

Hot inPlace



RECYCLING

Presented by:
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Sneak Preview. . .

- Saves Money
- Saves Time
- Reduces User Delays
- Reduces Carbon Footprint
- Reuses Existing Pavement

Who is **GALLAGHER** ? **ASPHALT**

- Founded in 1928
- 3rd-Generation, Family-owned Highway Paving Contractor
- Asphalt Plants throughout the Chicagoland area
- Well-respected and active member of NAPA, ARTBA, NCAT, ARRA
- Hot-in-Place Recycler for over 65 years
- 3rd Largest HIP Recycler in the U.S.



Agencies We've Worked For...

- Waukesha County, WI
- Hayward, CA
- Lake County, IN
- Tinley Park, IL
- Adams County, OH
- Roxbury Township, NJ
- Howard County, MD
- St. Louis County, MN
- Lafayette County, WI
- Obion County, TN
- Cobb County, GA
- Atlanta, GA
- Chisago County, MN
- Ingham County, MI
- DeWitt County, IL
- St. Louis County, MO
- Bernards Township, NJ
- Wilkin County, MN
- Cook County, IL
- Bartow County, GA
- Washington County, TN
- Rock Island, IL

What is Asphalt Recycling and Pavement Preservation?

Milling



Hot-in-Place Recycling



Cold-in-Place Recycling

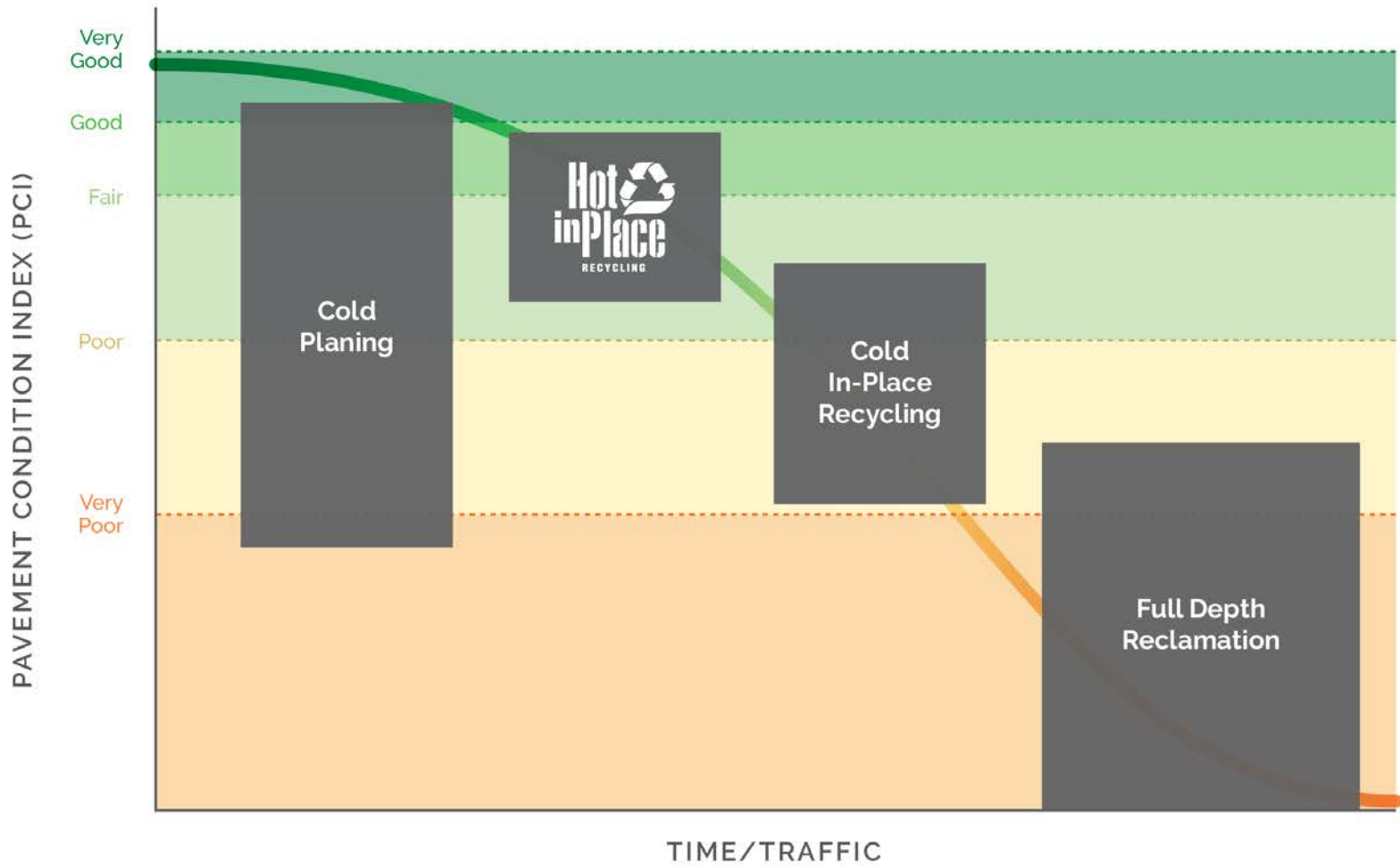


Full Depth Reclamation



Soil Stabilization





ADMINISTRATOR'S MESSAGE:

The National Highway System (NHS) is extensive, with over 160,000 miles of highway pavements and over 128,000 structures, built using large quantities of asphalt, concrete, steel, and aggregate, and smaller quantities of nonferrous metals, plastics, and other materials. Much of the system was constructed in the 1960's and 70's and is in need of major rehabilitation or total reconstruction; and much of the materials used to build that system can be recycled for use in the new construction.

In order to carry out the mission of the FHWA, i.e., to "improve the quality of the Nation's highway system," the NHS must be properly preserved, maintained, rehabilitated, and when necessary, reconstructed. Maintenance of highways and associated structures is critical to our ability to provide the safest, most efficient roadway system possible, while simultaneously providing the greatest level of protection to the human and natural environment.

