


I-440 Concrete Ramps

Attendees: Miller Bernhardt, Red Jordan, Brian Lee

Report: Miller Bernhardt, Julie Hartman

- RP-J-23, RP-J-24, RP-J-25 Standard drawings were used to determine which areas needed to be repaired.
- These yellow bars represent a standard 6' X 16" section of full depth repair. 
- The 6' X 16" areas shown in the photos below are a general representation of what is out there. Not all areas were photographed.

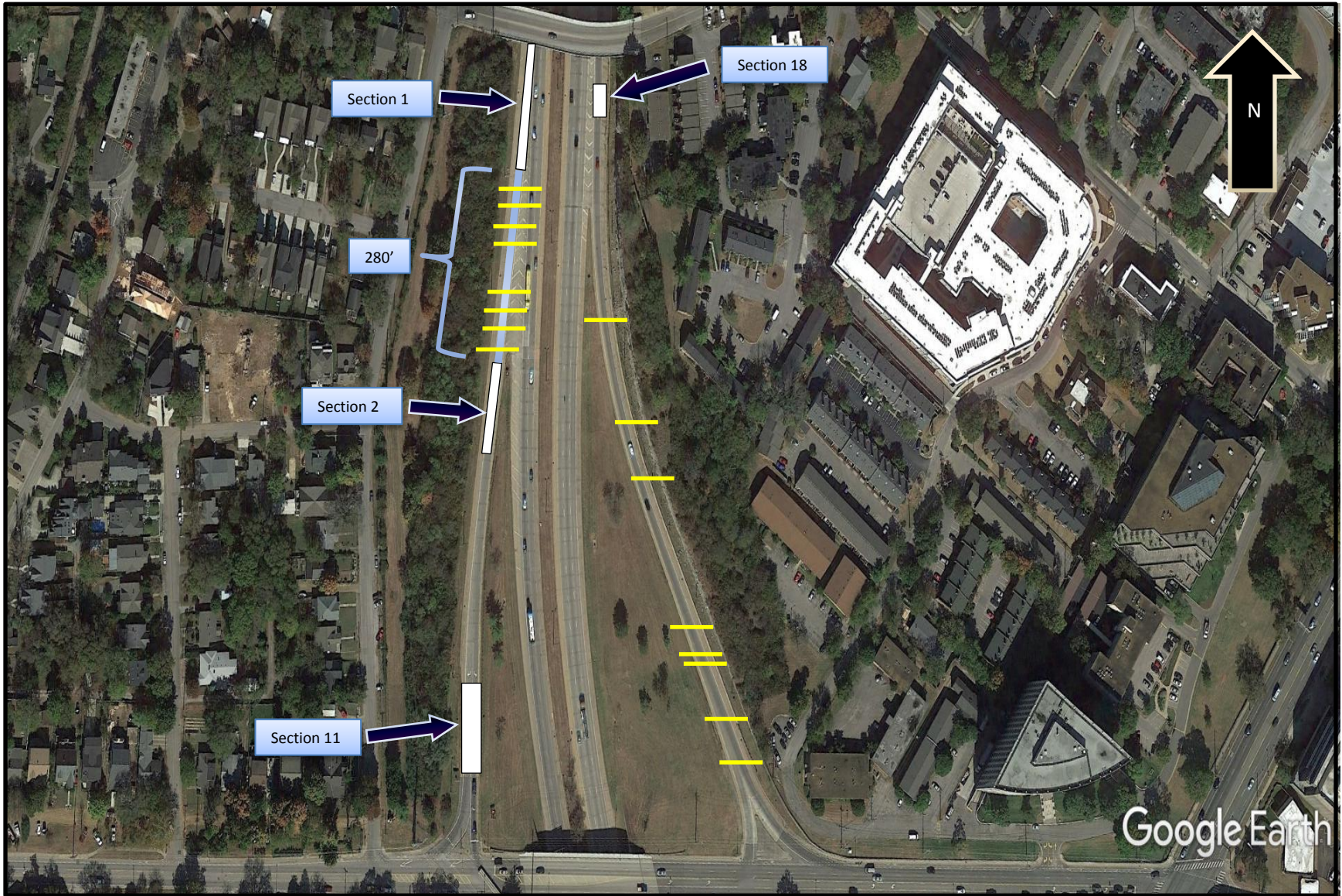


Figure 1: Murphy Road

Section 1



Section 2



Sections 3-10



Sections 12-18



Section 19



Possible faulting and subgrade issues

I440 EB Off Ramp To Murphy Road						Total Square Yards		2680	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards					
1	170	16	2720	302.22					
2	150	16	2400	266.67					
3	6	16	96	10.67					
4	6	16	96	10.67					
5	6	16	96	10.67					
6	6	16	96	10.67					
7	6	16	96	10.67					
8	6	16	96	10.67					
9	6	16	96	10.67					
10	6	16	96	10.67					
11	150	24	3600	400.00					
Totals			9488	1054.22					
Percent Damaged	39%								

Murphy Road On Ramp To I440 WB						Total Square Yards		2384	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards					
12	6	16	96	10.67					
13	6	16	96	10.67					
14	6	16	96	10.67					
15	6	16	96	10.67					
16	6	16	96	10.67					
17	6	16	96	10.67					
18	6	16	96	10.67					
19	25	24	600	66.67					
Totals							1272		141.33
Percent Damaged	6%								



