

Omar Smadi
June 11th, 2013

MAP-21 and Data (AM and Highways)

TRB Midyear Meeting

ctre

Center for Transportation
Research and Education

IOWA STATE
UNIVERSITY



MAP-21

Moving Ahead for Progress in the 21st Century

1,676 Pages

- **Safety: 971 times**
- **Performance: 369**
- **Data: 361 times**
- **Condition: 171 times**
- **Performance Measures: 41 times**
- **Asset Management: 40 times**

DATA Issues

- DATA
- DATA
- DATA

Garbage **IN** Garbage **OUT**



Asset Data

Q3. Does your agency have an asset inventory?	Responses	Percent
Yes	43	100%
No	0	0%

Asset	Inventory		
	Yes	Partial	No
Pavements	43	0	0
Bridges	43	0	0
Signs	33	6	4
Guardrail	27	8	8
Culverts	26	5	12
Other	23		20
Lighting	21	9	13
Pavement Markings	14	12	17
Retaining Walls	11	10	22

*Responses from 43 agencies



DATA

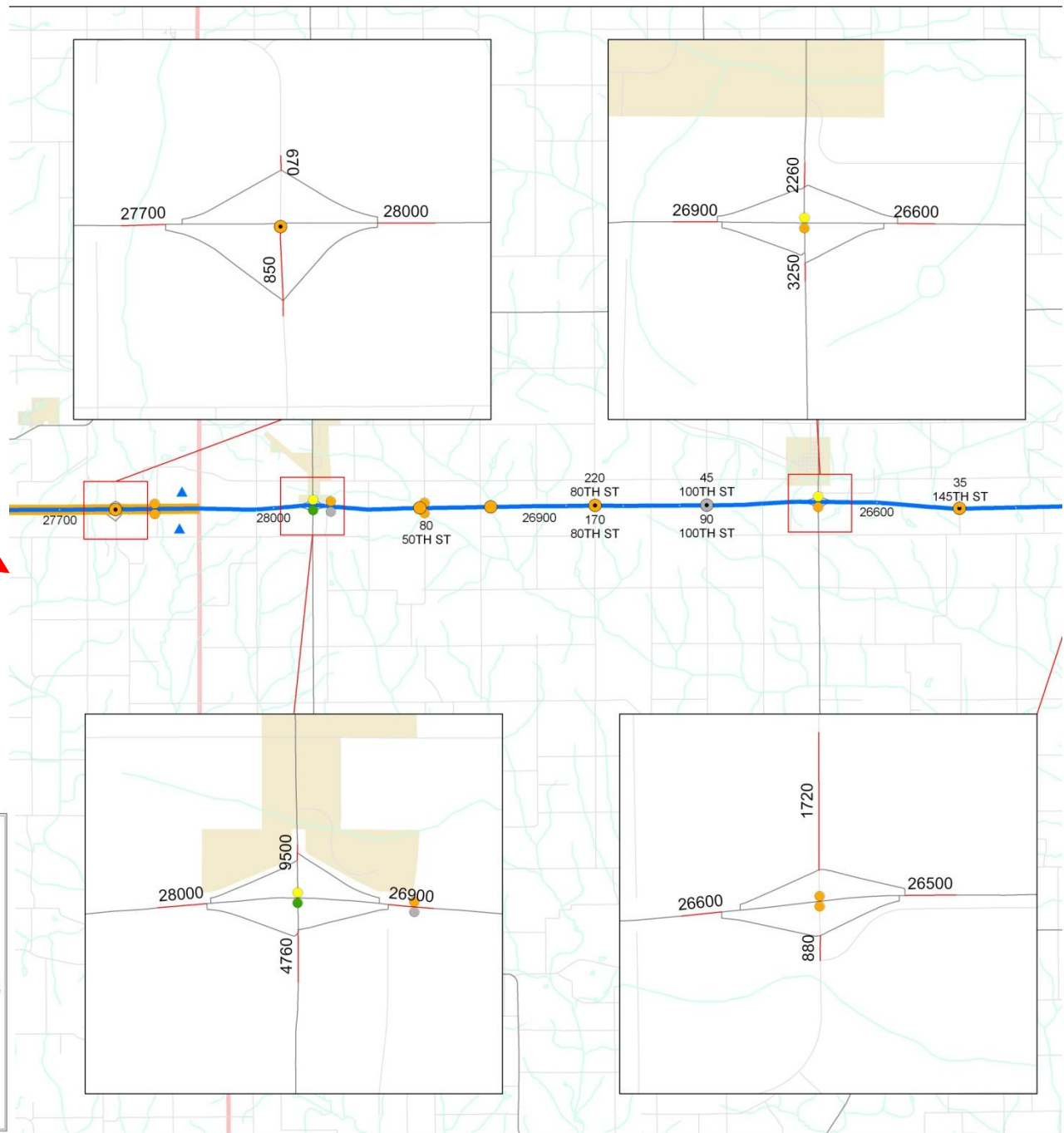
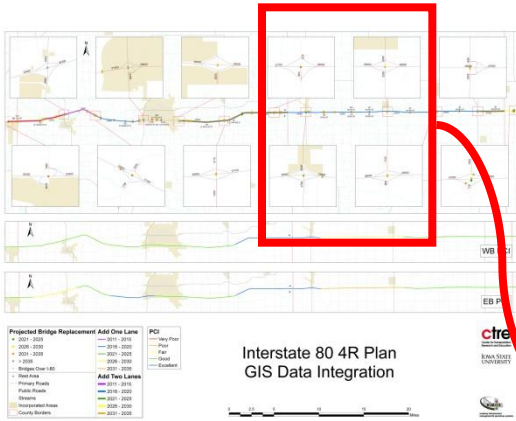
PMS Section ID	Length	Treatment	Treatment Yr	Treatment Cost	MOD_YEAR
03511059 88061 0091	1.243	REPL	2012	\$1.859	2015
03511101 72102 5685	0.802	REPL	2012	\$1.199	2015
03511105 79111 7585	5.959	REPL	2013	\$9.312	2015
03511111 75112 7285	0.969	REPL	2023	\$2.352	2025
03511126 04130 6040	4.592	REPL	2009	\$6.017	2010
03511194 88197 1817	2.293	4F3B	2015	\$1.252	2015
02911043 63046 8378	3.219	REPL	2011	\$4.606	2015
02911037 23037 7265	0.621	REPL	2010	\$0.850	2010
03511112 72117 1585	4.418	REPL	2012	\$6.607	2015
03511134 01140 1940	6.183	REPL	2013	\$9.662	2015
