

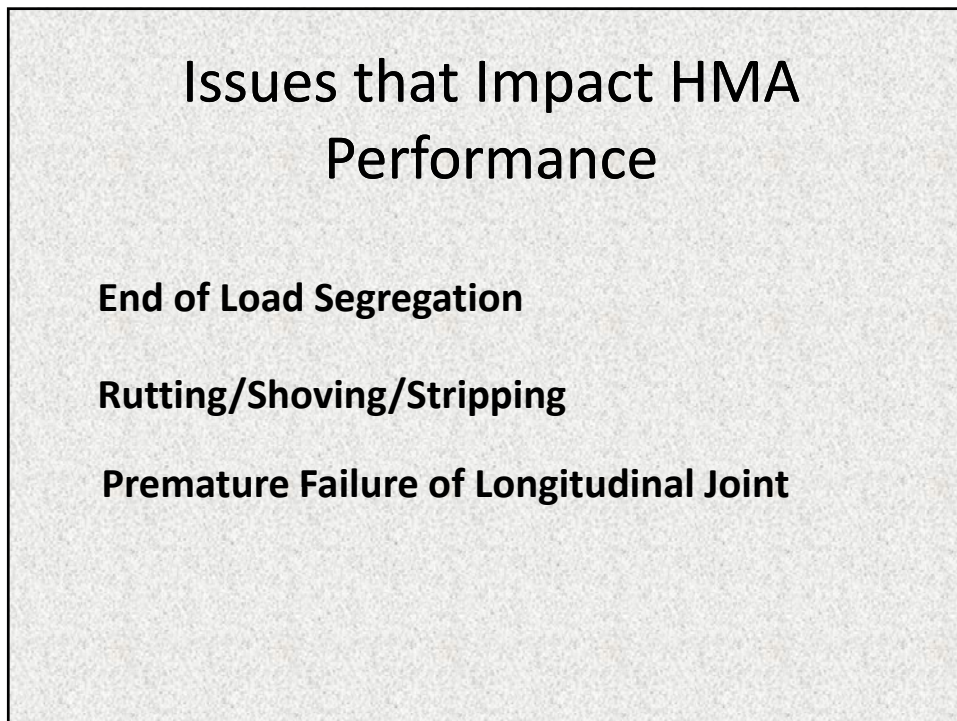


54th Annual Illinois Bituminous Paving Conference
December 11, 2013

**Hot
Mix
Asphalt**

*In Pursuit of a
Better
Longitudinal Joint*

*Steve Warsfold
D4 Mixtures Control Engineer*

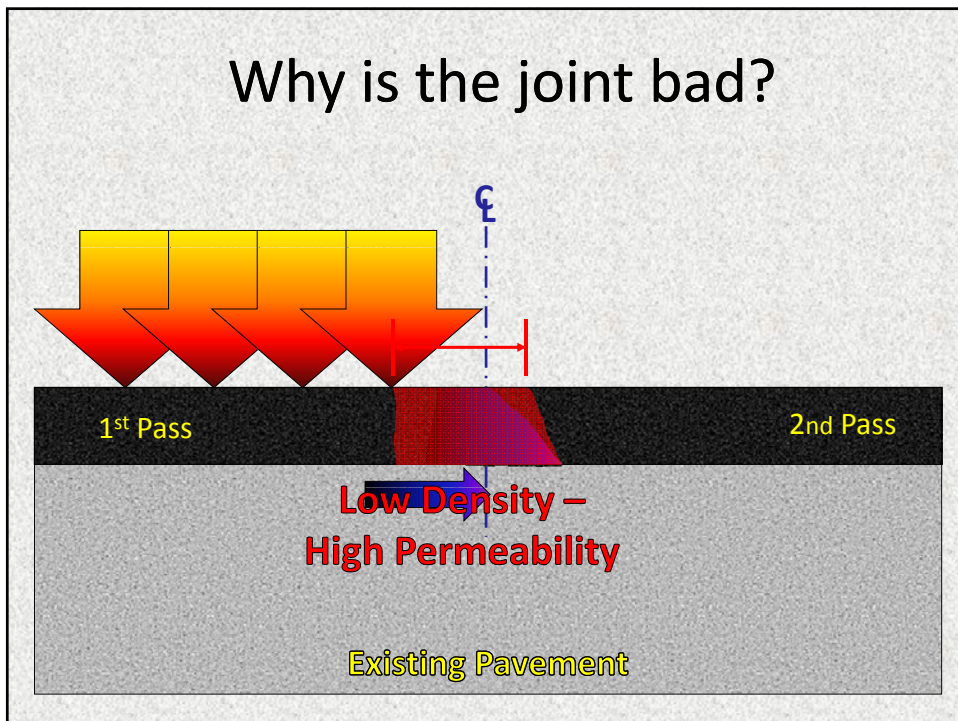


**Issues that Impact HMA
Performance**

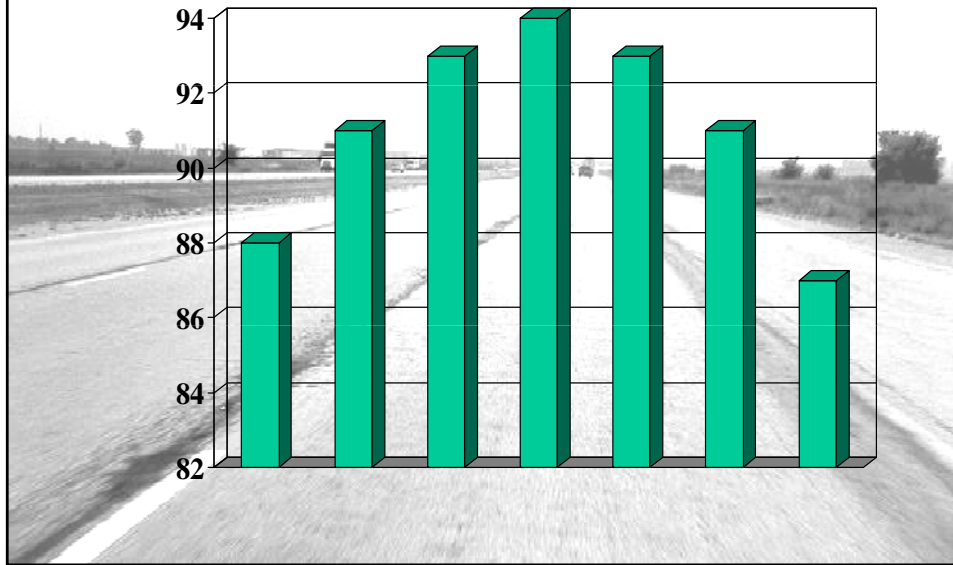
