# PAVEMENT MANAGEMENT IMPLEMENTATION





The overall goal and objective of PMS is to provide a tool to facilitate the pavement preservation decision making process.

### This PMS tool will:

Provide information on existing condition for the State Highway
 Network to Districts.(Digital images and CURRENT CONDITIONS/TREATMENTS LIST)

### This PMS tool will:

Provide recommendations for the right treatments, to the right roads, at the right time. (CURRENT CONDITIONS/TREATMENTS LIST and PRIORITY LIST).

This PMS tool will:

3. Make program and budget recommendations to the Department Directors.

### This PMS tool will:

4. Provide feed back on the performance of "Experimental" or "New" treatments.

- Input Data
- Hardware/Software Development
- Output Implementation/Generate Reports

## Input Data

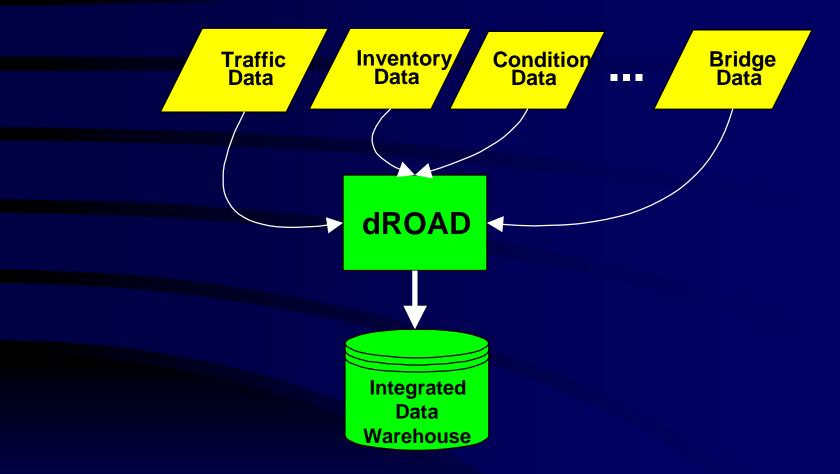
 Collected pavement management condition data in 1995, 1998, and 2001

- Input Data
- Hardware/Software Development
- Output Implementation/Generate Reports

## Hardware/Software Development

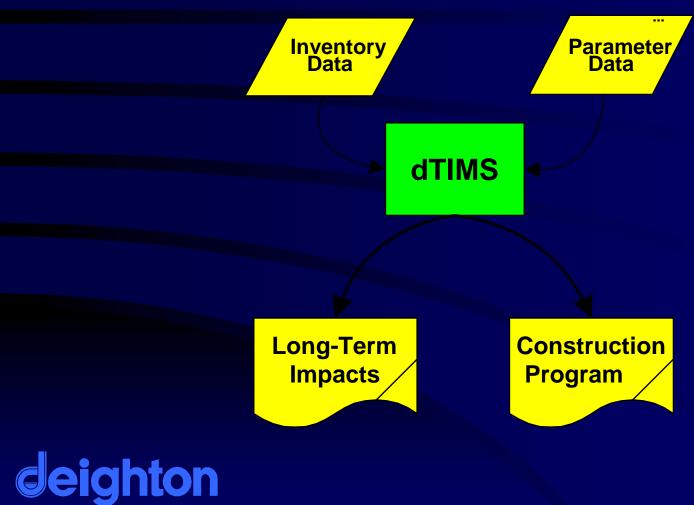
- Acquired licenses for two(2) pieces of software "dROAD" and "dTIMS", that are used to store and analyze the huge PMS database.
- Distributed copies of dROAD to each District and trained District personnel on the use of the software.

## dROAD





## dTIMS





## Hardware/Software Development

 Developed PMS Database structure, with Performance curves, Treatments, Deduct tables, Triggers, Resets, and Costs.

## DEDUCT TABLE

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	ALLIGATOR CRACKING DEDUCTS									
		EXTENT (SQ.FT.)								
SEVERITY	0-51	51-701	701-1301	1301-2401	2401-9999.99					
LOW	0	16	21	25	28					
MED	0	21	29	36	49					
HIGH	0	29	43	50	6l					

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	PATCHING DEDUCTS (FOR FLEXIBLE AND COMPOSITE)									
		EXTENT (SQ.FT.)								
SEVERITY	0-31	31-81	81-151	151-251	251-501	501 <i>-9</i> 999 99				
LOW	0	2	21	23	27	30				
MED	0	4	23	27	31	41				
HIGH	0	11	27	30	47	65				

PATCHING DEDUCTS (FOR JCP AND CRC)										
		EXTENT (SQ.FT.)								
SEVERITY	0-31	31-81	81-151	151-251	251-501	501 <i>-9</i> 999 99				
LOW	0	2	6	12	15	20				
MED	0	4	11	31	40	45				
HIGH	0	11	20	35	47	65				

RANDOM CRACKING DEDUCTS (FOR FLEXIBLE)									
		EXTENT (LIN FT.)							
SEVERITY	0-31	31-301	301-1601	1601-5001	5001-9999.99				
LOW	0	3	16	18	20				
MED	0	16	21	30	30				
HIGH	0	26	28	42	48				

## DEDUCT TABLE

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	ALLICATOR CRACKING DEDUCTS									
			EXTENT (SQ.FT.)							
	SEVERITY	0-51	51- <i>7</i> 01	701-1301	1301-2401	2401-9999.99				
1	LOW	0	16	21	25	28				
	MED	0	21	29	36	49				
_[	HIGH	0	29	43	50	6l				

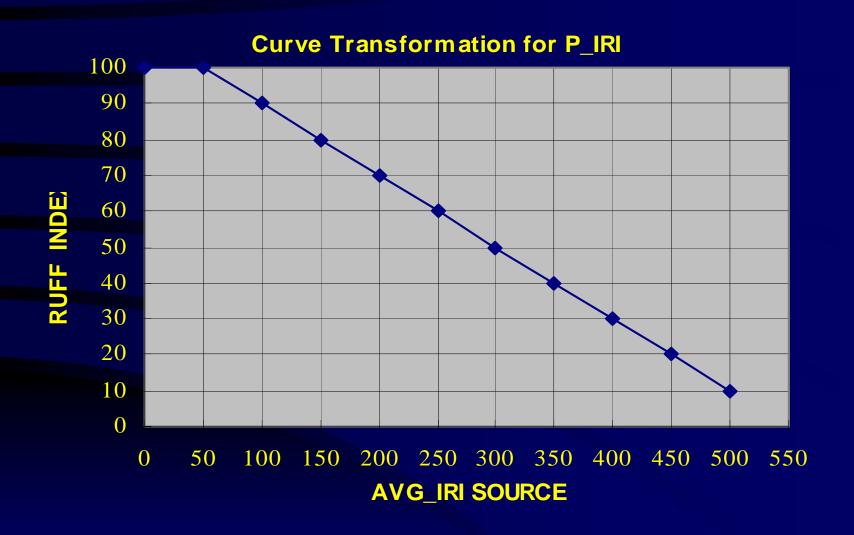
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	PATCHING DEDUCTS (FOR FLEXIBLE AND COMPOSITE)										
		EXTENT(SQ.FT.)									
SEVERITY	0-31	0-31 31-81 81-151 151-251 251-501 501-9999 99									
LOW	0	2	21	23	27	30					
MED	0	4	23	27	31	41					
HIGH	0	11	27	30	47	65					

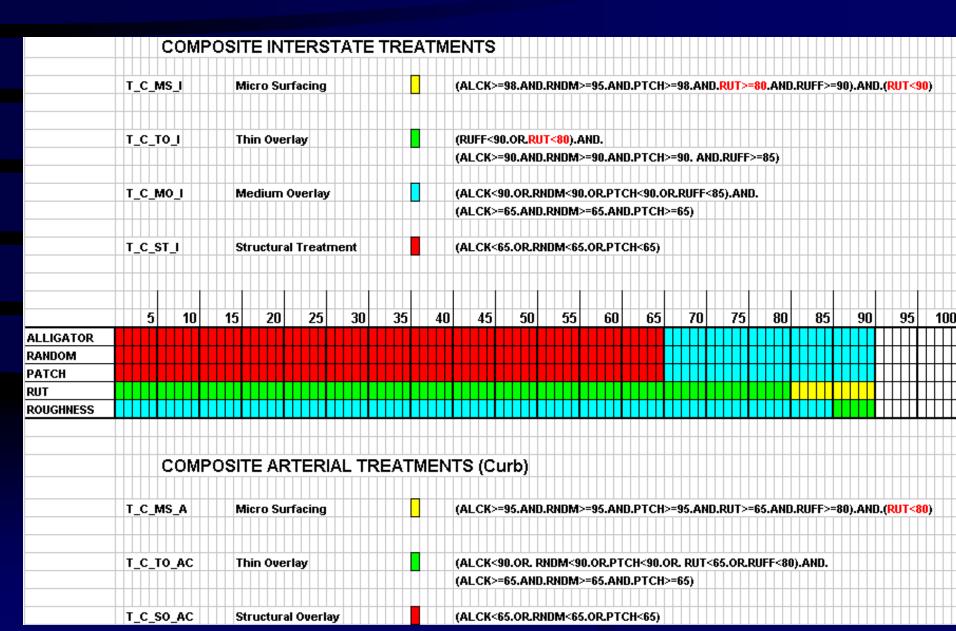
	PATCHING DEDUCTS (FOR JCP AND CRC)										
		EXTENT (SQ.FT.)									
SEVERIT Y	0-31	0-31 31-81 81-151 151-251 251-501 501-9999 99									
LOW	0	2	6	12	15	20					
MED	0	4	11	31	40	45					
HIGH	0	11	20	35	47	65					

RANDOM CRACKING DEDUCTS (FOR FLEXIBLE)									
		EXTENT(LIN FT.)							
SEVERIT Y	0-31	31-301	301-1601	1601-5001	5001-9999.99				
LOW	0	3	16	18	20				
MED	0	16	21	30	30				
HIGH	0	26	28	42	48				

## **CURVE TRANSFORMATION**



## TRIGGER TABLE



- Input Data
- Hardware/Software Development
- Output Implementation/Generate Reports

## Output Implementation

• Issued annual recommended project lists for each District and yearly condition data.

# CURRENT CONDITIONS/TREATMENTS

#### CURRENT CONDITION/TREATMENTS

#### DISTRICT 61

CONTROL	DIRECTION	$BEG\_LOG$	LENGTH	RESET	RUFF	RUT	AL CK	LGCK	TRCK	RNDM	PTCH	PERF_ INDEX
00502	1	0.00	0.69	NONE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
US0090	BRIDGE	DO NOTHING		CONVENTS								
00502	1	0.69	2.90	NONE	75	59	91	N/A	N/A	87	100	70
US0090	ASPHALT	MEDIUM OVER	LAY	CONVENTS								
00705	1	0.00	1.83	NONE	94	100	100	N/A	N/A	99	100	97
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00705	1	1.83	0.54	NONE	96	100	100	N/A	N/A	100	100	98
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00705	1	2.37	2.51	NONE	93	100	100	N/A	N/A	99	100	96
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00705	1	4.88	3.95	NONE	98	100	99	N/A	N/A	100	100	99
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00705	2	0.00	1.83	NONE	97	100	100	N/A	N/A	97	100	97
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00705	2	1.83	0.54	NONE	97	100	100	N/A	N/A	98	100	98
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00705	2	2.37	2.51	NONE	96	100	100	N/A	N/A	99	100	98
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00705	2	4.88	3.95	NONE	98	100	100	N/A	N/A	99	100	99
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00706	1	0.00	5.45	NONE	99	100	99	N/A	N/A	97	100	98
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00706	2	0.00	5.45	NONE	99	100	100	N/A	N/A	97	100	98
US0061	COMPOSITE	DO NOTHING		CONVENTS								
00707	1	0.00	4.01	NONE	92	99	71	N/A	N/A	83	100	80
US0061	COMPOSITE	MEDIUM OVER	LAY	CONVENTS								
00707	1	4.01	1.12	NONE	90	95	72	N/A	N/A	81	100	79
US0061	COMPOSITE	MEDIUM OVER	LAY	CONVENTS								
00707	1	5.13	0.39	NONE	90	100	66	N/A	N/A	87	100	78
US0061	COMPOSITE	MEDIUM OVER	LAY	CONVENTS								
Thursday, Janu	arv 10. 2002										Pas	re 1 of 67

