



September 24 & 25
*Data and Modeling
User Conference*

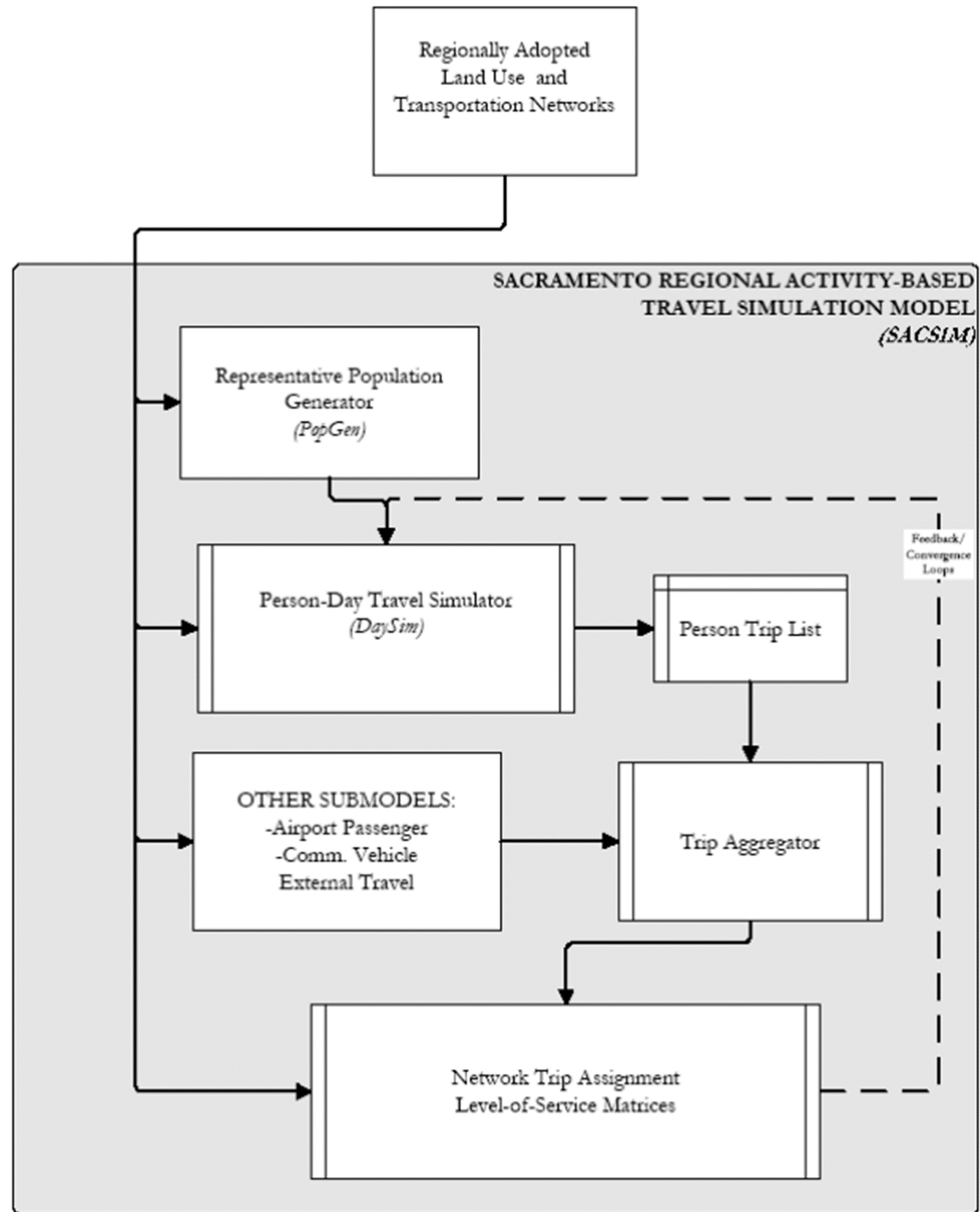
Unlocking SACSIM: Right Questions, Right Insights