Figure 2: West End

Section 1



Sections 2-5



I440 EB Off Ramp To West End South					Figure 2 Table				
Section	Length (FT)	Width (FT)	Square Feet	Square Yards					
1	60	24	1440	160.00					
2	6	16	96	10.67					
3	6	16	96	10.67					
4	6	16	96	10.67					
5	6	16	96	10.67					
Totals			1824	202.67					
Percent Damaged	10%								



Figure 3: West End

Section 1



Section 2



Section 3



Sections 4-9



Sections 10-16



Figure 3 Table

I440 WB Off Ramp To West End					Total Square Yards		4000				
Section	Length (FT)	Width (FT)	Square Feet	Square Yards							
3	60	36	2160	240.00							
4	6	16	96	10.67							
5	6	16	96	10.67							
6	6	16	96	10.67							
7	6	16	96	10.67							
8	6	16	96	10.67							
9	6	16	96	10.67							
Totals			2736	304.00							
Percent Damaged	8%										
West End To I440 WB					Total Square Yards		2384				
Section	Length (FT)	Width (FT)	Square Feet	Square Yards							
2	60	16	960	106.67							
Totals			960	106.67							
Percent Damaged	4%										
					West End To I440 EB		Total Square Yards		4240		
					Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
					1	80	16	1280	142.22		
					10	6	16	96	10.67		
					11	6	16	96	10.67		
					12	6	16	96	10.67		
					13	6	16	96	10.67		
					14	6	16	96	10.67		
					15	6	16	96	10.67		
					16	6	16	96	10.67		
					Totals			1952	216.89		
					Percent Damaged	5%					

