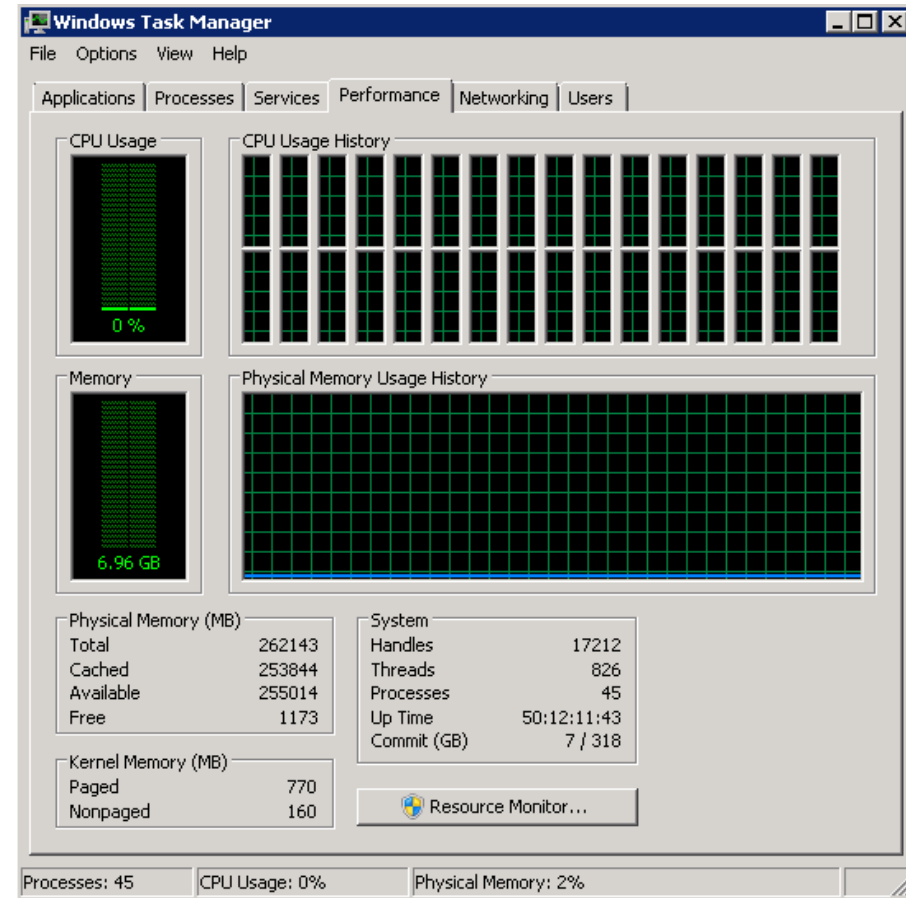


# Transportation Authority Of Marin

## Transportation Authority of Marin Demand Model (TAMDM) - Model Update

# What is TAMDM?

- Activity-Based Model
  - Based on MTC TM2
- Demand Model
  - Not Operations Model
- Current State of the practice
- Consists of Data and Software on Servers



Server-based Computing Platform with  
32 cores and 256 GB of RAM

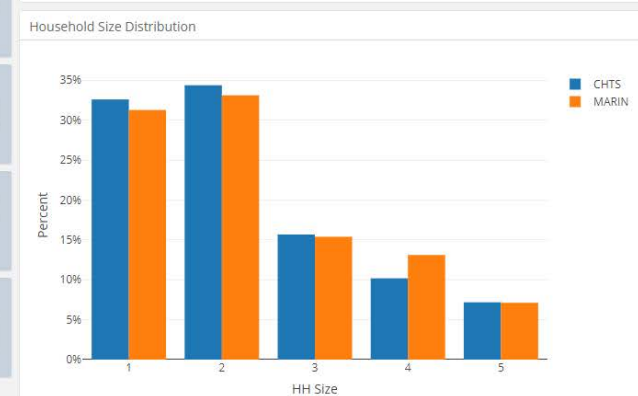
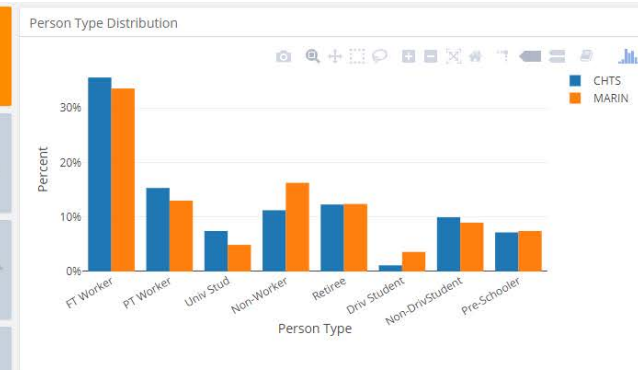
# Use of the TAM model

