APPENDIX C
VISSIM MODEL CALIBRATION DOCUMENTATION

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

BRIAN SANDOVAL
Governor

RUDY MALFABON, P.E., *Director*
In Reply Refer to:

December 2, 2016
VIA E-Mail: chad.anson@c-agroup.com

Chad Anson, P.E.
Vice President
CA Group
1135 Terminal Way, Suite #106
Reno, NV 89502

Subject: Reno Sparks Freeway Traffic Study

Dear Mr. Anson:

The Nevada Department of Transportation (NDOT) Traffic and Operations Division reviewed the technical memorandums and reports for the subject project provided by your firm as summarized below:

- Traffic Volume Balancing Methodology – November 14, 2016
- Traffic Modeling and Operational Analysis Methodology – November 11, 2016
- VISSIM Model Calibration Methodology – November 11, 2016
- Confidence and Calibration Report – November 11, 2016

The information and documentation provided in the memorandums were acceptable to the Department. This is a formal NDOT approval letter for the use of the balanced traffic volumes and calibrated models as the base to develop future scenarios for the RENO SPARKS FREEWAY TRAFFIC STUDY Project.

Sincerely,

Denise M. Inda, P.E.
NDOT Chief Traffic Operations Engineer

DMI/HH/JLT
CC: Hoang Hong, NDOT Traffic Operations
Nick Johnson, NDOT Project Management
Chris Wright, NDOT Traffic Information

Technical Memorandum

TO: Hoang Hong, NDOT **DATE:** November 11, 2016

FROM: Chad Anson, CA Group

SUBJECT: Confidence and Calibration Report

COPIES: Nick Johnson, NDOT; Judy Tortelli, NDOT; Fidel Calixto, CA Group; Vinay Virupaksha, CA Group

1. Introduction

The purpose of this memorandum is to document the approach used to develop the base VISSIM models for the Reno Sparks Freeway Traffic Study project. The following technical documents and guidelines were used as references in developing the models:

- Protocol for VISSIM Simulation, WDOT, 2014
- CORSIM Modeling Guidelines, NDOT, 2012
- Guidance on the Level of Effort Required to Conduct Traffic Analysis Using Microsimulation, FHWA, 2012
- PTV VISSIM Training Manuals

The approach are outlined below and discussed further to calibrate the base models.

- Data Collection
- Base Model Development
- Error Checking

2. Data Collection

The 2016 traffic volumes for mainline and ramps are provided by NDOT (hourly counts), and turning movements counts are collected by Silver State Traffic Data Collection, LLC. The volumes were balanced as discussed in the submitted *Traffic Volume Balancing Methodology Memorandum*. Also, posted speeds, roadway geometry, and traffic signal timing data were gathered for the development and calibration of the models.

3. Base Model Development

The base VISSIM model geometry (number of lanes, link lengths, and link behavior type) was coded over an aerial image of the study area. The freeway was coded with VISSIM's default "freeway" link behavior type and the arterial network was coded with VISSIM's default "urban" link behavior type. Grades that were greater than 3% were coded along the mainline network as discussed in the submitted *Traffic Modeling and Operational Analysis Methodology Memorandum*.

Traffic signal timing data was provided by the Cities of Reno and Sparks. Traffic signal timing was coded into the VISSIM models at study intersections using the VISSIM provided RBC controllers. Right turns on red and stop controlled intersections were coded into the network consistent with existing traffic operations.

Desired speeds were coded into the network based posted speed limits along the roadway. The speed distribution for both mainline and arterial network was coded as ± 5 miles per hour (mph); with at least 85% of the driver population driving at or above the posted speed limit. Reduced right turning speed for passenger cars and trucks were coded at 9 mph and 7 mph, respectively. For left turns, the reduced speed was 15 mph and 12 mph for passenger cars and trucks respectively.

Conflict points were coded in locations where links/connectors overlap creating conflicting vehicle routes. The conflict point's parameters were adjusted to values that are anticipated to reflect driver behavior that was consistent with observed field conditions. For locations where a vehicle was anticipated to enter the conflict point zone and possibly block it, the "avoid blocking" parameter was coded to 0 (allows vehicles to enter zone). The factors for front, rear and satisfactory distance were adjusted to reduce incidences of vehicles entering the dilemma zone.

Balanced vehicle inputs (hourly volume) were coded at entry points in four 30-minutes time intervals including a 15-minute seeding period. The vehicle compositions were coded for passenger cars, single and multi-unit trucks as provided by NDOT. VISSIM's static routing feature was then used to route traffic to their destinations.

4. Error Checking

The coded data including volumes, traffic signal timing, speeds and network layout was reviewed by the model developer and by a quality control reviewer. The review of the animation was conducted to determine locations where signal timing may be operating incorrectly, where conflict points might be missing, where field conditions such as weaving and congestion did not reflect observed field conditions or any other locations where general coded parameters may have been overlooked. Some model parameters were adjusted to accurately reflect the vehicle interactions on the network based on the modeler's judgment as part of this review. A list of driver behaviors was created by various adjustments to the parameters. Each location were reviewed and applied with relevant driver behaviors to match the field conditions. The list of various driver behaviors along with the applied locations is included in Appendix A.

Error log files for the ten simulation runs did not indicate any major errors. There were minor errors that were logged and these are not anticipated to influence the average results. Some of the minor errors are listed below.

- Simulation time 1049.5: Vehicle 9103 (on Static Vehicle Route 84: 4th St WB @ Galletti Way - 1: 4th St WBL @ Galletti Way) arrived at the end of link 364: 4th St WB without having found the next link (10339) of its route.
- Simulation time 1050.5: vehicle 7550 already passed start of travel time section 208 at simulation time 806.4
- Vehicle input 101 (link 133) could not be finished completely (remain: 3 vehicles). This error occurred occasionally in run 10.

5. Confidence

Since the true average of the model results is unknown, statistical tests were conducted to evaluate models' results to ensure that they are not skewed towards a statistical outlier. An initial sampling of the model outputs was used to determine the level of confidence in the reported results. This is due to the varying results that inherently exist between microsimulation runs (resulting from random seed number). An initial NDOT recommended sample of 10 simulation runs was used to determine the number of simulations runs that would be required for calibration. Traffic volumes and speeds from the field were compared to the VISSIM to determine the minimum number of runs. The detail calculations are included in Appendix B. Most of the calculations resulted in less than 10 number of runs except for 2 locations with 15 runs and 54 runs. Due to the size of the network and consulting with NDOT the number of runs were finalized to be 10 (NDOT also recommends a minimum sample size of 10 simulation runs). Following the procedure outlined in the *Traffic Modeling and Operational Analysis Methodology Memorandum* and *VISSIM Model Calibration Methodology Memorandum*, 10 simulation runs were used. A 95 percent confidence level for the probability that the true mean of the model lies within the target confidence interval was used as recommended by NDOT.

6. Calibration

Model parameters were reviewed and adjusted to replicate the observed field conditions. Model output MOE's (traffic volumes, travel time/speed and queues) were compared to field collected data resulting in adjustments of default model parameters and geometry where necessary to reflect observed operating conditions based on engineering judgment. A list of driver behaviors was created by various adjustments to the parameters. Each calibration location were analyzed and applied with different driver behavior to meet the calibration target. The detail list of various driver behavior types and adjustments for the calibration parameters are included in Appendix A.

7. Base Model Calibration Results

A comparison of the models' data output to the field data was iteratively conducted until calibration targets were met. Confidence tests were performed throughout the iterative calibration process to ensure that model results that are representative of the true model average were used. Appendix C provides a table showing the comparison of the field volumes, speed/travel time and queues with VISSIM output.

Model throughput volumes were calibrated to be within a GEH of 5 for at least 85 percent of the cases. All the mainline volumes for I-80 and US-395/I-580 between each interchanges for each direction were calibrated. All the ramp movement volumes at the spaghetti bowl were also calibrated which was critical since the majority of the volumes pass through the system-to-system interchange. In addition the percentage difference between the model and field volumes was less than 5 percent for at least 85 percent of the cases. Data collection points were defined to collect average volumes from 10 runs to compare with the existing field volumes.

The vehicle travel time/speed measurements were defined at all the selected calibration locations that are listed in Table 1 for each model. The average speeds from 10 runs were compared with the field data along with the standard deviation. A statistical test (Z-test) was performed to check if the results for "Reject" or "Do Not Reject". If the result is "Reject", the process of calibration was continued by adjusting the calibration parameters until the statistical test results are "Do Not Reject". The statistical test for speed shows that target is met for all locations.

Table 1: Travel Time/Speed Calibration Segments

No.	Freeway Segment	Time
1	US-395/I-580 NB between I-80 WB off-ramp and Oddie Boulevard off-ramp	PM
2	US-395/I-580 NB between Oddie Boulevard off-ramp and Clear Acre Lane off-ramp	PM
3	US-395/I-580 SB between Clear Acre Lane Exit 70 sign structure and Oddie Boulevard on-ramp	AM
4	US-395/I-580 SB between 2nd/Glendale Avenue off-ramp and 2nd/Glendale Avenue on-ramp	AM & PM
5	I-80 EB between Rock Boulevard on-ramp and Pyramid Way off-ramp	PM

Queue counters were placed in VISSIM at all the selected locations shown in Table 2. The average of the maximum queues from all 10 runs was compared with the field queues. If one of the queue location was not representing the queues from the field, similar method of adjusting the driver behavior parameter was followed until closely matching the field condition. All the queue locations matched closely to what was the observed in the field. Figures 1 through 6 show the screenshots from VISSIM for various queue locations in the following pages.

Table 2: Queue Calibration Locations

No.	Location	Time
1	I-80 EB to US-395/I-580 SB (ES ramp)	AM
2	I-80 EB to Rock Boulevard off-ramp	AM
3	I-80 WB to US-395/I-580	AM
4	I-580 NB to I-80 EB (NE ramp)	PM
5	I-580 SB to Moana Lane off-ramp	PM

8. List of Appendices

- Appendix A: List of Driver Behavior Parameters and Segments
- Appendix B: Minimum Number of Simulation Runs Calculation
- Appendix C: VISSIM Results for Calibration (Volumes, Travel Time/Speed and Queues)
- Appendix D: Field Data – Travel Time
- Appendix E: Field Data – Queues

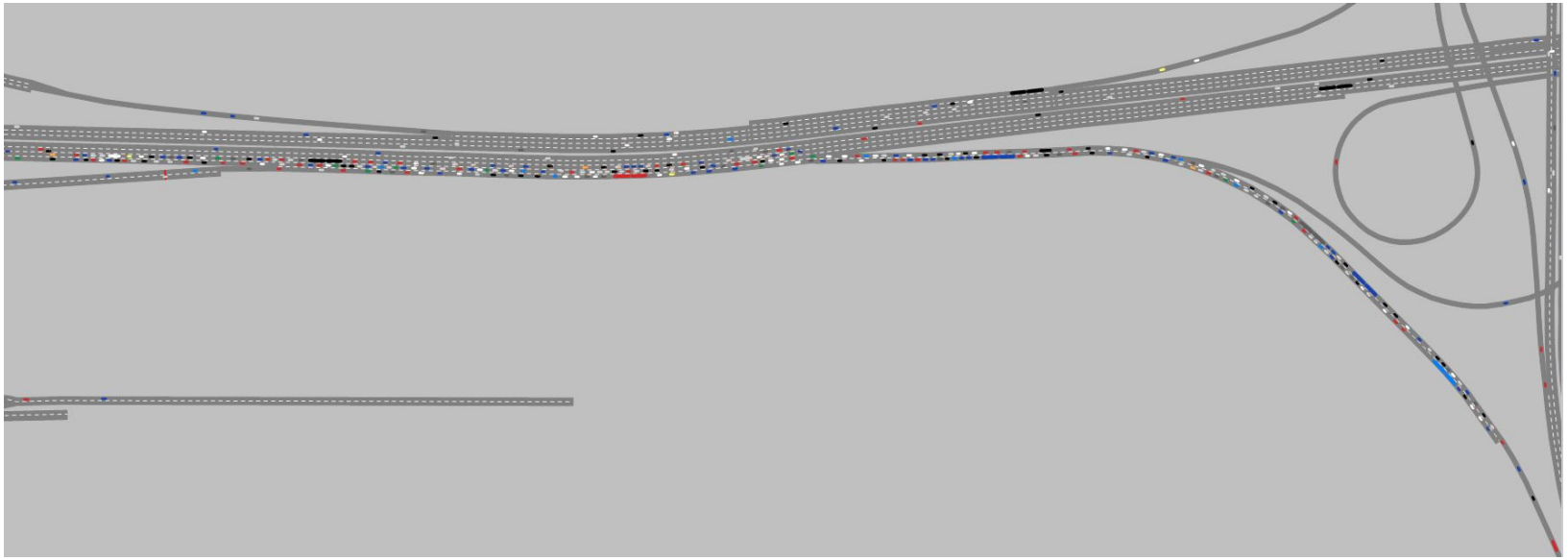


Figure 1: ES Ramp Queues backing up on mainline west of Wells Ave On-Ramp during AM Peak Period

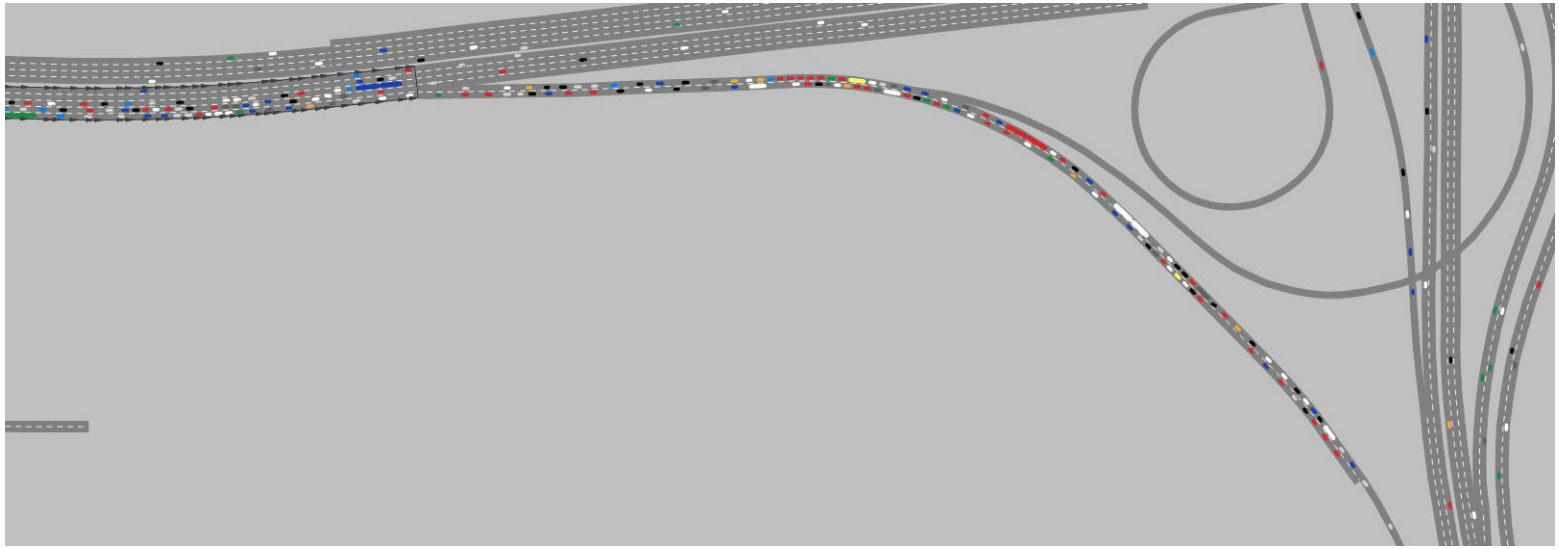


Figure 2: ES Ramp Queue blocking EN Ramp during AM Peak Period

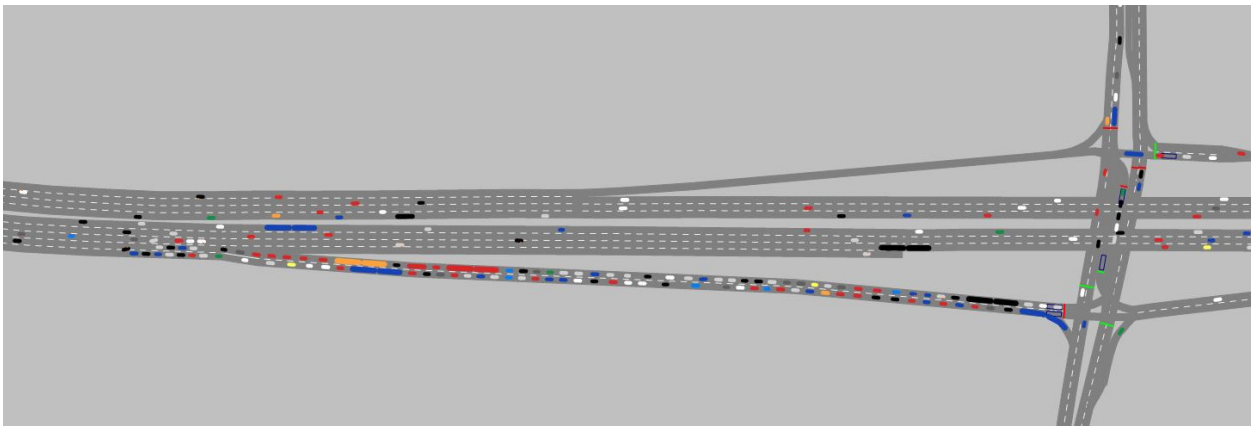


Figure 3: Rock Blvd Off-Ramp Queue backing up to mainline during AM Peak Period

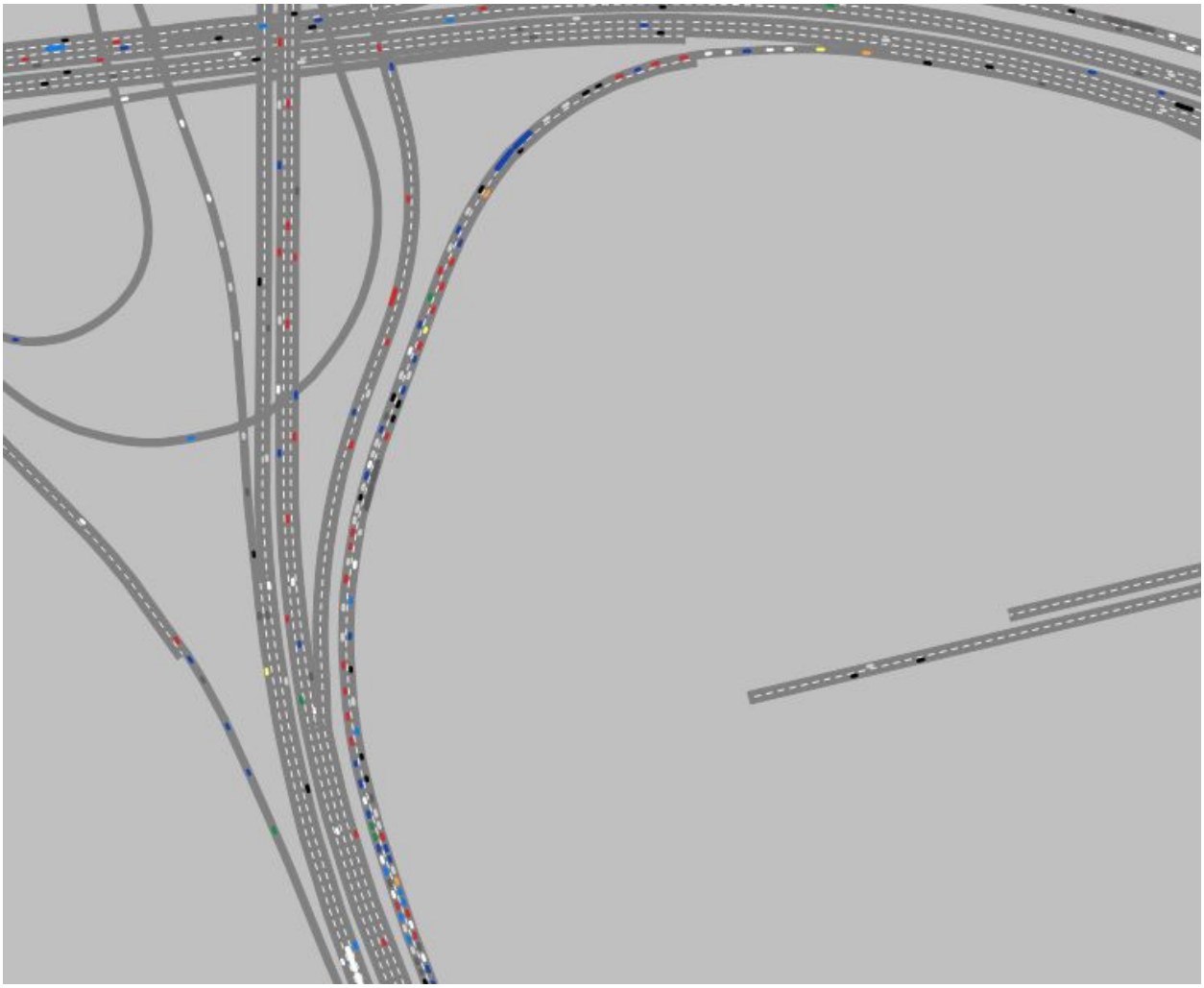


Figure 4: NE Ramp Queues during PM Peak Period

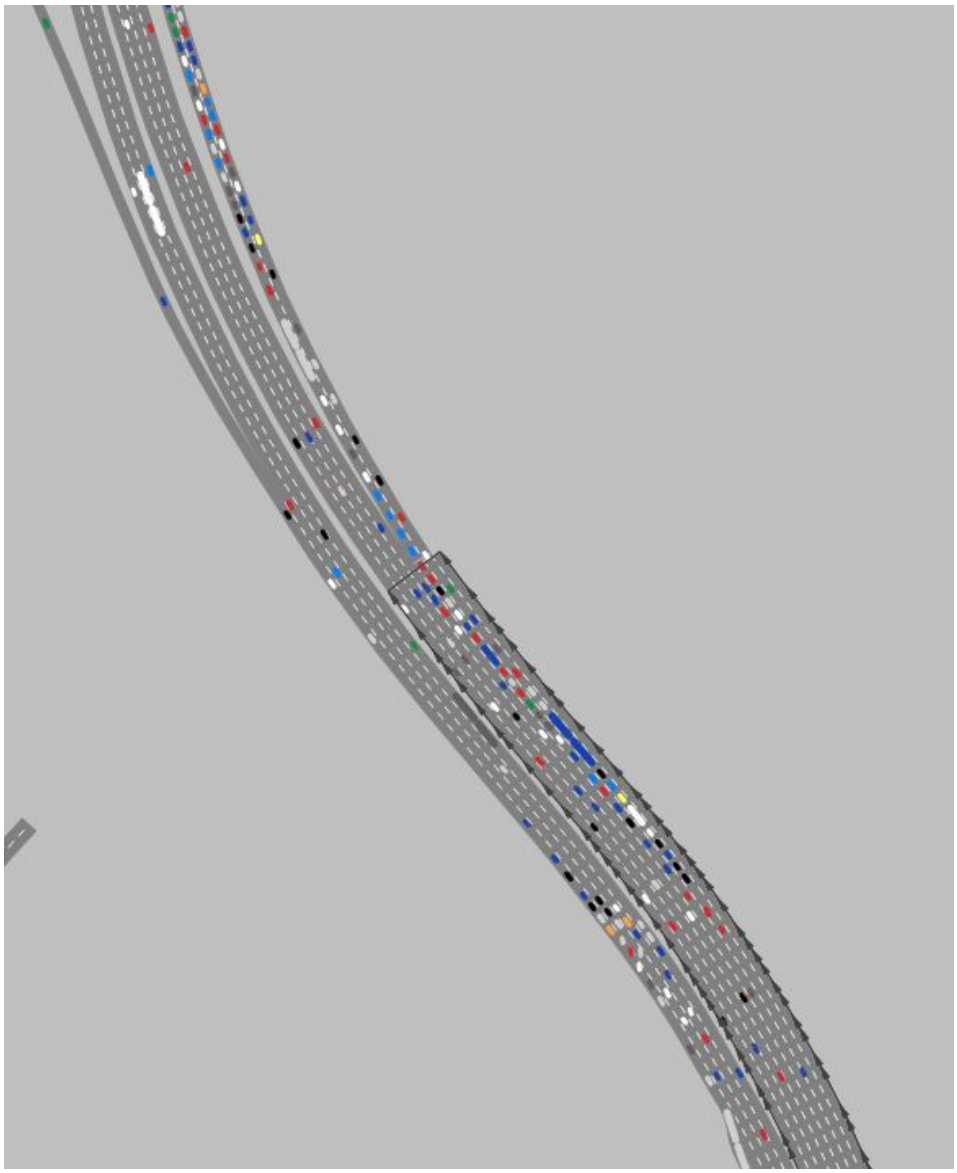


Figure 5: NE Ramp Queue backing up to mainline during PM Peak Period

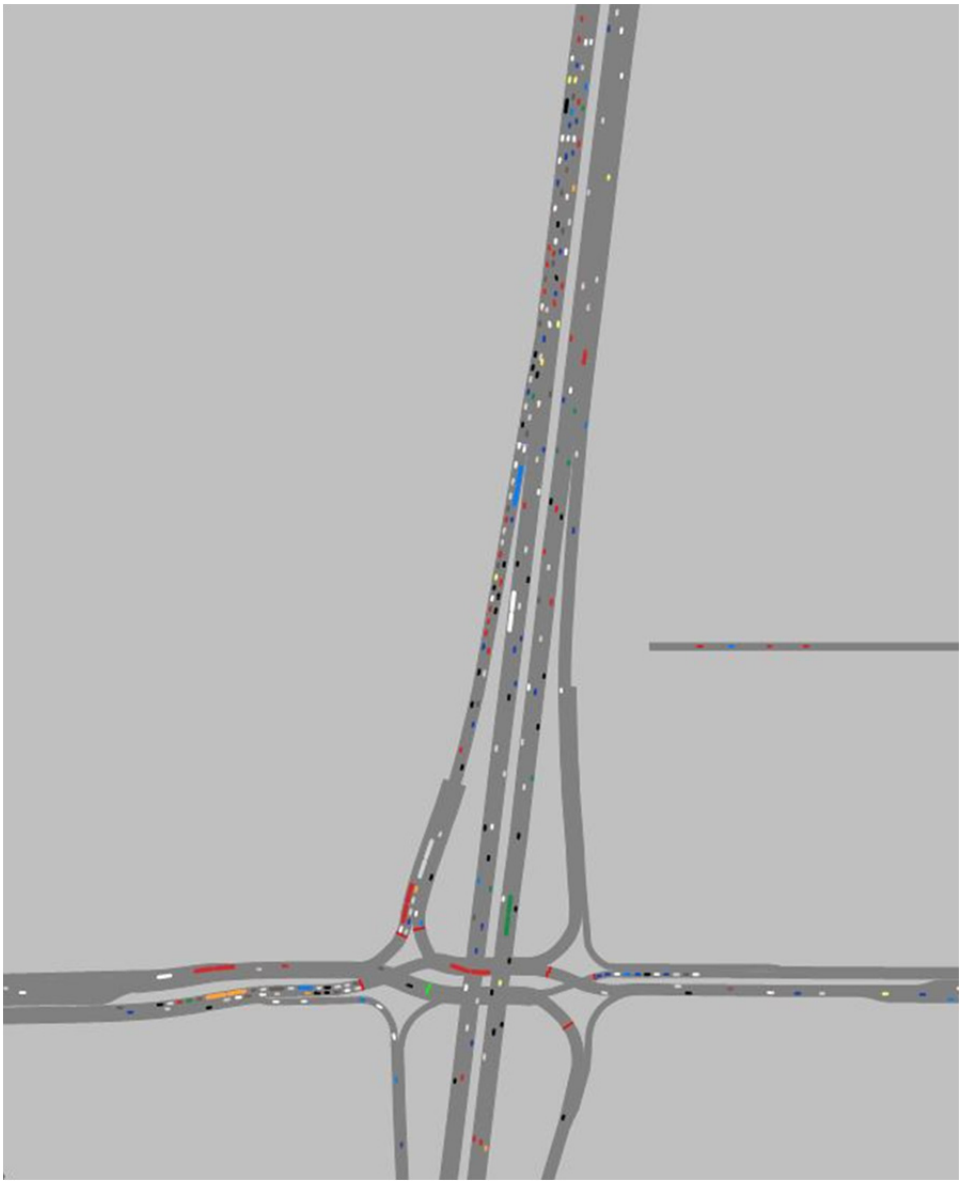


Figure 6: Moana Ln Off-Ramp Queue extending on to mainline during PM Peak Period

Appendix A

Table 1: Driver Behavior Parameters for Freeway

Car Following Parameters	Driver Behavior Model							
	Freeway (Default)	**Freeway (network wide)**	**Freeway (B2)**	**Freeway (B3)**	**Freeway (B4)**	**Freeway (B5)**	**Freeway (B6)**	**Weaving (W1)**
Look ahead distance (ft)	0 – 820.21	0 – 820.21	0 – 820.21	0 – 820.21	0 – 820.21	0 – 820.21	0 – 820.21	0 – 820.21
Observed Vehicles	2	2	2	4	2	4	4	4
Look back distance (ft)	0 – 492.13	0 – 492.13	0 – 492.13	0 – 492.13	0 – 492.13	0 – 492.13	0 – 492.13	0 – 492.13
CC0 (Standstill Distance) (ft)	4.92	4.70	4.70	4.50	4.50	4.70	4.50	4.50
CC1 (Headway Time) (sec)	0.90	0.85	0.85	0.85	0.85	0.85	0.85	1.00
CC2 ('Following' Variation) (ft)	13.12	13.12	13.12	13.12	12.00	13.12	6.56	13.12
Lane Change Parameters	**Freeway (Default)**	**Freeway (network wide)**	**Freeway (B2)**	**Freeway (B3)**	**Freeway (B4)**	**Freeway (B5)**	**Freeway (B6)**	**Weaving (W1)**
Maximum Deceleration (ft/sec^2)								
Own	-13.12	-13.12	-13.12	-15.00	-15.00	-13.12	-15.00	-13.12
Trailing Vehicle	-9.84	-9.84	-9.84	-12.00	-12.00	-9.84	-12.00	-9.84
-1 ft/sec^2 per distance (ft)								
Own	200	200	200	150	150	200	150	200
Trailing Vehicle	200	200	200	150	150	200	150	200
Accepted Deceleration (ft/sec^2)								
Own	-3.28	-3.28	-3.28	-2.50	-2.50	-3.28	-2.50	-3.28
Trailing Vehicle	-1.64	-1.64	-1.64	-1.50	-1.50	-1.64	-1.50	-1.64
Waiting Time before Diffusion (sec)	60	200	200	200	200	200	200	200
Minimum Headway (front/rear) (ft)	1.64	1.64	1.64	1.50	1.64	1.50	1.50	1.64
Safety Distance Reduction Factor	0.60	0.60	0.25	0.20	0.20	0.20	0.20	0.53
Maximum Deceleration for Cooperative Braking (ft/sec^2)	-9.84	-9.84	-9.84	-8.00	-8.00	-8.00	-8.00	-9.84
Cooperative Lane Change Allowed?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 2: Driver Behavior Parameters for Urban

Car Following Parameters	Driver Behavior Model		
	Urban (Default)	**Urban (U1)**	**Urban (U2)**
Look ahead distance (ft)	0 – 820.21	0 – 820.21	0 – 820.21
Observed Vehicles	2	2	4
Look back distance (ft)	0 – 492.13	0 – 492.13	0 – 492.13
Average Standstill Distance (ft)	6.56	9.50	9.50
Additive Part of Safety Distance (ft)	2.00	4.00	4.50
Multiplic. Part of Safety Distance (ft)	3.00	5.00	5.50
Lane Change Parameters	**Urban (Default)**	**Urban (U1)**	**Urban (U2)**
Maximum Deceleration (ft/sec^2) Own Trailing Vehicle	 -13.12 -9.84	 -13.12 -9.84	 -10.00 -8.00
-1 ft/sec^2 per distance (ft) Own Trailing Vehicle	 100 100	 100 100	 100 100
Accepted Deceleration (ft/sec^2) Own Trailing Vehicle	 -3.28 -3.28	 -3.28 -3.28	 -3.28 -3.28
Waiting Time before Diffusion (sec)	200	200	200
Minimum Headway (front/rear) (ft)	1.64	1.64	1.64
Safety Distance Reduction Factor	0.60	0.80	0.95
Maximum Deceleration for Cooperative Braking (ft/sec^2)	-9.84	-9.84	-9.00

VISSIM DRIVER BEHAVIOR SEGMENTS

	PM MODEL				AM MODEL			
No.	**Freeway Behavior (B2)**	**Freeway Behavior (B3)**	**Freeway Behavior (B4)**	**Urban Behavior (U2)**	**Freeway Behavior (B5)**	**Freeway Behavior (B6)**	**Weaving Behavior (W1)**	**Urban Behavior (U1)**
					EASTBOUND			
1	I-80 EB b/n N-E ramp to Pyramid Wy on-ramp	E-S on-ramp at I-580 (1 Ln)			I-80 EB b/n W McCarran Blvd on-ramp to Wells on-ramp		I-80 EB b/n Wells Ave on-ramp and E-S ramp	I-80 EB to Rock Blvd off-ramp
2	I-80 EB to US-395/I-580 ramp	E-N on-ramp at I-580 (1 Ln)			I-80 EB after E-S ramp to 4th St/Prater Wy on-ramp		I-80 EB b/n 4th St/Prater Wy on-ramp and Rock Blvd off-ramp	
3					I-80 EB after Rock Blvd off-ramp to end of lane drop segment before Rock Blvd on-ramp		E-S Ramp (merging lanes)	
					WESTBOUND			
4	I-80 WB to US-395/I-580 ramp	I-80 WB from starting point to Rock Blvd on-ramp			I-80 WB from starting point to S-W on-ramp			
5		I-80 WB at Keystone Ave on-ramp to W McCarran Blvd off-ramp			I-80 WB at Wells Ave on-ramp to before Keystone Ave on-ramp			
6		W-N ramp (Spaghetti Bowl)						
7		W-S ramp (Spaghetti Bowl)						
					NORTHBOUND			
8	I-580 NB after Virginia St/Kietzke Ln on-ramp to lane drop segment before Moana Ln off-ramp	I-580 NB from Villanova Dr on-ramp to N-W ramp	I-580 NB b/n N-W ramp and McCarran on-ramp		I-580 NB after Virginia St/Kietzke Ln on-ramp to lane drop segment before Moana off-ramp			
9	I-580 NB b/n Plumb off-ramp to Villanova Dr on-ramp	I-580 NB to I-80 EB ramp (N-E)			I-580 NB b/n 2nd St/Glendale Ave off-ramp and on-ramp			
					SOUTHBOUND			
10	I-580 SB b/n Mills St off-ramp and on-ramp	I-580 SB from starting point to E-S on-ramp	I-580 SB from E-S on-ramp to 2nd St/Glendale Ave on-ramp	I-580 SB to Moana Ln off-ramp	I-580 SB from Oddie Blvd on-ramp to lane drop segment before S-W/E-ramp	I-580 SB from starting point to Oddie Blvd on-ramp		
11		I-580 SB between 2nd St/Glendale Ave on-ramp and Mills off-ramp			I-580 SB from 2nd St/Glendale Ave on-ramp to Moana Ln off-ramp	I-580 SB after lane drop segment to 2nd St/Glendale Ave on-ramp		
12		I-580 SB from Mills St on-ramp to end point.			S-E ramp (Spaghetti Bowl)			
13		S-E ramp (Spaghetti Bowl)						
14		S-W ramp (Spaghetti Bowl)						

Appendix B

Speed

	Field			Model	
	N	AVG	STD DEV	AVG	STD DEV
I-80 WB	24	61.16	4.11	59.98	0.39
I-80 EB	26	64.61	4.95	41.39	4.53
US-395/I-580 SB	19	58.43	6.05	60.44	0.35
US-395/I-580 NB	19	50.86	11.80	49.20	0.87

	Z-crit	1.96	3.84
	stdev	**0.39**	0.15
I-80 WB	E	1.65	
	e	0.03	2.61
	n-rqd	***0.22***	
	Z-crit	1.96	3.84
	stdev	**4.53**	20.55
I-80 EB	E	1.90	
	e	0.03	1.48
	n-rqd	***53.23***	
	Z-crit	1.96	3.84
	stdev	**0.35**	0.13
US-395/I-580 SB	E	2.72	
	e	0.05	7.92
	n-rqd	***0.06***	
	Z-crit	1.96	3.84
	stdev	**0.87**	0.76
US-395/I-580 NB	E	5.31	
	e	0.10	26.34
	n-rqd	***0.11***	

Volume (I-80)

	Field			Model	
	N	AVG	STD DEV	AVG	STD DEV
EB (4th/Prater on-ramp - Rock off-ramp)	3	10,931	99	9,795	198.28
WB (Rock on-ramp - 4th/Prater off-ramp)	3	9,032	49	8,522	53.03

	Z-crit	1.96	3.84
	stdev	**198.28**	39316.77
4th/Prater on-ramp - Rock off-ramp	E	112.03	
	e	0.01	10077.65
	n-rqd	***14.99***	
	Z-crit	1.96	3.84
	stdev	**53.03**	2811.88
Rock on-ramp - 4th/Prater off-ramp	E	55.45	
	e	0.01	2737.21
	n-rqd	***3.95***	

Volume (US-395/I-580)

	Field			Model	
	N	AVG	STD DEV	AVG	STD DEV
NB (Mill on-ramp - Glendale off-ramp)	3	16,811	162	15,768	135.92
SB (Glendale on-ramp - Mill off-ramp)	3	10,610	101	9,889	70.36

	Z-crit	1.96	3.84
	stdev	**135.92**	18474.25
NB Mill on-ramp - Glendale off-ramp	E	183.32	
	e	0.01	29565.62
	n-rqd	***2.40***	
	Z-crit	1.96	3.84
	stdev	**70.36**	4950.53
SB Glendale on-ramp - Mill off-ramp	E	114.29	
	e	0.01	11347.69
	n-rqd	***1.68***	

$$n = \frac{(Z)^2(\sigma)^2}{(e\bar{X})^2}$$

Where:
n is the minimum number of model runs required;
Z is the critical Z statistic (for a 95-percent Confidence Interval, $Z = 1.96$);
σ is the standard deviation calculated on the basis of the conducted model runs for the given performance measure;
*e is the Tolerance Error calculated from field data variability; and
$\bar{X}$ is the mean calculated on the basis of the performed model runs for the given MOE.

* $\frac{Error\ 'E'}{Field\ Mean} = Tolerance\ \%\ 'e'$ $\qquad E = Z\left(\frac{\sigma}{\sqrt{n}}\right)$

Where:
Z is the critical Z statistic (for a 95-percent Confidence Interval, Z = 1.96);
σ is the standard deviation calculated based on field data; and
n is the sample size (number of observations in the field).