- End of Load Segregation**
- Rutting/Shoving/Stripping**
- Premature Failure of Longitudinal Joint**



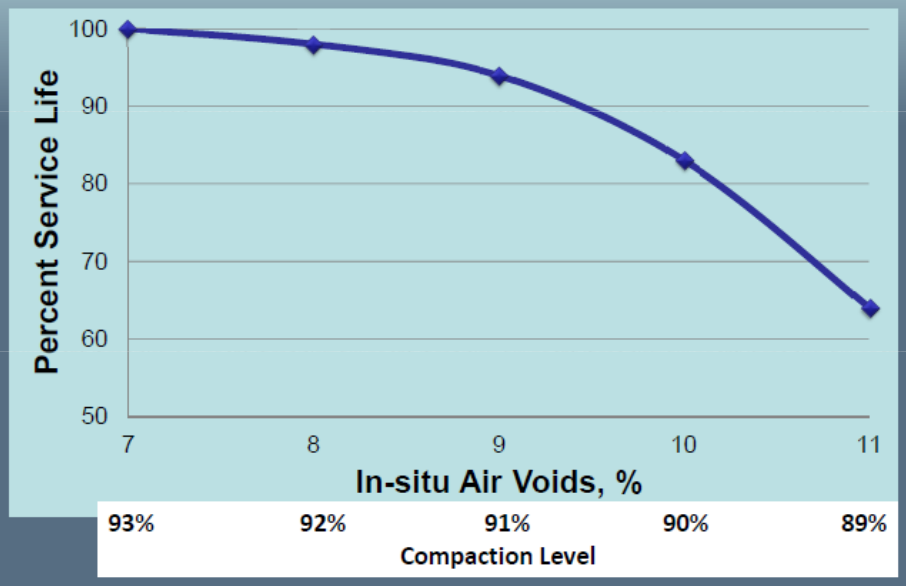




Typical Density Across the Mat



Effect of In-Place Voids on Life Washington State DOT Study



Negative Effects of High Permeability

High permeability is a problem because it allows water and air to penetrate the mix.

