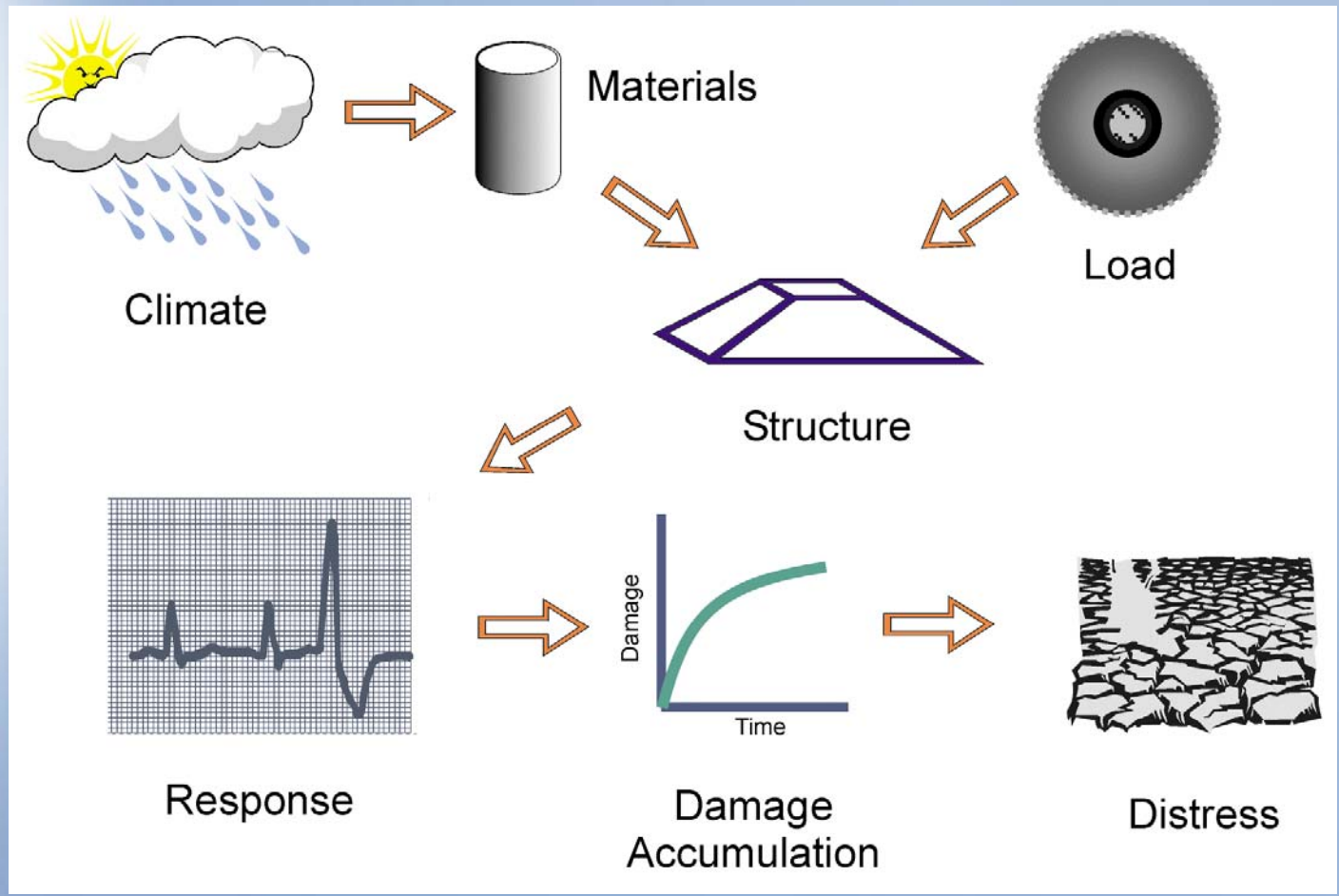
Stantec

Integration of AASHTO 2002 and NJDOT PMS

February 2003

AASHTO 2002 Guide
(Mechanistic-Empirical)



Design Input Levels

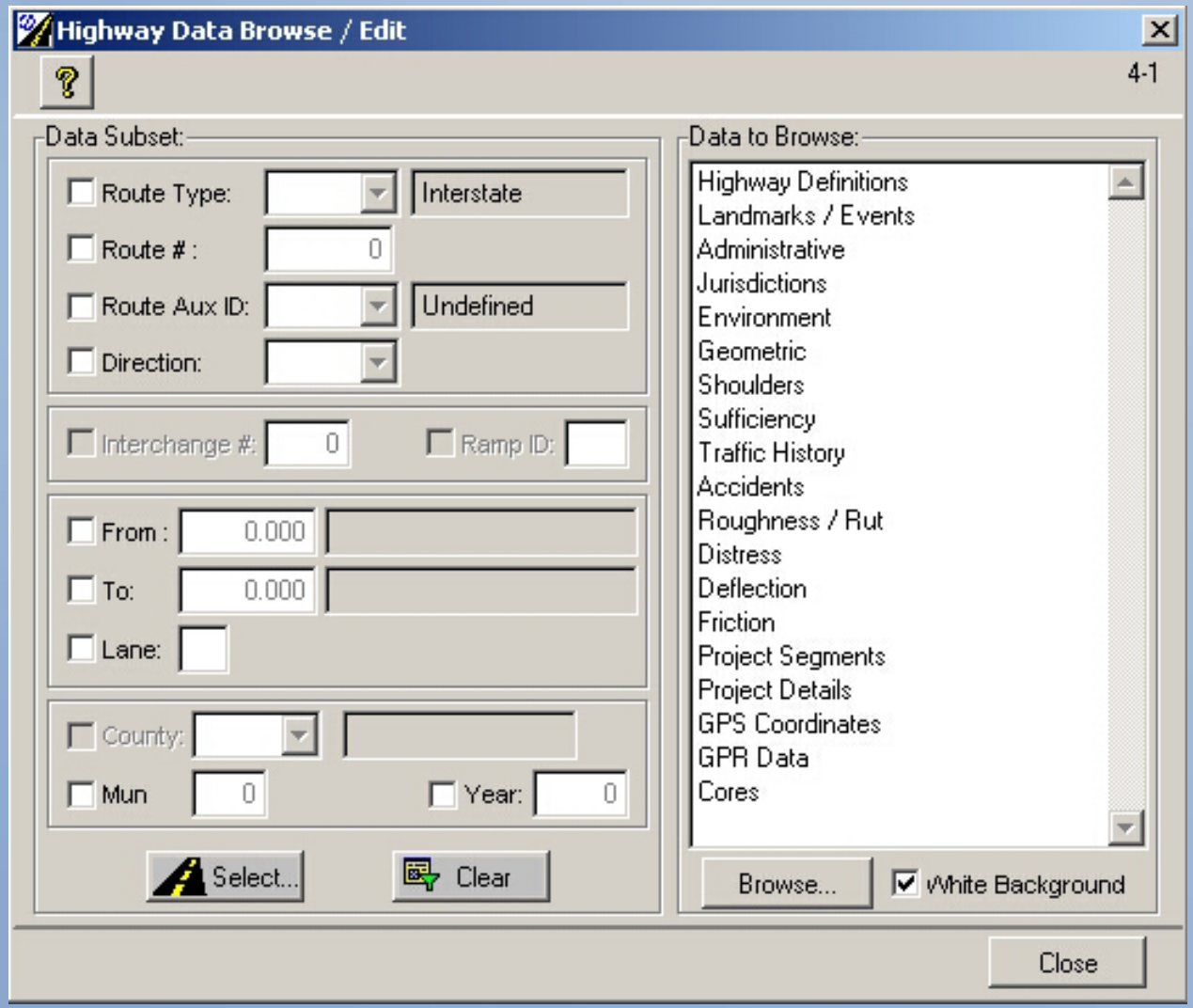
- Allows different levels of confidence in the design procedure
- Allows for different levels of design budgets
- The levels are:
  - Level 1 (Most Accurate) – Uses primarily measured data
  - Level 2 – Uses primarily estimated input data
  - Level 3 (Least Accurate) – Uses assumed input data

Overview of NJDOT PMS

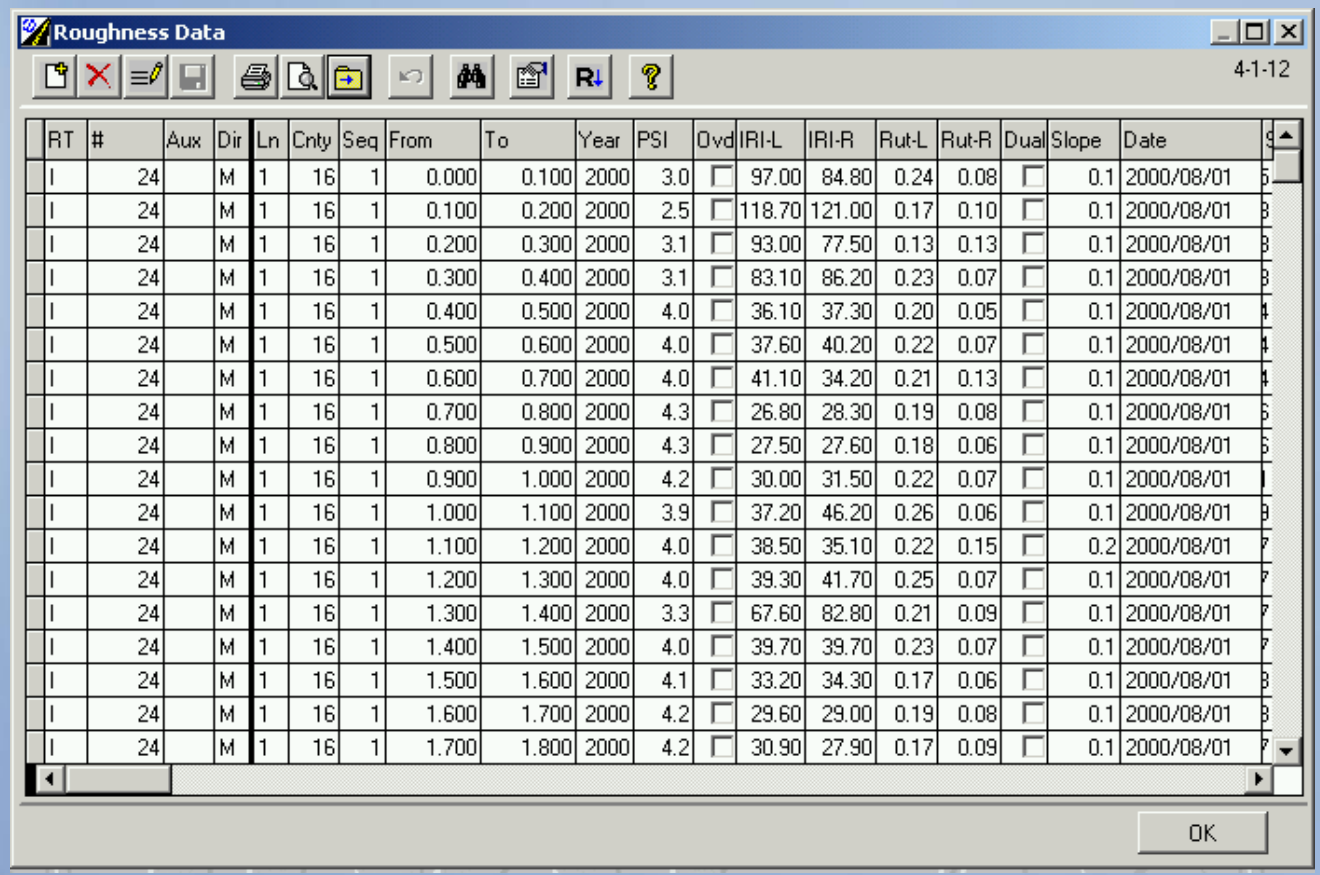
NJDOT PMS Modules

- Highway Database
- Dynamic Sectioning
- Section Data Reporting
- M&R Analysis & Optimization
- Project Design Analysis
- Engineering Feedback Analysis

