



Hot-in-Place Asphalt Recycling in Oklahoma

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OTA Asphalt Turnpikes



- Turner Turnpike
 - ✓ Opened to traffic May 1953
 - ✓ Full-depth asphalt, 86 miles in length
 - ✓ 28,000 ADT
 - ✓ Connecting Metropolitan Areas, Oklahoma City to Tulsa
- Will Rogers Turnpike
 - ✓ Opened to traffic June 1957
 - ✓ Full Depth asphalt, 88.5 miles in length
 - ✓ 33,000 ADT
 - ✓ Connecting Northeast Tulsa to Joplin, MO

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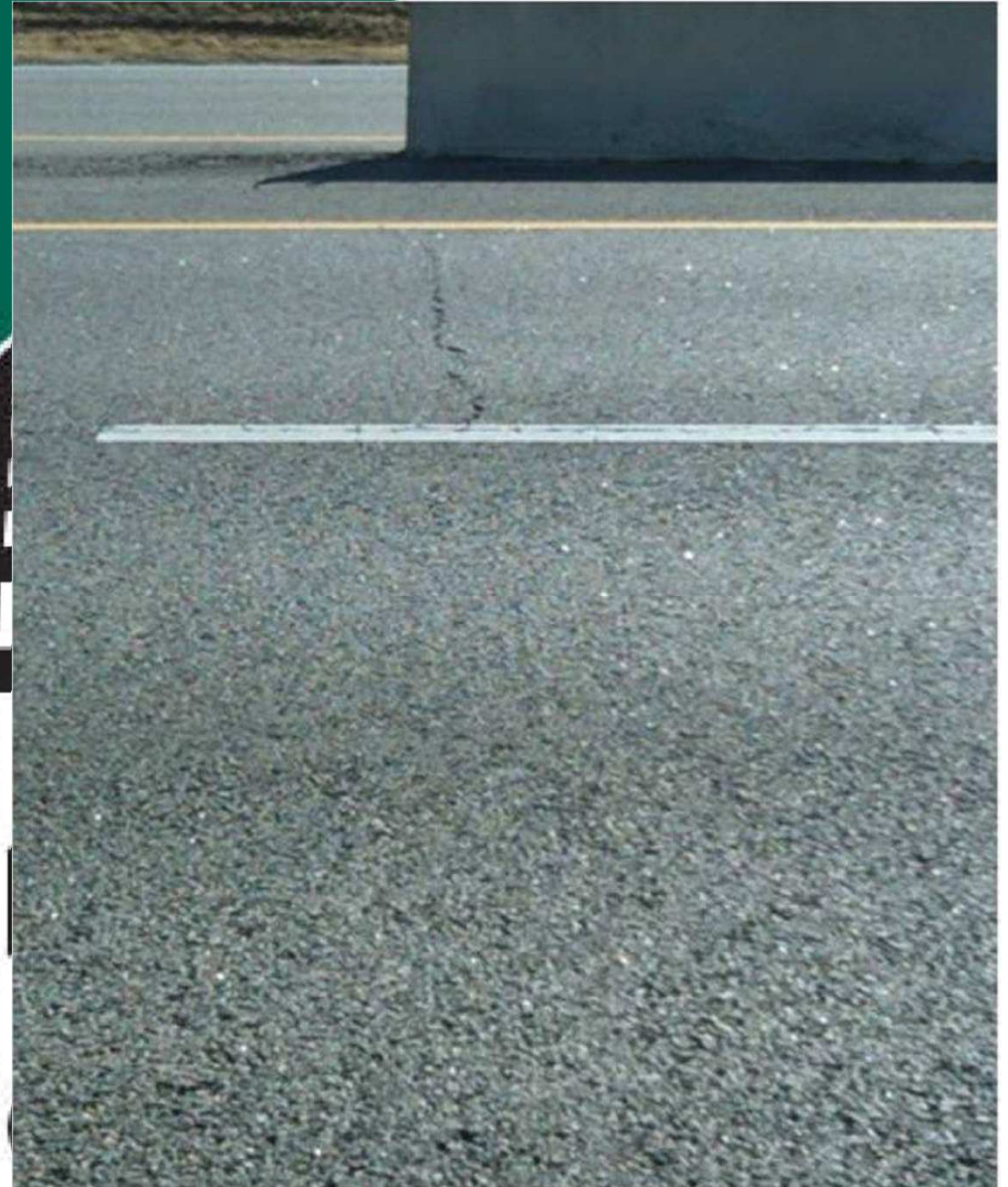
Introduction of HIR at OTA

