Falling Weight Deflectometer Analysis Worksheet

Bureau of Materials and Tests, Pavement Management Section
Alabama Department of Transportation

610e035w
06.23.10

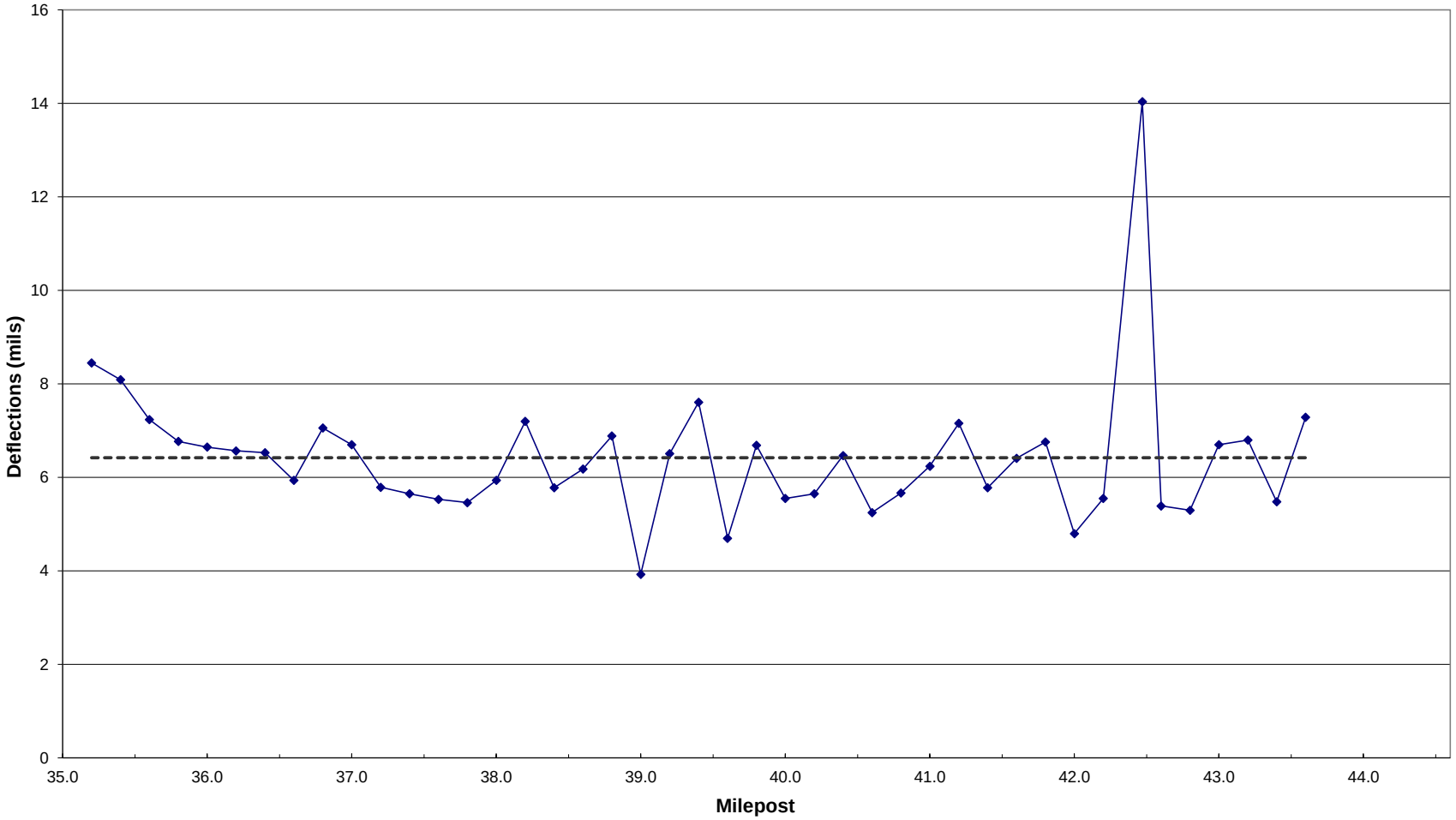
Project	I-10 Eastbound from MP 35.2 to MP 44.40 Baldwin County	**Short-term growth factor**	1.045	**Reliability**	95 %
Date tested	05.13.10	**% commercial**	21 %	**TSI**	3.5
FWD	18002-332	**Lane distribution factor**	95 %	**Design Period**	8 years
		Truck factor	0.99	**Layer Coefficient**	0.54