08011156 28160 3550	4.051	REPL	2034	\$6.615	2035
38011030 29037 1957	6.959	REPL	2015	\$11.876	2015
03511045 56054 4791	8.898	REPL	2013	\$13.905	2015
38011004 68011 8252	7.140	4M3B	2008	\$3.656	2010
08011253 58257 6616	4.051	REPL	2023	\$9.831	2025
08011209 65215 1248	5.462	4S3A	2017	\$3.257	2020
08011039 29045 1478	5.841	REPL	2027	\$16.904	2030
08011099 21100 8025	1.597	REPL	2012	\$2.388	2015
08011106 71110 9525	4.350	REPL	2032	\$6.505	2035
03511056 77058 0491	1.243	REPL	2009	\$1.629	2010
03511121 48126 0485	4.350	REPL	2012	\$6.505	2015
38011011 82014 8557	3.007	4M3B	2009	\$1.609	2010
38011065 88070 9207	4.971	REPL	2018	\$9.681	2020
03511102 56105 7985	3.219	4M3A	2016	\$2.344	2020
03511197 18201 7817	4.611	REPL	2018	\$8.980	2020
03511201 78202 6998	0.932	REPL	2015	\$1.590	2015
03511212 95216 6398	3.697	REPL	2020	\$7.862	2020
03511216 63218 6398	1.957	6S3B	2016	\$1.821	2020
02911041 85043 6365	1.752	6M3B	2010	\$1.380	2010
08011246 67247 9052	1.243	REPL	2011	\$1.779	2015
08011142 15149 8977	7.668	REPL	2018	\$14.933	2020
08011039 29045 1478	5.841	REPL	2027	\$16.904	2030
03511033 04034 0020	0.957	REPL	2010	\$1.311	2010
03511092 65101 7277	9.128	4F3A	2008	\$3.663	2010
03511192 79194 8817	2.088	REPL	2011	\$2.988	2015
03511204 69212 9598	8.270	6S3B	2016	\$7.694	2020
02911072 45076 5443	4.058	REPL	2034	\$6.627	2035
38011064 43065 8807				\$2.996	2025
08011119 46122 4125				\$4.117	2015
08011289 06290 9282				\$5.450	2030
38011000 00004 6852				\$2.393	2010



