

Independent Assessment of the Washington County, Oregon Pavement Preservation and Maintenance Program

Executive Summary

May 28, 2013

In response to a request from the Washington County (the County) Department of Land Use and Transportation (DLUT) Applied Pavement Technology, Inc. (APTech) conducted an independent assessment of the pavement preservation and maintenance (P&M) program being used to maintain the County's road network. The County expressed a desire to identify ways to more effectively use available resources (funding and manpower) and asked APTech to review spending, strategies, cost effectiveness, performance goals, and pavement management system utilization. To complete this assessment APTech performed the following tasks:

- Gathered information from the County.
- Conducted a web-based survey of similar agencies in the region.
- Reviewed information from other sources (surveys on related topics for California, Washington, and Oregon agencies).
- Applied background knowledge on industry practice.
- Developed a comprehensive report of observations and recommendations.

County practices were reviewed and compared to other agencies and industry practices. The following key areas were identified as objectives for the study:

- Spending.
- Strategies.
- Cost effectiveness.
- Pavement Condition Index (PCI) targets.
- Life-cycle costs.
- Pavement Management System (PMS) support.

The following comments summarize analyses, findings and conclusions from each of the objective areas.

Spending

The County has two primary funding sources for P&M: the Road Fund and the Urban Road Maintenance District (URMD). The Road Fund is used for P&M of arterial and collector roadways, and rural local roadways. The URMD funding is used for maintenance of the urban local and urban neighborhood roadways in the County. This study found that the County spending and associated network conditions are in reasonable alignment with other counties surveyed. However, other agencies indicated current spending was insufficient to maintain their networks at desired levels. A review of trends in the County showed declines in mileage of roads treated with P&M for both Road Fund and URMD roadways per dollar spent, attributable to increasing treatment costs and roadway widening requiring greater dollars

for each centerline mile. Spending may not be keeping pace with needs and the desired levels of service may not be sustainable over time without adjustments to the treatment strategies (lowering costs per mile or unit area) and/or increased funding.

Treatment Strategies

The County's strategies are applied by functional class and are limited to a relatively few treatments that have worked well in the past. County practice is not altogether divergent from either similar agencies in the area or industry practice. It is not at all uncommon for agencies to focus on treatments that they are confident that local contractors can successfully build and that will provide reliable performance.

It is recommended that the County employ as broad a range of treatment alternatives as reasonably possible, especially on urban arterial and collector routes. On these roads, treatments to consider include slurry seals (conventional or polymer-modified), microsurfacing, and thin overlays. It is also recommended that the County consider applying preservation treatments to their PCC pavements. While there are only about 6 miles of these pavements, they are in very good condition after over 20 years of life, and may last much longer if proactively maintained.

Cost Effectiveness

This review found that the strategies employed on local and neighborhood routes is excellent, but greater consideration needs to be given to the use of P&M treatments on arterials and collectors for greater cost effectiveness. Treatments currently used on these routes are generally considered rehabilitation approaches, and they are being applied when the pavements are in condition categories where rehabilitation is not necessarily an appropriate course of action. The timing of treatments is good, but the selected treatments provide more benefit at a greater cost than is required. Use of preservation approaches, including surface seals (slurry, cape, or microsurfacing), will preserve pavements and extend the time between overlays. This will reduce the County's pavement rehabilitation costs and is a more cost effective overall strategy.

PCI Targets

Arterial roadways (both urban and rural) are currently below target PCI values, both in average and percent above minimum, and the collector routes are slightly above the PCI target but fall below the percent above minimum. Rural collector routes are in slightly better condition than the urban collectors, with an average PCI just above the target value. While the PCI values for these critical routes are still in the good range, they are expensive to maintain. Furthermore, using treatments that are too expensive limits the number of miles that can be treated. It appears the combination of PCI target, treatment strategy, and funding does not provide a sustainable approach for meeting target service levels defined by the County for these functional classifications; addressing this may require consideration and possible adjustment of all three variables.

Reduction of the PCI target for arterial roadways to 75, consistent with the collector routes, could be considered and will ease some of the pressure in terms of comparing current conditions to

requirements, but it is believed that any benefit of this will be short-lived and the same concerns will resurface as the impact of treatment strategy (use of preservation treatments on arterial and collector routes) and funding needs (addressing the required funding to meet the combination of increasing costs of treatments and higher cost per unit length of roadway for required maintenance) still need to be addressed for long-term sustainability of condition.

Life-cycle Costs

Strategies actively employing preservation treatments in lieu of structural repairs (when conditions do not require structural repairs) will decrease life cycle costs. Strategies being used by the County for URMD roadways on an 8-8-15 model may be well suited to the needs of the collector and arterial routes throughout the County, with slurry seals (or micro/cape for greater structural capability) placed at 7- to 10-year intervals, and an overlay placed at the 30-year mark. If a more proactive preservation strategy is implemented that delays the need for structural HMA overlays, life cycle costs will be lower. At the same time, it is also conceded that these treatments do not provide the same benefits, and real needs must be considered in development of strategies. Thin overlays and mill/inlay treatments maintain or add structural capacity, while the slurry/micro strategies maintain the surface and assume that sufficient structural capacity exists. The PCI over the life of each of these strategies may not be similar.

It is also worth noting that adding a treatment to the life-cycle increases the disruption of traffic, which is of particular concern on high volume arterials. HMA overlays are conducive to night work with lower temperatures often an advantage. However, the proper placement of bituminous surface treatments (slurry, cape and microsurfacing) have specific limitations related to ambient temperature and humidity which are not always prevalent for extended periods in the Willamette Valley after sunset, making it an added challenge to apply them at night. Careful consideration needs to be given to addressing the needs of the facility with cost-effective treatment strategies that result in an acceptable level of disruption to roadway users.

PMS Support

The County's pavement management system (PMS), maintenance practices supporting that system, and the County staff using the system were reviewed and compared against those of similar agencies in the area. Needs and opportunities for potential improvement were identified.

The County uses the Metropolitan Transit Commission (MTC) StreetSaver PMS. This system provides reasonably good functionality, and has a decent user base. However, some of the system's features can be somewhat frustrating in their limitations. If used properly those limitations may also be considered strengths, but the program must be used with consideration given to its underlying assumptions to achieve the full benefit of the capabilities.

The County's staffing, training, and PCI scheduling were consistent with those of others in the area. Nonetheless, there are opportunities for improvements. Given StreetSaver's strict reliance on condition data for self-calibration of performance predictions, it is imperative that the County maintain an appropriate schedule of periodic surveys. While the frequency of surveys meets the minimum

recommended by MTC, it may not be adequate to capture periods of unusual network activity, such as environmental events or heavy construction traffic.

The County uses contractor resources for PCI data collection. The importance of this data to the County decision process requires accurate field data collection. Regardless of whether the data collection is completed in-house or under contract, it is recommended that a QC/QA program be established for the PCI survey activities.

Staffing to support the County's PMS appears sufficient, but there is not a formal schedule of training for County staff using the PMS that would allow them to remain abreast of program feature enhancements and innovations. It is recommended that County staff attend at least one StreetSaver User Week conference a year. This will provide a face-to-face opportunity for the County to learn how to better make use of the PMS that helps guide their decision process.