Complete Streets and Pavement Preservation

Linking Planning and Public Works for Better Communities and Better Infrastructure

Presented by
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Scott is a Project Manager for the Regional Transportation Commission in Reno, NV. He also does training and consulting on pavement preservation and complete streets through his company *Complete Pavements*.

He has been designing, building, and maintaining roads and pavements for more than 40 years. He is a parent of a thirteen year old, lives in a traditional walkable neighborhood, and is a MAMIL (Middle Aged Man in Lycra)

MAMIL (Middle Aged Man in Lycra)

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Learning Objectives

- Describe the benefits of a robust Pavement Preservation Program.
- Describe the basic concepts and benefits of Complete Streets policies for safety, health, and livability.
- Explain how Pavement Preservation policies can facilitate Complete Street improvements and how Complete Street Policies can gain support for Pavement Preservation.
- Understand the details on the preventive maintenance component Pavement Preservation: slurry seals, microsurfacing, and chip seals.
- Clarify the FHWA rule around ADA Maintenance vs. Alteration for microsurfacing and slurry seals.

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Cross Training

Complete Streets Policies

- Generally come out of an agency's planning or community development department.
- Provide a variety of demonstrated benefits such as safety, health, and economic development.
- They are becoming broadly accepted and often enjoy enthusiastic community and political support.

Pavement Preservation Policies

- Generally reside in the public works department.
- Often underfunded yet still commanding a large chunk of budget.
- Often poorly understood and unappreciated outside of Public Works.

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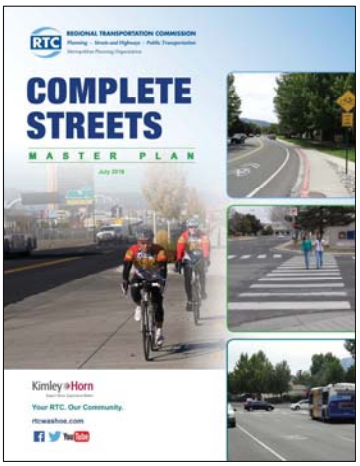
Why Complete Streets?

- RTC of Washoe County, NV
  - Transit (mode split and trip reduction)
  - MPO (long range mobility)
  - Street and Highway (Provides Opportunity)
- Member agencies are the Cities of Reno, Sparks, and Washoe County



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Why Complete Streets?

- Funding: Indexed Fuel Tax
  (Indexed to PPI, Capped at 7%/year)
  - County Tax
  - State Tax
  - Federal Gas Tax
  - Federal Diesel Tax
- Voter Initiative with State Legislature Approval
- Cyclists are taxpayers too!

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Why Complete Streets?

Evolution of the Concept

- Context Sensitive Design
- Smart Growth
- Multi Modal
- New Urbanism
- Livable Communities
- Walkability
- Traditional Design
- Placemaking

National Complete Streets Coalition

Smart Growth America
Making Neighborhoods Great Together

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Towards a Complete Street

Why?

- Increase safety
- **Provide for users of all ages, modes and mobility**
- Improve livability and quality of life
- Economic development
- Improved traffic flow
- More on-street parking
- Connectivity

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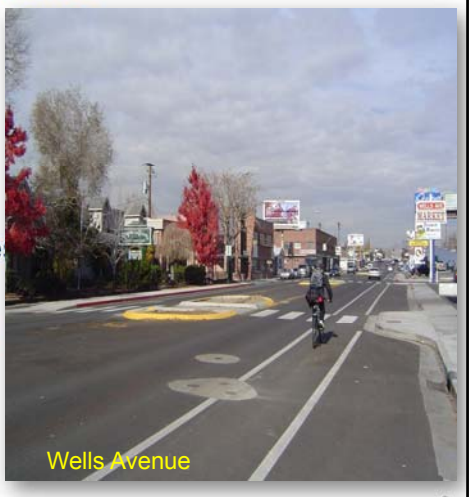
Towards a Complete Street

Checklist of Possible Improvements:

- ✓ Road conversion (Road Diet)
- ✓ Wide sidewalks
- ✓ Bike lanes
- ✓ Special bus lanes
- ✓ Accessible transit stops
- ✓ Frequent crossing opportunities
- ✓ Median islands
- ✓ Accessible pedestrian signals
- ✓ Curb extensions
- ✓ Narrower lanes, 10' OK
- ✓ Tight curb radii



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What is Pavement Preservation?

- A Pavement Preservation policy provides a planned program of clearly defined strategies to increase and optimize the performance life of an agency's pavement infrastructure.