			Temperature	FWD Force	FWD Deflections							Traffic	Asphalt Layer Thickness	Granular Layer Thickness	8-year Design	(psi)		(psi)		Overlay	(in) Overlay
#	Direction	Marker	T(°F)	P (lb)	D0 (mils)	D1 (mils)	D2 (mils)	D3 (mils)	D4 (mils)	D5 (mils)	D6 (mils)	AADT	H1 (in)	H2 (in)	ESALs	M_R	SN_{req}	E_P	SN_{eff}	SN	Thickness
1	e	35.20	84	8939	8.5	5.6	3.2	2.3	1.5	1.1	0.9	48720	13.20	6.30	16472476	8592	7.22	197778	5.11	2.11	3.90
2	e	35.40	84	8972	8.1	5.0	3.4	2.2	1.5	1.1	0.8	48720	13.20	6.30	16472476	8936	7.13	208535	5.20	1.93	3.57
3	e	35.60	84	8972	7.2	4.5	3.0	2.0	1.4	1.0	0.8	48720	13.20	6.30	16472476	9826	6.92	235765	5.42	1.50	2.78
4	e	35.80	84	9015	6.8	4.1	2.7	1.7	1.1	0.8	0.6	48720	13.20	6.30	16472476	11742	6.54	235123	5.42	1.12	2.08
5	e	36.00	84	8950	6.7	4.4	2.9	2.0	1.4	1.1	0.8	48720	13.20	6.30	16472476	9801	6.93	272980	5.69	1.24	2.29
6	e	36.20	84	8972	6.6	4.6	3.5	2.7	2.1	1.7	1.4	48720	13.20	6.30	16472476	7425	7.55	356499	6.22	1.33	2.46
7	e	36.40	84	8994	6.5	4.5	3.4	2.5	1.9	1.5	1.2	48720	13.20	6.30	16472476	8048	7.37	336224	6.10	1.26	2.34
8	e	36.60	84	8928	5.9	4.1	3.1	2.2	1.7	1.3	1.0	48720	13.20	6.30	16472476	8773	7.17	367246	6.28	0.89	1.65
9	e	36.80	84	9005	7.1	4.7	3.2	2.2	1.7	1.2	1.0	48720	13.20	6.30	16472476	8849	7.15	268820	5.66	1.49	2.76
10	e	37.00	80	8972	6.7	4.3	2.8	2.0	1.4	1.1	0.9	48720	13.20	6.30	16472476	10025	6.88	240381	5.46	1.42	2.64
11	e	37.20	80	9005	5.8	3.5	2.3	1.7	1.2	0.9	0.7	48720	13.20	6.30	16472476	11941	6.50	274135	5.70	0.80	1.49
12	e	37.40	80	8961	5.7	3.9	3.0	2.4	1.9	1.5	1.2	48720	13.20	6.30	16472476	8394	7.27	379546	6.35	0.92	1.70
13	e	37.60	80	8939	5.5	3.8	2.7	2.0	1.4	1.1	0.8	48720	13.20	6.30	16472476	10091	6.87	334361	6.09	0.78	1.44
14	e	37.80	80	9048	5.5	3.8	2.9	2.2	1.7	1.3	1.0	48720	13.20	6.30	16472476	9053	7.10	385096	6.38	0.72	1.33
15	e	38.00	80	8906	5.9	4.2	3.0	2.0	1.5	1.2	1.0	48720	13.20	6.30	16472476	9705	6.95	301031	5.88	1.07	1.98
16	e	38.20	80	8994	7.2	4.7	3.1	1.9	1.2	0.8	0.5	48720	13.20	6.30	16472476	10365	6.81	208592	5.20	1.60	2.97
17	e	38.40	80	8983	5.8	3.7	2.5	1.7	1.2	0.9	0.8	48720	13.20	6.30	16472476	11496	6.59	281447	5.75	0.84	1.55
18	e	38.60	80	8939	6.2	3.7	2.2	1.4	0.9	0.6	0.5	48720	13.20	6.30	16472476	14575	6.08	213722	5.25	0.84	1.55
19	e	38.80	80	8961	6.9	4.1	2.4	1.4	0.9	0.6	0.4	48720	13.20	6.30	16472476	13891	6.19	185870	5.01	1.18	2.18
20	e	39.00	84	8961	3.9	2.3	1.5	1.0	0.7	0.5	0.4	48720	13.20	6.30	16472476	19725	5.45	407878	6.51	0.00	0.00
