

SHRP 2 Roadway Information Database (RID)

Zach Hans, CTRE

ctre

Center for Transportation
Research and Education

IOWA STATE
UNIVERSITY

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES
 **SHRP2**
STRATEGIC HIGHWAY RESEARCH PROGRAM

SHRP 2 NDS RID Sites



RID Data Sources



Existing (~ 200,000 miles)
(DOT, ESRI)



Supplemental Information

Critical in further characterizing or analyzing operations of a roadway segment



Mobile Van Data
(~ 25,000 collection miles)

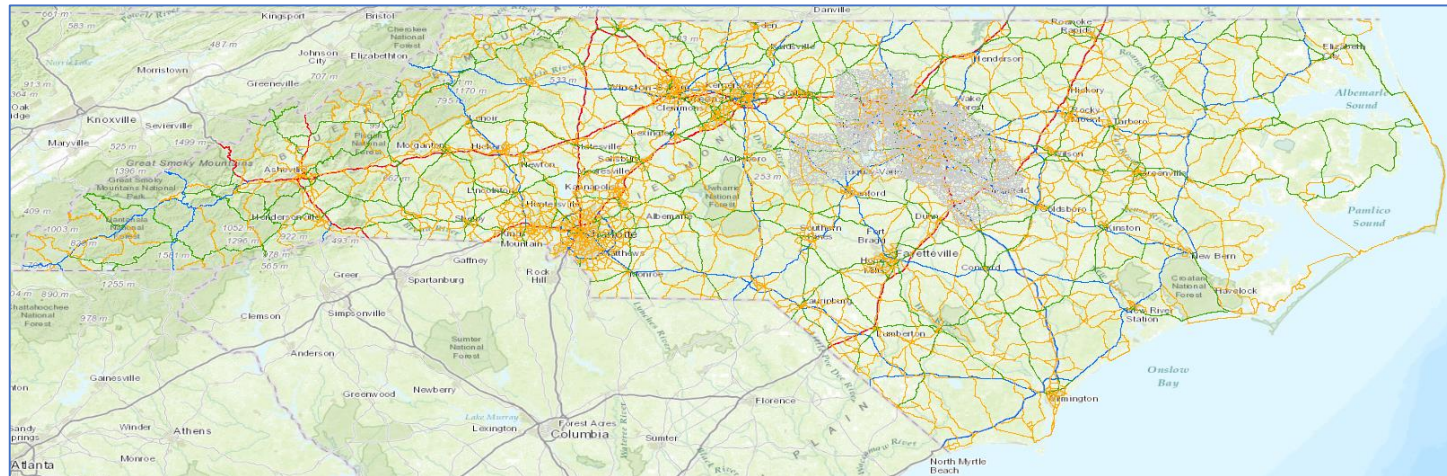
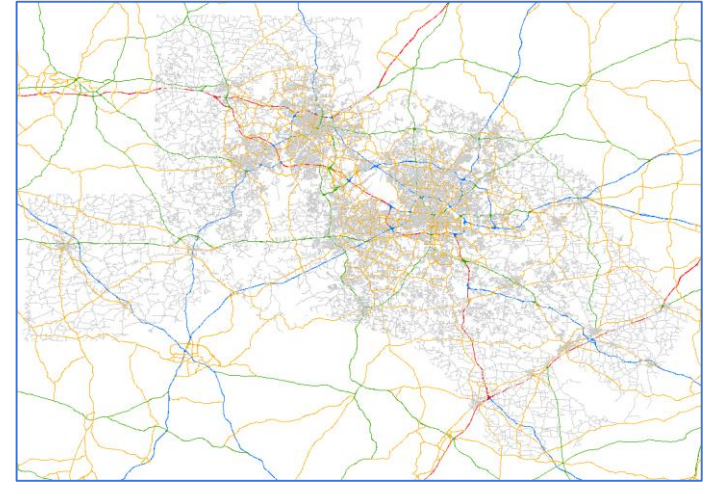
RID Linear Referencing System (LRS)

National - state primary routes (+)

All roads in core study areas

Base level attributes

- **name**
- **speed limit**
- **# lanes**
- **class**
- **access**
- **type**



Acquired DOT Data

Obtained from all six states

Varied by state

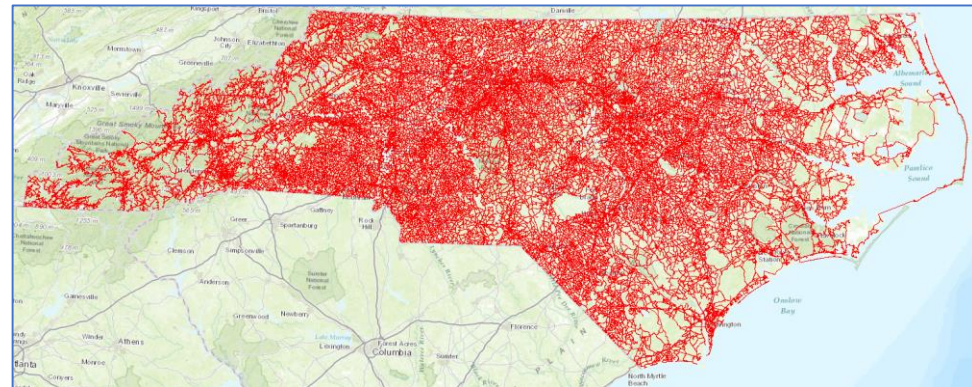
- **roadway extent**
- **content, attributes**
- **format**



Conflated to RID LRS

- **source LRS attributes retained**

All source data retained



Acquired DOT Data

State	Curvature	Grade/cross slope	Inventory				Intersection
			Lanes	Shoulders	Median	Speed limit	
Indiana							
Florida							
New York							
North Carolina							
Pennsylvania							
Washington*		Grade					

* Generally state system

State	Other/Additional Data
Indiana	State, county, city centerline Reference posts Bridges
Florida	Roadway Characteristics Inventory (RCI) Sign inventory (Pasco County)
New York	Roadway Inventory System Structures
North Carolina	Roadway characteristics database Signals Electrical service points Pavement condition
Pennsylvania	Roadway management system Bridges Sign inventory Guardrail
Washington*	Roadway data - extensive Roadside inventory