The same materials used to build the original highway system can be re-used to repair, reconstruct, and maintain them. Where appropriate, recycling of aggregates and other highway construction materials makes sound economic, environmental, and engineering sense. The economic benefits from the re-use of nonrenewable highway materials can provide a great boost to the highway industry. Recycling highway construction materials can be a cost-saving measure, freeing funds for additional highway construction, rehabilitation, preservation or maintenance.

Congress declares that it is in the national interest to promote the use of innovative technologies and practices that increase the efficiency of construction of, improve the safety of, and extend the service life of highways and bridges... The innovative technologies and practices described in paragraph (1) include state-of-the-art intelligent transportation system technologies, elevated performance standards, and new highway construction business practices that improve highway safety and quality, accelerate project delivery, and reduce congestion related to highway construction... such as... (ii) innovative construction equipment, materials, or techniques, including the use of in-place recycling technology and digital 3-dimensional modeling technologies;



What is the Hot-in-Place Recycling **SURFACE METHOD?**

Hot-In-Place Recycling Surface Method is an on-site, in place, pavement rehabilitation method that consists of **heating, scarifying, mixing, replacing and re-compacting** the existing bituminous pavement.



HIR as an Alternative to:

- Mill & Overlay
- Hotmix Overlay
- Precursor to Chip Sealing or Microsurfacing
- Watermain Replacement Streets

Pre-requisites for HIR:

- Pavement must have at least 3” of hotmix asphalt
- Pavement must be structurally-sound with no base failures
- Pavement must not contain petromat within top 2.5”
- Multiple layers of chip seal pavements can be problematic
- Rubberized Crack Filler is very problematic