Source: Guidance on the Level of Effort Required to Conduct Traffic Analysis Using Microsimulation, FHWA, January 2012

Appendix C

	Freeway Segment (I-80)	Eastbound		Freeway Segment (I-80)	Westbound	
		AM	PM		AM	PM
		Total	Total		Total	Total
Field Volumes	W McCarran Blvd & Keystone Ave	6,536	5,151	E McCarran Blvd & Pyramid Wy	7,118	7,306
	Keystone Ave & Sierra St/Center St	8,630	6,779	Pyramid Wy & Rock Blvd	8,889	8,585
	Sierra St/Center St & Wells Ave	8,755	8,841	Rock Blvd & 4th St/Prater Wy	9,091	9,725
	Wells Ave & US-395/I-580	8,259	9,791	4th St/Prater Wy & US-395/I-580	4,288	4,552
	US-395/I-580 & 4th St/Prater Wy	7,546	10,508	US-395/I-580 & Wells Ave	8,574	10,472
	4th St/Prater Wy & Rock Blvd	7,242	10,382	Wells Ave & Sierra St/Center St	7,326	10,684
	Rock Blvd & Pyramid Wy	6,364	10,168	Sierra St/Center St & Keystone Ave	4,881	9,688
	Pyramid Wy & E McCarran Blvd	5,577	8,022	Keystone Ave & W McCarran Blvd &	3,695	7,841
		AM	PM		AM	PM
		Total	Total		Total	Total
VISSIM Model Volumes	W McCarran Blvd & Keystone Ave	6,536	5,147	E McCarran Blvd & Pyramid Wy	7,119	7,600
	Keystone Ave & Sierra St/Center St	8,636	6,769	Pyramid Wy & Rock Blvd	8,853	8,831
	Sierra St/Center St & Wells Ave	8,589	8,704	Rock Blvd & 4th St/Prater Wy	9,058	9,935
	Wells Ave & US-395/I-580	8,093	9,702	4th St/Prater Wy & US-395/I-580	4,331	4,656
	US-395/I-580 & 4th St/Prater Wy	7,437	10,387	US-395/I-580 & Wells Ave	8,590	10,617
	4th St/Prater Wy & Rock Blvd	7,142	10,268	Wells Ave & Sierra St/Center St	7,320	10,799
	Rock Blvd & Pyramid Wy	6,266	10,043	Sierra St/Center St & Keystone Ave	4,894	9,784
	Pyramid Wy & E McCarran Blvd	5,479	7,921	Keystone Ave & W McCarran Blvd &	3,706	7,894
		AM	PM		AM	PM
		Total	Total		Total	Total
Percent Difference	W McCarran Blvd & Keystone Ave	0.0%	-0.1%	E McCarran Blvd & Pyramid Wy	0.0%	4.0%
	Keystone Ave & Sierra St/Center St	0.1%	-0.1%	Pyramid Wy & Rock Blvd	-0.4%	2.9%
	Sierra St/Center St & Wells Ave	-1.9%	-1.5%	Rock Blvd & 4th St/Prater Wy	-0.4%	2.2%
	Wells Ave & US-395/I-580	-2.0%	-0.9%	4th St/Prater Wy & US-395/I-580	1.0%	2.3%
	US-395/I-580 & 4th St/Prater Wy	-1.4%	-1.2%	US-395/I-580 & Wells Ave	0.2%	1.4%
	4th St/Prater Wy & Rock Blvd	-1.4%	-1.1%	Wells Ave & Sierra St/Center St	-0.1%	1.1%
	Rock Blvd & Pyramid Wy	-1.5%	-1.2%	Sierra St/Center St & Keystone Ave	0.3%	1.0%
	Pyramid Wy & E McCarran Blvd	-1.8%	-1.3%	Keystone Ave & W McCarran Blvd &	0.3%	0.7%
		AM	PM		AM	PM
		Total	Total		Total	Total
GEH	W McCarran Blvd & Keystone Ave	0.0	0.1	E McCarran Blvd & Pyramid Wy	0.0	3.4
	Keystone Ave & Sierra St/Center St	0.1	0.1	Pyramid Wy & Rock Blvd	0.4	2.6
	Sierra St/Center St & Wells Ave	1.8	1.5	Rock Blvd & 4th St/Prater Wy	0.3	2.1
	Wells Ave & US-395/I-580	1.8	0.9	4th St/Prater Wy & US-395/I-580	0.7	1.5
	US-395/I-580 & 4th St/Prater Wy	1.3	1.2	US-395/I-580 & Wells Ave	0.2	1.4
	4th St/Prater Wy & Rock Blvd	1.2	1.1	Wells Ave & Sierra St/Center St	0.1	1.1
	Rock Blvd & Pyramid Wy	1.2	1.2	Sierra St/Center St & Keystone Ave	0.2	1.0
	Pyramid Wy & E McCarran Blvd	1.3	1.1	Keystone Ave & W McCarran Blvd &	0.2	0.6

	Freeway Segment (US-395/I-580)	Northbound		Freeway Segment (US-395/I-580)	Southbound	
		AM	PM		AM	PM
		Total	Total		Total	Total
Field Volumes	Virginia St/Kietzkie Ln and Moana Ln	8,786	11,903	Parr Blvd & Clear Acre Ln	6,337	4,725
	Moana Ln & Airport	9,572	14,038	McCarran Blvd & Oddie Blvd	9,596	6,434
	Plumb Ln & Villanova Dr	8,127	12,885	Oddie Blvd & I-80	10,158	6,835
	Villanova Dr & Mill St	9,120	15,232	I-80 & Glendale Ave/2nd St	14,486	10,357
	Mill St & Glendale Ave/2nd St	8,028	16,079	Glendale Ave/2nd St & Mill St	14,109	10,692
	Glendale Ave/2nd St & I-80	7,665	16,572	Mill St & Villanova Dr	13,104	11,109
	I-80 & Oddie Blvd	4,360	11,597	Villanova Dr & Plumb Ln	11,685	9,481
	Oddie Blvd & McCarran Blvd	4,128	11,028	Airport & Moana Ln	12,481	11,114
	Clear Acre Ln & Parr Blvd	3,084	7,979	Moana Ln and Virginia St/Kietzkie Ln	10,680	9,316
		AM	PM		AM	PM
		Total	Total		Total	Total
VISSIM Model Volumes	Virginia St/Kietzkie Ln and Moana Ln	8,782	11,897	Parr Blvd & Clear Acre Ln	6,346	4,728
	Moana Ln & Airport	9,582	14,012	McCarran Blvd & Oddie Blvd	9,491	6,451
	Plumb Ln & Villanova Dr	8,126	12,851	Oddie Blvd & I-80	10,081	6,837
	Villanova Dr & Mill St	9,112	15,279	I-80 & Glendale Ave/2nd St	14,224	10,350
	Mill St & Glendale Ave/2nd St	7,980	16,135	Glendale Ave/2nd St & Mill St	13,999	10,704
	Glendale Ave/2nd St & I-80	7,589	16,615	Mill St & Villanova Dr	13,040	11,064
	I-80 & Oddie Blvd	4,325	11,653	Villanova Dr & Plumb Ln	11,615	9,417
	Oddie Blvd & McCarran Blvd	4,106	10,925	Airport & Moana Ln	12,517	11,042
	Clear Acre Ln & Parr Blvd	3,038	8,006	Moana Ln and Virginia St/Kietzkie Ln	10,691	9,219
		AM	PM		AM	PM
		Total	Total		Total	Total
Percent Difference	Virginia St/Kietzkie Ln and Moana Ln	0.0%	-0.1%	Parr Blvd & Clear Acre Ln	0.1%	0.1%
	Moana Ln & Airport	0.1%	-0.2%	McCarran Blvd & Oddie Blvd	-1.1%	0.3%
	Plumb Ln & Villanova Dr	0.0%	-0.3%	Oddie Blvd & I-80	-0.8%	0.0%
	Villanova Dr & Mill St	-0.1%	0.3%	I-80 & Glendale Ave/2nd St	-1.8%	-0.1%
	Mill St & Glendale Ave/2nd St	-0.6%	0.3%	Glendale Ave/2nd St & Mill St	-0.8%	0.1%
	Glendale Ave/2nd St & I-80	-1.0%	0.3%	Mill St & Villanova Dr	-0.5%	-0.4%
	I-80 & Oddie Blvd	-0.8%	0.5%	Villanova Dr & Plumb Ln	-0.6%	-0.7%
	Oddie Blvd & McCarran Blvd	-0.5%	-0.9%	Airport & Moana Ln	0.3%	-0.6%
	Clear Acre Ln & Parr Blvd	-1.5%	0.3%	Moana Ln and Virginia St/Kietzkie Ln	0.1%	-1.0%
		AM	PM		AM	PM
		Total	Total		Total	Total
GEH	Virginia St/Kietzkie Ln and Moana Ln	0.0	0.1	Parr Blvd & Clear Acre Ln	0.1	0.0
	Moana Ln & Airport	0.1	0.2	McCarran Blvd & Oddie Blvd	1.1	0.2
	Plumb Ln & Villanova Dr	0.0	0.3	Oddie Blvd & I-80	0.8	0.0
	Villanova Dr & Mill St	0.1	0.4	I-80 & Glendale Ave/2nd St	2.2	0.1
	Mill St & Glendale Ave/2nd St	0.5	0.4	Glendale Ave/2nd St & Mill St	0.9	0.1
	Glendale Ave/2nd St & I-80	0.9	0.3	Mill St & Villanova Dr	0.6	0.4
	I-80 & Oddie Blvd	0.5	0.5	Villanova Dr & Plumb Ln	0.6	0.7
	Oddie Blvd & McCarran Blvd	0.3	1.0	Airport & Moana Ln	0.3	0.7
	Clear Acre Ln & Parr Blvd	0.8	0.3	Moana Ln and Virginia St/Kietzkie Ln	0.1	1.0

	Freeway Segment	AM	PM
		Total	Total
Field Volumes	N - E	2,216	4,459
	N - W	3,058	4,567
	S - E	1,703	1,475
	S - W	1,228	1,353
	E - N	880	1,626
	E - S	3,752	3,591
	W - N	1,089	2,425
	W - S	3,507	2,759
		Total	Total
VISSIM Model Volumes	N - E	2,187	4,427
	N - W	3,035	4,608
	S - E	1,688	1,483
	S - W	1,231	1,347
	E - N	896	1,617
	E - S	3,612	3,564
	W - N	1,062	2,480
	W - S	3,456	2,785
		Total	Total
Percent Difference	N - E	-1.3%	-0.7%
	N - W	-0.8%	0.9%
	S - E	-0.9%	0.5%
	S - W	0.2%	-0.4%
	E - N	1.8%	-0.6%
	E - S	-3.7%	-0.8%
	W - N	-2.5%	2.3%
	W - S	-1.5%	0.9%
		Total	Total
GEH	N - E	0.6	0.5
	N - W	0.4	0.6
	S - E	0.4	0.2
	S - W	0.1	0.2
	E - N	0.5	0.2
	E - S	2.3	0.5
	W - N	0.8	1.1
	W - S	0.9	0.5

Speed Calibration

	Freeway Segment	AM Peak Period			PM Peak Period		
		Average	Standard Deviation	Runs	Average	Standard Deviation	Runs
Field Data	US-395/I-580 NB between I-80 WB off-ramp and Oddie off-ramp				37.239	16.575	19
	US-395/I-580 NB between Oddie off-ramp and Clear Acre off-ramp				48.113	9.482	19
	US-395/I-580 SB between Clear Acre Exit 70 Sign structure and Oddie on -ramp	51.47	13.53	34			
	US-395/I-580 SB between 2nd St/Glendale off-ramp and 2nd St/Glendale on-ramp	67.72	24.93	34	63.157	8.542	19
	I-80 EB between Rock on-ramp and Pyramid off-ramp				52.898	9.715	26
		Average	Standard Deviation	Runs	Average	Standard Deviation	Runs
VISSIM Data	US-395/I-580 NB between I-80 WB off-ramp and Oddie off-ramp				57.81	0.96	10
	US-395/I-580 NB between Oddie off-ramp and Clear Acre off-ramp				47.59	4.58	10
	US-395/I-580 SB between Clear Acre Exit 70 Sign structure and Oddie on -ramp	62.16	1.97	10			
	US-395/I-580 SB between 2nd St/Glendale off-ramp and 2nd St/Glendale on-ramp	62.24	0.33	10	60.623	0.749	10
	I-80 EB between Rock on-ramp and Pyramid off-ramp				49.862	2.183	10
		Z -critical	Z-calculated	Result	Z -critical	Z-calculated	Result
Z-Test	US-395/I-580 NB between I-80 WB off-ramp and Oddie off-ramp				1.960	-5.393	Do Not Reject
	US-395/I-580 NB between Oddie off-ramp and Clear Acre off-ramp				1.960	0.199	Do Not Reject
	US-395/I-580 SB between Clear Acre Exit 70 Sign structure and Oddie on -ramp	1.960	-4.45	Do Not Reject			
	US-395/I-580 SB between 2nd St/Glendale off-ramp and 2nd St/Glendale on-ramp	1.960	1.28	Do Not Reject	1.960	1.284	Do Not Reject
	I-80 EB between Rock on-ramp and Pyramid off-ramp				1.960	1.498	Do Not Reject

Queue Calibration

Location	AM Peak Period		PM Peak Period	
	Field	VISSIM	Field	VISSIM
I-80 EB to US-395/I-580 (ES Ramp)	~ 1650'	~ 1340'		
I-80 EB to Rock Blvd off-ramp	~ 330'	~ 220'		
I-80 WB to US-395/I-580	Gore	Gore		
I-580 NB to I-80 EB (NE Ramp)			~ 690'	~ 730'
I-580 SB to Moana Blvd off-ramp			~ 290'	~270'

Appendix D

EASTBOUND

January 12, 2016		January 13, 2016		January 14, 2016
AM	PM	AM	PM	AM
7:00am - 9:00am	4:00pm - 6:00pm	7:00am - 9:00am	4:00pm - 6:00pm	7:00am - 9:00am

January 12, 2016 6:59 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	29	68.18
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	12	75.57
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	27	64.14
	15	1510	Off Ramp Pyramid	16	64.35
	16	2540	On Ramp Pyramid	27	64.14
	17	790	End Point	8	67.33
	Total	28320		287	67.46

January 12, 2016 3:57 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	29	68.18
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	28	65.02
	6	1070	Off Ramp Wells	11	66.32
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	24	66.19
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	22	64.46
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	29	59.72
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	29	59.72
	17	790	End Point	9	59.85
	Total	28320		299	64.62

January 13, 2016 7:01 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	18	70.45
	3	2900	On Ramp Keystone	31	63.78
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	22	69.73
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	5	79.09
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	25	69.27
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	27	64.14
	17	790	End Point	8	67.33
	Total	28320		286	68.12

January 13, 2016 4:01 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	28	70.62
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	25	72.82
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	7	56.49
	12	2080	On Ramp Prater	22	64.46
	13	1390	Off Ramp Rock	13	72.90
	14	2540	On Ramp Rock	26	66.61
	15	1510	Off Ramp Pyramid	16	64.35
	16	2540	On Ramp Pyramid	27	64.14
	17	790	End Point	8	67.33
	Total	28320		286	67.00

January 14, 2016 6:58 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	19	66.03
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	24	66.19
	10	640	On Ramp I-580 NB	8	54.55
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	23	61.66
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	29	59.72
	15	1510	Off Ramp Pyramid	18	57.20
	16	2540	On Ramp Pyramid	31	55.87
	17	790	End Point	8	67.33
	Total	28320		306	63.50

January 12, 2016 7:03 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
2nd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	29	68.18
	4	1840	Off Ramp Sierra/Maple	19	66.03
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	21	75.65
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	5	79.09
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	26	66.61
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	27	64.14
	17	790	End Point	8	67.33
	Total	28320		286	68.05

January 12, 2016 4:01 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
2nd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	29	68.18
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	12	60.80
	7	2250	On Ramp Wells	25	61.36
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	24	66.19
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	25	56.73
	13	1390	Off Ramp Rock	17	55.75
	14	2540	On Ramp Rock	28	61.85
	15	1510	Off Ramp Pyramid	20	51.48
	16	2540	On Ramp Pyramid	32	54.12
	17	790	End Point	9	59.85
	Total	28320		311	62.33

January 13, 2016 7:18 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
2nd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	18	70.45
	3	2900	On Ramp Keystone	28	70.62
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	22	69.73
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	20	79.43
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	26	66.61
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	25	69.27
	17	790	End Point	8	67.33
	Total	28320		279	69.16

January 13, 2016 4:09 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
2nd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	28	70.62
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	12	60.80
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	30	57.73
	15	1510	Off Ramp Pyramid	26	39.60
	16	2540	On Ramp Pyramid	29	59.72
	17	790	End Point	7	76.95
	Total	28320		300	66.01

January 14, 2016 7:02 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
2nd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	21	60.39
	3	2900	On Ramp Keystone	31	63.78
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	25	72.82
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	22	69.73
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	22	72.21
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	7	56.49
	12	2080	On Ramp Prater	23	61.66
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	28	61.85
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	28	61.85
	17	790	End Point	8	67.33
	Total	28320		295	65.38

January 12, 2016 7:17 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
3rd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	27	73.23
	4	1840	Off Ramp Sierra/Maple	19	66.03
	5	2670	On Ramp Center/Maple	28	65.02
	6	1070	Off Ramp Wells	12	60.80
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	29	59.72
	15	1510	Off Ramp Pyramid	19	54.19
	16	2540	On Ramp Pyramid	32	54.12
	17	790	End Point	10	53.86
	Total	28320		304	63.43

January 12, 2016 4:16 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
3rd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	21	60.39
	3	2900	On Ramp Keystone	31	63.78
	4	1840	Off Ramp Sierra/Maple	19	66.03
	5	2670	On Ramp Center/Maple	28	65.02
	6	1070	Off Ramp Wells	11	66.32
	7	2250	On Ramp Wells	27	56.82
	8	1330	Off Ramp I-580 NB/SB	15	60.45
	9	2330	On Ramp I-580 SB	25	63.55
	10	640	On Ramp I-580 NB	8	54.55
	11	580	Off Ramp Prater	7	56.49
	12	2080	On Ramp Prater	24	59.09
	13	1390	Off Ramp Rock	16	59.23
	14	2540	On Ramp Rock	32	54.12
	15	1510	Off Ramp Pyramid	19	54.19
	16	2540	On Ramp Pyramid	30	57.73
	17	790	End Point	8	67.33
	Total	28320		321	60.32

January 13, 2016 7:42 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
3rd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	28	70.62
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	24	75.85
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	23	61.66
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	25	69.27
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	31	55.87
	17	790	End Point	9	59.85
	Total	28320		292	66.46

January 13, 2016 4:18 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
3rd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	29	68.18
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	25	72.82
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	27	56.82
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	20	79.43
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	35	49.48
	15	1510	Off Ramp Pyramid	29	35.50
	16	2540	On Ramp Pyramid	32	54.12
	17	790	End Point	6	89.77
	Total	28320		309	66.35

January 14, 2016 7:18 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
3rd Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	8	49.43
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	27	64.14
	15	1510	Off Ramp Pyramid	18	57.20
	16	2540	On Ramp Pyramid	9	192.42
	17	790	End Point	8	67.33
	Total	28320		277	73.07

January 12, 2016

AM

January 12, 2016 7:20 AM — 4th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	26	48.78
3	2900	On Ramp Keystone	30	65.91
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	25	61.36
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	6	72.73
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	19	74.64
13	1390	Off Ramp Rock	16	59.23
14	2540	On Ramp Rock	25	69.27
15	1510	Off Ramp Pyramid	18	57.20
16	2540	On Ramp Pyramid	29	59.72
17	790	End Point	8	67.33
Total	28320		299	65.63

January 12, 2016 7:35 AM — 5th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	22	57.64
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	5	79.09
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	25	69.27
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	25	69.27
17	790	End Point	9	59.85
Total	28320		287	67.33

January 12, 2016 7:37 AM — 6th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	25	50.73
3	2900	On Ramp Keystone	30	65.91
4	1840	Off Ramp Sierra/Maple	16	78.41
5	2670	On Ramp Center/Maple	24	75.85
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	23	66.70
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	26	61.10
10	640	On Ramp I-580 NB	8	54.55
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	23	61.66
13	1390	Off Ramp Rock	16	59.23
14	2540	On Ramp Rock	26	66.61
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	30	57.73
17	790	End Point	8	67.33
Total	28320		302	64.20

PM

January 12, 2016 4:21 PM — 4th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	27	73.23
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	25	61.36
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	22	72.21
10	640	On Ramp I-580 NB	6	72.73
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	28	50.65
13	1390	Off Ramp Rock	10	94.77
14	2540	On Ramp Rock	29	59.72
15	1510	Off Ramp Pyramid	18	57.20
16	2540	On Ramp Pyramid	27	64.14
17	790	End Point	9	59.85
Total	28320		295	67.03

January 12, 2016 4:32 PM — 5th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	22	57.64
3	2900	On Ramp Keystone	32	61.79
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	22	64.46
13	1390	Off Ramp Rock	15	63.18
14	2540	On Ramp Rock	30	57.73
15	1510	Off Ramp Pyramid	18	57.20
16	2540	On Ramp Pyramid	29	59.72
17	790	End Point	8	67.33
Total	28320		303	64.33

January 12, 2016 4:37 PM — 6th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	16	78.41
5	2670	On Ramp Center/Maple	25	72.82
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	27	56.82
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	22	72.21
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	5	79.09
12	2080	On Ramp Prater	26	54.55
13	1390	Off Ramp Rock	15	63.18
14	2540	On Ramp Rock	28	61.85
15	1510	Off Ramp Pyramid	17	60.56
16	2540	On Ramp Pyramid	26	66.61
17	790	End Point	8	67.33
Total	28320		296	66.15

January 13, 2016

AM

January 13, 2016 7:49 AM — 4th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	24	52.84
3	2900	On Ramp Keystone	31	63.78
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	22	72.21
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	5	79.09
12	2080	On Ramp Prater	20	70.91
13	1390	Off Ramp Rock	13	72.90
14	2540	On Ramp Rock	27	64.14
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	27	64.14
17	790	End Point	8	67.33
Total	28320		289	67.83

January 13, 2016 8:07 AM — 5th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	21	60.39
3	2900	On Ramp Keystone	28	70.62
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	12	75.57
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	5	79.09
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	29	59.72
15	1510	Off Ramp Pyramid	18	57.20
16	2540	On Ramp Pyramid	24	72.16
17	790	End Point	7	76.95
Total	28320		284	69.05

January 13, 2016 8:12 AM — 6th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	18	70.45
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	16	78.41
5	2670	On Ramp Center/Maple	24	75.85
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	20	76.70
8	1330	Off Ramp I-580 NB/SB	11	82.44
9	2330	On Ramp I-580 SB	21	75.65
10	640	On Ramp I-580 NB	6	72.73
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	20	70.91
13	1390	Off Ramp Rock	13	72.90
14	2540	On Ramp Rock	23	75.30
15	1510	Off Ramp Pyramid	15	68.64
16	2540	On Ramp Pyramid	28	61.85
17	790	End Point	7	76.95
Total	28320		267	72.86

PM

January 13, 2016 4:28 PM — 4th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	19	66.75
3	2900	On Ramp Keystone	25	79.09
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	12	60.80
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	22	72.21
10	640	On Ramp I-580 NB	8	54.55
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	23	61.66
13	1390	Off Ramp Rock	15	63.18
14	2540	On Ramp Rock	35	49.48
15	1510	Off Ramp Pyramid	27	38.13
16	2540	On Ramp Pyramid	41	42.24
17	790	End Point	10	53.86
Total	28320		322	61.69

January 13, 2016 4:35 PM — 5th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	22	57.64
3	2900	On Ramp Keystone	35	56.49
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	30	60.68
6	1070	Off Ramp Wells	13	56.12
7	2250	On Ramp Wells	29	52.90
8	1330	Off Ramp I-580 NB/SB	15	60.45
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	6	72.73
11	580	Off Ramp Prater	7	56.49
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	26	66.61
15	1510	Off Ramp Pyramid	17	60.56
16	2540	On Ramp Pyramid	30	57.73
17	790	End Point	9	59.85
Total	28320		314	62.27

January 13, 2016 4:46 PM — 6th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	18	70.45
3	2900	On Ramp Keystone	30	65.91
4	1840	Off Ramp Sierra/Maple	15	83.64
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	24	63.92
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	24	66.19
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	26	54.55
13	1390	Off Ramp Rock	16	59.23
14	2540	On Ramp Rock	32	54.12
15	1510	Off Ramp Pyramid	20	51.48
16	2540	On Ramp Pyramid	29	59.72
17	790	End Point	8	67.33
Total	28320		305	64.53

January 14, 2016

AM

January 14, 2016 7:20 AM — 4th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	19	66.75
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	20	76.70
8	1330	Off Ramp I-580 NB/SB	17	53.34
9	2330	On Ramp I-580 SB	22	72.21
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	26	66.61
15	1510	Off Ramp Pyramid	15	68.64
16	2540	On Ramp Pyramid	29	59.72
17	790	End Point	7	76.95
Total	28320		286	67.83

January 14, 2016 7:33 AM — 5th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	19	66.75
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	20	62.73
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	26	59.00
8	1330	Off Ramp I-580 NB/SB	16	56.68
9	2330	On Ramp I-580 SB	24	66.19
10	640	On Ramp I-580 NB	8	54.55
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	20	70.91
13	1390	Off Ramp Rock	15	63.18
14	2540	On Ramp Rock	28	61.85
15	1510	Off Ramp Pyramid	15	68.64
16	2540	On Ramp Pyramid	24	72.16
17	790	End Point	7	76.95
Total	28320		294	65.88

January 14, 2016 7:38 AM — 6th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	30	65.91
4	1840	Off Ramp Sierra/Maple	19	66.03
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	25	61.36
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	22	72.21
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	25	69.27
15	1510	Off Ramp Pyramid	15	68.64
16	2540	On Ramp Pyramid	27	64.14
17	790	End Point	7	76.95
Total	28320		289	67.03

January 12, 2016		January 13, 2016		January 14, 2016
AM	PM	AM	PM	AM

January 12, 2016 7:55 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
7th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	22	57.64
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	26	70.02
	6	1070	Off Ramp Wells	11	66.32
	7	2250	On Ramp Wells	22	69.73
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	24	66.19
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	11	86.16
	14	2540	On Ramp Rock	29	59.72
	15	1510	Off Ramp Pyramid	15	68.64
	16	2540	On Ramp Pyramid	29	59.72
	17	790	End Point	8	67.33
	Total	28320		291	67.25

January 12, 2016 4:51 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
7th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	11	66.32
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	26	61.10
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	7	56.49
	12	2080	On Ramp Prater	23	61.66
	13	1390	Off Ramp Rock	16	59.23
	14	2540	On Ramp Rock	30	57.73
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	30	57.73
	17	790	End Point	9	59.85
	Total	28320		308	62.70

January 13, 2016 8:23 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
7th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	31	63.78
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	25	72.82
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	22	72.21
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	13	72.90
	14	2540	On Ramp Rock	25	69.27
	15	1510	Off Ramp Pyramid	15	68.64
	16	2540	On Ramp Pyramid	26	66.61
	17	790	End Point	7	76.95
	Total	28320		281	69.53

January 13, 2016 4:53 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
7th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	32	61.79
	4	1840	Off Ramp Sierra/Maple	15	83.64
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	12	75.57
	9	2330	On Ramp I-580 SB	22	72.21
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	7	56.49
	12	2080	On Ramp Prater	25	56.73
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	29	59.72
	15	1510	Off Ramp Pyramid	20	51.48
	16	2540	On Ramp Pyramid	30	57.73
	17	790	End Point	8	67.33
	Total	28320		300	65.85

January 14, 2016 7:52 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
7th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	11	66.32
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	7	56.49
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	27	64.14
	15	1510	Off Ramp Pyramid	16	64.35
	16	2540	On Ramp Pyramid	27	64.14
	17	790	End Point	8	67.33
	Total	28320		290	66.66

January 12, 2016 8:01 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
8th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	26	70.02
	6	1070	Off Ramp Wells	9	81.06
	7	2250	On Ramp Wells	21	73.05
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	22	72.21
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	22	64.46
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	27	64.14
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	28	61.85
	17	790	End Point	8	67.33
	Total	28320		287	68.04

January 12, 2016 4:56 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
8th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	21	60.39
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	28	65.02
	6	1070	Off Ramp Wells	12	60.80
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	15	60.45
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	27	64.14
	15	1510	Off Ramp Pyramid	20	51.48
	16	2540	On Ramp Pyramid	31	55.87
	17	790	End Point	9	59.85
	Total	28320		306	63.50

January 13, 2016 8:27 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
8th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	28	70.62
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	24	75.85
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	28	61.85
	15	1510	Off Ramp Pyramid	16	64.35
	16	2540	On Ramp Pyramid	27	64.14
	17	790	End Point	8	67.33
	Total	28320		287	67.25

January 13, 2016 5:04 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
8th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	27	73.23
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	26	70.02
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	25	61.36
	8	1330	Off Ramp I-580 NB/SB	15	60.45
	9	2330	On Ramp I-580 SB	26	61.10
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	24	59.09
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	30	57.73
	15	1510	Off Ramp Pyramid	21	49.03
	16	2540	On Ramp Pyramid	31	55.87
	17	790	End Point	7	76.95
	Total	28320		306	64.36

January 14, 2016 7:59 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
8th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	31	63.78
	4	1840	Off Ramp Sierra/Maple	19	66.03
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	21	73.05
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	28	61.85
	15	1510	Off Ramp Pyramid	17	60.56
	16	2540	On Ramp Pyramid	28	61.85
	17	790	End Point	8	67.33
	Total	28320		291	67.14

January 12, 2016 8:13 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
9th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	28	65.02
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	5	79.09
	12	2080	On Ramp Prater	22	64.46
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	26	66.61
	15	1510	Off Ramp Pyramid	16	64.35
	16	2540	On Ramp Pyramid	27	64.14
	17	790	End Point	7	76.95
	Total	28320		289	67.91

January 12, 2016 5:09 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
9th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	20	63.41
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	12	60.80
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	26	54.55
	13	1390	Off Ramp Rock	17	55.75
	14	2540	On Ramp Rock	33	52.48
	15	1510	Off Ramp Pyramid	23	44.76
	16	2540	On Ramp Pyramid	34	50.94
	17	790	End Point	8	67.33
	Total	28320		322	61.19

January 13, 2016 8:42 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
9th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	23	55.14
	3	2900	On Ramp Keystone	33	59.92
	4	1840	Off Ramp Sierra/Maple	16	78.41
	5	2670	On Ramp Center/Maple	26	70.02
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	13	69.76
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	5	87.27
	11	580	Off Ramp Prater	7	56.49
	12	2080	On Ramp Prater	22	64.46
	13	1390	Off Ramp Rock	13	72.90
	14	2540	On Ramp Rock	26	66.61
	15	1510	Off Ramp Pyramid	15	68.64
	16	2540	On Ramp Pyramid	28	61.85
	17	790	End Point	8	67.33
	Total	28320		292	67.80

January 13, 2016 5:11 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
9th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	21	60.39
	3	2900	On Ramp Keystone	28	70.62
	4	1840	Off Ramp Sierra/Maple	16	78.41
	5	2670	On Ramp Center/Maple	25	72.82
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	25	61.36
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	8	54.55
	11	580	Off Ramp Prater	5	79.09
	12	2080	On Ramp Prater	27	52.53
	13	1390	Off Ramp Rock	19	49.88
	14	2540	On Ramp Rock	59	29.35
	15	1510	Off Ramp Pyramid	24	42.90
	16	2540	On Ramp Pyramid	32	54.12
	17	790	End Point	7	76.95
	Total	28320		343	61.86

January 14, 2016 8:06 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
9th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	21	60.39
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	26	70.02
	6	1070	Off Ramp Wells	10	72.95
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	21	67.53
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	26	66.61
	15	1510	Off Ramp Pyramid	16	64.35
	16	2540	On Ramp Pyramid	28	61.85
	17	790	End Point	8	67.33
	Total	28320		291	66.45

January 12, 2016

AM

January 12, 2016 8:20 AM

10th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	16	78.41
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	25	63.55
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	22	64.46
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	25	69.27
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	27	64.14
17	790	End Point	9	59.85
Total	**28320**		**289**	**66.55**

January 12, 2016 8:30 AM

11th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	28	70.62
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	24	66.19
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	25	69.27
15	1510	Off Ramp Pyramid	15	68.64
16	2540	On Ramp Pyramid	26	66.61
17	790	End Point	7	76.95
Total	**28320**		**284**	**68.01**

January 12, 2016 8:34 AM

12th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	30	65.91
4	1840	Off Ramp Sierra/Maple	16	78.41
5	2670	On Ramp Center/Maple	25	72.82
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	24	63.92
8	1330	Off Ramp I-580 NB/SB	15	60.45
9	2330	On Ramp I-580 SB	24	66.19
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	7	56.49
12	2080	On Ramp Prater	20	70.91
13	1390	Off Ramp Rock	15	63.18
14	2540	On Ramp Rock	24	72.16
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	25	69.27
17	790	End Point	7	76.95
Total	**28320**		**286**	**67.07**

PM

January 12, 2016 5:16 PM

10th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	19	66.75
3	2900	On Ramp Keystone	31	63.78
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	24	63.92
8	1330	Off Ramp I-580 NB/SB	15	60.45
9	2330	On Ramp I-580 SB	25	63.55
10	640	On Ramp I-580 NB	8	54.55
11	580	Off Ramp Prater	8	49.43
12	2080	On Ramp Prater	23	61.66
13	1390	Off Ramp Rock	16	59.23
14	2540	On Ramp Rock	31	55.87
15	1510	Off Ramp Pyramid	18	57.20
16	2540	On Ramp Pyramid	33	52.48
17	790	End Point	10	53.86
Total	**28320**		**317**	**60.39**

January 12, 2016 5:27 PM

11th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	30	65.91
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	27	67.42
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	25	61.36
8	1330	Off Ramp I-580 NB/SB	15	60.45
9	2330	On Ramp I-580 SB	27	58.84
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	7	56.49
12	2080	On Ramp Prater	20	70.91
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	26	66.61
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	28	61.85
17	790	End Point	7	76.95
Total	**28320**		**297**	**65.45**

January 12, 2016 5:36 PM

12th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	18	70.45
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	30	60.68
6	1070	Off Ramp Wells	13	56.12
7	2250	On Ramp Wells	28	54.79
8	1330	Off Ramp I-580 NB/SB	15	60.45
9	2330	On Ramp I-580 SB	25	63.55
10	640	On Ramp I-580 NB	6	72.73
11	580	Off Ramp Prater	7	56.49
12	2080	On Ramp Prater	22	64.46
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	30	57.73
15	1510	Off Ramp Pyramid	17	60.56
16	2540	On Ramp Pyramid	29	59.72
17	790	End Point	8	67.33
Total	**28320**		**309**	**63.16**

January 13, 2016

AM

January 13, 2016 8:44 AM

10th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	18	70.45
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	12	60.80
7	2250	On Ramp Wells	26	59.00
8	1330	Off Ramp I-580 NB/SB	15	60.45
9	2330	On Ramp I-580 SB	25	63.55
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	23	61.66
13	1390	Off Ramp Rock	15	63.18
14	2540	On Ramp Rock	26	66.61
15	1510	Off Ramp Pyramid	14	73.54
16	2540	On Ramp Pyramid	24	72.16
17	790	End Point	8	67.33
Total	**28320**		**292**	**65.93**

January 13, 2016 5:30 PM

11th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	21	60.39
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	27	56.82
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	24	66.19
10	640	On Ramp I-580 NB	8	54.55
11	580	Off Ramp Prater	7	56.49
12	2080	On Ramp Prater	25	56.73
13	1390	Off Ramp Rock	22	43.08
14	2540	On Ramp Rock	32	54.12
15	1510	Off Ramp Pyramid	29	35.50
16	2540	On Ramp Pyramid	34	50.94
17	790	End Point	7	76.95
Total	**28320**		**333**	**59.68**

January 13, 2016 5:44 PM

12th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	21	60.39
3	2900	On Ramp Keystone	33	59.92
4	1840	Off Ramp Sierra/Maple	19	66.03
5	2670	On Ramp Center/Maple	30	60.68
6	1070	Off Ramp Wells	13	56.12
7	2250	On Ramp Wells	24	63.92
8	1330	Off Ramp I-580 NB/SB	12	75.57
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	8	49.43
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	26	66.61
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	27	64.14
17	790	End Point	7	76.95
Total	**28320**		**301**	**64.42**

PM

January 13, 2016 5:25 PM

10th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	28	65.02
6	1070	Off Ramp Wells	12	60.80
7	2250	On Ramp Wells	33	46.49
8	1330	Off Ramp I-580 NB/SB	17	53.34
9	2330	On Ramp I-580 SB	27	58.84
10	640	On Ramp I-580 NB	8	54.55
11	580	Off Ramp Prater	8	49.43
12	2080	On Ramp Prater	33	42.98
13	1390	Off Ramp Rock	24	39.49
14	2540	On Ramp Rock	3	577.27
15	1510	Off Ramp Pyramid	26	39.60
16	2540	On Ramp Pyramid	37	46.81
17	790	End Point	11	48.97
Total	**28320**		**334**	**86.55**

January 13, 2016 5:30 PM

11th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	21	60.39
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	27	56.82
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	24	66.19
10	640	On Ramp I-580 NB	8	54.55
11	580	Off Ramp Prater	7	56.49
12	2080	On Ramp Prater	25	56.73
13	1390	Off Ramp Rock	22	43.08
14	2540	On Ramp Rock	32	54.12
15	1510	Off Ramp Pyramid	29	35.50
16	2540	On Ramp Pyramid	34	50.94
17	790	End Point	7	76.95
Total	**28320**		**333**	**59.68**

January 13, 2016 5:44 PM

12th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	21	60.39
3	2900	On Ramp Keystone	33	59.92
4	1840	Off Ramp Sierra/Maple	19	66.03
5	2670	On Ramp Center/Maple	30	60.68
6	1070	Off Ramp Wells	13	56.12
7	2250	On Ramp Wells	24	63.92
8	1330	Off Ramp I-580 NB/SB	12	75.57
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	8	49.43
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	14	67.69
14	2540	On Ramp Rock	26	66.61
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	27	64.14
17	790	End Point	7	76.95
Total	**28320**		**301**	**64.42**

January 14, 2016

AM

January 14, 2016 8:15 AM

10th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	18	70.45
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	18	69.70
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	22	69.73
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	23	69.07
10	640	On Ramp I-580 NB	7	62.34
11	580	Off Ramp Prater	5	79.09
12	2080	On Ramp Prater	22	64.46
13	1390	Off Ramp Rock	16	59.23
14	2540	On Ramp Rock	28	61.85
15	1510	Off Ramp Pyramid	17	60.56
16	2540	On Ramp Pyramid	29	59.72
17	790	End Point	8	67.33
Total	**28320**		**291**	**67.15**

January 14, 2016 8:24 AM

11th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	20	63.41
3	2900	On Ramp Keystone	30	65.91
4	1840	Off Ramp Sierra/Maple	20	62.73
5	2670	On Ramp Center/Maple	28	65.02
6	1070	Off Ramp Wells	11	66.32
7	2250	On Ramp Wells	24	63.92
8	1330	Off Ramp I-580 NB/SB	14	64.77
9	2330	On Ramp I-580 SB	24	66.19
10	640	On Ramp I-580 NB	6	72.73
11	580	Off Ramp Prater	7	56.49
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	15	63.18
14	2540	On Ramp Rock	27	64.14
15	1510	Off Ramp Pyramid	16	64.35
16	2540	On Ramp Pyramid	28	61.85
17	790	End Point	8	67.33
Total	**28320**		**299**	**64.74**

January 14, 2016 8:33 AM

12th Round

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Starting Point		
2	1860	Off Ramp Keystone	19	66.75
3	2900	On Ramp Keystone	29	68.18
4	1840	Off Ramp Sierra/Maple	17	73.80
5	2670	On Ramp Center/Maple	26	70.02
6	1070	Off Ramp Wells	10	72.95
7	2250	On Ramp Wells	24	63.92
8	1330	Off Ramp I-580 NB/SB	13	69.76
9	2330	On Ramp I-580 SB	25	63.55
10	640	On Ramp I-580 NB	6	72.73
11	580	Off Ramp Prater	6	65.91
12	2080	On Ramp Prater	21	67.53
13	1390	Off Ramp Rock	13	72.90
14	2540	On Ramp Rock	25	69.27
15	1510	Off Ramp Pyramid	17	60.56
16	2540	On Ramp Pyramid	28	61.85
17	790	End Point	9	59.85
Total	**28320**		**288**	**67.47**

January 12, 2016		January 13, 2016		January 14, 2016
AM	PM	AM	PM	AM

January 12, 2016
8:44 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
13th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	29	68.18
	4	1840	Off Ramp Sierra/Maple	18	69.70
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	11	66.32
	7	2250	On Ramp Wells	25	61.36
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	24	66.19
	10	640	On Ramp I-580 NB	6	72.73
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	20	70.91
	13	1390	Off Ramp Rock	14	67.69
	14	2540	On Ramp Rock	25	69.27
	15	1510	Off Ramp Pyramid	15	68.64
	16	2540	On Ramp Pyramid	26	66.61
	17	790	End Point	8	67.33
	Total	**28320**		**287**	**67.49**

January 12, 2016
5:43 PM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
13th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	31	63.78
	4	1840	Off Ramp Sierra/Maple	19	66.03
	5	2670	On Ramp Center/Maple	27	67.42
	6	1070	Off Ramp Wells	12	60.80
	7	2250	On Ramp Wells	24	63.92
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	25	63.55
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	24	59.09
	13	1390	Off Ramp Rock	13	72.90
	14	2540	On Ramp Rock	26	66.61
	15	1510	Off Ramp Pyramid	15	68.64
	16	2540	On Ramp Pyramid	29	59.72
	17	790	End Point	8	67.33
	Total	**28320**		**299**	**64.97**

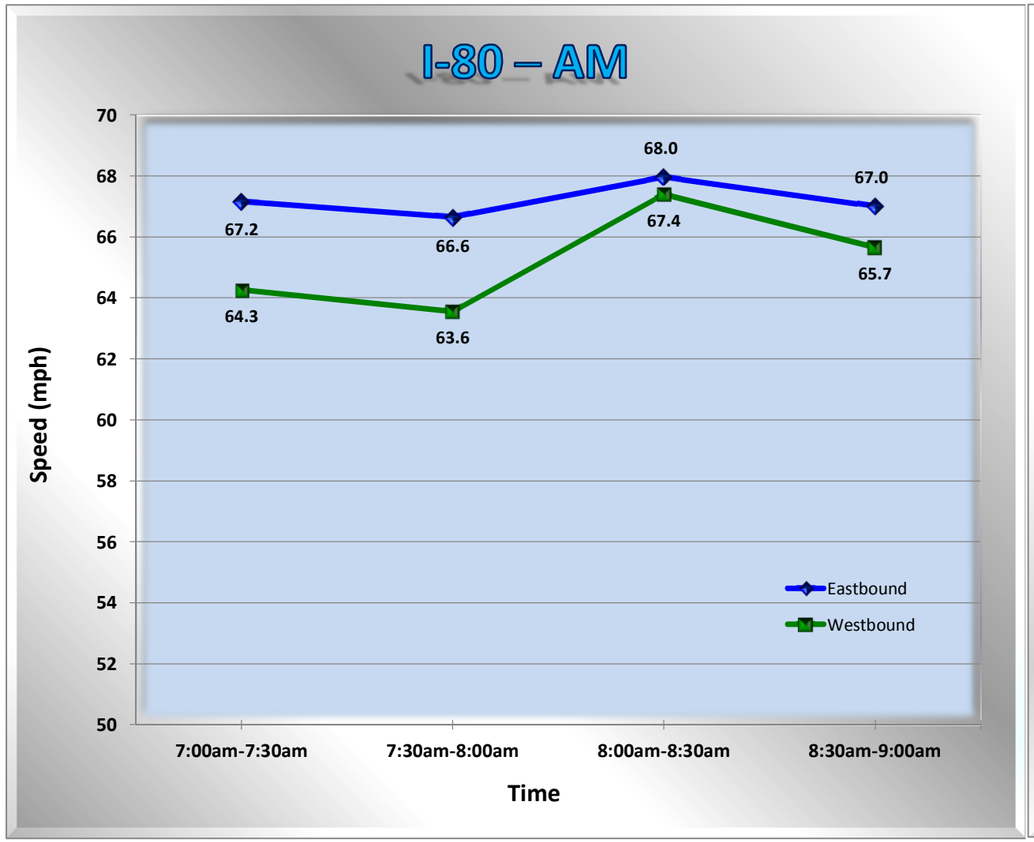
January 13, 2016
5:48 PM

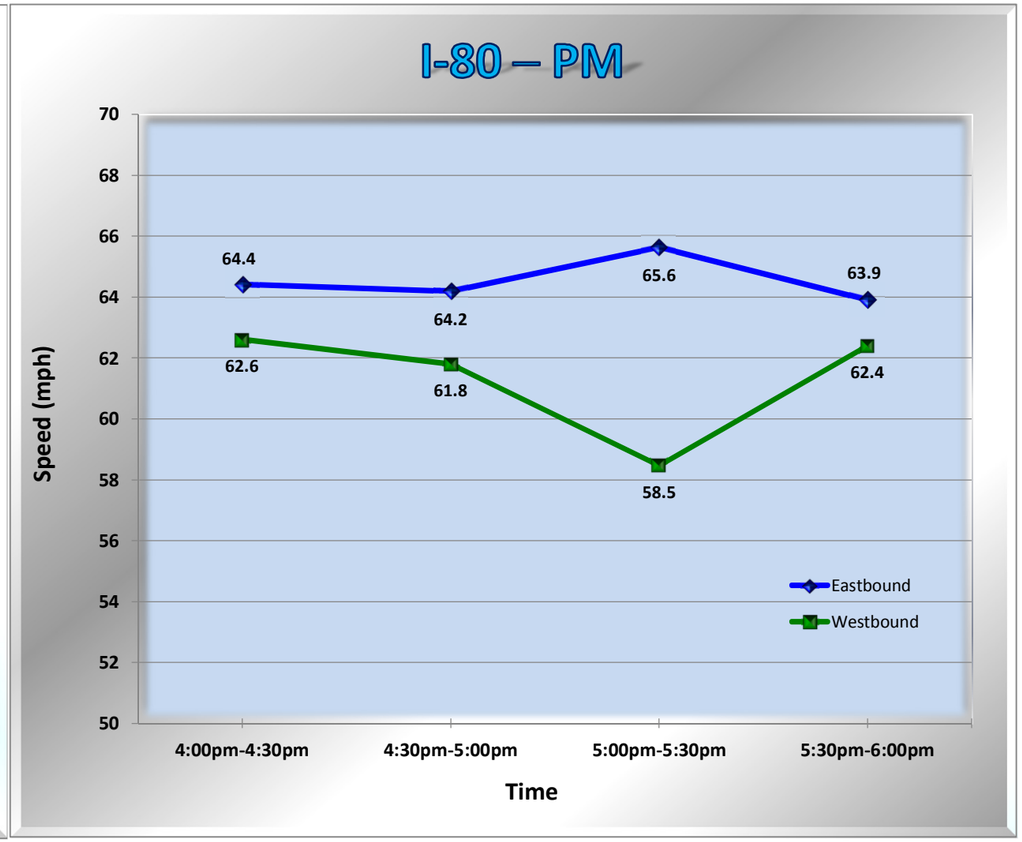
	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
13th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	30	65.91
	4	1840	Off Ramp Sierra/Maple	17	73.80
	5	2670	On Ramp Center/Maple	24	75.85
	6	1070	Off Ramp Wells	13	56.12
	7	2250	On Ramp Wells	26	59.00
	8	1330	Off Ramp I-580 NB/SB	15	60.45
	9	2330	On Ramp I-580 SB	23	69.07
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	23	61.66
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	30	57.73
	15	1510	Off Ramp Pyramid	19	54.19
	16	2540	On Ramp Pyramid	35	49.48
	17	790	End Point	8	67.33
	Total	**28320**		**310**	**63.05**