- June 2006
 - ✓ 1 mile demo on Turner Turnpike, MP 194 WB driving lane
 - ✓ Work performed concurrently with an inlay of the passing lanes
 - ✓ All lanes were capped with an Ultra-Thin Bonded Wearing Course



HIR Demo Performance

- Turner Turnpike experiences heavy truck traffic ~ 20%
- 2 years after the Demo
 - ✓ The inside/passing lane that received the virgin mix shows a crack thru the UTBWC
 - ✓ The outside/driving lane that received the HIR demo did not exhibit any signs of crack propagation



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OTA Design Selection Process



- OTA performs a detailed Engineering Report
- Report typically includes options for:
 - ✓ 10 year pavement life
 - ✓ 15 year pavement life
 - ✓ 20 year pavement life
 - ✓ Reconstruction Option, typically 35-40 year pavement life
- Engineering Obstacles:
 - ✓ Concrete median barrier with limited area for “build up”
 - ✓ Maintenance of existing bridge clearances at TPUs
 - ✓ Limited Funding Available

Why consider HIR?



- Ability to Utilize Short-term Lane Closures
- Elimination of Edge Drop-offs
- Reduced Exposure of Milled Surfaces to Elements
- Cost Comparison
- Speed of Construction

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Potential Obstacles

- Requires suitable base structure to withstand equipment loading
- Should not be the final surface course
- OTA considers this option on rehabilitation contracts that will receive a surface or wearing course to cap the HIR.



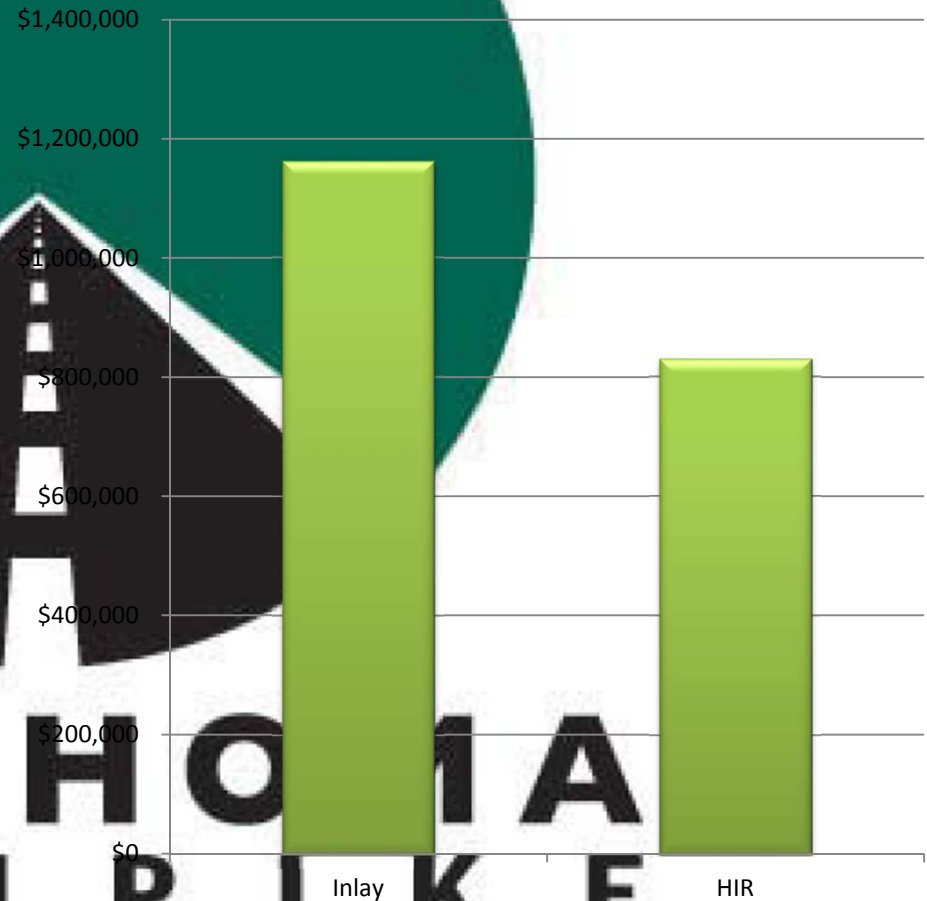
When HIR becomes desirable...

- 2" inlay of driving lanes using Virgin Mix
 - ✓ OTA uses Superpave Type S4 (PG 76-28 OK), Nominal Maximum Size = ½ inch (12.5 mm)
 - ✓ Average Cost = \$68/ton
 - ✓ Average cost for a 2" inlay, 13 ft wide, 1 mile long \$58,100
- 2" inlay of driving lanes using In-Place Recycle
 - ✓ Work consists of 2 pay items:
 1. Hot-in-Place Recycled Asphalt Concrete = \$3.75/SY
 2. Hot-in-Place Asphalt Emulsion = \$750/ton
 - ✓ Average cost of 2" in-place recycle, 13 ft wide, 1 mile long \$41,500

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When HIR becomes desirable...