21	e	39.20	84	9015	6.5	4.0	2.6	1.8	1.4	1.1	0.9	48720	13.20	6.30	16472476	10785	6.72	266949	5.65	1.07	1.99
22	e	39.40	84	8950	7.6	4.5	2.9	1.8	1.2	0.8	0.7	48720	13.20	6.30	16472476	10945	6.69	200386	5.13	1.56	2.88
23	e	39.60	84	8972	4.7	2.9	2.0	1.3	0.9	0.6	0.5	48720	13.20	6.30	16472476	15192	6.00	362197	6.26	0.00	0.00
24	e	39.80	84	8764	6.7	4.1	2.8	1.8	1.2	0.9	0.7	48720	13.20	6.30	16472476	10899	6.70	240773	5.46	1.24	2.30
25	e	40.00	84	8994	5.6	3.5	2.3	1.4	0.9	0.6	0.5	48720	13.20	6.30	16472476	13748	6.21	293806	5.83	0.37	0.69
26	e	40.20	84	8928	5.7	3.9	3.1	2.3	1.7	1.4	1.1	48720	13.20	6.30	16472476	8620	7.21	411222	6.53	0.69	1.27
27	e	40.40	84	8972	6.5	4.5	3.3	2.4	1.9	1.5	1.3	48720	13.20	6.30	16472476	8263	7.31	332568	6.08	1.23	2.27
28	e	40.60	84	8961	5.3	3.0	2.0	1.3	0.8	0.6	0.5	48720	13.20	6.30	16472476	15057	6.02	301294	5.88	0.13	0.25
29	e	40.80	84	8961	5.7	3.5	2.2	1.4	0.9	0.7	0.5	48720	13.20	6.30	16472476	14089	6.16	277011	5.72	0.44	0.81
30	e	41.00	84	9037	6.2	4.2	3.1	2.3	1.8	1.3	1.1	48720	13.20	6.30	16472476	8611	7.21	347995	6.17	1.04	1.93
31	e	41.20	84	9005	7.2	4.4	3.0	2.1	1.6	1.2	1.0	48720	13.20	6.30	16472476	9394	7.02	250168	5.53	1.49	2.77
32	e	41.40	84	9015	5.8	3.6	2.2	1.3	0.8	0.5	0.4	48720	13.20	6.30	16472476	15148	6.00	258602	5.59	0.41	0.76
33	e	41.60	84	8972	6.4	3.5	2.1	1.2	0.8	0.5	0.4	48720	13.20	6.30	16472476	14431	6.11	223713	5.33	0.78	1.44
34	e	41.80	84	9005	6.8	4.8	3.5	2.7	2.0	1.6	1.2	48720	13.20	6.30	16472476	7480	7.53	337317	6.11	1.42	2.63
35	e	42.00	84	9037	4.8	2.9	1.9	1.3	0.9	0.6	0.5	48720	13.20	6.30	16472476	15541	5.95	347962	6.17	0.00	0.00
36	e	42.20	84	8994	5.6	3.5	2.4	1.6	1.1	0.9	0.7	48720	13.20	6.30	16472476	12374	6.43	317032	5.98	0.45	0.83
37	e	42.47	84	8983	14.0	8.0	4.2	2.2	1.3	0.9	0.7	48720	13.20	6.30	16472476	7035	7.67	98470	4.05	3.62	6.70
38	e	42.60	84	8939	5.4	3.5	2.5	1.9	1.4	1.1	0.9	48720	13.20	6.30	16472476	10636	6.75	373018	6.32	0.44	0.81
39	e	42.80	84	8829	5.3	3.4	2.7	2.1	1.6	1.3	1.1	48720	13.20	6.30	16472476	9434	7.01	418490	6.56	0.45	0.83
40	e	43.00	83	8961	6.7	4.2	2.8	1.9	1.4	1.1	0.9	48720	13.20	6.30	16472476	10274	6.83	253860	5.56	1.27	2.35
41	e	43.20	83	9015	6.8	4.2	2.7	1.8	1.3	1.0	0.8	48720	13.20	6.30	16472476	10844	6.71	240471	5.46	1.25	2.32
42	e	43.40	83	8950	5.5	3.5	2.2	1.4	0.9	0.7	0.5	48720	13.20	6.30	16472476	14173	6.14	284379	5.77	0.37	0.69
43	e	43.60	83	8950	7.3	5.1	3.6	2.7	2.1	1.6	1.3	48720	13.20	6.30	16472476	7406	7.55	283232	5.76	1.79	3.32
		Average		8968	6.4	4.1	2.8	1.9	1.4	1.0	0.8					10968	6.76	288650	5.76	1.04	1.92

