

Multimedia Highway
Information System
(MMHIS)

A picture is worth a thousand words.

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MMHIS Development

- Research problem statement was submitted by Dr. Kelvin Wang – University of Arkansas Civil Engineering Department
- Initial research project was initiated in 1996
- Development and implementation continued under three research projects - TRC-9606, TRC-9904, TRC-0202

MMHIS Development

- Implemented by AHTD at Central Offices in 2002
- Initial deployment to 12 workstations in Roadway Design, Bridge Design, and Planning and Research
- Focus was on utilization of the MMHIS for the Interstate Rehabilitation Project (IRP)

MMHIS Implementation

- Initially used MPEG-2 streaming video
- Utilized Sigma Designs MPEG-2 cards for video overlay
- Required administrative rights to install
- Too expensive for Department-wide implementation

MMHIS Implementation

- Converted to JPEG imagery
 - Easier deployment – did not require administrative rights
 - Standards-based (Intel jpeg library)
 - Allowed widespread implementation

MMHIS Hurdles

- Integration of Departmental databases in a distributed environment
 - Linear referencing issues
 - Differing update cycles
 - Route changes
 - Data disagreements

Route: 530 South

Category	Item	Value
GPS	Latitude	34.617611
	Longitude	-92.269035
Roadway	Roadway Data Date	1/1/06
	District	6
	County	PULASKI
	Log Mile	6.709 mile
	Section	1
	Beginning Log Mile	5.530 mile
	Ending Log Mile	7.840 mile
	Length	2.310 mile
	Number of Lanes	4
	Rural/Urban	Rural - Outsid
	Functional Classifi...	1
	NHS System Class...	Interstate
	Surface Type	bitconc - conc
	Surface Width	48 ft
	Lane Width	12 ft
Median Width	53 ft	
Pavement ...	Right Shoulder Su...	bitconc - conc
	Right Shoulder Wi...	10 ft
	Left Shoulder Sur...	bitconc - conc
	Left Shoulder Width	4 ft
	Job Number	
	Year Built	1999
	Average Daily Tra...	39014
	PMS Data Date	2006C
	IRI - Left Wheel P...	43.72 in/mi
	IRI - Right Wheel ...	87.44 in/mi
Bridge	Rutting -Left Whe...	0.118 inches
	Rutting - Right W...	0.157 inches
	Grade	-0.40
	Fault Count	0
	Average Fault	0.00
	Maximum Fault	0
	Bridge Data Date	5/19/06
	Structure Number	05210
	Facility On Structure	PRATT RD.
	HighestMinimumV...	16'0"
Year Built	1969K	
Main Span Type	302: Steel, St	
Approach Span T...	000: Other, C	
Number of Appro...	0	
Maximum Span Le...	0087	
Structure Length	268	
Curb-to-Curb Width	39	
Out-to-Out Deck ...	42	
DeckCondition	F	



Route: 530 South Frame:2111, File: \\San2\MMHIS Data2\VideoFiles\Contract\2006\16280570000\000010001753\00001055

06 060 00530 010 5 06/02/11 10.556 73.6



Route 30 East

Bridge Selection

Please Select a Bridge From the Following List:

Struct #	Log Mile	Facility On Struct	Year Built
03247	108.43	CO RD 3	1963K
03249	109.98	CO RD 23 (CROSSROA	1963K
B3251	110.78	I30-EB	1963K
A3092	113.66	I-30-SEC 22 EB	1958K
M3031	113.73	I - 30	1958K
A3093	113.96	I-30 E BOUND LANES	1958K
A3094	114.38	I-30 EASTBOUND	1958K
03141	115.79	N 22 ST & SEVIER S	1982K
M3032	116.17	I - 30	1952K
06866	116.66	SH 35 Sec 1	2003K
X0121	117.57	I-30 M.L. & Fr. Rd	1952K
06867	118.28	Congo Road	2003K
06826	119.37	Military Road	2003K
06834	120.62	CR 25 (Alcoa Rd)	2002K
06911	121.36	I-30 Log 121.36	2003K
06778	121.67	SPRINGHILL ROAD	2000K
06910	122.93	SH183	2003K
06711	124.37	RAYMAR RD	1999K