January 14, 2016
8:40 AM

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
13th Round	1	0	Starting Point		
	2	1860	Off Ramp Keystone	19	66.75
	3	2900	On Ramp Keystone	29	68.18
	4	1840	Off Ramp Sierra/Maple	20	62.73
	5	2670	On Ramp Center/Maple	28	65.02
	6	1070	Off Ramp Wells	11	66.32
	7	2250	On Ramp Wells	23	66.70
	8	1330	Off Ramp I-580 NB/SB	14	64.77
	9	2330	On Ramp I-580 SB	22	72.21
	10	640	On Ramp I-580 NB	7	62.34
	11	580	Off Ramp Prater	6	65.91
	12	2080	On Ramp Prater	22	64.46
	13	1390	Off Ramp Rock	15	63.18
	14	2540	On Ramp Rock	29	59.72
	15	1510	Off Ramp Pyramid	15	68.64
	16	2540	On Ramp Pyramid	26	66.61
	17	790	End Point	7	76.95
	Total	**28320**		**293**	**66.28**

	I-80 (AM)								I-80 (PM)							
	7:00am-7:30am		7:30am-8:00am		8:00am-8:30am		8:30am-9:00am		4:00pm-4:30pm		4:30pm-5:00pm		5:00pm-5:30pm		5:30pm-6:00pm	
Direction	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)
EASTBOUND (5.4 mi)	290.50	67.16	291.67	66.64	286.27	67.96	289.67	67.01	305.38	64.42	304.57	64.19	321.71	65.64	304.75	63.90
WESTBOUND (5.4 mi)	304.00	64.26	312.00	63.55	287.80	67.40	296.71	65.66	310.57	62.60	317.00	61.80	337.71	58.46	310.50	62.40





Jan 12 2016 — AM

Round 1 — January 12, 2016, 7:00

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	30	64.16
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	7	78.21
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	25	65.97
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	32134		322	68.04

Round 2 — January 12, 2016, 7:16

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	10	80.93
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	12	62.73
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	25	65.97
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
Total	32134		324	67.62

Round 3 — January 12, 2016, 7:37

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	10	77.18
3	2823	On Moana Ln	29	66.37
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	23	65.84
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	10	78.75
11	2091	Off I-80 East	22	64.80
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	9	53.79
16	2419	On Oddie Blvd	23	71.71
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	30	53.00
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		323	67.83

Jan 12 2016 — PM

Round 1 — January 12, 2016, 4:01

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	27	71.29
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	24	59.40
12	1104	Off I-80 West	19	39.62
13	1530	On I-80 East	53	19.68
14	803	On I-80 West	17	32.21
15	710	Off Oddie Blvd	12	40.34
16	2419	On Oddie Blvd	38	43.40
17	1233	Off N. McCarran Blvd	21	40.03
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	12	62.61
20	2332	On Clear Acre Ln	26	61.15
21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
Total	32134		408	53.70

Round 2 — January 12, 2016, 4:19

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	29	66.37
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	14	57.81
9	1848	Off E. 2nd St	16	78.75
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	26	54.83
12	1104	Off I-80 West	20	37.64
13	1530	On I-80 East	37	28.19
14	803	On I-80 West	16	34.22
15	710	Off Oddie Blvd	12	40.34
16	2419	On Oddie Blvd	29	56.87
17	1233	Off N. McCarran Blvd	16	52.54
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	13	57.80
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	32134		385	56.91

Round 3 — January 12, 2016, 4:34

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	29	66.37
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	16	80.79
6	2221	On Villanova Dr	27	56.08
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	13	62.25
9	1848	Off E. 2nd St	21	60.00
10	1155	On E. 2nd St	17	46.32
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	15	50.18
13	1530	On I-80 East	21	49.67
14	803	On I-80 West	14	39.11
15	710	Off Oddie Blvd	10	48.41
16	2419	On Oddie Blvd	29	56.87
17	1233	Off N. McCarran Blvd	18	46.70
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	12	62.61
20	2332	On Clear Acre Ln	28	56.78
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		367	59.70

Jan 13 2016 — AM

Round 1 — January 13, 2016, 6:52

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	16	80.79
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	10	80.93
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	19	75.03
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	23	71.71
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	24	62.87
Total	32134		320	68.47

Round 2 — January 13, 2016, 7:05

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	23	65.84
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	25	65.97
17	1233	Off N. McCarran Blvd	0	#DIV/0!
18	993	Off Clear Acre Ln	0	#DIV/0!
19	1102	On N. McCarran Blvd	0	#DIV/0!
20	2332	On Clear Acre Ln	0	#DIV/0!
21	2213	Clear Acre Ln Exit 70 Sign Structure	0	#DIV/0!
Total	24261		240	68.92

Round 3 — January 13, 2016, 7:09

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	27	71.29
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	20	75.71
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	16	78.75
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	19	75.03
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
Total	32134		310	70.67

Jan 13 2016 — PM

Round 1 — January 13, 2016, 4:00

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	19	75.03
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	26	63.43
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	24	66.25
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	32134		320	68.47

Round 2 — January 13, 2016, 4:05

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	32	60.15
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	25	60.57
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	15	53.95
9	1848	Off E. 2nd St	16	78.75
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	19	75.03
12	1104	Off I-80 West	12	62.73
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	27	61.08
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	13	52.08
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	27	58.89
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	32134		341	64.25

Round 3 — January 13, 2016, 4:08

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	13	59.37
3	2823	On Moana Ln	33	58.32
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	14	57.81
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	13	57.90
13	1530	On I-80 East	19	54.90
14	803	On I-80 West	14	39.11
15	710	Off Oddie Blvd	12	40.34
16	2419	On Oddie Blvd	33	49.98
17	1233	Off N. McCarran Blvd	15	56.04
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	29	54.83
21	2213	Clear Acre Ln Exit 70 Sign Structure	24	62.87
Total	32134		368	59.54

Jan 14 2016 — AM

Round 1 — January 14, 2016, 7:02

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	10	77.18
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	13	62.25
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	14	74.51
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	24	66.25
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		315	69.55

Round 2 — January 14, 2016, 7:05

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	18	71.82
6	2221	On Villanova Dr	20	75.71
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	12	67.44
9	1848	Off E. 2nd St	17	74.12
10	1155	On E. 2nd St	14	56.25
11	2091	Off I-80 East	22	64.80
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	18	57.95
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	22	72.27
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		319	68.68

Round 3 — January 14, 2016, 7:18

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	27	61.08
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	20	79.50
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		316	69.33

Jan 12 2016		Jan 13 2016	
AM	PM	AM	PM

January 12, 2016 7:56 — Round 4

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	16	80.79
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	12	62.50
8	1187	On Mill St	12	67.44
9	1848	Off E. 2nd St	21	60.00
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	24	66.25
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	32134		325	67.41

January 12, 2016 4:51 — Round 4

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	29	66.37
4	2242	Off Plumb Ln	25	61.14
5	1896	On Airport	20	64.63
6	2221	On Villanova Dr	25	60.57
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	10	80.93
9	1848	Off E. 2nd St	21	60.00
10	1155	On E. 2nd St	10	78.75
11	2091	Off I-80 East	24	59.40
12	1104	Off I-80 West	14	53.76
13	1530	On I-80 East	22	47.42
14	803	On I-80 West	20	27.37
15	710	Off Oddie Blvd	14	34.58
16	2419	On Oddie Blvd	33	49.98
17	1233	Off N. McCarran Blvd	16	52.54
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	12	62.61
20	2332	On Clear Acre Ln	27	58.89
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	32134		377	58.11

January 13, 2016 7:26 — Round 4

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	23	65.84
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	15	53.95
9	1848	Off E. 2nd St	16	78.75
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	23	71.71
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	24	66.25
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		314	69.77

January 13, 2016 4:22 — Round 4

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	13	59.37
3	2823	On Moana Ln	35	54.99
4	2242	Off Plumb Ln	24	63.69
5	1896	On Airport	19	68.04
6	2221	On Villanova Dr	25	60.57
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	15	53.95
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	14	56.25
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	12	62.73
13	1530	On I-80 East	17	61.36
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	32	51.54
17	1233	Off N. McCarran Blvd	18	46.70
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	12	62.61
20	2332	On Clear Acre Ln	26	61.15
21	2213	Clear Acre Ln Exit 70 Sign Structure	24	62.87
Total	32134		365	60.02

January 14, 2016 7:21 — Round 4

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	27	71.29
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	21	72.11
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	18	79.20
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	14	74.51
14	803	On I-80 West	7	78.21
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	12	62.61
20	2332	On Clear Acre Ln	23	69.13
21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
Total	32134		308	71.13

January 12, 2016 8:12 — Round 5

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	29	66.37
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	25	60.57
7	1100	Off Mill St	12	62.50
8	1187	On Mill St	12	67.44
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	25	65.97
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	23	69.13
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		322	68.04

January 12, 2016 5:08 — Round 5

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	21	36.75
3	2823	On Moana Ln	36	53.46
4	2242	Off Plumb Ln	27	56.61
5	1896	On Airport	21	61.56
6	2221	On Villanova Dr	26	58.24
7	1100	Off Mill St	13	57.69
8	1187	On Mill St	14	57.81
9	1848	Off E. 2nd St	30	42.00
10	1155	On E. 2nd St	35	22.50
11	2091	Off I-80 East	56	25.46
12	1104	Off I-80 West	47	16.02
13	1530	On I-80 East	42	24.84
14	803	On I-80 West	16	34.22
15	710	Off Oddie Blvd	12	40.34
16	2419	On Oddie Blvd	35	47.12
17	1233	Off N. McCarran Blvd	21	40.03
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	13	57.80
20	2332	On Clear Acre Ln	27	58.89
21	2213	Clear Acre Ln Exit 70 Sign Structure	24	62.87
Total	32134		528	41.49

January 13, 2016 7:45 — Round 5

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	13	59.37
3	2823	On Moana Ln	31	62.09
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	21	72.11
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	17	74.12
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	7	78.21
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	25	65.97
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	24	66.25
21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
Total	32134		318	68.90

January 13, 2016 4:25 — Round 5

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	13	59.37
3	2823	On Moana Ln	30	64.16
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	14	57.81
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	17	61.36
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	26	63.43
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	32134		334	65.60

January 14, 2016 7:33 — Round 5

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	27	71.29
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	18	71.82
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	12	67.44
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	9	53.79
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	26	61.15
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		330	66.39

January 12, 2016 8:27 — Round 6

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	20	75.71
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	17	74.12
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	22	64.80
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	7	78.21
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	23	71.71
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	9	75.23
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
Total	32134		310	70.67

January 12, 2016 5:30 — Round 6

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	15	51.45
3	2823	On Moana Ln	35	54.99
4	2242	Off Plumb Ln	24	63.69
5	1896	On Airport	18	71.82
6	2221	On Villanova Dr	30	50.48
7	1100	Off Mill St	24	31.25
8	1187	On Mill St	20	40.46
9	1848	Off E. 2nd St	74	17.03
10	1155	On E. 2nd St	41	19.21
11	2091	Off I-80 East	72	19.80
12	1104	Off I-80 West	45	16.73
13	1530	On I-80 East	49	21.29
14	803	On I-80 West	21	26.07
15	710	Off Oddie Blvd	15	32.27
16	2419	On Oddie Blvd	42	39.27
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	34	46.76
21	2213	Clear Acre Ln Exit 70 Sign Structure	30	50.29
Total	32134		626	35.00

January 13, 2016 7:58 — Round 6

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	13	59.37
3	2823	On Moana Ln	36	53.46
4	2242	Off Plumb Ln	24	63.69
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	27	61.08
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	26	61.15
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	32134		341	64.25

January 13, 2016 4:38 — Round 6

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	19	40.62
3	2823	On Moana Ln	35	54.99
4	2242	Off Plumb Ln	24	63.69
5	1896	On Airport	18	71.82
6	2221	On Villanova Dr	26	58.24
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	15	53.95
9	1848	Off E. 2nd St	17	74.12
10	1155	On E. 2nd St	14	56.25
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	13	57.90
13	1530	On I-80 East	19	54.90
14	803	On I-80 West	10	54.75
15	710	Off Oddie Blvd	10	48.41
16	2419	On Oddie Blvd	40	41.23
17	1233	Off N. McCarran Blvd	24	35.03
18	993	Off Clear Acre Ln	14	48.36
19	1102	On N. McCarran Blvd	13	57.80
20	2332	On Clear Acre Ln	26	61.15
21	2213	Clear Acre Ln Exit 70 Sign Structure	26	58.03
Total	32134		395	55.47

January 14, 2016 7:36 — Round 6

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	23	71.71
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	9	75.23
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	22	72.27
21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
Total	32134		306	71.60

Jan 12 2016

AM

January 12, 2016 8:30 — Round 7

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	30	64.16
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	18	71.82
6	2221	On Villanova Dr	25	60.57
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	14	57.81
9	1848	Off E. 2nd St	16	78.75
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	7	78.21
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	**32134**		**324**	**67.62**

PM

January 12, 2016 5:53 — Round 6

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	13	59.37
3	2823	On Moana Ln	33	58.32
4	2242	Off Plumb Ln	26	58.79
5	1896	On Airport	19	68.04
6	2221	On Villanova Dr	27	56.08
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	12	67.44
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	17	46.32
11	2091	Off I-80 East	29	49.16
12	1104	Off I-80 West	16	47.04
13	1530	On I-80 East	43	24.26
14	803	On I-80 West	15	36.50
15	710	Off Oddie Blvd	14	34.58
16	2419	On Oddie Blvd	38	43.40
17	1233	Off N. McCarran Blvd	18	46.70
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
Total	**32134**		**422**	**51.92**

Jan 13 2016

AM

January 13, 2016 8:02 — Round 7

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	26	74.03
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	25	65.97
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
Total	**32134**		**315**	**69.55**

PM

January 13, 2016 4:40 — Round 7

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	30	64.16
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	21	61.56
6	2221	On Villanova Dr	25	60.57
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	15	53.95
9	1848	Off E. 2nd St	17	74.12
10	1155	On E. 2nd St	15	52.50
11	2091	Off I-80 East	22	64.80
12	1104	Off I-80 West	27	27.88
13	1530	On I-80 East	49	21.29
14	803	On I-80 West	18	30.42
15	710	Off Oddie Blvd	14	34.58
16	2419	On Oddie Blvd	57	28.93
17	1233	Off N. McCarran Blvd	23	36.55
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	27	58.89
21	2213	Clear Acre Ln Exit 70 Sign Structure	24	62.87
Total	**32134**		**452**	**48.47**

Jan 14 2016

AM

January 14, 2016 7:49 — Round 7

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	19	68.04
6	2221	On Villanova Dr	27	56.08
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	12	67.44
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	21	67.89
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	27	61.08
17	1233	Off N. McCarran Blvd	15	56.04
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	26	61.15
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	**32134**		**337**	**65.01**

January 12, 2016 8:41 — Round 7

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	10	77.18
3	2823	On Moana Ln	26	74.03
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	16	80.79
6	2221	On Villanova Dr	23	65.84
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	10	80.93
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	13	60.58
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	20	82.46
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	26	61.15
21	2213	Clear Acre Ln Exit 70 Sign Structure	25	60.35
Total	**32134**		**312**	**70.22**

January 13, 2016 8:14 — Round 8

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	29	66.37
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	18	71.82
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	12	67.44
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	15	52.50
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	9	60.83
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	24	68.72
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	10	67.70
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	23	69.13
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	**32134**		**322**	**68.04**

January 13, 2016 4:55 — Round 8

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	30	64.16
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	12	62.50
8	1187	On Mill St	14	57.81
9	1848	Off E. 2nd St	17	74.12
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	15	50.18
13	1530	On I-80 East	41	25.44
14	803	On I-80 West	26	21.06
15	710	Off Oddie Blvd	19	25.48
16	2419	On Oddie Blvd	62	26.60
17	1233	Off N. McCarran Blvd	25	33.63
18	993	Off Clear Acre Ln	14	48.36
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	29	54.83
21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
Total	**32134**		**446**	**49.12**

January 14, 2016 7:53 — Round 8

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	21	72.79
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	21	72.11
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	20	63.00
10	1155	On E. 2nd St	11	71.59
11	2091	Off I-80 East	20	71.28
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	26	63.43
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	9	75.23
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	**32134**		**317**	**69.11**

January 12, 2016 8:48 — Round 7

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	28	68.74
4	2242	Off Plumb Ln	22	69.48
5	1896	On Airport	17	76.04
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	21	60.00
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	22	64.80
12	1104	Off I-80 West	11	68.43
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	8	60.51
16	2419	On Oddie Blvd	26	63.43
17	1233	Off N. McCarran Blvd	14	60.05
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	25	63.60
21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
Total	**32134**		**329**	**66.59**

January 13, 2016 8:18 — Round 9

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	12	64.32
3	2823	On Moana Ln	27	71.29
4	2242	Off Plumb Ln	20	76.43
5	1896	On Airport	16	80.79
6	2221	On Villanova Dr	19	79.70
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	10	80.93
9	1848	Off E. 2nd St	18	70.00
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	19	75.03
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	15	69.54
14	803	On I-80 West	8	68.44
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	23	71.71
17	1233	Off N. McCarran Blvd	13	64.67
18	993	Off Clear Acre Ln	9	75.23
19	1102	On N. McCarran Blvd	10	75.13
20	2332	On Clear Acre Ln	24	66.25
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	**32134**		**303**	**72.31**

January 13, 2016 4:59 — Round 9

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	25	30.87
3	2823	On Moana Ln	44	43.74
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	16	80.79
6	2221	On Villanova Dr	22	68.83
7	1100	Off Mill St	11	68.18
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	22	57.27
10	1155	On E. 2nd St	14	56.25
11	2091	Off I-80 East	118	12.08
12	1104	Off I-80 West	46	16.36
13	1530	On I-80 East	78	13.37
14	803	On I-80 West	17	32.21
15	710	Off Oddie Blvd	14	34.58
16	2419	On Oddie Blvd	30	54.98
17	1233	Off N. McCarran Blvd	26	32.33
18	993	Off Clear Acre Ln	12	56.42
19	1102	On N. McCarran Blvd	12	62.61
20	2332	On Clear Acre Ln	27	58.89
21	2213	Clear Acre Ln Exit 70 Sign Structure	21	71.85
Total	**32134**		**589**	**37.20**

January 14, 2016 8:09 — Round 9

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1	0	Moana 1/4 Sign Structure		
2	1132	Off Moana Ln	11	70.16
3	2823	On Moana Ln	29	66.37
4	2242	Off Plumb Ln	23	66.46
5	1896	On Airport	18	71.82
6	2221	On Villanova Dr	24	63.09
7	1100	Off Mill St	10	75.00
8	1187	On Mill St	11	73.57
9	1848	Off E. 2nd St	19	66.31
10	1155	On E. 2nd St	12	65.62
11	2091	Off I-80 East	18	79.20
12	1104	Off I-80 West	10	75.27
13	1530	On I-80 East	16	65.20
14	803	On I-80 West	7	78.21
15	710	Off Oddie Blvd	7	69.15
16	2419	On Oddie Blvd	25	65.97
17	1233	Off N. McCarran Blvd	12	70.05
18	993	Off Clear Acre Ln	11	61.55
19	1102	On N. McCarran Blvd	11	68.30
20	2332	On Clear Acre Ln	24	66.25
21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
Total	**32134**		**318**	**68.90**

Jan 12 2016		Jan 13 2016		Jan 14 2016
AM	PM	AM	PM	AM

January 13, 2016 8:29

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	11	70.16
	3	2823	On Moana Ln	29	66.37
	4	2242	Off Plumb Ln	23	66.46
	5	1896	On Airport	16	80.79
	6	2221	On Villanova Dr	23	65.84
	7	1100	Off Mill St	11	68.18
	8	1187	On Mill St	11	73.57
	9	1848	Off E. 2nd St	19	66.31
	10	1155	On E. 2nd St	11	71.59
Round 10	11	2091	Off I-80 East	21	67.89
	12	1104	Off I-80 West	10	75.27
	13	1530	On I-80 East	16	65.20
	14	803	On I-80 West	8	68.44
	15	710	Off Oddie Blvd	7	69.15
	16	2419	On Oddie Blvd	23	71.71
	17	1233	Off N. McCarran Blvd	12	70.05
	18	993	Off Clear Acre Ln	10	67.70
	19	1102	On N. McCarran Blvd	11	68.30
	20	2332	On Clear Acre Ln	24	66.25
	21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
	Total	32134		316	69.33

January 13, 2016 5:17

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	17	45.40
	3	2823	On Moana Ln	34	56.61
	4	2242	Off Plumb Ln	24	63.69
	5	1896	On Airport	18	71.82
	6	2221	On Villanova Dr	36	42.06
	7	1100	Off Mill St	44	17.05
	8	1187	On Mill St	60	13.49
	9	1848	Off E. 2nd St	97	12.99
	10	1155	On E. 2nd St	49	16.07
Round 10	11	2091	Off I-80 East	106	13.45
	12	1104	Off I-80 West	47	16.02
	13	1530	On I-80 East	54	19.32
	14	803	On I-80 West	19	28.82
	15	710	Off Oddie Blvd	12	40.34
	16	2419	On Oddie Blvd	36	45.81
	17	1233	Off N. McCarran Blvd	18	46.70
	18	993	Off Clear Acre Ln	12	56.42
	19	1102	On N. McCarran Blvd	10	75.13
	20	2332	On Clear Acre Ln	28	56.78
	21	2213	Clear Acre Ln Exit 70 Sign Structure	25	60.35
	Total	32134		746	29.37

January 14, 2016 8:23

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	11	70.16
	3	2823	On Moana Ln	27	71.29
	4	2242	Off Plumb Ln	22	69.48
	5	1896	On Airport	17	76.04
	6	2221	On Villanova Dr	23	65.84
	7	1100	Off Mill St	11	68.18
	8	1187	On Mill St	11	73.57
	9	1848	Off E. 2nd St	19	66.31
	10	1155	On E. 2nd St	12	65.62
Round 10	11	2091	Off I-80 East	22	64.80
	12	1104	Off I-80 West	10	75.27
	13	1530	On I-80 East	16	65.20
	14	803	On I-80 West	8	68.44
	15	710	Off Oddie Blvd	7	69.15
	16	2419	On Oddie Blvd	24	68.72
	17	1233	Off N. McCarran Blvd	12	70.05
	18	993	Off Clear Acre Ln	10	67.70
	19	1102	On N. McCarran Blvd	11	68.30
	20	2332	On Clear Acre Ln	22	72.27
	21	2213	Clear Acre Ln Exit 70 Sign Structure	20	75.44
	Total	32134		315	69.55

January 13, 2016 8:33

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	11	70.16
	3	2823	On Moana Ln	27	71.29
	4	2242	Off Plumb Ln	20	76.43
	5	1896	On Airport	17	76.04
	6	2221	On Villanova Dr	21	72.11
	7	1100	Off Mill St	10	75.00
	8	1187	On Mill St	11	73.57
	9	1848	Off E. 2nd St	18	70.00
	10	1155	On E. 2nd St	12	65.62
Round 11	11	2091	Off I-80 East	19	75.03
	12	1104	Off I-80 West	10	75.27
	13	1530	On I-80 East	14	74.51
	14	803	On I-80 West	7	78.21
	15	710	Off Oddie Blvd	7	69.15
	16	2419	On Oddie Blvd	24	68.72
	17	1233	Off N. McCarran Blvd	12	70.05
	18	993	Off Clear Acre Ln	10	67.70
	19	1102	On N. McCarran Blvd	11	68.30
	20	2332	On Clear Acre Ln	27	58.89
	21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
	Total	32134		311	70.45

January 13, 2016 5:20

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	19	40.62
	3	2823	On Moana Ln	35	54.99
	4	2242	Off Plumb Ln	24	63.69
	5	1896	On Airport	17	76.04
	6	2221	On Villanova Dr	40	37.86
	7	1100	Off Mill St	28	26.79
	8	1187	On Mill St	30	26.98
	9	1848	Off E. 2nd St	75	16.80
	10	1155	On E. 2nd St	50	15.75
Round 11	11	2091	Off I-80 East	51	27.95
	12	1104	Off I-80 West	24	31.36
	13	1530	On I-80 East	48	21.73
	14	803	On I-80 West	38	14.41
	15	710	Off Oddie Blvd	23	21.05
	16	2419	On Oddie Blvd	47	35.09
	17	1233	Off N. McCarran Blvd	18	46.70
	18	993	Off Clear Acre Ln	14	48.36
	19	1102	On N. McCarran Blvd	15	50.09
	20	2332	On Clear Acre Ln	22	72.27
	21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
	Total	32134		641	34.18

January 14, 2016 8:24

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	11	70.16
	3	2823	On Moana Ln	29	66.37
	4	2242	Off Plumb Ln	22	69.48
	5	1896	On Airport	19	68.04
	6	2221	On Villanova Dr	22	68.83
	7	1100	Off Mill St	11	68.18
	8	1187	On Mill St	11	73.57
	9	1848	Off E. 2nd St	18	70.00
	10	1155	On E. 2nd St	12	65.62
Round 11	11	2091	Off I-80 East	20	71.28
	12	1104	Off I-80 West	10	75.27
	13	1530	On I-80 East	16	65.20
	14	803	On I-80 West	8	68.44
	15	710	Off Oddie Blvd	7	69.15
	16	2419	On Oddie Blvd	23	71.71
	17	1233	Off N. McCarran Blvd	15	56.04
	18	993	Off Clear Acre Ln	9	75.23
	19	1102	On N. McCarran Blvd	11	68.30
	20	2332	On Clear Acre Ln	25	63.60
	21	2213	Clear Acre Ln Exit 70 Sign Structure	19	79.41
	Total	32134		318	68.90

January 13, 2016 8:44

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	11	70.16
	3	2823	On Moana Ln	29	66.37
	4	2242	Off Plumb Ln	22	69.48
	5	1896	On Airport	17	76.04
	6	2221	On Villanova Dr	24	63.09
	7	1100	Off Mill St	11	68.18
	8	1187	On Mill St	12	67.44
	9	1848	Off E. 2nd St	20	63.00
	10	1155	On E. 2nd St	13	60.58
Round 12	11	2091	Off I-80 East	21	67.89
	12	1104	Off I-80 West	12	62.73
	13	1530	On I-80 East	16	65.20
	14	803	On I-80 West	8	68.44
	15	710	Off Oddie Blvd	8	60.51
	16	2419	On Oddie Blvd	24	68.72
	17	1233	Off N. McCarran Blvd	13	64.67
	18	993	Off Clear Acre Ln	10	67.70
	19	1102	On N. McCarran Blvd	11	68.30
	20	2332	On Clear Acre Ln	25	63.60
	21	2213	Clear Acre Ln Exit 70 Sign Structure	23	65.60
	Total	32134		330	66.39

January 13, 2016 5:41

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	15	51.45
	3	2823	On Moana Ln	32	60.15
	4	2242	Off Plumb Ln	23	66.46
	5	1896	On Airport	17	76.04
	6	2221	On Villanova Dr	25	60.57
	7	1100	Off Mill St	13	57.69
	8	1187	On Mill St	12	67.44
	9	1848	Off E. 2nd St	52	24.23
	10	1155	On E. 2nd St	21	37.50
Round 12	11	2091	Off I-80 East	77	18.51
	12	1104	Off I-80 West	33	22.81
	13	1530	On I-80 East	65	16.05
	14	803	On I-80 West	18	30.42
	15	710	Off Oddie Blvd	16	30.25
	16	2419	On Oddie Blvd	56	29.45
	17	1233	Off N. McCarran Blvd	22	38.21
	18	993	Off Clear Acre Ln	15	45.14
	19	1102	On N. McCarran Blvd	10	75.13
	20	2332	On Clear Acre Ln	24	66.25
	21	2213	Clear Acre Ln Exit 70 Sign Structure	32	47.15
	Total	32134		578	37.90

January 14, 2016 8:37

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	12	64.32
	3	2823	On Moana Ln	28	68.74
	4	2242	Off Plumb Ln	21	72.79
	5	1896	On Airport	17	76.04
	6	2221	On Villanova Dr	22	68.83
	7	1100	Off Mill St	11	68.18
	8	1187	On Mill St	11	73.57
	9	1848	Off E. 2nd St	18	70.00
	10	1155	On E. 2nd St	12	65.62
Round 12	11	2091	Off I-80 East	19	75.03
	12	1104	Off I-80 West	10	75.27
	13	1530	On I-80 East	15	69.54
	14	803	On I-80 West	8	68.44
	15	710	Off Oddie Blvd	7	69.15
	16	2419	On Oddie Blvd	24	68.72
	17	1233	Off N. McCarran Blvd	12	70.05
	18	993	Off Clear Acre Ln	10	67.70
	19	1102	On N. McCarran Blvd	10	75.13
	20	2332	On Clear Acre Ln	26	61.15
	21	2213	Clear Acre Ln Exit 70 Sign Structure	19	79.41
	Total	32134		312	70.22

Jan 12 2016		Jan 13 2016		Jan 14 2016
AM	PM	AM	PM	AM

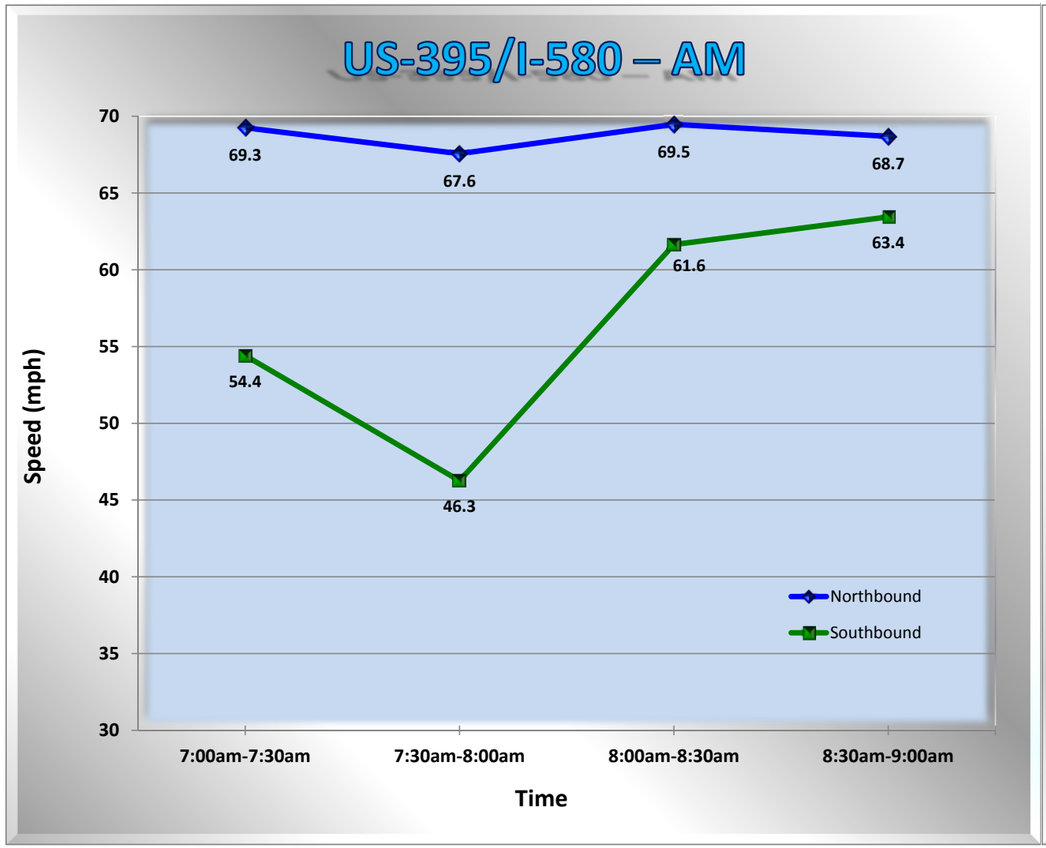
January 14, 2016
8:48

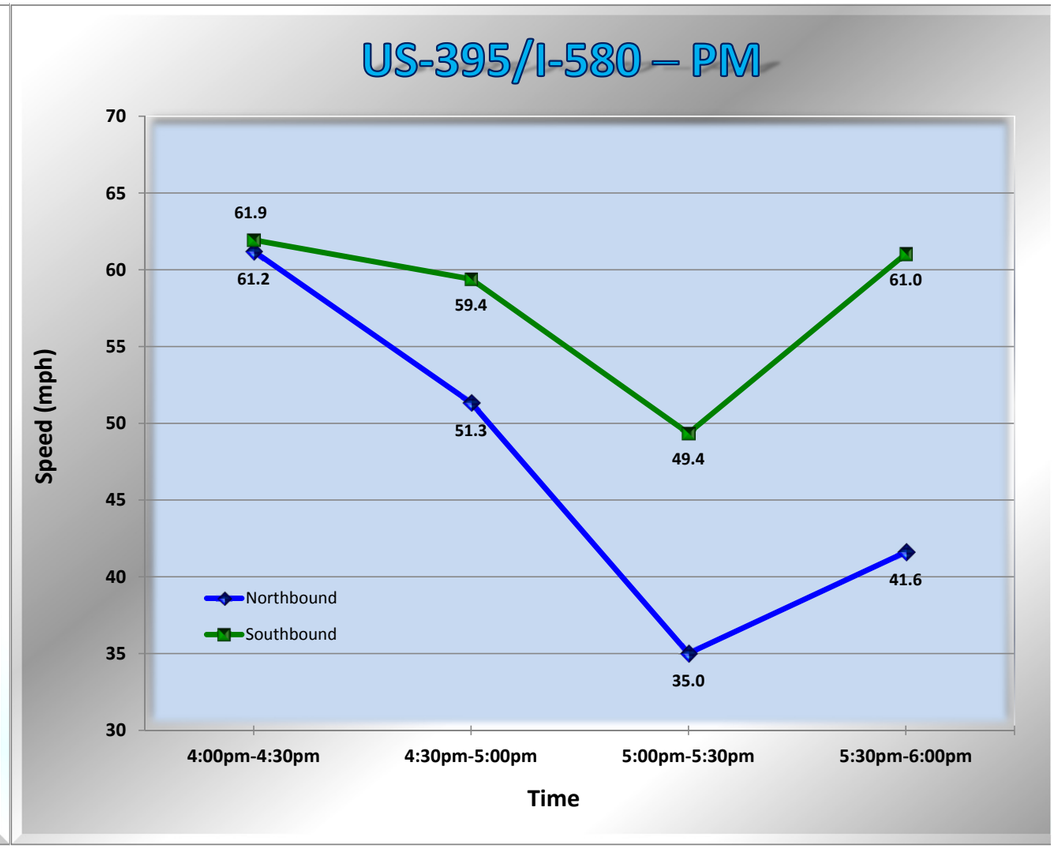
	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	11	70.16
	3	2823	On Moana Ln	28	68.74
	4	2242	Off Plumb Ln	21	72.79
	5	1896	On Airport	17	76.04
	6	2221	On Villanova Dr	22	68.83
	7	1100	Off Mill St	10	75.00
	8	1187	On Mill St	11	73.57
	9	1848	Off E. 2nd St	19	66.31
	10	1155	On E. 2nd St	12	65.62
Round 13	11	2091	Off I-80 East	21	67.89
	12	1104	Off I-80 West	10	75.27
	13	1530	On I-80 East	15	69.54
	14	803	On I-80 West	8	68.44
	15	710	Off Oddie Blvd	7	69.15
	16	2419	On Oddie Blvd	23	71.71
	17	1233	Off N. McCarran Blvd	13	64.67
	18	993	Off Clear Acre Ln	9	75.23
	19	1102	On N. McCarran Blvd	12	62.61
	20	2332	On Clear Acre Ln	24	66.25
	21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
	Total	**32134**		**315**	**69.55**

January 14, 2016
8:52

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
	1	0	Moana 1/4 Sign Structure		
	2	1132	Off Moana Ln	11	70.16
	3	2823	On Moana Ln	27	71.29
	4	2242	Off Plumb Ln	21	72.79
	5	1896	On Airport	18	71.82
	6	2221	On Villanova Dr	25	60.57
	7	1100	Off Mill St	10	75.00
	8	1187	On Mill St	11	73.57
	9	1848	Off E. 2nd St	18	70.00
	10	1155	On E. 2nd St	12	65.62
Round 14	11	2091	Off I-80 East	20	71.28
	12	1104	Off I-80 West	11	68.43
	13	1530	On I-80 East	15	69.54
	14	803	On I-80 West	8	68.44
	15	710	Off Oddie Blvd	8	60.51
	16	2419	On Oddie Blvd	25	65.97
	17	1233	Off N. McCarran Blvd	13	64.67
	18	993	Off Clear Acre Ln	11	61.55
	19	1102	On N. McCarran Blvd	11	68.30
	20	2332	On Clear Acre Ln	23	69.13
	21	2213	Clear Acre Ln Exit 70 Sign Structure	22	68.58
	Total	**32134**		**320**	**68.47**

	I-580 (AM)								I-580 (PM)							
	7:00am-7:30am		7:30am-8:00am		8:00am-8:30am		8:30am-9:00am		4:00pm-4:30pm		4:30pm-5:00pm		5:00pm-5:30pm		5:30pm-6:00pm	
Direction	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)
NORTHBOUND(6.089 mile)	316.44	69.25	324.63	67.56	315.44	69.48	319.13	68.69	360.14	61.21	437.67	51.34	638.33	35.01	542.00	41.61
SOUTHBOUND(6.089 mile)	390.60	54.41	460.17	46.26	345.33	61.64	333.44	63.45	341.50	61.94	356.60	59.40	434.50	49.35	347.00	61.04





January 12, 2016		January 13, 2016		January 14, 2016
AM	PM	AM	PM	AM
7:00am - 9:00am	4:00pm - 6:00pm	7:00am - 9:00am	4:00pm - 6:00pm	7:00am - 9:00am

M2U00001 — January 12, 2016, 7:00

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	30	51.14
	3	1330	Off Ramp 395	17	53.34
	4	3110	On Ramp 395	42	50.49
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**102**	**52.12**

GOPR2448 — January 12, 2016, 15:56

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	35	43.83
	3	1330	Off Ramp 395	22	41.22
	4	3110	On Ramp 395	104	20.39
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**173**	**40.85**

GOPR2460 — January 13, 2016, 7:00

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	29	52.90
	3	1330	Off Ramp 395	16	56.68
	4	3110	On Ramp 395	43	49.31
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**100**	**54.21**

GOPR2470 — January 13, 2016, 16:01

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	30	51.14
	3	1330	Off Ramp 395	17	53.34
	4	3110	On Ramp 395	45	47.12
	5	1020	Off Ramp 2nd St	15	46.36
	Total	**7710**		**107**	**49.49**

GOPR2480 — January 14, 2016, 6:56

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	27	56.82
	3	1330	Off Ramp 395	16	56.68
	4	3110	On Ramp 395	42	50.49
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**97**	**55.48**

M2U00002 — January 12, 2016, 7:12

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	28	54.79
	3	1330	Off Ramp 395	16	56.68
	4	3110	On Ramp 395	40	53.01
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**97**	**54.49**

GOPR2449 — January 12, 2016, 16:09

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	31	49.49
	3	1330	Off Ramp 395	27	33.59
	4	3110	On Ramp 395	47	45.12
	5	1020	Off Ramp 2nd St	11	63.22
	Total	**7710**		**116**	**47.85**

GOPR2461 — January 13, 2016, 7:10

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	28	54.79
	3	1330	Off Ramp 395	16	56.68
	4	3110	On Ramp 395	42	50.49
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**98**	**54.98**

GOPR2471 — January 13, 2016, 16:13

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	32	47.94
	3	1330	Off Ramp 395	20	45.34
	4	3110	On Ramp 395	41	51.72
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**105**	**50.74**

GOPR2481 — January 14, 2016, 7:07

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	26	59.00
	3	1330	Off Ramp 395	15	60.45
	4	3110	On Ramp 395	36	58.90
	5	1020	Off Ramp 2nd St	11	63.22
	Total	**7710**		**88**	**60.40**

M2U00003 — January 12, 2016, 7:25

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	26	59.00
	3	1330	Off Ramp 395	16	56.68
	4	3110	On Ramp 395	84	25.24
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**138**	**49.72**

GOPR2450 — January 12, 2016, 16:21

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	31	49.49
	3	1330	Off Ramp 395	44	20.61
	4	3110	On Ramp 395	78	27.19
	5	1020	Off Ramp 2nd St	11	63.22
	Total	**7710**		**164**	**40.13**

GOPR2462 — January 13, 2016, 7:21

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	31	49.49
	3	1330	Off Ramp 395	17	53.34
	4	3110	On Ramp 395	38	55.80
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**98**	**54.15**

GOPR2472 — January 13, 2016, 16:23

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	54	28.41
	3	1330	Off Ramp 395	22	41.22
	4	3110	On Ramp 395	46	46.10
	5	1020	Off Ramp 2nd St	16	43.47
	Total	**7710**		**138**	**39.80**

GOPR2482 — January 14, 2016, 7:18

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	34	45.12
	3	1330	Off Ramp 395	19	47.73
	4	3110	On Ramp 395	43	49.31
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**109**	**48.91**

M2U00004 — January 12, 2016, 7:39

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	25	61.36
	3	1330	Off Ramp 395	15	60.45
	4	3110	On Ramp 395	40	53.01
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**93**	**57.08**

GOPR2451 — January 12, 2016, 16:36

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	36	42.61
	3	1330	Off Ramp 395	24	37.78
	4	3110	On Ramp 395	59	35.94
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**131**	**43.57**

GOPR2463 — January 13, 2016, 7:32

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	39	39.34
	3	1330	Off Ramp 395	17	53.34
	4	3110	On Ramp 395	50	42.41
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**119**	**47.15**