These files represent data collected in 2010, with some update (likely traffic) done in 2013.

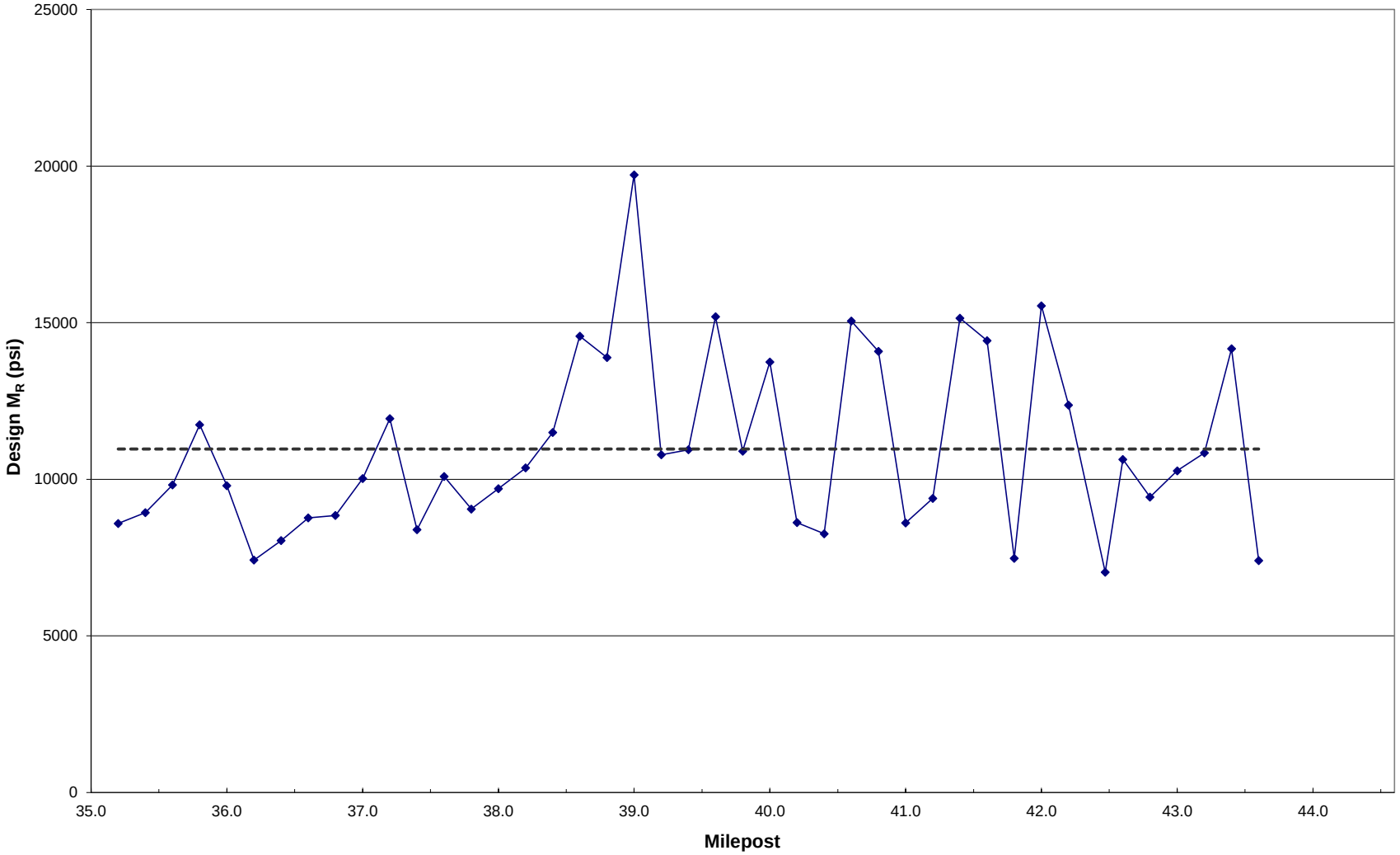
Load Cell Deflections

I-10 Eastbound from MP 35.2 to MP 44.40 Baldwin County



Design Subgrade Resilient Modulus

I-10 Eastbound from MP 35.2 to MP 44.40 Baldwin County



Falling Weight Deflectometer Analysis Worksheet

Bureau of Materials and Tests, Pavement Management Section
Alabama Department of Transportation

