

# Assessment of Washington County Pavement Preservation and Maintenance Program



## An Overview and Study Findings

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For  
Washington County Dept. of Land Use and Transportation**



# Presentation Outline



- Project goals
- Objectives
- Findings by objective area
- Conclusions
- Study recommendations



# Project Goals



- Comprehensive review of County preservation and maintenance (P&M) practices.
- Evaluate strategies used to ensure the most cost effective use of available funds.
- Evaluate long-term spending needs.
- Address fiscal sustainability of program.



# Objective Areas



- **Spending** – Review historical spending and outcome. Compare to similar agencies.
- **Strategies** – Review P&M strategies. Compare to other agencies and industry practice.
- **Cost effectiveness** – Evaluate effectiveness of spending and strategies.



## Objective Areas (cont.)



- **Pavement condition targets** – Review current targets. Compare to similar agencies and industry practice.
- **Life cycle costs** – Evaluate costs to apply recommended strategies and targets.
- **Pavement management system (PMS)** – For internal use to assess PMS software and suitability to County's future needs and FTE requirements.



# Spending – Other Similar Agencies

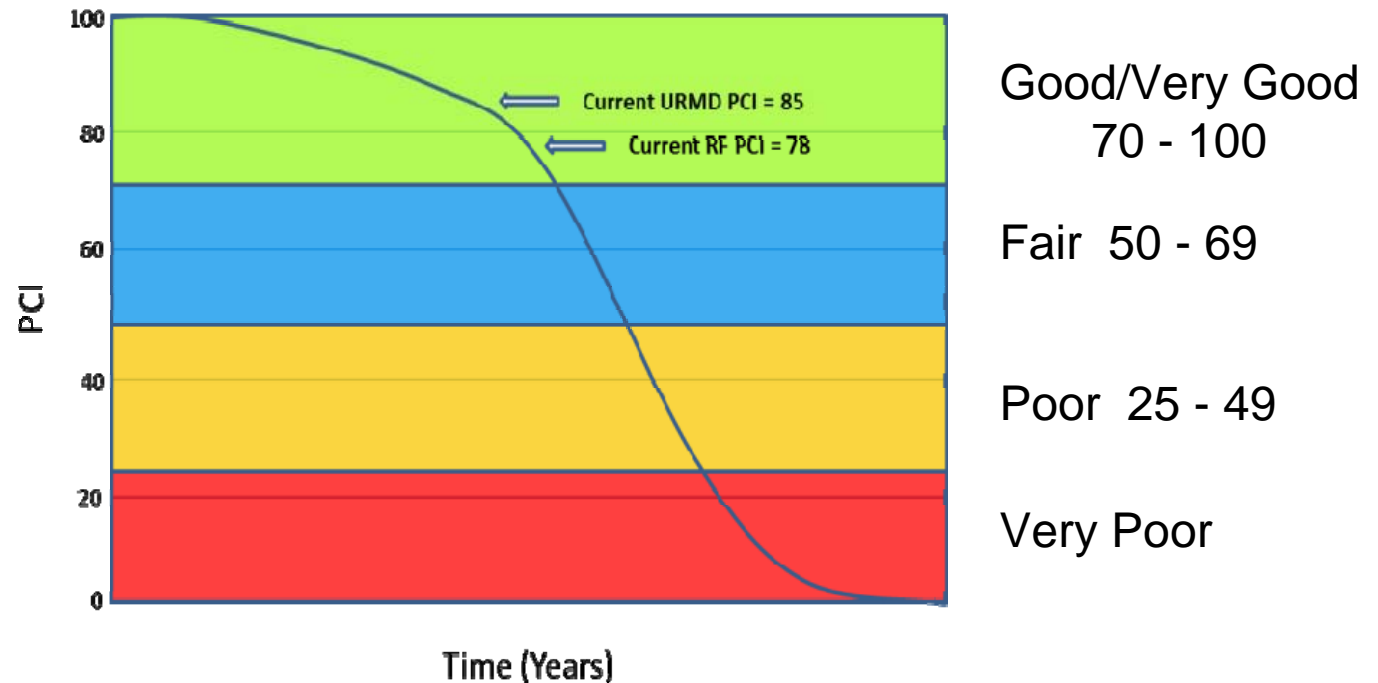


<b>Network Length (CL mi)</b>	<b>Dollars Spent on P&amp;M (\$/CL mi)</b>	<b>Network PCI</b>
148	\$10,811	70
218	\$15,571	81
220	\$1,136	84
519	\$20,424	NA
579	\$10,363	63
1525	\$7,803	86

**Washington County is spending less per CL mile (\$6,185) than the average of similar agencies (\$11,018) while maintaining a network condition near the median of surveyed agencies.**



# Findings - Spending



Washington County Current Network conditions in terms of PCI

Network is in good condition, but approaching break point where more expensive treatments will be required to maintain level of service expectations.



