

IDOT's Recycling Efforts and Development of Total Recycle Asphalt

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**Green
Road
Ahead**

IDOT – A Major Recycler

Utilization of Recycled and Reclaimed Materials in Illinois Highway Construction in 2010

PHYSICAL RESEARCH REPORT NO. 160

DECEMBER 2011



Illinois Department of Transportation

Division of Highways / Bureau of Materials and Physical Research
126 East Ash Street / Springfield, Illinois / 62704-4766

Utilization of Recycled Materials in Illinois Highway Construction

PHYSICAL RESEARCH REPORT NO. 142
MAY 2002



Illinois Department of Transportation

Utilization of Recycled and Reclaimed Materials in Illinois Highway Construction in 2009

PHYSICAL RESEARCH REPORT NO. 158
2011

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Recycled and Reclaimed Materials Utilized in Highway Construction 2010

Utilization of Recycled and
Reclaimed Materials in Illinois
Highway Construction in 2010

Very popular report especially
after elections

PHYSICAL RESEARCH REPORT NO. 142
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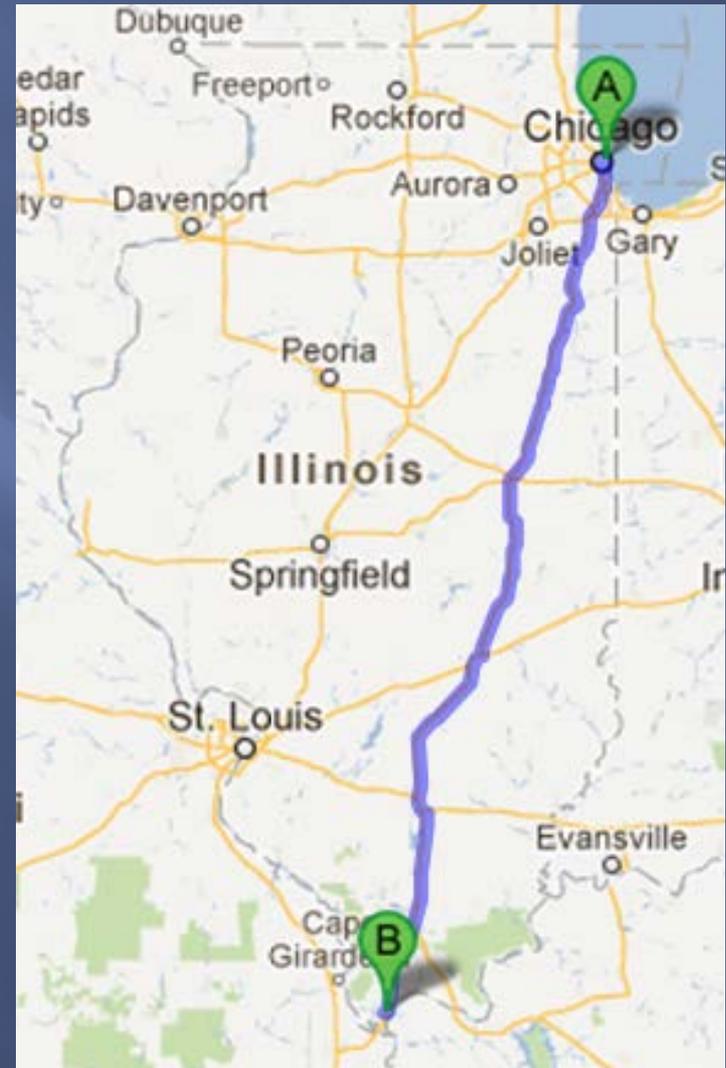
<http://www.dot.il.gov/materials/research/pdf/prr160.pdf>

Recycled and Reclaimed Materials Utilized in Highway Construction 2010

- **Air-Cooled Blast Furnace Slag**
- **By-Product Lime**
- **Crumb Rubber**
- **Fly Ash**
- **Glass Beads**
- **Glass Cullet**
- **Ground Granulated Blast Furnace Slag**
- **Microsilica**
- **Reclaimed Asphalt Pavement**
- **Reclaimed Asphalt Shingles**
- **Recycled Concrete Material**
- **Steel Reinforcement**
- **Steel Slag**
- **Wet-Bottom Boiler Slag**

2010 Recycling

- **1.7M Tons**
 - 73,913 semi truck loads
 - Line of Trucks 700 miles long
 - Downtown Chicago to Mississippi River on I-57 (both directions)
- **Value \$53M**



