



City of Dallas

Asset Management Through Pavement Management

December 01, 2011



Definitions

- PCI - Pavement Condition Index
- IRI - International Ride Index
- SSI – Surface Systems and Instruments



Previous Collection Method

- All Visual - Labor Intensive, Subjective
- Complete Inspection Form – Every Street & Alley
- Clerical Staff Input Data – Every Street & Alley
- Does Not Support Budget Forecasting
- Does Not Support Pavement Modeling
- Generate Report Every Street & Alley



Previous Collection Method

INSPECTION DATE:
SAS: TSO, ANSMITH, PMP, DALLAS (NEWFIELD)
INSPECTORS: _____

STREET SERVICES - CITY OF DALLAS
FIELD SHEETS
2006 PAVEMENT MANAGEMENT

DATE: 06DEC05 PAGE: 2
MAINT DIST: 1
2000s CENSUS TRACT: 02701

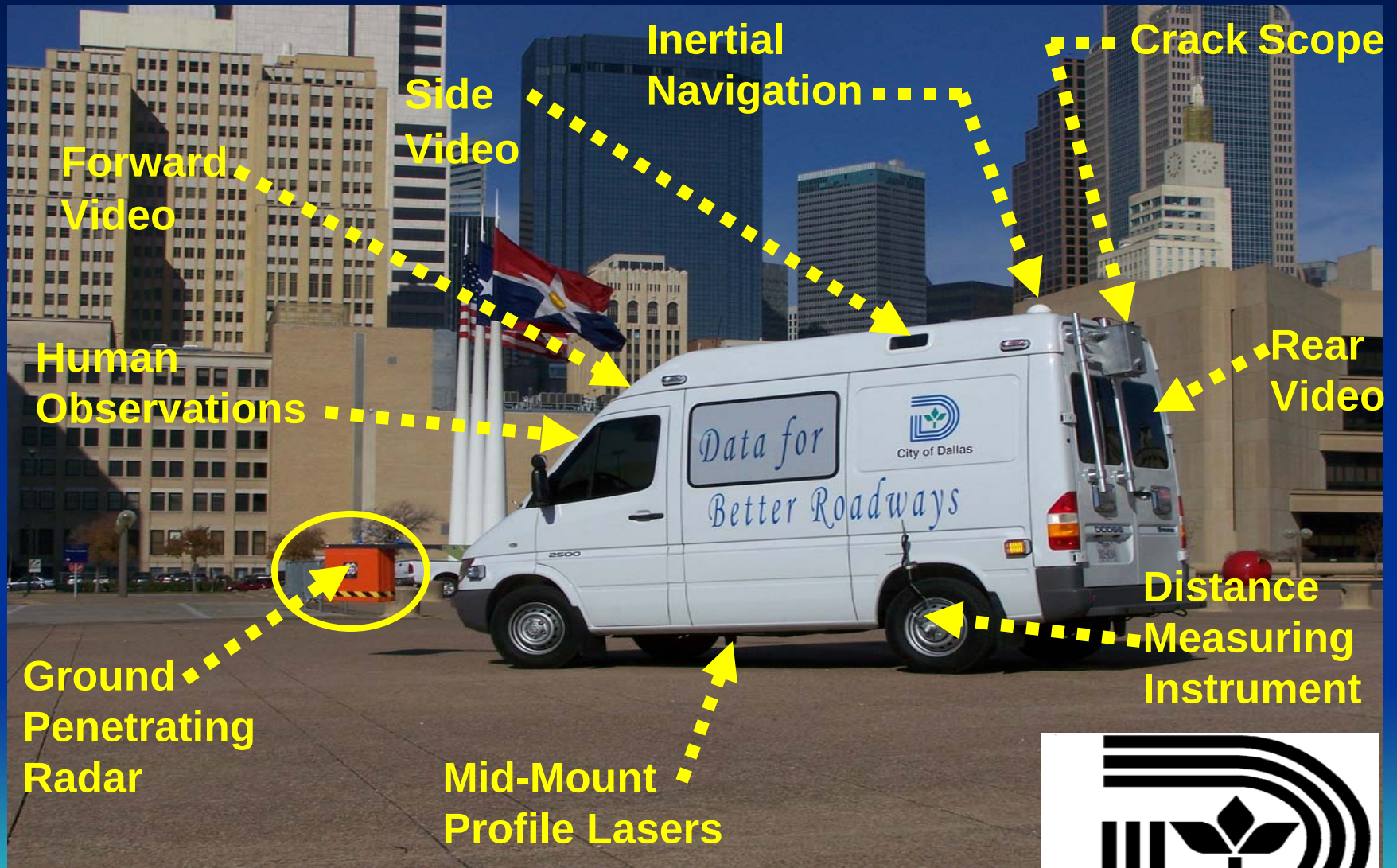
STREET INFORMATION										SURFACE		TOTAL		USE		CURB AND GUTTER		SIDEWALKS							
CODE	BLK	DIR	NAME	TYPE	SUF	F	CND	TYPE	LNS	DIV	LGTH	WD	CLASS	R	MR	EVN	CND	ODD	CND	EVN	WD	CND	ODD	WD	CND
B030	46		BALDWIN	ST		2	U	2	2		0369	26	4		7	0	B	0	B	0	04	A	0	04	A
CONSTRUCTED				TRK	DESIGN	SECONDARY	SURFACE		VALLEY GUTTERS				EVEN		ODD		EVEN		ODD						
YR	BY	EST	TRF	PAVMT	TYPE	LEN		#				#L		#M		#H		%C		%C		%C		%C	
955	1																								
CRACKS				P O T H O L E S			POPOUTS		BASE FAIL		RUTTING		SPL		ALG CRK		RAVEL		RGH		JOINTS		POL		
S1	S2	S3	S4	S1	S2	S3	SEV	EXT	S1	S2	S3	SEV	EXT	LEV	SEV	EXT	SEV	EXT	LEV	SEV	S1	S2	S3	%	
5	3	2		02					1	X								1	3	1	2	1			

