

Antigo

Reconstructing Composite Pavements - Rubblization and HMA



Presented by Matt Shinnars, Antigo Construction, Inc.

at Illinois Asphalt Pavement Association Annual Conference 3/27/23

Presentation Outline

- ⇒ Reuse existing asphalt overlay as an intermediate base layer along with concrete rubblization and HMA overlay
- ⇒ Wisconsin DOT USH 14 projects
- ⇒ Crushed aggregate as an intermediate base layer
- ⇒ Questions & answers

Reflective Cracking of Asphalt Overlay



Before rubblization



After rubblization



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MHB Badger Breaker[®]



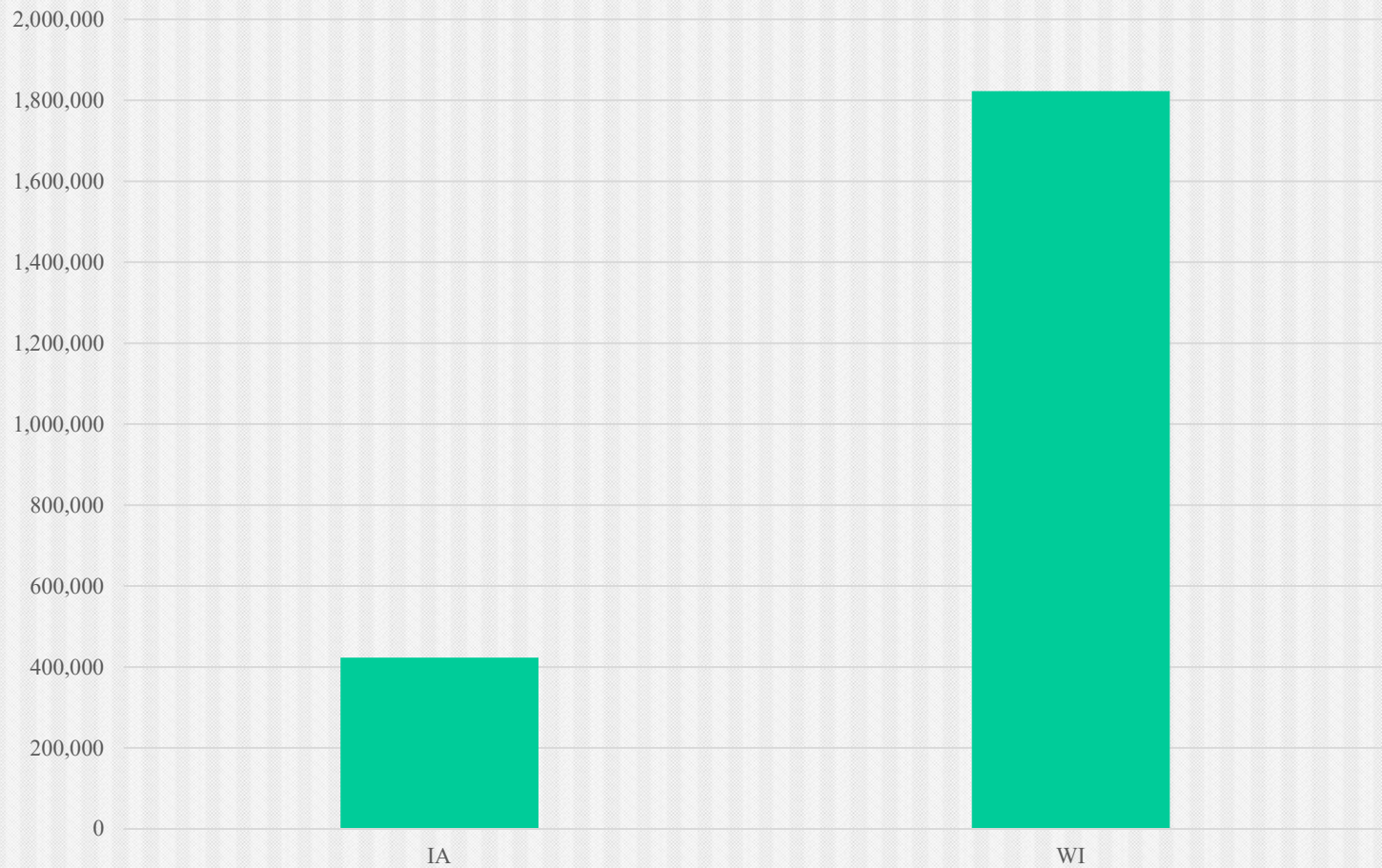
Grid Roller



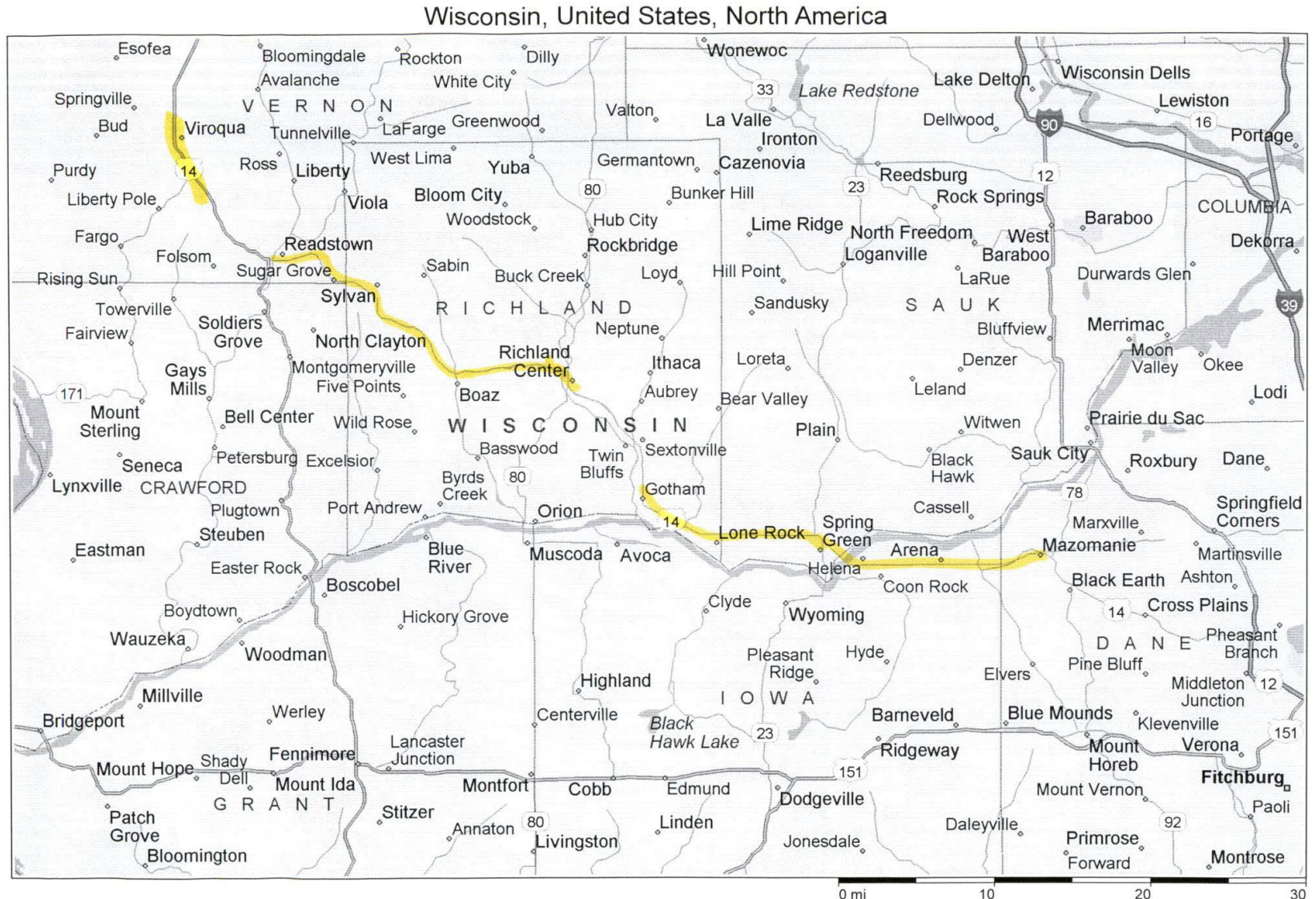
Rantoul: Professor Marshall Thompson's inspection