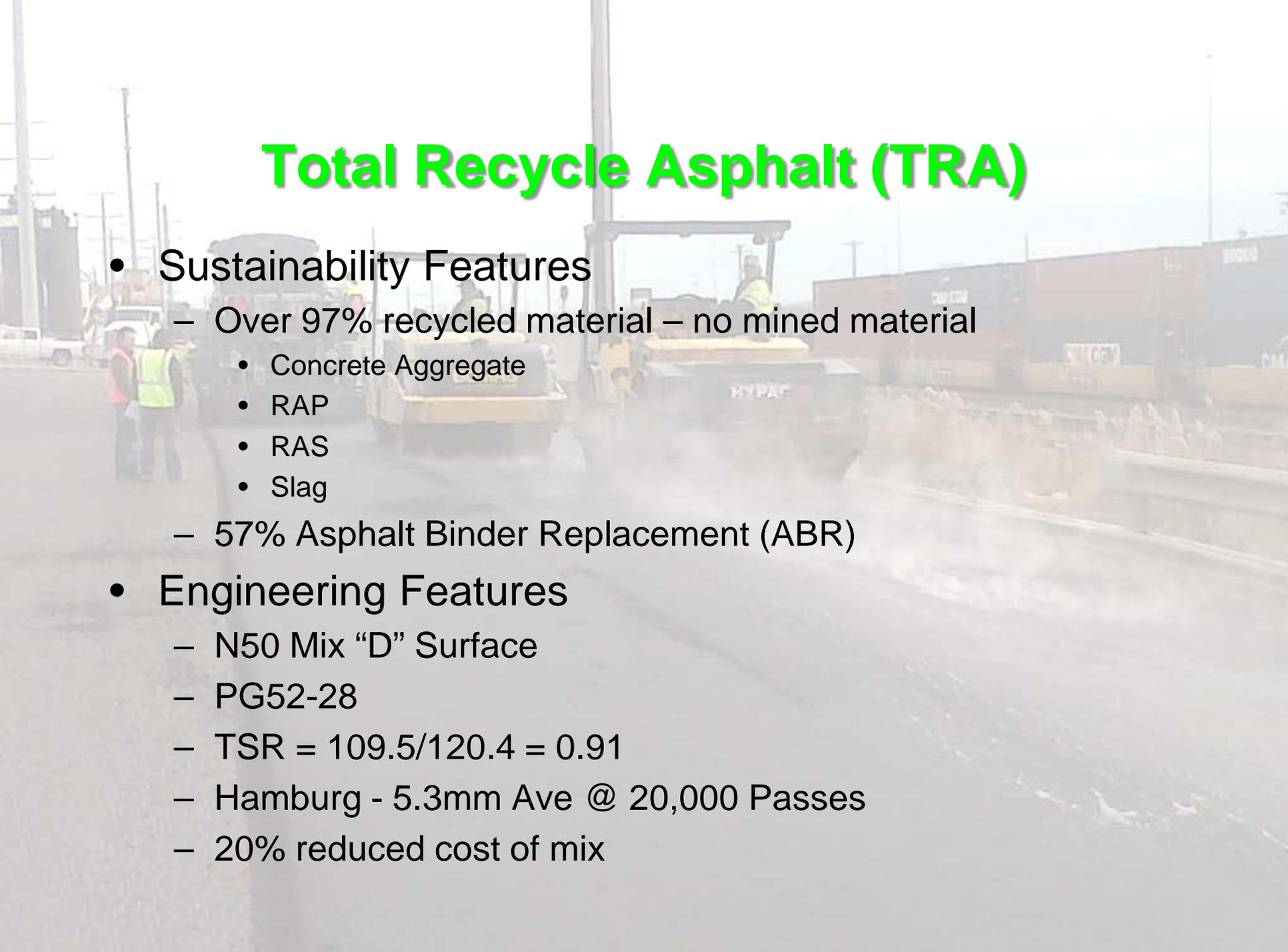
Recycling Research

- ▣ Past few years have completed several studies to address recycling issues
 - Quality of materials
 - Engineering of end product
 - Health and safety issues
- ▣ Illinois Center for Transportation
 - <http://www.dot.il.gov/materials/research/ict.html>
- ▣ Bureau of Materials and Physical Research
 - <http://www.dot.il.gov/materials/research/reports.html>
- ▣ FHWA – RAP Expert Task Group (ETG)
 - <http://www.morerap.us/index.html>

A construction site showing the paving of a road using recycled asphalt. In the foreground, a yellow BOMAG roller is compacting the surface, followed by a larger yellow HYPAC roller. To the left, two workers in high-visibility vests stand near a large truck. In the background, there are utility poles, a white car, and a train with blue and red containers. The sky is overcast.

