

CDOT's Four Ps of Hot In-Place Recycling

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Processes



Projects



Price



Performance



● Processes

● Projects

● Price

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Current CDOT Processes

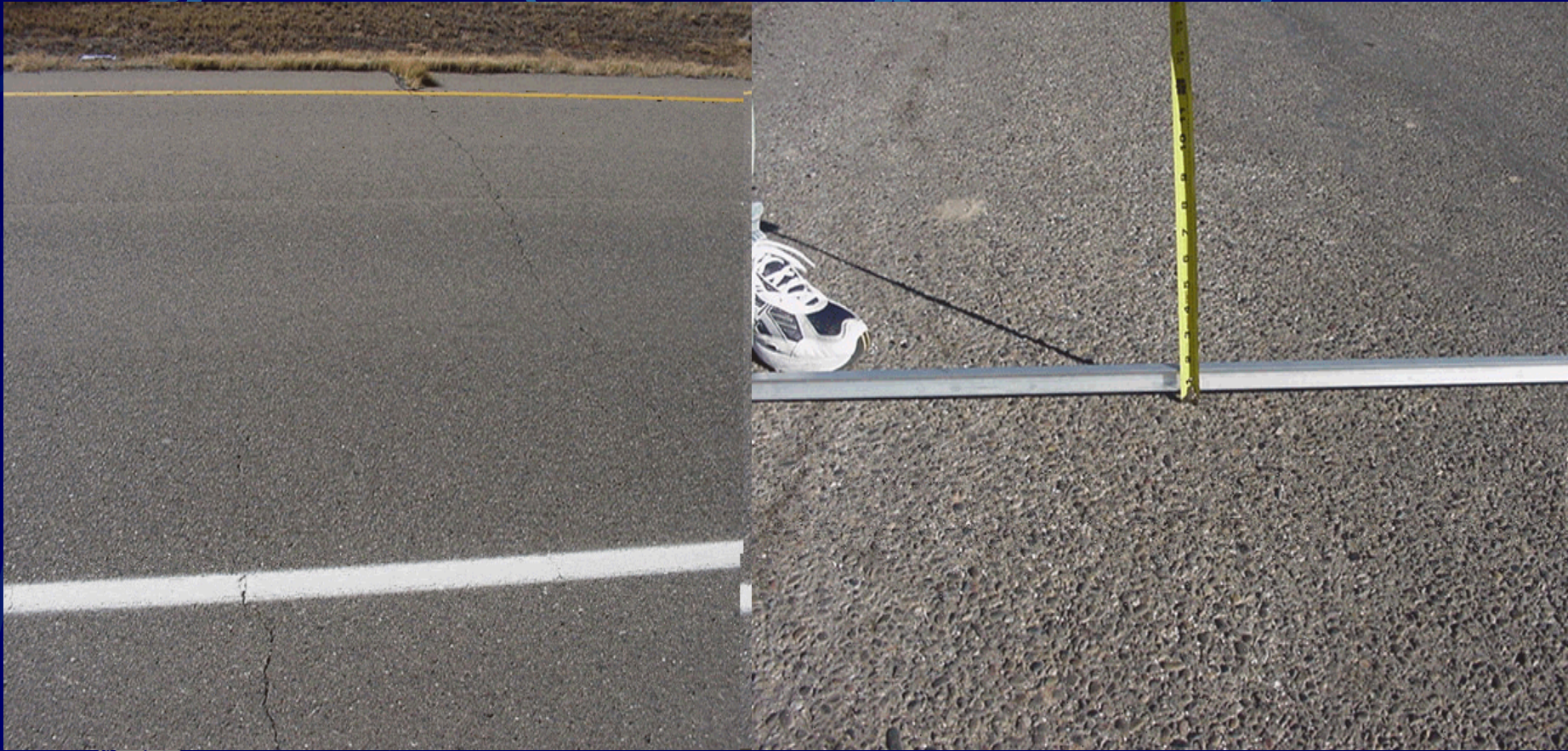
- Surface Recycling
- Remixing, and
- Repaving

Data Collection

- Review and define distress (SHRP-P-338)
 - Longitudinal Cracking
 - Transverse Cracking
 - Alligator/Fatigue Cracking
 - Average Rutting
 - Review Coring and Investigate Moisture Susceptible Pavements
- Review and investigate Base and Subgrade
 - Determine Base thickness and properties
 - Review Structural Adequacy of the pavement template
 - Investigate any locations of unstable subgrade

Hot Recycle Candidates

- Low-Moderate Transverse
- Avg. Ruts < than 1"



Hot Recycle Candidates

- Moderate/Poor Longitudinal Joints/ Cracks
- Low Fatigue Cracking



Hot Recycle Candidates

- Roads with Minimal Stripping/Moisture Damage
- Roads w/ Existing Chipseal or Plant Mixed Seal Coats



Process Considerations

- Heater Scarification (1" - 1.5" Surface Recycle)
 - Low to moderate transverse cracks (< ¼")
 - Blend a chip seal into the existing pavement for a second chip application.
 - Blend crack sealer into the existing pavement prior to an overlay

Process Considerations

- Heater Remixing (1.5" - 2" with addition of virgin mix)
 - Moderate transverse cracks ($> \frac{1}{4}$ " prefer depth of recycle to penetrate $\frac{1}{2}$ of crack depth)
 - Ideal for blending plant mixed seal coats or other wearing courses.
 - Need leveling or grade/cross-slope improvements in existing pavement.
 - Slight modification of existing mix properties