- Data Requests
  - From existing model runs, retrieval of specific information.
  - i.e. What is the estimated VMT for residents?
- Project Specific Model Run (full or limited)
  - If we build a development project, or improve a piece of the transportation network, what is the effect of that change?
- General Plan/Specific Plan
  - What is the effect of new development plan or general plan changes?
- Other planning/policy analysis requests

## What Sources of Data are used?

- California Household Travel Survey
- Census Data
- Roadway and Transit Networks
- Traffic Counts
- Origin and Destination Study

CHTS	MARIN
Sample Rate: %	Sample Rate: 100%
<b>247,199</b> Population	<b>252,787</b> Population
<b>108,154</b> Households	<b>106,619</b> Households
<b>308,293</b> Total Tours	<b>325,736</b> Total Tours
<b>836,828</b> Total Trips	<b>969,467</b> Total Trips
<b>233,854</b> Total Stops	<b>317,995</b> Total Stops
<b>4,184,220</b> Total VMT	<b>5,599,361</b> Total VMT

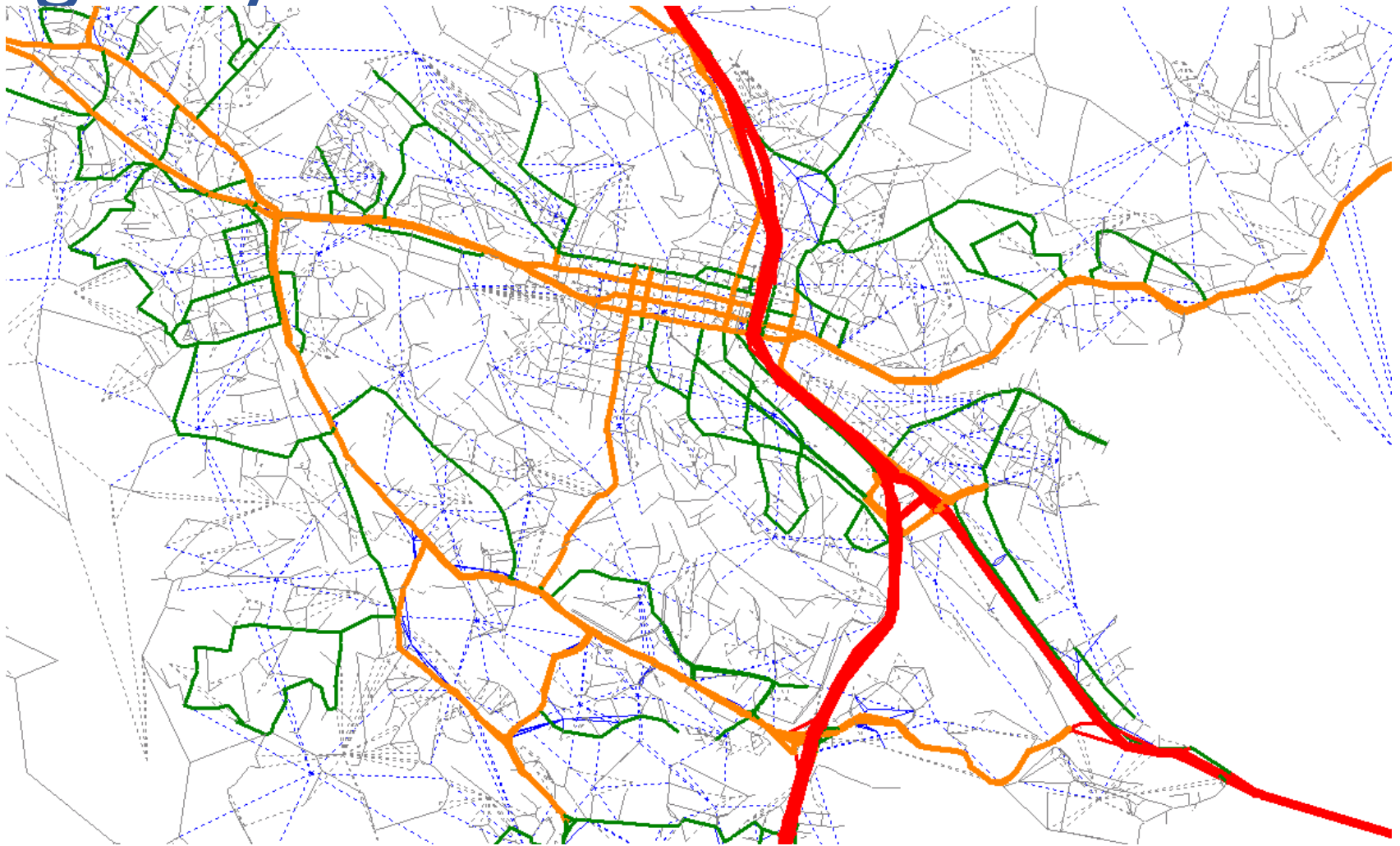


# Model Development Process

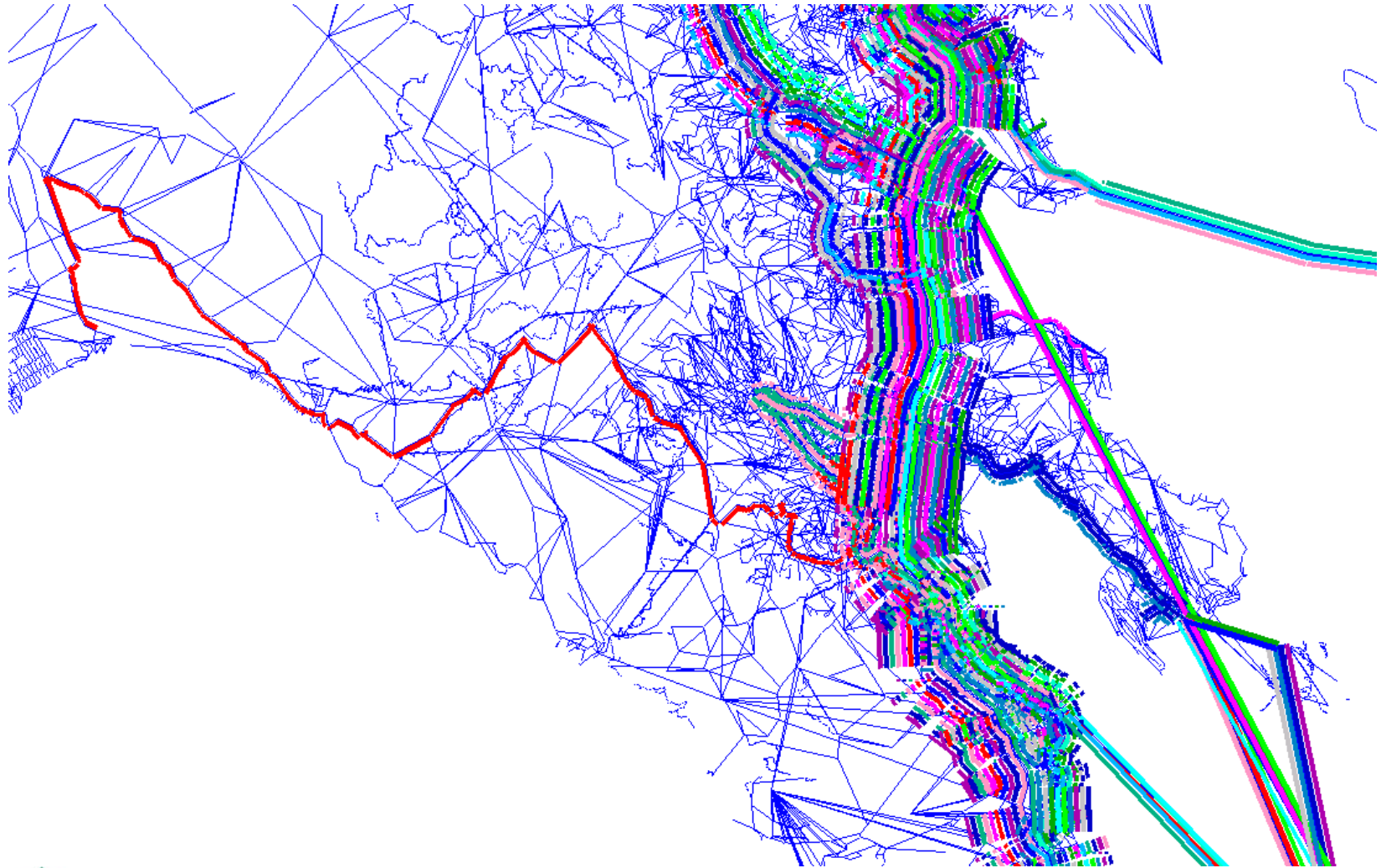
- Local Review of 2015 Roadway & Transit Networks, Zones, Population and Employment
- Script revisions to change sampling rates based on Origin and Destination Report
- Reduced roadway and zonal detail outside Marin
  - TAMDM retains all network and zonal detail within Marin
- Reduced model runtime to approximately 24 hours
- Reviewed and compared to other CMAs Models