Antigo's Square Yards of Rubblization & HMA Overlay with Intermediate Layer of Asphalt Millings



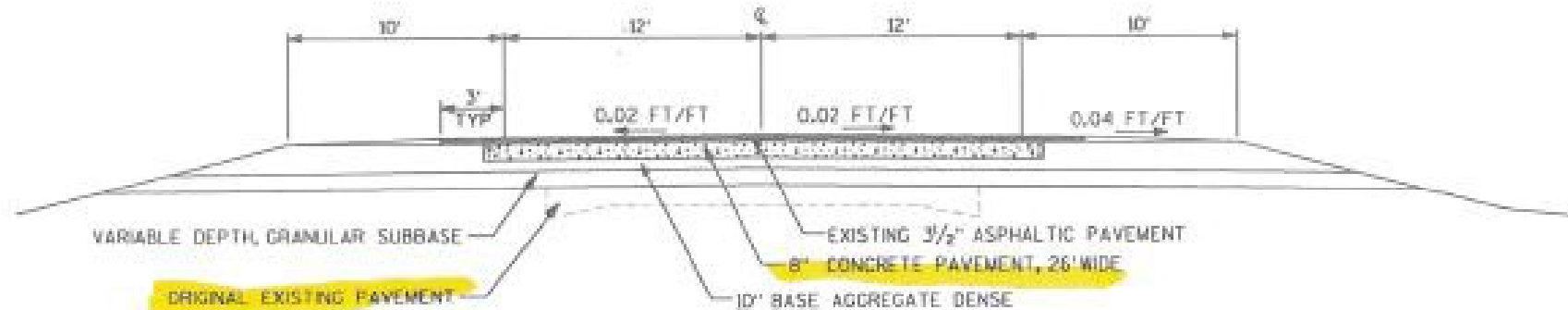
USH 14, SW Wisconsin



USH 14, SW Wisconsin

- ⇒ Rubblized and overlaid 55 miles of JPCP on 2-lane highway between 1998 and 2013 on 8 WisDOT projects
- ⇒ Milled and crushed existing asphalt overlay and reused as intermediate base layer (typically 4" to 5" thick)
- ⇒ HMA overlays ranged from 3.0" to 5.5" thick
- ⇒ Constructed one lane at a time with traffic flagging

