

National Concrete Pavement
Technology Center



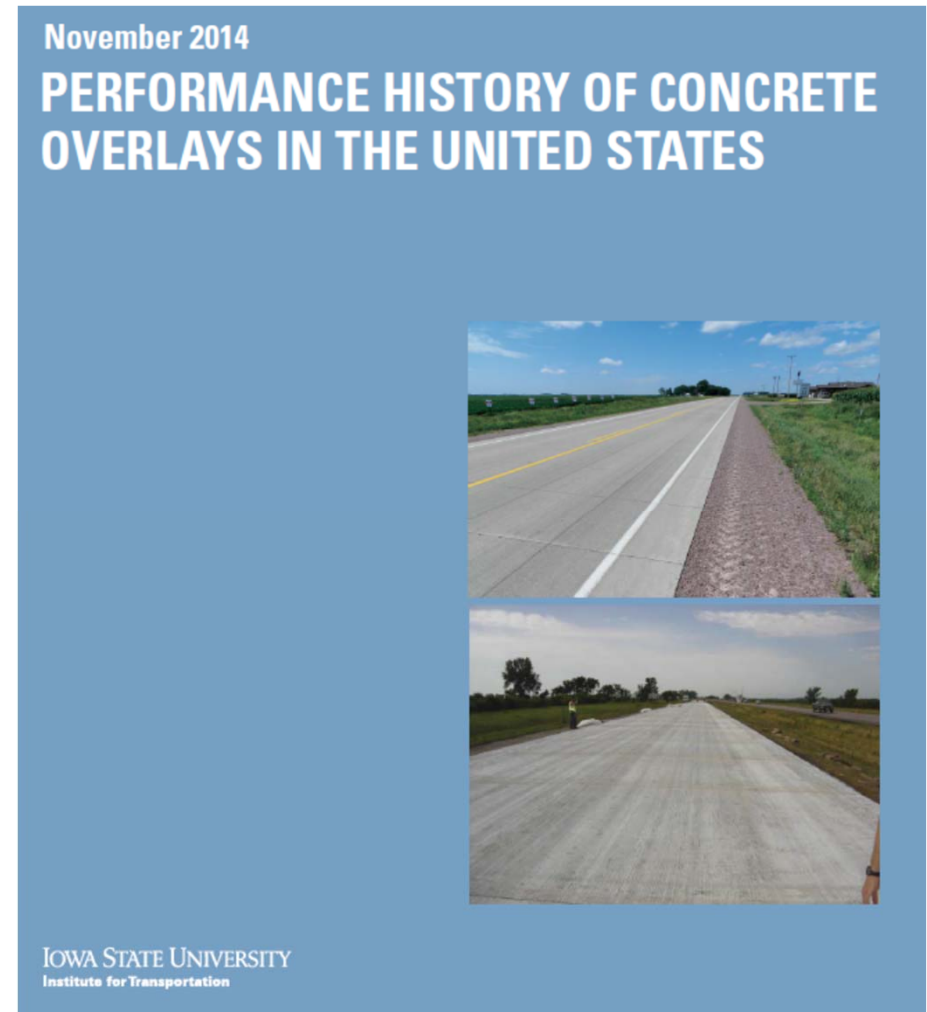
Concrete Overlay Webinar Series

Performance History of Concrete Overlays

Concrete Overlay

Case Histories

- 2014 CP Tech Center publication – free download!

