

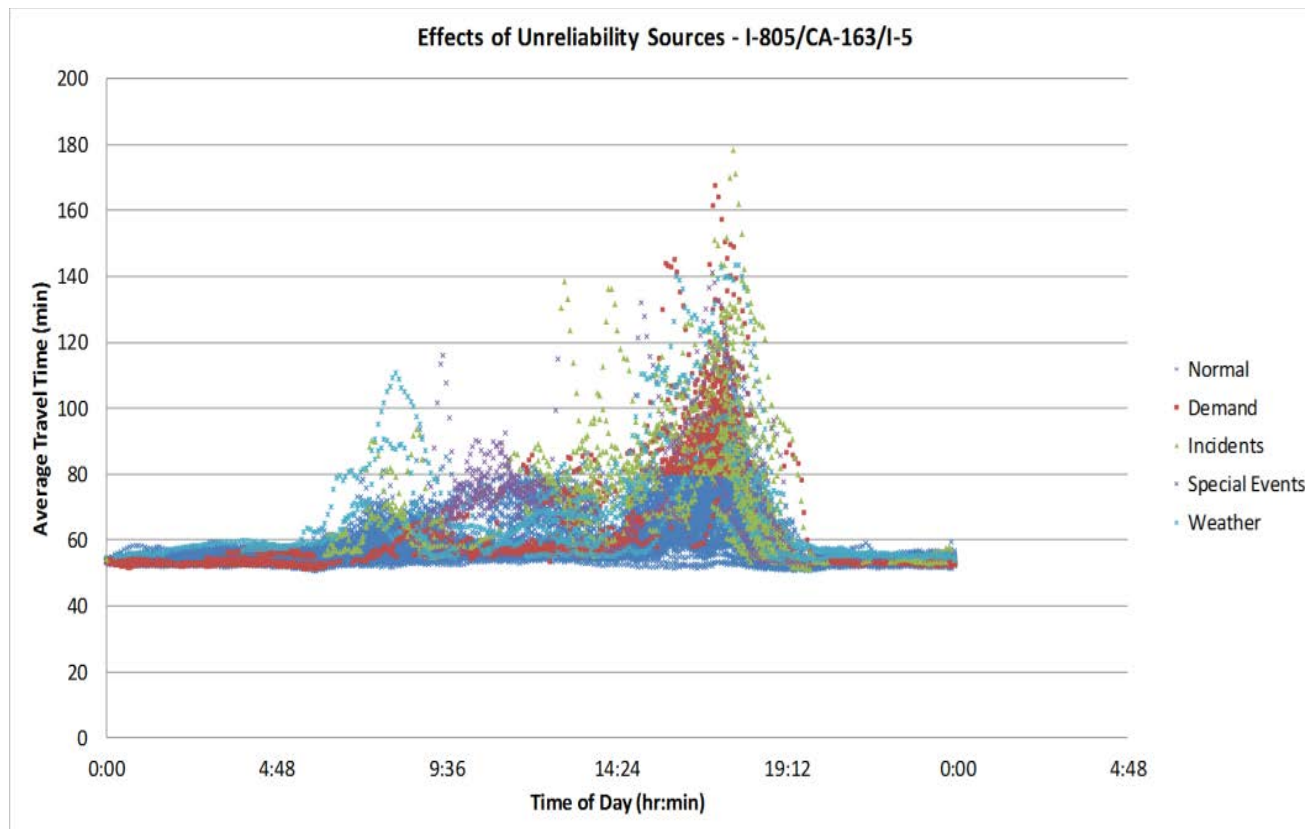


Comparison of Statewide Single Source and Regional Multi- Source Traffic Speed Data Sets in the Austin, Texas Region

NATMEC 2016, Miami, FL

Monday, May 2, 2016

Congestion Studies: Accuracy and Accountability



- Data
- Method
- Function

Courtesy of North Carolina State University, and “Dr. George List. (2014)”, from his research on SHRP 2 Project L02: Establishing Monitoring Programs for Travel Time Reliability.

