

Traffic Message Channel Codes: Impact and Use within the Coalition

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**I-95 CORRIDOR
COALITION**

I-95 Vehicle Probe Project

- Initiated in 2008 – July 1
- Initial 2500 miles (1500 freeway, 1000 arterial)
- Maine to Florida
- Several states all in
- 2016 ~ 40,000 miles
 - Three vendors
 - Leading edge tools
 - One purchase, all share



www.I95Coalition.org

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Traffic Message Channel 101

- The white paper, “**Traffic Message Channel (TMC) Codes: Impact and Use within the Coalition**”, reviews:
 - TMC Background
 - TMC Code Governance
 - TMC Implementation
 - TMC Pros and Cons
 - Recommendations and Key Findings
- Funded by MCOM1

What is a TMC code?

- Traffic Message Channel code:
 - Shorthand method to communicate a location
 - Breaks the roadway network into links and nodes
 - ***Tech issues***: Length of segments, frequency of update, and availability of codes for all roadways are the primary issues
 - ***Programmatic issues***: Availability of base maps, conflation, and licensing

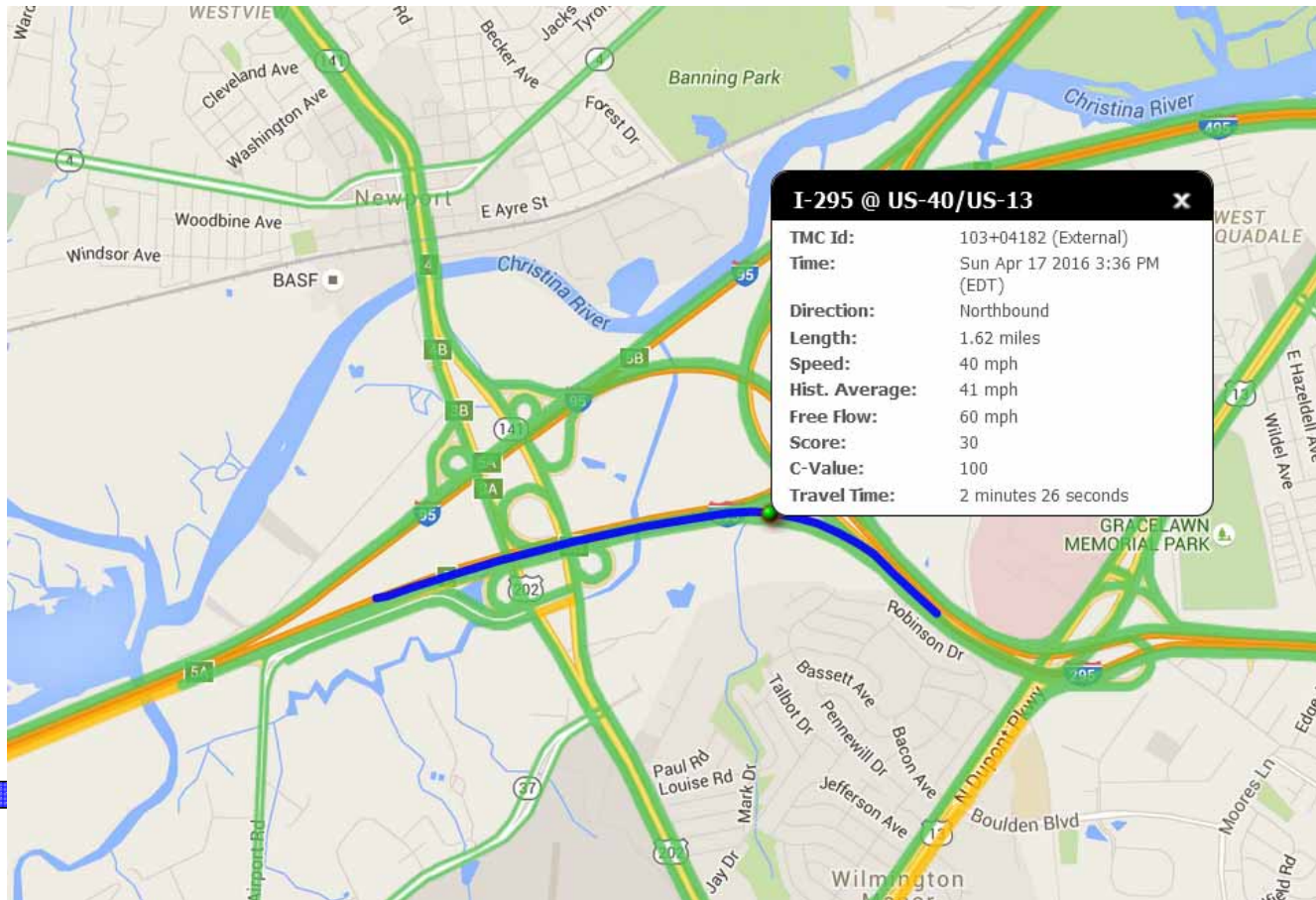
Example from the VPP Project

TMC Codes defined for:

- Freeways
- Principle Arterials
- Some Minor Arterials
- Freeway to freeway ramps
- Special use lanes
 - If separate roadway

Note defined for:

- Individual lanes
 - Most minor arterials and below
- TMC Codes breaks the network into logical segments for reporting traffic



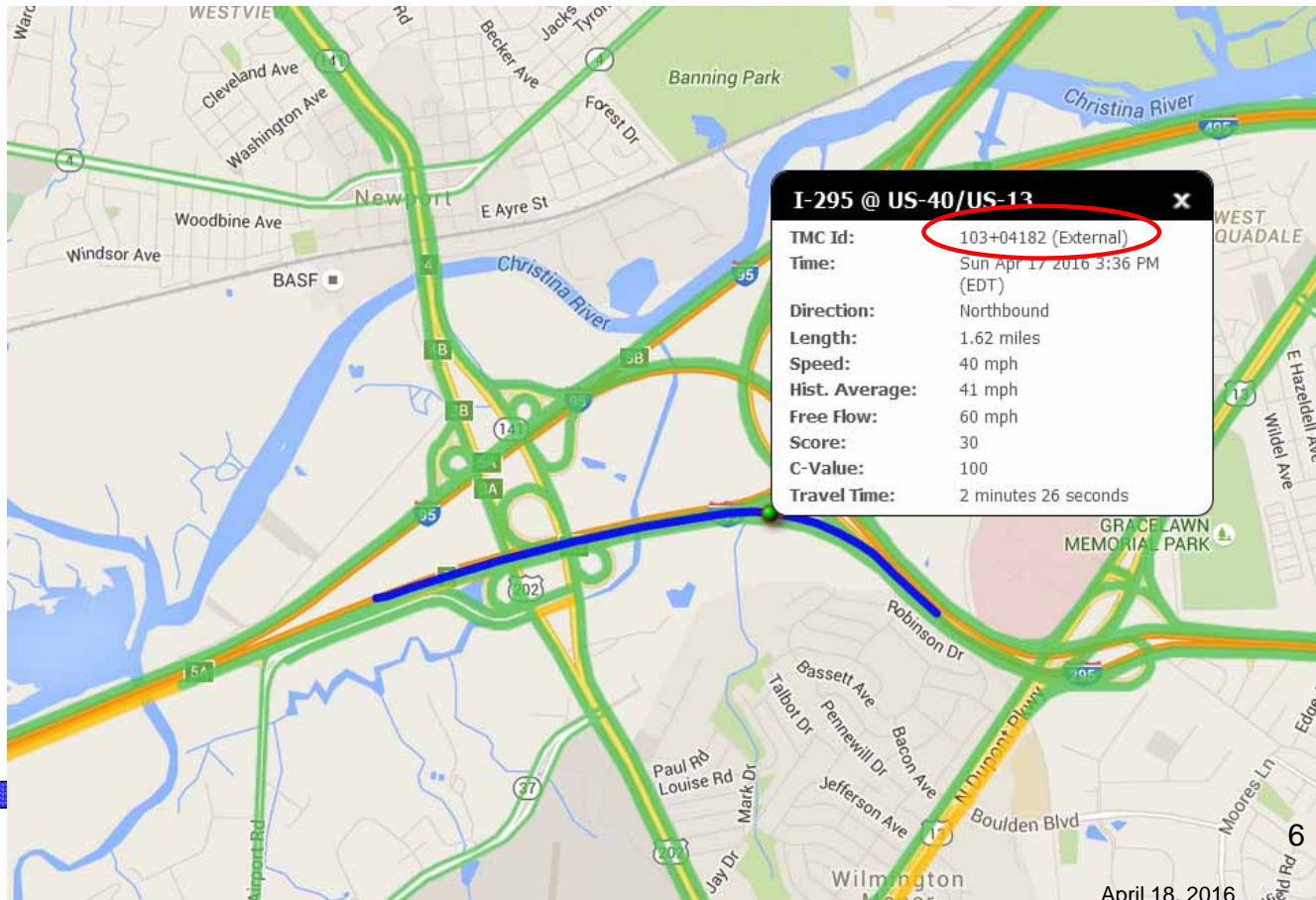
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TMC Background