# Highway Network

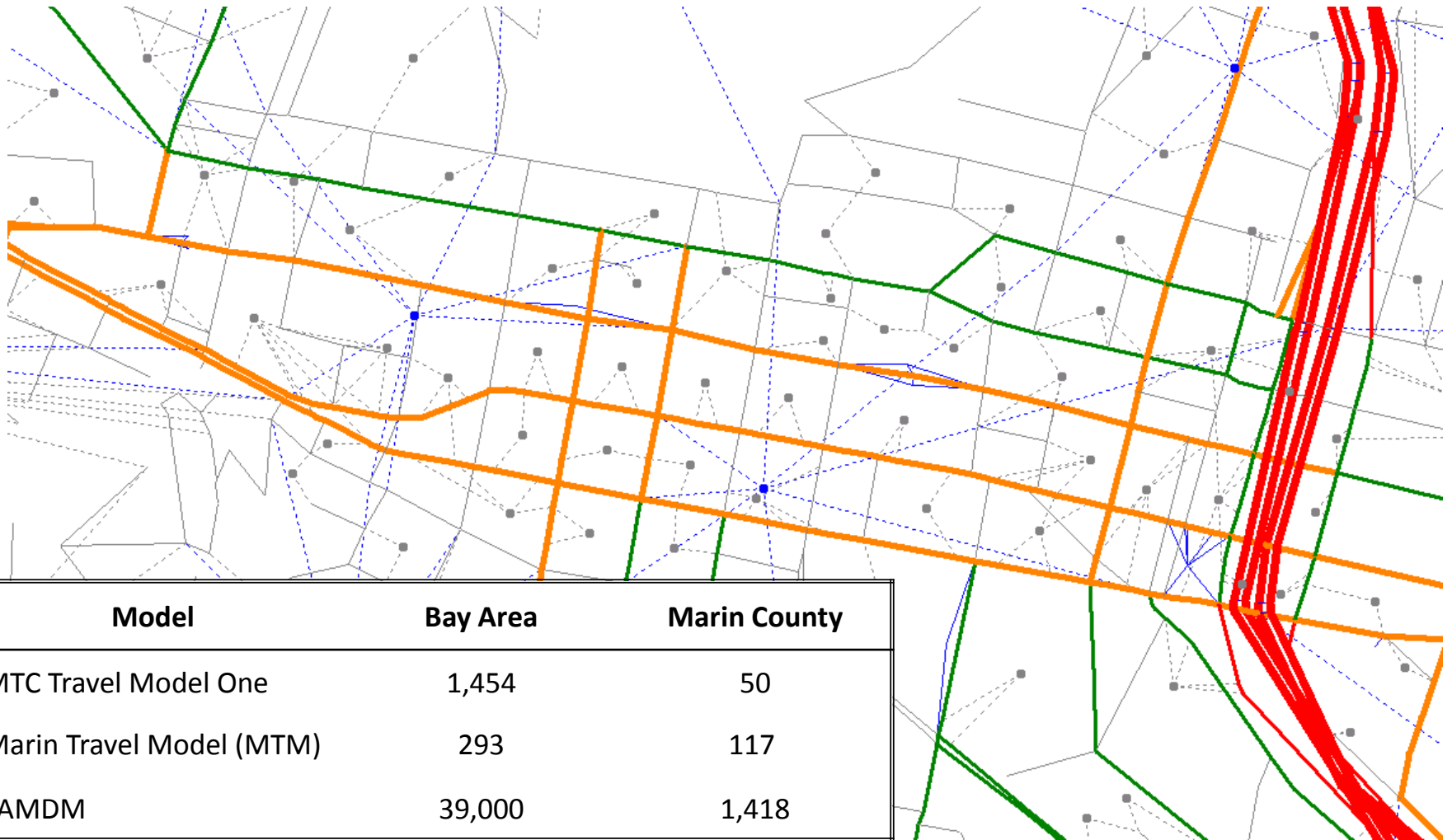


# Transit Network



## Zonal Detail

Capturing local traffic and short trips better than models have in the past



Model	Bay Area	Marin County
MTC Travel Model One	1,454	50
Marin Travel Model (MTM)	293	117
TAMDM	39,000	1,418



# Model Calibration/Validation

- Highway (traffic counts)
- Transit (transit boardings)
- Origin-Destination (Travel Behavior Study)
- Workers and Work Location (Census, TBS)
- Vehicle Miles Travelled (CHTS, Models, TBS)
- Travel Times (Big Data)
- We are doing more calibration and validation work than other models developed in the Bay Area

# Highway Validation – Other Models

## By Facility Type

Facility Type	AM Peak Period	PM Peak Period	Daily	Target
Freeway	-5%	-2%	-4%	+/- 7%
Arterial	10%	12%	6%	+/- 15%
Collector	17%	5%	2%	+/- 25%
Total	-1%	1%	-1%	+/- 5%

## By Area Type

Area Type	AM Peak Period	PM Peak Period	Daily	Target
Urban Business	-1%	-2%	-9%	+/- 10%
Urban	-7%	-6%	-6%	+/- 10%
Suburban	2%	2%	1%	+/- 10%
Rural	-9%	8%	-3%	+/- 10%
Total	-1%	1%	-2%	+/- 5%