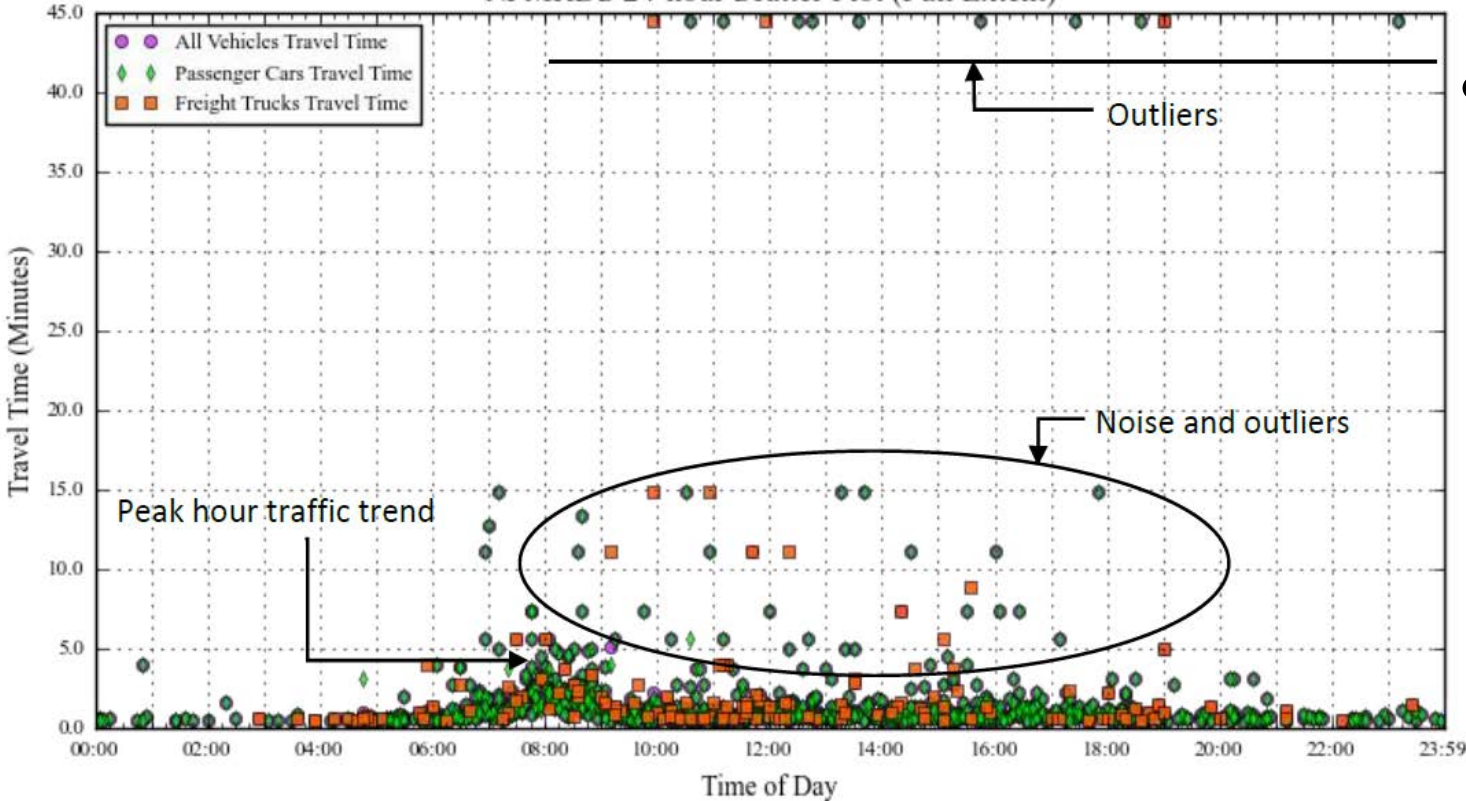


Congestion Analysis Studies using NPMRDS and Other Data

Organization	University of Maryland	DAMA Consultants	Old Dominion University	Texas A&M Transportation Institute
Study	<i>NPMRDS Performance Measure Computation – August 2014</i>	<i>Illinois Truck-Rail Intermodal Connector Evaluation using NPMRDS- January 2016</i>	<i>Freight and Passenger Traffic Data Comparison- May 2015</i>	<i>Congestion Measurement 2012 Roadway Congestion Analysis- August 2014</i>
Data	<ul style="list-style-type: none"> • NPMRDS speed data, • Bluetooth sensors speed data, • INRIX TMC speed data 	<ul style="list-style-type: none"> • NPMRDS speed data, • Illinois DOT Roadway Inventory shapefiles, • NHS Roadway shapefiles. 	<ul style="list-style-type: none"> • NPMRDS traffic speed data, • INRIX TMC speed data, • ATRI GPS data 	<ul style="list-style-type: none"> • Texas DOT Roadway Inventory (RhINO), • Bluetooth Sensors, • INRIX TMC and XD speed data.
Challenge	Scarcity: In the NPMRDS data, if one passenger or freight vehicle is not reported in a five minute period on a TMC segment, the field remains empty for that vehicle type.	Segmentation: The end points of NPMRDS TMC segments do not match the end points defined by the Illinois DOT IRIS and NHPN shapefiles.	Scarcity: HERE data was scarce.	Segmentation: Creation of segments based on major roadway crossings required conflation of multiple sources of speed and volume data whose segments did not match.
Solution	Aggregation: Rather than imputing missing values, improve data density by merging data from multiple Tuesdays or Wednesdays over a two week period together on a 24 hour period assuming repeated traffic patterns will emerge.	Weighting: Weighted Averages (based on the number of traffic speed measurements within, and the length of the overlap) are applied to traffic speeds in overlapped portions of NPMRDS TMC segments and IRIS segments.	Aggregation: HERE data was aggregated from five minute to 15 minute bins and the study focused on peak periods to further increase speed data observations.	Weighting: Break apart Volume, TMC, XD, and Bluetooth speed data segments and merge with newly created congestion analysis segments using volume-weighting.
Segmentation	Sum the travel times for NPMRDS and INRIX data for multiple TMC segments located within a lengthier Blue Tooth Signal reader segment.	Based on merger of NHS/IRIS Shape files with NPMRDS TMC and resulting overlap captured through weighted average methodology.	INRIX TMCs were used as the basis segment length and ArcGIS buffer tools were used to snap ATRI GPS data within the defined segment using a distance buffer of 300 feet.	Created segments that match major road crossings with the segment endpoints.

