NPMRDS/Probe Data Applications

Agenda

- NPMRDS Speed Data
  - Summary
  - Shape File
  - Static File
  - Lookup Table
  - Analysis and Customized Tools
- Applications
- Next Steps

NPMRDS/Probe Data Applications

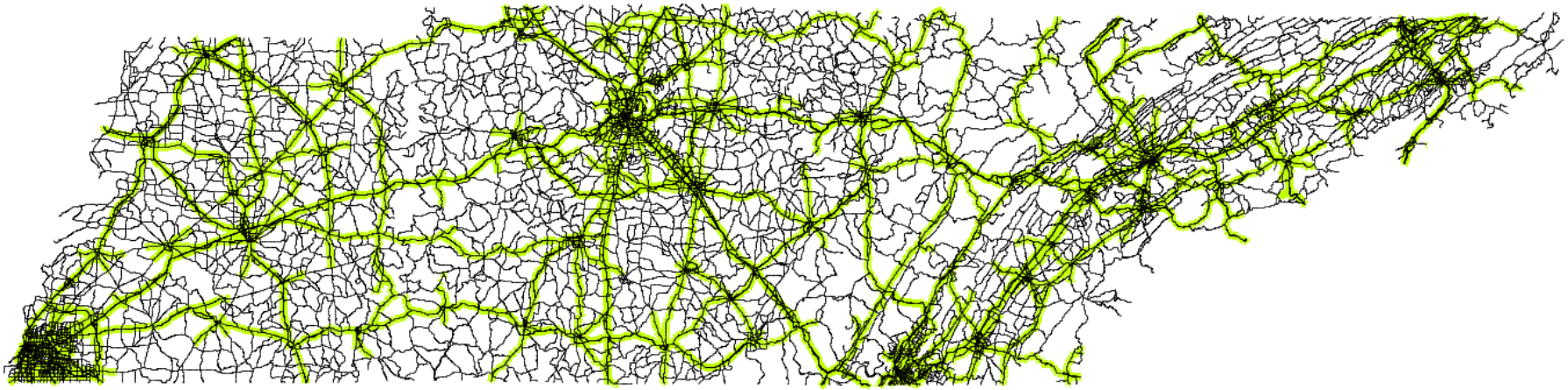
Speed Data Summary

- Data
  1. HERE Data: All Street Network Data
  2. NPMRDS: Free, a subset of HERE data
  3. Others: Inrix, Google.. Etc

- NPMRDS
  - Average Travel Time in Seconds by 5-Minute Bin
  - By Passenger Vehicle, Truck, and All Traffic
  - NHS Network GIS File: Link ID, Alignments
  - Static File: TMC, Distance,
  - Lookup Table: TMC, Link ID