- Cost Savings on a 5 mile contract, 4 lanes wide
 - ✓ \$332,000 savings
 - ✓ approximately 30% reduction of contract item work
- 100% Recycled Material



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How do we ensure quality ?

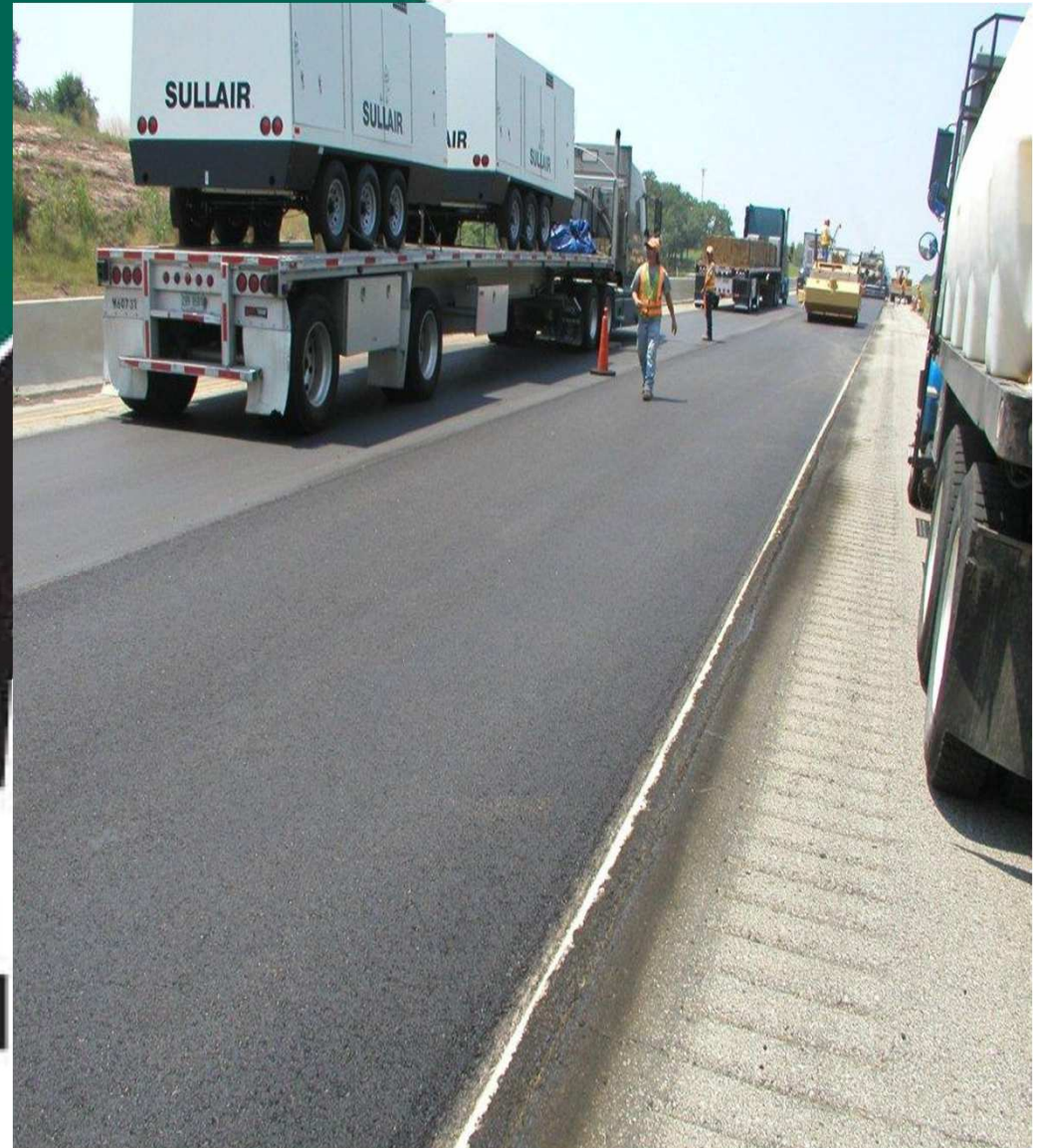
- Quality Control Testing
 - ✓ Asphalt Emulsion Content
 - ✓ Rice Specific Gravity
 - ✓ Depth Checks every $\frac{1}{4}$ mile
- Compaction Requirement
 - ✓ Require same compaction efforts as Hot-Mix
 - ✓ Minimum 92.0% of Maximum Theoretical Specific Gravity at JMF emulsion content
 - ✓ Test by core or nuclear method

