Appendix C-2
VISSIM Development and Calibration Report

NEW YORK STATE OF OPPORTUNITY. Department of Transportation

I-81 Viaduct Project

Onondaga County, New York

VISSIM DEVELOPMENT AND CALIBRATION REPORT

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1. INTRODUCTION

The New York State Department of Transportation (NYSDOT) is proposing to address the existing structural, geometric, and operational deficiencies of I-81 from approximately Colvin Street to Hiawatha Boulevard (the "I-81 Viaduct Project") in the City of Syracuse, New York. NYSDOT is also investigating modifications along I-690 between its interchange at West Street and Lodi Street and potential improvements on I-481 from its southern to northern termini. In cooperation with the Federal Highway Administration (FHWA), NYSDOT is preparing an Environmental Impact Statement (EIS) to summarize transportation, social, economic, and environmental impacts of four project alternatives, including No Build Alternative, one Viaduct Alternative, and two Community-Grid Alternatives.

Integral to the EIS process is the development of a traffic simulation model (VISSIM) that will be used to predict the outcome of the proposed roadway system changes and help select a preferred alternative. More specifically, the traffic simulation model would support the following activities:

- Identify existing and future traffic congestion/safety problems.
- Support the development of I-81 Viaduct Project alternatives.
- Provide information for project evaluation.
- Provide inputs for environmental or other analyses (e.g., cost-benefit analysis).
- Address specific concerns of the public and other project stakeholders.

The purpose of this technical memorandum is to document the methodology followed to build and calibrate a detailed VISSIM simulation model for the I-81 Viaduct Project. The methodology describes the approach, source data, assumptions, technical tools, and calibration and validation procedure for developing a VISSIM model capable of serving as a testing tool for the operation of roadway design alternatives and their impact on the transportation system. The methodology builds on currently available state-of-the-practice techniques, with a goal of providing reliable results to meet the Federal mandates and standards for accuracy.

2. VISSIM MODEL DEVELOPMENT

For the I-81 Viaduct Project, a VISSIM model was selected as the environment for simulation modeling and used to investigate detailed geometric and traffic operational and safety issues. The VISSIM model development involves a number of steps, including model area, analysis years, analysis peak periods, data input, base model development, and model calibration and validation. Establishing the model area, analysis years, analysis peak periods, data input, and base model development are discussed below, and model calibration and validation are discussed in Sections 3 and 4).

2.1 Overview of VISSIM Software

The I-81 Viaduct simulation models were developed using the VISSIM simulation software (Version 9.00-10) developed by PTV. VISSIM is a microscopic, time-step and behavior-based model which analyzes multi-modal traffic flows with the flexibility of modeling all types of geometries and traffic control schemes. Therefore, VISSIM simulation modeling is a very useful tool to help predict the outcomes of a

proposed change to the roadway system and assist in evaluating the advantages and disadvantages of design alternatives within the urban environment.

VISSIM can generate a wide range of performance measures for traffic operational analysis, and its trajectory files can be incorporated into FHWA's Surrogate Safety Assessment Model (SSAM) to produce surrogate safety measures used to quantify the likelihood of accident frequency and severity associated with the proposed alternatives. Furthermore, VISSIM simulation modeling can generate AVI files for 3-D simulation runs, to provide a visual tool to help convey operational performance of the improvement alternatives to non-technical audiences. More detailed descriptions of the VISSIM model can be found in the VISSIM User Manual – Version 9.00.

2.2 Simulation Study Area

The VISSIM model extents, as shown in Figure 1, consist of the I-81, I-690, I-481, and I-90 interstate system and surface streets that could be affected by the project, including Downtown Syracuse and University Hill, extending south to East Castle/Stratford Streets, north to Hiawatha Boulevard, west to South West Street, and east to Westcott Street. The model area was purposely defined as the area where a major shift in local traffic using alternate routes could occur as a result of the reconstruction or removal of the I-81 viaduct. The geographic scope and level of detail were developed specifically to allow for a detailed area-wide assessment of transportation needs and options.

2.3 Base Year/Future Analysis Years

The base year selected for the VISSIM traffic analysis is 2013 and the future analysis years include the estimated-time-of-completion (ETC) year 2020 and design year 2050 (ETC+30). Traffic analysis during the worst-case construction year may also be performed if deemed necessary. The ETC year is the calendar year that the built project is expected to commence operation. The design year is the horizon year representing the end of the economic life of a proposed transportation improvement.

2.4 Analysis Peak Periods

Although peak traffic conditions in the study area generally occur for less than a one-hour period, the VISSIM modeling periods for this project include the two-hour AM (7:00 – 9:00) and PM (4:00 – 6:00) periods to reflect build-up of peak congestion and the recovery afterwards. In these two-hour periods, the AM and PM peak hours are identified as 7:30 – 8:30 AM and 4:30 – 5:30 PM, respectively. For traffic simulation, the analysis period is two hours, but simulation was performed for more than two hours, to include the warm-up period. A 30-minute warm-up period is set to span the longest trip that would occur in the network. Empirical testing reveals that a 30-minute warm-up period would load all the simulated traffic onto the network and achieve model equilibrium during the main simulation period.

Within the two-hour time periods, traffic flow rates were adjusted every 15 minutes to reflect the dynamic nature of traffic flow and capture actual time-varying traffic congestion.

Figure 1: VISSIM Model Network Extents

2.5. Data Collection and Preparation

A database of existing physical and operational characteristics of the study area was established to assist in the VISSIM model development, including existing traffic data, transit data, and roadway data. Since the VISSIM model is ultimately used to predict how well the roadways operate under alternative scenarios and future analysis years, data related to future transportation projects to be implemented within the study area and future year traffic volume predictions also were assembled.

To minimize the cost and time for field data collection, this project adopted a three-step procedure to assemble the data:

- Identify readily available data from various public agencies.
- Review the available database to determine whether it is current and suitable for the VISSIM model development.
- Collect supplemental data for model development to fill the gaps and/or to update the available database.

After reviewing all readily available data pertaining to the study area, existing data was utilized to the greatest extent possible. However, additional data were required to supplement existing data, because the traffic network established for this project is larger than those of previous studies. Therefore, traffic data collection plans (see Appendix A) were prepared for collecting new automatic traffic recorder (ATR) volume counts, manual turning movement and vehicle classification counts, pedestrian crosswalk counts, travel time and speeds, and queue lengths for those areas where available data did not exist. All data items collected and used for VISSIM model development are listed in Table 1 and the main data items are briefly described below.

Table 1: Data Items used for VISSIM Development

Data Item	Source(s)	VISSIM Incorporation
Road survey video data (2013)	I-81 Viaduct Project	Roadway geometry, turn restrictions, number of lanes, lane assignment
Streetview imagery	Google	Confirm roadway geometry, turn restrictions, parking regulations
Traffic signal timing plans	City of Syracuse, NYSDOT	Detector placement, signal phasing, splits, offsets
Synchro files (AM and PM weekday peak hours)	City of Syracuse, NYSDOT	Signal phasing, split, offset
Vehicle speed reports	I-81 Corridor Study, NYSDOT website	Speed distributions
ATR counts	I-81 Viaduct Project, I-81 Corridor Study, SMTC website, NYSDOT website	Route decision splits, vehicle inputs, vehicle compositions
Turning movement counts	I-81 Viaduct Project, I-81 Corridor Study, SMTC website, NYSDOT website	Route decision splits, vehicle inputs, vehicle compositions, pedestrian demand, bike demand
Vehicle classification counts	Stantec, NYSDOT website	Route decision splits, vehicle inputs, vehicle compositions
Map of Onondaga County bus routes	Centro website	Develop transit routes, route stops
Centro Bus Schedule	Centro website	Bus route schedule, bus demand along transit routes
Speed Limits Google earth.kmz	Google	Speed decision locations, desired speeds, vehicle compositions

Various field observations, notes, video logs	I-81 Viaduct Project	Fine calibration adjustments, matching traffic congestion pattern, queues
Vehicle travel times (select corridors)	I-81 Viaduct Project	Model validation
Existing conditions partial VISSIM network	I-81 Corridor Study	Sub-area base network coding, expanded upon
Pedestrian crossing counts	I-81 Viaduct Project, I-81 Corridor Study	Develop pedestrian-crossing at selected key intersections
Bicycle routes	City of Syracuse, SMTC	Incorporate bicycle exclusive lanes and shared lanes into network
List of planned transportation improvements	City of Syracuse, NYSDOT	Confirm roadway geometry, turn restrictions, number of lanes, lane assignment
Downtown Syracuse Two-Way Feasibility Technical Analysis Report	SMTC	Intersection configurations in corridors where two-way conversions are recommended/planned
Downtown Syracuse Two-Way Feasibility Technical Analysis Synchro Files	SMTC	Planned signal phasing, splits, offsets in downtown area
Turning movement forecasts for all intersections (AM and PM Peak hours)	SMTC Travel Demand Model	Route decision splits, vehicle inputs
Select link analysis query results	SMTC Travel Demand Model	Route decision splits, vehicle inputs
I-690 Teall/Beech VISSIM network	I-81 Viaduct Project	Base network for future configuration in I-690 study area
Pass through traffic study	I-81 Corridor Study	Vehicles travel through or around Syracuse without an internal origin or destination
Video files recorded at the NYSDOT Region 3 Traffic Management Center (TMC) for interstates and manual observations for intersections	I-81 Viaduct Project	Develop queue lengths for model validation

2.5.1 Existing Traffic Data

Data related to travel and operational characteristics of the interstate system and key surface streets within the study area were collected. They include:

- Automatic Traffic Recorder (ATR) counts

- Turning movement counts (TMC)
- Vehicle classification
- Origin-destination information
- Travel time and delay
- Queue lengths
- On- and off-street parking
- Bicycle and pedestrian counts

Origin-destination (O-D) information represents O-D trip patterns generated from the SMTC regional travel demand model (Version 4.041) and recently validated by Airsage's O-D transportation planning data. Vehicle classification data include three mode categories: passenger cars, buses, and trucks (vehicles with two or more axles and six tires or more). ATR and TMC data were assembled to develop the base year (2013) balanced traffic volume diagrams used to establish traffic demands for use in the VISSIM simulation. Development of 2013 balanced volume diagrams involved the following steps:

- **Traffic count adjustments** – All available ATR and TMC data were digitized, and formatted into a single structured database. All counts collected prior to 2013 were factored using an annual growth rate of 0.3% (estimated from the SMTC model) to represent the common base year of 2013. Counts were adjusted from the month the count was taken to a "seasonal peak period" which represents average volume levels for the fall season, which is historically the busiest time of year within the study area.

- **Peak Hour Determination** – Counts taken at 15-minute intervals were summed to produce hourly volumes at increments of 15 minutes. The 60-minute windows with the greatest total vehicular volume were determined to be 7:30-8:30 AM and 4:30-5:30PM for the morning and afternoon commuter peaks, respectively.

- **Geo-Coding of Count Data** – A separate GIS database was created for visual reference and to support map creation. To accomplish this, each count was associated with a geographic point and each turning movement counted was associated with a corresponding GIS feature arrow. GIS feature arrows were jointed with count data to produce unbalanced traffic volume diagrams.

- **Data Mapping to VISSIM Network** – Every location where a link branches off into multiple connectors forms a "Route Decision". A spreadsheet was developed which assigns a particular turn movement from the dataset to every such connector in the VISSIM network.

- **Volume Balancing Procedure** – An algorithm was developed in Python, which invokes a bi-proportional procedure to vary link flows and turning movements iteratively in order to converge on a set of balanced volumes. The volume balancing algorithm was given the VISSIM network geometry and associated volumes for each peak period as input to produce a set of balanced volumes for the AM and PM peaks.

2.5.2 Existing Transit Data

An inventory of existing bus service and usage within the study area was collected and used in developing the simulations. The bus data include bus routes, schedules, bus stop locations and loading areas, ridership, and average dwell times.

2.5.3 Existing Roadway Data

A physical inventory of the major roadways was conducted within the study area to gather information about the existing roadway geometries and traffic control regulations, as follows:

- Lane, shoulder, and median widths
- Number of lanes
- Direction of travel
- Intersection configuration
- Traffic control devices (including signal, signs, and pavement markings)
- Posted speed limits
- Traffic/parking regulations
- Truck routes
- Off-street parking
- Horizontal and vertical clearances
- Alignment constraints
- Location and profile controls
- Typical roadway sections
- Sidewalks.

2.5.4 Future Transportation Projects

Future committed/programmed highway improvement projects were assembled for updating the VISSIM transportation networks for the forecast years. A list of future highway improvement projects (obtained from SMTC) is illustrated in Appendix B.

2.5.5 Future Traffic Volumes

The future year SMTC traffic volumes (including link volumes and turning movements) were compiled to establish traffic demand and route choice input for the VISSIM simulation. However, this demand data conversion is not straightforward due to the required volume adjustment process used to obtain future year traffic prediction. Therefore, an automatic interface program was developed to expedite the transfer of traffic data between the SMTC and VISSIM models, as shown in Figure 2. The basic steps in the data conversion process are summarized as follows:

- **Geometry Mapping** – To transfer information between the SMTC, VISSIM, and the intermediate modules, a program was developed to establish an index joining the geometric features of both model datasets.

- **Furnessing Calculations** – The SMTC model's turning movement volumes were post-processed using a furnessing method where the numerical difference between the existing model volume and the future model volume from the SMTC output were added to the base year counts to capture the projected magnitude of change while minimizing model errors. For locations where the result was positive, the difference method was used. For locations where the computed result was negative, the ratio method was used.

- **Volume Balancing Procedure** – A script was created in Python to reconcile differences in counts after the modeled difference was applied the base year counts. This step was necessary because subtle differences caused by the application of the ratio and difference method in adjacent areas. The volume balancing process was given the traffic study network geometry and volumes for all turning movements for each peak period as input and invoked a bi-proportional algorithm to produce a set of reconciled turning movement volumes for the AM and PM peaks.

- **VISSIM Input Preparations –** Roadway geometry, vehicle inputs, and static route configurations were coded in VISSIM to supply a skeletal framework upon which the final balanced demand profiles could be superimposed. Custom programs were developed to incorporate the processed traffic volumes into VISSIM demand profiles by associating them with and modifying individual network elements such as route decision split percentages and the hourly flow rate for each time interval for all entry links.

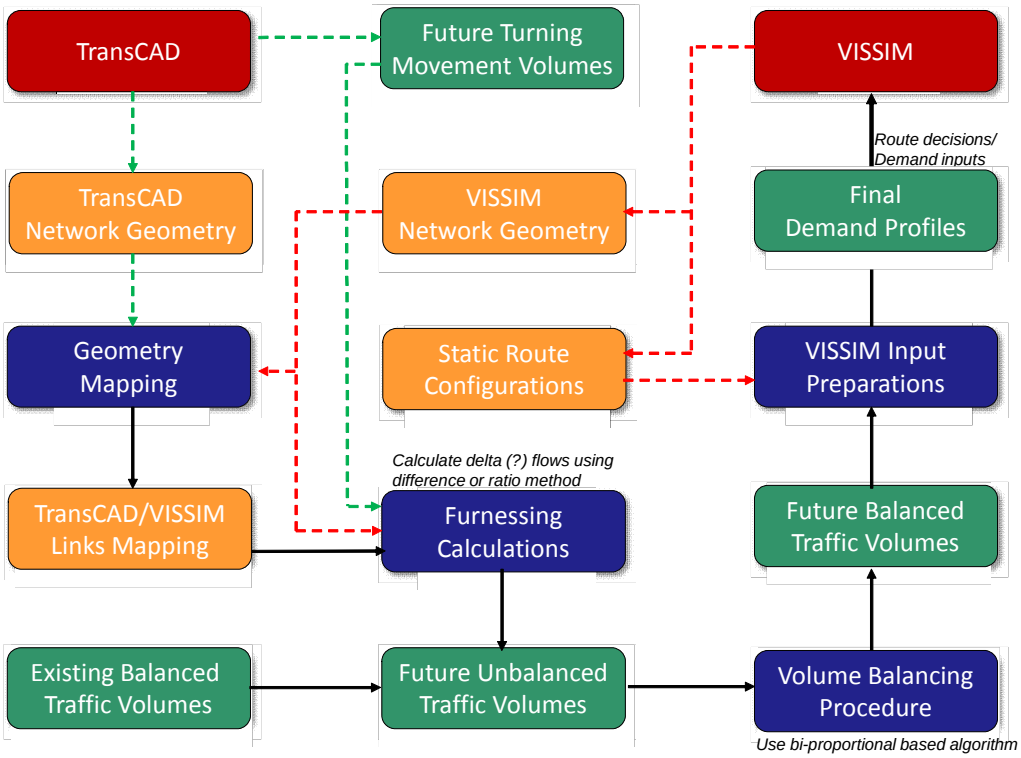


Figure 2: Generation of Future Demand Profiles for VISSIM

2.6 VISSIM Base Model Development

The VISSIM base model was developed and calibrated, and used for subsequent analyses of future scenarios or alternatives. The base model development involves the following steps:

- Geometry coding – An aerial photograph of the study area was imported into VISSIM and scale was established on this image by matching landmarks with the scaled aerial photograph. Links and link connectors were then digitized over this background image, and various control and supply attributes were applied.
- Create speed profiles – define distributions of desired speeds for each vehicle type and develop vehicle acceleration and deceleration functions to represent the differences in a driver's behavior.
- Code signal control measures – include signal, stop signs, and yield conditions

- Enter speed changes – develop reduced speed areas for turn movements at intersections and place a desired speed decision at a location where a permanent speed change should become effective
- Code conflict points and priority rules – used to correctly replicate vehicle interactions, such as controlling any movements that may require yielding.
- Enter vehicle inputs – prepare traffic demand data in the forms of entry volumes and turning movements at intersections. Input vehicles would be classified by vehicle type (car, truck, and bus)
- Code vehicle routing – direct vehicles where to go.
- Determine the seeding (or warm-up) period.

Additional details for the base model development can be found in Table 2. Once the VISSIM base models were developed, they were run for the AM and PM peak hour scenarios. For each scenario, the error checking procedure was undertaken by reviewing the on-screen animation and model outputs to determine the model's accuracy in simulating field operations. Input coding error checking also was performed so that the later calibration process would not result in parameters that are distorted to compensate for overlooked coding errors.

Table 2: VISSIM Model Assumptions

Type	Category	Setting	Assumption	Reason
Base Data	Distribution	Desired speed	Linear and non-linear Distributions	Use posted speed limits + 5 mph as the upper bound of desired speed. Distributions were developed based on available data
		Turn-speed	Varies on turn-type and vehicle types	Linear distribution of 9 mph, 15 mph, 20 mph or 25 mph was defined for each turn according to its turn-type and vehicle type,
		Rolling-stop-speed	Some drivers don't make a full stop at "stop" sign	Speed Distribution was borrowed from the "VISSIM Standards Project", July 2012, DVRPC
Traffic	Vehicle Composition	Highways/ local streets	Vehicles classified by heavy truck, medium truck, bus and cars	Vehicle compositions were developed from available field data
Vehicle Inputs	Warm-up Time	All demand input links	30 minutes	Used the WSDOT VISSIM Protocol as guidance - 2.2.1 Seeding Period, September 2014
Signal Control	Controllers	Intersections	Fixed time (TOD) and actuated signal	Existing signal timing was used for 2013 signals
Stop/Yield Control	Stop/Yield Signs	Intersections	Some drivers don't make a full stop at "stop" sign	"Rolling Speed -Zones" was set up for some approaches at stop controlled intersections
Priority Control/	Location	Intersections	Combinations of priority rules and	Allows more flexibility to realistically capture existing conditions

Conflict Area			conflict areas were used	
Links/ Connectors	Lane Change	Lane change back distance	Varies on location	Lane change back distance and emergency stop vary by individual locations. The values are based on field observations
Routing Decisions	Static	Highways/ local streets	All vehicles types have same routes, but allowed to vary in certain areas	Typical routes, combined routes and routes with lane selection were used to capture lane utilization.
Detectors	Location	Signalized intersections	Varies on location	Detectors were placed according to Google map or available signal timing plans
Transit	Bus	Local streets	Bus routes would be bus-exclusive lane or shared lane	All bus routes coded shared lanes except NB Onondaga St between West St and Clinton St
Non-motorized	Pedestrian	Intersection pedestrian-Crossing	Crossing was coded at key intersections. No ped routes were coded between intersections	Due to lack of pedestrian O-D information
	Bicycle	Routes	Bike routes were coded either exclusive lane or shared lane	Due to lack of bicycle O-D information

3. MODEL PARAMETER CALIBRATION

Because the default values for the VISSIM input parameters were not calibrated using field data from the United States, they need to be revised to produce valid output that better correlates with local traffic conditions. Furthermore, parameter adjustments are necessary because no simulation models can include all the site-specific factors (including driver demographics, road conditions, etc.) that might affect capacity, driving behavior, and traffic operations. The purpose of this section is to describe a logical process used to calibrate and validate the VISSIM model so that it is capable of serving as a testing tool for the operation of roadway design alternatives and their impact on the transportation system.

3.1 Calibration Procedure

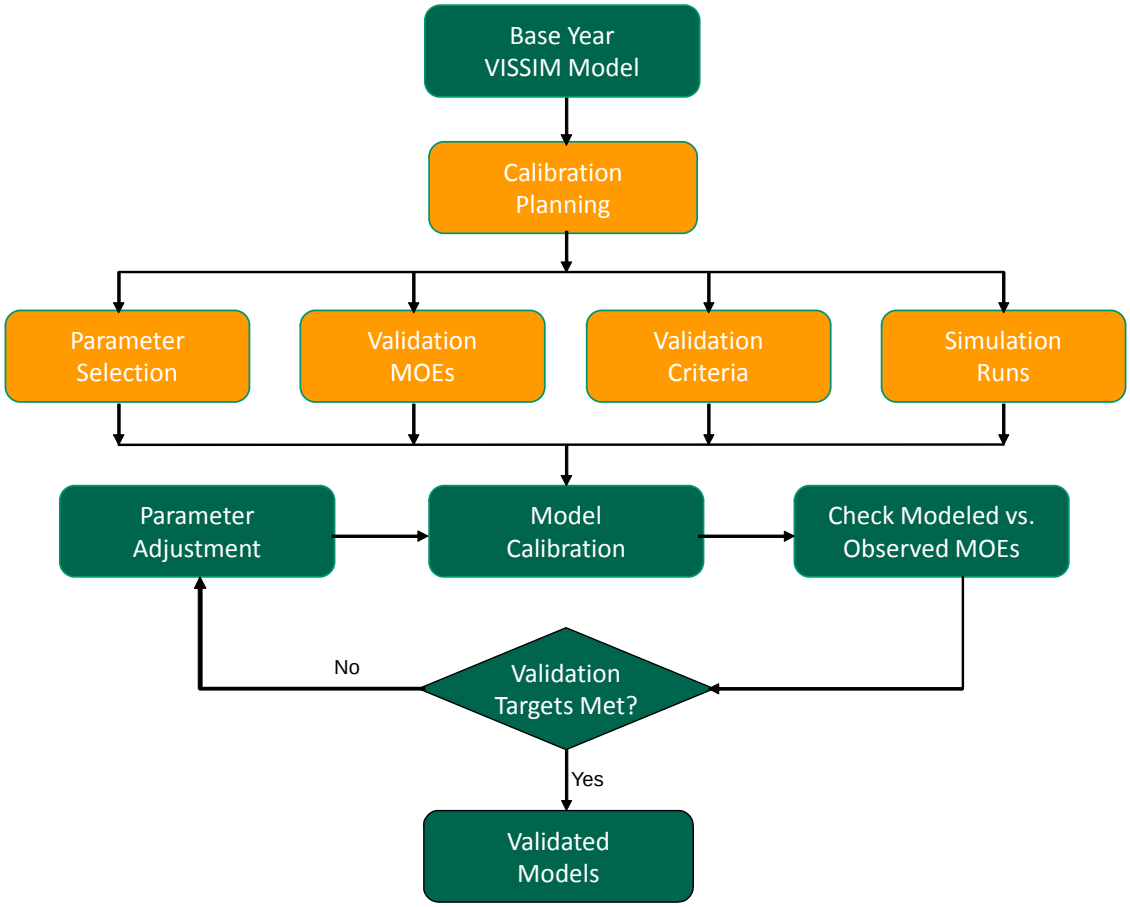
Model calibration is an iterative process that involves adjusting model input parameters to produce a result that can reasonably represent the existing observed traffic conditions on the simulation network. Two major calibration methods have been documented, namely trial-and-error method (manual calibration) and systematic approach (automated calibration). This project used the trial-and-error method by adjusting parameters iteratively (often one parameter at a time) to obtain the best match possible between the model outputs and field measurements. A general model calibration procedure is illustrated in Figure 3 and can be summarized as follows:

- Identify appropriate model parameters to adjust or calibrate

- Select appropriate measures of effectiveness (MOEs) and data for validation
- Determine the number of simulation runs required to achieve a confidence level of 95% with a 5% margin of error for all MOEs.
- Identify validation criteria and targets
- Modify the selected parameters until the model generates results that closely replicate field measured traffic conditions or satisfy the validation targets

In summary, given the selected parameters for calibration, these parameters would be iteratively adjusted to achieve an acceptable level of accuracy. In this project, traffic volumes and travel times were used as the validation MOEs. The calibration target is to obtain the best match possible between the modeled and observed traffic volumes and travel times.

Figure 3: A General Framework of Model Parameter Calibration



3.2 Selection of Calibration Parameters

There are numerous input parameters in the VISSIM model that describe network geometry, traffic demand, general configuration, traffic control operation, traffic flow and vehicle characteristics, driver behavior, and route choice strategies. Typically, these input parameters have impacts on the simulation results in a way that is highly correlated to those of other parameters. Fixing one problem by adjusting

multiple parameters could easily result in other problems somewhere else in the model. Therefore, the FHWA guidelines suggest selecting a reasonable number of parameters for adjustment to avoid a never-ending circular process and to keep the calibration effort manageable.

For the I-81 VISSIM model, the main calibration effort focused on driver behavior and vehicle parameters. Driver behavior parameters directly affect vehicle interaction, govern traffic movement over the simulation network, change the saturation flow rate on arterial and freeway links, and provide various types of drivers to the traffic stream, such as aggressive and passive drivers. The most-used calibration parameters include ten parameters (CC0-CC9) in Wiedemann's 1999 car following model; average standstill distance and desired safety distances in Wiedemann's 1974 car following model; and waiting time before diffusion and minimum headway (front/rear) in the lane changing algorithm.

Vehicle parameters represent the vehicle characteristics and operational performance of the traffic stream. Examples include traffic composition, vehicle length, desired speed, desired acceleration/deceleration, maximum acceleration/deceleration, and attributes associated with each vehicle type modeled. In addition, the need to adjust signal control parameters such as reaction to amber signal reduced safety distance close to a stop line also were examined. Finally, the simulation resolution was considered because it would impact on the response to traffic controls such as traffic signals or priority rules.