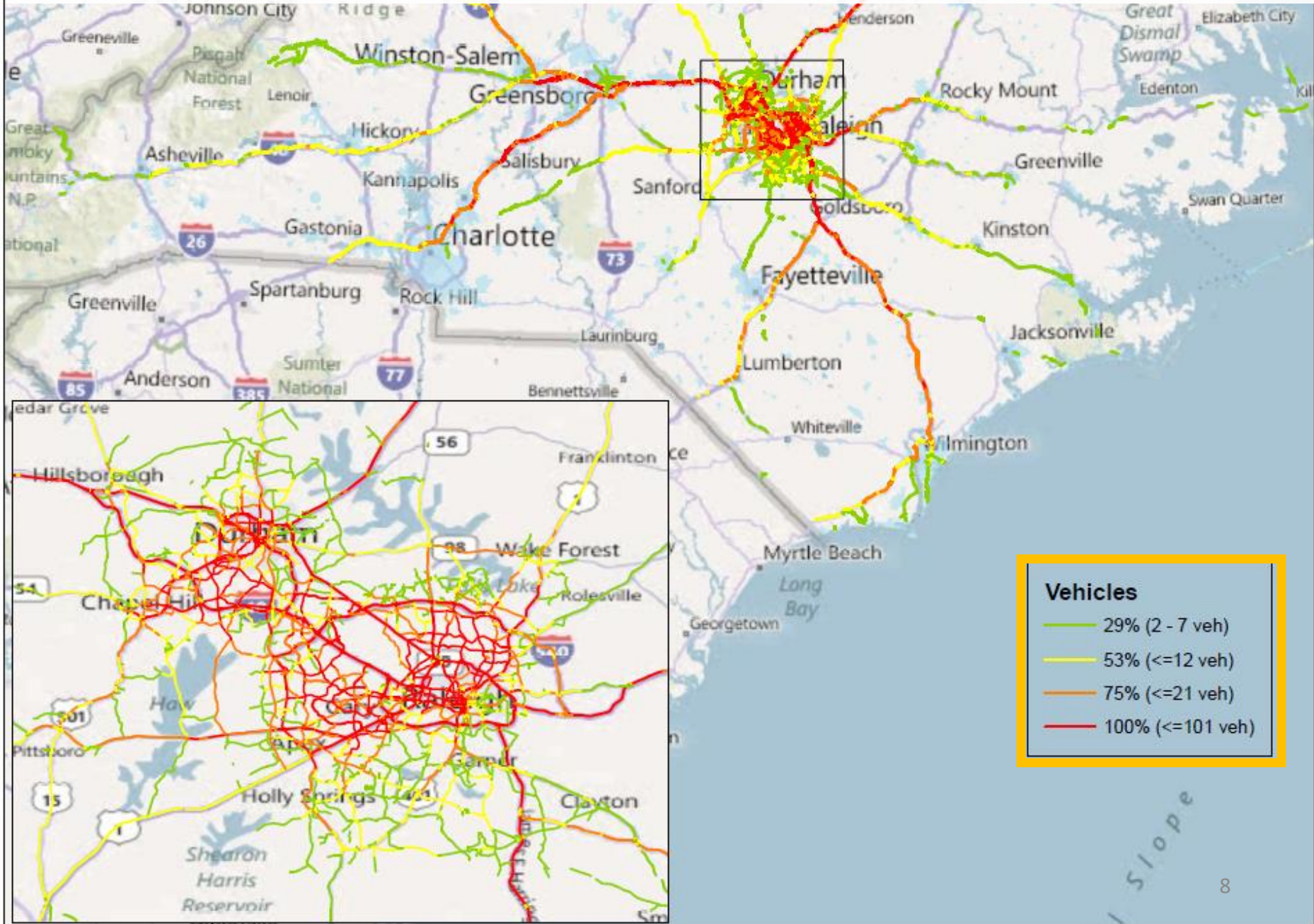
* Generally state system

Note: Data content and extent may vary over the public road system.

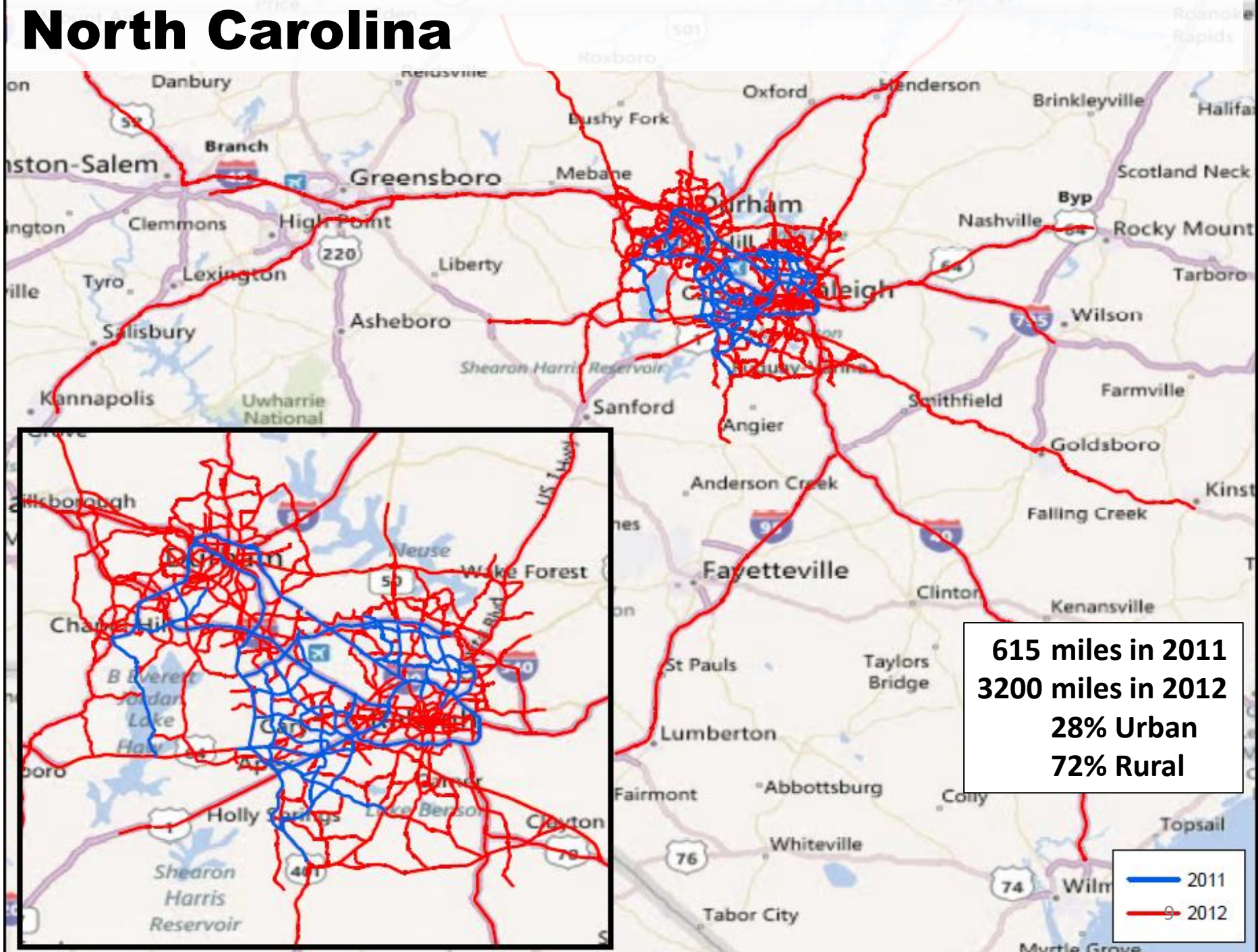
Which roads to collect?

