Applying Modeling Outputs To TCR Data Requirements

by
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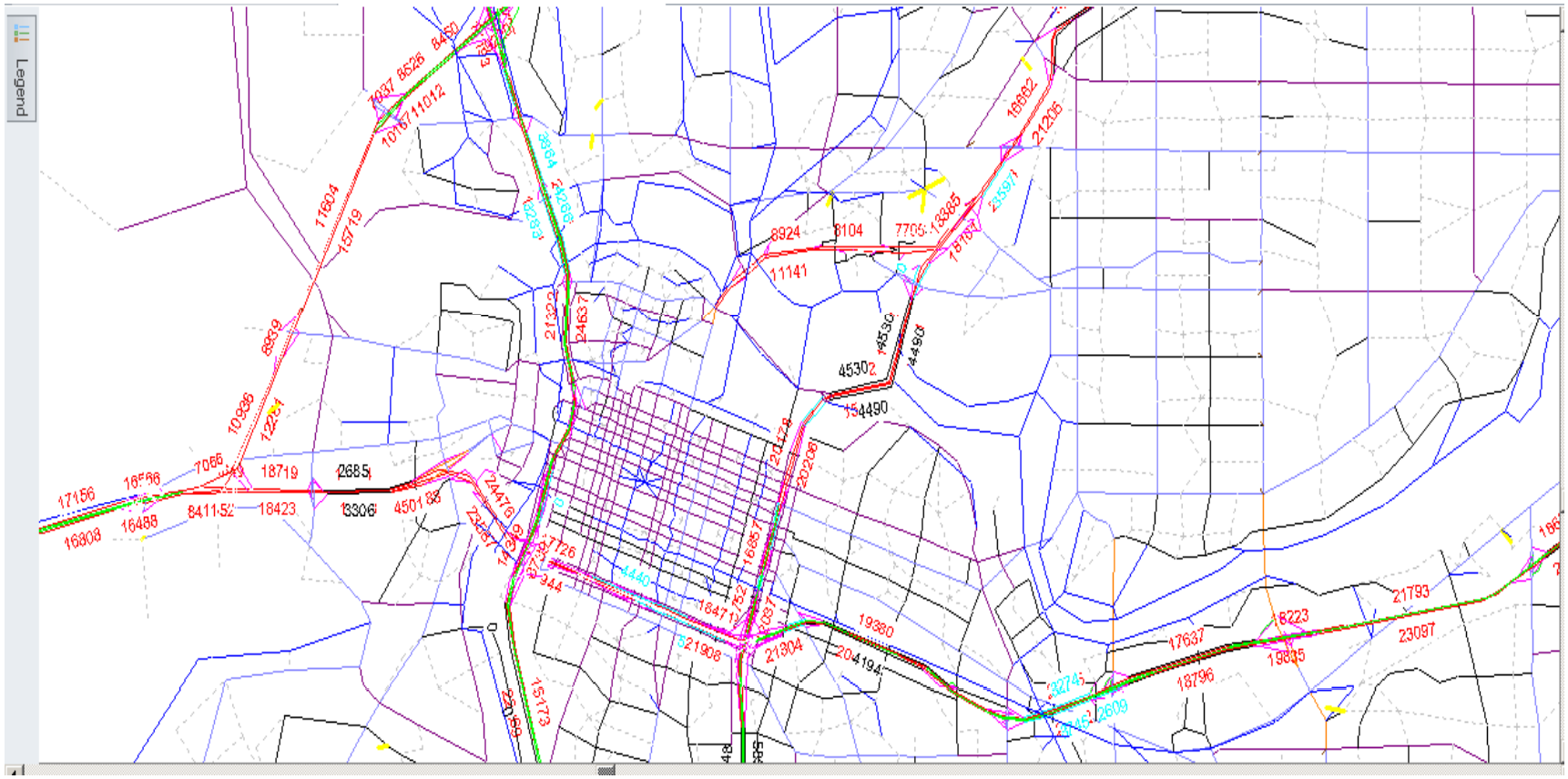
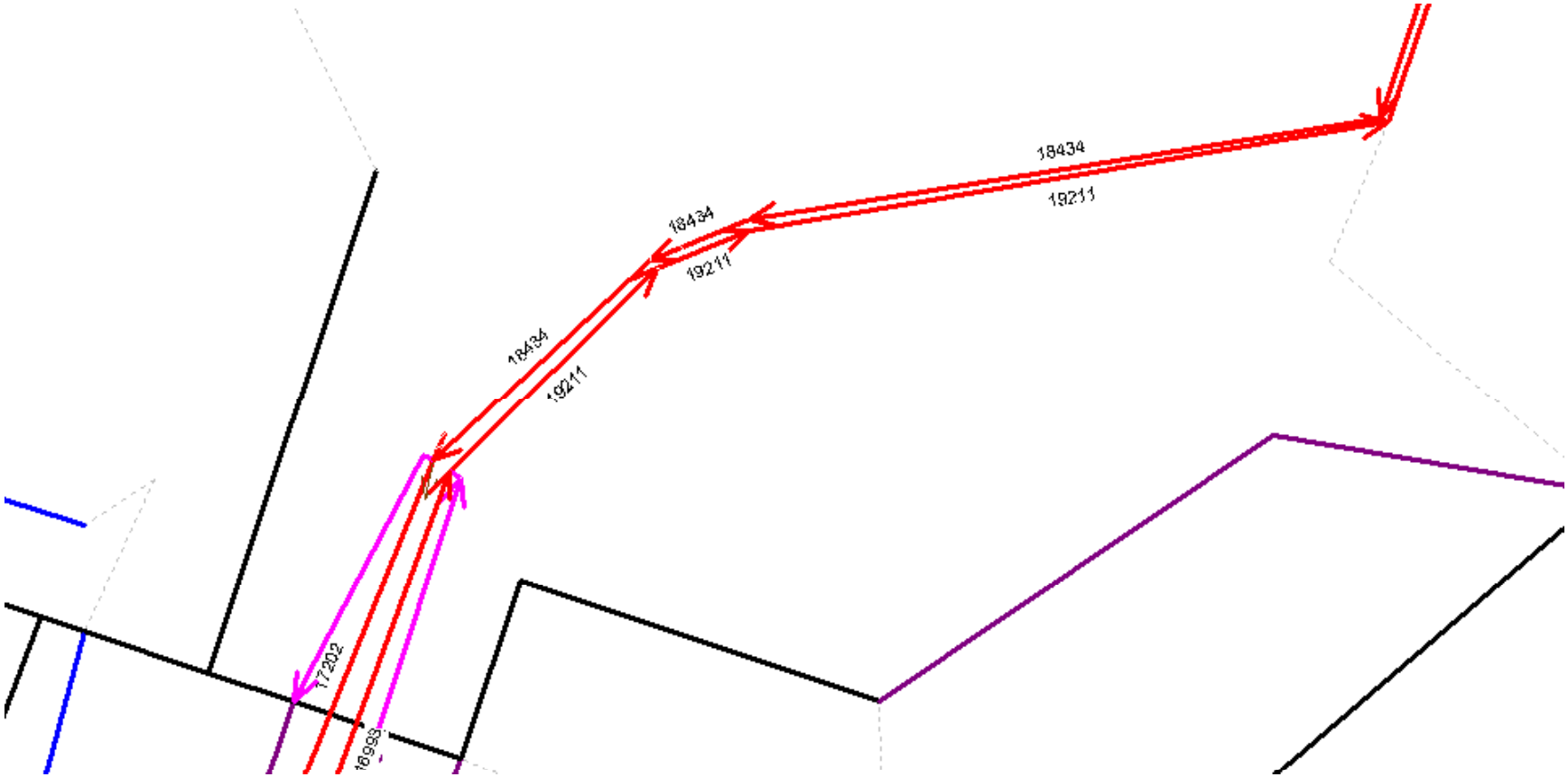