## PRIORITY LIST

### DISTRICT 62 PRIORITY LIST

ROUTE	CONTROL SECTION	DIRECTION	BEGIN LOG MILE	SECTION LENGTH	TREAT MENT YEAR	RECOMMENDED TREATMENT	COMMENT S
US0061	00704	2	5.95	2.73	2001	THIN OVERLAY	
US0061	00704	2	8.68	1.78	2001	THIN OVERLAY	
US0190	01306	1	5.12	1.38	2001	THIN OVERLAY	
US0190	01306	1	6.5	2.40	2001	THIN OVERLAY	
US0190	01306	1	8.9	6.11	2001	THIN OVERLAY	
US0190	01308	1	4.44	0.67	2001	MINOR REHABILITATION	
US 00 51-X	01308	1	5.11	0.55	2001	MINOR REHABILITATION	
US 00 51-X	01308	1	5.66	0.50	2001	MINOR REHABILITATION	
US 00 51-X	01308	1	6.16	0.25	2001	MINOR REHABILITATION	
US0190	01308	2	4.44	0.67	2001	MINOR REHABILITATION	
US0190	01309	1	0.18	0.77	2001	MINOR REHABILITATION	
US0190	01309	1	0.95	0.13	2001	MINOR REHABILITATION	
US0190	01309	1	1.08	0.09	2001	MINOR REHABILITATION	
US0190	01309	2	0.95	0.13	2001	MINOR REHABILITATION	
US0190-X	01310	1	9.09	0.24	2001	THIN OVERLAY	
US0190-X	01310	1	9.33	0.25	2001	THIN OVERLAY	
US0190-X	01310	1	9.58	0.20	2001	MINOR REHABILITATION	
US0190-X	01310	1	9.78	0.51	2001	MINOR REHABILITATION	
US 00 51	01704	1	0	0.79	2001	MINOR REHABILITATION	
US0051	01704	1	0.79	0.09	2001	MINOR REHABILITATION	
US0051	01704	1	0.88	1.41	2001	MINOR REHABILITATION	
US0051	01704	1	11.44	0.42	2001	THIN OVERLAY	
US0051	01704	2	0	0.79	2001	MINOR REHABILITATION	
US0051	01704	2	0.88	1.41	2001	MINOR REHABILITATION	
US0011	01804	1	1.43	0.57	2001	THIN OVERLAY	
LA0433	01830	1	6.17	0.47	2001	MINOR REHABILITATION	
LA0433	01830	1	6.64	1.59	2001	MINOR REHABILITATION	
LA0433	01830	2	6.17	0.47	2001	MINOR REHABILITATION	
LA0433	01830	2	6.64	1.59	2001	MINOR REHABILITATION	
Thursday, J	anuary 10, 2002	2					Page 1 of 24

Thursday, January 10, 2002

## Output Implementation

 Generated reports on the Condition of the State Pavement Network and on each District network. Analyzed different Budget scenarios and recommended Budgets to achieve desired goals.

### CLASSIFICATION OF HIGHWAY BASED ON ROUGHNESS INDEX

#

	RC	UGHNESS INDE	X
CONDITION	INTERSTATES	ARTERIAL	COLLECTORS
Very Good	96 – 100	95 – 100	95 – 100
Good	90 – 95	88 – 94	85 – 94
Fair	76 – 89	70 – 87	65 – 84
Poor	65 – 75	60 – 69	50 – 64
Very Poor	0 – 64	0 – 59	0 – 49

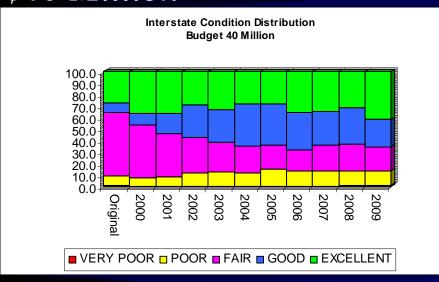
### CLASSIFICATION OF HIGHWAYS BASED ON IRI

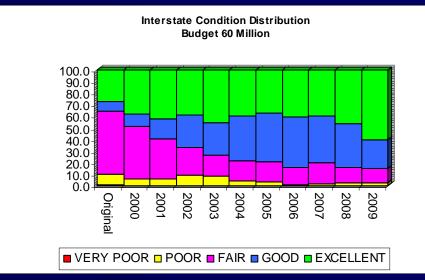
CONDITION	INTERSTATES	ARTERIALS	COLLECTORS
Very Good	IRI ≤ 70	IRI ≤ 75	IRI ≤ 75
Good	IRI = 71 - 100	IRI = 76 - 110	IRI = 76 - 125
Fair	IRI = 101 – 170	IRI = 111 – 200	IRI = 126 – 225
Poor	IRI = 171 – 225	IRI = 201 - 250	IRI = 226 – 300
Very Poor	IRI ≥ 226	IRI ≥ 251	IRI ≥ 301

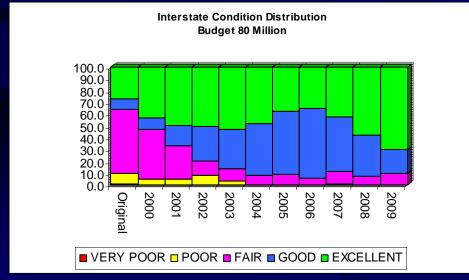
## Interstate Based on Roughness Condition Distribution

\$40 Million

\$60 Million



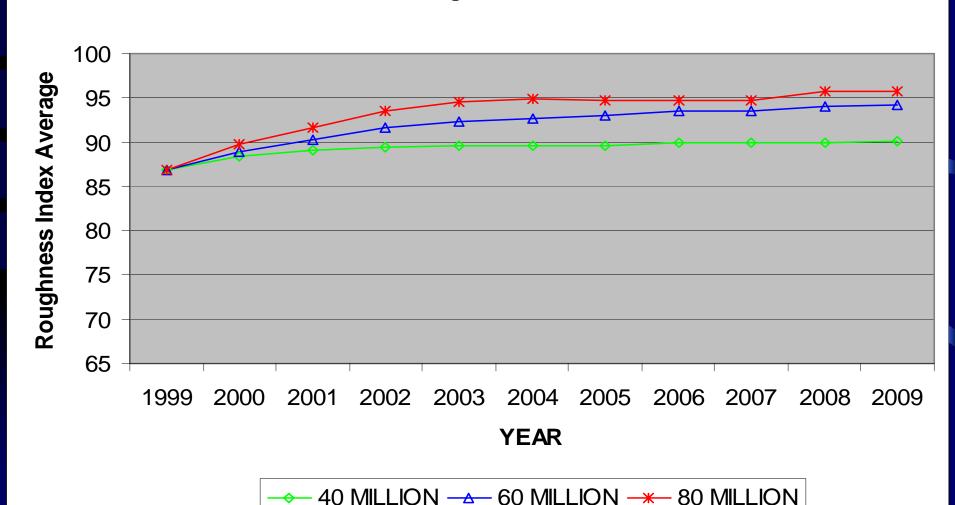




\$80 Million

## Interstate Average Network

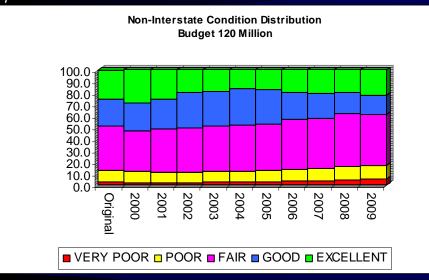
### **Interstate Average Network Condition**

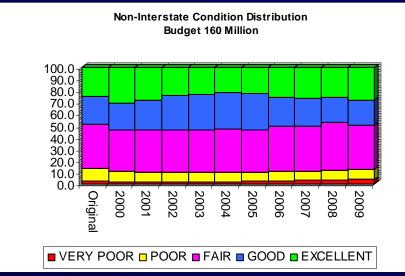


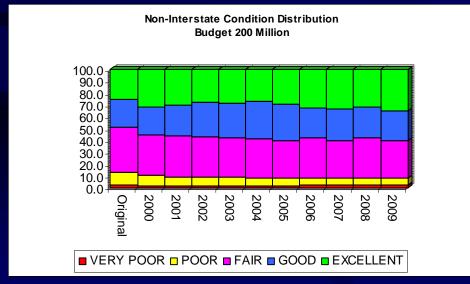
## Non-Interstate Based on Roughness Condition Distribution

\$120 Million

\$160 Million



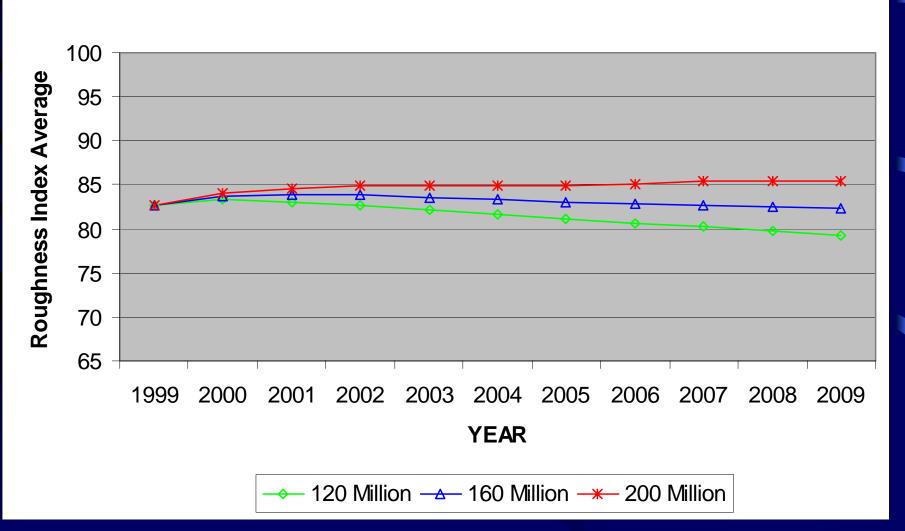




\$200 Million

## Non-Interstate Average Network





## NHS CONDITION REPORT

National Highway System (NHS)	VERY GOOD	GOOD	FAIR	POOR	VERY POOR	TOTAL
	CL_MILES	CL_MILES	CL_MILES	CL_MILES	CL_MILES	CL_MILES
Rural Interstate	254	75	183	28	14	554.0
Rural Other Principal Arterial	329	216	313	45	11	914.0
Rural Minor Arterial	55	28	102	34	7	226.0
Rural Major Collector	13	5	5	0	0	23.0
Rural Minor Collector	0	0	0	0	0	0.0
						1717
Urban Interstate	79	5	114	47	3	248.0
Urban Other Freeways and Exp. Way	15	3	18	2	1	39.0
Urban Other Principal Arterial	98	40	92	40	35	305.0
Urban Minor Arterial	6	2	2	2	2	14.0
Urban Major Collector	0	0	0	0	0	0.0
Urban Minor Collector	0	0	0	0	0	0.0
						606
TOTAL MILES	849	374	829	198	73	2323
NHS PERCENT	37	16	36	9	3	100

## SHS CONDITION REPORT

Statewide Highway System (SHS)	VERY GOOD	GOOD	FAIR	POOR	VERY POOR	TOTAL	
(Excluding NHS)	CL_MILES	CL_MILES	CL_MILES	CL_MILES	CL_MILES	CL_MILES	
Rural Other Principal Arterial	0	7	9	0	0	16.0	
Rural Minor Arterial	504	395	645	102	6	1652.0	
Rural Major Collector	1440	1 <b>0</b> 58	1927	426	51	4902.0	
						6570	
Urban Other Freeways and Exp. Way	0	0	0	0.2	0.8	1.0	
Urban Other Principal Arterial	73	56	143	77	47	396.0	
Urban Minor Arterial	0	0	0	0	0	0.0	
Urban Major Collector	0	0	0	0	0	0.0	
Urban Minor Collector	0	0	0	0	0	0.0	
						397	
TOTAL MILES	2017	1516	2724	605	105	6967	
SHS PERCENT	29	22	39	9	2	100	