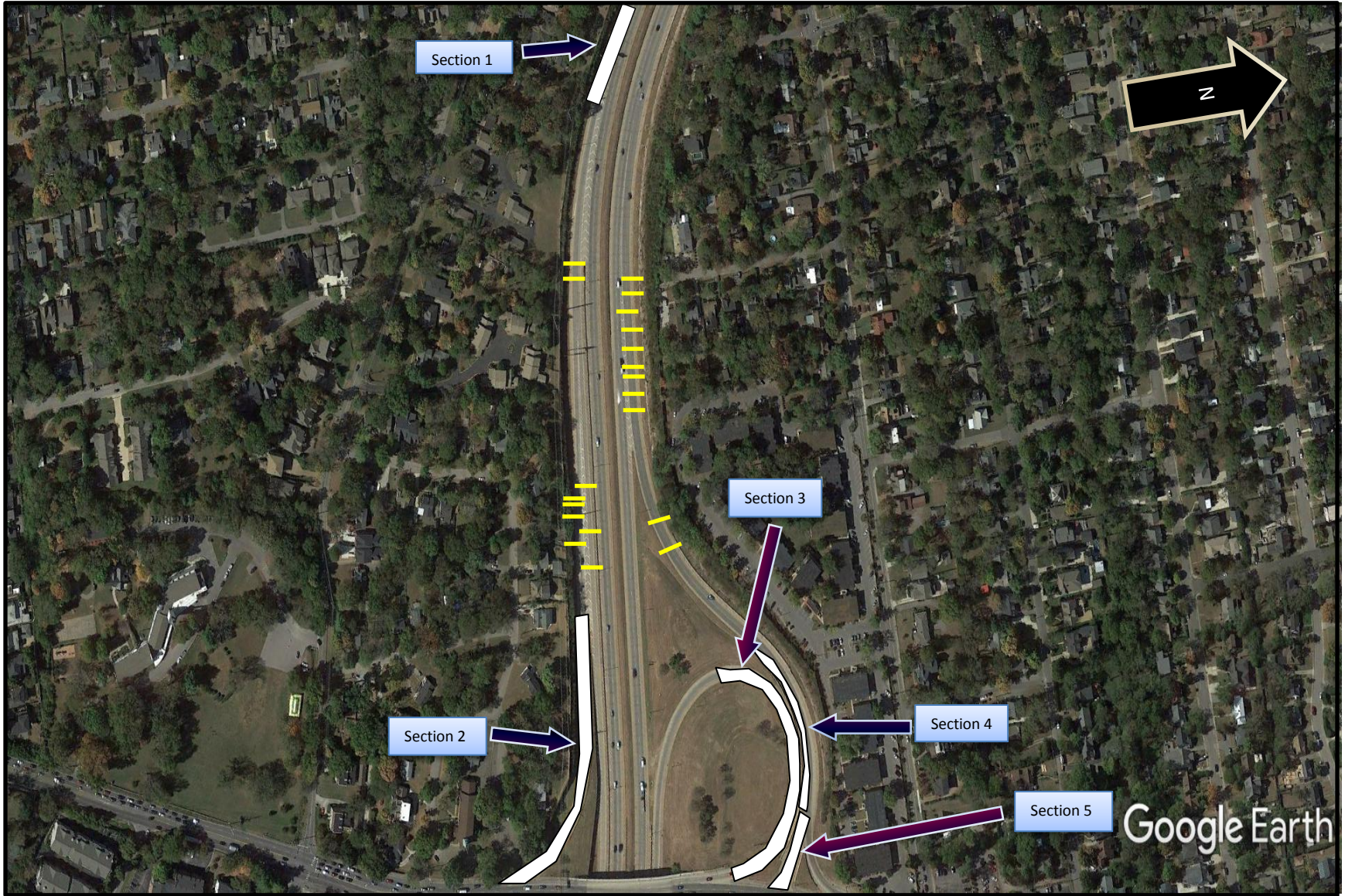


Figure 4: Hillsboro Road

Section 1





Section 2







Section 3





Section 4





Section 5





Sections 6-25





Figure 4 Table

I440 EB Off Ramp To Hillsboro Rd					Total Square Yards	6000	Hillsboro Rd To I440 WB					Total Square Yards	5200
Section	Length (FT)	Width (FT)	Square Feet	Square Yards			Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
1	230	16	3680	408.89			4	420	12	5040	560.00		
2	600	24	14400	1600.00			5	120	24	2880	320.00		
6	6	16	96	10.67			15	6	16	96	10.67		
7	6	16	96	10.67			16	6	16	96	10.67		
8	6	16	96	10.67			17	6	16	96	10.67		
9	6	16	96	10.67			18	6	16	96	10.67		
10	6	16	96	10.67			19	6	16	96	10.67		
11	6	16	96	10.67			20	6	16	96	10.67		
12	6	16	96	10.67			21	6	16	96	10.67		
13	6	16	96	10.67			22	6	16	96	10.67		
14	6	16	96	10.67			23	6	16	96	10.67		
Totals			18944	2104.89			24	6	16	96	10.67		
Percent Damaged	35%						25	6	16	96	10.67		
							Totals					8976	997.33
I440 WB Off Ramp To Hillsboro Rd (Circle)					Total Square Yards	2200	Percent Damaged					19%	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards									
3	600	16	9600	1066.67									
Totals			9600	1066.67									
Percent Damaged	48%												



Figure 5: Hillsboro Rd

Section 1





Section 2





Section 3



Section 4





Section 5



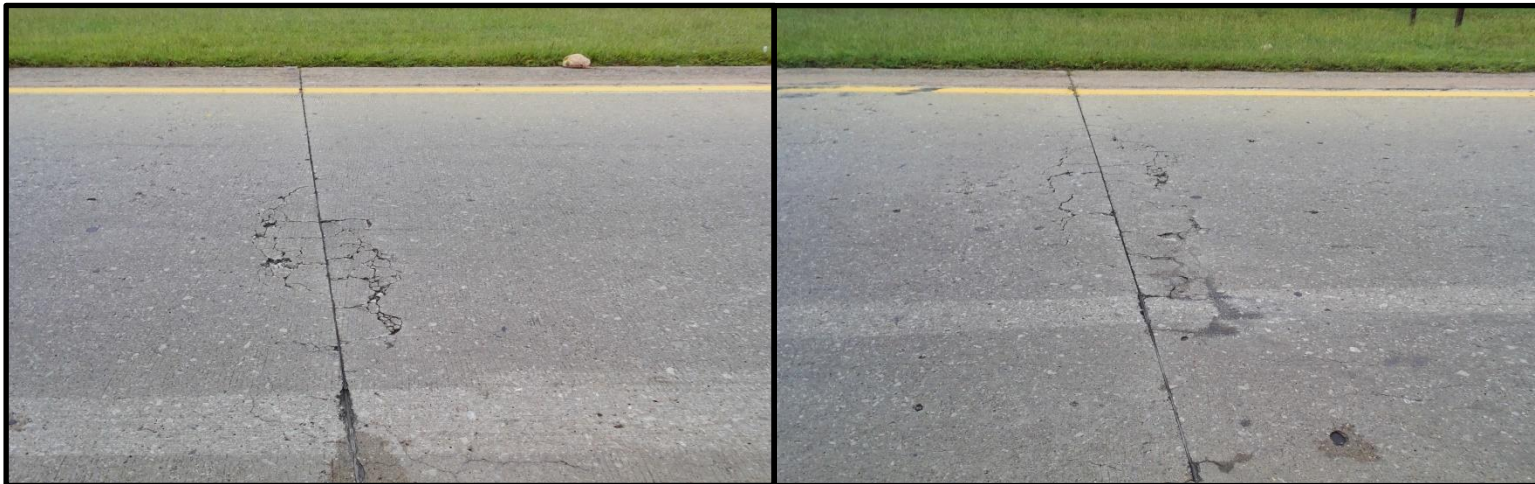




Section 6



Section 7



Sections 9-22



Figure 5 Table

I440 EB Off Ramp To 21ST					Total Square Yards	1750	Hillsboro Rd To I440 EB					Total Square Yards	4500
Section	Length (FT)	Width (FT)	Square Feet	Square Yards			Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
4	400	16	6400	711.11			1	320	30	9600	1066.67		
Totals			6400	711.11			2	350	24	8400	933.33		
Percent Damaged	41%						3	540	12	6480	720.00		
							8	6	16	96	10.67		
							9	6	16	96	10.67		
							Totals			24672	2741.33		
							Percent Damaged	61%					
I440 WB Off Ramp To Hillsboro Rd					Total Square Yards	4000	I440 WB Off Ramp To 21ST					Total Square Yards	2600
Section	Length (FT)	Width (FT)	Square Feet	Square Yards			Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
5	650	18	11700	1300			7	50	16	800	88.89		
6	22	16	352	39.11			21	6	16	96	10.67		
10	6	16	96	10.67			22	6	16	96	10.67		
11	6	16	96	10.67									
12	6	16	96	10.67									
13	6	16	96	10.67									
14	6	16	96	10.67									
15	6	16	96	10.67									
16	6	16	96	10.67									
17	6	16	96	10.67									
18	6	16	96	10.67									
19	6	16	96	10.67									
20	6	16	96	10.67									
Totals			13108	1456.44			Totals			992	110.22		
Percent Damaged	36%						Percent Damaged	4%					