HPMA Data Attributes

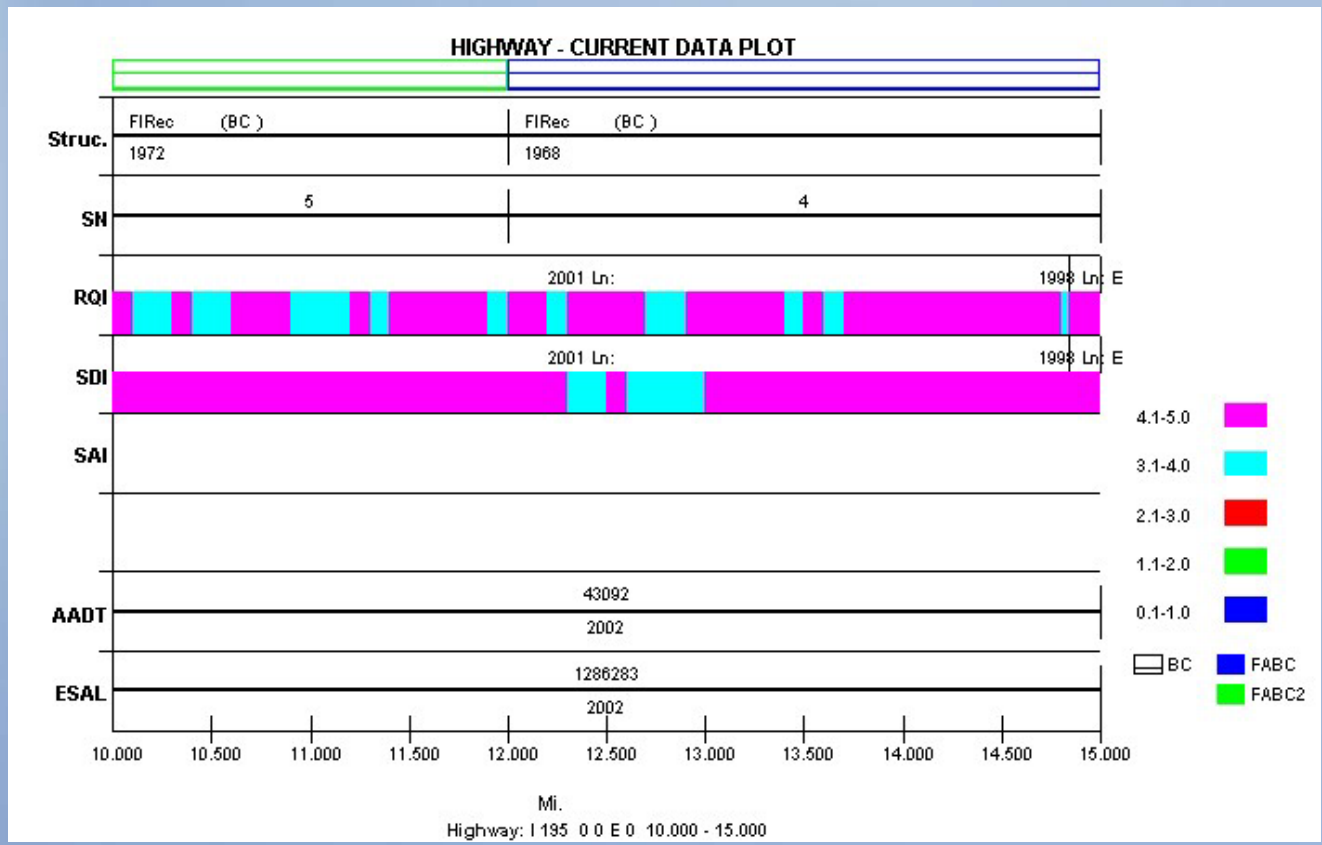


Highway Data Browse

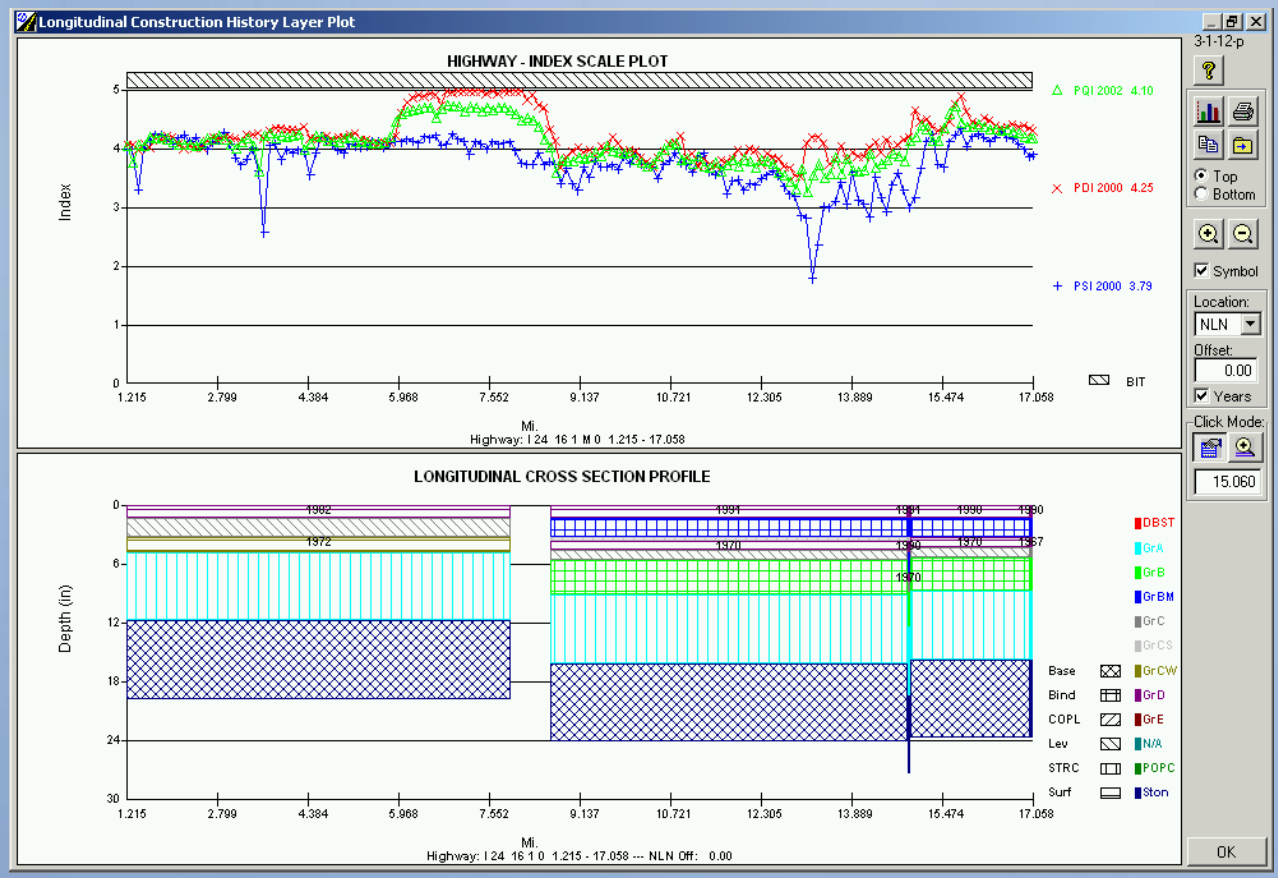


RT	#	Aux	Dir	Ln	Cnty	Seq	From	To	Year	PSI	Ovd	IRI-L	IRI-R	Rut-L	Rut-R	Dual	Slope	Date	S
I	24		M	1	16	1	0.000	0.100	2000	3.0		97.00	84.80	0.24	0.08		0.1	2000/08/01	5
I	24		M	1	16	1	0.100	0.200	2000	2.5		118.70	121.00	0.17	0.10		0.1	2000/08/01	3
I	24		M	1	16	1	0.200	0.300	2000	3.1		93.00	77.50	0.13	0.13		0.1	2000/08/01	3
I	24		M	1	16	1	0.300	0.400	2000	3.1		83.10	86.20	0.23	0.07		0.1	2000/08/01	3
I	24		M	1	16	1	0.400	0.500	2000	4.0		36.10	37.30	0.20	0.05		0.1	2000/08/01	4
I	24		M	1	16	1	0.500	0.600	2000	4.0		37.60	40.20	0.22	0.07		0.1	2000/08/01	4
I	24		M	1	16	1	0.600	0.700	2000	4.0		41.10	34.20	0.21	0.13		0.1	2000/08/01	4
I	24		M	1	16	1	0.700	0.800	2000	4.3		26.80	28.30	0.19	0.08		0.1	2000/08/01	5
I	24		M	1	16	1	0.800	0.900	2000	4.3		27.50	27.60	0.18	0.06		0.1	2000/08/01	5
I	24		M	1	16	1	0.900	1.000	2000	4.2		30.00	31.50	0.22	0.07		0.1	2000/08/01	1
I	24		M	1	16	1	1.000	1.100	2000	3.9		37.20	46.20	0.26	0.06		0.1	2000/08/01	9
I	24		M	1	16	1	1.100	1.200	2000	4.0		38.50	35.10	0.22	0.15		0.2	2000/08/01	7
I	24		M	1	16	1	1.200	1.300	2000	4.0		39.30	41.70	0.25	0.07		0.1	2000/08/01	7
I	24		M	1	16	1	1.300	1.400	2000	3.3		67.60	82.80	0.21	0.09		0.1	2000/08/01	7
I	24		M	1	16	1	1.400	1.500	2000	4.0		39.70	39.70	0.23	0.07		0.1	2000/08/01	7
I	24		M	1	16	1	1.500	1.600	2000	4.1		33.20	34.30	0.17	0.06		0.1	2000/08/01	8
I	24		M	1	16	1	1.600	1.700	2000	4.2		29.60	29.00	0.19	0.08		0.1	2000/08/01	8
I	24		M	1	16	1	1.700	1.800	2000	4.2		30.90	27.90	0.17	0.09		0.1	2000/08/01	7

