Sustainable Engineering
Technologies in Pavement Infrastructure

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What are Sustainable Engineering Technologies?

Tools that help transportation agencies plan and build infrastructure as well as operate and maintain systems that are cost-effective, long-lasting, and efficient while minimizing impacts to the human and natural environments.
Developing A Healthy Transportation Network

Pavement Management

Recycling with Engineered Emulsions saves 30% to 50% the cost over traditional methods allowing more roads to be repaired with same to better performance expectations over traditional approach.

Pavement Recycling and Rehab

Roadway inventory, condition assessment, deterioration and work history allows agencies to track performance, develop political support of treatments and build accurate models for future planning.

Pavement Preservation

Preservation of good roads with low cost treatments saves big money—cost savings is then used to repair poor roads.

Pavement Management
Cold In-place Recycling (CIR) and Central Plant Recycling (CCPR) are the most sustainable treatments used today for rehabilitation of pavements.

- Reduces costs 30 - 50%
- Reduces Construction time by 1/3
- Reduces Green House Gas Emissions
- Reduces truck traffic over network
- Used by hundreds of CA agencies
- Over 20 year history

Video Highlighting and explaining CIR Process
Cities and counties own and operate 81% of the local streets and roads in California.

In 10 years, under existing funding levels, a quarter of the streets and roads in California will be in “failed” condition.
The conditions of California’s local streets and roads are rolling off the edge of a cliff. On a scale of zero (failed) to 100 (excellent), the statewide average Pavement Condition Index (PCI) has deteriorated to 65 (“at risk” category) in 2016. Even more alarming, 52 of 58 counties are either at risk or have poor pavements. If the current funding remains the same, the unfunded backlog will swell from $39 billion to $59 billion by 2026.”

$1 deferred today will result in a higher cost of $1.53 in 10 years, assuming that there is no increase in construction or labor costs.
Unit cost data for asphalt treatments from 355 agencies (both 2016 and prior survey data were used) were summarized and averaged for the analysis.

There were small increases (less than 10 percent) in the unit costs for all categories EXCEPT for reconstruction on major roads, where the unit cost dropped by approximately 23 percent from 2008 levels. This is possibly due to the increased use of recycling techniques.
California Local Road Funding

California Local Agencies have currently $1.98 Billion in funding per year.
- Currently, 6.9% Pavements in failed condition
- In 10 years, 22.2% Pavements in failed condition

We need $3.5 Billion per year to stay at current PCI 65 (over next ten years)
- 21.8% Pavements in Failed Condition

We need $7.5 Billion per year to reach BMP of PCI 87 (over next ten years).
- 0% Pavements in failed condition
- Only $2.5 Billion needed annually to maintain at that level.

SB1 provides and additional $1.5 Billion annually.

Current Funding Levels $1.98 Billion
SB1 Additional Funding $1.5 Billion

**Current Total Annual Funding $3.48 Billion**

**Current Annual Funding Shortfall $4.02 Billion**

WHERE CAN WE FIND MORE FUNDING?
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CAN WE DO MORE WITH WHAT WE CURRENTLY HAVE?
2012 LSRNA - Scenario 4: Efficiency Cost Savings Scenario

In this scenario, it was assumed that cost savings could be achieved if cities and counties were to employ recycling techniques as part of their rehabilitation and reconstruction treatments. Examples of such techniques include cold-in-place recycling (CIR), and full-depth reclamation (FDR), where cost savings over conventional techniques range from 25% to 35%. It was assumed that half the streets and roads would be eligible for these cost savings (not all streets are eligible for various reasons such as shallow utilities, geometric factors, inadequate pavement sections etc.). This results in an additional $882 million/year available for use on additional streets and roads.

An additional benefit to using CIR or FDR technologies is that it can result in the equivalent of as many as 34,000 cars removed from roads!
“This is the first scenario where we can see improvements to the local streets and roads system.”
In Summary:

- CIR and CCPR are Sustainable Engineering Technologies that help agencies:
  - Reduce costs
  - Minimize impacts to the travelling public and natural environments
  - Are long lasting
- LSRNA Shows funding levels are still much lower than needed to achieve BMP’s
- Additional SB1 monies help but there still a need to close the gap
- CIR and CCPR have a proven history of lowering costs with the same life cycle expectations as traditional methods
- Utilizing CIR and CCPR as first choices in the design process can immediately put hundreds of millions of dollars back into the funding pool.
Thank you!

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