

Statewide Travel Demand Model V4.0 Enhancements: Reporting & Visualization

Tennessee Model Users Group
Mt. Juliet, Tennessee

October 11, 2022
TDOT Long Range Planning Division

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Project Scope and Purpose

Enhance the Tennessee Statewide Travel Demand Model (TSM) V4.0 with further improvements in scenario output features such as summary reporting, visualization, application, and mapping through the model GUI interface.

This is an interim report – scheduled completion is January 2023.

Project Goal

- Make the TSM easier to use.
 - Provide enhanced outputs.
 - Add features and tools.
 - Clarify documentation.
 - Provide Training.
-
- Work thus far has focused on a model output **dashboard** that is refreshed every time the model is run.
 - Dashboard results follow:
 - **Live demo if possible**

Implementation

- Programmed in Rmarkdown. All open-source.
- Will be called from GISDK code every time the model is run.
- Running time ~ 10 minutes.
- Creates a completely self-contained HTML file.
- Modeling software not required to view.
- Can be posted on a web page.

Dashboard Opening Screen

Main menu

Tennessee Statewide Model: Scenarios.Base_2015 Long Range Planning Division — 10 October, 2022



MAPS ▾

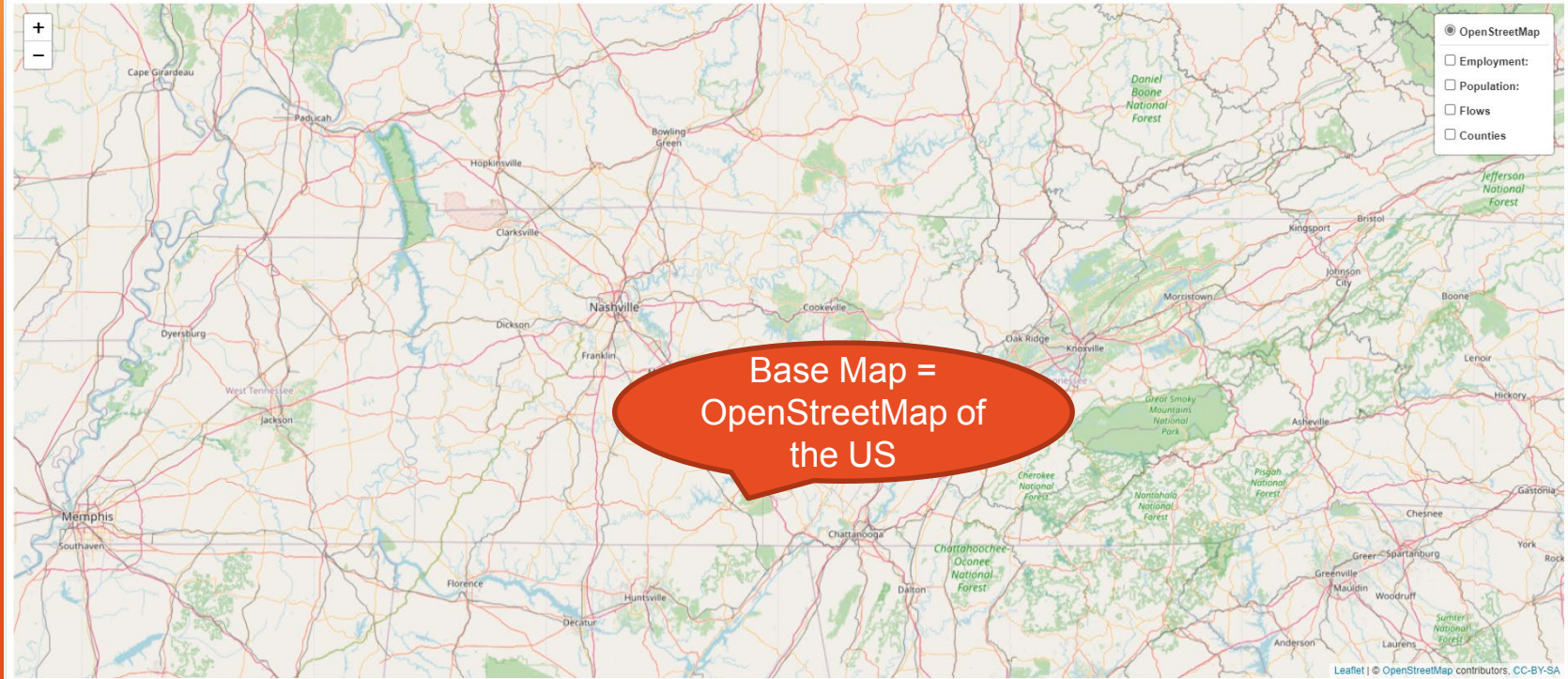
ZDATA ▾

DESIRE LINES ▾

Distribution ▾

Valid ▾

Zdata & Assignment



Employment by TAZ

Tennessee Statewide Model: Scenarios.Base_2015 Long Range Planning Division — 10 October, 2022