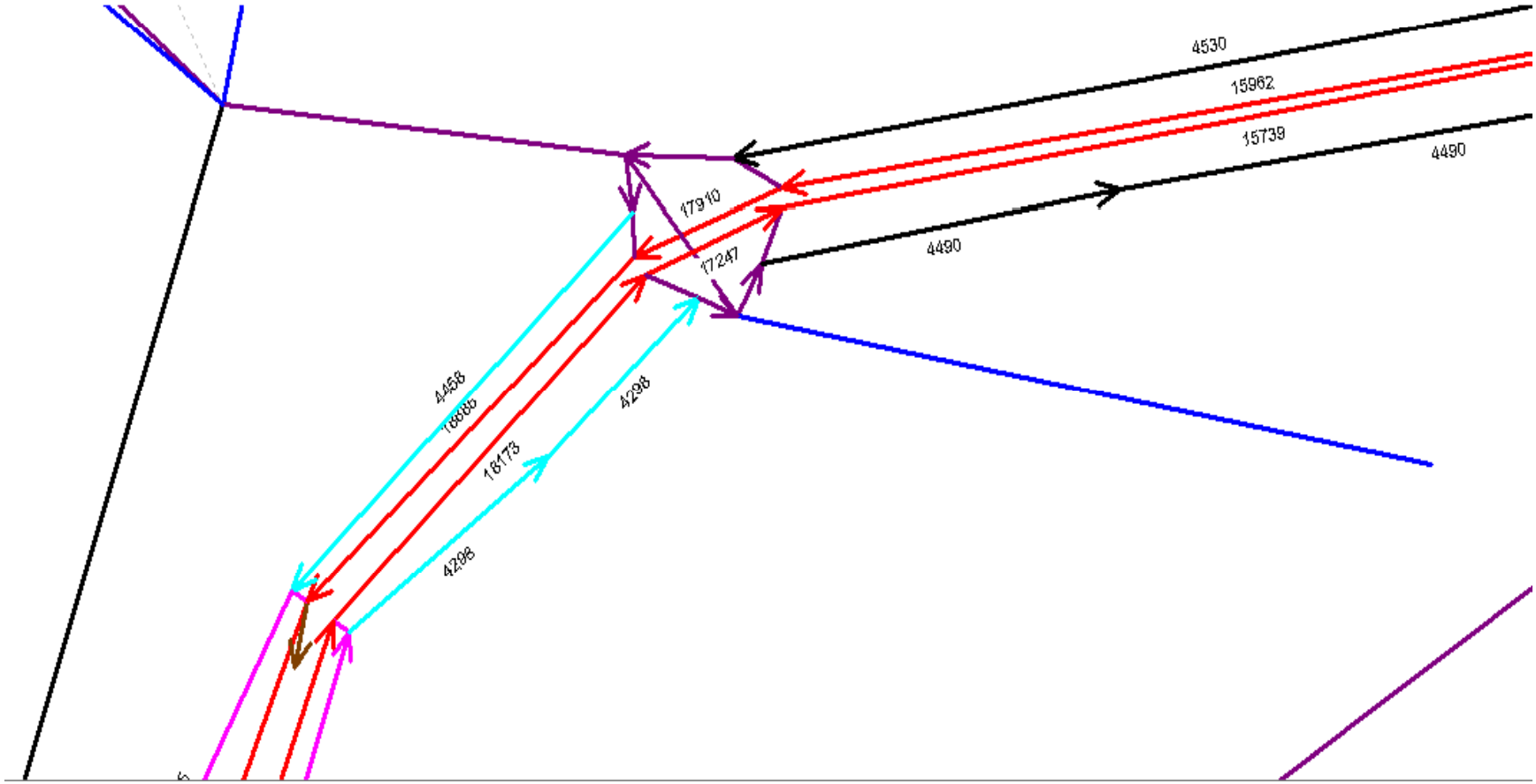
SACSIM Travel Demand Model
Downtown Sacramento Year 2035