USH 14, SW Wisconsin

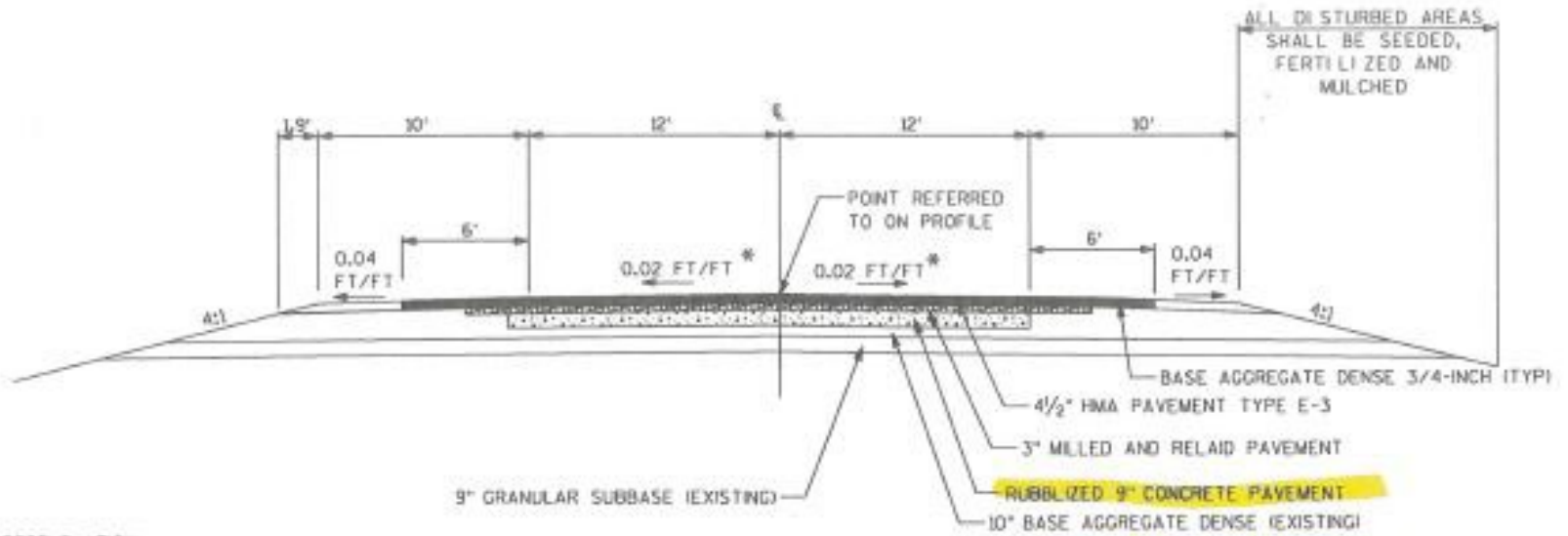


EXISTING TYPICAL SECTION

USH 14

STA. 0+50 - 02+00
STA. 230+00 - 340+00

USH 14, SW Wisconsin



SUPERELEVATION

MAINLINE

e+ 4.0%	STA. 20+46.84 - 50+05.76
e+ 2.0%	STA. 64+44.59 - 88+30.73
e- 2.7%	STA. 233+64.52 - 247+26.01
e+ 2.7%	STA. 269+93.02 - 291+92.49

TYPICAL FINISHED SECTION

USH 14

STA 29+50 - STA 112+00
STA 230+00 - STA 340+00

EXCAVATION BELOW SU

USH 14, SW Wisconsin

DESIGN CALCULATION

Required SN

4.29

RUBBLIZE & HMA

HMA Alternative # 1

LAYER	MATERIAL TYPE	LAYER COEFFICIENT	LAYER THICKNESS (in)	SN
SURFACE	E-3	0.44	4.5	1.98
BASE	Milled & Relayed Asphaltic Concrete	0.2	3	0.6
SUBBASE 1	Rubblized Concrete Pavement	0.2	8	1.6
SUBBASE 2	EXISTING BASE	0.05	3	0.15
				4.33