Water Influx ↑ = Potential for Stripping of AC ↑

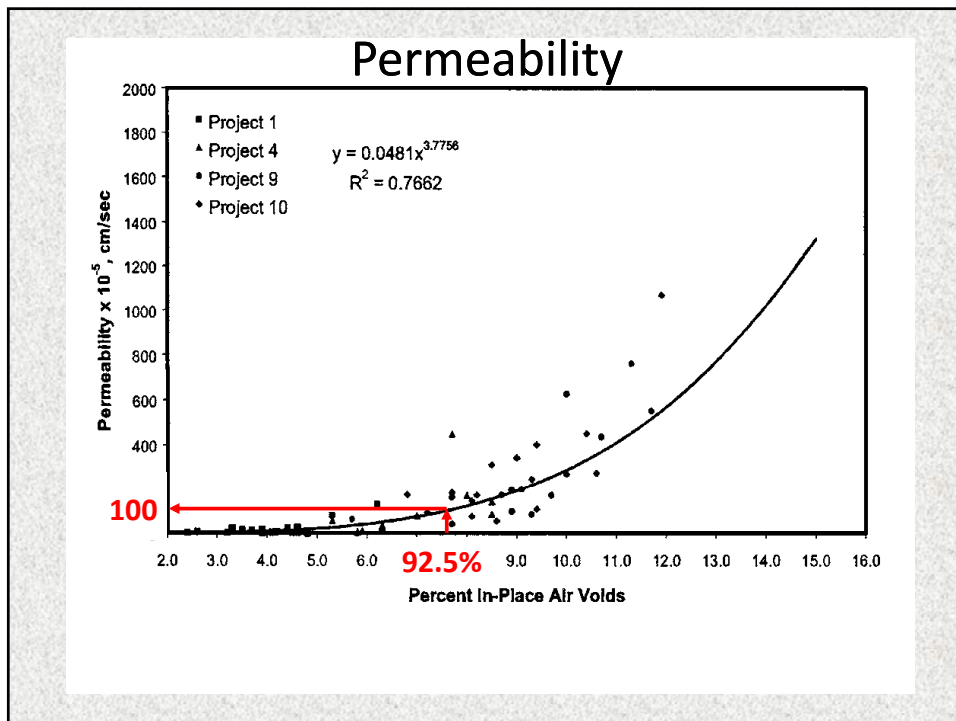
Air Influx ↑ = Potential for Oxidation of AC ↑

Stripping and oxidation weaken the mix, which ultimately leads to deterioration.

