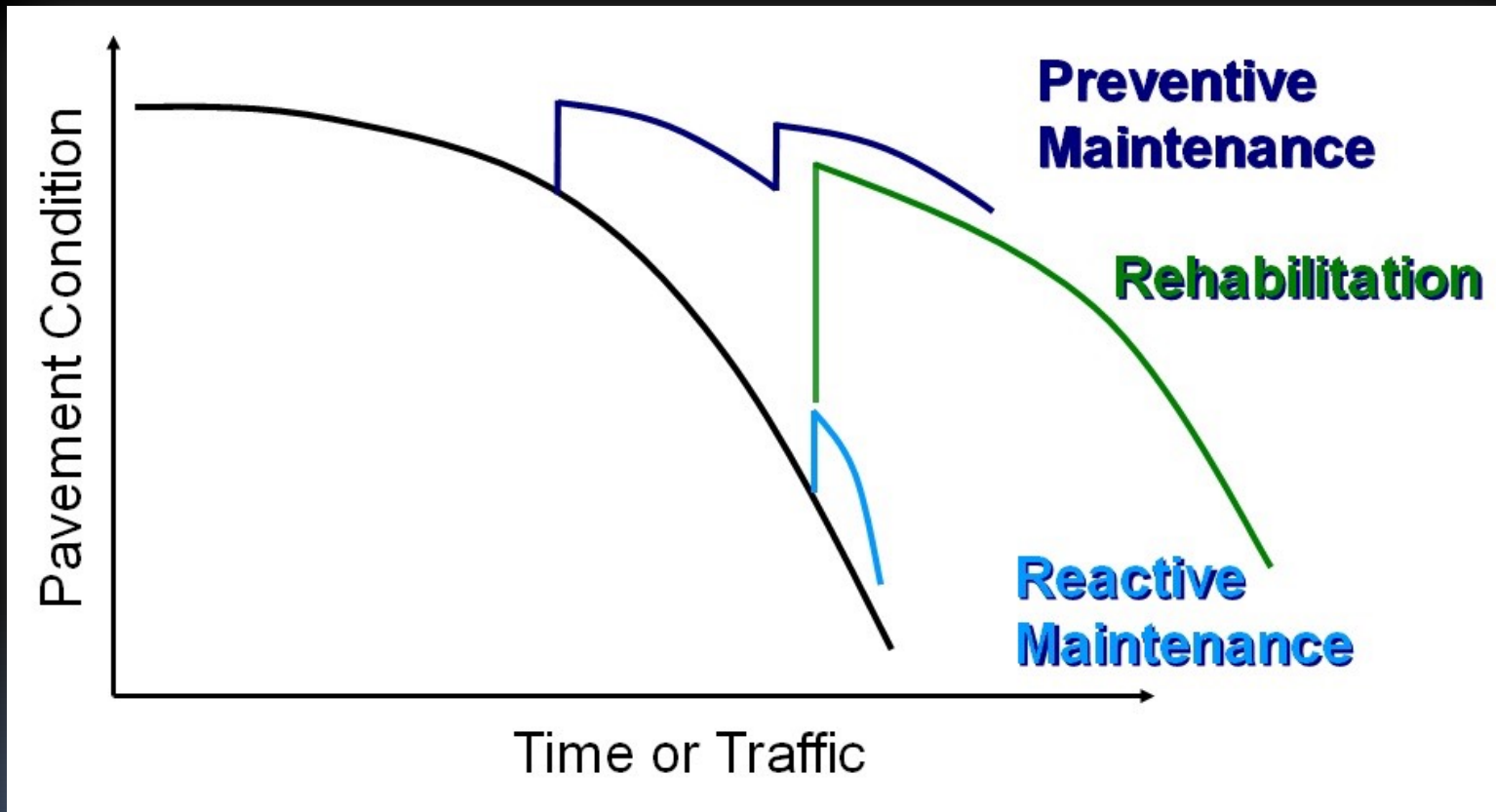
Why Rate Your Pavement?

- Pavement management
 - Inventory pavement conditions
 - Prioritize ratings
 - Maintain system
 - Schedule repairs