brkey	Object	Action	Year	Cost	Benefit
000000000017820	0-Bridge	11-Replace	2012	\$586,713	\$1,157,059
000000000017850	0-Bridge	11-Replace	2012	\$280,766	\$620,785
000000000027530	0-Bridge	11-Replace	2012	\$276,989	\$556,180
000000000017400	107-Paint Stl Open Girder	33-Rehab Element	2015	\$51,378	\$2,028,263
000000000017720	0-Bridge	11-Replace	2010	\$1,247,709	\$3,711,081
000000000017800	0-Bridge	11-Replace	2010	\$824,671	\$2,418,938
0000000000050930	0-Bridge	21-Widen	2014	\$64,173	\$5,839
000000000046260	0-Bridge	11-Replace	2016	\$245,513	\$591,273
000000000046805	107-Paint Stl Open Girder	33-Rehab Element	2015	\$94,239	\$3,384,288
000000000046805	331-Conc Bridge Railing	41-Min Repair	2010	\$3,340	\$8,191
0000000000601100	0-Bridge	11-Replace	2011	\$893,681	\$2,503,883
000000000047780	0-Bridge	11-Replace	2012	\$1,861,522	\$4,918,303
0000000000050960	0-Bridge	11-Replace	2020	\$1,243,932	\$3,174,667
0000000000054370	0-Bridge	11-Replace	2020	\$186,338	\$339,544
000000000048830	0-Bridge	11-Replace	2013	\$1,174,684	\$2,023,608
000000000030610	0-Bridge	11-Replace	2011	\$906,509	\$2,856,815
0000000000050990	0-Bridge	11-Replace	2013	\$1,500,776	\$2,923,655
0000000000051740	107-Paint Stl Open Girder	31-Repl Element	2013	\$44,805	\$47,610
0000000000051740	107-Paint Stl Open Girder	31-Repl Element	2013	\$50,292	\$250,468
000000000029310	0-Bridge	11-Replace	2017	\$161,157	\$324,622
0000000000699780	0-Bridge	11-Replace	2012	\$66,667	\$353,663
000000000043370	0-Bridge	11-Replace	2019	\$138,494	\$370,543
000000000029560	0-Bridge	11-Replace	2012	\$195,502	\$424,972
000000000013420	0-Bridge	11-Replace	2013	\$736,538	\$1,313,475
000000000013860	0-Bridge	11-Replace	2013	\$203,965	\$422,748
0000000000037710	0-Bridge	11-Replace	2013	\$271,044	\$555,794
000000000013010	0-Bridge	11-Replace	2012	\$702,544	\$1,746,944
0000000000038570	0-Bridge	11-Replace	2013	\$168,794	\$81,382