Process Considerations

- Heater Repaving (1" Scarification with 1" - 2" overlay)
 - Similar to existing conditions for heater scarification
 - Heavy traffic that warrants a "one pass operation"
 - Need for a less than 2" overlay – often curb and gutter

Candidate Hot-In-Place Recycling Process

Pavement Distress Mode	Surface Recycling	Repaving	Remixing
Raveling	Green	Green	Green
Potholes	Yellow	Green	Green
Bleeding	Yellow	Yellow	Green
Skid Resistance	Red	Green	Yellow
Rutting	Yellow	Yellow	Green
Corrugations	Yellow	Yellow	Green
Shoving	Yellow	Yellow	Green
Fatigue and Edge Cracking	Red	Green	Yellow
Block, Longitudinal, and Transverse Cracking	Yellow	Green	Yellow
Marginal Existing Pavement Strength	Red	Yellow	Red





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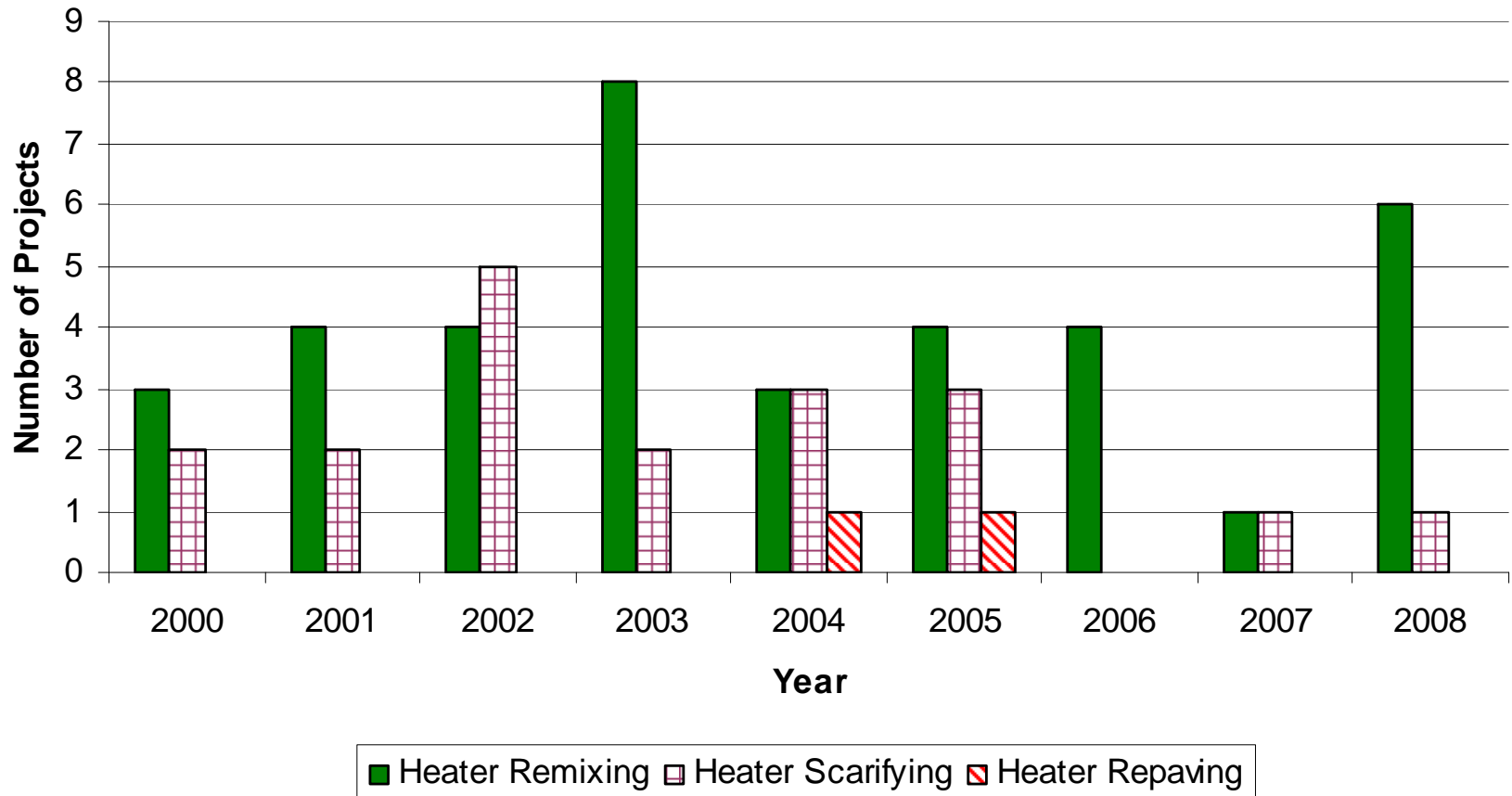
● Performance

