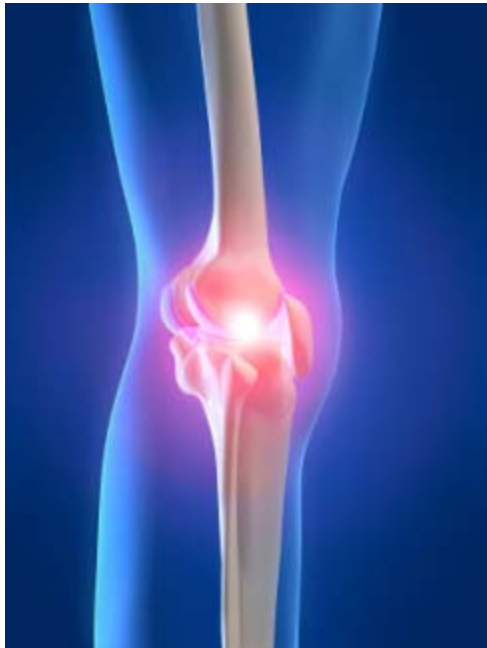


Joint Deterioration



Peter Taylor
CP Tech Center
Iowa State University

State observations 2008

	Transverse joints	Longitudinal joints
CA	X	X
IL	X	X
IN	X	X
IA	X	X
LA		
MI	X	X
MN	X	
NC		
SD		
WI		