3.3 Measures of Effectiveness for Validation

The validation stage compares modeled values for chosen measures of effectiveness (MOEs) to observed values for the same MOEs. The validation process is used to determine how closely the VISSIM model replicates real world field conditions. Three validation MOEs were selected for VISSIM model validation, including:

- Traffic volume – peak hour balanced traffic volume diagrams were developed using observed ATR and turning movement counts
- Travel time – using the "floating-car" method, peak hour travel times along several travel routes were collected and compared to modeled travel times.
- Queue length – field queue observations were conducted on freeway segments and intersection approaches. Maximum queues were measured and defined as the maximum back of queue observed during an analysis period. For intersection approaches, a maximum queue length is the number of vehicles in the queue at the beginning of a green interval. For freeway segments, a maximum queue length was developed using two steps: (1) the current queue length is measured every time step (1 minute), and (2) from these values the maximum value is taken for every time interval (15 minutes).

3.4 Validation Criteria and Targets

VISSIM model validation was conducted according to the validation guidelines recommended by FHWA's document: *Traffic Analysis Toolbox Volume III – Guidelines for Applying Traffic Microsimulation Modeling Software* (Federal Highway Administration, August 2003). Table 3 shows the FHWA's validation criteria and acceptance targets for volume, travel time, and queue length.

Table 3: Validation Criteria and Targets

Criteria/Measures	Acceptance Targets
Individual Hourly Link Flows	
Within 15%, for 700 vph < flow < 2,700 vph	> 85% of cases
Within 100 vph, for flow < 700 vph	> 85% of cases
Within 400 vph, for flow > 2,700 vph	> 85% of cases
Sum of all link volumes	Within 5% of sum of all link counts
GEH < 5 for individual link volumes	> 85% of cases
GEH for sum of all flows	GEH < 4 for sum of all link counts
Journey Travel Times	
Within 15% (or 1 min, if higher)	> 85% of cases
Queue Lengths	
Within 20% (or < 12 vehicles, if higher)	> 85% of cases

Note that in Table 3, acceptance targets for queue lengths are based on guidelines established in Chapter 5 of NYSDOT's Highway Design Manual (September 1, 2017). Also note that the GEH (Geoffrey E. Havers) statistic, a modified chi-square statistic that accounts for both absolute and relative errors, is defined as:

$$GEH_i = \sqrt{\frac{2(M_i - O_i)^2}{(M_i + O_i)}}$$

where M_i and O_i are the modeled and observed hourly flows on link i, respectively. A GEH value of less than 5 is considered as a good match between the modeled and observed hourly flows. The validation criteria and targets in Table 3 can be summarized as follows:

- The modeled link volumes would be within ±15% of the observed volumes for flows between 700 and 2,700 vehicles per hour (vph), within ±100 vph for flows less than 700 vph, or within ±400 vph for flows greater than 2700 vph. These targets must be satisfied for 85% of the cases;
- The sum of (modeled) link flows is within ±5% of the actual sum of all link flows
- The GEH statistic would be less than 5 for individual link flows for 85% of the cases;
- Sum of all link flows have a GEH statistic less than 4;
- The modeled travel times would be within ±15% of (or ±1 minute different from) observed travel times for more than 85% of the measured travel time routes.
- The modeled queue lengths would be within ±20% of (or ±12 vehicles different from) observed queue lengths.

3.5 Simulation Runs

VISSIM models rely on random numbers to release vehicles, assign vehicle type, and determine their behavior as the vehicles move through the network. Therefore, multiple simulation runs using different seed numbers are required to obtain an average traffic condition of a specific scenario. The required number of simulation runs was calculated using the formula outlined in FHWA's *Traffic Analysis Toolbox Volume III (page 107):*

$$CI_{(1-\alpha)\%} = \frac{2t_{(1-\alpha/2),N-1}s}{\sqrt{N}}$$

where
$CI_{(1-\alpha)\%}$ = (1-α)% confidence interval for the true mean, where α is the level of significance which equals the probability of the true mean not lying within the confidence interval. CI is also known as the maximum allowable error of the estimate which equals μe, where μ is the mean and e is the margin of error, usually specified as a fraction of μ.
$t_{(1-\alpha/2),N-1}$ = critical value of the two-tailed t-distribution at the confidence interval of 1-α and N-1 degree of freedom.
s = the estimate of the real standard deviation
N = number of simulation runs required

Note that the above formula calculates the required number of simulation runs (N) for a specific performance measure only. If there is more than one performance measure of interest, we need to determine N for each measure and take the largest value of N to be the required number of simulation runs, i.e., N = Max (N_1, N_2, …..,N_n). Also note that the above formula requires an iterative procedure to estimate the final number of simulation runs because the degree of freedom (N-1) associated with the t-statistic is based on the total number of runs N needed to achieve a desired accuracy. To this end, the following procedure was used:

- Select three performance measures including total delay time, average speed, and average delay time per vehicle.
- Conduct an initial set of 11 simulation runs.
- Use simulation results to calculate the mean and standard deviation for each performance measure
- Assume a 95% level of confidence and use a 5% margin of error to calculate a desired confidence interval (CI) for each performance measure
- Set N equal to 2 and use the above formula to calculate the corresponding confidence interval (CI)
- Continue the process by increasing N, until the calculated confidence interval is less than or equal to the desired confidence interval
- Determine N required for each performance measure and take the largest value of N to be the required number of simulation runs.

Based on the above procedure, the required number of simulation runs for the total delay time, average speed, and average delay time per vehicle performance measures were determined to be 6, 4, and 10 runs, respectively. Therefore, 10 simulation runs are required to achieve a confidence level of 95% with a 5% margin of error for all performance measures. The final calibration statistics represent an average of these 10 simulation runs.

3.6 Parameter Refinement

The model calibration was accomplished by adjusting the default values of the VISSIM parameters so that the model results could reproduce local driver behavior and traffic performance characteristics. As suggested in the FHWA guidelines, one should select a reasonable number of parameters for adjustment to avoid a never-ending circular process and to keep the calibration effort manageable. After reviewing

all the VISSIM parameters, attention was given to the parameters in model components related to driver behavior, including:

- Freeway car following (Wiedemann 99) parameters – Parameters related to headway time, following variation, following threshold, and standstill acceleration were calibrated to represent the observed following behavior, break-down conditions, and recovery from break-down conditions. These parameters are also the most influential when calibrating maximum flow rates for mainline freeway sections.

- Arterial car following (Wiedemann 74) parameters – To reflect local driver behavior, Wiedemann 74 car following parameters were calibrated by re-defining the distance that a vehicle can see forward or backward, the distance between stopped cars, and the safety distance between two vehicles. Particularly, two parameters of "additive part of desired safety distance" and "multiple part of desired safety distance" were calibrated so that they could generate results as close to the maximum service flow rate of HCM 2010 as possible.

- Lane change parameters – Lane change parameters (same for both freeway and arterial links) were also calibrated to better reflect real world lane changing conditions, particularly in those merging, diverging, and weaving areas. Modifying a combination of the maximum and accepted deceleration rates for the merging (own) and trailing vehicles as well as the car following headway parameter can give throughput priority to the mainline section or the ramp section. Freeway diverges are most affected by the necessary lane changing and lane change distance parameters. Weaving sections use both merging and diverging section calibration parameters.

Calibrated driver behavior parameter values by roadway segment type are provided for freeways and arterials in Tables 4 and 5, respectively. Detailed descriptions of each parameter can be found in "*VISSIM Version 9.00 User Manual*". Singular values represent global adjustments inherited by all segments of the specified type. Where ranges are given, unique values were assigned to differing network elements to represent local conditions as accurately as possible. The adjusted values fall within ranges that are considered reasonable according to common practice in order to maintain the integrity of the processes they represent.

In addition to driver behavior parameters, attention also was given to vehicle parameters, such as traffic composition, vehicle length, speed distribution, and maximum acceleration and deceleration rates. Once the above parameters were set with acceptable overall model performance, local fine tuning was performed for individual roadway segments and intersections by adjusting conflict areas, priority rules, and routing decisions. As an additional calibration step, driver yield behavior to pedestrians at right turn locations was calibrated in the VISSIM models to match observed conditions.

Table 4: Calibrated Parameter Values by Segment Type - Freeways

Parameter	Default Value	Calibrated Value	
		Basic Segments	**Merges, Diverges, and Weaves**
Car Following (Wiedemann '99)			
CC0 Standstill distance	4.92 ft	default	default

CC1 Headway time	0.90 s	0.50 s	default
CC2 'Following' variation	13.12 ft	default	20.01 ft
CC3 Threshold for entering 'following'	-8.00 s	default	-5.00 s
CC4 Negative 'following' threshold	-0.35 ft/s	default	-0.25 ft/s
CC5 Positive 'following' threshold	0.35 ft/s	default	0.25 ft/s
CC6 Speed dependency of oscillation	11.44	default	default
CC7 Oscillation acceleration	0.82 ft/s^2	default	default
CC8 Standstill acceleration	11.48 ft/s^2	default	12.01 ft/s^2
CC9 Acceleration at 50 mph	4.92 ft/s^2	default	4.99 ft/s^2
Look ahead distance	0 ft - 820 ft	80 ft - 1000 ft	default
Look back distance	0 ft - 492 ft	25 ft - 400 ft	default
Lane Changing			
Maximum deceleration (own)	-13.12 ft/s^2	default	-14.99 ft/s^2
Maximum deceleration (trail)	-9.84 ft/s^2	default	-12.01 ft/s^2
-1 ft/s^2 per distance	200 ft	default	default
Accepted deceleration (own)	-3.28 ft/s^2	default	default
Accepted deceleration (trail)	-1.64 ft/s^2	default	default
Waiting time before diffusion	60 s	default	30 s
Min. headway (front/rear)	1.64 ft	default	1.51 ft
Safety distance reduction factor	0.60	0.2 - 0.25	0.10
Max. dec. for cooperative braking	-9.84 ft/s^2	default	-29.53 ft/s^2
Cooperative lane change	unchecked	checked	checked

Table 5: Calibrated Parameter Values by Segment Type - Arterials

Parameter	Default Value	Calibrated Value	
		Basic Segments	**Merges, Diverges, and Weaves**
Car Following (Wiedemann '74)			
Average standstill distance	6.56 ft	default	4.99 ft
Additive part of safety distance	2.00	1.75	default
Multiplicative part of safety distance	3.00	2.75	default
Look ahead distance	0 ft - 820 ft	default	200 ft - 900 ft
Look back distance	0 ft - 492 ft	default	100 ft - 500 ft
Lane Changing			

Maximum deceleration (own)	-13.12 ft/s^2	default	-16.01 ft/s^2
Maximum deceleration (trail)	-9.84 ft/s^2	default	-12.01ft/s^2
-1 ft/s^2 per distance	100 ft	default	default
Accepted deceleration (own)	-3.28 ft/s^2	default	-4.99 ft/s^2
Accepted deceleration (trail)	-1.64 ft/s^2	default	-4.99 ft/s^2
Waiting time before diffusion	60 s	default	15 s - 120 s
Min. headway (front/rear)	1.64 ft	default	default
Safety distance reduction factor	0.60	default	0.20 - 0.30
Max. dec. for cooperative braking	-9.84 ft/s^2	default	-29.53 ft/s^2
Advanced merging	checked	checked	checked
Cooperative lane change	unchecked	checked	checked

4. MODEL VALIDATION RESULTS

After calibrating model parameters to reflect the prevailing conditions of the study area, model validation focused on comparing quantitative and qualitative model output against existing field data to verify that the existing model is operating similar to the actual field conditions. Model output statistics represent an average of 10 simulation runs to achieve a confidence level of 95% with a 5% margin of error for all performance measures. Each simulation run was set to 9,000 seconds and the data were collected from 1,800 seconds to 9,000 seconds, for a total of two hours.

Following the FHWA's guidance, the model's ability to match field observed traffic volumes and travel times along key routes was examined, as well as reviewing queue lengths between the model and the field. Three MOEs - traffic volumes, travel times, and queue lengths - were validated based on the criteria listed in Table 3. Each MOE was validated for six time periods, including:

- Pre-Peak: 7:00 - 7:30 AM and 4:00 - 4:30 PM
- Peak hour: 7:30 - 8:30 AM and 4:30 - 5:30 PM
- Post-peak: 8:30 - 9:00 AM and 5:30 - 6:00 PM

Both the AM and PM peak periods include three time periods: pre-peak, peak hour, and post-peak. For pre- and post-peak periods, the observed traffic flow rate for each 30-minute period was normalized to allow its corresponding hourly flow rate to be compared to the VISSIM results directly.

4.1 Traffic Volumes

A summary of link volume validation statistics for the AM and PM peak periods is presented in Tables 6 and 7. The FHWA microsimulation guidelines require that link volumes for at least 85 percent of cases meet the following criteria:

- For volumes less than 700 vehicles per hour (vph), within 100 vph
- For volumes between 700 and 2,700 vph, within 15%

- For volumes greater than 2,700 vph, within 400 vph

Tables 6 and 7 show that the link volume calibration results meet the criteria for the three volume categories. In addition, more than 98 percent of freeway or arterial links have a GEH below 5, which is substantially larger than the acceptance criteria of 85 percent in the FHWA guidance. A detailed listing of the freeway and arterial link count GEH validation statistics for the AM and PM peak periods are presented in Appendices C-F.

Table 6: Traffic Volume Validation Summary - AM Peak Period

Criteria/Measures	Targets	Pre-Peak		Peak Hour		Post-Peak	
		Freeway	Arterial	Freeway	Arterial	Freeway	Arterial
Within 100 vph, for flow < 700 vph	> 85%	100%	99%	100%	100%	100%	100%
Within 15%, for 700 vph < flow < 2,700 vph	> 85%	100%	92%	100%	100%	100%	100%
Within 400 vph, for flow > 2,700 vph	> 85%	97%	100%	95%	100%	100%	100%
GEH < 5 for individual link flows	> 85%	99%	100%	99%	100%	100%	100%

Table 7: Traffic Volume Validation Summary - PM Peak Period

Criteria/Measures	Targets	Pre-Peak		Peak Hour		Post-Peak	
		Freeway	Arterial	Freeway	Arterial	Freeway	Arterial
Within 100 vph, for flow < 700 vph	> 85%	100%	99%	100%	99%	100%	99%
Within 15%, for 700 vph < flow < 2,700 vph	> 85%	99%	88%	99%	100%	99%	100%
Within 400 vph, for flow > 2,700 vph	> 85%	100%	100%	100%	100%	100%	100%
GEH < 5 for individual link flows	> 85%	100%	100%	99%	98%	99%	99%

4.2 Travel Time

Travel time information was checked by comparing average travel time data obtained from the field to those generated from the models within the simulation period. Travel time comparisons were performed for the eleven routes (or eighteen routes by direction) in the network and for the AM and PM peak periods, respectively. Based on travel time criteria described in Table 3, the modeled travel times should be within ±15% of (or ±1 minute different from) observed travel times for more than 85% of the measured travel time routes. Percent differences for most routes in Tables 8 and 9 are found to be within ±15%. The modeled travel times on a number of routes (e.g., Clinton Street from Comstock Avenue to South West Street, West Street from Genesee Street to Adams Street, etc.) are not within ±15% of observed travel times. However, since the differences between the modeled and observed travel times are less than one minute, most of these routes still achieved travel-time validation targets established by FHWA. As shown in the last row of Tables 8 and 9, of the eighteen routes (by direction), there are 17 (94%) routes

for which the model can reproduce travel times within the tolerance of the calibration criteria (±15%) during the AM peak period, PM peak hour, and PM post-peak. In the PM pre-peak, 16 (89%) of the routes meet the travel-time validation targets.

Table 8: Route Travel Time Validation Summary – AM Peak Period

Route Name	Dir	Difference Between Observed and Modeled Travel Time (min)					
		Pre-Peak		Peak Hour		Post-Peak	
		Actual	Percent	Actual	Percent	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	0.98	8%	-0.24	-2%	0.32	3%
	SB	1.29	11%	1.45	11%	1.83	15%
I-481 from Exit 2 to Exit 8	NB	0.46	4%	0.49	4%	0.38	3%
	SB	0.44	3%	0.67	5%	0.43	3%
I-690 from Exit 8 to Exit 17	EB	1.03	13%	-1.77	-13%	0.95	12%
	WB	1.15	15%	1.05	13%	0.87	11%
Fayette St from West St to Walnut Ave	EB	0.99	21%	1.52	33%	1.11	24%
	WB	0.96	18%	0.36	6%	-0.04	-1%
Adams St from West St to Comstock Ave	EB	1.80	29%	0.68	9%	0.15	2%
Harrison St from Comstock Ave to S West St	WB	0.91	14%	-0.72	-9%	-0.67	-8%
State St from Adams St to Butternut St	NB	-0.25	-4%	-0.89	-14%	-0.95	-15%
Clinton St from Webster Landing to Adams St	SB	-0.87	-17%	0.59	15%	0.65	17%
West St from Genesee St To Adams St	NB	0.29	12%	0.75	47%	0.81	51%
	SB	0.83	56%	0.58	36%	0.58	36%
Irving Ave from E Raynor St to Fayette St	NB	-0.16	-4%	-0.50	-12%	-0.65	-15%
	SB	0.35	10%	-0.09	-2%	-0.38	-9%
Almond St from Van Burn St to Burnet St	NB	-0.03	-1%	-0.52	-11%	-0.83	-17%
	SB	-1.05	-14%	0.95	21%	0.74	16%
Within 15% or 1 min	> 85%	94%		94%		94%	

Table 9: Route Travel Time Validation Summary – PM Peak Period

Route Name	Dir	Difference Between Observed and Modeled Travel Time (min)					
		Pre-Peak		Peak Hour		Post-Peak	
		Actual	Percent	Actual	Percent	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	1.09	9%	1.31	11%	0.8	6%
	SB	1.14	9%	0.86	7%	0.14	1%
I-481 from Exit 2 to Exit 8	NB	0.40	3%	-0.02	0%	0.38	3%
	SB	0.60	5%	0.11	1%	-0.12	-1%
I-690 from Exit 8 to Exit 17	EB	1.35	17%	0.91	11%	0.83	10%
	WB	0.86	10%	0.66	7%	0.13	1%
Fayette St from West St to Walnut Ave	EB	-0.20	-3%	-0.62	-11%	-0.82	-14%
	WB	0.05	1%	-1.13	-14%	-0.89	-11%
Adams St from West St to Comstock Ave	EB	1.02	14%	0.42	5%	0.86	11%

Harrison St from Comstock Ave to S West St	WB	-0.29	-4%	-0.92	-12%	-0.55	-9%
State St from Adams St to Butternut St	NB	-0.92	-14%	-2.12	-24%	-1.20	-19%
Clinton St from Webster Landing to Adams St	SB	0.69	16%	0.80	19%	-0.47	-9%
West St from Genesee St To Adams St	NB	0.46	24%	0.17	7%	0.44	23%
	SB	0.58	40%	0.89	74%	0.74	44%
Irving Ave from E Raynor St to Fayette St	NB	0.51	14%	-0.29	-7%	-0.21	-6%
	SB	-0.06	-1%	-0.64	-11%	-0.90	-14%
Almond St from Van Burn St to Burnet St	NB	-1.05	-16%	-0.10	-2%	0.02	0%
	SB	0.53	11%	-0.18	-3%	-0.01	0%
Within 15% or 1 min	> 85%	89%		94%		94%	

In the AM peak period, the eastbound Fayette Street route (from West Street to Walnut Avenue) does not achieve the travel-time validation target during the AM peak hour and AM post-peak. The eastbound Adams Street route (from West Street to Comstock Avenue) during AM pre-peak also does not achieve travel time validation. Differences between observed and modeled travel times on these two routes are less than two minutes. These two routes (approximately 1.5 miles each) are longer than the other local street routes and, therefore, their travel time survey results have a higher likelihood to be affected by signal control systems such as signal progression. In the PM peak period, the eastbound I-690 route (from Exit 8 to Exit 17) does not achieve the travel-time validation target during PM pre-peak. In addition, the northbound State Street route (from Adams Street to Butternut Street) during PM peak hour and PM post-peak and the northbound Almond Street route (from Van Burn Street to Burnet Street) during PM pre-peak do not achieve travel time validation. Although travel times for these routes are outside of the criteria range, most of them are sufficiently close to warrant use of the model. A detailed listing of the route travel time validation statistics for the AM and PM peak periods are presented in Appendices G and H.

In addition to the route travel time comparisons, the freeway link travel times obtained from the field were also compared to those generated from the models within the simulation period. Travel time comparisons were performed for the 59 links (by direction) on I-81, I-481, and I-690 in the network and for the AM and PM peak periods, respectively. As shown in Table 10, of the 59 links, only one link during AM peak hour and two links during AM post-peak do not meet travel-time validation targets established by FHWA. More than 97 percent of freeway links achieve travel-time validation targets during various time periods, which is substantially larger than the acceptance criteria of 85 percent in the FHWA guidance. A detailed listing of the freeway link travel time validation statistics for the AM and PM peak periods are presented in Appendices I and J.

Table 10: Freeway Link Travel Time Validation Summary

Time Period	Threshold/Target	Pre-Peak	Peak Hour	Post-Peak
AM Peak Period	> 15% or > 1 min	0 link	1 links	2 links
	> 85% of cases	100%	98%	97%
PM Peak Period	> 15% or > 1 min	0 link	0 link	0 link
	> 85% of cases	100%	100%	100%

4.3 Queue Lengths

Queue length information was checked by comparing maximum queue length data obtained from the field to those generated from the models within the simulation period. Queue length comparisons were performed for the 9 freeway facility segments and 17 intersection approaches in the network. Of the 26 locations, 23 and 16 locations were selected for queue length comparisons in the AM and PM peak periods, respectively (see freeway and intersection locations in Appendix A). Based on queue length criteria described in Table 3, the modeled queue lengths should be within ±20% of (or ±12 vehicles different from) observed queue lengths for more than 85% of the measured queue length locations. (Note: An average length of 25 feet per vehicle is assumed – this includes a 20-foot vehicle length and a 5-foot headway between vehicles). Tables 11 and 12 show that the maximum queue lengths in terms of vehicles in queue are found to be less than ±12 vehicles for vast majority of locations during the AM and PM peak periods (including pre-peak, peak-hour, and post-peak). A detailed listing of the queue length validation statistics for 23 locations in the AM peak period and 16 locations and in the PM peak period are, respectively, presented in Appendices G and H.

Table 11: Queue Length Validation Summary - AM Peak Period

Freeway/ Intersection	Segment/Approach	Pre-Peak		Peak Hour		Post-Peak	
		Diff (%)	Diff (veh)	Diff (%)	Diff (veh)	Diff (%)	Diff (veh)
NB I-81	At Exit 18	N/A	0	-61%*	-5*	-100%	-15
SB I-81	At Exit 19	-95%	-8	-16%	-33	28%	26
	At Harrison St off-ramp	-100%	-10	-3%	-2	-6%	-4
EB I-690	At diverge to SB I-81	N/A	-8	38%	7	4646%	12
EB I-690/SB I-81	At merge onto SB I-81	-99%	-4	10%	2	-8%	-2
WB I-690	At diverge to SB I-81	N/A	0	N/A	0	N/A	0
NB I-481	At diverge to WB I-690	N/A	0	N/A	0	N/A	0
Almond St and Adams St	Adams St EB	12%	2	-14%	-4	16%	3
	Almond St NB	196%	4	65%	3	43%	2
	Almond St SB	-44%	-6	-22%	-4	-3%	0
	NB I-81 off-ramp	-25%	-4	-7%	-2	-31%	-7
Almond St and Harrison St	Almond St NB	0%	0	12%	4	-25%	-7
	Almond St SB	-28%	-8	-22%	-7	-21%	-6
	Harrison St WB	72%	5	2%	0	35%	4
Erie Blvd and Crouse Ave	Crouse Ave NB	940%	7	423%	7	413%	6
	Crouse Ave SB	128%	2	74%	2	90%	2
	Erie Blvd EB	594%	3	451%	3	229%	3
	Erie Blvd WB	724%	4	150%	3	238%	3
Genesee St/EB I-690 off-ramp/West St	EB I-690 off-ramp	168%	7	112%	9	215%	8
	Genesee St EB	401%	10	177%	11	36%	3
Almond St and SB I-81 off-ramp	SB I-81 off-ramp	49%	7	40%	9	35%	7

Salina St and SB I-81 off-ramp	SB I-81 off-ramp	701%	7	40%	6	30%	4
Townsend St and WB I-690 off-ramp	WB I-690 off-ramp	111%	3	42%	2	36%	2
Within 20% or < 12 vehicles	> 85%	100%		100%		91%	

*Difference calculation was based on the queue information observed by TMC staff rather than video file recorded.

Table 12: Queue Length Validation Summary - PM Peak Period

Freeway/Intersection	Segment/Approach	Pre-Peak		Peak Hour		Post-Peak	
		Diff (%)	Diff (veh)	Diff (%)	Diff (veh)	Diff (%)	Diff (veh)
NB I-81	At Exit 18	N/A	1	N/A	5	N/A	3
	At I-690 EB Split	130%	8	128%	11	183%	7
EB I-690	At diverge to SB I-81	N/A	-8	-100%	-2	N/A	0
WB I-690	At diverge to SB I-81	N/A	1	N/A	2	N/A	1
SB I-481	At Exit 3E (5/92)	N/A	12	N/A	18	N/A	12
Almond St and Adams St	Adams St EB	36%	8	20%	6	58%	11
	Almond St NB	-35%	-10	-29%	8	25%	3
	Almond St SB	-35%	-8	-34%	10	-26%	-6
Almond St and Harrison St	Almond St NB	37%	7	40%	8	53%	10
	Almond St SB	-26%	-7	-41%	-12	-28%	-6
	Harrison St WB	-5%	-1	-31%	-12	-9%	-2
Erie Blvd and Crouse Ave	Crouse Ave NB	140%	5	174%	6	371%	7
	Crouse Ave SB	291%	5	342%	5	528%	5
	Erie Blvd EB	17%	1	0%	0	63%	2
	Erie Blvd WB	95%	2	41%	1	154%	3
Genesee St/EB I-690 off-ramp/West St	Genesee St WB	-6%	0	2%	0	23%	1
Within 20% or < 12 vehicles	> 85%	100%		94%		100%	

As shown in the last rows of Tables 11 and 12, more than 91 percent of the queue locations achieve queue length validation targets during the various time periods. More specifically, of the 23 locations, only two locations in the AM post-peak do not achieve queue length validation targets. Similarly, of the 16 locations, only one location in the PM peak hour does not achieve queue length validation targets. At southbound I-81 Exit 19 (Clinton and Salina Streets), a 2,325-foot (93 vehicles) queue was observed during AM post-peak, compared to 2,986 feet (119 vehicles) reported by the model (see Table K-3 of Appendix K). Although this location does not achieve queue length validation target, its modeled and observed queues have the similar pattern of long queues. At northbound I-81 Exit 18 (Harrison and Adams Streets), a 15-vehicle queue was observed during the AM post-peak, compared to a 0-vehicle queue reported by the model. The observed queue (375 feet) at this location may be questionable because it is larger than the observed queue in the AM peak hour (218 feet). Furthermore, based on additional queue observations recently made by NYSDOT Traffic Management Center staff (10/30/17 and 11/1/17), the queue length has already approached zero at approximately 8:00 AM.