NPMRDS – Shape File

- NHS Routes Only
- **Link ID**
- **Street Name**



NPMRDS Static File

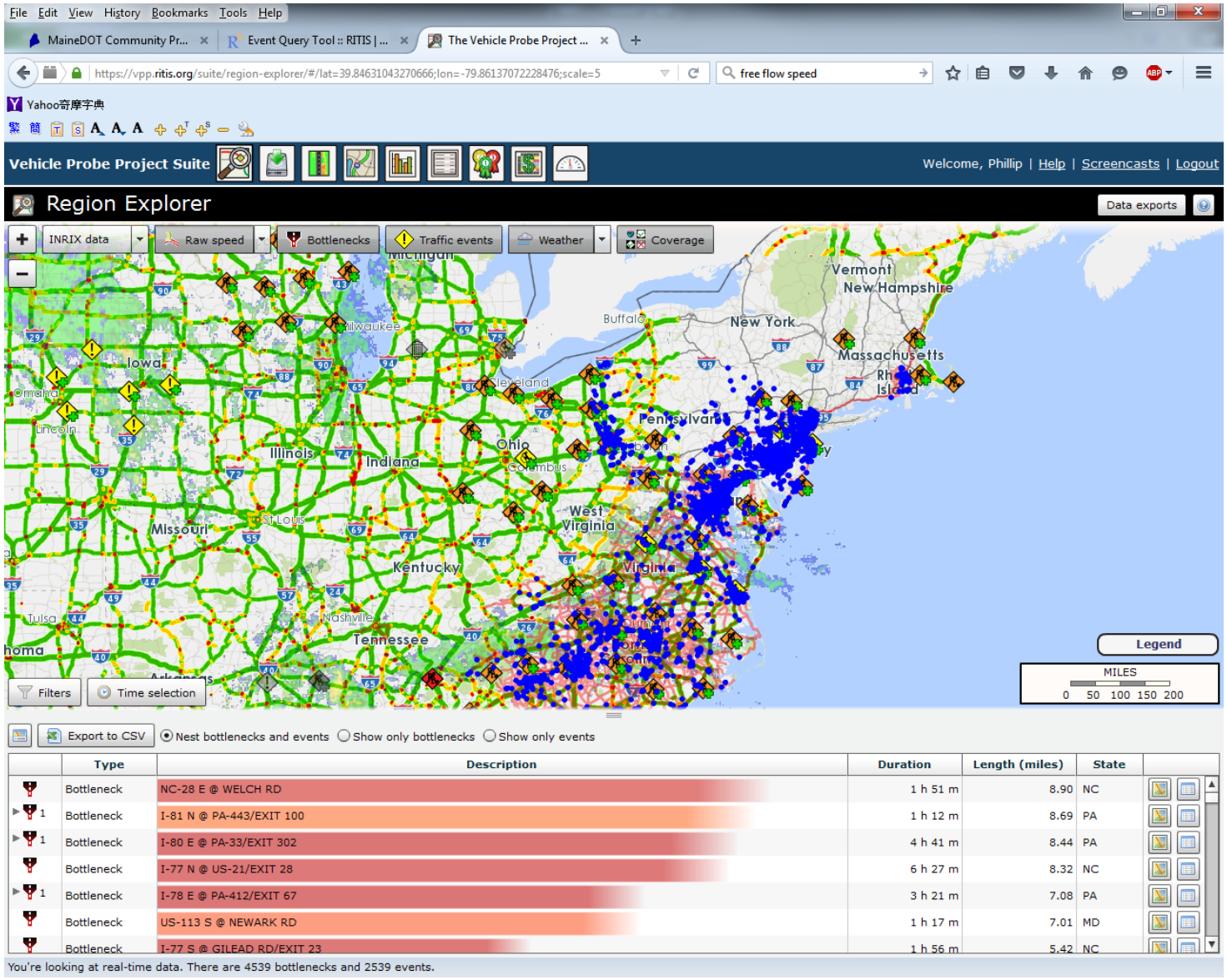
- **TMC**
- **Road Direction:** Eastbound, Northbound, Southbound, Westbound, Inner Loop, Outer Loop

NPMRDS Visualization and Quick Analysis

- Existing Websites
  - https://www.ritis.org

- Manual Processing Using the Raw Data
  - Calculate the travel speed (distance/time)
  - Join the Link ID and TMC ID to the shape file by Direction (N, E, S, W)