What is the Conventional Heater Scarification **SURFACE METHOD?**

Surface Recycling: Step 1

- 1st Pre-Heater takes pavement temp to 180 – 200 degrees

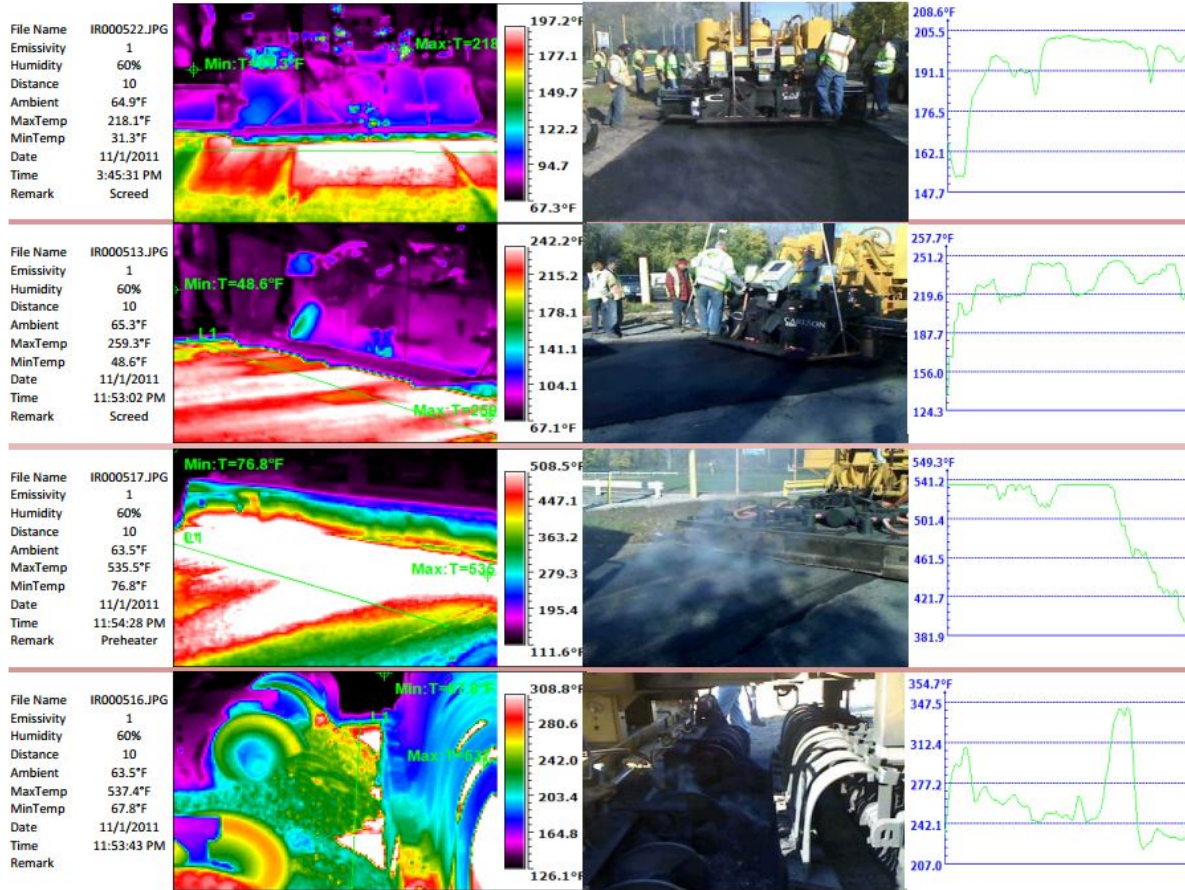


Surface Recycling: Step 2

- 2nd Heater takes pavement temp to 280 – 300 degrees



Thermo Study





Surface Recycling: Step 3

- Introduction of rejuvenating agent



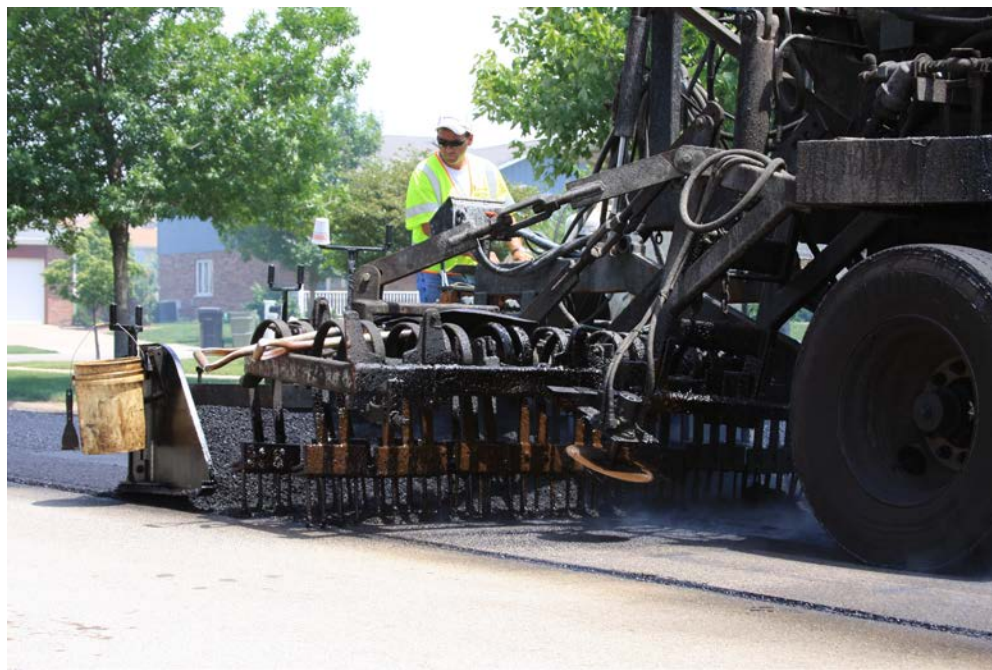
Rejuvenating Agent Application Rate

HIR introduces a rejuvenating agent typically at the rate of 1/10th gallon per square yard.



Surface Recycling: Step 4

- Spring-loaded tines set hydraulically at prescribed depth will drag over existing structures to avoid damage