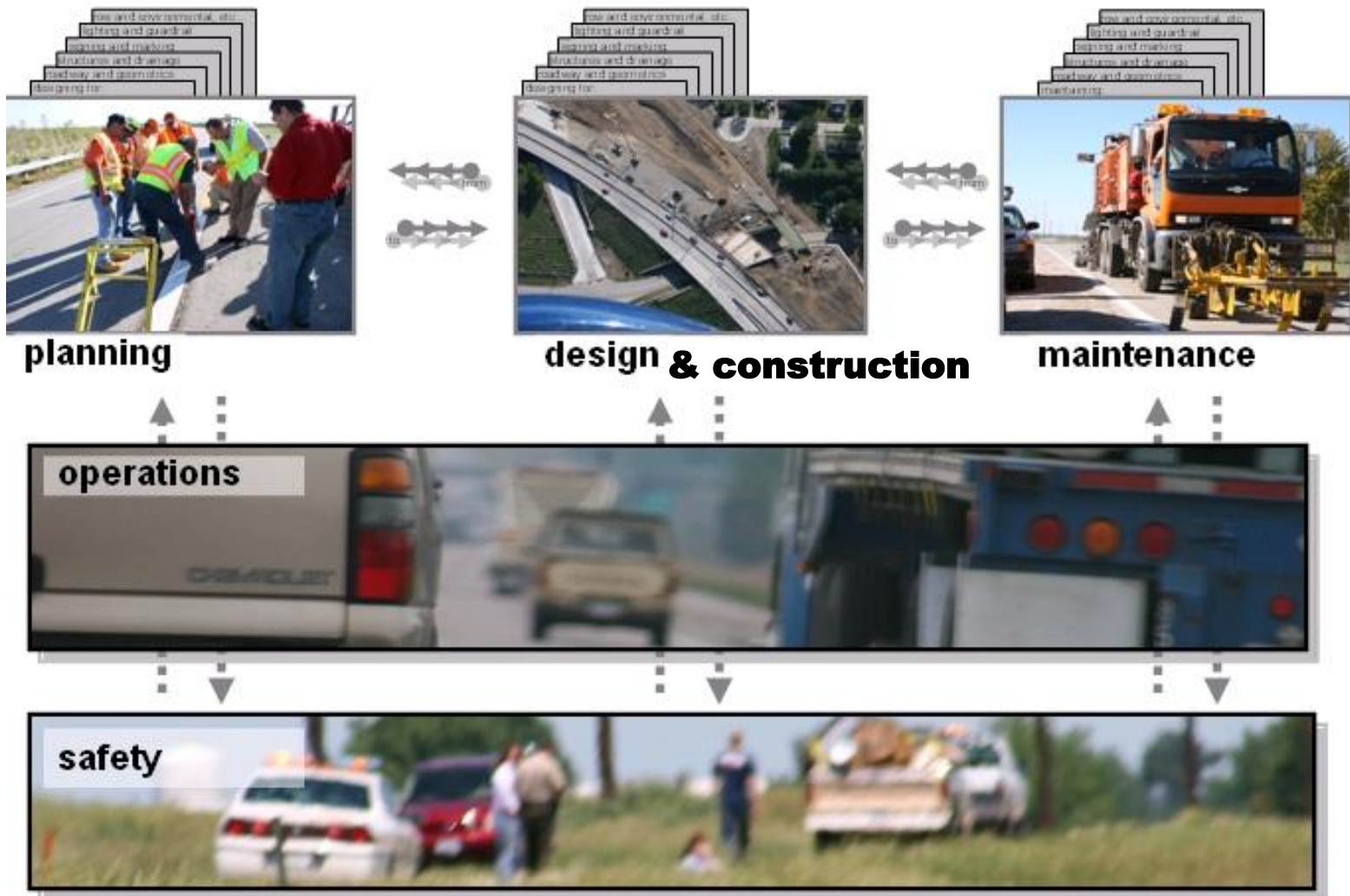
Turn Data into INFORMATION

INFORMATION

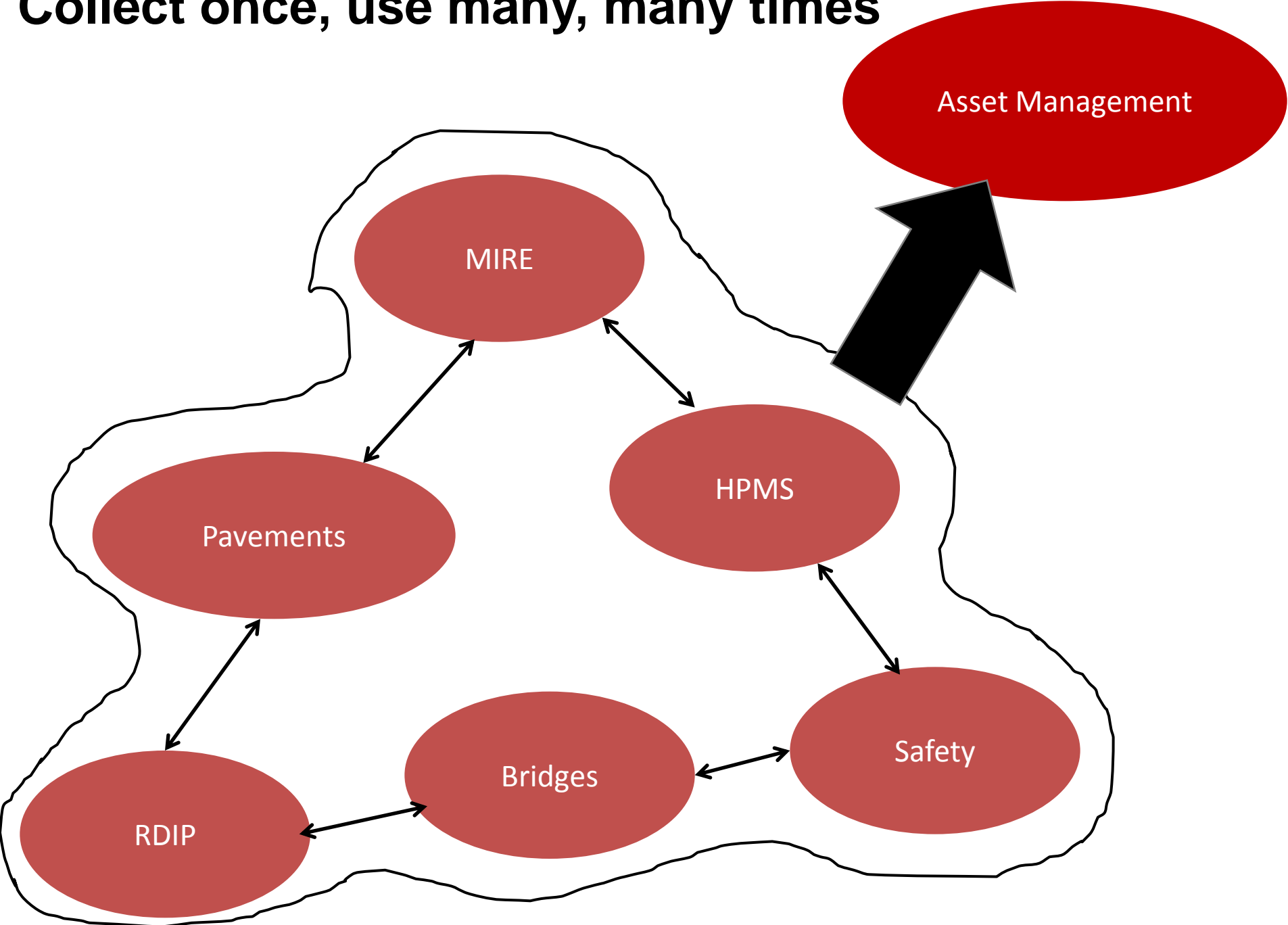


Projected Bridge Replacement Add One Lane	
● 2021 - 2025	● 2011 - 2015
● 2026 - 2030	● 2016 - 2020
● 2031 - 2035	● 2021 - 2025
● > 2035	● 2026 - 2030
● Bridges Over I-80	● 2031 - 2035
▲ Rest Area	■ 2011 - 2015
— Primary Roads	■ 2016 - 2020
— Public Roads	■ 2021 - 2025
— Streams	■ 2026 - 2030
■ Incorporated Areas	■ 2031 - 2035
□ County Borders	

