



Public Works Officers Department 2010 SUMMER NEWSLETTER



Cold In-Place Recycling Saves as it Paves in Agoura Hills

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The City of Agoura Hills is a suburban community, located just 50 miles north of downtown Los Angeles. Annually, the City's street rehabilitation program typically resurfaces two to three miles of roads with asphalt-rubber hot mix overlay. For the City's 2010 street rehabilitation program Thousand Oaks Boulevard was the only road slated for restoration.

Thousand Oaks Boulevard is classified as one of the City's primary arterials, providing access to many of the City's residential neighborhoods, and designed to move high volumes of traffic at higher speeds. Over the years, Thousand Oaks Boulevard has undergone much wear-and-tear, as can be seen by the asphalt shoving and crack-sealing throughout the roadway. Although crack-sealing and occasional removals and replacements are okay for quick fixes, every road reaches a point at which an overlay becomes the correct rehabilitation method. Thousand Oaks Boulevard covered over 2 miles through the City and consisted of pavement that was over 30 years old, had never been resurfaced, has a relatively straight alignment and a thick base, making it an optimal candidate for Cold In-Place Recycling (CIPR).

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CIPR has been in use for over 30 years by many other states and the Federal Highway Administration for pavement restoration. More recently, Caltrans and other local jurisdictions have approved and started to use CIPR to rehabilitate their highways and roadways. The existing materials in our old roads contain valuable non-renewable resources—the biggest fraction, the engineered aggregates that comprise 95% of the roadway are in many cases of higher quality than the aggregates that are mined today. Recycling in-place allows those aggregates to be reused, saving money, saving energy, and thereby helping both the taxpayer and

the environment. CIPR offers an effective tool to rehabilitate Thousand Oaks Boulevard, which will not only meet the City's PCI rating goal, but also meet the City's goal of reducing energy and environmental impacts.

This past July, Pavement Recycling Systems, Inc. paired with Excel Paving to CIPR the existing pavement on Thousand Oaks Boulevard. The City of Agoura Hills has embraced the economic and environmental savings that Cold In-place Recycling provides. Thousand Oaks Boulevard was completed this year and more projects are to be considered in the following years. We are also proud to have been an example for other agencies to view CIPR as we received visitors from multiple agencies during the duration of the process.

EFFICIENCY: 1) Cold In-place Recycling or CIPR translates into fewer dollars per lane mile, less energy used in construction, more efficient labor utilization and less construction traffic. CIPR can result in up to 50% cost savings comparing equivalent structural sections in comparison

2) Energy use less by over 1,000,000 BTU's per ton of recycled asphalt produced compared to virgin hot mix asphalt. In other words, CIPR uses 1/5 of the energy expenditure of Hot Mix Asphalt. One mile of 3-inch CIPR uses two trucks on the roadways compared to 85 used for an equivalent "mill and fill" operation with hot mix asphalt. That takes over 83 trucks off of the roadway for every mile that is constructed that would ordinarily increase congestion, energy usage and greenhouse gases. *(continued on page 6)*

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3) On-site recycle crews typically consist of a 20-man team: a) Two people drive the engine and steer the train; b) One person operates a water truck for tool lubrication and water in which to distribute the recycling agent; c) One person controls the recycler and monitors computer interlocked pumps and meters; d) A fourth person acts a trouble-shooter, constantly surveying the operation and clearing up bottlenecks and snags; e) Three people on the paver including the operator and two screed operators; f) Two rakers to match seams, and adjust for adjacent structures like storm drains and manhole covers; g) Three people on the rollers to compact the recycled mat; (continued on page 6)

h) Two on-site supervisors – one for the recycle train, one for the paving operation; i) Typically two people on full time traffic control; j) Two people (at a time) delivering emulsified recycling agent to the recycle train; k) The Engineer, and/or the inspector verifying the work is per “plans and specifications”; l) Many more people operate in the background aiding in the dispatch of crews and equipment, project management and estimating, manufacture and delivery of recycling agents, repair and maintenance of equipment, and countless tasks to put the crew on the job with the right equipment and correct design parameters.

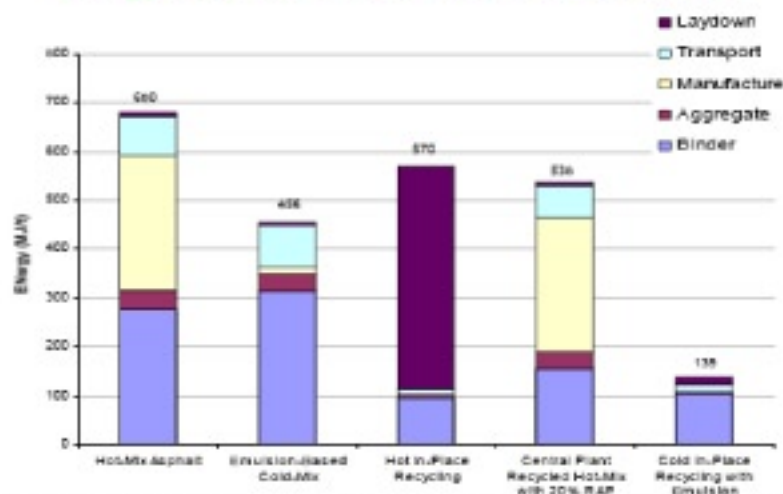
CARBON FOOT PRINT: As can be seen in the graph (below) from the Ontario Ministry of Transportation, CIPR is the most energy efficient technology for roadway preservation and rehabilitation.

DESIGN: CIPR requires minimal design work. Cores and asphalt samples are taken throughout the project to provide a good representation of the existing asphalt thickness. Samples are sent to an AASHTO approved lab for mix design. At most, the profile of the street to be recycled might increase by 1 to 1.5” in thickness. Typically, the extra thickness is required for additional loading beyond the street’s originally designed traffic index. Other projects may require full width profile milling prior to CIPR operations to allow for the additional final asphalt overlay back to existing elevations. Adjacent improvements (curb and gutter, storm drains, and bridge abutments) require no adjustment. Oftentimes, utility covers do require adjusting to the final grades.

When properly constructed and designed, the structural load-carrying capability of the CIPR asphalt section is completed in-place and utilizes existing city asphalt assets. Additional asphalt thickness to the final overlay section can be added to account for any future increase to the traffic index.

SUMMARY: Recycling makes the most sense when it not only spends less resources and uses less energy, but also when recycling gives an equivalent or better product. CIPR fits those criteria. ◀

Energy Use Per Tonne Of Material Laid Down



Source: *The Environmental Road of the Future, Life Cycle Analysis* by Clappert, M. and Julius Bilal, Colas Group, 2003, p.34



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