Surface Recycling: Step 5

- Full width reversible augers to re-mix



Surface Recycling: Step 6

- Re-profiling with standard paving screed



Surface Recycling: Step 7

- Roller



Open to Traffic. . .



Surface Recycling: Step 8

The now re-plasticized asphalt is ready to receive its final surface course; such as:

- Hotmix
- Microsurface
- Slurry Surface
- Chip Seal



What Types of Asphalt Pavements Are Candidates for Hot-in-Place?

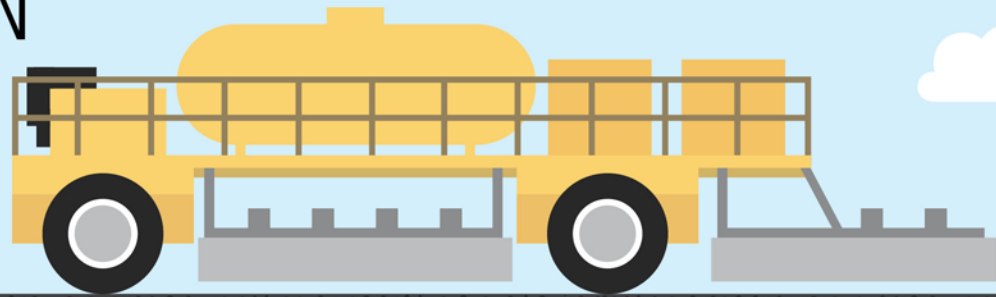
Typical Candidates for HIR:



NON-Candidates for HIR:



COST SAVINGS COMPARISON



1.5" HOT IN-PLACE RECYCLING (HIR)