Managing Assets



Collect once, use many, many times



SHRP 2 Recent Efforts

❖ RID (Roadway Information Database)

Date: 9/21/12		NDS State: NC		Name:		Through				Gravel		Paved		depressed		uncontrolled							
S = W->E, S->N		E = E->W, N->S		%	%	Number	Feet	Left Turn	Right Turn	Center Turn Ln	Acceleration	Deceleration	Gravel	Paved	raised	flush	Centerline						
S = W->E, S->N		E = E->W, N->S		%	%	Number	Feet	Left Turn	Right Turn	Center Turn Ln	Acceleration	Deceleration	Gravel	Paved	raised with barrier	flush with barrier	Left Shoulder	Right Shoulder					
S = W->E, S->N		E = E->W, N->S		%	%	Number	Feet	Left Turn	Right Turn	Center Turn Ln	Acceleration	Deceleration	Gravel	Paved	raised with barrier	flush with barrier	Left Edge Line	Right Edge Line	yes	no	Value	Controlled T	Number
ID	Location	Route	Dir	Grade	Cross Slope	#Lanes	Width	Type 1	Type 2	Type 3	Type 4	UnPaved Shoulder	Paved Shoulder	Paved Width	Median	Rumble Strip/Stripe	Lighting	Speed Limit	Int Control Type	Intersection Approaches			
536		Cameron Blvd	6	2.2	1.2	2	12	T	T				Mix	1	-	-	NO						
537	@ LaSalle St	Erwin Rd	5																Signal	4			
538	@ Erwin Rd	NC 751	5																Roundabout	3			
539		NC 751	5	1.2	6.5	1	10	T					Mix	2	-	-	NO						
540	@ 45 SL	Cornwallis Rd	5	1.7	1.3	1	9	T					Mix	1	-	-	NO	45					
541	@ Curve Warn 35 mph	Erwin Rd	6			1	10	T					Mix	1	-	-	NO	35					
542	@ Holon Dr	Pickett rd	5																Controlled T	3			
543	@ 35 SL	Old Chapel Hill Rd	5	3.2	5	1	10	T					Mix	1	-	-	NO	35					
544		MLK	5	3.6	2	2	11	T	T			road	Mix	5	raised	-	Yes						
545	@ Curve Sign	Roxboro	5			1	14	T				curb			-	-	Yes						
546	@ Old Fayetteville	Fayetteville	5																Two-way	4			
547		NC 55	6	0.9	1.2	2	11	T	T				Mix	2	depressed	-	Yes						
548	@ 45 SL	Cornwallis Rd	5			1	11	T					Paved bike	6	-	-	Yes	45					
549		Alston Ave	6	0	2.4	1	9	T					Mix	1	-	-	Yes						
550	@ 45 SL	NC 55	6			3	15	T	T	CTL		curb			-	-	Yes	45					
551	@ Curve 35 mph	NC 54	6	-2.2	1.4	2	10	T	CTL				Mix	2	-	-	NO						
552		Fayetteville	6	0.9	1.6	1	11	T					Mix	2	-	-	NO						
553	@ 55 mph SL	NC 751	6															55					

