

Quality and Productivity Commission
27th Annual Productivity and Quality Awards Program
"Saluting County Excellence"

3.0

2013 APPLICATION

Title of Project (Limited to 50 characters, including spaces, using Arial 12 point font):

NAME OF PROJECT: Sustainable Pavement Treatment for County Roads

DATE OF IMPLEMENTATION/ADOPTION: 2009
 (Must have been implemented at least one year - on or before June 30, 2012)

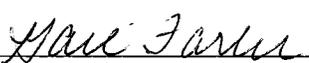
PROJECT STATUS: Ongoing One-time only

HAS YOUR DEPARTMENT PREVIOUSLY SUBMITTED THIS PROJECT? Yes No

EXECUTIVE SUMMARY: Describe the project in 15 lines or less using Arial 12 point font. Summarize the problem, solution, and benefits of the project in a clear and direct manner

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The 2012 California Statewide Needs Assessment report estimates that approximately \$8 billion is needed annually over the next 10 years to bring local streets and roads to sustainable levels. Passage of California's Global Warming Solutions (AB 32) legislation in 2006 confirmed California's commitment to be a leader in the nation of a sustainable, clean energy economy by requiring California to take proactive steps to reduce greenhouse gas emissions to 1990 levels by 2020. Developing strategies that are in alignment and meet the objectives of AB 32 by 2020 will place further challenges for local agencies throughout the State. To address these two challenges, the LA County Public Works Department has established a sustainable pavement treatment program that addresses the unfunded backlog and reduces greenhouse gas emissions and energy usage. Maintaining roads in good condition not only benefits automobile users but also other modes of transportation including bicyclists, public transportation and vehicles that support commerce and our states economic engine. Providing a well maintained transportation system is imperative to the vitality and success for all the people who live and work within the community.

(1) ESTIMATED/ACTUAL ANNUAL COST AVOIDANCE	(2) ESTIMATED/ACTUAL ANNUAL COST SAVINGS	(3) ESTIMATED/ACTUAL ANNUAL REVENUE	(1) + (2) + (3) TOTAL ESTIMATED/ACTUAL BENEFIT	SERVICE ENHANCEMENT PROJECT
\$	\$4,005,000	\$	\$4,005,000	
SUBMITTING DEPARTMENT NAME AND COMPLETE ADDRESS County of Los Angeles Department of Public Works 900 S. Fremont Ave., Alhambra CA 91803			TELEPHONE NUMBER (626) 458-4093	
PROGRAM MANAGER'S NAME Greg Kelley Geotechnical & Materials Engineering Division			TELEPHONE NUMBER (626) 458-4911 EMAIL gkelley@dpw.lacounty.gov	
PRODUCTIVITY MANAGER'S NAME AND SIGNATURE (PLEASE CALL (213) 893-0322 IF YOU DO NOT KNOW YOUR PRODUCTIVITY MANAGER'S NAME) Emma L. Ayala 		DATE 6/26/13	TELEPHONE NUMBER (626) 458-4093 EMAIL	
DEPARTMENT HEAD'S NAME AND SIGNATURE Gail Farber 		DATE 6/27/13	TELEPHONE NUMBER (626) 458-4002	

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CHALLENGE:

Counties and Cities throughout the State face the challenge of managing their road network on very limited resources. The 2012 California Statewide Needs Assessment report estimates that approximately \$8 billion is needed annually over the next 10 years to bring local streets and roads to sustainable levels. Passage of California's Global Warming Solutions (AB 32) legislation in 2006 confirmed California's commitment to be a leader in the nation of a sustainable, clean energy economy by requiring California to take proactive steps to reduce greenhouse gas emissions to 1990 levels by 2020. Developing strategies that are in alignment and meet the objectives of AB 32 by 2020 will place further challenges for local agencies throughout the State. To address these two challenges, Public Works has established a sustainable pavement treatment program that addresses the unfunded backlog and reduces greenhouse gas emissions and energy usage.

SOLUTION:

In 2009, Public Works in collaboration with technical experts and representatives with the paving industry performed several pilot green projects on County roads to evaluate their performance and cost effectiveness. The early successes of the treatments and their cost effectiveness led to more widespread sustainable projects and the development of a sustainable program that focused on green approaches to maintaining the County roads. The program developed utilizes the following 3 green/sustainable approaches in treating County roads:

(1) Take care of our roads that are in good condition, first – To some, this approach might not make sense. Why would you use scarce resources to fix good roads while the bad roads are the ones that need the repair the most? Many people understand the long term benefits of performing preventative maintenance activities on their homes and automobiles. Painting your house every 10 years or changing the oil in your car every 3,000 miles are activities that preserve the value and improve the performance of these assets. These regularly scheduled preventative maintenance costs are generally far less than the ultimate repair cost and go a long way to keeping the assets in tip-top shape. Regularly scheduled preventative maintenance treatments on roads provide these same benefits. Because the treatment costs to preserve the good roads is substantially less, it enables the County to preserve between 4 to 10 times more streets than if we focused on the bad roads. This practice of keeping the good roads in good condition is an industry-wide practice called “pavement preservation.”