5. CONCLUSIONS

This technical memorandum documents the methodology followed to build and calibrate detailed VISSIM simulation models for the I-81 Viaduct Project. The approach, data collection, assumptions, and technical tools built on currently available state-of-the-practice techniques, with a goal of providing reliable results to meet the Federal mandates and standards for accuracy. The VISSIM models were calibrated in accordance with the calibration acceptance criteria recommended by FHWA. Detailed link volume counts, route/link travel times, and observed queue lengths have been used to validate the VISSIM models for both AM and PM peak periods. Disaggregated and aggregated validation statistics presented within this memorandum show that the base year (2013) VISSIM models are valid and stable. Therefore, the models can be used as the basis for development of all future No Build and Build condition models.

APPENDIX A:
TRAFFIC DATA COLLECTION PLANS

For the I-81 Viaduct Project, data collection was conducted for ATR volume counts, turning movement counts, pedestrian crosswalk counts, travel time and speeds, and queue lengths in the study area. Whereas the queue length survey was performed in September, 2017, all the remaining data items were collected in November, 2013. The collection plan for each data item is briefly described below.

ATR Volume Counts

Obtain continuous ATR volume counts at forty-two (42) unidirectional highway locations for one week period to establish traffic flow variations, to provide average hourly traffic volume estimates, and to adjust manual traffic counts taken on different weekdays to a common basis. The contractor must calibrate the raw ATR axle counts in order to represent the total number of vehicles. The proposed ATR count locations are shown below.

Expressways - Mainline

1. I-81 mainline NB between Exits 16A and 16
2. I-81 mainline SB between Exits 16A and 16
3. I-690 mainline EB between Exits 14 and 15
4. I-690 mainline WB between Exits 14 and 15

Note: 1 and 2 above shall be counted simultaneously, as shall 3 and 4.

Expressways - Ramp

1. I-81 NB off-ramp to I-481 EB
2. I-81 NB on-ramp from I-481 WB
3. I-81 NB off-ramp to S. Salina St/E. Calthrop Ave
4. I-81 NB on-ramp from S. Salina St/E. Calthrop Ave
5. I-81 NB on-ramp from E. Colvin St
6. I-81 NB off-ramp to Almond St/Harrison St
7. I-81 NB on-ramp from Almond St/Harrison St
8. I-81 NB off-ramp to I-690 EB
9. I-81 NB off-ramp to I-690 WB
10. I-81 NB on-ramp from I-690 WB
11. I-81 NB on-ramp from Pearl St
12. I-81 SB off-ramp to Franklin St/West St
13. I-81 SB off-ramp to Clinton St/Salina St
14. I-81 SB off-ramp to I-690 EB
15. I-81 SB on-ramp from I-690 EB
16. I-81 SB on-ramp from I-690 WB
17. I-81 SB off-ramp to Adams St/Harrison St
18. I-81 SB on-ramp from Almond St/E. Adams St
19. I-81 SB off-ramp to S. State St/Salina St/Brighton St
20. I-81 SB on-ramp from S. State St/Salina St/Brighton St
21. I-81 SB off-ramp to I-481 EB
22. I-81 SB on-ramp from I-481WB
23. I-690 WB off-ramp to Teall Ave
24. I-690 WB on-ramp from Teall Ave

25. I-690 WB off-ramp to N. Townsend St/Downtown
26. I-690 WB off-ramp to N. West St
27. I-690 WB off-ramp to N. West St
28. I-690 WB off-ramp to N. Geddes St
29. I-690 WB on-ramp from Bear St W.
30. I-690 WB on-ramp from Hiawatha Blvd W.
31. I-690 EB off-ramp to Hiawatha Blvd W.
32. I-690 EB off-ramp to Bear St W.
33. I-690 EB on-ramp from N. Geddes St
34. I-690 EB off-ramp to N. West St
35. I-690 EB on-ramp from N. West St
36. I-690 EB on-ramp from McBride St
37. I-690 EB off-ramp to Teall Ave
38. I-690 EB on-ramp from Teall Ave

Manual Turning Movement/Vehicle Classification Counts

Conduct manual turning movement counts in three categories (i.e., cars, buses and trucks) in 15-minute intervals during the morning (6:00 – 10:00 AM), midday (11:00 AM – 2:00 PM) and the afternoon (3:00 – 7:00 PM) peak periods on one (1) mid-weekday, i.e., Tuesday, Wednesday or Thursday, at twenty-eight (28) intersections identified below.

Local Streets - Intersection

1. Park St and Court St
2. Butternut St and Park St
3. W. Onondaga St and S. West St
4. W. Onondaga St and Tallman St
5. W. Onondaga St and W. Adams St
6. Tallman St and Midland Ave
7. Cortland Ave and W. Castle St
8. S. State St and Burt St
9. S. State St and E. Castle St
10. Burt St and Almond St
11. Park St and Oak St
12. Lodi St, Oak St and Burnet Ave
13. E Fayette St and University Ave
14. E.Genesee.st and Comstock Ave
15. Burnet St and Teall Ave
16. Erie Blvd E. and Teall Ave
17. E. Fayette St and Westcott St
18. E. Genesee St and Westcott St
19. Euclid Ave and Westcott St
20. E. Hiawatha Blvd and Park St
21. E. Hiawatha Blvd and Solar St
22. Bear St and Solar St
23. Bear St and Van Rensselaer St

24. South Ave and Slocum Ave
25. Van Buren St and Renwick Ave
26. N. State St and Butternut St
27. E. Genesee St and Irving Ave
28. University Ave and Waverly Ave

Pedestrian Crosswalk Counts

Perform pedestrian crosswalk counts during the three peak periods (6:00 – 10:00 AM, 11:00 AM – 2:00 PM and 3:00 – 7:00 PM) on one (1) mid-weekday concurrently with other manual traffic counts at twenty-two (22) locations specified below:

Local Streets - Intersection

1. S. State St and Erie Blvd W.
2. S. State St and W. Water St
3. S. State St and W. Washington St
4. S. State St and W. Fayette St
5. S. State St and W. Genesee St
6. S. State St and E. Jefferson St
7. S. State St and Harrison St
8. S. State St and E. Adams St
9. Harrison St and Montgomery St
10. Harrison St and S. Warren St
11. Harrison St and S. Salina St
12. E. Jefferson St and Montgomery St
13. E. Jefferson St and Warren St
14. E. Jefferson St and Salina St
15. Irving Ave and W. Genesee St
16. Irving Ave and Harrison St
17. Irving Ave and E. Adams St
18. Irving Ave and Waverly Ave
19. University Ave and W. Genesee St
20. University Ave and Harrison St
21. University Ave and E. Adams St
22. University Ave and Waverly Ave

Travel Time and Speed Runs

Conduct travel time and delay runs on ten (10) major travel routes in the study area using the “floating car” method to obtain a minimum of 3 runs in each travel direction during the AM (6:00 – 10:00 AM), Midday (11:00 AM – 2:00 PM) and PM (3:00 – 7:00 PM) peak periods for one (1) typical weekday. Elapsed time, mileage, delays, and the reason of delays (e.g., accident, signal, vehicle breakdown, etc.) will be recorded at the designated checkpoints, i.e., interchanges and major cross streets, over a predetermined travel route. The travel time and speed runs will be conducted concurrent with the other traffic counts. The proposed 10 major travel routes are presented below.

Expressways

1. I-81 NB from I-81/I-481 Interchange on the south to I-81/I-481 Interchange on the north
2. I-81 SB from I-81/I-481 Interchange on the north to I-81/I-481 Interchange on the south
3. I-481 NB from I-81/I-481 Interchange on the south to I-81/I-481 Interchange on the north
4. I-481 SB from I-81/I-481 Interchange on the north to I-81/I-481 Interchange on the south
5. I-690 WB from I-481/I-690 Interchange on the east to I-690/State Route 695 Interchange on the west
6. I-690 EB from I-690/State Route 695 Interchange on the west to I-481/I-690 Interchange on the east

Local Streets

1. Irving Ave NB from E Raynor Ave to E Fayette St
2. Irving Ave SB from E Fayette St to Raynor Ave
3. Almond St NB from Van Buren St to Burnet Ave
4. Almond St SB from Burnet Ave to Van Buren St
5. State St NB from E Adams St to Butternut St
6. Clinton St SB from Webster Landing to E Adams St
7. West St NB from Adams St to Genesee St
8. West St SB from Genesee St to Adams St
9. Harrison St WB from Comstock Ave to S. West St
10. E. Adams St EB from West St to Comstock Ave
11. E Fayette St WB from Walnut Ave to West St
12. E Fayette St EB from West St to Walnut Ave

Queue Lengths

Conduct queue length surveys on the freeway facility segments and intersection approaches during the morning peak period of 7:00 – 9:00 AM and evening peak period of 4:00 – 6:00 PM for two (2) typical weekdays (Tuesday, Wednesday, or Thursday). Queue locations were selected based on the following criteria:

- Locations with significant queues observed in the AM or PM peak hours based on field observations as well as known problem areas identified by the public and DOT
- Key merge and diverge locations on mainline interstates within the central study area
- Approaches at intersections within the central study area which are high volume access points to the local street grid from the interstate system

Queue locations on the freeway facility segments and intersection approaches are listed below in Tables A-1 and A-2 respectively. The peak time periods required to collect queue data for each location are also noted.

Table A-1: Freeway Locations for Queue Data Collection

#	Freeway	Segment	Peak
1	NB I-81	at Exit 18 (Harrison St/Adams St)	AM/PM
2		at I-690 EB Split	PM
3	SB I-81	at Exit 19 (Clinton St/Salina St)	AM
4		at Harrison St off-ramp	AM
5	EB I-690	at Diverge to SB I-81	AM/PM
6	EB I-690 Connector to SB I-81	at Merge onto SB 1-81	AM
7	WB I-690	at Diverge to I-81 SB	AM/PM
8	NB I-481	at Diverge to WB I-690	AM
9	SB I-481	at Exit 3E (5/92)	PM

Table A-2: Intersection Locations for Queue Data Collection

#	Intersection	Approach	Peak
10	Almond St and Adams St	Adams St EB	AM/PM
11		Almond St NB	AM/PM
12		Almond St SB	AM/PM
13		NB I-81 off-ramp	AM
14	Almond St and Harrison St	Almond St NB	AM/PM
15		Almond St SB	AM/PM
16		Harrison St WB	AM/PM
17	Erie Blvd and Crouse Ave	Crouse Ave NB	AM/PM
18		Crouse Ave SB	AM/PM
19		Erie Blvd EB	AM/PM
20		Erie Blvd WB	AM/PM
21	Genesee St and Eastbound I-690 off-ramp/N. West St	EB I-690 off-ramp	AM
22		Genesee St EB	AM
23		Genesee St WB	PM
24	Almond St and SB I-81 off-ramp	SB I-81 off-ramp	AM
25	Salina St and SB I-81 off-ramp	SB I-81 off-ramp	AM
26	Townsend St and WB I-690 off-ramp	WB I-690 off-ramp	AM

APPENDIX B:
PROJECTS FOR INCLUSION IN FUTURE MODELS (DRAFT 5-8-14)

NYSDOT – Future Base

- **Third lane of Frontage Road:** Beginning at Exit 23B, the on ramp from Carousel Center Drive to the Interstate 81 Southbound Frontage Road (SR 936F), a third lane will be constructed southward to Bear Street. Traffic from the ramp will default into this lane upon reaching the service road (the ramp is currently controlled by a Yield sign and has no acceleration lane). The intersection with Bear Street will be reconfigured by virtue of the elimination of the existing slip ramp from the Frontage Road southbound to bear Street westbound (2020)

  The existing right turn slip ramp, currently operating with a Yield sign at the Bear St/Frontage Rd intersection will be reconfigured to continue as right lane only and, controlled by the traffic signal. No conceptual/detailed intersection configuration drawings are available for this "future" project. (It appears no detailed signal timing for this intersection due to too earlier to project implementation, we will use its adjacent intersection signal timing)

- **Route 5 widening:** Widen section of highway from 2 lanes to provide for a center turn lane consistent with the highway sections at either end. (2030) (There are sections if Route 5 in the study area it is unclear where this change affects.

  This section relates to Route 5 between Ike Dixon Rd and Bennetts Corners Road in the Town of Elbridge that is outside the viaduct study area.

City of Syracuse – By 2020

- E Gene is 2 lanes from Forman to the city line, with a couple of 3 lane cross sections (i.e., two-way center turn lane)

  The City of Syracuse restriped E Genesee St from Cherry St to Salt Springs Rd last year and through work on the Connective Corridor (E Genesee St from Forman Park to University Ave). E Genesee from Salt Springs Rd to the eastern city line is currently 2 lanes with a few 3 lane cross section. Center

turn lanes are intermixed throughout the entire E Genesee St corridor. For additional details, please contact the City DPW.

- S Salina 2-3 lanes from Dorwin Ave up to Water. We are looking to do one section with two NB lanes between W Onondaga and Warren. (Unsure of implementation timeline. 2015 maybe?)

  Based on update from City DPW, Dorwin Ave to Water St would be 2 lanes, with one section between Onondaga and Warren with 2 NB lanes and 1 SB lane. For lane widths, City DPW anticipates between 10 and 12 feet.

- Erie Blvd W: 3 lane cross section between Clinton St and W Gene (2015)
  Lane widths unknown at this time. Potentially 12' lanes with TWCTL. There has been discussion of "floating" parking and a two-way cycle track without the TWCTL. (We will code the TWCTL though this is uncertain at this time).

- Closure of parts of Water Street (partially implemented. Make it local access only.)
  University Ave to Walnut Ave.

- **Waverly Ave Lane Reduction:** Removal of one lane in each direction on Waverly Ave between Comstock Ave and S. Crouse Ave. Current configuration of 2 lanes in each direction will be reduced to 1 lane in each direction with left turn bays at appropriate intersections.
  - *Waverly EB onto University NB: 120' storage bay*
  - *Waverly EB onto Crouse NB: 70' storage bay*
  - *Waverly WB onto Irving SB: 90' storage bay*

- **Comstock Ave Lane Reduction:** Removal of one lane in each direction on Comstock Ave between Euclid Ave and Waverly Ave. Current configuration of 2 lanes in each direction will be reduced to 1 lane in each direction with left turn bays at appropriate intersections.

  Please contact the City DPW. (Need to contact city DPW, otherwise assume a storage length based on LT volume & standard 12' lane width).

- **West Street:** reduced to 2 NB /2 SB lanes.

  Starts at the railroad bridge on the north to roughly Shonnard St on the south. Check with Region staff for additional details as several meetings have occurred between City, NYSDOT and others. (Assume 2 NB/2 SB lanes are between railroad bridge and Shonnard St)

City of Syracuse – By 2030

- S Geddes: have 2 SB lanes, 1 NB lane between Fayette and Shonnard, with the typical 3 lanes cross section elsewhere. (Just a concept plan at this point)
- James Street (State to Grant/Shotwell): 3 lane cross section (Conceptual/detailed lane configuration whichever is available).

Project recommended in SMTC's James Street Road Diet report (i.e., Alternative 2). Report available on the SMTC website at: http://www.smtcmpo.org/finalreps.asp?fy=2011&ShowAll=0. Synchro and/or VISSUM files are available and would contain detailed information perhaps not noted in the final report.

- Closure of Taylor St (between Clinton & Salina)
- Conversion of downtown streets to 2 way

Draft final report and all associated Synchro files have been transmitted to NYSDOT. Technical Memorandum 2 of the draft final report contains tables of "typical" sections for each proposed two-way street (number of lanes/widths). Preferred streets are:

- *Clinton St – Herald Pl to Adams St*
- *Warren St – Willow St to Washington St*
- *Montgomery St – Erie Blvd to Adams St*
- *Jefferson St – Montgomery St to State St*

City of Syracuse – By 2040

- Roundabouts at:
  - W Onondaga / Salina / Harrison
  - Clinton / W Onondaga

- Erie Boulevard East being reduced to a 2 or 4 lane cross section.

APPENDIX C:
ARTERIAL TRAFFIC VOLUME COMPARISON – AM PEAK PERIOD

Table C-1: Arterial Traffic Volume Comparison – AM Pre-Peak

Route	Segment	Dir	Travel Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
West St	Genesee St and Erie Blvd	NB	787	713	-74	-9%	2.7
		SB	1433	1362	-72	-5%	1.9
	Erie Blvd and Fayette St	NB	510	468	-41	-8%	1.9
		SB	1243	1175	-68	-5%	1.9
	Fayette St and Gifford St	NB	401	387	-14	-4%	0.7
		SB	829	791	-38	-5%	1.3
	Gifford St and Seymour St	NB	336	322	-14	-4%	0.8
		SB	826	788	-38	-5%	1.3
	South of Seymour St	NB	355	291	-64	-18%	3.5
		SB	766	653	-113	-15%	4.2
Clinton St	North of James St	SB	482	488	6	1%	0.3
	James St and Erie Blvd	SB	653	620	-33	-5%	1.3
	Erie Blvd and Fayette St	SB	624	596	-29	-5%	1.2
	Fayette St and Harrison St	SB	530	484	-46	-9%	2.1
	Harrison St and Adams St	SB	187	179	-8	-4%	0.6
	South of Adams St	SB	87	93	6	7%	0.6
Salina St	North of James St	NB	163	163	0	0%	0.0
		SB	677	684	7	1%	0.3
	James St and Erie Blvd	NB	199	213	14	7%	1.0
		SB	435	415	-20	-5%	1.0
	Erie Blvd and Fayette St	NB	232	264	32	14%	2.0
		SB	314	314	1	0%	0.0
	Fayette St and Harrison St	NB	297	312	15	5%	0.9
		SB	274	308	34	12%	2.0
	Harrison St and Adams St	NB	239	272	33	14%	2.1
		SB	279	334	55	20%	3.2
	South of Adams St	NB	352	365	13	4%	0.7
		SB	256	252	-4	-1%	0.2
State St	North of James St	NB	301	295	-6	-2%	0.3
		SB	375	335	-40	-11%	2.1
	James St and Erie Blvd	NB	167	155	-12	-7%	1.0
		SB	426	383	-43	-10%	2.1
	Erie Blvd and Fayette St	NB	213	211	-1	-1%	0.1
		SB	474	436	-38	-8%	1.8
	Fayette St and Harrison St	NB	117	128	11	9%	1.0
		SB	395	350	-45	-11%	2.3
	Harrison St and Adams St	NB	102	119	17	17%	1.7
		SB	206	196	-11	-5%	0.8
	South of Adams St	NB	180	180	0	0%	0.0
		SB	105	100	-5	-5%	0.5
Townsend St	North of James St	NB	173	167	-7	-4%	0.5
		SB	136	127	-8	-6%	0.7
	James St and Erie Blvd	NB	64	56	-8	-12%	1.0
		SB	173	157	-16	-9%	1.3
	Erie Blvd and Fayette St	NB	139	140	2	1%	0.1
		SB	816	683	-134	-16%	4.9
	Fayette St and Harrison St	NB	388	347	-40	-10%	2.1
		SB	752	730	-22	-3%	0.8
	Harrison St and Adams St	NB	168	146	-22	-13%	1.7
		SB	402	356	-46	-11%	2.3
	South of Adams St	NB	84	79	-5	-6%	0.5
		SB	198	171	-27	-14%	2.0
Almond St	North of James St	NB	85	86	1	1%	0.1
		SB	104	103	-1	-1%	0.1
	James St and Erie Blvd	NB	151	148	-3	-2%	0.3
		SB	169	169	-1	0%	0.0
	Erie Blvd and Fayette St	NB	232	218	-14	-6%	0.9
		SB	228	195	-32	-14%	2.2
	Fayette St and Harrison St	NB	552	519	-33	-6%	1.4
		SB	1164	1071	-93	-8%	2.8
	Harrison St and Adams St	NB	1103	1012	-91	-8%	2.8
		SB	1173	1064	-108	-9%	3.2
	South of Adams St	NB	121	121	-1	-1%	0.1
		SB	370	360	-10	-3%	0.5
Irving Ave	Fayette and Genesee St	NB	87	76	-11	-13%	1.3

		SB	299	236	-63	-21%	3.8
	Genesee St and Harrison St	NB	95	88	-7	-7%	0.7
		SB	459	434	-24	-5%	1.1
	Harrison St and Adams St	NB	251	232	-19	-7%	1.2
		SB	268	248	-20	-7%	1.2
	South of Adams St	NB	209	195	-14	-7%	1.0
		SB	701	589	-112	-16%	4.4
Crouse Ave	North of Erie Blvd	NB	173	159	-13	-8%	1.0
		SB	188	187	-2	-1%	0.1
	Erie Blvd and Fayette St	NB	87	83	-5	-6%	0.5
		SB	183	181	-2	-1%	0.2
	Fayette and Genesee St	NB	76	67	-9	-12%	1.1
		SB	58	56	-3	-4%	0.3
	Genesee St and Harrison	NB	129	118	-11	-9%	1.0
	Harrison St and Adams St	NB	281	216	-66	-23%	4.2
	South of Adams St	NB	267	249	-18	-7%	1.1
University Ave	North of Erie Blvd	NB	61	54	-7	-12%	1.0
		SB	158	158	1	0%	0.0
	Erie Blvd and Fayette St	NB	22	17	-5	-21%	1.0
		SB	190	189	-1	0%	0.0
	Fayette and Genesee St	NB	32	29	-4	-11%	0.7
		SB	218	222	3	1%	0.2
	Genesee St and Harrison St	NB	61	57	-5	-8%	0.6
		SB	342	331	-11	-3%	0.6
	Harrison St and Adams St	NB	71	66	-5	-7%	0.6
		SB	210	196	-14	-7%	1.0
	South of Adams St	NB	41	38	-3	-8%	0.5
		SB	288	268	-20	-7%	1.2
Comstock Ave	Genesee St and Harrison St	NB	227	215	-12	-5%	0.8
		SB	128	113	-15	-12%	1.4
	Harrison St and Adams St	NB	250	237	-13	-5%	0.8
	South of Adams St	NB	232	213	-18	-8%	1.2

Table C-2: Arterial Traffic Volume Comparison – AM Peak Hour

Route	Segment	Dir	Travel Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
West St	Genesee St and Erie Blvd	NB	999	954	-45	-4%	1.4
		SB	1819	1757	-62	-3%	1.5
	Erie Blvd and Fayette St	NB	647	626	-21	-3%	0.8
		SB	1577	1522	-55	-3%	1.4
	Fayette St and Gifford St	NB	509	509	0	0%	0.0
		SB	1052	1034	-18	-2%	0.5
	Gifford St and Seymour St	NB	426	426	0	0%	0.0
		SB	1048	1040	-8	-1%	0.2
	South of Seymour St	NB	450	377	-73	-16%	3.6
		SB	972	867	-105	-11%	3.5
Clinton St	North of James St	SB	612	582	-30	-5%	1.2
	James St and Erie Blvd	SB	829	776	-53	-6%	1.9
	Erie Blvd and Fayette St	SB	792	751	-41	-5%	1.5
	Fayette St and Harrison St	SB	673	632	-41	-6%	1.6
	Harrison St and Adams St	SB	237	231	-6	-3%	0.4
	South of Adams St	SB	110	113	3	3%	0.3
Salina St	North of James St	NB	207	205	-2	-1%	0.1
		SB	859	845	-14	-2%	0.5
	James St and Erie Blvd	NB	252	253	1	0%	0.1
		SB	552	525	-27	-5%	1.2
	Erie Blvd and Fayette St	NB	295	314	19	6%	1.1
		SB	398	399	1	0%	0.1
	Fayette St and Harrison St	NB	377	396	19	5%	1.0
		SB	348	365	17	5%	0.9
	Harrison St and Adams St	NB	303	309	6	2%	0.3
		SB	354	386	32	9%	1.7
	South of Adams St	NB	447	444	-3	-1%	0.2
		SB	325	320	-5	-2%	0.3
State St	North of James St	NB	382	391	9	2%	0.5

		SB	476	435	-41	-9%	1.9
	James St and Erie Blvd	NB	212	215	3	1%	0.2
		SB	541	514	-27	-5%	1.2
	Erie Blvd and Fayette St	NB	270	277	7	3%	0.4
		SB	602	581	-21	-3%	0.9
	Fayette St and Harrison St	NB	149	156	7	5%	0.6
		SB	501	466	-35	-7%	1.6
	Harrison St and Adams St	NB	129	141	12	10%	1.1
		SB	262	259	-3	-1%	0.2
	South of Adams St	NB	228	234	6	3%	0.4
		SB	133	132	-1	0%	0.1
Townsend St	North of James St	NB	220	209	-11	-5%	0.8
		SB	172	163	-9	-5%	0.7
	James St and Erie Blvd	NB	81	66	-15	-19%	1.8
		SB	220	203	-17	-8%	1.2
	Erie Blvd and Fayette St	NB	176	162	-14	-8%	1.1
		SB	1036	887	-149	-14%	4.8
	Fayette St and Harrison St	NB	492	453	-39	-8%	1.8
		SB	954	931	-23	-2%	0.7
	Harrison St and Adams St	NB	213	194	-19	-9%	1.3
		SB	510	487	-23	-5%	1.0
	South of Adams St	NB	107	104	-3	-3%	0.3
		SB	251	243	-8	-3%	0.5
Almond St	North of James St	NB	108	102	-6	-6%	0.6
		SB	132	131	-1	-1%	0.1
	James St and Erie Blvd	NB	192	189	-3	-2%	0.2
		SB	215	214	-1	-1%	0.1
	Erie Blvd and Fayette St	NB	295	280	-15	-5%	0.9
		SB	289	249	-40	-14%	2.4
	Fayette St and Harrison St	NB	700	664	-36	-5%	1.4
		SB	1477	1348	-129	-9%	3.4
	Harrison St and Adams St	NB	1400	1306	-94	-7%	2.5
		SB	1488	1344	-144	-10%	3.8
	South of Adams St	NB	154	154	0	0%	0.0
		SB	469	435	-34	-7%	1.6
Irving Ave	Fayette and Genesee St	NB	111	111	0	0%	0.0
		SB	379	305	-74	-20%	4.0
	Genesee St and Harrison St	NB	121	121	0	0%	0.0
		SB	582	573	-9	-2%	0.4
	Harrison St and Adams St	NB	318	299	-19	-6%	1.1
		SB	340	335	-5	-1%	0.3
	South of Adams St	NB	265	263	-2	-1%	0.1
		SB	889	781	-108	-12%	3.7
Crouse Ave	North of Erie Blvd	NB	219	210	-9	-4%	0.6
		SB	239	235	-4	-2%	0.3
	Erie Blvd and Fayette St	NB	111	106	-5	-4%	0.5
		SB	232	228	-4	-2%	0.3
	Fayette and Genesee St	NB	97	85	-12	-13%	1.3
		SB	74	74	0	-1%	0.0
	Genesee St and Harrison	NB	164	152	-12	-8%	1.0
	Harrison St and Adams St	NB	357	273	-84	-24%	4.7
	South of Adams St	NB	339	322	-17	-5%	0.9
University Ave	North of Erie Blvd	NB	78	75	-3	-4%	0.3
		SB	200	199	-1	-1%	0.1
	Erie Blvd and Fayette St	NB	28	26	-2	-6%	0.3
		SB	241	233	-8	-3%	0.5
	Fayette and Genesee St	NB	41	40	-1	-3%	0.2
		SB	277	269	-8	-3%	0.5
	Genesee St and Harrison St	NB	78	76	-2	-2%	0.2
		SB	434	417	-17	-4%	0.8
	Harrison St and Adams St	NB	90	83	-7	-8%	0.7
		SB	267	256	-11	-4%	0.7
	South of Adams St	NB	52	50	-2	-5%	0.4
		SB	366	345	-21	-6%	1.1
Comstock Ave	Genesee St and Harrison St	NB	288	278	-10	-3%	0.6
		SB	162	153	-9	-5%	0.7
	Harrison St and Adams St	NB	317	302	-15	-5%	0.9
	South of Adams St	NB	294	279	-15	-5%	0.9