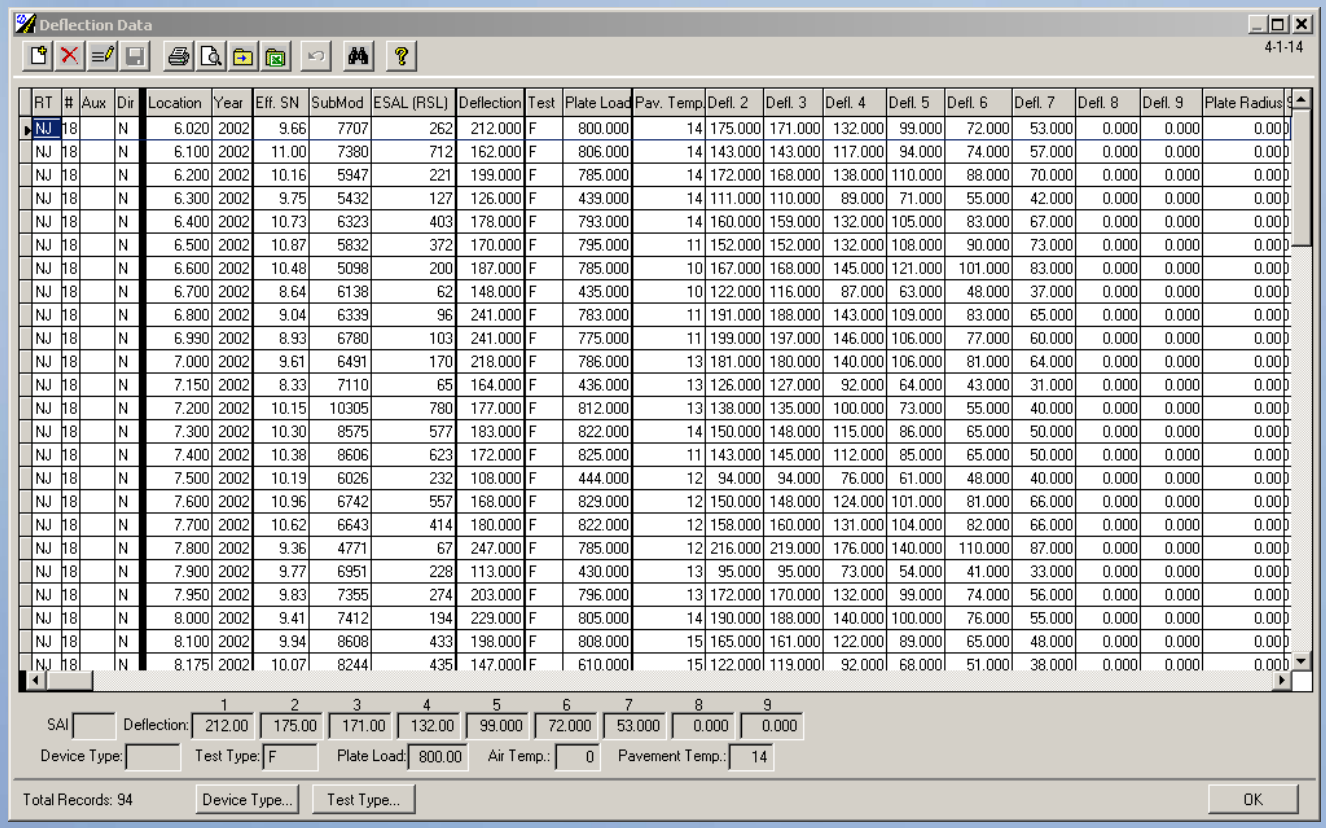
Highway Information



Highway Log Plot



Deflection Data



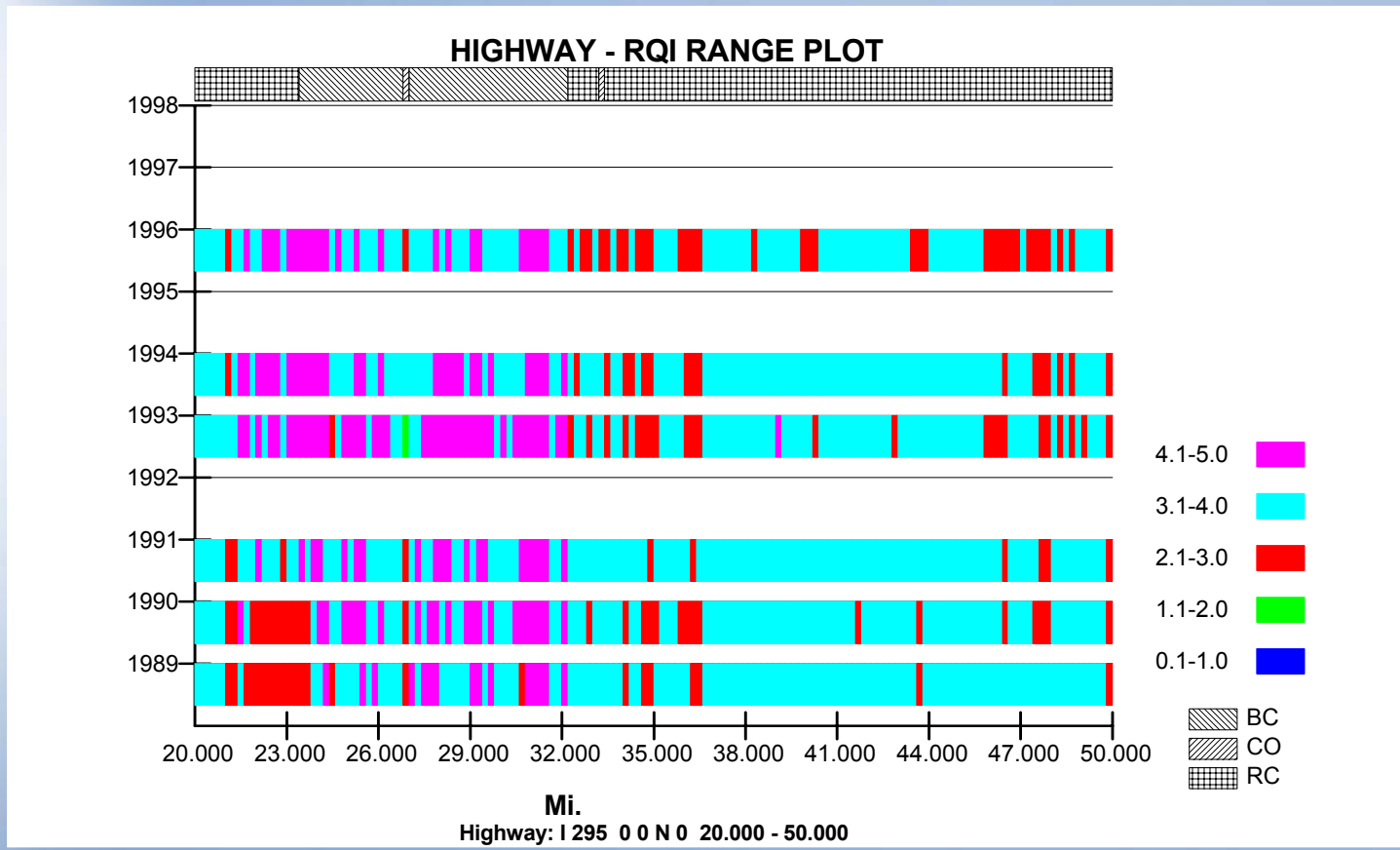
RT	#	Aux	Dir	Location	Year	Eff. SN	SubMod	ESAL (RSL)	Deflection	Test	Plate Load	Pav. Temp	Defl. 2	Defl. 3	Defl. 4	Defl. 5	Defl. 6	Defl. 7	Defl. 8	Defl. 9	Plate Radius
NJ	18		N	6.020	2002	9.66	7707	262	212.000	F	800.000	14	175.000	171.000	132.000	99.000	72.000	53.000	0.000	0.000	0.000
NJ	18		N	6.100	2002	11.00	7380	712	162.000	F	806.000	14	143.000	143.000	117.000	94.000	74.000	57.000	0.000	0.000	0.000
NJ	18		N	6.200	2002	10.16	5947	221	199.000	F	785.000	14	172.000	168.000	138.000	110.000	88.000	70.000	0.000	0.000	0.000
NJ	18		N	6.300	2002	9.75	5432	127	126.000	F	439.000	14	111.000	110.000	89.000	71.000	55.000	42.000	0.000	0.000	0.000
NJ	18		N	6.400	2002	10.73	6323	403	178.000	F	793.000	14	160.000	159.000	132.000	105.000	83.000	67.000	0.000	0.000	0.000
NJ	18		N	6.500	2002	10.87	5832	372	170.000	F	795.000	11	152.000	152.000	132.000	108.000	90.000	73.000	0.000	0.000	0.000
NJ	18		N	6.600	2002	10.48	5098	200	187.000	F	785.000	10	167.000	168.000	145.000	121.000	101.000	83.000	0.000	0.000	0.000
NJ	18		N	6.700	2002	8.64	6138	62	148.000	F	435.000	10	122.000	116.000	87.000	63.000	48.000	37.000	0.000	0.000	0.000
NJ	18		N	6.800	2002	9.04	6339	96	241.000	F	783.000	11	191.000	188.000	143.000	109.000	83.000	65.000	0.000	0.000	0.000
NJ	18		N	6.990	2002	8.93	6780	103	241.000	F	775.000	11	199.000	197.000	146.000	106.000	77.000	60.000	0.000	0.000	0.000
NJ	18		N	7.000	2002	9.61	6491	170	218.000	F	786.000	13	181.000	180.000	140.000	106.000	81.000	64.000	0.000	0.000	0.000
NJ	18		N	7.150	2002	8.33	7110	65	164.000	F	436.000	13	126.000	127.000	92.000	64.000	43.000	31.000	0.000	0.000	0.000
NJ	18		N	7.200	2002	10.15	10305	780	177.000	F	812.000	13	138.000	135.000	100.000	73.000	55.000	40.000	0.000	0.000	0.000
NJ	18		N	7.300	2002	10.30	8575	577	183.000	F	822.000	14	150.000	148.000	115.000	86.000	65.000	50.000	0.000	0.000	0.000
NJ	18		N	7.400	2002	10.38	8606	623	172.000	F	825.000	11	143.000	145.000	112.000	85.000	65.000	50.000	0.000	0.000	0.000
NJ	18		N	7.500	2002	10.19	6026	232	108.000	F	444.000	12	94.000	94.000	76.000	61.000	48.000	40.000	0.000	0.000	0.000
NJ	18		N	7.600	2002	10.96	6742	557	168.000	F	829.000	12	150.000	148.000	124.000	101.000	81.000	66.000	0.000	0.000	0.000
NJ	18		N	7.700	2002	10.62	6643	414	180.000	F	822.000	12	158.000	160.000	131.000	104.000	82.000	66.000	0.000	0.000	0.000
NJ	18		N	7.800	2002	9.36	4771	67	247.000	F	785.000	12	216.000	219.000	176.000	140.000	110.000	87.000	0.000	0.000	0.000
NJ	18		N	7.900	2002	9.77	6951	228	113.000	F	430.000	13	95.000	95.000	73.000	54.000	41.000	33.000	0.000	0.000	0.000
NJ	18		N	7.950	2002	9.83	7355	274	203.000	F	796.000	13	172.000	170.000	132.000	99.000	74.000	56.000	0.000	0.000	0.000
NJ	18		N	8.000	2002	9.41	7412	194	229.000	F	805.000	14	190.000	188.000	140.000	100.000	76.000	55.000	0.000	0.000	0.000
NJ	18		N	8.100	2002	9.94	8608	433	198.000	F	808.000	15	165.000	161.000	122.000	89.000	65.000	48.000	0.000	0.000	0.000
NJ	18		N	8.175	2002	10.07	8244	435	147.000	F	610.000	15	122.000	119.000	92.000	68.000	51.000	38.000	0.000	0.000	0.000