MAPS ▾

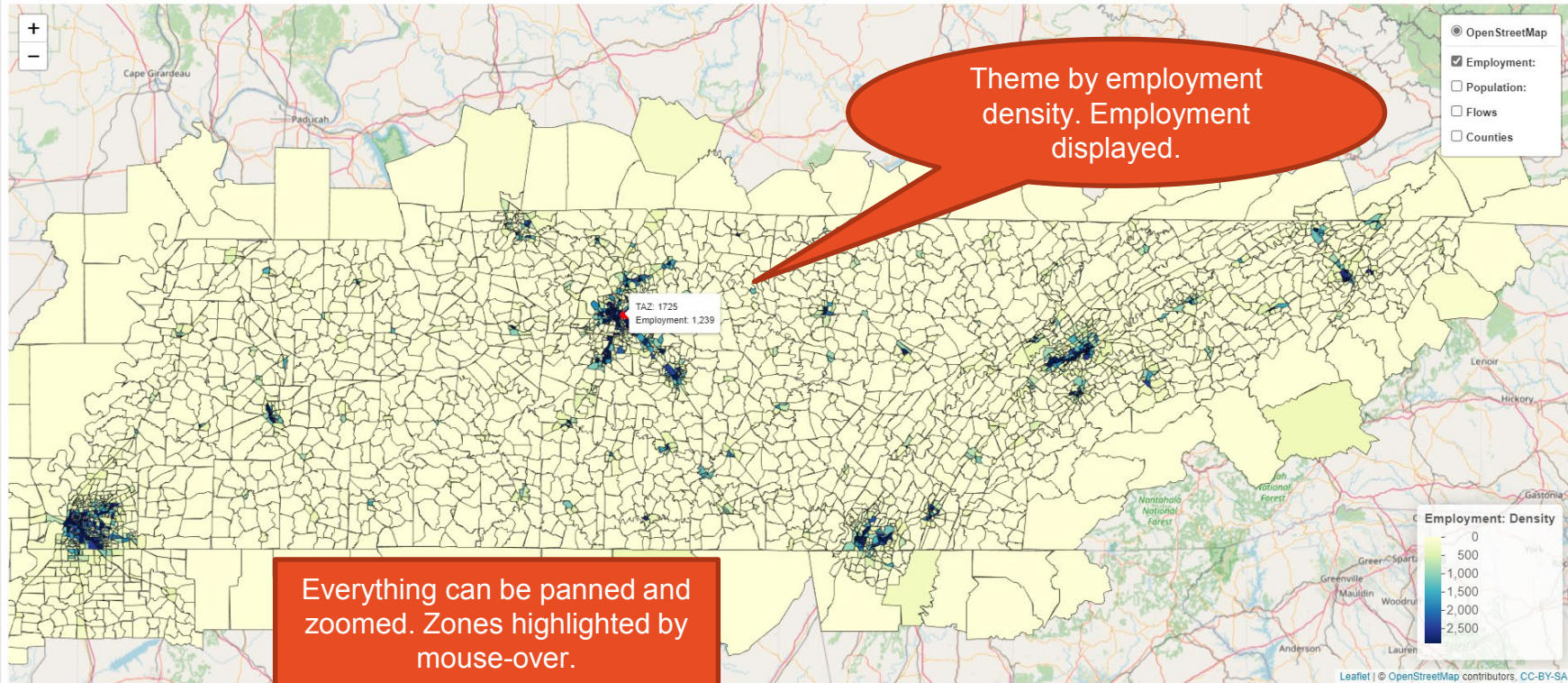
ZDATA ▾

DESIRE LINES ▾

Distribution ▾

Valid ▾

Zdata & Assignment



Population, HH & trip ends by TAZ

Tennessee Statewide Model: Scenarios.Base_2015 Long Range Planning Division — 10 October, 2022