- Decades old, developed by traffic industry to relay traffic data with low-bandwidth channels
- VPPI – TeleAtlas TMC codes were used
 - Timeliness of updates (new roads)
 - Availability on non-freeway facilities (ramps, special use lanes, arterials)
- VPPII – TeleAtlas & Navteq TMC codes
 - Alternate segmentation schemes

How to read a TMC code

The following TMC can be broken down

110**N**04615

110 - The area code/ region

N – The direction of travel

04615 – Defines road and segment in linear manner

Symbol	Internal/ External	Direction
N	I	S, E, CCW
- *	E	
P	I	N, W, CW
+ *	E	

* TeleAtlas only

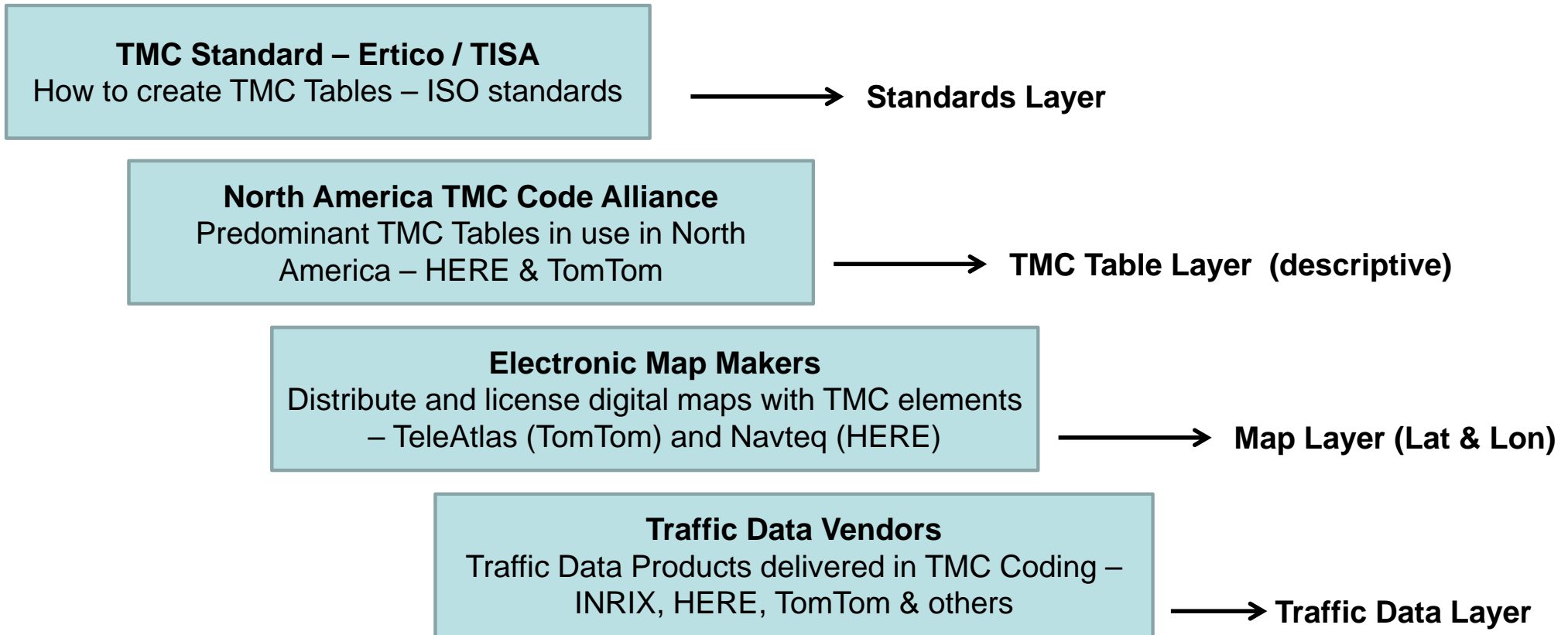
TMC Code Governance

- Standards
 - Maintained by the Traveler Information Services Association (TISA), hosted in ERTICO (ITS Europe)
 - Serve as guidelines to create TMC tables containing roadway points and corresponding segments
- The North American TMC Code Alliance (NATMCCA) maintains the American and Canadian TMC Table

What is a TMC Table?

- Provides locations where roadway is broken into segments usually at intersection, political borders, or natural features
- TMCs are descriptive, not Lat/Lon's
- Defines technically points, connecting points creates segments in TISA standards.
- Are proprietary and different from the vendors' TMC maps