Table C-3: Arterial Traffic Volume Comparison – AM Post-Peak

Route	Segment	Dir	Travel Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
West St	Genesee St and Erie Blvd	NB	832	817	-15	-2%	0.5
		SB	1515	1552	37	2%	0.9
	Erie Blvd and Fayette St	NB	539	516	-23	-4%	1.0
		SB	1314	1352	39	3%	1.1
	Fayette St and Gifford St	NB	424	436	12	3%	0.6
		SB	876	937	61	7%	2.0
	Gifford St and Seymour St	NB	355	360	5	1%	0.3
		SB	873	935	62	7%	2.1
	South of Seymour St	NB	375	322	-53	-14%	2.8
		SB	810	791	-19	-2%	0.7
Clinton St	North of James St	SB	510	537	27	5%	1.2
	James St and Erie Blvd	SB	690	728	37	5%	1.4
	Erie Blvd and Fayette St	SB	660	707	47	7%	1.8
	Fayette St and Harrison St	SB	561	580	19	3%	0.8
	Harrison St and Adams St	SB	197	216	18	9%	1.3
	South of Adams St	SB	92	103	11	12%	1.1
Salina St	North of James St	NB	172	177	4	3%	0.3
		SB	715	765	49	7%	1.8
	James St and Erie Blvd	NB	210	202	-7	-4%	0.5
		SB	460	475	15	3%	0.7
	Erie Blvd and Fayette St	NB	246	232	-14	-6%	0.9
		SB	332	350	19	6%	1.0
	Fayette St and Harrison St	NB	314	298	-16	-5%	0.9
		SB	290	305	15	5%	0.9
	Harrison St and Adams St	NB	252	252	0	0%	0.0
		SB	295	298	3	1%	0.2
	South of Adams St	NB	372	377	4	1%	0.2
		SB	271	283	12	5%	0.7
State St	North of James St	NB	318	350	31	10%	1.7
		SB	396	372	-25	-6%	1.3
	James St and Erie Blvd	NB	177	204	27	15%	2.0
		SB	451	445	-6	-1%	0.3
	Erie Blvd and Fayette St	NB	225	245	20	9%	1.3
		SB	501	517	16	3%	0.7
	Fayette St and Harrison St	NB	124	142	18	14%	1.5
		SB	417	403	-14	-3%	0.7
	Harrison St and Adams St	NB	107	124	16	15%	1.5
		SB	218	225	6	3%	0.4
	South of Adams St	NB	190	200	10	5%	0.7
		SB	111	118	7	6%	0.6
Townsend St	North of James St	NB	183	196	13	7%	0.9
		SB	143	135	-8	-6%	0.7
	James St and Erie Blvd	NB	67	58	-9	-14%	1.2
		SB	183	180	-3	-2%	0.2
	Erie Blvd and Fayette St	NB	147	142	-4	-3%	0.4
		SB	863	746	-117	-14%	4.1
	Fayette St and Harrison St	NB	410	418	8	2%	0.4
		SB	795	797	2	0%	0.1
	Harrison St and Adams St	NB	177	173	-4	-2%	0.3
		SB	425	420	-4	-1%	0.2
	South of Adams St	NB	89	83	-6	-7%	0.6
		SB	209	202	-7	-3%	0.5
Almond St	North of James St	NB	90	88	-2	-3%	0.3
		SB	110	110	0	0%	0.0
	James St and Erie Blvd	NB	160	171	11	7%	0.9
		SB	179	183	4	2%	0.3
	Erie Blvd and Fayette St	NB	246	245	-1	0%	0.0
		SB	241	208	-33	-14%	2.2
	Fayette St and Harrison St	NB	583	594	11	2%	0.4
		SB	1230	1280	50	4%	1.4
	Harrison St and Adams St	NB	1166	1137	-29	-3%	0.9

		SB	1239	1284	45	4%	1.3
	South of Adams St	NB	128	133	5	4%	0.5
		SB	391	415	25	6%	1.2
Irving Ave	Fayette and Genesee St	NB	92	98	5	6%	0.5
		SB	316	273	-43	-14%	2.5
	Genesee St and Harrison St	NB	101	106	5	5%	0.5
		SB	485	510	25	5%	1.1
	Harrison St and Adams St	NB	265	267	2	1%	0.1
		SB	283	307	24	8%	1.4
	South of Adams St	NB	221	236	15	7%	1.0
		SB	740	719	-21	-3%	0.8
Crouse Ave	North of Erie Blvd	NB	182	194	11	6%	0.8
		SB	199	201	2	1%	0.1
	Erie Blvd and Fayette St	NB	92	94	2	2%	0.2
		SB	193	198	5	2%	0.3
	Fayette and Genesee St	NB	81	80	-1	-1%	0.1
		SB	62	61	-1	-1%	0.1
	Genesee St and Harrison	NB	137	140	4	3%	0.3
	Harrison St and Adams St	NB	297	249	-48	-16%	2.9
	South of Adams St	NB	282	293	10	4%	0.6
University Ave	North of Erie Blvd	NB	65	63	-2	-2%	0.2
		SB	167	166	-1	-1%	0.1
	Erie Blvd and Fayette St	NB	23	26	3	12%	0.6
		SB	201	199	-2	-1%	0.1
	Fayette and Genesee St	NB	34	33	-2	-5%	0.3
		SB	231	228	-2	-1%	0.2
	Genesee St and Harrison St	NB	65	63	-2	-4%	0.3
		SB	361	370	9	2%	0.5
	Harrison St and Adams St	NB	75	68	-7	-10%	0.9
		SB	222	236	14	6%	0.9
	South of Adams St	NB	43	42	-1	-3%	0.2
		SB	305	313	8	3%	0.5
Comstock Ave	Genesee St and Harrison St	NB	240	240	0	0%	0.0
		SB	135	132	-3	-2%	0.3
	Harrison St and Adams St	NB	264	258	-7	-2%	0.4
	South of Adams St	NB	245	240	-5	-2%	0.3

APPENDIX D:
ARTERIAL TRAFFIC VOLUME COMPARISON – PM PEAK PERIOD

Table D-1: Arterial Traffic Volume Comparison – PM Pre-Peak

Route	Segment	Dir	Travel Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
West St	Genesee St and Erie Blvd	NB	1579	1725	145	9%	3.6
		SB	1324	1537	213	16%	5.6
	Erie Blvd and Fayette St	NB	950	1040	89	9%	2.8
		SB	1234	1415	181	15%	5.0
	Fayette St and Gifford St	NB	627	707	79	13%	3.1
		SB	568	663	95	17%	3.8
	Gifford St and Seymour St	NB	456	513	56	12%	2.6
		SB	597	699	102	17%	4.0
	South of Seymour St	NB	349	342	-7	-2%	0.4
		SB	522	573	51	10%	2.2
Clinton St	North of James St	SB	224	269	45	20%	2.9
	James St and Erie Blvd	SB	438	499	60	14%	2.8
	Erie Blvd and Fayette St	SB	279	329	50	18%	2.9
	Fayette St and Harrison St	SB	285	313	28	10%	1.6
	Harrison St and Adams St	SB	263	197	-66	-25%	4.4
	South of Adams St	SB	172	148	-23	-14%	1.9
Salina St	North of James St	NB	295	333	39	13%	2.2
		SB	289	366	77	27%	4.2
	James St and Erie Blvd	NB	355	393	39	11%	2.0
		SB	273	329	57	21%	3.3
	Erie Blvd and Fayette St	NB	384	413	29	8%	1.5
		SB	258	314	56	22%	3.3
	Fayette St and Harrison St	NB	392	427	35	9%	1.7
		SB	229	295	65	28%	4.0
	Harrison St and Adams St	NB	237	275	37	16%	2.3
		SB	296	389	93	32%	5.1
	South of Adams St	NB	377	440	63	17%	3.1
		SB	286	330	44	15%	2.5
State St	North of James St	NB	742	835	93	13%	3.3
		SB	231	249	18	8%	1.2
	James St and Erie Blvd	NB	589	683	94	16%	3.7
		SB	239	272	33	14%	2.1
	Erie Blvd and Fayette St	NB	384	453	69	18%	3.4
		SB	183	206	23	13%	1.7
	Fayette St and Harrison St	NB	177	216	40	22%	2.8
		SB	273	301	28	10%	1.7
	Harrison St and Adams St	NB	125	159	34	27%	2.9
		SB	247	285	39	16%	2.4
	South of Adams St	NB	162	191	28	17%	2.1
		SB	112	135	23	21%	2.1
Townsend St	North of James St	NB	224	253	29	13%	1.9
		SB	195	221	26	13%	1.8
	James St and Erie Blvd	NB	157	164	7	4%	0.5
		SB	199	219	19	10%	1.3
	Erie Blvd and Fayette St	NB	370	415	46	12%	2.3
		SB	368	371	3	1%	0.1
	Fayette St and Harrison St	NB	330	371	41	12%	2.2
		SB	347	379	33	9%	1.7
	Harrison St and Adams St	NB	240	259	18	8%	1.2
		SB	340	361	22	6%	1.2
	South of Adams St	NB	177	204	27	15%	2.0
		SB	116	113	-3	-3%	0.3
Almond St	North of James St	NB	180	213	32	18%	2.3
		SB	135	158	24	18%	2.0
	James St and Erie Blvd	NB	216	260	44	20%	2.8
		SB	211	249	38	18%	2.5
	Erie Blvd and Fayette St	NB	299	348	49	16%	2.7
		SB	241	236	-5	-2%	0.3
	Fayette St and Harrison St	NB	397	464	67	17%	3.2
		SB	756	851	96	13%	3.4
	Harrison St and Adams St	NB	1622	1689	67	4%	1.6
		SB	916	1029	113	12%	3.6
	South of Adams St	NB	347	406	60	17%	3.1
		SB	203	240	37	19%	2.5
Irving Ave	Fayette and Genesee St	NB	111	127	15	14%	1.4

		SB	95	113	18	19%	1.8
	Genesee St and Harrison St	NB	206	242	36	17%	2.4
		SB	273	315	42	15%	2.4
	Harrison St and Adams St	NB	478	544	66	14%	2.9
		SB	121	131	11	9%	0.9
	South of Adams St	NB	444	520	76	17%	3.5
		SB	325	355	29	9%	1.6
Crouse Ave	North of Erie Blvd	NB	190	205	15	8%	1.1
		SB	183	216	34	18%	2.4
	Erie Blvd and Fayette St	NB	225	245	20	9%	1.3
		SB	164	183	19	11%	1.4
	Fayette and Genesee St	NB	160	170	10	6%	0.8
		SB	79	95	16	20%	1.7
	Genesee St and Harrison	NB	264	286	22	8%	1.3
	Harrison St and Adams St	NB	403	385	-19	-5%	0.9
	South of Adams St	NB	335	387	52	16%	2.7
University Ave	North of Erie Blvd	NB	44	49	5	11%	0.7
		SB	101	118	17	17%	1.6
	Erie Blvd and Fayette St	NB	64	76	12	18%	1.4
		SB	98	115	17	17%	1.7
	Fayette and Genesee St	NB	76	94	18	24%	2.0
		SB	143	162	20	14%	1.6
	Genesee St and Harrison St	NB	105	128	23	22%	2.2
		SB	171	193	22	13%	1.6
	Harrison St and Adams St	NB	229	257	28	12%	1.8
		SB	122	145	22	18%	1.9
	South of Adams St	NB	72	81	9	12%	1.0
		SB	188	220	31	17%	2.2
Comstock Ave	Genesee St and Harrison St	NB	240	266	26	11%	1.6
		SB	53	58	6	11%	0.8
	Harrison St and Adams St	NB	405	437	31	8%	1.5
	South of Adams St	NB	193	216	23	12%	1.6

Table D-2: Arterial Traffic Volume Comparison – PM Peak Hour

Route	Segment	Dir	Travel Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
West St	Genesee St and Erie Blvd	NB	2004	1855	-149	-7%	3.4
		SB	1680	1603	-77	-5%	1.9
	Erie Blvd and Fayette St	NB	1206	1112	-94	-8%	2.8
		SB	1566	1476	-90	-6%	2.3
	Fayette St and Gifford St	NB	796	769	-27	-3%	1.0
		SB	721	700	-21	-3%	0.8
	Gifford St and Seymour St	NB	579	555	-24	-4%	1.0
		SB	757	736	-21	-3%	0.8
	South of Seymour St	NB	443	360	-83	-19%	4.2
		SB	663	613	-50	-8%	2.0
Clinton St	North of James St	SB	284	281	-3	-1%	0.2
	James St and Erie Blvd	SB	556	513	-43	-8%	1.8
	Erie Blvd and Fayette St	SB	354	341	-13	-4%	0.7
	Fayette St and Harrison St	SB	362	340	-22	-6%	1.2
	Harrison St and Adams St	SB	334	206	-128	-38%	7.8
	South of Adams St	SB	218	155	-63	-29%	4.6
Salina St	North of James St	NB	374	336	-38	-10%	2.0
		SB	367	364	-3	-1%	0.2
	James St and Erie Blvd	NB	450	401	-49	-11%	2.4
		SB	346	327	-19	-5%	1.0
	Erie Blvd and Fayette St	NB	487	450	-37	-8%	1.7
		SB	328	320	-8	-2%	0.5
	Fayette St and Harrison St	NB	498	455	-43	-9%	1.9
		SB	291	303	12	4%	0.7
	Harrison St and Adams St	NB	301	282	-19	-6%	1.1
		SB	375	394	19	5%	1.0
	South of Adams St	NB	478	459	-19	-4%	0.9
		SB	363	341	-22	-6%	1.2

State St	North of James St	NB	941	903	-38	-4%	1.3
		SB	293	278	-15	-5%	0.9
	James St and Erie Blvd	NB	747	731	-16	-2%	0.6
		SB	303	297	-6	-2%	0.3
	Erie Blvd and Fayette St	NB	487	478	-9	-2%	0.4
		SB	232	224	-8	-4%	0.6
	Fayette St and Harrison St	NB	224	222	-2	-1%	0.2
		SB	346	326	-20	-6%	1.1
	Harrison St and Adams St	NB	159	167	8	5%	0.6
		SB	313	303	-10	-3%	0.6
	South of Adams St	NB	206	207	1	1%	0.1
		SB	142	140	-2	-1%	0.2
Townsend St	North of James St	NB	284	278	-6	-2%	0.3
		SB	247	235	-12	-5%	0.8
	James St and Erie Blvd	NB	199	173	-26	-13%	1.9
		SB	253	239	-14	-6%	0.9
	Erie Blvd and Fayette St	NB	469	438	-31	-7%	1.4
		SB	467	396	-71	-15%	3.4
	Fayette St and Harrison St	NB	419	387	-32	-8%	1.6
		SB	440	422	-18	-4%	0.9
	Harrison St and Adams St	NB	305	280	-25	-8%	1.4
		SB	431	398	-33	-8%	1.6
	South of Adams St	NB	225	219	-6	-3%	0.4
		SB	147	140	-7	-5%	0.6
Almond St	North of James St	NB	229	220	-9	-4%	0.6
		SB	171	168	-4	-2%	0.3
	James St and Erie Blvd	NB	274	265	-9	-3%	0.5
		SB	268	262	-6	-2%	0.4
	Erie Blvd and Fayette St	NB	380	358	-22	-6%	1.2
		SB	306	254	-52	-17%	3.1
	Fayette St and Harrison St	NB	504	483	-21	-4%	1.0
		SB	959	906	-53	-5%	1.7
	Harrison St and Adams St	NB	2058	1817	-241	-12%	5.5
		SB	1162	1080	-82	-7%	2.4
	South of Adams St	NB	440	434	-6	-1%	0.3
		SB	257	258	1	0%	0.0
Irving Ave	Fayette and Genesee St	NB	141	142	1	0%	0.1
		SB	120	107	-13	-11%	1.2
	Genesee St and Harrison St	NB	261	258	-3	-1%	0.2
		SB	347	337	-10	-3%	0.5
	Harrison St and Adams St	NB	606	575	-31	-5%	1.3
		SB	153	155	2	1%	0.1
	South of Adams St	NB	563	554	-9	-2%	0.4
		SB	413	386	-27	-7%	1.3
Crouse Ave	North of Erie Blvd	NB	241	230	-11	-5%	0.7
		SB	232	227	-5	-2%	0.3
	Erie Blvd and Fayette St	NB	286	273	-13	-5%	0.8
		SB	208	196	-12	-6%	0.8
	Fayette and Genesee St	NB	203	184	-19	-10%	1.4
		SB	100	99	-1	-1%	0.1
	Genesee St and Harrison	NB	335	317	-18	-5%	1.0
	Harrison St and Adams St	NB	512	415	-97	-19%	4.5
	South of Adams St	NB	425	409	-16	-4%	0.8
University Ave	North of Erie Blvd	NB	56	55	-1	-2%	0.1
		SB	128	126	-2	-2%	0.2
	Erie Blvd and Fayette St	NB	81	77	-4	-4%	0.4
		SB	124	122	-2	-2%	0.2
	Fayette and Genesee St	NB	96	93	-3	-3%	0.3
		SB	181	176	-5	-3%	0.4
	Genesee St and Harrison St	NB	133	129	-4	-3%	0.4
		SB	217	212	-5	-2%	0.4
	Harrison St and Adams St	NB	290	266	-24	-8%	1.5
		SB	155	148	-7	-5%	0.6
	South of Adams St	NB	92	87	-5	-6%	0.6
		SB	239	232	-7	-3%	0.5
Comstock Ave	Genesee St and Harrison St	NB	305	294	-11	-4%	0.6
		SB	67	64	-3	-5%	0.4
	Harrison St and Adams St	NB	514	478	-36	-7%	1.6
	South of Adams St	NB	245	238	-7	-3%	0.4

Table D-3: Arterial Traffic Volume Comparison – PM Post-Peak

Route	Segment	Dir	Travel Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
West St	Genesee St and Erie Blvd	NB	1669	1617	-52	-3%	1.3
		SB	1399	1425	25	2%	0.7
	Erie Blvd and Fayette St	NB	1004	950	-55	-5%	1.7
		SB	1304	1321	17	1%	0.5
	Fayette St and Gifford St	NB	663	628	-35	-5%	1.4
		SB	601	643	42	7%	1.7
	Gifford St and Seymour St	NB	482	450	-32	-7%	1.5
		SB	631	671	40	6%	1.6
	South of Seymour St	NB	369	303	-66	-18%	3.6
		SB	552	560	8	1%	0.3
Clinton St	North of James St	SB	237	245	8	4%	0.5
	James St and Erie Blvd	SB	463	439	-24	-5%	1.1
	Erie Blvd and Fayette St	SB	295	285	-9	-3%	0.6
	Fayette St and Harrison St	SB	302	294	-7	-2%	0.4
	Harrison St and Adams St	SB	278	176	-102	-37%	6.8
	South of Adams St	SB	182	136	-46	-25%	3.7
Salina St	North of James St	NB	312	295	-17	-5%	1.0
		SB	306	305	0	0%	0.0
	James St and Erie Blvd	NB	375	342	-33	-9%	1.7
		SB	288	286	-2	-1%	0.1
	Erie Blvd and Fayette St	NB	406	379	-26	-7%	1.3
		SB	273	272	-1	0%	0.1
	Fayette St and Harrison St	NB	415	391	-23	-6%	1.2
		SB	242	251	8	3%	0.5
	Harrison St and Adams St	NB	251	243	-8	-3%	0.5
		SB	312	298	-15	-5%	0.8
	South of Adams St	NB	398	384	-14	-4%	0.7
		SB	302	290	-12	-4%	0.7
State St	North of James St	NB	784	784	0	0%	0.0
		SB	244	227	-17	-7%	1.1
	James St and Erie Blvd	NB	622	623	1	0%	0.0
		SB	252	235	-17	-7%	1.1
	Erie Blvd and Fayette St	NB	406	402	-3	-1%	0.2
		SB	193	185	-8	-4%	0.6
	Fayette St and Harrison St	NB	187	205	19	10%	1.3
		SB	288	246	-42	-15%	2.6
	Harrison St and Adams St	NB	132	146	13	10%	1.1
		SB	261	254	-7	-3%	0.4
	South of Adams St	NB	172	177	6	3%	0.4
		SB	118	115	-3	-2%	0.3
Townsend St	North of James St	NB	237	236	0	0%	0.0
		SB	206	204	-1	-1%	0.1
	James St and Erie Blvd	NB	166	134	-32	-19%	2.6
		SB	211	210	-1	0%	0.0
	Erie Blvd and Fayette St	NB	391	371	-20	-5%	1.0
		SB	389	331	-58	-15%	3.1
	Fayette St and Harrison St	NB	349	322	-27	-8%	1.5
		SB	366	357	-9	-3%	0.5
	Harrison St and Adams St	NB	254	232	-22	-9%	1.4
		SB	359	344	-15	-4%	0.8
	South of Adams St	NB	187	176	-12	-6%	0.9
		SB	122	116	-6	-5%	0.6
Almond St	North of James St	NB	191	183	-8	-4%	0.6
		SB	142	136	-6	-5%	0.6
	James St and Erie Blvd	NB	228	245	17	7%	1.1
		SB	223	217	-6	-3%	0.4
	Erie Blvd and Fayette St	NB	317	311	-5	-2%	0.3
		SB	255	216	-39	-15%	2.5
	Fayette St and Harrison St	NB	420	400	-20	-5%	1.0
		SB	799	797	-2	0%	0.1
	Harrison St and Adams St	NB	1714	1555	-159	-9%	3.9
		SB	968	966	-1	0%	0.0
	South of Adams St	NB	366	359	-8	-2%	0.4
		SB	214	214	0	0%	0.0

Irving Ave	Fayette and Genesee St	NB	117	137	20	17%	1.7
		SB	100	91	-9	-9%	0.9
	Genesee St and Harrison St	NB	217	223	6	3%	0.4
		SB	289	292	3	1%	0.2
	Harrison St and Adams St	NB	505	478	-27	-5%	1.2
		SB	127	127	0	0%	0.0
	South of Adams St	NB	469	452	-17	-4%	0.8
		SB	344	359	15	4%	0.8
Crouse Ave	North of Erie Blvd	NB	201	198	-3	-1%	0.2
		SB	193	187	-6	-3%	0.4
	Erie Blvd and Fayette St	NB	238	248	9	4%	0.6
		SB	173	169	-4	-2%	0.3
	Fayette and Genesee St	NB	169	163	-6	-3%	0.5
		SB	83	85	2	2%	0.2
	Genesee St and Harrison	NB	279	281	2	1%	0.1
	Harrison St and Adams St	NB	426	365	-62	-14%	3.1
	South of Adams St	NB	354	356	2	1%	0.1
University Ave	North of Erie Blvd	NB	47	48	1	2%	0.2
		SB	107	102	-5	-4%	0.5
	Erie Blvd and Fayette St	NB	67	61	-7	-10%	0.8
		SB	103	99	-4	-4%	0.4
	Fayette and Genesee St	NB	80	70	-10	-12%	1.1
		SB	151	143	-8	-5%	0.6
	Genesee St and Harrison St	NB	111	105	-6	-5%	0.6
		SB	181	171	-10	-5%	0.7
	Harrison St and Adams St	NB	242	227	-14	-6%	0.9
		SB	129	126	-3	-3%	0.3
	South of Adams St	NB	77	77	1	1%	0.1
		SB	199	196	-3	-2%	0.2
Comstock Ave	Genesee St and Harrison St	NB	254	240	-14	-6%	0.9
		SB	56	58	2	3%	0.2
	Harrison St and Adams St	NB	428	419	-10	-2%	0.5
	South of Adams St	NB	204	204	0	0%	0.0