Asphalt Repairs

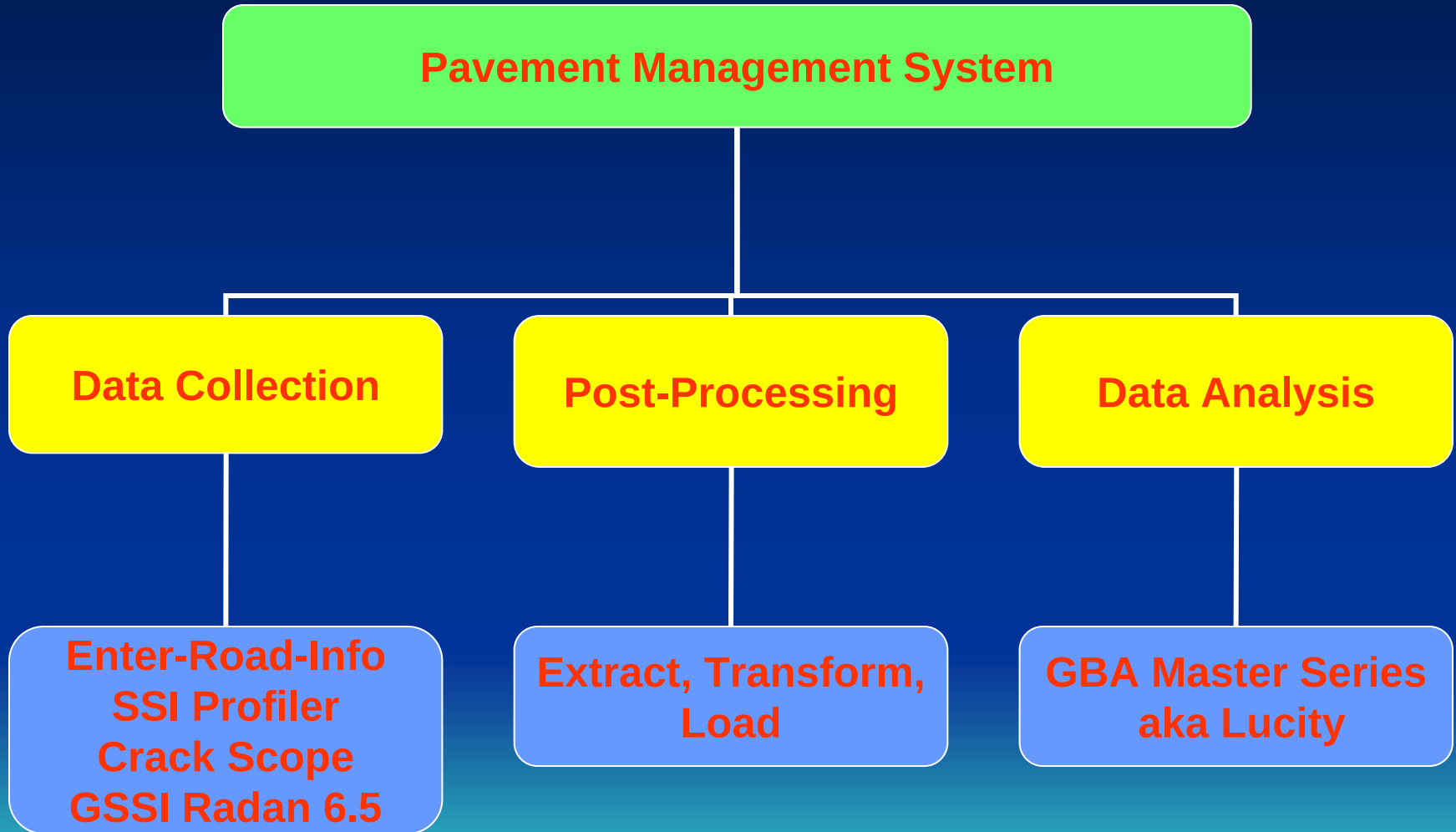
STREET INFORMATION										SURFACE		TOTAL		USE		CURB AND GUTTER		SIDEWALKS							
CODE	BLK	DIR	NAME	TYPE	SUF	F	CND	TYPE	LNS	DIV	LGTH	WD	CLASS	R	MR	EVN	CND	ODD	CND	EVN	WD	CND	ODD	WD	CND
B030	47		BALDWIN	ST		2	U	2	2		0341	26	4		7	0	A	0	A	0	04	B	0	04	A
CONSTRUCTED				TRK	DESIGN	SECONDARY	SURFACE		VALLEY GUTTERS				EVEN		ODD		EVEN		ODD						
YR	BY	EST	TRF	PAVMT	TYPE	LEN		#				#L		#M		#H		%C		%C		%C		%C	
961	1																								
CRACKS				P O T H O L E S			POPOUTS		BASE FAIL		RUTTING		SPL		ALG CRK		RAVEL		RGH		JOINTS		POL		
S1	S2	S3	S4	S1	S2	S3	SEV	EXT	S1	S2	S3	SEV	EXT	LEV	SEV	EXT	SEV	EXT	LEV	SEV	S1	S2	S3	%	
6	3	2					2	1	1	X				2					1		3	1			