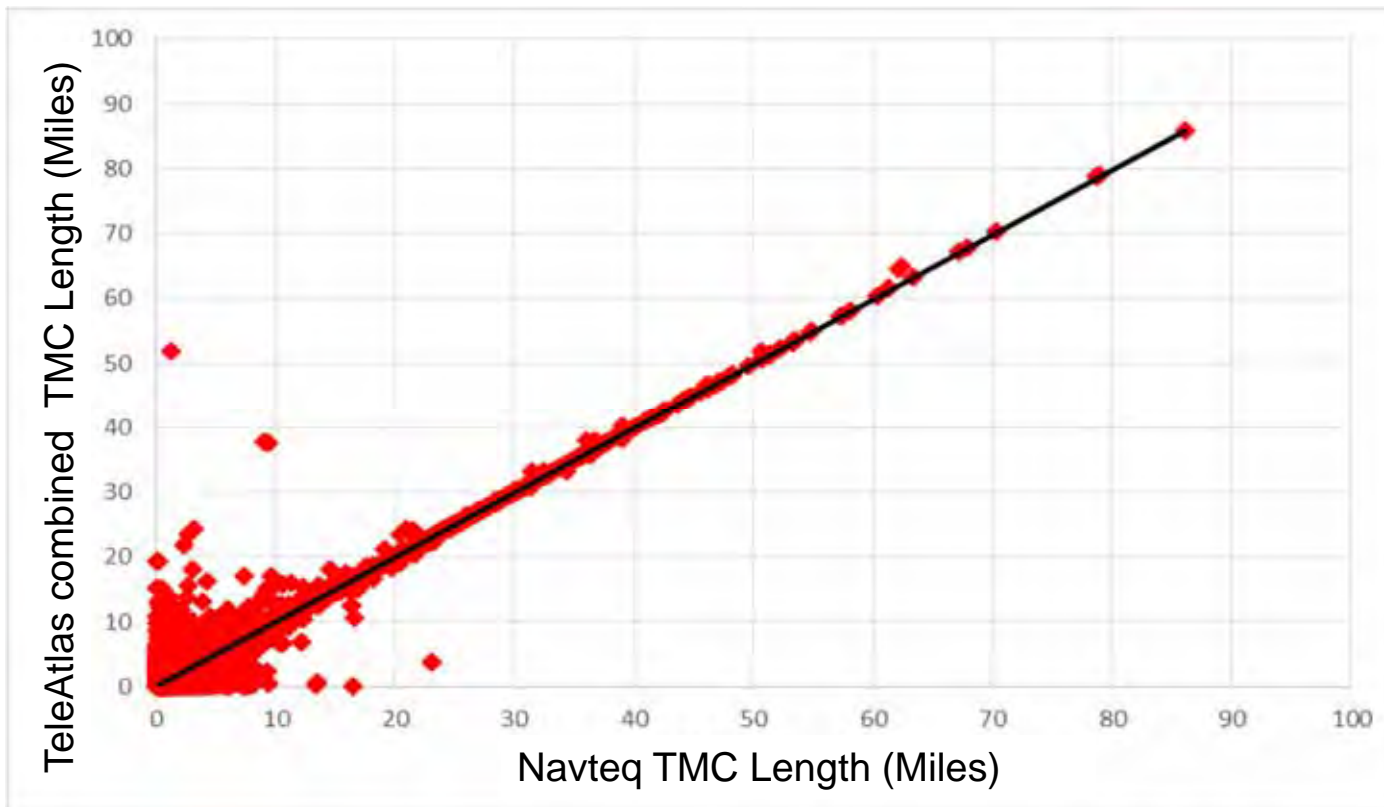
TMC Layers



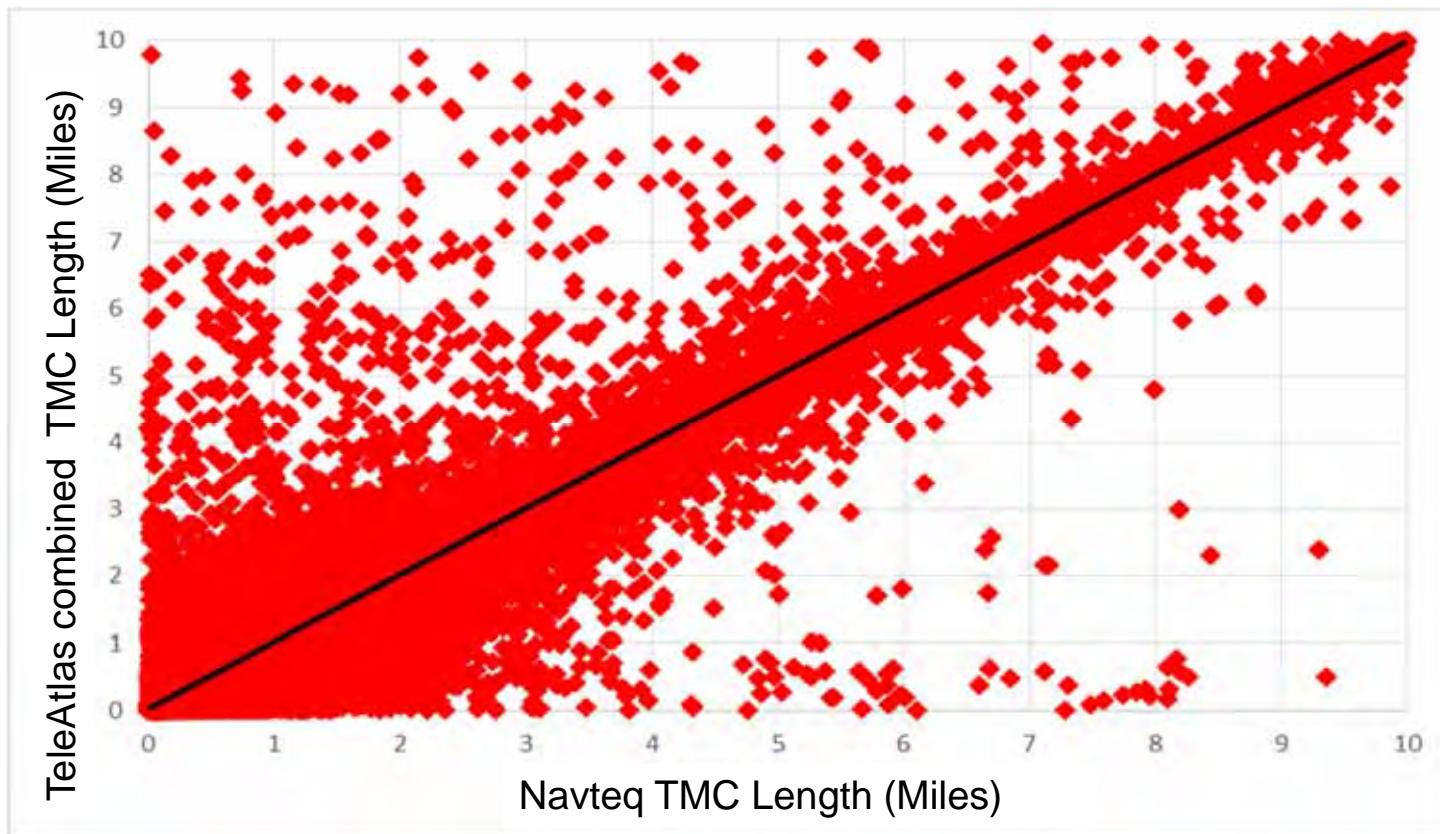
Flavors of TMC



TMC Length Differences



TMC Length Differences



TMC - Pros and Cons

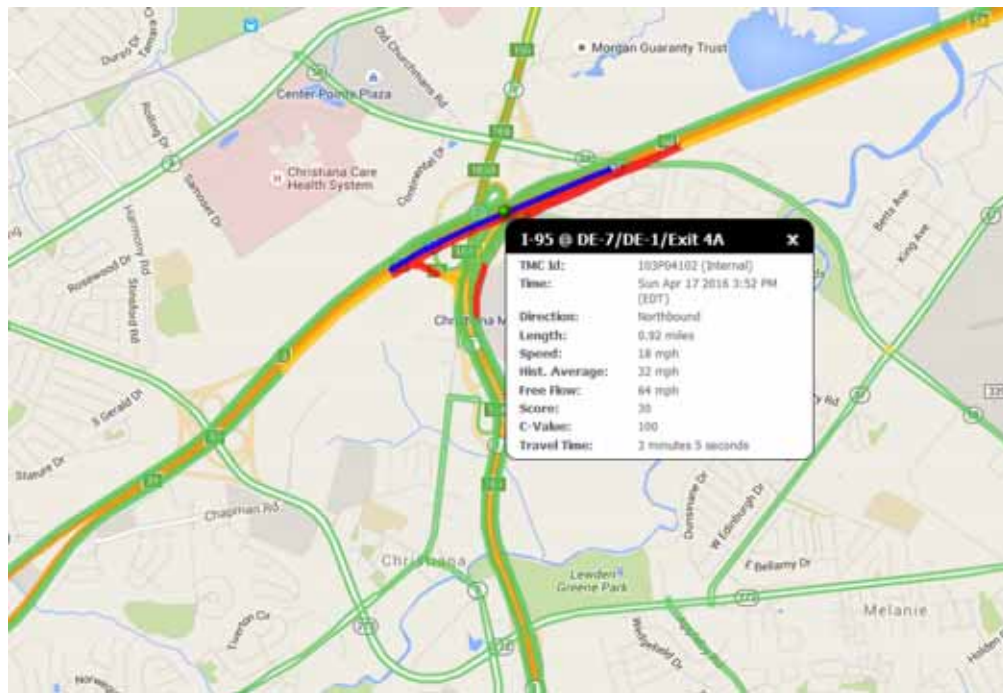
Pros	Cons
Not data intensive	Segment lengths can be too long or short
Maintained by industry	Inflexible
Maintained to TISA standard	Not always available (HOV/HOT, ramps, lower classifications)
Backward/forwards compatible	Slow to update