		1	2	3	4	5	6	7	8	9
SAI	Deflection:	212.00	175.00	171.00	132.00	99.000	72.000	53.000	0.000	0.000

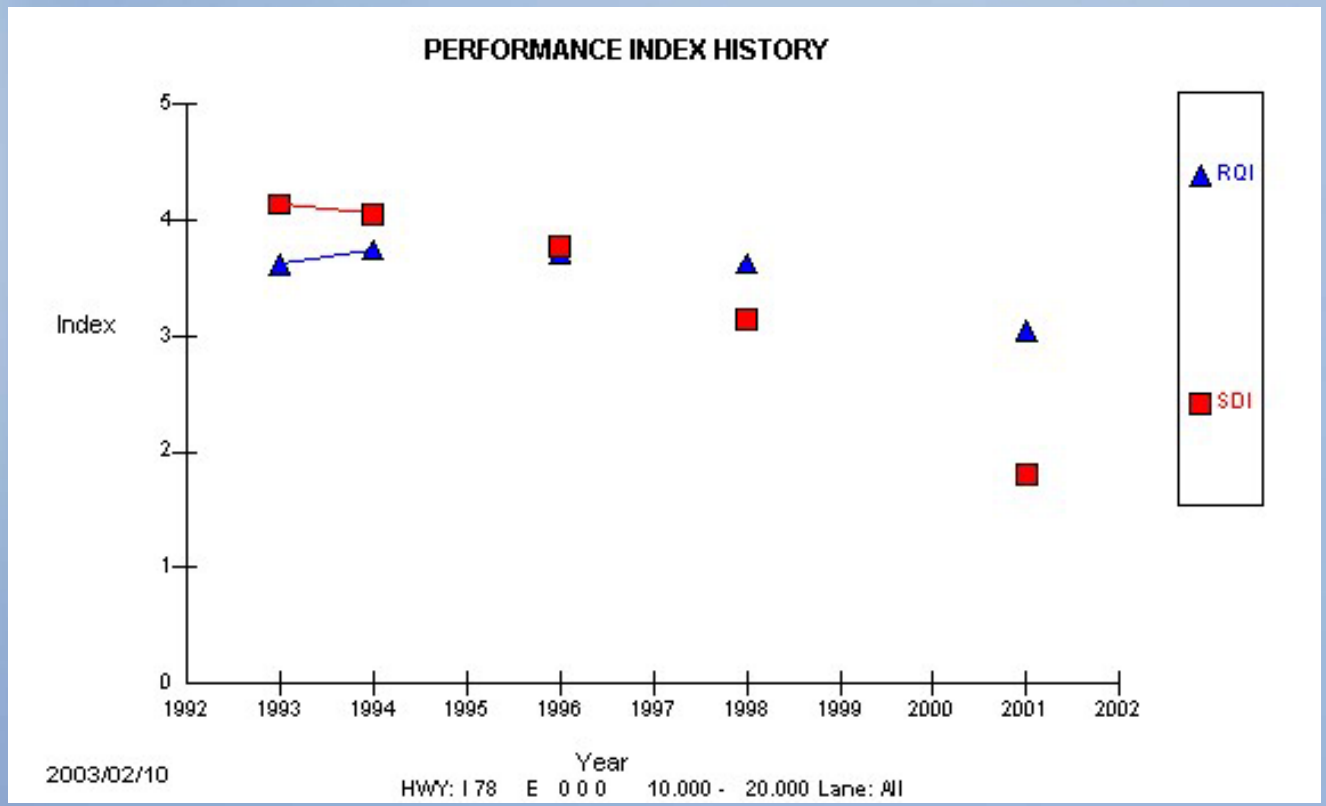
Device Type: | Test Type: F | Plate Load: 800.00 | Air Temp.: 0 | Pavement Temp.: 14