RITIS

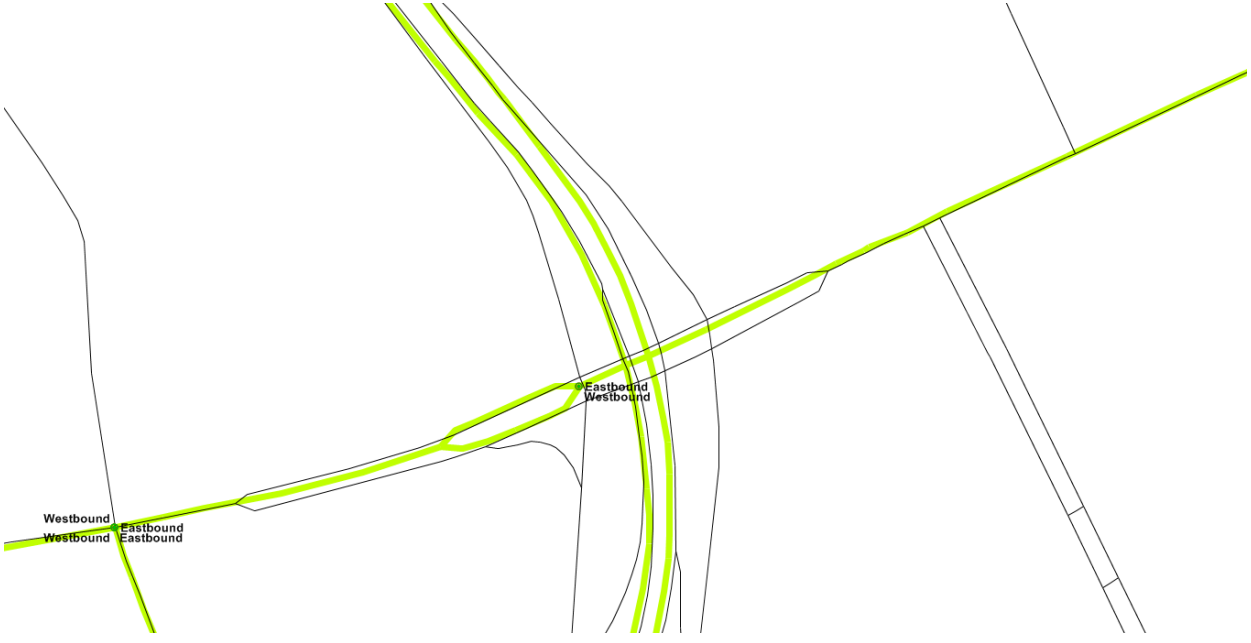

File Edit View History Bookmarks Tools Help
MaineDOT Community Pr...
Event Query Tool :: RITIS | ...
The Vehicle Probe Project ...
https://vpp.ritis.org/suite/region-explorer/#/lat=39.84631043270666;lon=-79.86137072228476;scale=5
free flow speed
Yahoo奇摩字典
Vehicle Probe Project Suite
Welcome, Phillip | Help | Screencasts | Logout
Region Explorer
Data exports
INRIX data
Raw speed
Bottlenecks
Traffic events
Weather
Coverage
Vermont
New Hampshire
New York
Massachusetts
Buffalo
Iowa
Illinois
Indiana
Ohio
Pennsylvania
West Virginia
Missouri
Kentucky
Tennessee
Filters
Time selection
Legend
MILES
0 50 100 150 200
Export to CSV
Nest bottlenecks and events
Show only bottlenecks
Show only events
Type
Description
Duration
Length (miles)
State
Bottleneck NC-28 E @ WELCH RD 1 h 51 m 8.90 NC
Bottleneck I-81 N @ PA-443/EXIT 100 1 h 12 m 8.69 PA
Bottleneck I-80 E @ PA-33/EXIT 302 4 h 41 m 8.44 PA
Bottleneck I-77 N @ US-21/EXIT 28 6 h 27 m 8.32 NC
Bottleneck I-78 E @ PA-412/EXIT 67 3 h 21 m 7.08 PA
Bottleneck US-113 S @ NEWARK RD 1 h 17 m 7.01 MD
Bottleneck I-77 S @ GILEAD RD/EXIT 23 1 h 56 m 5.42 NC
You're looking at real-time data. There are 4539 bottlenecks and 2539 events.