Key Findings

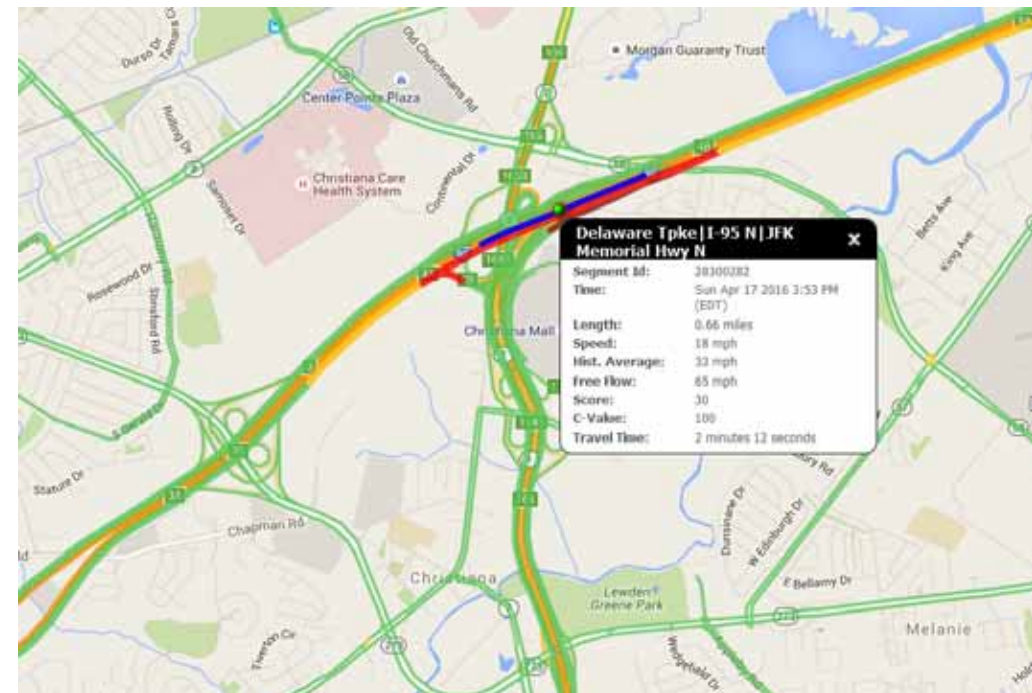
- TMC's will continue to enable cost-effective and stable data delivery
 - TMC traffic data 'sweet spot' are performance measures and traveler information on freeway and other principle arterials
- Alternative segmentation schemes are available by each vendor (available in appendix)
 - Alternate segmentation schemes enable applications requiring greater spatial resolution
- New standard unlikely