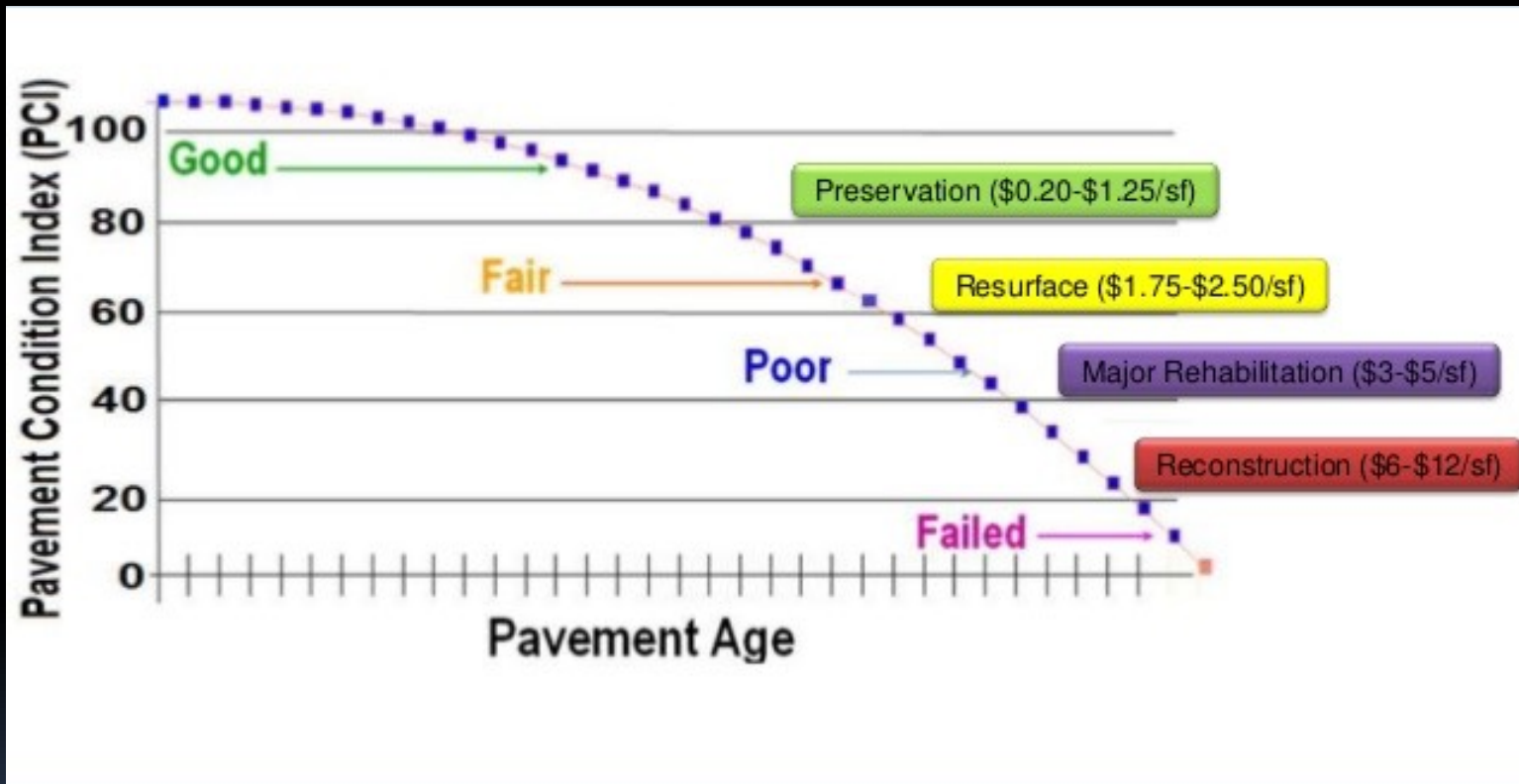
Why Rate Your Pavement?



Why Rate Your Pavement?



Why Rate Your Pavement?



Pavement Evaluation Methods

- Nondestructive testing
- Destructive testing
- Ride quality
- Roughness (International Roughness Index)
- Skid resistance
- Pavement serviceability index

Pavement Evaluation Methods

- Visual inspection
 - Benefits
 - Cost
 - Frequency

Inspection Guidelines

- What to look for
 - Defect
 - Severity
 - Extent
- Rating scale
- Rating calculation

Rating Considerations

- Mode used
- How to evaluate
 - Predominate severity
 - Extent of each severity
- What to look at
- Segment length
- Timing