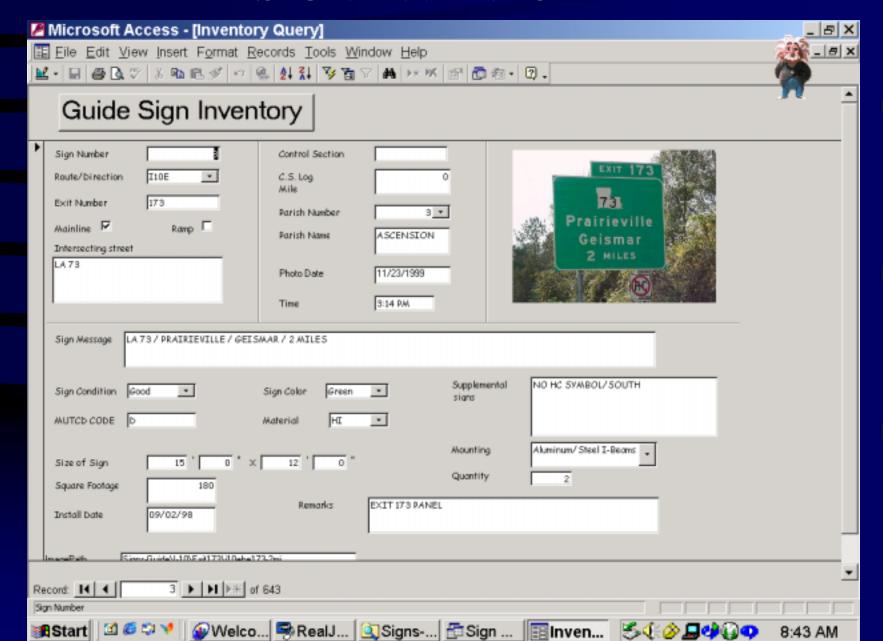
## RHS CONDITION REPORT

Regional Highway System (RHS)	VERY GOOD	GOOD	FAIR	POOR	VERY POOR	TOTAL	
(Excluding NHS)	CL_MILES	CL_MILES	CL_MILES	CL_MILES	CL_MILES	CL_MILES	
Rural Minor Arterial	0	0	0	0	0	0.0	
Rural Minor Collectors	933	664	1232	538	163	3530.0	
Rural Local	478	403	708	604	399	2592.0	
						6122	
Urban Minor Arterial	180	68	279	84	70	681.0	
Urban Collectors	62	47	53	36	19	217.0	
Urban Local	1	2	8	1	2	14	
						912	
TOTAL MILES	1654	1184	2280	1263	653	7034	
RHS PERCENT	24	17	32	18	9	100	

## GASB REPORT

		GASB PROJECT	January 10, 2001				
			CL_MILES	LANE_MILES	YEAR	AGE	
RURAL	BLACK	INTERSTATE	240.45	961.80	1990		11
RURAL	WHITE	INTERSTATE	312.62	1250.48	1986		15
URBAN	BLACK	INTERSTATE	73.86	330.50	1988		13
URBAN	WHITE	INTERSTATE	172.06	812.42	1986		15
			798.99	3355.20			
			CL_MILES	LANE_MILES	YEAR	AGE	
RURAL	BLACK	NONINTERSTATE NHS	982.52	2519.67	1990		11
RURAL	WHITE	NONINTERSTATE NHS	170.06	564.04	1982		19
URBAN	BLACK	NONINTERSTATE NHS	247.19	979.39	1991		10
URBAN	WHITE	NONINTERSTATE NHS	135.75	571.42	1976		25
			1535.52	4634.52			
			CL_MILES	LANE_MILES	YEAR	AGE	
RURAL	BLACK	OTHER	12550.21	25443.80	1984		17
RURAL	WHITE	OTHER	187.11	470.38	1981		20
URBAN	BLACK	OTHER	1051.69	2512.40	1986		15
HDRAN	WHITE	OTHER	292 91	1044 27	1978		23

### SIGN INVENTORY



# EXPANDING THE IMPLEMENTATION OF PMS

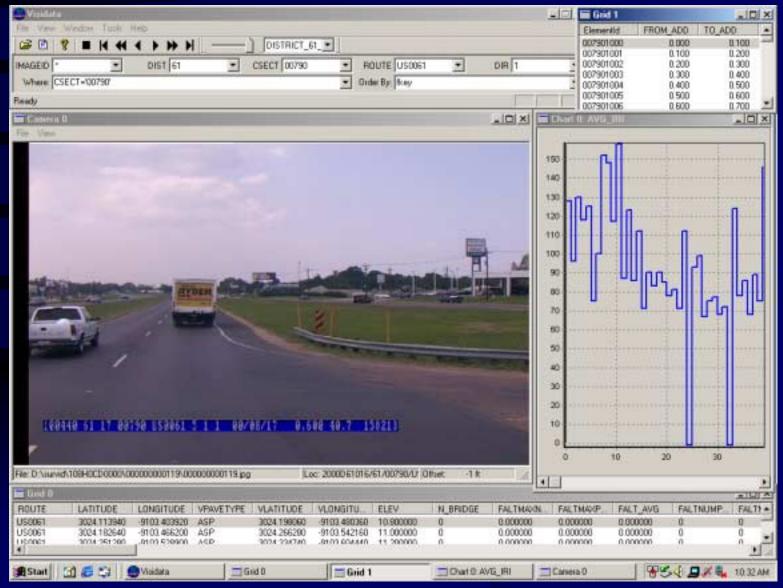
Improve the friendliness and accessibility to the user.

VISI DATA: Digital images (clarity, user friendly, accessibility)

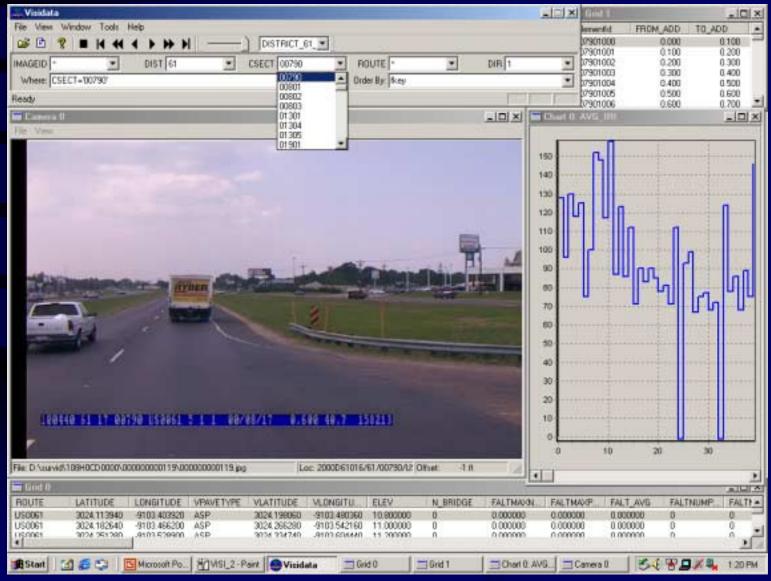
SURVEYOR: linear measurements

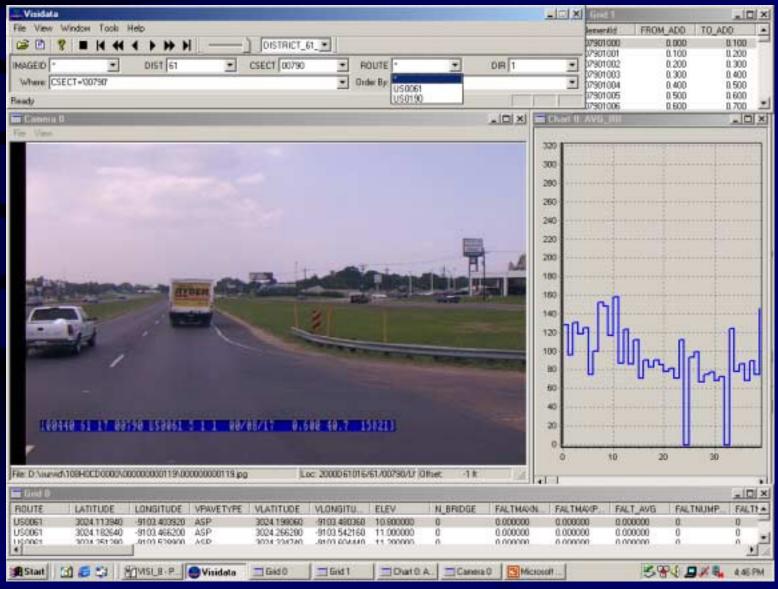
GIS CAPABILITY: Simple click on GIS State map to obtain data.