APPENDIX E: FREEWAY TRAFFIC VOLUME COMPARISON – AM PEAK PERIOD

Table E-1: Freeway Traffic Volume Comparison – AM Pre-Peak

Route	Segment	Direction	Traffic Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
I-81 Highway	Exit 16 onramp and Exit 16A	NB	900	935	35	3.9%	1.2
	Exit 16A off and onramps	NB	409	419	10	2.4%	0.5
	Exit 16A onramp and Exit 17	NB	1310	1243	-67	-5.1%	1.9
	Exit 17 off and onramps	NB	1243	1221	-22	-1.8%	0.6
	Exit 17 Brighten Ave onramp and Exit 17 Colvin St onramp	NB	1826	1781	-46	-2.5%	1.1
	Exit 17 onramp and Exit 18	NB	2262	2191	-71	-3.1%	1.5
	Exit 18 off and onramps	NB	1511	1480	-31	-2.1%	0.8
	Exit 18 onramp and I-690 East offramp	NB	2116	2023	-93	-4.4%	2.0
	I-690 EB on ramp and I-690 WB on ramp	NB	1361	1321	-40	-3.0%	1.1
	Exit 19 onramp and Exit 20 onramp	NB	744	725	-19	-2.5%	0.7
	WB, I-690 onramp and Salina St onramp	NB	1415	1255	-160	-11.3%	4.4
	Salina St onramp and Butternut St onramp	NB	1615	1560	-55	-3.4%	1.4
	Butternut St onramp and Genant Dr offramp	NB	1941	1844	-97	-5.0%	2.2
	Exit 22 off and onramps	NB	1740	1647	-93	-5.4%	2.3
	Exit 22 onramp and Exit 23 /Exits 24A and 24B	NB	1912	1812	-100	-5.2%	2.3
	Exit 23 off and onramps	NB	1186	1136	-51	-4.3%	1.5
	Exit 23 onramp and Exit 25	NB	1745	1676	-70	-4.0%	1.7
	Exit 25 off and onramps	NB	1410	1325	-85	-6.1%	2.3
	Exit 25 onramp and Exit 25A	NB	1553	1464	-89	-5.8%	2.3
	I-90 onramp and US 11 offramp	NB	1738	1665	-73	-4.2%	1.8
	Exit 25A off and onramps	NB	1332	1259	-72	-5.4%	2.0
	Exit 25A onramp and Exit 26	NB	1738	1665	-73	-4.2%	1.8
	Exit 26 and Exits 27-28	NB	1211	1137	-74	-6.1%	2.2
	Exit 27-28 and Exit 27 onramp	NB	792	747	-45	-5.7%	1.6
	Exit 27 onramp and Exit 28 onramp	NB	1117	1068	-48	-4.3%	1.5
	Airport Blvd onramp and E Taft Rd onramp	NB	1117	1068	-49	-4.4%	1.5
	Exit 28 onramp and Exit 29S	NB	1393	1342	-52	-3.7%	1.4
	Exit 29S and Exit 29N onramp	NB	1297	1257	-40	-3.1%	1.1
	Exit 29N on and offramps	NB	1360	1318	-42	-3.1%	1.1
	Exit 29N and Exit 29S onramp	NB	946	911	-34	-3.6%	1.1
	Exit 29S onramp and Exit 30	NB	1208	1139	-69	-5.7%	2.0
	Exit 30 onramp and Exit 29N	SB	2748	2750	2	0.1%	0.0
	Exit 29N and Exit 29S onramp	SB	2633	2629	-4	-0.1%	0.1
	Exit 29S and Exit 29N onramp	SB	2224	2217	-7	-0.3%	0.1
	Exit 29S on and offramps	SB	2794	2774	-20	-0.7%	0.4
	Exit 29N onramp and Exit 28	SB	3622	3590	-32	-0.9%	0.5
	Exit 28 and Exits 27-26	SB	3235	3212	-24	-0.7%	0.4
	Airport Blvd onramp and Airport Blvd offramp	SB	2766	2740	-25	-0.9%	0.5
	Exit 27 onramp and Exit 26 onramp	SB	3207	3175	-32	-1.0%	0.6
	NY 370 onramp and Old Liverpool Rd onramp	SB	3103	2975	-128	-4.1%	2.3
	Exit 26 onramp and Exit 25A	SB	3737	3699	-39	-1.0%	0.6
	Exit 25A off and onramps	SB	3426	3378	-47	-1.4%	0.8
	Exit 25 off and onramps	SB	3145	3041	-104	-3.3%	1.9
	Exit 25 onramp and Exits 23A and 23B and Exit 22	SB	3550	3470	-80	-2.3%	1.4
	Exit 25A onramp and Exit 25	SB	3737	3631	-105	-2.8%	1.7
	Exits 23A and 23B and Exit 22 and Old Liverpool Rd onramp	SB	2669	2611	-57	-2.1%	1.1
	Onondaga Lake Pkwy onramp and Exit 22 onramp	SB	3954	3793	-161	-4.1%	2.6
	Exit 21 off and onramps	SB	3988	3687	-301	-7.5%	4.9
	Exit 21 onramp and Exit 20	SB	4128	3708	-420	-10.2%	6.7
	Clinton St offramp and Butternut St offramp	SB	3517	3357	-160	-4.6%	2.7
	I-690 East off and onramps	SB	2339	2247	-91	-3.9%	1.9
	EB I-690 onramp and Adams St offramp	SB	2653	2387	-265	-10.0%	5.3
	Adams St offramp and Adams St onramp	SB	1656	1580	-76	-4.6%	1.9
	Exit 18 and I-690 West onramp	SB	1282	1227	-55	-4.3%	1.5
	I-690 West onramp and Exit 18 onramp	SB	1656	1580	-76	-4.6%	1.9
	Exit 18 and Exit 17	SB	1806	1714	-92	-5.1%	2.2
	Exit 17 off and onramps	SB	797	777	-20	-2.5%	0.7
	Exit 16A off and onramps	SB	853	816	-37	-4.4%	1.3
	Exit 17 onramp and Exit 16A offramp	SB	1105	1062	-43	-3.9%	1.3
	Exit 16A onramp and Exit 16 offramp	SB	1132	1095	-37	-3.3%	1.1
	I-481 Offramp	NB	491	516	24	4.9%	1.1
	I-481 onramp	NB	901	872	-29	-3.2%	1.0

	S. Salina St, Brighton Av offramp	NB	66	68	1	1.8%	0.1
	S. Salina St, Brighton Av onramp	NB	583	576	-7	-1.2%	0.3
	E Colvin St onramp	NB	436	432	-5	-1.1%	0.2
	Adams St, Harrison St offramp	NB	751	736	-14	-1.9%	0.5
	Adams St, Harrison St onramp	NB	606	552	-54	-8.8%	2.2
	EB I-690 offramp	NB	755	710	-45	-6.0%	1.7
	EB I-690 onramp	NB	989	895	-94	-9.5%	3.1
	WB I-690 offramp	NB	617	571	-46	-7.4%	1.9
	WB I-690 onramp	NB	671	662	-9	-1.4%	0.4
	Salina St onramp	NB	201	163	-38	-18.9%	2.8
	Butternut St onramp	NB	326	293	-33	-10.1%	1.9
	Genant Dr offramp	NB	201	197	-4	-1.9%	0.3
	Sunset St onramp	NB	173	172	-1	-0.5%	0.1
	Hiawatha offramp	NB	726	690	-36	-4.9%	1.3
	7th N St offramp	NB	335	327	-8	-2.5%	0.5
	7th N St onramp	NB	143	141	-2	-1.7%	0.2
	I-90 offramp	NB	221	213	-8	-3.7%	0.6
	I-90 onramp	NB	407	405	-2	-0.4%	0.1
	US 11 offramp	NB	527	517	-10	-1.8%	0.4
	Airport Blvd offramp	NB	419	388	-31	-7.4%	1.5
	Airport Blvd onramp	NB	325	322	-3	-0.8%	0.1
	E Taft Rd onramp	NB	277	275	-1	-0.5%	0.1
	EB I-481 offramp	NB	96	82	-15	-15.4%	1.6
	EB I-481 onramp	NB	63	59	-3	-5.3%	0.4
	WB I-481 offramp	NB	414	408	-6	-1.5%	0.3
	WB I-481 onramp	NB	262	260	-2	-0.9%	0.2
	I-481 Offramp	SB	252	241	-11	-4.4%	0.7
	I-481 onramp	SB	279	285	6	2.1%	0.4
	S. Salina St, Brighton Av offramp	SB	1009	925	-84	-8.4%	2.7
	S. Salina St, Brighton Av onramp	SB	309	282	-26	-8.5%	1.5
	Adams St, Harrison St offramp	SB	1370	1279	-91	-6.6%	2.5
	Adams St, Harrison St onramp	SB	151	132	-18	-12.2%	1.5
	WB I-690 onramp	SB	375	358	-17	-4.5%	0.9
	EB I-690 onramp	SB	989	895	-94	-9.5%	3.1
	EB I-690 offramp	SB	673	634	-39	-5.7%	1.5
	Clinton St offramp	SB	1178	1058	-120	-10.2%	3.6
	Butternut St offramp	SB	609	571	-38	-6.2%	1.6
	Genant Dr onramp	SB	141	136	-4	-3.2%	0.4
	Genant Dr offramp	SB	276	258	-18	-6.5%	1.1
	Genant Dr onramp	SB	313	278	-35	-11.2%	2.0
	NY 370 onramp	SB	852	774	-78	-9.2%	2.7
	Old Liverpool Rd onramp	SB	435	407	-28	-6.4%	1.4
	Onondaga Lake Pkwy off-ramp	SB	881	849	-33	-3.7%	1.1
	7th N St offramp	SB	592	598	6	0.9%	0.2
	7th N St onramp	SB	406	406	0	0.0%	0.0
	I-90 onramp	SB	311	308	-4	-1.1%	0.2
	I-90 offramp	SB	312	313	1	0.2%	0.0
	US 11 onramp	SB	530	529	-2	-0.3%	0.1
	Airport Blvd onramp	SB	441	439	-2	-0.5%	0.1
	Airport Blvd offramp	SB	470	447	-23	-4.9%	1.1
	E Taft Rd offramp	SB	387	379	-8	-2.0%	0.4
	EB I-481 onramp	SB	1398	1366	-33	-2.3%	0.9
	EB I-481 offramp	SB	570	549	-20	-3.6%	0.9
	WB I-481 onramp	SB	161	153	-8	-5.1%	0.7
	WB I-481 offramp	SB	115	111	-4	-3.5%	0.4
I-690 Highway	Exit 7 and Exit 8 onramp	EB	4746	4721	-25	-0.5%	0.4
	Willls Ave onramp and Hawthawa Blvd offramp	EB	4879	4850	-29	-0.6%	0.4
	Exit 8 and Exit 9	EB	4252	4239	-13	-0.3%	0.2
	Exit 9 and Exit 10 onramp	EB	3831	3814	-17	-0.4%	0.3
	Geddes St onramp and West St offramp	EB	4192	4150	-42	-1.0%	0.7
	West St offramp and West St onramp	EB	3043	2939	-104	-3.4%	1.9
	I-81 South off and onramps	EB	2221	2240	18	0.8%	0.4
	McBride onramp and I-81 onramp	EB	3303	3247	-56	-1.7%	1.0
	I-81 North onramp and Exit 14	EB	4260	4055	-205	-4.8%	3.2
	Exit 14 off and onramps	EB	3210	3167	-42	-1.3%	0.7
	Teal Ave onramp and S Midler Ave offramp	EB	3480	3444	-36	-1.0%	0.6
	Exit 15 off and onramps	EB	2505	2466	-39	-1.5%	0.8
	Exit 15 onramp and Exits 16S-N and Exit 17	EB	2678	2651	-26	-1.0%	0.5
	Exit 16S-N off and onramps	EB	1135	1128	-7	-0.6%	0.2

	Exit 16S-N onramp and Exit 17 onramp	EB	1276	1279	3	0.3%	0.1
	Bridge St onramp and EB I690 onramp	EB	1455	1458	3	0.2%	0.1
	Bridge St offramp and WB I690 offramp	WB	3329	3369	40	1.2%	0.7
	Exit 17 and Exits 16N-S	WB	2632	2665	32	1.2%	0.6
	Exit 16N-S off and onramps	WB	2148	2182	34	1.6%	0.7
	S Midler Ave offramp and Thompson Rd onramp	WB	3860	3878	18	0.5%	0.3
	Exit 15 off and onramps	WB	3617	3655	38	1.0%	0.6
	Teal Ave offramp and S Midler Ave onramp	WB	3949	3970	21	0.5%	0.3
	Exit 14 off and onramps	WB	3402	3396	-6	-0.2%	0.1
	Exit 14 onramp and I-81 South offramp	WB	4122	4062	-60	-1.5%	0.9
	Townsend St offramp and WB I-690 onramp	WB	3645	3661	16	0.4%	0.3
	Exit 13 and I-81 North offramp	WB	2239	2221	-18	-0.8%	0.4
	I-81 North off and onramps	WB	1386	1362	-25	-1.8%	0.7
	West St offramp and WB I-690 offramp	WB	2168	1995	-173	-8.0%	3.8
	Exit 11 off and onramps	WB	1548	1522	-26	-1.7%	0.7
	Exit 11 onramp and Exit 10	WB	1835	1810	-25	-1.3%	0.6
	Exit 10 and Exit 9 onramp	WB	1207	1203	-5	-0.4%	0.1
	Exit 9 onramp and Exit 8 onramp	WB	1687	1644	-43	-2.5%	1.0
	Exit 8 onramp and Exit 7	WB	1939	1906	-33	-1.7%	0.8
	Hawthawa Blvd offramp	EB	627	608	-19	-3.0%	0.7
	Bear St offramp	EB	420	419	-1	-0.4%	0.1
	Geddes St onramp	EB	361	352	-10	-2.6%	0.5
	West St offramp	EB	1148	1104	-44	-3.8%	1.3
	West St onramp	EB	435	446	12	2.7%	0.6
	McBride onramp	EB	229	213	-17	-7.3%	1.1
	Teal Ave offramp	EB	1050	1033	-17	-1.6%	0.5
	Teal Ave onramp	EB	271	268	-3	-1.1%	0.2
	S Midler Ave offramp	EB	974	947	-27	-2.8%	0.9
	S Midler Ave onramp	EB	173	172	-1	-0.6%	0.1
	Thompson Rd offramp	EB	1543	1526	-16	-1.1%	0.4
	Thompson Rd onramp	EB	141	146	5	3.8%	0.4
	Bridge St onramp	EB	179	178	-2	-0.9%	0.1
	Willls Ave onramp	EB	133	131	-2	-1.4%	0.2
	Hawthawa Blvd onramp	WB	252	247	-6	-2.2%	0.4
	Bear St onramp	WB	479	439	-40	-8.4%	1.9
	Geddes St offramp	WB	627	615	-12	-1.9%	0.5
	West St onramp	WB	288	289	1	0.3%	0.1
	West St offramp	WB	620	593	-27	-4.3%	1.1
	Townsend St offramp	WB	1405	1419	14	1.0%	0.4
	Teal Ave onramp	WB	720	688	-32	-4.5%	1.2
	Teal Ave offramp	WB	546	537	-9	-1.6%	0.4
	S Midler Ave onramp	WB	332	330	-2	-0.6%	0.1
	S Midler Ave offramp	WB	242	242	-1	-0.2%	0.0
	Thompson Rd onramp	WB	1712	1706	-5	-0.3%	0.1
	Thompson Rd offramp	WB	484	487	3	0.6%	0.1
	Bridge St offramp	WB	697	706	9	1.3%	0.3
I-481 Highway	I-81 onramps and Exit 1	NB	944	941	-3	-0.3%	0.1
	Exit 1 off and onramps	NB	825	826	2	0.2%	0.1
	Exit 1 and Exit 2	NB	1327	1331	4	0.3%	0.1
	Exit 2 off and onramps	NB	1104	1114	9	0.8%	0.3
	Exit 3E onramp and Exit 3W	NB	1698	1707	9	0.5%	0.2
	Exit 2 onramp and Exit 3E	NB	1699	1709	10	0.6%	0.2
	Exit 3E off and onramps	NB	1451	1474	23	1.6%	0.6
	Exit 3W off and onramps	NB	1450	1480	30	2.1%	0.8
	Exit 3W onramp and Exit 4	NB	3311	3336	24	0.7%	0.4
	Exit 4 offramp and Exit 4 onramp	NB	1407	1404	-3	-0.2%	0.1
	Exit 4 onramp and Exit 5E	NB	2135	2122	-14	-0.6%	0.3
	Exit 5E off and onramps	NB	2006	1987	-19	-1.0%	0.4
	Exit 5E onramp and Exit 5W	NB	2092	2077	-15	-0.7%	0.3
	WB Kirkville Rd onramp and I90 offramp	NB	1666	1664	-2	-0.1%	0.1
	Exit 5W off and onramps	NB	1487	1485	-2	-0.1%	0.1
	Exit 5W onramp and Exit 6	NB	1666	1664	-2	-0.1%	0.1
	Exit 6 off and onramps	NB	1157	1166	8	0.7%	0.2
	I90 onramp and US 298 offramp	NB	1471	1477	6	0.4%	0.2
	Exit 7 off and onramps	NB	1007	1020	12	1.2%	0.4
	Exit 7 onramp and Exit 8	NB	1105	1121	16	1.5%	0.5
	Exit 8 off and onramps	NB	799	817	18	2.2%	0.6
	Exit 8 onramp and Exit 9N	NB	1130	1149	19	1.7%	0.6
	Exit 9N off and onramps	NB	797	816	20	2.5%	0.7

	Exit 9N onramp and Exit 9S	NB	1322	1345	23	1.7%	0.6
	Exit 9S off and onramps	NB	1118	1138	20	1.8%	0.6
	Before WB I-481 offramp	NB	1263	1260	-4	-0.3%	0.1
	Before EB I-481 onramp	SB	3311	3298	-13	-0.4%	0.2
	Exit 9S onramp and Exit 9N	SB	2259	2272	12	0.5%	0.3
	Exit 9S off and onramps	SB	1537	1555	18	1.2%	0.5
	Exit 9N off and onramps	SB	2180	2201	22	1.0%	0.5
	Exit 9N onramp and Exit 8	SB	2302	2325	23	1.0%	0.5
	Exit 8 off and onramps	SB	1626	1656	30	1.8%	0.7
	Exit 8 onramp and Exit 7	SB	2050	2083	32	1.6%	0.7
	Exit 7 off and onramps	SB	1542	1576	34	2.2%	0.9
	Exit 7 and Exit 6	SB	1941	1981	40	2.1%	0.9
	Exit 6 off and onramps	SB	1690	1743	53	3.1%	1.3
	Exit 6 and Exit 5W	SB	2380	2434	54	2.3%	1.1
	Exit 5W off and onramps	SB	2081	2118	37	1.8%	0.8
	Exit 5W onramp and Exit 5E	SB	2405	2434	29	1.2%	0.6
	Exit 5E off and onramps	SB	2223	2254	31	1.4%	0.7
	Exit 5E onramp and Exit 4	SB	2602	2640	38	1.5%	0.7
	Exit 4 offramp and Exit 4 onramp	SB	1177	1197	20	1.7%	0.6
	Exit 4 onramp and Exit 3W	SB	1904	1932	28	1.5%	0.6
	Exit 3W onramp and Exit 3E	SB	1967	1984	18	0.9%	0.4
	Exit 3W off and onramps	SB	1688	1714	26	1.6%	0.6
	Exit 3E off and onramps	SB	1087	1117	30	2.7%	0.9
	Exit 3E onramp and Exit 2	SB	1204	1229	26	2.1%	0.7
	Exit 3E onramp and Exit 2	SB	1204	1230	27	2.2%	0.8
	Exit 2 off and onramps	SB	851	870	20	2.3%	0.7
	Exit 2 onramp and Exit 1	SB	1338	1355	17	1.3%	0.5
	I-81 North offramp and E. Brighton Av onramp	SB	441	424	-16	-3.7%	0.8
	I-81 North and I-81 South ramps	SB	795	802	7	0.9%	0.2
	I-81 North offramp and E. Brighton Av onramp	SB	1143	1123	-20	-1.8%	0.6
	Rock Cut Rd offramp	NB	119	116	-4	-3.0%	0.3
	Rock Cut Rd onramp	NB	503	491	-11	-2.2%	0.5
	Jamesville Rd offramp	NB	223	215	-8	-3.5%	0.5
	Jamesville Rd onramp	NB	595	592	-3	-0.4%	0.1
	EB US 5 offramp	NB	248	237	-11	-4.5%	0.7
	WB US 5 onramp	NB	1861	1856	-5	-0.3%	0.1
	EB US 5 onramp	NB	247	246	-1	-0.3%	0.1
	WB US 5 offramp	NB	248	240	-7	-3.0%	0.5
	WB I690 offramp	NB	1905	1929	24	1.3%	0.5
	EB I690 onramp	NB	729	717	-12	-1.6%	0.4
	EB Kirkville Rd onramp	NB	86	85	-1	-1.4%	0.1
	EB Kirkville Rd offramp	NB	129	130	0	0.4%	0.0
	WB Kirkville Rd offramp	NB	605	596	-10	-1.6%	0.4
	WB Kirkville Rd onramp	NB	180	179	-1	-0.5%	0.1
	I90 offramp	NB	509	493	-16	-3.1%	0.7
	I90 onramp	NB	314	312	-1	-0.5%	0.1
	US 298 offramp	NB	463	458	-6	-1.2%	0.3
	US 298 onramp	NB	98	97	-1	-0.9%	0.1
	Northern Blvd offramp	NB	306	301	-4	-1.4%	0.3
	Northern Blvd onramp	NB	331	329	-2	-0.6%	0.1
	Brighton Ave offramp	SB	544	545	2	0.3%	0.1
	Jamesville Rd offramp	SB	353	360	7	1.9%	0.4
	Jamesville Rd onramp	SB	488	486	-2	-0.3%	0.1
	WB US 5 offramp	SB	217	219	2	1.1%	0.2
	EB US 5 onramp	SB	116	116	0	-0.3%	0.0
	EB US 5 offramp	SB	879	879	0	0.0%	0.0
	WB US 5 onramp	SB	279	278	-1	-0.3%	0.0
	EB I690 onramp	SB	727	739	13	1.7%	0.5
	WB I690 offramp	SB	1425	1445	20	1.4%	0.5
	EB Kirkville Rd onramp	SB	379	377	-2	-0.4%	0.1
	EB Kirkville Rd offramp	SB	182	179	-3	-1.6%	0.2
	WB Kirkville Rd onramp	SB	325	322	-2	-0.7%	0.1
	WB Kirkville Rd offramp	SB	299	310	11	3.7%	0.6
	I90 offramp	SB	251	238	-13	-5.2%	0.8
	I90 onramp	SB	690	691	1	0.1%	0.0
	US 298 offramp	SB	508	500	-8	-1.6%	0.4
	US 298 onramp	SB	399	397	-1	-0.3%	0.1
	Northern Blvd onramp	SB	424	424	0	-0.1%	0.0
	Northern Blvd offramp	SB	676	668	-8	-1.2%	0.3

Table E-2: Freeway Traffic Volume Comparison – AM Peak Hour

Route	Segment	Direction	Traffic Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
I-81 Highway	Exit 16 onramp and Exit 16A	NB	1142	1190	48	4.2%	1.4
	Exit 16A off and onramps	NB	519	533	14	2.6%	0.6
	Exit 16A onramp and Exit 17	NB	1662	1593	-69	-4.1%	1.7
	Exit 17 off and onramps	NB	1578	1573	-5	-0.3%	0.1
	Exit 17 Brighten Ave onramp and Exit 17 Colvin St onramp	NB	2317	2296	-21	-0.9%	0.4
	Exit 17 onramp and Exit 18	NB	2871	2831	-39	-1.4%	0.7
	Exit 18 off and onramps	NB	1918	1924	6	0.3%	0.1
	Exit 18 onramp and I-690 East offramp	NB	2686	2652	-34	-1.3%	0.7
	I-690 EB on ramp and I-690 WB on ramp	NB	1727	1723	-4	-0.3%	0.1
	Exit 19 onramp and Exit 20 onramp	NB	944	939	-5	-0.6%	0.2
	WB I-690 onramp and Salina St onramp	NB	1795	1618	-178	-9.9%	4.3
	Salina St onramp and Butternut St onramp	NB	2050	2014	-36	-1.7%	0.8
	Butternut St onramp and Genant Dr offramp	NB	2463	2373	-91	-3.7%	1.8
	Exit 22 off and onramps	NB	2208	2131	-77	-3.5%	1.7
	Exit 22 onramp and Exit 23 /Exits 24A and 24B	NB	2427	2344	-83	-3.4%	1.7
	Exit 23 off and onramps	NB	1506	1490	-16	-1.0%	0.4
	Exit 23 onramp and Exit 25	NB	2214	2182	-33	-1.5%	0.7
	Exit 25 off and onramps	NB	1789	1756	-33	-1.9%	0.8
	Exit 25 onramp and Exit 25A	NB	1971	1940	-31	-1.6%	0.7
	I-90 onramp and US 11 offramp	NB	2206	2186	-19	-0.9%	0.4
	Exit 25A off and onramps	NB	1690	1675	-15	-0.9%	0.4
	Exit 25A onramp and Exit 26	NB	2206	2186	-19	-0.9%	0.4
	Exit 26 and Exits 27-28	NB	1537	1527	-10	-0.7%	0.3
	Exit 27-28 and Exit 27 onramp	NB	1005	1008	3	0.3%	0.1
	Exit 27 onramp and Exit 28 onramp	NB	1417	1417	0	0.0%	0.0
	Airport Blvd onramp and E Taft Rd onramp	NB	1417	1414	-3	-0.2%	0.1
	Exit 28 onramp and Exit 29S	NB	1768	1764	-3	-0.2%	0.1
	Exit 29S and Exit 29N onramp	NB	1646	1633	-13	-0.8%	0.3
	Exit 29N on and offramps	NB	1725	1716	-10	-0.6%	0.2
	Exit 29N and Exit 29S onramp	NB	1200	1190	-10	-0.9%	0.3
	Exit 29S onramp and Exit 30	NB	1533	1488	-45	-2.9%	1.2
	Exit 30 onramp and Exit 29N	SB	3487	3491	4	0.1%	0.1
	Exit 29N and Exit 29S onramp	SB	3341	3333	-8	-0.2%	0.1
	Exit 29S and Exit 29N onramp	SB	2823	2812	-10	-0.4%	0.2
	Exit 29S on and offramps	SB	3545	3535	-10	-0.3%	0.2
	Exit 29N onramp and Exit 28	SB	4597	4556	-40	-0.9%	0.6
	Exit 28 and Exits 27-26	SB	4106	4072	-33	-0.8%	0.5
	Airport Blvd onramp and Airport Blvd offramp	SB	3510	3481	-29	-0.8%	0.5
	Exit 27 onramp and Exit 26 onramp	SB	4070	4025	-44	-1.1%	0.7
	NY 370 onramp and Old Liverpool Rd onramp	SB	3938	3822	-115	-2.9%	1.9
	Exit 26 onramp and Exit 25A	SB	4743	4692	-50	-1.1%	0.7
	Exit 25A off and onramps	SB	4347	4295	-52	-1.2%	0.8
	Exit 25 off and onramps	SB	3991	3895	-96	-2.4%	1.5
	Exit 25 onramp and Exits 23A and 23B and Exit 22	SB	4505	4453	-53	-1.2%	0.8
	Exit 25A onramp and Exit 25	SB	4742	4621	-121	-2.5%	1.8
	Exits 23A and 23B and Exit 22 and Old Liverpool Rd onramp	SB	3386	3361	-26	-0.8%	0.4
	Onondaga Lake Pkwy onramp and Exit 22 onramp	SB	5017	4857	-161	-3.2%	2.3
	Exit 21 off and onramps	SB	5061	4687	-375	-7.4%	5.4
	Exit 21 onramp and Exit 20	SB	5239	4670	-569	-10.9%	8.1
	Clinton St offramp and Butternut St offramp	SB	4463	4216	-247	-5.5%	3.8
	I-690 East off and onramps	SB	2968	2809	-158	-5.3%	2.9
	EB I-690 onramp and Adams St offramp	SB	3366	2923	-443	-13.2%	7.9
	Adams St offramp and Adams St onramp	SB	2101	1951	-150	-7.1%	3.3
	Exit 18 and I-690 West onramp	SB	1626	1499	-128	-7.8%	3.2
	I-690 West onramp and Exit 18 onramp	SB	2101	1965	-136	-6.5%	3.0
	Exit 18 and Exit 17	SB	2292	2147	-144	-6.3%	3.1
	Exit 17 off and onramps	SB	1011	972	-39	-3.9%	1.3
	Exit 16A off and onramps	SB	1082	1036	-46	-4.3%	1.4
	Exit 17 onramp and Exit 16A offramp	SB	1403	1341	-61	-4.4%	1.7
	Exit 16A onramp and Exit 16 offramp	SB	1436	1412	-24	-1.6%	0.6
	I-481 Offramp	NB	624	657	33	5.3%	1.3
	I-481 onramp	NB	1143	1123	-20	-1.8%	0.6