PAVEMENT DESIGN WORKSHEET

1/2
EXHIBIT #4

Mill overlay, crush, & windrow on shoulder



Windrow on shoulder



Grader scrape concrete surface



Rubblize 1st lane



Close-up of MHB rubblizing



Grid roll 1st lane



Rubblized & grid rolled surface



After rubblize & grid roll



Blade crushed millings over rubblized concrete



Pneumatic-tired roller on crushed millings



Rubblize 2nd lane



Rubblize 2nd lane



Grid roll 2nd lane



Blade millings over 2nd lane



Some projects: pave 1st HMA lift each day



Grid roll 2nd lane



Blade crushed millings on 2nd lane



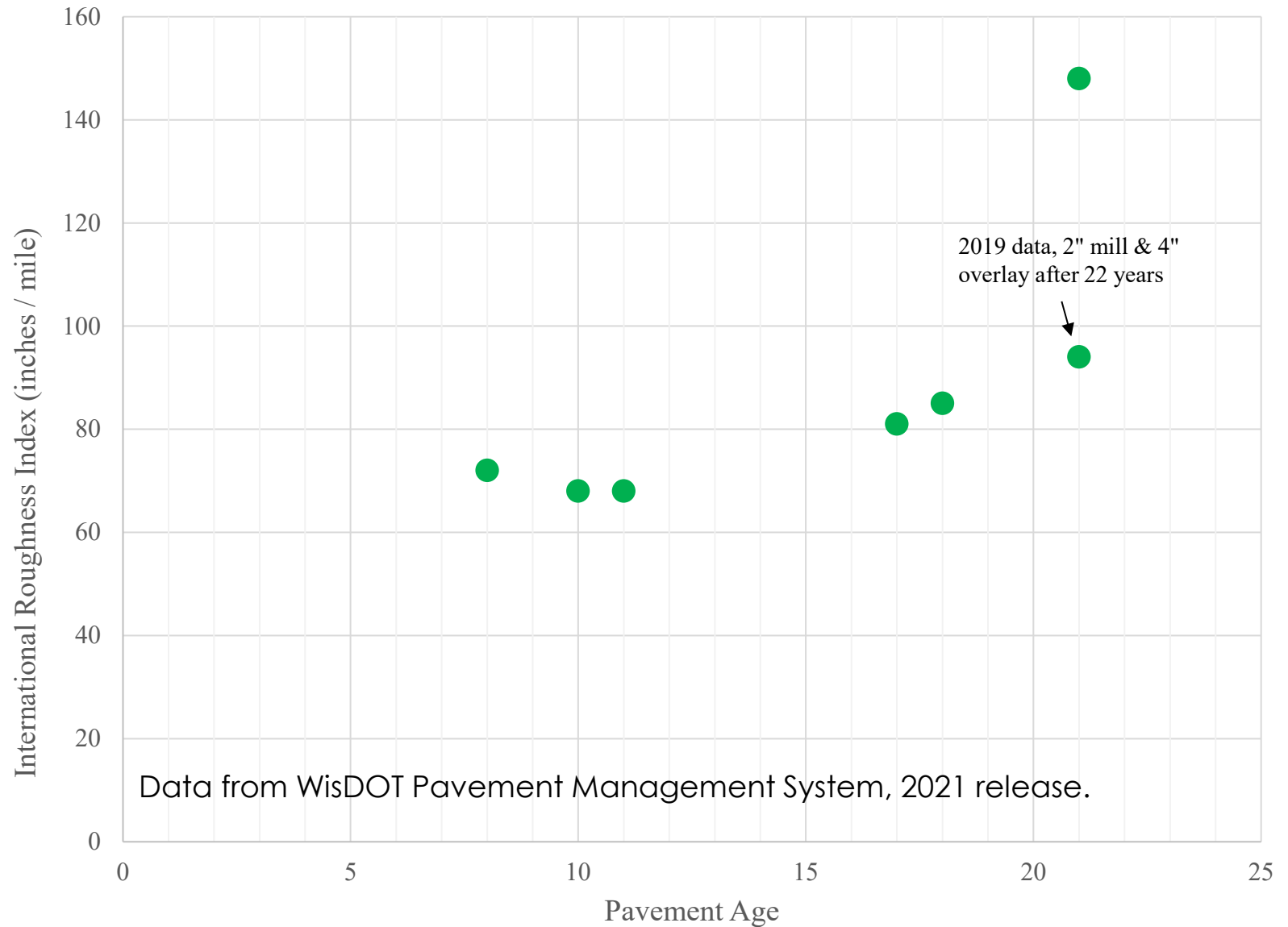
Smooth drum vibratory on crushed millings