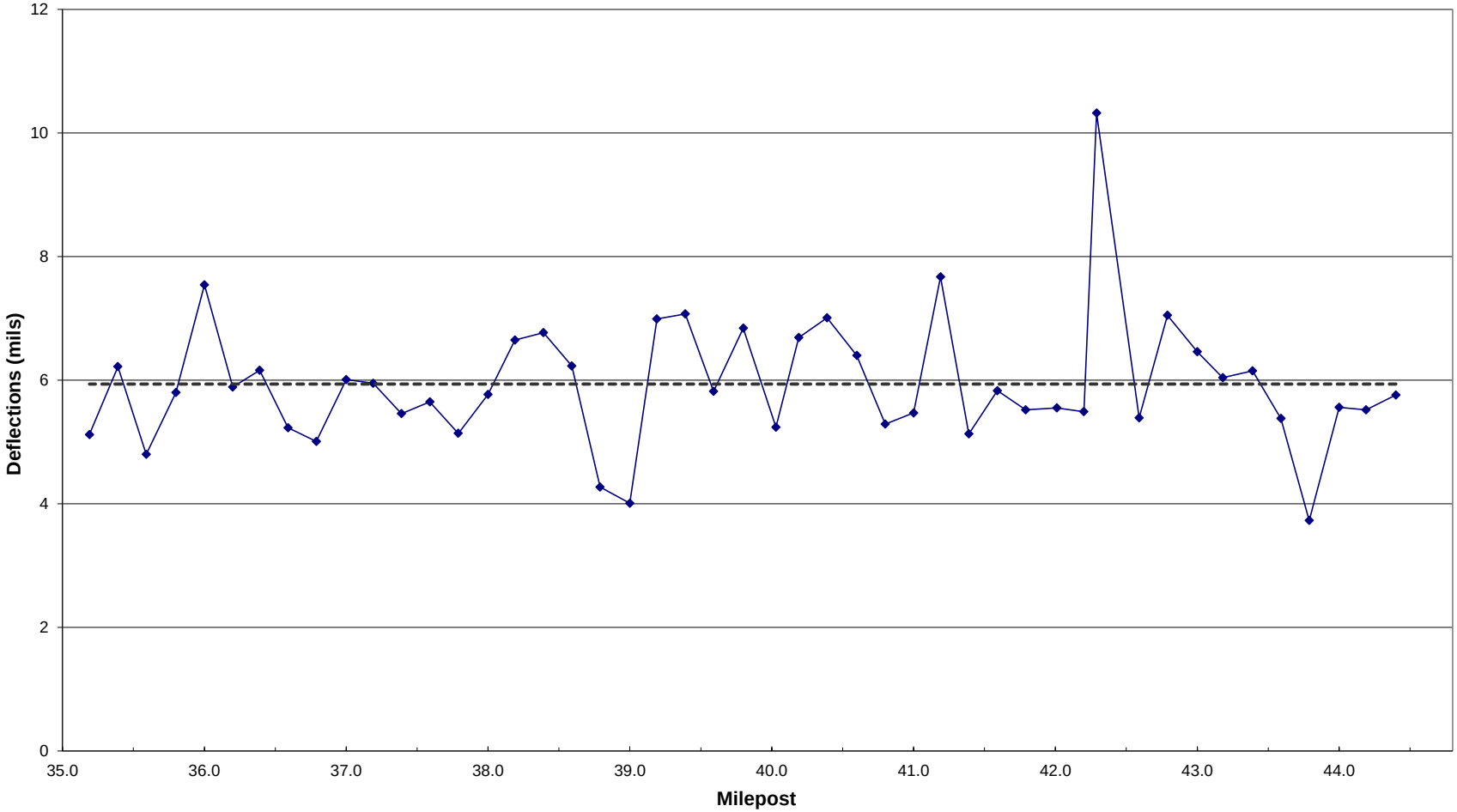
610w044w
06.23.10

Project	I-10 Westbound from MP 44.40 to MP 35.20 Baldwin County	**Short-term growth factor**	1.045	**Reliability**	95 %
Date tested	05.20.10	**% commercial**	21 %	**TSI**	3.5
FWD	18002-332	**Lane distribution factor**	95 %	**Design Period**	8 years
		Truck factor	0.99	**Layer Coefficient**	0.54