Projects

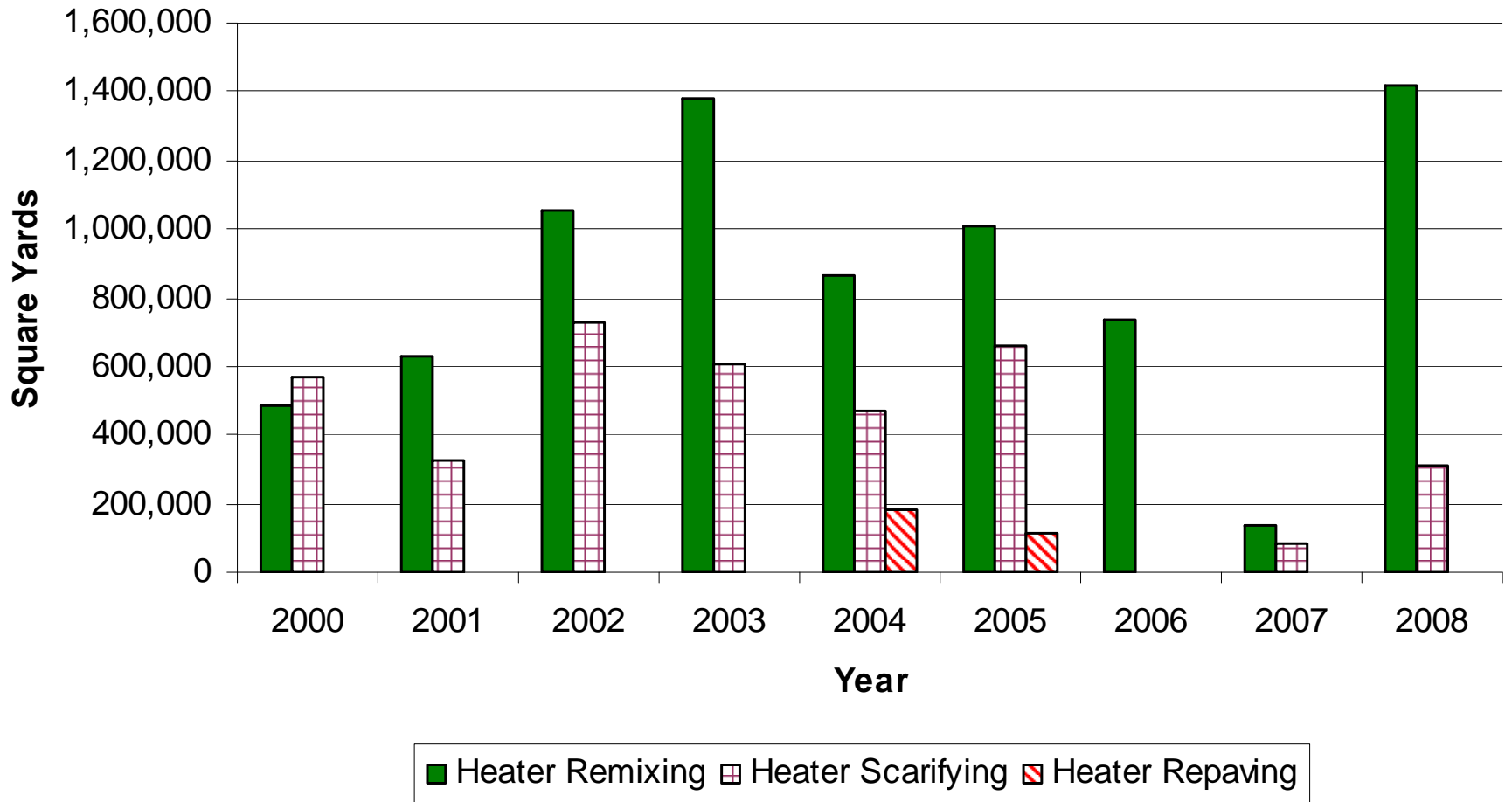
Since January 1, 2000 to the beginning of June 2008, CDOT has constructed 58 projects which recycled almost 12 million square yards (1,668 lane-miles).

- 19 heater scarifying projects recycling 3,724,725 sq. yds.
- 37 heater remixing projects recycling 7,704,631 sq. yds.
- 2 heater repaving projects recycling 294,243 sq. yds.