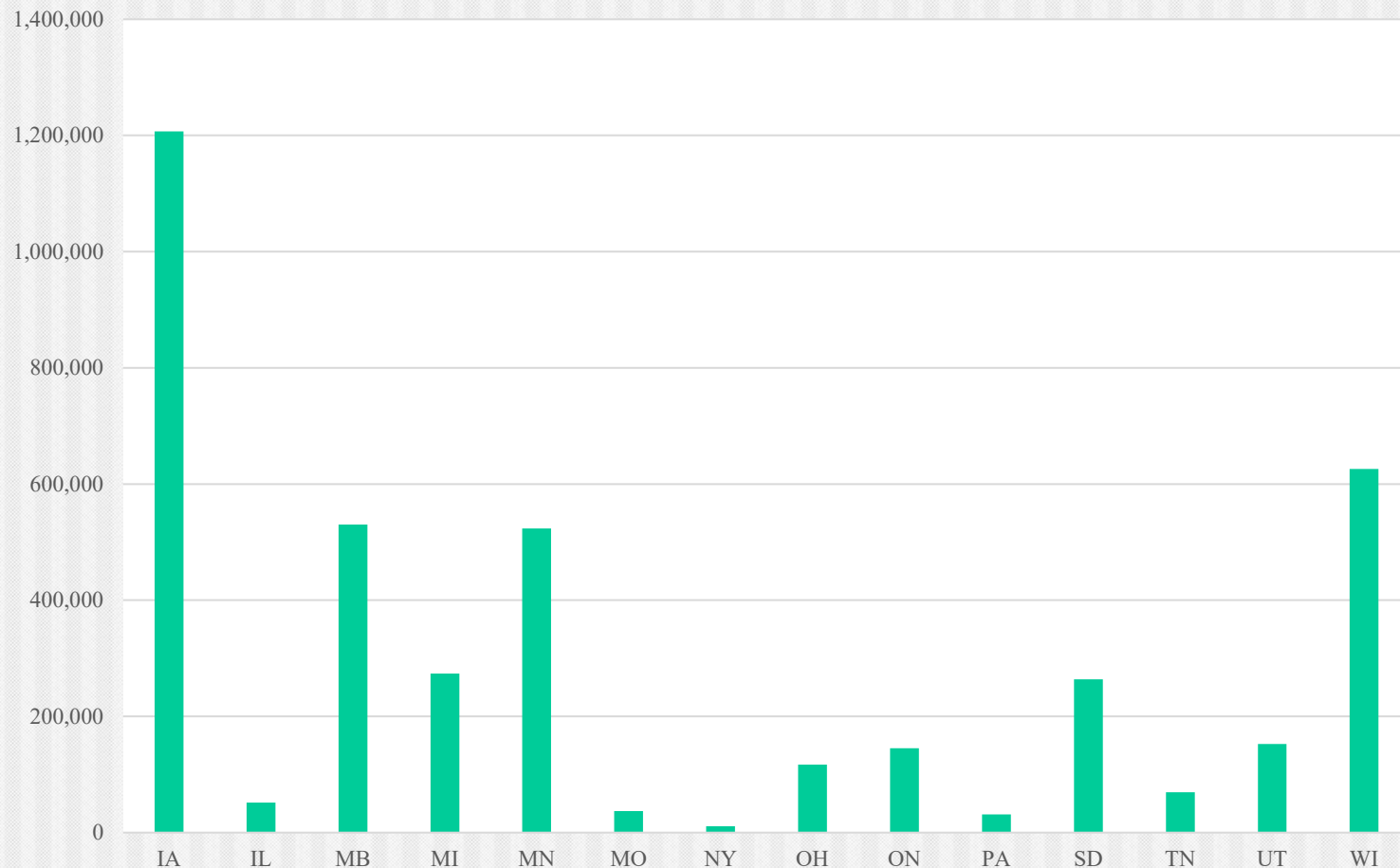
Lined up for paving



USH 14 Projects: 2021 Average IRI vs Age



Antigo's Square Yards of Rubblization & HMA Overlay with Intermediate Layer of Crushed Aggregate



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Modified rubblization w/occasional spalling