Total Records: 94 | Device Type... | Test Type... | OK

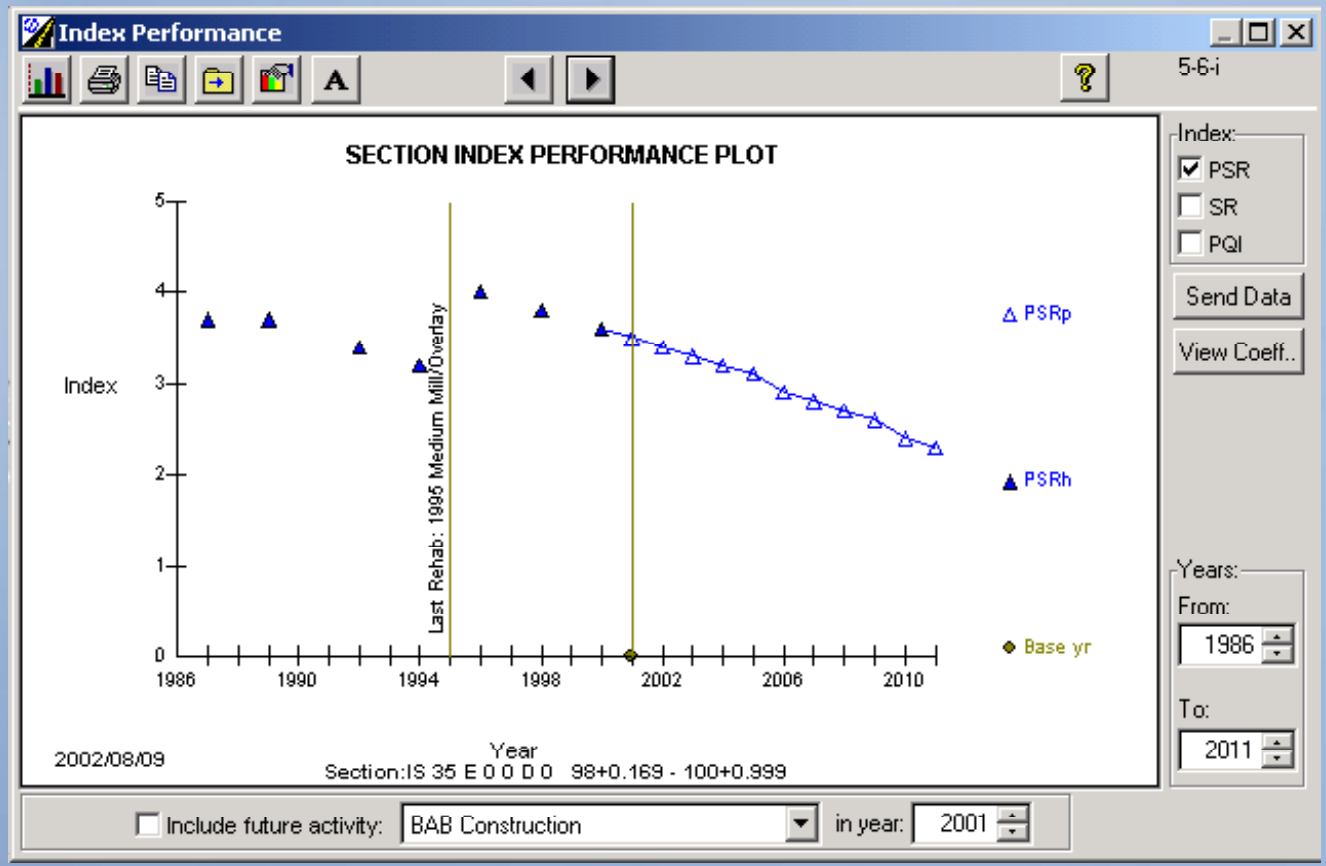
Current Road Performance



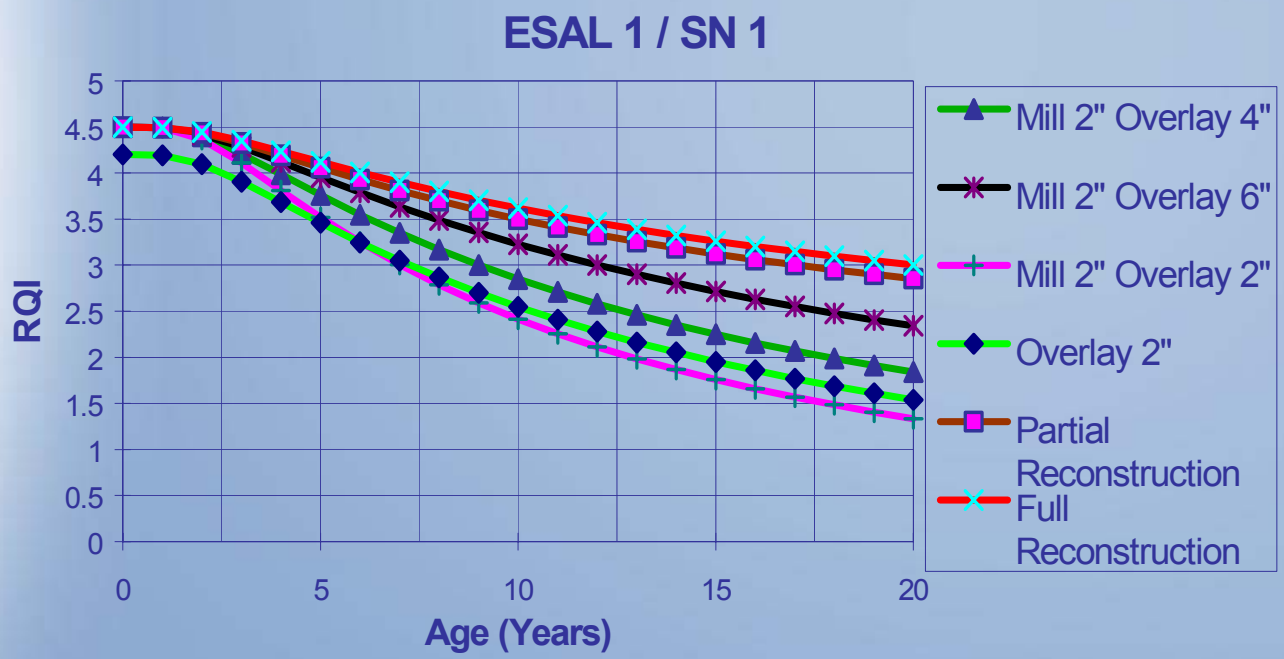
Highway Performance



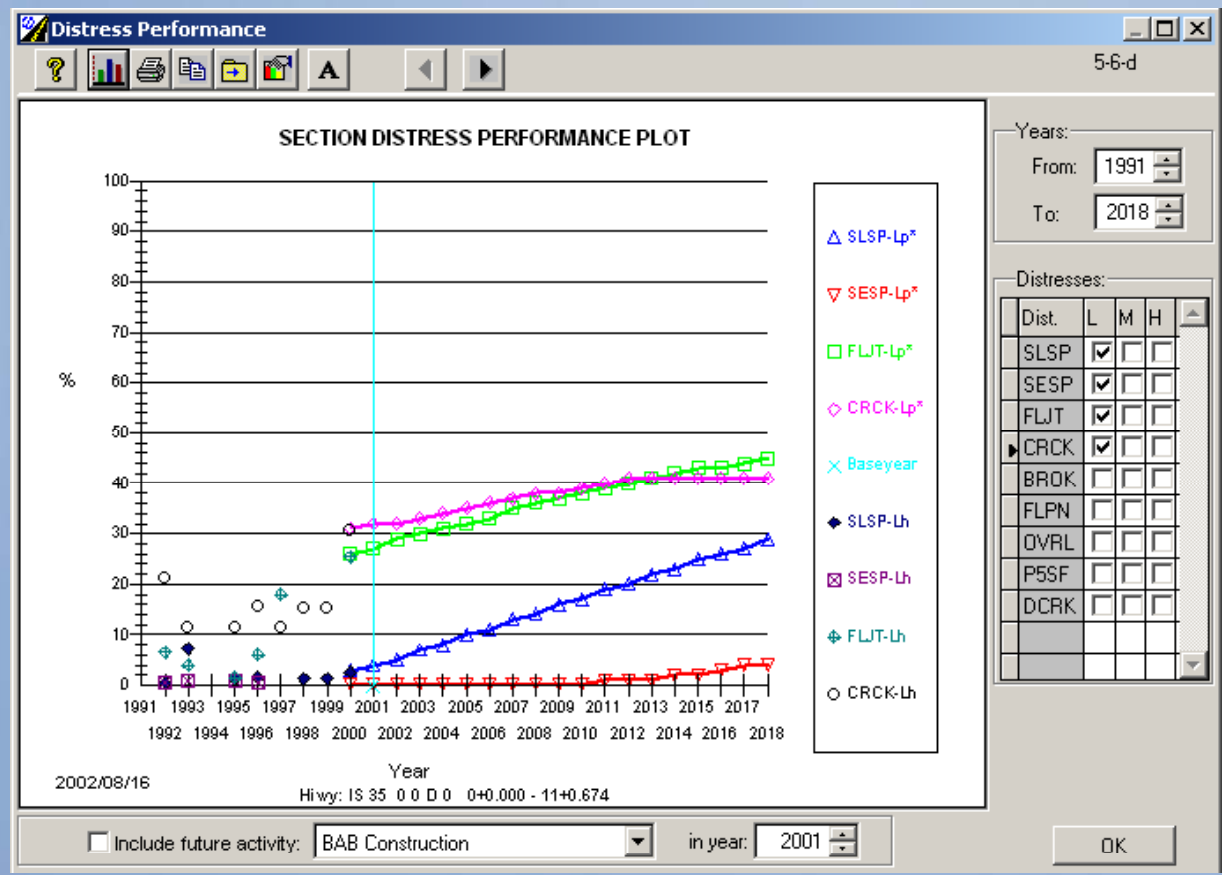
Index Prediction Example



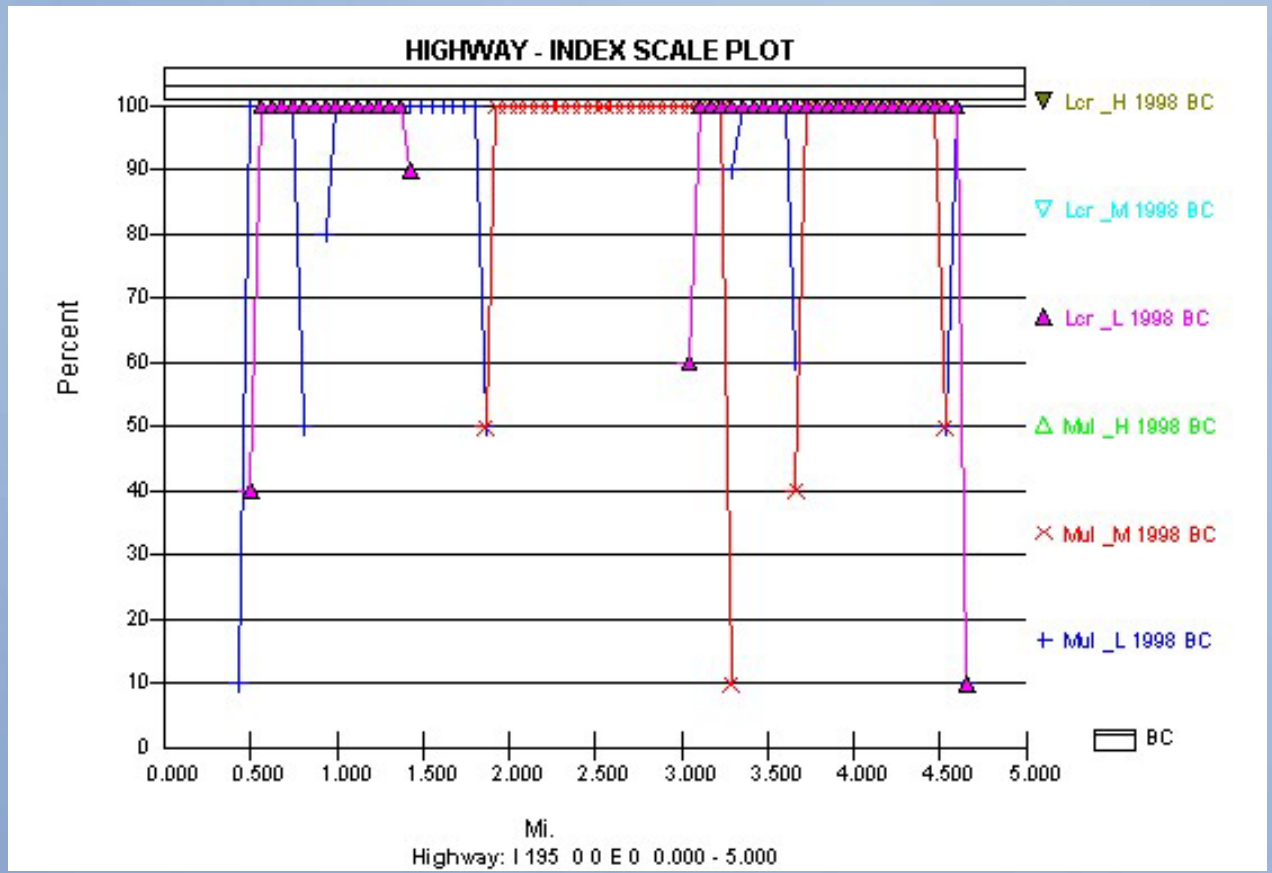
Default Performance Models



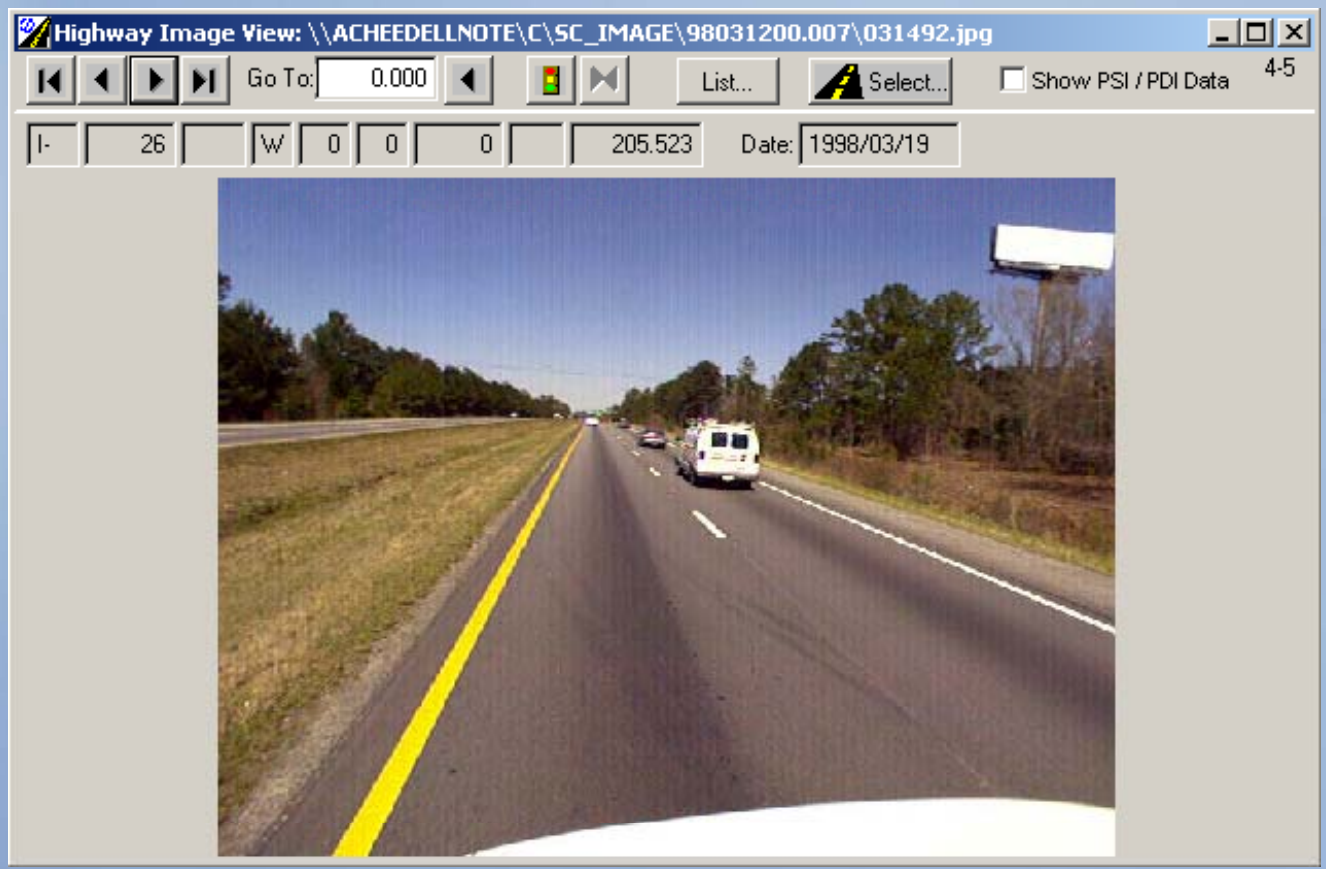
Distress Prediction Example



Highway Distress