Sacsim Model 2008 PM Peak 3-Hour SR 51 (E St to Exposition Blvd)



Sacsim Model 2035 PM Peak 3-Hour SR 51 (E St to Exposition Blvd)



Sources For Traffic Count Data

- PEMS

http://pems.dot.ca.gov/?redirect=%2F%3Fdnode%3DState

- Instructions for TSN:

http://onramp/hq/traffops/otrafsaf/tasas/TrafficCensus/TrafficCensus/TSN/TSNindex.htm

- Access TSN:

http://svhqdb38.dot.ca.gov:7778/forms/frmservlet?config=tsn

TSN 2008 Traffic Data
Hourly Counts

OTM32520
03/14/2013
08:19:55

CALTRANS TRAFFIC VOLUMES
Detail All Vehicle Hourly Count Report

District	County	Route	Sfx	Prefix	Postmile	Hg	Leg
03	SAC	051			3.357		B

Location Description
SACRAMENTO, EXPOSITION

Traffic Station: 430
Location Type: Trend Station
Lanes: 3
Lane Code: 1

Direction of Count: North

Year	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
2008	MAR 10	MAR 11	MAR 12	MAR 13	MAR 14	MAR 15	MAR 16	MAR 17
0-1	731 A	709 A	654 A	784 A	809 A	1249 A	1336 A	749 A
1-2	559 A	509 A	509 A	553 A	620 A	1070 A	1077 A	487 A
2-3	391 A	363 A	340 A	452 A	481 A	739 A	791 A	402 A
3-4	447 A	432 A	439 A	468 A	497 A	552 A	482 A	396 A
4-5	646 A	660 A	656 A	678 A	669 A	502 A	395 A	611 A
5-6	1901 A	1900 A	1922 A	1941 A	1887 A	764 A	478 A	1840 A
6-7	3734 A	3871 A	3746 A	3909 A	3748 A	1499 A	968 A	3629 A
7-8	5364 A	5497 A	5132 A	5479 A	5511 A	2639 A	1486 A	5175 A
8-9	5460 A	5634 A	5854 A	5798 A	5626 A	3772 A	2072 A	5116 A
9-10	4777 A	5043 A	5056 A	4959 A	5114 A	4555 A	3024 A	4703 A
10-11	4934 A	4987 A	4995 A	5090 A	5457 A	5133 A	4219 A	4897 A
11-12	5155 A	5285 A	5491 A	5310 A	5847 A	5390 A	4905 A	5094 A
12-13	5352 A	5290 A	5368 A	5425 A	6047 A	5845 A	5013 A	5493 A
13-14	5447 A	5485 A	5426 A	5444 A	5959 A	5994 A	5198 A	5417 A
14-15	5639 A	5696 A	5833 A	5745 A	5977 A	5947 A	5021 A	5628 A
15-16	5644 A	5907 A	5709 A	5792 A	5741 A	5616 A	4970 A	5441 A
16-17	5521 A	5534 A	5517 A	5142 A	5408 A	5563 A	4557 A	5609 A
17-18	5043 A	5407 A	4969 A	4804 A	5294 A	5175 A	4223 A	4785 A
18-19	4380 A	4723 A	4466 A	4868 A	4945 A	4486 A	3477 A	4127 A
19-20	3671 A	4017 A	3905 A	3934 A	4661 A	3849 A	3175 A	3625 A
20-21	2782 A	3048 A	2934 A	3228 A	3578 A	3265 A	2750 A	2844 A
21-22	2230 A	2423 A	2543 A	2704 A	3162 A	2988 A	2511 A	2393 A
22-23	1663 A	1719 A	1759 A	2080 A	2698 A	2853 A	1795 A	1804 A
23-24	1124 A	1117 A	1205 A	1337 A	1892 A	1926 A	1216 A	1278 A
Day Total	82595 A	85256 A	84428 A	85924 A	91628 A	81371 A	65139 A	81543 A
AM Peak Hour	08-09	08-09	08-09	08-09	11-12	11-12	11-12	07-08
AM Peak Traffic	5460	5634	5854	5798	5847	5390	4905	5175
PM Peak Hour	15-16	15-16	14-15	15-16	12-13	13-14	13-14	14-15
PM Peak Traffic	5644	5907	5833	5792	6047	5994	5198	5628