University of Maryland: NPMRDS and Scarcity Challenges

NPMRDS 24-hour Scatter Plot (Full Extent)

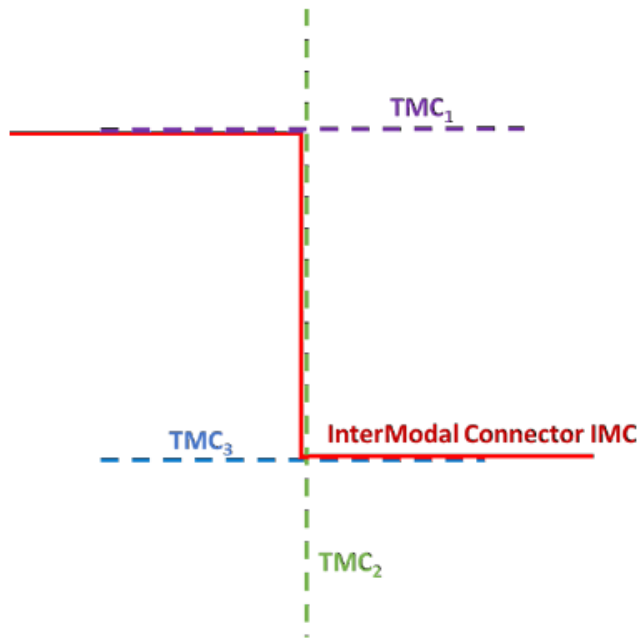


- NPMRDS:
Data
Scarcity.

Courtesy of University of
Maryland, CATT Lab, and
"Kaushik, Sharifi, Young. (2014)"