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Complete Street Opportunities

Roadwork Type	Opportunities
Capacity ($$$$$...)	Bike/Ped, Full ADA, ROW
Reconstruction ($$$$)	Bike/Ped, Full ADA, ROW
Rehabilitation ($$$)	Bike/Ped, Full ADA
Corrective Maintenance ($-$$)	Bike/Ped, Minor ADA
Preventive Maintenance (¢¢)	Bike/Ped,

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Good Pavement Preservation Creates Opportunities

- Capacity Projects are Rare
- Rehabilitation/Reconstruction – 15-30 Lane miles/year
- Preventive Maintenance – 150 -200 Lane Miles/Year
- RTC is on a 7 year cycle of microsurfacing roadways.

Provides a blank canvas of opportunities to enhance bicycle and pedestrian space.

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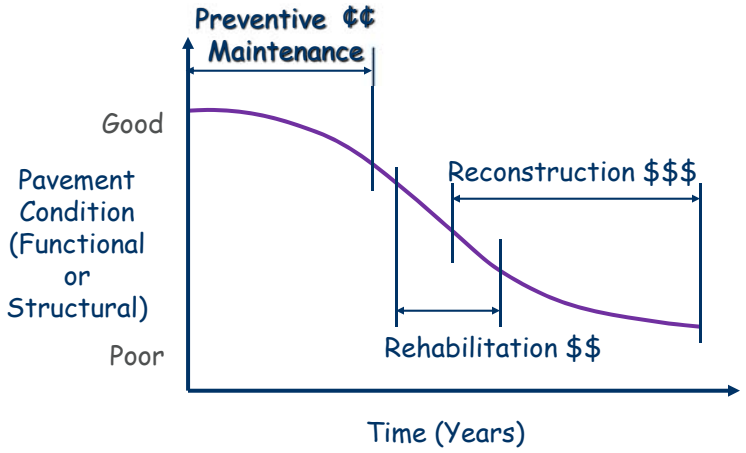
Pavement Preservation Overview



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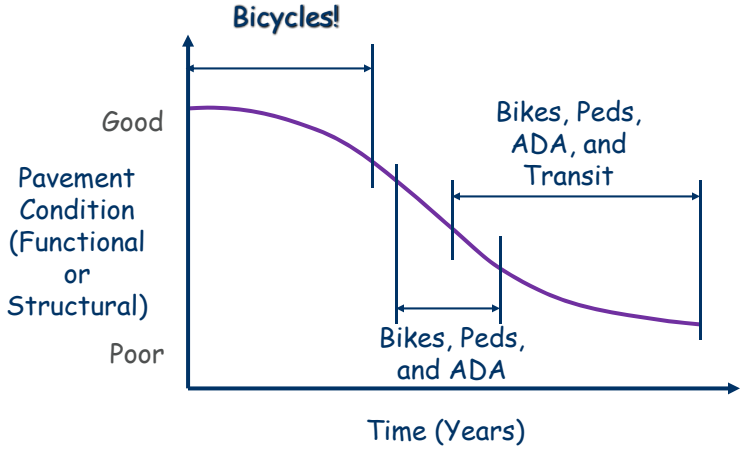
Multi-Modal Pavement Preservation



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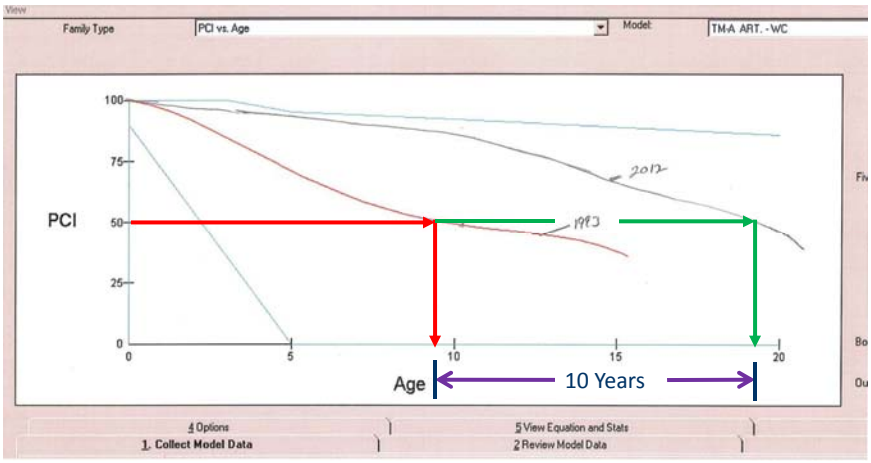
Network Performance Life after Pavement Preservation



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Complete Street Tools: Preventive Maintenance

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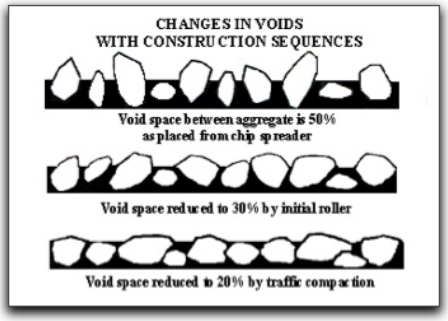
Basic Preventive Maintenance Treatments

- Chip Seals
- Slurry Seals and Microsurfacing
- Cape Seals (Chip Seal with Slurry Surface)



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Chip Seals

Spray thick layer of emulsion …

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Chip Seals

Spread Chips…

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Chip Seals

And Roll.

