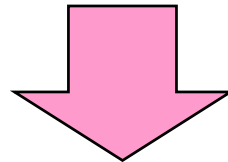

**HOT IN-PLACE THIN OVERLAY
FOR ROAD SURFACE MAINTENANCE
in JAPAN**

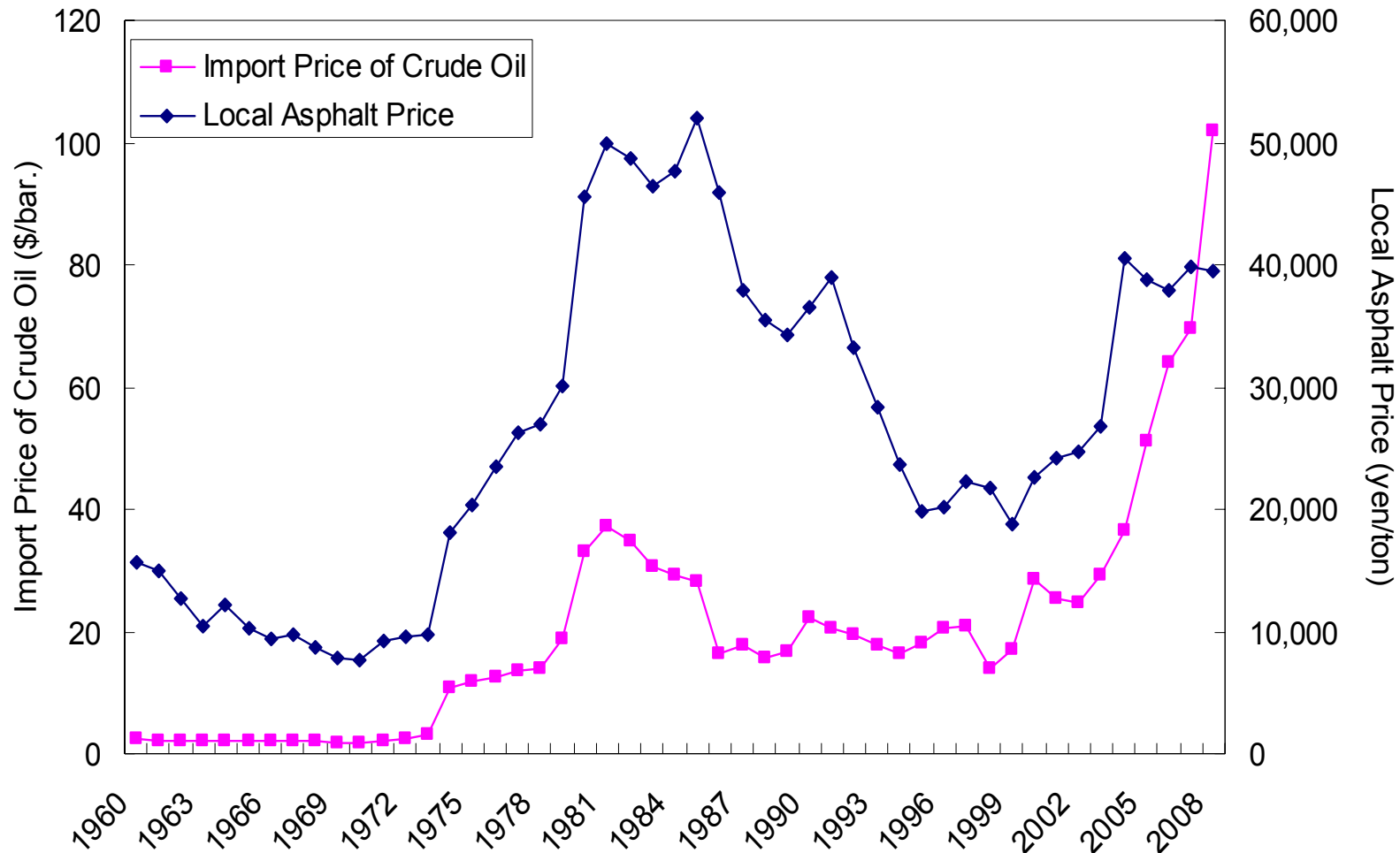
Background

- Economics Including Construction Cost & Long Life
- Resource Saving
- Safety Assurance
- CO₂ Reduction



Innovative Method beyond the Conventional Method

Material Price



-Source-

- Import Price of Crude Oil: Petroleum Association of Japan
- Local Asphalt Price: Construction Research Institute

Pavement Preservation Work Trend

- Increasing Crack Sealing & Patch Works;