DAMA Consultants: NPMRDS and Segmentation Challenges

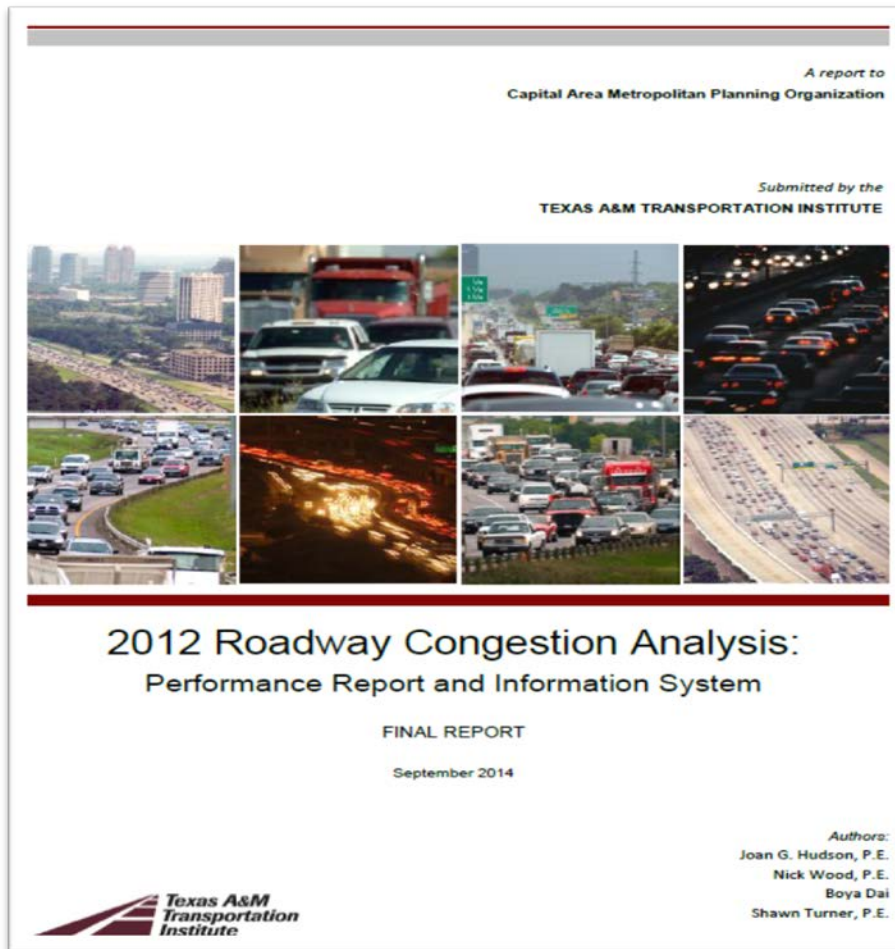


- NPMRDS:
Segmentation

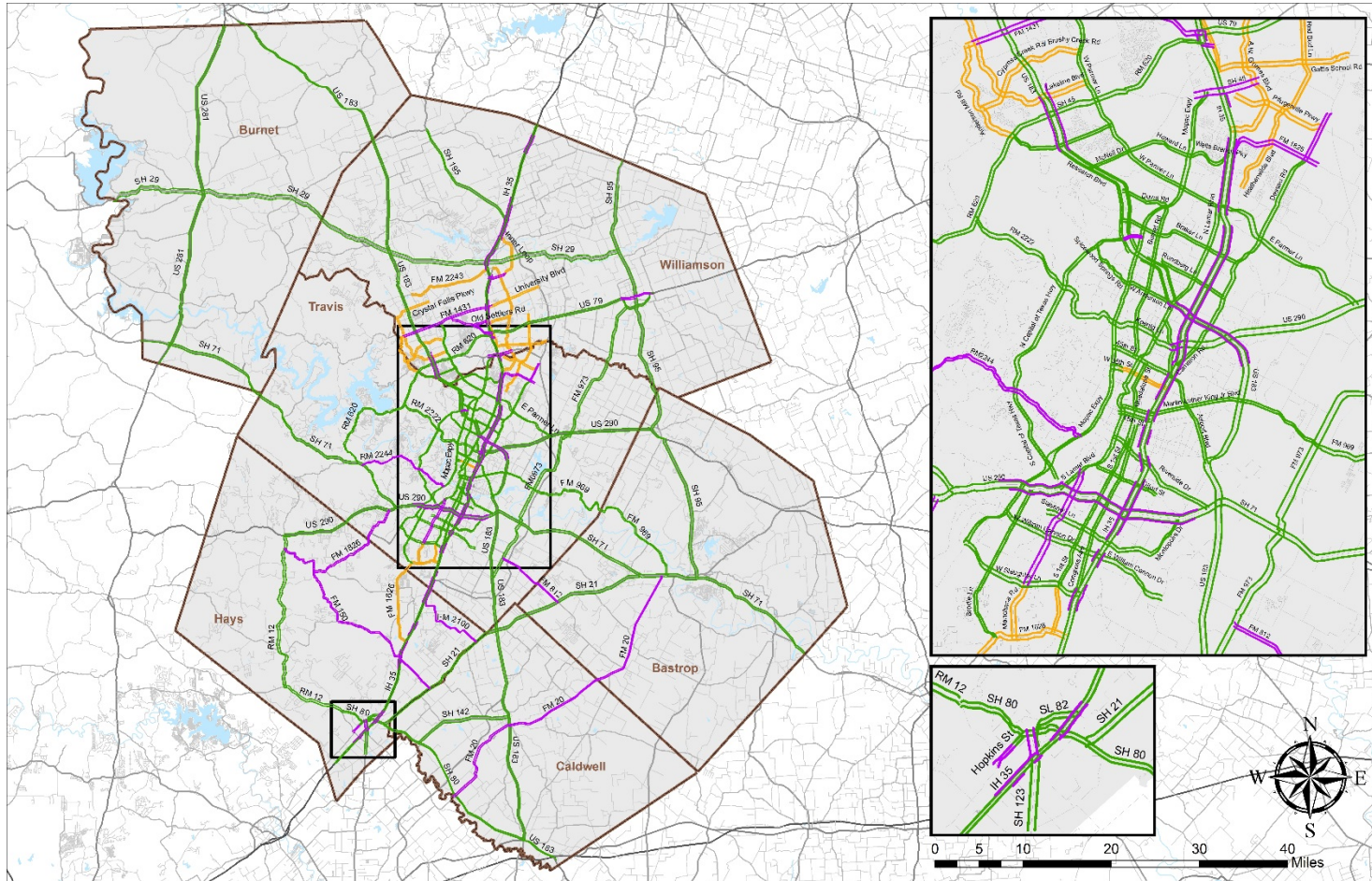
FIGURE 1 Illustration of an overlap between TMCs and an intermodal connector.

Courtesy of Dama Consultants
and “Hafeez, Sturm, Kasemsarn,
Rawling, Sherman. (2016)”