State observations - IN



State observations - IN



State observations - IN



State observations - IN



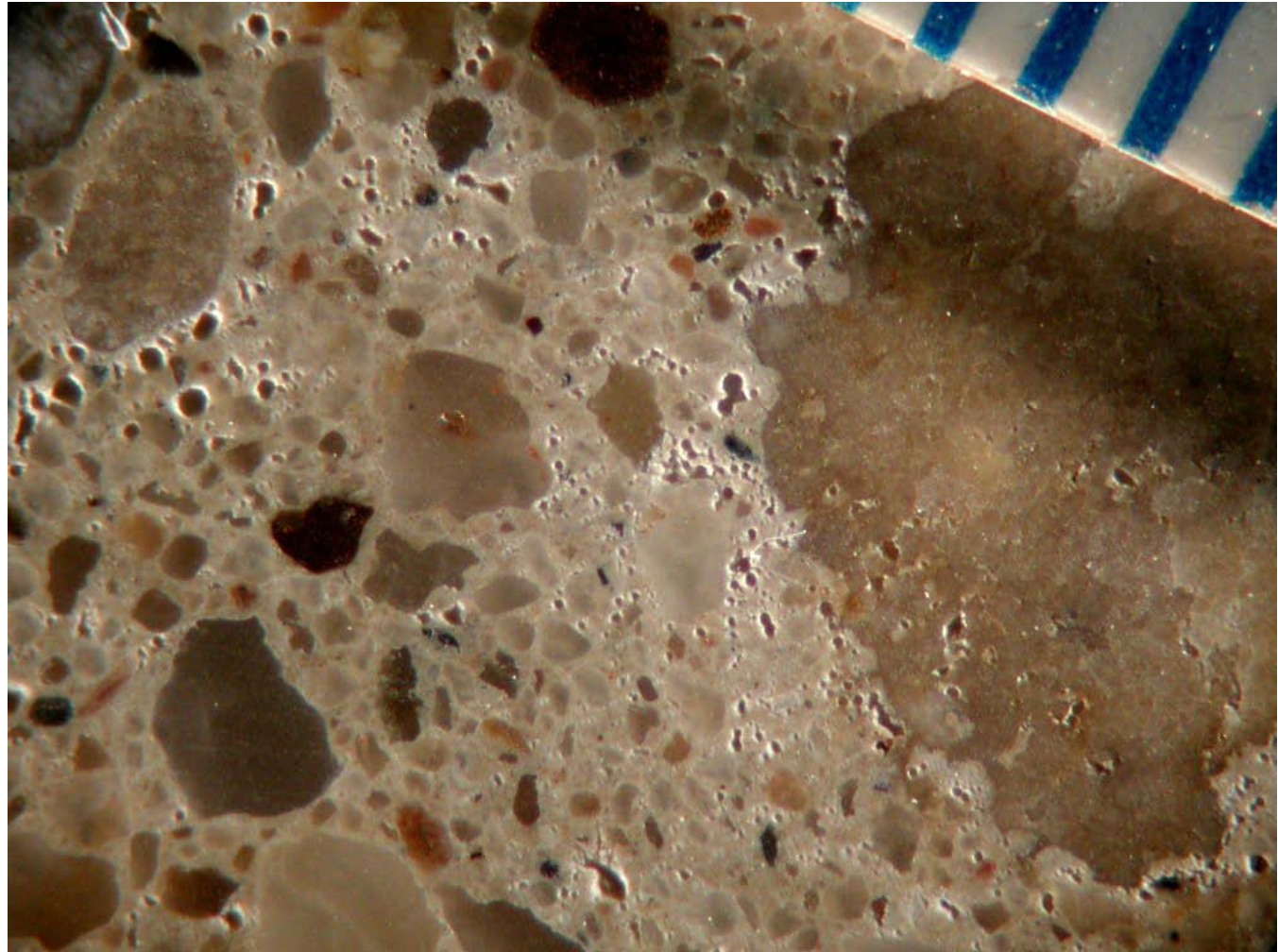
State observations - IA



State observations - IA



State observations - IA



State observations - LA



State observations - MI



State observations - MI



State observations - MN



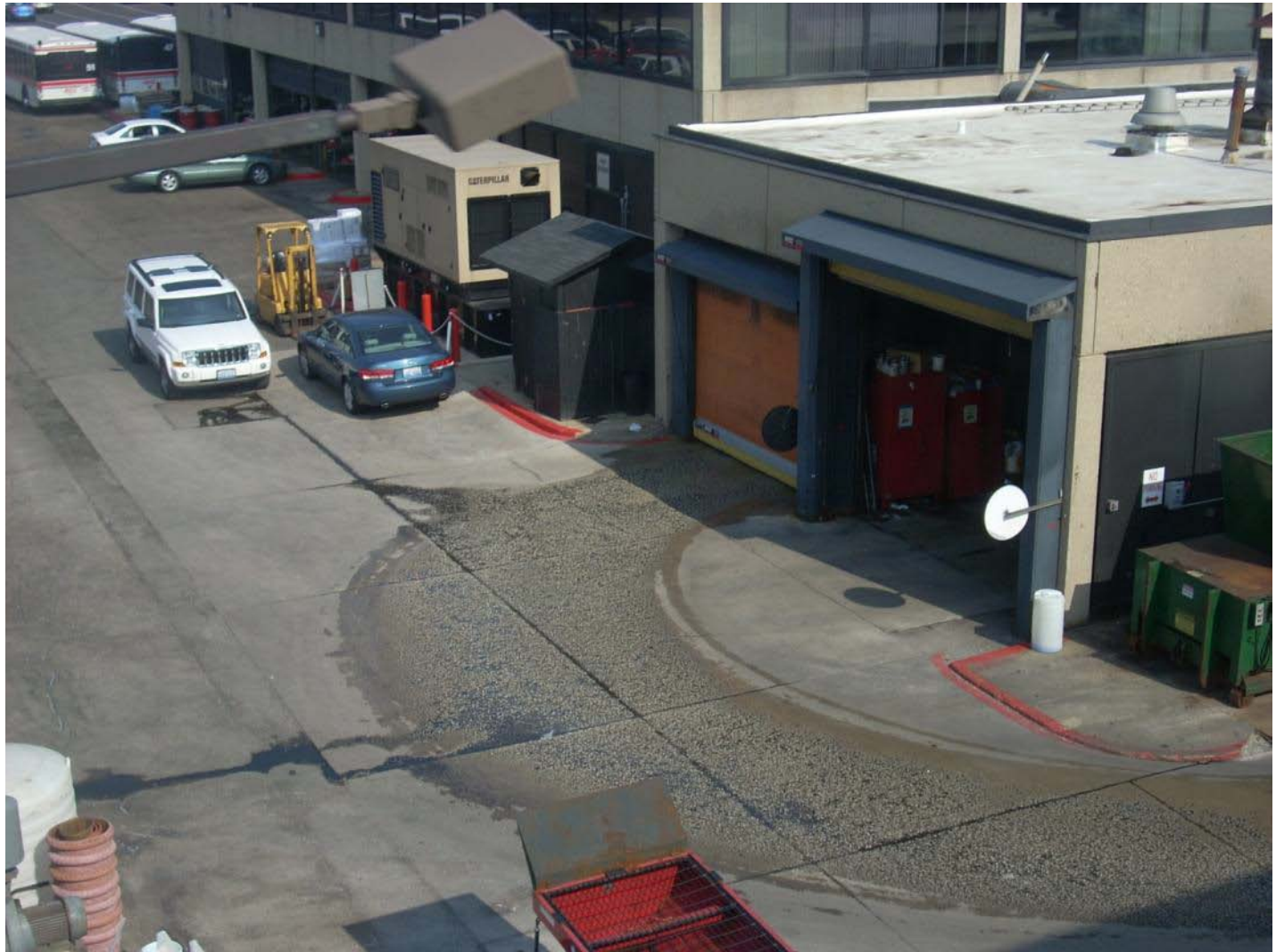
Potential mechanisms?