# Highway Validation – Additional

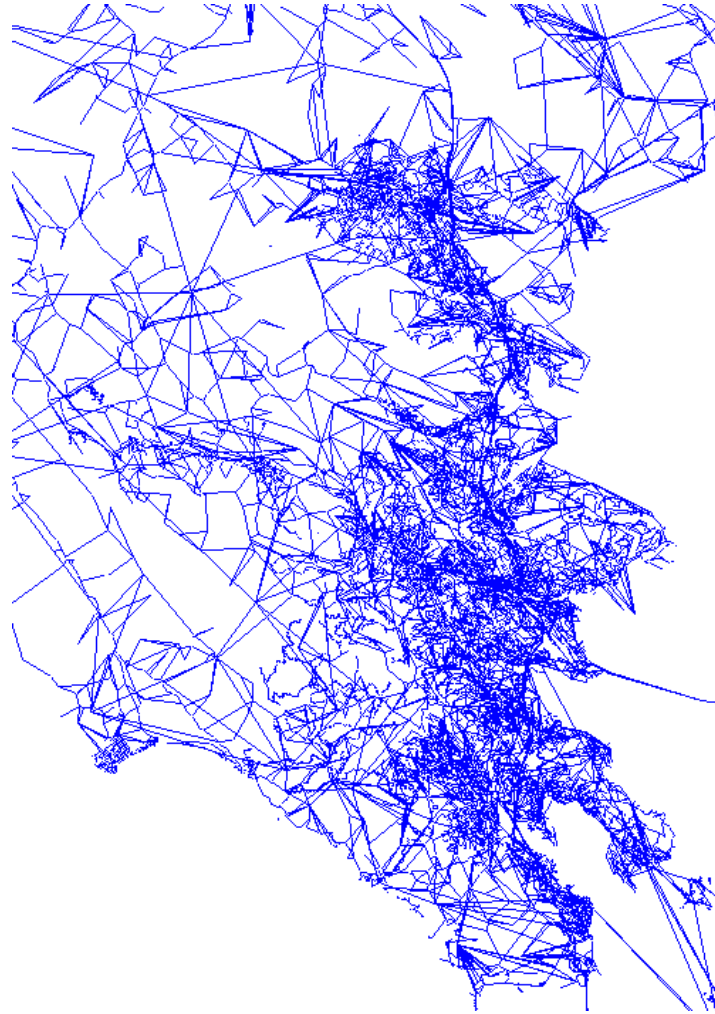
2017 California Regional Transportation Plan Guidelines Model Validation Standards - County Gateways

Validation Measure	AM Peak Period (4-Hour)	PM Peak Period (4-Hour)	Daily	Threshold
Volume-to-Count Ratio (Sum of all Locations) <sup>1</sup> =	0.94	1.05	0.98	None Specified <sup>2</sup>
Percent of Links Within Caltrans Deviation Allowance <sup>1</sup> =	100.0%	83.3%	91.7%	At Least 75%
Percent Root Mean Square Error (RMSE) <sup>1</sup> =	11.1%	20.9%	15.1%	Below 40%
Number of Links/Validation Locations =	12	12	12	

2017 California Regional Transportation Plan Guidelines Model Validation Standards - All Count Locations

Validation Measure	AM Peak Period (4-Hour)	PM Peak Period (4-Hour)	Daily	Threshold
Volume-to-Count Ratio (Sum of all Locations) <sup>1</sup> =	1.00	0.99	0.97	None Specified <sup>2</sup>
Percent of Links Within Caltrans Deviation Allowance <sup>1</sup> =	61.6%	62.3%	62.3%	At Least 75%
Percent Root Mean Square Error (RMSE) <sup>1</sup> =	31.4%	29.9%	24.7%	Below 40%
Correlation Coefficient <sup>1</sup> =	0.95	0.95	0.97	At Least 0.88
Number of Links/Validation Locations =	151	151	151	

