



# ASPHALT RECYCLING & RECLAIMING ASSOCIATION

ARRA 1976

# Asphalt Recycling 1975



# Recycling Fact

Asphalt is the most commonly recycled material on the face of the earth

# MEMBERSHIP of ARRA

- CONTRACTORS
- SUPPLIERS
- AFFILIATE MEMBERS

# DISCIPLINES of ARRA

- CP Cold Planning
- HR Hot Recycling
- HIR Hot In-Place Recycling
- CIR Cold In-Place Recycling
- FDR Full Depth Reclamation

# Hot In-Place Recycling

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A Rehabilitation Alternative



# 3 Types of HIR

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- Surface Recycling
- Surface Repaving
  - Remixing



# The Bottom Line Question

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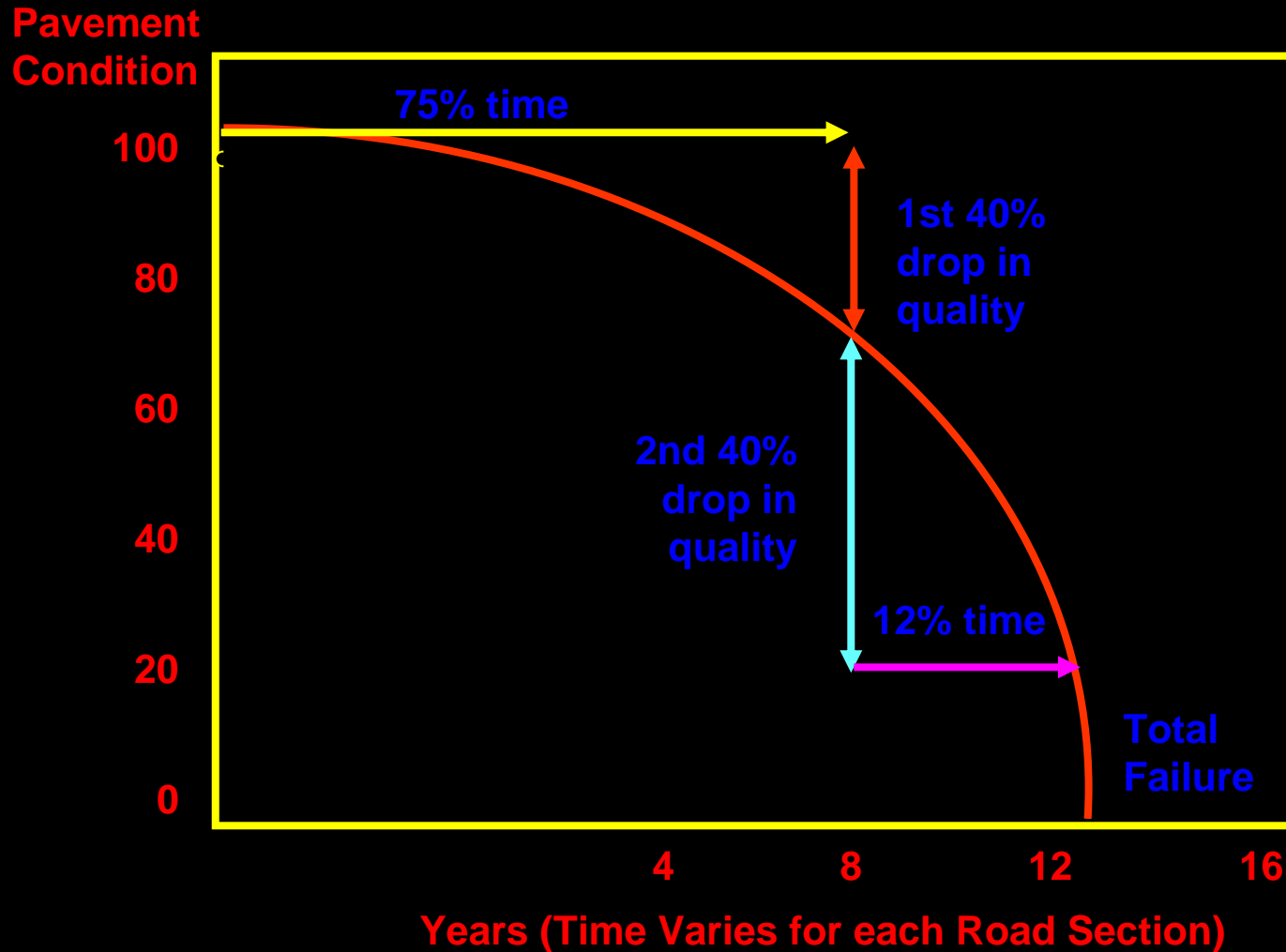
- How can I maximize the return on my investment in asphalt pavement rehabilitation funding?