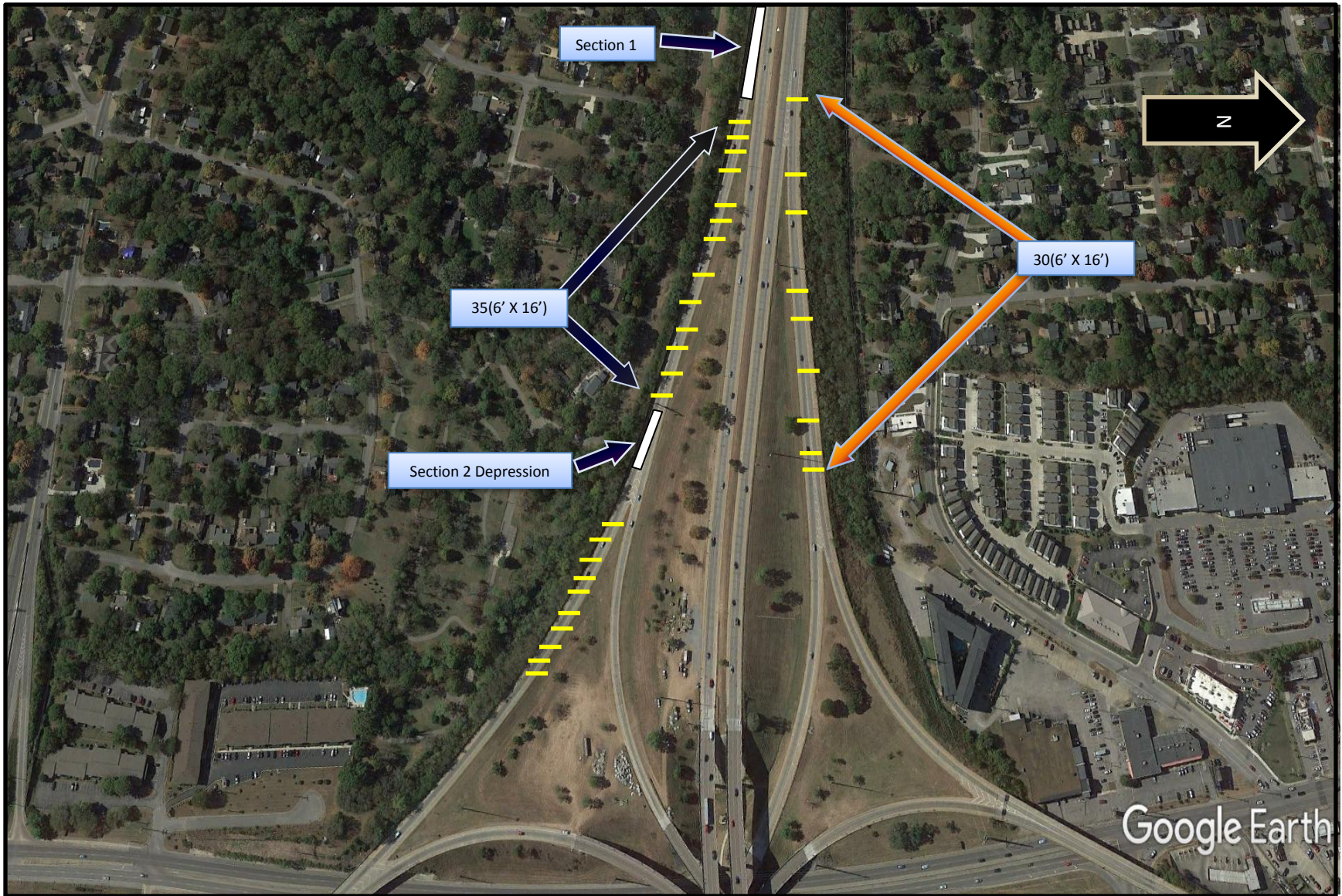
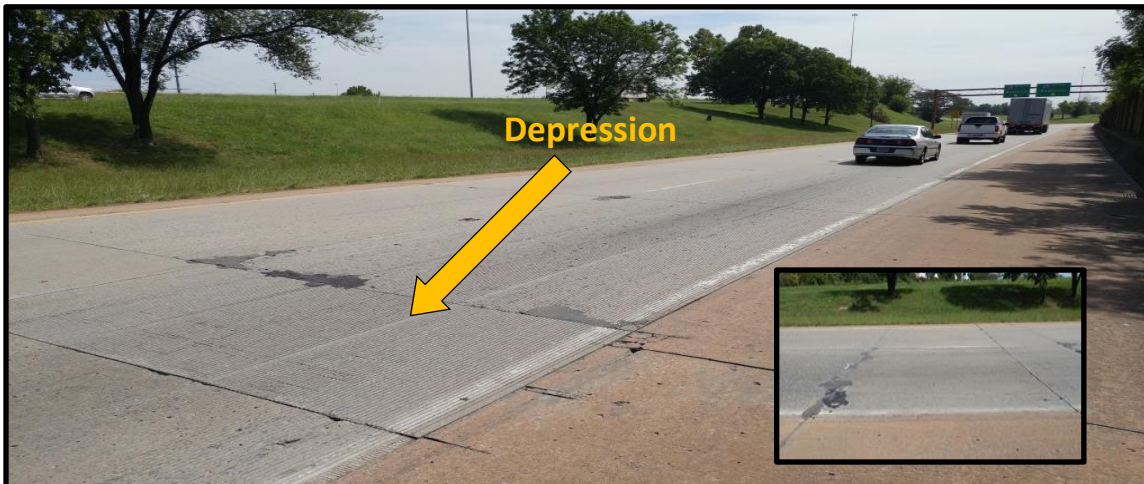