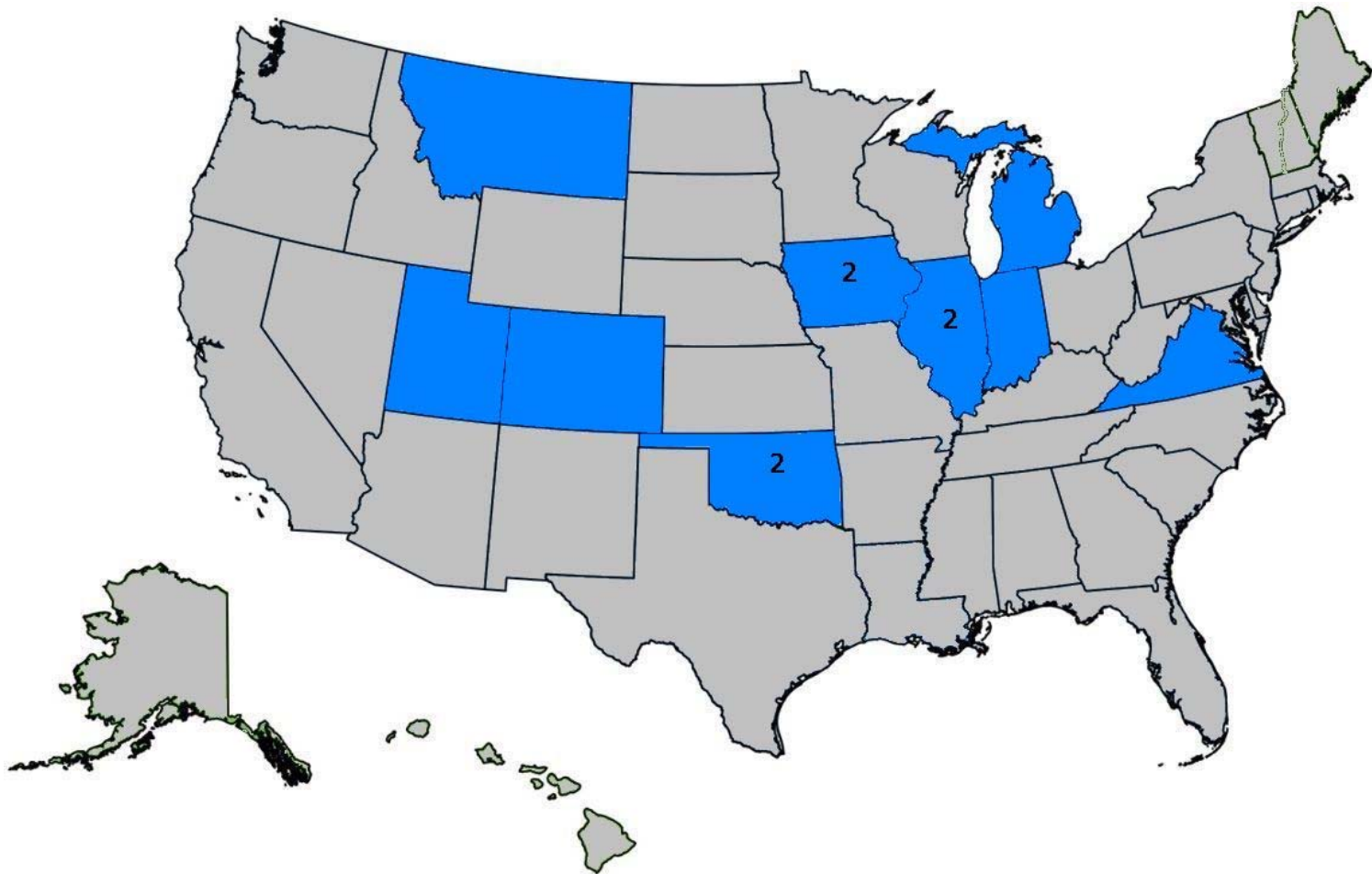


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Concrete Overlay

Case Histories

- Highlights twelve concrete overlay projects across the US



Concrete Overlay

Case Histories

Case History #	State	Route	Year Constructed	Existing Pavement Type and <i>Overlay Type</i>			Functional Classification			
				Asphalt	Composite	Concrete	Interstate or Freeway or Expressway	Principal or Minor Arterial	Major or Minor Collector	Local
1	OK	US-69	2001	<i>Bonded</i>				<input checked="" type="checkbox"/>		
2	MT	US-16	2001	<i>Bonded</i>					<input checked="" type="checkbox"/>	
3	IL	Plank Rd	1974	<i>Unbonded</i>						<input checked="" type="checkbox"/>
4	CO	US-287	1998	<i>Unbonded</i>				<input checked="" type="checkbox"/>		
5	UT	SR-89/114	2001		<i>Bonded</i>					<input checked="" type="checkbox"/>
6	IA	SH-13	2002		<i>Bonded</i>				<input checked="" type="checkbox"/>	
7	IN	I-69	1986		<i>Unbonded</i>		<input checked="" type="checkbox"/>			
8	OK	I-35	2004		<i>Unbonded</i>		<input checked="" type="checkbox"/>			
9	IA	V-63	2002			<i>Bonded</i>				<input checked="" type="checkbox"/>
10	IL	I-88	1996			<i>Bonded</i>	<input checked="" type="checkbox"/>			
11	MI	US-131	1998			<i>Unbonded</i>		<input checked="" type="checkbox"/>		
12	NC	I-85	1998			<i>Unbonded</i>	<input checked="" type="checkbox"/>			