NCHRP 255

NCHRP 255 – Highway Traffic Data For Urbanized Area Project Planning and Design

- RATIO Adjustment:

$$\text{Ratio} = (\text{Count} / A_b) * A_f$$

Count = base year traffic count

A_b = base year traffic assignment

A_f = future year traffic forecast

NCHRP 255

- DIFFERENCE Adjustment:

$$\text{Difference} = (\text{Count} - A_b) + A_f$$

The value for the DIFFERENCE can be either positive or negative; the value for the RATIO can be greater or less than one, but always positive.

NCHRP 255

Ratio Adjustment				
DIR	2008 Sacsim PM 3 HR (A_b)	2008 Count PM 3 HR	2035 Sacsim PM 3 HR (A_f)	Ratio
NB	19,211	16,848	22,471	19,707
SB	18,434	17,237	23,343	21,827

Difference Adjustment				
DIR	2008 Sacsim PM 3 HR (A_b)	20008 Count PM 3 HR	2035 Sacsim PM 3 HR (A_f)	Difference
NB	19,211	16,848	22,471	20,108
SB	18,434	17,237	23,343	22,146

NCHRP 255

- RA_f = (RATIO + DIFFERENCE)/2

  RA_f = Average of these two results:

DIR	Ratio Adjust	Difference Adjust	Adjusted 2035 PM 3 HR RA_f
NB	19,707	20,108	19,908
SB	21,827	22,146	21,987

Peak Hour Calculation

TSN Hourly Count Data 2008

Time	**Hourly Volume SB**	**100%**	**Hourly Volume NB**	**100%**
3-4	5,988	35%	5,907	35%
4-5	5,763	33%	5,534	33%
5-6	5,486	32%	5,407	32%
Total	17,237		16,848	

DIR	Adjusted 2035 PM 3 HR Vol (RA_f)	New 2035 PM 1-HR Vol
NB	19,908	6,916
SB	21,987	7,709
Total		14,624

NCHRP 255 Method

Two Problems May Occur

- RA_f could assume an impossible negative value if DIFFERENCE is less than zero and if the absolute value of DIFFERENCE is greater than the absolute value of the RATIO.

  If this occurs use the RATIO

- If COUNT is significantly greater than A_b. In this case a very high ratio factor may be compiled, resulting in excessively high values of RATIO RA_f.

  If this occurs use the DIFFERENCE

ADT Calculation

- NCHRP calculation for your ADT volumes.

DIR	2008 Sacsim ADT (A_b)	2008 ADT Count	2035 Sacsim ADT HR (A_f)	Difference	Ratio	ADT 2035 RA_F
NB	87,428	85,256	109,508	107,336	106,787	107,062
SB	94,516	87,648	117,893	111,025	109,326	110,176
					Total	217,237

Develop Future Year Forecasts For Your Desired Project Year

	Caltrans 2011 Traffic Volumes (y)	2035 Adjusted Volumes (x)	Growth Rate (g)	2040 Forecast Volume $x = (g)^z * y$	2040 Forecast Volume
ADT	159,000	217,237	1.0131	=((1.1013)^(2040-2011))x Base Yr Vol	231,831
PK HR	11,700	14,624	1.0093	=((1.0093)^(2040-2011))x Base Yr Vol	15,320