# Answer

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- By repairing your asphalt pavement during the first 40% drop in quality

# The Cost of Timely Maintenance



Each \$1 spent during the first 40% drop in quality will cost \$4-5 if delayed until pavement loses 80% of its original quality.

# The Surface is the Critical Area

**Aging of asphalt pavement occurs  
most rapidly at the surface**

## ***Surface Defects***

- Ruts, Shoves & Bumps
- Patches & Utility Costs
- Reflective & Shrinkage Cracks
- Weathering, Bleeding & Raveling
- Pavement Geometry

# Surface Recycling

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Heating, reworking and rejuvenating the top one inch of an existing asphalt pavement in preparation of either a seal coat, micro-surfacing or overlay

































**WARNING**  
This machine is equipped with a hydraulic system. The hydraulic system is under high pressure. Do not touch or adjust the hydraulic system while the machine is running. Failure to follow these instructions could result in injury or death.

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# Surface Repaving

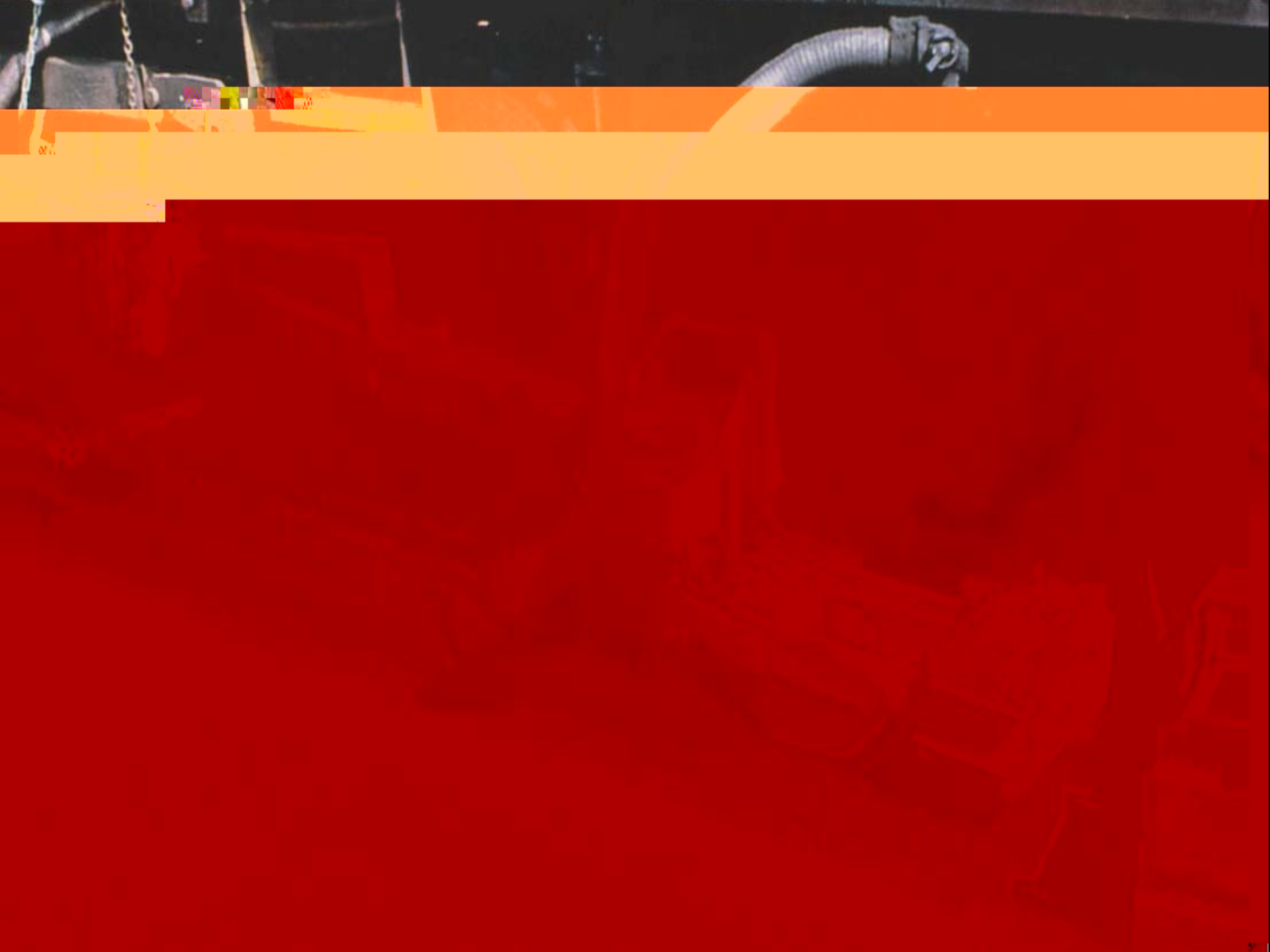
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Heating, reworking and rejuvenating the top one inch of an existing asphalt pavement and simultaneously applying an overlay while the temperature of the recycled layer is 200°F