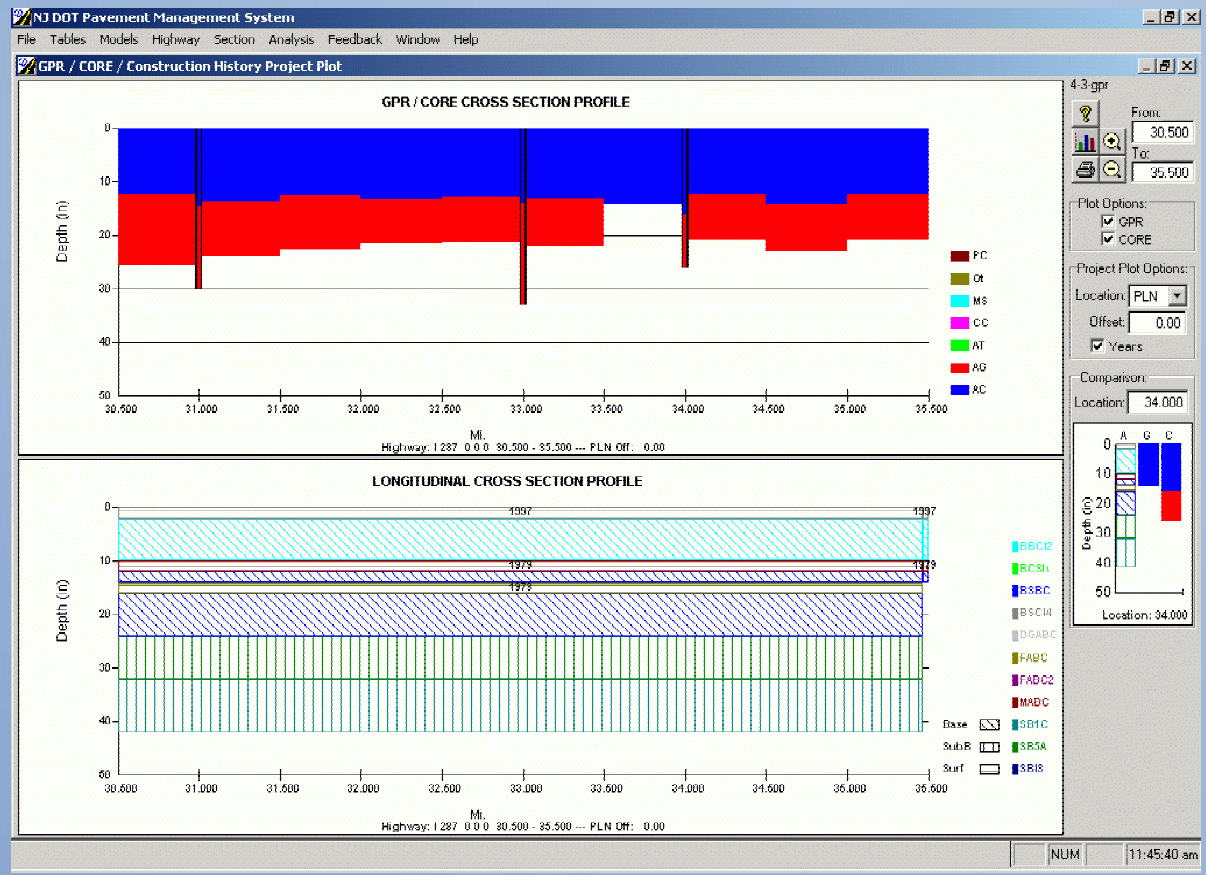
Highway Images



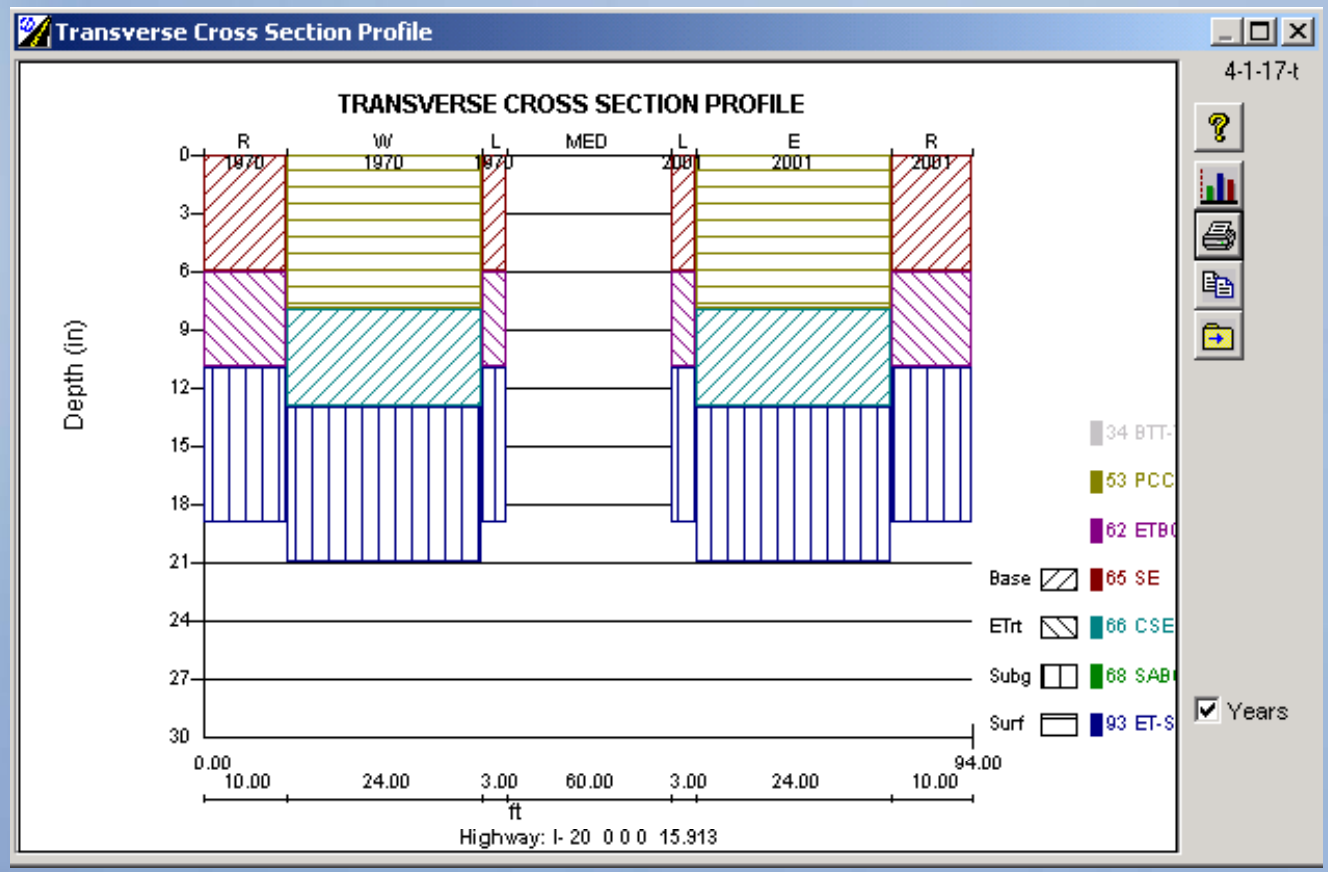
Detailed Layer Information

- Material properties can be stored to increase accuracy level of rehabilitation activities
- Material variability and reliability information can be accumulated
- Layer thickness and variability information from as-built documents, coring, and non-destructive methods (GPR)