Thin and Ultra-thin Hot-mix Asphalt Overlay

Slurry or Micro-Surfacing

Chip Sealing

Asphalt Crack Sealing

- Increasing Reuse & Recycling of the Asphalt Mixture in Use

Crack Sealing & Thin Hot Mix Asphalt Overlay



Pavement Preservation Guidelines

	Type of Activity	Increase Capacity	Increase Strength	Reduce Aging	Restore Serviceability
	New Construction	○	○	○	○
	Reconstruction	○	○	○	○
	Major (Heavy) Rehabilitation		○	○	○
	Structural Overlay		○	○	○
	Minor (Light) Rehabilitation			○	○
Pavement Preservation	Preventive Maintenance			○	○
	Routine Maintenance				○
	Corrective (Reactive) Maintenance				○
	Catastrophic Maintenance				○

Reference;
 U. S. Department of Transportation
 Federal Highway Administration

Summary

	Type of Activity	Increase Capacity	Increase Strength	Reduce Aging	Restore Serviceability
Pavement Preservation	New Construction	○	○	○	○
	Reconstruction	○	B	○	○
	Major (Heavy) Rehabilitation		○	○	○
	Structural Overlay		○	○	○
	Minor (Light) Rehabilitation			○	○
	Preventive Maintenance		A	○	○
	Routine Maintenance				○
	Corrective (Reactive) Maintenance				○
	Catastrophic Maintenance				○

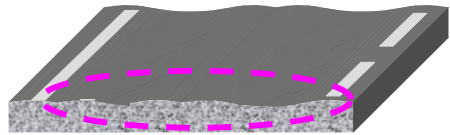
A: New Target Zone

Increase Strength

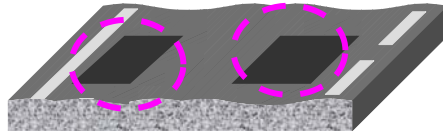
- Cost; $A < B$
- Resource Required; $A < B$
- CO_2 ; $A < B$
- Life (Innovative Method) > Life (Conventional Method)
- Serviceability (Innovative Method) > Serviceability (Conventional Method)