Customized Tools

1. GIS – Spatial Join
2. Data Processing – Outliners
3. Data Processing – Percentiles, Average Speed, Time of Day

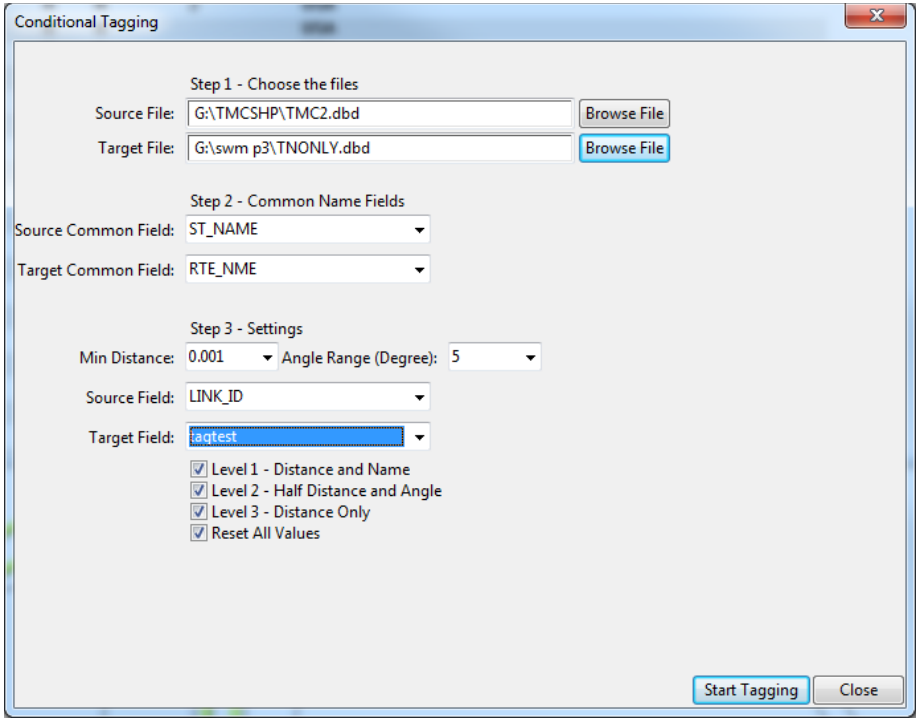
NPMRDS Spatial Join

- TRIMS – Lanes, Post Speed, Counts
- Model Network – Forecast Volume, Capacity, Project Location… etc
- Other Street Network



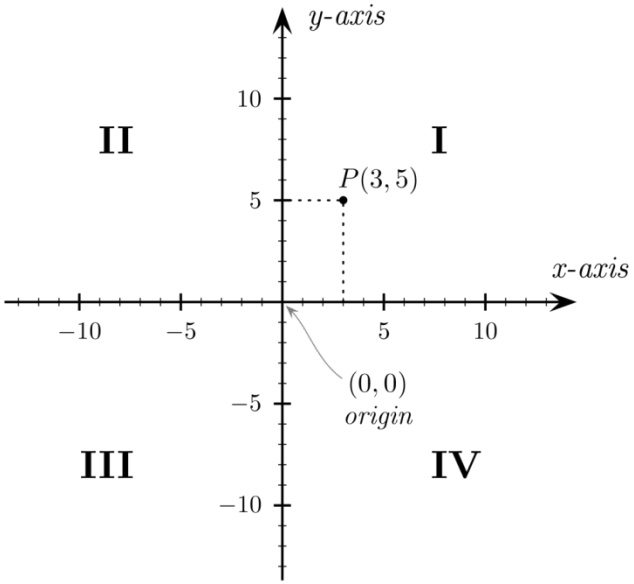
NPMRDS Spatial Join

- Consultants: $20,000 to $80,000
- In House Manual Processing
  - Customized Script



Customized GISDK Script

- Level 1: 4-Tier Distance and Names
- Level 2: Direction and Names
- Level 3: Distance Only
- It's not perfect but it saves time
- The tool is still being refined.
- The tool will be applied to transfer the data to TRIMS network