Figure 6: I65

Section 1



Section 2



Sections 3-77



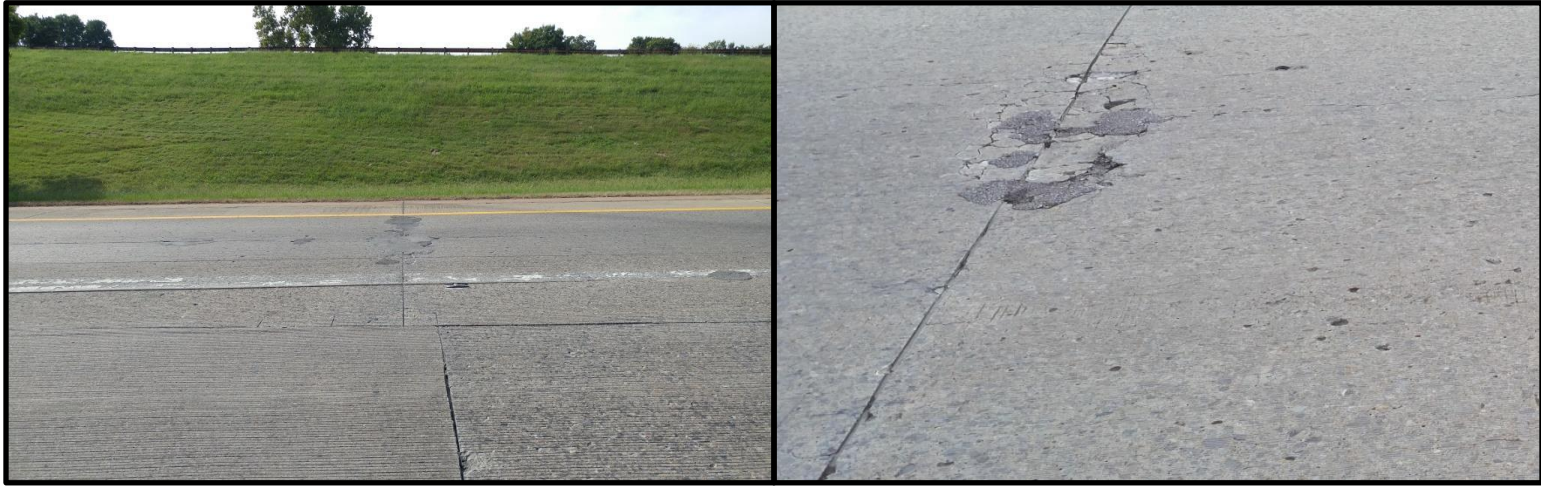


Figure 6 Table

I440 EB Off Ramp To I65 SB					Total Square Yards	4250	I65 SB To I440 WB					Total Square Yards	3200
Section	Length (FT)	Width (FT)	Square Feet	Square Yards			Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
1	360	24	8640	960.00			48	6	16	96	10.67		
2	30	24	720	80.00			49	6	16	96	10.67		
3	6	16	96	10.67			50	6	16	96	10.67		
4	6	16	96	10.67			51	6	16	96	10.67		
5	6	16	96	10.67			52	6	16	96	10.67		
6	6	16	96	10.67			53	6	16	96	10.67		
7	6	16	96	10.67			54	6	16	96	10.67		
8	6	16	96	10.67			55	6	16	96	10.67		
9	6	16	96	10.67			56	6	16	96	10.67		
10	6	16	96	10.67			57	6	16	96	10.67		
11	6	16	96	10.67			58	6	16	96	10.67		
12	6	16	96	10.67			59	6	16	96	10.67		
13	6	16	96	10.67			60	6	16	96	10.67		
14	6	16	96	10.67			61	6	16	96	10.67		
15	6	16	96	10.67			62	6	16	96	10.67		
16	6	16	96	10.67									
17	6	16	96	10.67									
18	6	16	96	10.67									
19	6	16	96	10.67									
20	6	16	96	10.67									
21	6	16	96	10.67									
22	6	16	96	10.67									
Totals			11280	1253.33			Totals			1440	160.00		
Percent Damaged	29%						Percent Damaged	5%					
I440 EB Off Ramp To I65 NB					Total Square Yards	3750	I65 NB To I440 WB					Total Square Yards	3200
Section	Length (FT)	Width (FT)	Square Feet	Square Yards			Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
23	6	16	96	10.67			63	6	16	96	10.67		
24	6	16	96	10.67			64	6	16	96	10.67		
25	6	16	96	10.67			65	6	16	96	10.67		
26	6	16	96	10.67			66	6	16	96	10.67		
27	6	16	96	10.67			67	6	16	96	10.67		
28	6	16	96	10.67			68	6	16	96	10.67		
29	6	16	96	10.67			69	6	16	96	10.67		
30	6	16	96	10.67			70	6	16	96	10.67		
31	6	16	96	10.67			71	6	16	96	10.67		
32	6	16	96	10.67			72	6	16	96	10.67		
33	6	16	96	10.67			73	6	16	96	10.67		
34	6	16	96	10.67			74	6	16	96	10.67		
35	6	16	96	10.67			75	6	16	96	10.67		
36	6	16	96	10.67			76	6	16	96	10.67		
37	6	16	96	10.67			77	6	16	96	10.67		
38	6	16	96	10.67									
39	6	16	96	10.67									
40	6	16	96	10.67									
41	6	16	96	10.67									
42	6	16	96	10.67									
43	6	16	96	10.67									
44	6	16	96	10.67									
45	6	16	96	10.67									
46	6	16	96	10.67									
47	6	16	96	10.67									
Totals			2400	266.67			Totals			1440	160.00		
Percent Damaged	7%						Percent Damaged	5%					