New Preservation Method=Hot In-place Thin Overlay

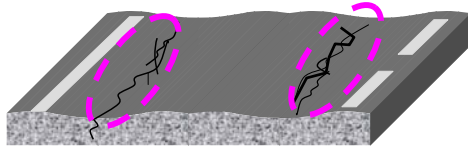
Light Distress



Rutting



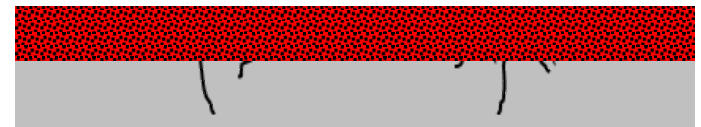
Patching



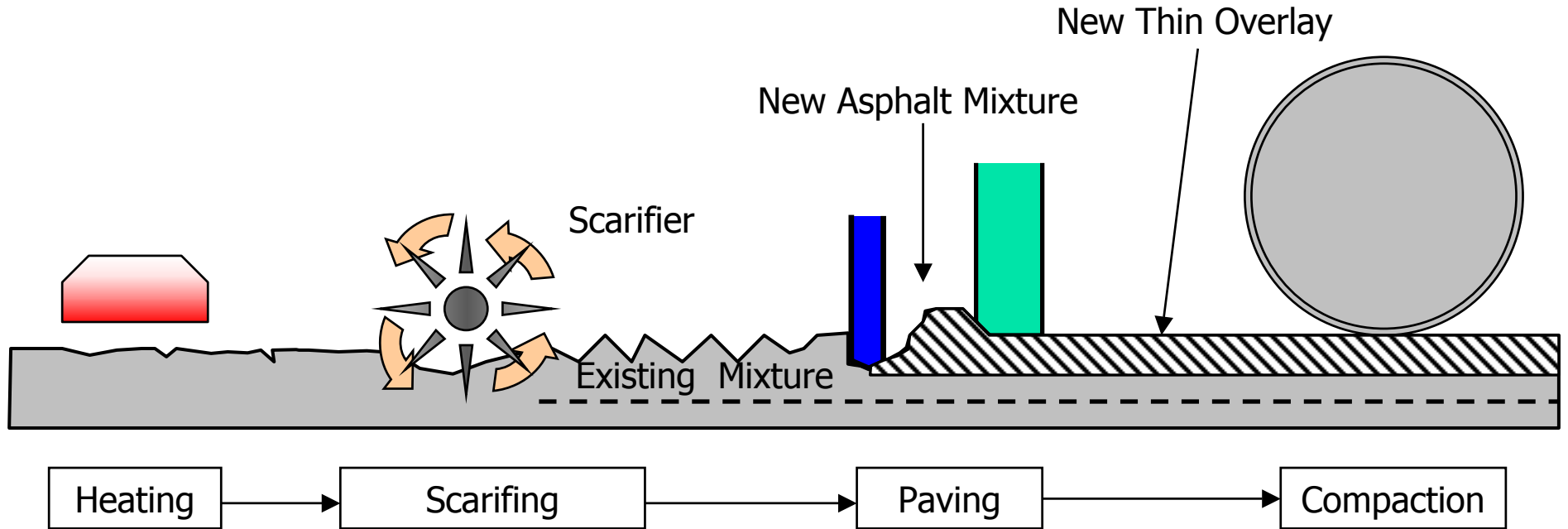
Crack



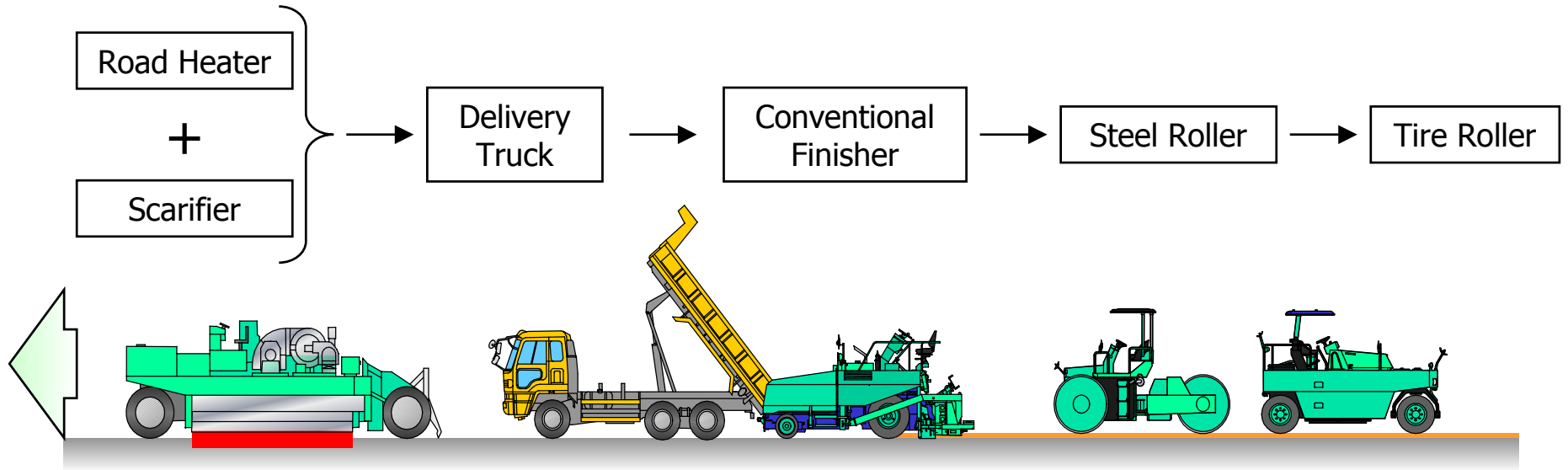
Structural Profile



Method of Hot In-place Thin Overlay (HITO)