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FEHR  PEERS

Questions

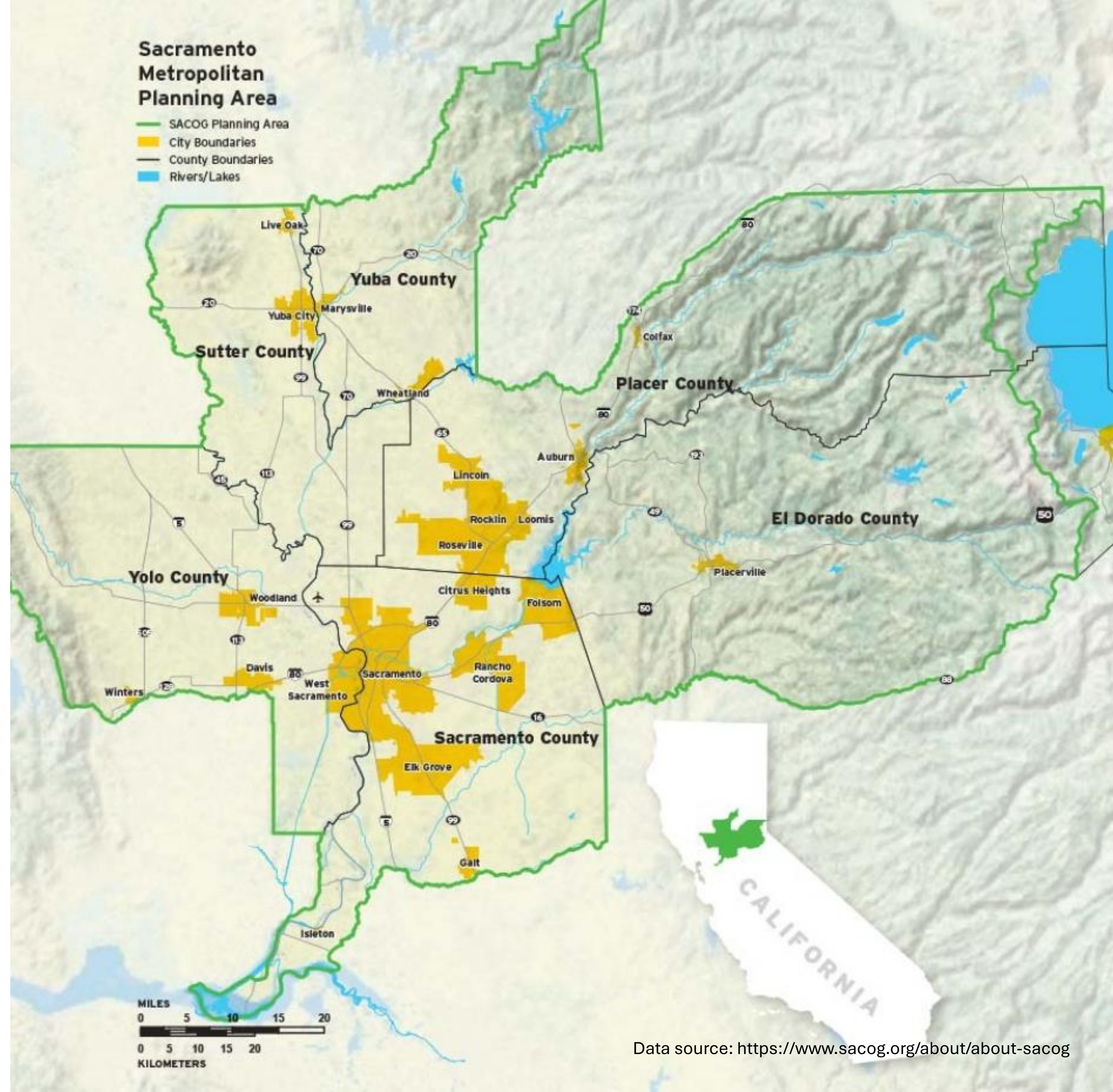
- Is SACSIM the right tool for your project?
- How to adequately scope your analysis ?
- Do model settings matter?
- Do we need buffering?
- Do we need to adjust gateways?
- Does post processing matter?