# Highway Validation



## Item 9

AM	PM	Daily
-11%	-7%	-8%

AM	PM	Daily
-12%	14%	-15%

AM	PM	Daily
-14%	0%	-2%

AM	PM	Daily
21%	1%	12%

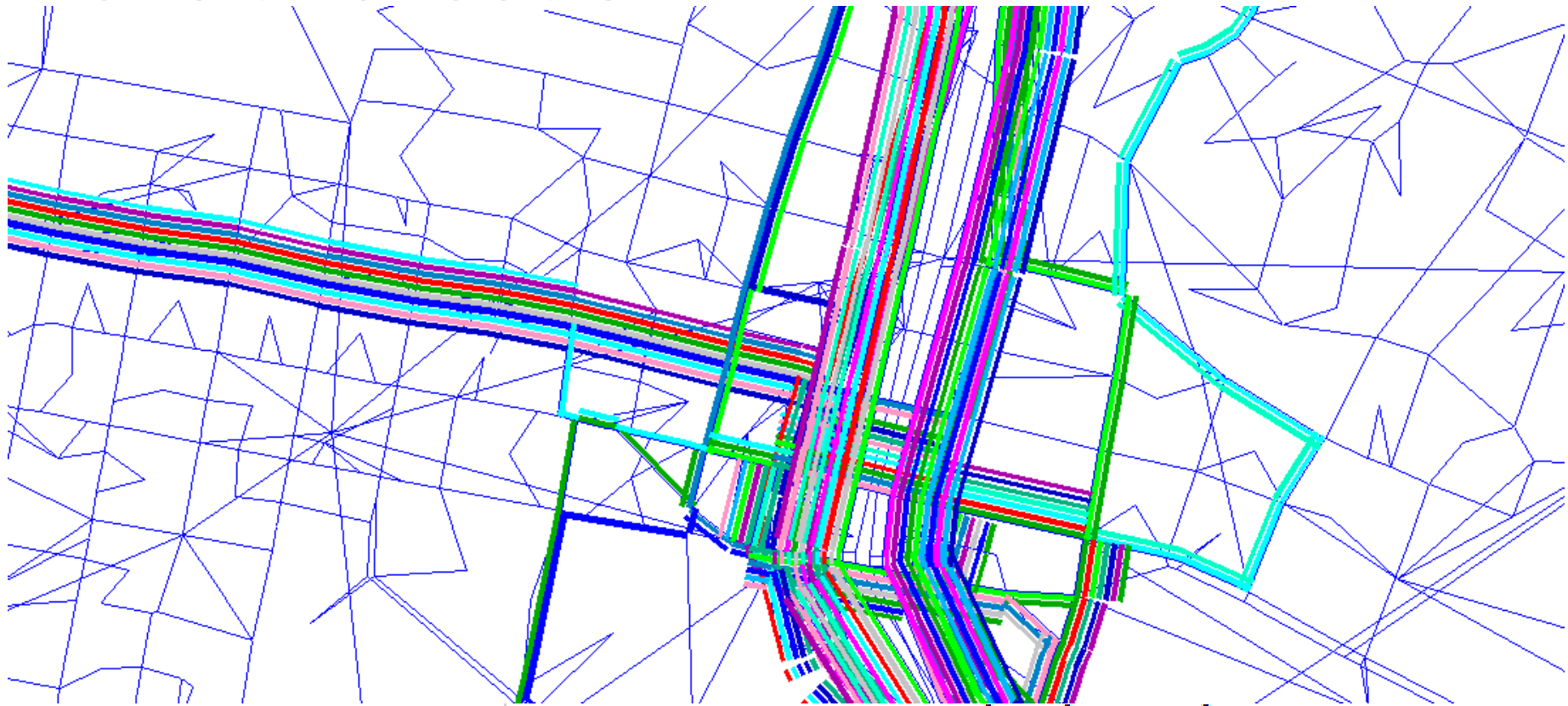
AM	PM	Daily
4%	-8%	1%

AM	PM	Daily
-10%	-7%	-8%

AM	PM	Daily
-4%	13%	1%

## Transit Validation

Includes Golden Gate Transit Bus and Ferry, and Marin Transit Bus



**2015 Total Daily Boardings**

Transit Option	TAMDM	Count	Delta	% Difference
<b>Total Marin Transit</b>	<b>41,857</b>	<b>31,484</b>	<b>10,373</b>	<b>33%</b>

Accurately depicted are routes and headways. No capacity limitation so overestimating demand. MTC is working on a fix and will utilize when available.





# Model Use Policy

- TAM continues retention of consultants to develop and maintain model. – NO CHANGE
- TAM continues to provide TAM modeling consultants to jurisdictions – NO CHANGE
- TAM provides model access to local/regional agencies and consultants - CHANGE
- TAM requires all agencies to:
  - Receive written permission from TAM prior to using Model
  - Use Qualified Consultants
  - Document any revisions made to the model (TAM will consider whether to direct our consultants to make these changes or not)
  - Commit to legal and operating commitments.
- TAM model requires a licensed software (\$\$\$) with dedicated hardware – NO CHANGE

# Next Steps

- San Rafael begins General Plan Circulation Element Update
- TAM begins development of 2040 Forecast
- TAM begins sharing Vehicle Miles Traveled (VMT) data with jurisdictions for SB 743 compliance