NCHRP 255:

$$g = (x/y)^{1/z}$$

g = average annual growth rate

x = future year volume

y = earlier year volume

z = number of years

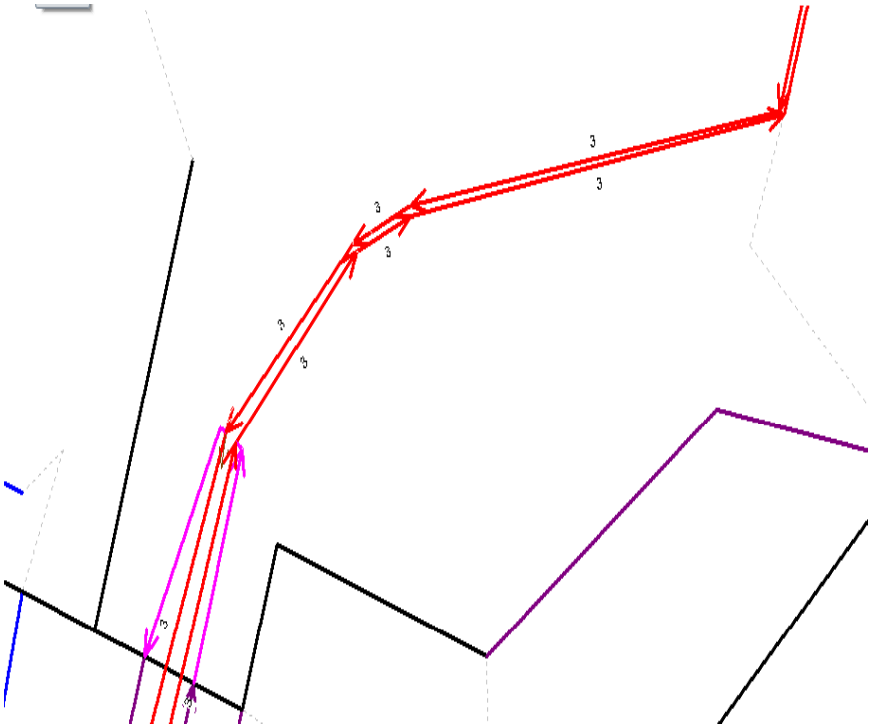
NCHRP 255
http://teachamerica.com/tih/PDF/nchrp255.pdf

Other Information From The Demand Forecast Models

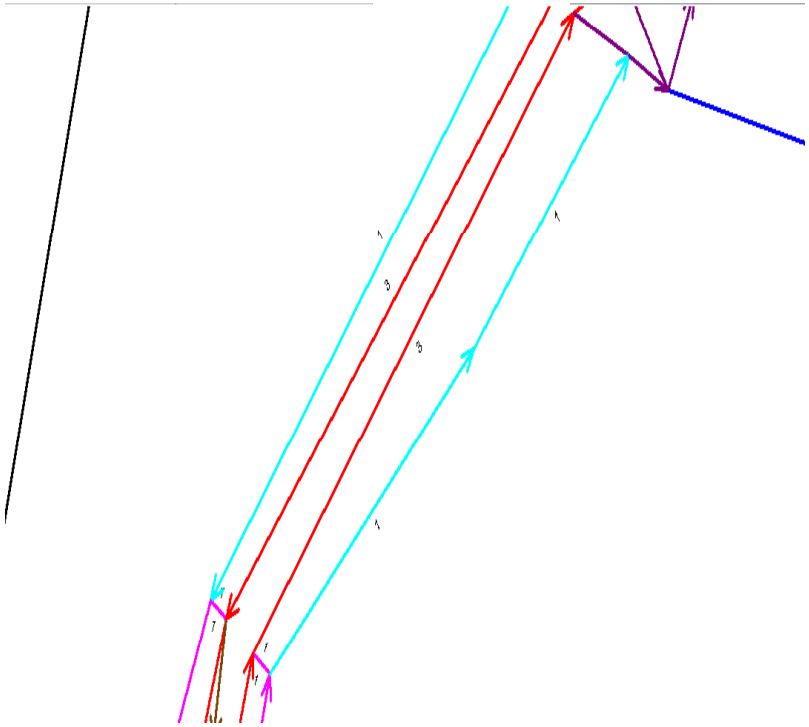
- Number of Lanes
- Volume Capacity
- Free flow Speeds