Accuracy and Accountability



- Austin, TX: 2012 CAMPO Congestion Analysis



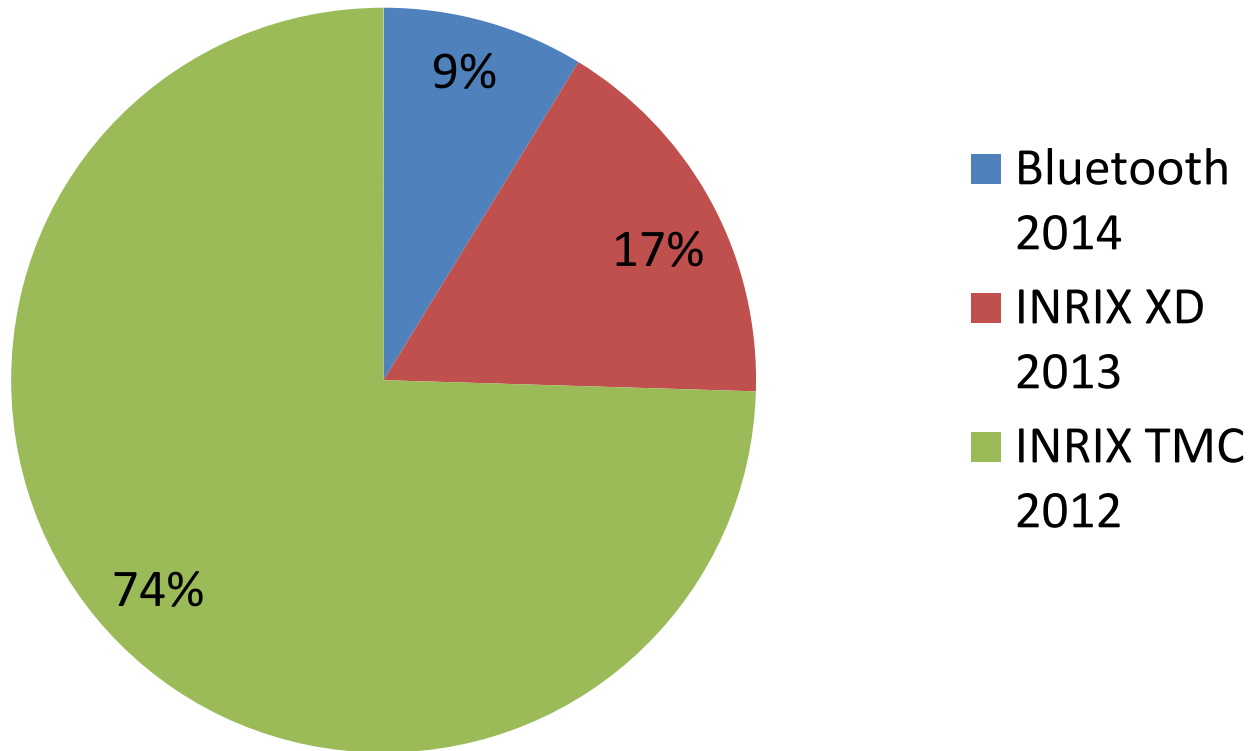
2012 CAMPO CMP Data Sources

CAMPO CMP Roadways

- Data Source**
- Bluetooth
 - INRIX - TMC
 - INRIX - XD

Due to data coverage limitations, three sources of data were used: 2012 INRIX traffic message channel (TMC) data; data that TTI collected using Bluetooth readers in February 2014; 2013 INRIX off-TMC data from the newly released XD Traffic on the remaining roadways.