CDOT Projects



CDOT Quantities





● Processes

● Projects

● Price

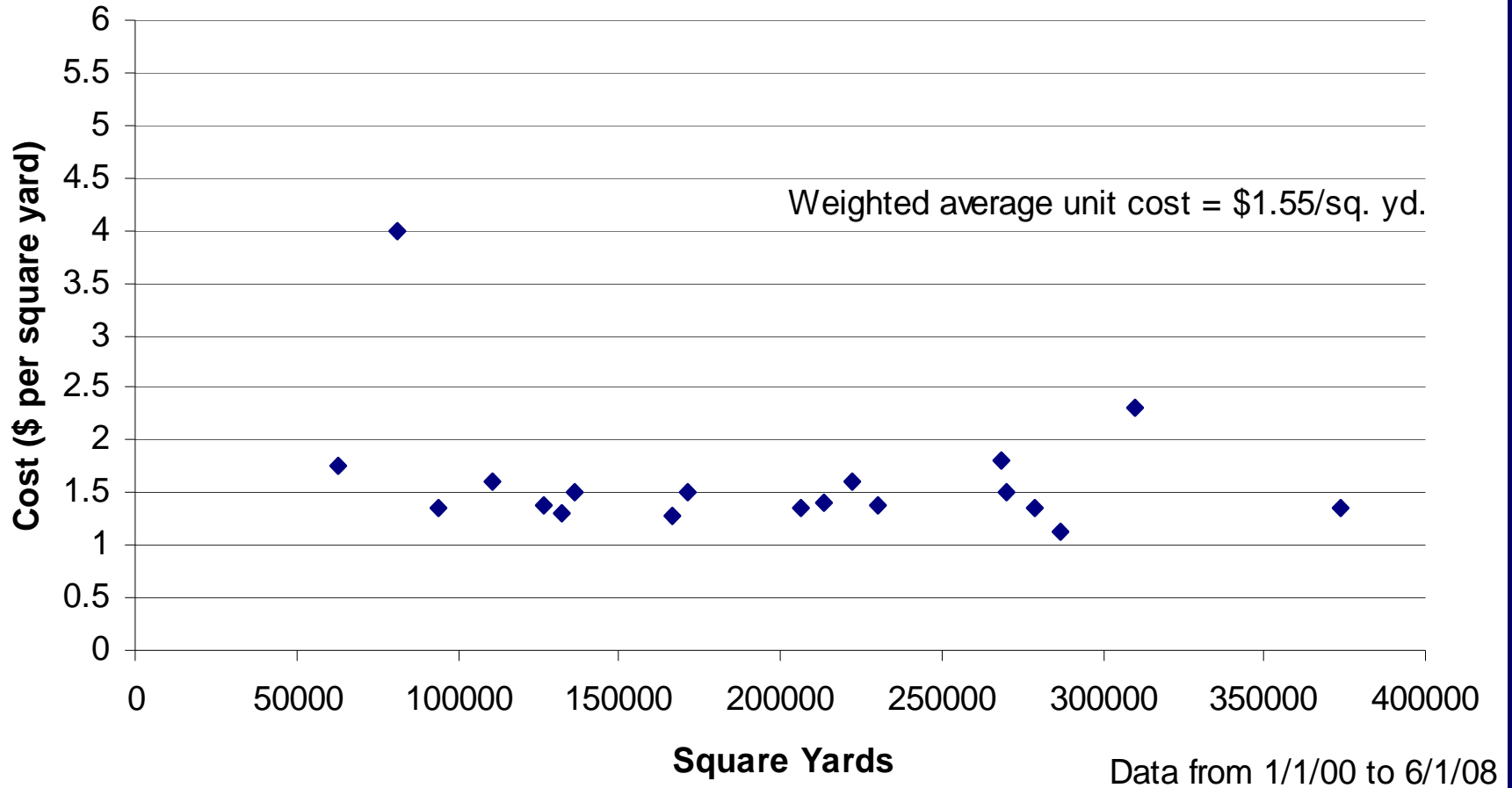
● Performance

Price \$

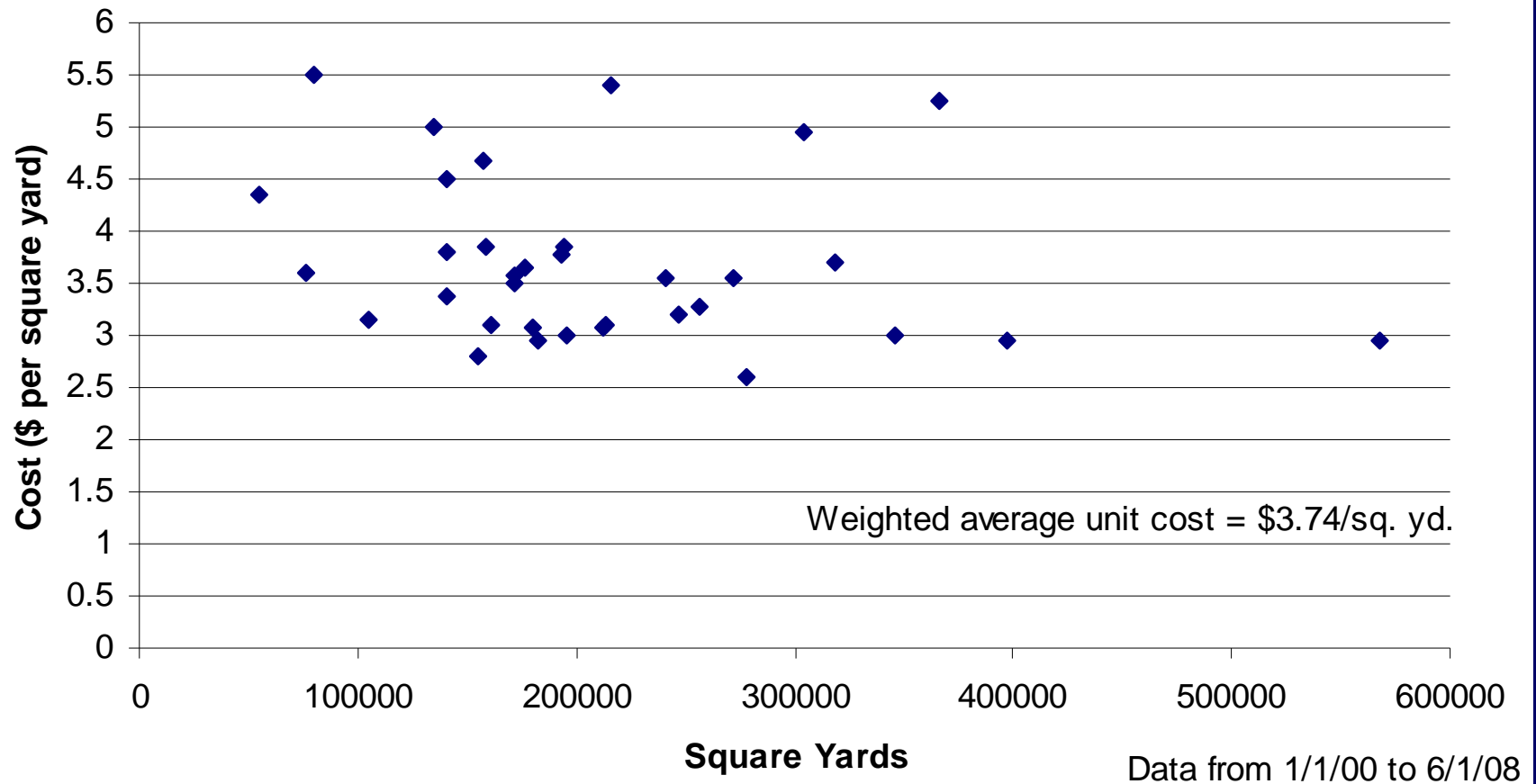
The amount spent on these 58 hot in-place recycling treatments was almost \$36.5 million dollars.