Concrete & Asphalt Repairs

Data Collection Van



Data Flow



Data Collection

- Both Electronic Data and Human Input Is Collected
- Based on Numerical Values
- Reproducible Data
- More Extensive Data Collection
- More Accurate Representation of Pavements
- Objective & Repeatable
- Electronically Stored Data



EnterRoadInfo

Microsoft Access - [ImageViewer : Form]

File Edit View Insert Format Records Tools Window Help Adobe PDF

Type a question for help

Tahoma 8 B I U

Session: 2007_1107_1444_53093

Image: 21

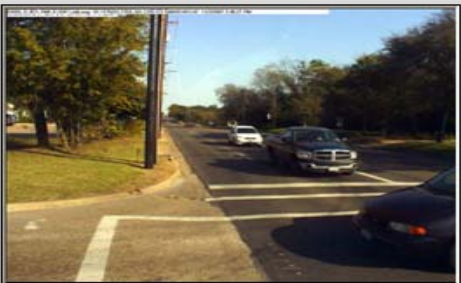
Longitude: -97.12354202520

Latitude: 32.735859609466

Forward



Left



Rear



Right



Frame Navigation

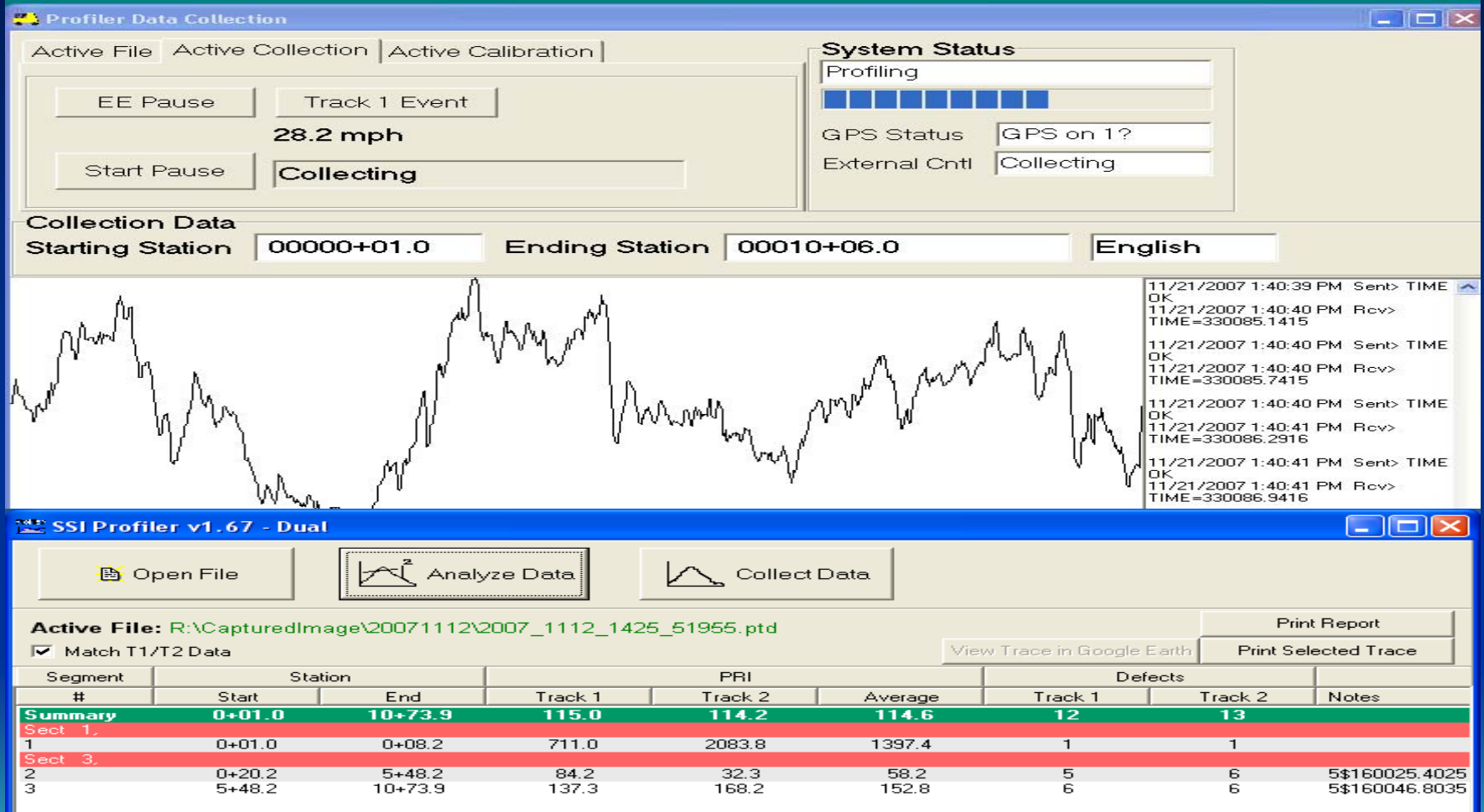
Frame Speed (ms) 500

Record: 21 of 140

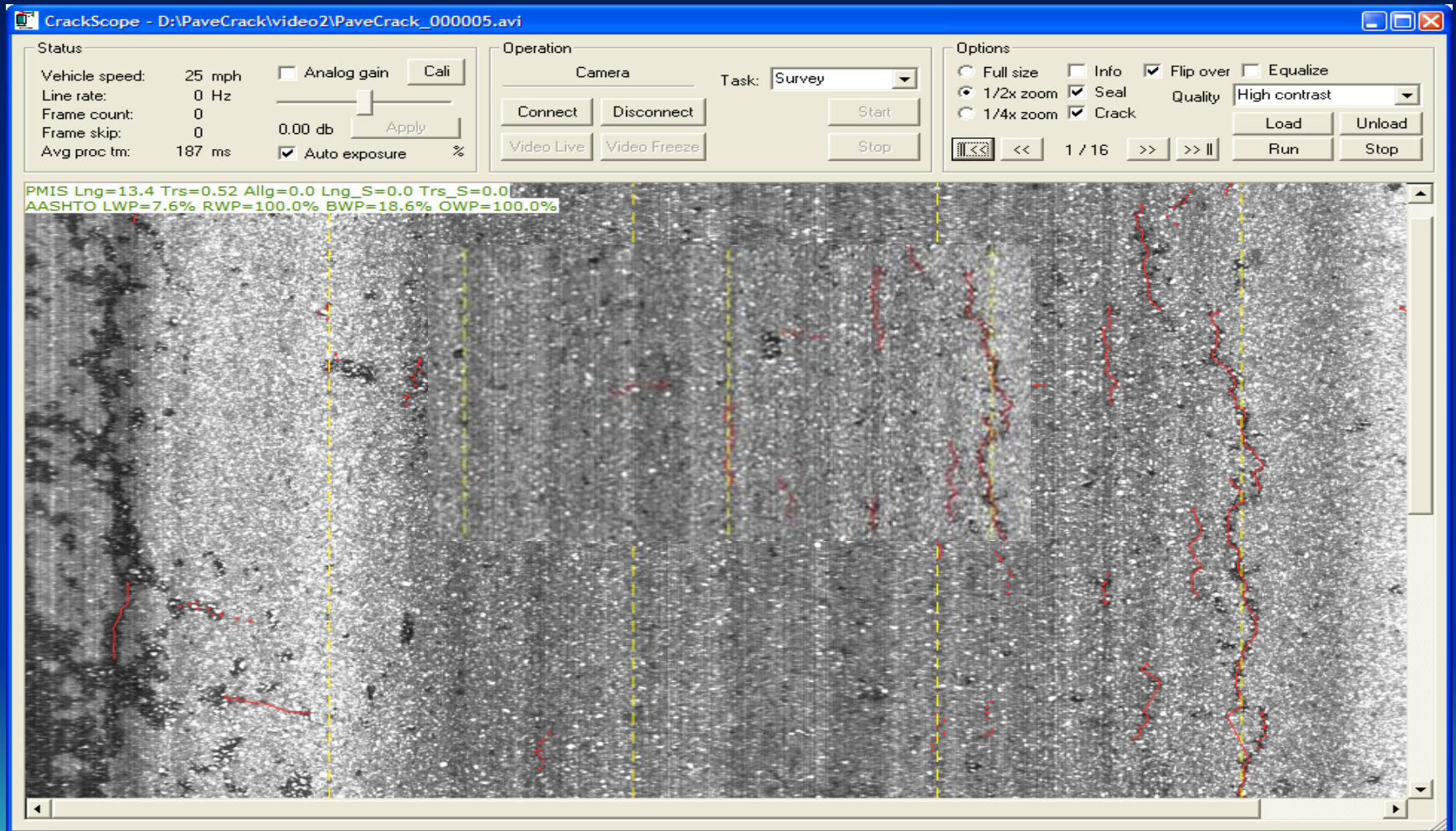
Form View

CAPS NUM

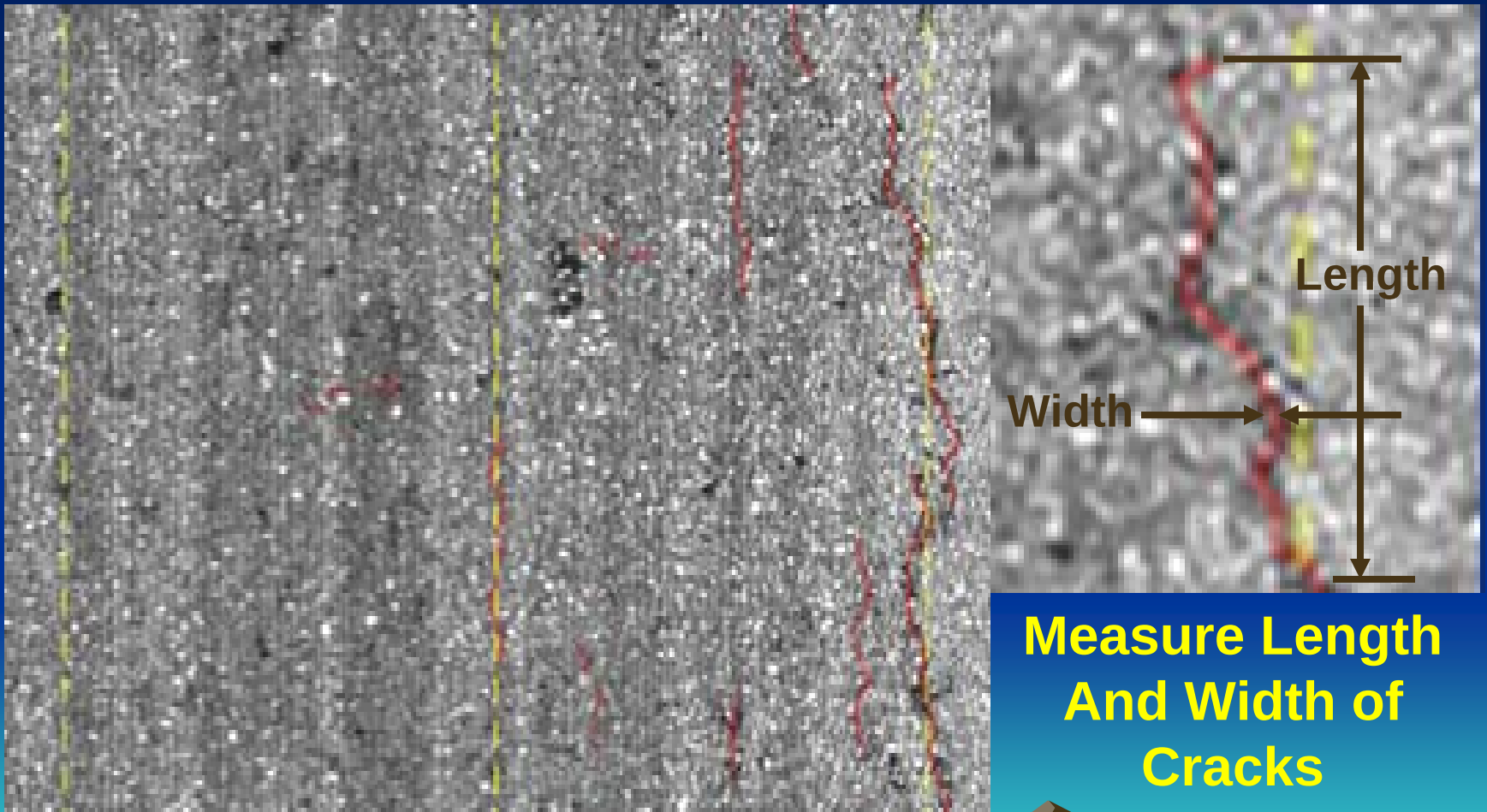
SSI Profiler



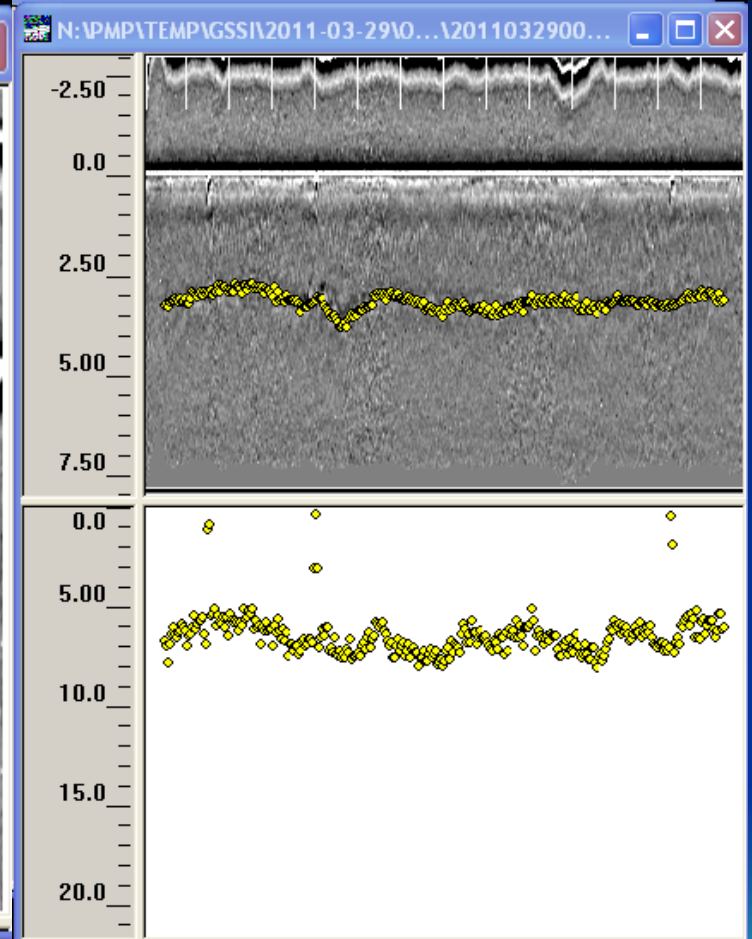
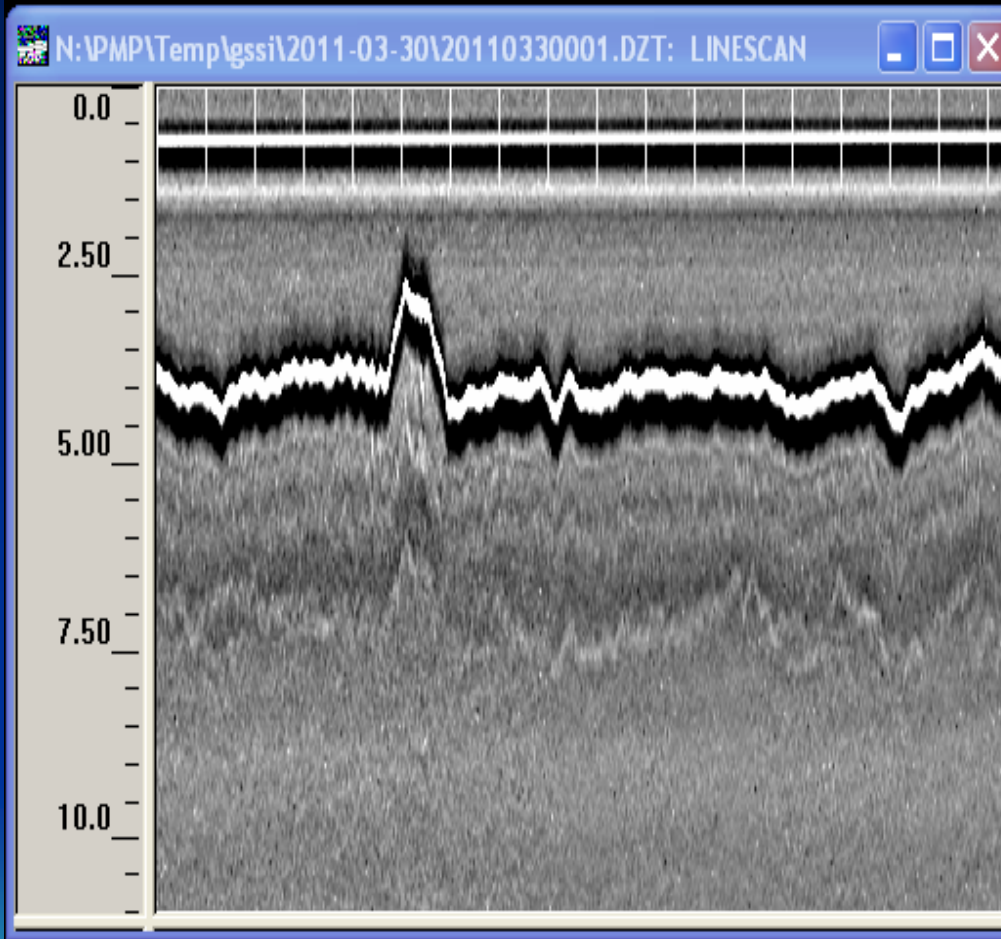
Crack Scope