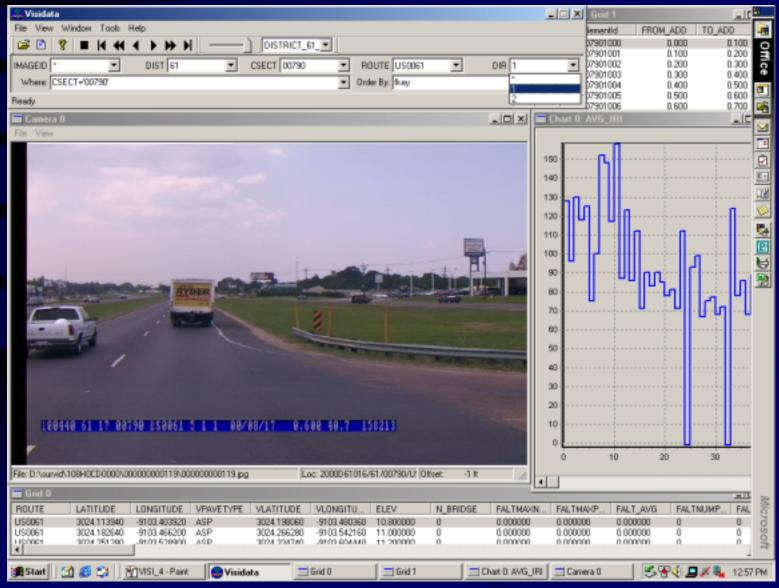
## VISIDATA

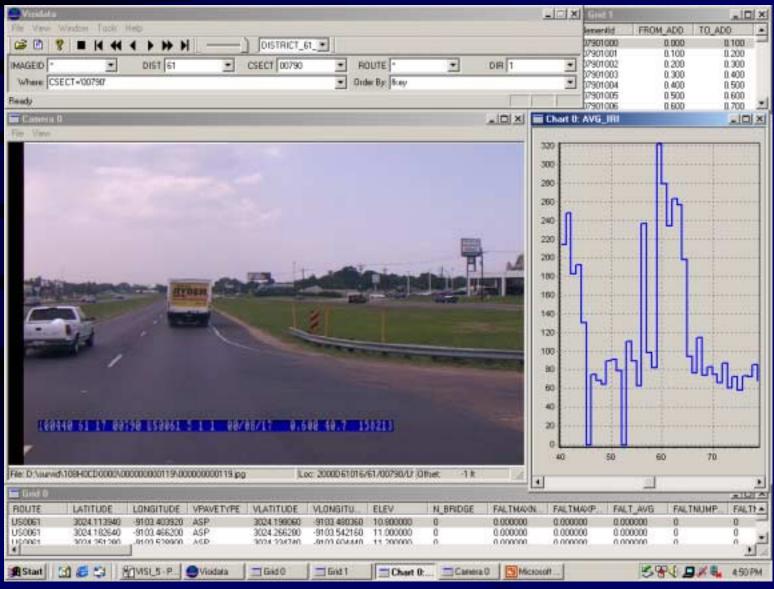


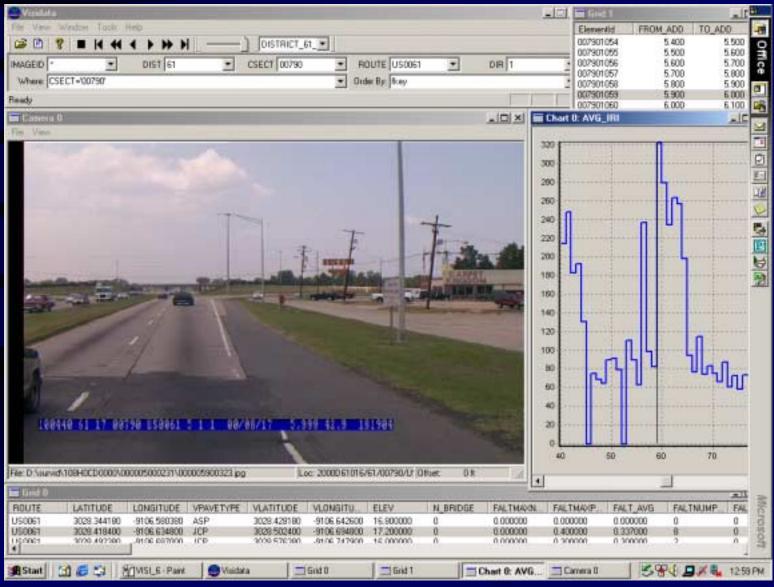
## VISIDATA

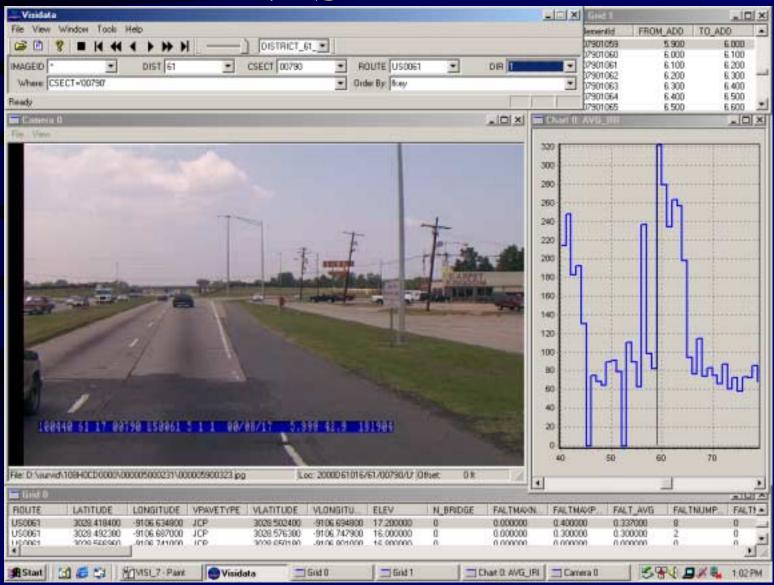


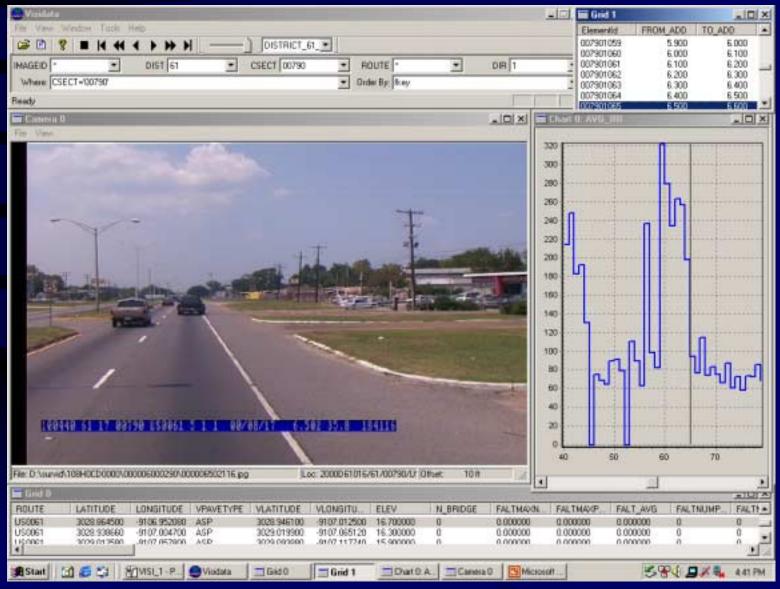


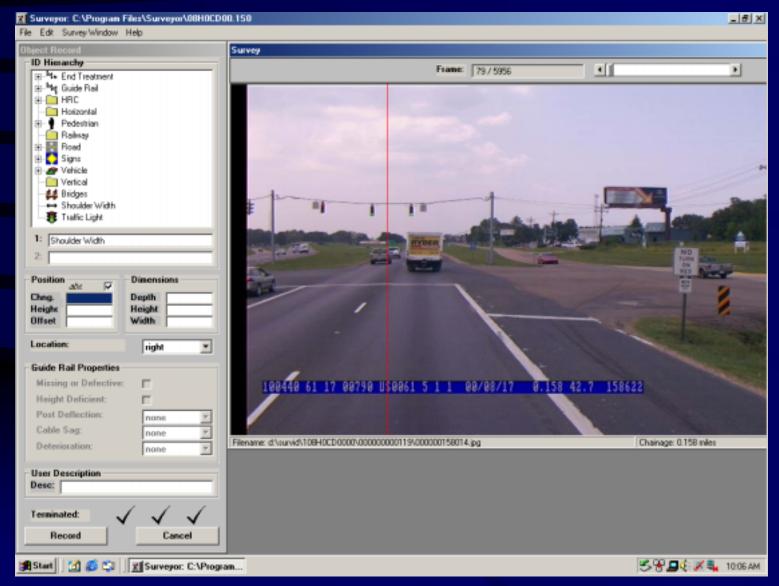


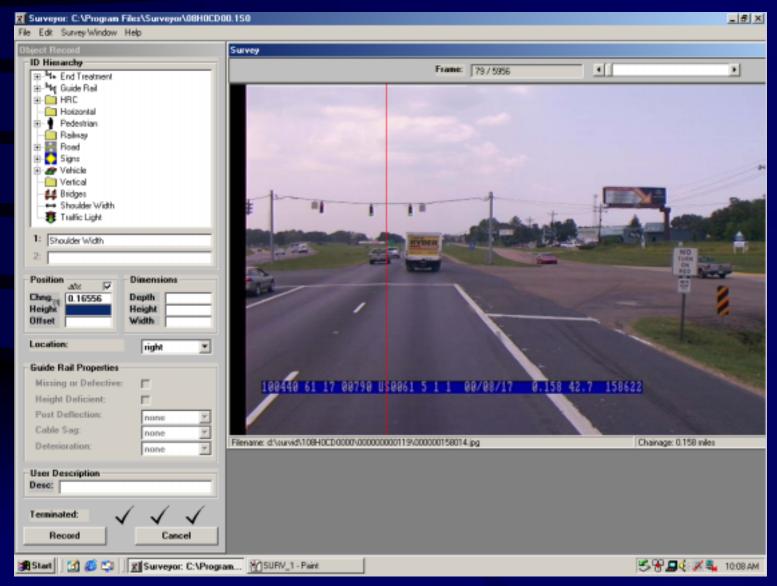


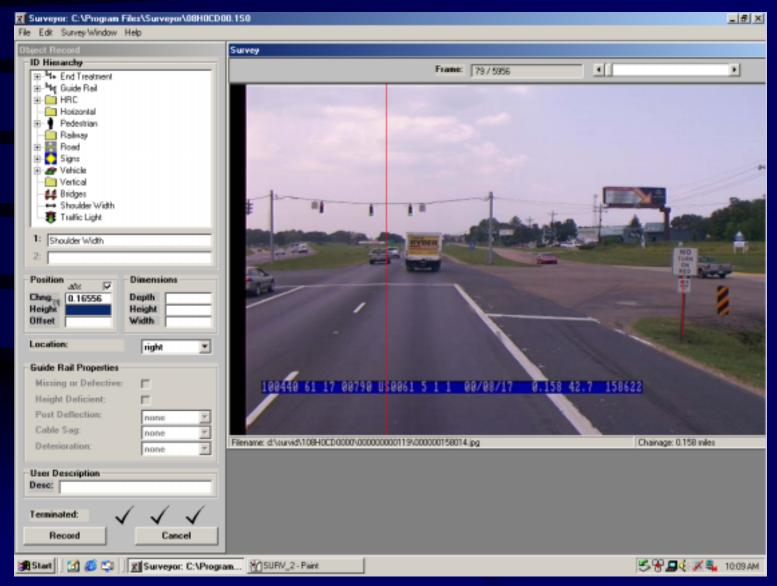


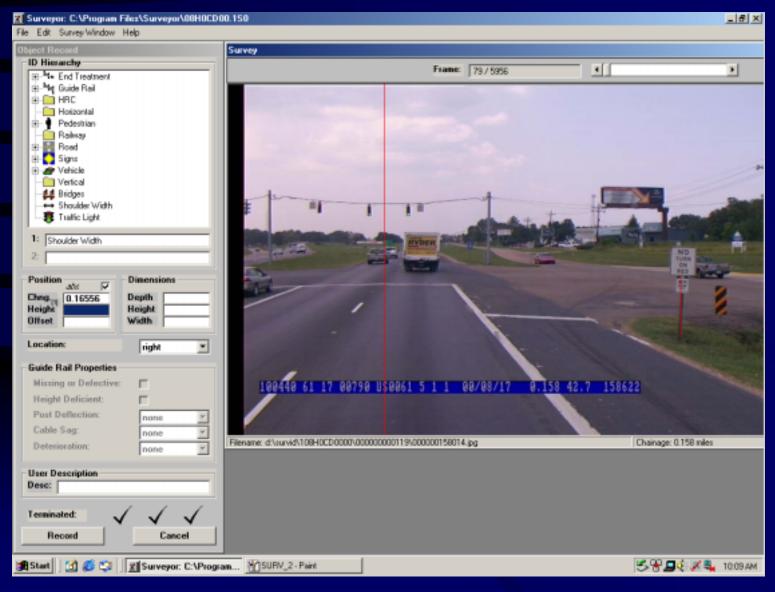


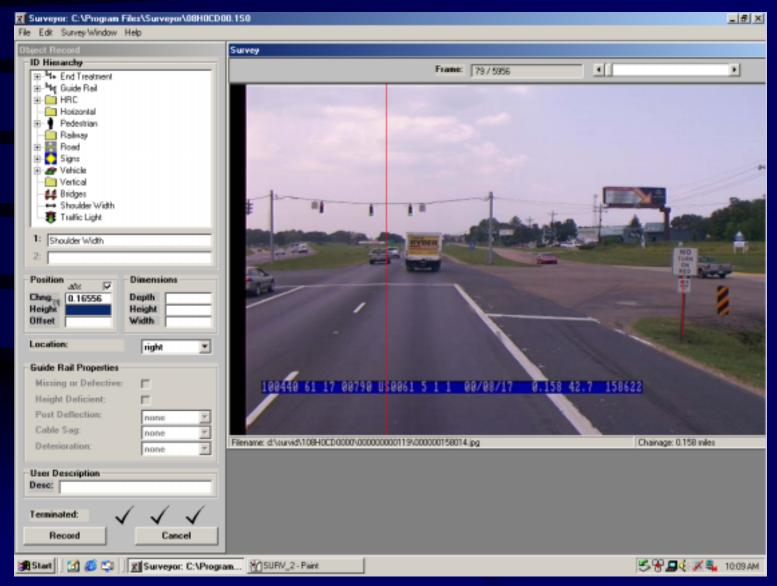


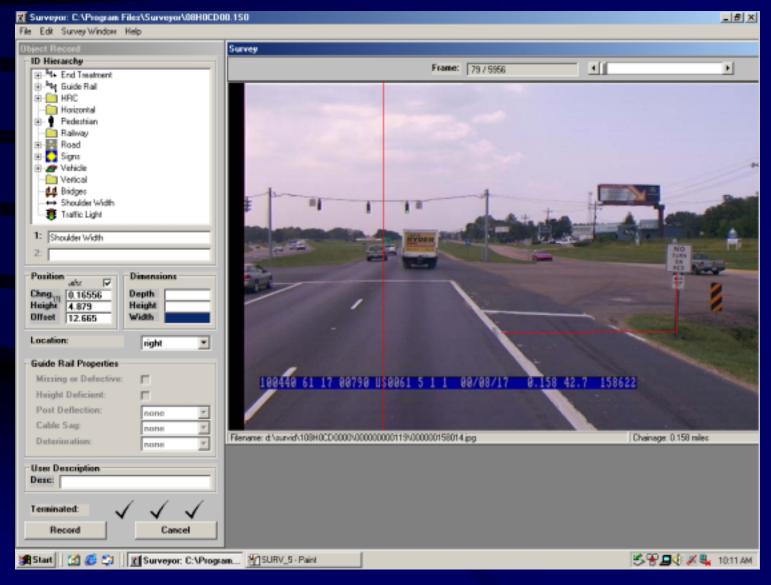


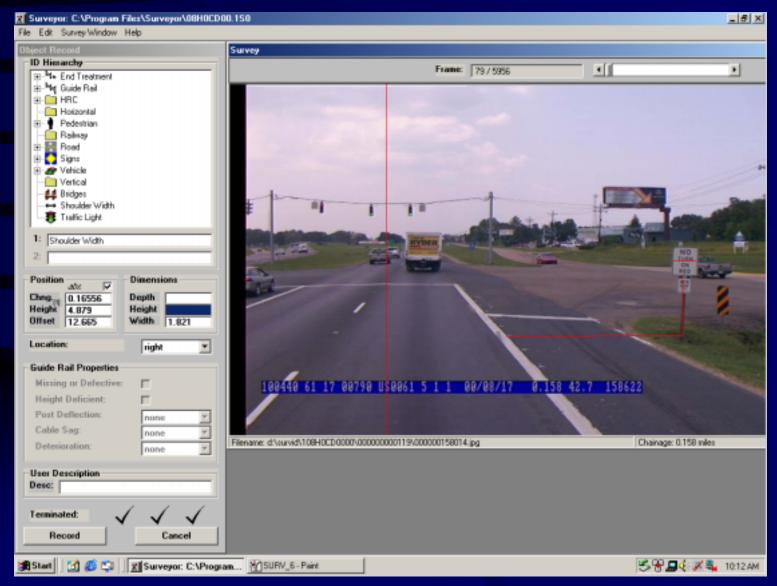


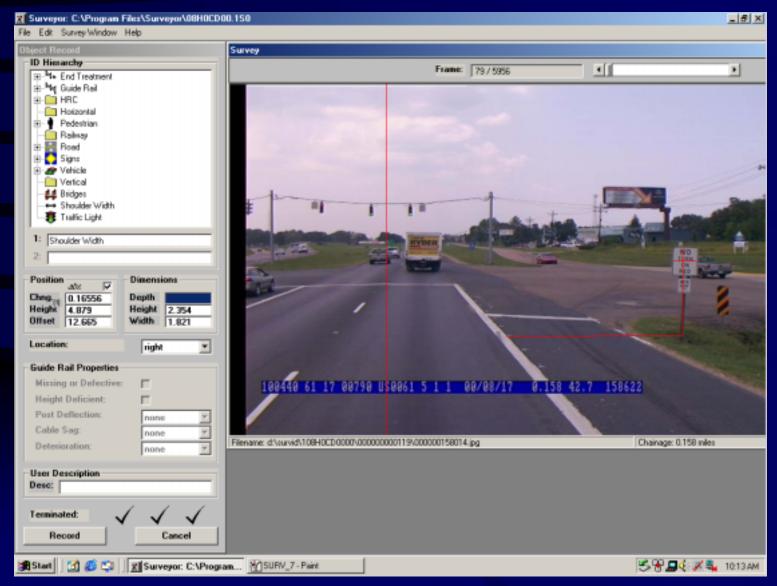


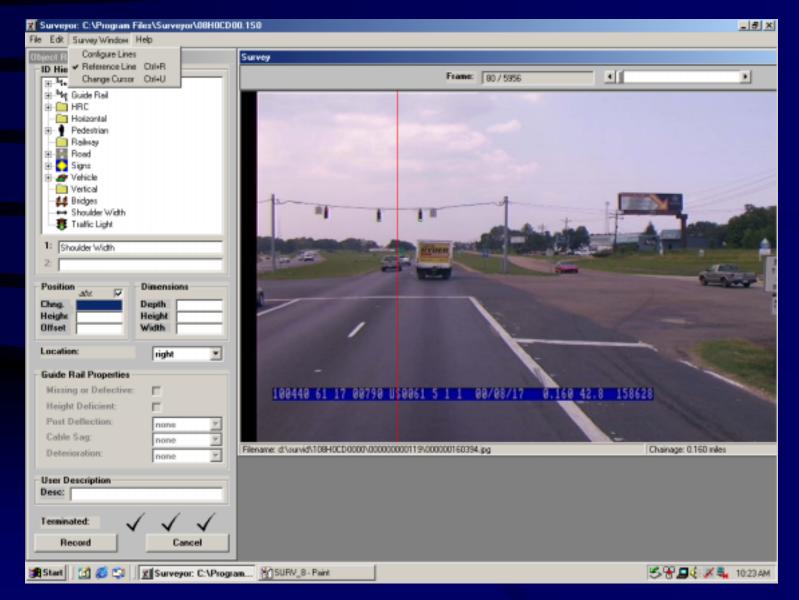