MAPS ▾

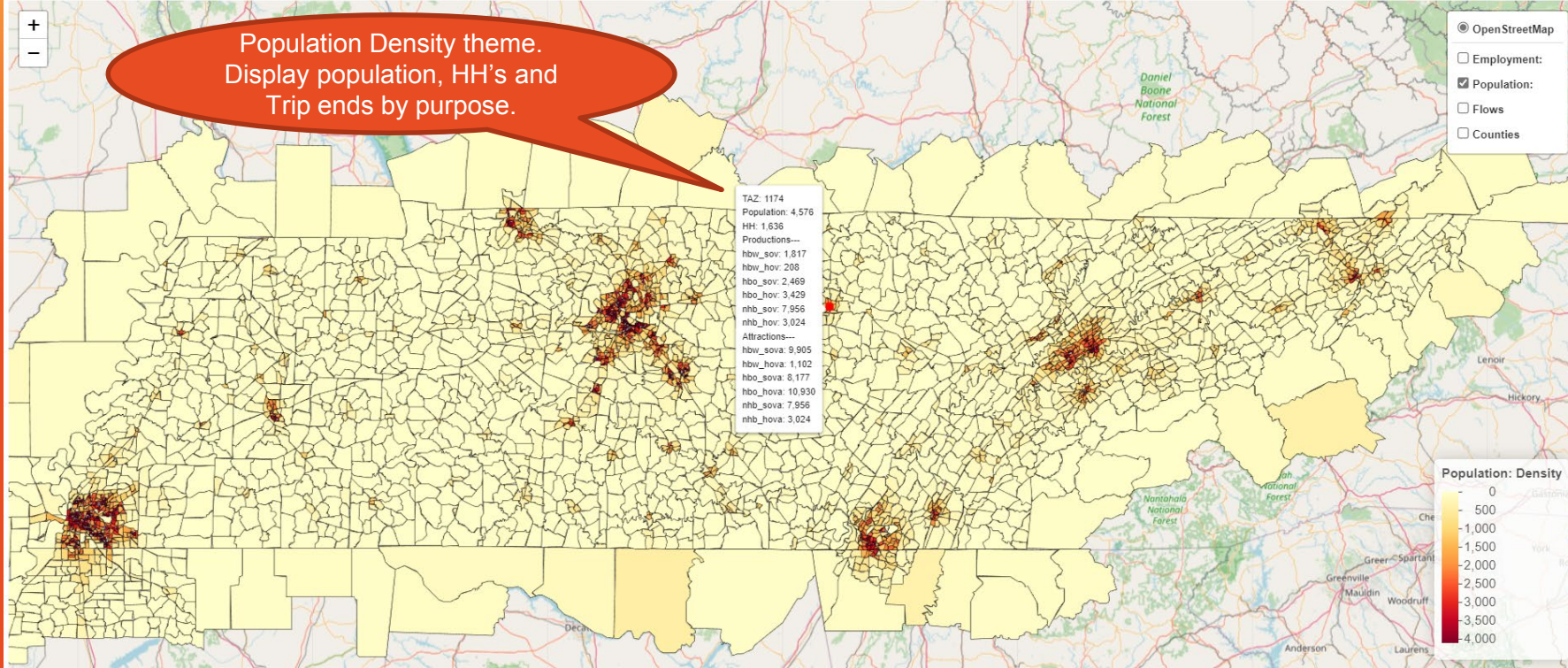
ZDATA ▾

DESIRE LINES ▾

Distribution ▾

Valid ▾

Zdata & Assignment



Employment with Flows

Tennessee Statewide Model: Scenarios.Base_2015 Long Range Planning Division — 10 October, 2022