2012 CAMPO CMP Roadway Speed Data by Source





Inrix Speed Data Sets: XD vs. TMC

TMC

XD

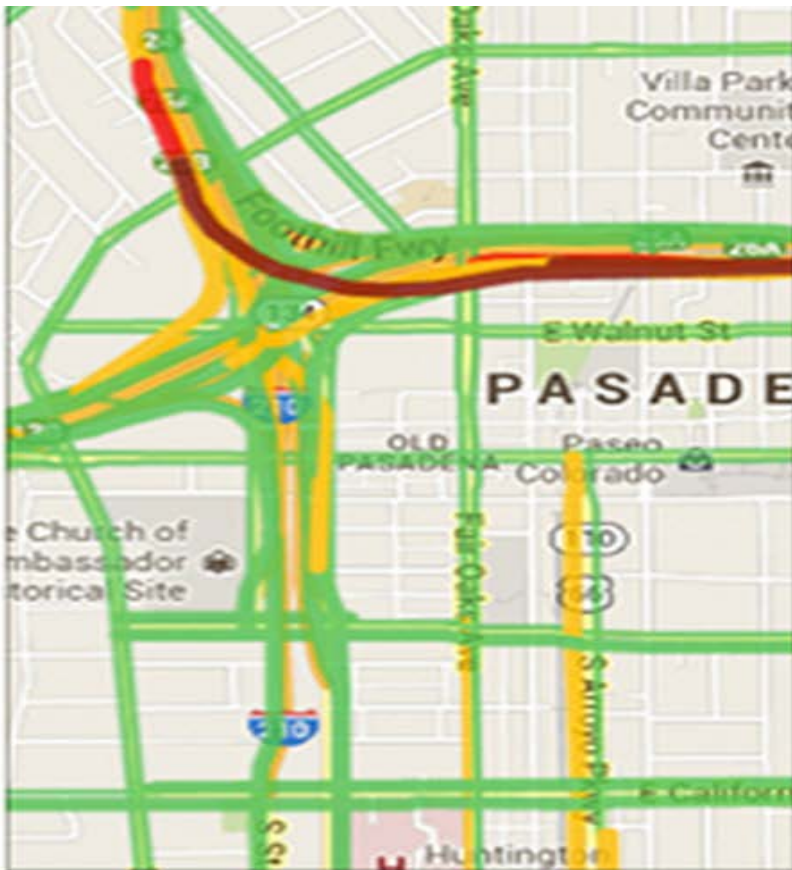
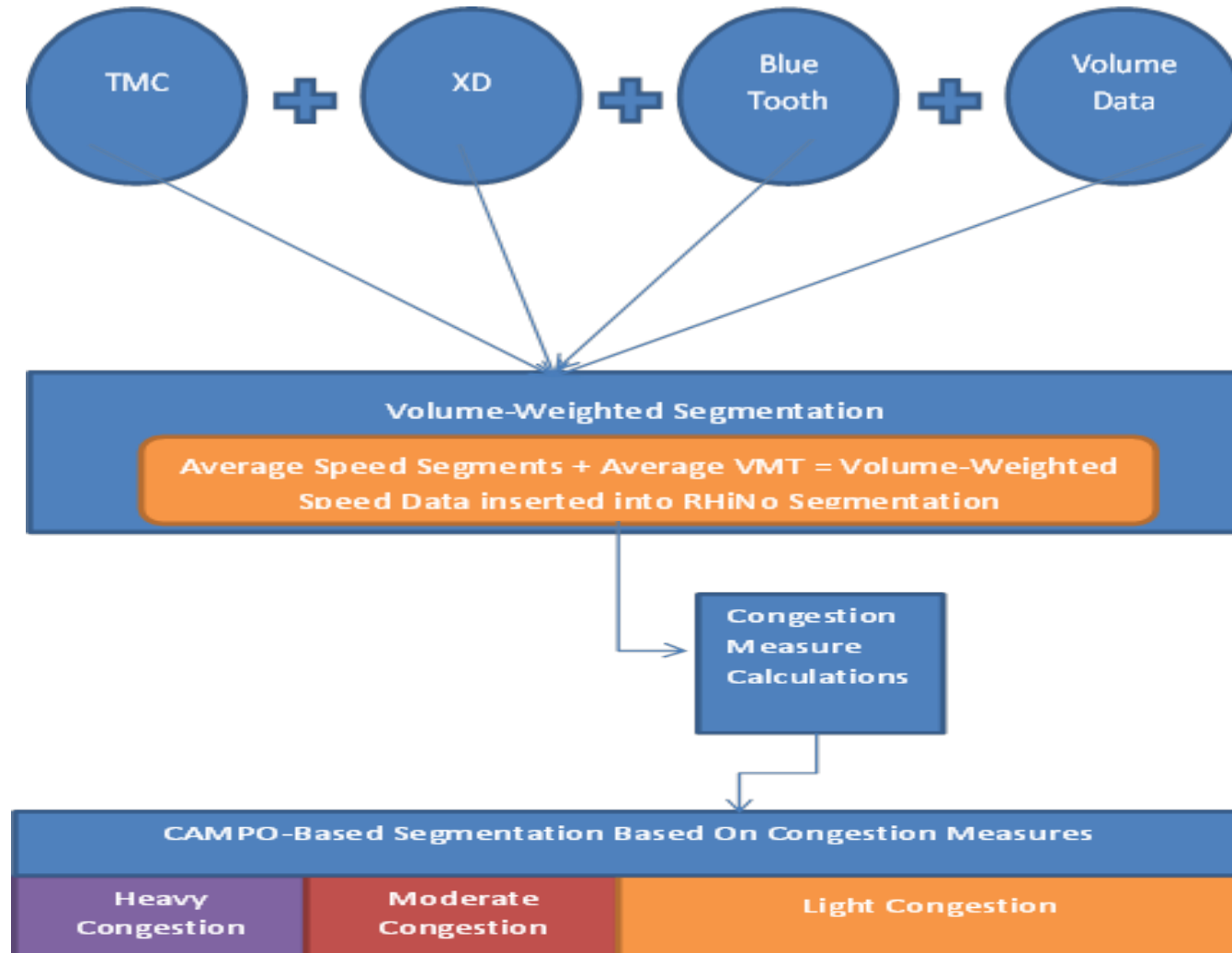
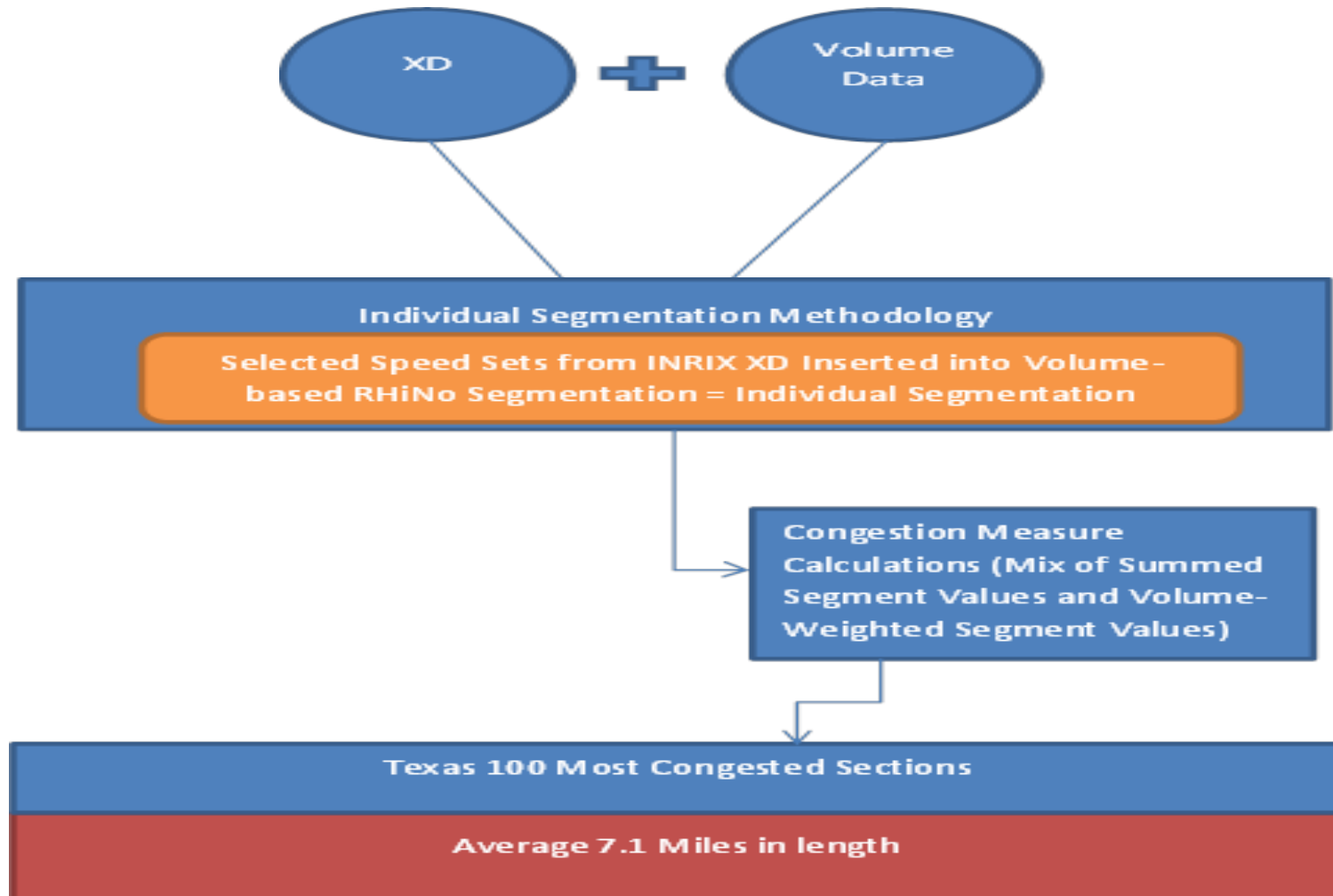