			Temperature	FWD Force	FWD Deflections							Traffic	Asphalt Layer Thickness	Granular Layer Thickness	8-year Design	(psi)		(psi)		Overlay	(in) Overlay
#	Direction	Marker	T(°F)	P (lb)	D0 (mils)	D1 (mils)	D2 (mils)	D3 (mils)	D4 (mils)	D5 (mils)	D6 (mils)	AADT	H1 (in)	H2 (in)	ESALs	M_R	SN_{req}	E_P	SN_{eff}	SN	Thickness
1	w	44.40	83	8961	5.8	3.9	2.9	2.1	1.5	1.2	0.9	48720	13.20	6.70	16472476	9304	7.04	353904	6.33	0.71	1.31
2	w	44.19	83	8961	5.5	3.9	2.7	1.9	1.4	1.1	0.8	48720	13.20	6.70	16472476	10220	6.84	353567	6.33	0.51	0.94
3	w	44.00	85	8972	5.6	3.1	2.1	1.3	0.9	0.6	0.4	48720	13.20	6.70	16472476	14849	6.05	279995	5.86	0.19	0.35
4	w	43.79	85	8961	3.7	1.9	1.4	1.0	0.7	0.5	0.4	48720	13.20	6.70	16472476	20128	5.41	443783	6.83	0.00	0.00
5	w	43.59	85	8972	5.4	3.7	2.8	2.2	1.7	1.4	1.2	48720	13.20	6.70	16472476	9143	7.08	434080	6.78	0.30	0.56
6	w	43.39	85	9037	6.2	3.8	2.6	1.8	1.3	0.9	0.7	48720	13.20	6.70	16472476	10930	6.69	295788	5.97	0.73	1.35
7	w	43.18	85	9005	6.0	3.6	2.4	1.7	1.2	0.9	0.8	48720	13.20	6.70	16472476	11729	6.54	287935	5.91	0.63	1.17
8	w	43.00	85	8939	6.5	4.1	2.8	1.9	1.4	1.0	0.8	48720	13.20	6.70	16472476	10248	6.83	279448	5.85	0.98	1.81
9	w	42.79	85	8994	7.1	4.8	3.5	2.5	1.9	1.5	1.2	48720	13.20	6.70	16472476	7794	7.44	301168	6.00	1.44	2.66
10	w	42.59	85	8961	5.4	3.6	2.7	2.0	1.5	1.2	1.0	48720	13.20	6.70	16472476	9814	6.93	404542	6.62	0.30	0.56
11	w	42.29	85	9026	10.3	6.6	3.9	2.6	1.8	1.4	1.1	48720	13.20	6.70	16472476	7791	7.44	155002	4.81	2.63	4.87
12	w	42.20	85	9005	5.5	3.3	2.0	1.2	0.8	0.6	0.5	48720	13.20	6.70	16472476	16382	5.84	270405	5.79	0.05	0.09
13	w	42.01	83	9005	5.6	3.4	2.4	1.8	1.3	1.0	0.7	48720	13.20	6.70	16472476	11199	6.64	328157	6.18	0.47	0.86
14	w	41.79	83	8950	5.5	3.4	2.5	1.8	1.4	1.1	0.9	48720	13.20	6.70	16472476	10945	6.69	333699	6.21	0.48	0.89