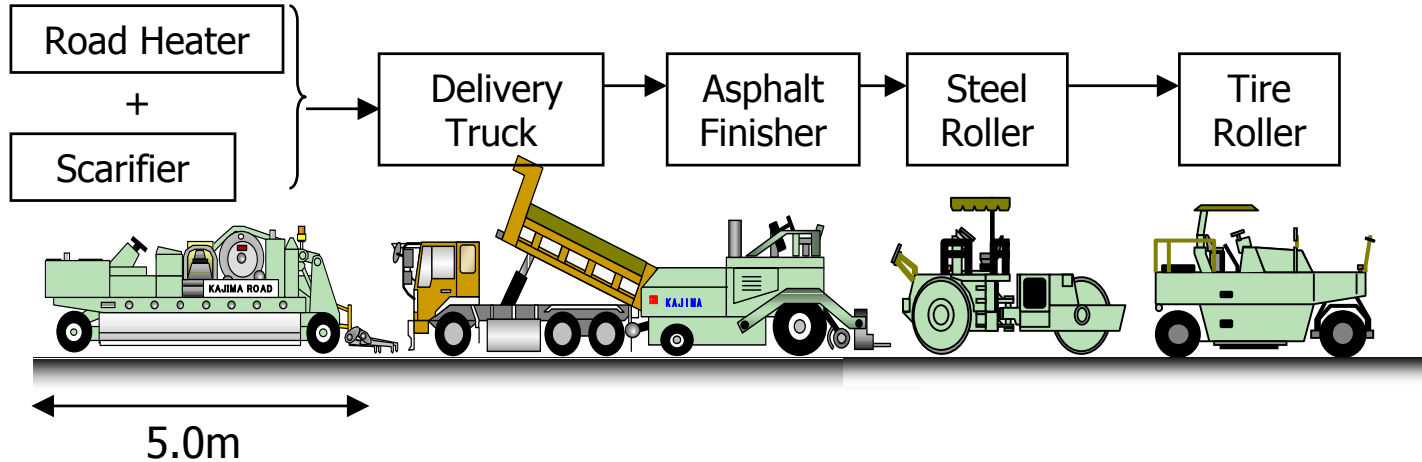


HITO Method

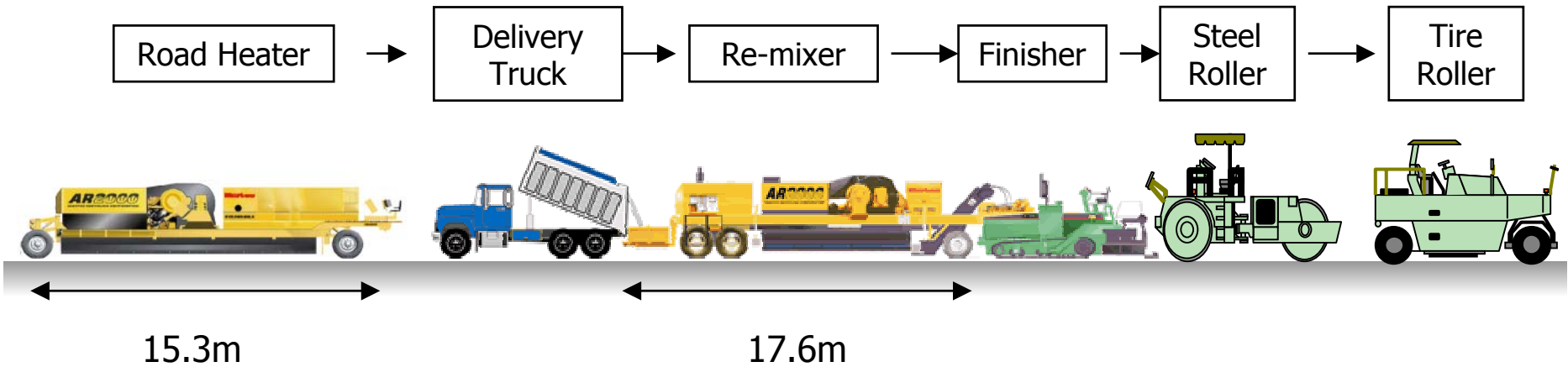


HITO vs HIR

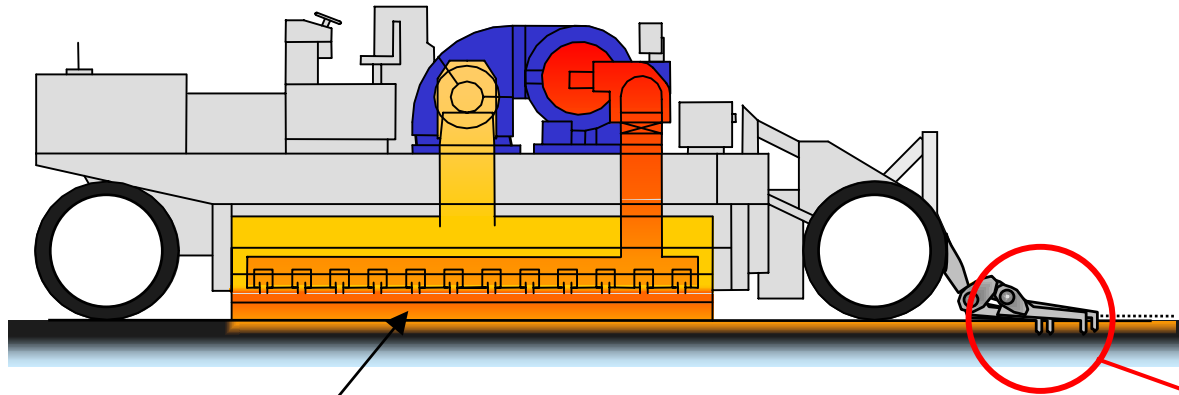
HITO Method



HIR Method



Key Technology of HITO