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Slurry Seals and Microsurfacing

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Design Considerations

- Slurry and Micro Surfacing Systems are 5 component systems:
  - Aggregate
  - Emulsified Asphalt
  - Water
  - Cement or other mineral fillers (optional)
  - Chemical Additives (as required)

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Slurry Seals and Microsurfacing

Specialized Truck Precisely combines and mixes all the materials

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Slurry Seals and Microsurfacing

Material is delivered to a “box” that evenly distributes the material across the road at the desired rate

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Slurry Seals and Microsurfacing

Hydraulic augers spread the slurry evenly across the box

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Preventive Maintenance Treatments

- Cape Seals - Chip Seal with a Slurry Surface
- RTC Program includes:
  - Patching – to address localized failures and wide cracks
  - Crack Sealing – Prior to slurry sealing and mid way between cycles ≈ 3-4 years
  - Manhole and valve raising – to improve ride and address tripping hazards at crosswalks.

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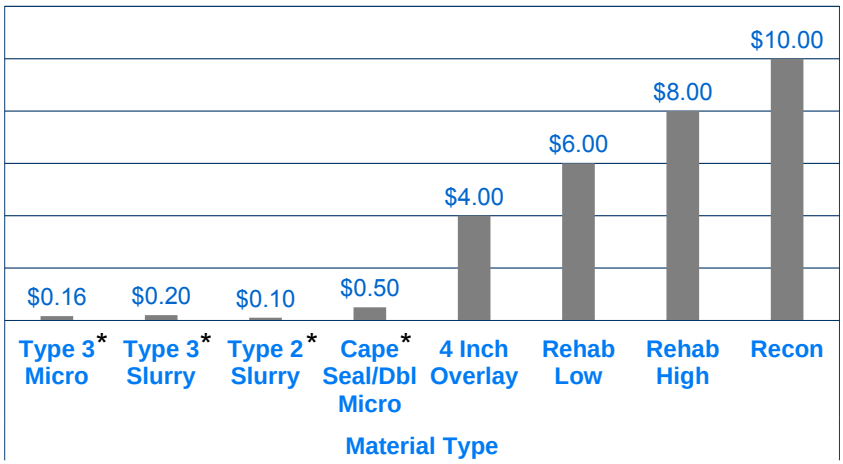
Treatment Costs ($/sf)



* Add $0.05 to $0.10 for Patching, Crack Sealing, and Striping.

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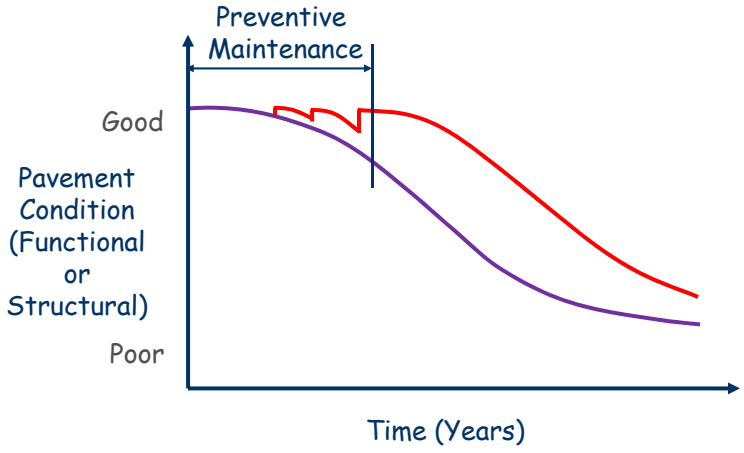
When Should Preventive Maintenance be Applied?



"Keeping Good Roads Good"