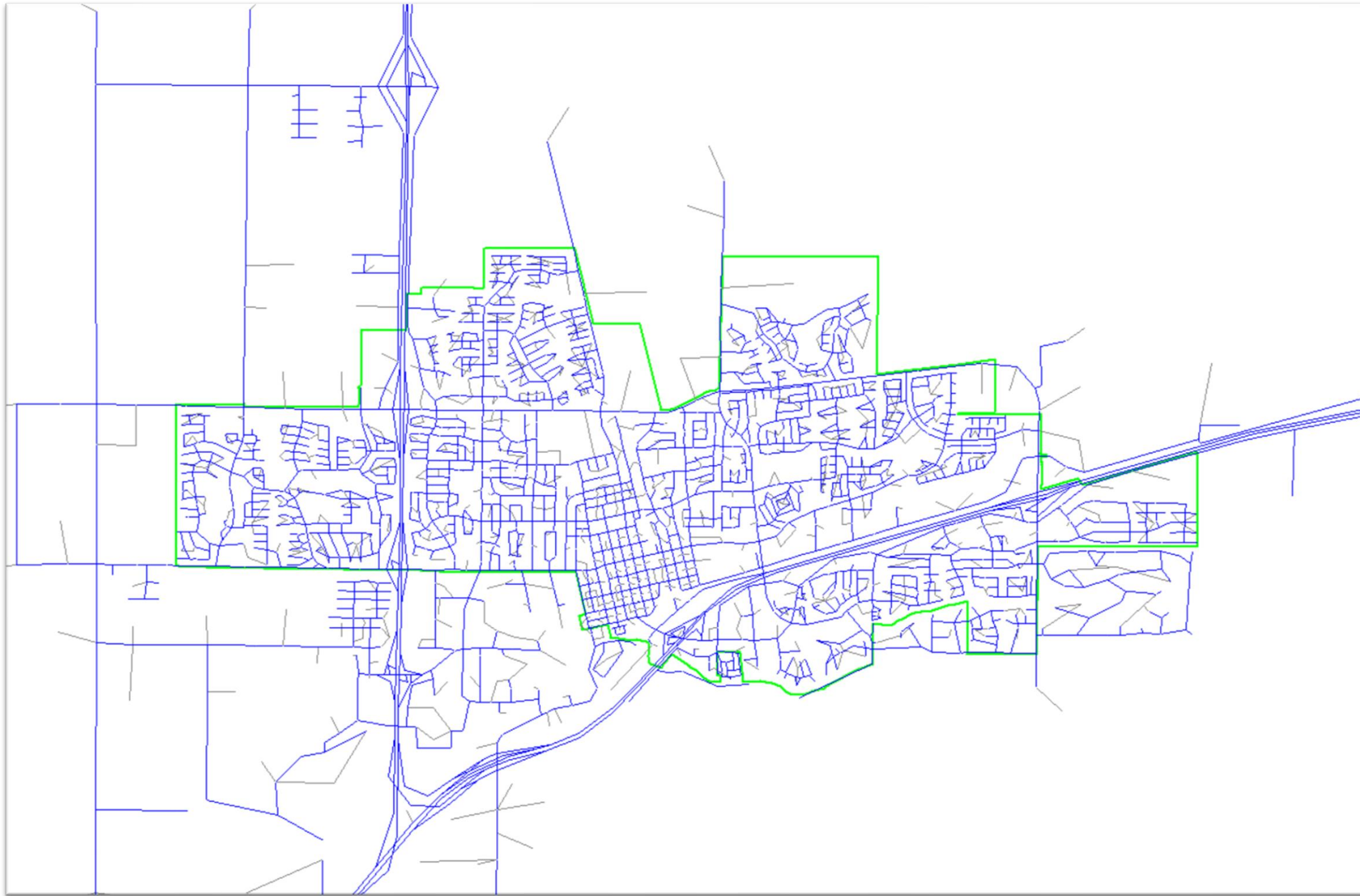
What is SACSIM?

Is SACSIM the right tool for your project?