GOPR2473 — January 13, 2016, 16:35

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	35	43.83
	3	1330	Off Ramp 395	20	45.34
	4	3110	On Ramp 395	43	49.31
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**110**	**49.11**

GOPR2483 — January 14, 2016, 7:29

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	38	40.37
	3	1330	Off Ramp 395	18	50.38
	4	3110	On Ramp 395	120	17.67
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**189**	**40.48**

M2U00005 — January 12, 2016, 7:52

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	35	43.83
	3	1330	Off Ramp 395	18	50.38
	4	3110	On Ramp 395	98	21.64
	5	1020	Off Ramp 2nd St	14	49.68
	Total	**7710**		**165**	**41.38**

GOPR2452 — January 12, 2016, 16:49

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	NO VIDEO	NO VIDEO
	3	1330	Off Ramp 395		
	4	3110	On Ramp 395		
	5	1020	Off Ramp 2nd St		
	Total	**7710**			

GOPR2464 — January 13, 2016, 7:43

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	34	45.12
	3	1330	Off Ramp 395	84	10.80
	4	3110	On Ramp 395	128	16.57
	5	1020	Off Ramp 2nd St	14	49.68
	Total	**7710**		**260**	**30.54**

GOPR2474 — January 13, 2016, 16:47

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	29	52.90
	3	1330	Off Ramp 395	18	50.38
	4	3110	On Ramp 395	41	51.72
	5	1020	Off Ramp 2nd St	15	46.36
	Total	**7710**		**103**	**50.34**

GOPR2484 — January 14, 2016, 7:43

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	66	23.24
	3	1330	Off Ramp 395	94	9.65
	4	3110	On Ramp 395	160	13.25
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**333**	**24.91**

M2U00006 — January 12, 2016, 8:06

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	32	47.94
	3	1330	Off Ramp 395	19	47.73
	4	3110	On Ramp 395	82	25.86
	5	1020	Off Ramp 2nd St	13	53.50
	Total	**7710**		**146**	**43.76**

GOPR2453 — January 12, 2016, 16:49

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	57	26.91
	3	1330	Off Ramp 395	21	43.18
	4	3110	On Ramp 395	100	21.20
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**190**	**37.31**

GOPR2465 — January 13, 2016, 7:59

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	25	61.36
	3	1330	Off Ramp 395	35	25.91
	4	3110	On Ramp 395	154	13.77
	5	1020	Off Ramp 2nd St	17	40.91
	Total	**7710**		**231**	**35.49**

GOPR2475 — January 13, 2016, 17:03

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	32	47.94
	3	1330	Off Ramp 395	19	47.73
	4	3110	On Ramp 395	41	51.72
	5	1020	Off Ramp 2nd St	12	57.95
	Total	**7710**		**104**	**51.34**

GOPR2485 — January 14, 2016, 7:58

	Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round	1	0	Starting Point		
	2	2250	On Ramp Wells	60	25.57
	3	1330	Off Ramp 395	80	11.34
	4	3110	On Ramp 395	125	16.96
	5	1020	Off Ramp 2nd St	14	49.68
	Total	**7710**		**279**	**25.89**

January 12, 2016 — AM

M2U00007 — January 12, 2016, 8:20

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	25	61.36
3	1330	Off Ramp 395	18	50.38
4	3110	On Ramp 395	36	58.90
5	1020	Off Ramp 2nd St	14	49.68
Total	**7710**		**93**	**55.08**

M2U00008 — January 12, 2016, 8:33

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	32	47.94
3	1330	Off Ramp 395	18	50.38
4	3110	On Ramp 395	44	48.19
5	1020	Off Ramp 2nd St	10	69.55
Total	**7710**		**104**	**54.01**

M2U00009 — January 12, 2016, 8:46

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	26	59.00
3	1330	Off Ramp 395	15	60.45
4	3110	On Ramp 395	37	57.31
5	1020	Off Ramp 2nd St	11	63.22
Total	**7710**		**89**	**60.00**

M2U00010 — January 12, 2016, 8:59

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	28	54.79
3	1330	Off Ramp 395	16	56.68
4	3110	On Ramp 395	85	24.95
5	1020	Off Ramp 2nd St	12	57.95
Total	**7710**		**141**	**48.59**

M2U00011 — January 12, 2016, 9:13

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	27	56.82
3	1330	Off Ramp 395	21	43.18
4	3110	On Ramp 395	121	17.52
5	1020	Off Ramp 2nd St	11	63.22
Total	**7710**		**180**	**45.19**

January 12, 2016 — PM

GOPR2454 — January 12, 2016, 16:58

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	NO VIDEO	NO VIDEO
3	1330	Off Ramp 395		
4	3110	On Ramp 395		
5	1020	Off Ramp 2nd St		
Total	**7710**			

GOPR2455 — January 12, 2016, 17:04

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	30	51.14
3	1330	Off Ramp 395	22	41.22
4	3110	On Ramp 395	141	15.04
5	1020	Off Ramp 2nd St	14	49.68
Total	**7710**		**207**	**39.27**

GOPR2456 — January 12, 2016, 17:20

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	30	51.14
3	1330	Off Ramp 395	43	21.09
4	3110	On Ramp 395	111	19.10
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**197**	**36.21**

GOPR2457 — January 12, 2016, 17:33

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	28	54.79
3	1330	Off Ramp 395	19	47.73
4	3110	On Ramp 395	50	42.41
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**110**	**49.61**

GOPR2458 — January 12, 2016, 17:43

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	27	56.82
3	1330	Off Ramp 395	16	56.68
4	3110	On Ramp 395	44	48.19
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**100**	**53.80**

GOPR2459 — January 12, 2016, 17:55

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	29	52.90
3	1330	Off Ramp 395	16	56.68
4	3110	On Ramp 395	40	53.01
5	1020	Off Ramp 2nd St	11	63.22
Total	**7710**		**96**	**56.45**

January 13, 2016 — AM

GOPR2466 — January 13, 2016, 8:16

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	34	45.12
3	1330	Off Ramp 395	18	50.38
4	3110	On Ramp 395	43	49.31
5	1020	Off Ramp 2nd St	11	63.22
Total	**7710**		**106**	**52.01**

GOPR2467 — January 13, 2016, 8:27

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	25	61.36
3	1330	Off Ramp 395	14	64.77
4	3110	On Ramp 395	38	55.80
5	1020	Off Ramp 2nd St	12	57.95
Total	**7710**		**89**	**59.97**

GOPR2468 — January 13, 2016, 8:38

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	30	51.14
3	1330	Off Ramp 395	18	50.38
4	3110	On Ramp 395	40	53.01
5	1020	Off Ramp 2nd St	14	49.68
Total	**7710**		**102**	**51.05**

GOPR2469 — January 13, 2016, 8:39

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	29	52.90
3	1330	Off Ramp 395	34	26.67
4	3110	On Ramp 395	155	13.68
5	1020	Off Ramp 2nd St	12	57.95
Total	**7710**		**230**	**37.80**

January 13, 2016 — PM

GOPR2476 — January 13, 2016, 17:16

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	31	49.49
3	1330	Off Ramp 395	16	56.68
4	3110	On Ramp 395	43	49.31
5	1020	Off Ramp 2nd St	14	49.68
Total	**7710**		**104**	**51.29**

GOPR2477 — January 13, 2016, 17:28

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	41	37.42
3	1330	Off Ramp 395	20	45.34
4	3110	On Ramp 395	71	29.87
5	1020	Off Ramp 2nd St	12	57.95
Total	**7710**		**144**	**42.64**

GOPR2478 — January 13, 2016, 17:39

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	29	52.90
3	1330	Off Ramp 395	18	50.38
4	3110	On Ramp 395	45	47.12
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**105**	**50.97**

GOPR2479 — January 13, 2016, 17:50

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	33	46.49
3	1330	Off Ramp 395	18	50.38
4	3110	On Ramp 395	39	54.37
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**103**	**51.18**

January 14, 2016 — AM

GOPR2486 — January 14, 2016, 8:13

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	NO VIDEO	NO VIDEO
3	1330	Off Ramp 395		
4	3110	On Ramp 395		
5	1020	Off Ramp 2nd St		
Total	**7710**			

GOPR2487 — January 14, 2016, 8:17

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	28	54.79
3	1330	Off Ramp 395	16	56.68
4	3110	On Ramp 395	61	34.76
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**118**	**49.93**

GOPR2488 — January 14, 2016, 8:28

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	25	61.36
3	1330	Off Ramp 395	15	60.45
4	3110	On Ramp 395	42	50.49
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**95**	**56.45**

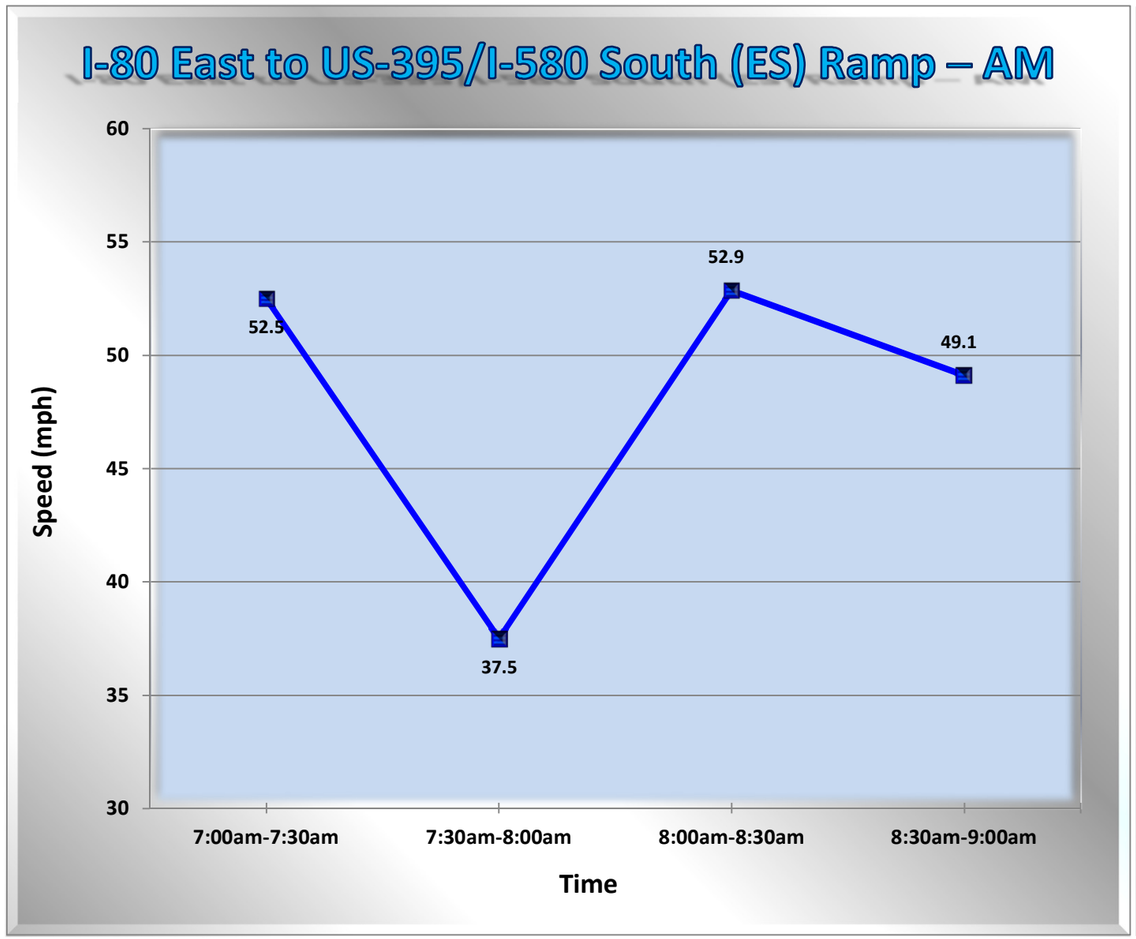
GOPR2489 — January 14, 2016, 8:37

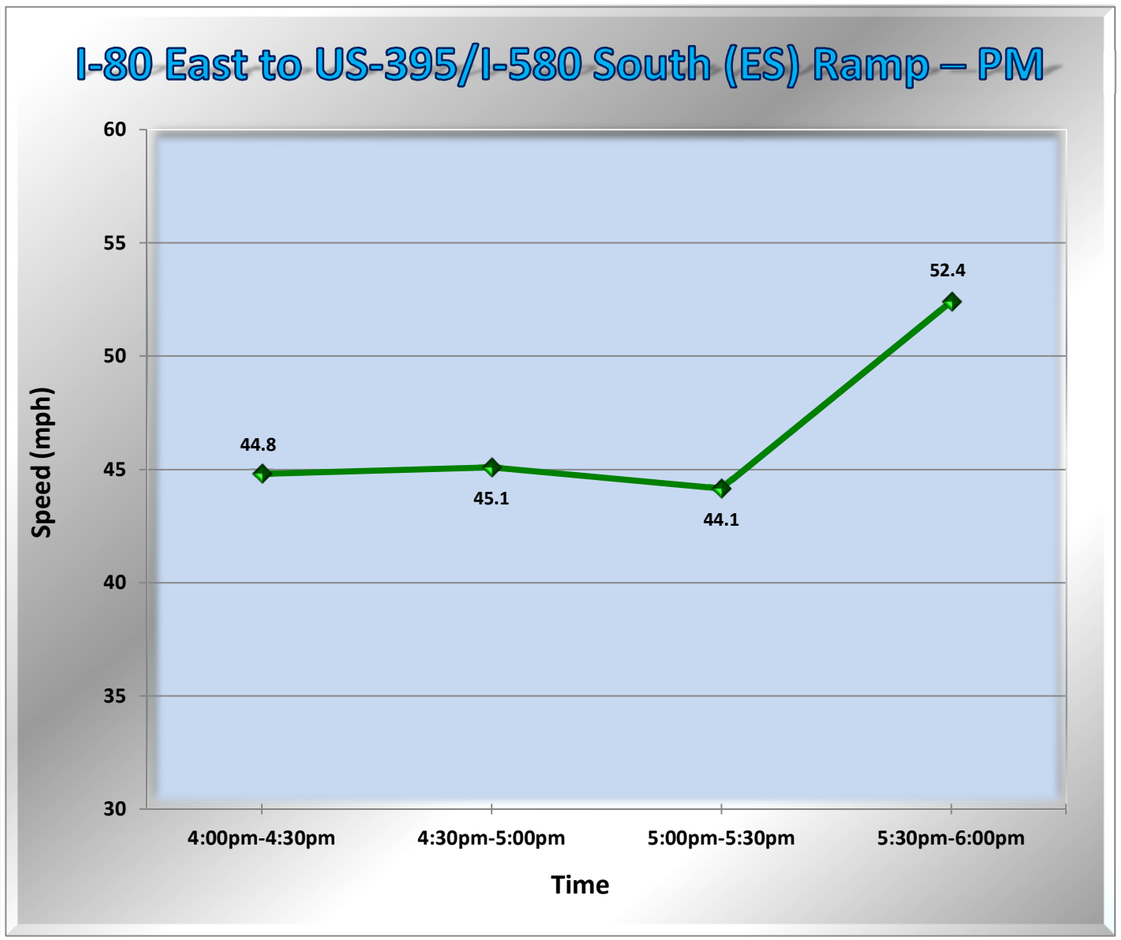
Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	34	45.12
3	1330	Off Ramp 395	18	50.38
4	3110	On Ramp 395	49	43.27
5	1020	Off Ramp 2nd St	13	53.50
Total	**7710**		**114**	**48.07**

GOPR2490 — January 14, 2016, 8:50

Node #	Length (ft)	Location	Travel Time (sec)	Avg Speed (mph)
1st Round 1	0	Starting Point		
2	2250	On Ramp Wells	30	51.14
3	1330	Off Ramp 395	20	45.34
4	3110	On Ramp 395	55	38.55
5	1020	Off Ramp 2nd St	12	57.95
Total	**7710**		**117**	**48.25**

	ES Ramp (AM)								ES Ramp (AM)							
	7:00am-7:30am		7:30am-8:00am		8:00am-8:30am		8:30am-9:00am		4:00pm-4:30pm		4:30pm-5:00pm		5:00pm-5:30pm		5:30pm-6:00pm	
	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)	Travel Time (sec)	Avg Speed (mph)
ES Ramp	111.60	52.49	211.43	37.49	107.83	52.87	134.63	49.12	133.83	44.81	133.50	45.08	151.20	44.15	102.80	52.40





Appendix E

Maximum Queues from field data collection (January 19-21, 2016)

ES Ramp		
Day	**AM**	**PM**
Tuesday	Queue on right most mainline is till ramp meter signal (reference point) from 7:40 to 7:50	-
Wednesday	Queue on right most mainline is till ramp meter signal (reference point) from 7:53 to 7:54	-
Thursday	Queue on right most mainline is till ramp meter signal (reference point) from 7:40 to 7:41	-

WB I-80 to US-395	
Day	**AM**
Tuesday	-
Wednesday	No queues. Significant weaving from 7:40 to 8:10
Thursday	-

SB I-580 to Moana off-ramp		
Day	**AM**	**PM**
Tuesday	-	Queue on exit only lane till cantilever sign structure (5:20 to 5:25)
Wednesday	-	Queue on exit only lane till cantilever sign structure (5:43 to 5:44)
Thursday	-	-

EB I-80 to Rock off-ramp	
Day	**AM**
Tuesday	queue on exit only lane till painted gore (7:50 to 7:55)
Wednesday	queue till sign bridge on option lane from 7:40 till 8:00
Thursday	queue on exit only lane 14 veh past sign bridge (7:55 to 7:56)

NE Ramp	
Day	**PM**
Tuesday	Right most lane up to first streetlight pole south of billboard sign
Wednesday	Right two lanes up to billboard sign (5:15 to 5:20). Third lane from right with 10 cars past painted gore (5:10 to 5:13)
Thursday	Right two lanes up to second streetlight pole south of billboard sign (5:15 to 5:30)

- denotes no queues

Location		EB I-80 to SB I-580									
Time		Queue (veh)	Time		Queue (veh)	Time		Queue (veh)	Time		Queue (veh)
7:00	7:01		7:30	7:31		8:00	8:01	8	8:30	8:31	
7:01	7:02		7:31	7:32		8:01	8:02	6	8:31	8:32	
7:02	7:03		7:32	7:33		8:02	8:03	6	8:32	8:33	
7:03	7:04		7:33	7:34		8:03	8:04	4	8:33	8:34	
7:04	7:05		7:34	7:35		8:04	8:05		8:34	8:35	
7:05	7:06		7:35	7:36		8:05	8:06		8:35	8:36	
7:06	7:07		7:36	7:37	4	8:06	8:07		8:36	8:37	
7:07	7:08		7:37	7:38	4	8:07	8:08		8:37	8:38	
7:08	7:09		7:38	7:39		8:08	8:09		8:38	8:39	
7:09	7:10		7:39	7:40		8:09	8:10		8:39	8:40	
7:10	7:11		7:40	7:41		8:10	8:11		8:40	8:41	
7:11	7:12		7:41	7:42		8:11	8:12		8:41	8:42	
7:12	7:13		7:42	7:43		8:12	8:13		8:42	8:43	
7:13	7:14		7:43	7:44	Queue till ramp meter (Right lane on EB I-80)	8:13	8:14		8:43	8:44	
7:14	7:15		7:44	7:45		8:14	8:15		8:44	8:45	
7:15	7:16		7:45	7:46		8:15	8:16		8:45	8:46	
7:16	7:17		7:46	7:47		8:16	8:17		8:46	8:47	
7:17	7:18		7:47	7:48		8:17	8:18		8:47	8:48	
7:18	7:19		7:48	7:49		8:18	8:19		8:48	8:49	
7:19	7:20		7:49	7:50	On-ramp painted gore	8:19	8:20		8:49	8:50	
7:20	7:21		7:50	7:51		8:20	8:21		8:50	8:51	
7:21	7:22		7:51	7:52	Sign bridge	8:21	8:22		8:51	8:52	
7:22	7:23		7:52	7:53		8:22	8:23		8:52	8:53	
7:23	7:24		7:53	7:54	On-ramp painted gore	8:23	8:24		8:53	8:54	
7:24	7:25		7:54	7:55	Ramp meter	8:24	8:25		8:54	8:55	
7:25	7:26		7:55	7:56	Sign bridge	8:25	8:26		8:55	8:56	
7:26	7:27		7:56	7:57	On-ramp painted gore	8:26	8:27		8:56	8:57	
7:27	7:28		7:57	7:58	Sign bridge	8:27	8:28		8:57	8:58	
7:28	7:29		7:58	7:59	Just short of sign bridge	8:28	8:29		8:58	8:59	
7:29	7:30		7:59	8:00		8:29	8:30		8:59	9:00	

Reference: Cars west of US 395/I-580 off-ramp painted gore

Comments:

1. At 7:38 crash at SB US-395/I-580 north of Glendale. NHP stopped the traffic to move the vehicle. ES, WS & SB US-395 traffic affected according to Alex (ROC)
2. By 8:20 everything is cleared with no queues at all

January 20, 2016 (Wednesday)																
Location	**EB I-80 to SB I-580**															
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**		
7:00	7:01		7:30	7:31		8:00	8:01	4(4) past painted gore	8:30	8:31						
7:01	7:02		7:31	7:32	Platoons but no queue	8:01	8:02	4(3) past painted gore	8:31	8:32						
7:02	7:03		7:32	7:33		8:02	8:03	Painted gore (big pole)	8:32	8:33						
7:03	7:04		7:33	7:34		8:03	8:04	Just past guardrail	8:33	8:34						
7:04	7:05		7:34	7:35		8:04	8:05		8:34	8:35						
7:05	7:06		7:35	7:36		8:05	8:06		8:35	8:36						
7:06	7:07		7:36	7:37		8:06	8:07		8:36	8:37						
7:07	7:08		7:37	7:38		8:07	8:08		8:37	8:38						
7:08	7:09		7:38	7:39		8:08	8:09		8:38	8:39						
7:09	7:10		7:39	7:40		8:09	8:10		8:39	8:40						
7:10	7:11		7:40	7:41		8:10	8:11		8:40	8:41						
7:11	7:12		7:41	7:42		8:11	8:12		8:41	8:42						
7:12	7:13		7:42	7:43		8:12	8:13		8:42	8:43						
7:13	7:14		7:43	7:44	Painted gore on option lane	8:13	8:14		8:43	8:44	Low exit volumes					
7:14	7:15		7:44	7:45	5	8:14	8:15		8:44	8:45						
7:15	7:16		7:45	7:46	4	8:15	8:16		8:45	8:46						
7:16	7:17		7:46	7:47	10	8:16	8:17		8:46	8:47						
7:17	7:18		7:47	7:48	3 (west of sign bridge)	8:17	8:18	Low exit volumes	8:47	8:48						
7:18	7:19		7:48	7:49	4 (west of sign bridge)	8:18	8:19		8:48	8:49						
7:19	7:20		7:49	7:50	6 (4) (west of sign bridge)	8:19	8:20		8:49	8:50						
7:20	7:21		7:50	7:51	both lanes east of end of soundwall	8:20	8:21		8:50	8:51						
7:21	7:22		7:51	7:52		8:21	8:22		8:51	8:52						
7:22	7:23	Platoons but no queue	7:52	7:53	Option lane (2nd sign bridge)	8:22	8:23		8:52	8:53						
7:23	7:24		7:53	7:54	Ramp meter	8:23	8:24		8:53	8:54						
7:24	7:25		7:54	7:55	both lanes (soundwall)	8:24	8:25		8:54	8:55						
7:25	7:26		7:55	7:56	between 1st & 2nd sign bridge	8:25	8:26		8:55	8:56						
7:26	7:27		7:56	7:57		8:26	8:27		8:56	8:57	Platoon but no queue					
7:27	7:28		7:57	7:58	both lanes (east of soundwall)	8:27	8:28		8:57	8:58						
7:28	7:29		7:58	7:59		8:28	8:29		8:58	8:59						
7:29	7:30		7:59	8:00	Half way between 1st and 2nd sign bridge	8:29	8:30		8:59	9:00	Low exit volumes					

Reference: Cars west of US 395/I-580 off-ramp painted gore

Comments:

1. At 7:45 option lane is being used with low or no traffic on the right lane from the end of guardrail
2. At 7:50 option lane is backed-up to the first sign bridge
3. At 7:55 traffic backs-up to ramp meter for 3-5 seconds and moves to the soundwall/sign bridge at Wells on-ramp

January 21, 2016 (Thursday)												
Location	**EB I-80 to SB I-580**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**
7:00	7:01		7:30	7:31		8:00	8:01	14 (3)	8:30	8:31	
7:01	7:02		7:31	7:32		8:01	8:02	12 (off-ramp gore)	8:31	8:32	
7:02	7:03		7:32	7:33		8:02	8:03	10	8:32	8:33	
7:03	7:04		7:33	7:34	Moderate exit volume. Platoon of 15 veh	8:03	8:04	3	8:33	8:34	Very low exit volume
7:04	7:05		7:34	7:35	1 (past gore)	8:04	8:05	All clear	8:34	8:35	
7:05	7:06		7:35	7:36	17 (-) Right exit only lane is not used	8:05	8:06		8:35	8:36	
7:06	7:07		7:36	7:37	14 [Right exit lane till gore]	8:06	8:07		8:36	8:37	
7:07	7:08		7:37	7:38	16	8:07	8:08	Very low exit volume	8:37	8:38	
7:08	7:09		7:38	7:39	18	8:08	8:09		8:38	8:39	
7:09	7:10		7:39	7:40	Second sign bridge	8:09	8:10		8:39	8:40	Moderate exit volume. No queues
7:10	7:11		7:40	7:41	Ramp meter signal	8:10	8:11		8:40	8:41	
7:11	7:12		7:41	7:42	East of second sign bridge	8:11	8:12		8:41	8:42	Low exit volume
7:12	7:13		7:42	7:43	23 (23)	8:12	8:13		8:42	8:43	
7:13	7:14		7:43	7:44	Both lanes till second sign bridge	8:13	8:14	Low exit volume	8:43	8:44	
7:14	7:15		7:44	7:45	both lanes till soundwall	8:14	8:15		8:44	8:45	Low exit volume
7:15	7:16		7:45	7:46		8:15	8:16		8:45	8:46	
7:16	7:17		7:46	7:47		8:16	8:17	Low exit volumes. Platoon of 15 veh	8:46	8:47	
7:17	7:18		7:47	7:48	Ramp meter (Right lane till east of soundwall)	8:17	8:18		8:47	8:48	
7:18	7:19		7:48	7:49		8:18	8:19		8:48	8:49	
7:19	7:20	Low exit volumes. Platoons of about 10 veh	7:49	7:50	Both lanes east of sign bridge	8:19	8:20		8:49	8:50	
7:20	7:21		7:50	7:51		8:20	8:21		8:50	8:51	
7:21	7:22		7:51	7:52	15 (7)	8:21	8:22		8:51	8:52	Moderate exit volume
7:22	7:23		7:52	7:53	Second sign bridge (15)	8:22	8:23		8:52	8:53	
7:23	7:24		7:53	7:54	Second sign bridge (5)	8:23	8:24		8:53	8:54	Low exit volume
7:24	7:25	Low exit volumes. Platoons of about 10 veh	7:54	7:55	East of second sign bridge (10)	8:24	8:25		8:54	8:55	Moderate exit volume
7:25	7:26		7:55	7:56	22 (6)	8:25	8:26		8:55	8:56	
7:26	7:27		7:56	7:57	18 (9)	8:26	8:27		8:56	8:57	
7:27	7:28		7:57	7:58	18 (5)	8:27	8:28		8:57	8:58	Low exit volume
7:28	7:29		7:58	7:59	21 (2)	8:28	8:29		8:58	8:59	
7:29	7:30	Moderate exit traffic. Most of them using option lane	7:59	8:00	19 (11)	8:29	8:30	Very low exit volume	8:59	9:00	Moderate exit volume. No queues

Reference: Cars west of US 395/I-580 off-ramp painted gore

Comments:

1. At 7:35 queues on option lane close to second sign bridge but crawling <10 mph
2. At 7:40 both lanes equally used and backed-up close to second sign bridge
3. At 7:45 both lanes congested close to second sign bridge
4. At 8:05 all clear. Exit traffic is not even till guard rail
5. At 8:15 very low exit traffic. Platoon of 10 to 15 veh and nothing else

January 19, 2016 (Tuesday)												
Location	**EB I-80 to Rock off-ramp (AM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	
7:00	7:01	Smooth traffic flow	7:30	7:31		8:00	8:01	Smooth traffic flow	8:30	8:31	Smooth traffic flow	
7:01	7:02		7:31	7:32		8:01	8:02		8:31	8:32		
7:02	7:03		7:32	7:33		8:02	8:03		8:32	8:33		
7:03	7:04		7:33	7:34		8:03	8:04		8:33	8:34		
7:04	7:05		7:34	7:35		8:04	8:05		8:34	8:35		
7:05	7:06		7:35	7:36		8:05	8:06		8:35	8:36		
7:06	7:07		7:36	7:37		8:06	8:07		8:36	8:37		
7:07	7:08		7:37	7:38		8:07	8:08		8:37	8:38		
7:08	7:09		7:38	7:39		8:08	8:09		8:38	8:39		
7:09	7:10		7:39	7:40		8:09	8:10		8:39	8:40		
7:10	7:11		7:40	7:41		8:10	8:11		8:40	8:41		
7:11	7:12		7:41	7:42		8:11	8:12		8:41	8:42		
7:12	7:13		7:42	7:43		8:12	8:13		8:42	8:43		
7:13	7:14		7:43	7:44		8:13	8:14		8:43	8:44		
7:14	7:15		7:44	7:45		8:14	8:15		8:44	8:45		
7:15	7:16		7:45	7:46		8:15	8:16		8:45	8:46		
7:16	7:17		7:46	7:47		8:16	8:17		8:46	8:47		
7:17	7:18		7:47	7:48		8:17	8:18		8:47	8:48		
7:18	7:19		7:48	7:49		8:18	8:19		8:48	8:49		
7:19	7:20		7:49	7:50	3 vehicles queued on right most lane	8:19	8:20		8:49	8:50		
7:20	7:21		7:50	7:51	queue upto painted gore on right most	8:20	8:21		8:50	8:51		
7:21	7:22		7:51	7:52	2 vehicles queued on right most lane	8:21	8:22		8:51	8:52		
7:22	7:23		7:52	7:53	4 vehicles queued on right most lane	8:22	8:23		8:52	8:53		
7:23	7:24		7:53	7:54		8:23	8:24		8:53	8:54		
7:24	7:25		7:54	7:55		8:24	8:25		8:54	8:55		
7:25	7:26		7:55	7:56	queue upto gore	8:25	8:26		8:55	8:56		
7:26	7:27		7:56	7:57		8:26	8:27		8:56	8:57		
7:27	7:28		7:57	7:58		8:27	8:28		8:57	8:58		
7:28	7:29		7:58	7:59		8:28	8:29		8:58	8:59		
7:29	7:30		7:59	8:00		8:29	8:30		8:59	9:00		

Reference: Cars west of Rock off-ramp painted gore

Comments: Drivers mainly using midlle lane on Offramp, back up doesn't get past gore

January 20, 2016 (Wednesday)												
Location	**EB I-80 to Rock off-ramp (AM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**
7:00	7:01		7:30	7:31		8:00	8:01	queue upto gore on option lane	8:30	8:31	
7:01	7:02		7:31	7:32		8:01	8:02		8:31	8:32	
7:02	7:03		7:32	7:33		8:02	8:03	queue upto sign bridge on option lane	8:32	8:33	
7:03	7:04		7:33	7:34		8:03	8:04		8:33	8:34	
7:04	7:05		7:34	7:35		8:04	8:05		8:34	8:35	
7:05	7:06		7:35	7:36		8:05	8:06		8:35	8:36	
7:06	7:07		7:36	7:37		8:06	8:07		8:36	8:37	Smooth traffic flow
7:07	7:08		7:37	7:38		8:07	8:08		8:37	8:38	
7:08	7:09		7:38	7:39		8:08	8:09		8:38	8:39	
7:09	7:10		7:39	7:40		8:09	8:10		8:39	8:40	
7:10	7:11		7:40	7:41	queue upto sign bridge on option lane	8:10	8:11		8:40	8:41	
7:11	7:12		7:41	7:42		8:11	8:12		8:41	8:42	
7:12	7:13		7:42	7:43		8:12	8:13		8:42	8:43	
7:13	7:14		7:43	7:44		8:13	8:14		8:43	8:44	
7:14	7:15	Smooth traffic flow	7:44	7:45		8:14	8:15		8:44	8:45	
7:15	7:16		7:45	7:46	queue upto gore on option lane	8:15	8:16		8:45	8:46	
7:16	7:17		7:46	7:47		8:16	8:17		8:46	8:47	
7:17	7:18		7:47	7:48		8:17	8:18		8:47	8:48	
7:18	7:19		7:48	7:49		8:18	8:19		8:48	8:49	
7:19	7:20		7:49	7:50		8:19	8:20	Smooth traffic flow	8:49	8:50	
7:20	7:21		7:50	7:51		8:20	8:21		8:50	8:51	
7:21	7:22		7:51	7:52	queue upto sign bridge on option lane	8:21	8:22		8:51	8:52	
7:22	7:23		7:52	7:53		8:22	8:23		8:52	8:53	
7:23	7:24		7:53	7:54		8:23	8:24		8:53	8:54	queue upto sign bridge on option lane
7:24	7:25		7:54	7:55		8:24	8:25		8:54	8:55	
7:25	7:26		7:55	7:56		8:25	8:26		8:55	8:56	
7:26	7:27		7:56	7:57		8:26	8:27		8:56	8:57	
7:27	7:28		7:57	7:58		8:27	8:28		8:57	8:58	
7:28	7:29		7:58	7:59		8:28	8:29		8:58	8:59	
7:29	7:30		7:59	8:00	queue upto sign bridge on option lane	8:29	8:30		8:59	9:00	Smooth traffic flow

Reference: Cars west of Rock off-ramp painted gore

Comments: Option lane recieves most off-ramp traffic

January 21, 2016 (Thursday)												
Location	**EB I-80 to Rock off-ramp (AM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	
7:00	7:01		7:30	7:31	Heavy weaving traffic	8:00	8:01	queue upto sign bridge	8:30	8:31		
7:01	7:02		7:31	7:32		8:01	8:02		8:31	8:32		
7:02	7:03		7:32	7:33		8:02	8:03		8:32	8:33		
7:03	7:04		7:33	7:34		8:03	8:04		8:33	8:34		
7:04	7:05		7:34	7:35		8:04	8:05		8:34	8:35	Smooth traffic flow	
7:05	7:06		7:35	7:36		8:05	8:06		8:35	8:36		
7:06	7:07		7:36	7:37		8:06	8:07		8:36	8:37		
7:07	7:08		7:37	7:38		8:07	8:08		8:37	8:38		
7:08	7:09		7:38	7:39	queue upto sign bridge	8:08	8:09		8:38	8:39		
7:09	7:10		7:39	7:40	7 vehicles queued past sign bridge	8:09	8:10		8:39	8:40		
7:10	7:11		7:40	7:41	queue upto sign bridge	8:10	8:11		8:40	8:41		
7:11	7:12		7:41	7:42	3 vehicles queued past sign bridge	8:11	8:12		8:41	8:42		
7:12	7:13		7:42	7:43	6 vehicles queued past sign bridge	8:12	8:13		8:42	8:43		
7:13	7:14		7:43	7:44		8:13	8:14		8:43	8:44	queue upto sign bridge	
7:14	7:15		7:44	7:45	queue upto sign bridge	8:14	8:15		8:44	8:45		
7:15	7:16	Heavy utilization of middle right lane	7:45	7:46	2 vehicles queued past sign bridge	8:15	8:16		8:45	8:46	Queue clears	
7:16	7:17		7:46	7:47		8:16	8:17		8:46	8:47		
7:17	7:18		7:47	7:48	Slow moving queue	8:17	8:18		8:47	8:48		
7:18	7:19		7:48	7:49		8:18	8:19	Smooth traffic flow	8:48	8:49		
7:19	7:20	queue upto sign bridge	7:49	7:50	6 vehicles queued past sign bridge	8:19	8:20		8:49	8:50		
7:20	7:21	2 vehicles queued past sign bridge	7:50	7:51	queue upto sign bridge	8:20	8:21		8:50	8:51		
7:21	7:22		7:51	7:52	8 vehicles queued past sign bridge	8:21	8:22		8:51	8:52		
7:22	7:23	queue upto sign bridge	7:52	7:53	4 vehicles queued past sign bridge	8:22	8:23		8:52	8:53		
7:23	7:24		7:53	7:54	8 vehicles queued past sign bridge	8:23	8:24		8:53	8:54		
7:24	7:25		7:54	7:55	9 vehicles queued past sign bridge	8:24	8:25		8:54	8:55		
7:25	7:26	Offramp clears	7:55	7:56	14 vehicles queued past sign bridge	8:25	8:26		8:55	8:56		
7:26	7:27		7:56	7:57	Queue clears	8:26	8:27		8:56	8:57		
7:27	7:28		7:57	7:58		8:27	8:28		8:57	8:58	Smooth traffic flow	
7:28	7:29		7:58	7:59		8:28	8:29		8:58	8:59		
7:29	7:30		7:59	8:00	Queue upto gore	8:29	8:30		8:59	9:00		

Reference: Cars west of Rock off-ramp painted gore

Comments: Option lane recieves most off-ramp traffic, queueing on option lane

January 19, 2016 (Tuesday)												
Location	**WB I-80 to I-580/US 395 (AM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	
7:00	7:01	Smooth traffic flow	7:30	7:31	Smooth traffic flow	8:00	8:01	Smooth traffic flow	8:30	8:31	Smooth traffic flow	
7:01	7:02		7:31	7:32		8:01	8:02		8:31	8:32		
7:02	7:03		7:32	7:33		8:02	8:03		8:32	8:33		
7:03	7:04		7:33	7:34		8:03	8:04		8:33	8:34		
7:04	7:05		7:34	7:35		8:04	8:05		8:34	8:35		
7:05	7:06		7:35	7:36		8:05	8:06		8:35	8:36		
7:06	7:07		7:36	7:37		8:06	8:07		8:36	8:37		
7:07	7:08		7:37	7:38		8:07	8:08		8:37	8:38		
7:08	7:09		7:38	7:39		8:08	8:09		8:38	8:39		
7:09	7:10		7:39	7:40		8:09	8:10		8:39	8:40		
7:10	7:11		7:40	7:41		8:10	8:11		8:40	8:41		
7:11	7:12		7:41	7:42		8:11	8:12		8:41	8:42		
7:12	7:13		7:42	7:43		8:12	8:13		8:42	8:43		
7:13	7:14		7:43	7:44		8:13	8:14		8:43	8:44		
7:14	7:15		7:44	7:45		8:14	8:15		8:44	8:45		
7:15	7:16		7:45	7:46		8:15	8:16		8:45	8:46		
7:16	7:17		7:46	7:47		8:16	8:17		8:46	8:47		
7:17	7:18		7:47	7:48		8:17	8:18		8:47	8:48		
7:18	7:19		7:48	7:49		8:18	8:19		8:48	8:49		
7:19	7:20		7:49	7:50		8:19	8:20		8:49	8:50		
7:20	7:21		7:50	7:51		8:20	8:21		8:50	8:51		
7:21	7:22		7:51	7:52		8:21	8:22		8:51	8:52		
7:22	7:23		7:52	7:53		8:22	8:23		8:52	8:53		
7:23	7:24		7:53	7:54		8:23	8:24		8:53	8:54		
7:24	7:25		7:54	7:55		8:24	8:25		8:54	8:55		
7:25	7:26		7:55	7:56		8:25	8:26		8:55	8:56		
7:26	7:27		7:56	7:57		8:26	8:27		8:56	8:57		
7:27	7:28		7:57	7:58		8:27	8:28		8:57	8:58		
7:28	7:29		7:58	7:59		8:28	8:29		8:58	8:59		
7:29	7:30		7:59	8:00		8:29	8:30		8:59	9:00		

Reference: Cars east of US 395/I-580 off-ramp painted gore

Comments:

January 20, 2016 (Wednesday)								
Location	**WB I-80 to I-580/US 395 (AM only)**							
Time	**Queue (veh)**	**Time**	**Queue (veh)**	**Time**	**Queue (veh)**	**Time**	**Queue (veh)**
7:00 7:01	Smooth traffic flow	7:30 7:31	Smooth traffic flow	8:00 8:01	Smooth traffic flow	8:30 8:31	Smooth traffic flow
7:01 7:02		7:31 7:32		8:01 8:02		8:31 8:32	
7:02 7:03		7:32 7:33		8:02 8:03		8:32 8:33	
7:03 7:04		7:33 7:34		8:03 8:04		8:33 8:34	
7:04 7:05		7:34 7:35		8:04 8:05		8:34 8:35	
7:05 7:06		7:35 7:36		8:05 8:06		8:35 8:36	
7:06 7:07		7:36 7:37		8:06 8:07		8:36 8:37	
7:07 7:08		7:37 7:38		8:07 8:08		8:37 8:38	
7:08 7:09		7:38 7:39		8:08 8:09		8:38 8:39	
7:09 7:10		7:39 7:40		8:09 8:10		8:39 8:40	
7:10 7:11		7:40 7:41		8:10 8:11		8:40 8:41	
7:11 7:12		7:41 7:42		8:11 8:12		8:41 8:42	
7:12 7:13		7:42 7:43		8:12 8:13		8:42 8:43	
7:13 7:14		7:43 7:44		8:13 8:14		8:43 8:44	
7:14 7:15		7:44 7:45		8:14 8:15		8:44 8:45	
7:15 7:16		7:45 7:46		8:15 8:16		8:45 8:46	
7:16 7:17		7:46 7:47		8:16 8:17		8:46 8:47	
7:17 7:18		7:47 7:48		8:17 8:18		8:47 8:48	
7:18 7:19		7:48 7:49		8:18 8:19		8:48 8:49	
7:19 7:20		7:49 7:50		8:19 8:20		8:49 8:50	
7:20 7:21	Slow moving queue upto gore in option lane	7:50 7:51		8:20 8:21		8:50 8:51	
7:21 7:22		7:51 7:52		8:21 8:22		8:51 8:52	
7:22 7:23		7:52 7:53		8:22 8:23		8:52 8:53	
7:23 7:24		7:53 7:54		8:23 8:24		8:53 8:54	
7:24 7:25		7:54 7:55		8:24 8:25		8:54 8:55	
7:25 7:26		7:55 7:56		8:25 8:26		8:55 8:56	
7:26 7:27		7:56 7:57		8:26 8:27		8:56 8:57	
7:27 7:28		7:57 7:58		8:27 8:28		8:57 8:58	
7:28 7:29		7:58 7:59		8:28 8:29		8:58 8:59	
7:29 7:30		7:59 8:00		8:29 8:30		8:59 9:00	

Reference: Cars east of US 395/I-580 off-ramp painted gore

Comments:

January 21, 2016 (Thursday)												
Location	**WB I-80 to I-580/US 395 (AM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	
7:00	7:01	Smooth traffic flow	7:30	7:31	3 queued vehicles in option lane	8:00	8:01	Smooth traffic flow	8:30	8:31	Smooth traffic flow	
7:01	7:02		7:31	7:32	Queue clears	8:01	8:02		8:31	8:32		
7:02	7:03		7:32	7:33		8:02	8:03		8:32	8:33		
7:03	7:04		7:33	7:34		8:03	8:04		8:33	8:34		
7:04	7:05		7:34	7:35	2 queued vehicles in option lane	8:04	8:05		8:34	8:35		
7:05	7:06		7:35	7:36		8:05	8:06		8:35	8:36		
7:06	7:07		7:36	7:37		8:06	8:07		8:36	8:37		
7:07	7:08		7:37	7:38		8:07	8:08		8:37	8:38		
7:08	7:09		7:38	7:39		8:08	8:09		8:38	8:39		
7:09	7:10		7:39	7:40		8:09	8:10		8:39	8:40		
7:10	7:11		7:40	7:41	3 vehicles queued past gore	8:10	8:11		8:40	8:41		
7:11	7:12		7:41	7:42	Queue clears	8:11	8:12		8:41	8:42		
7:12	7:13		7:42	7:43		8:12	8:13		8:42	8:43		
7:13	7:14		7:43	7:44	Queueing upto to gore in option lane	8:13	8:14		8:43	8:44		
7:14	7:15		7:44	7:45		8:14	8:15		8:44	8:45		
7:15	7:16		7:45	7:46		8:15	8:16		8:45	8:46		
7:16	7:17		7:46	7:47		8:16	8:17		8:46	8:47		
7:17	7:18		7:47	7:48		8:17	8:18		8:47	8:48		
7:18	7:19		7:48	7:49	Slow moving queue upto gore in option lane	8:18	8:19		8:48	8:49		
7:19	7:20		7:49	7:50		8:19	8:20		8:49	8:50		
7:20	7:21		7:50	7:51		8:20	8:21		8:50	8:51		
7:21	7:22		7:51	7:52		8:21	8:22		8:51	8:52		
7:22	7:23		7:52	7:53		8:22	8:23		8:52	8:53		
7:23	7:24		7:53	7:54		8:23	8:24		8:53	8:54		
7:24	7:25		7:54	7:55	4 vehicles queued past gore	8:24	8:25		8:54	8:55		
7:25	7:26		7:55	7:56	Queueing upto to gore in option lane	8:25	8:26		8:55	8:56		
7:26	7:27		7:56	7:57	Queue clears	8:26	8:27		8:56	8:57		
7:27	7:28		7:57	7:58		8:27	8:28		8:57	8:58		
7:28	7:29		7:58	7:59	Queueing upto to gore in option lane	8:28	8:29		8:58	8:59		
7:29	7:30		7:59	8:00	Queue clears	8:29	8:30		8:59	9:00		

Reference: Cars east of US 395/I-580 off-ramp painted gore

Comments: Queueing on option lane

January 19, 2016 (Tuesday)												
Location	**NB US 395 I-80 EB (PM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	
4:00	4:01		4:30	4:31		5:00	5:01		5:30	5:31		
4:01	4:02		4:31	4:32		5:01	5:02		5:31	5:32		
4:02	4:03		4:32	4:33		5:02	5:03		5:32	5:33		
4:03	4:04		4:33	4:34		5:03	5:04		5:33	5:34		
4:04	4:05		4:34	4:35		5:04	5:05		5:34	5:35		
4:05	4:06		4:35	4:36		5:05	5:06		5:35	5:36		
4:06	4:07		4:36	4:37		5:06	5:07		5:36	5:37		
4:07	4:08		4:37	4:38		5:07	5:08	Smooth traffic flow	5:37	5:38		
4:08	4:09		4:38	4:39		5:08	5:09		5:38	5:39		
4:09	4:10		4:39	4:40		5:09	5:10		5:39	5:40		
4:10	4:11		4:40	4:41		5:10	5:11		5:40	5:41		
4:11	4:12		4:41	4:42		5:11	5:12		5:41	5:42		
4:12	4:13		4:42	4:43		5:12	5:13		5:42	5:43		
4:13	4:14		4:43	4:44		5:13	5:14		5:43	5:44		
4:14	4:15	Smooth traffic flow	4:44	4:45	Smooth traffic flow	5:14	5:15		5:44	5:45	Smooth traffic flow	
4:15	4:16		4:45	4:46		5:15	5:16	10 queued vehicles in right most lane	5:45	5:46		
4:16	4:17		4:46	4:47		5:16	5:17		5:46	5:47		
4:17	4:18		4:47	4:48		5:17	5:18		5:47	5:48		
4:18	4:19		4:48	4:49		5:18	5:19		5:48	5:49		
4:19	4:20		4:49	4:50		5:19	5:20		5:49	5:50		
4:20	4:21		4:50	4:51		5:20	5:21		5:50	5:51		
4:21	4:22		4:51	4:52		5:21	5:22		5:51	5:52		
4:22	4:23		4:52	4:53		5:22	5:23	Queue upto sign board	5:52	5:53		
4:23	4:24		4:53	4:54		5:23	5:24		5:53	5:54		
4:24	4:25		4:54	4:55		5:24	5:25		5:54	5:55		
4:25	4:26		4:55	4:56		5:25	5:26		5:55	5:56		
4:26	4:27		4:56	4:57		5:26	5:27		5:56	5:57		
4:27	4:28		4:57	4:58		5:27	5:28	Queue upto first streetlight pole south of sign	5:57	5:58		
4:28	4:29		4:58	4:59		5:28	5:29	board	5:58	5:59		
4:29	4:30		4:59	5:00		5:29	5:30	Queue clears	5:59	6:00		

Reference: Cars south of I-80 EB off-ramp painted gore

Comments:

January 20, 2016 (Wednesday)												
Location	**NB US 395 I-80 EB (PM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**
4:00	4:01		4:30	4:31		5:00	5:01		5:30	5:31	Queue upto sign board (rd outer right offramp lanes)
4:01	4:02		4:31	4:32		5:01	5:02		5:31	5:32	Queue clears on 2nd outer right lane
4:02	4:03		4:32	4:33		5:02	5:03		5:32	5:33	Moderate traffic flow on offramp
4:03	4:04		4:33	4:34		5:03	5:04		5:33	5:34	
4:04	4:05		4:34	4:35		5:04	5:05		5:34	5:35	
4:05	4:06		4:35	4:36		5:05	5:06	Smooth to moderate traffic flow	5:35	5:36	
4:06	4:07		4:36	4:37		5:06	5:07		5:36	5:37	Queue upto to sign board on right most lane
4:07	4:08		4:37	4:38		5:07	5:08		5:37	5:38	
4:08	4:09		4:38	4:39		5:08	5:09		5:38	5:39	
4:09	4:10		4:39	4:40		5:09	5:10		5:39	5:40	
4:10	4:11		4:40	4:41	Smooth traffic flow	5:10	5:11		5:40	5:41	
4:11	4:12		4:41	4:42		5:11	5:12		5:41	5:42	
4:12	4:13		4:42	4:43		5:12	5:13	10 queued vehicles on 3rd right offramp lane	5:42	5:43	
4:13	4:14		4:43	4:44		5:13	5:14	4 queued vehicles on 3rd right offramp lane	5:43	5:44	Queue clears on outer right lane
4:14	4:15	Smooth traffic flow	4:44	4:45		5:14	5:15	Queue upto end of lane line (2 outer right offram	5:44	5:45	Queueing mainstream traffic
4:15	4:16		4:45	4:46		5:15	5:16	5 queued vehicles on 3rd right offramp lane	5:45	5:46	
4:16	4:17		4:46	4:47		5:16	5:17		5:46	5:47	slow mainstream traffic
4:17	4:18		4:47	4:48		5:17	5:18	Queue upto sign board (2 outer right offramp	5:47	5:48	Clear offramp
4:18	4:19		4:48	4:49		5:18	5:19	lanes)	5:48	5:49	
4:19	4:20		4:49	4:50		5:19	5:20		5:49	5:50	
4:20	4:21		4:50	4:51		5:20	5:21		5:50	5:51	
4:21	4:22		4:51	4:52		5:21	5:22		5:51	5:52	
4:22	4:23		4:52	4:53		5:22	5:23		5:52	5:53	
4:23	4:24		4:53	4:54		5:23	5:24		5:53	5:54	Smooth to moderate traffic flow
4:24	4:25		4:54	4:55		5:24	5:25		5:54	5:55	
4:25	4:26		4:55	4:56	Smooth to moderate traffic flow	5:25	5:26		5:55	5:56	
4:26	4:27		4:56	4:57		5:26	5:27	Queue upto sign board (2 outer right offramp lane	5:56	5:57	
4:27	4:28		4:57	4:58		5:27	5:28		5:57	5:58	
4:28	4:29		4:58	4:59		5:28	5:29		5:58	5:59	
4:29	4:30		4:59	5:00		5:29	5:30		5:59	6:00	Smooth traffic flow

Reference: Cars south of I-80 EB off-ramp painted gore

Comments:

January 21, 2016 (Thursday)												
Location	**NB US 395 I-80 EB (PM only)**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	
4:00	4:01		4:30	4:31		5:00	5:01	Smooth traffic flow	5:30	5:31		
4:01	4:02		4:31	4:32		5:01	5:02		5:31	5:32		
4:02	4:03		4:32	4:33		5:02	5:03		5:32	5:33	Queue upto to 1st lamp past sign board	
4:03	4:04		4:33	4:34		5:03	5:04		5:33	5:34		
4:04	4:05		4:34	4:35		5:04	5:05		5:34	5:35		
4:05	4:06		4:35	4:36		5:05	5:06	Moderate traffic flow on 2nd right offramp lane	5:35	5:36		
4:06	4:07		4:36	4:37		5:06	5:07		5:36	5:37		
4:07	4:08		4:37	4:38		5:07	5:08		5:37	5:38	Queue upto cantilever sign bridge	
4:08	4:09		4:38	4:39		5:08	5:09	Heavy traffic on 3rd right offramp lane	5:38	5:39		
4:09	4:10		4:39	4:40		5:09	5:10	8 queued vehicles on 2nd right offramp lane	5:39	5:40		
4:10	4:11		4:40	4:41		5:10	5:11	Queue upto end of lane line (2 outer right offramp	5:40	5:41	6 queued vehicles on 2nd right offramp lane	
4:11	4:12	Smooth traffic flow	4:41	4:42		5:11	5:12	lanes)	5:41	5:42		
4:12	4:13		4:42	4:43	Smooth traffic flow	5:12	5:13	Queue upto sign board (2 outer right offramp	5:42	5:43		
4:13	4:14		4:43	4:44		5:13	5:14	Queue past sign board (2 outer right offramp lanes)	5:43	5:44		
4:14	4:15		4:44	4:45		5:14	5:15	Queue upto to 1st lamp past sign board	5:44	5:45	Moderate mainstream traffic flow, off ramp traffic clears	
4:15	4:16		4:45	4:46		5:15	5:16	Queue upto sign board	5:45	5:46		
4:16	4:17		4:46	4:47		5:16	5:17		5:46	5:47		
4:17	4:18		4:47	4:48		5:17	5:18		5:47	5:48		
4:18	4:19		4:48	4:49		5:18	5:19		5:48	5:49		
4:19	4:20		4:49	4:50		5:19	5:20		5:49	5:50		
4:20	4:21		4:50	4:51		5:20	5:21		5:50	5:51		
4:21	4:22		4:51	4:52		5:21	5:22	Queue upto to 2nd lamp past sign board (2 outer	5:51	5:52		
4:22	4:23		4:52	4:53		5:22	5:23	right offramp lanes)	5:52	5:53		
4:23	4:24		4:53	4:54		5:23	5:24		5:53	5:54		
4:24	4:25		4:54	4:55		5:24	5:25		5:54	5:55	smooth mainstream and offramp traffic flow	
4:25	4:26	Moderate traffic flow	4:55	4:56		5:25	5:26		5:55	5:56		
4:26	4:27		4:56	4:57	Moderate traffic flow	5:26	5:27		5:56	5:57		
4:27	4:28		4:57	4:58		5:27	5:28		5:57	5:58		
4:28	4:29		4:58	4:59		5:28	5:29	Queue upto cantilever sign bridge (3rd outer lane)	5:58	5:59		
4:29	4:30		4:59	5:00		5:29	5:30		5:59	6:00		

Reference: Cars south of I-80 EB off-ramp painted gore

Comments: 5:25 Heavey usage of 2nd & 3rd outer ight most lanes

January 19, 2016 (Tuesday)										
Location	**SB I-580 aux lane between Plumb on-ramp and Moana off-ramp**									
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**
4:00	4:01	Smooth flowing traffic	4:30	4:31	Smooth flowing traffic	5:00	5:01	Traffic flow back to normal	5:30	5:31	Smooth flowing traffic
4:01	4:02		4:31	4:32		5:01	5:02		5:31	5:32	
4:02	4:03		4:32	4:33		5:02	5:03		5:32	5:33	
4:03	4:04		4:33	4:34		5:03	5:04		5:33	5:34	
4:04	4:05		4:34	4:35		5:04	5:05		5:34	5:35	
4:05	4:06		4:35	4:36		5:05	5:06		5:35	5:36	
4:06	4:07		4:36	4:37		5:06	5:07		5:36	5:37	
4:07	4:08		4:37	4:38		5:07	5:08		5:37	5:38	
4:08	4:09		4:38	4:39		5:08	5:09		5:38	5:39	
4:09	4:10		4:39	4:40		5:09	5:10		5:39	5:40	
4:10	4:11		4:40	4:41		5:10	5:11		5:40	5:41	
4:11	4:12		4:41	4:42		5:11	5:12		5:41	5:42	
4:12	4:13		4:42	4:43		5:12	5:13		5:42	5:43	
4:13	4:14		4:43	4:44		5:13	5:14		5:43	5:44	
4:14	4:15		4:44	4:45		5:14	5:15		5:44	5:45	
4:15	4:16		4:45	4:46		5:15	5:16		5:45	5:46	
4:16	4:17		4:46	4:47		5:16	5:17		5:46	5:47	
4:17	4:18		4:47	4:48		5:17	5:18		5:47	5:48	
4:18	4:19		4:48	4:49		5:18	5:19		5:48	5:49	
4:19	4:20		4:49	4:50	Slow mainstream traffic flow (no a	5:19	5:20	14 queued vehicles on right most	5:49	5:50	
4:20	4:21		4:50	4:51		5:20	5:21	Queue on right lane upto cantilever sign	5:50	5:51	
4:21	4:22		4:51	4:52		5:21	5:22		5:51	5:52	
4:22	4:23		4:52	4:53		5:22	5:23		5:52	5:53	
4:23	4:24		4:53	4:54		5:23	5:24		5:53	5:54	
4:24	4:25		4:54	4:55	Offramp traffic flowing ok, slow m	5:24	5:25		5:54	5:55	
4:25	4:26		4:55	4:56		5:25	5:26	Traffic flow back to normal	5:55	5:56	
4:26	4:27		4:56	4:57		5:26	5:27		5:56	5:57	
4:27	4:28		4:57	4:58		5:27	5:28		5:57	5:58	
4:28	4:29		4:58	4:59		5:28	5:29		5:58	5:59	
4:29	4:30		4:59	5:00		5:29	5:30		5:59	6:00	

Reference: Cars north of Moana off-ramp painted gore

Comments:

4:15 - 4:45 Concrete bar on right most freeway lane on Moana exit. Traffic flow not impacted

5:02 Vehicle with flat tire due to concrete bar stops on shoulder at Moana exit

January 20, 2016 (Wednesday)												
Location	**SB I-580 aux lane between Plumb on-ramp and Moana off-ramp**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	
4:00	4:01	Low traffic flow	4:30	4:31	Low traffic flow	5:00	5:01	Increased mainstream tyraffic flow	5:30	5:31	Smooth traffic flow, no queues	
4:01	4:02		4:31	4:32		5:01	5:02		5:31	5:32		
4:02	4:03		4:32	4:33		5:02	5:03		5:32	5:33		
4:03	4:04		4:33	4:34		5:03	5:04		5:33	5:34		
4:04	4:05		4:34	4:35		5:04	5:05		5:34	5:35		
4:05	4:06		4:35	4:36		5:05	5:06		5:35	5:36		
4:06	4:07		4:36	4:37		5:06	5:07		5:36	5:37		
4:07	4:08		4:37	4:38		5:07	5:08		5:37	5:38		
4:08	4:09		4:38	4:39		5:08	5:09		5:38	5:39		
4:09	4:10		4:39	4:40		5:09	5:10		5:39	5:40		
4:10	4:11		4:40	4:41		5:10	5:11		5:40	5:41	Increased traffic o right lane on the o	
4:11	4:12		4:41	4:42		5:11	5:12	Heavy right lane utilization	5:41	5:42		
4:12	4:13		4:42	4:43		5:12	5:13		5:42	5:43	10 queued vehicles in right offramp	
4:13	4:14		4:43	4:44		5:13	5:14		5:43	5:44	Queue on right lane upto cantilever s	
4:14	4:15		4:44	4:45		5:14	5:15		5:44	5:45		
4:15	4:16		4:45	4:46		5:15	5:16		5:45	5:46	Queue clears	
4:16	4:17		4:46	4:47	Heavy right lane utilization	5:16	5:17		5:46	5:47		
4:17	4:18		4:47	4:48		5:17	5:18		5:47	5:48	No queue on offramp, moderate mainstream traffic flow	
4:18	4:19		4:48	4:49		5:18	5:19	Smooth traffic flow, no queues	5:48	5:49		
4:19	4:20		4:49	4:50		5:19	5:20		5:49	5:50		
4:20	4:21		4:50	4:51		5:20	5:21		5:50	5:51		
4:21	4:22		4:51	4:52	Increased mainstream tyraffic flow	5:21	5:22		5:51	5:52		
4:22	4:23		4:52	4:53		5:22	5:23		5:52	5:53		
4:23	4:24		4:53	4:54		5:23	5:24		5:53	5:54		
4:24	4:25		4:54	4:55		5:24	5:25		5:54	5:55		
4:25	4:26		4:55	4:56		5:25	5:26		5:55	5:56		
4:26	4:27		4:56	4:57		5:26	5:27		5:56	5:57		
4:27	4:28		4:57	4:58		5:27	5:28		5:57	5:58		
4:28	4:29		4:58	4:59		5:28	5:29		5:58	5:59		
4:29	4:30		4:59	5:00		5:29	5:30		5:59	6:00		

Reference: Cars north of Moana off-ramp painted gore

Comments:
4:17 Incident in mainstream traffic
5:20 Mainstream traffic flow ok
Decent amount of truck percentage

January 21, 2016 (Thursday)												
Location	**SB I-580 aux lane between Plumb on-ramp and Moana off-ramp**											
Time		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**	**Time**		**Queue (veh)**
4:00	4:01	Smooth mainstream traffic flow. No queues on aux lane	4:30	4:31	Moderate mainstream traffic flow. No queues on aux lane	5:00	5:01	Moderate mainstream traffic flow. No queues on ramp	5:30	5:31	Slow mainstream traffic flow as well as on aux & option lane. No queues
4:01	4:02		4:31	4:32		5:01	5:02		5:31	5:32	
4:02	4:03		4:32	4:33		5:02	5:03		5:32	5:33	
4:03	4:04		4:33	4:34		5:03	5:04		5:33	5:34	
4:04	4:05		4:34	4:35		5:04	5:05		5:34	5:35	
4:05	4:06		4:35	4:36		5:05	5:06		5:35	5:36	
4:06	4:07		4:36	4:37	Increasing mainstream traffic flow. No queues	5:06	5:07		5:36	5:37	
4:07	4:08		4:37	4:38		5:07	5:08	Low mainstream traffic	5:37	5:38	
4:08	4:09		4:38	4:39		5:08	5:09		5:38	5:39	
4:09	4:10		4:39	4:40		5:09	5:10		5:39	5:40	
4:10	4:11		4:40	4:41		5:10	5:11		5:40	5:41	
4:11	4:12		4:41	4:42		5:11	5:12		5:41	5:42	
4:12	4:13		4:42	4:43		5:12	5:13		5:42	5:43	
4:13	4:14		4:43	4:44		5:13	5:14	Slow mainstream traffic flow, no queues on aux lane	5:43	5:44	
4:14	4:15		4:44	4:45		5:14	5:15		5:44	5:45	Moderate traffic flow on freeway, aux & option lanes
4:15	4:16		4:45	4:46		5:15	5:16		5:45	5:46	
4:16	4:17		4:46	4:47		5:16	5:17		5:46	5:47	
4:17	4:18		4:47	4:48		5:17	5:18		5:47	5:48	
4:18	4:19		4:48	4:49		5:18	5:19		5:48	5:49	
4:19	4:20		4:49	4:50		5:19	5:20		5:49	5:50	
4:20	4:21		4:50	4:51		5:20	5:21	Stop & go flow mainstream flow	5:50	5:51	
4:21	4:22		4:51	4:52		5:21	5:22		5:51	5:52	
4:22	4:23		4:52	4:53		5:22	5:23	Slow traffic flow on aux & option lane	5:52	5:53	
4:23	4:24		4:53	4:54	Moderate mainstream traffic flow. No queues	5:23	5:24		5:53	5:54	
4:24	4:25		4:54	4:55		5:24	5:25		5:54	5:55	
4:25	4:26		4:55	4:56		5:25	5:26		5:55	5:56	Moderate to fast traffic flow on freeway, aux & option lanes
4:26	4:27		4:56	4:57		5:26	5:27		5:56	5:57	
4:27	4:28		4:57	4:58		5:27	5:28		5:57	5:58	
4:28	4:29		4:58	4:59		5:28	5:29		5:58	5:59	
4:29	4:30		4:59	5:00		5:29	5:30		5:59	6:00	

Reference: Cars north of Moana off-ramp painted gore

Comments:
4:12 Increased traffic flow, but no queues
No incidents on segment

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

BRIAN SANDOVAL
Governor

RUDY MALFABON, P.E., *Director*
In Reply Refer to:

June 7, 2017
VIA E-Mail: Jim.Roldan@CH2M.com

Jim Roldan, P.E.
Senior Transportation Engineer
CH2M
6 Hutton Centre Drive Suite 700
Santa Ana, CA 92707

Subject: Reno Spaghetti Bowl – NEPA

Dear Mr. Roldan:

The Nevada Department of Transportation (NDOT) Traffic and Operations Division reviewed the VISSIM Adjustments to Original Existing Conditions Calibrated Models technical memorandum for the subject project provided by your firm on June 6, 2017. The information and documentation provided in the memorandum were acceptable to the Department.

This is a formal NDOT approval letter for the use of the 2017 Calibrated VISSIM models as the base to develop future scenarios for the RENO SPAGHETTI BOWL – NEPA Project.

Sincerely,

Denise M. Inda, P.E.
NDOT Chief Traffic Operations Engineer

DMI/HH/JLT

CC: Hoang Hong, NDOT Traffic Operations
Nick Johnson, NDOT Project Management
Chris Wright, NDOT Traffic Information

Reno Spaghetti Bowl - VISSIM Adjustments to Original Existing Conditions Calibrated Models

To:	Judy Tortelli, Nevada Department of Transportation Hoang Hong, Nevada Department of Transportation
FROM:	Jim Roldan, CH2M Loren Bloomberg, CH2M Sajeev Kumar Keecheril, CH2M
DATE:	June 6, 2017
PROJECT NUMBER:	684384

1. Introduction

The Nevada Department of Transportation (NDOT) and the Federal Highway Administration (FHWA), in cooperation with the Regional Transportation Commission of Washoe County (RTC) and the cities of Reno and Sparks, are studying alternatives to address the obsolete design, improve safety, and reduce travel delay in the Interstate 80 (I-80) and Interstate 580/U.S. Highway 395 (I-580/US 395) corridors and the interchange that connects these freeways (referred to as the Reno Spaghetti Bowl).

The Reno Spaghetti Bowl was originally constructed between 1969 and 1971 for a metropolitan population of about 130,000 people. The current population of Washoe County has increased to approximately 420,000 people, with a forecasted growth rate exceeding state and national averages. As the existing Reno Spaghetti Bowl nears its design capacity, NDOT and FHWA desire to complete the necessary National Environmental Policy Act of 1969 (NEPA) and design studies to determine appropriate measures to reconstruct the interchange to accommodate the future travel demands. CH2M is leading the effort to prepare the environmental document for the project. As part of this effort, a traffic operations technical study is being prepared.

The I-80/I-580system-to-system interchange, referred to as the Reno Spaghetti Bowl, is located in Washoe County, NV. The Project limits are as follows:

- I-80 Western Limits: Keystone Avenue interchange
- I-80 Eastern Limits: McCarran Boulevard interchange
- I-580/US 395 Northern Limits: Parr Avenue/Dandini Boulevard interchange
- I-580/US 395 Southern Limits: Meadowood Mall Way interchange

The study area includes a total of 16 service interchanges, one system-to-system interchange, braided/collector distributor systems, and multiple local roads (cross streets and frontages).

The existing conditions calibrated VISSIM models done as part of the Reno/Sparks Traffic Study (prepared by C A Group in December, 2016 and approved by NDOT) were used as the existing conditions models for this study. The existing conditions models from the C A Group are described as the "original models" in this memo. Review of the original models revealed that the simulation and output results showed less demand and congestion at I-80/I-580 interchange compared to a typical weekday. Therefore, the original models were refined, in coordination and agreement with NDOT, by increasing demand and changing the driver behavior parameters in VISSIM at specific locations identified as inconsistent with the field conditions. The purpose of this memorandum is to document the calibration adjustments done to the original models.

2. VISSIM Calibration

The purpose of a simulation model is to investigate the traffic operational effects of improvement alternatives. Simulation models are an efficient tool for evaluating improvements, but are only reliable when the base model reasonably matches real-world conditions. VISSIM, like all simulation models, was designed to be flexible enough that an analyst can correctly calibrate the network to match the local conditions at a reasonably accurate level. However, the default values will (almost) never give accurate results for a specific area. Therefore, it is well-established that calibration is essential. For complex projects, however, the specific steps and rules for calibration can vary greatly. Identifying the formal calibration steps is important to identify the structure for calibration and the framework for evaluating when calibration is complete.

The sections below outline the steps that were followed in the modification of the original models. The modification of the calibration parameters in original models was focused on calibrating the models for the queues at the following main bottleneck locations:

1. I-80 eastbound to I-580 southbound connector in the AM peak period
2. I-80 eastbound to I-580 southbound connector in the PM peak period
3. I-580 northbound to I-80 eastbound connector in the PM peak period

To improve calibration, changes in VISSIM input parameters were tested in an iterative process. The parameters adjusted were the car-following parameters and traffic demand.

2.1 Queue Length

Since the field queue length data was not available, Google speed maps for a typical weekday from Spring 2017 were used for the comparison. Google speed maps at the main bottleneck locations were compared to the original model speed plots, and the VISSIM calibration parameters were adjusted to refine the original model to match the field conditions.

I-80 eastbound to I-580 southbound connector in the AM and PM peak period: On this connector, there is a lane drop (two to one) before merging onto southbound I-580. Since the AM and PM peak period demand is too high for one lane, a bottleneck forms at this location and the queue extends west of Wells Avenue. Exhibits 2-1 and 2-2 are Google Maps screenshots that illustrate the queue lengths on a typical weekday during AM and PM peak periods.

Exhibits 2-3 and 2-4 illustrate the speed plots from the original model for the time intervals of 8:00 to 8:30 in the AM and 5:00 to 5:30 in the PM. In the original VISSIM model, the queue on I-80 from the I-580 southbound ramp extends back to between Wells Avenue and the I-580 off-ramp in the AM peak period. In PM, peak period, there is no queue in the original VISSIM model and vehicles are traveling at or above 45 mph. Therefore, the calibration parameters were adjusted to increase the length of the queue on this ramp. The results from the adjusted models are discussed in Section 3.

I-580 northbound to I-80 eastbound connector in PM peak period: On this connector, there is a lane drop (two to one) before merging onto I-80 eastbound. Since the PM peak period demand is too high for one lane, a bottleneck form at this location and the queue extends south of Mill Street. Exhibit 2-5 is a Google Maps screenshot that displays the queue length on a typical weekday during PM peak period.

Exhibit 2-6 is the speed plot from the original model between 5:00 and 5:30 PM. In the original model, the queue on this connector extends back to between Glendale Avenue and the I-80 off-ramp. Therefore, the calibration parameters for this ramp were adjusted to increase the length of the queue. The results from the adjusted model are discussed in Section 3.

EXHIBIT 2-1
Queue Length on a Typical Weekday During AM Peak Period on I-80 Eastbound To I-580 Southbound Connector

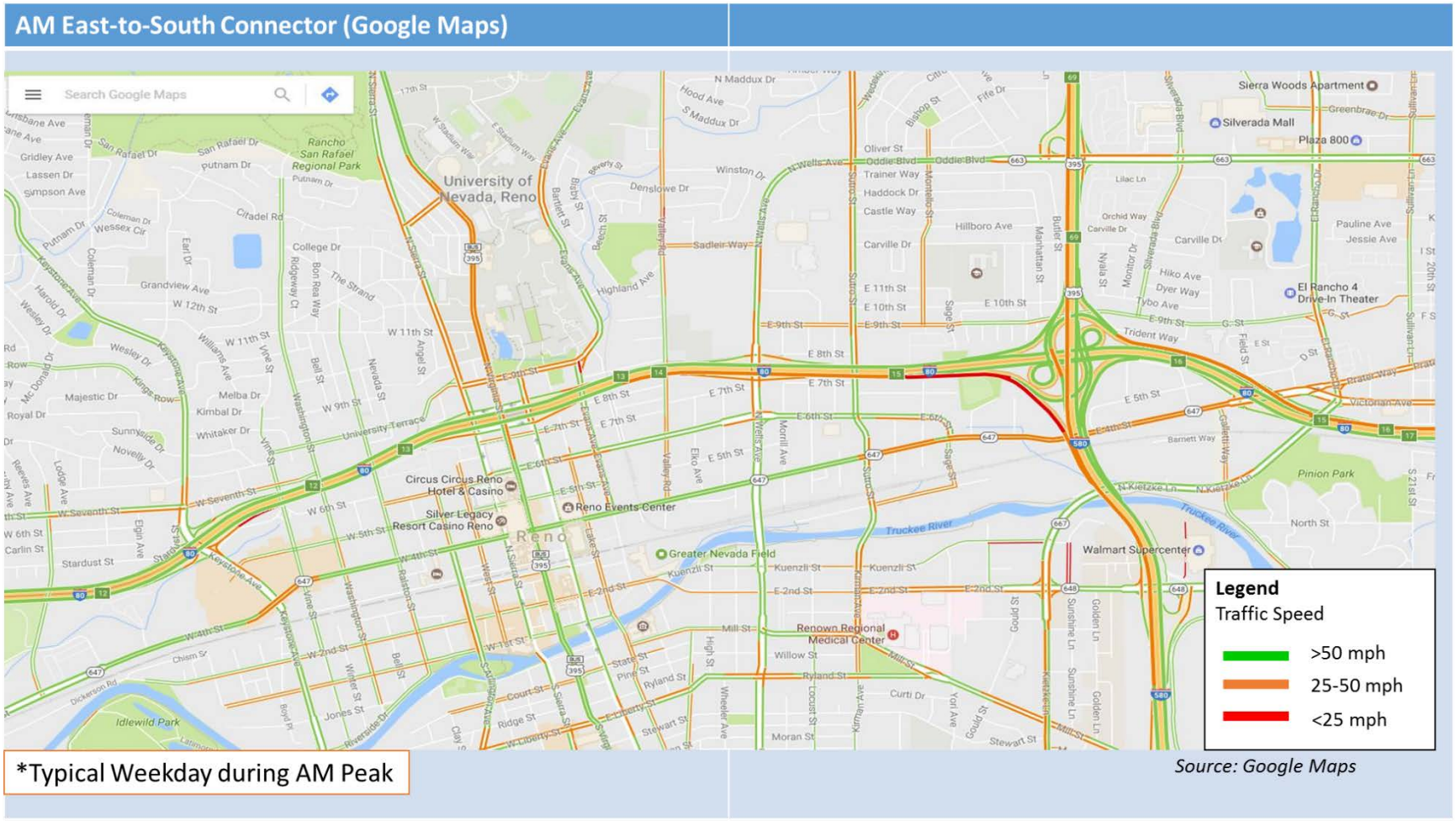


EXHIBIT 2-2
Queue Length on a Typical Weekday During PM Peak Period on I-80 Eastbound To I-580 Southbound Connector

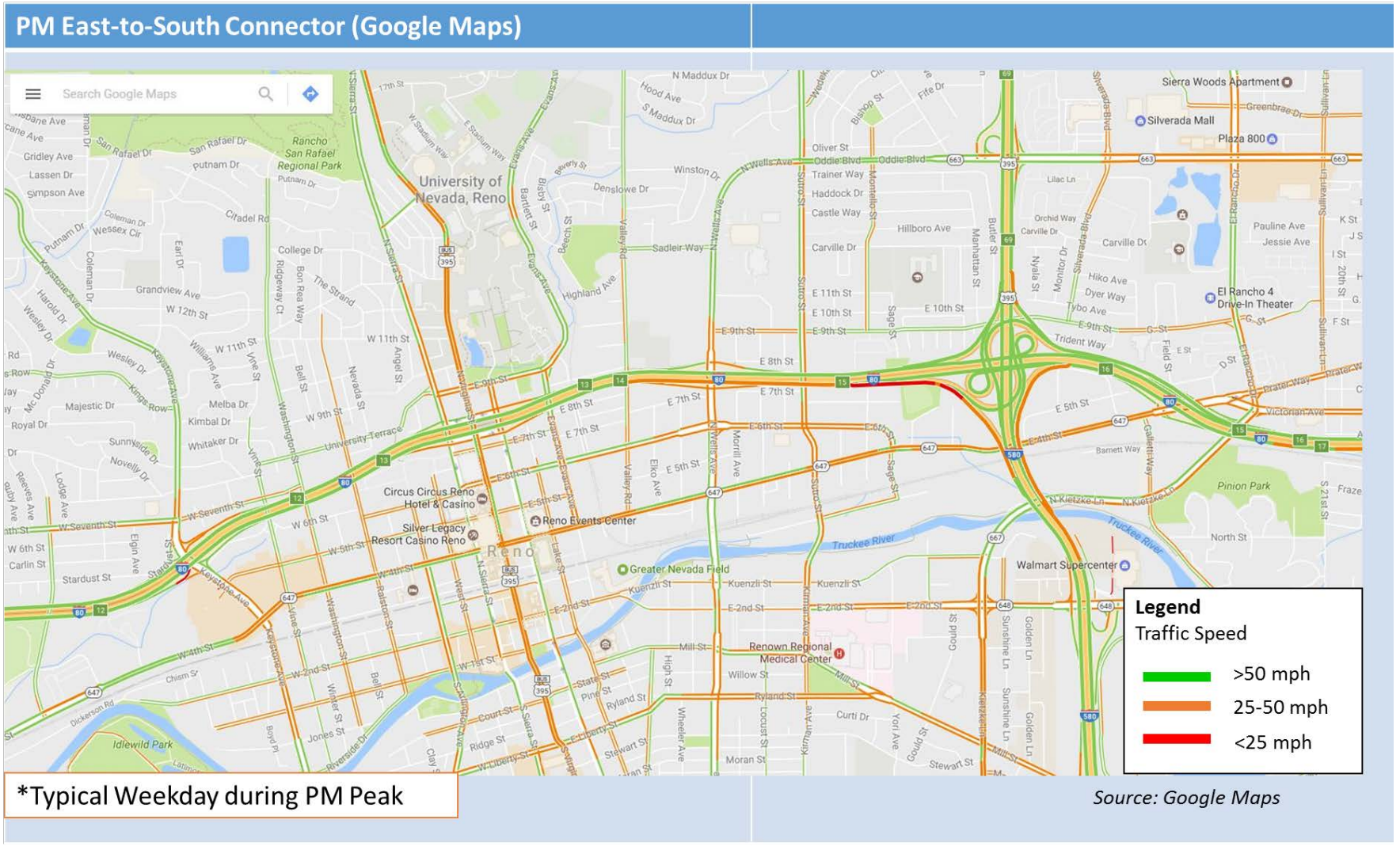


EXHIBIT 2-3
AM Peak Period Speed Plots from The Original Model For I-80 Eastbound to I-580 Southbound Connector

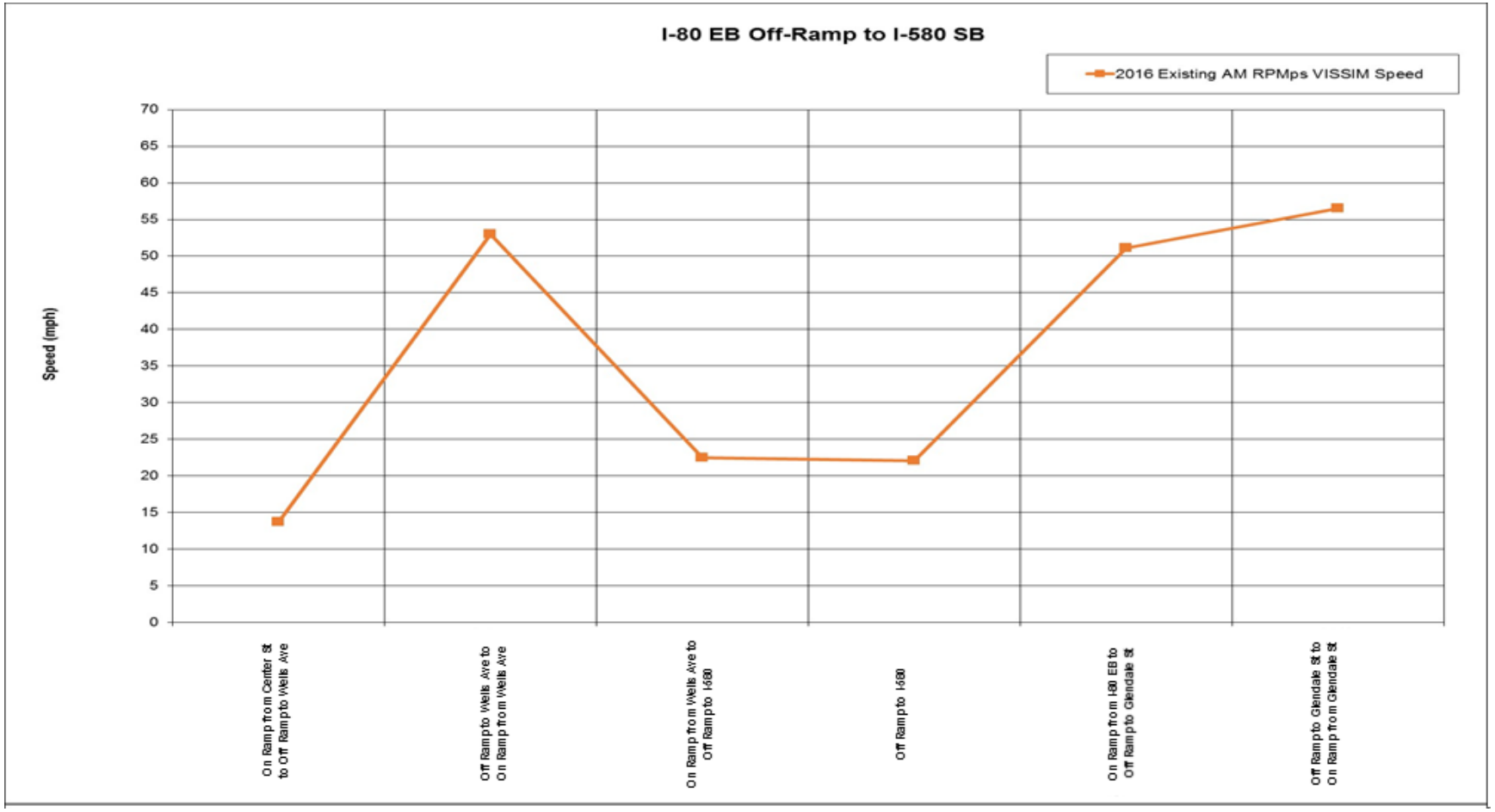


EXHIBIT 2-4
PM Peak Period Speed Plots from The Original Model For I-80 Eastbound to I-580 Southbound Connector

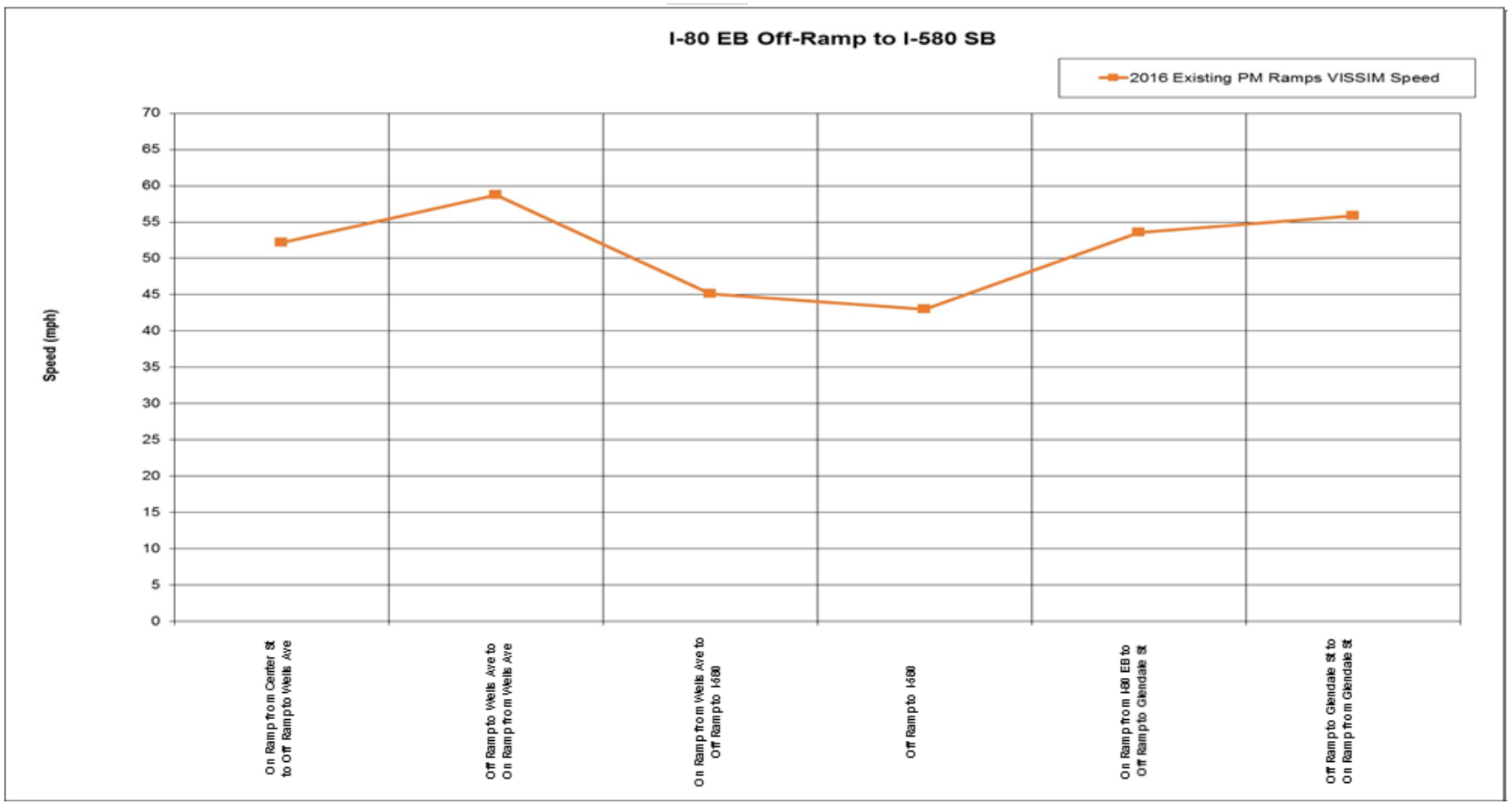


EXHIBIT 2-5
Queue Length on a Typical Weekday During PM Peak Period on I-580 Northbound to I-80 Eastbound Connector