Figure 1- INRIX.com Advertisement on INRIX XD Dataset Comparing INRIX TMC to INRIX XD

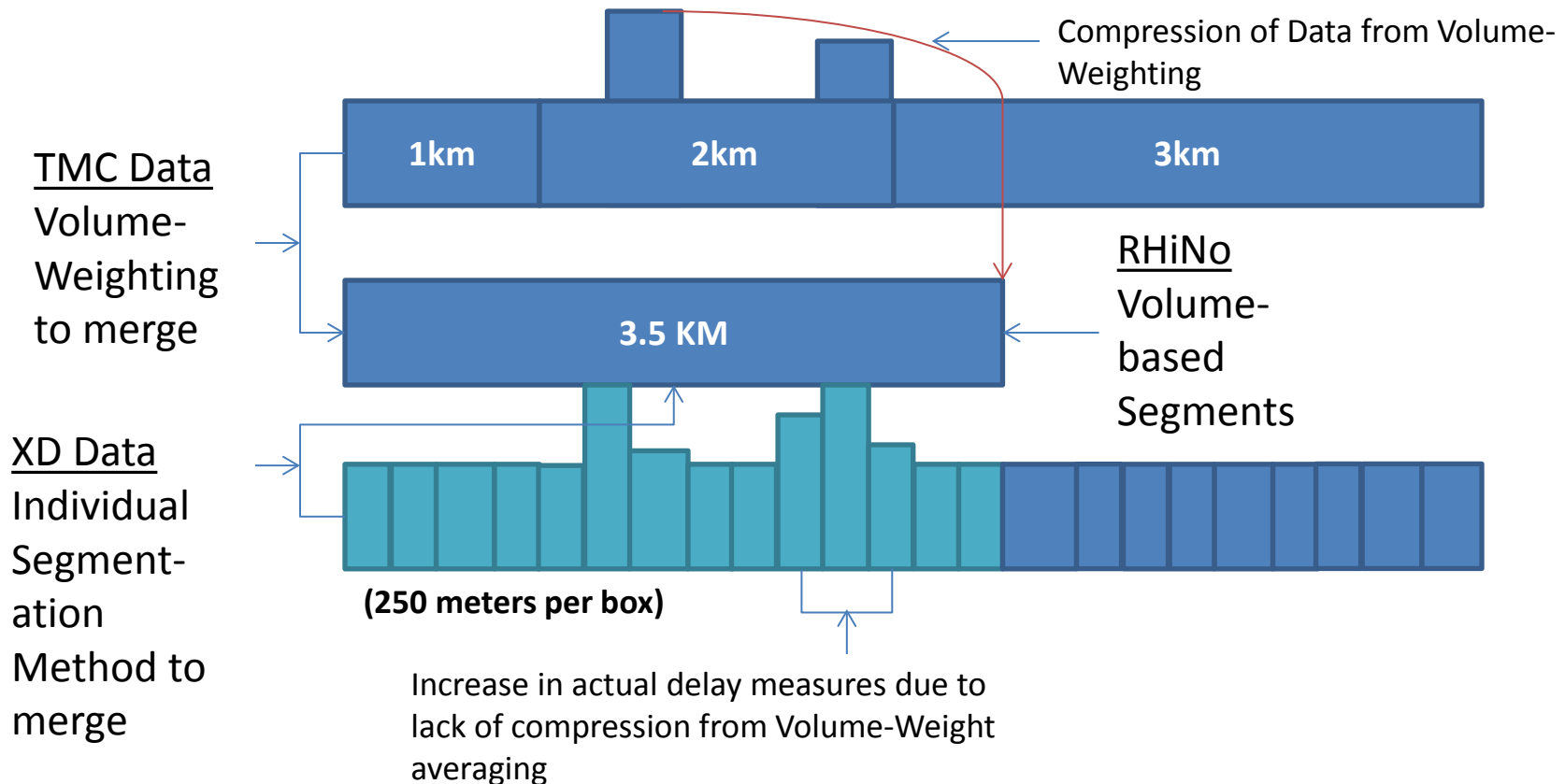
CAMPO CMP Process



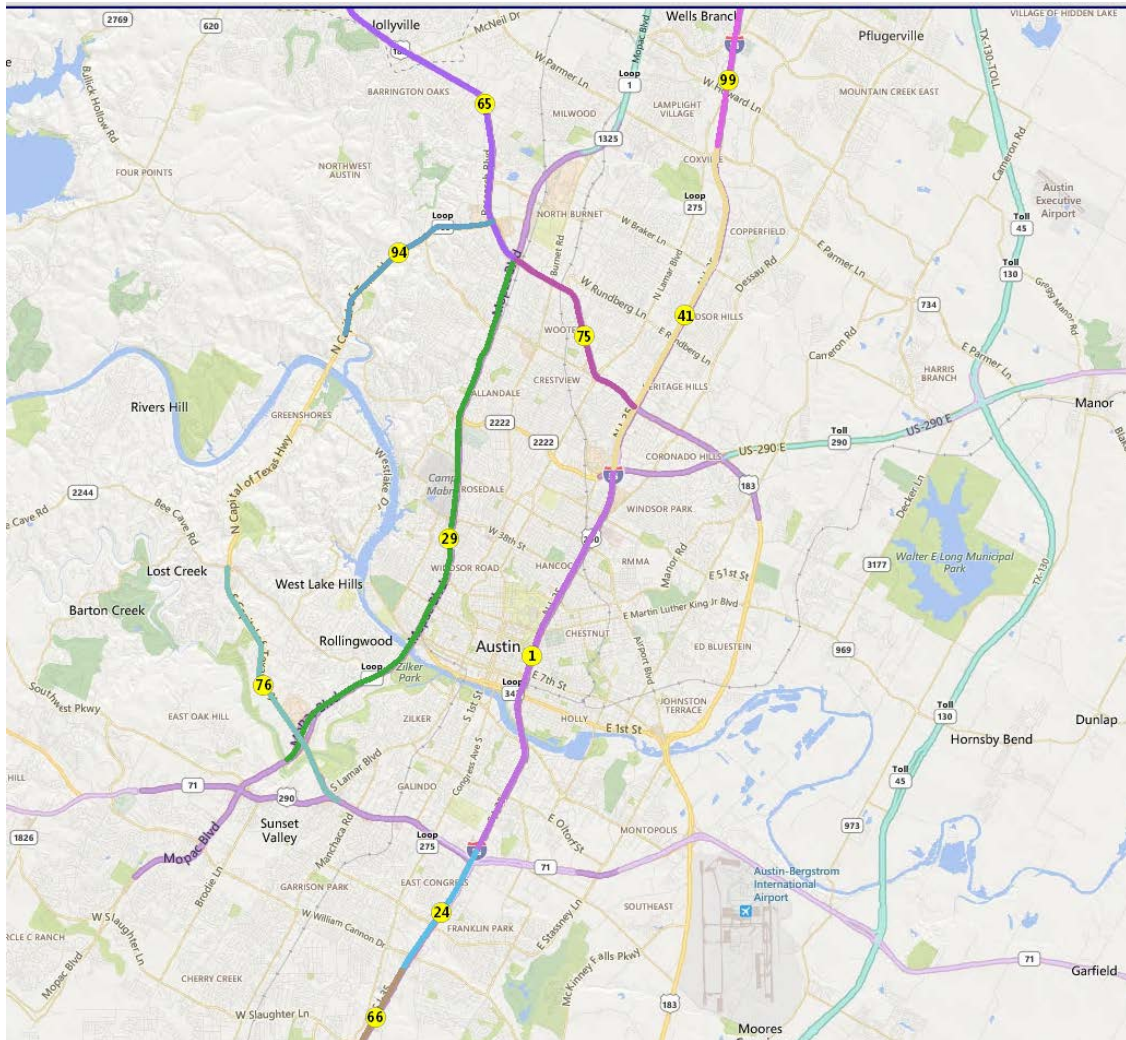
Texas 100 Most Congested Roads Process



Individual Segmentation Methodology



Data Comparison: CAMPO CMP vs. Texas 100



- Data
- Method
- Function



Accuracy and Accountability

- Summary:
 - NPMRDS
 - Raw
 - TMC-Based
 - Scarce at points
 - 5 Minute Bins
 - Congestion Analysis Methods
 - Segmentation
 - Weighting



Thank you!

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