Maximize collection to match where the NDS participants are driving.

Traces from VTTI (NC)



North Carolina



RID Mobile Data

Collected by Fugro and post processed
Length varies depending on asset, data
Conflated to RID LRS



Data Element

Alignment (PC/PT, radius, length, direction, super elevation)

Location: grade (+ or -) and cross slope [21' intervals]

Barrier (type, start/end treatment, post material)

Lighting (presence)

Lane (#, types, width)

Shoulder (type, width)

Signs (MUTC type, message)

Guardrail (location and Type)

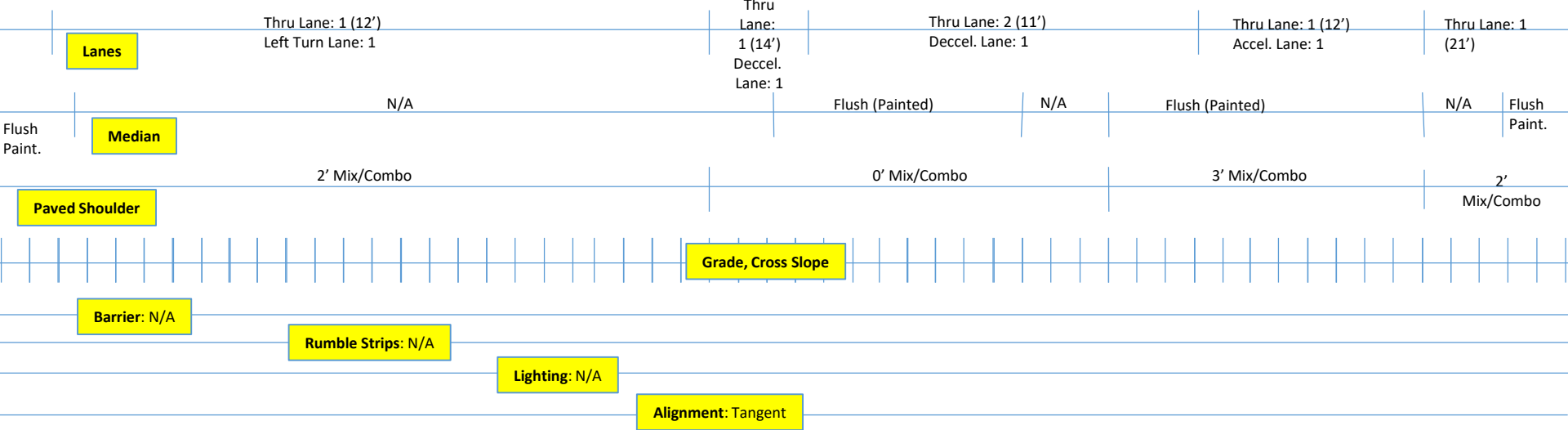
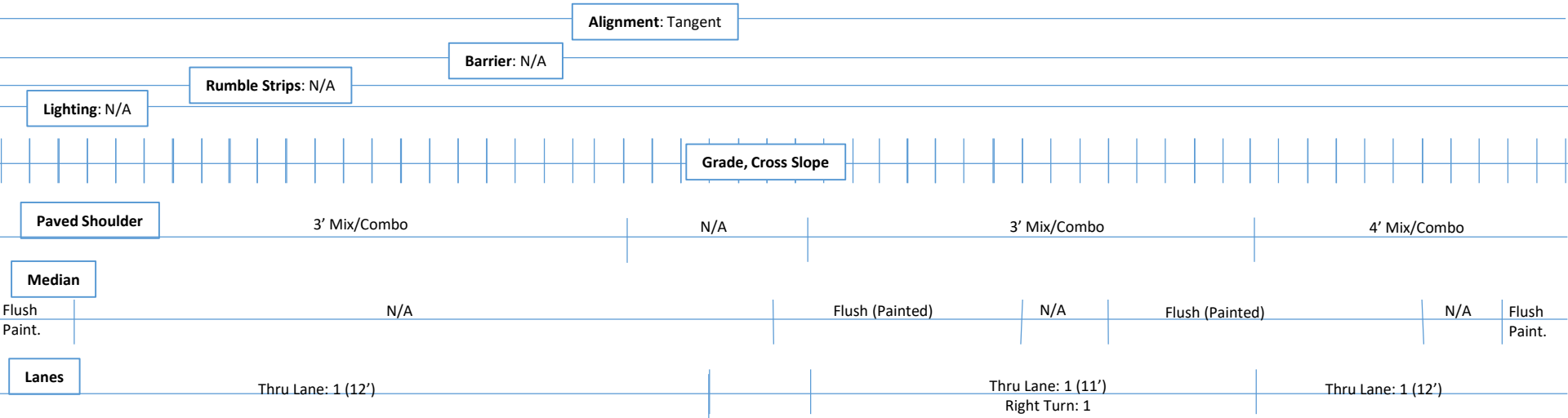
Intersection (type, # approaches)

Rumble Strip (presence, location)