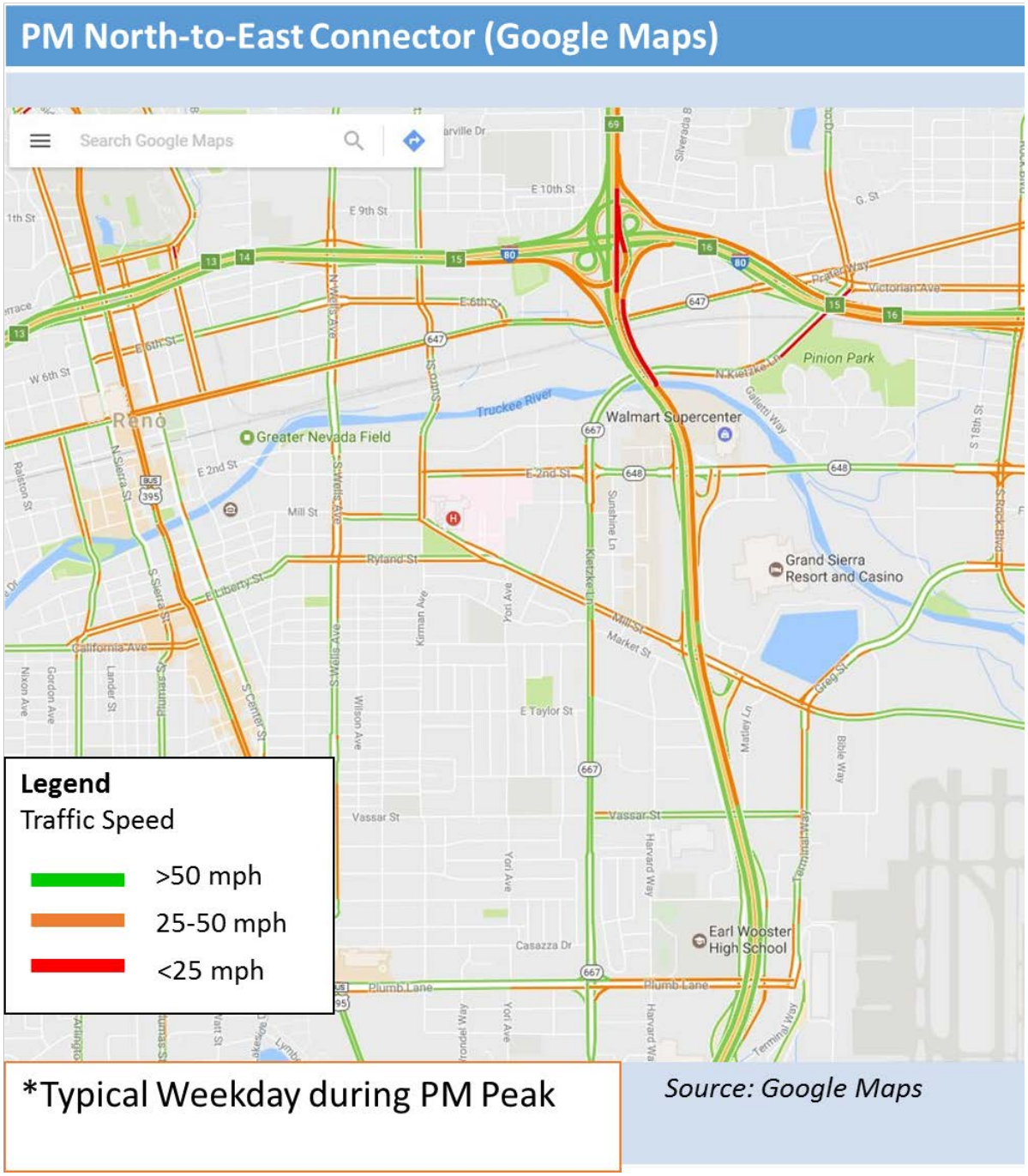
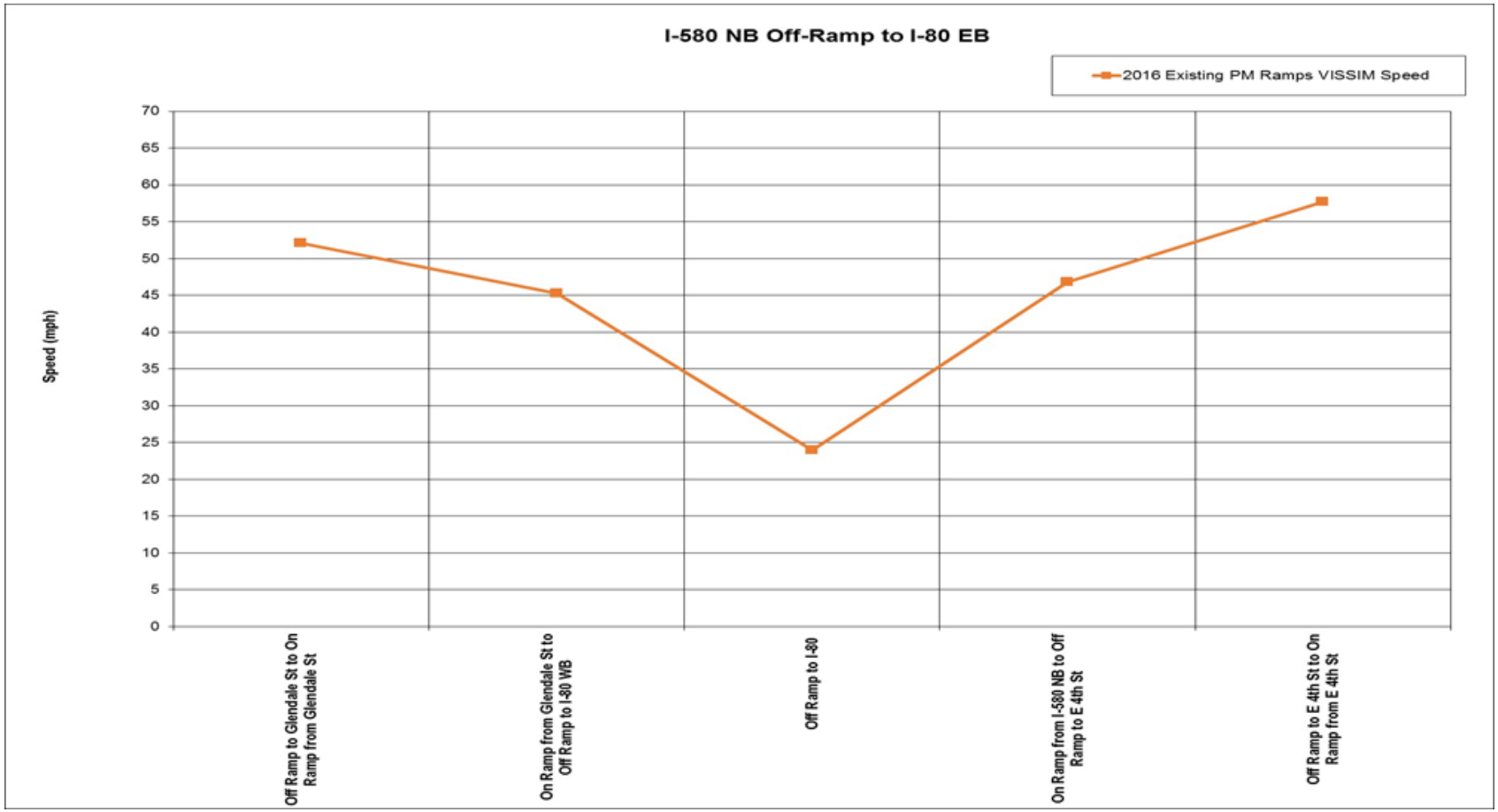


EXHIBIT 2-6
PM Peak Period Speed Plots from The Original Model For I-580 Northbound to I-80 Eastbound Connector



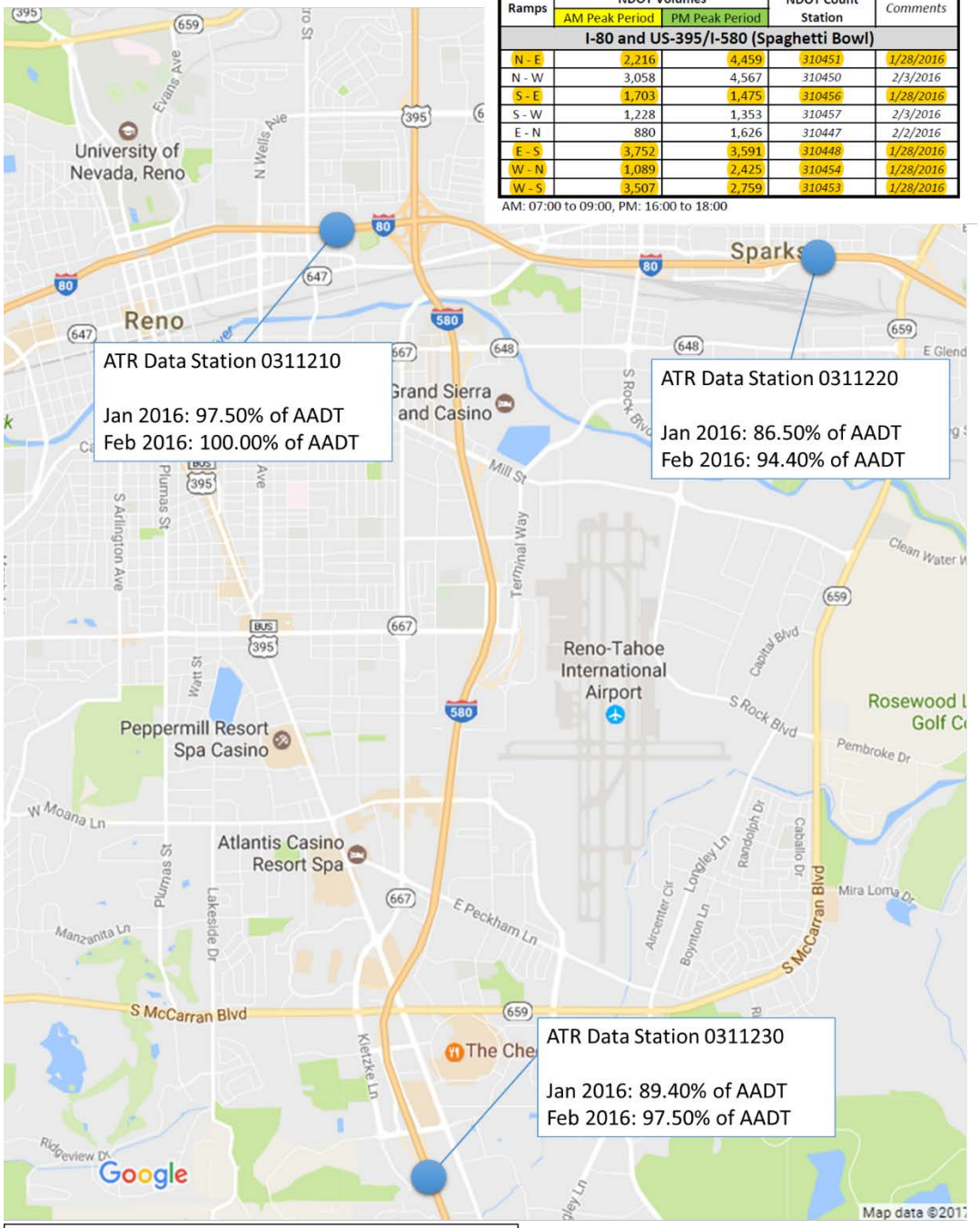
2.2 Traffic Demand

The original models were calibrated to the field volume data collected in January 2016, which was found to be a lighter traffic count month when compared to other months in 2016 using data from nearby NDOT Annual Traffic Recorded (ATR) count stations. Review of nearby 2016 ATR data shows that February of 2016 was a more representative month for the typical weekday in 2016. The Annual Average Daily Traffic (AADT) data from February 2016 shows an overall average increase of 6-13% compared to January 2016 AADT data, at different ATR locations on I-80 and I-580 as shown in Exhibit 2-7. The percentage adjustments were determined by calculating the average shortfall for the two count stations for the major system movements. For example, the north to east traffic had an average shortfall of 12.05% based on the southern and eastern count stations. The adjustment percentages in the far right column of the table at the bottom of Exhibit 2-7 were applied to each of the five system movements listed in that same table (all other ramps were determined acceptable). To replicate the queues during the heavier month, the end-to-end AM and PM peak period demands in the original models were increased by the numbers shown in Exhibit 2-8 which are the volumes calculated using the adjustment percentages at the bottom of Exhibit 2-7.

EXHIBIT 2-7
AADT from ATR Data Station for January and February 2016

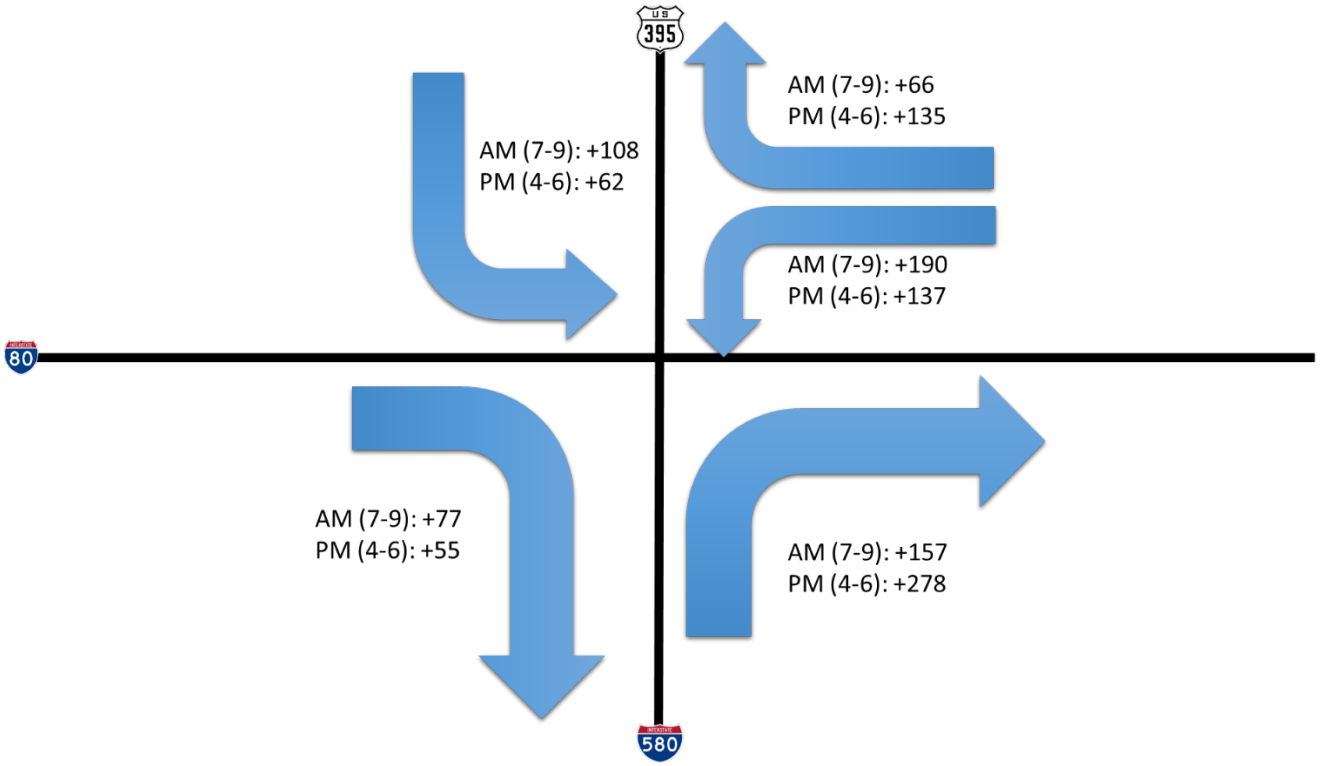
Peak Period Traffic Volumes for VISSIM				
Ramps	NDOT Volumes		NDOT Count Station	Comments
	AM Peak Period	PM Peak Period		
I-80 and US-395/I-580 (Spaghetti Bowl)				
N - E	2,216	4,459	310451	1/28/2016
N - W	3,058	4,567	310450	2/3/2016
S - E	1,703	1,475	310456	1/28/2016
S - W	1,228	1,353	310457	2/3/2016
E - N	880	1,626	310447	2/2/2016
E - S	3,752	3,591	310448	1/28/2016
W - N	1,089	2,425	310454	1/28/2016
W - S	3,507	2,759	310453	1/28/2016

AM: 07:00 to 09:00, PM: 16:00 to 18:00



Proposed Adjustment to Existing End-to-End Demand		
Ramps	Avg Shortfall	Adjustment
N - E	87.95%	12.05%
S - E	86.50%	13.50%
E - S	93.45%	6.55%
W - N	86.50%	13.50%
W - S	87.95%	12.05%

EXHIBIT 2-8
Existing VISSIM End-to-End Peak Period Demand Adjustments



3. Adjusted Model VISSIM Calibration and Results

3.1 VISSIM Calibration Adjustments

Calibrating the peak period VISSIM models involved adjusting the parameters in the original VISSIM models to achieve the queue length. The primary parameters that were adjusted included:

- Car following parameters
- Lane change behaviors
- Lane change look back distances

3.1.1 Parameter Descriptions

VISSIM incorporates two car following models – one for freeways and one for arterials. In combination with other operational parameters, users can adjust these parameters as needed to achieve desired flow conditions. The default parameter network-wide settings for the freeway car following model (Wiedemann 99) are shown in Exhibit 3-1.

The Wiedemann 99 car following model has nine different adjustable parameters. The four parameters listed below are the only ones that were adjusted during the calibration process. Next to each parameter is a brief definition (from the VISSIM 8.00 User Manual). These parameters in the original model were adjusted, to achieve the calibration targets and reflect the operational conditions in the study area.

- *CC0 – Standstill Distance* defines the desired distance between stopped cars. This parameter can have an effect on the length of queues observed during congested conditions.
- *CC1 – Headway Time* is not a direct measure of headway time, but rather a factor that affects the following (minimum desired safety) distance. Lower values allow the vehicles to travel closer together and increases capacity. In the case of high volumes (like those on I-80 and US 395/I-580), it is the following distance that has the strongest influence on capacity.
- *CC4 and CC5 – Following Thresholds* control speed differentials during the following state. Smaller values result in more aggressive reactions to speed changes of preceding vehicles. The vehicles are more tightly coupled with smaller values.

Another important parametric change focused on the lane changing parameters. VISSIM includes parameters for necessary and discretionary lane changes. The default parameter network-wide settings for freeway lane changes are shown in Exhibit 3-2.

EXHIBIT 3-1
VISSIM v8.00-13 Default Freeway Car Following Parameters

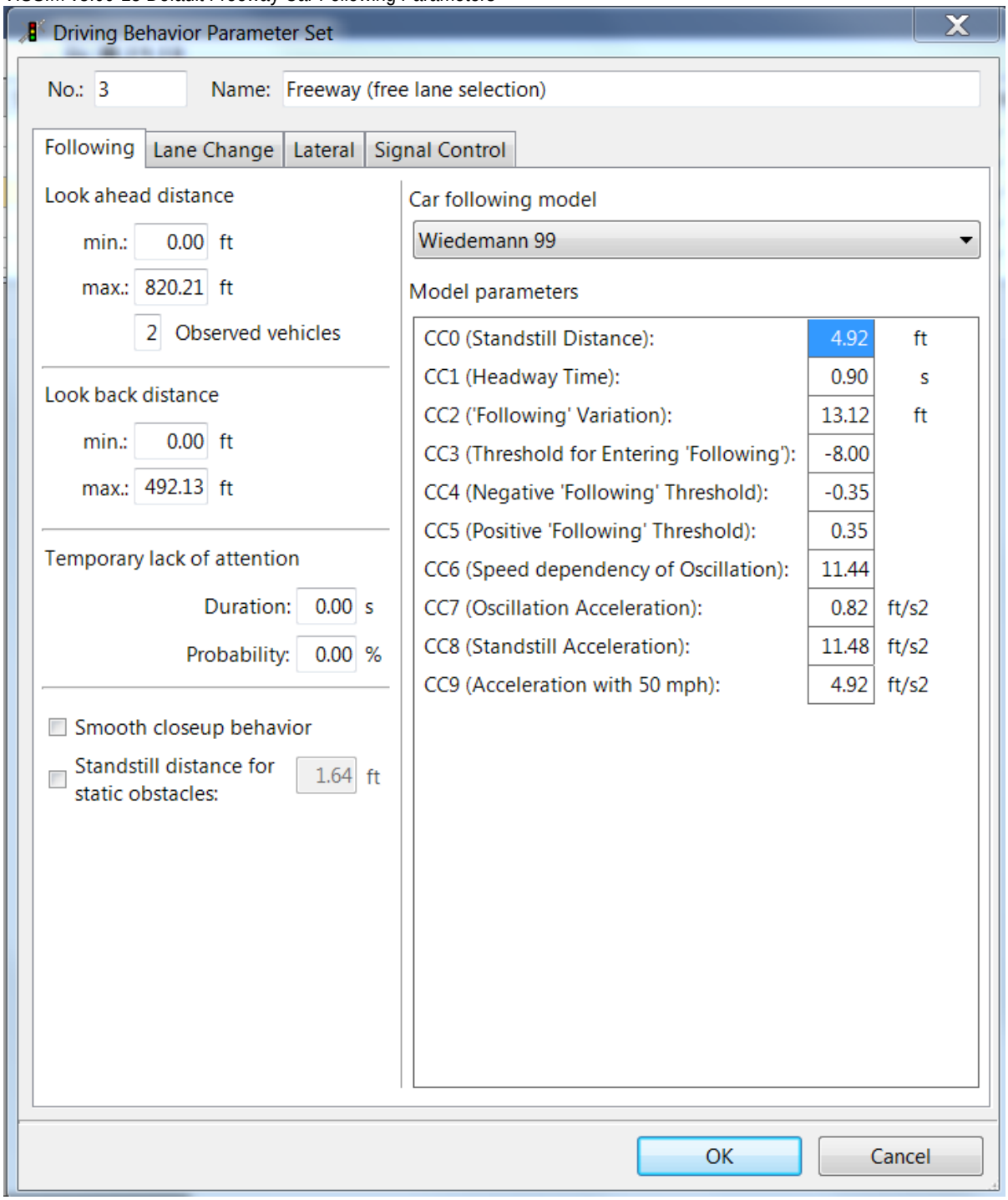
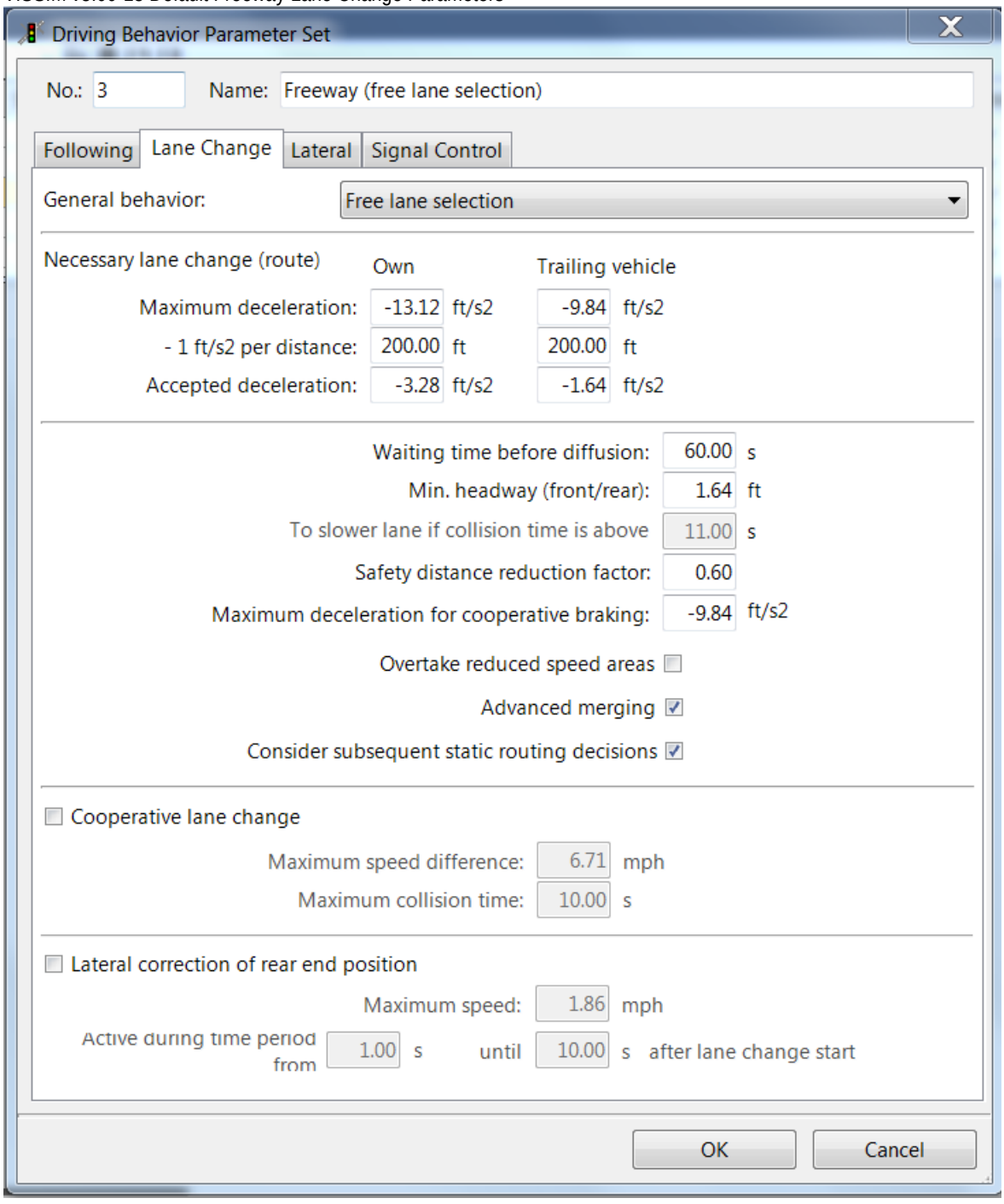


EXHIBIT 3-2
VISSIM v8.00-13 Default Freeway Lane Change Parameters



3.1.2 Parameter Changes

Table 3-1 is a summary of the driver behavior parameter adjustments performed during the calibration process for the I-80 eastbound to I-580 southbound connector. Driver behavior parameters for all other locations were kept the same as in the original model.

TABLE 3-1
I-80 Eastbound to I-580 Southbound Connector AM/PM Peak Calibration Parameters

	Car Following Parameters				Lane Changing
Location	CC0 Standstill Distance (ft)	CC1 Headway (sec)	CC4 Following Variation (ft)	CC5 Following Variation (ft)	Waiting Time before diffusion (sec)
Default Values	4.92	0.90	-0.35	0.35	60
I-80 eastbound to I-580 southbound connector	**4.7**	**1.20**	**-0.5**	**0.5**	**200**

Below is a summary of why each of the default car following parameters listed in Table 3-1 were adjusted:

- Standstill Distance (CC0): Standstill distance is the distance between lead and following vehicles when they are stopped. A reduction in this value increases the number of vehicles that can be stored in a queue.
- Headway (CC1): An increase in headway decreases the flow rate and reduces capacity. An increase in this value increases the length of the queue.
- Following Variation (CC4 and CC5): An increase in the CC4 and CC5 decreases the flow rate and capacity.
- Waiting time before Diffusion: An increase in this parameter increases the amount of time a vehicle waits for a gap. The result is an increase in queue length.

Tables 3-2 is the summary of the lane change look back distance adjustments made during the calibration process on I-80 eastbound to I-580 southbound and the I-580 northbound to I-80 eastbound connectors. Lane change distances for all other connectors were kept the same as in the original model. A decrease in the lane change distance generally decreases the demand served for the mainline sections and ramp. An increase in the lane change distance generally increases the demand served for the mainline sections and ramp.

TABLE 3-2
Lane Change Distances

Location	Link	AM Peak		PM Peak	
		Existing Model Value (ft)	Adjusted Value (ft)	Existing Model Value (ft)	Adjusted Value (ft)
Default Values		656			
I-80 eastbound to I-580 southbound connector	10310	656	2500	656	2500
I-580 northbound to I-80 eastbound connector	10775	No change	No change	1250	1000
	10247	No change	No change	656	400

3.2 VISSIM Results

Speed contour plots from original models were compared with output data from refined VISSIM model to verify that the model was calibrated and replicating the volume and queue length from the field (Google Maps speed maps).

Table 3-3 summarizes the volume comparison of field data and VISSIM modeled data for each system ramp. As shown in Table 3-3, all system interchange ramps meet NDOT Modeling Guideline calibration volume criteria (within 5% of field volumes and GEH<5) with the exception of the E-S and E-N ramps with the calibration adjustments outlined in the previous sections of this memorandum. However, when these system ramps are included with the remainder of the study area (including all freeway segments and ramps), the revised model was found to meet volume calibration criteria (within 5% of field volumes and GEH<5 for 85% of the study area cases).

Exhibits 3-3 and 3-4 show the speed plots from the original and refined VISSIM models for the I-80 eastbound to I-580 southbound connector between 8:00 to 8:30 in the AM peak period. The refined model shows lower speeds at this location and the queue extends west of Wells Avenue.

Exhibits 3-5 compares the VISSIM simulation to the Google Maps screenshot. The refined VISSIM model simulation shows the same queue length as the Google Maps speed map.

TABLE 3-3
VISSIM Volume Calibration Results, System Interchange Ramp Volumes

		Peak Period (two hours)	
	Ramp	AM	PM
Field Volumes	N-E	2,202	4,231
	N-W	2,936	4,609
	S-E	1,703	1,475
	S-W	1,189	1,353
	E-N	866	1,533
	E-S	3,752	3,591
	W-N	998	2,473
	W-S	3,394	2,839

		Peak Period (two hours)	
	Ramp	AM	PM
VISSIM Model Volumes	N-E	2,101	4,138
	N-W	2,817	4,390
	S-E	1,629	1,514
	S-W	1,139	1,347
	E-N	800	1,558
	E-S	3,216	3,477
	W-N	1,020	2,541
	W-S	3,287	2,846

		Peak Period (two hours)	
	Ramp	AM	PM
Percent Difference	N-E	-4.6%	-2.2%
	N-W	-4.1%	-4.8%
	S-E	-4.3%	2.6%
	S-W	-4.2%	-0.4%
	E-N	-7.7%	1.6%
	E-S	-14.3%	-3.2%
	W-N	2.2%	2.7%
	W-S	-3.2%	0.2%

		Peak Period (two hours)	
	Ramp	AM	PM
GEH	N-E	2.2	1.4
	N-W	2.2	3.3
	S-E	1.8	1.0
	S-W	1.5	0.2
	E-N	2.3	0.6
	E-S	9.1	1.9
	W-N	0.7	1.4
	W-S	1.9	0.1

* Red text indicates values that exceed NDOT modeling calibration guideline threshoolds.

EXHIBIT 3-3
Speed plot for the I-80 eastbound to I-580 southbound connector from the original model (AM peak period)

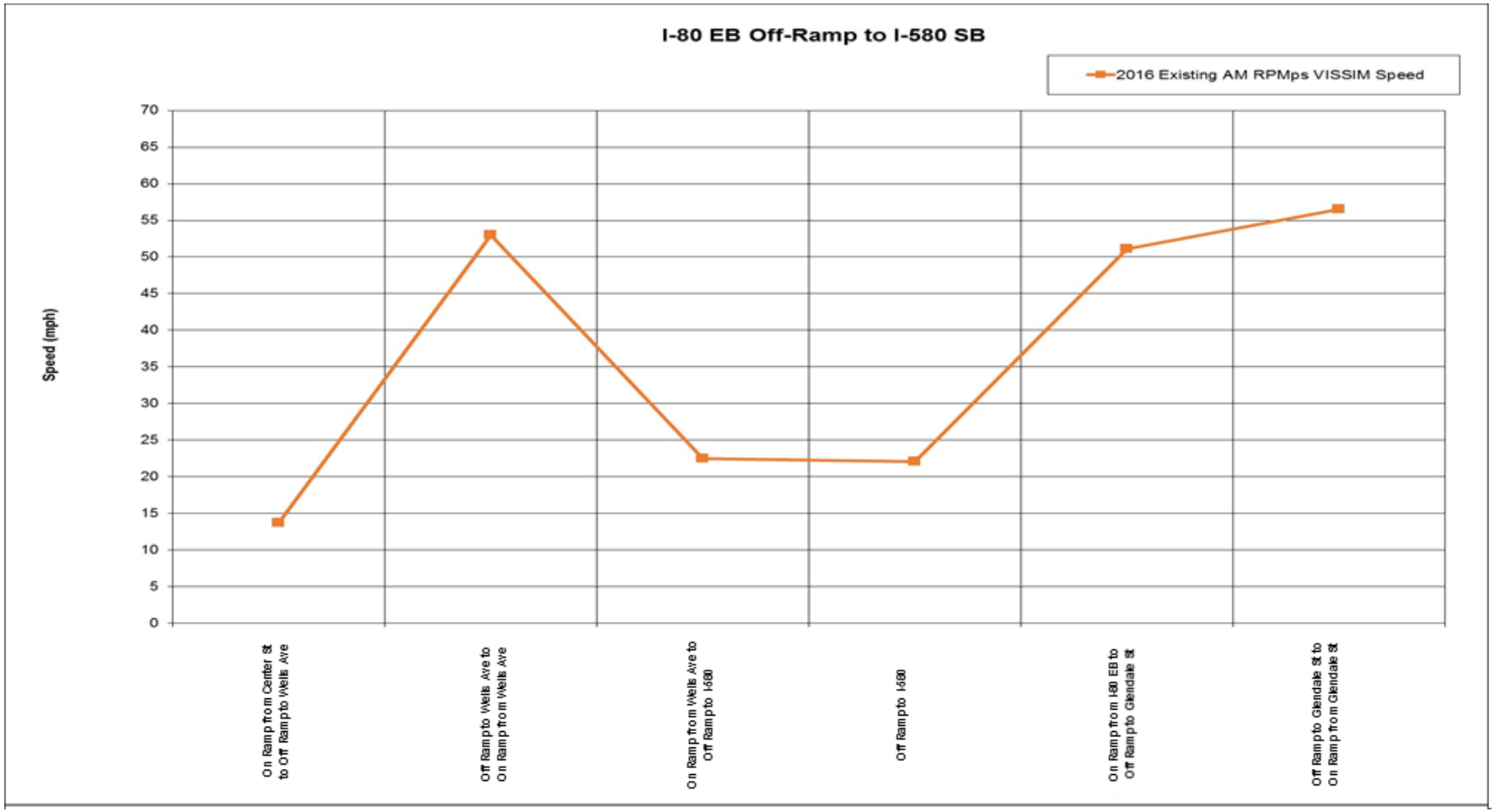


EXHIBIT 3-4
Speed plot for the I-80 eastbound to I-580 southbound connector from the refined model (AM peak period)

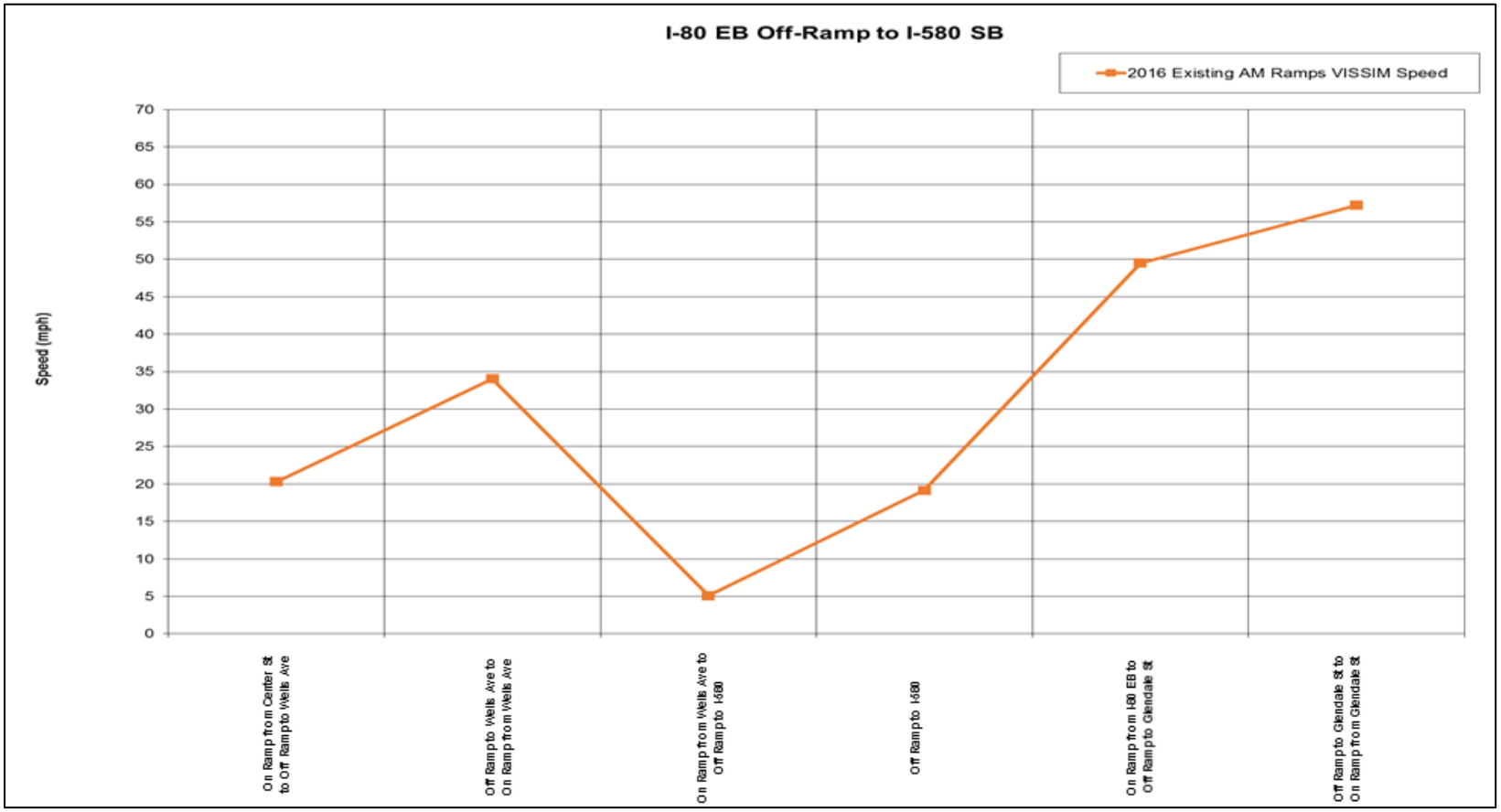
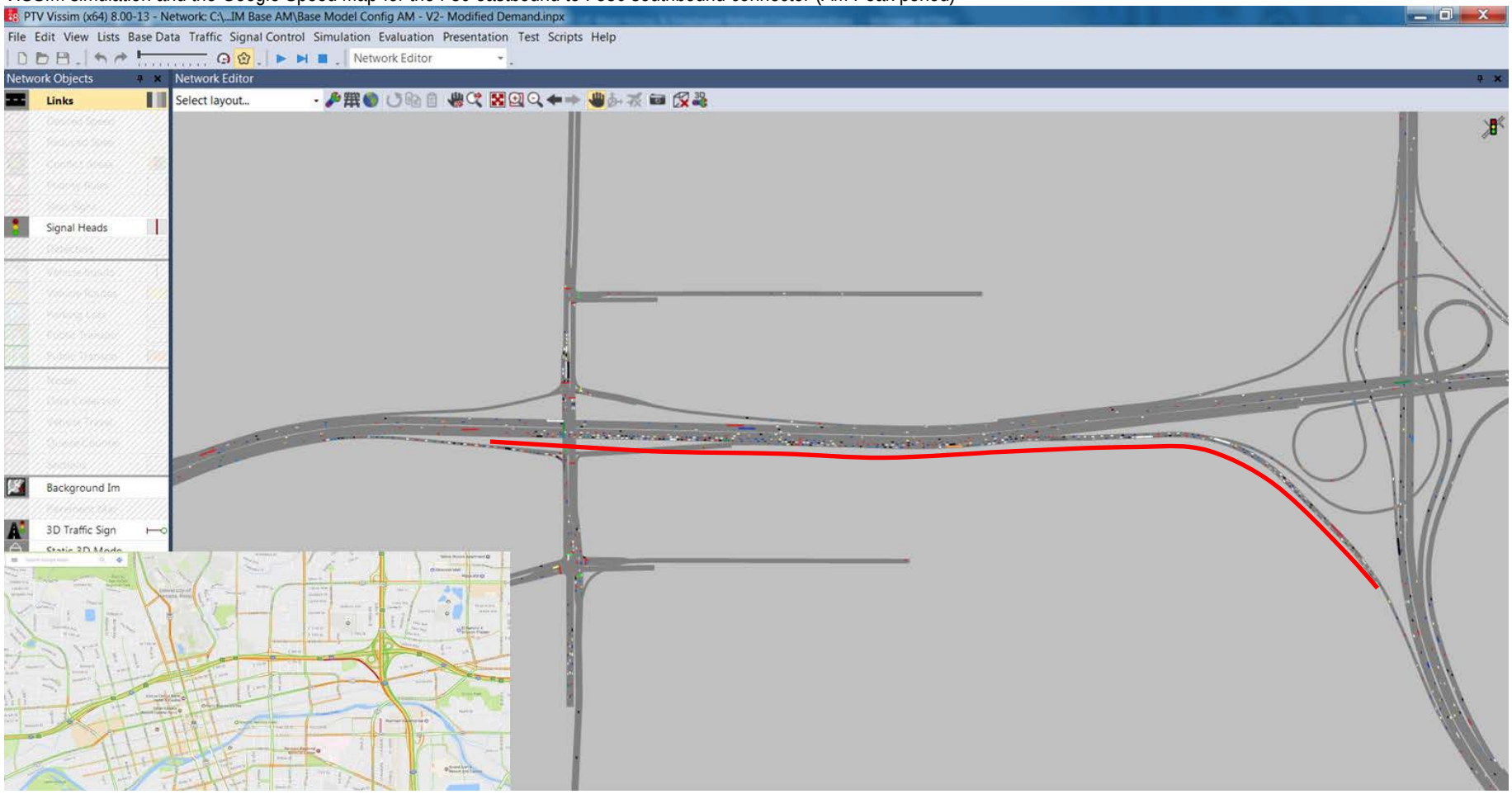


EXHIBIT 3-5
VISSIM simulation and the Google Speed Map for the I-80 eastbound to I-580 southbound connector (AM Peak period)



Exhibits 3-6 and 3-7 show the speed plots from the original and refined VISSIM models for the I-80 eastbound to I-580 southbound connector in the PM peak period. The refined model shows lower speed on this connector and the queue extends west of Wells Avenue.