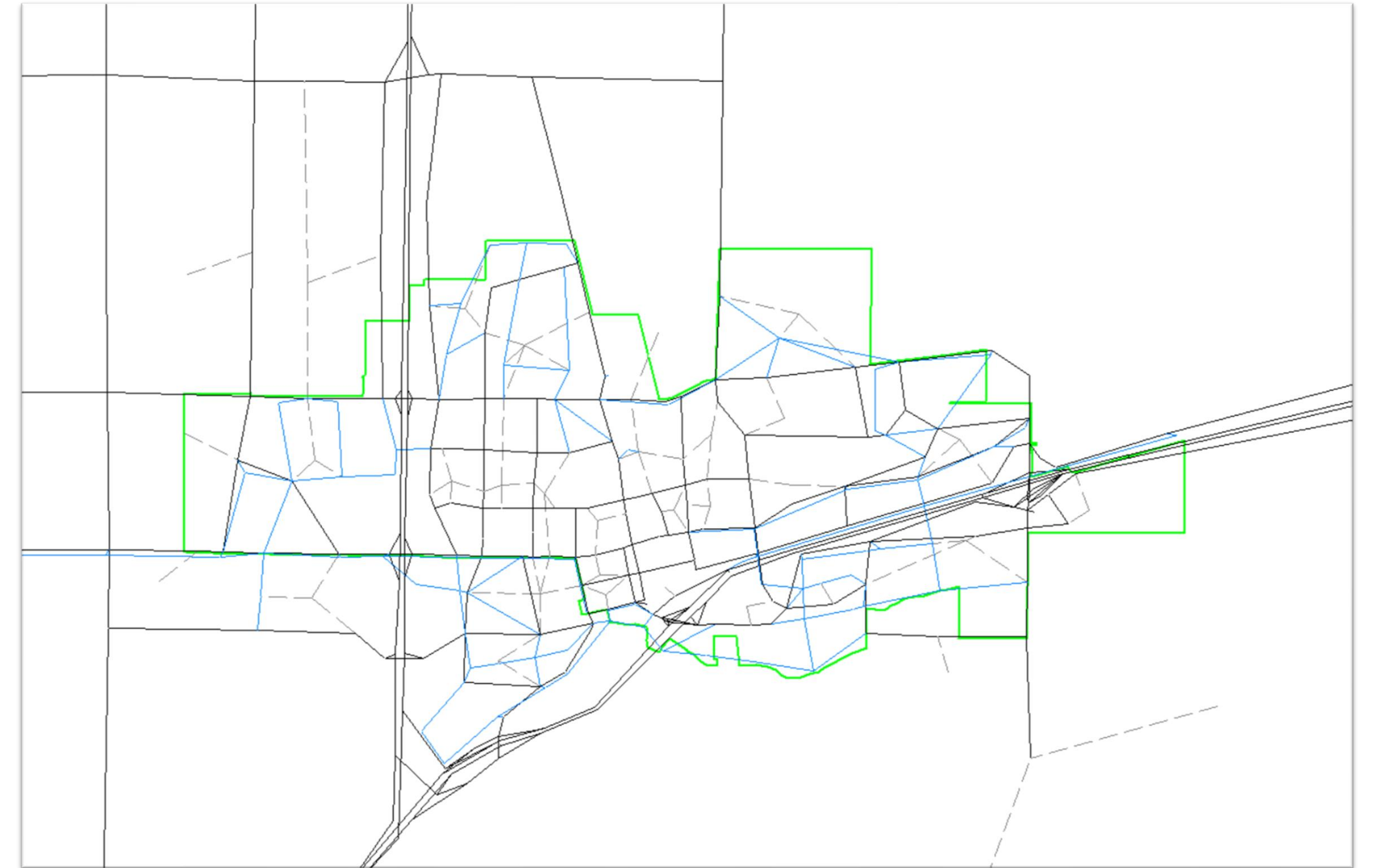
- What type of project is it?
- What is the project size?
- Where is the study area?
- What are the outputs we want to forecast?



Model Network Comparison



City of Davis Model



City of Davis, SACSIM

How to adequately scope your analysis ?

Do we need subarea validation?

Does it matter if the model does not pass all the tests?

Do we need full model runs or assignment only runs?

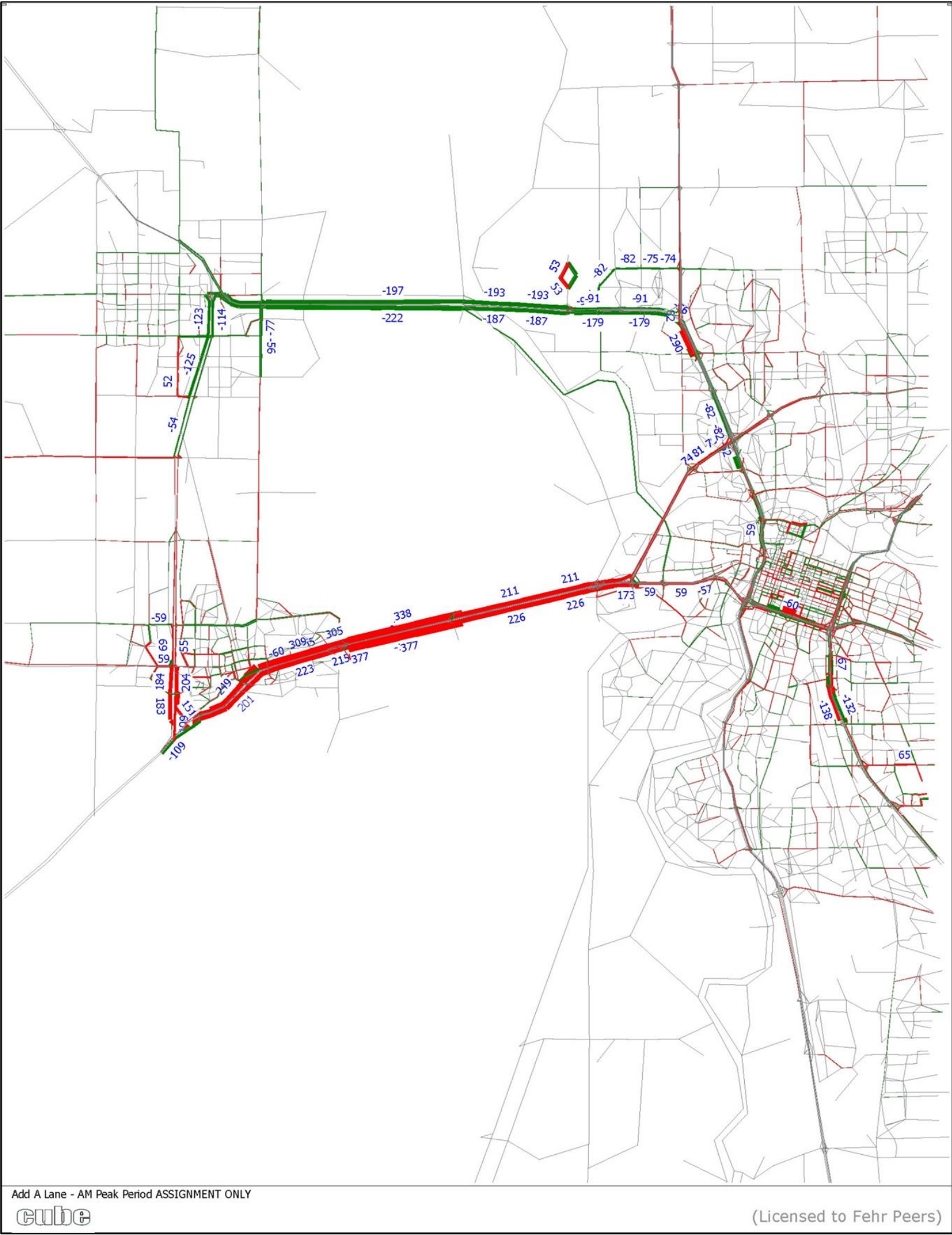
Should the output be focused on the full model area or within specific boundary?