Hot Air Circulation

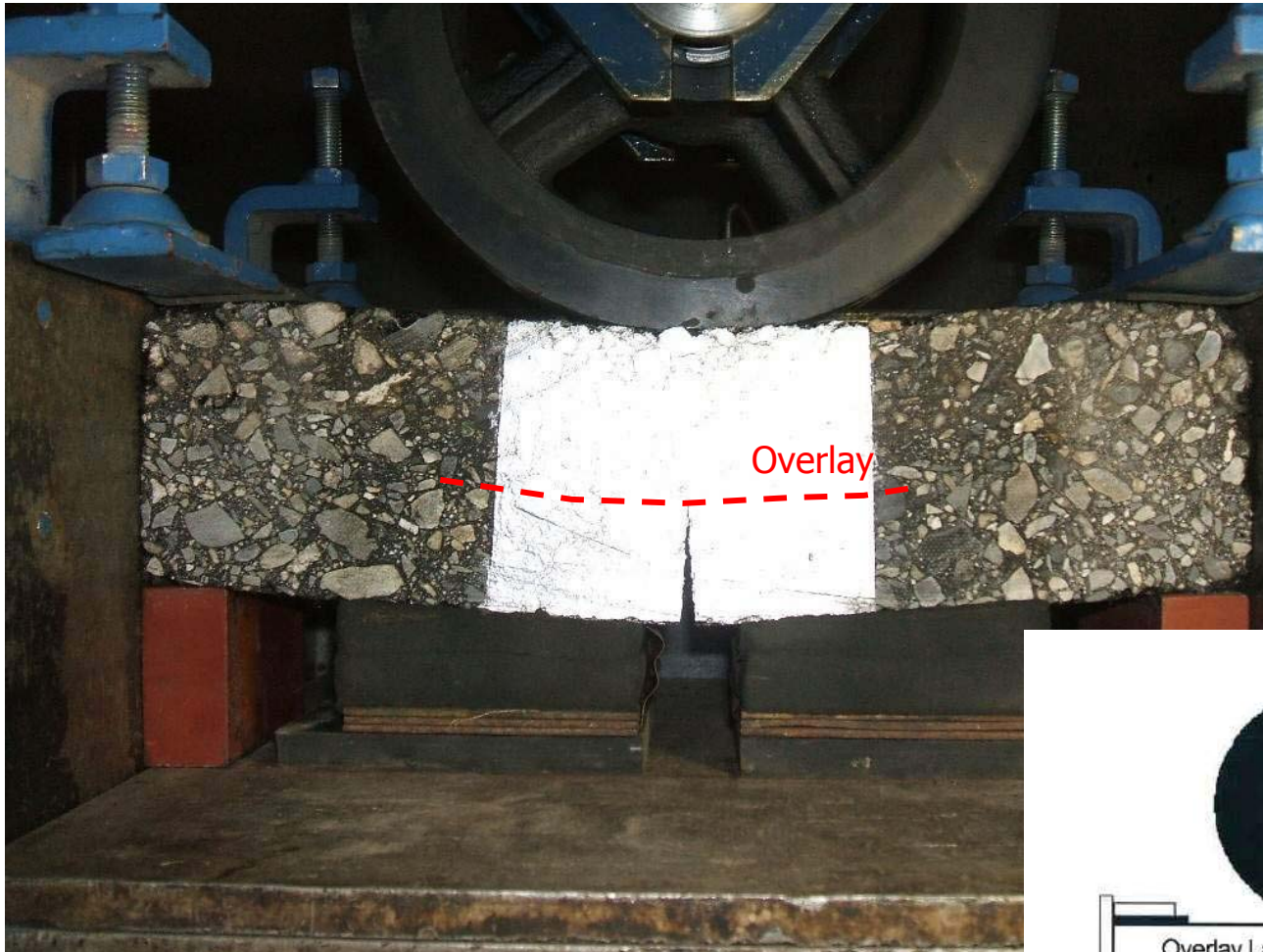


Characteristic Features of HITO Method

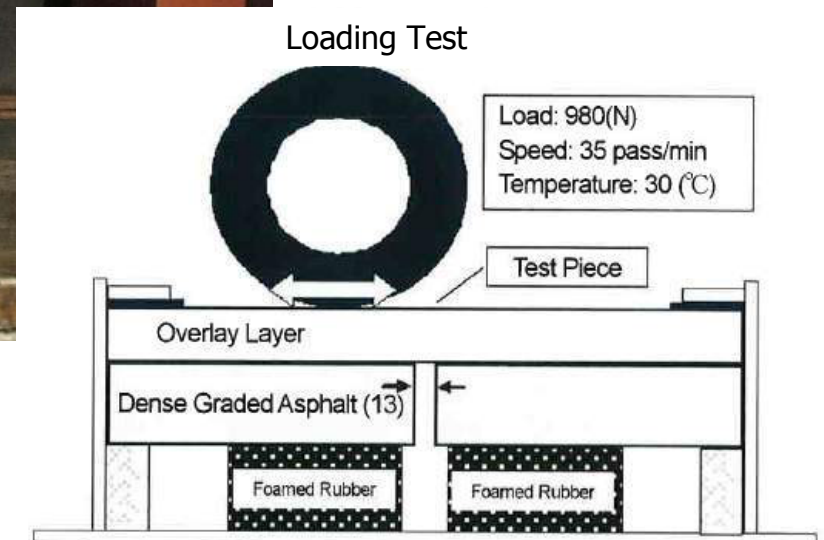
Simple HITO Work;

1. Combination of Efficient Heater