Confirm selection by clicking the "Locate" button or by double-clicking on list

Locate Cancel



Bridge

IRI - Left Wheel P...	76.67 in/mi
IRI - Right Wheel ...	83.64 in/mi
Rutting -Left Whe...	0.236 inches
Rutting - Right W...	0.276 inches
Grade	-4.30
Fault Count	0
Average Fault	0.00
Maximum Fault	0
Bridge Data Date	11/5/07
Structure Number	06867
Facility On Structure	Congo Road
HighestMinimumV...	17'11"
Year Built	2003K
Main Span Type	402: Steel cor
Approach Span T...	000: Other, C
Number of Appro...	0
Maximum Span Le...	96
Structure Length	354
Curb-to-Curb Width	50
Out-to-Out Deck ...	65
DeckCondition	0



Job Status Details

Job ...	Beginning Log Mile	Project Length	Minute Order Number	Minute Order Date	Let Date	Completion ...	Total Cost	Location	Type Work	HIP Type Work	Include
6 755	105.46	20.89	SPA		01/1998	12/1998	\$20,802	Existing...	MISC		N
B60122	115.70	3.85	STAFF	04/2000	02/2002	11/2005	\$33,761,908	Existing...	MAJOR WIDEN	Bond Job	Y
R60092	115.82	8.00	1989-231	05/1989	07/1989	10/1989	\$140,819	Sel. Se...	RESURF		N
R60159	111.38	12.02	1998-148	05/1998	08/1998	09/1999	\$1,438,058	Existing...	RESURF		N

Job Status	Job Status Data ...	4/18/2007
Details...	Job Number	6 755
	Project Length	20.89 mile
	Minute Order Nu...	SPA
	Minute Order Date	
	Let Date	01/1998
	Completion Date	12/1998
	Total Cost	\$20,802
	Location	Existing Locat
	Type Work	MISC
	HIP Type Work	
	Included In HIP 91	
Accident	Year	10/9/07
Details...	Number of Accide...	212
	Number of Fataliti...	1
	Number of Injuri...	286
	Number in Constr...	7
Layers	Layers Data Date	N/A
	Layer 1 Thickness	N/A
	Layer 2 Thickness	N/A
	Layer 3 Thickness	N/A
	Layer 4 Thickness	N/A
	Layer 5 Thickness	N/A
	Layer 6 Thickness	N/A
	Layer 7 Thickness	N/A
	Layer 8 Thickness	N/A
	Layer 9 Thickness	N/A
	Layer 10 Thickness	N/A



Route: 30 East

Category	Item	Value
GPS	Latitude	34.473782
	Longitude	-92.735367
Roadway	Roadway Data Date	3/5/07
	District	6



