



Department of Public Works

- Flood Control
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Kevin Blakeslee, P.E.
Director

Title: Performance Based Pavement Preservation

Overview: An efficient/effective road preventative maintenance program to achieve a system with an overall pavement condition index rating of good or better with less cost.

Challenge: The standard practice of road preservation can be costly. A strategy is needed to maximize every maintenance dollar spent. The County of San Bernardino maintains over 2,175 miles of paved roads with limited revenues. Road quality is determined by a Pavement Condition Index (PCI) score from 0 to a 100, with 0 indicating a failed road and 100 indicating a new, reconstructed, or resurfaced road. Paved roads deteriorate over time based on traffic, weather, and other factors. As PCI score drops, the cost of rehabilitation escalates if preventive maintenance is not addressed in a timely manner. Using a systematic approach the County developed, we achieved a current overall PCI score of 80 at less cost than traditional practices.

Innovative Solution: While the County was able to achieve a road network with an overall PCI in Good condition, it became extremely difficult to maintain the network in Good condition. In fact, using traditional practices caused the County's network PCI to decline. Using a strategy that can be replicated by any agency, the County developed a system that placed its roads into five categories according to traffic volume, amount of truck traffic, urban/rural location, climate location, and residential vs. non-residential. A Category 1 road has a large amount of traffic and truck use and serves high economic value facilities. A Category 5 road is a seldom used road. The categories in between range in traffic amounts and types of facilities served, and whether they are residential or non-residential or rural or urban. A pavement preservation cycle was developed for each category of road based on the type and frequency of preservation treatment that would address the rate of deterioration within that category. Since unincorporated areas are located in pockets, the most efficient

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practice is to divide the County into zones with all road preservation treatments completed within each zone and not jump from zone to zone. This reduces mobilization costs and increases efficiency. Pavement management software helps the County track the condition of each road, analyzes data for each road and runs a budget plan to produce a report that recommends road projects and suggests repair costs based on the road's category. Key to keeping the road in Good condition is application of a chip seal prior to the point where pavement condition improvement costs increase exponentially. While many local agencies are reluctant to use chip seal as a road preservation strategy, the County applies a quality chip seal with proper preparation beforehand to ensure a lasting road surface at considerably less cost

Originality: What makes the program unique is the County categorizes its roads, confines projects to remain within a zone, and conducts preventative maintenance prior to critical point before road repair costs escalate.

Cost Effectiveness: This methodology reduces the County's road improvement costs from the traditional \$1 million to 1.5 million per two-lane road mile for reconstruction to \$195,000 (\$65,000 every 7 years) per two-lane road mile for road preparation and chip sealing over the same road lifespan. Agencies that use this method should see similar results.

Results: The County maintains over 2,175 miles of paved roadway with an overall average PCI score of Good or better, reducing vehicle maintenance costs for the public that may occur from traveling on roads in poor condition. An efficient, cost-effective systematic approach allows the County to stretch the road maintenance dollar further, enabling the County to address other priorities within the road network. The County was able to increase its network PCI from 69 in 2013 to 80 in 2017. This process can be easily replicated by any agency seeking to reduce their maintenance costs.

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