MAPS ▾

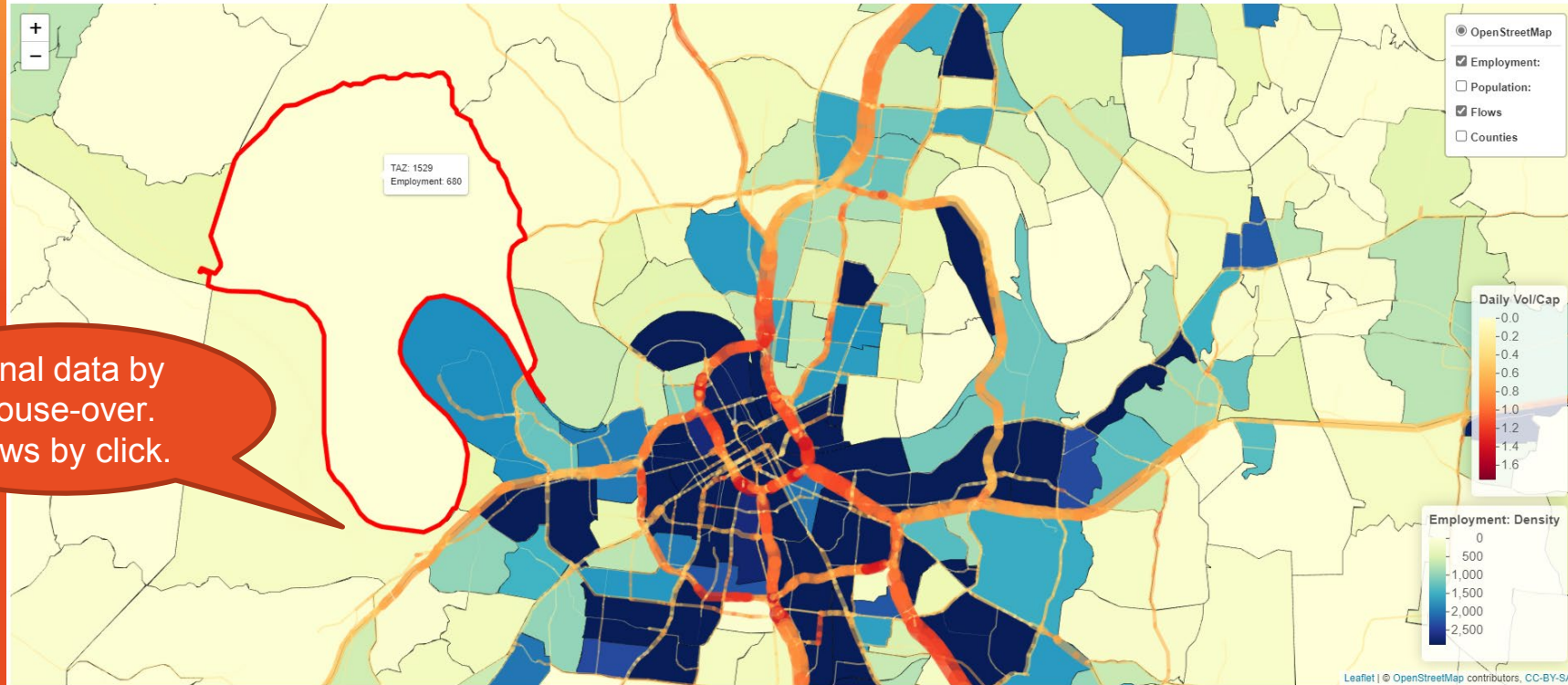
ZDATA ▾

DESIRE LINES ▾

Distribution ▾

Valid ▾

Zdata & Assignment



Zonal data by
mouse-over.
Flows by click.