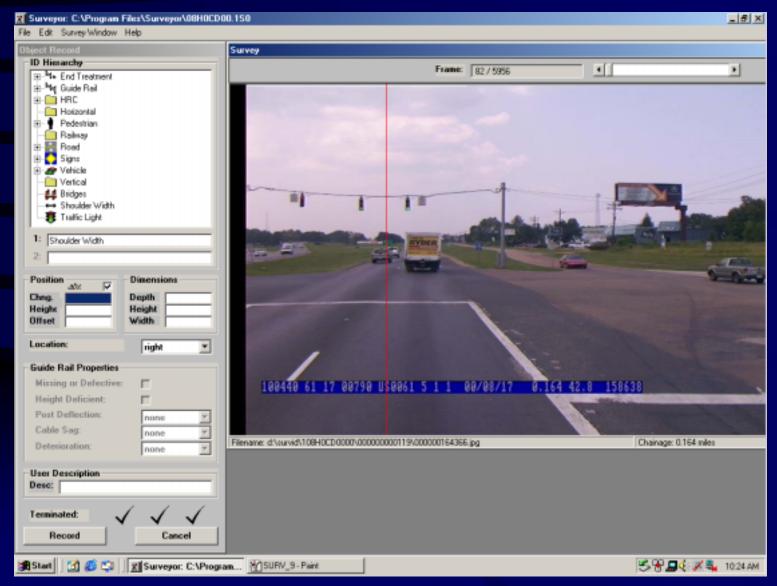


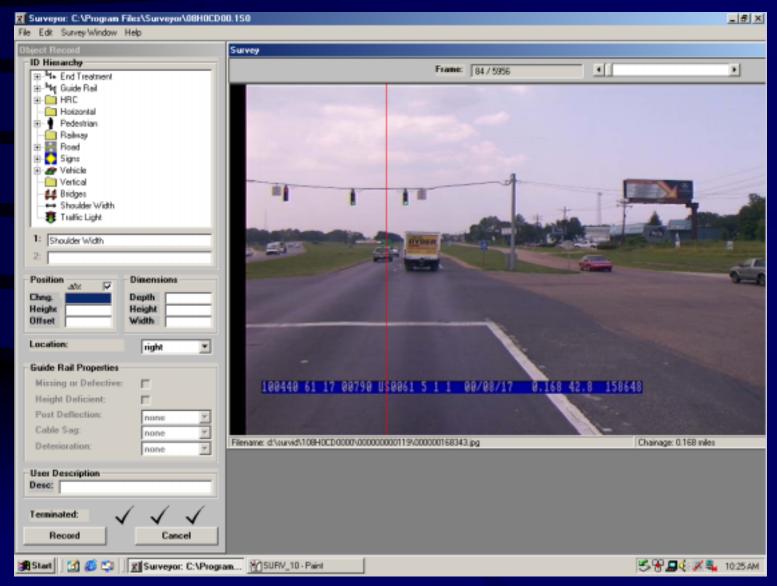


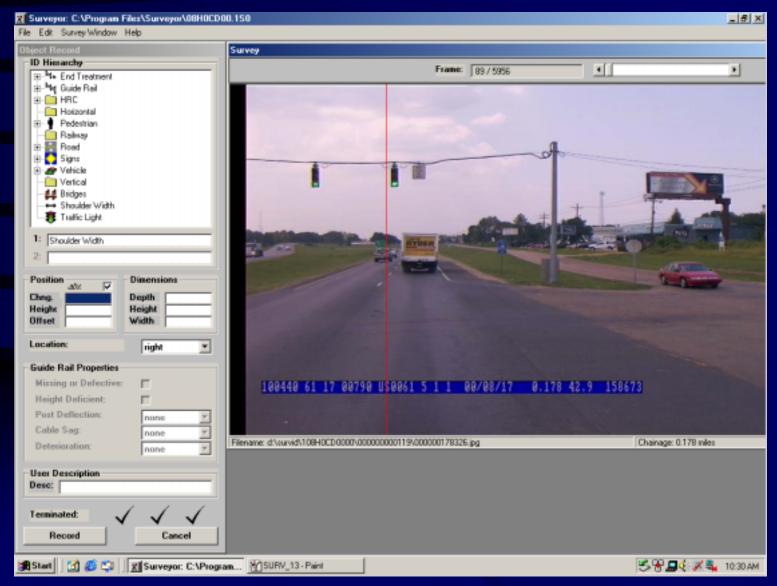


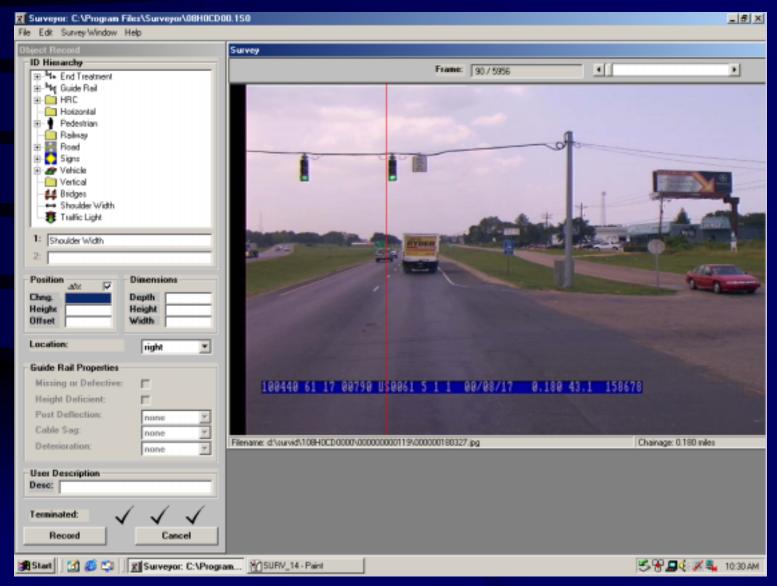


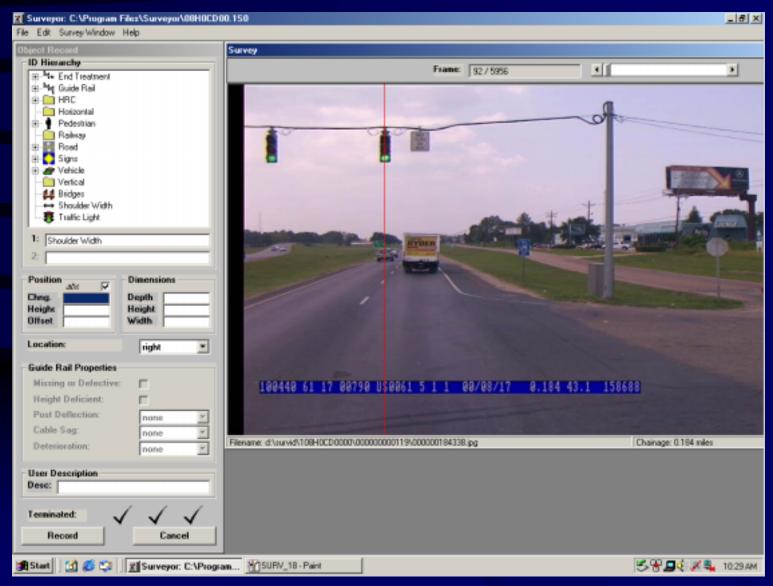


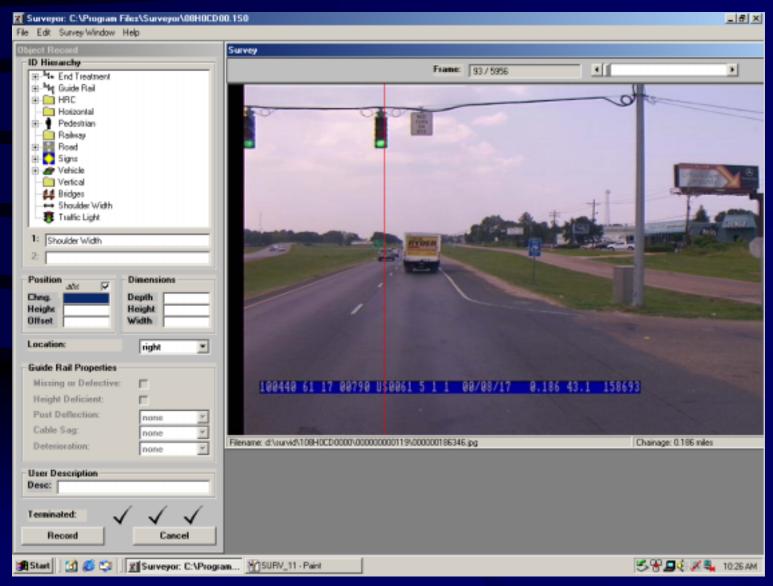


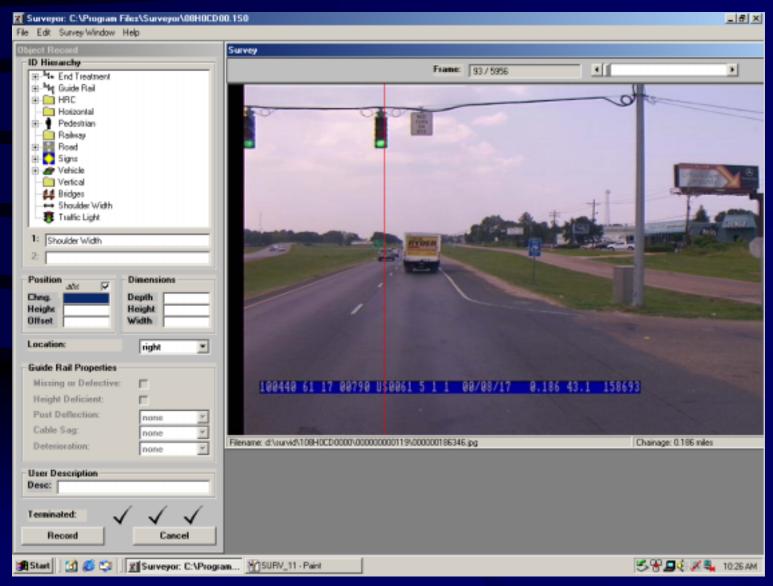


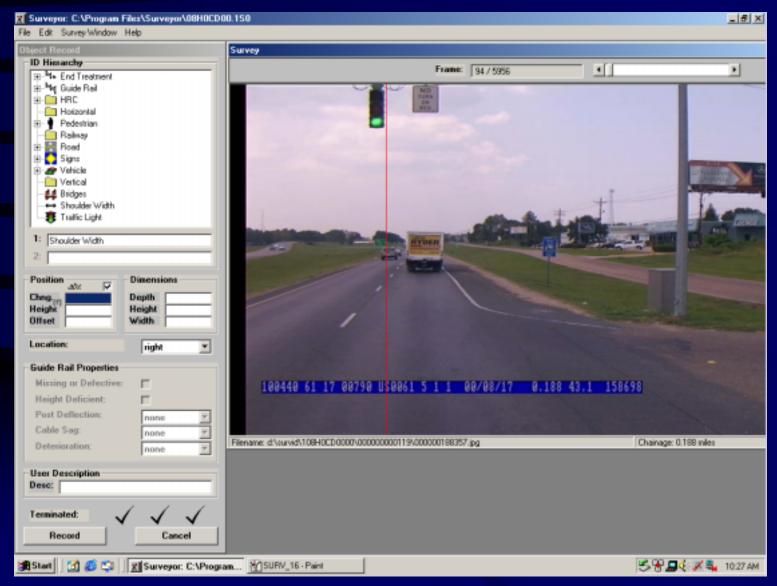


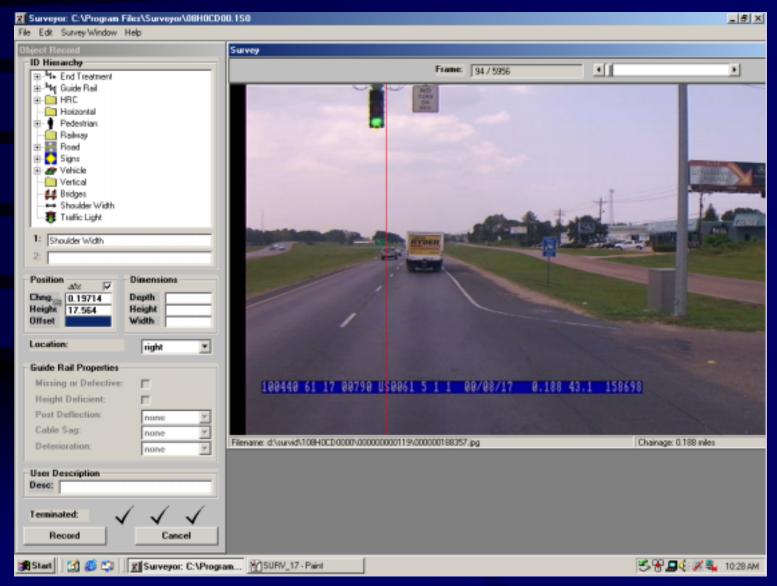




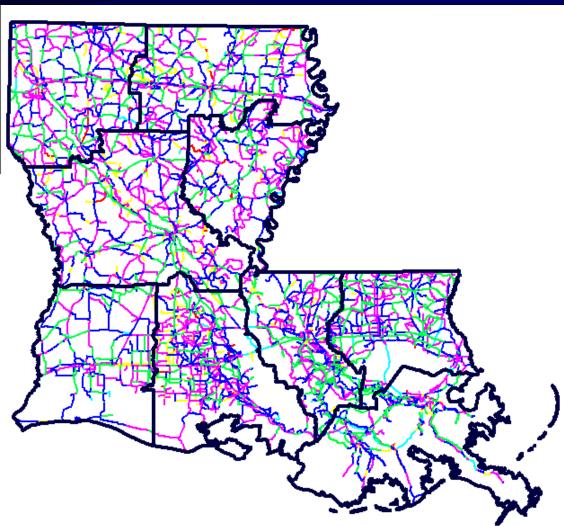


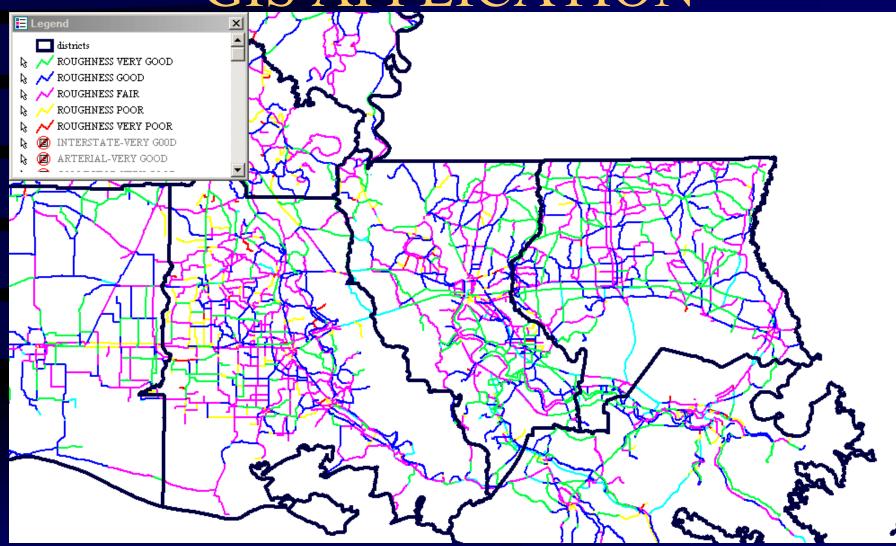


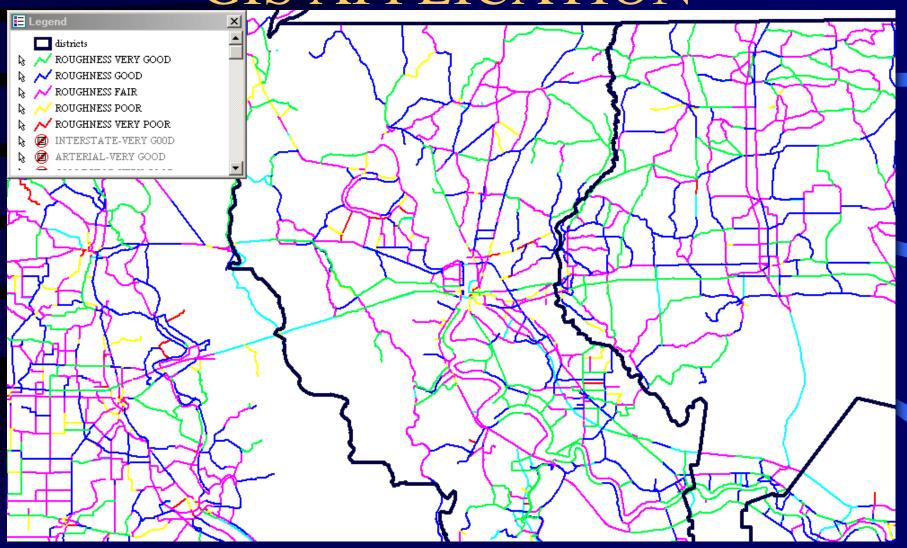


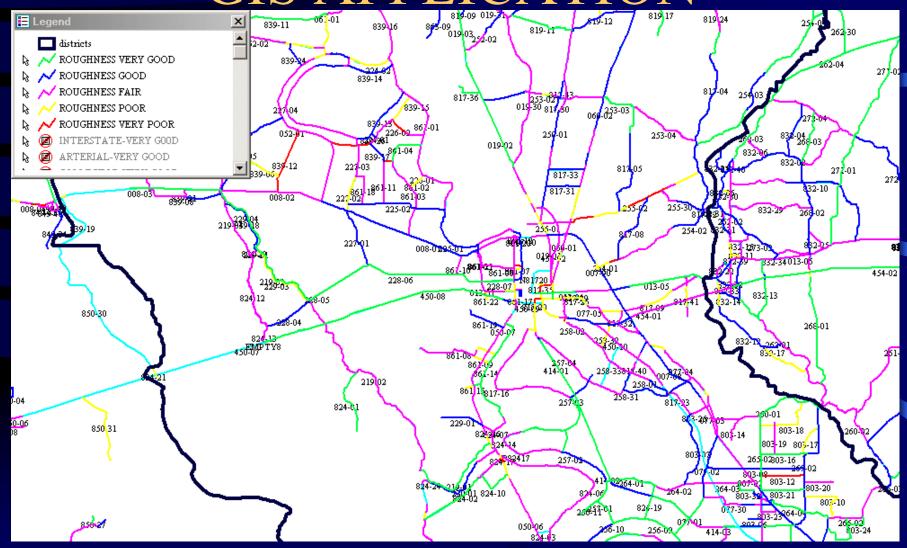


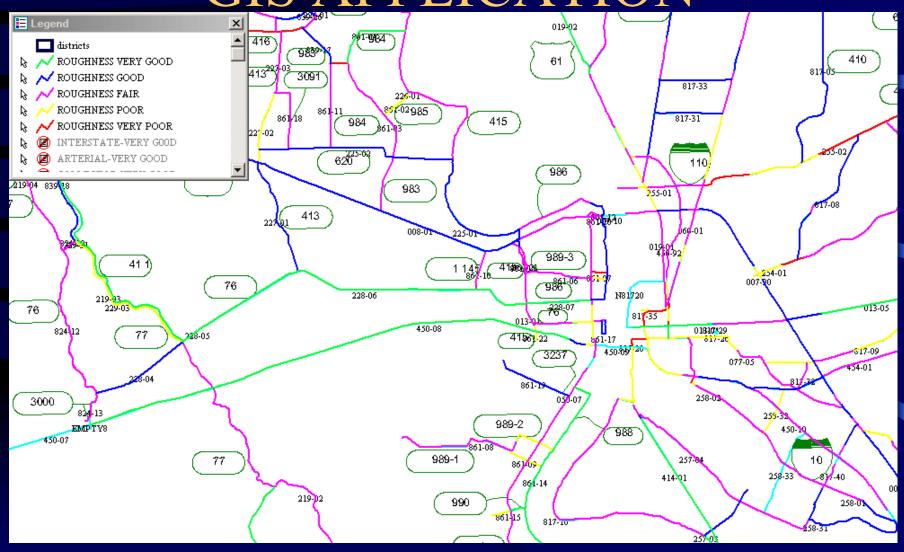