3/5

Collected Data

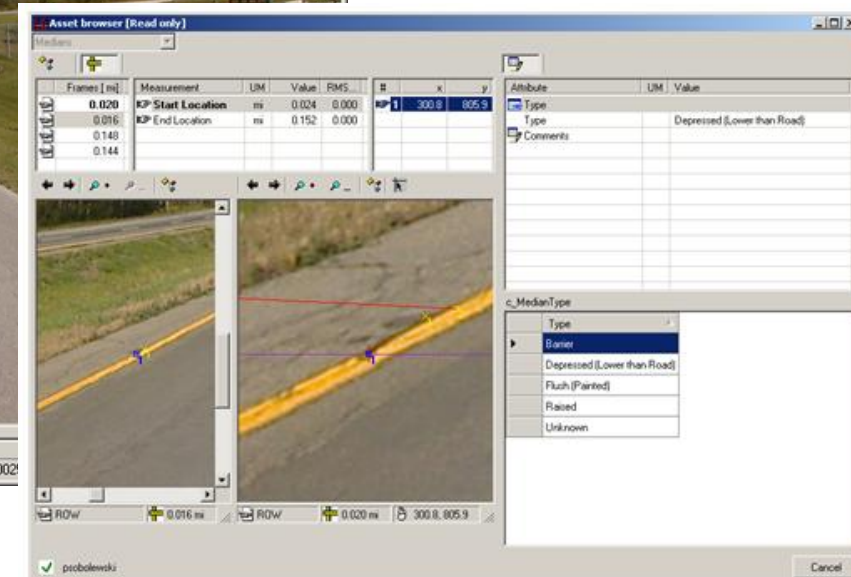
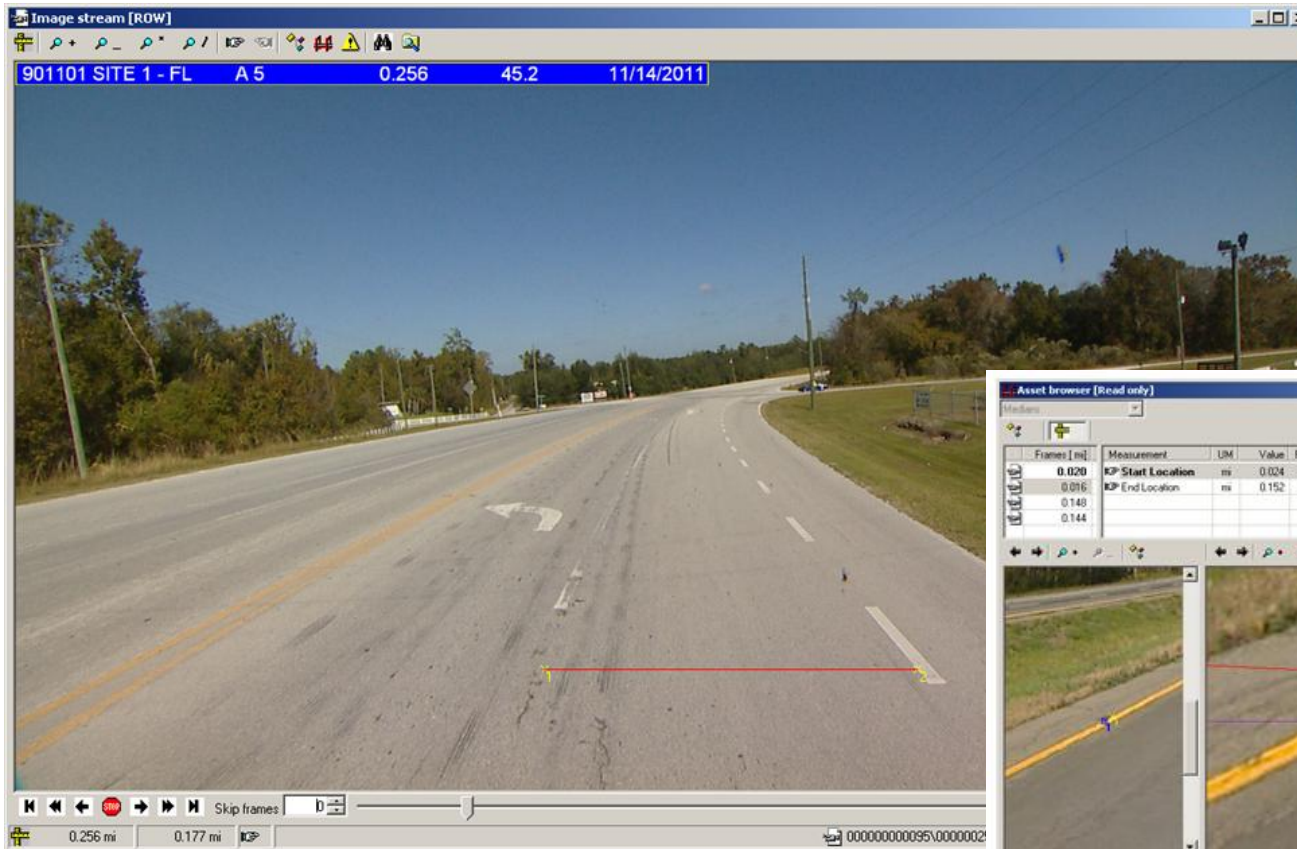
Data Element
Curvature Length
Curvature Radius
Begin point and end point of curvature
Grade (+ or -) and Cross Slope/Super Elevation
Lane Width/Type
Paved Shoulder Width/Type
All MUTCD signs and Barriers
Intersection Information
Presence of Lighting/Medians/Rumble Strips
Front Video Log

Data QA

Data Element	Accuracy Requirement
Curvature Length	100 feet (curves less than 1500 ft radius)
Curvature Radius	100 feet (curves less than 1500 ft radius)
PC	50 feet
PT	50 feet
Grade (+ or -)	1.0%
Cross Slope/Super Elevation	1.0%
Lane Width	1 foot
Paved Shoulder Width	1 foot
Inventory Features (signs) Location	7 feet