Sub-area Static Validation

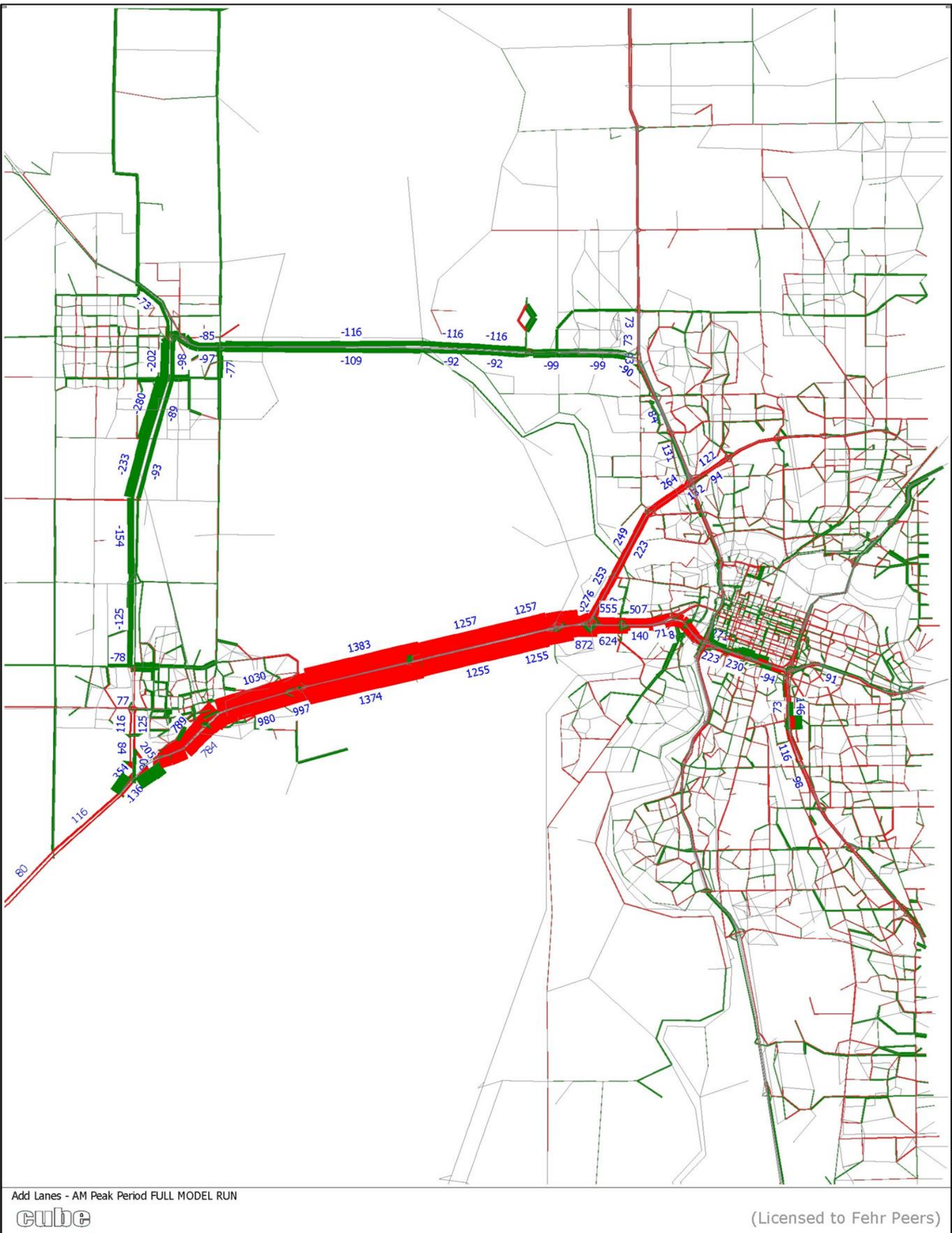
Parameters	Off-the-shelf Model			Calibrated EGSIM model		
	Daily	AM	PM	Daily	AM	PM
Model/Count Ratio	0.87	0.92	0.86	0.99	1.01	0.94
Percent Within Caltrans Maximum Deviation (>75%)	66%	71%	70%	86%	86%	89%
Percent Root Mean Square Error (<40%)	32%	38%	41%	22%	26%	22%
Correlation Coefficient (>0.88)	0.92	0.87	0.85	0.96	0.94	0.95