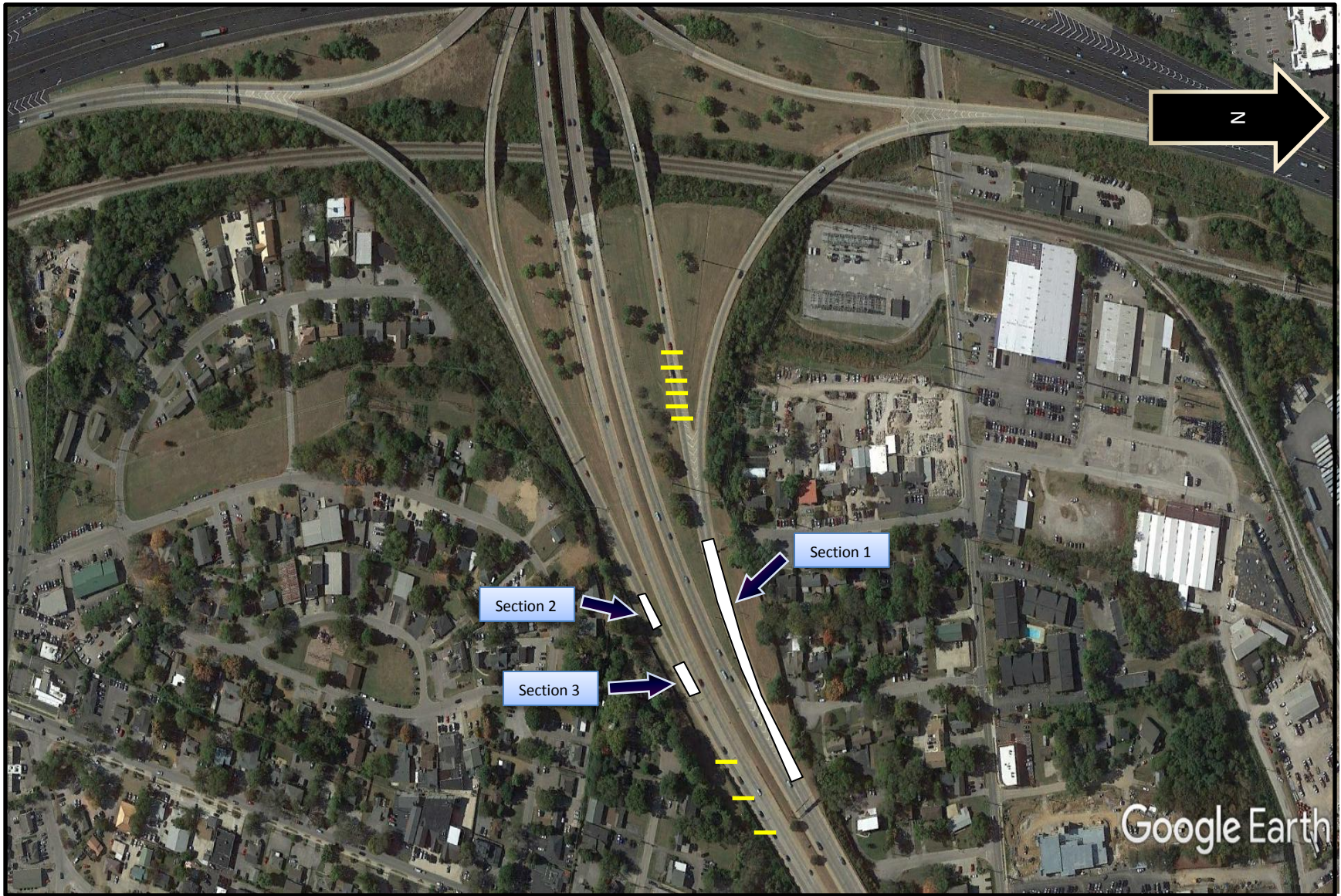


Figure 7: I65

Section 1



Section 2



Section 3



Sections 4-12



Figure 7 Table													
I440 WB Off Ramp To I65 SB					Total Square Yards	2600	I65 SB To I440 EB					Total Square Yards	1780
Section	Length (FT)	Width (FT)	Square Feet	Square Yards			Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
1	300	12	3600	400.00			10	6	16	96	10.67		
4	30	24	720	80.00			11	6	16	96	10.67		
5	6	16	96	10.67			12	6	16	96	10.67		
6	6	16	96	10.67			Totals			288	32.00		
7	6	16	96	10.67			Percent Damaged	2%					
8	6	16	96	10.67									
9	6	16	96	10.67									
Totals			4800	533.33			I65 NB To I440 EB					Total Square Yards	1000
Percent Damaged	21%						Section	Length (FT)	Width (FT)	Square Feet	Square Yards		
I440 WB Off Ramp To I65 NB					Total Square Yards	2200	2	6	16	96	10.67		
Section	Length (FT)	Width (FT)	Square Feet	Square Yards			3	6	16	96	10.67		
1	300	12	3600	400			Totals			192	21.33		
Totals			3600	400.00			Percent Damaged	2%					
Percent Damaged	18%												