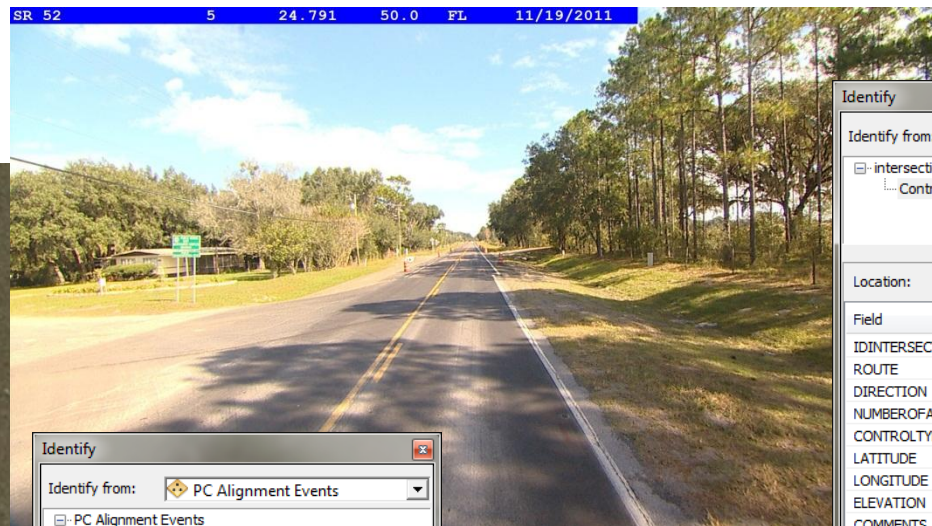
- ✓ **Control sites (2 per location-urban and rural)**
- ✓ **Random checks**

Data Collection Manual



Attributes:

Type: Depressed (Lower than Road), Raised, Flush (Painted), Barrier, or Unknown.



Identify

Identify from: PC Alignment Events

- PC Alignment Events
 - 862

Location: -82.304561 28.325512 Decimal Degrees

Field	Value
Fkey	904
Route	SR 52
Direction	5
Tangent	N
Radius	862
Length	530
PC_Lat	28.325514
PC_Long	-82.304571
PT_Lat	28.32609
PT_Long	-82.303066
Direction_curve	L
SuperElevation	-8.4

Identified 1 feature

Identify

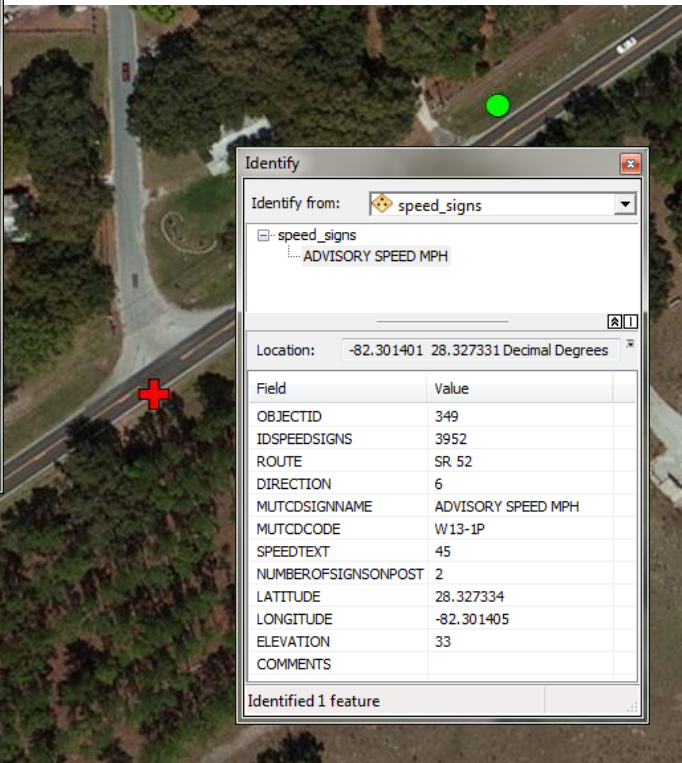
Identify from: intersections

- intersections
 - Controlled T Intersection

Location: -82.302200 28.326676 Decimal Degrees

Field	Value
IDINTERSECTIONS	3796
ROUTE	SR 52
DIRECTION	5
NUMBEROFAPPROACHES	3
CONTROLTYPE	Controlled T Intersection
LATITUDE	28.326667
LONGITUDE	-82.3022
ELEVATION	29.9
COMMENTS	

Identified 1 feature



Identify

Identify from: speed_signs

- speed_signs
 - ADVISORY SPEED MPH

Location: -82.301401 28.327331 Decimal Degrees

Field	Value
OBJECTID	349
IDSPEEDSIGNS	3952
ROUTE	SR 52
DIRECTION	6
MUTCDSIGNNAME	ADVISORY SPEED MPH
MUTCDCODE	W13-1P
SPEEDTEXT	45
NUMBEROFSIGNSONPOST	2
LATITUDE	28.327334
LONGITUDE	-82.301405
ELEVATION	33
COMMENTS	

Identified 1 feature



Unpaved Shoulder: N/A

Rumble Strips: N/A

Lighting: N/A



Paved Shoulder	3' Mix/Combo	N/A	3' Mix/Combo	4' Mix/Combo
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Median						
Flush Paint.	N/A	Flush (Painted)	N/A	Flush (Painted)	N/A	Flush Paint.