Why is taking care of our good roads first green/sustainable? One component of being green/sustainable is to use less energy to perform the specific treatment. Pavement preservation treatments are treatments that are applied directly to the

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pavement surface and use materials (emulsions - temperature 100-150 degrees) that use far less energy than repairs for the heavily distressed roads. For roads that are in poor condition, generally, the top layer(s) of the road are removed and hauled to a landfill and require hot paving material (temperature 275-300 degrees Fahrenheit) to repair the road. The energy utilized in the operations of removing and hauling the distressed pavement to a landfill, importing new pavement and heating the pavement to a higher temperature all add up to a much larger energy use and greenhouse gas impact than pavement preservation treatments.

- (2) Use recycled materials in treatment selections** – Another green/sustainable approach in our program is to utilize materials that typically would go to the landfill as part of the pavement mix. Public Works has been a long time recycler (over 20 years) of incorporating automobile tires into our pavements. For each lane mile of roadway that incorporates tire particles into the asphalt hot mix, 2,000 tires are eliminated from going into the landfill. Not only does this approach help reduce the amount of tires going into landfills, the addition of tire particles into our pavement mix has also resulted in significantly improving the performance of our roads. Public Works performed a study that evaluated the performance of “rubber roads” and learned that adding tire particles to our pavement mix resulted in (a) significant reduction in pavement cracking (b) roads lasted 40 to 60 percent longer than conventional asphalt (c) less pavement noise than other pavement treatments and (d) less fading of the roadway surface. In addition, Public Works is now using recycling asphalt millings called Reclaimed Asphalt Pavement (RAP) into our pavement treatments. In fact, in 2012, Public Works committed to using 100 percent RAP for all pavement preservation projects in the North County. This process will enable us to recycle these millings into our pavement treatments rather than hauling them to a landfill.
- (3) Reutilize existing materials in place** – Of all the pavement treatments, roads that require major reconstruction are pavement treatments that impact the environment the most. Typically, these projects include removing the existing asphalt and at times the layers of material below the pavement. Trucks then haul the material away from the project site generally to a landfill. Virgin pavement material with aggregate (crushed rock that is mined from the earth) is then imported to replace what was removed. Significant energy is needed to transport the material in both directions from the project location and raw materials from the earth are needed to construct the road. Processes such as “Cold-In-place Recycling (CIR) and Cold Central Plant Recycling (CCPR) refurbish the existing asphalt in-place. Treating the soil beneath the pavement by adding cement, lime or emulsion to the soil provides another in-place treatment opportunity resulting in significant environmental benefits. These processes that reuse what is in place eliminates the energy required to transport old and new material from and to the construction site. By reusing the

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existing materials, we also avoid removing raw materials from the earth. Eliminating the truck traffic on the project also helps reduce the impact to motorists and greatly expedites the project completion. Reutilizing the existing materials in-place is an approach that not only reduces the environmental impacts and public inconvenience on a project, it also has the added benefit of saving significant project costs.

BENEFITS:

Maintaining roads in good condition not only benefits automobile users but also other modes of transportation including bicyclists, public transportation and vehicles that support commerce and our states economic engine. Providing a well maintained transportation system is imperative to the vitality and success for all the people who live and work within the community. The ability to effectively move from one place to another is a key element in the economic stability and quality of life of the residents. With the cost savings achieved from the sustainable pavement treatment approach, additional roads were treated further improving Public Works' network. By recycling the existing pavement and subgrade material in-place, the truck trips to remove and replace material were both eliminated and greatly reduced the impact to road users and the community as compared to the conventional method. Furthermore, the efficiencies of treating the pavement in-place often results in a reduction in the number of construction days by up to 67 percent.

When compared to hot mix alternatives, sustainable pavement treatments have reduced energy consumption and GHG emissions by approximately 80 percent resulting in 50 million pounds of CO2e removed from the environment. In addition, since 2009, Public Works has recycled over 526,000 tires that would have otherwise been placed in a landfill.

TABLE 1 - ENERGY USAGE, GREENHOUSE GAS EMISSIONS, AND COST SAVINGS FOR SUSTAINABLE PAVEMENT TREATMENTS

	COLD CENTRAL				TOTAL
	COLD IN-PLACE RECYCLING (CIR)	PLANT RECYCLING	SUBGRADE STABILIZATION	PAVEMENT PRESERVATION	
REDUCTION IN ENERGY CONSUMPTION	76%	71%	45%	84%	83%
REDUCTION IN GHG EMISSIONS	78%	74%	28%	91%	88%
COST SAVINGS	\$2,500,000	\$650,000	\$2,200,000	\$7,500,000	\$12,800,000

* Sources: Energy Usage and Greenhouse Gas Emissions of Pavement Preservation Processes for Asphalt Concrete Pavements

	FY 2009-10	FY 2010-11	FY 2011-12	FY 2012-13	TOTAL
TOTAL NUMBER OF LANE-MILES OF ARHM USED	68	13	41	142	263
TOTAL NUMBER OF TIRES RECYCLED	136,000	26,000	82,000	284,000	526,000

LINKAGE TO THE COUNTY STRATEGIC PLAN (DETAIL IS REQUIRED FOR COUNTY DEPARTMENTS):

The County's 3-pronged sustainable pavement program is in alignment with Los Angeles County's Strategic Plan (Goal 2: Fiscal Sustainability; Strategic Initiative 4: Long-term investments- "energy efficiencies/global climate change and environmental sustainability"). This program has resulted in reducing energy consumption and GHG emissions by approximately 80 percent resulting in 50 million pounds of CO2e removed from the environment.