Sacsim Model Lanes

2008



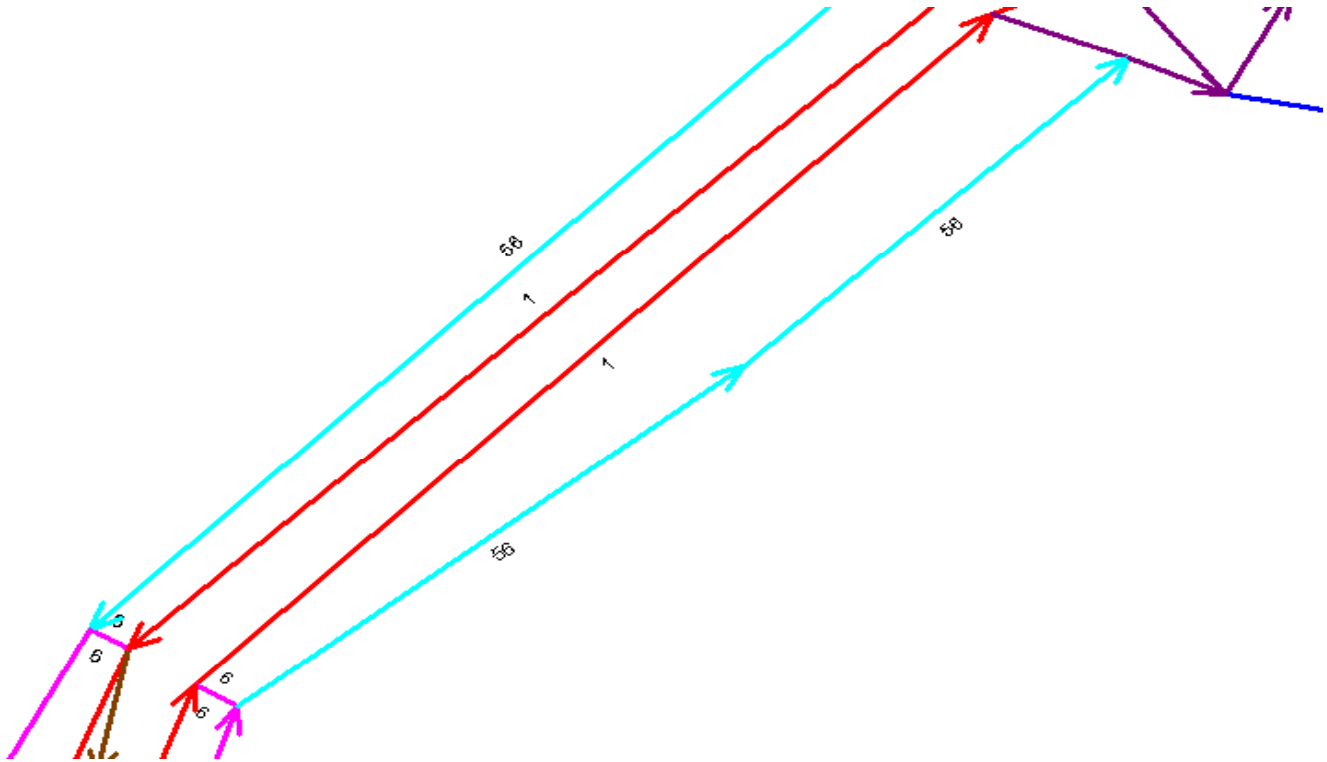
2035



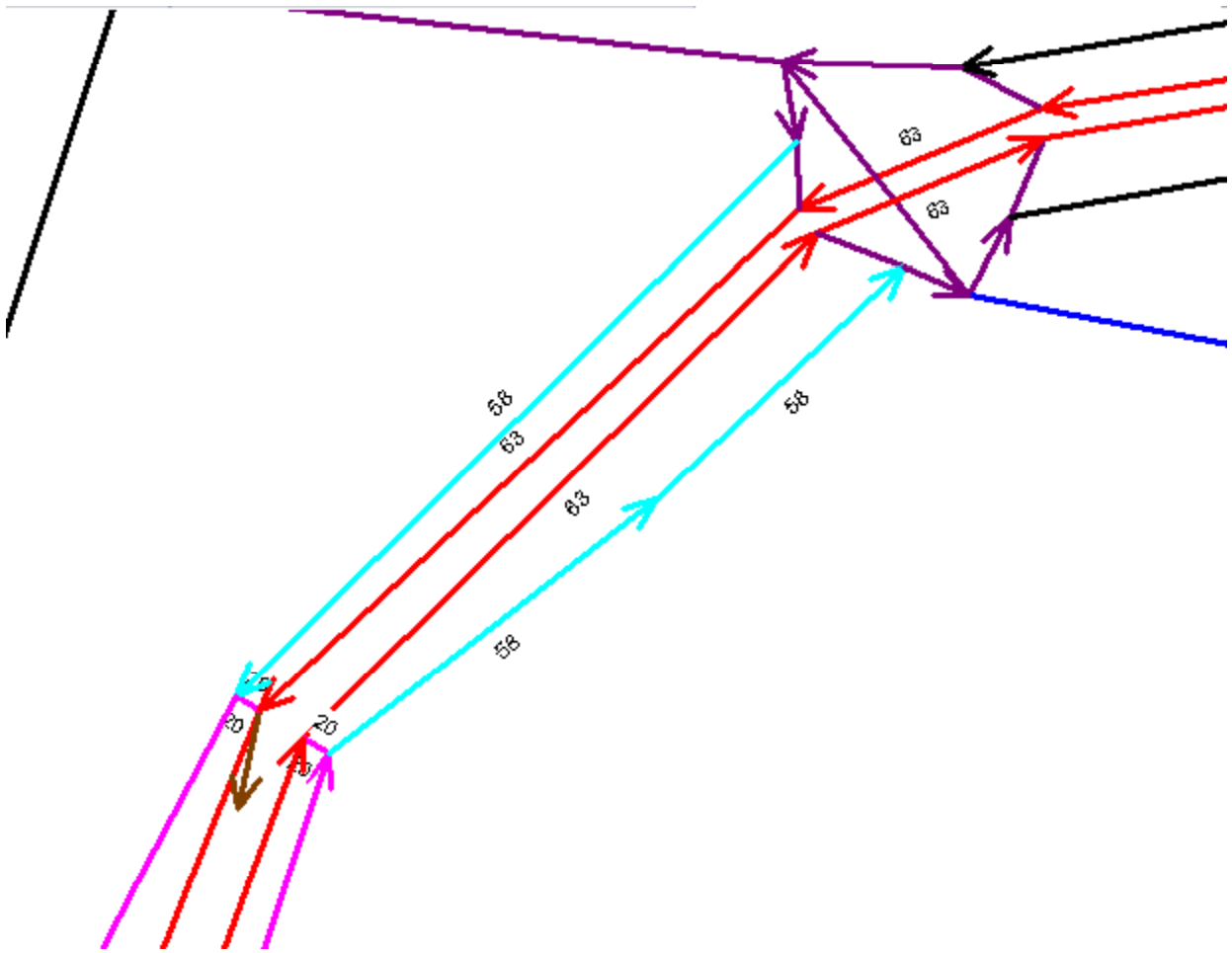
Sacsim Capacity Classes

Capacity 1 = 2,000 vphpl

Capacity 56 = 1,500 vphpl



Sacsim Free Flow Speeds



Questions