Case History #1

US-69 Oklahoma

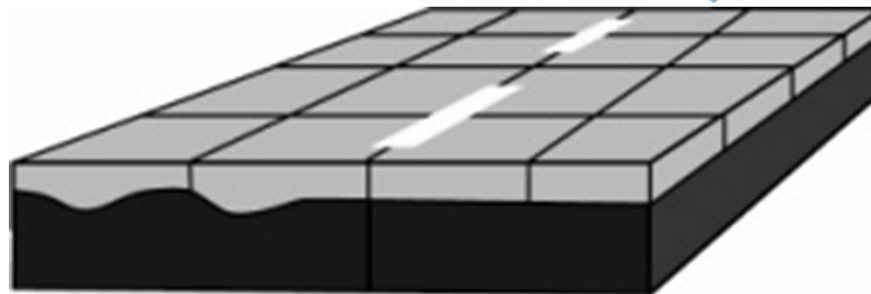


Case History #1

US-69 Oklahoma

- Bonded on Asphalt

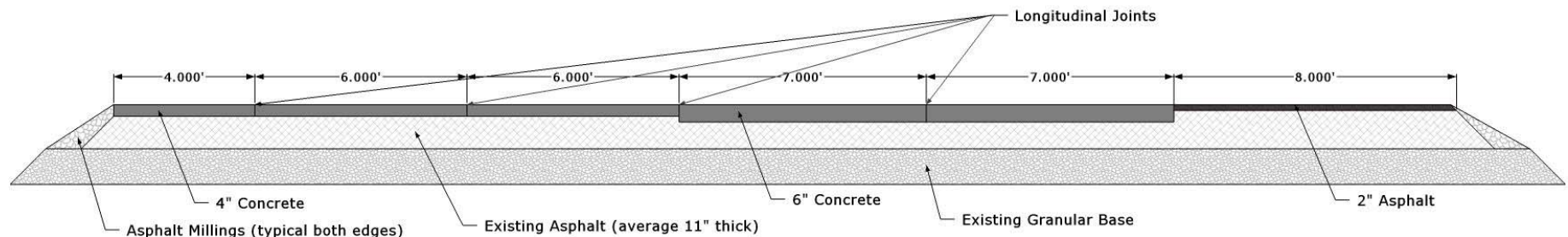
- **4" and 6" thickness**
- **13 years old**
- **10,100,000 ESALs**



Case History #1

US-69 Oklahoma

- Typical Section
 - 4" and 6" concrete pavement
 - Slab sizes (w x l): 4' x 6', 6' x 6' and 7' x 6'
 - Existing asphalt pavement milled (approx. 11" remaining)
 - Existing granular base



Case History #1

US-69 Oklahoma

- Constructed adjacent to traffic
- Fiber reinforced (3 lb/yd³)



Case History #1

US-69 Oklahoma

- Less than 1% cracked slabs after 9 years



Case History #3

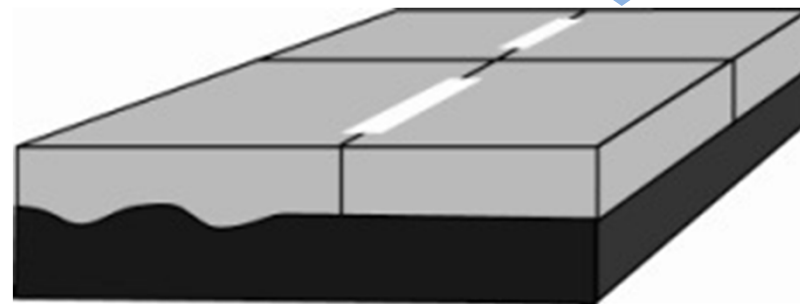
CR-56 LaSalle County Illinois



Case History #3

CR-56 LaSalle County Illinois

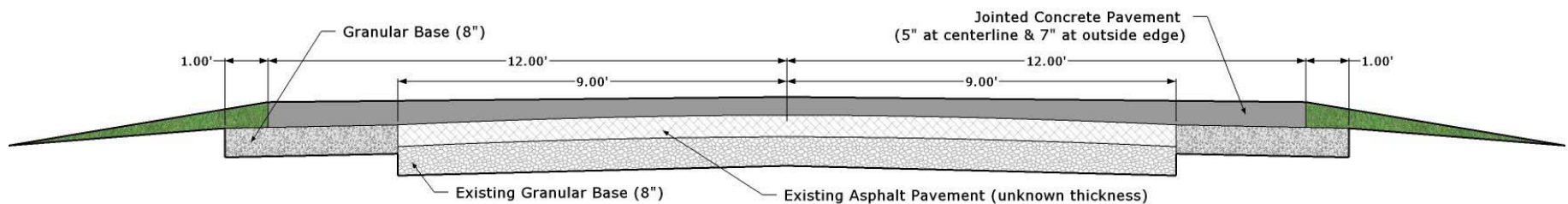
- Unbonded on Asphalt
 - **5" to 7" thick**
 - **40 years old**
 - **8,400,000 ESALs**