Figure 8: Nolensville Rd

Section 1







Section 2



Section 3



Section 4



Section 5



Sections 6-14



I440 EB Off Ramp To Nolensville Rd					Total Square Yards		5000	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards				
1	1000	20	20000	2222.22				
6	6	16	96	10.67				
7	6	16	96	10.67				
8	6	16	96	10.67				
9	6	16	96	10.67				
10	6	16	96	10.67				
Totals			20480	2275.56				
Percent Damaged	46%							
Nolensville Rd SB To I440 EB					Total Square Yards		1000	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards				
2	175	16	2800	311.1111111				
Totals			2800	311.11				
Percent Damaged	31%							

Figure 8 Table									
Nolensville Rd SB To I440 WB					Total Square Yards		1600		
Section	Length (FT)	Width (FT)	Square Feet	Square Yards					
3	240	16	3840	426.67					
4	60	16	960	106.67					
5	150	16	2400	266.67					
11	6	16	96	10.67					
12	6	16	96	10.67					
13	6	16	96	10.67					
14	6	16	96	10.67					
Totals			7584	842.67					
Percent Damaged	53%								

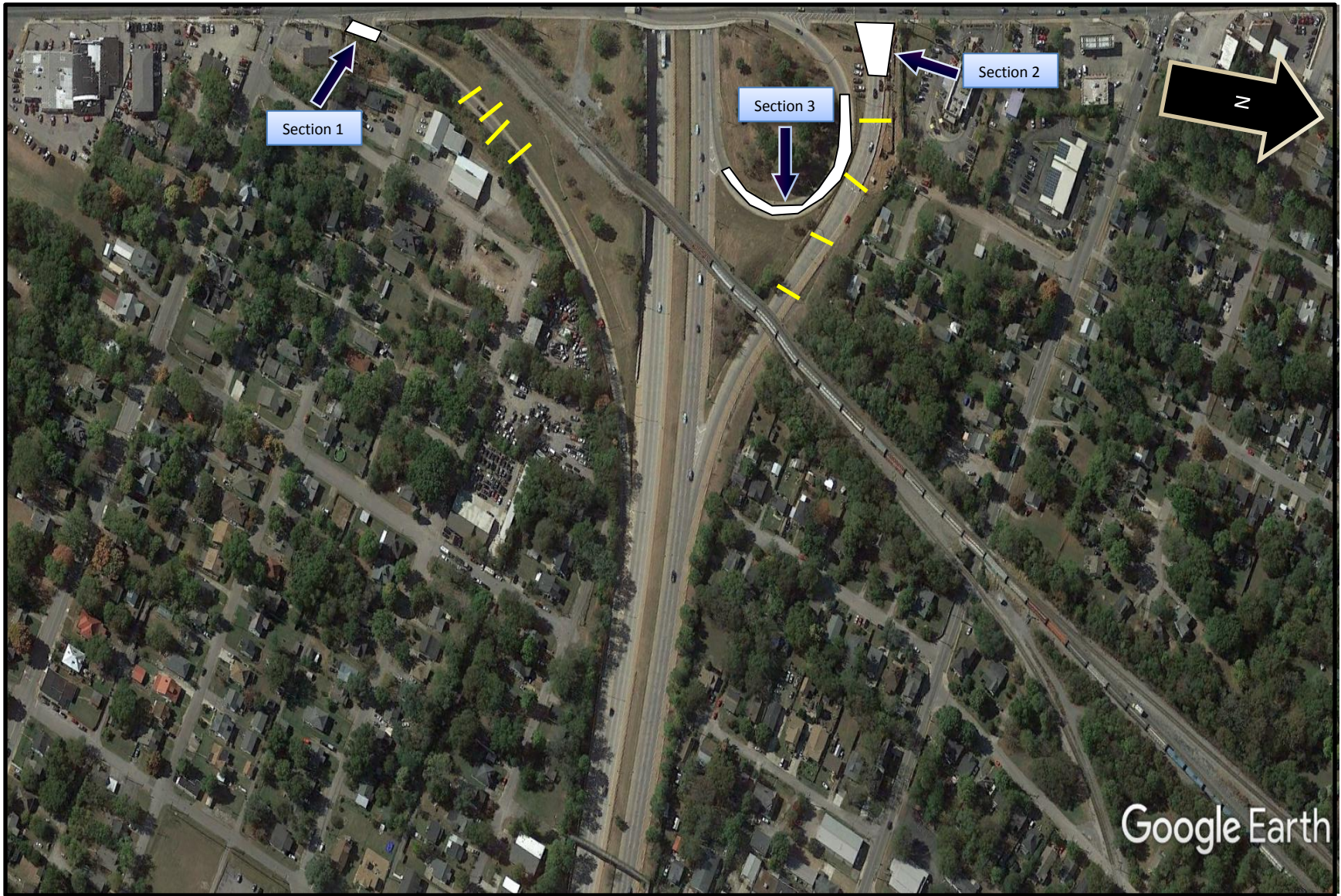


Figure 9: Nolensville Rd

Section 1



Section 2



Section 3



Sections 4-11

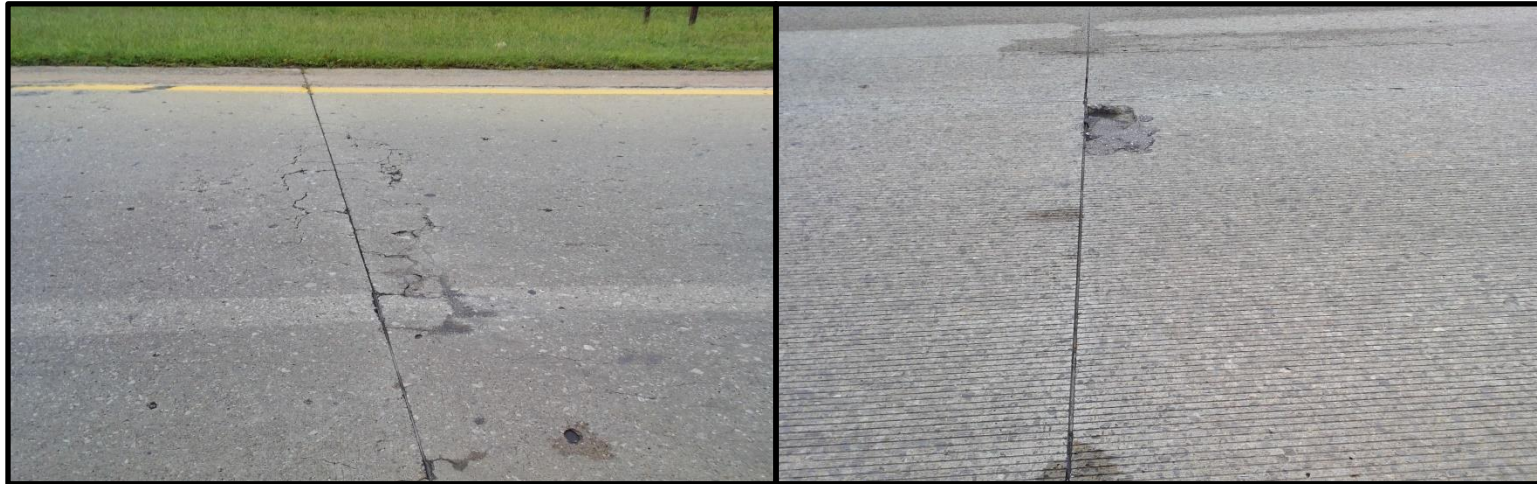


Figure 9 Table													
I440 WB Off Ramp To Nolensville Rd					Total Square Yards	3400	Nolensville Rd NB To I440 EB					Total Square Yards	2800
Section	Length (FT)	Width (FT)	Square Feet	Square Yards		Section	Length (FT)	Width (FT)	Square Feet	Square Yards			
2	75	36	2700	300.00		1	25	16	400	44.44			
4	6	16	96	10.67		8	6	16	96	10.67			
5	6	16	96	10.67		9	6	16	96	10.67			
6	6	16	96	10.67		10	6	16	96	10.67			
7	6	16	96	10.67		11	6	16	96	10.67			
Totals			3084	342.67		Totals			784	87.11			
Percent Damaged		10%				Percent Damaged		3%					



Figure 10: I24 and I40 Interchange

Section 1



Asphalt overlay on concrete deteriorating



Section 2



Section 3



Section 4



Section 5





Section 6



Section 7



Sections 8-19



Figure 10 Table

I440 EB Off Ramp To I24EB					Total Square Yards		I24 EB TO I440 WB		Total Square Yards	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards	Section	Length (FT)	Width (FT)	Square Feet	Square Yards	