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\$\$\$ Time is Money \$\$\$

- Can utilize temporary lane closures during working hours only
- Can typically cover 3.5 lane miles in a days operation vs. 1-1.5 miles of inlay
- If a weather event occurs, can pick up equipment and move off road fairly quickly
- Full traffic can drive on completed section within 45 minutes to an hour

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HIR Contracts

- Completed Contracts

- ✓ T-MC-96, 40 lane miles
- ✓ T-MC-97, 24 lane miles
- ✓ WR-MC-112, 38 lane miles

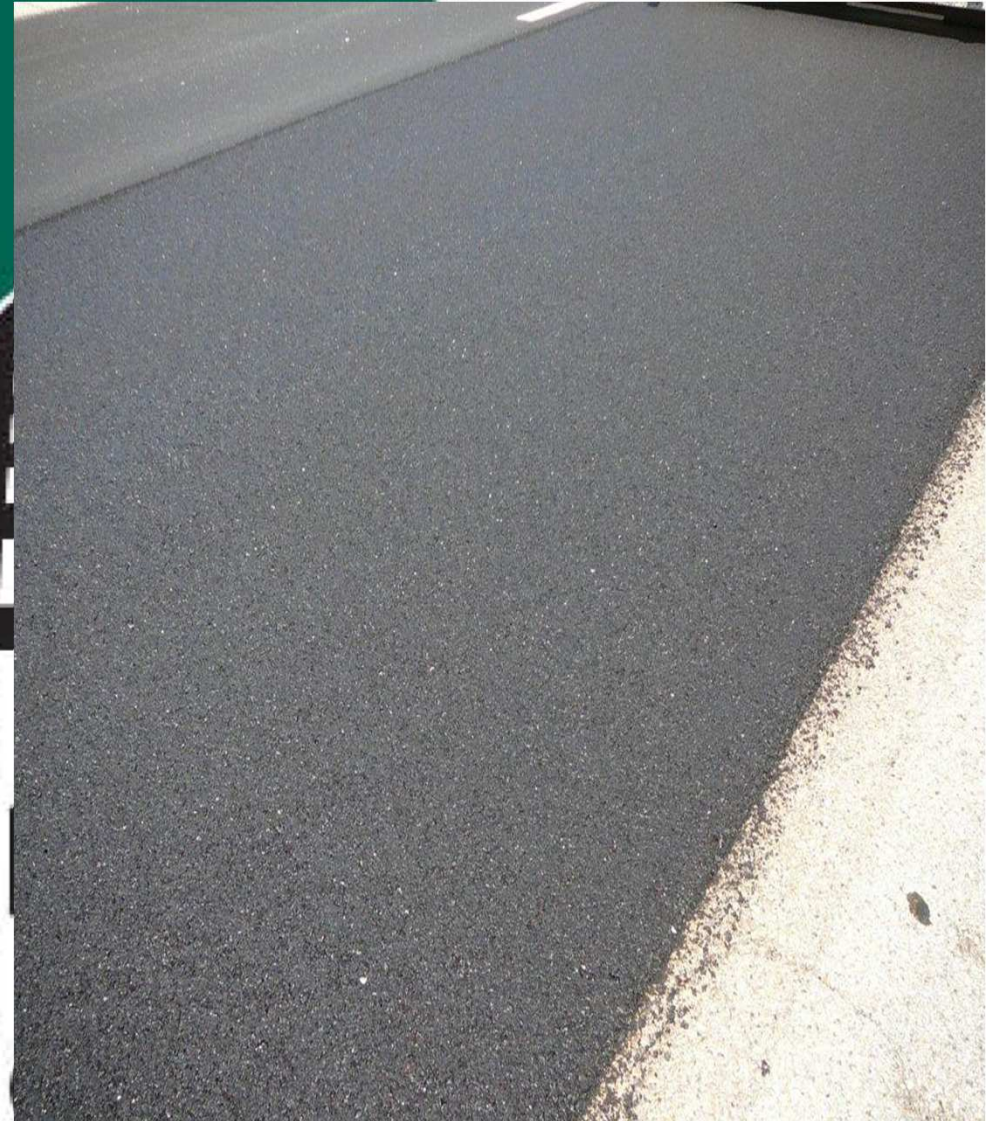
- Current Contracts

- ✓ WR-MC-113A, 27 lane miles
- ✓ WR-MC-117, 19 lane miles

- Upcoming Contracts

- ✓ WR-MC-113B, 17 lane miles
- ✓ Considering inclusion on other rehabilitation contracts

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Questions ???

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