Flexible Pavement Distresses

Cracking

Fatigue Cracking Square

Block Cracking Square

Edge Cracking

Wheel Path Longitudinal Cracking

Non-Wheel Path Longitudinal Cracking

Reflection Cracking at Joints

Transverse Cracking

Patching and Potholes

Patch/Patch Deterioration

Potholes

Surface Deformation

Rutting

Shoving

Surface Defects

Bleeding Square

Polished Aggregate

Raveling Square

Miscellaneous Distresses

Lane-to-Shoulder Drop-off

Water Bleeding and Pumping

Flexible Pavement Distresses

The screenshot shows the Asphalt Institute website. At the top is the logo with the text "asphalt institute" and a tagline "Serving the industry". Below the logo is a navigation bar with links for "HOME", "ABOUT AI", "STORE", and "STATE BINDER". The main heading is "Asphalt Pavement Distress Summary". Below this is a brief summary paragraph and a link to "Pavement Preservation and Maintenance". A green circular highlight is placed over a dropdown menu titled "Asphalt Pavement Distress Summary Contents". The dropdown menu lists various distress types: "Choose from list", "Fatigue/Alligator Cracking", "Block Cracking", "Edge/Joint Cracks", "Ravelling", "Bleeding", "Depressions", "Corrugations", "Alligator Cracks", "Dry Surface/Cracking", "Slippage Cracks", "Rutting", "Loss of Aggregate on Surface Treatments", "Longitudinal Streaking", "Moisture Damage (stripping)", and "Transverse Uniform Crack Spaces". To the right of the dropdown, a table is partially visible with a header "CAUSE". Below the dropdown, the first row of the table shows "Block Cracking" and "1. Old and dried out mix".

Asphalt Institute
Serving the industry

HOME ABOUT AI STORE STATE BINDER

Asphalt Pavement Distress Summary

This is a very brief summary. For in depth details on distresses and suggested repair techniques, see the [Pavement Preservation and Maintenance](#).

Asphalt Pavement Distress Summary Contents

- Choose from list
- Choose from list
- Fatigue/Alligator Cracking
- Block Cracking
- Edge/Joint Cracks
- Ravelling
- Bleeding
- Depressions
- Corrugations
- Alligator Cracks
- Dry Surface/Cracking
- Slippage Cracks
- Rutting
- Loss of Aggregate on Surface Treatments
- Longitudinal Streaking
- Moisture Damage (stripping)
- Transverse Uniform Crack Spaces

CAUSE	
Block Cracking	1. Old and dried out mix

Flexible Pavement Distresses

Fatigue (alligator) cracking

Bleeding

Block cracking

Corrugation and shoving

Depression

Joint reflection cracking

Lane/shoulder drop-off

Longitudinal cracking

Patching

Polished aggregate

Potholes

Raveling

Rutting

Slippage cracking

Stripping

Transverse cracking

Water bleeding & pumping

What You Need to Know...

- Distress
 - How to identify
 - Causes
 - How to measure

Rutting and Wear

- What is it?
- Why is it a problem?
- Causes



Rutting and Wear

- How to measure



Alligator Cracking

- What is it?
- Why is it a problem?
- Causes



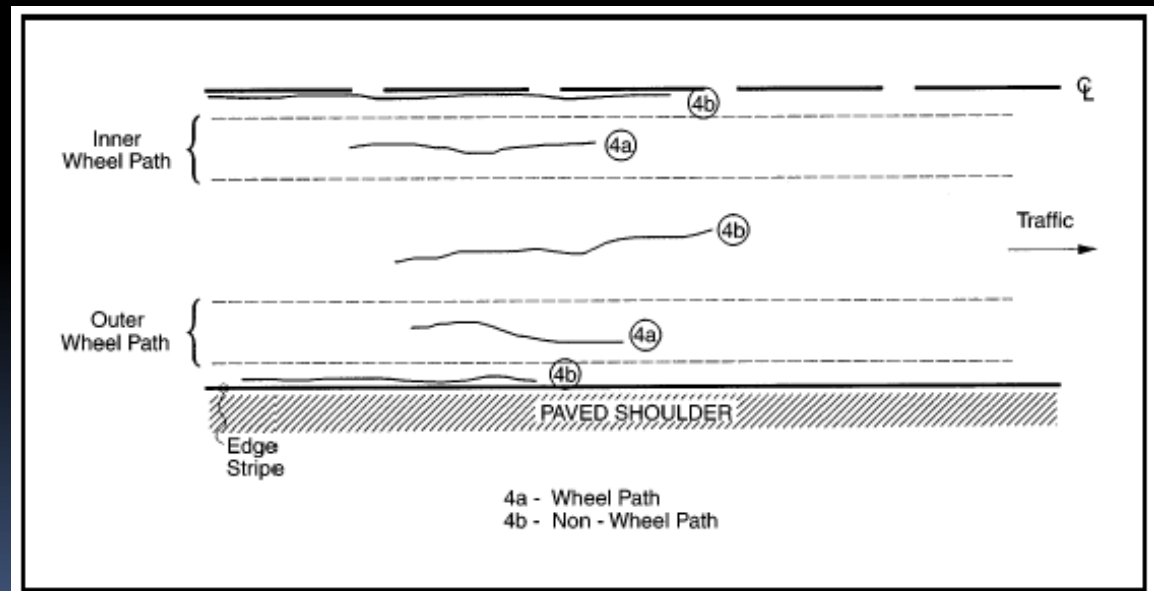
Alligator Cracking

- How to measure



Longitudinal Cracking

- What is it?
 - Wheel path or non-wheel path
- Why is it a problem?