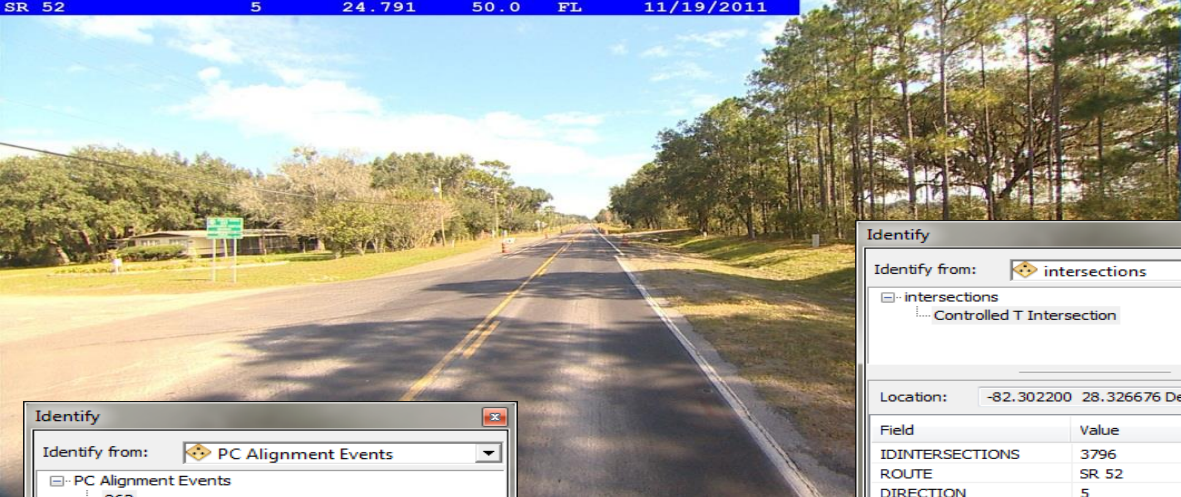
Median (presence, type)