# Spending - Concerns



- Static Revenue supporting Road Fund
  - Increasing use of alternate modes
  - Improving fuel economy of newer vehicles
- Increasing Demand
  - More lane miles (over 200 added in 10-years)
  - Signals, lighting and landscaping (130 acres)
- Increasing Material and Labor Costs
  - 5% to 8%





# Strategies – Treatments Used



- The County has made extensive use of a few treatments. That strategy has worked well.

Treatment Type	Trigger	Functional Class			
		Arterial	Collector	Urban L/NR	Rural Local
Mill & Inlay	Distress	X			
Thick Overlay	Distress	X	X		
Thin Overlay	Time/Distress	X	X	X	X
Chip Seal	Time/Distress	X (rural)	X (rural)		X
Type II Slurry Seal	Time/Distress			X	
Crack Seal	Distress	X	X	X	



# Strategies – Survey Findings



- Agencies surveyed are using the same treatments as the County, and in much the same manner.
  - For arterials and collectors - mill and inlay, thick overlays, localized repairs, and crack sealing.
  - On local urban roads - treatments are localized repairs, crack sealing, slurry seals, and thin overlays.
- General practice above mirrors industry practice.



# Strategies - Implications



- Due to higher upfront costs an HMA-only strategy (overlays and mill/inlay) for arterials and collectors presents challenge to constrained budgets.
- HMA-only treatment strategy often results in a worst-first approach – can be less cost effective.
- Introducing a mix of different treatments into the decision process can save money.



## Cost Effectiveness - Improvements



- Typical deterioration is longitudinal and transverse cracking. Fatigue cracking is not a primary concern.
- These distress types support greater use of surface treatments (crack sealing and micro-surfacing) for preservation of arterial and collector routes.
- Current timing of treatments is good, but selected treatments may provide more benefit than is required.



# PCI Targets – Targets **vs.** Current Conditions



<b>Functional Class</b>	<b>Target PCI</b>	<b>2010 PCI</b>	<b>2012 PCI</b>
<b>Arterials</b>	80	76	<b>77</b>
<b>Collectors</b>	75	80	81
<b>Neighborhood Routes</b>	70	83	85
<b>Urban Local Roads</b>	65	85	86
<b>Rural Local Roads</b>	65	75	76

- **Average PCI values in 2004: Arterials – 88.5 Collectors – 89**



# PCI Targets – Other Agencies



<b>Agency</b>	<b>Arterials / Collectors</b>	<b>Urban Local / Neighborhoods</b>	<b>Rural Local</b>
<b>City of Beaverton, OR</b>	80	80	NA
<b>City of Hillsboro, OR</b>	70 – 100	70 – 100	70 – 100
<b>City of Tigard, OR</b>	75	75	NA
<b>City of Vancouver, WA</b>	75	70	NA
<b>Clark County, WA</b>	80 <sup>1</sup>		
<b>Franklin County, WA</b>	80 – 100 <sup>1</sup>		
<b>Pierce County, WA</b>	75	75	75
<b>Spokane County, WA</b>	70 <sup>1</sup>		
<b>Walla Walla County, WA</b>	> 70 <sup>1</sup>		
<b>Washington County, OR</b>	75 – 80	65 – 70	65

PCI targets shown for Washington County are from Section 21 of the 2020 TSP



# PCI Targets - Findings



- The PCI targets established by the County are very similar to those of similar agencies.
- It would appear from this analysis that for the local and neighborhood routes (URMD) the current PCI targets are sustainable.
- For arterial and collector routes targets do not appear sustainable in light of increasing costs, increasing area, current strategies and expected revenue.
- Reducing the target PCI for arterials from 80 to 75 decreases cost and increases risk long-term