Case History #3

CR-56 LaSalle County Illinois

- Typical Section
 - Variable thickness (5" to 7") concrete pavement
 - Slab sizes (w x l): 12' x 15'
 - Existing asphalt pavement
 - Existing base/subgrade



Case History #3

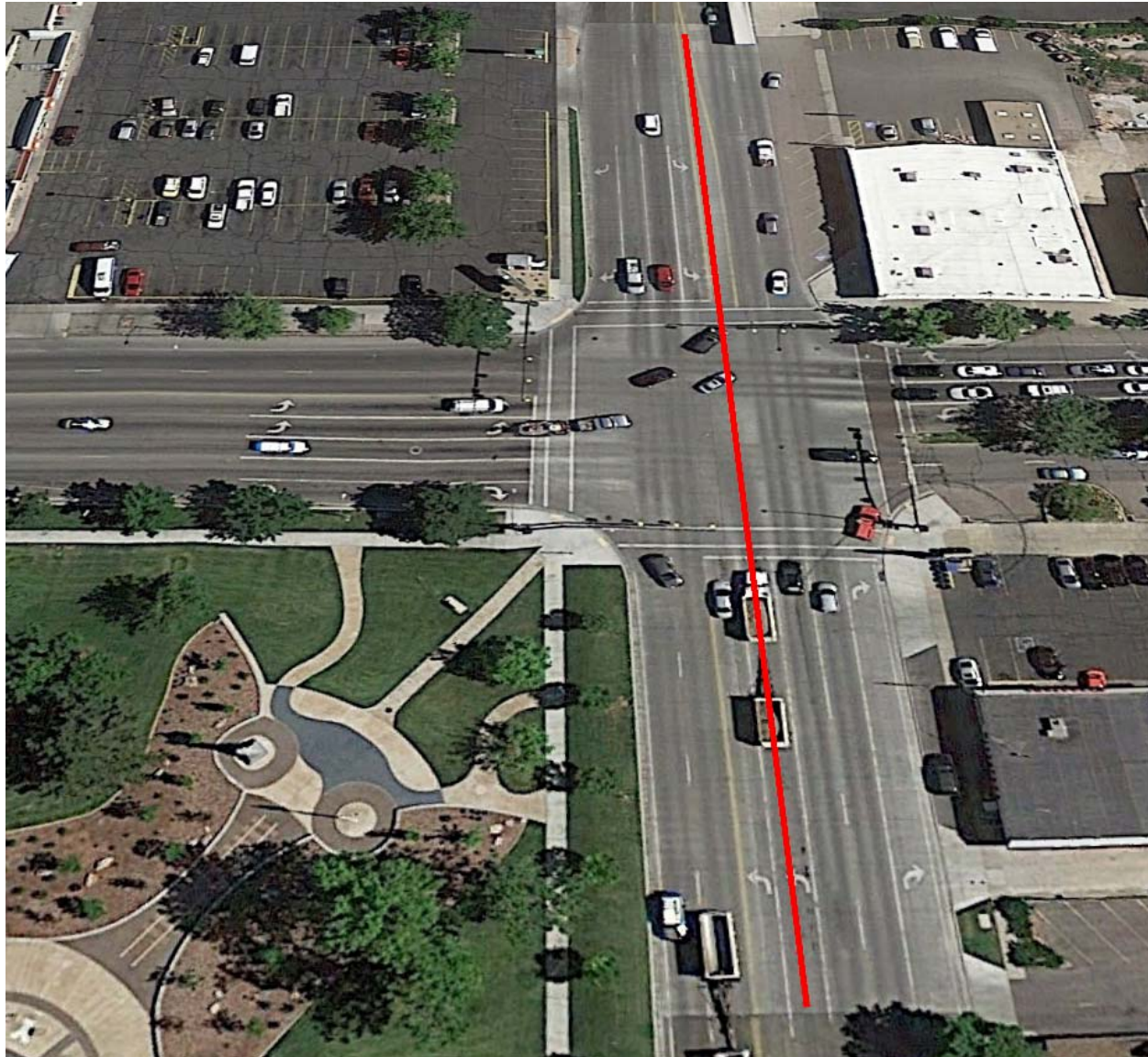
CR-56 LaSalle County Illinois

- Local traffic maintained during construction
- Integral widening from 18' to 24'