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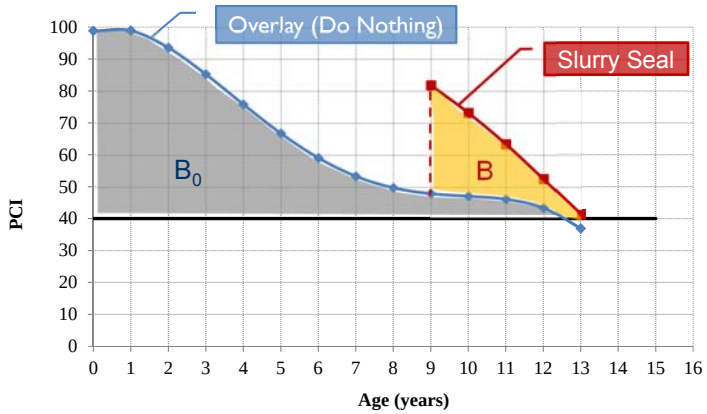
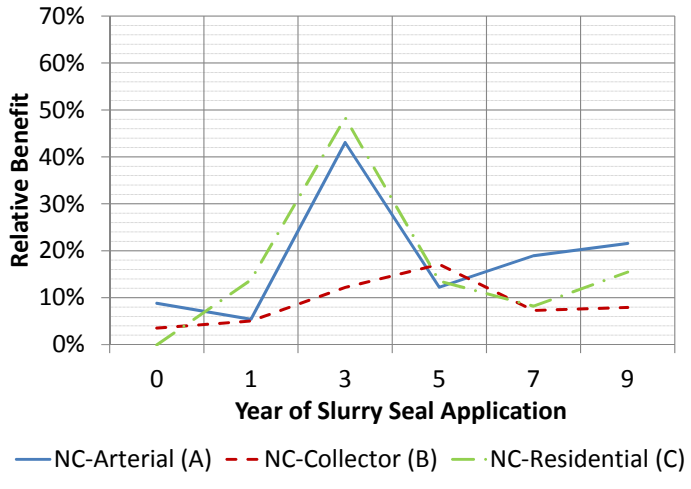
Slurry Seal Effectiveness

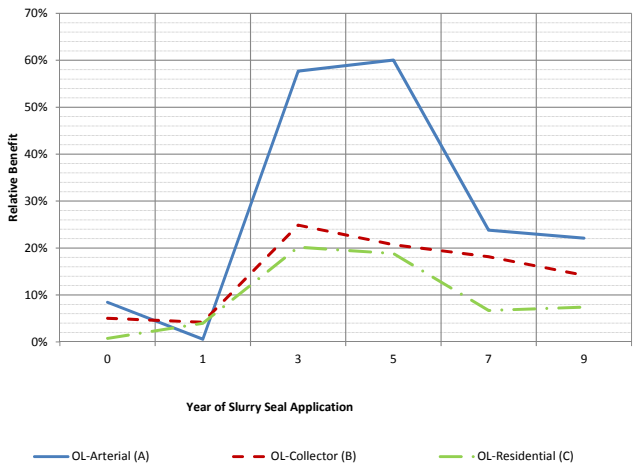


Relative Benefit = 100×B / B_0

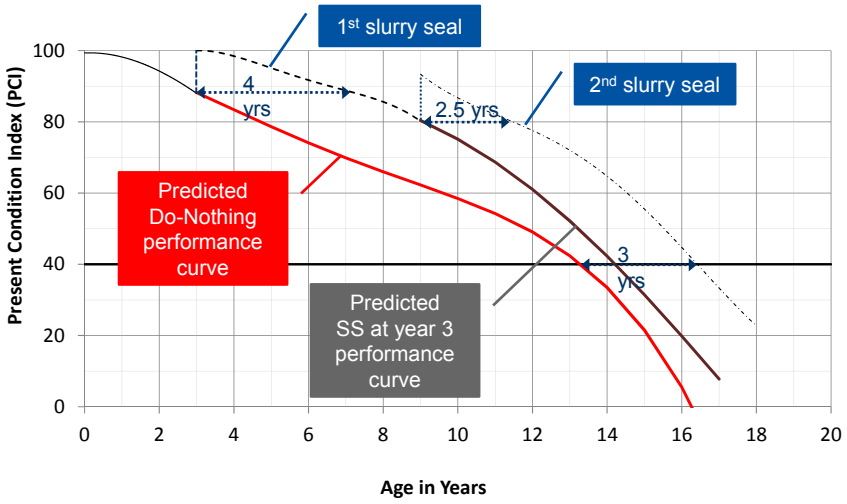
Effectiveness Analysis – New Construction