- 19 heater scarifying projects cost \$5,819,010.
- 37 heater remixing projects cost \$27,645,323.
- 2 heater repaving projects cost \$638,300.

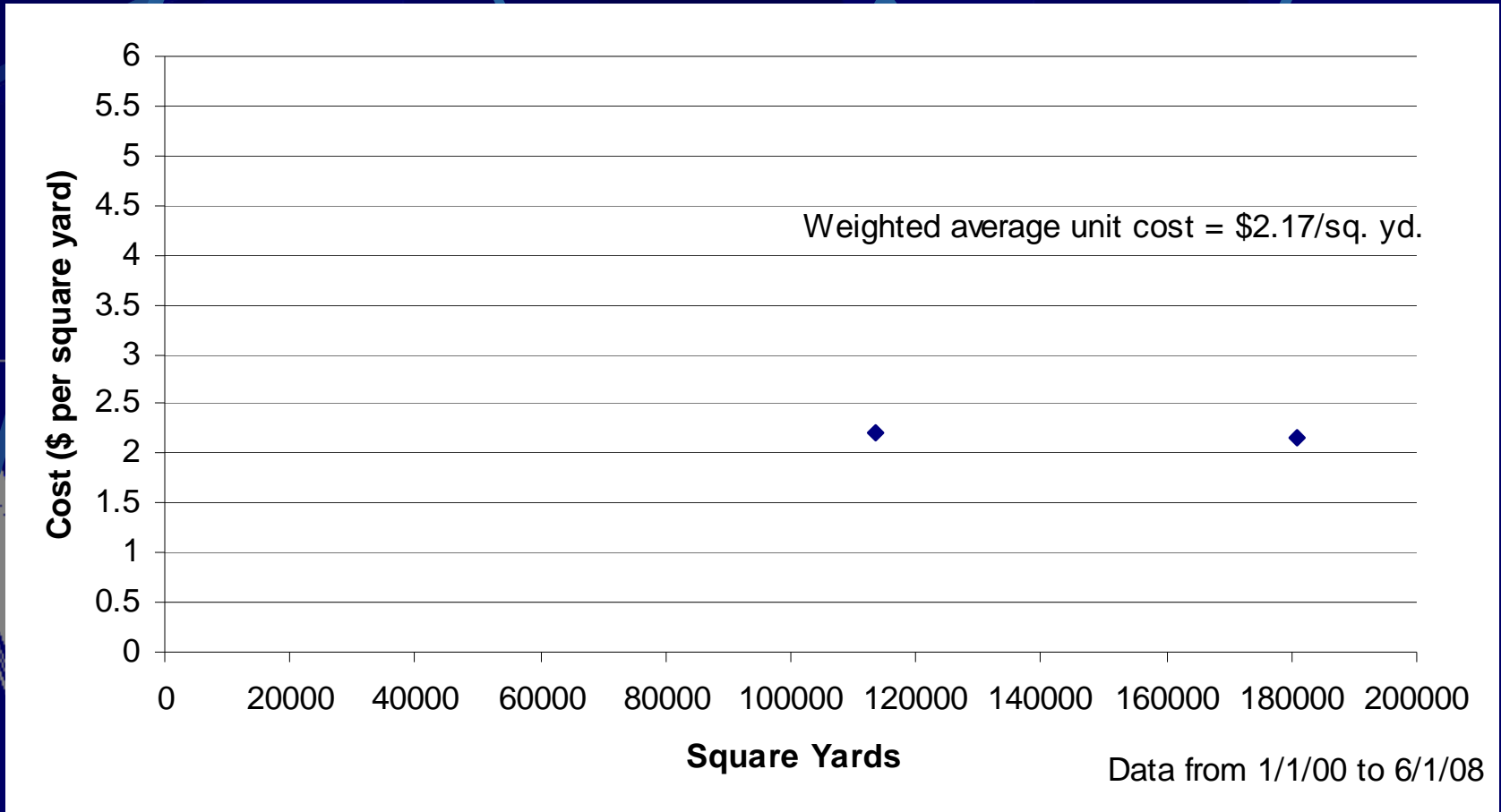
Heater Scarifying Treatment



Heater Remixing Treatment



Heater Repaving Treatment





● Processes

● Projects

