Intelligent Compaction
Pooled Fund Project

INTELLIGENT COMPACTION
For Hot Mix Asphalt

Robert D. Horan, PE
Facilitator
ICPF
What is Intelligent Compaction?

An Innovation in Compaction Control and Acceptance
Why Do We Need IC?

- Proper in-place density is vital for good performance
- Conventional compaction equipment and procedures have shortcomings and too often produce poor results
- Intelligent compaction technology appears to offer "a better way"
INTELLIGENT COMPACTION for HMA

- Shortcomings in the Compaction Process…

Limited “On The Fly” Feedback

Over or Under-Compaction Can Occur
INTELLIGENT COMPACCTION for HMA

- Shortcomings in Density Acceptance Process…

Limited Number of Locations

After Compaction is Complete
INTelligent Compaction for HMA

- Roller Passes

Shoulder (Supported) • Longitudinal Joint • Paving Direction

Courtesy Sakai America
What is Intelligent Compaction?

Vibratory Single Drum Soil Roller  
Vibratory Tandem Drum Asphalt Roller
Currently Available Tandem Drum IC Rollers

Bomag America

Sakai America
INTELLIGENT COMPACTATION for HMA

Typical GPS Setup

On roller

Base station
INTELLIGENT COMPACTION for HMA

HMA Surface Temperature

Roller Passes
Compaction/mapping of HMA base course layer
INTELLIGENT COMPACTION for HMA

Subsurface Layer (1)

Final Layer (2)

~ 200 ft

~ 40 ft

~ 40 ft

Region of soft subsurface layer condition reflecting through surface compaction layer

Hard subsurface layer reflecting through surface compaction layer

~ 40 ft

~ 40 ft

Courtesy of Dr. David White
Special Issues for IC on HMA

- Thin lift construction
- Allowable temperature ranges to eliminate binder viscosity stiffening
- Surface vs. internal mat temperature measurement
- Non-destructive, in-situ stiffness / modulus companion tests
Benefits of IC for HMA

• Improve density….better performance
• Improve efficiency….cost savings
• Increase information…better QC/QA

• Overall Benefit:
  Improved Pavement Performance!
Yesterday

Buffalo Springfield Steam Roller
INTELLIGENT COMPACTATION for HMA

Today
IC – The Future of Compaction Technology

IC 101
Do you have some fundamental questions on IC but afraid to ask? If so, this page is just for you to understand correct and concise basic knowledge about IC. This section contains the following topics:

- What is IC?
- How IC Rollers Work
- Benefits of IC
- Issues

What are benefits of IC?

What are issues regarding IC?

www.intelligentcompaction.com
INTELLIGENT COMPACTION

For Hot Mix Asphalt

Thank you!