History Graph

Data Source

IRI Rutting

Fault Ct Avg Fault

Max Fault

Detail Level

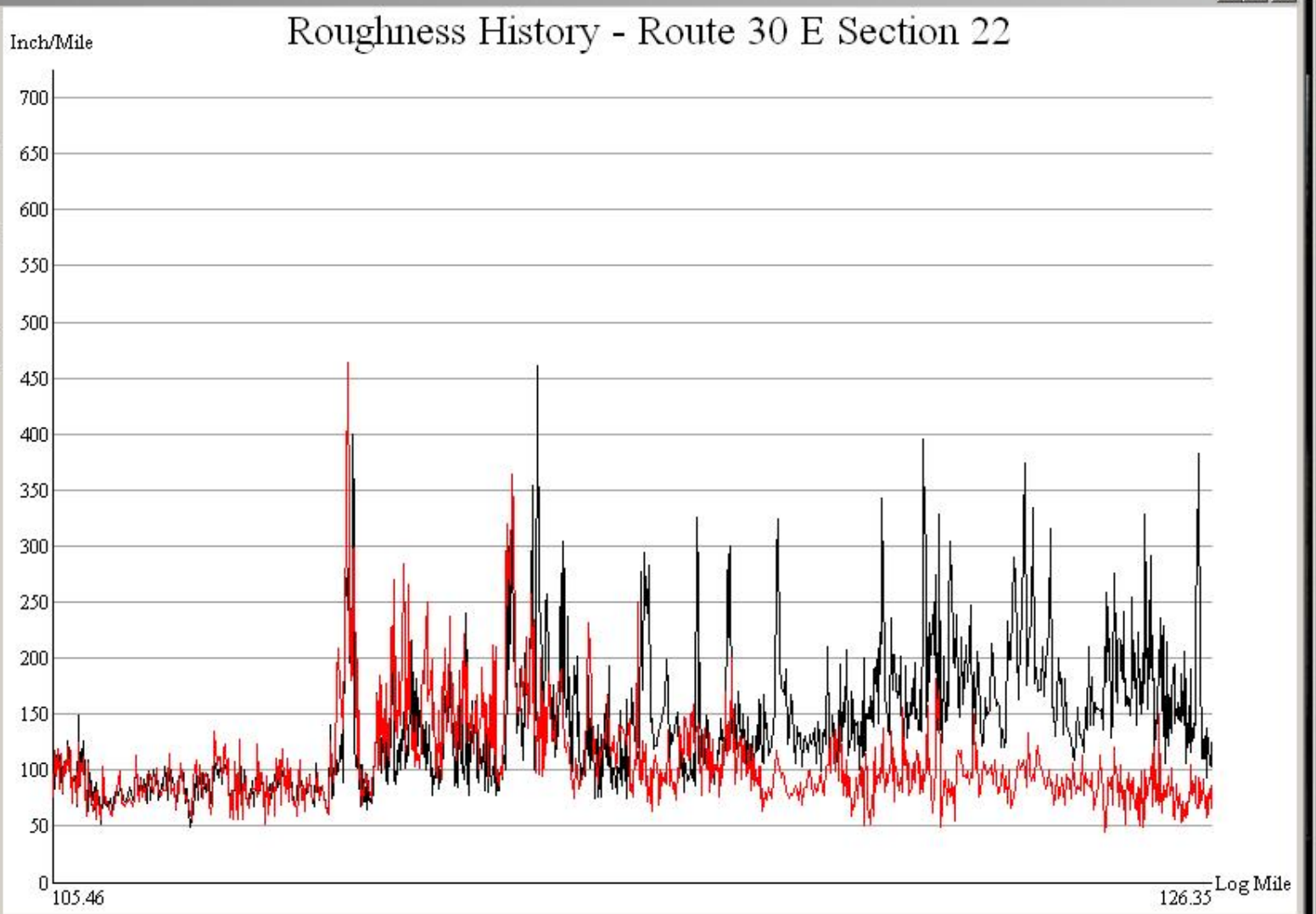
0.016 mile

Zoom Range

From 105.460 169.721

To 126.350 203.341

Zoom Out Zoom In Print... Bridge



Years Average

2001

2002-3

2002-6

2003-1

2003-4

2004-1

2004-8

2005-11

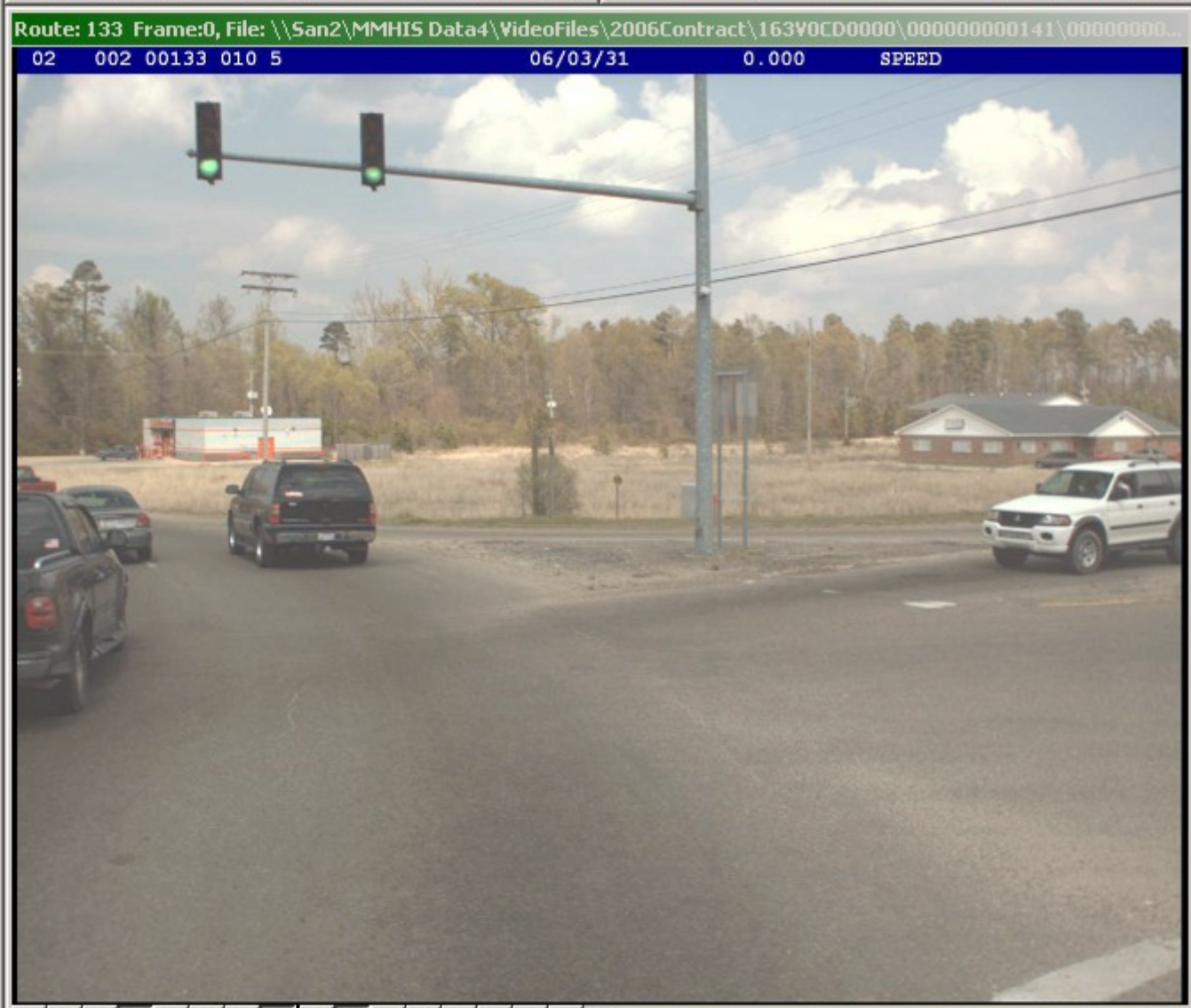
2005-4

2006C

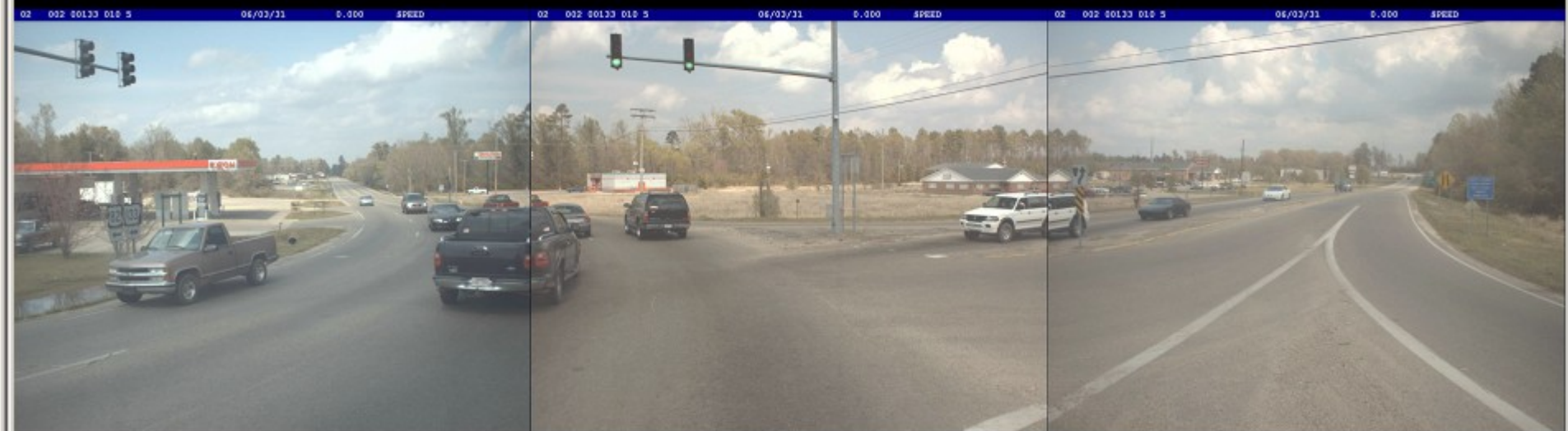
2007-11

Route: 133

Category	Item	Value
Future Info.	Latitude	33.136127
	Longitude	-91.953529
Roadway	Roadway Data Date	1/1/06
	District	2