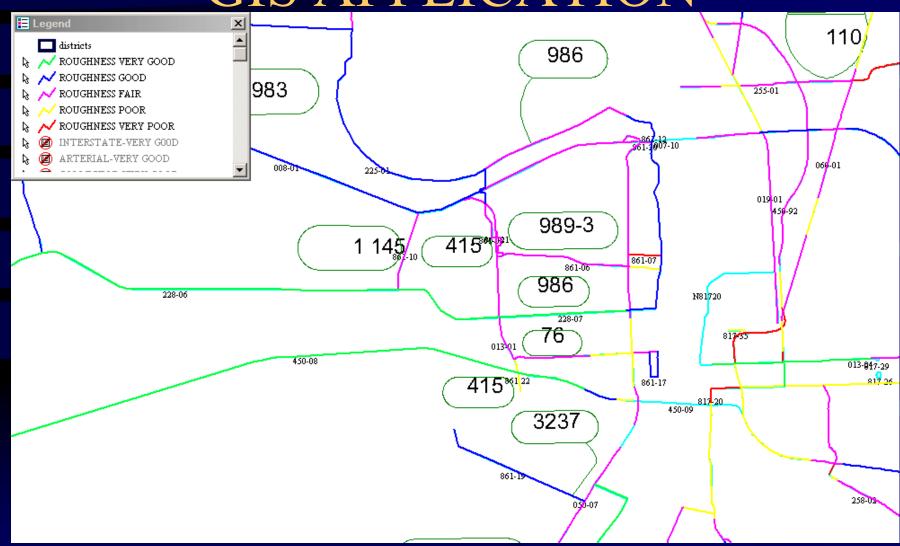


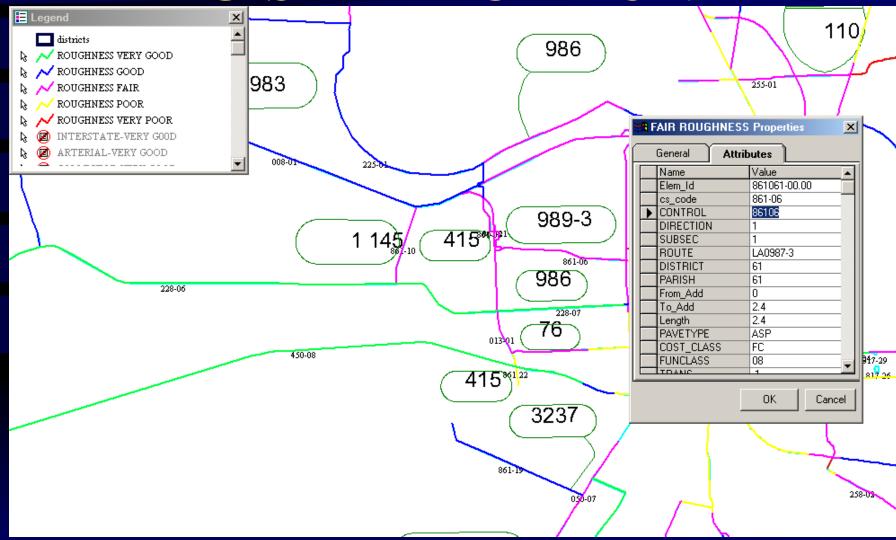




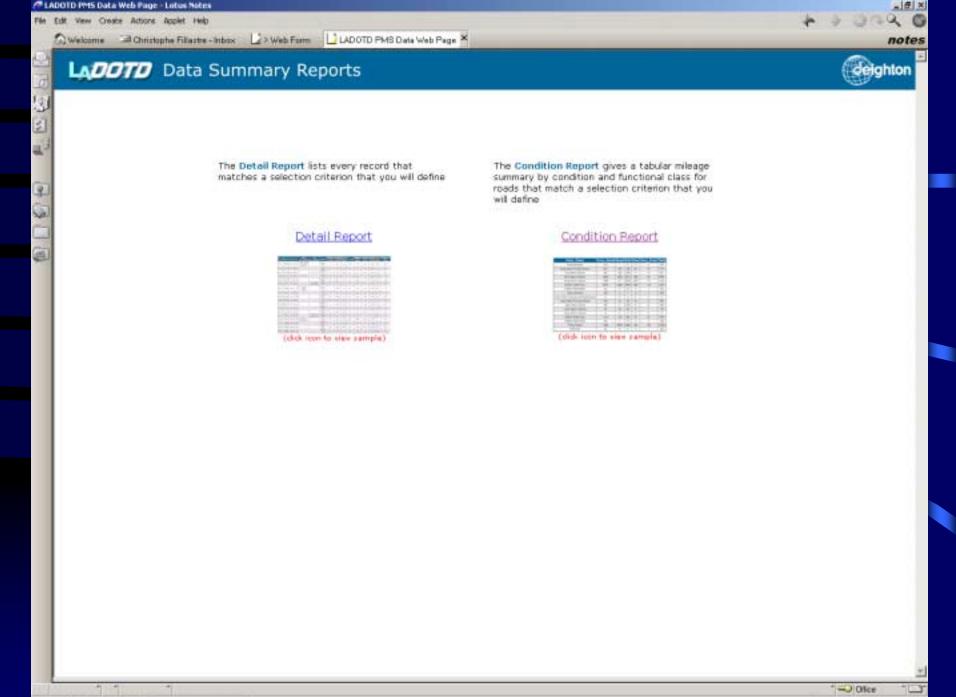


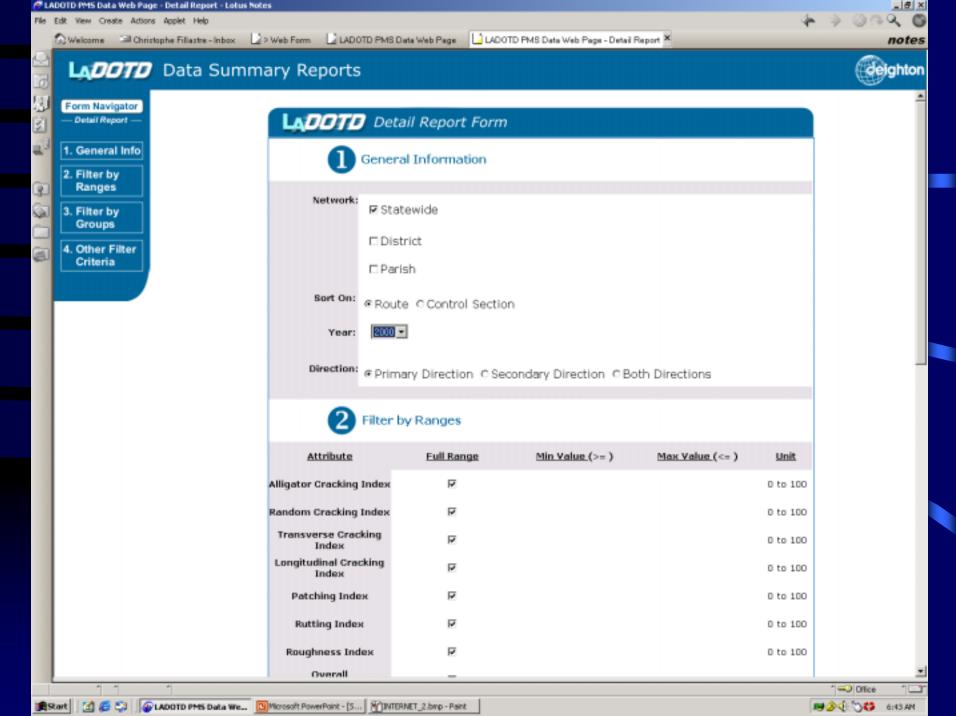


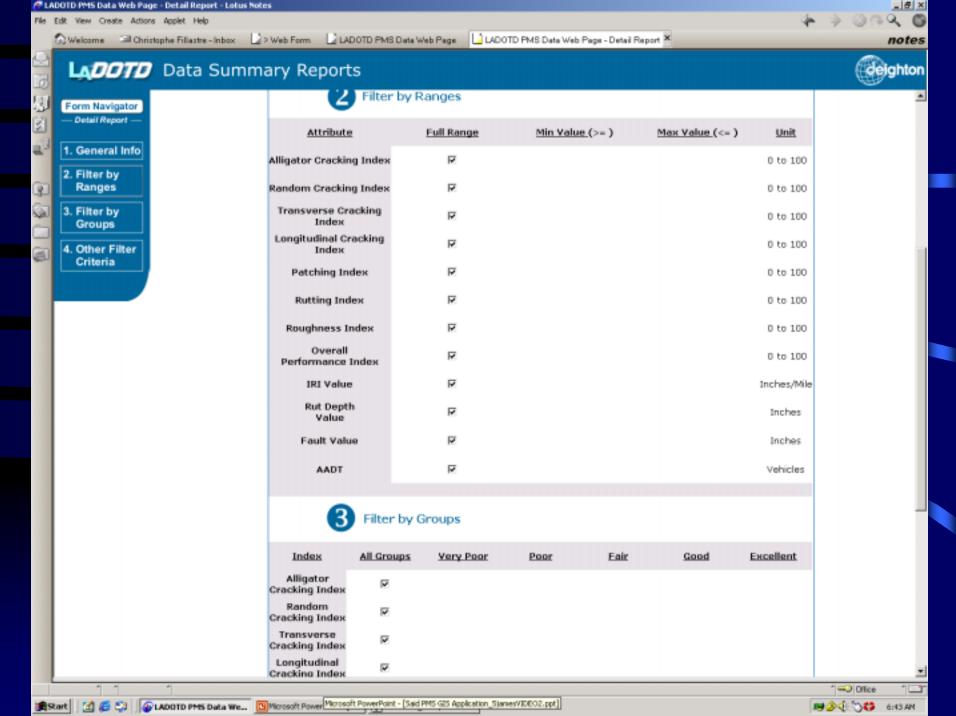


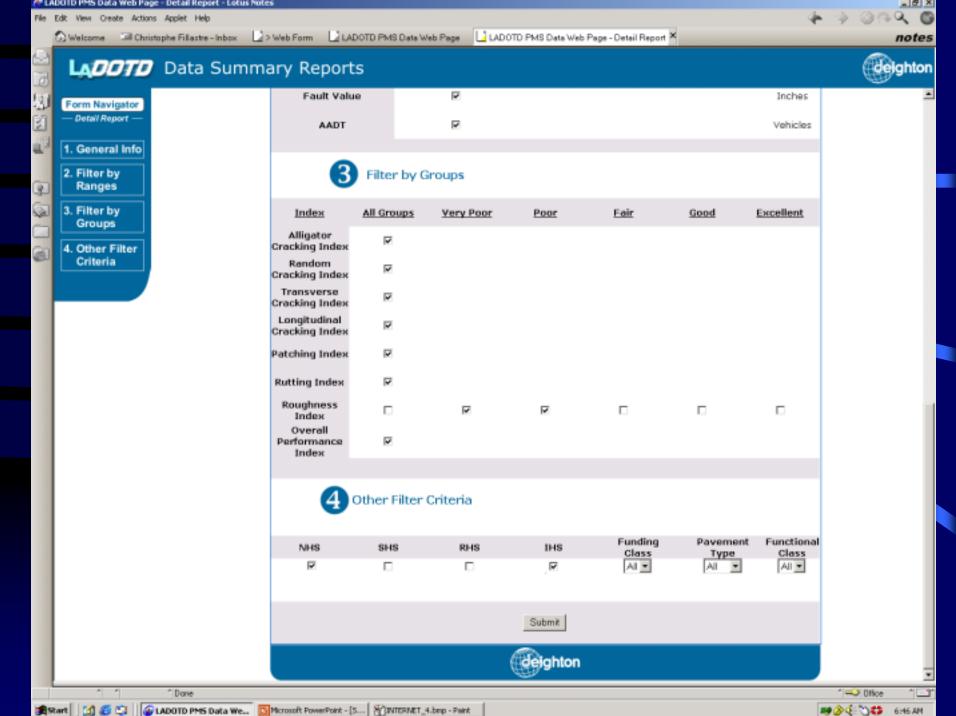


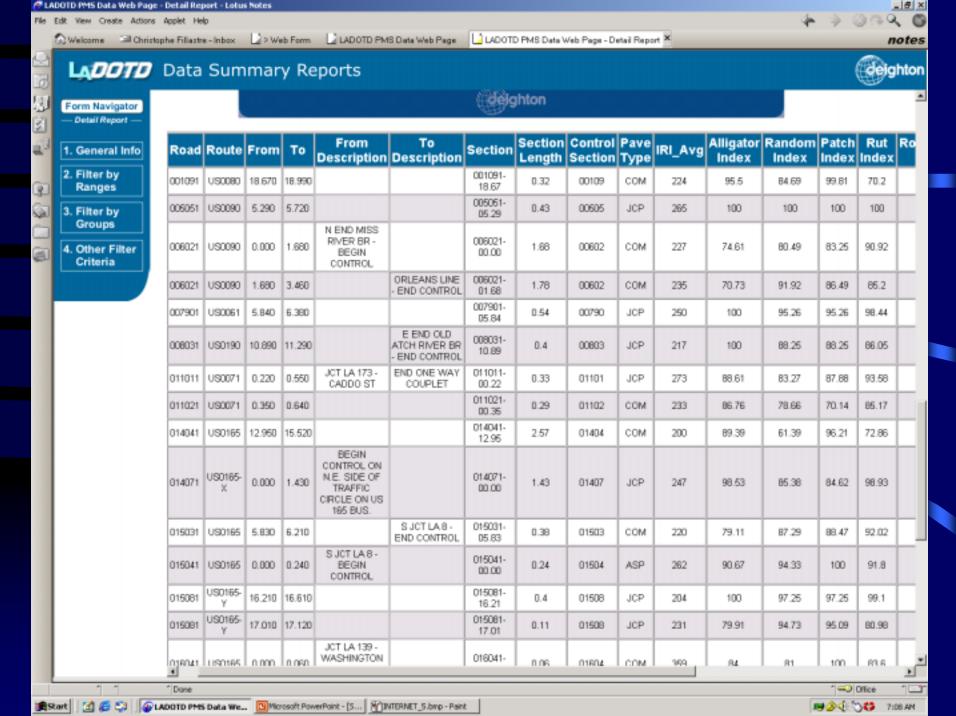
# PMS DATA ON THE INTRANET

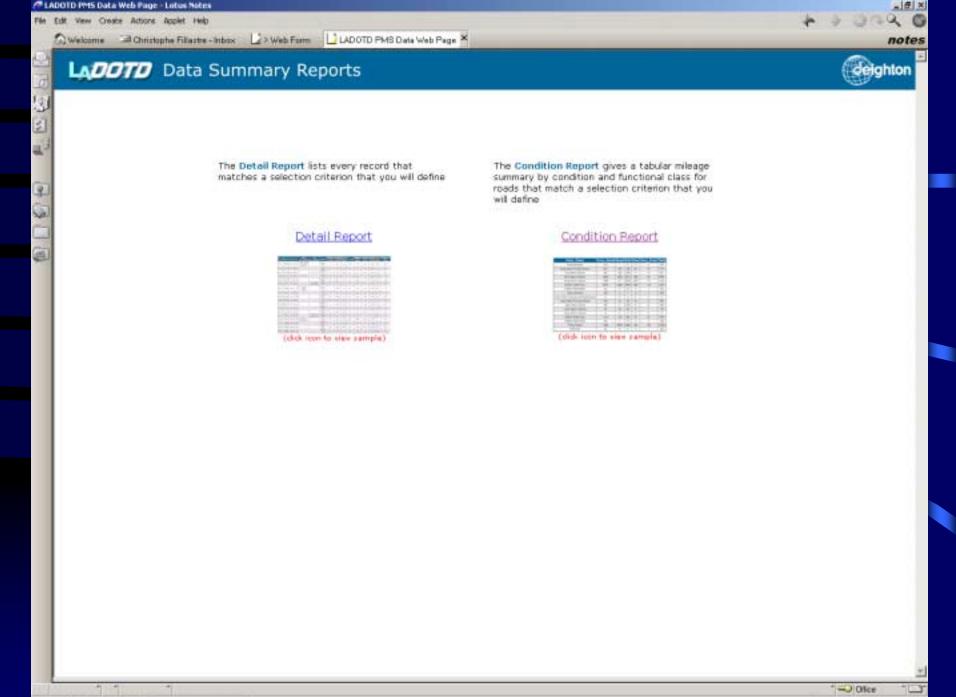


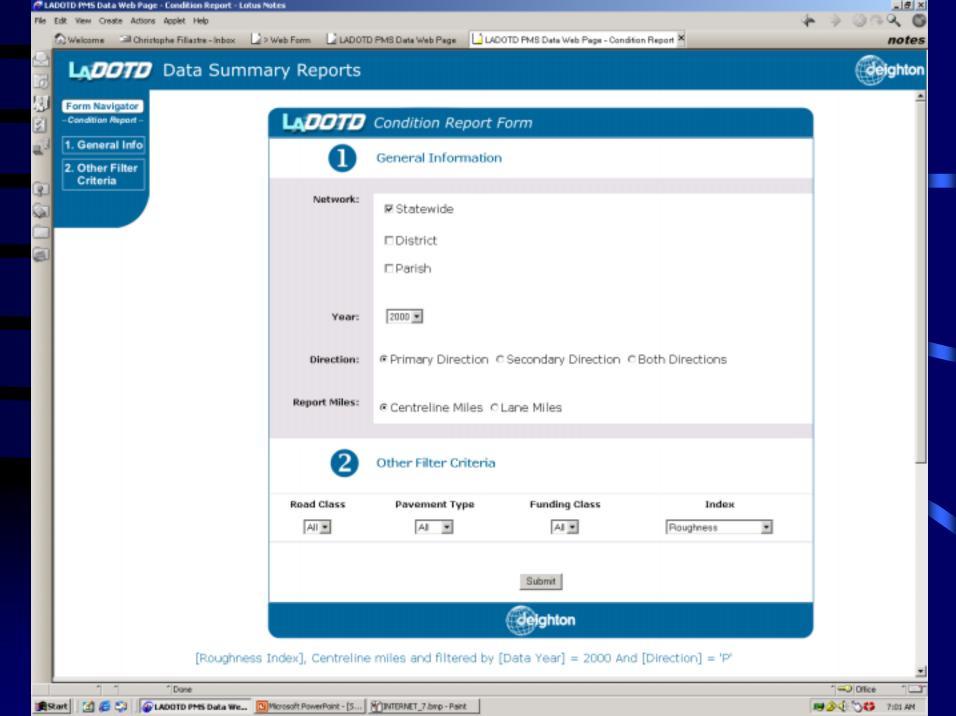


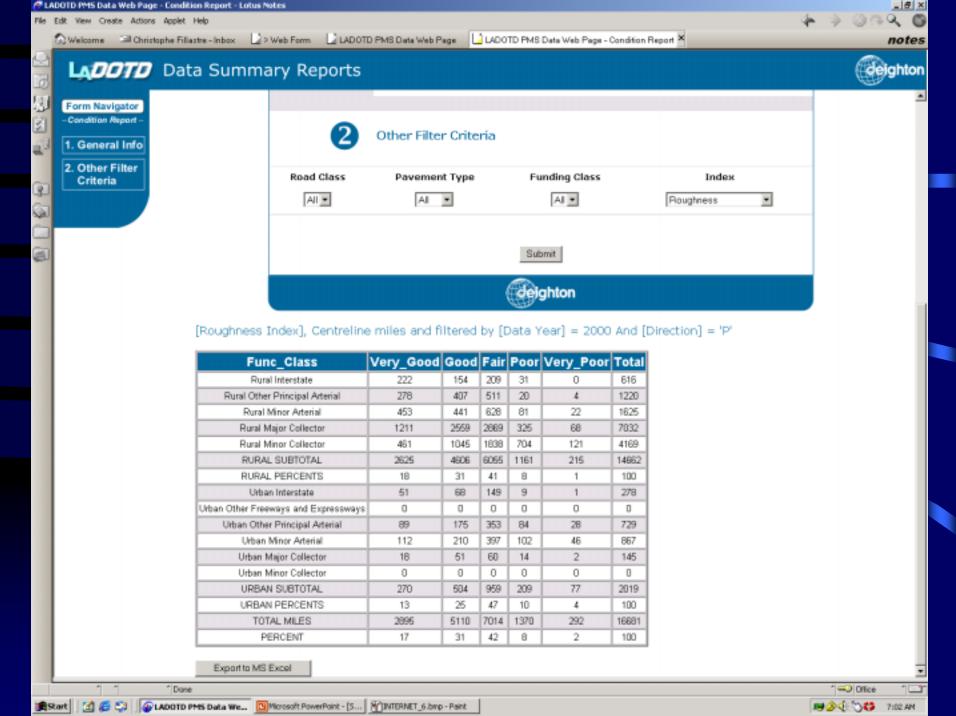












# Next Cycle

• First cycle of data collection has ended and a new cycle of data collection will start on August, 2002 And end by May, 2003.

 Data will be delivered to Districts June, 2003.

# Implemented September\October, 2001

- Digital images made available to Districts(clarity, user friendly, accessibility)
- GIS Maps made available to Districts (user friendly, accessibility)
- A 120 Gigabyte of network storage was installed at each District (user friendly, accessibility, simultaneously, more users)

# Implemented September\October, 2001

- CURRENT
   CONDITIONS/TREATMENTS LIST and
   PRIORITY LIST was delivered to the
   Districts.
- Updated dROAD database was delivered again to the Districts.
- Signalized Intersection Location database with digital Images to Section 45.

# Implemented December 2001

- Asset Management Inventory Items:
- Railroad Grade Crossing database indexed by Control Section Log mile including GPS coordinates.
- Horizontal and Vertical obstruction location database by Control Section Log mile including GPS coordinates.
- "Surveyor Compatible" digital Images, will be delivered to the Districts.

# Implemented December 2001

- Asset Management Inventory Items continued
- Bridge Location Database, with begin and end points by control section log mile and GPS coordinates.
- Interstate Sign Inventory, including all ramps and 1 mile of all intersecting roads.