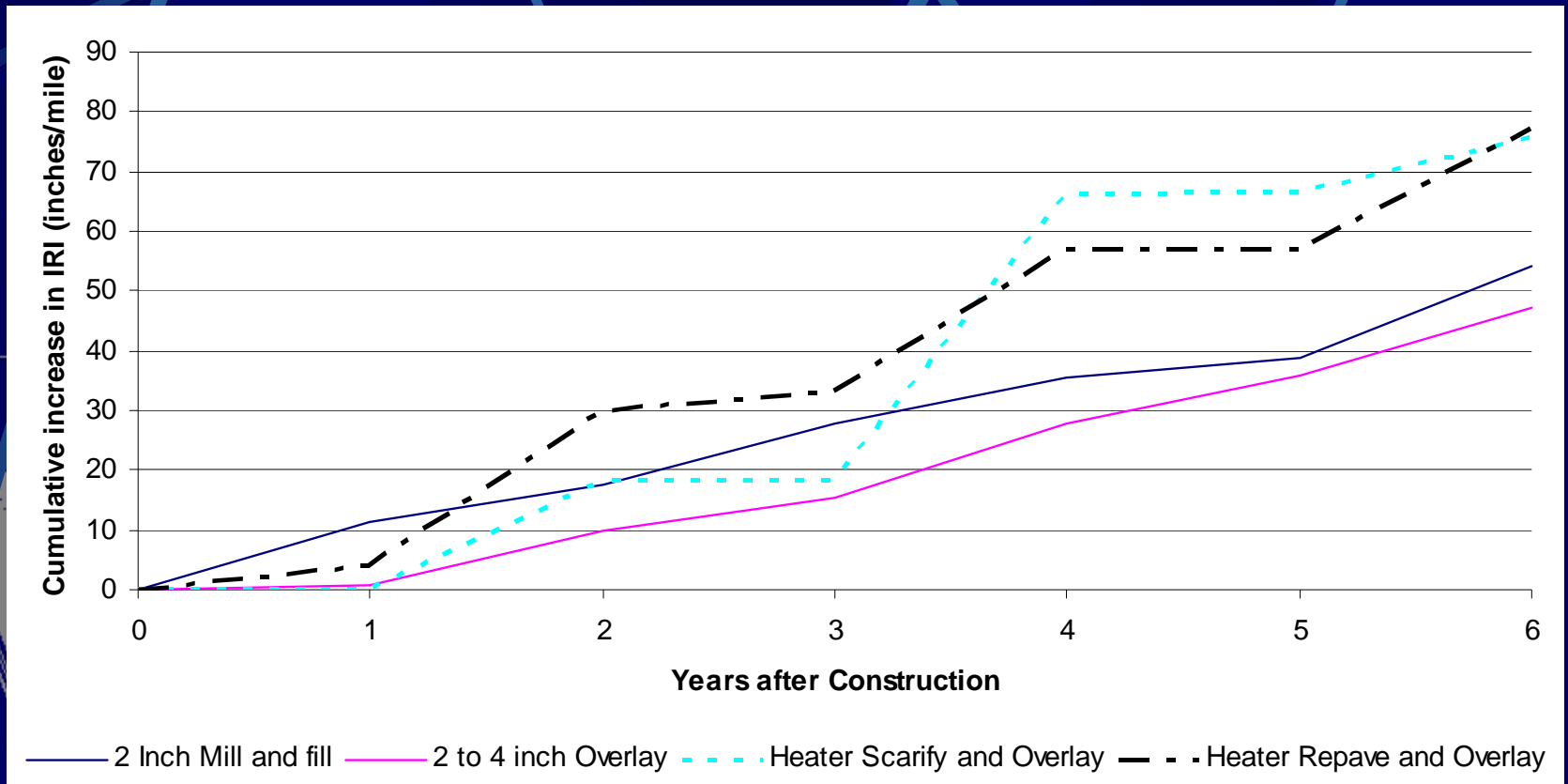
● Price

● Performance

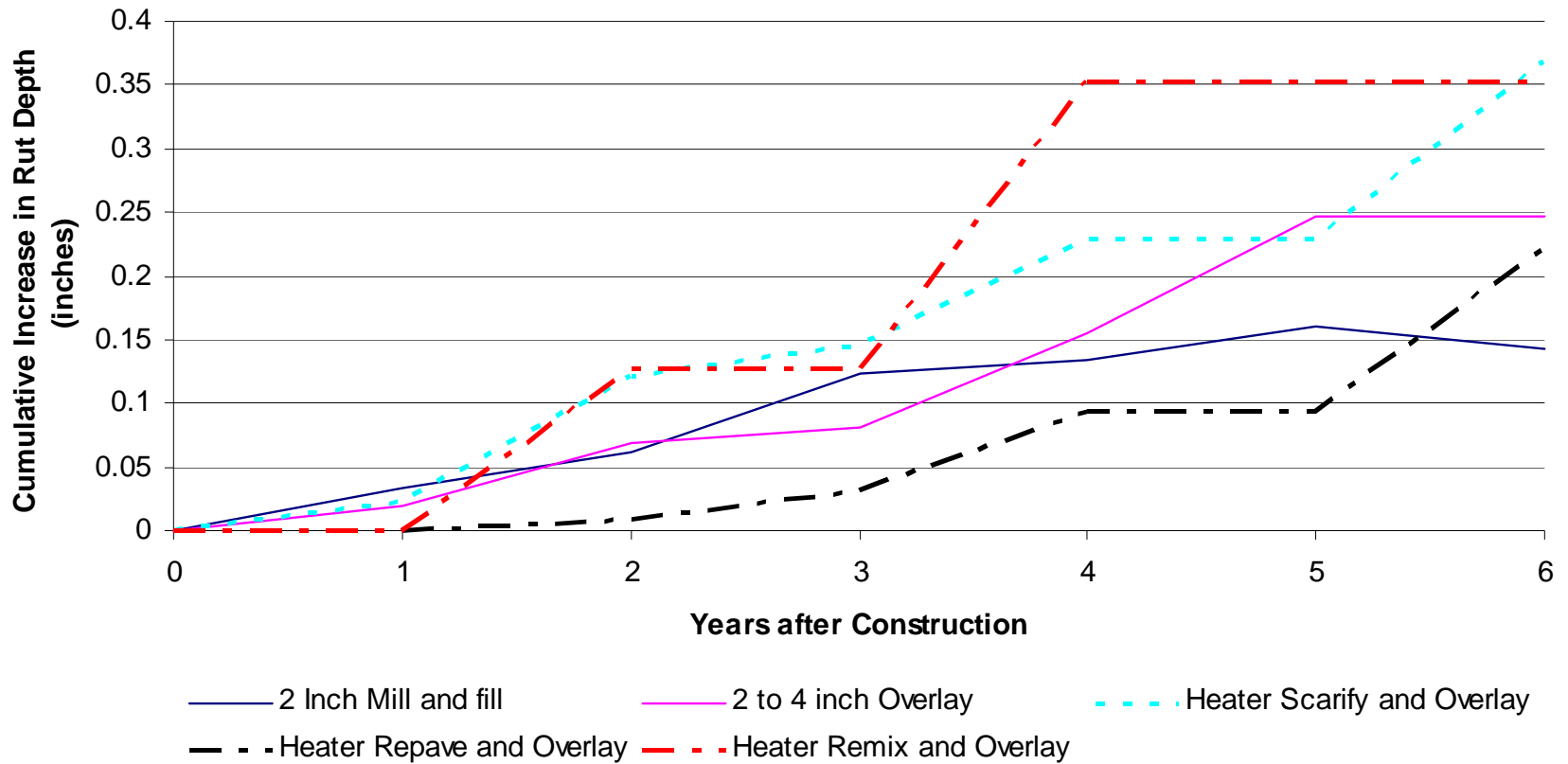
Performance Information

Type of Rehabilitation	Number of Projects
Two Inch Mill and Fill	57
Two to Four Inch Overlay	73
Heater Scarification and Overlay	19
Heater Remix and Overlay	6
Heater Repave and Overlay	2