Case History #5

US-89 Utah

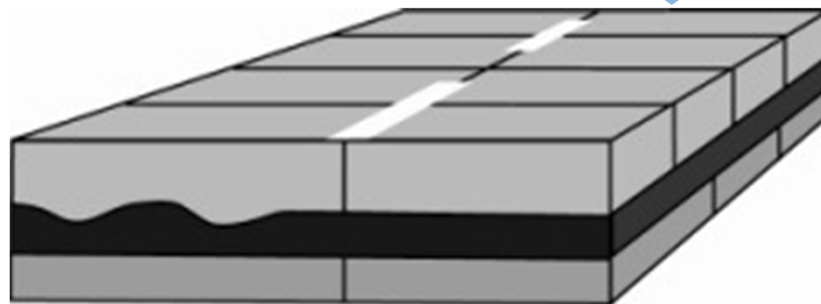


Case History #5

US-89 Utah

- Unbonded on Composite

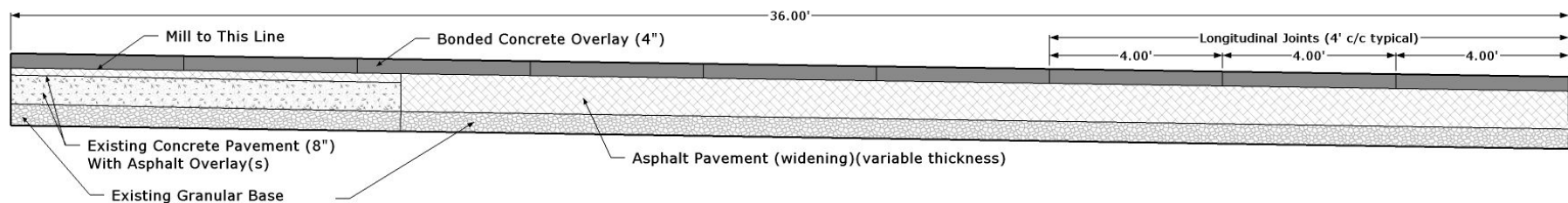
- **4" thick**
- **Reconstructed after 10 years**
- **6,000,000 ESALs**



Case History #5

US-89 Utah

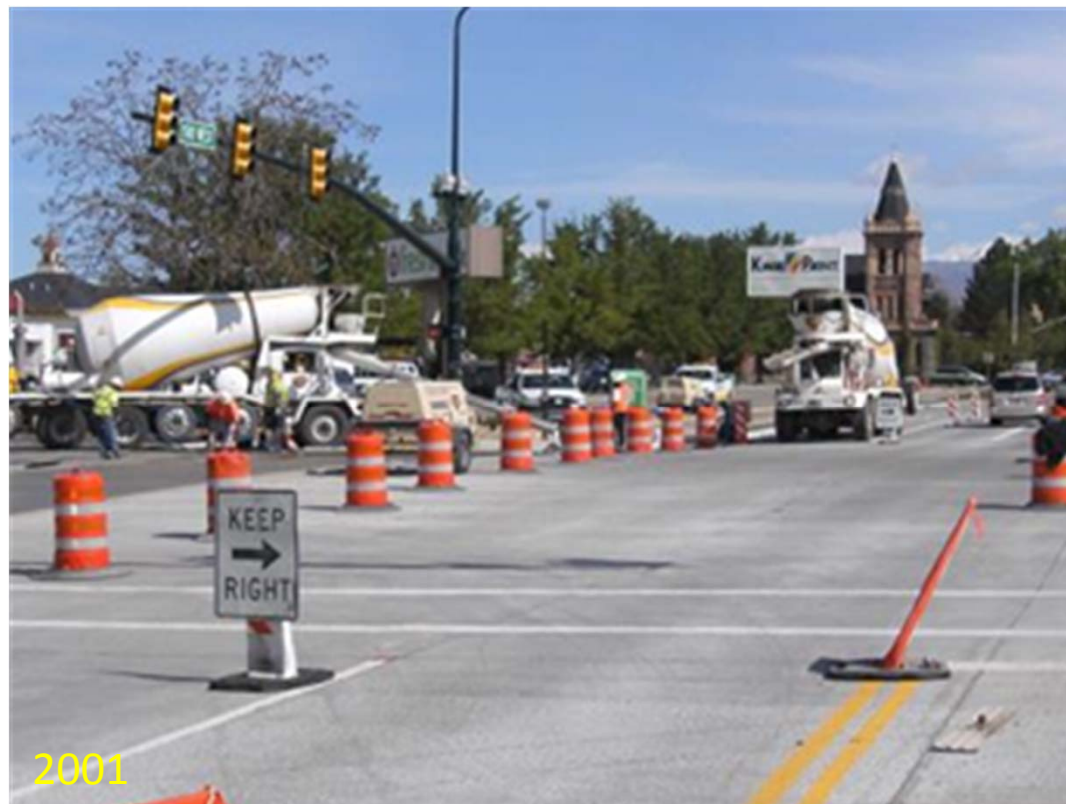
- Typical Section
 - 4" concrete pavement
 - Slab sizes (w x l): 4' x 4'
 - Existing concrete pavement with asphalt overlays (milled)
 - Existing base/subgrade