Longitudinal Cracking

- Causes
- How to measure



Transverse Cracking

- What is it?
- Why is it a problem?
- Causes



Transverse Cracking

- How to measure



Raveling and Aging

- What is it?
- Why is it a problem?
- Causes



Raveling and Aging

- How to measure



Flushing / Bleeding

- Causes
- How to measure



Patching

- Severity
- How to measure



Corrugation and Waves

- Causes
- How to measure



Sags and Humps

- Causes
- How to measure



Block Cracking

- Causes
- How to measure



Pavement Edge Condition

- Causes
- How to measure



Crack Seal Condition

- How to measure



How to Evaluate Sections

- Determine section limits
- Determine section geometrics
- Evaluate entire section for distress severity & extent
- Determine pavement rating

Distress Measurement

- Project-level analysis
 - Measure areas & lengths with wheel
 - Annotate all measurements
 - Mark boundaries of alligatored areas
- System-level review
 - Approximate area or length of all distresses present on surface

Measurement of Distresses



TIB Street Inventory

- Detailed inventory data
- Streamlined pavement rating

TIB Street Inventory Form

Review Date _____

Agency _____ Reviewer _____

Street Name _____

Termini _____ To _____

Section Length	Number Intersections including termini		
Average Pavement Width (feet)	Number Compliant ADA Ramps		
Number of Travel Lanes	Number ADA Ramps Needed		
Roadway Surfacing	<input type="checkbox"/> ACP	<input type="checkbox"/> Concrete	<input type="checkbox"/> Gravel
Shoulder Surfacing	<input type="checkbox"/> Paved	<input type="checkbox"/> Gravel	<input type="checkbox"/> Earth <input type="checkbox"/> Unpaved Parking
Parking Lanes	<input type="checkbox"/> One Side	<input type="checkbox"/> Both Sides	<input type="checkbox"/> Intermittent <input type="checkbox"/> None

Sidewalk	Left Side	Right Side
Placement (Percent of Length)		
Width (feet)		
Condition	<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor
Surfacing		
Curb Placement (Percent of Length)		

Asphalt Concrete Pavement Rating	Severity	ALLIGATOR CRACKING Percent of Area						LONGITUDINAL CRACKING Percent of Area			TRANSVERSE CRACKING Cracks per 100 feet			PATCHING Percent of Area			TOTAL DEDUCTIONS	RIDE FACTOR	PAVEMENT RATING (100 - Deductions) x Ride Factor
		(1) Hairline (2) Spalling (3) Spalling & Pumping	1 to 12%	13 to 24%	25 to 49%	50 to 74%	Over 74 %	(1) Less than 1/8" Wide (2) 1/8" to 3/8" Wide (3) Any Cracks surrounded by over 3/8" cracks	(1) Less than 1/8" Wide (2) 1/8" to 3/8" Wide (3) Over 3/8" Wide	(1) 1 to 4 (2) 5 to 9 (3) 10 or over	(1) 1 to 5% (2) 6 to 25% (3) Over 25%	Good	Fair	Poor					
1	15	20	25	30	35	5	10	20	5	10	20	10	15	20					
2	30	35	40	45	50	15	30	50	10	20	40	15	20	30					
3	45	50	55	60	65	20	40	65	15	30	50	20	30	40					

COMMENTS:

F:\USER\GLORIA\Funding Programs\TAP Class\TIB Street Inventory Blank Form - NEW.docx

Exercise Rating Worksheet

- How form works

Street Inventory Form

Agency **YOUR AGENCY** Review Date _____
 Street Name **TEST AVENUE** Reviewer _____
 Termini **BEGINNING CROSS SECTION** To **ENDING CROSS SECTION**

Section Length	350 FT
Average Pavement Width (feet)	28 FT
Number of Travel Lanes	2
Roadway Surfacing	<input checked="" type="checkbox"/> ACP <input type="checkbox"/> Concrete <input type="checkbox"/> Gravel
Shoulder Surfacing	<input checked="" type="checkbox"/> Paved <input type="checkbox"/> Gravel <input type="checkbox"/> Earth <input type="checkbox"/> Unpaved Parking
Paved Parking Lanes	<input type="checkbox"/> One Side <input type="checkbox"/> Both Sides <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> None