2024 Regional Transportation Plan Guidelines for Metropolitan Planning Organizations, California Transportation Commission, January 2024

Right Sizing Model Run Type



Assignment Only



Full Model

Right Sizing Analysis Area – Model-wide VMT vs Study Area VMT

Scenario		Study Area			Model-wide		
		VMT	VHT	VHD	VMT	VHT	VHD
Base	Daily Total	602,202	19,561	1,752	62,101,320	1,827,611	221,091
Base Plus Project	Daily Total	604,732	19,658	1,762	62,088,238	1,826,606	220,509
	% change	0.42%	0.50%	0.58%	-0.02%	-0.06%	-0.26%

Do Model Settings Matter?

How different
convergence
parameters change
model iterations/ run
time?

Do different
convergence
parameters give
different results?

How many runs for
your analysis?

Model Convergence Comparison

- # of Iteration Change

Scenarios	Base Year	Add Lanes			
Run Type	Full Model	Assignment Only		Full Model	
Parameter	Original Settings	Original Settings	Revised Settings	Original Settings	Revised Settings
Relative Gap	0.0002	0.0002	0.00001	0.0002	0.00001
Maximum Iterations	300	300	500	300	500
# of Iterations by modeling period					
7-8 AM	87	56	103	67	102
8-9 AM	63	56	85	64	62
9-10 AM	22	20	44	17	32
10 AM-3 PM	18	29	31	22	28
3-4 PM	43	34	71	48	58
4-5 PM	54	37	90	62	81
5-6 PM	65	42	97	37	74
6-8 PM	10	29	23	17	27
8 PM-7 AM	4	9	12	3	7

Model Convergence Comparison

- Model Result Difference

Short Term Elasticity VMT Change for the project	Low	8,092
	High	48,550

Scenarios	Base Year	Add Lanes			
Run Type	Full Model	Assignment Only		Full Model	
Parameter	Original Settings	Original Settings	Revised Settings	Original Settings	Revised Settings
Relative Gap	0.0002	0.0002	0.00001	0.0002	0.00001
Maximum Iterations	300	300	500	300	500
Run Time	15:39:00	4:28:17	5:58:12	17:33:00	18:24:00
VMT	58,230,898	58,251,355	58,246,905	58,385,989	58,373,077
Model VMT Change	-	20,457	16,007	155,091	142,179

Is one run per scenario enough?

Why multiple runs?

