

# CUTLER COURIER

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## SUPER-SMOOTH RIDES RESULT FROM TEXAS URBAN REPAVING

Houston one-pass, hot in-place recycling wins performance bonus, while eliminating tack coat and keeping driveways clean

Experience in Texas is proving that one-pass, hot in-place recycling (HIR) of existing urban asphalt roads can be done swiftly and with bonus-winning smoothness.

In summer 2000 an HIR contractor repaved a seven-lane, highly congested urban arterial highway in suburban Houston with such attention to detail that it qualified for 85 percent of a smoothness bonus, as subsequently determined by the customer, the Texas Department of Transportation (TxDOT), Houston District.

“State Highway 6, from south of I-10 to the Harris County line, is a 45,000-vehicle per

day project in a congested business/commercial area of Houston,” said Jim King, regional sales representative, Cutler Repaving Inc., Lawrence, Kan.

“The traffic made it a hard job,” King said. “The road is flanked by shopping malls, apartment complexes, a total business environment through the whole project. But we only disturbed traffic one time in each lane. We cut the traffic disruption by at least half. And while that may not seem like a lot, when you consider how many lane closures would be required, the savings are substantial.”



*J. A. (Tony) Yrigoyen, Design Engineer for the Texas Department of Transportation West Area Office, relied on one-pass, hot in-place recycling (HIR) for successful repaving of seven-lane State Highway 6 in suburban Houston*

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Under these circumstances, Cutler earned a smoothness (“ride”) bonus of \$46,000 out of a possible \$50,000 on the 281,000-square yard, two-month, \$1 million-plus project.

In Texas, ride bonuses can be awarded on projects which involve pavement removal and leveling course, or overlays. The result can be smoother pavements.

“Based on the criteria, the ride quality was excellent, and they got the bonus in accordance with the provisions of the specifications,” said J.A. (Tony) Yrigoyen, P.E., design manager, West Harris Area Engineer’s Office, TxDOT Houston District.

“The bonus was nice, but what we were trying to achieve was customer satisfaction,” said John Rathbun, Cutler vice president-sales. “There were monetary benefits that we would realize, but we were more concerned with the state feeling our process had a lot of benefit and value for the money they spent, especially

when they had not had any experience with the process up until then.”

### MONOLITHIC RIDING COURSE CREATED

The state utilized a unique, one-pass HIR process that reuses the existing deteriorated asphalt as a leveling course, and on it places a fresh layer of virgin hot mix asphalt (HMA).

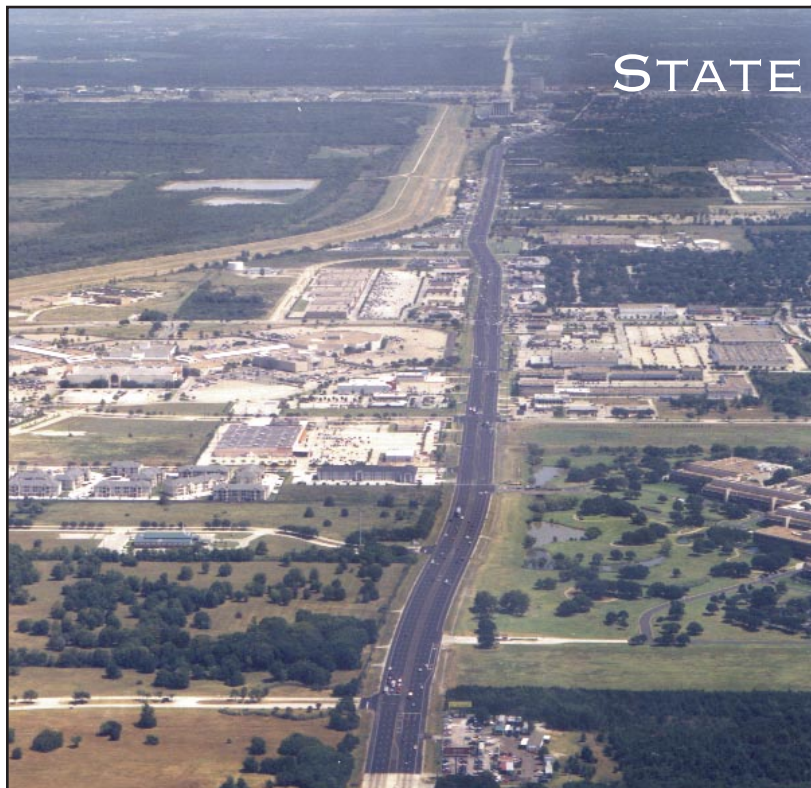
“The pavement is heated to about 350 degrees F,” Rathbun said, “and once it’s in a softened, pliant condition, it’s scarified to a depth of 1 inch. A recycling agent that restores the viscosity of the aged asphalt is applied and mixed in. This material is then reapplied and distributed with a screed as a 1-inch leveling course.”

While that material remains at 225 degrees F, a 1-inch virgin hot mix asphalt overlay is placed over the recycled leveling course. “What’s

unique is that the machine that does the scarification, applies the recycling agent, and places the leveling course, also applies the new overlay simultaneously,” Rathbun said.

That benefits road users because there is no delay between the time the pavement is recycled and the time a riding or friction course is placed, resulting in a safer road for users.

But there is an engineering benefit as well. “We achieve a thermal bond between the recycled layer and the new layer,” Rathbun said. “From an engineering point of view, there is no delamination between the recycled layer and the new overlay. That’s very important in predicting life cycle performance. The same heat that’s used to take the road apart is used to put it back together, and the two layers are effectively compacted into one lift.”