Crack Scope



Ground Penetrating Radar



Raw Data

Processed Data

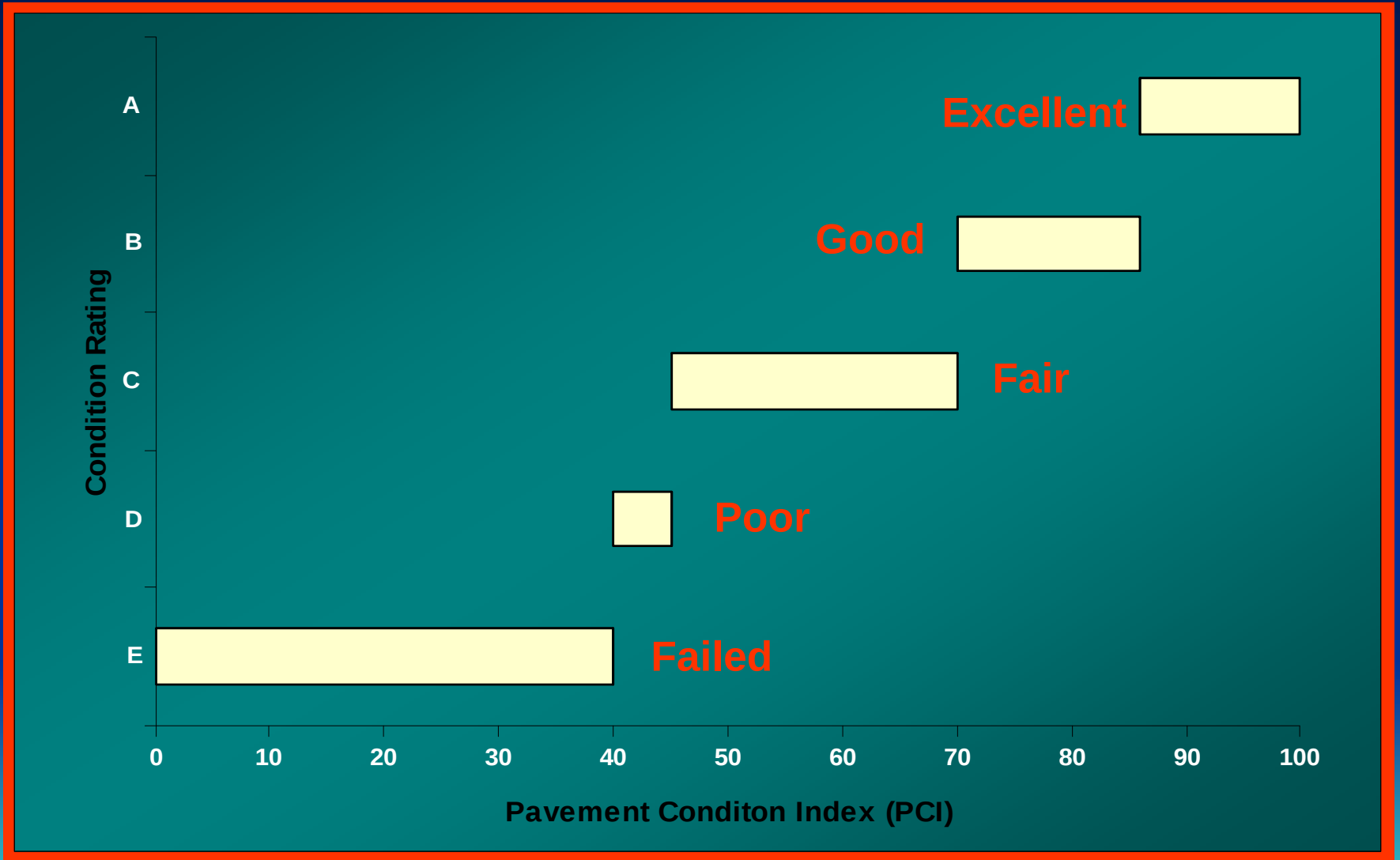
Ground Penetrating Radar

Scan#	Layer 1	z(in)	Vel. Type	v(in/ns)	t(ns)
11	Layer 1	6.7	Automatic	4.157	3.23
12	Layer 1	7.0	Automatic	4.331	3.209
13	Layer 1	7.8	Automatic	4.744	3.295
14	Layer 1	6.8	Automatic	4.311	3.166
15	Layer 1	6.4	Automatic	4.091	3.123
16	Layer 1	6.0	Automatic	3.862	3.123
17	Layer 1	6.3	Automatic	4.098	3.08
18	Layer 1	6.5	Automatic	4.165	3.123
19	Layer 1	6.3	Automatic	3.953	3.166
20	Layer 1	6.2	Automatic	4.055	3.059
21	Layer 1	5.8	Automatic	3.673	3.166