	County	ASHLEY
	Log Mile	0.000 mile
	Section	1
	Beginning Log Mile	0.000 mile
	Ending Log Mile	0.540 mile
	Length	0.540 mile
	Number of Lanes	4
	Rural/Urban	Urban - Inside
	Functional Classifi...	Minor Arterial
	NHS System Class...	Other Eligible
	Surface Type	Bitconc - mixb
	Surface Width	40 ft
	Lane Width	10 ft
Median Width	0 ft	
Right Shoulder Su...	Bitconc - dirt b	
Right Shoulder Wi...	1 ft	
Left Shoulder Sur...	Bitconc - dirt b	
Left Shoulder Width	1 ft	
Job Number		
Year Built	1998	
Average Daily Tra...	12300	
Pavement ...	PMS Data Date	2006C
	IRI - Left Wheel P...	0.00 in/mi
	IRI - Right Wheel ...	0.00 in/mi
	Rutting -Left Whe...	0.118 inches
	Rutting - Right W...	0.118 inches
Grade	-1.60	
Fault Count	2	
Average Fault	3.40	
Maximum Fault	-3	
Bridge	Bridge Data Date	N/A
	Structure Number	N/A
	Facility On Structure	N/A
	HighestMinimumV...	N/A
	Year Built	N/A
	Main Span Type	N/A
	Approach Span T...	N/A
	Number of Appro...	N/A
	Maximum Span Le...	N/A



Route: 133 Frame:0, File: \\San2\MMHIS Data4\VideoFiles\2006Contract\163V0CD0000\000000000141\000000000141.jpg