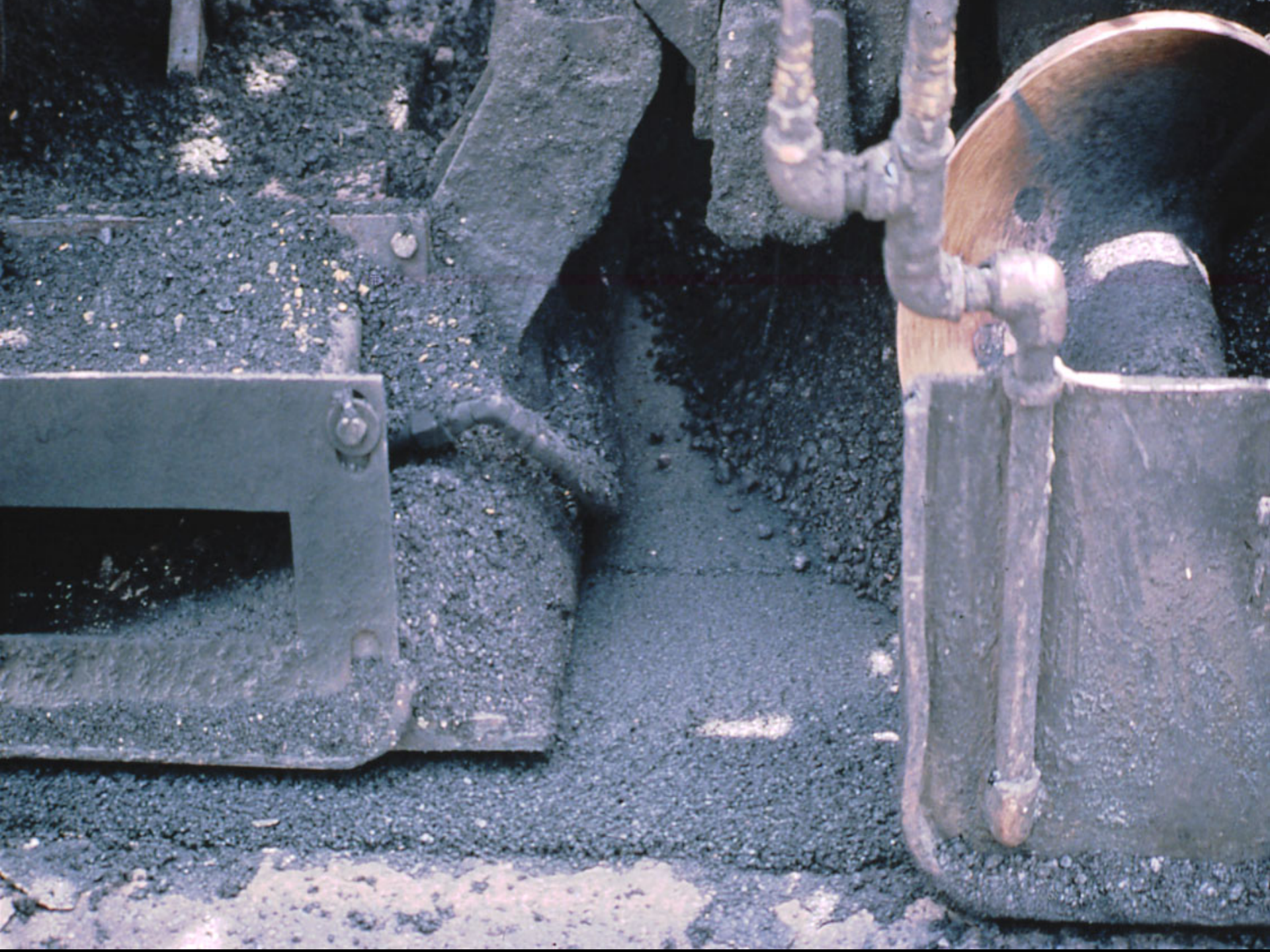
















# Urban Applications

- Curb line milling may be necessary
- Traffic easily controlled in work zone
- Environmental considerations



NO  
PARKING  
7:00 AM  
TO  
5:00 PM





# Remixing

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Heating, reworking and rejuvenating the top 1 to 1-1/2 inches of an existing asphalt pavement adding virgin admix and mixing the combined recycled and new material in a pugmill prior to laying, either as a binder or surface course.