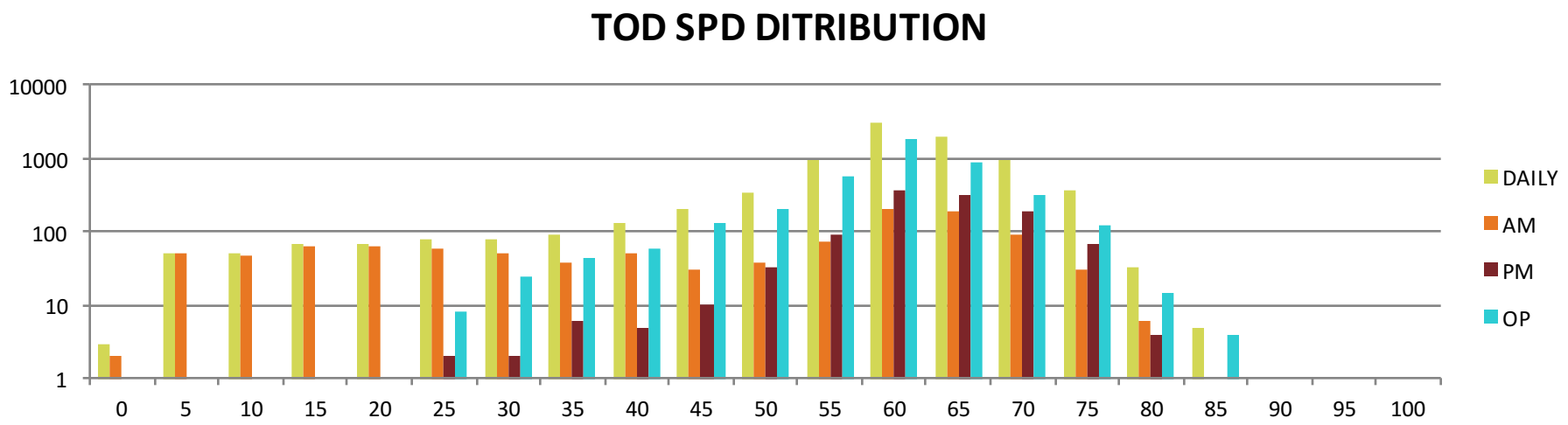
Script

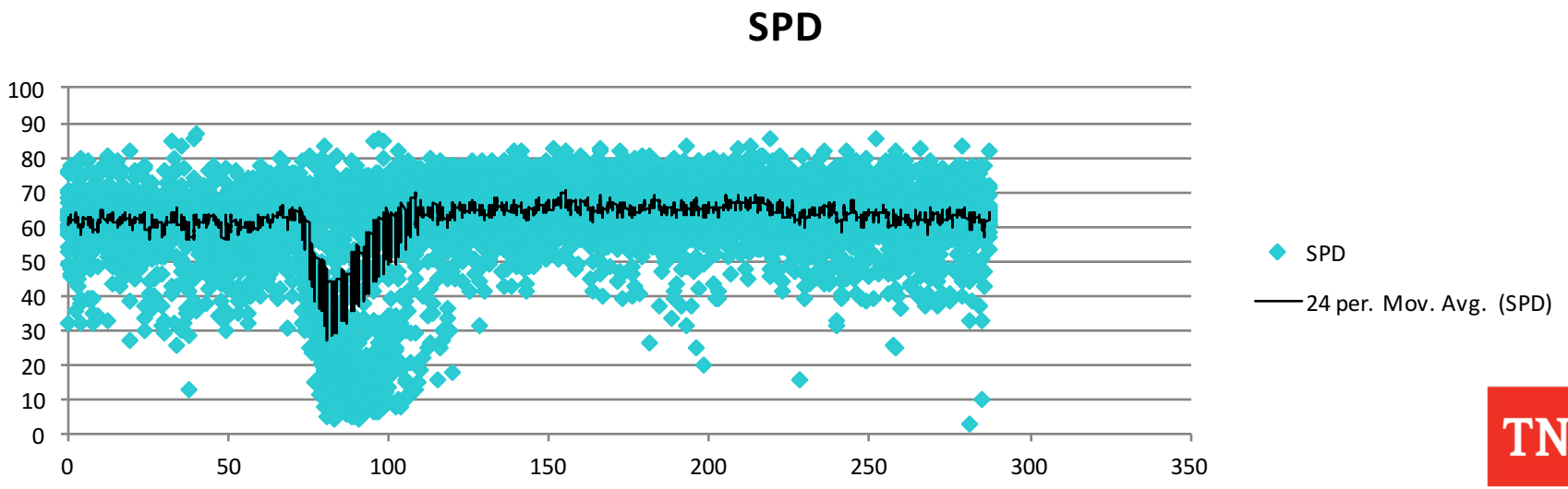
Applications

Applications

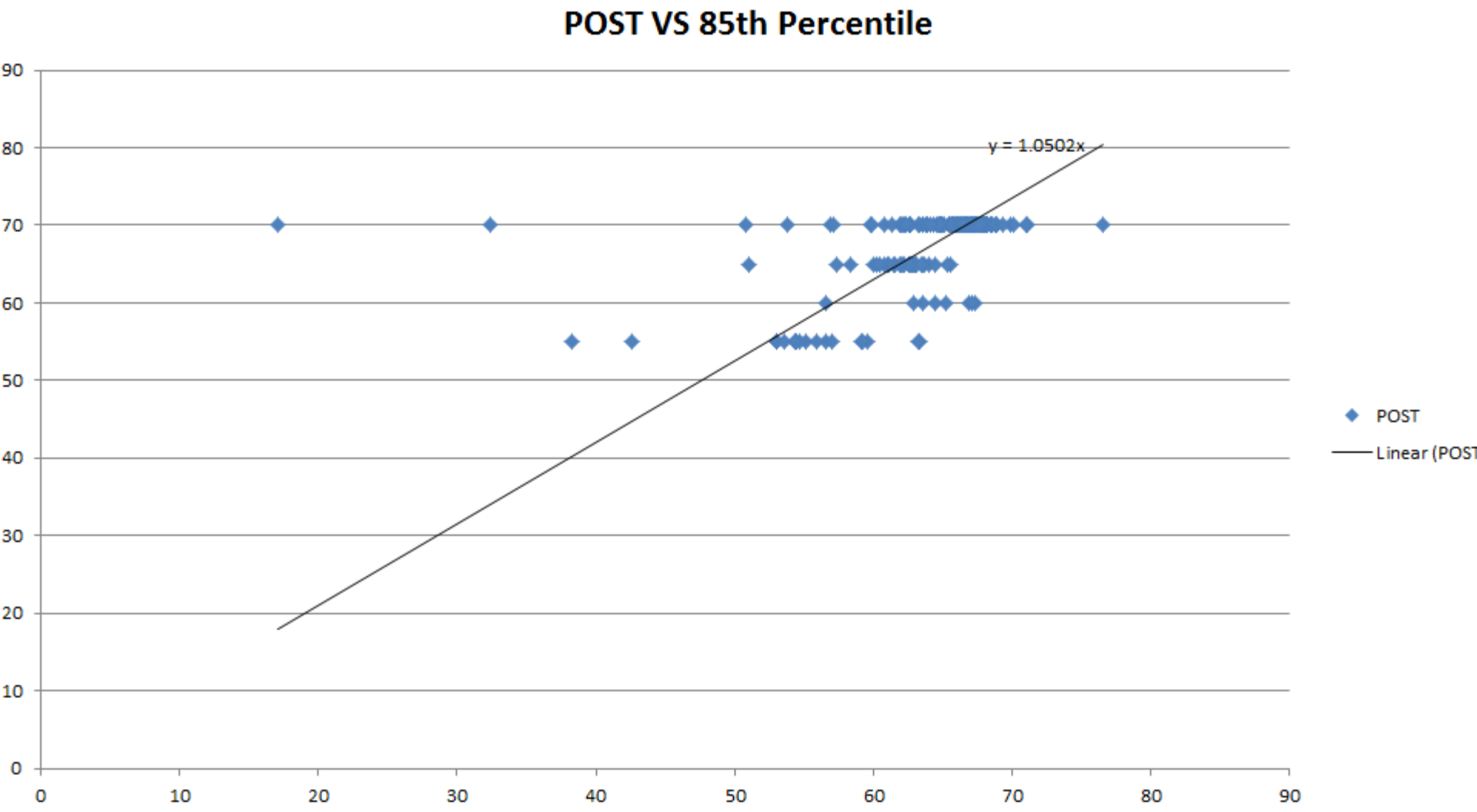
- Model Inputs
  - Time of Day Analysis
  - Post / Free Flow Speed
  - Travel Speed Calibration (VDF Function)
  - Travel Speed Validation
- System Performance Management
- Project Performance Evaluation

Applications Time of Day





Applications – POST / Free Flow Speed



Applications – POST / Free Flow Speed

Table 3-2 Free Flow Speed Adjustment Factors