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COST AVOIDANCE, COST SAVINGS, AND REVENUE GENERATED (ESTIMATED BENEFIT): If you are claiming cost benefits, include a calculation on this page. You must include an explanation of the County cost savings, cost avoidance or new revenue that matches the numbers in the box. Remember to keep your supporting documentation.

Cost Avoidance: Costs that are eliminated or not incurred as a result of program outcomes.

Cost Savings: A reduction or lessening of expenditures as a result of program outcomes.

Revenue: Increases in existing revenue streams or new revenue sources to the County as a result of program outcomes.

(1) ACTUAL/ESTIMATED ANNUAL COST AVOIDANCE	(2) ACTUAL/ESTIMATED ANNUAL COST SAVINGS	(3) ACTUAL/ESTIMATED ANNUAL REVENUE	(1) + (2) + (3) TOTAL ANNUAL ACTUAL/ESTIMATED BENEFIT	SERVICE ENHANCEMENT PROJECT
\$	\$4,005,000	\$	\$4,005,000	<input type="checkbox"/>

ANNUAL= 12 MONTHS ONLY

The County's 3-pronged sustainable pavement program has resulted in significant reductions in energy usage and greenhouse gas emissions (GHG) as well as substantial cost savings. Since implementing the program in 2009, about \$12.8 million has been saved with these practices. The total annual cost savings is **\$4,005,000**.

CALCULATIONS FOR ANNUAL COST SAVINGS ON SUSTAINABLE PAVEMENT TREATMENT

NO.	PROJECT NAME	SUSTAINABLE TREATMENT STRATEGY	TOTAL COST SAVINGS	WORK DURATION (YR)	ANNUAL COST SAVINGS
1	CALIFORNIA BOULEVARD, ET AL (RDC0012976)		\$ 109,074		\$ 43,630
2	VASQUEZ CANYON ROAD (RDC0014929)		\$ 263,347		\$ 105,339
3	VALLEY BOULEVARD (CITY OF POMONA PUBLIC WORKS)	COLD IN-PLACE RECYCLING (CIR)	\$ 176,988	2.5	\$ 70,795
4	ANGELES FOREST HIGHWAY (RDC0015511)		\$ 769,919		\$ 307,968
5	UPPER BIG TUJUNGA (RDC0015758)		\$ 1,179,904		\$ 471,962
			\$ 2,500,000		\$ 1,000,000

NO.	PROJECT NAME	SUSTAINABLE TREATMENT STRATEGY	TOTAL COST SAVINGS	WORK DURATION (YR)	ANNUAL COST SAVINGS
1	QUARTZ HILL DRAIN & 50TH STREET WEST (RDC0015478)		\$ 268,176		\$ 107,270
2	ADMIRALTY WAY SETTLEMENT REPAIR (RDC0015061)	COLD CENTRAL PLANT RECYCLING (CCPR)	\$ 381,094	2.5	\$ 152,438
			\$ 650,000		\$ 260,000

NO.	PROJECT NAME	SUSTAINABLE TREATMENT STRATEGY	TOTAL COST SAVINGS	WORK DURATION (YR)	ANNUAL COST SAVINGS
1	HOLLISTON AVENUE, ET AL (RDC0015526)		\$ 244,934		\$ 97,974
2	QUARTZ HILL DRAIN & 50TH STREET WEST (RDC0015478)		\$ 872,276		\$ 348,910
3	ADMIRALTY WAY SETTLEMENT REPAIR (RDC0015061)	SUBGRADE STABILIZATION (SS)	\$ 754,981	2.5	\$ 301,992
4	DEL AIRE & EL CAMINO VILLAGE, ET AL (RDC0015501)		\$ 307,211		\$ 122,884
			\$ 2,200,000		\$ 870,000

NO.	PROJECT NAME	SUSTAINABLE TREATMENT STRATEGY	TOTAL COST SAVINGS	WORK DURATION (YR)	ANNUAL COST SAVINGS
1	PAVEMENT PRESERVATION PROJECTS BETWEEN FISCAL YEAR 2009-10 TO 2012-13	PAVEMENT PRESERVATION	\$ 7,500,000	4	\$ 1,875,000
			\$ 7,500,000		\$ 1,875,000

TOTAL ANNUAL COST SAVINGS = \$ 4,005,000