& Conventional Paving Machine
2. Mix Design Work Not Required ;
Ordinary Asphalt Mixture in the Market ready to be used

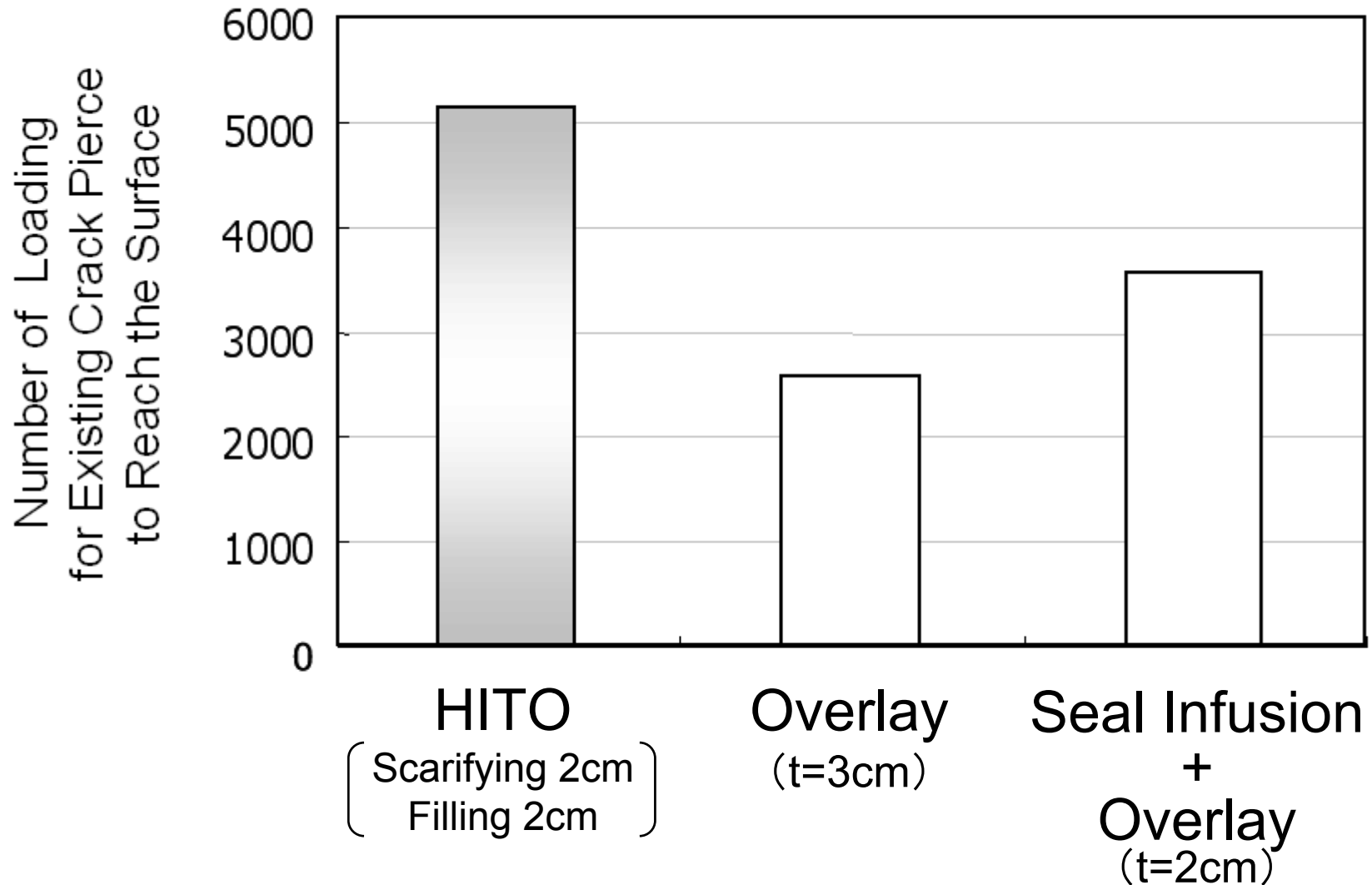
Experimental Evaluation of Increase Strength