\$4.75/SY

CHIP SEAL

\$1.50/SY

2" MILL & OVERLAY

Various putdown price points per ton + \$2/SY for milling

COST SAVINGS

\$65/TON

18%
SAVINGS

\$8.83
2" Traditional Mill & Fill
vs.
\$7.25
1.5" HIR Chip Seal

\$75/TON

27%
SAVINGS

\$9.88
2" Traditional Mill & Fill
vs.
\$7.25
1.5" HIR Chip Seal

\$85/TON

34%
SAVINGS

\$10.93
2" Traditional Mill & Fill
vs.
\$7.25
1.5" HIR Chip Seal



hotinplacerecycling.com

HIR PRICE COMPARISON 2017-18	\$/SY	Savings %	\$/Lane-Mile	Savings / Lane-Mile
Traditional 2" Mill & Fill vs 1.5" HIR + 1.5" surface overlay	\$12.88 \$10.66	17%	\$90,640.00 \$75,020.00	\$15,620.00
Traditional 2" Mill & Fill vs 1.5" HIR + Microsurfacing	\$12.88 \$8.58	33%	\$90,640.00 \$60,403.20	\$30,236.80
Traditional 2" Mill & Fill vs 1.5" HIR + PME Chip Seal	\$12.88 \$8.05	37%	\$90,640.00 \$56,672.00	\$33,968.00
Traditional 2" Mill & Fill vs 1.5" HIR + Chip Seal	\$12.88 \$7.00	46%	\$90,640.00 \$49,280.00	\$41,360.00
Traditional 2" Mill & Fill vs 1.5" HIR + Slurry Seal	\$12.88 \$6.80	47%	\$90,640.00 \$47,872.00	\$42,768.00
Mill 1.5", Binder 1.5", Surface 1.5" vs 1.5" HIR + 1.5" surface overlay	\$15.37 \$10.66	31%	\$108,174.00 \$75,020.00	\$33,154.00
Mill 1.5", Binder 1.5", Surface 1.5" vs 1.5" HIR + 1.5" Surface overlay w/ edge milling	\$15.37 \$11.49	25%	\$108,174.00 \$80,886.67	\$27,287.33
2.5" CIR + 1.5" Surface overlay vs 1.5" HIR + 1.5" Surface overlay	\$15.23 \$10.66	30%	\$107,184.00 \$75,020.00	\$32,164.00

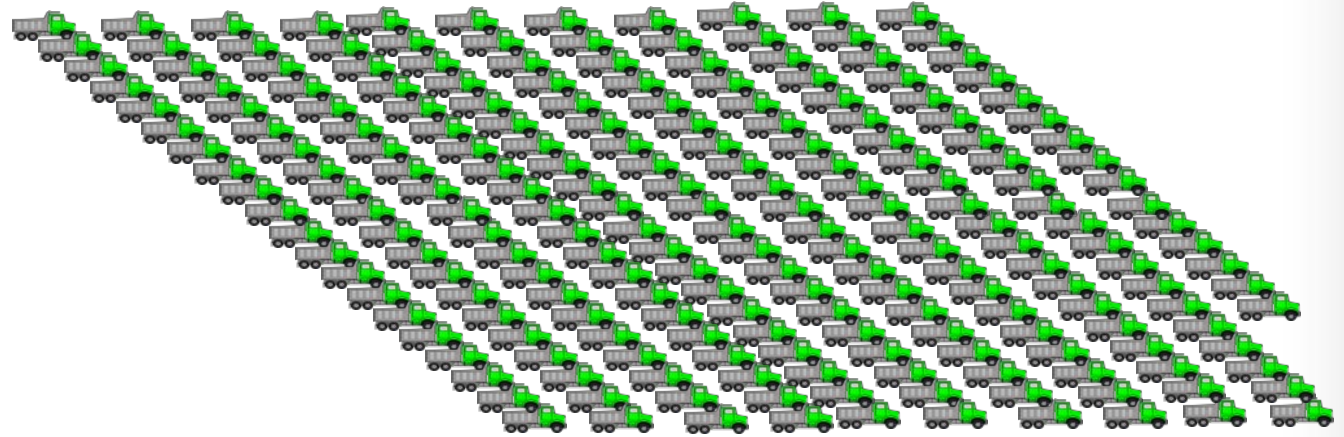
Service Life & PCI Improvement Comparisons

Process COMPARISON	Expected Service Life	Overall PCI Improvement
Traditional 2" Mill & Fill	15 +/-	40%+
Polymer Modified Chip Seal	6+/-	20%+
3.0" <u>CIR</u> + 1.5" Surface overlay	15 +/-	60-80%

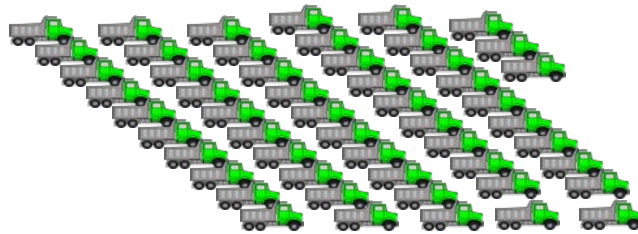
1.5" HIR + Slurry Seal	6 +/-	20-40%
1.5" HIR + Microsurfacing	6 +/-	20-40%
1.5" HIR + PME Chip Seal	6 +/-	20-40%
1.5" HIR + Chip Seal	8 +/-	20-40%
1.5" HIR + 1.5" Surface overlay	15 +/-	50%+
1.5" HIR + 1.5" Surface overlay w/ edge milling	15 +/-	50%+

Comparison: # of Truck Trips / Mile

**Standard 2 ¼ " Mill
& Overlay**
(215 trucks)



**HIR w/ 1" Hotmix
Overlay**
(53 trucks)



So What Have We Done?