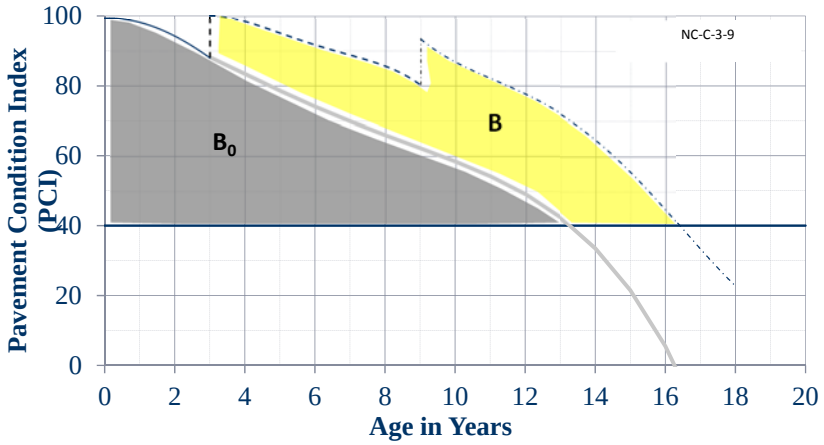
Effectiveness Analysis – Overlay



Benefit of Multiple Treatments: 1st SS at year 3, 2nd SS at year 9

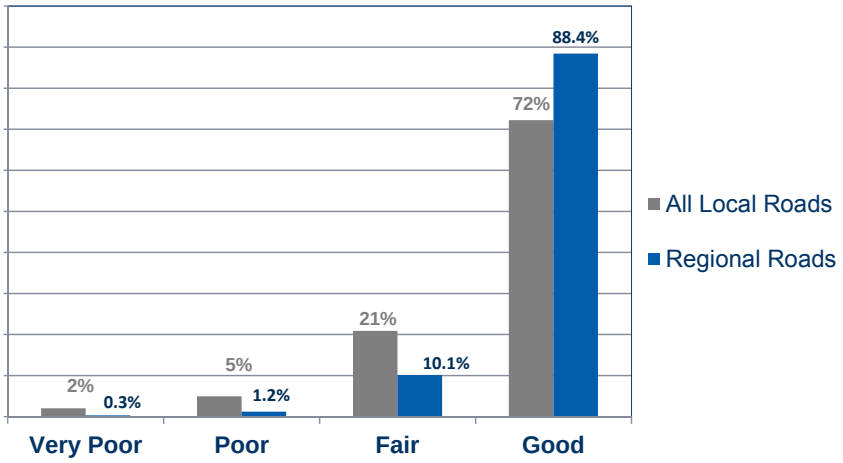


Benefit of Multiple Treatments

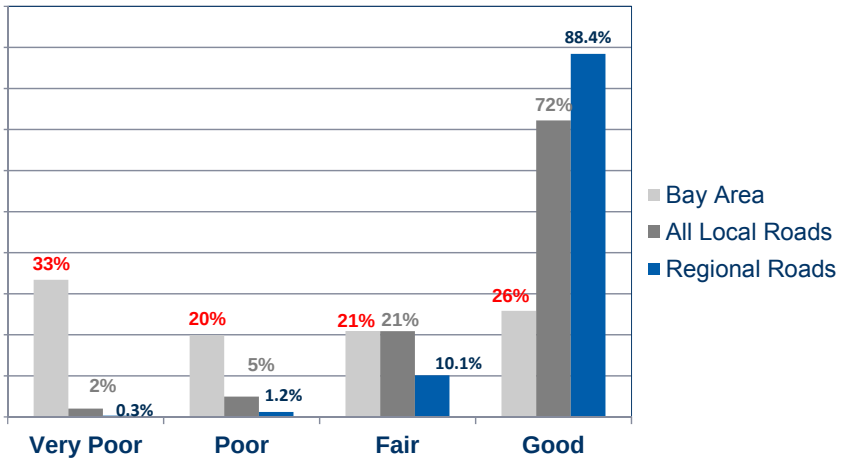


Relative Benefit = $100 \times B / B_0$

Network Condition Comparison



Good Roads are Cheaper!



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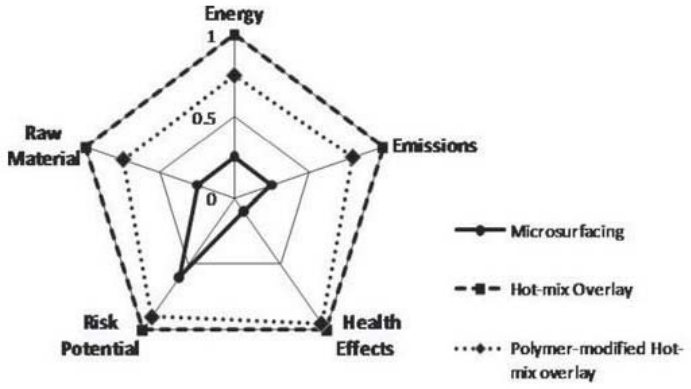
Microsurfacing Environmental Footprint



From NCHRP Synthesis 411; *Microsurfacing*

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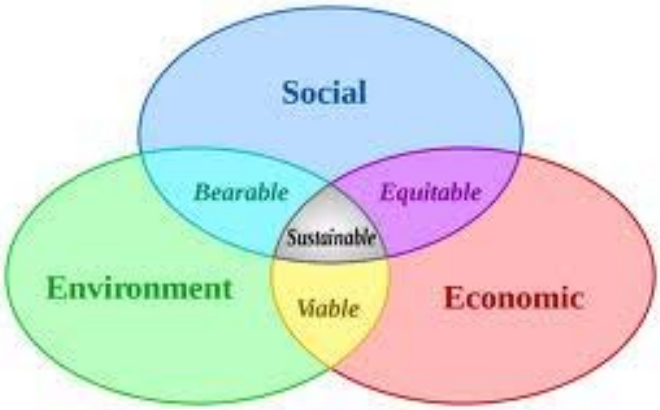
The Triple Bottom Line