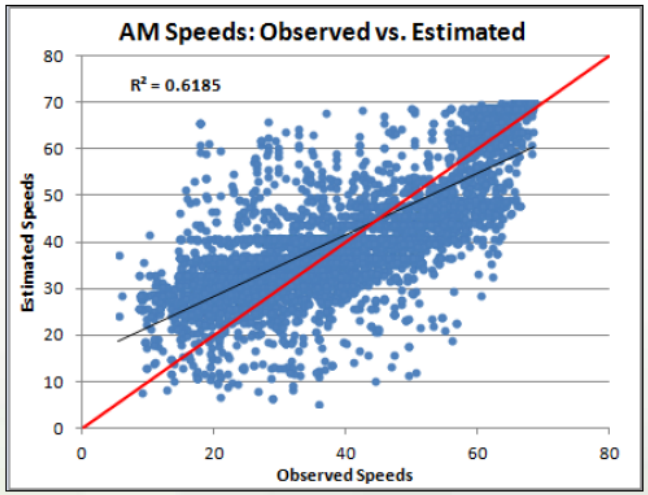
Functional Classification	Area Type			
	CBD	Urban	Suburban	Rural
Freeway	1.10	1.10	1.10	1.10
Arterial (Posted Speed >= 45 mph)	0.95	1.00	1.05	1.08
Arterial (Posted Speed < 45 mph)	0.95	1.00	1.10	1.15
Collector	0.90	1.00	1.13	1.20
Local	0.90	1.10	1.20	1.20

Functional Class	CBD	Urban	Suburban	Rural
Interstate	1.15	1.15	1.15	1.15
Freeway	1.1	1.1	1.1	1.1
ART>=45	0.97	1.05	1.05	1.05
ART<45	0.9	0.95	1	1.15
COLLECTOR	1.1	1.15	1.15	1.1
LOCAL	1.1	1.1	1.35	1.35