Exhibits 3-8 compares the VISSIM simulation to the Google Maps screenshot. The refined VISSIM model simulation shows the same queue length as the Google Maps speed map.

EXHIBIT 3-6
Speed plot for the I-80 eastbound to I-580 southbound connector from the original model (PM peak period)

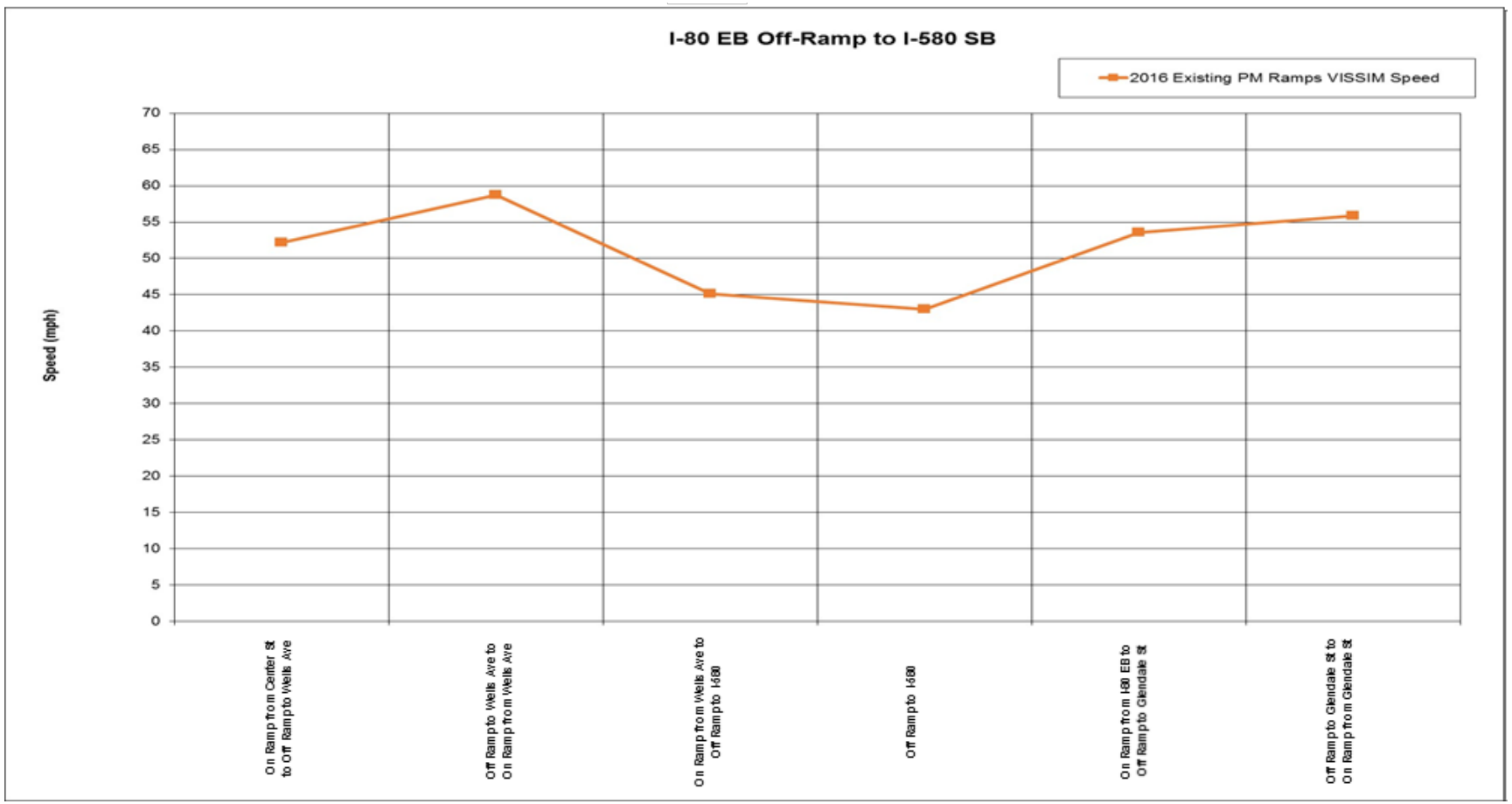


EXHIBIT 3-7
Speed plot for the I-80 eastbound to I-580 southbound connector from the refined model (PM peak period)

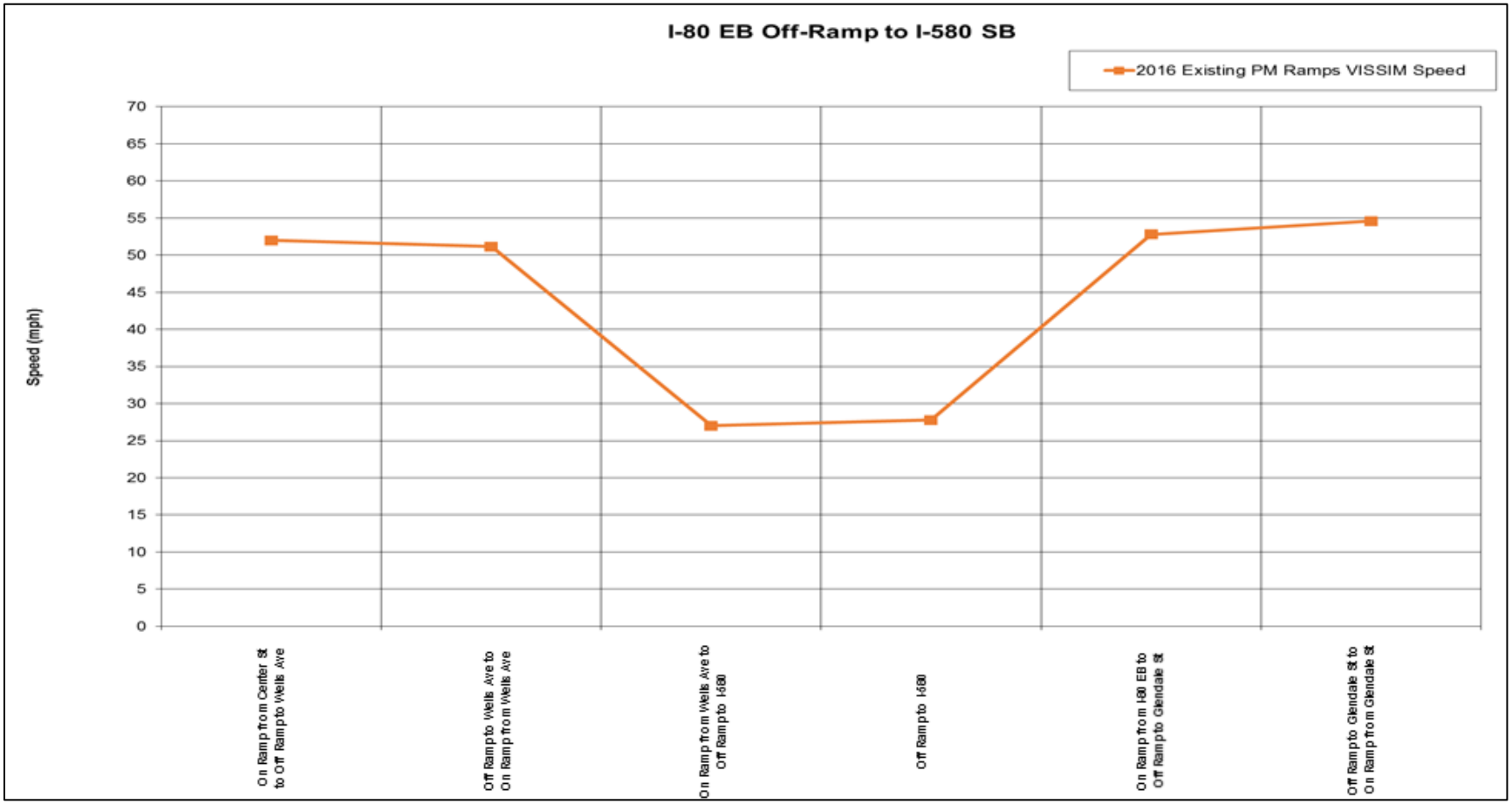
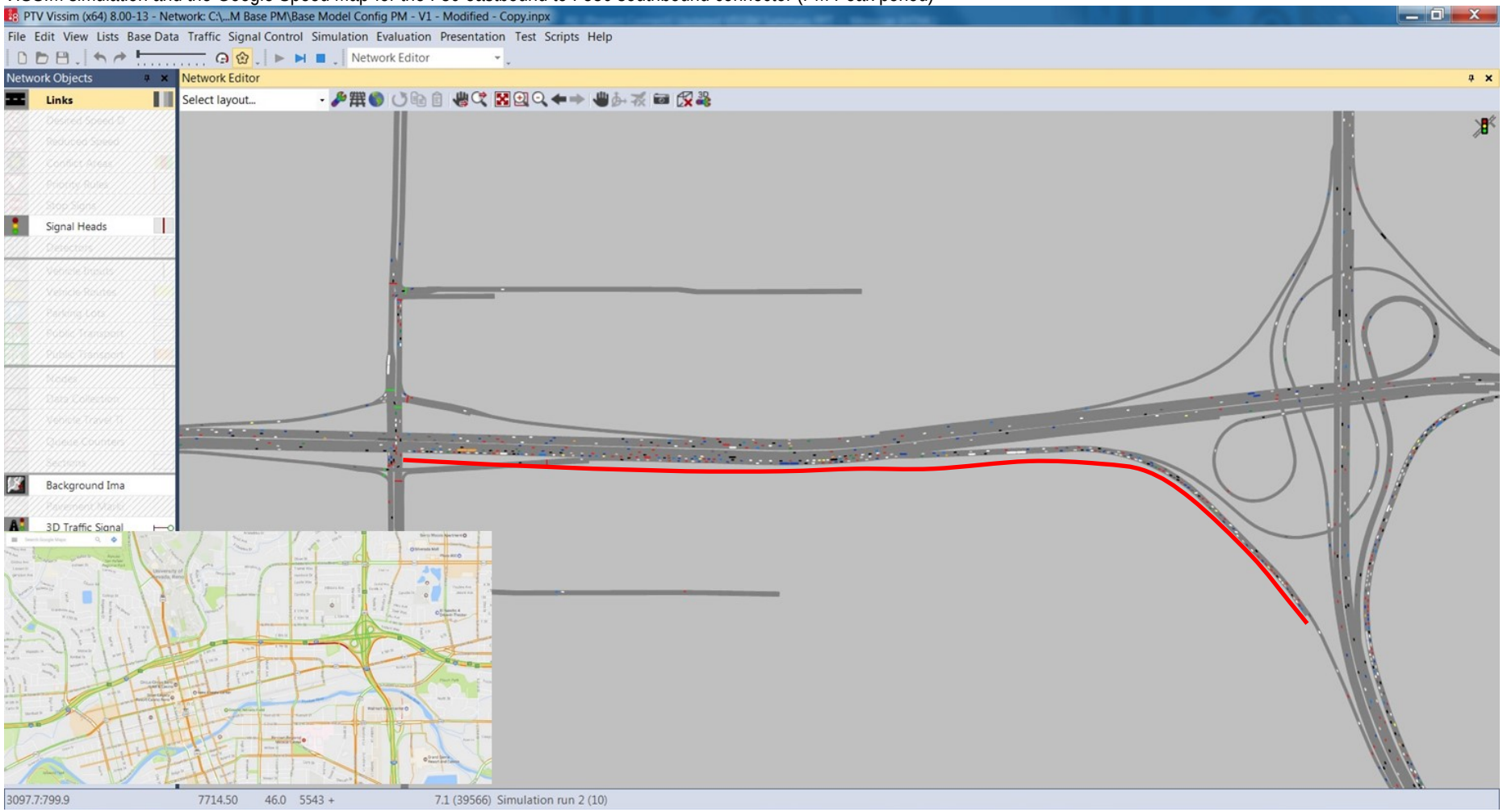


EXHIBIT 3-8
VISSIM simulation and the Google Speed Map for the I-80 eastbound to I-580 southbound connector (PM Peak period)



Exhibits 3-9 and 3-10 show the speed plots from the original and the refined VISSIM models for the I-580 northbound to I-80 eastbound connector during the PM peak period. The refined model shows lower speed on this connector and the queue extends south of Mill Street.

Exhibits 3-11 compares the VISSIM simulation to the Google Maps screenshot. The refined VISSIM model simulation shows the same queue length as the Google Maps speed map.

EXHIBIT 3-9

Speed plot for the I-580 northbound to I-80 eastbound connector from the original model (PM peak period)

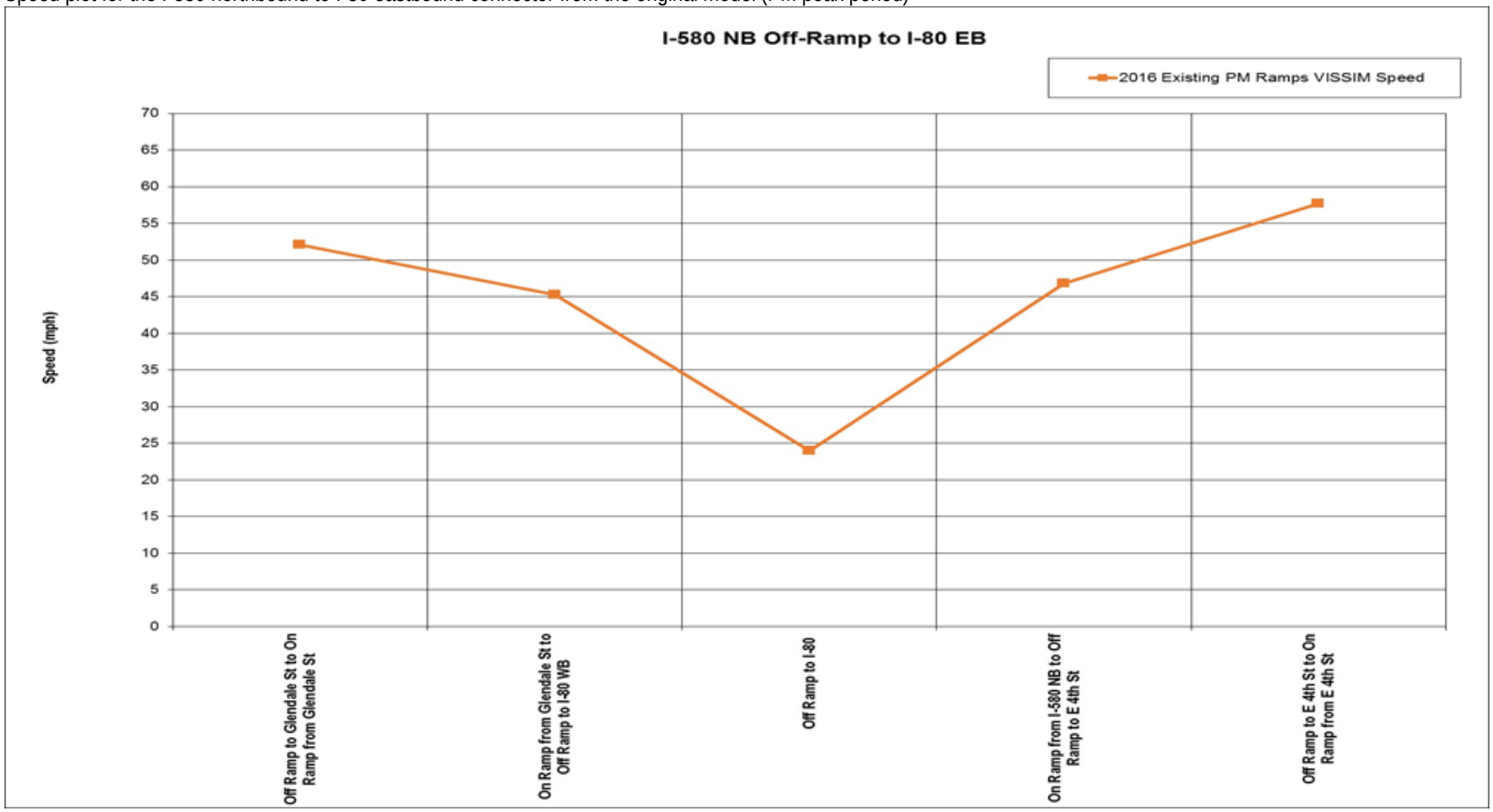


EXHIBIT 3-10
Speed plot for the I-580 northbound to I-80 eastbound connector from the refined model (PM peak period)

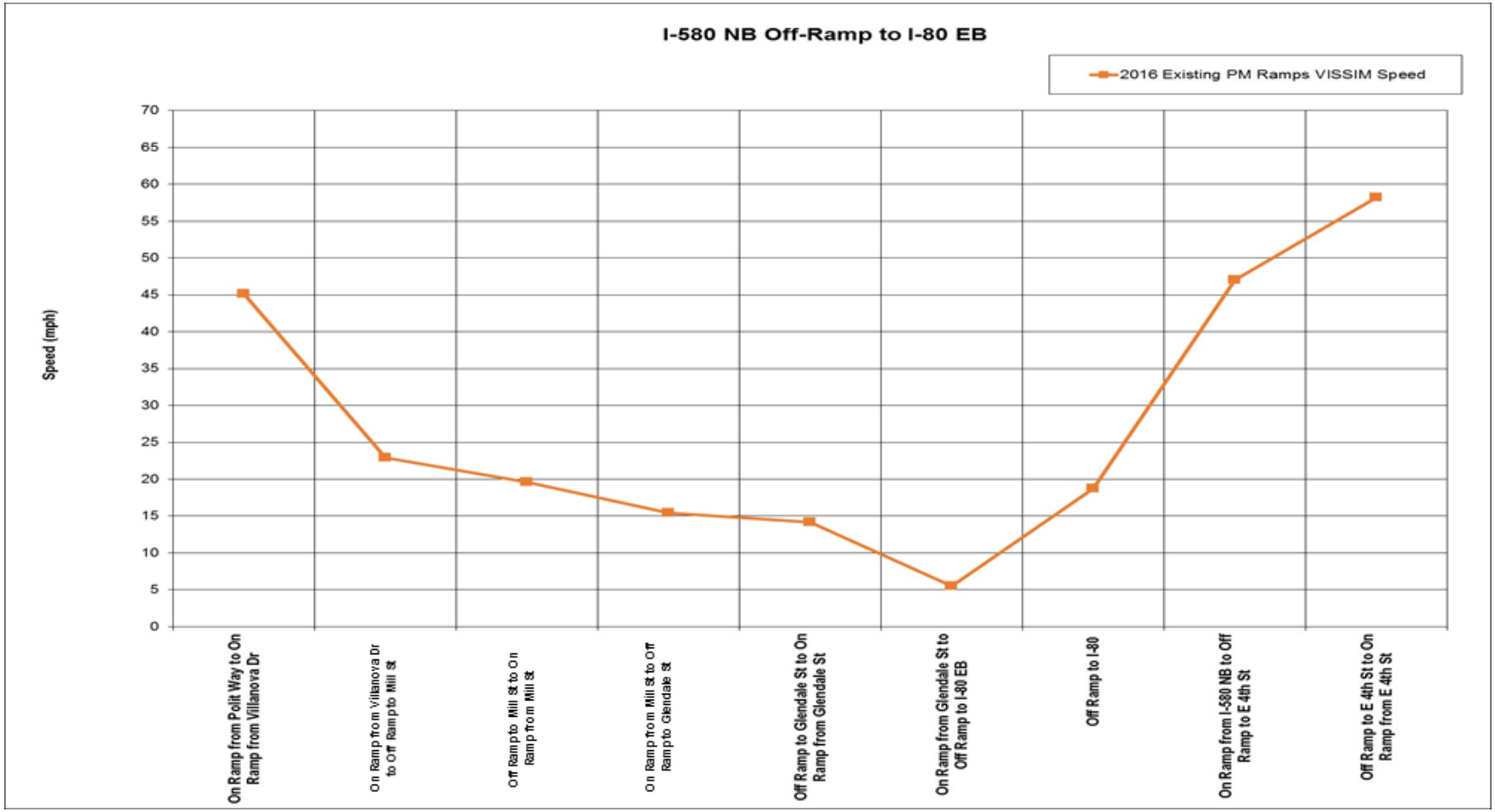
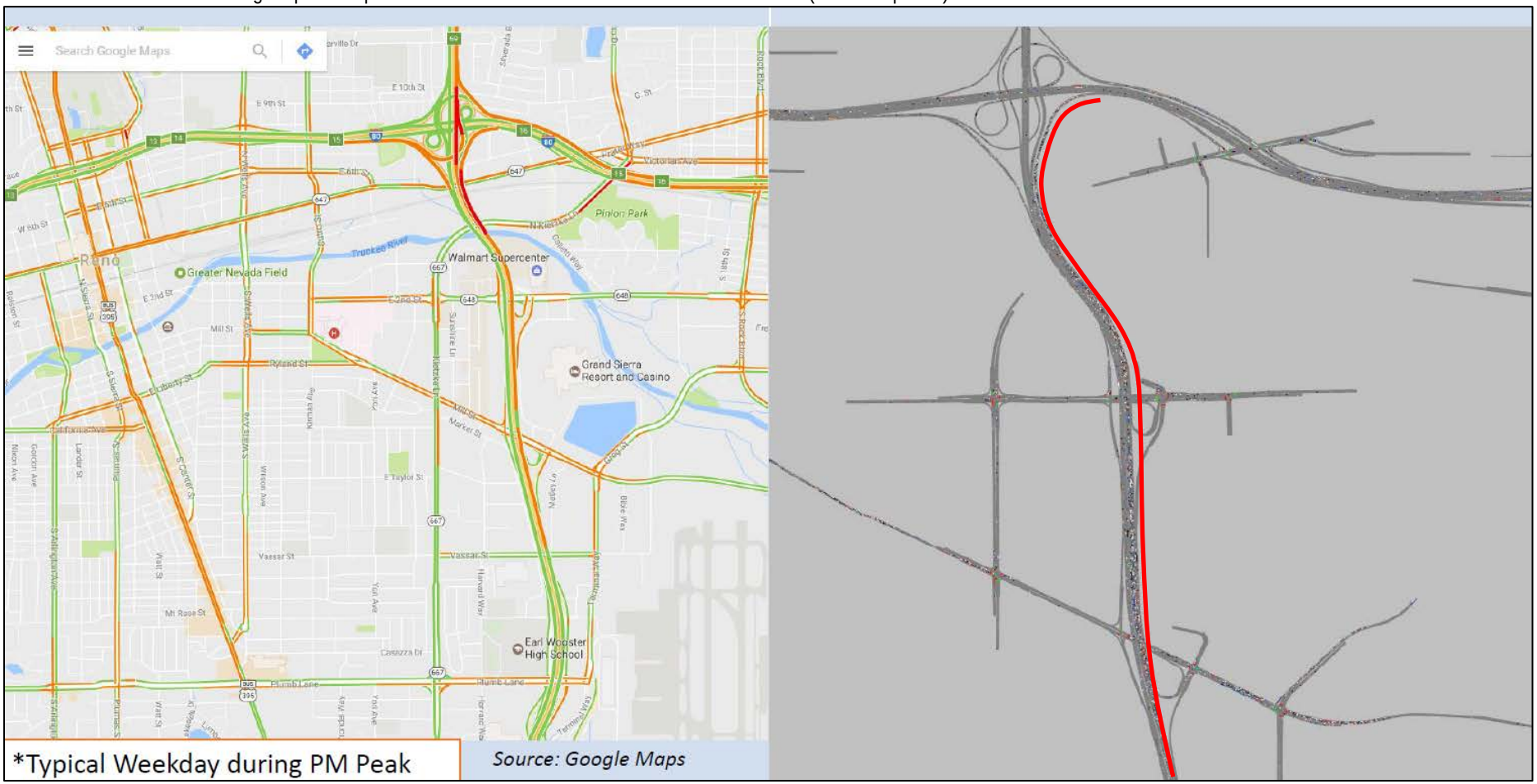


EXHIBIT 3-11
VISSIM simulation and the Google Speed Map for the I-580 northbound to I-80 eastbound connector (PM Peak period)



4. Conclusion

The original models were refined by increasing demand and changing the driver behavior parameters in VISSIM at specific locations. These refinements were made to ensure that the calibrated models used in the Reno Spaghetti Bowl traffic analysis replicates field conditions as accurately as possible. Review of the refined model results shows the following:

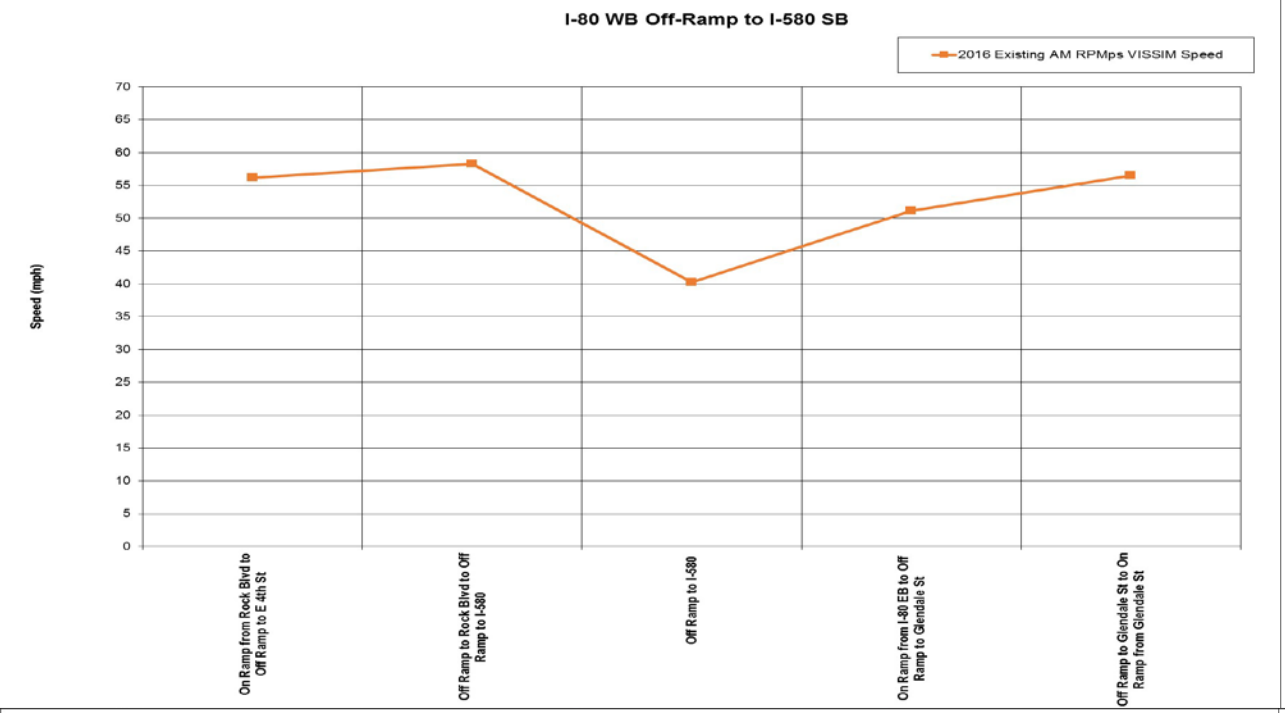
- Volume: demand adjustments in the refined model results in volume flows on the system ramps that meet NDOT calibration criteria.
- Queues: visual comparison indicates the refined model is calibrated with field conditions.

In the refined model, the I-80 eastbound to I-580 southbound connector in the AM and PM peak period show lower speed and the queue extends west of Wells Avenue as in the field conditions. The I-580 northbound to I-80 eastbound connector during the PM peak period shows lower speed and the queue extends south of Mill Street as in the field. Speed plots from the original and the refined VISSIM models for all other ramps are included in Attachment A.

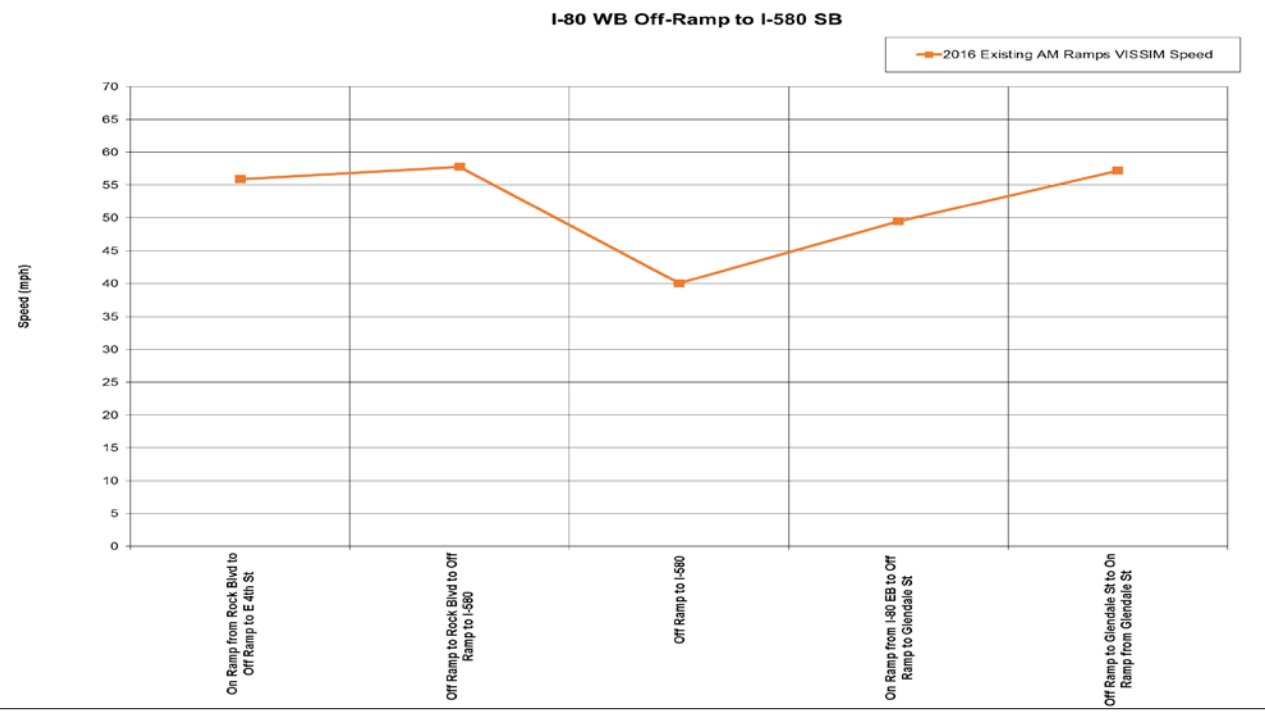
The refined calibrated model will be used as the existing conditions baseline modeling for the Reno Spaghetti Bowl traffic analysis. In addition, the refined calibration settings will be used as the settings for the future year no-build VISSIM analysis.

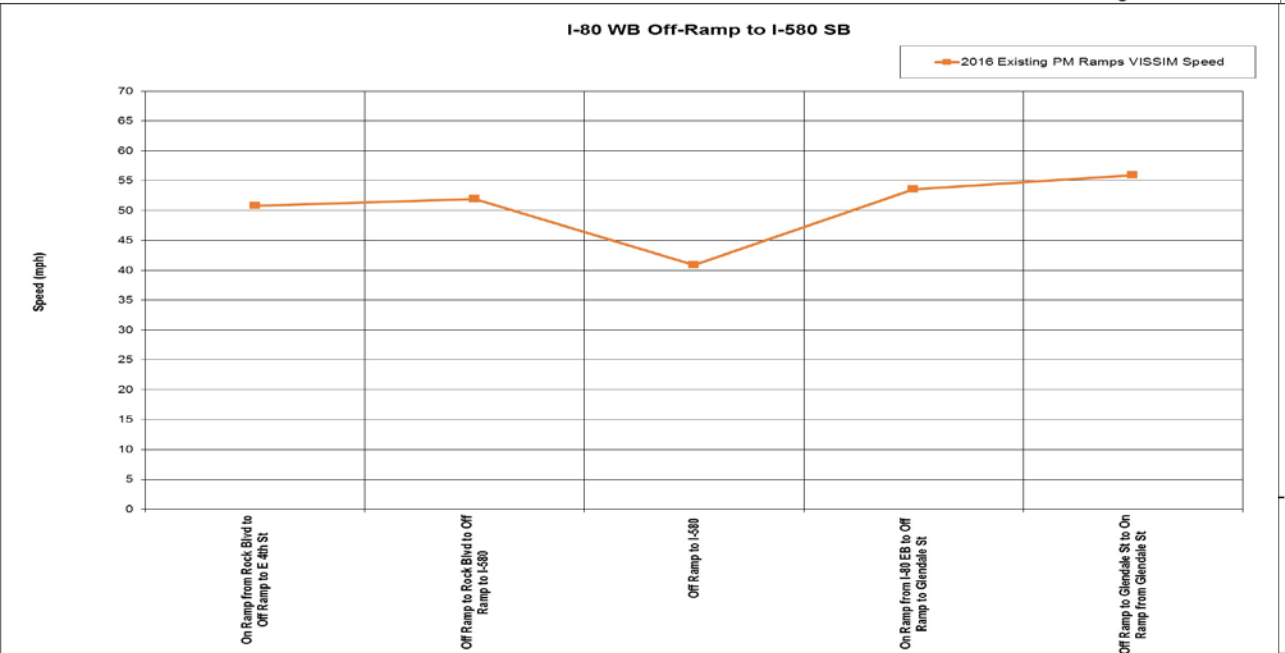
Attachment A
VISSIM Speed Plots for Other System Ramps
(original vs. refined)

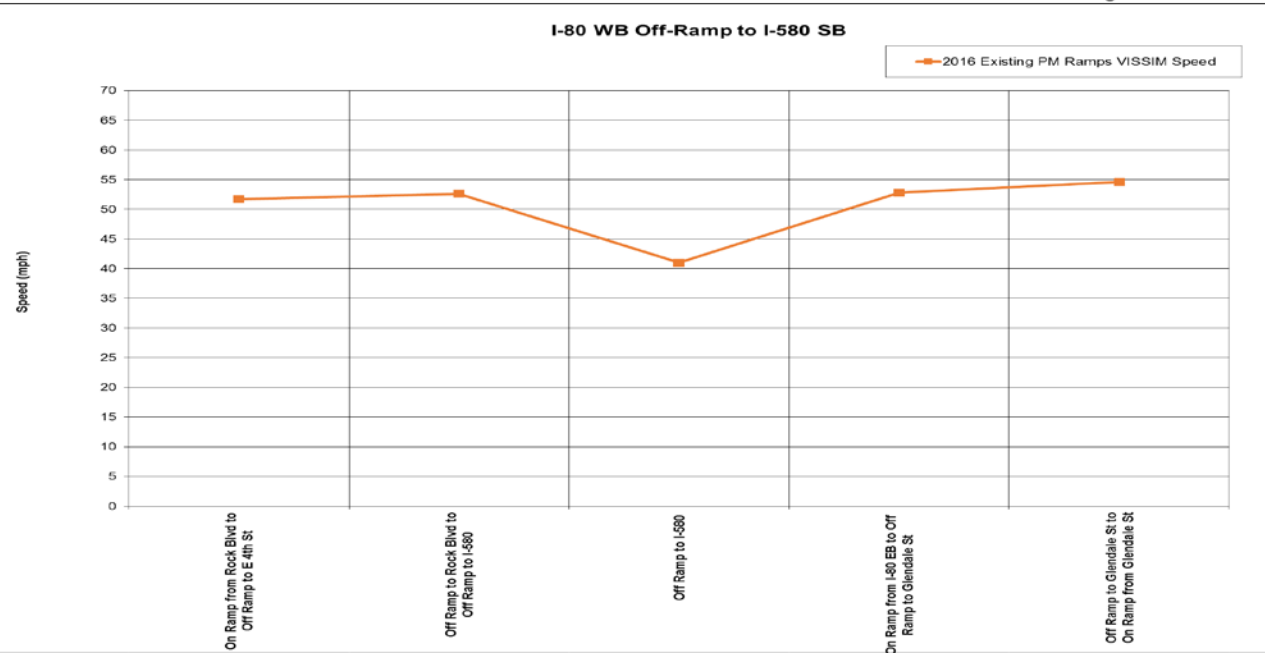
AM and PM Existing Old Demand (8:00-8:30 and 5:00-5:30)



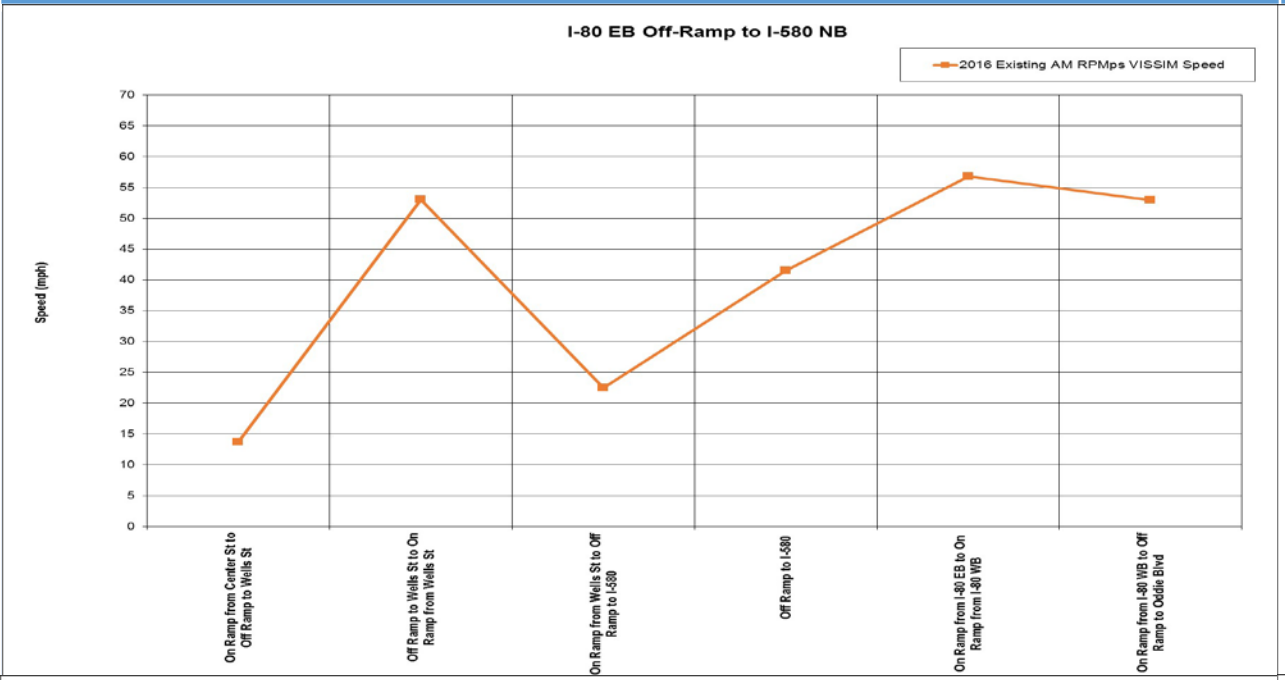
AM and PM Existing New Demand (8:00-8:30 and 5:00-5:30)