Case History #5

US-89 Utah

- Local traffic maintained during construction
- Constructed on consecutive weekends
- Fiber reinforced (3 lb/yd³)



Case History #5

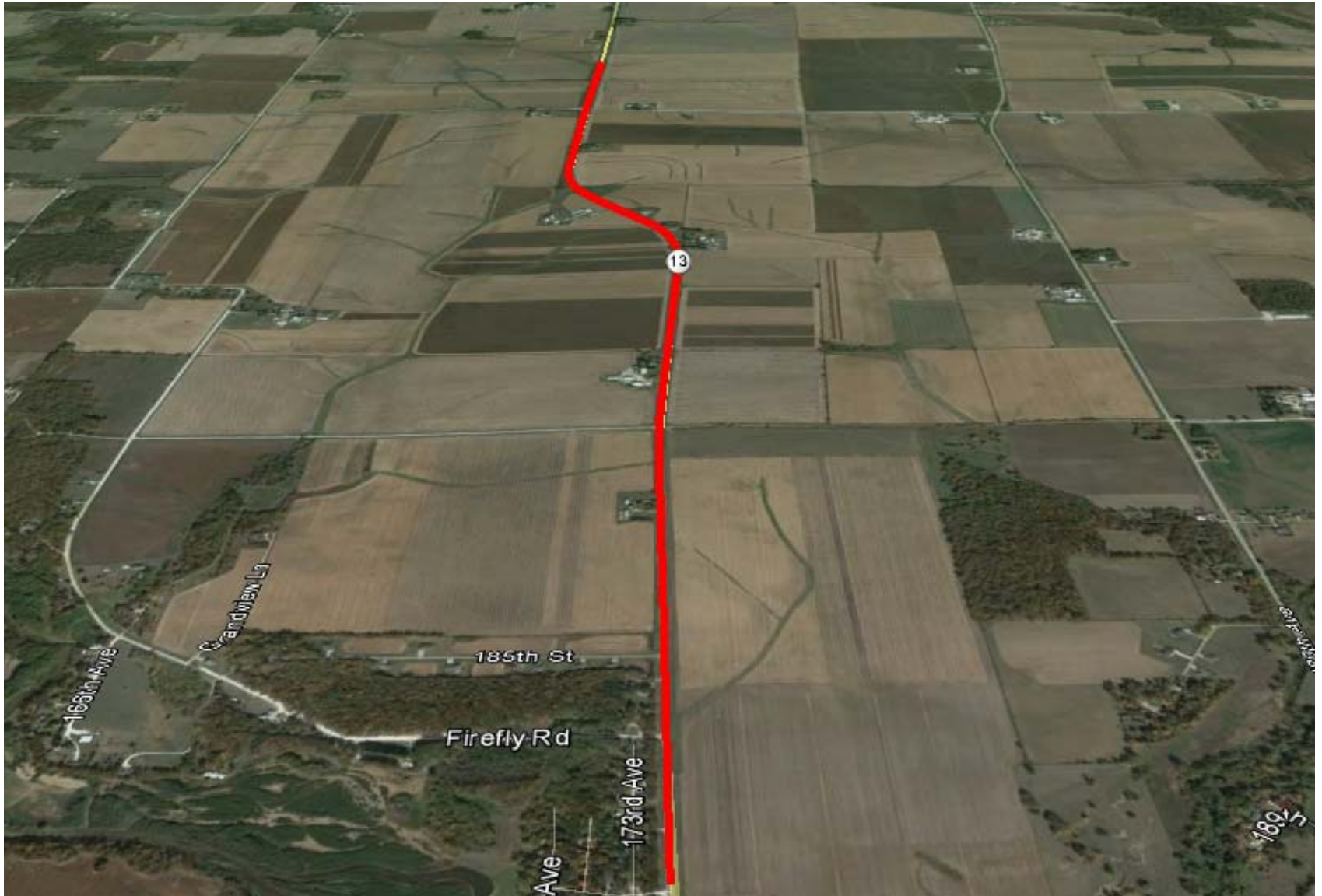
US-89 Utah

- Reconstructed during capacity widening project in 2012
- Early cracking and panel replacement around utility structures