Wisconsin



Missouri



Minnesota



Indiana

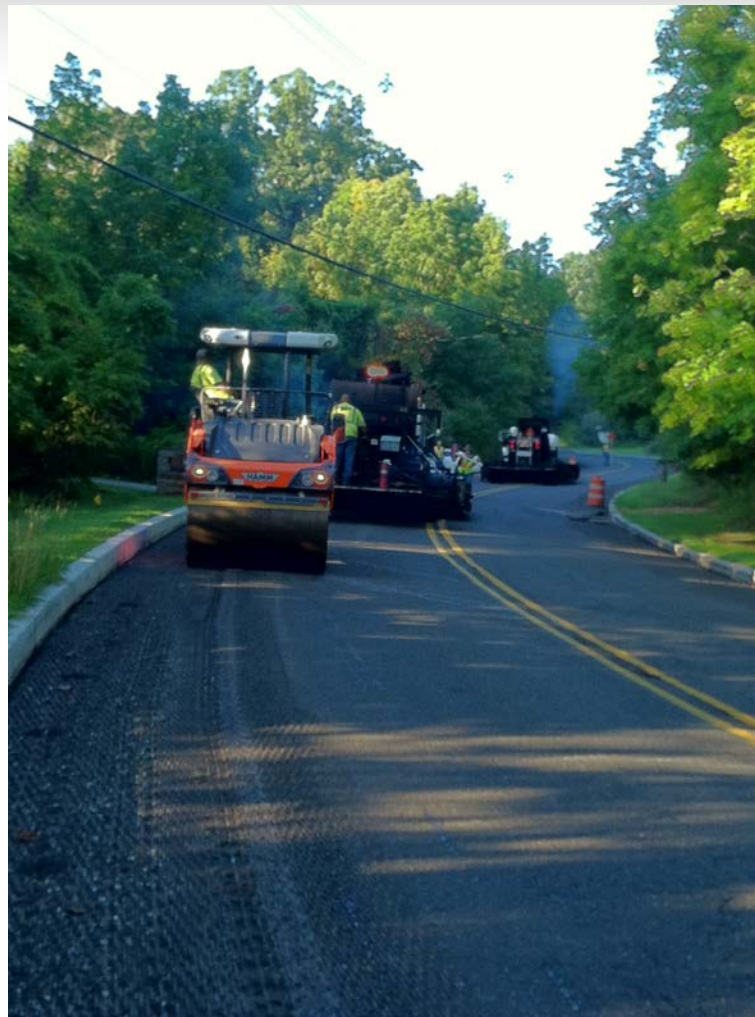




Ohio



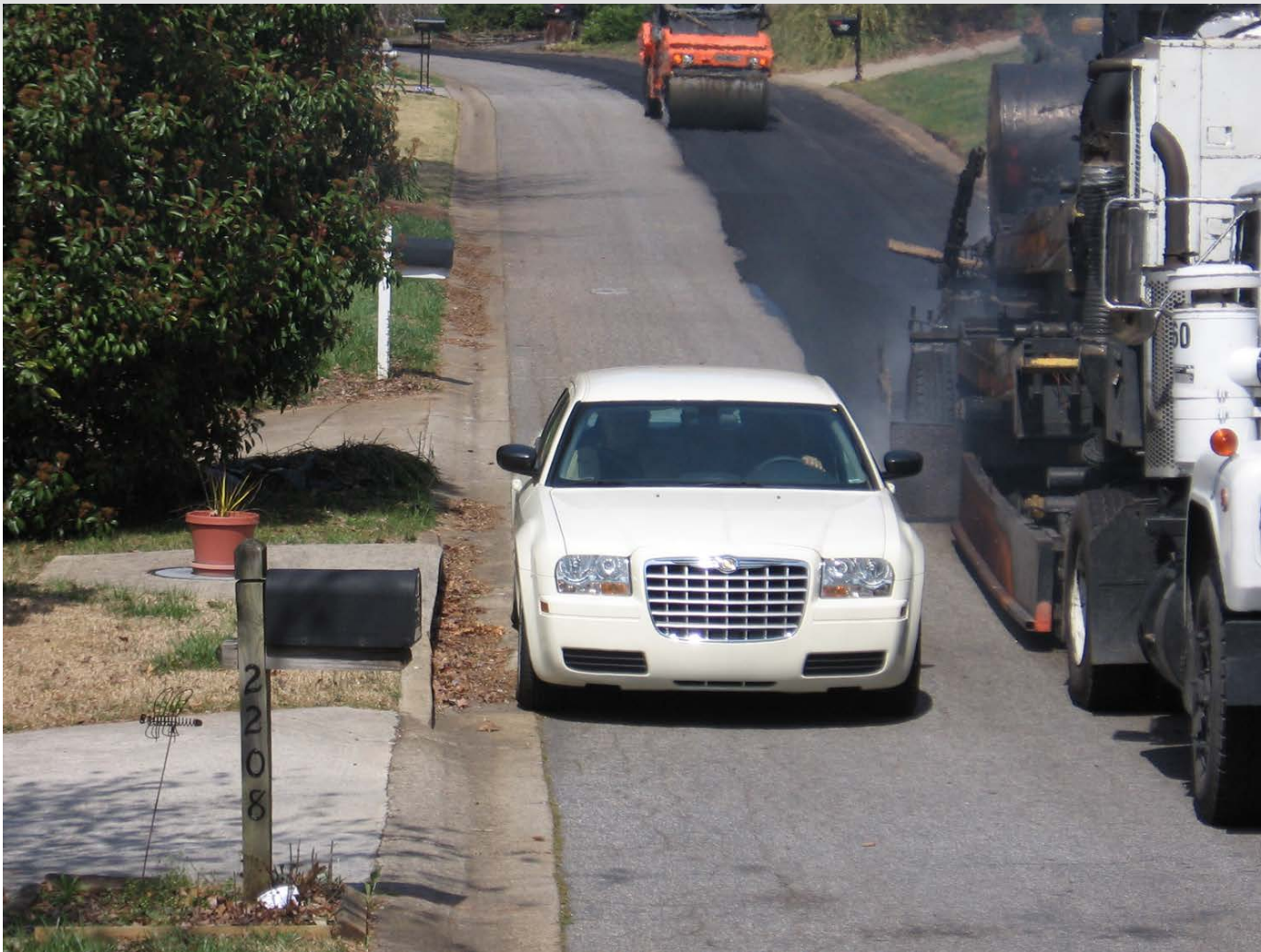
Tennessee



New Jersey



Oregon



Georgia

Key Take-Aways:

- **Nominal 1.5” Scarification Depth**
- **Preliminary Coring PRE-BID**
- **Budgetary Price: \$4.75/SY**
- **Minimum Quantity: 75,000-100,000 Sys**
- **Daily Production: 12,000 Sys**
- **Non-Proprietary**

The Bottom Line Re-Cap:

- Saves Money
- Saves Time
- Reduces User Delays
- Reduces Carbon Footprint/Green
- Reuses Existing Pavement
 - 100,000 Years!





SPEED
LIMIT
20
WHEN
CHILDREN
ARE PRESENT

3008



Life Green







Cobb County, Georgia

- Timing: Summer 2006
- Quantity: Approximately 50,000 SYs



GALGER
SERVAT

GALGER
SERVAT

ES301





Washington County, Minnesota

- Timing: Summer 2010
- Quantity: Approximately 60,000 SYs











Waukesha County, Wisconsin

- Process: Heater Scarification
- Timing: 2006 – 2012
- Quantity: 1 million+ SYs











City of Manistee, Michigan

- Timing: 2009
- Quantity: 63,000 SYs





STOP

Go Green, Save Green







A man in a yellow polo shirt and khaki pants stands on the grass to the left of the roller, looking down at the pavement.

A man in a blue long-sleeved shirt and jeans stands on the grass to the right of the roller, watching the work.

R87

HYPAC

R87

R87

GÄLCHER ASPHALT

W