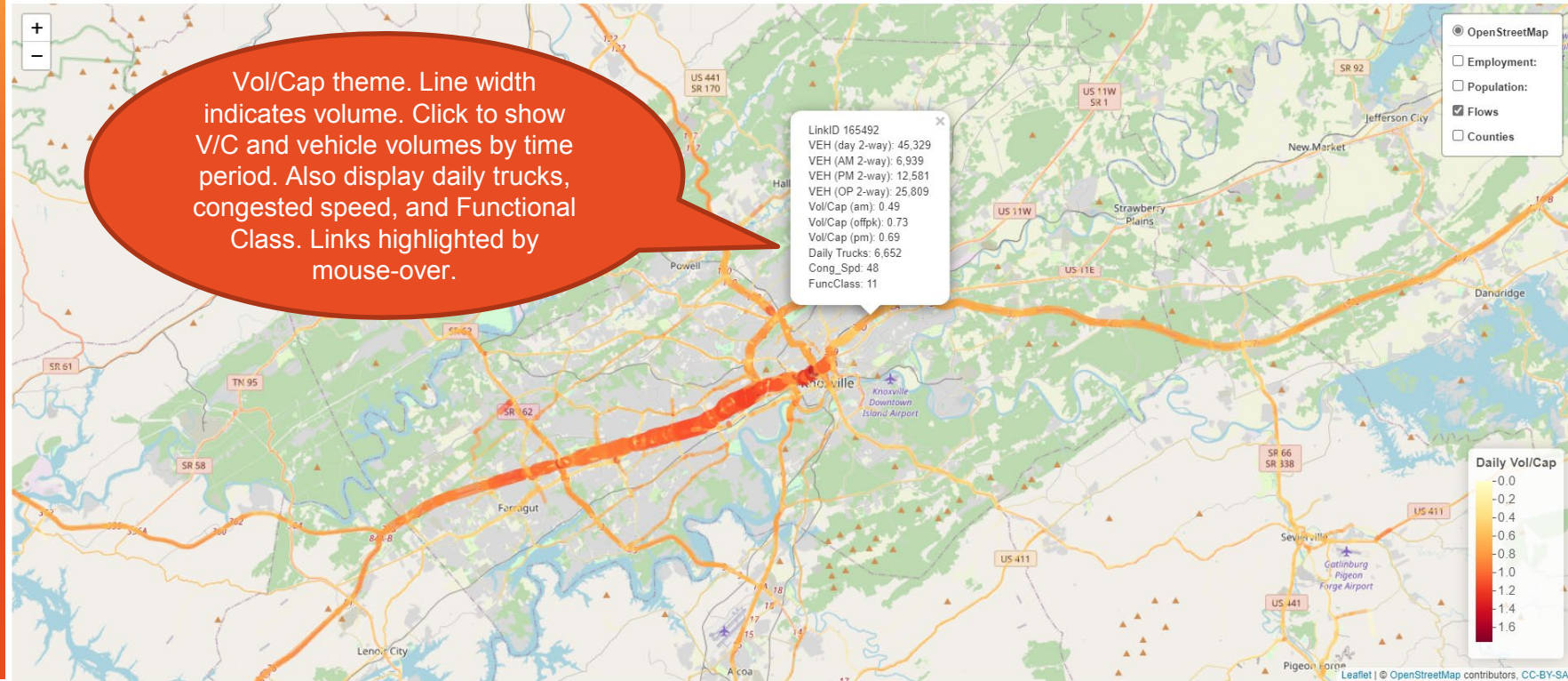
Reporting of Flows (draft)

Tennessee Statewide Model: Scenarios.Base_2015 Long Range Planning Division — 10 October, 2022