15	w	41.59	85	8972	5.8	3.7	2.5	1.7	1.2	0.9	0.7	48720	13.20	6.70	16472476	11969	6.50	299693	5.99	0.51	0.94
16	w	41.39	85	9026	5.1	3.0	2.0	1.2	0.8	0.5	0.4	48720	13.20	6.70	16472476	16023	5.89	307356	6.04	0.00	0.00
17	w	41.19	85	8939	7.7	5.5	3.8	2.6	2.0	1.5	1.2	48720	13.20	6.70	16472476	7453	7.54	264601	5.75	1.79	3.32
18	w	41.00	85	9005	5.5	3.1	1.9	1.2	0.7	0.6	0.5	48720	13.20	6.70	16472476	16942	5.77	266562	5.76	0.01	0.01
19	w	40.80	85	9037	5.3	3.5	2.7	2.0	1.5	1.2	0.9	48720	13.20	6.70	16472476	9848	6.92	424612	6.73	0.19	0.35
20	w	40.60	85	8961	6.4	4.0	2.5	1.6	1.0	0.7	0.5	48720	13.20	6.70	16472476	12484	6.41	247996	5.63	0.78	1.45
21	w	40.39	85	9005	7.0	4.8	3.6	2.7	2.1	1.7	1.4	48720	13.20	6.70	16472476	7288	7.59	323977	6.15	1.44	2.67
22	w	40.19	85	9005	6.7	4.4	3.2	2.5	2.0	1.6	1.4	48720	13.20	6.70	16472476	8058	7.36	323486	6.15	1.22	2.25
23	w	40.03	85	8961	5.2	2.8	1.7	1.1	0.8	0.6	0.5	48720	13.20	6.70	16472476	17456	5.71	278251	5.85	0.00	0.00
24	w	39.80	85	8994	6.8	4.4	2.9	1.9	1.3	1.0	0.8	48720	13.20	6.70	16472476	10258	6.83	255503	5.68	1.15	2.13
25	w	39.59	85	8972	5.8	3.2	1.9	1.3	0.9	0.7	0.6	48720	13.20	6.70	16472476	15674	5.93	251417	5.65	0.28	0.52
26	w	39.39	85	8994	7.1	4.4	2.7	1.6	1.0	0.7	0.5	48720	13.20	6.70	16472476	12530	6.40	211499	5.34	1.07	1.98
27	w	39.19	85	9015	7.0	4.5	3.0	2.2	1.7	1.4	1.1	48720	13.20	6.70	16472476	9145	7.08	269318	5.78	1.30	2.41
28	w	39.00	85	9015	4.0	2.2	1.4	0.9	0.6	0.5	0.4	48720	13.20	6.70	16472476	21807	5.24	377311	6.47	0.00	0.00
29	w	38.79	85	9048	4.3	2.7	1.8	1.1	0.7	0.5	0.4	48720	13.20	6.70	16472476	17625	5.69	393385	6.56	0.00	0.00
30	w	38.59	85	8939	6.2	3.8	2.3	1.4	0.9	0.6	0.4	48720	13.20	6.70	16472476	13760	6.21	242526	5.58	0.62	1.15
31	w	38.39	85	9005	6.8	4.1	2.6	1.7	1.2	0.9	0.8	48720	13.20	6.70	16472476	11729	6.54	237332	5.54	1.00	1.85
32	w	38.19	85	9005	6.7	4.3	2.8	1.9	1.4	1.1	0.8	48720	13.20	6.70	16472476	10218	6.84	269669	5.79	1.05	1.95