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Microsurfacing and Slurry Seals

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Complete Streets/Road Conversions

Before: incomplete urban street

- ✓ 4-lane undivided
- ✓ No center turn lane
- ✓ No bike facilities
- ✓ Numerous driveways
- ✓ Pedestrian hostile
- ✓ Wide lanes
- ✓ No designated parking

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Complete Streets /Road Conversions

After: More complete urban street

- ✓ 3-lane divided
- ✓ Center turn lane
- ✓ Bike facilities
- ✓ Pedestrian Friendlier
- ✓ Narrow lanes
- ✓ More Parking
- ✓ Slower traffic

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Safer Streets

Recent Road Conversions Reduce – Annualized Vehicle Crash Rates

Location	Before	After	% Reduction
Wells Ave			-31%
California/ Mayberry	33.4	19.4	-42%
Arlington	18.6	10.0	-46%
Mill Street	7.7	4.4	-43%

Sources: UNR Center for Advanced Transportation Education and Research and Nevada Department of Transportation

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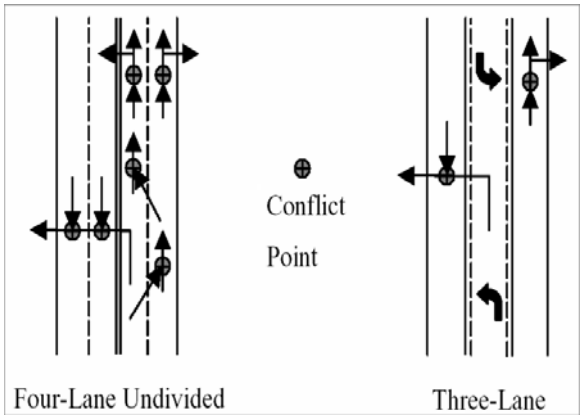
Complete Street/Road Conversions

Significant safety benefits:

- Lower speeds,
- Reduced conflict points and crashes,
- Better sight distance,
- Refuge for pedestrians,
- Space for bicycles (and others)

6 conflict points Vs. 2 conflict points



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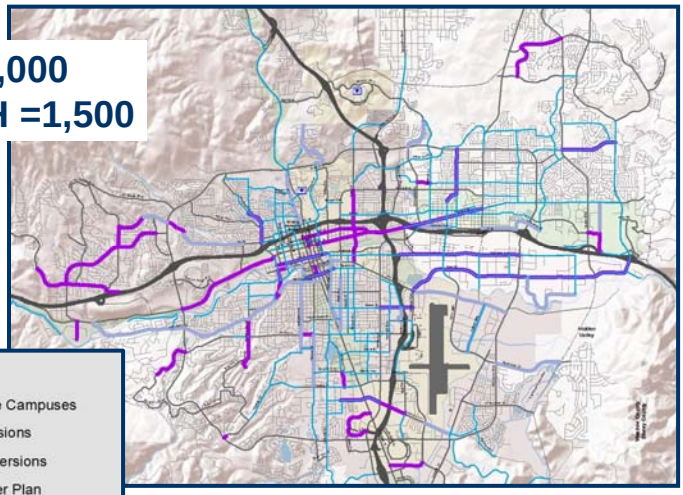
Road Diet Candidate Rules of Thumb

- **ADT = 18,000**
- **Peak VPH =1,500**



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Narrowing Lanes

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Toward a Complete Street

How?

Road conversions - Narrow lanes, 10' OK! - Just stripe it!

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Making Adjustments/Costs

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UC Davis Surface Effects Study

ITS UCDAVIS INSTITUTE OF TRANSPORTATION STUDIES

Research Report – UCD-ITS-RR-13-30

Surface Treatment Macrotexture and Bicycle Ride Quality

December 2013

Hui Li
John Harvey
Calvin Thigpen
Rongzong Wu

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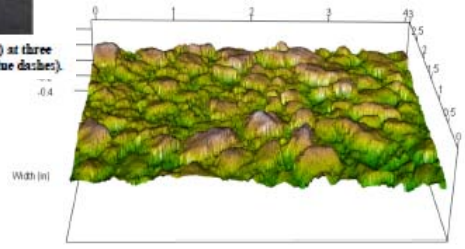
UC Davis Surface Effects Study

Figure 3.6: Bicycle instrumented with accelerometers (solid red circles) at three typical mounting locations and a GPS unit on the handle bar (circle of blue dashes).

Bike Mounted Accelerometers and GPS

Correlated to Laser Surface texture Measurements



(d) Coarser 3/8" gradation chip seal on Mon-198 EB PM 10.05 placed in 2012

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UC Davis Surface Effects Study

Figure 4.7: Instrumented vehicle with an inertial profiler (IP).