MAPS ▾ ZDATA ▾ DESIRE LINES ▾ Distribution ▾ Valid ▾

Zdata & Assignment



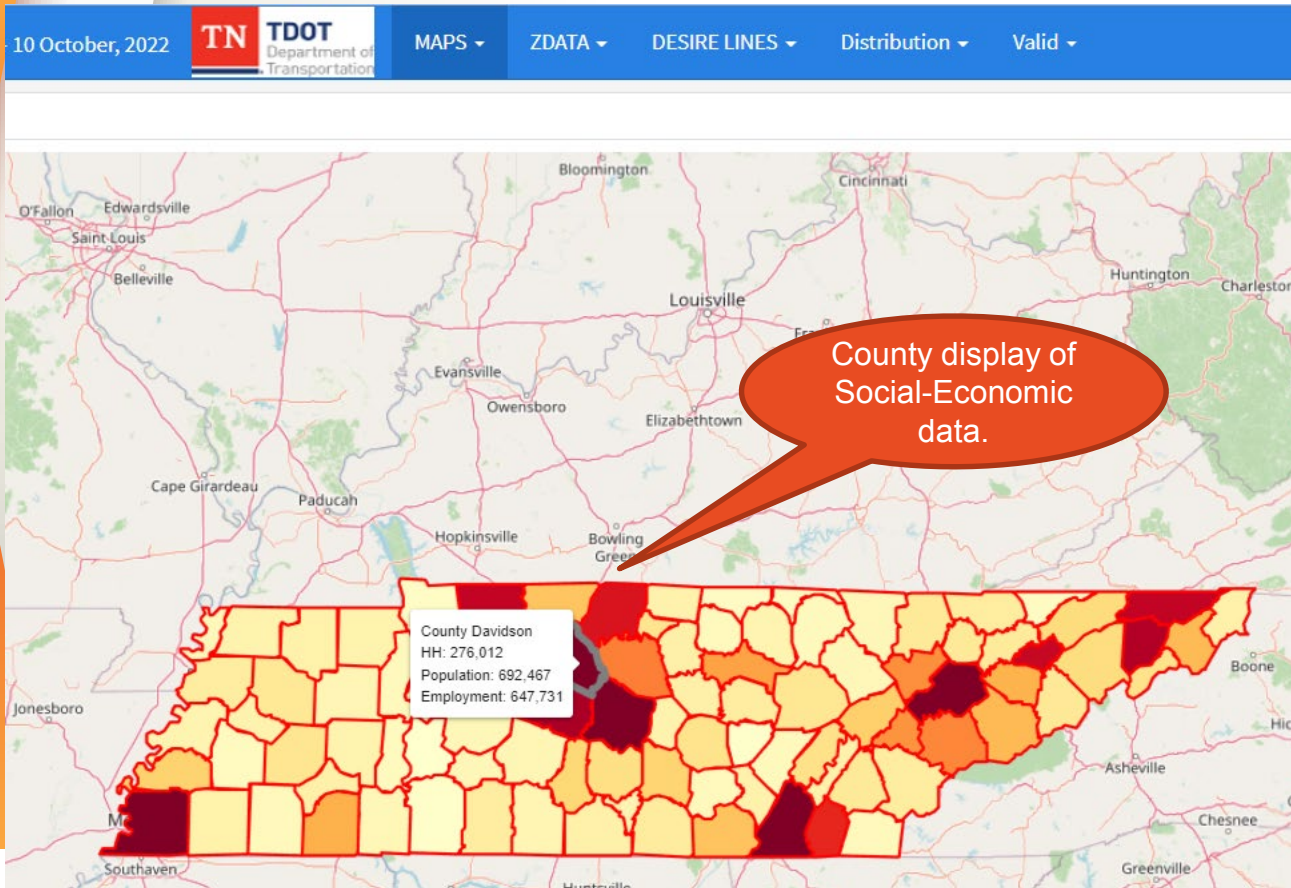
Report of County-level Soccec. Data

COUNTY DATA SUMMARY

NAME	HH	TOTPOP	TOTEMP	AREA
Anderson	30,302	76,479	47,481	344.7312
Bedford	17,144	48,809	25,268	474.7620
Benton	6,707	16,071	6,462	436.1534
Bledsoe	4,557	14,773	3,632	406.7196
Blount	50,572	131,342	63,795	566.5563
Bradley	39,692	106,567	55,365	331.4574
Campbell	15,916	39,617	13,847	497.9895
Cannon	5,597	14,362	4,814	265.6636
Carroll	10,727	27,903	11,578	599.9864
Carter	22,963	56,595	15,945	347.5554
Cheatham	15,038	40,499	15,254	307.1027
Chester	5,659	17,222	6,388	285.9484
Claiborne	12,789	31,716	13,554	441.4551
Clay	3,131	7,701	3,330	259.2701
Cocke	14,187	35,694	11,519	443.0546
Coffee	21,705	55,529	33,838	434.5328
Crockett	5,212	14,394	6,032	265.7070
Cumberland	25,449	59,670	27,709	685.5337
Davidson	276,012	692,467	647,731	525.8146
Decatur	4,536	11,725	5,841	344.8578

County summaries.
TAZ data could be added.

Map Display of County-level Soccec. Data



Daily Movements Between Counties (veh)