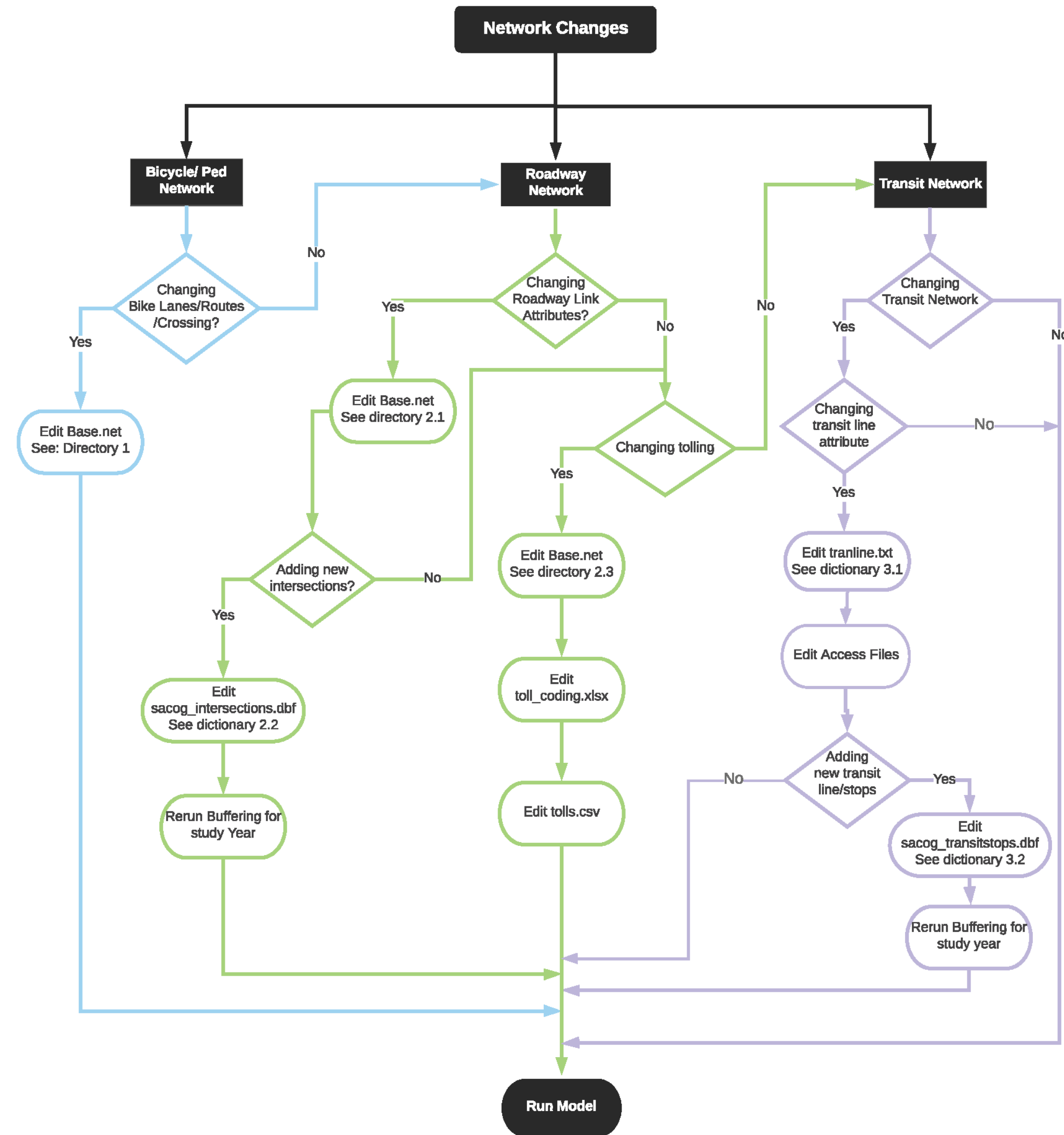
	Citywide VMT -			
	Run 1	Run 2	Run 3	Average
Random Seed	1234	6421	7638	-
Cumulative No Project	14,886,090	14,889,439	14,883,669	14,886,400
Cumulative Plus Alt 1	14,895,300	14,898,290	14,882,710	14,892,100

Do we need Buffering?

- What is buffering?
- When do we need buffering?
- Example projects
 - Sacramento GP
 - Elk Grove GP
- What happens if you don't do buffering