Also Correlated to Inertial Profiler…

And to sand patch Measurements


(a) SLO-1 PM 60.16 coarser 3/8" gradation chip seal

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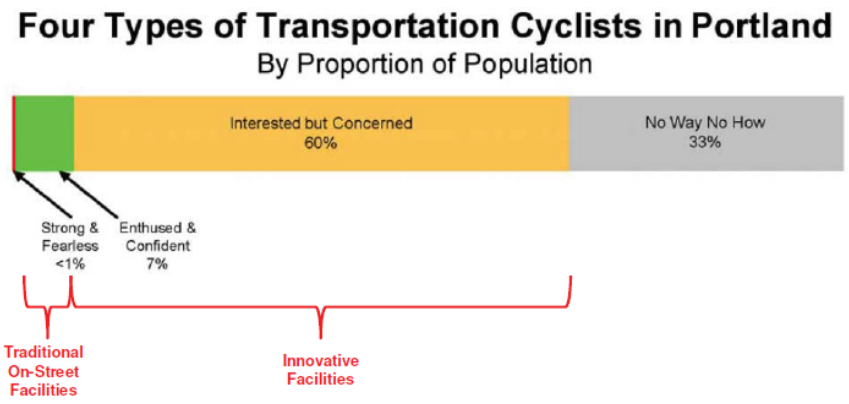
City of Portland Cyclist Classification System



ASCE Webinar: *Innovative Bicycle Facilities*

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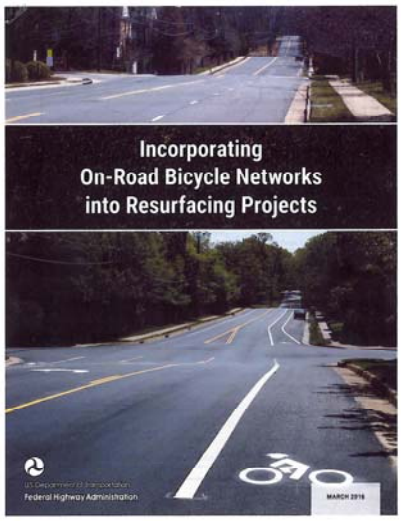
FHWA Guidance on Incorporating Bicycle Facilities



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Who Are Bike Facilities For?

People for Bikes campaign for low stress, connected bike networks.

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Level of Traffic Stress

Table 2. Criteria for Bike Lanes Alongside a Parking Lane

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Street width (through lanes per direction)	1	(no effect)	2 or more	(no effect)
Sum of bike lane and parking lane width (includes marked buffer and paved gutter)	15 ft. or more	14 or 14.5 ft.[a]	13.5 ft. or less	(no effect)
Speed limit or prevailing speed	25 mph or less	30 mph	35 mph	40 mph or more
Bike lane blockage (typically applies in commercial areas)	rare	(no effect)	frequent	(no effect)

Note: (no effect) = factor does not trigger an increase to this level of traffic stress.

[a] *If speed limit < 25 mph or Class = residential, then any width is acceptable for LTS 2.*

Source: Mineta Transportation Institute

8 to 80 Criteria – Based on Portland Grouping

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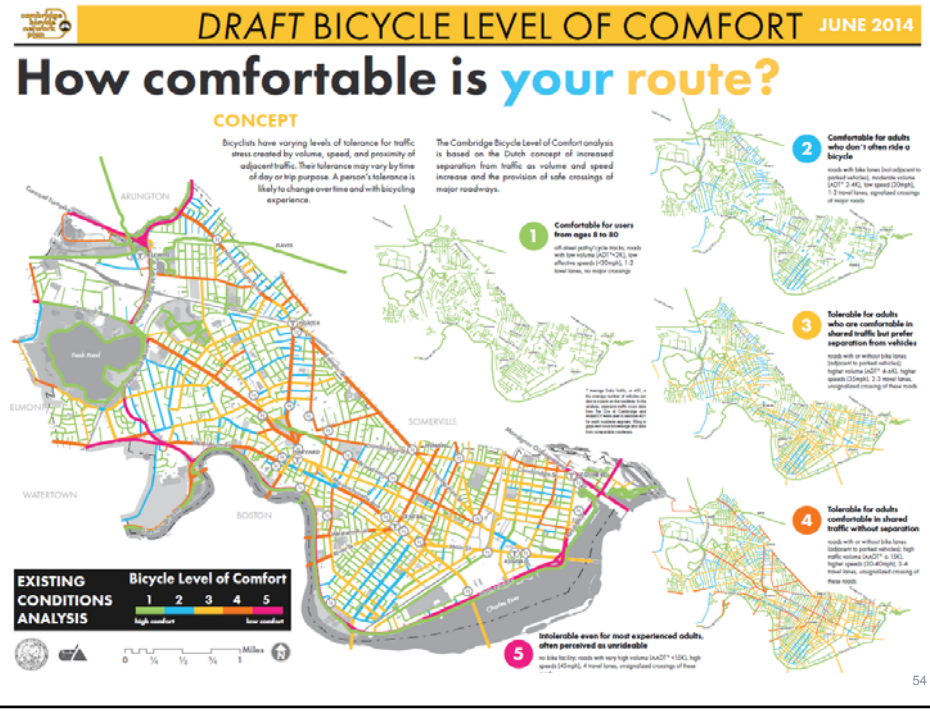