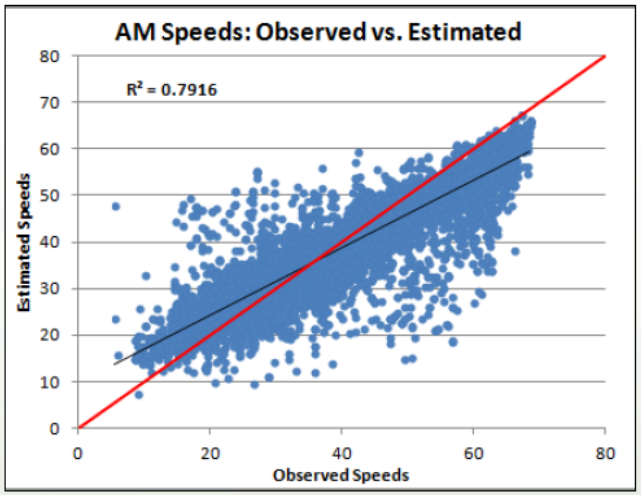
Fclass	85th SPD Factor	FF SPD Factor
1	1.06	1.05
2	1	1
6	1.07	1.06
7	0.96	0.95
8	0.93	0.92
11	1.03	1.03
12	1	1
14	1.13	1.13
16	1.15	1.15
17	1	1
18	0.85	0.84

Travel Speed Calibration

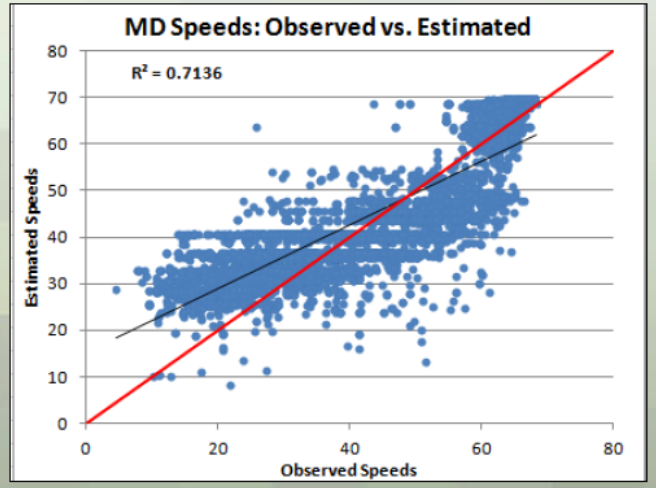
Current Model



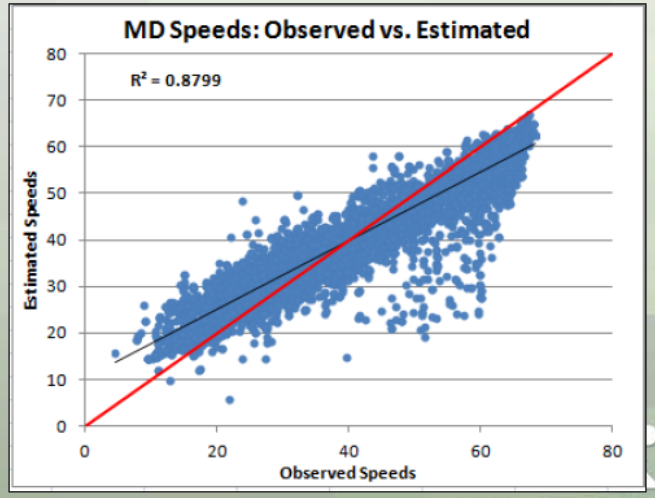
Updated Model



Current Model



Updated Model



System Performance Measure

Measures

- **Annual Hours of Delay (AHD)**—Travel time above a congestion threshold (defined by State DOTs and MPOs) in units of vehicle -hours of delay on Interstate and NHS corridors.
- **Reliability Index (RI_{80})**—The Reliability Index is defined as the ratio of the 80th percentile travel time to the agency-determined threshold travel time.

Others

- Current Congestions
- Project Performance Measure
- Identify Bottleneck Locations.. etc

Next Steps

Next Steps

- Finalizing the HERE data purchase
- Refine the GISDK Scripts
- Finalizing the Outliner Method
- Transfer the TMC network to TRIMS and Provide
  - Travel Speed by Vehicle Types by Time of Day

Questions?