Average 6.5



Grading



ASTM D6433 - 09 Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys

GPS, GIS & Inertial Navigation

LV-POSView

File Settings Logging View Tools Diagnostics Help

STAND BY nav Log

192.

Status		Accuracy
POS Mode	Nav: Full	☒ Attitude
IMU Status	OK	☒ Heading
DMI Status	ZUPD	☒ Position
Nav Status	RTCM DGPS	☒ Velocity
GAMS	Not Ready	
PC Card	Idle	
Disk Usage	0%	

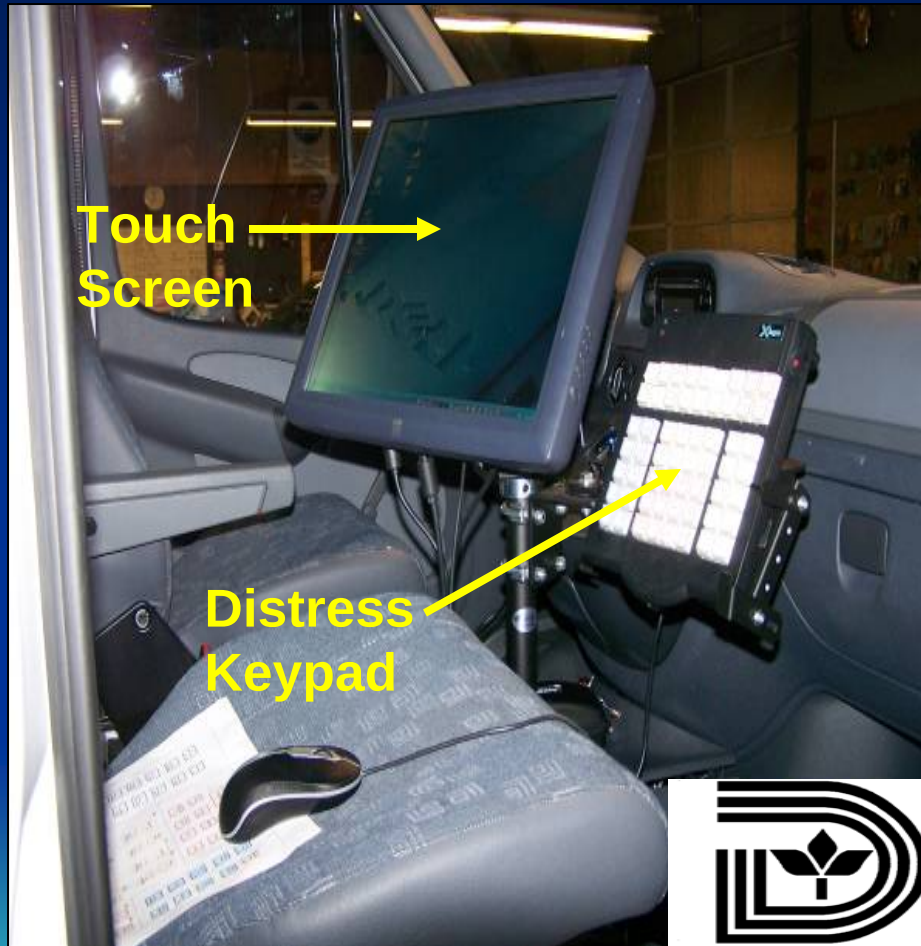
Position		RMS Accuracy (m)
Latitude	32°44'12.4871" N	0.291
Longitude	97°07'13.0499" W	0.407
Altitude (m)	166.843	0.605