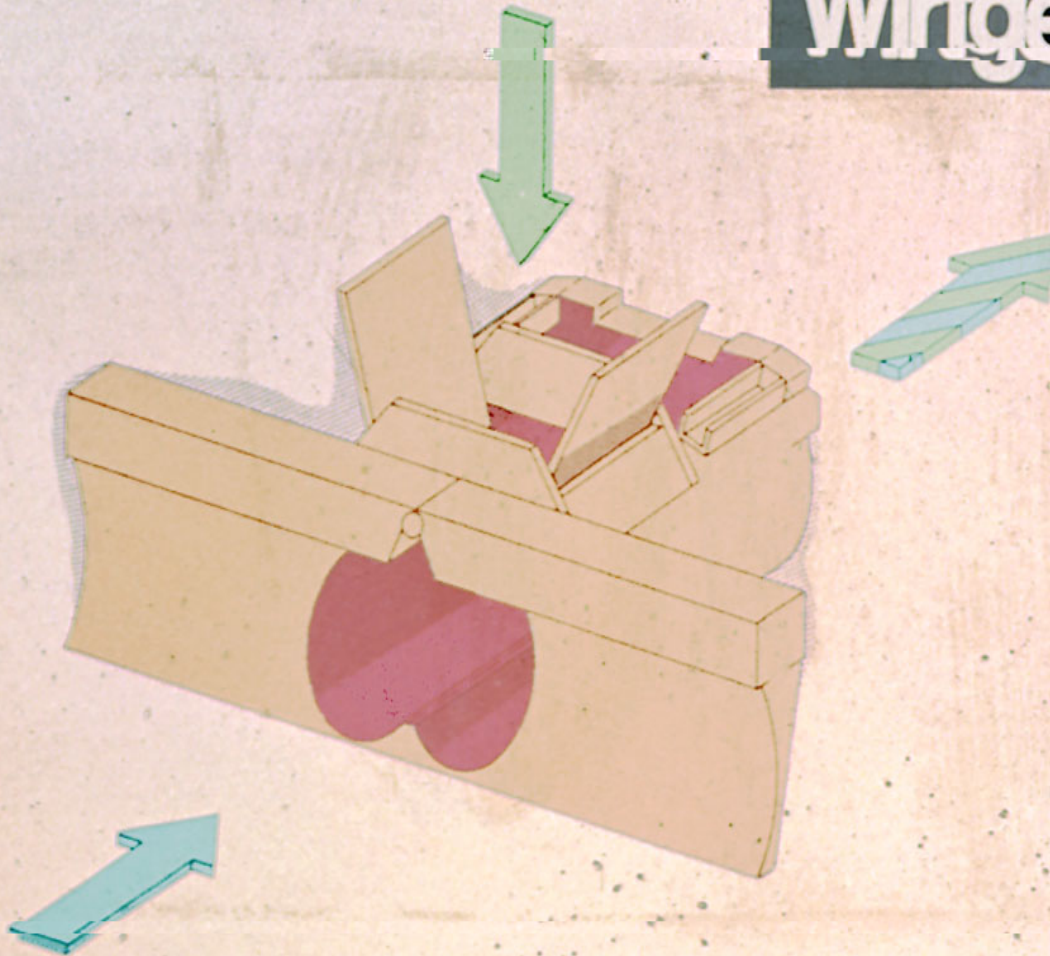




WIRTGEN  
REMXER

SLOAN

Wirtgen 



Mischwerk für Remixer









# Laydown



# Hot In-Place Recycling

- Treats surface to a depth of 1 inch
- A hot process
- Adds additional binder/modifier
- Adds additional hot mix asphalt
- Increase structural coefficient

# Recycling Depth Considerations

- Depth of existing HMA
- Depth of distress
- Recompaction considerations
- Smoothness considerations
- Asphalt content
- Age of asphalt cement

# Project Considerations

- Uniformity
- Depth of existing HMA
- Presence of Chip Seals
- Asphalt content (bleeding)
- Asphalt properties
- Traffic
- Types of pavement distress
- Environment

# Decision Making Process of Public Agency

- Field Samples
- Field tests
- Analysis
- Evaluation (pavement history)
- Options

# Potential HIPR Benefits

- Repairs Distress
- Extends Life
- Improves Ride Quality
- Improves Friction Coefficient
- Improves Appearance
- Improved Bonding
- Work completed in a single pass