Route: 133

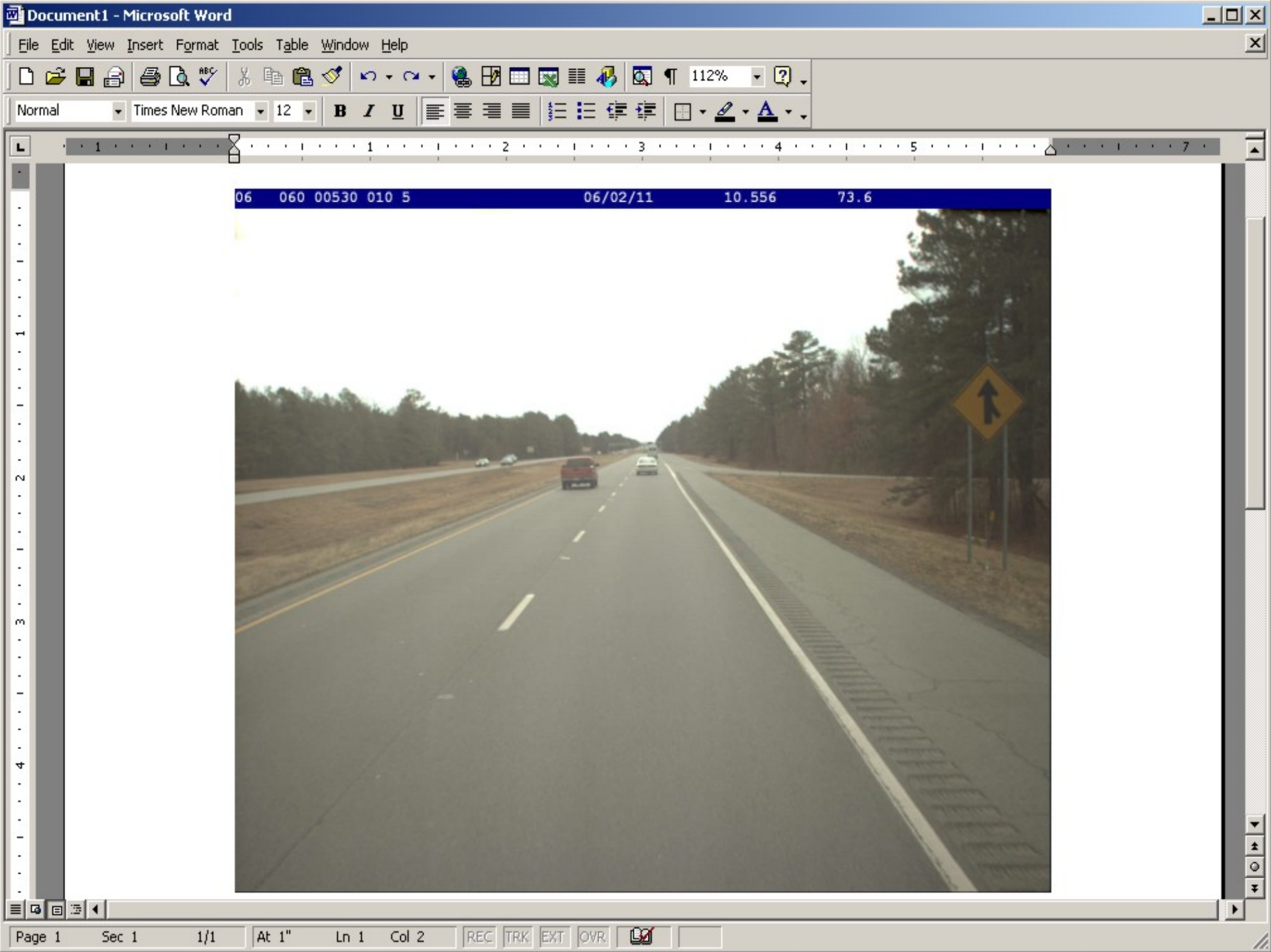
Category	Item	Value
GPS	Latitude	33.184185
	Longitude	-91.940491
Roadway	Roadway Data Date	1/1/06
	District	2
	County	ASHLEY
	Log Mile	3.651 mile
	Section	1
	Beginning Log Mile	3.630 mile
	Ending Log Mile	9.140 mile
	Length	5.510 mile
	Number of Lanes	2
	Rural/Urban	Rural - Outsid
	Functional Classifi...	7
	NHS System Class...	Other Eligible
	Surface Type	Bitconc - dblbi
	Surface Width	24 ft
	Lane Width	12 ft
Median Width	0 ft	
Right Shoulder Su...	Bitconc - dirt b	
Right Shoulder Wi...	6 ft	
Left Shoulder Sur...	Bitconc - dirt b	
Left Shoulder Width	6 ft	
Job Number		
Year Built	1996	
Average Daily Tra...	4387	
Pavement ...	PMS Data Date	2006C
	IRI - Left Wheel P...	167.27 in/mi
	IRI - Right Wheel ...	139.39 in/mi
	Rutting -Left Whe...	0.130 inches
	Rutting - Right W...	0.209 inches
	Grade	-0.10
	Fault Count	0
	Average Fault	0.00
	Maximum Fault	0
Bridge	Bridge Data Date	N/A
	Structure Number	N/A
	Facility On Structure	N/A
	HighestMinimumV...	N/A
	Year Built	N/A
	Main Span Type	N/A
	Approach Span T...	N/A
	Number of Appro...	N/A
	Maximum Span Le...	N/A
	Structure Length	N/A
	Curb-to-Curb Width	N/A
	Out-to-Out Deck ...	N/A
	DeckCondition	N/A



Route: 133 Frame:1178, File: \\San2\MMHIS Data4\VideoFiles\Contract\2006\163Y0CD0070\000005000630\000005890924

02 002 00133 010 5 06/03/31 5.891 75.8





Database Year:

Route Types to be Included:

- 01-INTERSTATE
- 02-U. S. NUMBERED (EXCLUDING INTERS
- 03-STATE HIGHWAY

Type of Records to be Included

- Mileage Description
- Bridge Job
- Railroad Exception
- Frontage Roads Ramps
- Summary

Code and Meaning Display

- Show Code Show Meaning

Data Fields to be Included

- Record Type
- District
- County
- Route
- Section
- Beginning Logmile
- Ending Logmile
- Description
- Route Prefix
- Length
- Population Group
- Rural/Urban Area
- Urban Area
- Place Code
- Functional Class
- National Highway System
- System Status

Move Up

MoveDown

Saved Configurations:

MMHIS Default

Time saver: Save the field list settings to the above box so you can reload it later...

Delete Selected Configuration...