Weak area



Grid roll



Early start



“Pave” choke stone 2” thick



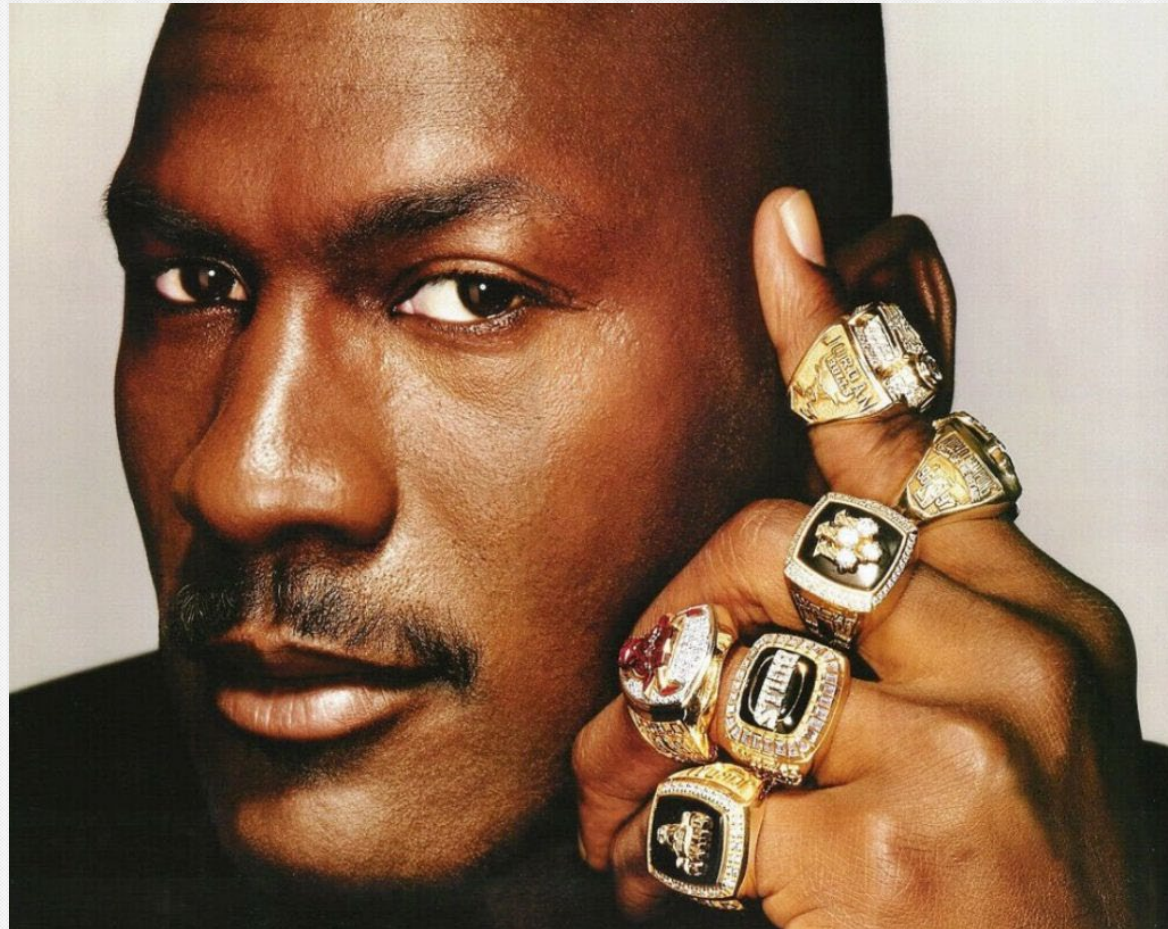
Compact stone layer



Rubblization is Green

1. Existing concrete pavement and base recycled in-place reduces need for new materials.
2. Reduction in truck movements and equipment usage.
3. Good long-term performance of asphalt overlay.
4. Asphalt surface can be replaced as needed over time leaving rubblized layer as is (perpetual pavement).
5. Accelerated construction reduces impact on travelling public and reduces associated emissions.

Questions & Answers



Antigo Construction Family of Companies

715-627-2222

ac@antigoconstruction.com
www.antigoconstruction.com

2520 Clermont St
Antigo, WI 54409
USA