Asphalt Concrete Pavement Rating	ALLIGATOR CRACKING	LONGITUDINAL CRACKING	TRANSVERSE CRACKING	PATCHING	TOTAL DEDUCTIONS	RIDE FACTOR	PAVEMENT RATING
	Percent of Area	Percent of Length	Cracks per 100 feet	Percent of Area			
	(1) Hairline (2) Spalling (3) Spalling & Pumping	(1) < 100% (2) 100% to 200% (3) Over 200%	(1) 1 to 4 (2) 5 to 9 (3) 10 or over	(1) 1 to 3% (2) 6 to 23% (3) Over 23%			
Ride Factor Excellent = 100% Very Good = 95%	Severity 1 to 12% 13 to 24% 25 to 49% 50 to 74% Over 74 %	Less than 1/4" Wide Over 1/4" Wide Crack surrounded by over 1/4" cracks Less than 1/4" Wide Over 1/4" Wide Spalled	Good Fair Poor				

Field Exercise

- Location
- Segments

Location Choice

- Grandridge and Young
 - Close
 - Limited distresses
- Arthur Street
 - 2.7 miles away
 - Variation of distresses

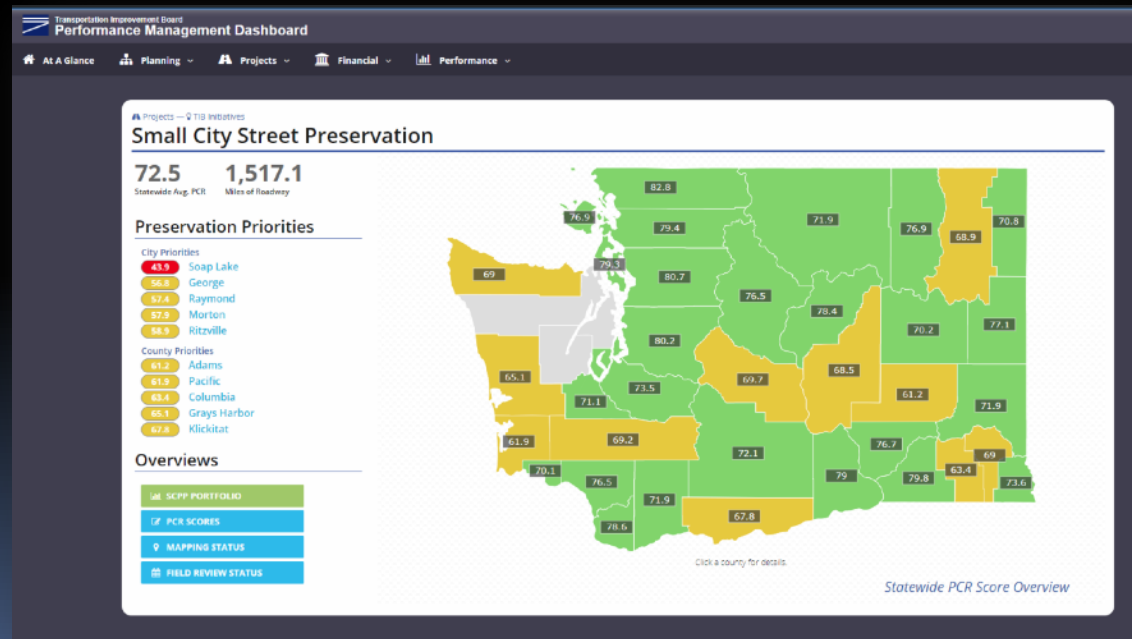


Field Exercise Recap

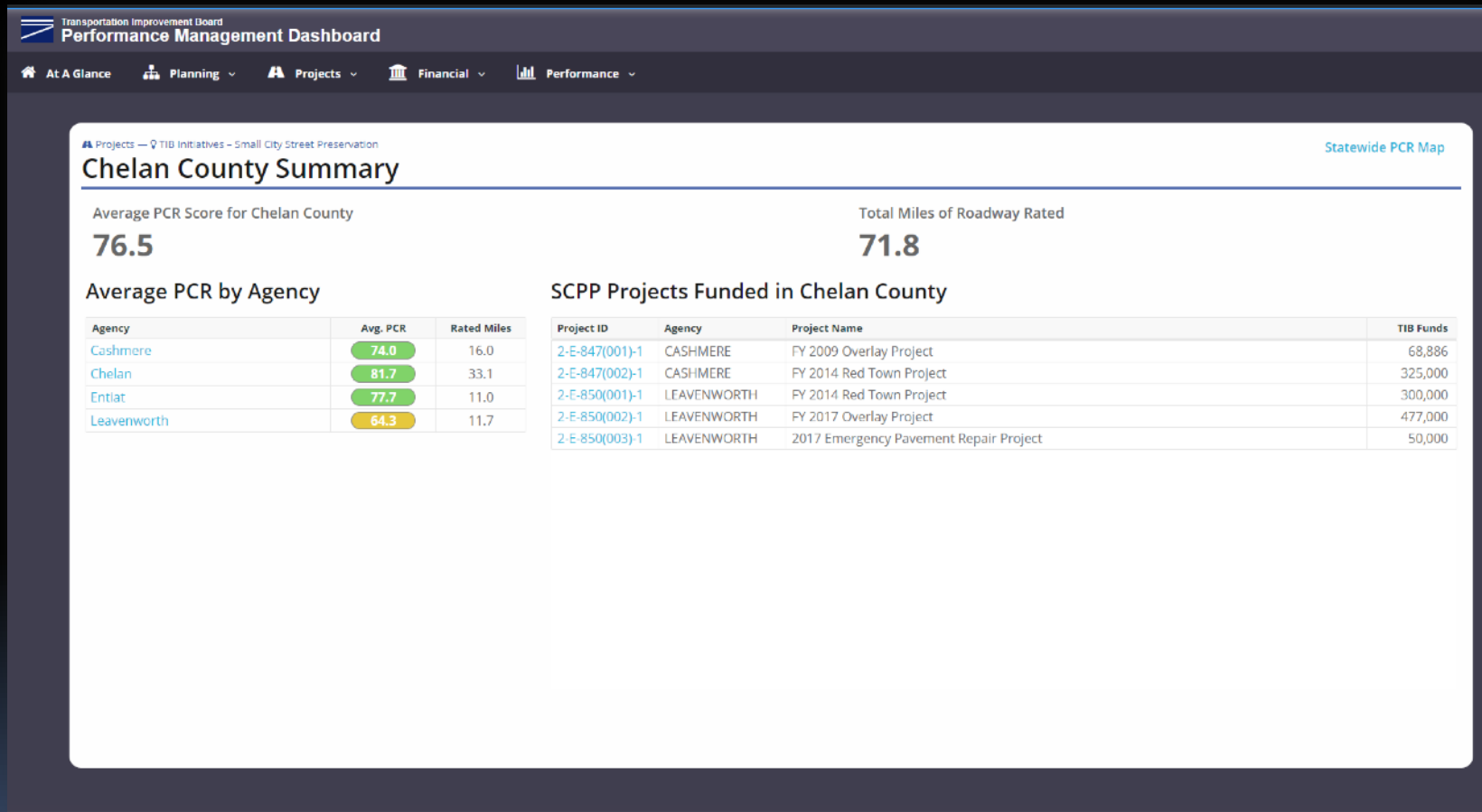
- Identification
- Calculation of pavement condition rating
- Issues encountered

Small City Maintenance Data

- Available to all small cities
- Link <http://www.tib.wa.gov/Dashboard/modules/SmallCityMaintenance/>



Small City Maintenance Data



Small City Maintenance Data

Transportation Improvement Board
Performance Management Dashboard

At A Glance | Planning | Projects | Financial | Performance

Projects - TIB Initiatives - Small City Street Preservation Statewide PCR Map | Chelan County


City of Leavenworth - Street Inventory

Average PCR for Street System: 64.3

Rated Streets in Inventory

Street	Miles	PCR Score
10TH ST	0.1	63.0
12TH ST	0.1	50.8
13TH ST	0.1	50.0
14TH ST	0.1	41.0
1ST ST	0.1	59.0
2ND ST	0.0	63.0
3RD ST	0.1	81.0
8TH ST	0.1	81.0
9TH ST	0.1	95.0
ALPENSEE STRASSE	0.6	45.0
ALPINE PL	0.1	71.0
ASH ST	0.1	95.0
BENTON ST	0.4	46.0
BIRCH ST	0.5	61.5
DURKE AVE	0.1	95.0