Damp Longitudinal Joint

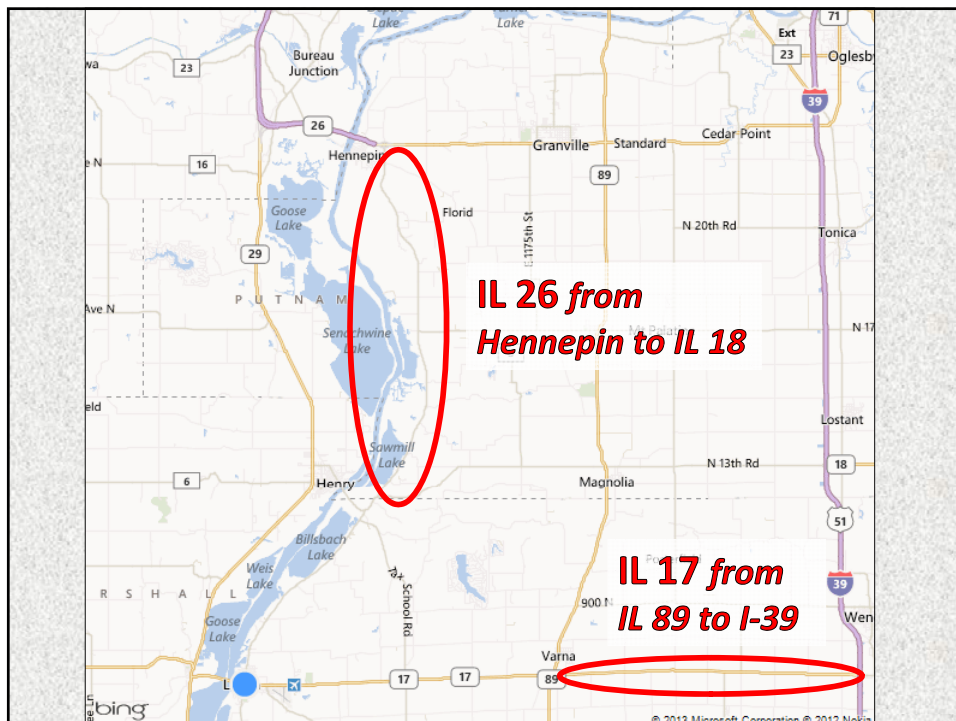


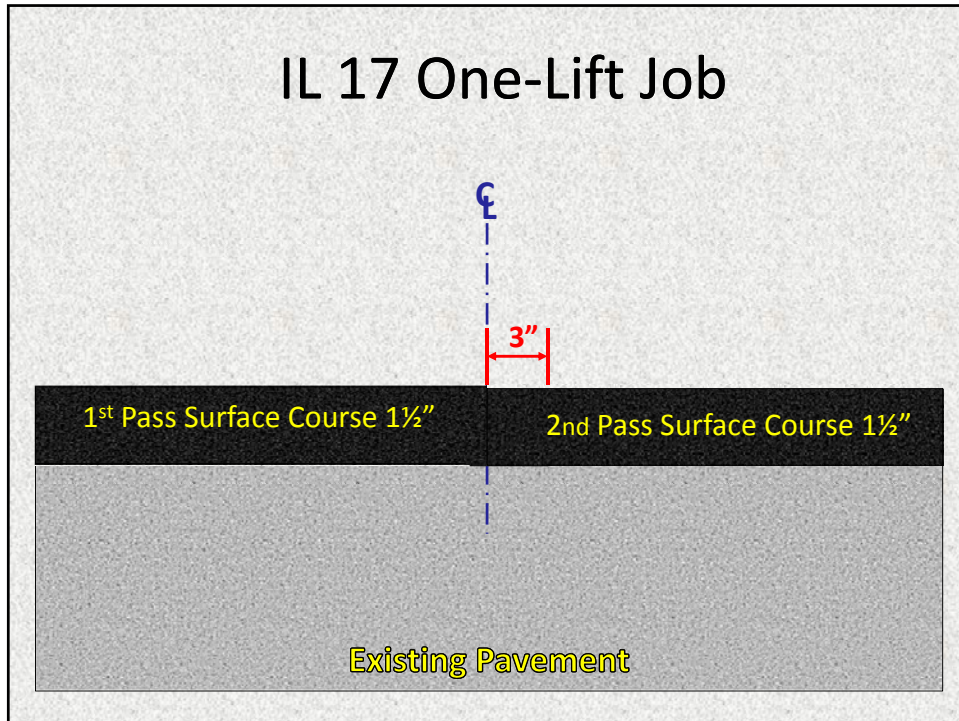
HMA Surface Course is impermeable < 100×10^{-5} cm/sec



What's Been Tried Already?

1. Notched Wedge Joints
2. Supplemental Joint Compactors
3. Joint Sealants
4. Joint Heaters
5. Joint Cutters
6. Various Other Methods
7. Longitudinal Joint Spec.







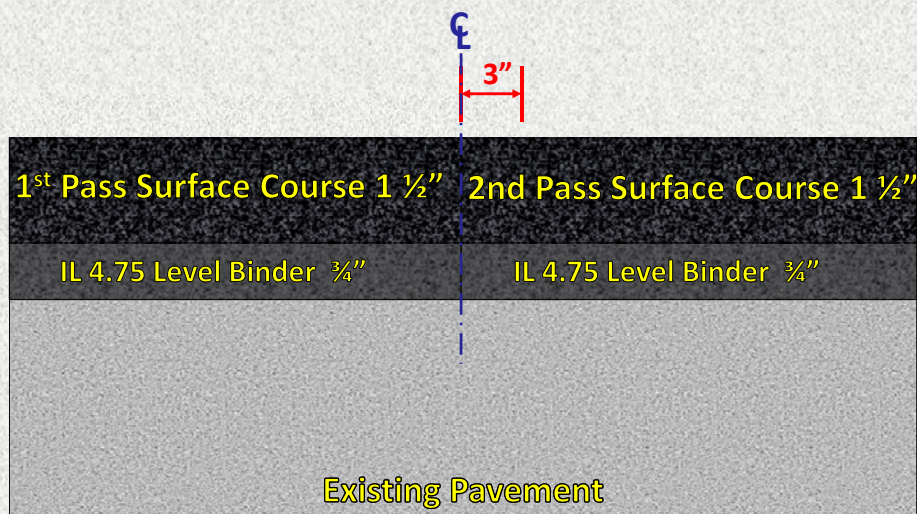


Cost of this Method?