Alternate Segmentation Schemes - Freeways

TMC

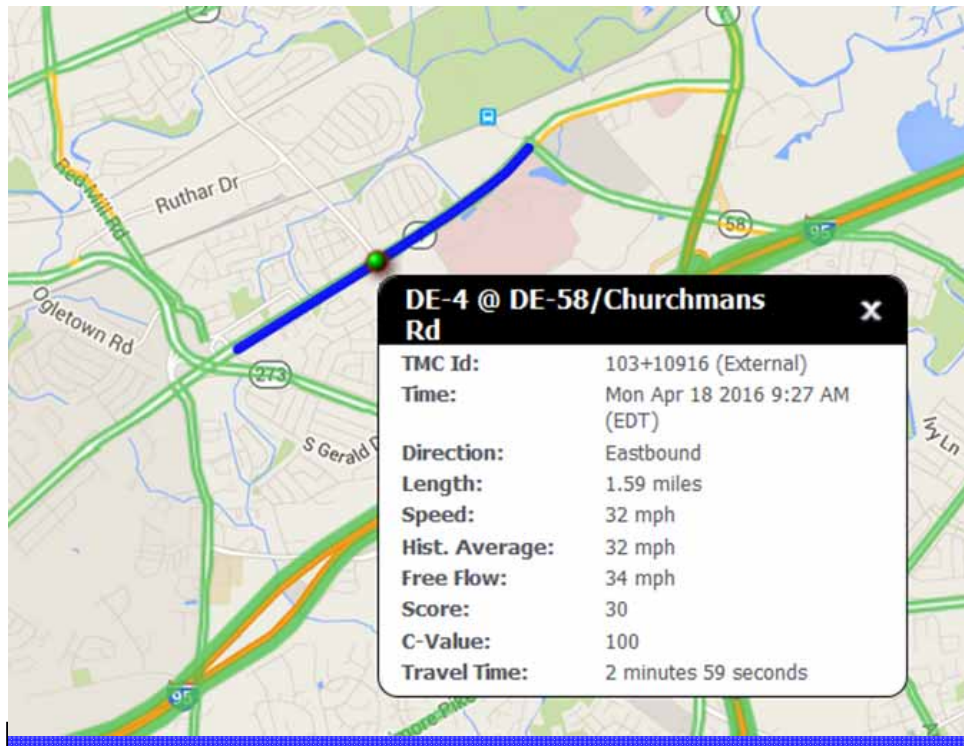


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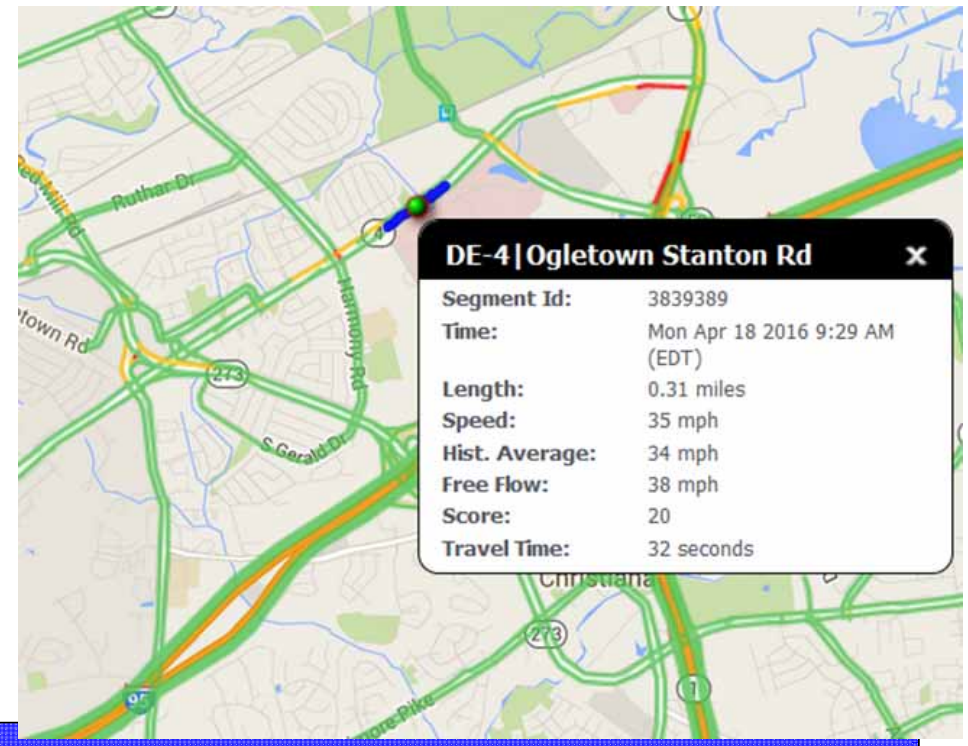


Alternate Segmentation Schemes - Arterials

TMC



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Probe Data Quality on Arterials (~2015)

✓ RECOMMENDED	🔑 SHOULD BE TESTED	✗ NOT RECOMMENDED
<ul style="list-style-type: none"> • ≤ 1 signal per mile • AADT > 40,000 vpd (2-way) • Limited curb cuts <p>Principal Arterials Likely to be accurate...</p>	<ul style="list-style-type: none"> • 1 to 2 signals per mile • AADT 20K to 40K vpd (2-way) • Moderate number of curb cuts <p>Minor Arterials Possibly accurate, test ...</p>	<ul style="list-style-type: none"> • ≥ 2 signals per mile • AADT < 20K (2-way) - low volume • Substantial number of curb cuts <p>Major Collectors Unlikely to be accurate...</p>

- **Probe data quality most correlated to signal density**
- Increased volume aids probe data quality, but does not overcome issues resulting from high signal density
- Accuracy anticipated to improve with increased probe density and better processing

Alternate Segmentation Schemes

- Pros
 - More responsive – can create new segments faster
 - Higher granularity, fully controlled by vendor
- Cons
 - Vendor Specific – may be proprietary or open source
 - Cannot be easily ported to new data source or maps
 - Not standard, tools (apart from vendor) lacking
 - Conflation required

Recommendations for the Coalition

- Continue developing and sharing TMC educational material
- Use TMCs for long-term analysis, traveler info, sharing of data, higher level facilities
- Use non-TMC methods as needed, conflation required
- I-95CC provide forum for best practices
- Encourage open standards when possible