1	1000	12	12000	1333.33	2	275	16	4400	488.89	
Totals			12000	1333.33	3	150	16	2400	266.67	
Percent Damaged	30%				4	190	16	3040	337.78	
					8	6	16	96	10.67	
					9	6	16	96	10.67	
I24 WB To I440 WB					Total Square Yards		I24 WB To I440 WB		Total Square Yards	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards	Section	Length (FT)	Width (FT)	Square Feet	Square Yards	
6	750	18	13500	1500	10	6	16	96	10.67	
7	100	24	2400	266.67	11	6	16	96	10.67	
Totals			2400	266.67	12	6	16	96	10.67	
Percent Damaged	15%				13	6	16	96	10.67	
					14	6	16	96	10.67	
					15	6	16	96	10.67	
I40 WB To I440 WB					Total Square Yards		I40 WB To I440 WB		Total Square Yards	
Section	Length (FT)	Width (FT)	Square Feet	Square Yards	Section	Length (FT)	Width (FT)	Square Feet	Square Yards	
5	275	16	4400	488.89	16	6	16	96	10.67	
19	6	16	96	10.67	17	6	16	96	10.67	
Totals			4496	499.56	18	6	16	96	10.67	
Percent Damaged	40%				Totals			10896	1210.67	
					Percent Damaged	45%				

General Comments

- Murphy Road and Hillsboro Road intersection improvement areas were included in this ramp research. With our right of way review plans we were unable to tell if the existing ramp area would be replaced or repaired.
- There is cracking, faulting, spalling, and may have some subgrade issues.
- The interchange at I24 and I40 has multiple overlays and the concrete is deteriorating underneath.
- There are centerline cracks throughout.
- Several areas at the intersections near the tops of the ramps have loop wires and handicap ramps.
- Most ramps are polished and have friction issues.
- Shoulders are in very good condition except about 4-5 locations (shown above).

Considerations

- Add random crack sealing.
- West End ramps on the eastside are in the best condition and should be considered for repair only.
- Multiple 6' X 16' repair areas in a row will look like the image below: Rides smooth but not aesthetically pleasing.