Segment Information - 10TH ST

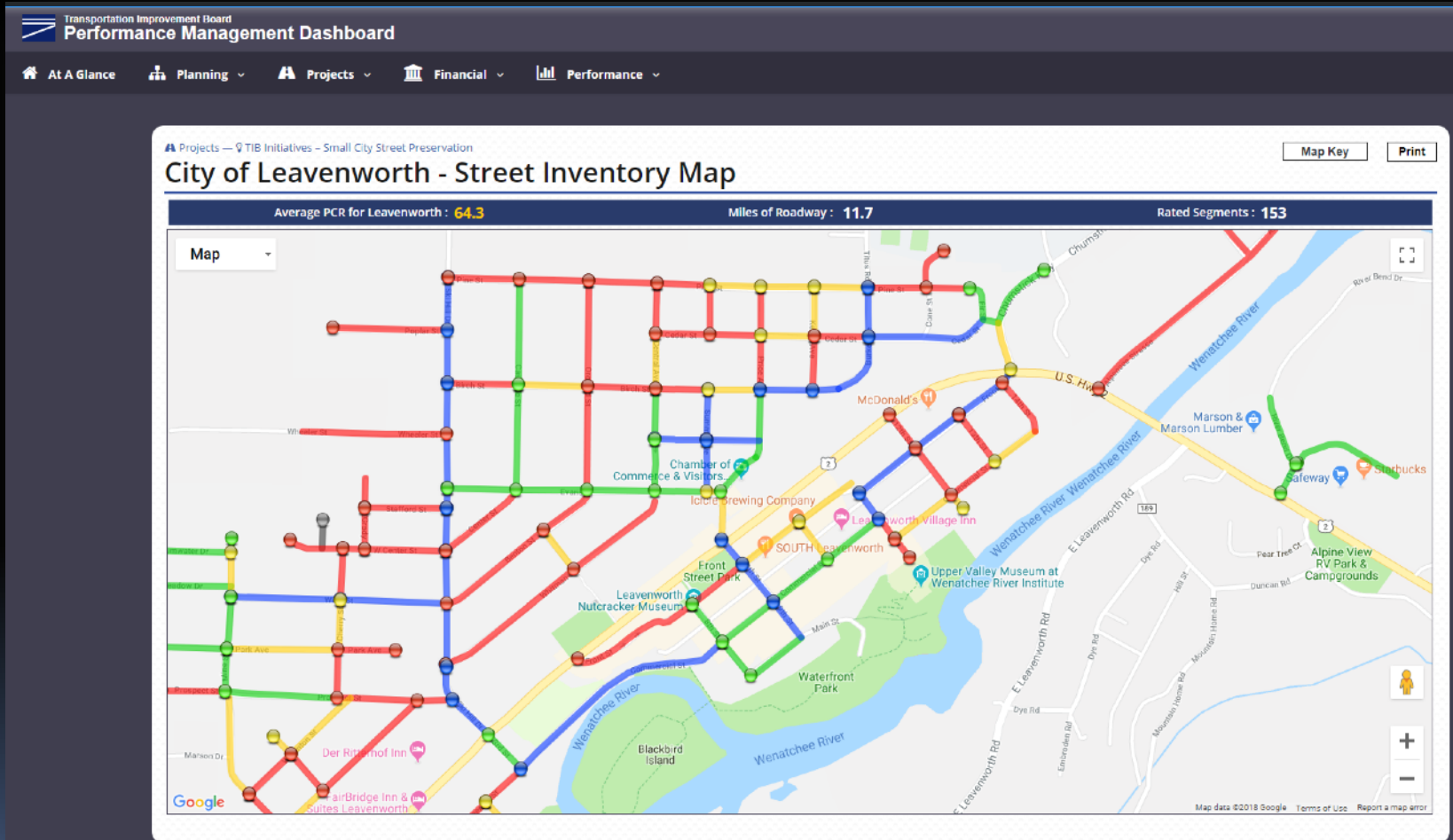


Termini	Length	Surface	Last Review	PCR Score
COMMERCIAL ST to FRONT ST	0.05	ACP	04/24/2015	63

City Maps

- STREET SYSTEM MAP
- SIDEWALK SYSTEM MAP
- DOWNLOAD SEGMENT DATA (.XLS)

Small City Maintenance Data



StreetSaver Inventory Detail

City of Anywhere Section Summary
Printed: 05/13/2015

Street ID: AURORA	Begin Location: CARLI DR.	Constructed: 01/01/1993
Section ID: 10	End Location: EMERALD DR.	No. Lanes: 2
Road Name: AURORA DRIVE		
Functional Class: Residential/Local	Length (ft): 307	Width (ft): 32
Surface Type: AC	Slab Width: 0.00	Slab Length: 0.00
General Code: PS PARKING/SHOULDER	Funding Source:	Area ID:
Comments:		
Parking Lot Type:		

Maintenance Rehabilitation History

Maint. Date	Treatment	Sq. Ft.	Thickness	PCI after M&R	Cost Maint.
06/01/2003	CAPE SEAL	0	0	62	\$0