33	w	38.00	84	9005	5.8	3.1	2.0	1.3	1.0	0.8	0.7	48720	13.20	6.70	16472476	14793	6.05	259335	5.71	0.34	0.63
34	w	37.79	84	8961	5.1	3.4	2.5	1.8	1.3	1.0	0.8	48720	13.20	6.70	16472476	11020	6.68	388847	6.54	0.14	0.26
35	w	37.59	84	8961	5.7	3.7	2.8	2.1	1.5	1.2	0.9	48720	13.20	6.70	16472476	9622	6.97	366314	6.41	0.56	1.04
36	w	37.39	84	8972	5.5	3.6	2.7	2.1	1.7	1.4	1.2	48720	13.20	6.70	16472476	9404	7.02	399539	6.60	0.42	0.79
37	w	37.19	84	8994	6.0	3.8	2.7	1.9	1.4	1.0	0.8	48720	13.20	6.70	16472476	10365	6.81	315504	6.10	0.71	1.32
38	w	37.00	84	9005	6.0	4.1	3.0	2.3	1.7	1.3	1.0	48720	13.20	6.70	16472476	8732	7.18	358454	6.36	0.82	1.52
39	w	36.79	84	8950	5.0	3.5	2.6	1.9	1.4	1.1	0.9	48720	13.20	6.70	16472476	10592	6.76	420929	6.71	0.05	0.09
40	w	36.59	84	8983	5.2	3.5	2.6	2.0	1.5	1.1	0.9	48720	13.20	6.70	16472476	10089	6.87	408070	6.64	0.23	0.42
41	w	36.39	84	9015	6.2	4.7	3.6	2.7	2.1	1.6	1.3	48720	13.20	6.70	16472476	7187	7.62	411413	6.66	0.96	1.78
42	w	36.20	84	9005	5.9	4.1	3.2	2.6	2.0	1.6	1.3	48720	13.20	6.70	16472476	7357	7.57	438687	6.80	0.76	1.42
43	w	36.00	83	9015	7.5	5.3	3.6	2.4	1.6	1.1	0.9	48720	13.20	6.70	16472476	8166	7.33	243807	5.59	1.74	3.22
44	w	35.80	83	8983	5.8	3.7	2.6	1.7	1.2	0.9	0.7	48720	13.20	6.70	16472476	11430	6.60	297707	5.98	0.62	1.15
45	w	35.59	83	8994	4.8	3.0	2.1	1.5	1.2	0.9	0.8	48720	13.20	6.70	16472476	13025	6.32	376887	6.47	0.00	0.00
46	w	35.39	83	9015	6.2	4.4	3.1	2.1	1.4	1.0	0.8	48720	13.20	6.70	16472476	9680	6.96	300833	6.00	0.96	1.77
47	w	35.19	83	8994	5.1	3.9	3.1	2.5	2.0	1.6	1.2	48720	13.20	6.70	16472476	7612	7.49	545551	7.32	0.17	0.32
		Average		8989	5.9	3.8	2.6	1.9	1.3	1.0	0.8					11485	6.68	325486	6.12	0.64	1.19

Load Cell Deflections

I-10 Westbound from MP 44.40 to MP 35.20 Baldwin County



Design Subgrade Resilient Modulus

I-10 Westbound from MP 44.40 to MP 35.20 Baldwin County