- New air entraining admixtures
- Compromised air void systems
- Sawing (bruising, heating, cracking)
- Early traffic
- Lack of curing on joint faces
- Over vibration at joints
- Increasing use of SCMs

Potential mechanisms?

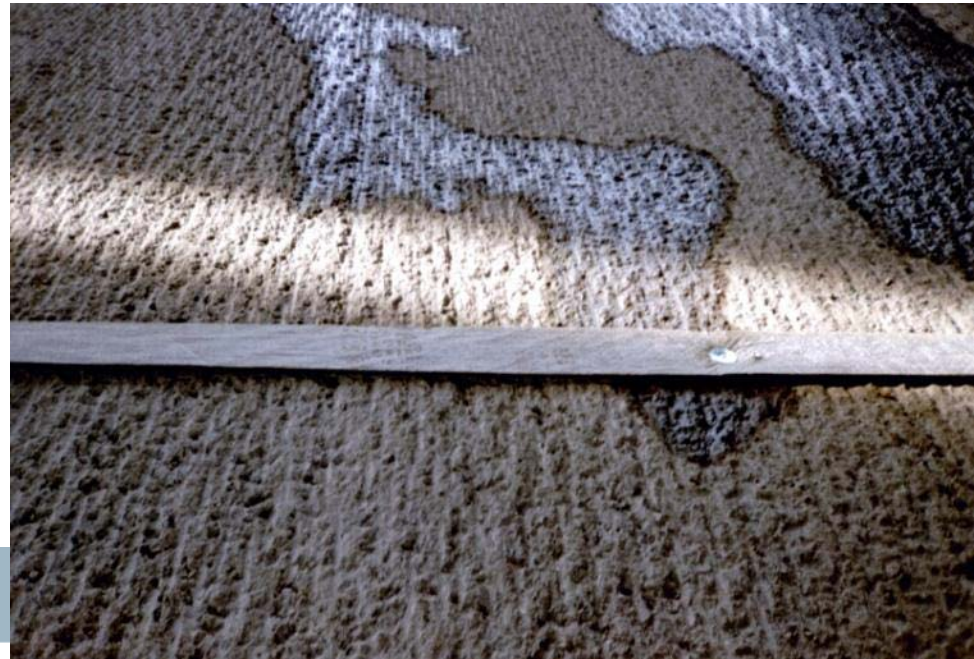
- Application rates of deicing salts
- Aggressive deicing salts
- Trapped water
- Longer harder winters
- Cementitious chemistry
- Aggregate faces exposed to weather

Saturation



What advice can we give now?

- Allow water to leave. For example:
 - No backer rods
 - Drainable base
 - Geotextiles
- Pay attention to air void system
- Seal existing
 - Siloxane
- Partial / full depth repair?



How do we research it?

- Brain storm
- Interviews
- Field review
- Test cores from the field
- Mimic mechanisms in the lab
- Develop mitigation methods
- Teach



Interviews

	Age	Local /State?	Where	Edge	Distress	AEA	ASR	SCM
IN	5	Both						All
IL	10-15	Local	Long & trans	No	Mortar			C
MI	5-20	Local	Trans	No		Syn	Some	All
WI	5-10	Both	Both	With salt				C
IA	5-40	Both	Long & trans	No				C

Initial Lab Work

- Matrix
 - With and without 15% fly ash
 - Vinsol and synthetic AEA
 - Curing compound and moist curing
 - Water and NaCl solution
- Mixture
 - 564 pcy
 - 4-5% air
 - Samples dry sawn longitudinally
- Test
 - ASTM C 666

Initial Lab Work

- Future variables:
 - Different salts
 - Wet sawing
 - Sealed joints
 - Cracked specimens
 - Vary SCM type/dose
 - Ground surfaces

Who pays?

- Pooled Fund TPF 1227
- CP Tech Center Cooperative Agreement
- Industry
- FHWA