3" of HMA per mile = 12.3 tons
 12.3 tons @ \$83/ton = \$1021/mile
 3" milling @ \$0.45/sy= \$66/mile

\$8150/\$1.3M total job = 0.6% contract
 increase

IL 26 Two-Lift Job





Why is IL 26 so much better?

1. **Built on 100% flexible base. No 9-6-9 concrete pavement.**
2. **Excellent draining sand sub-base.**
3. **Two lift job. Does the IL 4.75 sand mix make a difference in joint performance?**

Cost of this Method?

3" of HMA per mile = 12.3 tons
12.3 tons @ \$84/ton = \$1033/mile
Additional 3" milling ≈ \$1000/mile

≈ \$18300/\$3.0M total job = 0.6% contract
increase

Additional Projects with Joint Treatment

Summer 2013, IL 9 from Canton to Banner
(one lift job, 4" removal, joint matching device)

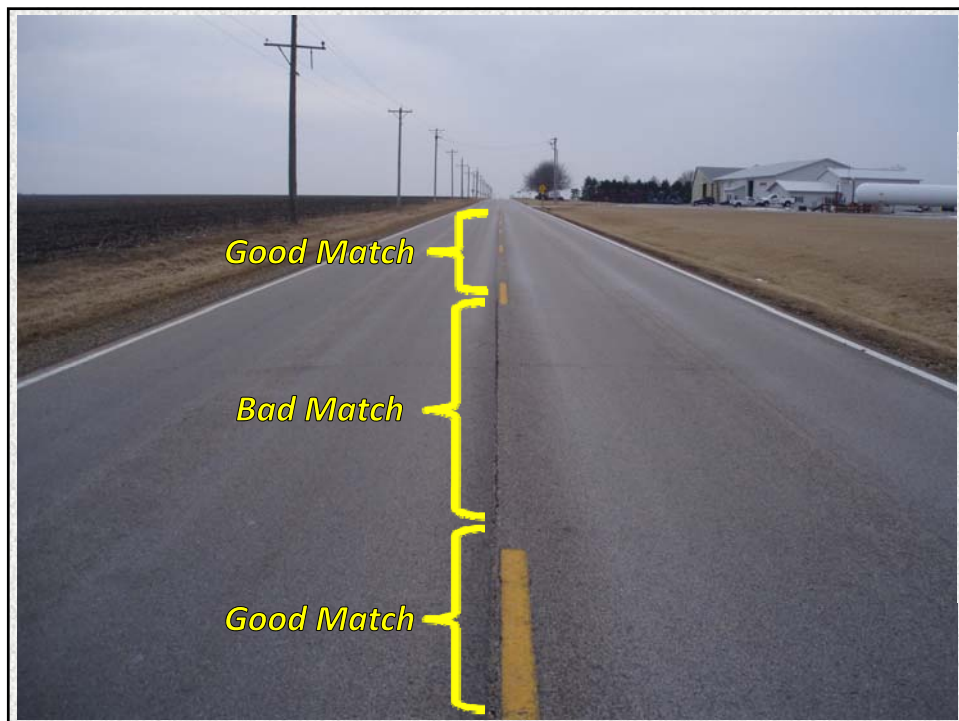
Spring 2014, US 150 from Kickapoo to IL 78
(two lift job, 4" removal, joint matching device)