**TOTAL RECYCLE
ASPHALT**

Total Recycle Asphalt (TRA)

The background image shows a road construction site. A large yellow roller, labeled 'HYPAC', is paving a road surface. In the background, there are several large blue and red storage containers or trailers. Two workers in high-visibility vests are visible on the left side of the road. The scene is outdoors, and the overall tone is slightly hazy or overcast.

- Sustainability Features

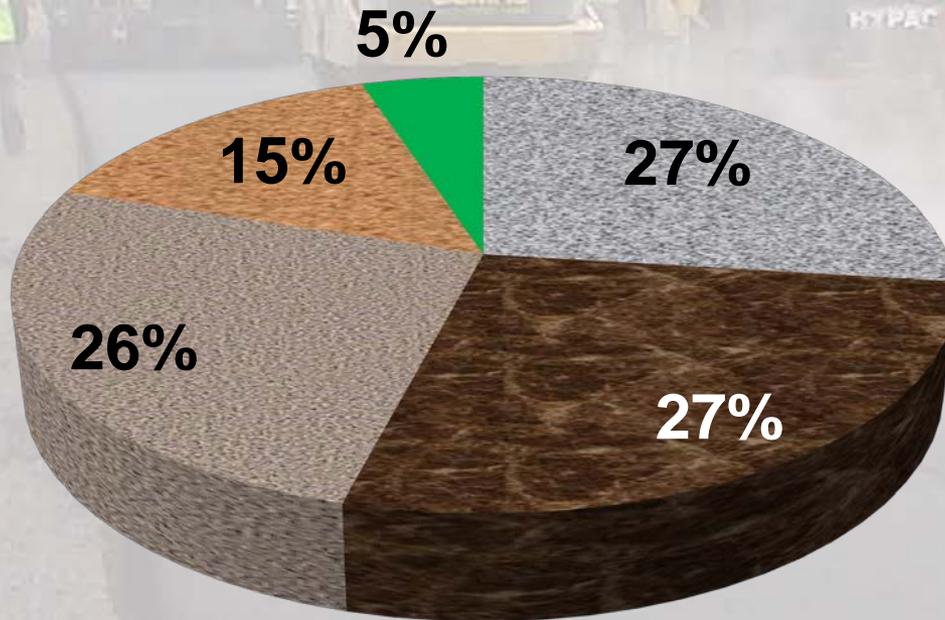
- Over 97% recycled material – no mined material
 - Concrete Aggregate
 - RAP
 - RAS
 - Slag
- 57% Asphalt Binder Replacement (ABR)

- Engineering Features

- N50 Mix “D” Surface
- PG52-28
- $TSR = 109.5/120.4 = 0.91$
- Hamburg - 5.3mm Ave @ 20,000 Passes
- 20% reduced cost of mix

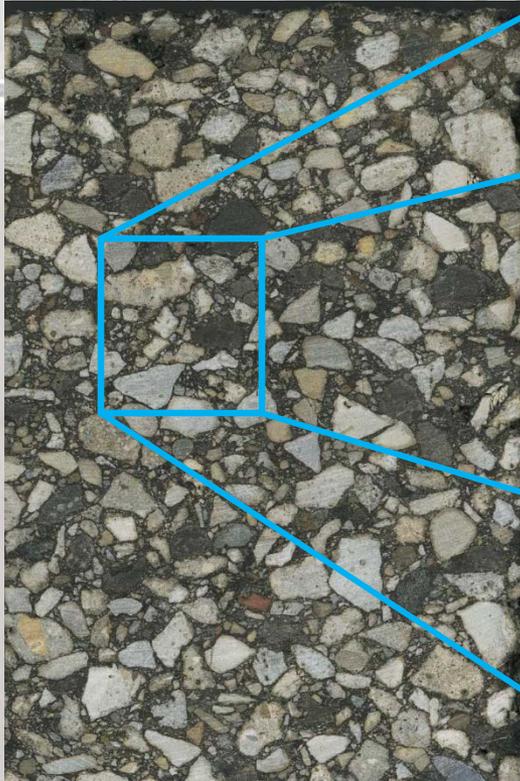
Mix Details

Aggregate Design
+2.8% PG 52-28



- Crushed Concrete
- Course FRAP
- Fine RAP
- Steel Slag
- Shingle - RAS

Total Recycle Asphalt



TRA Future

The background image shows a construction site with heavy machinery, including a yellow BOMAG roller and a yellow HYPAC roller, working on a road surface. Several workers in high-visibility vests are visible. In the background, there are large blue and red storage containers or trailers. The scene is slightly hazy, suggesting an overcast day.

- Testing of plant produced material
 - District
 - BMPR
 - ICT @ UIUC
- Demo projects 2013 construction
- Special Provision for use as soon as 2014



Questions