Dynamics		
	Angular Rate (deg/s)	Accel. (m/s ²)
Longitudinal	0.000	0.000
Transverse	0.000	0.000
Vertical	0.000	0.000

11/21/2007 16:27:52 GPS 1:18:37 POS 1300.7



Manual Entry & QA/QC



Pavement Record: IVY HILL DR (14791)

Pavement Condition - IVY HILL DR(14791)

Distress: 1-ALLIGATOR CRACKING **Severity:** ☒ Low ☐ Med. ☐ High

Quantity: 10 $\div$ % = 780 SqFt **Calc %**

Add **Update** **Delete** **Report**

PCI: 96 ☐ Auto **Copy Distress from Last Segment**

DistressID	Severity	Quantity	Percentage	Modifie
ALLIGATOR CRACKING	Low	3437.2	10%	DALLA
WEATHERING/RAVELING	Low	3437.2	10%	DALLA

Sug. Repair: DO NOTHING % **\$0**

Override: NO OVERRIDE

Drain Repair: DO NOTHING \$

Priority: 6022 Override: 0 **Total Cost:** \$

Road Segment Info. **M&R Activities** **Condition Projection**

Length (Ft): 300. Width (Ft): 26. Area(SqFt): 7800.

of Lanes: 4 Traffic Vol: 1000 Contr. Date: 1 / 1 /1900

Surface Type: 2 Asphalt Func. Class: Urban Collector

From Street: BRIARGROVE LN From MP: 0

To Street: BELLERIVE DR To MP: 0

Route ID: Division:

Shoulder: Unknown Width: 0 Sidewalk: None

Notes:

Data Analysis

- More Accurate, Objective Representation of Pavement Condition
- Based on ASTM International Standards
- Pavement Modeling Support
- Budget Forecasting Support
- GIS Integration



Data Analysis - SQL

The screenshot displays the Microsoft SQL Server Management Studio Express interface. The left pane shows the Object Explorer with the database structure of 'SQGIS03\pmp (SQL Server 9.0.1399)'. The central query window contains a SQL script that uses the 'gbastret' database and executes two queries. The first query is a grouped select statement, and the second is a simple select statement. The bottom pane shows the results of the first query in a table format.

SQL Query:

```
use gbastret;
go

select SP_USER3TY, sum(sp_area) as Area_SY, sum(sp_area * 9.0) as area_sf, sum(sp_area * 9.0) as LaneMiles, sum(sp_area * 9.0) as Mi
from stsUPER
where sp_clas_cd = 6
group by SP_USER3TY;

select rz_clas_ty, rz_pave_ty, rz_rehb_ty, rz_rehcd from stprehabdf
where rz_clas_cd=6
order by rz_pave_cd, rz_rehb_cd;
```

Results Table:

	SP_USER3TY	Area_SY	area_sf	Inmi	LaneMiles	Mi
2	Microsurfacing	41991.79	377926.11	7.15769147727273	7.1575	6.3
3	Reconstruction/Construct	2026757.89	18240821.01	345.470094886363	345.4698	382.9
4	Restoration/Bomag	160142.14	1441279.26	27.2969556818182	27.2968	24.6
5	NULL	266490.58	2398415.22	45.4245306818182	45.4251	56.2
6	No Treatment	1853207.82	16678870.38	315.887696590909	315.889699999999	351.8
7	Blade and Grade	73321.36	659892.24	12.4979590909091	12.4975	15.5
8	Rehabilitation	32900.21	296101.89	5.60799034090909	5.6081	5.3
9	Partial Reconstruction	2248599.95	20237399.55	383.284082386364	383.2842	421.9

Second Query Results Table:

	rz_clas_ty	rz_pave_ty	rz_rehb_ty	rz_rehcd
1	Alley	Concrete	No Treatment	0

Query executed successfully. SQGIS03\pmp (9.0 RTM) CITY\cosmin.spiridon (63) GBASTret 00:00:00 35 rows