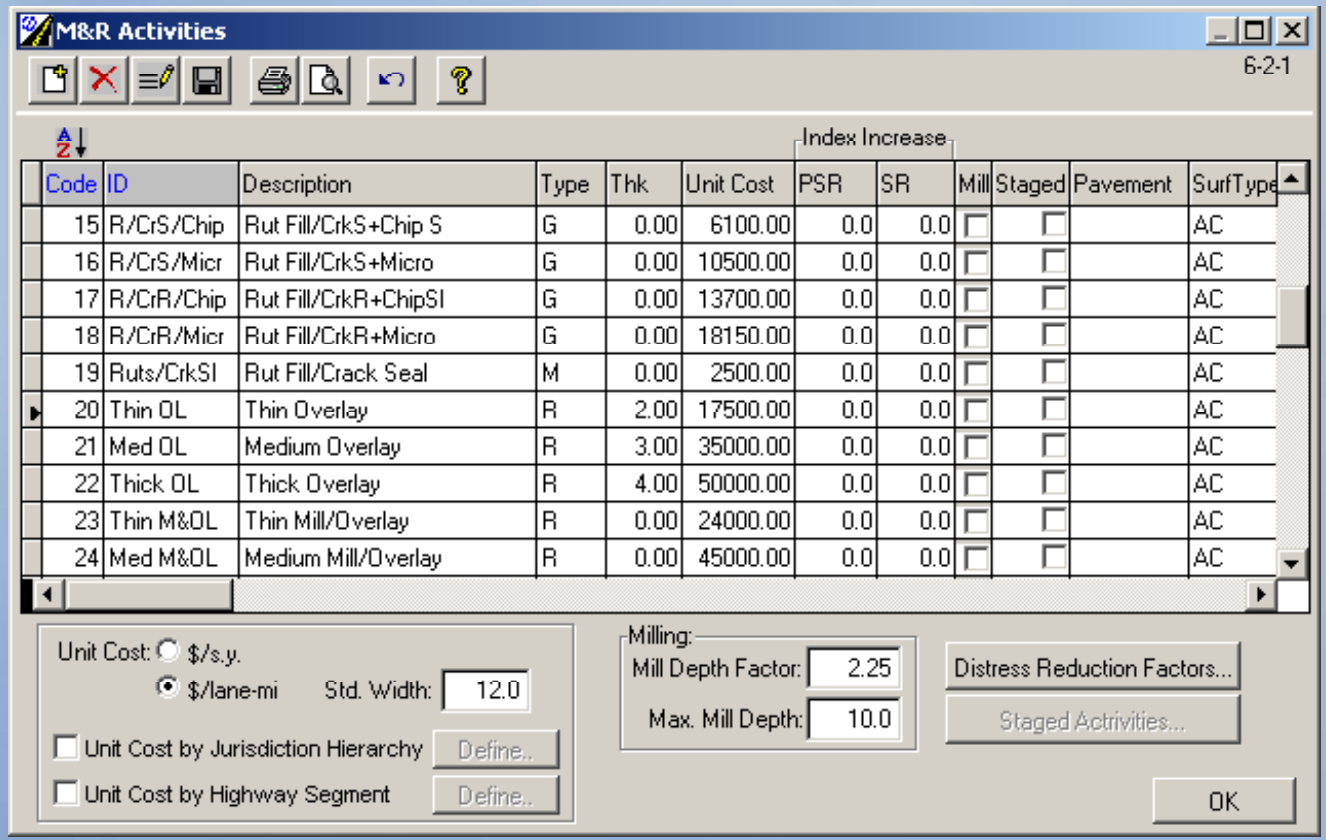
Highway Cross-Section



Highway Layer Graph



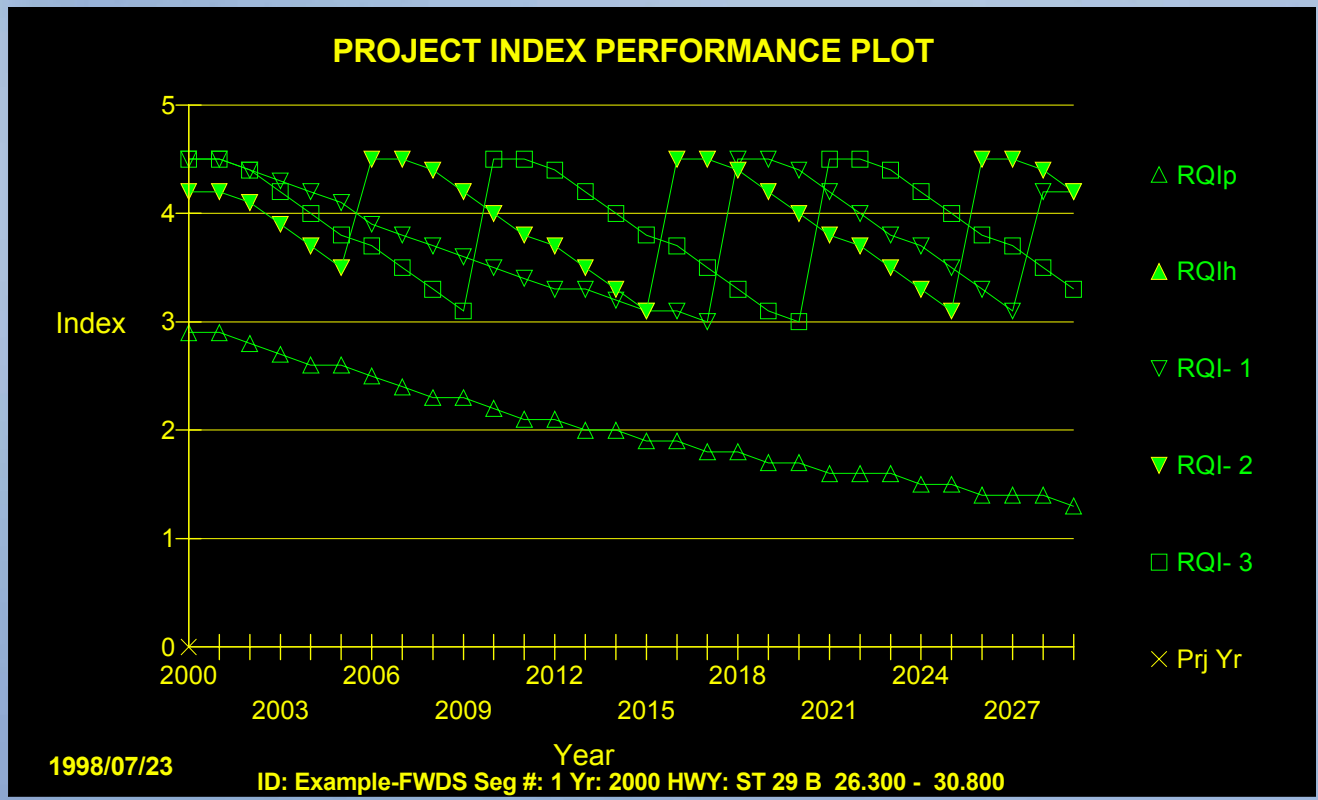
M & R Treatments



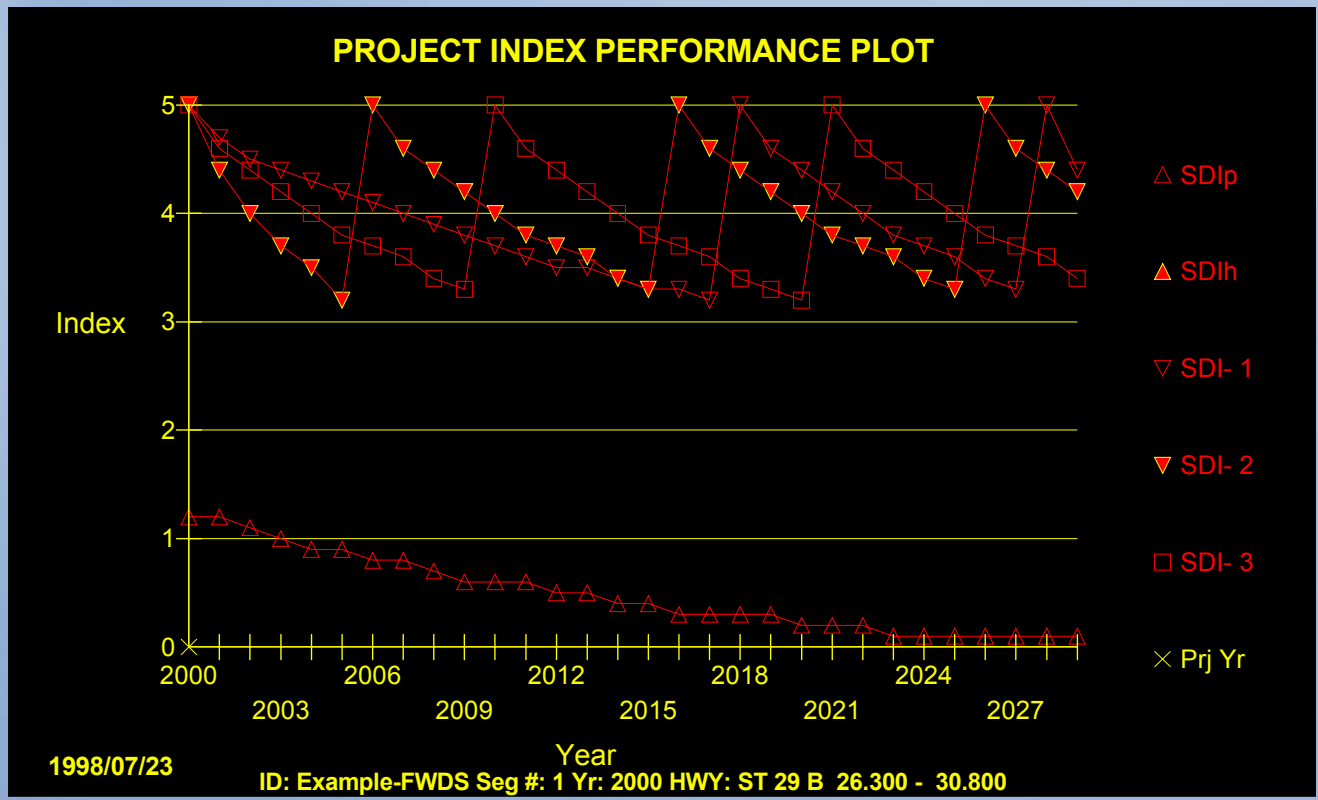
Project Design Analysis

- Standard or Staged Alternatives
- Detailed User Delay Cost Analysis
- Life Cycle Cost Analysis

Life Cycle Analysis (RQI)



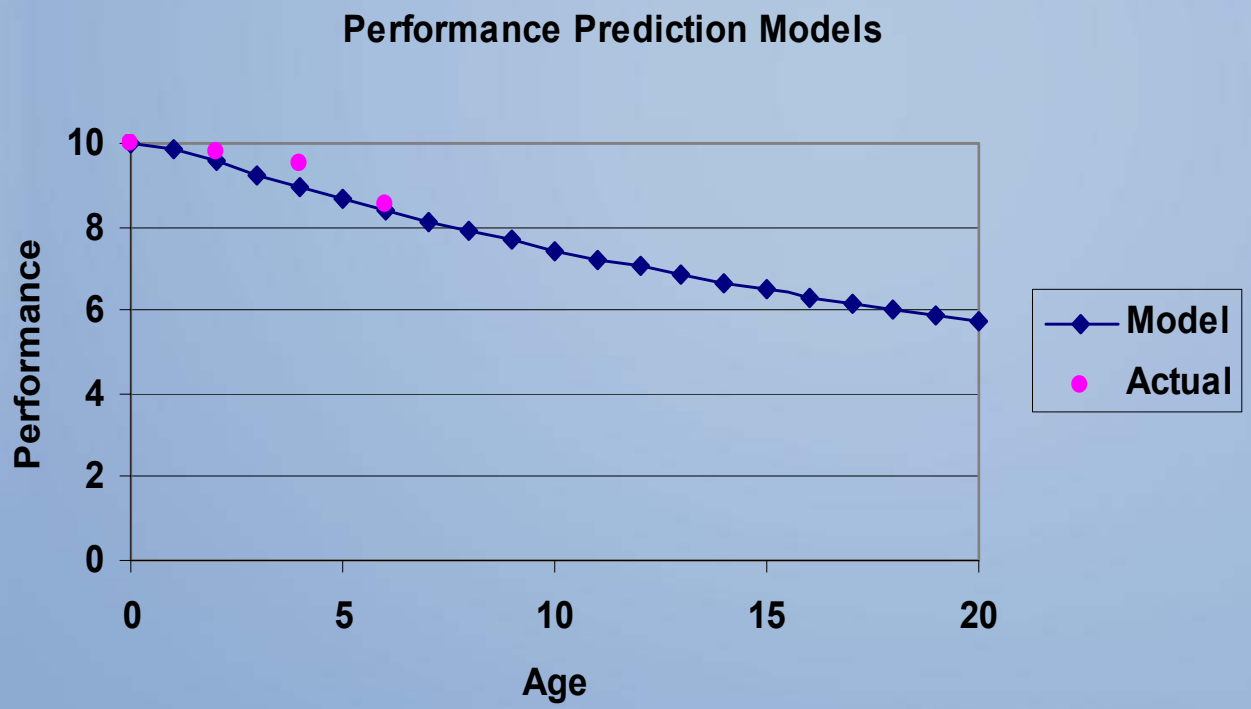
Life Cycle Analysis (SDI)