Front ROW Video Log

Example RID Mobile Data: Longitudinal



Example Mobile Data: Point



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

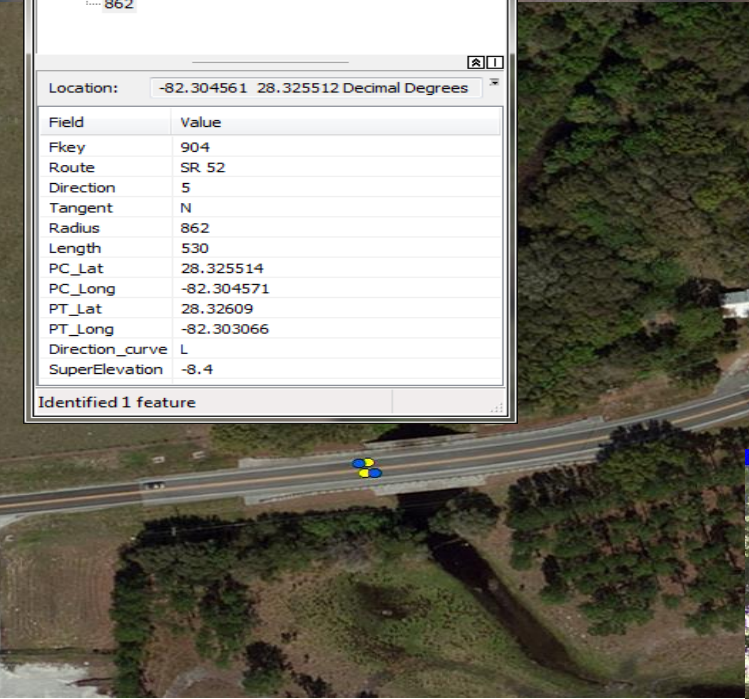
Identify from: **speed_signs**

- 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



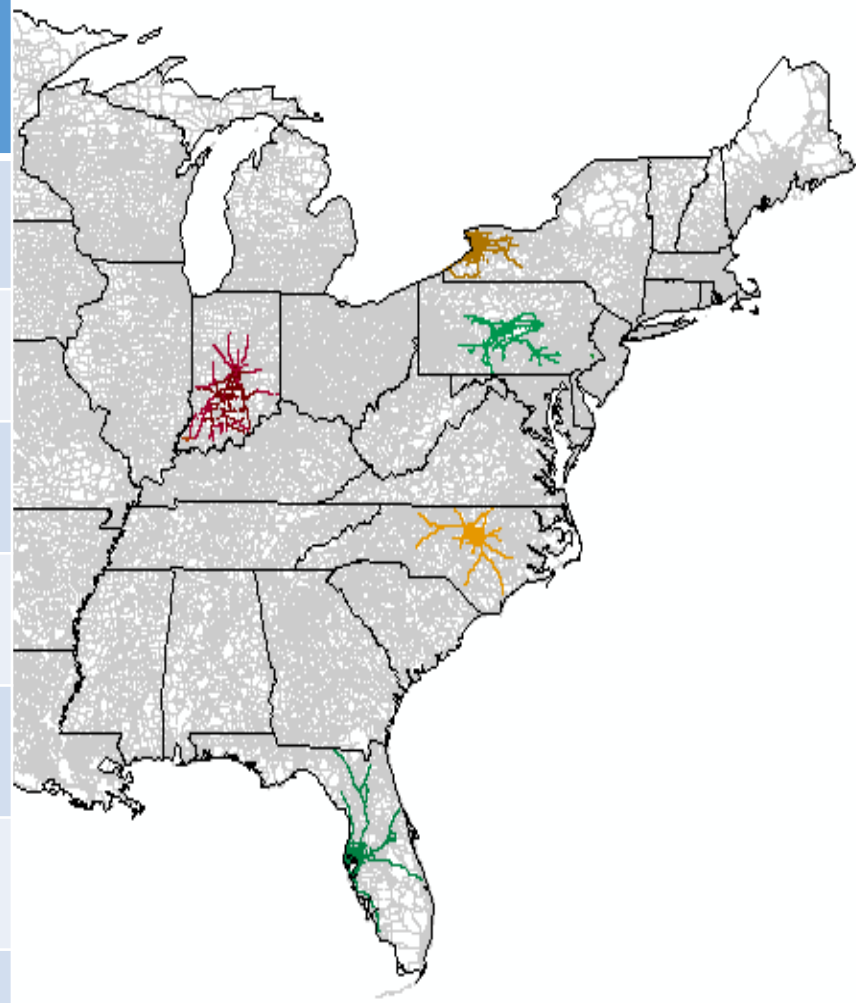
SR 52 6 24.845 47.6 FL 11/19/2011



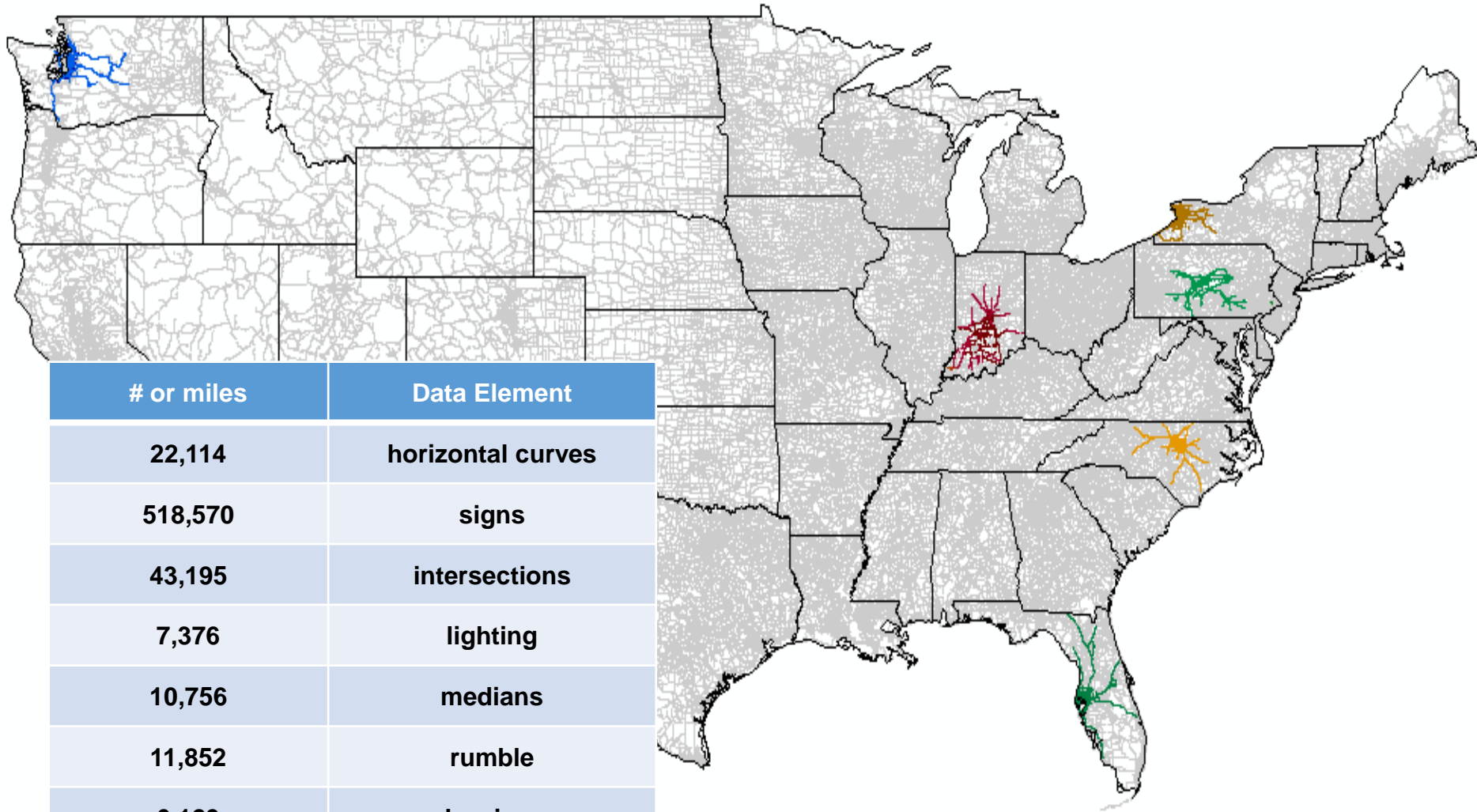
RID Mobile Data



Site	Total miles collected	Approx. % Rural/Urban
FL	4,366	Rural: 45% Urban: 55%
IN	4,635	Rural: 64% Urban: 36%
NC	4,558	Rural: 59% Urban: 41%
NY	3,570	Rural: 68% Urban: 32%
PA	3,670	Rural: 83% Urban: 17%
WA	4,277	Rural: 31% Urban: 69%
Total	25,076	



RID Mobile Data