	S. Salina St, Brighton Av offramp	NB	84	84	-1	-0.7%	0.1
	S. Salina St, Brighton Av onramp	NB	740	734	-6	-0.8%	0.2
	E Colvin St onramp	NB	553	547	-6	-1.1%	0.3
	Adams St, Harrison St offramp	NB	953	944	-9	-0.9%	0.3
	Adams St, Harrison St onramp	NB	769	739	-29	-3.8%	1.1
	EB I-690 offramp	NB	958	937	-22	-2.2%	0.7
	EB I-690 onramp	NB	1254	1150	-105	-8.3%	3.0
	WB I-690 offramp	NB	783	756	-27	-3.4%	1.0
	WB I-690 onramp	NB	852	850	-2	-0.2%	0.1
	Salina St onramp	NB	255	214	-41	-16.0%	2.7
	Butternut St onramp	NB	414	373	-41	-9.9%	2.1
	Genant Dr offramp	NB	255	245	-10	-3.9%	0.6
	Sunset St onramp	NB	219	217	-2	-1.1%	0.2
	Hiawatha offramp	NB	921	873	-48	-5.2%	1.6
	7th N St offramp	NB	425	395	-30	-7.1%	1.5
	7th N St onramp	NB	181	179	-3	-1.6%	0.2
	I-90 offramp	NB	281	276	-5	-1.7%	0.3
	I-90 onramp	NB	516	516	0	0.0%	0.0
	US 11 offramp	NB	669	656	-13	-1.9%	0.5
	Airport Blvd offramp	NB	532	523	-9	-1.7%	0.4
	Airport Blvd onramp	NB	412	409	-3	-0.8%	0.2
	E Taft Rd onramp	NB	351	348	-2	-0.7%	0.1
	EB I-481 offramp	NB	122	126	4	3.0%	0.3
	EB I-481 onramp	NB	80	79	-1	-1.0%	0.1
	WB I-481 offramp	NB	525	526	1	0.1%	0.0
	WB I-481 onramp	NB	333	338	5	1.4%	0.3
	I-481 Offramp	SB	320	302	-18	-5.7%	1.0
	I-481 onramp	SB	354	374	20	5.7%	1.1
	S. Salina St, Brighton Av offramp	SB	1281	1170	-111	-8.7%	3.2
	S. Salina St, Brighton Av onramp	SB	392	370	-21	-5.4%	1.1
	Adams St, Harrison St offramp	SB	1739	1576	-162	-9.3%	4.0
	Adams St, Harrison St onramp	SB	191	170	-21	-11.0%	1.6
	WB I-690 onramp	SB	476	459	-16	-3.4%	0.8
	EB I-690 onramp	SB	1254	1150	-105	-8.3%	3.0
	EB I-690 offramp	SB	854	818	-36	-4.2%	1.2
	Clinton St offramp	SB	1494	1326	-169	-11.3%	4.5
	Butternut St offramp	SB	773	722	-51	-6.6%	1.9
	Genant Dr onramp	SB	179	169	-10	-5.5%	0.7
	Genant Dr offramp	SB	351	338	-13	-3.7%	0.7
	Genant Dr onramp	SB	397	374	-23	-5.8%	1.2
	NY 370 onramp	SB	1081	991	-90	-8.3%	2.8
	Old Liverpool Rd onramp	SB	552	524	-28	-5.1%	1.2
	Onondaga Lake Pkwy off-ramp	SB	1119	1092	-27	-2.4%	0.8
	7th N St offramp	SB	751	740	-11	-1.5%	0.4
	7th N St onramp	SB	515	514	0	-0.1%	0.0
	I-90 onramp	SB	395	392	-3	-0.9%	0.2
	I-90 offramp	SB	396	393	-3	-0.8%	0.2
	US 11 onramp	SB	673	672	-1	-0.1%	0.0
	Airport Blvd onramp	SB	560	551	-9	-1.5%	0.4
	Airport Blvd offramp	SB	596	581	-15	-2.5%	0.6
	E Taft Rd offramp	SB	491	488	-3	-0.6%	0.1
	EB I-481 onramp	SB	1774	1728	-46	-2.6%	1.1
	EB I-481 offramp	SB	723	715	-8	-1.1%	0.3
	WB I-481 onramp	SB	204	205	1	0.4%	0.1
	WB I-481 offramp	SB	146	146	0	0.2%	0.0
I-690 Highway	Exit 7 and Exit 8 onramp	EB	4746	4721	-25	-0.5%	0.4
	Willls Ave onramp and Hawthawa Blvd offramp	EB	4879	4850	-29	-0.6%	0.4
	Exit 8 and Exit 9	EB	4252	4239	-13	-0.3%	0.2
	Exit 9 and Exit 10 onramp	EB	3831	3814	-17	-0.4%	0.3
	Geddes St onramp and West St offramp	EB	4192	4150	-42	-1.0%	0.7
	West St offramp and West St onramp	EB	3043	2939	-104	-3.4%	1.9
	I-81 South off and onramps	EB	2221	2240	18	0.8%	0.4
	McBride onramp and I-81 onramp	EB	3303	3247	-56	-1.7%	1.0
	I-81 North onramp and Exit 14	EB	4260	4055	-205	-4.8%	3.2
	Exit 14 off and onramps	EB	3210	3167	-42	-1.3%	0.7
	Teal Ave onramp and S Midler Ave offramp	EB	3480	3444	-36	-1.0%	0.6
	Exit 15 off and onramps	EB	2505	2466	-39	-1.5%	0.8
	Exit 15 onramp and Exits 16S-N and Exit 17	EB	2678	2651	-26	-1.0%	0.5
	Exit 16S-N off and onramps	EB	1135	1128	-7	-0.6%	0.2

	Exit 16S-N onramp and Exit 17 onramp	EB	1276	1279	3	0.3%	0.1
	Bridge St onramp and EB I690 onramp	EB	1455	1458	3	0.2%	0.1
	Bridge St offramp and WB I690 offramp	WB	3329	3369	40	1.2%	0.7
	Exit 17 and Exits 16N-S	WB	2632	2665	32	1.2%	0.6
	Exit 16N-S off and onramps	WB	2148	2182	34	1.6%	0.7
	S Midler Ave offramp and Thompson Rd onramp	WB	3860	3878	18	0.5%	0.3
	Exit 15 off and onramps	WB	3617	3655	38	1.0%	0.6
	Teal Ave offramp and S Midler Ave onramp	WB	3949	3970	21	0.5%	0.3
	Exit 14 off and onramps	WB	3402	3396	-6	-0.2%	0.1
	Exit 14 onramp and I-81 South offramp	WB	4122	4062	-60	-1.5%	0.9
	Townsend St offramp and WB I-690 onramp	WB	3645	3661	16	0.4%	0.3
	Exit 13 and I-81 North offramp	WB	2239	2221	-18	-0.8%	0.4
	I-81 North off and onramps	WB	1386	1362	-25	-1.8%	0.7
	West St offramp and WB I-690 offramp	WB	2168	1995	-173	-8.0%	3.8
	Exit 11 off and onramps	WB	1548	1522	-26	-1.7%	0.7
	Exit 11 onramp and Exit 10	WB	1835	1810	-25	-1.3%	0.6
	Exit 10 and Exit 9 onramp	WB	1207	1203	-5	-0.4%	0.1
	Exit 9 onramp and Exit 8 onramp	WB	1687	1644	-43	-2.5%	1.0
	Exit 8 onramp and Exit 7	WB	1939	1906	-33	-1.7%	0.8
	Hawthawa Blvd offramp	EB	627	608	-19	-3.0%	0.7
	Bear St offramp	EB	420	419	-1	-0.4%	0.1
	Geddes St onramp	EB	361	352	-10	-2.6%	0.5
	West St offramp	EB	1148	1104	-44	-3.8%	1.3
	West St onramp	EB	435	446	12	2.7%	0.6
	McBride onramp	EB	229	213	-17	-7.3%	1.1
	Teal Ave offramp	EB	1050	1033	-17	-1.6%	0.5
	Teal Ave onramp	EB	271	268	-3	-1.1%	0.2
	S Midler Ave offramp	EB	974	947	-27	-2.8%	0.9
	S Midler Ave onramp	EB	173	172	-1	-0.6%	0.1
	Thompson Rd offramp	EB	1543	1526	-16	-1.1%	0.4
	Thompson Rd onramp	EB	141	146	5	3.8%	0.4
	Bridge St onramp	EB	179	178	-2	-0.9%	0.1
	Willls Ave onramp	EB	133	131	-2	-1.4%	0.2
	Hawthawa Blvd onramp	WB	252	247	-6	-2.2%	0.4
	Bear St onramp	WB	479	439	-40	-8.4%	1.9
	Geddes St offramp	WB	627	615	-12	-1.9%	0.5
	West St onramp	WB	288	289	1	0.3%	0.1
	West St offramp	WB	620	593	-27	-4.3%	1.1
	Townsend St offramp	WB	1405	1419	14	1.0%	0.4
	Teal Ave onramp	WB	720	688	-32	-4.5%	1.2
	Teal Ave offramp	WB	546	537	-9	-1.6%	0.4
	S Midler Ave onramp	WB	332	330	-2	-0.6%	0.1
	S Midler Ave offramp	WB	242	242	-1	-0.2%	0.0
	Thompson Rd onramp	WB	1712	1706	-5	-0.3%	0.1
	Thompson Rd offramp	WB	484	487	3	0.6%	0.1
	Bridge St offramp	WB	697	706	9	1.3%	0.3
I-481 Highway	I-81 onramps and Exit 1	NB	944	941	-3	-0.3%	0.1
	Exit 1 off and onramps	NB	825	826	2	0.2%	0.1
	Exit 1 and Exit 2	NB	1327	1331	4	0.3%	0.1
	Exit 2 off and onramps	NB	1104	1114	9	0.8%	0.3
	Exit 3E onramp and Exit 3W	NB	1698	1707	9	0.5%	0.2
	Exit 2 onramp and Exit 3E	NB	1699	1709	10	0.6%	0.2
	Exit 3E off and onramps	NB	1451	1474	23	1.6%	0.6
	Exit 3W off and onramps	NB	1450	1480	30	2.1%	0.8
	Exit 3W onramp and Exit 4	NB	3311	3336	24	0.7%	0.4
	Exit 4 offramp and Exit 4 onramp	NB	1407	1404	-3	-0.2%	0.1
	Exit 4 onramp and Exit 5E	NB	2135	2122	-14	-0.6%	0.3
	Exit 5E off and onramps	NB	2006	1987	-19	-1.0%	0.4
	Exit 5E onramp and Exit 5W	NB	2092	2077	-15	-0.7%	0.3
	WB Kirkville Rd onramp and I90 offramp	NB	1666	1664	-2	-0.1%	0.1
	Exit 5W off and onramps	NB	1487	1485	-2	-0.1%	0.1
	Exit 5W onramp and Exit 6	NB	1666	1664	-2	-0.1%	0.1
	Exit 6 off and onramps	NB	1157	1166	8	0.7%	0.2
	I90 onramp and US 298 offramp	NB	1471	1477	6	0.4%	0.2
	Exit 7 off and onramps	NB	1007	1020	12	1.2%	0.4
	Exit 7 onramp and Exit 8	NB	1105	1121	16	1.5%	0.5
	Exit 8 off and onramps	NB	799	817	18	2.2%	0.6
	Exit 8 onramp and Exit 9N	NB	1130	1149	19	1.7%	0.6
	Exit 9N off and onramps	NB	797	816	20	2.5%	0.7

	Exit 9N onramp and Exit 9S	NB	1322	1345	23	1.7%	0.6
	Exit 9S off and onramps	NB	1118	1138	20	1.8%	0.6
	Before WB I-481 offramp	NB	1263	1260	-4	-0.3%	0.1
	Before EB I-481 onramp	SB	3311	3298	-13	-0.4%	0.2
	Exit 9S onramp and Exit 9N	SB	2259	2272	12	0.5%	0.3
	Exit 9S off and onramps	SB	1537	1555	18	1.2%	0.5
	Exit 9N off and onramps	SB	2180	2201	22	1.0%	0.5
	Exit 9N onramp and Exit 8	SB	2302	2325	23	1.0%	0.5
	Exit 8 off and onramps	SB	1626	1656	30	1.8%	0.7
	Exit 8 onramp and Exit 7	SB	2050	2083	32	1.6%	0.7
	Exit 7 off and onramps	SB	1542	1576	34	2.2%	0.9
	Exit 7 and Exit 6	SB	1941	1981	40	2.1%	0.9
	Exit 6 off and onramps	SB	1690	1743	53	3.1%	1.3
	Exit 6 and Exit 5W	SB	2380	2434	54	2.3%	1.1
	Exit 5W off and onramps	SB	2081	2118	37	1.8%	0.8
	Exit 5W onramp and Exit 5E	SB	2405	2434	29	1.2%	0.6
	Exit 5E off and onramps	SB	2223	2254	31	1.4%	0.7
	Exit 5E onramp and Exit 4	SB	2602	2640	38	1.5%	0.7
	Exit 4 offramp and Exit 4 onramp	SB	1177	1197	20	1.7%	0.6
	Exit 4 onramp and Exit 3W	SB	1904	1932	28	1.5%	0.6
	Exit 3W onramp and Exit 3E	SB	1967	1984	18	0.9%	0.4
	Exit 3W off and onramps	SB	1688	1714	26	1.6%	0.6
	Exit 3E off and onramps	SB	1087	1117	30	2.7%	0.9
	Exit 3E onramp and Exit 2	SB	1204	1229	26	2.1%	0.7
	Exit 3E onramp and Exit 2	SB	1204	1230	27	2.2%	0.8
	Exit 2 off and onramps	SB	851	870	20	2.3%	0.7
	Exit 2 onramp and Exit 1	SB	1338	1355	17	1.3%	0.5
	I-81 North offramp and E. Brighton Av onramp	SB	441	424	-16	-3.7%	0.8
	I-81 North and I-81 South ramps	SB	795	802	7	0.9%	0.2
	I-81 North offramp and E. Brighton Av onramp	SB	1143	1123	-20	-1.8%	0.6
	Rock Cut Rd offramp	NB	119	116	-4	-3.0%	0.3
	Rock Cut Rd onramp	NB	503	491	-11	-2.2%	0.5
	Jamesville Rd offramp	NB	223	215	-8	-3.5%	0.5
	Jamesville Rd onramp	NB	595	592	-3	-0.4%	0.1
	EB US 5 offramp	NB	248	237	-11	-4.5%	0.7
	WB US 5 onramp	NB	1861	1856	-5	-0.3%	0.1
	EB US 5 onramp	NB	247	246	-1	-0.3%	0.1
	WB US 5 offramp	NB	248	240	-7	-3.0%	0.5
	WB I690 offramp	NB	1905	1929	24	1.3%	0.5
	EB I690 onramp	NB	729	717	-12	-1.6%	0.4
	EB Kirkville Rd onramp	NB	86	85	-1	-1.4%	0.1
	EB Kirkville Rd offramp	NB	129	130	0	0.4%	0.0
	WB Kirkville Rd offramp	NB	605	596	-10	-1.6%	0.4
	WB Kirkville Rd onramp	NB	180	179	-1	-0.5%	0.1
	I90 offramp	NB	509	493	-16	-3.1%	0.7
	I90 onramp	NB	314	312	-1	-0.5%	0.1
	US 298 offramp	NB	463	458	-6	-1.2%	0.3
	US 298 onramp	NB	98	97	-1	-0.9%	0.1
	Northern Blvd offramp	NB	306	301	-4	-1.4%	0.3
	Northern Blvd onramp	NB	331	329	-2	-0.6%	0.1
	Brighton Ave offramp	SB	544	545	2	0.3%	0.1
	Jamesville Rd offramp	SB	353	360	7	1.9%	0.4
	Jamesville Rd onramp	SB	488	486	-2	-0.3%	0.1
	WB US 5 offramp	SB	217	219	2	1.1%	0.2
	EB US 5 onramp	SB	116	116	0	-0.3%	0.0
	EB US 5 offramp	SB	879	879	0	0.0%	0.0
	WB US 5 onramp	SB	279	278	-1	-0.3%	0.0
	EB I690 onramp	SB	727	739	13	1.7%	0.5
	WB I690 offramp	SB	1425	1445	20	1.4%	0.5
	EB Kirkville Rd onramp	SB	379	377	-2	-0.4%	0.1
	EB Kirkville Rd offramp	SB	182	179	-3	-1.6%	0.2
	WB Kirkville Rd onramp	SB	325	322	-2	-0.7%	0.1
	WB Kirkville Rd offramp	SB	299	310	11	3.7%	0.6
	I90 offramp	SB	251	238	-13	-5.2%	0.8
	I90 onramp	SB	690	691	1	0.1%	0.0
	US 298 offramp	SB	508	500	-8	-1.6%	0.4
	US 298 onramp	SB	399	397	-1	-0.3%	0.1
	Northern Blvd onramp	SB	424	424	0	-0.1%	0.0
	Northern Blvd offramp	SB	676	668	-8	-1.2%	0.3

Table E-3: Freeway Traffic Volume Comparison – AM Post-Peak

Route	Segment	Direction	Traffic Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
I-81 Highway	Exit 16 onramp and Exit 16A	NB	952	992	41	4.3%	1.3
	Exit 16A off and onramps	NB	432	445	13	2.9%	0.6
	Exit 16A onramp and Exit 17	NB	1384	1367	-18	-1.3%	0.5
	Exit 17 off and onramps	NB	1314	1356	42	3.2%	1.1
	Exit 17 Brighten Ave onramp and Exit 17 Colvin St onramp	NB	1930	1945	14	0.7%	0.3
	Exit 17 onramp and Exit 18	NB	2391	2383	-8	-0.3%	0.2
	Exit 18 off and onramps	NB	1597	1637	40	2.5%	1.0
	Exit 18 onramp and I-690 East offramp	NB	2237	2284	47	2.1%	1.0
	I-690 EB on ramp and I-690 WB on ramp	NB	1439	1466	27	1.9%	0.7
	Exit 19 onramp and Exit 20 onramp	NB	786	801	15	1.9%	0.5
	WB I-690 onramp and Salina St onramp	NB	1495	1388	-107	-7.1%	2.8
	Salina St onramp and Butternut St onramp	NB	1707	1752	45	2.6%	1.1
	Butternut St onramp and Genant Dr offramp	NB	2052	2091	39	1.9%	0.9
	Exit 22 off and onramps	NB	1839	1868	28	1.5%	0.7
	Exit 22 onramp and Exit 23 /Exits 24A and 24B	NB	2021	2047	25	1.3%	0.6
	Exit 23 off and onramps	NB	1254	1295	41	3.3%	1.2
	Exit 23 onramp and Exit 25	NB	1844	1904	59	3.2%	1.4
	Exit 25 off and onramps	NB	1490	1533	43	2.9%	1.1
	Exit 25 onramp and Exit 25A	NB	1641	1693	51	3.1%	1.3
	I-90 onramp and US 11 offramp	NB	1837	1909	72	3.9%	1.7
	Exit 25A off and onramps	NB	1407	1477	69	4.9%	1.8
	Exit 25A onramp and Exit 26	NB	1837	1909	72	3.9%	1.7
	Exit 26 and Exits 27-28	NB	1280	1339	59	4.6%	1.6
	Exit 27-28 and Exit 27 onramp	NB	837	887	50	6.0%	1.7
	Exit 27 onramp and Exit 28 onramp	NB	1180	1243	62	5.3%	1.8
	Airport Blvd onramp and E Taft Rd onramp	NB	1180	1235	55	4.7%	1.6
	Exit 28 onramp and Exit 29S	NB	1473	1536	63	4.3%	1.6
	Exit 29S and Exit 29N onramp	NB	1371	1433	63	4.6%	1.7
	Exit 29N on and offramps	NB	1437	1504	67	4.7%	1.8
	Exit 29N and Exit 29S onramp	NB	999	1032	33	3.3%	1.0
	Exit 29S onramp and Exit 30	NB	1277	1285	8	0.6%	0.2
	Exit 30 onramp and Exit 29N	SB	2904	2910	6	0.2%	0.1
	Exit 29N and Exit 29S onramp	SB	2783	2782	-1	0.0%	0.0
	Exit 29S and Exit 29N onramp	SB	2351	2333	-18	-0.8%	0.4
	Exit 29S on and offramps	SB	2953	2952	-1	0.0%	0.0
	Exit 29N onramp and Exit 28	SB	3829	3838	9	0.2%	0.2
	Exit 28 and Exits 27-26	SB	3420	3429	10	0.3%	0.2
	Airport Blvd onramp and Airport Blvd offramp	SB	2923	2935	12	0.4%	0.2
	Exit 27 onramp and Exit 26 onramp	SB	3390	3415	26	0.8%	0.4
	NY 370 onramp and Old Liverpool Rd onramp	SB	3280	3280	0	0.0%	0.0
	Exit 26 onramp and Exit 25A	SB	3950	3982	32	0.8%	0.5
	Exit 25A off and onramps	SB	3621	3654	33	0.9%	0.5
	Exit 25 off and onramps	SB	3324	3319	-5	-0.2%	0.1
	Exit 25 onramp and Exits 23A and 23B and Exit 22	SB	3753	3790	37	1.0%	0.6
	Exit 25A onramp and Exit 25	SB	3950	3933	-17	-0.4%	0.3
	Exits 23A and 23B and Exit 22 and Old Liverpool Rd onramp	SB	2821	2873	53	1.9%	1.0
	Onondaga Lake Pkwy onramp and Exit 22 onramp	SB	4179	4193	14	0.3%	0.2
	Exit 21 off and onramps	SB	4216	4193	-22	-0.5%	0.3
	Exit 21 onramp and Exit 20	SB	4363	4271	-92	-2.1%	1.4
	Clinton St offramp and Butternut St offramp	SB	3718	3882	164	4.4%	2.7
	I-690 East off and onramps	SB	2472	2627	155	6.3%	3.1
	EB I-690 onramp and Adams St offramp	SB	2804	2849	46	1.6%	0.9
	Adams St offramp and Adams St onramp	SB	1750	1833	82	4.7%	1.9
	Exit 18 and I-690 West onramp	SB	1355	1431	76	5.6%	2.0
	I-690 West onramp and Exit 18 onramp	SB	1750	1838	87	5.0%	2.1
	Exit 18 and Exit 17	SB	1909	2024	115	6.0%	2.6
	Exit 17 off and onramps	SB	842	901	59	7.0%	2.0
	Exit 16A off and onramps	SB	901	962	60	6.7%	2.0
	Exit 17 onramp and Exit 16A offramp	SB	1168	1250	82	7.0%	2.4
	Exit 16A onramp and Exit 16 offramp	SB	1196	1292	96	8.0%	2.7
	I-481 Offramp	NB	519	546	27	5.2%	1.2
	I-481 onramp	NB	952	970	18	1.9%	0.6

	S. Salina St, Brighton Av offramp	NB	70	65	-5	-7.2%	0.6
	S. Salina St, Brighton Av onramp	NB	616	596	-20	-3.2%	0.8
	E Colvin St onramp	NB	461	456	-4	-1.0%	0.2
	Adams St, Harrison St offramp	NB	793	787	-6	-0.8%	0.2
	Adams St, Harrison St onramp	NB	640	647	6	1.0%	0.3
	EB I-690 offramp	NB	798	821	23	2.9%	0.8
	EB I-690 onramp	NB	1045	1018	-27	-2.6%	0.8
	WB I-690 offramp	NB	652	648	-4	-0.6%	0.1
	WB I-690 onramp	NB	710	736	26	3.7%	1.0
	Salina St onramp	NB	213	204	-9	-4.1%	0.6
	Butternut St onramp	NB	345	338	-7	-2.0%	0.4
	Genant Dr offramp	NB	212	223	11	5.4%	0.8
	Sunset St onramp	NB	182	181	-1	-0.6%	0.1
	Hiawatha offramp	NB	767	774	7	0.9%	0.3
	7th N St offramp	NB	354	351	-3	-0.8%	0.2
	7th N St onramp	NB	151	150	-1	-0.6%	0.1
	I-90 offramp	NB	234	234	0	0.0%	0.0
	I-90 onramp	NB	430	428	-1	-0.3%	0.1
	US 11 offramp	NB	557	572	15	2.7%	0.6
	Airport Blvd offramp	NB	443	460	18	4.0%	0.8
	Airport Blvd onramp	NB	343	340	-3	-0.8%	0.1
	E Taft Rd onramp	NB	292	290	-3	-0.9%	0.1
	EB I-481 offramp	NB	102	104	2	2.4%	0.2
	EB I-481 onramp	NB	66	64	-2	-3.0%	0.2
	WB I-481 offramp	NB	438	471	33	7.6%	1.6
	WB I-481 onramp	NB	277	290	12	4.5%	0.7
	I-481 Offramp	SB	267	282	15	5.8%	0.9
	I-481 onramp	SB	295	325	30	10.1%	1.7
	S. Salina St, Brighton Av offramp	SB	1067	1109	42	3.9%	1.3
	S. Salina St, Brighton Av onramp	SB	326	344	18	5.4%	1.0
	Adams St, Harrison St offramp	SB	1448	1562	114	7.9%	2.9
	Adams St, Harrison St onramp	SB	159	170	11	7.0%	0.9
	WB I-690 onramp	SB	396	405	9	2.4%	0.5
	EB I-690 onramp	SB	1045	1018	-27	-2.6%	0.8
	EB I-690 offramp	SB	711	765	54	7.6%	2.0
	Clinton St offramp	SB	1245	1211	-33	-2.7%	1.0
	Butternut St offramp	SB	644	672	28	4.4%	1.1
	Genant Dr onramp	SB	149	146	-3	-2.2%	0.3
	Genant Dr offramp	SB	292	286	-6	-2.2%	0.4
	Genant Dr onramp	SB	331	312	-19	-5.7%	1.1
	NY 370 onramp	SB	900	837	-63	-7.0%	2.1
	Old Liverpool Rd onramp	SB	460	447	-13	-2.7%	0.6
	Onondaga Lake Pkwy off-ramp	SB	932	918	-14	-1.5%	0.4
	7th N St offramp	SB	626	631	6	0.9%	0.2
	7th N St onramp	SB	429	429	0	0.0%	0.0
	I-90 onramp	SB	329	325	-5	-1.4%	0.3
	I-90 offramp	SB	330	335	6	1.7%	0.3
	US 11 onramp	SB	561	559	-2	-0.3%	0.1
	Airport Blvd onramp	SB	466	464	-2	-0.5%	0.1
	Airport Blvd offramp	SB	496	496	-1	-0.2%	0.0
	E Taft Rd offramp	SB	409	419	10	2.5%	0.5
	EB I-481 onramp	SB	1478	1482	5	0.3%	0.1
	EB I-481 offramp	SB	602	618	16	2.6%	0.6
	WB I-481 onramp	SB	170	173	3	2.0%	0.3
	WB I-481 offramp	SB	121	126	5	4.2%	0.5
I-690 Highway	Exit 7 and Exit 8 onramp	EB	4746	4721	-25	-0.5%	0.4
	Willis Ave onramp and Hawthawa Blvd offramp	EB	4879	4850	-29	-0.6%	0.4
	Exit 8 and Exit 9	EB	4252	4239	-13	-0.3%	0.2
	Exit 9 and Exit 10 onramp	EB	3831	3814	-17	-0.4%	0.3
	Geddes St onramp and West St offramp	EB	4192	4150	-42	-1.0%	0.7
	West St offramp and West St onramp	EB	3043	2939	-104	-3.4%	1.9
	I-81 South off and onramps	EB	2221	2240	18	0.8%	0.4
	McBride onramp and I-81 onramp	EB	3303	3247	-56	-1.7%	1.0
	I-81 North onramp and Exit 14	EB	4260	4055	-205	-4.8%	3.2
	Exit 14 off and onramps	EB	3210	3167	-42	-1.3%	0.7
	Teal Ave onramp and S Midler Ave offramp	EB	3480	3444	-36	-1.0%	0.6
	Exit 15 off and onramps	EB	2505	2466	-39	-1.5%	0.8
	Exit 15 onramp and Exits 16S-N and Exit 17	EB	2678	2651	-26	-1.0%	0.5
	Exit 16S-N off and onramps	EB	1135	1128	-7	-0.6%	0.2