Case History #6

SH-13 Iowa

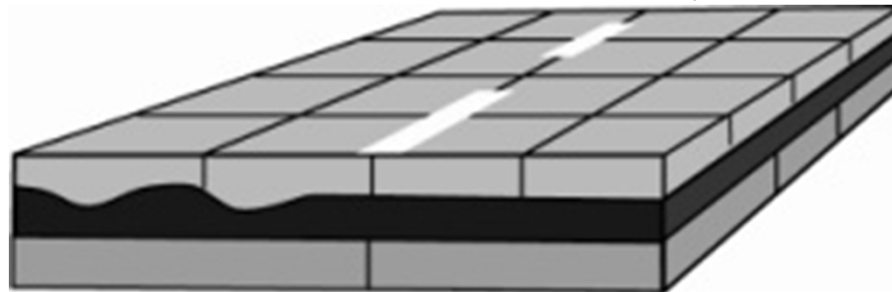


Case History #6

SH-13 Iowa

- Bonded on Composite

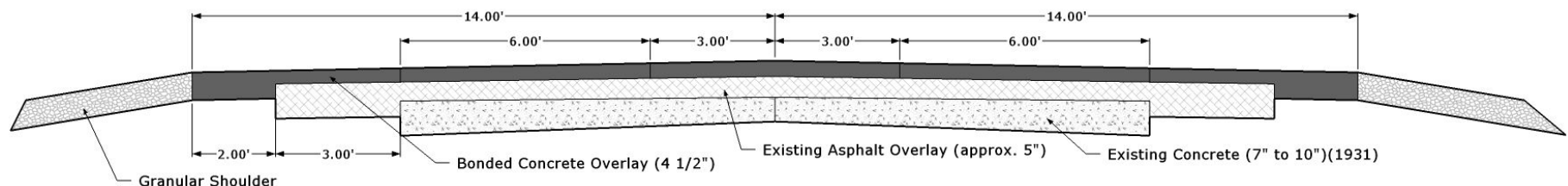
- **4" thickness**
- **12 years old**
- **1,000,000 ESALs**



Case History #6

SH-13 Iowa

- Typical Section
 - 4" concrete pavement
 - Multiple variations of slab size from 3' to 6' x 6'
 - Existing composite pavement (1931, 7" to 10") with asphalt pavement (1964 & 1984, 5")
 - Milled $\frac{1}{4}$ " nominal



Case History #6

SH-13 Iowa

- Fiber reinforced (3 lb/yd³)