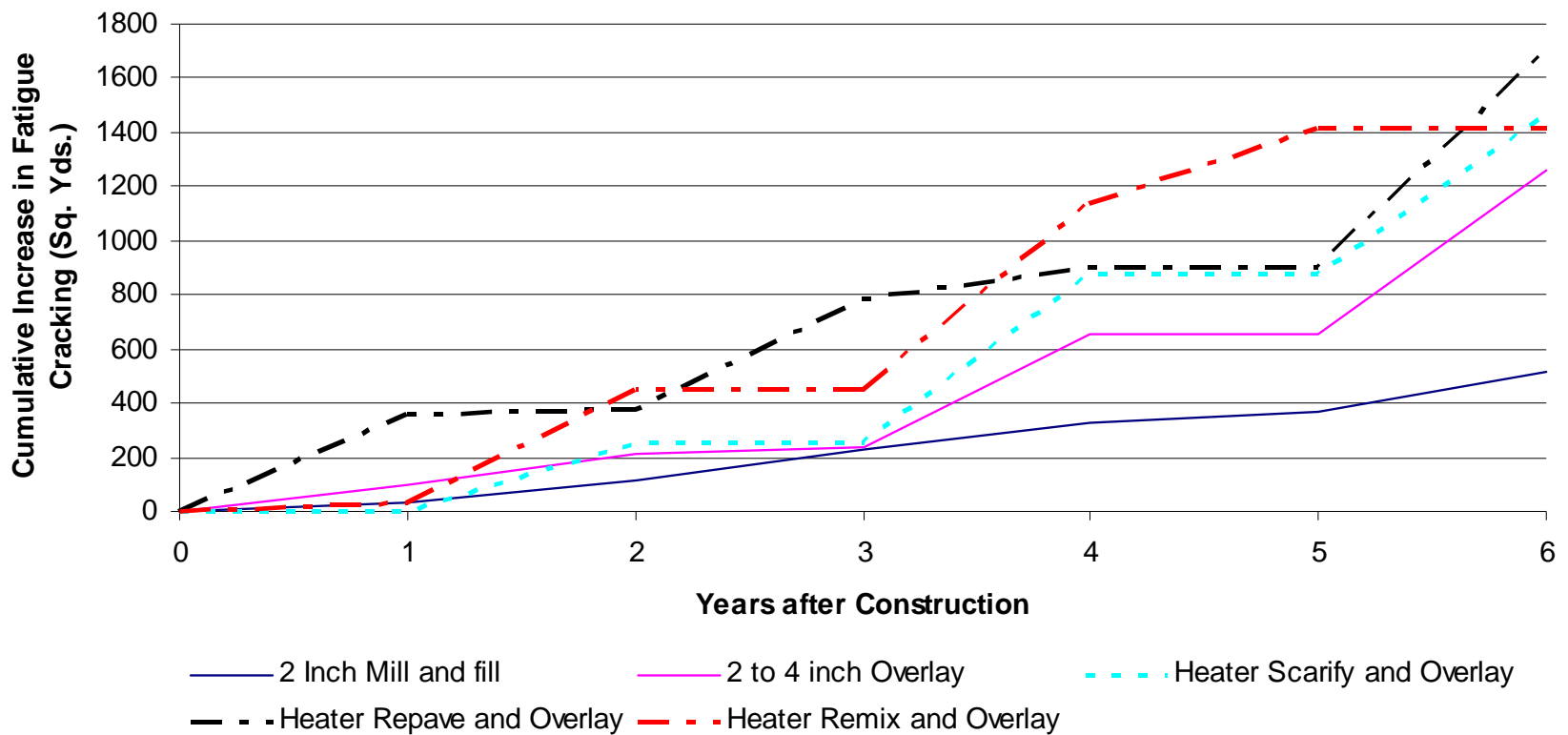
Smoothness Performance



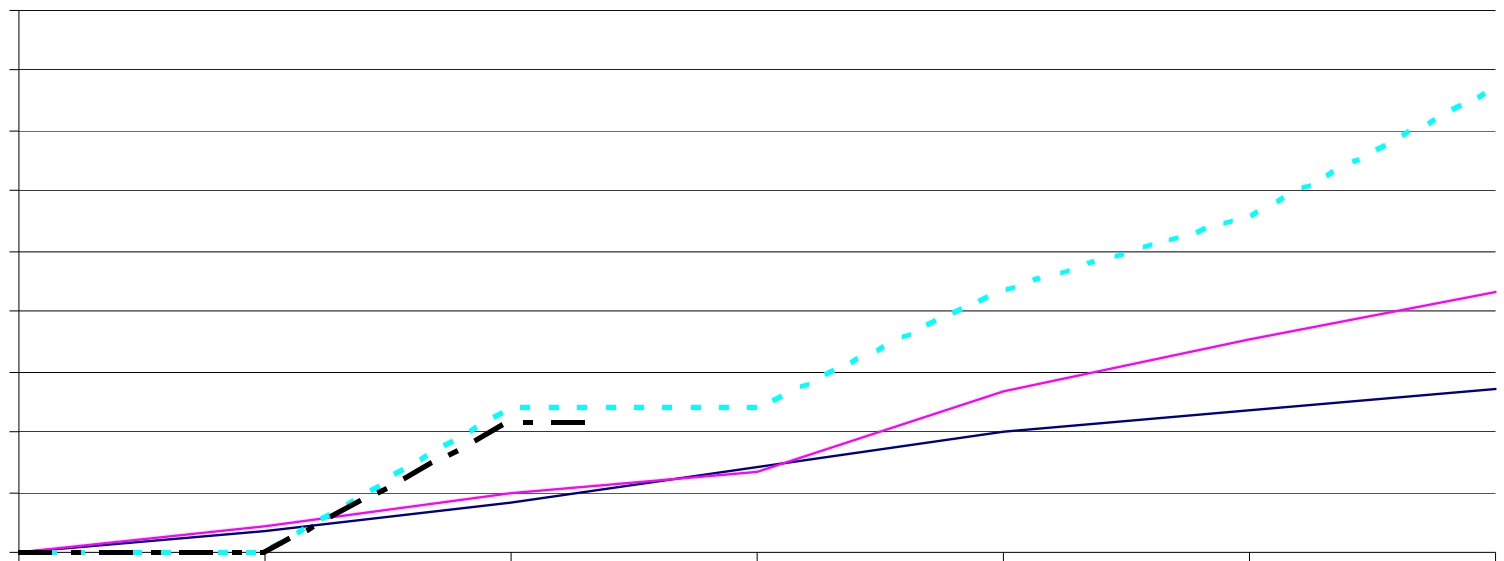
Rutting Performance