District	County:
<Don't Care>	00-<Don't Care>
01	01-Arkansas
02	02-Ashley
03	03-Baxter
04	04-Benton
05	05-Boone
06	06-Bradley
07	07-Calhoun
08	08-Carroll
09	09-Chicot
10	10-Clark
	11-Clay
	12-Cleburne
	13-Cleveland
	14-Columbia
	15-Conway

Route:
1
STATE HIGHWAY 1
STATE HIGHWAY 4
STATE HIGHWAY 5
STATE HIGHWAY 7
STATE HIGHWAY 8
STATE HIGHWAY 9
STATE HIGHWAY 10
STATE HIGHWAY 11
STATE HIGHWAY 12
STATE HIGHWAY 13
STATE HIGHWAY 14
STATE HIGHWAY 15
STATE HIGHWAY 16
STATE HIGHWAY 17
STATE HIGHWAY 18
STATE HIGHWAY 19

Section:
1
1Y
2
4
4B
5
5S
6
7
8
9
9B
10
11
11B
12

Automatically Resize Column Widths in Query Result

Left Align All Cell Contents

Show SQL Statement Before Executing

Execute Query...

Send to Back

Exit

Record Type	District	County	Route	Section	Beginning Logmile	Ending Logmile	Bridge Number (Bridge)	Length (Bridge)	Stream Name (Bridge)	L
Bridge	06	60	530	1				758.0	FOURCHE UP RR	1
Mileage	06	60	530	1						
Bridge	06	60	530	1				31.0	CREEK	1
Mileage	06	60	530	1						
Description	06	60	530	1						
Mileage	06	60	530	1						
Mileage	06	60	530	1						
Mileage	06	60	530	1						
Description	06	60	530	1						
Description	06	60	530	1						
Mileage	06	60	530	1						
Bridge	06	60	530	1				132.0	OVER SH 338	1
Bridge	06	60	530	1				132.0	OVER SH 338	2
Mileage	06	60	530	1						
Bridge	06	60	530	1				22.0	FISH CREEK	1
Mileage	06	60	530	1						
Mileage	06	60	530	1						
Mileage	06	60	530	1						
Bridge	06	60	530	1						
Bridge	06	60	530	1				0	DREHER ROAD	1
Bridge	06	60	530	1				217.0	OVER US 65	1
Mileage	06	60	530	1						
Mileage	06	60	530	1						
Bridge	06	60	530	1				24.0	CANE CREEK	2
Description	06	60	530	1						
Bridge	06	60	530	1				0	UNDER PRATT RD	1
Bridge	06	60	530	1				268.0	PRATT ROAD	1

Load Additional Data

Multimedia-based Highway Information System Data Available:

Route & Direction	Section	Time
530 North	1	2005-4
530 North	1	2005-11
530 North	1	2004-8
530 North	1	2004-1
530 North	1	2003-4
530 North	1	2002-3
530 North	1	2001
530 South	1	2005-4
530 South	1	2005-11
530 South	1	2004-8
530 South	1	2004-1

Click the above button(s) to continue.

Initial MMHIS Usage

- Began logging queries in November, 2002
- January 2003 – March 2003
- 628 queries
- Limited distribution of MMHIS
- Primarily Design, Planning and Research, and a few District Offices

Current MMHIS Usage

- February 2008 – April 2008
- 4,084 queries
- Total from all Divisions and District Offices currently using MMHIS
- Not used in Human Resources, Fiscal Services, Surveys, or Environmental

Benefits - Assumptions

- 25% of queries represent field trips
- Average length of trip is 100 miles roundtrip
- Estimated average salary - \$45,000
- Average rental rate – Cars/Light Trucks - \$0.25 per mile

Benefits to the AHTD

- Daily “Savings” – 15 field trips
 - Vehicle cost savings - \$375
 - Hours of travel/field work saved - 60
 - Salary - \$2100
- Yearly “Savings”
 - Vehicle cost savings - \$97,500
 - Hours of travel/field work saved – 15,600
 - Salary - \$546,000

Where do we go from
here?