## STATE HIGHWAY 6

was rutted, with small cracks and reflective cracking, Yrigoyen noted. Now, the state of Texas will benefit from these engineering advantages:

- No wheel ruts from motorists were placed in the recycled layer, prior to paving with the friction course, as is experienced with conventional paving, and
- The temperature of the leveling and surface courses were such that bonding took place between the two, far superior to that obtained if a tack coat were applied between a milled surface and a driving course.

*In this highly commercial stretch of State Highway 6, the HIR process allowed for a very successful repaving project and very limited inconveniences for highway users*

The virgin surface is applied by a separate, vibrating screed no more than 3.0 feet behind the leveling course screed. It's fed from a hopper at the front of the Repaver via a drag/slat conveyor chain which brings the HMA through a tunnel along the length of the machine, to the paving screed.

The result is a monolithic, 2-inch, finished pavement that is equivalent in ride to a 2-inch mill and overlay. Because the machine travels at 18 to 20 feet per minute, traffic barricades can come down with great speed, with all reclaimed material used on the spot without hauling. Traffic can drive on the new pavement as quickly as with conventional paving, while driveways and intersections are blocked no longer than 15 minutes from start to finish.

The process also reheats the edge of adjacent repaved lanes, resulting in a more durable, higher-density seam between the driving lanes, Rathbun said.

### NO TACK COAT ELIMINATES DELAYS, MESS

The lack of a tack coat was one of the considerations of TxDOT in awarding the contract. For the client, the West Harris Area office of TxDOT's Houston District, customer satisfaction drives its choice of paving processes.

In this congested commercial area, elimination of the tack coat and its being tracked all over customer parking lots during paving was important as it improves site relations with the traveling public, Yrigoyen said.

"The reason we selected this process was the location is highly commercial, with a lot of driveway traffic," TxDOT's Yrigoyen said. "We wanted a process that was customer-friendly, allowing users to drive from the highway without tracking the tack

## TEXAS SERIOUS ABOUT ROAD RECYCLING

Recycling of roads — and use of recycled materials in those roads — is a major policy of the Texas Department of Transportation (TxDOT).



"TxDOT's goal is to increase the use of recycled materials in road construction where economic or engineering benefits are identified," the department says.

"We are encouraged, where feasible and the quality of work can be maintained, to look for ways to recycle our roadway materials," said J.A. (Tony) Yrigoyen, P.E., design manager, West Harris Area Engineer's Office, TxDOT Houston District.

"Reclaimed Asphalt Pavement (RAP) can be used to create new asphalt," Yrigoyen said, "and with the [Cutler] repaving process we recycle 50 percent of the material that is placed on the pavement," that is, one inch of 100 percent recycled leveling course, followed by one inch of fresh hot mix asphalt friction course.

With its pro-active, goal-oriented Recycling and Recycled Products Program, Texas is a national leader in recycling. "The bottom line is that recycling and using recycled products benefit the environment and offer economic savings," the DOT says.

"Recycled materials can save money by reducing purchase and transportation costs," TxDOT says. "Recycled materials can, in some instances, exceed the performance of traditional materials."

To promote use of reclaimed materials in pavements, the Texas DOT declared 1999 the Year of Recycled Roadway Materials. To spotlight the variety of reclaimed materials that can be utilized in road construction, each month was assigned a reclaimed or recycled material of benefit to roadways.

Each month in 1999 an information packet was sent to TxDOT road construction and maintenance personnel, contractors, material suppliers, recycled materials generators, and local road construction personnel, focusing on that month's recycled product. June celebrated reclaimed asphalt pavements, and hot in-place recycling was described in the material.

Read more about 1999 and Texas' efforts on reclaimed materials in pavements at:

<http://www.dot.state.tx.us/>

coat that normally is required when we have an asphalt overlay. The tack coat is the most disturbing element for the traveling public because when vehicles cross the lanes to be paved, they pick up the tack coat, and it actually can get onto the cars — and into businesses — creating a nuisance.”

“This process does not require any tack coat,” he said, “In advance of the paving operation there is no tack in the roadway, and as we required ingress and egress to driveways from the open lanes, the process avoids spreading of the tack coat on passenger vehicles that would be traveling the roadway near the rehab operation, or into the parking lots of the businesses.”

“State Highway 6 is a six-lane urban arterial with a continuous turning lane,” Yrigoyen said. “They treated the existing asphalt surface down to 1-inch deep, and added a rejuvenating agent. Immediately behind they placed 1 inch of new asphalt, and compacted the two layers. A good bonding was created between the new and recycled surfaces.”

A specification permitting HIR with new asphalt overlay has been in place in Houston for about a year, Yrigoyen said, so the year 2000 represented the first year large-scale HIR has taken place there.

“So far we have not had any problems, although the process is new in our area,” he said. “We expect that this will be a good way to overlay our roadways, but time will tell.”

Yrigoyen’s office undertook two other repaving contracts by Cutler in summer 2000, on completely different types of roadways. They were the I-10 frontage roads, a two-month project of approximately 220,000 square yards of full-service highways paralleling an interstate expressway; and FM 159, a two-lane highway in Waller County, Tex. There, 92,000 square yards were repaved in and around Hempstead, Tex., including sections with curb-and-gutter. ■

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*The Texas Department of Transportation*

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