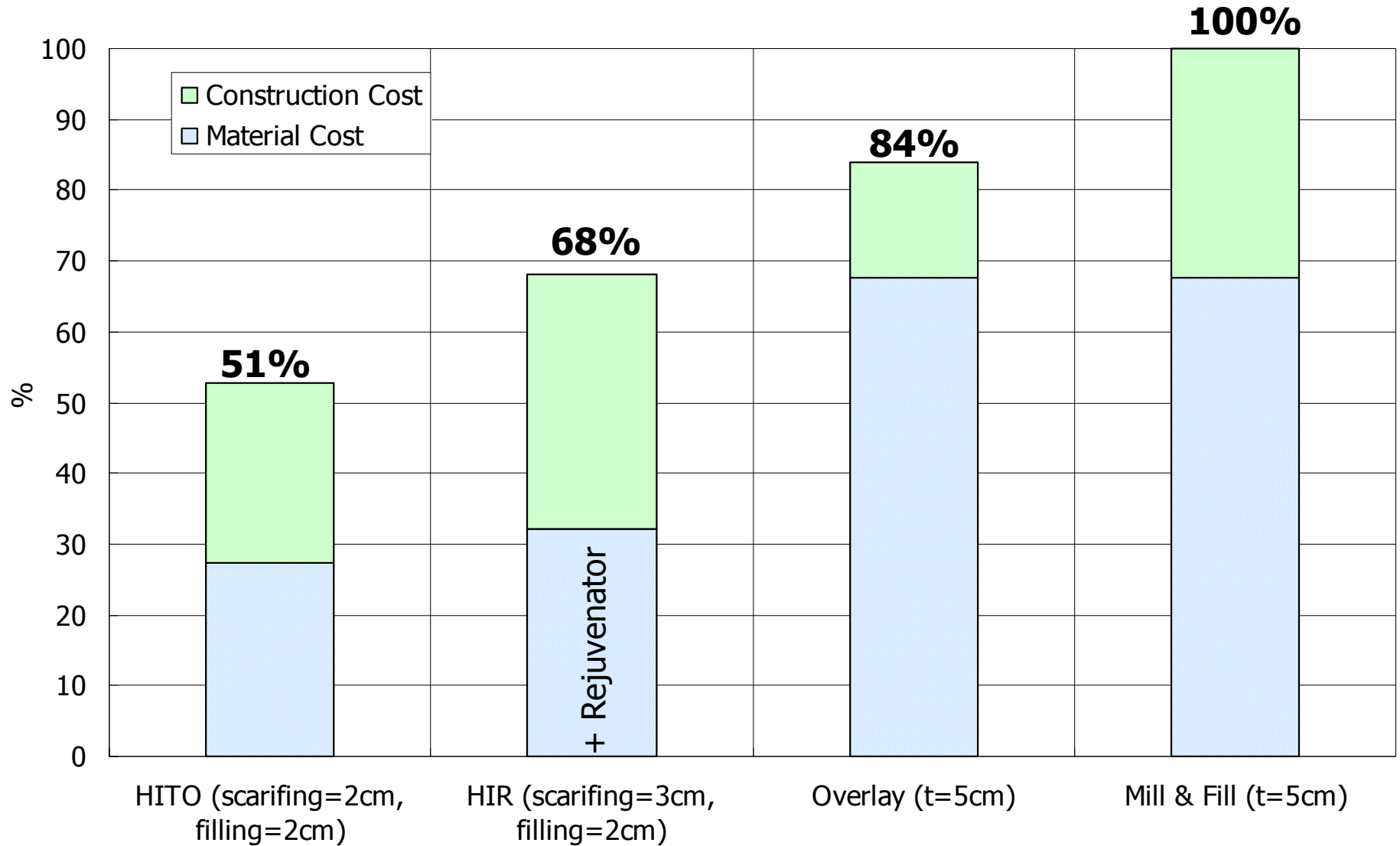
Loading Test
with Wheel Tracking



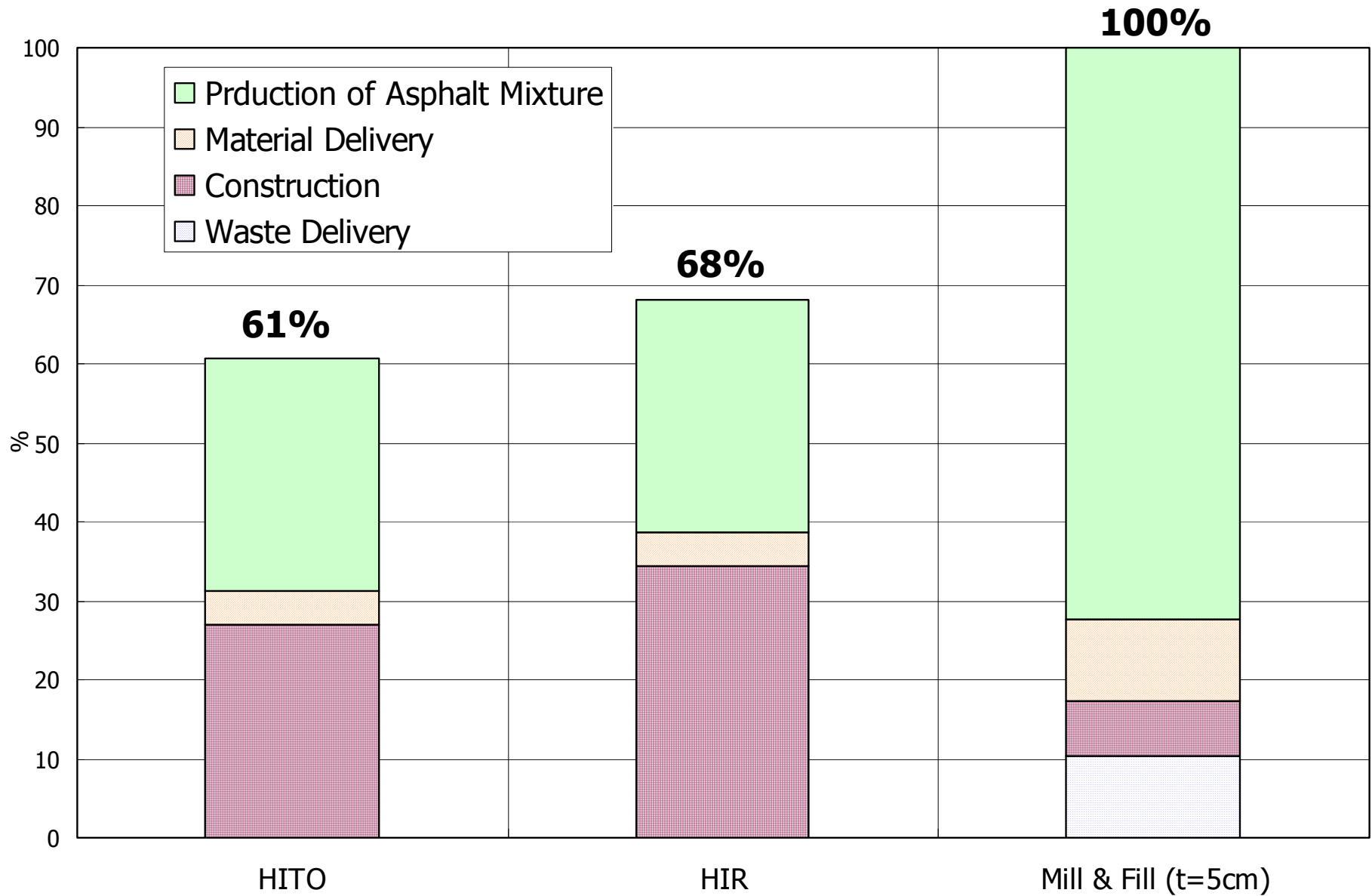
Loading Test Result



Cost Reduction



CO₂ Reduction



HITO Work





Before HITO Work

Traffic	Nos. of Site	Construction Area (m2)	Thickness of New Surface Layer (cm)
Medium	4	5,846	1.0~2.0
Low	20	56,472	1.0~2.0

Medium:
 Medium Traffic Highway (ave.2,000 vehicle/day)
 Low:
 Low Traffic Highway (ave.600 vehicle/day)



In 2 years



Conclusion

1. Life Extension

- Sound conditions confirmed in more than 3 years

2. Cost Reduction

- 49% Less than Mill & Fill

3. CO₂ Reduction

- 39% Less than Mill & Fill

4. Riding Quality Improvement

- Elimination Rutting
- Elimination Crack