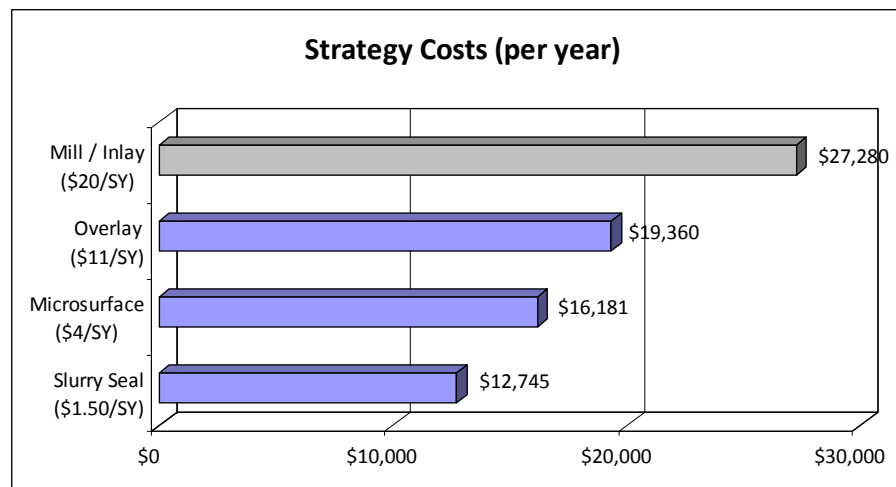


# Life Cycle Costs – Strategy Comparison



1st Treatment	Service Life (Years)	2nd Treatment	Service Life (Years)	3rd Treatment	Service Life (Years)	Service Window (Years)	Total Life Cycle Cost	Cost Per Year
Mill / Inlay (\$20/SY)	15	Overlay	15	N/A	N/A	30	\$818,400	\$27,280
Overlay (\$11/SY)	15	Overlay	15	N/A	N/A	30	\$580,800	\$19,360
Microsurface (\$4/SY)	8	Microsurface	8	Overlay	15	31	\$501,600	\$16,181
Slurry Seal (\$1.50/SY)	7	Slurry Seal	7	Overlay	15	29	\$369,600	\$12,745

The "Life Cycle Cost" represents the estimated cost, in today's dollars, to treat a typical 3-lane section of road (~45' wide) for one mile with the prescribed treatments, frequencies, and unit cost for the particular strategy





# Total Program Cost: 20-Year Horizon



<b>Time Frame</b>	<b>Primary Treatment</b>	<b>Total Estimated Cost</b>	<b>Target PCI</b>
<b>20 Years</b>	<b>Microsurface</b>	<b>\$204,900,000</b>	<b>80</b>
<b>20 Years</b>	<b>Overlay</b>	<b>\$212,500,000</b>	

Based on PMS projections changing the maintenance strategy to include microsurfacing could result in an estimated savings of \$7.6 million over 20-years



# Total Program Cost: 20-Year Horizon



Time Frame	Primary Treatment	Total Estimated Cost	Target PCI
20 Years	Microsurface	\$204,900,000	80
20 Years	Overlay	\$212,500,000	
20 Years	Microsurface	\$179,250,000	75
20 Years	Overlay	\$193,500,000	

Reducing the PCI target from 80 to 75 results in an additional savings of \$25.7 million over 20-years. The total potential combined savings is \$33.25 million.



# Expenditure vs. Revenue Analysis



- Continuing the current rate of Road Fund spending on pavement P&M results in about \$94 million spent over the next 20-years.
- That level of spending results in a projected PCI on arterials and collectors of 68 in 10-years and 62 in 20-years.
- Implementing an adjusted P&M strategy and reducing the PCI results in a projected shortfall of \$86 million over 20-years.



# Assessment Conclusions



- Washington County has a well maintained system.
- Refinements in current pavement preservation and maintenance strategies can reduce costs.
- Decreasing target PCI does result in significant cost savings and increases risk.
- Current level of spending is not adequate to maintain target PCI.



# Assessment Recommendations



- Use as broad a range of P&M treatment alternatives as reasonably possible.
- Expand use of preservation and maintenance treatments on urban arterial and collector roadways.
- Use preservation in lieu of overlays when additional structure is not required by conditions.
- Maintain frequency of PCI surveys to support capabilities of PMS program.



## Assessment Recommendations (cont.)



- Establish QA/QC program for PCI survey data collection.
- For fiscal sustainability, adjustments to PCI targets, treatment strategies, and revenue should be considered.
- Primary consideration should be given to ensuring P&M funding is adequate to preserve the public's investment.