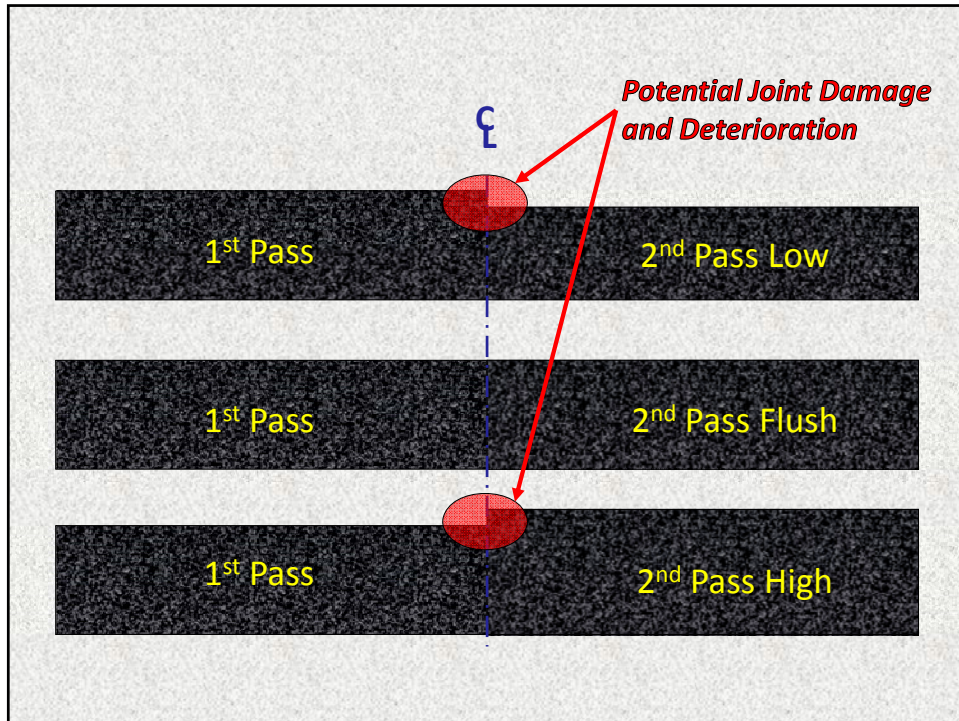
How Much to Remove???

3" → 4" → 6"?

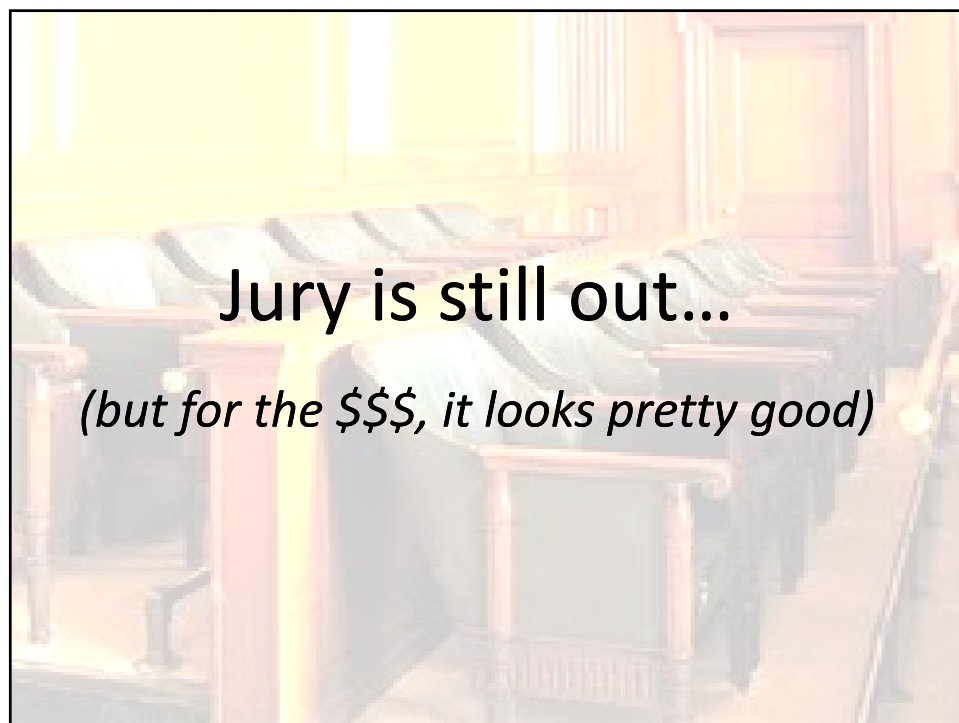
Then apply Rapid Penetrating Emulsion as additional protection???











Questions???