# or miles	Data Element
22,114	horizontal curves
518,570	signs
43,195	intersections
7,376	lighting
10,756	medians
11,852	rumble
6,129	barriers
33,013	shoulders

RID Mobile Data: 44,114 Curves



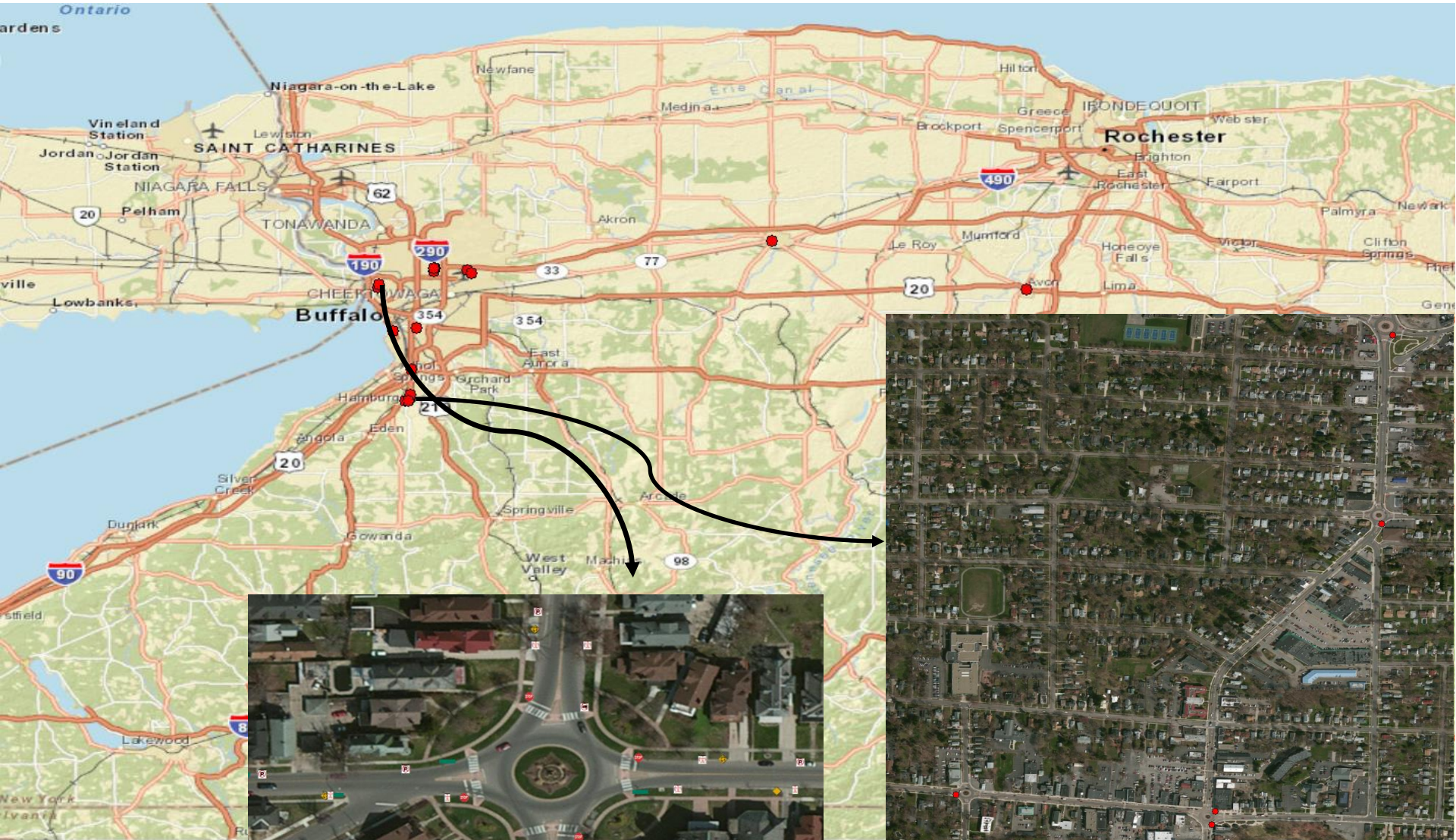
- ✓ 22,449 with radius less than 1500'
 - ✓ 18,028 with radius between 1500'-6000'
 - ✓ 3,637 with radius greater than 6000'
-
- ✓ 17,500 on two lane roads with radius less than 1500'
 - ✓ 11,000 on two lane roads with radius between 1500'-6000'
 - ✓ 1,500 on two lane roads with radius greater than 6000'
-
- ✓ 6,000 on four lane roads with radius less than 1500'
 - ✓ 7,000 on four lane roads with radius between 1500'-6000'
 - ✓ 1,600 on four lane roads with radius greater than 6000'