Surveyor™

- Allows the collection of GPS location on all types of Roadway assets.
- Anticipate use by various Divisions
- Others will build upon the foundation created by the Pavement Management Section
- Will be utilized by Pavement Management to automate the authoring of the MMHIS

Surveyor™

Pavement Management

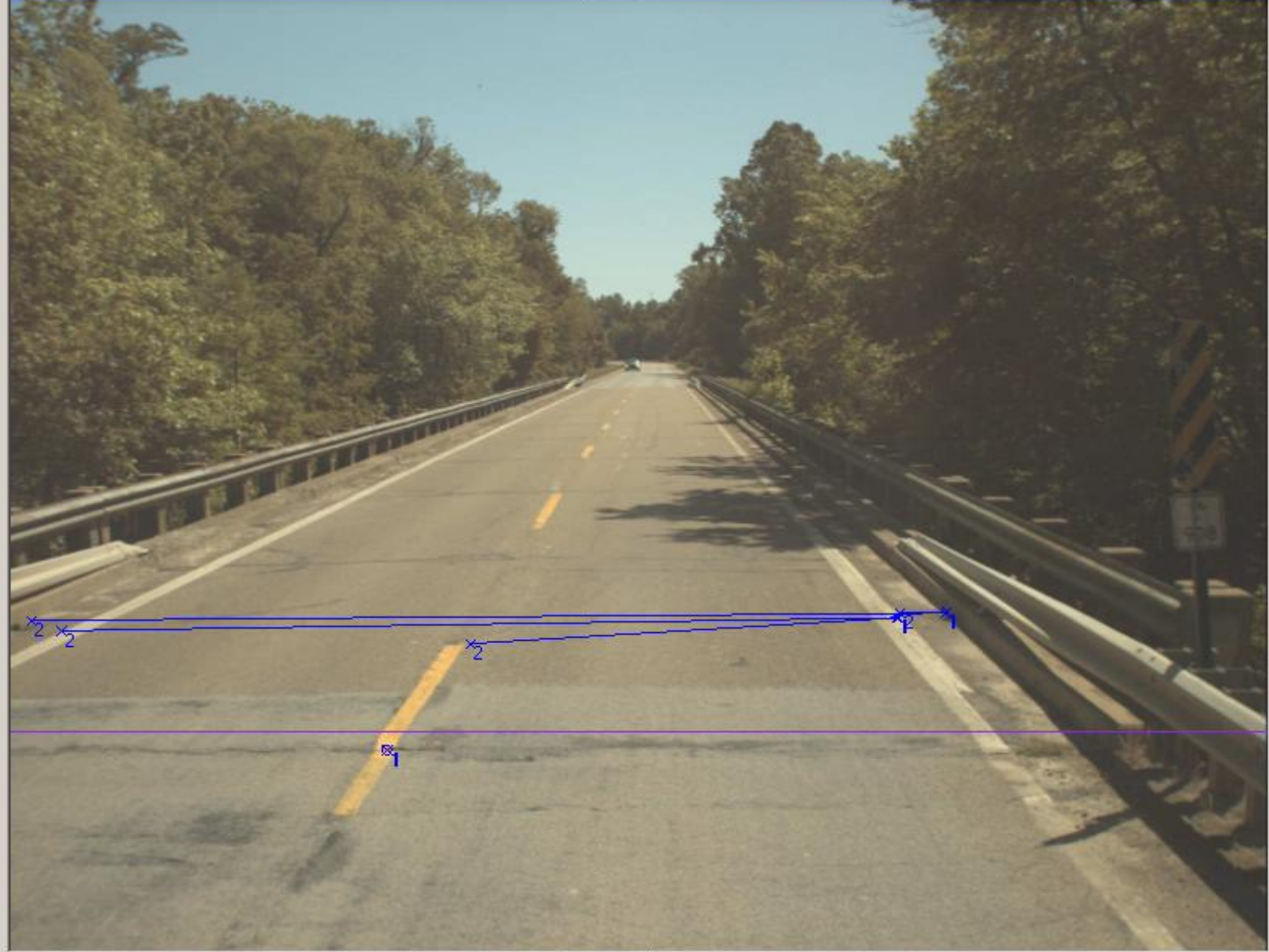
- Roadway Asset Inventory
 - Pavement Management - GPS Location of Assets
 - Begin and End of Sections
 - Begin and End of Bridges/Overpasses
 - Begin and End of Exceptions
 - Underpasses
 - Railroads

Surveyor™

Other Divisions

- Roadway Asset Inventory
 - Other Divisions
 - Bridge Rails and Guardrails
 - Crash Attenuators
 - Side Drains
 - Driveways
 - Intersections
 - Signs
 - Billboards

01 048 00001 060 5 06/05/12 14.700 79.9



Questions / Comments?