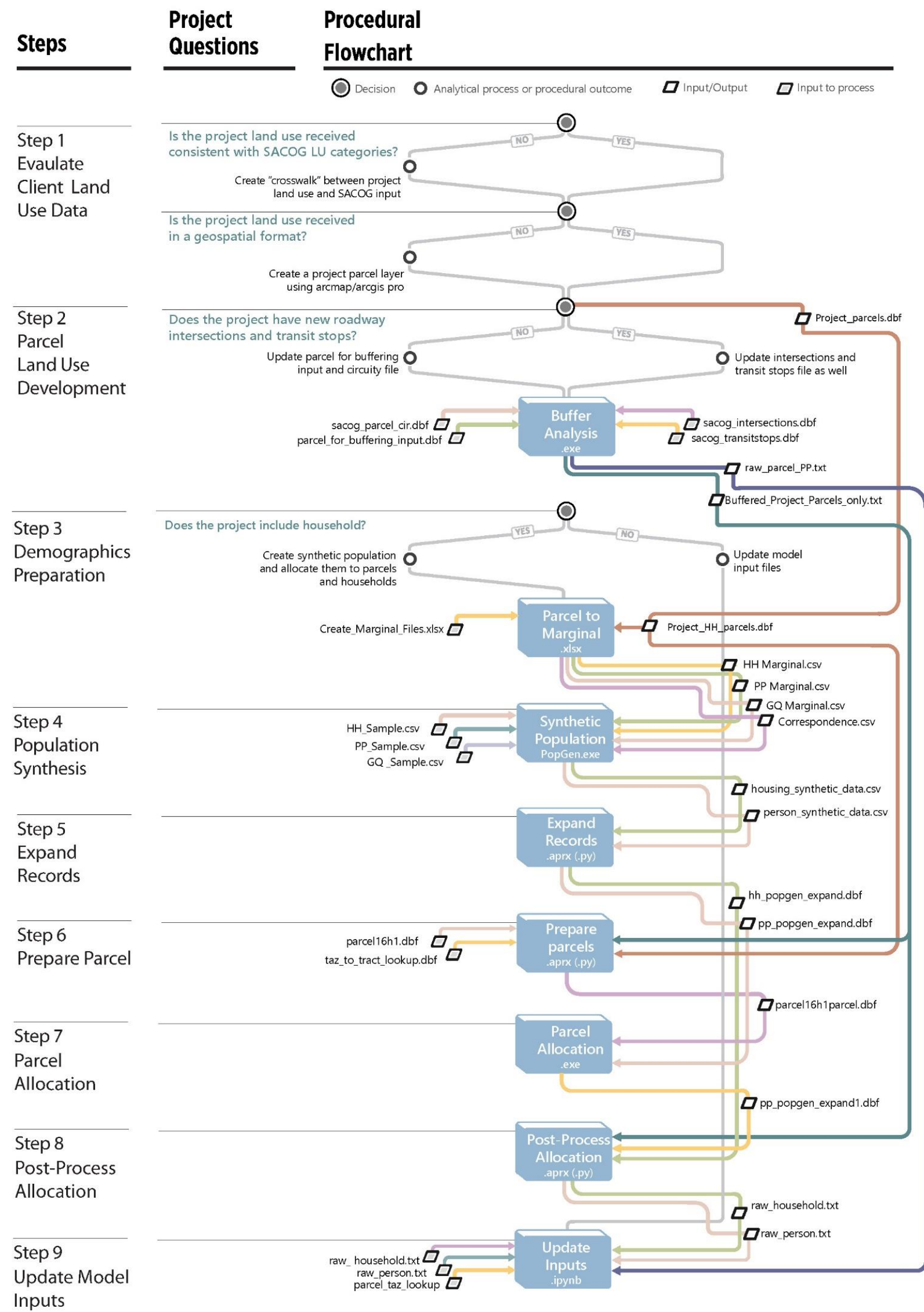
SACSIM19 - Making Network Changes

Fehr & Peers | August 25, 2020



Network Changes

Applying Land Use Projects in SACSIM19



Land Use Changes

Do we need to adjust Gateways?

Why/ when do we need that?

Gateway Volume Comparison – Year 2016

Gateway	PEMS/ StreetLight	Off-the-shelf Model Daily Volume	Yolo 80 Model		Elk Grove General Plan Model	
			Daily Volume	% Change	Daily Volume	% Change
SR99N--Sutter/Butte CL	17,300	13,477	17,303	28%	13,488	0%
SR70N--Yuba/Butte CL	13,900	11,009	13,944	27%	11,017	0%
SR49NE--Placer/Nevada CL	30,700	23,592	30,687	30%	23,592	0%
I-80NE--E.of Yuba Gap	28,700	24,683	28,738	16%	24,711	0%
SR16+SR49E--Sacramento/Amador CL	12,300	9,413	18,373	95%	9,430	0%
SR99S--Sacramento/SJ CL	73,100	59,033	73,300	24%	73,192	24%
I-5 S--Sacramento/SJ CL	55,700	46,894	55,820	19%	62,877	34%
SR160S--S of SR12	14,100	12,769	14,158	11%	12,779	0%
I-80 W--W. of I-505	176,000	141,250	158,959	13%	141,238	0%

Do post processing matter?

How can I get VMT?

Can I get VMT
from SACSIM?

How many types
of VMT are there?

Do different types
of VMT require
same level of
effort?

VMT Lexicon



Total VMT



Total VMT generated by a project



Total VMT per service population



Residential VMT per resident



Home-Based VMT per resident



Total VMT per land use unit (e.g., KSF)



Total VMT per employee



Work Tour VMT per employee



Home-Based Work (HBW) VMT per employee

Thank you

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