Case History #6

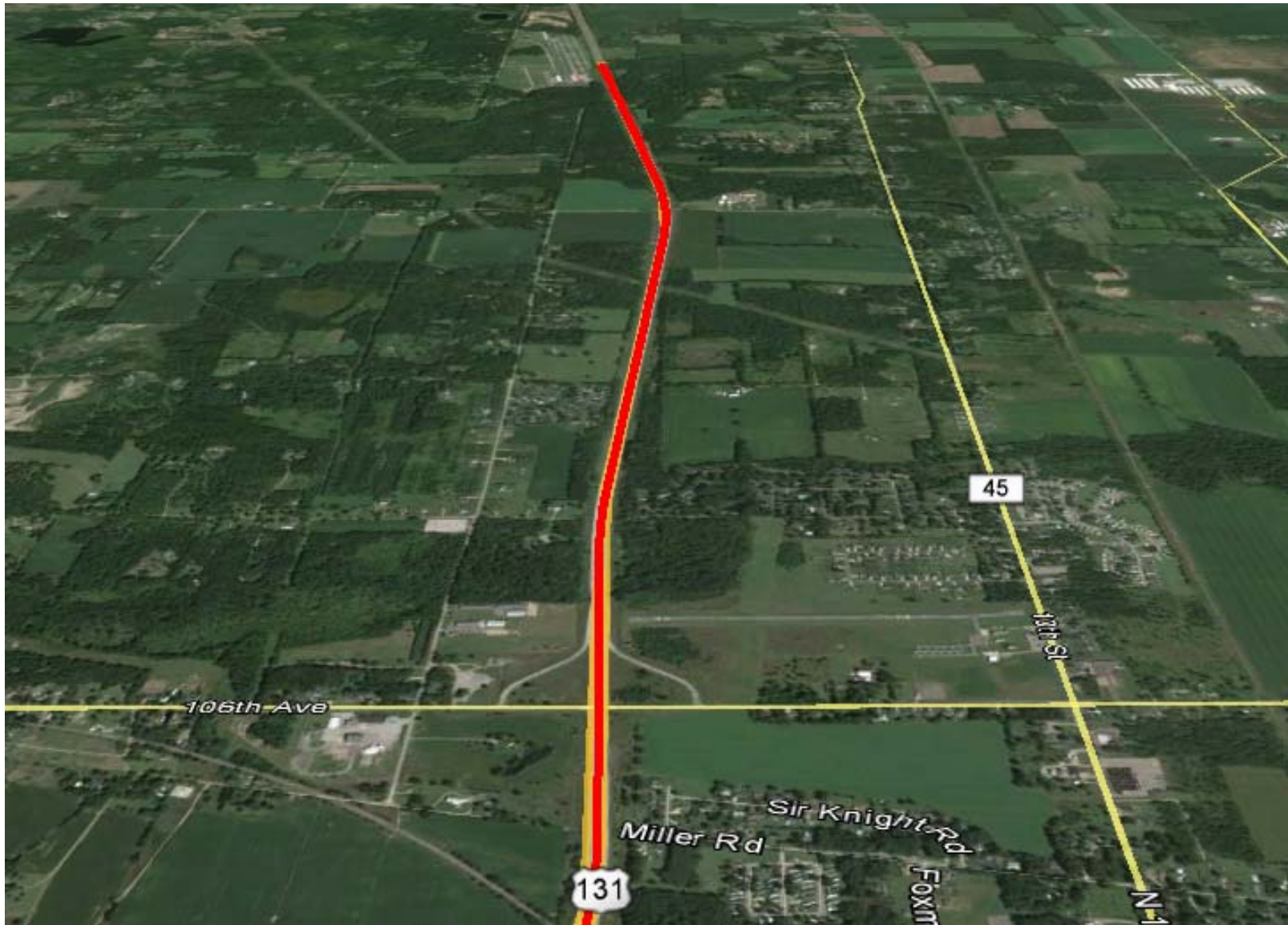
SH-13 Iowa

- Minimal repairs after 12 years
- Some longitudinal cracking attributed to tooled joints



Case History #11

US-131 Michigan

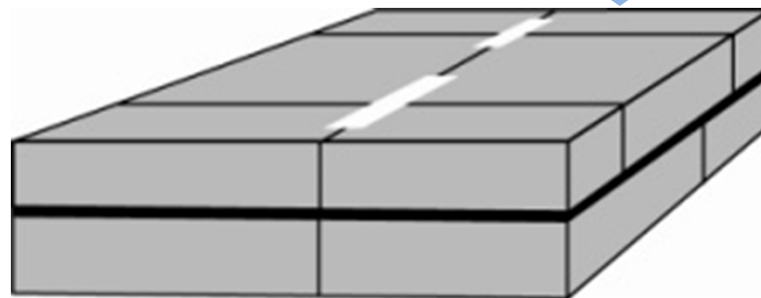


Case History #11

US-131 Michigan

- Unbonded on Concrete

- **$\pm 7''$ thickness**
- **16 years old**
- **8,000,000 ESALs**



Case History #11

US-131 Michigan (pre-overlay)



Case History #11

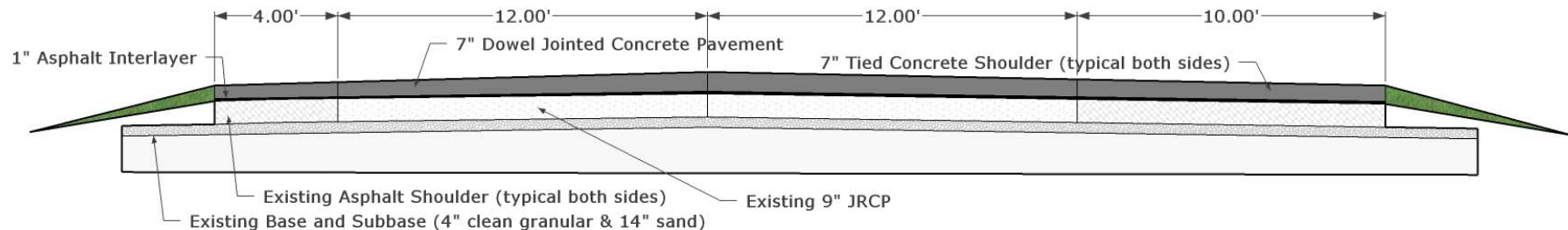
US-131 Michigan (9 years later)



Case History #11

US-131 Michigan

- Typical Section
 - ±7" concrete pavement
 - Slab sizes (w x l): 12' x 13'
 - 1" asphalt interlayer
 - Existing concrete pavement (9")
 - 4" granular base on 14" sand subbase



Case History #11

US-131 Michigan

- Constructed adjacent to traffic
- 40% GGBFS
- Crown correction made with variable thickness concrete



Case History #11

US-131 Michigan

- Estimates based on 2012 imagery
 - 18 patches (0.3%)
 - 24 cracked slabs (0.4%) that have been sealed
- 0.8 mile section experienced early joint deterioration



QUESTIONS?



THANK YOU!