	Exit 16S-N onramp and Exit 17 onramp	EB	1276	1279	3	0.3%	0.1
	Bridge St onramp and EB I690 onramp	EB	1455	1458	3	0.2%	0.1
	Bridge St offramp and WB I690 offramp	WB	3329	3369	40	1.2%	0.7
	Exit 17 and Exits 16N-S	WB	2632	2665	32	1.2%	0.6
	Exit 16N-S off and onramps	WB	2148	2182	34	1.6%	0.7
	S Midler Ave offramp and Thompson Rd onramp	WB	3860	3878	18	0.5%	0.3
	Exit 15 off and onramps	WB	3617	3655	38	1.0%	0.6
	Teal Ave offramp and S Midler Ave onramp	WB	3949	3970	21	0.5%	0.3
	Exit 14 off and onramps	WB	3402	3396	-6	-0.2%	0.1
	Exit 14 onramp and I-81 South offramp	WB	4122	4062	-60	-1.5%	0.9
	Townsend St offramp and WB I-690 onramp	WB	3645	3661	16	0.4%	0.3
	Exit 13 and I-81 North offramp	WB	2239	2221	-18	-0.8%	0.4
	I-81 North off and onramps	WB	1386	1362	-25	-1.8%	0.7
	West St offramp and WB I-690 offramp	WB	2168	1995	-173	-8.0%	3.8
	Exit 11 off and onramps	WB	1548	1522	-26	-1.7%	0.7
	Exit 11 onramp and Exit 10	WB	1835	1810	-25	-1.3%	0.6
	Exit 10 and Exit 9 onramp	WB	1207	1203	-5	-0.4%	0.1
	Exit 9 onramp and Exit 8 onramp	WB	1687	1644	-43	-2.5%	1.0
	Exit 8 onramp and Exit 7	WB	1939	1906	-33	-1.7%	0.8
	Hawthawa Blvd offramp	EB	627	608	-19	-3.0%	0.7
	Bear St offramp	EB	420	419	-1	-0.4%	0.1
	Geddes St onramp	EB	361	352	-10	-2.6%	0.5
	West St offramp	EB	1148	1104	-44	-3.8%	1.3
	West St onramp	EB	435	446	12	2.7%	0.6
	McBride onramp	EB	229	213	-17	-7.3%	1.1
	Teal Ave offramp	EB	1050	1033	-17	-1.6%	0.5
	Teal Ave onramp	EB	271	268	-3	-1.1%	0.2
	S Midler Ave offramp	EB	974	947	-27	-2.8%	0.9
	S Midler Ave onramp	EB	173	172	-1	-0.6%	0.1
	Thompson Rd offramp	EB	1543	1526	-16	-1.1%	0.4
	Thompson Rd onramp	EB	141	146	5	3.8%	0.4
	Bridge St onramp	EB	179	178	-2	-0.9%	0.1
	Willls Ave onramp	EB	133	131	-2	-1.4%	0.2
	Hawthawa Blvd onramp	WB	252	247	-6	-2.2%	0.4
	Bear St onramp	WB	479	439	-40	-8.4%	1.9
	Geddes St offramp	WB	627	615	-12	-1.9%	0.5
	West St onramp	WB	288	289	1	0.3%	0.1
	West St offramp	WB	620	593	-27	-4.3%	1.1
	Townsend St offramp	WB	1405	1419	14	1.0%	0.4
	Teal Ave onramp	WB	720	688	-32	-4.5%	1.2
	Teal Ave offramp	WB	546	537	-9	-1.6%	0.4
	S Midler Ave onramp	WB	332	330	-2	-0.6%	0.1
	S Midler Ave offramp	WB	242	242	-1	-0.2%	0.0
	Thompson Rd onramp	WB	1712	1706	-5	-0.3%	0.1
	Thompson Rd offramp	WB	484	487	3	0.6%	0.1
	Bridge St offramp	WB	697	706	9	1.3%	0.3
I-481 Highway	I-81 onramps and Exit 1	NB	944	941	-3	-0.3%	0.1
	Exit 1 off and onramps	NB	825	826	2	0.2%	0.1
	Exit 1 and Exit 2	NB	1327	1331	4	0.3%	0.1
	Exit 2 off and onramps	NB	1104	1114	9	0.8%	0.3
	Exit 3E onramp and Exit 3W	NB	1698	1707	9	0.5%	0.2
	Exit 2 onramp and Exit 3E	NB	1699	1709	10	0.6%	0.2
	Exit 3E off and onramps	NB	1451	1474	23	1.6%	0.6
	Exit 3W off and onramps	NB	1450	1480	30	2.1%	0.8
	Exit 3W onramp and Exit 4	NB	3311	3336	24	0.7%	0.4
	Exit 4 offramp and Exit 4 onramp	NB	1407	1404	-3	-0.2%	0.1
	Exit 4 onramp and Exit 5E	NB	2135	2122	-14	-0.6%	0.3
	Exit 5E off and onramps	NB	2006	1987	-19	-1.0%	0.4
	Exit 5E onramp and Exit 5W	NB	2092	2077	-15	-0.7%	0.3
	WB Kirkville Rd onramp and I90 offramp	NB	1666	1664	-2	-0.1%	0.1
	Exit 5W off and onramps	NB	1487	1485	-2	-0.1%	0.1
	Exit 5W onramp and Exit 6	NB	1666	1664	-2	-0.1%	0.1
	Exit 6 off and onramps	NB	1157	1166	8	0.7%	0.2
	I90 onramp and US 298 offramp	NB	1471	1477	6	0.4%	0.2
	Exit 7 off and onramps	NB	1007	1020	12	1.2%	0.4
	Exit 7 onramp and Exit 8	NB	1105	1121	16	1.5%	0.5
	Exit 8 off and onramps	NB	799	817	18	2.2%	0.6
	Exit 8 onramp and Exit 9N	NB	1130	1149	19	1.7%	0.6
	Exit 9N off and onramps	NB	797	816	20	2.5%	0.7

	Exit 9N onramp and Exit 9S	NB	1322	1345	23	1.7%	0.6
	Exit 9S off and onramps	NB	1118	1138	20	1.8%	0.6
	Before WB I-481 offramp	NB	1263	1260	-4	-0.3%	0.1
	Before EB I-481 onramp	SB	3311	3298	-13	-0.4%	0.2
	Exit 9S onramp and Exit 9N	SB	2259	2272	12	0.5%	0.3
	Exit 9S off and onramps	SB	1537	1555	18	1.2%	0.5
	Exit 9N off and onramps	SB	2180	2201	22	1.0%	0.5
	Exit 9N onramp and Exit 8	SB	2302	2325	23	1.0%	0.5
	Exit 8 off and onramps	SB	1626	1656	30	1.8%	0.7
	Exit 8 onramp and Exit 7	SB	2050	2083	32	1.6%	0.7
	Exit 7 off and onramps	SB	1542	1576	34	2.2%	0.9
	Exit 7 and Exit 6	SB	1941	1981	40	2.1%	0.9
	Exit 6 off and onramps	SB	1690	1743	53	3.1%	1.3
	Exit 6 and Exit 5W	SB	2380	2434	54	2.3%	1.1
	Exit 5W off and onramps	SB	2081	2118	37	1.8%	0.8
	Exit 5W onramp and Exit 5E	SB	2405	2434	29	1.2%	0.6
	Exit 5E off and onramps	SB	2223	2254	31	1.4%	0.7
	Exit 5E onramp and Exit 4	SB	2602	2640	38	1.5%	0.7
	Exit 4 offramp and Exit 4 onramp	SB	1177	1197	20	1.7%	0.6
	Exit 4 onramp and Exit 3W	SB	1904	1932	28	1.5%	0.6
	Exit 3W onramp and Exit 3E	SB	1967	1984	18	0.9%	0.4
	Exit 3W off and onramps	SB	1688	1714	26	1.6%	0.6
	Exit 3E off and onramps	SB	1087	1117	30	2.7%	0.9
	Exit 3E onramp and Exit 2	SB	1204	1229	26	2.1%	0.7
	Exit 3E onramp and Exit 2	SB	1204	1230	27	2.2%	0.8
	Exit 2 off and onramps	SB	851	870	20	2.3%	0.7
	Exit 2 onramp and Exit 1	SB	1338	1355	17	1.3%	0.5
	I-81 North offramp and E. Brighton Av onramp	SB	441	424	-16	-3.7%	0.8
	I-81 North and I-81 South ramps	SB	795	802	7	0.9%	0.2
	I-81 North offramp and E. Brighton Av onramp	SB	1143	1123	-20	-1.8%	0.6
	Rock Cut Rd offramp	NB	119	116	-4	-3.0%	0.3
	Rock Cut Rd onramp	NB	503	491	-11	-2.2%	0.5
	Jamesville Rd offramp	NB	223	215	-8	-3.5%	0.5
	Jamesville Rd onramp	NB	595	592	-3	-0.4%	0.1
	EB US 5 offramp	NB	248	237	-11	-4.5%	0.7
	WB US 5 onramp	NB	1861	1856	-5	-0.3%	0.1
	EB US 5 onramp	NB	247	246	-1	-0.3%	0.1
	WB US 5 offramp	NB	248	240	-7	-3.0%	0.5
	WB I690 offramp	NB	1905	1929	24	1.3%	0.5
	EB I690 onramp	NB	729	717	-12	-1.6%	0.4
	EB Kirkville Rd onramp	NB	86	85	-1	-1.4%	0.1
	EB Kirkville Rd offramp	NB	129	130	0	0.4%	0.0
	WB Kirkville Rd offramp	NB	605	596	-10	-1.6%	0.4
	WB Kirkville Rd onramp	NB	180	179	-1	-0.5%	0.1
	I90 offramp	NB	509	493	-16	-3.1%	0.7
	I90 onramp	NB	314	312	-1	-0.5%	0.1
	US 298 offramp	NB	463	458	-6	-1.2%	0.3
	US 298 onramp	NB	98	97	-1	-0.9%	0.1
	Northern Blvd offramp	NB	306	301	-4	-1.4%	0.3
	Northern Blvd onramp	NB	331	329	-2	-0.6%	0.1
	Brighton Ave offramp	SB	544	545	2	0.3%	0.1
	Jamesville Rd offramp	SB	353	360	7	1.9%	0.4
	Jamesville Rd onramp	SB	488	486	-2	-0.3%	0.1
	WB US 5 offramp	SB	217	219	2	1.1%	0.2
	EB US 5 onramp	SB	116	116	0	-0.3%	0.0
	EB US 5 offramp	SB	879	879	0	0.0%	0.0
	WB US 5 onramp	SB	279	278	-1	-0.3%	0.0
	EB I690 onramp	SB	727	739	13	1.7%	0.5
	WB I690 offramp	SB	1425	1445	20	1.4%	0.5
	EB Kirkville Rd onramp	SB	379	377	-2	-0.4%	0.1
	EB Kirkville Rd offramp	SB	182	179	-3	-1.6%	0.2
	WB Kirkville Rd onramp	SB	325	322	-2	-0.7%	0.1
	WB Kirkville Rd offramp	SB	299	310	11	3.7%	0.6
	I90 offramp	SB	251	238	-13	-5.2%	0.8
	I90 onramp	SB	690	691	1	0.1%	0.0
	US 298 offramp	SB	508	500	-8	-1.6%	0.4
	US 298 onramp	SB	399	397	-1	-0.3%	0.1
	Northern Blvd onramp	SB	424	424	0	-0.1%	0.0
	Northern Blvd offramp	SB	676	668	-8	-1.2%	0.3

APPENDIX F:
FREEWAY TRAFFIC VOLUME COMPARISON – PM PEAK PERIOD

Table F-1: Freeway Traffic Volume Comparison – PM Pre-Peak

Route	Segment	Direction	Traffic Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
I-81 Highway	Exit 16 onramp and Exit 16A	NB	1319	1360	41	3.1%	1.1
	Exit 16A off and onramps	NB	910	919	9	1.0%	0.3
	Exit 16A onramp and Exit 17	NB	1532	1537	5	0.3%	0.1
	Exit 17 off and onramps	NB	1419	1454	34	2.4%	0.9
	Exit 17 Brighten Ave onramp and Exit 17 Colvin St onramp	NB	2041	2027	-14	-0.7%	0.3
	Exit 17 onramp and Exit 18	NB	2752	2712	-40	-1.4%	0.8
	Exit 18 off and onramps	NB	1964	1953	-11	-0.5%	0.2
	Exit 18 onramp and I-690 East offramp	NB	4248	4087	-161	-3.8%	2.5
	I-690 EB on ramp and I-690 WB onramp	NB	3346	3266	-80	-2.4%	1.4
	Exit 19 onramp and Exit 20 onramp	NB	2269	2199	-70	-3.1%	1.5
	WB I-690 onramp and Salina St onramp	NB	3397	3248	-149	-4.4%	2.6
	Salina St onramp and Butternut St onramp	NB	4463	4350	-113	-2.5%	1.7
	Butternut St onramp and Genant Dr offramp	NB	5422	5216	-207	-3.8%	2.8
	Exit 22 off and onramps	NB	5011	4877	-134	-2.7%	1.9
	Exit 22 onramp and Exit 23 /Exits 24A and 24B	NB	5526	5367	-159	-2.9%	2.2
	Exit 23 off and onramps	NB	3389	3331	-58	-1.7%	1.0
	Exit 23 onramp and Exit 25	NB	4372	4286	-86	-2.0%	1.3
	Exit 25 off and onramps	NB	4033	3898	-136	-3.4%	2.2
	Exit 25 onramp and Exit 25A	NB	4479	4349	-130	-2.9%	2.0
	I-90 onramp and US 11 offramp	NB	4644	4557	-87	-1.9%	1.3
	Exit 25A off and onramps	NB	4132	4044	-88	-2.1%	1.4
	Exit 25A onramp and Exit 26	NB	4644	4557	-87	-1.9%	1.3
	Exit 26 and Exits 27-28	NB	3465	3402	-64	-1.8%	1.1
	Exit 27-28 and Exit 27 onramp	NB	2653	2604	-49	-1.8%	1.0
	Exit 27 onramp and Exit 28 onramp	NB	3294	3254	-40	-1.2%	0.7
	Airport Blvd onramp and E Taft Rd onramp	NB	3294	3245	-48	-1.5%	0.8
	Exit 28 onramp and Exit 29S	NB	3777	3734	-43	-1.1%	0.7
	Exit 29S and Exit 29N onramp	NB	3544	3486	-58	-1.6%	1.0
	Exit 29N on and offramps	NB	3701	3638	-63	-1.7%	1.0
	Exit 29N and Exit 29S onramp	NB	2194	2167	-28	-1.3%	0.6
	Exit 29S onramp and Exit 30	NB	2922	2821	-101	-3.5%	1.9
	Exit 30 onramp and Exit 29N	SB	1746	1731	-15	-0.9%	0.4
	Exit 29N and Exit 29S onramp	SB	1603	1587	-15	-0.9%	0.4
	Exit 29S and Exit 29N onramp	SB	1456	1447	-10	-0.7%	0.3
	Exit 29S on and offramps	SB	1759	1748	-11	-0.6%	0.3
	Exit 29N onramp and Exit 28	SB	2390	2413	22	0.9%	0.5
	Exit 28 and Exits 27-26	SB	2094	2139	45	2.2%	1.0
	Airport Blvd onramp and Airport Blvd offramp	SB	1707	1773	66	3.8%	1.6
	Exit 27 onramp and Exit 26 onramp	SB	2387	2444	57	2.4%	1.2
	NY 370 onramp and Old Liverpool Rd onramp	SB	2546	2507	-39	-1.5%	0.8
	Exit 26 onramp and Exit 25A	SB	3472	3514	42	1.2%	0.7
	Exit 25A off and onramps	SB	2944	2974	30	1.0%	0.6
	Exit 25 off and onramps	SB	2707	2676	-31	-1.2%	0.6
	Exit 25 onramp and Exits 23A and 23B and Exit 22	SB	3154	3146	-8	-0.3%	0.1
	Exit 25A onramp and Exit 25	SB	3254	3234	-20	-0.6%	0.4
	Exits 23A and 23B and Exit 22 and Old Liverpool Rd onramp	SB	2151	2171	21	1.0%	0.4
	Onondaga Lake Pkwy onramp and Exit 22 onramp	SB	3017	2994	-24	-0.8%	0.4
	Exit 21 off and onramps	SB	3209	3126	-82	-2.6%	1.5
	Exit 21 onramp and Exit 20	SB	3540	3411	-128	-3.6%	2.2
	Clinton St offramp and Butternut St offramp	SB	3141	3039	-102	-3.3%	1.8
	I-690 East off and onramps	SB	2662	2588	-75	-2.8%	1.5
	EB I-690 onramp and Adams St offramp	SB	2337	2255	-82	-3.5%	1.7
	Adams St offramp and Adams St onramp	SB	2274	2238	-37	-1.6%	0.8
	Exit 18 and I-690 West onramp	SB	1787	1769	-18	-1.0%	0.4
	I-690 West onramp and Exit 18 onramp	SB	2274	2241	-33	-1.5%	0.7
	Exit 18 and Exit 17	SB	3180	3112	-68	-2.1%	1.2
	Exit 17 off and onramps	SB	1834	1824	-10	-0.6%	0.2
	Exit 16A off and onramps	SB	1373	1349	-24	-1.7%	0.6
	Exit 17 onramp and Exit 16A offramp	SB	2223	2187	-36	-1.6%	0.8
	Exit 16A onramp and Exit 16 offramp	SB	1943	1908	-36	-1.8%	0.8
	I-481 Offramp	NB	409	437	28	6.8%	1.3
	I-481 onramp	NB	616	616	0	0.0%	0.0

	S. Salina St, Brighton Av offramp	NB	84	75	-9	-11.0%	1.0
	S. Salina St, Brighton Av onramp	NB	597	592	-5	-0.9%	0.2
	E Colvin St onramp	NB	711	702	-9	-1.3%	0.3
	Adams St, Harrison St offramp	NB	788	801	13	1.6%	0.4
	Adams St, Harrison St onramp	NB	2283	2186	-97	-4.2%	2.0
	EB I-690 offramp	NB	902	857	-46	-5.1%	1.5
	EB I-690 onramp	NB	767	736	-31	-4.0%	1.1
	WB I-690 offramp	NB	1078	1024	-54	-5.0%	1.7
	WB I-690 onramp	NB	1127	1109	-18	-1.6%	0.5
	Salina St onramp	NB	1066	1004	-62	-5.8%	1.9
	Butternut St onramp	NB	958	899	-59	-6.1%	1.9
	Genant Dr offramp	NB	412	391	-21	-5.1%	1.1
	Sunset St onramp	NB	513	491	-22	-4.4%	1.0
	Hiawatha offramp	NB	2137	2029	-108	-5.1%	2.4
	7th N St offramp	NB	339	330	-9	-2.7%	0.5
	7th N St onramp	NB	446	443	-3	-0.7%	0.2
	I-90 offramp	NB	323	329	6	1.9%	0.3
	I-90 onramp	NB	512	507	-5	-0.9%	0.2
	US 11 offramp	NB	1179	1147	-32	-2.7%	0.9
	Airport Blvd offramp	NB	813	806	-7	-0.9%	0.2
	Airport Blvd onramp	NB	641	635	-6	-1.0%	0.2
	E Taft Rd onramp	NB	483	478	-5	-1.0%	0.2
	EB I-481 offramp	NB	233	238	5	2.0%	0.3
	EB I-481 onramp	NB	158	143	-14	-9.0%	1.2
	WB I-481 offramp	NB	1507	1474	-33	-2.2%	0.8
	WB I-481 onramp	NB	728	731	3	0.4%	0.1
	I-481 Offramp	SB	850	820	-30	-3.5%	1.0
	I-481 onramp	SB	571	542	-28	-4.9%	1.2
	S. Salina St, Brighton Av offramp	SB	1346	1276	-70	-5.2%	1.9
	S. Salina St, Brighton Av onramp	SB	389	365	-24	-6.1%	1.2
	Adams St, Harrison St offramp	SB	551	522	-29	-5.2%	1.2
	Adams St, Harrison St onramp	SB	905	851	-53	-5.9%	1.8
	WB I-690 onramp	SB	487	471	-16	-3.3%	0.7
	EB I-690 onramp	SB	767	736	-31	-4.0%	1.1
	EB I-690 offramp	SB	1093	1046	-47	-4.3%	1.4
	Clinton St offramp	SB	480	437	-43	-8.9%	2.0
	Butternut St offramp	SB	399	386	-13	-3.3%	0.7
	Genant Dr onramp	SB	330	303	-27	-8.0%	1.5
	Genant Dr offramp	SB	304	289	-15	-5.0%	0.9
	Genant Dr onramp	SB	495	452	-43	-8.7%	2.0
	NY 370 onramp	SB	471	428	-42	-9.0%	2.0
	Old Liverpool Rd onramp	SB	395	368	-27	-6.8%	1.4
	Onondaga Lake Pkwy off-ramp	SB	1004	984	-20	-2.0%	0.6
	7th N St offramp	SB	547	566	19	3.5%	0.8
	7th N St onramp	SB	447	442	-5	-1.1%	0.2
	I-90 onramp	SB	310	304	-6	-1.9%	0.3
	I-90 offramp	SB	529	538	9	1.8%	0.4
	US 11 onramp	SB	1085	1079	-7	-0.6%	0.2
	Airport Blvd onramp	SB	680	672	-7	-1.1%	0.3
	Airport Blvd offramp	SB	387	357	-30	-7.8%	1.6
	E Taft Rd offramp	SB	297	274	-23	-7.8%	1.4
	EB I-481 onramp	SB	934	951	17	1.8%	0.5
	EB I-481 offramp	SB	302	297	-6	-1.9%	0.3
	WB I-481 onramp	SB	156	163	7	4.6%	0.6
	WB I-481 offramp	SB	144	138	-6	-4.1%	0.5
I-690 Highway	Exit 7 and Exit 8 onramp	EB	2218	2236	18	0.8%	0.4
	Willis Ave onramp and Hawthawa Blvd offramp	EB	2456	2475	19	0.8%	0.4
	Exit 8 and Exit 9	EB	1828	1840	13	0.7%	0.3
	Exit 9 and Exit 10 onramp	EB	1602	1618	16	1.0%	0.4
	Geddes St onramp and West St offramp	EB	2185	2195	11	0.5%	0.2
	West St offramp and West St onramp	EB	2005	1972	-33	-1.6%	0.7
	I-81 South off and onramps	EB	1744	1723	-21	-1.2%	0.5
	McBride onramp and I-81 onramp	EB	3741	3644	-97	-2.6%	1.6
	I-81 North onramp and Exit 14	EB	4645	4362	-283	-6.1%	4.2
	Exit 14 off and onramps	EB	3915	3805	-110	-2.8%	1.8
	Teal Ave onramp and S Midler Ave offramp	EB	4356	4234	-122	-2.8%	1.9
	Exit 15 off and onramps	EB	3627	3485	-142	-3.9%	2.4
	Exit 15 onramp and Exits 16S-N and Exit 17	EB	3921	3786	-135	-3.5%	2.2
	Exit 16S-N off and onramps	EB	2335	2273	-62	-2.6%	1.3

	Exit 16S-N onramp and Exit 17 onramp	EB	2794	2736	-58	-2.1%	1.1
	Bridge St onramp and EB I690 onramp	EB	3292	3229	-63	-1.9%	1.1
	Bridge St offramp and WB I690 offramp	WB	2031	2060	29	1.4%	0.6
	Exit 17 and Exits 16N-S	WB	1635	1648	13	0.8%	0.3
	Exit 16N-S off and onramps	WB	1303	1319	16	1.2%	0.4
	S Midler Ave offramp and Thompson Rd onramp	WB	3504	3500	-4	-0.1%	0.1
	Exit 15 off and onramps	WB	3115	3111	-4	-0.1%	0.1
	Teal Ave offramp and S Midler Ave onramp	WB	3802	3787	-15	-0.4%	0.2
	Exit 14 off and onramps	WB	3373	3324	-49	-1.4%	0.8
	Exit 14 onramp and I-81 South offramp	WB	4292	4061	-231	-5.4%	3.6
	Townsend St offramp and WB I-690 onramp	WB	3806	3675	-131	-3.4%	2.1
	Exit 13 and I-81 North offramp	WB	3238	3101	-137	-4.2%	2.4
	I-81 North off and onramps	WB	2112	1990	-122	-5.8%	2.7
	West St offramp and WB I-690 offramp	WB	3190	2841	-349	-11.0%	6.4
	Exit 11 off and onramps	WB	2524	2391	-134	-5.3%	2.7
	Exit 11 onramp and Exit 10	WB	3551	3358	-193	-5.4%	3.3
	Exit 10 and Exit 9 onramp	WB	2833	2689	-144	-5.1%	2.7
	Exit 9 onramp and Exit 8 onramp	WB	3690	3502	-188	-5.1%	3.1
	Exit 8 onramp and Exit 7	WB	4173	4002	-171	-4.1%	2.7
	Hawthawa Blvd offramp	EB	628	627	-1	-0.2%	0.0
	Bear St offramp	EB	226	223	-3	-1.3%	0.2
	Geddes St onramp	EB	583	574	-8	-1.4%	0.3
	West St offramp	EB	180	187	6	3.6%	0.5
	West St onramp	EB	505	475	-30	-5.9%	1.3
	McBride onramp	EB	904	833	-71	-7.8%	2.4
	Teal Ave offramp	EB	731	704	-27	-3.7%	1.0
	Teal Ave onramp	EB	441	413	-29	-6.5%	1.4
	S Midler Ave offramp	EB	729	715	-15	-2.0%	0.5
	S Midler Ave onramp	EB	294	292	-2	-0.8%	0.1
	Thompson Rd offramp	EB	1586	1518	-68	-4.3%	1.7
	Thompson Rd onramp	EB	459	460	1	0.2%	0.0
	Bridge St onramp	EB	497	493	-5	-0.9%	0.2
	Willls Ave onramp	EB	238	237	-1	-0.5%	0.1
	Hawthawa Blvd onramp	WB	483	468	-14	-3.0%	0.7
	Bear St onramp	WB	857	808	-50	-5.8%	1.7
	Geddes St offramp	WB	719	690	-29	-4.0%	1.1
	West St onramp	WB	1026	962	-64	-6.3%	2.0
	West St offramp	WB	667	632	-35	-5.3%	1.4
	Townsend St offramp	WB	568	543	-25	-4.4%	1.1
	Teal Ave onramp	WB	919	780	-139	-15.1%	4.8
	Teal Ave offramp	WB	430	433	3	0.7%	0.1
	S Midler Ave onramp	WB	687	681	-6	-0.8%	0.2
	S Midler Ave offramp	WB	389	402	13	3.2%	0.6
	Thompson Rd onramp	WB	2201	2188	-13	-0.6%	0.3
	Thompson Rd offramp	WB	332	329	-3	-0.9%	0.2
	Bridge St offramp	WB	397	412	15	3.8%	0.8
I-481 Highway	I-81 onramps and Exit 1	NB	1260	1271	12	0.9%	0.3
	Exit 1 off and onramps	NB	929	938	9	0.9%	0.3
	Exit 1 and Exit 2	NB	1275	1276	1	0.1%	0.0
	Exit 2 off and onramps	NB	850	843	-7	-0.8%	0.2
	Exit 3E onramp and Exit 3W	NB	1435	1433	-2	-0.2%	0.1
	Exit 2 onramp and Exit 3E	NB	1339	1328	-11	-0.8%	0.3
	Exit 3E off and onramps	NB	1104	1112	8	0.7%	0.2
	Exit 3W off and onramps	NB	1223	1239	16	1.3%	0.5
	Exit 3W onramp and Exit 4	NB	2490	2502	12	0.5%	0.2
	Exit 4 offramp and Exit 4 onramp	NB	1318	1340	22	1.7%	0.6
	Exit 4 onramp and Exit 5E	NB	2719	2689	-30	-1.1%	0.6
	Exit 5E off and onramps	NB	2275	2251	-24	-1.0%	0.5
	Exit 5E onramp and Exit 5W	NB	2509	2490	-19	-0.8%	0.4
	WB Kirkville Rd onramp and I90 offramp	NB	2348	2338	-9	-0.4%	0.2
	Exit 5W off and onramps	NB	2200	2192	-9	-0.4%	0.2
	Exit 5W onramp and Exit 6	NB	2348	2338	-9	-0.4%	0.2
	Exit 6 off and onramps	NB	1325	1311	-14	-1.0%	0.4
	I90 onramp and US 298 offramp	NB	1687	1667	-20	-1.2%	0.5
	Exit 7 off and onramps	NB	1244	1237	-7	-0.6%	0.2
	Exit 7 onramp and Exit 8	NB	1697	1694	-2	-0.1%	0.1
	Exit 8 off and onramps	NB	1335	1343	8	0.6%	0.2
	Exit 8 onramp and Exit 9N	NB	2405	2407	2	0.1%	0.0
	Exit 9N off and onramps	NB	1677	1676	-2	-0.1%	0.0