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"My favorite subject: watching asphalt congeal." – New Executive Director

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Transportation Community and System Preservation (TCSP) Grant – Sutro Complete Street

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Other Opportunities – TCSP Grant – Sutro Complete Street

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Other Opportunities – TCSP Grant – Sutro Complete Street

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Corridor Studies

- Allows for Upfront Planning for:
  - Neighborhood Characteristics
  - Complete Street Needs and Opportunities
  - Getting Ahead of the Public Outreach Process
  - Opens Funding Opportunities

Examples at:
www.rtcwashoe.com
Metropolitan Planning

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Leveraging a TIGER Grant

Good pavement preservation presents opportunities!

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The Tactical Urbanism Spectrum

From: *Tactical Urbanism 2, Short Term Action, Long Term Change*, The Street Plans Collaborative.

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Arlington Avenue Road Diet

"Its just paint and slurry, if it doesn't work we'll put it back."

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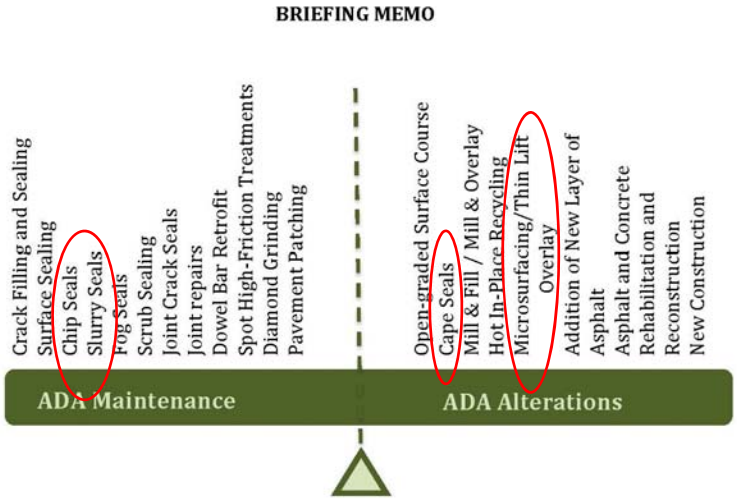
ADA Maintenance Vs. ADA Alterations



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Slurry vs. Microsurface (ISSA)

Difference In:	Slurry	Micro
Emulsion	Polymer optional Slow set, quick set Anionic, cationic	Always polymer modified Always cationic quick set
Additives/ Break	More dependent on weather	Chemical break
Mix Stiffness/ Equipment	More workable mix Drag box	Stiffer mix Double auger box Secondary strike-off
Aggregate	Type I, II, III	Type II and III only Higher S.E. (cleaner) More durable
Application	Fill voids, seal ageing pavement, durable wearing course	Same plus+ high traffic, rut filling, night work, correct minor profile irregularities

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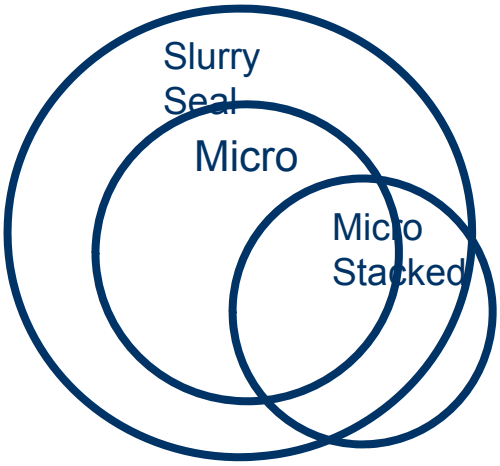
Micro IS a Slurry Seal



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ADA Maintenance Vs. ADA Alterations

This rule should not concern you if:

- Your agency has an ADA transition plan.
- Your agency has made a good faith effort to comply with ADA guidelines over the years.

This rule should concern you if:

- Your Agency has not done much to address ADA issues in the last 25 years or so.

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ADA Maintenance Vs. ADA Alterations

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Out of Date is OK!

This curb ramp is inadequate now, but if it met the ADA guidelines in place when it was built, placing a **microsurface** under the rule does not require upgrading to current standards!

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Webinar Outcomes

For Planners:

- Supporting a robust pavement preservation program can provide you with complete street opportunities and can also open up funding pools to meet your complete street goals.

For Public Works:

- Make your pavement program part of a **bigger conversation:** safety, Complete Streets, and stronger communities and neighborhoods and funding and political support will be easier to come by.

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