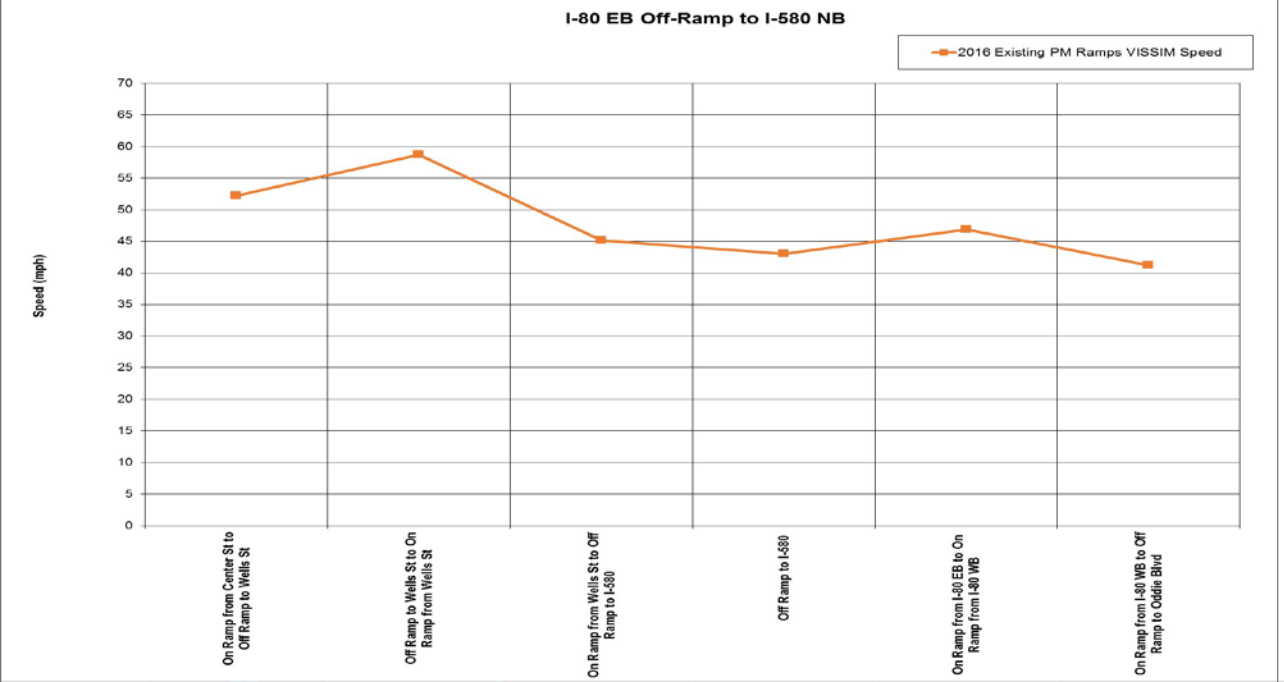




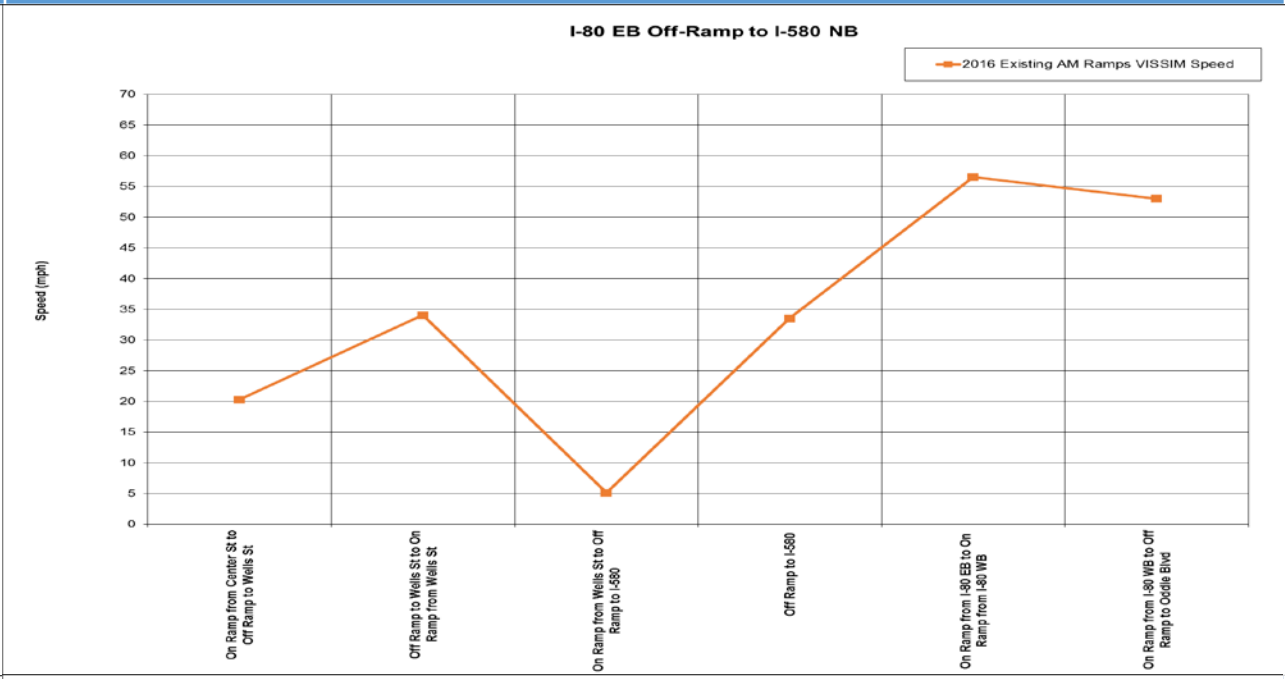


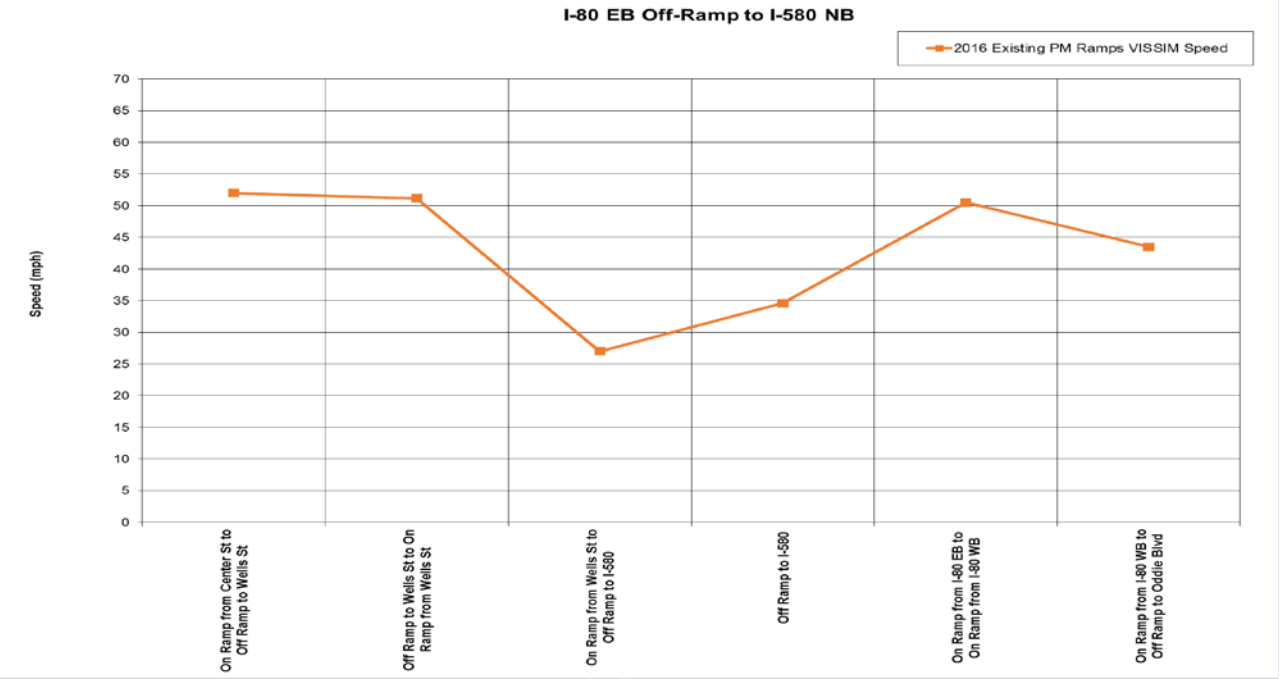
AM and PM Existing Old Demand (8:00-8:30 and 5:00-5:30)



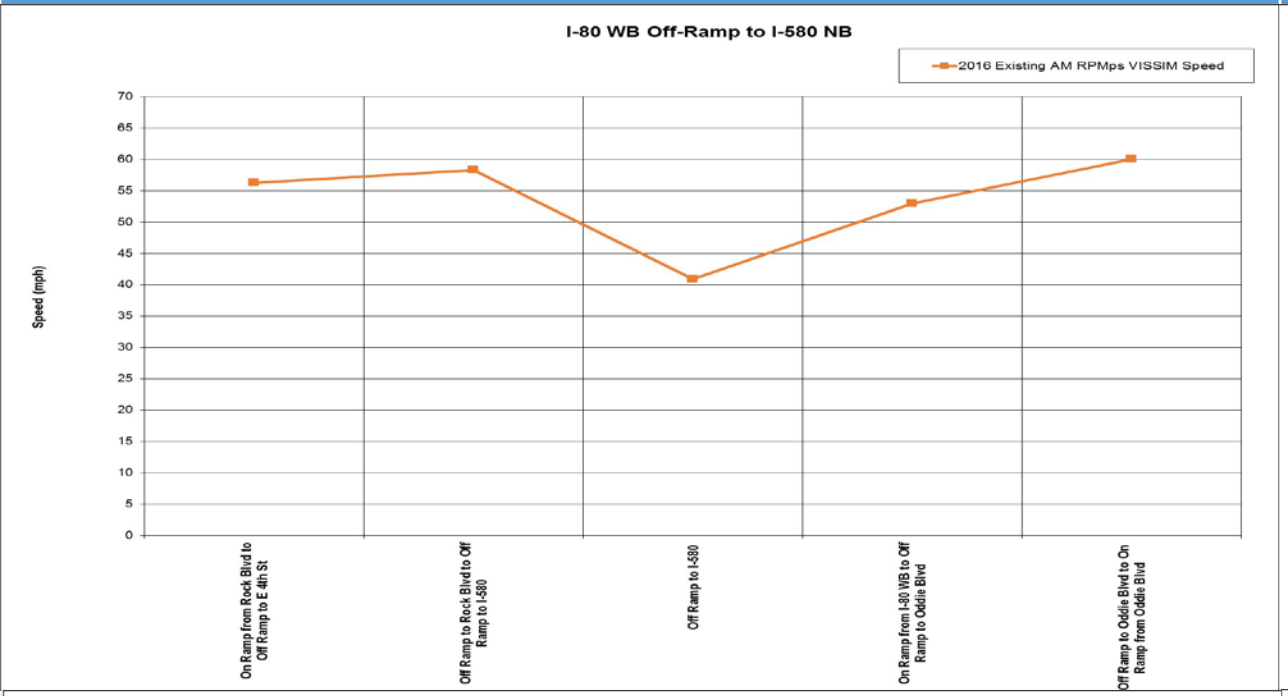


AM and PM Existing New Demand (8:00-8:30 and 5:00-5:30)

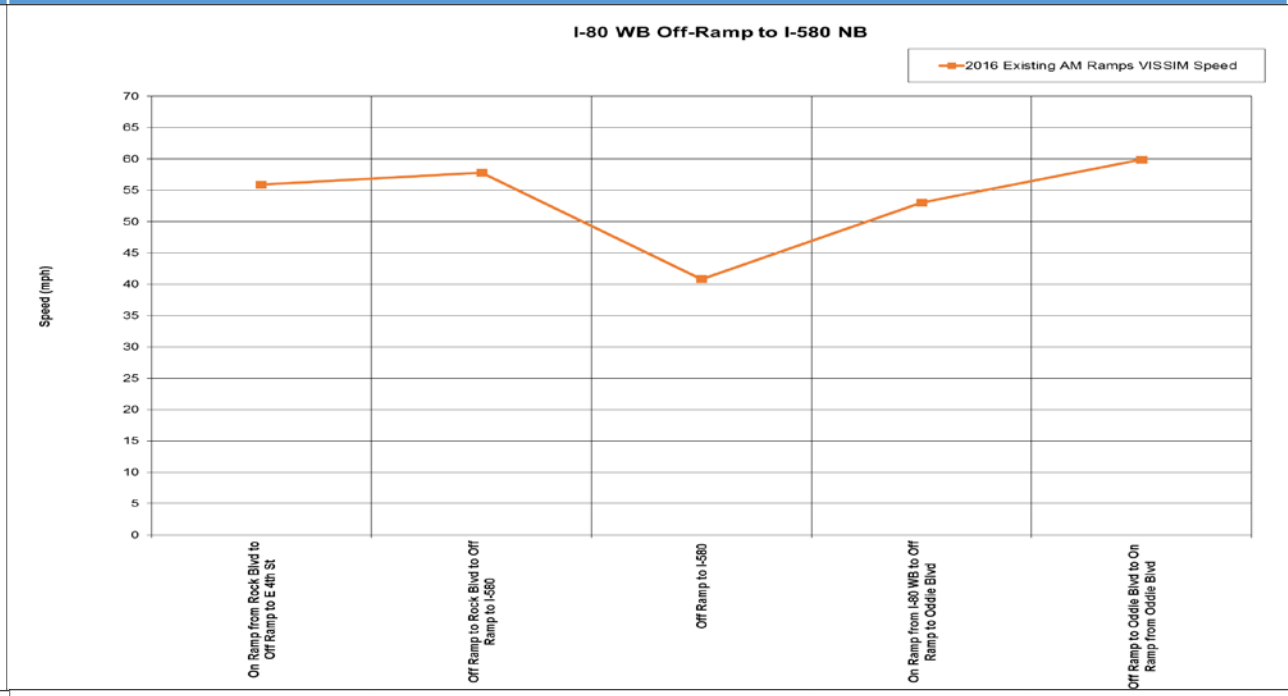


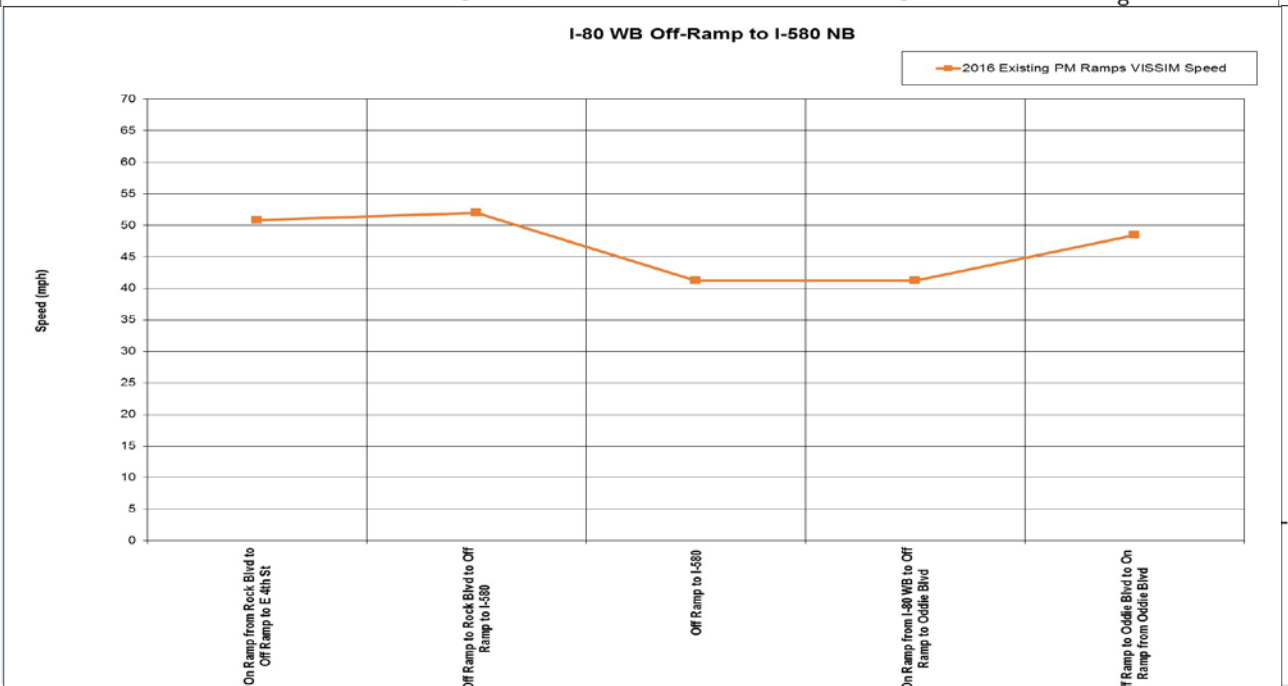


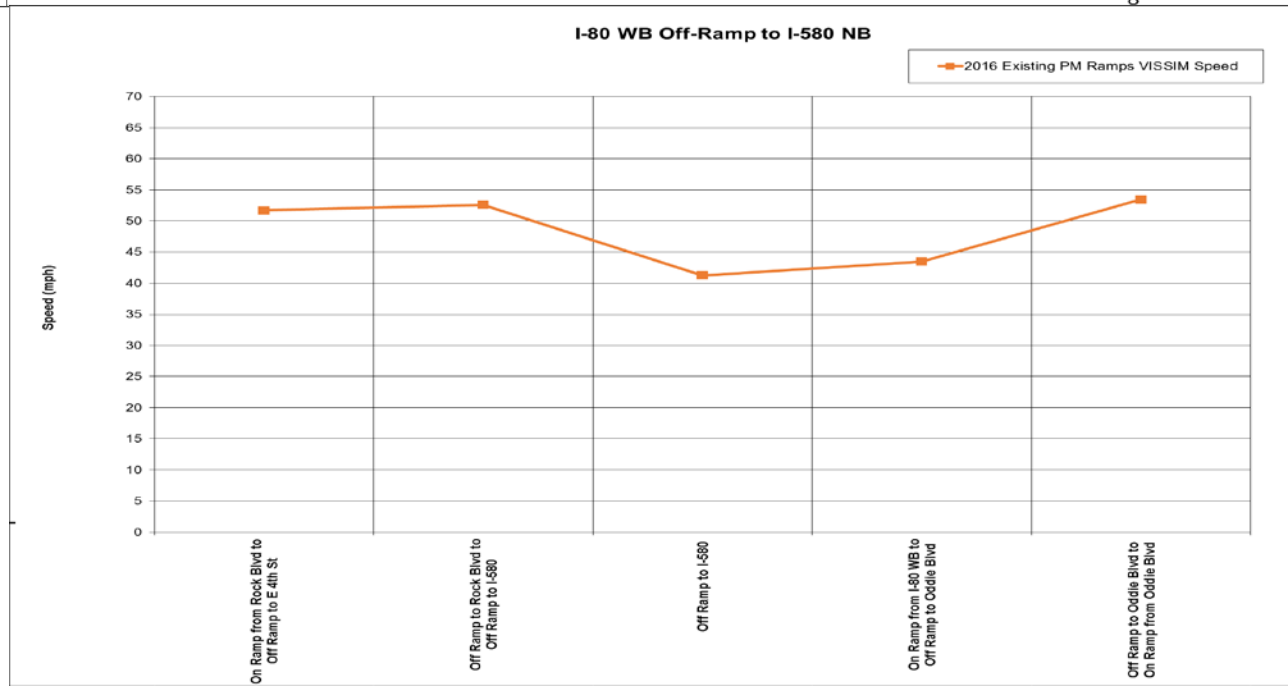
AM and PM Existing Old Demand (8:00-8:30 and 5:00-5:30)



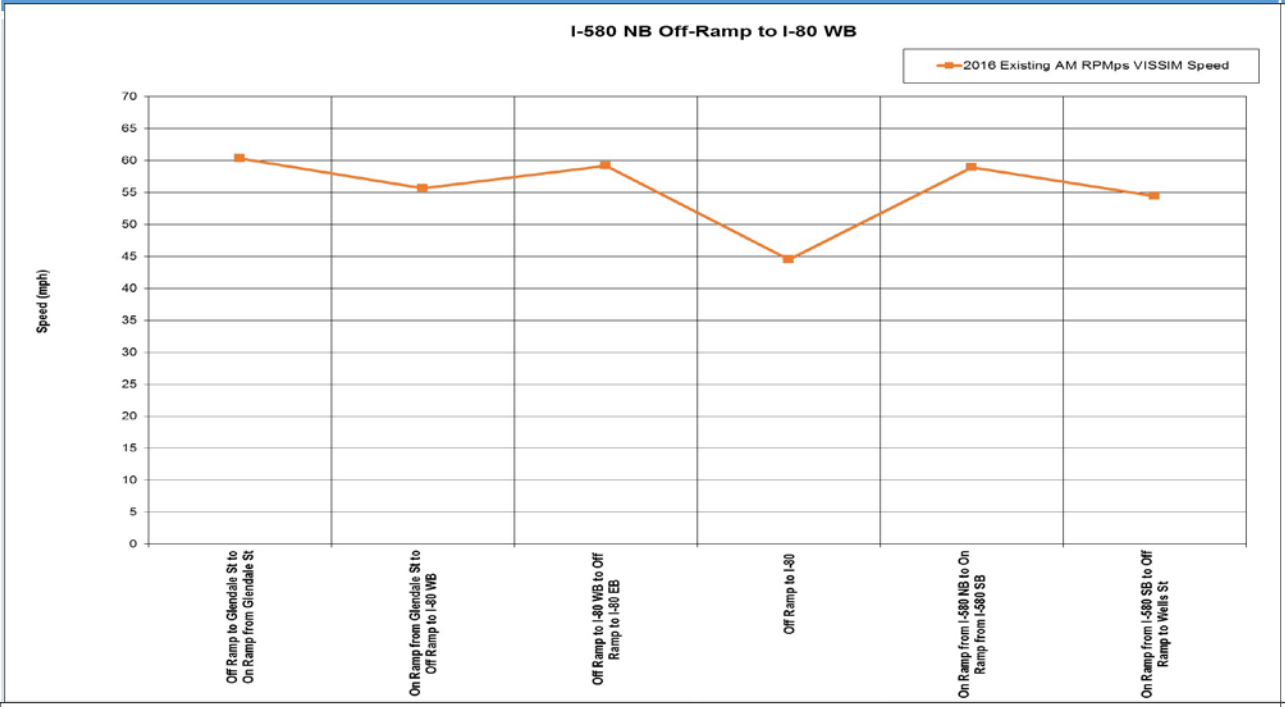
AM and PM Existing New Demand (8:00-8:30 and 5:00-5:30)

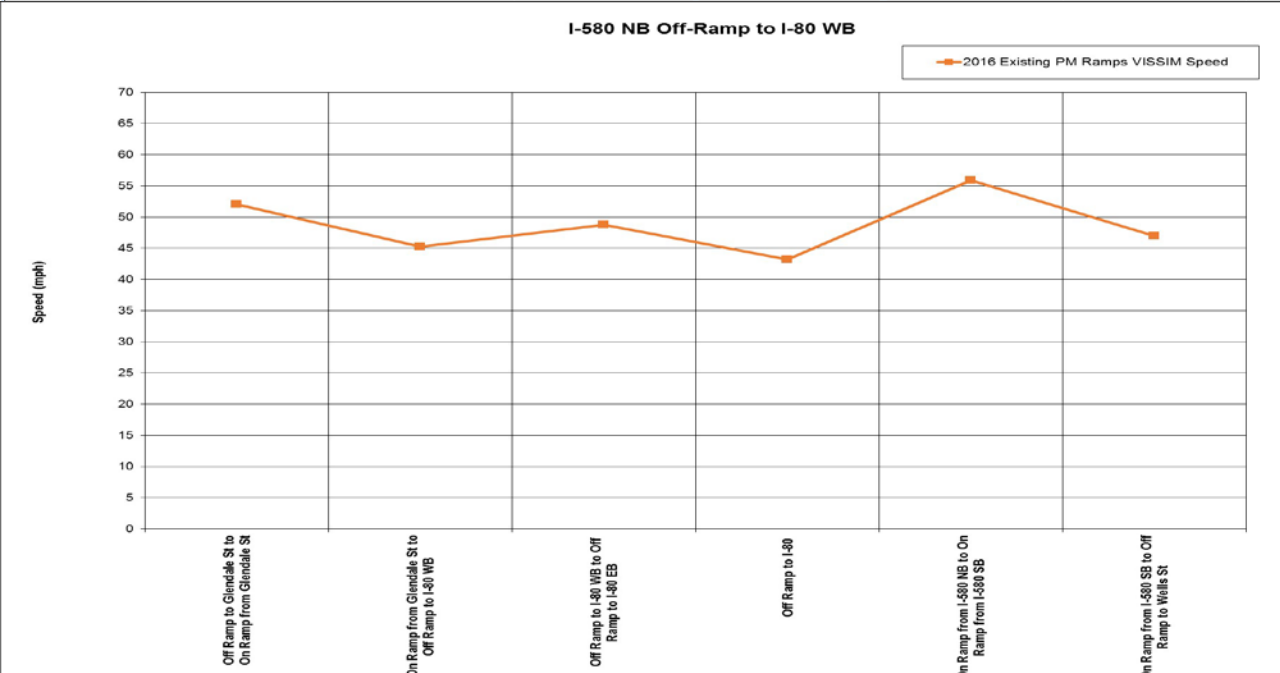




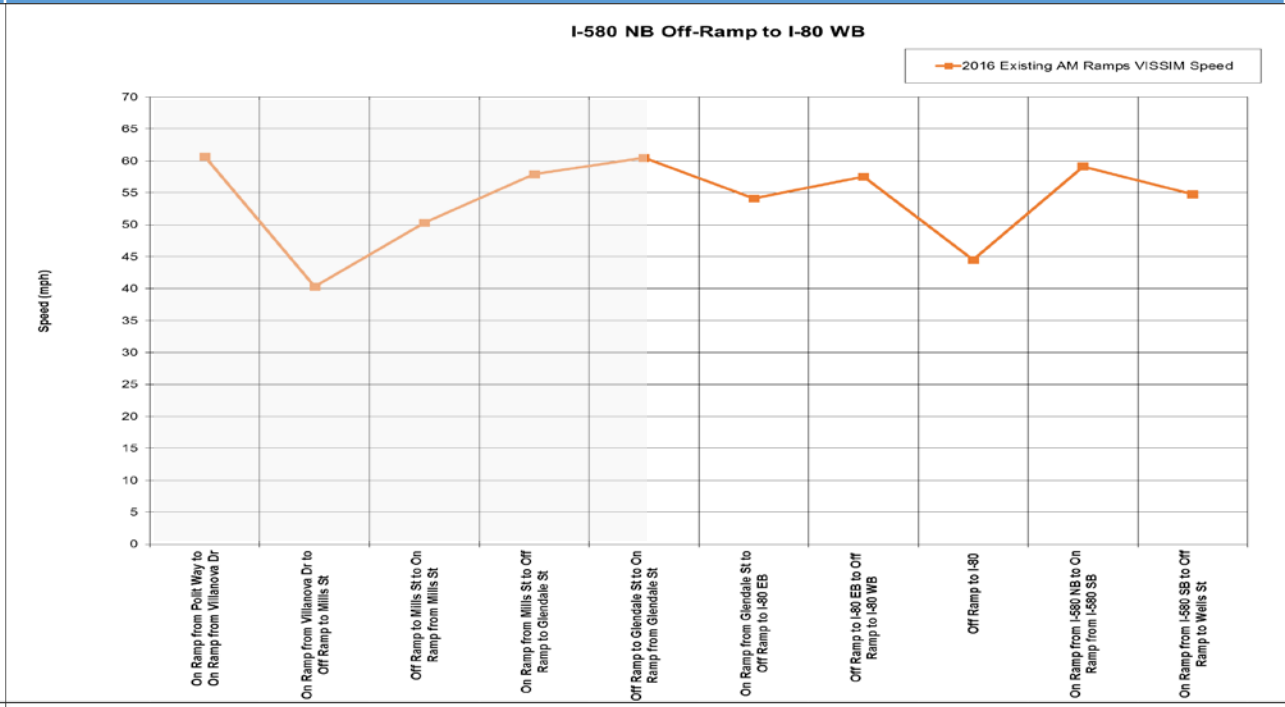


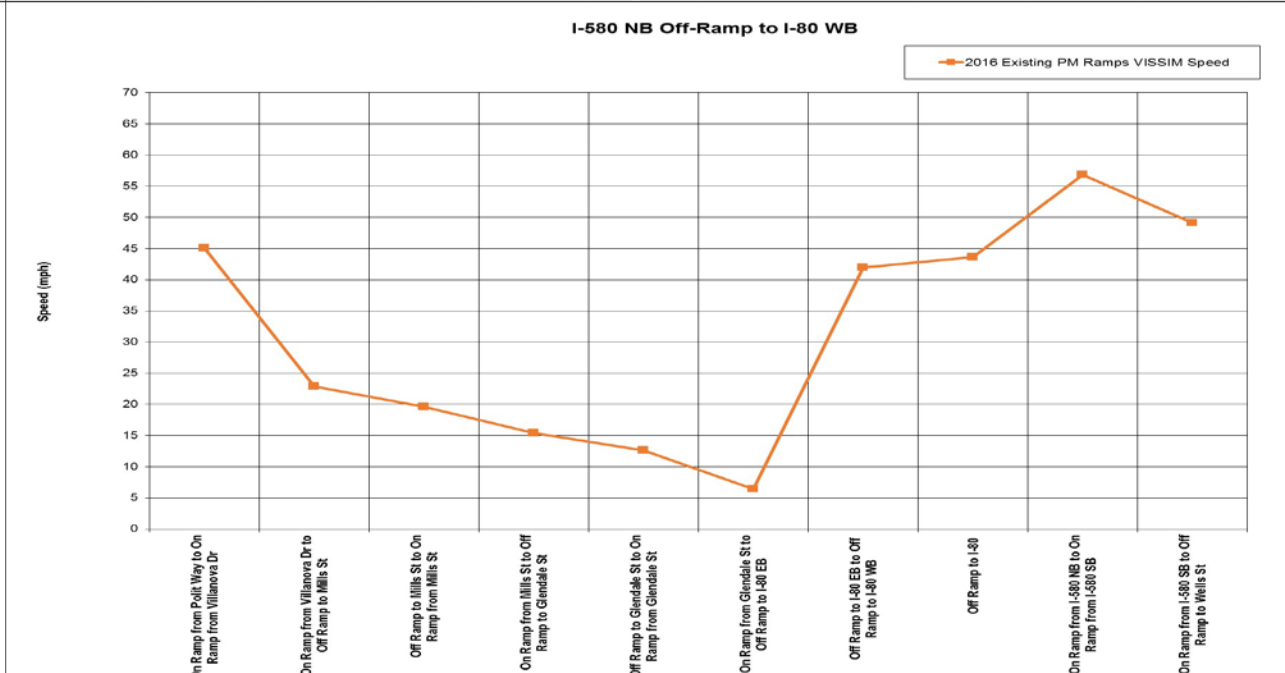
AM and PM Existing Old Demand (8:00-8:30 and 5:00-5:30)



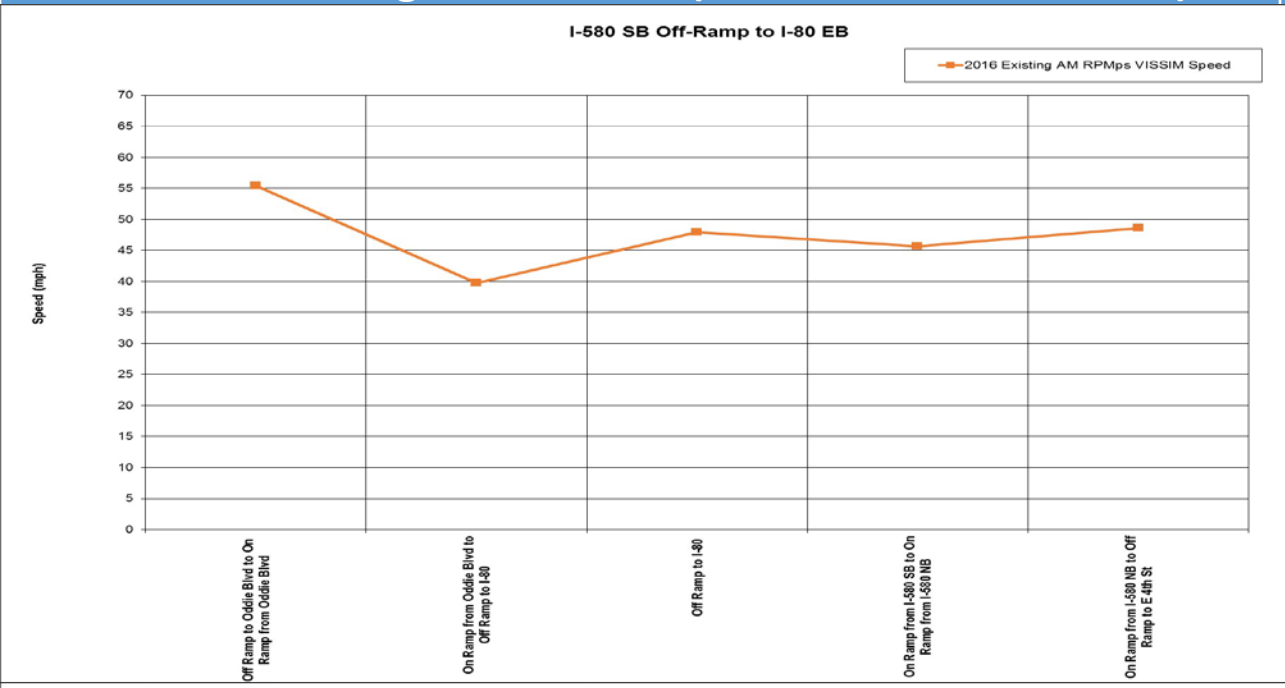


AM and PM Existing New Demand (8:00-8:30 and 5:00-5:30)

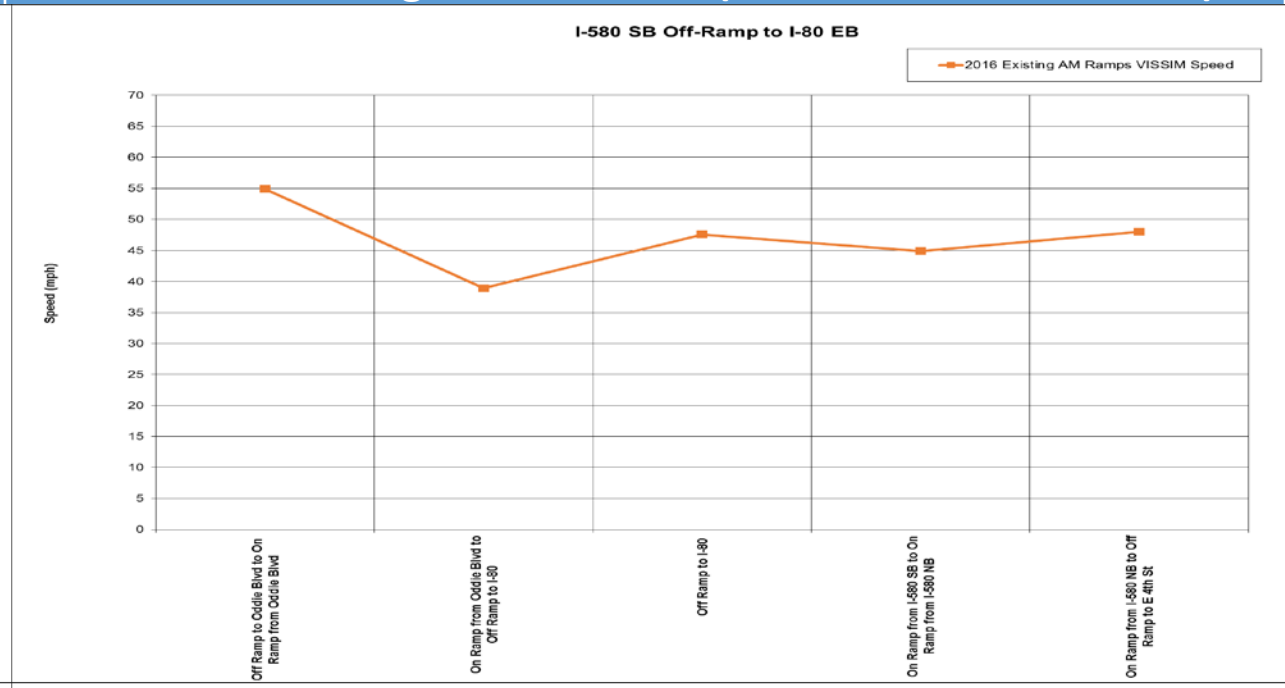


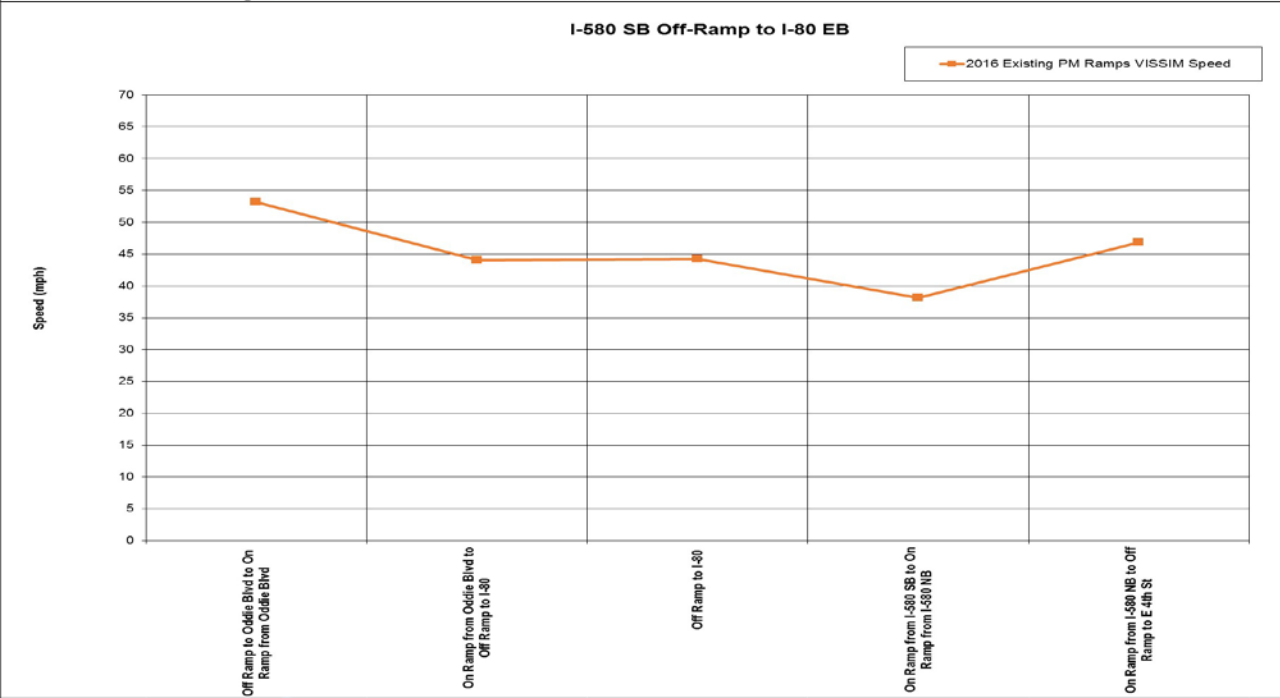


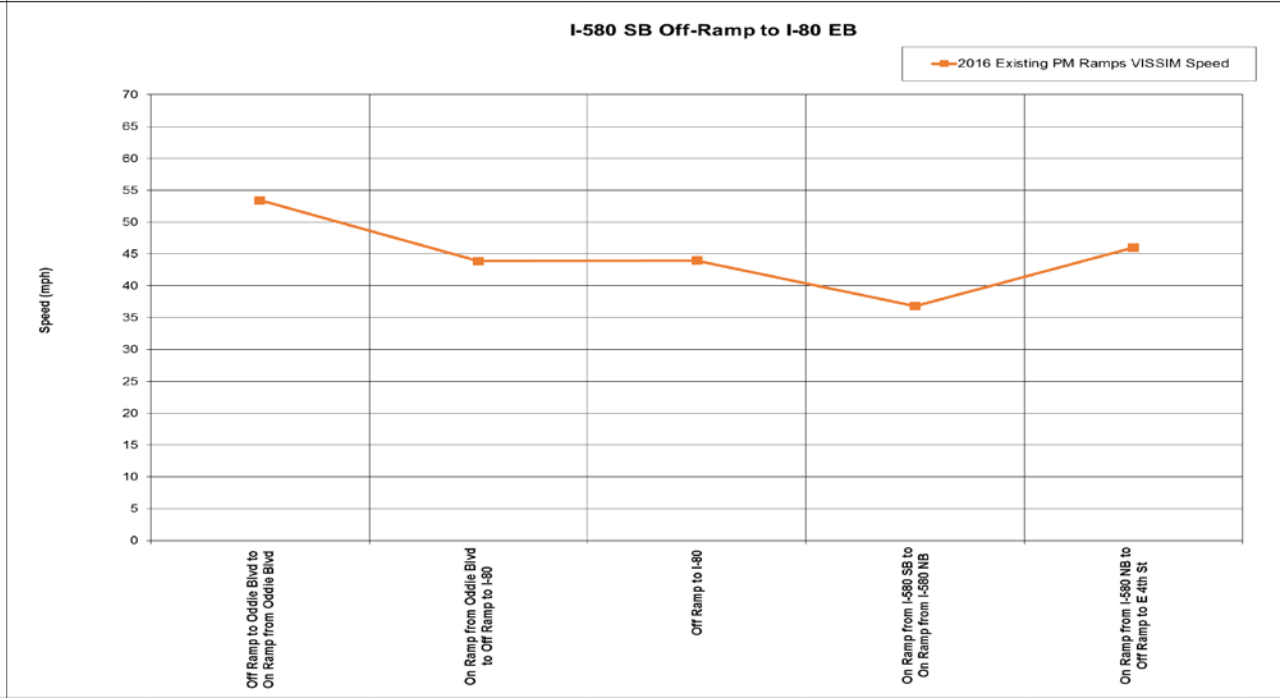
AM and PM Existing Old Demand (8:00-8:30 and 5:00-5:30)



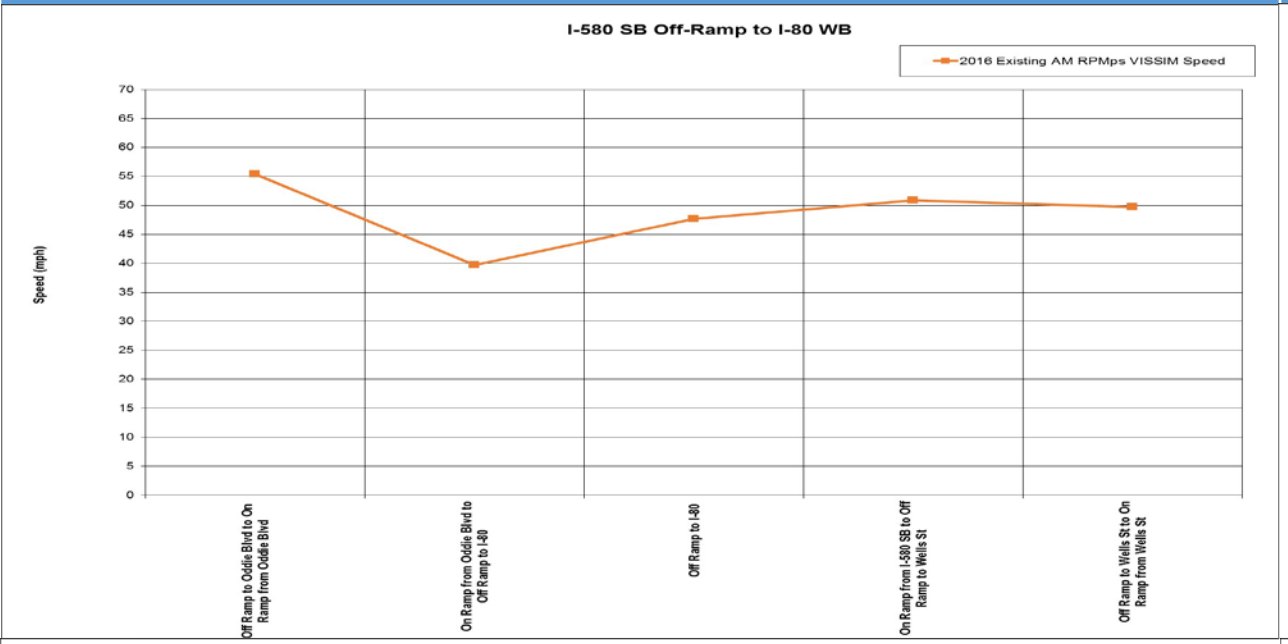
AM and PM Existing New Demand (8:00-8:30 and 5:00-5:30)







AM and PM Existing Old Demand (8:00-8:30 and 5:00-5:30)



AM and PM Existing New Demand (8:00-8:30 and 5:00-5:30)