RID Mobile Data: 43,195 Intersections

- ✓ 21,824 Controlled T
- ✓ 9,625 Signalized
- ✓ 7,241 Two-Way Stops
- ✓ 3,044 Uncontrolled
- ✓ 597 All-Way Stops
- ✓ 84 Roundabouts
- ✓ 21 Yield



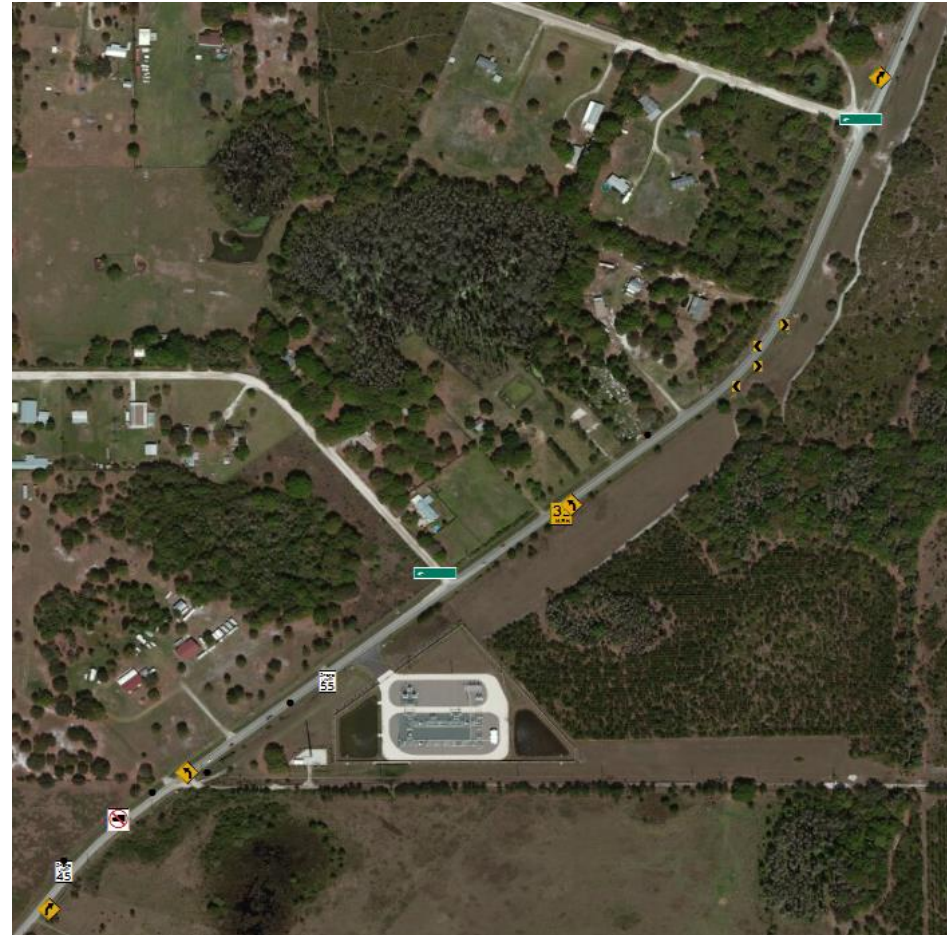
Example RID Mobile Data: Roundabouts



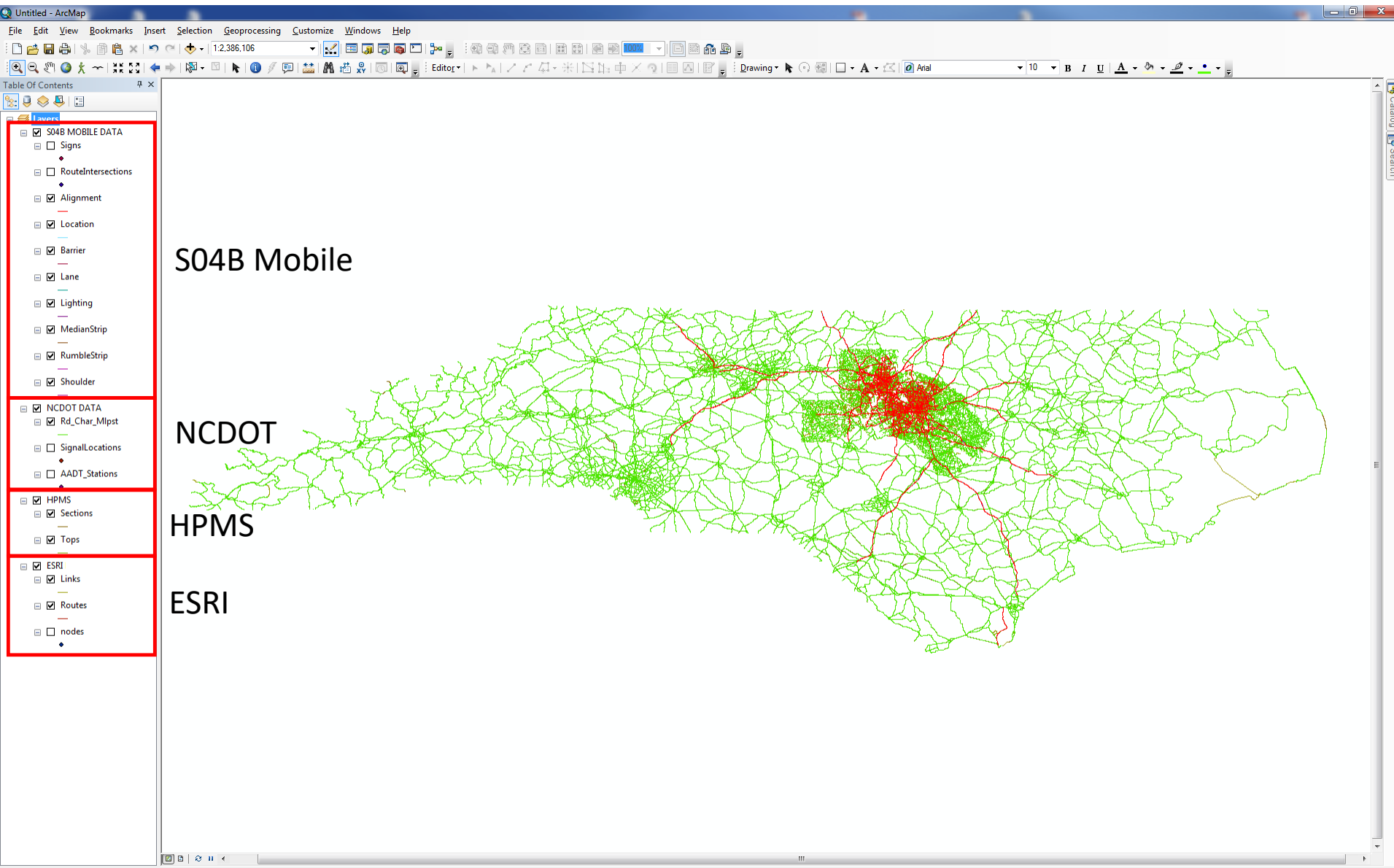
RID Mobile Data: 518,570 Signs

- ✓ 212,509 regulatory signs
- ✓ 208,797 guide signs
- ✓ 72,568 warning signs
- ✓ 13,025 markers
- ✓ 10,015 school signs
- ✓ 590 emergency signs

- ✓ 34,755 speed limit signs
- ✓ 5,646 advisory speed limit signs
- ✓ 818 school speed limit signs



Example North Carolina RID



Supplemental Data

- ❖ Crash data (5 years before NDS and during)
- ❖ Traffic information
- ❖ Weather data
- ❖ State laws:
 - ✓ Cell phone use
 - ✓ Texting
 - ✓ GDL
 - ✓ Seat belt
- ❖ Aerial imagery
- ❖ Changes to infrastructure
- ❖ Work zones

An aerial photograph of a road intersection with several map overlays. There are blue information icons (an 'i' in a square) and green rectangular markers on the road. There are also red circular 'STOP' signs overlaid on the road. The text is centered over the image.

Example SHRP 2 RID

Data Extraction

Horizontal Curves

Objective

Identify rural, two lane horizontal curves in North Carolina with a shoulder width less than 6'.

Data Requirements:

S04B Lane

- Identify two lane highways

S04B Alignment

- Identify horizontal curves

S04B Shoulder

- Identify shoulder width

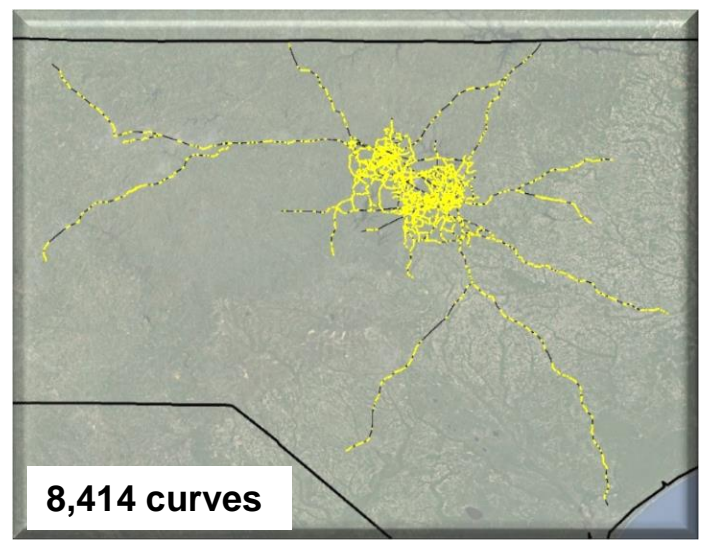
Urban Area Boundary

- Identify urban/rural location



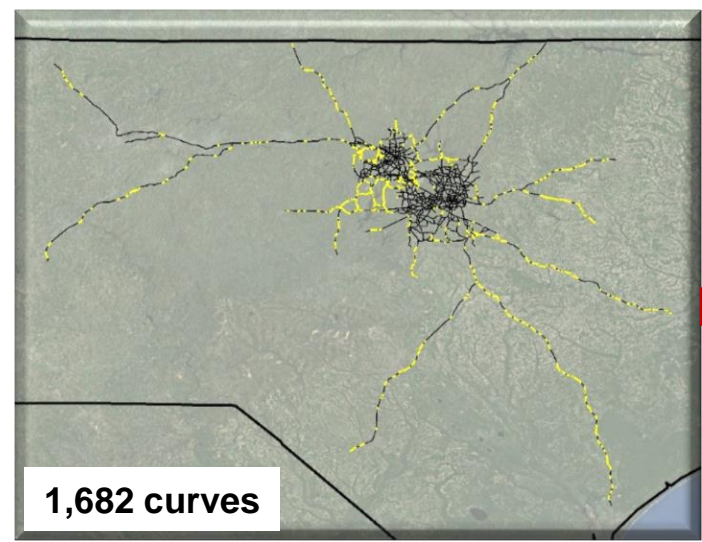
Methodology

All Horizontal Curves

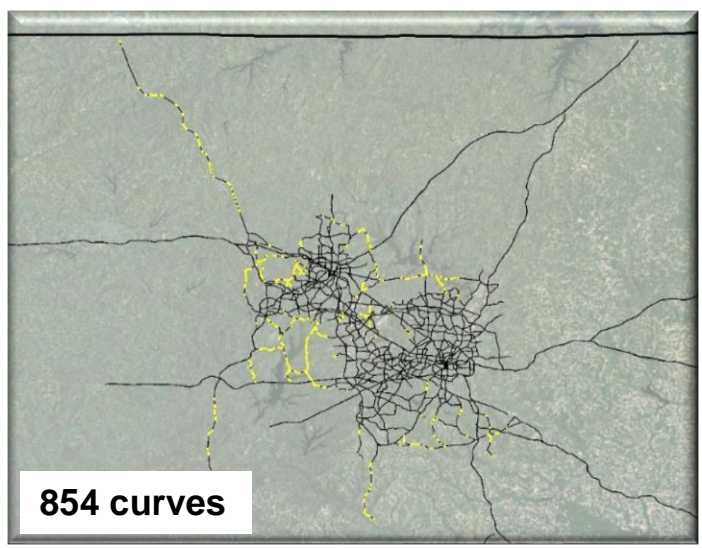


Select
"rural"
curves

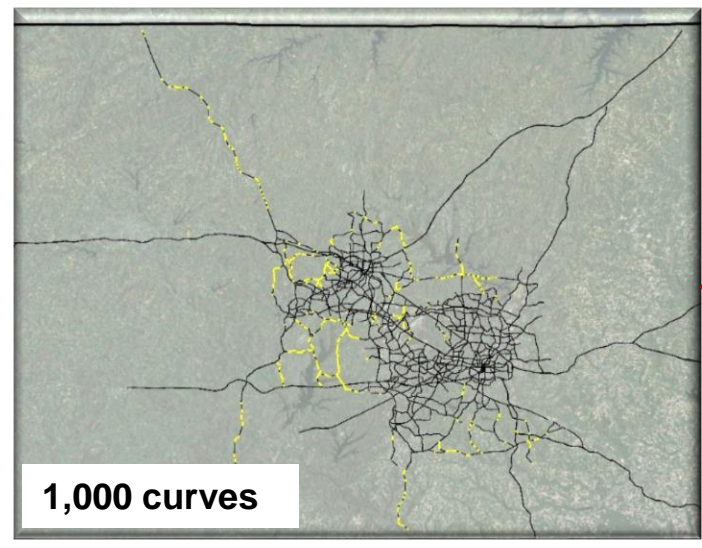
Rural Horizontal Curves



Overlay
two lane
roads



Overlay
< 6' shoulders



Rural Two Lane Curves w/ Shoulder < 6'

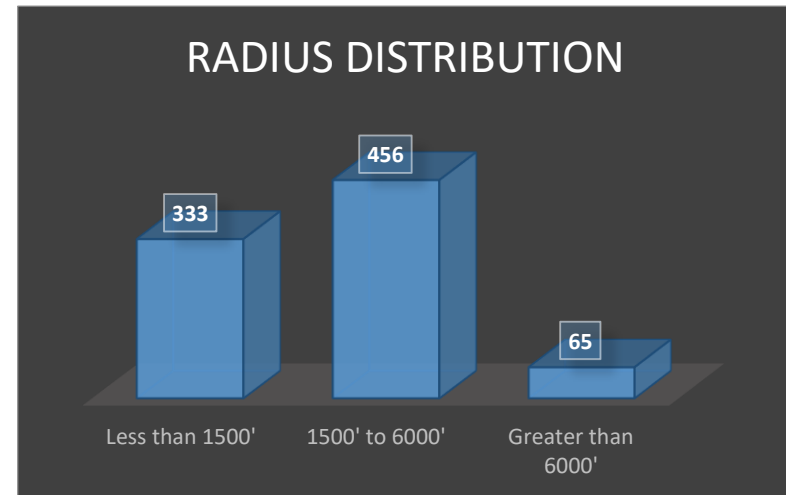
Rural, Two Lane Curves

Results

854 horizontal curves are located in a rural area, on a two lane highway, with a shoulder width less than 6'.

All attribute data contained in S04B Lane, Alignment and Shoulder attribute tables are now also associated with each curve.

CurveID	Radius	SuperElevation	LaneWidth	ShoulderWidth	ThroughLanes
{39CD6E13-7977-4ED6-B34F-5EEFF1261505}	2280	-4	10	1	1
{6F90EAF1-68EB-448F-A2B2-00EF3E4266BD}	1014	-6.6	12	1	1
{3E21C3F1-5C1E-45D8-A900-CC7E9529723D}	744	-7.9	10	1	1
{C317026E-04D2-4813-88F7-6009C570125C}	4790	3	9	1	1
{556A62BD-4DA1-4B1B-A783-F23E4C56515C}	3276	1.5	11	3	1
{3624715F-020A-4F22-B7D5-9C9ADEF24A52}	6411	1.2	9	2	1
{BD86466F-4D1E-43C0-90FC-9972DB259845}	1951	-5.2	10	3	1
{0773D6FB-57CC-4C19-AE51-A062BADFB475}	2864	0.5	9	1	1
{822849D7-5A00-4B62-A17B-893E8D452224}	1460	-3.5	11	1	1
{E1E52C9B-61AC-4FD9-AC72-5770368A7C43}	7243	1.6	10	1	1
{057D81BA-A352-487C-B207-21FB3A6AF97F}	1484	-7	12	3	1
{227AEAC6-A431-4487-884F-E28FBC35A695}	9917	-1.2	12	1	1
{4A1BBAF1-3BCA-4153-8C1D-BFCC93643506}	3601	4.4	11	1	1
{CB59543D-FA96-44B9-BCE0-59278B06FB79}	2673	0.9	10	1	1
{03FF3F34-95ED-401A-B23C-EE3FD4C62086}	480	4.4	13	2	1
{F395D396-9C0D-4C2D-RCF9-FD0D6653C40A}	2394	7.4	11	3	1



Questions

Omar Smadi

InTrans, CTRE, Iowa State University

Smadi@iastate.edu

Zach Hans

InTrans, CTRE, Iowa State University

zhans@iastate.edu



Center for Transportation
Research and Education

IOWA STATE
UNIVERSITY