Lanes	Thru Lane: 1 (12')		Thru Lane: 1 (11') Right Turn: 1	Thru Lane: 1 (12')
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Lanes	Thru Lane: 1 (12') Left Turn Lane: 1	Thru Lane: 1 (14') Deccel. Lane: 1	Thru Lane: 2 (11') Deccel. Lane: 1	Thru Lane: 1 (12') Accel. Lane: 1	Thru Lane: 1 (21')
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Flush Paint.	N/A	Flush (Painted)	N/A	Flush (Painted)	N/A	Flush Paint.
Median						

Paved Shoulder	2' Mix/Combo	0' Mix/Combo	3' Mix/Combo	2' Mix/Combo
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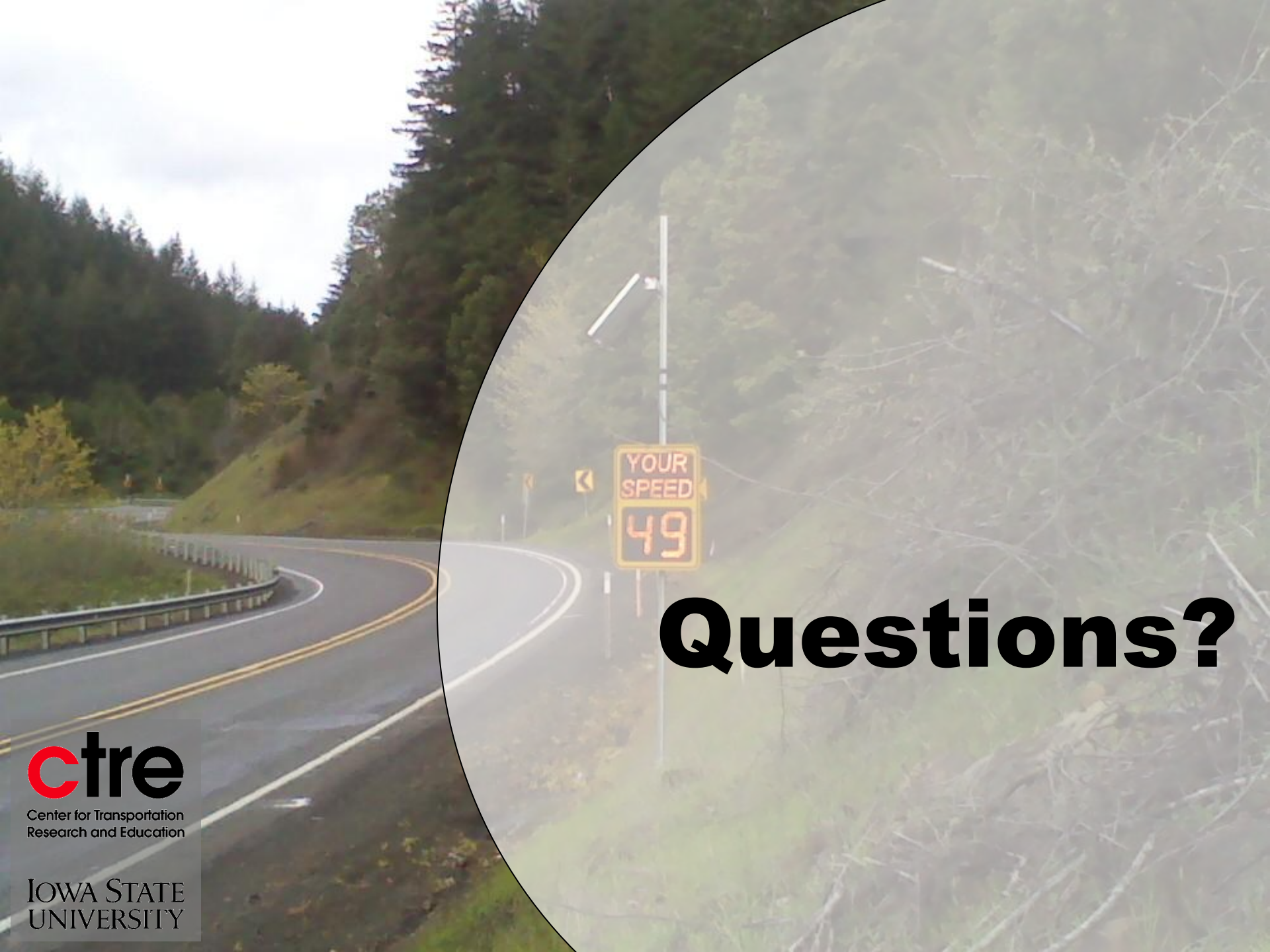
Unpaved Shoulder: N/A

Rumble Strips: N/A

Lighting: N/A

FHWA Recent Efforts

- ❖ HPMS (Highway Performance Monitoring System)
- ❖ RDIP (Roadway Data Improvement Program)
- ❖ MIRE (Model Inventory Roadway Elements)
- ❖ FDE (Fundamental Data Elements)



Questions?