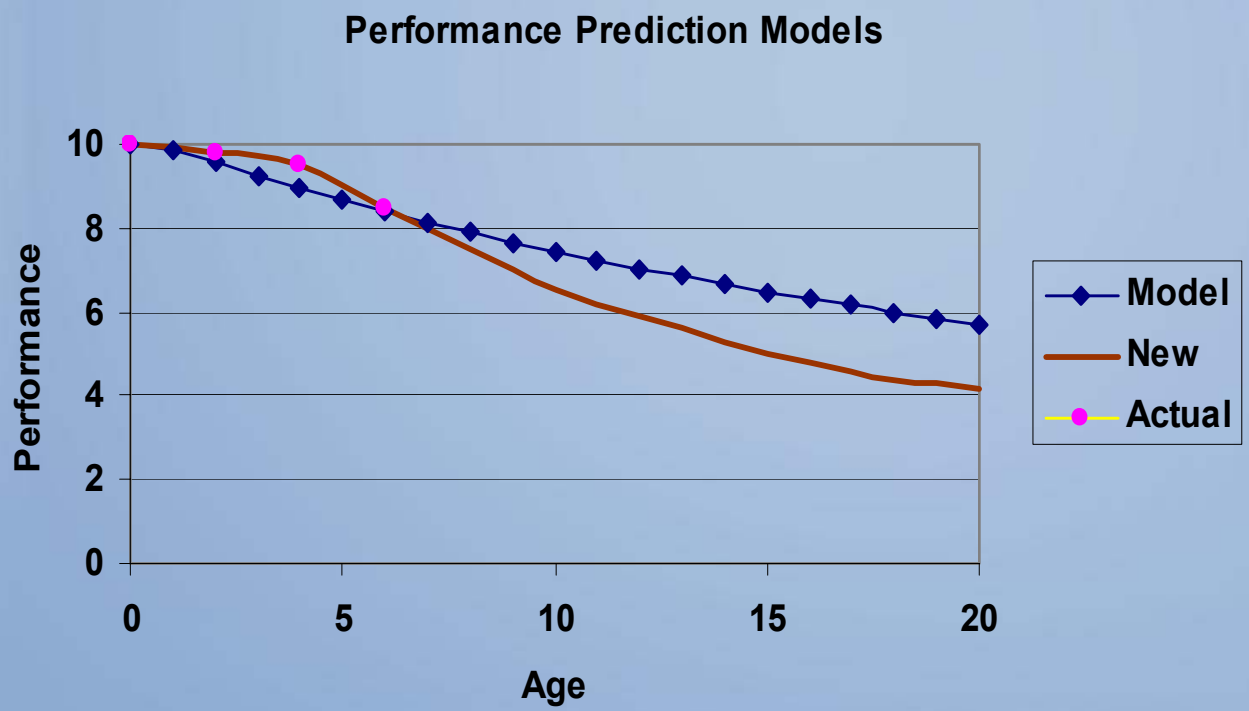
Feedback Analysis

- Analysis of Historical Database
- Update Prediction Models
- Analyze Treatment Effectiveness
- Track Work Programs

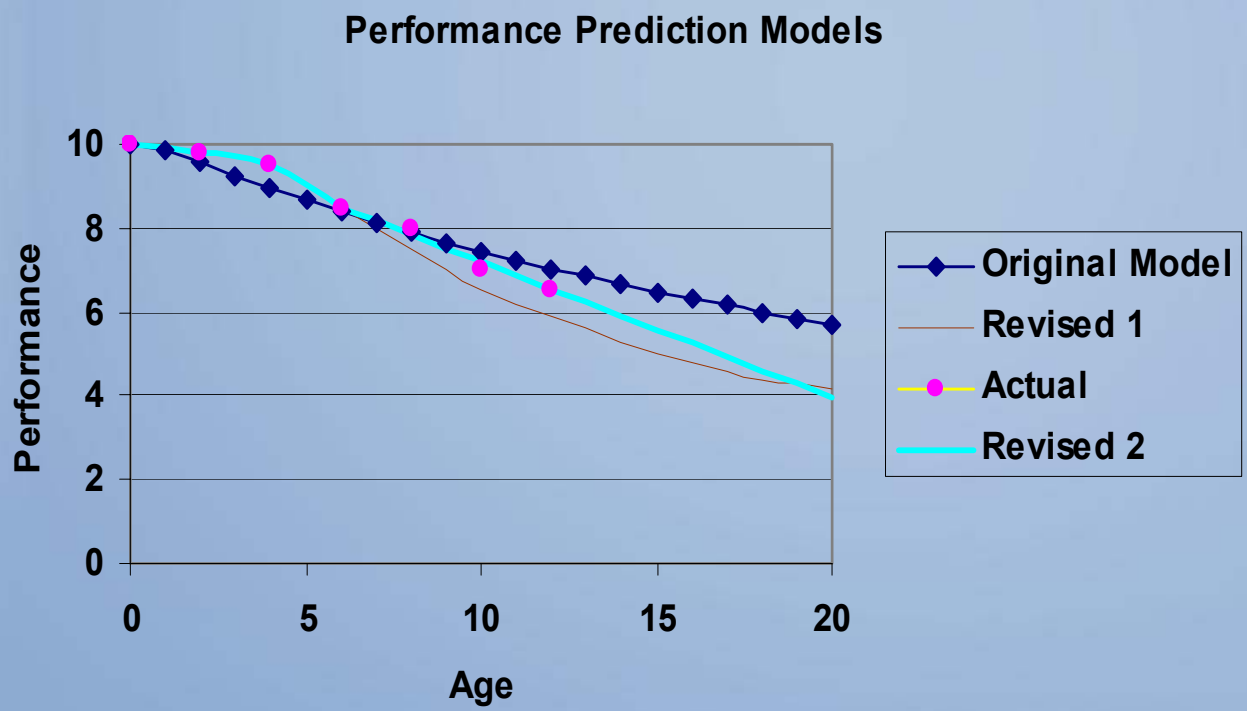
Index Prediction Models



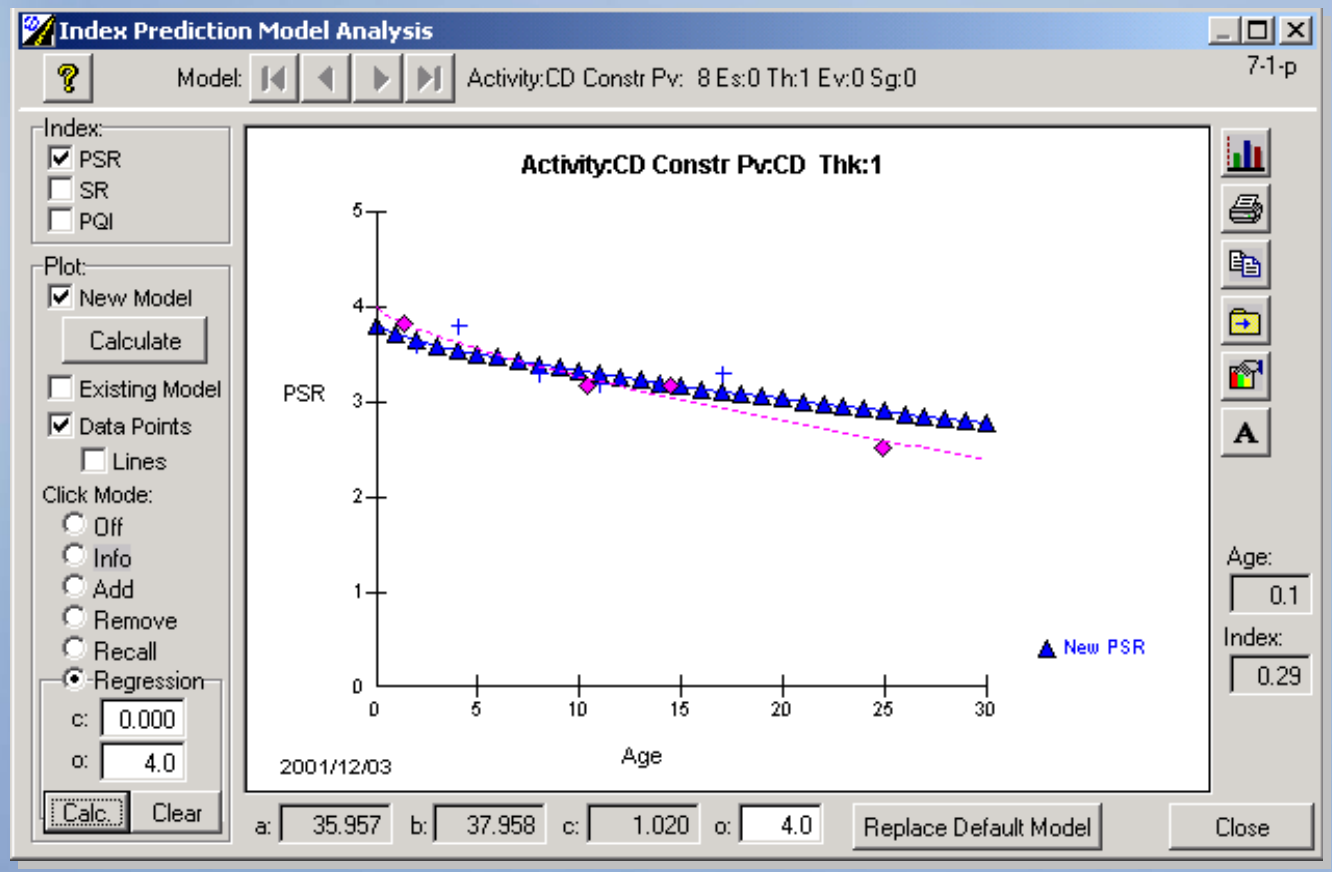
Index Prediction Models

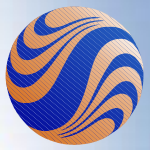


Index Prediction Models



Index Model Feedback





Thank You...