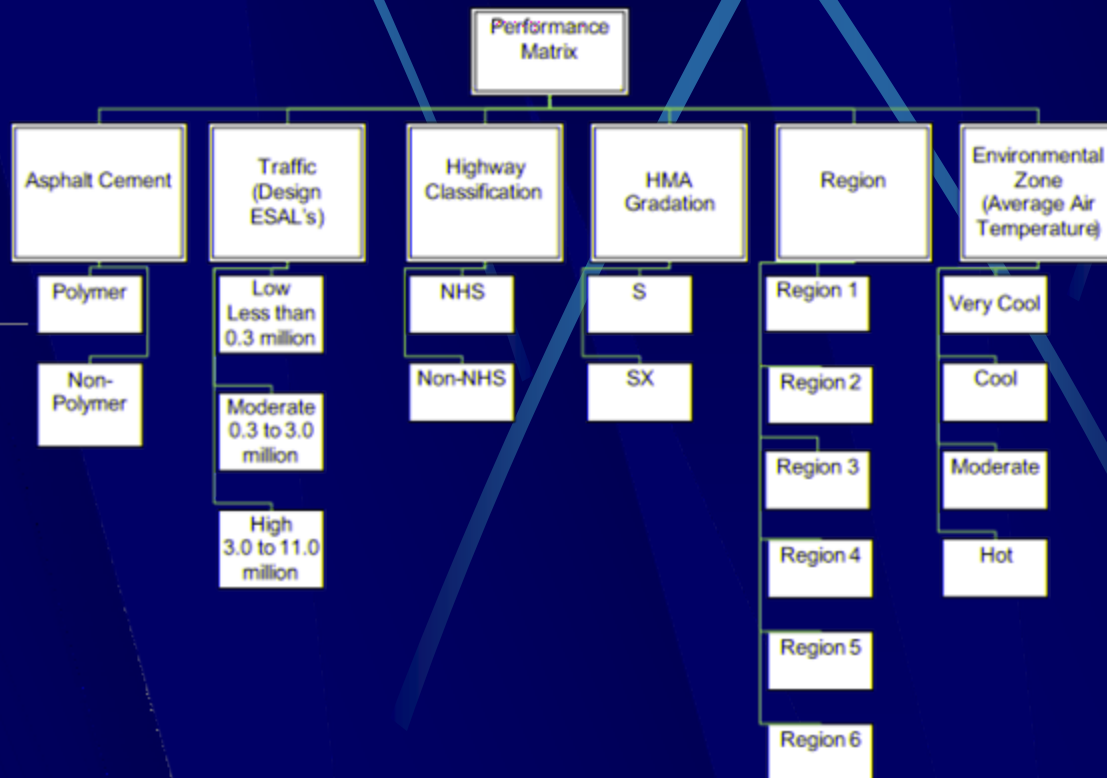
Fatigue Cracking Performance



Transverse Cracking Performance



Further Research Performance Matrix



Questions?