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MAPS ▾

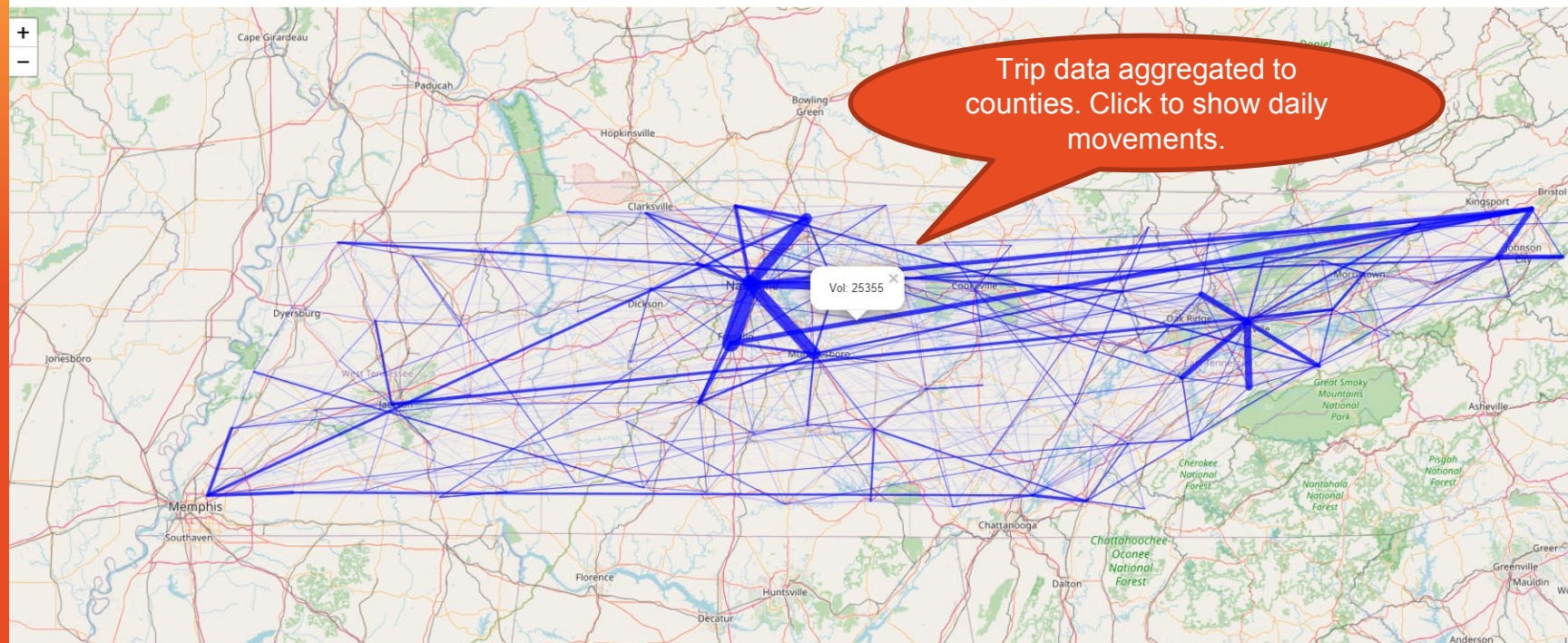
ZDATA ▾

DESIRE LINES ▾

Distribution ▾

Valid ▾

Desire Lines



Trip Length Frequency by Vehicle Type

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MAPS ▾

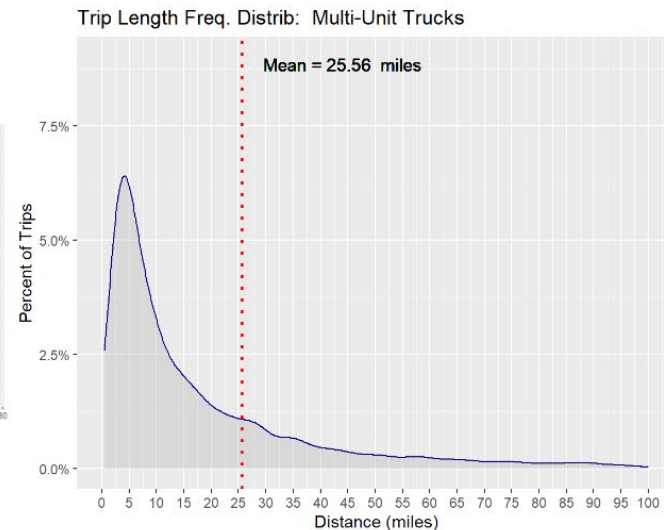
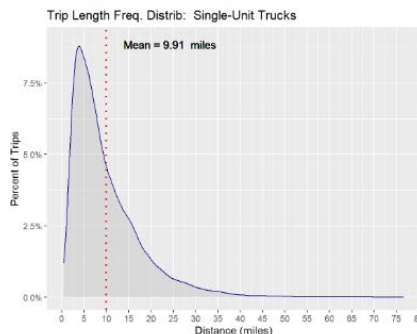
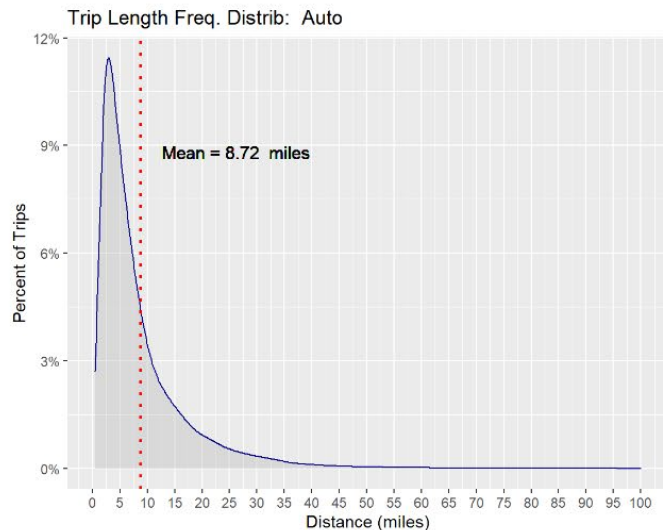
ZDATA ▾