Inspection History

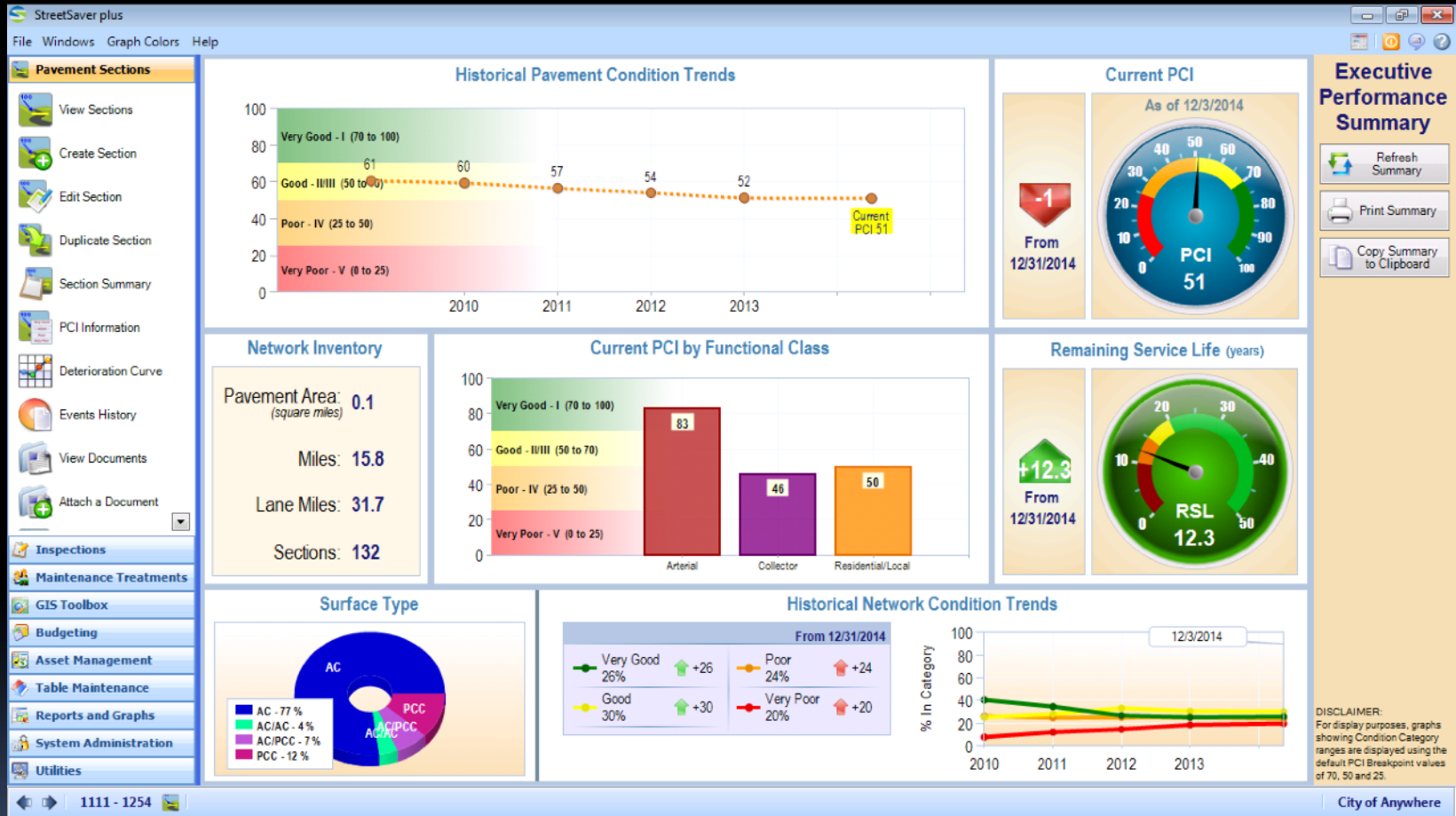
Inspection Date	Section PCI	Inspection #	Length	Area	No Distresses	Special
02/09/2000	61	1	0.00	1600.00	<input type="checkbox"/>	<input type="checkbox"/>
07/22/2002	49	1	0.00	1600.00	<input type="checkbox"/>	<input type="checkbox"/>
08/04/2004	83	1	50.00	1600.00	<input type="checkbox"/>	<input type="checkbox"/>
11/09/2006	78	1	100.00	3200.00	<input type="checkbox"/>	<input type="checkbox"/>
11/18/2008	72	1	100.00	3200.00	<input type="checkbox"/>	<input type="checkbox"/>
09/28/2010	70	1	100.00	3200.00	<input type="checkbox"/>	<input type="checkbox"/>
10/01/2014	89	1	100.00	3200.00	<input type="checkbox"/>	<input type="checkbox"/>

Other History

Transact Date	Transact Type	Attribute	Value
11/21/2008 2:41:21 PM	Attribute change	Section Length	307.00
11/21/2008 2:41:21 PM	Attribute change	Section Area	9824.00

Criteria: Section = AURORA - 10 1
SS1054 MTC StreetSaver

StreetSaver Dashboard



Pavement Rating Considerations

- Stewardship
- Agency method/standards
- Consistency
- Scheduling
- Reality check



Questions