DESIRE LINES ▾

Distribution ▾

Valid ▾

Trip Length Frequency



Spacing will be adjusted

Assignment Validation Reporting

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MAPS ▾

ZDATA ▾

DESIRE LINES ▾

Distribution ▾

Valid ▾

RMSE Table

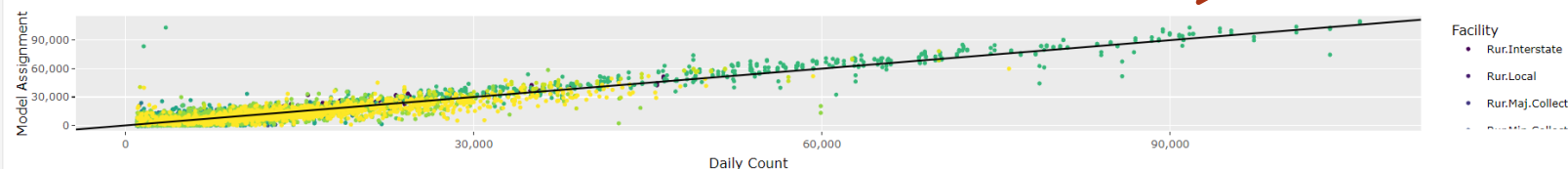
Regionwide RMSE

Volume		Modeled		Maximum Target Max	
Group	Count	Volume	N	RMSE%	Volume
1	12,823,134	13,973,297	4923	123.35	5,000
2	17,304,991	16,315,041	2415	47.28	10,000
3	25,585,531	24,609,750	1824	32.67	20,000

Points are "live".

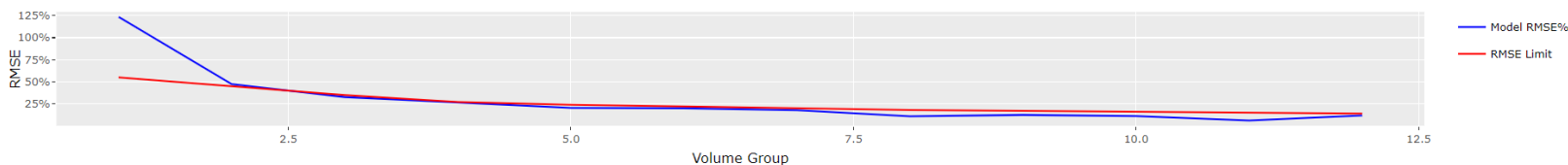
Scatter Plot

Count - Model Assignment Comparison: R-Square= 0.898



RMSE Plot

Root Mean Square Error by Volume Group



Will be rearranged

Assignment Validation Reporting

Volume		Modeled			Maximum	Target Max
Group	Count	Volume	N	RMSE%	Volume	RMSE%
10	2,307,366	2,311,469	27	11.09	90,000	16
11	1,486,836	1,524,247	16	6.07	100,000	15
12	725,751	700,590	7	11.74	500,000	14
Total	98,469,872	97,869,008	10332	43.66	999,999	39

More displays to come!

- Additional maps and attributes.
- Comparison of multiple years and alternatives.
- Integration of the Traffic Forecasting Tool (TFT).
- Highway assignment – alone.
- Selected link assignment.
- Revised model interface.

Thank you !

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14th in 20-24
Female Class.
Chicago Marathon.