	Exit 9N onramp and Exit 9S	NB	3184	3153	-31	-1.0%	0.6
	Exit 9S off and onramps	NB	3028	3001	-27	-0.9%	0.5
	Before WB I-481 offramp	NB	3171	3089	-82	-2.6%	1.5
	Before EB I-481 onramp	SB	1831	1864	33	1.8%	0.8
	Exit 9S onramp and Exit 9N	SB	1199	1210	11	0.9%	0.3
	Exit 9S off and onramps	SB	897	909	12	1.3%	0.4
	Exit 9N off and onramps	SB	1042	1073	31	3.0%	1.0
	Exit 9N onramp and Exit 8	SB	1275	1311	36	2.8%	1.0
	Exit 8 off and onramps	SB	985	1030	45	4.6%	1.4
	Exit 8 onramp and Exit 7	SB	1205	1254	49	4.1%	1.4
	Exit 7 off and onramps	SB	1084	1131	47	4.4%	1.4
	Exit 7 and Exit 6	SB	1611	1658	46	2.9%	1.1
	Exit 6 off and onramps	SB	1293	1344	51	3.9%	1.4
	Exit 6 and Exit 5W	SB	1875	1923	48	2.5%	1.1
	Exit 5W off and onramps	SB	1752	1795	43	2.4%	1.0
	Exit 5W onramp and Exit 5E	SB	1873	1904	31	1.7%	0.7
	Exit 5E off and onramps	SB	1641	1675	34	2.1%	0.8
	Exit 5E onramp and Exit 4	SB	2183	2224	41	1.9%	0.9
	Exit 4 offramp and Exit 4 onramp	SB	1323	1335	12	0.9%	0.3
	Exit 4 onramp and Exit 3W	SB	3214	3208	-5	-0.2%	0.1
	Exit 3W onramp and Exit 3E	SB	3170	3144	-26	-0.8%	0.5
	Exit 3W off and onramps	SB	2880	2872	-7	-0.3%	0.1
	Exit 3E off and onramps	SB	1438	1426	-12	-0.9%	0.3
	Exit 3E onramp and Exit 2	SB	1784	1758	-25	-1.4%	0.6
	Exit 3E onramp and Exit 2	SB	1784	1754	-29	-1.6%	0.7
	Exit 2 off and onramps	SB	1141	1114	-27	-2.4%	0.8
	Exit 2 onramp and Exit 1	SB	1379	1349	-30	-2.2%	0.8
	I-81 North offramp and E. Brighton Av onramp	SB	123	123	0	0.0%	0.0
	I-81 North and I-81 South ramps	SB	694	666	-27	-3.9%	1.0
	I-81 North offramp and E. Brighton Av onramp	SB	616	616	0	0.0%	0.0
	Rock Cut Rd offramp	NB	331	339	8	2.4%	0.4
	Rock Cut Rd onramp	NB	346	335	-11	-3.3%	0.6
	Jamesville Rd offramp	NB	425	423	-2	-0.6%	0.1
	Jamesville Rd onramp	NB	489	485	-4	-0.9%	0.2
	EB US 5 offramp	NB	235	222	-13	-5.5%	0.9
	WB US 5 onramp	NB	1267	1260	-7	-0.6%	0.2
	EB US 5 onramp	NB	331	328	-2	-0.7%	0.1
	WB US 5 offramp	NB	212	203	-9	-4.3%	0.6
	WB I690 offramp	NB	1172	1161	-11	-1.0%	0.3
	EB I690 onramp	NB	1401	1350	-51	-3.7%	1.4
	EB Kirkville Rd onramp	NB	234	232	-2	-1.0%	0.1
	EB Kirkville Rd offramp	NB	444	427	-17	-3.9%	0.8
	WB Kirkville Rd offramp	NB	309	301	-8	-2.6%	0.5
	WB Kirkville Rd onramp	NB	147	144	-3	-2.3%	0.3
	I90 offramp	NB	1023	1019	-5	-0.5%	0.1
	I90 onramp	NB	362	358	-5	-1.3%	0.2
	US 298 offramp	NB	443	433	-9	-2.1%	0.5
	US 298 onramp	NB	452	451	-1	-0.3%	0.1
	Northern Blvd offramp	NB	362	354	-8	-2.1%	0.4
	Northern Blvd onramp	NB	1070	1063	-7	-0.6%	0.2
	Brighton Ave offramp	SB	686	676	-9	-1.4%	0.4
	Jamesville Rd offramp	SB	642	643	1	0.2%	0.0
	Jamesville Rd onramp	SB	238	236	-2	-0.8%	0.1
	WB US 5 offramp	SB	334	338	4	1.1%	0.2
	EB US 5 onramp	SB	346	341	-5	-1.4%	0.3
	EB US 5 offramp	SB	1732	1725	-6	-0.4%	0.2
	WB US 5 onramp	SB	290	286	-4	-1.4%	0.2
	EB I690 onramp	SB	1890	1867	-23	-1.2%	0.5
	WB I690 offramp	SB	859	894	35	4.1%	1.2
	EB Kirkville Rd onramp	SB	541	537	-5	-0.8%	0.2
	EB Kirkville Rd offramp	SB	232	228	-4	-1.7%	0.3
	WB Kirkville Rd onramp	SB	121	117	-4	-3.2%	0.4
	WB Kirkville Rd offramp	SB	123	126	3	2.1%	0.2
	I90 offramp	SB	319	315	-3	-1.1%	0.2
	I90 onramp	SB	582	579	-4	-0.7%	0.2
	US 298 offramp	SB	122	117	-5	-3.7%	0.4
	US 298 onramp	SB	528	524	-4	-0.7%	0.2
	Northern Blvd onramp	SB	221	218	-3	-1.2%	0.2
	Northern Blvd offramp	SB	290	279	-11	-3.8%	0.7

Table F-2: Freeway Traffic Volume Comparison – PM Peak Hour

Route	Segment	Direction	Traffic Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
I-81 Highway	Exit 16 onramp and Exit 16A	NB	1408	1450	42	3.0%	1.1
	Exit 16A off and onramps	NB	971	992	21	2.2%	0.7
	Exit 16A onramp and Exit 17	NB	1635	1641	6	0.4%	0.2
	Exit 17 off and onramps	NB	1515	1546	31	2.0%	0.8
	Exit 17 Brighten Ave onramp and Exit 17 Colvin St onramp	NB	2178	2161	-18	-0.8%	0.4
	Exit 17 onramp and Exit 18	NB	2937	2895	-42	-1.4%	0.8
	Exit 18 off and onramps	NB	2096	2103	6	0.3%	0.1
	Exit 18 onramp and I-690 East offramp	NB	4534	4370	-164	-3.6%	2.5
	I-690 EB on ramp and I-690 WB on ramp	NB	3571	3490	-82	-2.3%	1.4
	Exit 19 onramp and Exit 20 onramp	NB	2422	2351	-71	-2.9%	1.4
	WB I-690 onramp and Salina St onramp	NB	3625	3438	-187	-5.2%	3.1
	Salina St onramp and Butternut St onramp	NB	4764	4605	-159	-3.3%	2.3
	Butternut St onramp and Genant Dr offramp	NB	5787	5538	-249	-4.3%	3.3
	Exit 22 off and onramps	NB	5349	5167	-182	-3.4%	2.5
	Exit 22 onramp and Exit 23 /Exits 24A and 24B	NB	5897	5693	-204	-3.5%	2.7
	Exit 23 off and onramps	NB	3617	3526	-90	-2.5%	1.5
	Exit 23 onramp and Exit 25	NB	4666	4572	-94	-2.0%	1.4
	Exit 25 off and onramps	NB	4305	4157	-147	-3.4%	2.3
	Exit 25 onramp and Exit 25A	NB	4781	4640	-141	-3.0%	2.1
	I-90 onramp and US 11 offramp	NB	4957	4855	-102	-2.1%	1.5
	Exit 25A off and onramps	NB	4410	4309	-101	-2.3%	1.5
	Exit 25A onramp and Exit 26	NB	4957	4855	-102	-2.1%	1.5
	Exit 26 and Exits 27-28	NB	3699	3613	-85	-2.3%	1.4
	Exit 27-28 and Exit 27 onramp	NB	2831	2769	-62	-2.2%	1.2
	Exit 27 onramp and Exit 28 onramp	NB	3515	3448	-67	-1.9%	1.1
	Airport Blvd onramp and E Taft Rd onramp	NB	3515	3443	-72	-2.0%	1.2
	Exit 28 onramp and Exit 29S	NB	4031	3953	-79	-1.9%	1.2
	Exit 29S and Exit 29N onramp	NB	3782	3679	-103	-2.7%	1.7
	Exit 29N on and offramps	NB	3950	3848	-102	-2.6%	1.6
	Exit 29N and Exit 29S onramp	NB	2342	2273	-69	-2.9%	1.4
	Exit 29S onramp and Exit 30	NB	3119	2982	-136	-4.4%	2.5
	Exit 30 onramp and Exit 29N	SB	1864	1882	18	1.0%	0.4
	Exit 29N and Exit 29S onramp	SB	1710	1728	17	1.0%	0.4
	Exit 29S and Exit 29N onramp	SB	1554	1581	26	1.7%	0.7
	Exit 29S on and offramps	SB	1877	1902	25	1.3%	0.6
	Exit 29N onramp and Exit 28	SB	2551	2602	51	2.0%	1.0
	Exit 28 and Exits 27-26	SB	2235	2270	35	1.6%	0.7
	Airport Blvd onramp and Airport Blvd offramp	SB	1822	1863	41	2.2%	0.9
	Exit 27 onramp and Exit 26 onramp	SB	2547	2578	30	1.2%	0.6
	NY 370 onramp and Old Liverpool Rd onramp	SB	2718	2686	-32	-1.2%	0.6
	Exit 26 onramp and Exit 25A	SB	3706	3729	24	0.6%	0.4
	Exit 25A off and onramps	SB	3142	3167	25	0.8%	0.4
	Exit 25 off and onramps	SB	2889	2874	-16	-0.5%	0.3
	Exit 25 onramp and Exits 23A and 23B and Exit 22	SB	3367	3378	11	0.3%	0.2
	Exit 25A onramp and Exit 25	SB	3473	3448	-25	-0.7%	0.4
	Exits 23A and 23B and Exit 22 and Old Liverpool Rd onramp	SB	2295	2321	26	1.1%	0.5
	Onondaga Lake Pkwy onramp and Exit 22 onramp	SB	3220	3203	-17	-0.5%	0.3
	Exit 21 off and onramps	SB	3425	3345	-80	-2.3%	1.4
	Exit 21 onramp and Exit 20	SB	3778	3661	-117	-3.1%	1.9
	Clinton St offramp and Butternut St offramp	SB	3353	3269	-83	-2.5%	1.4
	I-690 East off and onramps	SB	2841	2778	-64	-2.2%	1.2
	EB I-690 onramp and Adams St offramp	SB	2495	2400	-94	-3.8%	1.9
	Adams St offramp and Adams St onramp	SB	2427	2360	-67	-2.8%	1.4
	Exit 18 and I-690 West onramp	SB	1907	1877	-30	-1.6%	0.7
	I-690 West onramp and Exit 18 onramp	SB	2427	2365	-62	-2.6%	1.3
	Exit 18 and Exit 17	SB	3394	3274	-120	-3.5%	2.1
	Exit 17 off and onramps	SB	1957	1910	-47	-2.4%	1.1
	Exit 16A off and onramps	SB	1465	1427	-38	-2.6%	1.0
	Exit 17 onramp and Exit 16A offramp	SB	2373	2307	-65	-2.8%	1.4
	Exit 16A onramp and Exit 16 offramp	SB	2074	2024	-50	-2.4%	1.1
	I-481 Offramp	NB	437	453	16	3.6%	0.8
	I-481 onramp	NB	658	647	-11	-1.6%	0.4

	S. Salina St, Brighton Av offramp	NB	90	90	0	0.4%	0.0
	S. Salina St, Brighton Av onramp	NB	637	622	-15	-2.4%	0.6
	E Colvin St onramp	NB	759	748	-10	-1.4%	0.4
	Adams St, Harrison St offramp	NB	841	830	-11	-1.3%	0.4
	Adams St, Harrison St onramp	NB	2437	2307	-130	-5.3%	2.7
	EB I-690 offramp	NB	963	929	-34	-3.5%	1.1
	EB I-690 onramp	NB	818	808	-10	-1.2%	0.4
	WB I-690 offramp	NB	1150	1080	-70	-6.1%	2.1
	WB I-690 onramp	NB	1203	1152	-51	-4.2%	1.5
	Salina St onramp	NB	1138	1082	-56	-4.9%	1.7
	Butternut St onramp	NB	1022	954	-68	-6.6%	2.2
	Genant Dr offramp	NB	440	429	-11	-2.4%	0.5
	Sunset St onramp	NB	548	537	-11	-2.0%	0.5
	Hiawatha offramp	NB	2281	2154	-127	-5.6%	2.7
	7th N St offramp	NB	362	349	-12	-3.4%	0.7
	7th N St onramp	NB	476	472	-4	-0.8%	0.2
	I-90 offramp	NB	345	362	17	4.9%	0.9
	I-90 onramp	NB	546	543	-3	-0.6%	0.1
	US 11 offramp	NB	1258	1230	-28	-2.3%	0.8
	Airport Blvd offramp	NB	867	848	-20	-2.3%	0.7
	Airport Blvd onramp	NB	684	677	-7	-1.0%	0.3
	E Taft Rd onramp	NB	516	512	-3	-0.7%	0.2
	EB I-481 offramp	NB	249	262	13	5.2%	0.8
	EB I-481 onramp	NB	168	158	-10	-6.0%	0.8
	WB I-481 offramp	NB	1608	1573	-35	-2.2%	0.9
	WB I-481 onramp	NB	777	788	11	1.5%	0.4
	I-481 Offramp	SB	907	876	-31	-3.4%	1.0
	I-481 onramp	SB	609	596	-13	-2.1%	0.5
	S. Salina St, Brighton Av offramp	SB	1437	1346	-91	-6.3%	2.4
	S. Salina St, Brighton Av onramp	SB	415	400	-15	-3.7%	0.8
	Adams St, Harrison St offramp	SB	588	561	-27	-4.6%	1.1
	Adams St, Harrison St onramp	SB	966	896	-70	-7.2%	2.3
	WB I-690 onramp	SB	520	486	-34	-6.5%	1.5
	EB I-690 onramp	SB	818	808	-10	-1.2%	0.4
	EB I-690 offramp	SB	1166	1152	-14	-1.2%	0.4
	Clinton St offramp	SB	512	474	-38	-7.4%	1.7
	Butternut St offramp	SB	426	402	-24	-5.6%	1.2
	Genant Dr onramp	SB	352	336	-16	-4.6%	0.9
	Genant Dr offramp	SB	325	313	-12	-3.8%	0.7
	Genant Dr onramp	SB	528	481	-47	-8.9%	2.1
	NY 370 onramp	SB	503	458	-45	-8.9%	2.0
	Old Liverpool Rd onramp	SB	422	399	-24	-5.6%	1.2
	Onondaga Lake Pkwy off-ramp	SB	1071	1058	-14	-1.3%	0.4
	7th N St offramp	SB	583	584	0	0.0%	0.0
	7th N St onramp	SB	477	474	-3	-0.7%	0.1
	I-90 onramp	SB	331	327	-4	-1.2%	0.2
	I-90 offramp	SB	564	562	-2	-0.4%	0.1
	US 11 onramp	SB	1158	1152	-7	-0.6%	0.2
	Airport Blvd onramp	SB	726	715	-11	-1.5%	0.4
	Airport Blvd offramp	SB	413	400	-13	-3.1%	0.6
	E Taft Rd offramp	SB	317	329	12	3.9%	0.7
	EB I-481 onramp	SB	997	1013	16	1.6%	0.5
	EB I-481 offramp	SB	323	318	-5	-1.5%	0.3
	WB I-481 onramp	SB	167	177	10	6.3%	0.8
	WB I-481 offramp	SB	153	151	-3	-1.8%	0.2
I-690 Highway	Exit 7 and Exit 8 onramp	EB	2367	2381	14	0.6%	0.3
	Willis Ave onramp and Hawthawa Blvd offramp	EB	2621	2629	8	0.3%	0.1
	Exit 8 and Exit 9	EB	1951	1971	20	1.0%	0.5
	Exit 9 and Exit 10 onramp	EB	1710	1729	19	1.1%	0.5
	Geddes St onramp and West St offramp	EB	2332	2340	8	0.3%	0.2
	West St offramp and West St onramp	EB	2139	2103	-37	-1.7%	0.8
	I-81 South off and onramps	EB	1861	1822	-39	-2.1%	0.9
	McBride onramp and I-81 onramp	EB	3993	3908	-85	-2.1%	1.4
	I-81 North onramp and Exit 14	EB	4957	4667	-291	-5.9%	4.2
	Exit 14 off and onramps	EB	4178	4096	-82	-2.0%	1.3
	Teal Ave onramp and S Midler Ave offramp	EB	4649	4544	-106	-2.3%	1.6
	Exit 15 off and onramps	EB	3871	3741	-130	-3.4%	2.1
	Exit 15 onramp and Exits 16S-N and Exit 17	EB	4185	4071	-114	-2.7%	1.8
	Exit 16S-N off and onramps	EB	2492	2433	-59	-2.4%	1.2

	Exit 16S-N onramp and Exit 17 onramp	EB	2982	2933	-49	-1.7%	0.9
	Bridge St onramp and EB I690 onramp	EB	3513	3461	-52	-1.5%	0.9
	Bridge St offramp and WB I690 offramp	WB	2168	2174	6	0.3%	0.1
	Exit 17 and Exits 16N-S	WB	1745	1743	-2	-0.1%	0.0
	Exit 16N-S off and onramps	WB	1390	1385	-5	-0.4%	0.1
	S Midler Ave offramp and Thompson Rd onramp	WB	3740	3709	-31	-0.8%	0.5
	Exit 15 off and onramps	WB	3324	3314	-10	-0.3%	0.2
	Teal Ave offramp and S Midler Ave onramp	WB	4058	4028	-30	-0.7%	0.5
	Exit 14 off and onramps	WB	3599	3546	-53	-1.5%	0.9
	Exit 14 onramp and I-81 South offramp	WB	4581	4339	-242	-5.3%	3.6
	Townsend St offramp and WB I-690 onramp	WB	4062	3926	-136	-3.3%	2.1
	Exit 13 and I-81 North offramp	WB	3456	3287	-169	-4.9%	2.9
	I-81 North off and onramps	WB	2254	2126	-128	-5.7%	2.7
	West St offramp and WB I-690 offramp	WB	3405	3022	-383	-11.3%	6.8
	Exit 11 off and onramps	WB	2694	2556	-138	-5.1%	2.7
	Exit 11 onramp and Exit 10	WB	3790	3598	-192	-5.1%	3.2
	Exit 10 and Exit 9 onramp	WB	3023	2889	-134	-4.4%	2.5
	Exit 9 onramp and Exit 8 onramp	WB	3938	3738	-200	-5.1%	3.2
	Exit 8 onramp and Exit 7	WB	4453	4258	-196	-4.4%	3.0
	Hawthawa Blvd offramp	EB	670	653	-18	-2.6%	0.7
	Bear St offramp	EB	241	235	-6	-2.6%	0.4
	Geddes St onramp	EB	622	604	-18	-2.8%	0.7
	West St offramp	EB	193	192	-1	-0.5%	0.1
	West St onramp	EB	539	508	-31	-5.7%	1.4
	McBride onramp	EB	964	879	-86	-8.9%	2.8
	Teal Ave offramp	EB	780	741	-39	-4.9%	1.4
	Teal Ave onramp	EB	471	441	-30	-6.3%	1.4
	S Midler Ave offramp	EB	778	754	-25	-3.2%	0.9
	S Midler Ave onramp	EB	314	311	-3	-0.9%	0.2
	Thompson Rd offramp	EB	1693	1639	-54	-3.2%	1.3
	Thompson Rd onramp	EB	490	486	-5	-1.0%	0.2
	Bridge St onramp	EB	531	527	-4	-0.7%	0.2
	Willls Ave onramp	EB	254	251	-3	-1.3%	0.2
	Hawthawa Blvd onramp	WB	515	498	-17	-3.2%	0.7
	Bear St onramp	WB	915	853	-62	-6.7%	2.1
	Geddes St offramp	WB	767	734	-33	-4.3%	1.2
	West St onramp	WB	1095	1034	-61	-5.6%	1.9
	West St offramp	WB	712	658	-54	-7.5%	2.1
	Townsend St offramp	WB	607	602	-5	-0.8%	0.2
	Teal Ave onramp	WB	981	817	-164	-16.7%	5.5
	Teal Ave offramp	WB	459	443	-16	-3.4%	0.7
	S Midler Ave onramp	WB	733	726	-7	-1.0%	0.3
	S Midler Ave offramp	WB	415	410	-5	-1.2%	0.3
	Thompson Rd onramp	WB	2349	2335	-14	-0.6%	0.3
	Thompson Rd offramp	WB	354	360	6	1.7%	0.3
	Bridge St offramp	WB	423	428	5	1.1%	0.2
I-481 Highway	I-81 onramps and Exit 1	NB	1344	1332	-13	-1.0%	0.3
	Exit 1 off and onramps	NB	991	985	-6	-0.6%	0.2
	Exit 1 and Exit 2	NB	1361	1349	-12	-0.9%	0.3
	Exit 2 off and onramps	NB	907	914	7	0.8%	0.2
	Exit 3E onramp and Exit 3W	NB	1532	1529	-2	-0.2%	0.1
	Exit 2 onramp and Exit 3E	NB	1429	1431	2	0.1%	0.1
	Exit 3E off and onramps	NB	1179	1190	11	1.0%	0.3
	Exit 3W off and onramps	NB	1305	1316	11	0.8%	0.3
	Exit 3W onramp and Exit 4	NB	2658	2654	-3	-0.1%	0.1
	Exit 4 offramp and Exit 4 onramp	NB	1407	1413	6	0.5%	0.2
	Exit 4 onramp and Exit 5E	NB	2902	2879	-23	-0.8%	0.4
	Exit 5E off and onramps	NB	2428	2391	-37	-1.5%	0.8
	Exit 5E onramp and Exit 5W	NB	2678	2644	-34	-1.3%	0.7
	WB Kirkville Rd onramp and I90 offramp	NB	2506	2476	-30	-1.2%	0.6
	Exit 5W off and onramps	NB	2349	2324	-25	-1.0%	0.5
	Exit 5W onramp and Exit 6	NB	2506	2476	-30	-1.2%	0.6
	Exit 6 off and onramps	NB	1414	1403	-11	-0.8%	0.3
	I90 onramp and US 298 offramp	NB	1801	1786	-15	-0.8%	0.4
	Exit 7 off and onramps	NB	1328	1319	-10	-0.7%	0.3
	Exit 7 onramp and Exit 8	NB	1811	1801	-10	-0.5%	0.2
	Exit 8 off and onramps	NB	1425	1418	-7	-0.5%	0.2
	Exit 8 onramp and Exit 9N	NB	2567	2556	-11	-0.4%	0.2
	Exit 9N off and onramps	NB	1790	1765	-26	-1.4%	0.6

	Exit 9N onramp and Exit 9S	NB	3398	3341	-57	-1.7%	1.0
	Exit 9S off and onramps	NB	3231	3171	-60	-1.9%	1.1
	Before WB I-481 offramp	NB	3385	3268	-116	-3.4%	2.0
	Before EB I-481 onramp	SB	1954	1988	34	1.8%	0.8
	Exit 9S onramp and Exit 9N	SB	1280	1293	13	1.0%	0.4
	Exit 9S off and onramps	SB	957	970	13	1.4%	0.4
	Exit 9N off and onramps	SB	1112	1140	28	2.5%	0.8
	Exit 9N onramp and Exit 8	SB	1361	1399	38	2.8%	1.0
	Exit 8 off and onramps	SB	1051	1091	40	3.8%	1.2
	Exit 8 onramp and Exit 7	SB	1287	1321	34	2.6%	0.9
	Exit 7 off and onramps	SB	1157	1186	29	2.5%	0.9
	Exit 7 and Exit 6	SB	1720	1747	27	1.6%	0.7
	Exit 6 off and onramps	SB	1380	1400	21	1.5%	0.6
	Exit 6 and Exit 5W	SB	2001	2019	18	0.9%	0.4
	Exit 5W off and onramps	SB	1870	1877	7	0.4%	0.2
	Exit 5W onramp and Exit 5E	SB	1999	1997	-2	-0.1%	0.1
	Exit 5E off and onramps	SB	1752	1751	-1	0.0%	0.0
	Exit 5E onramp and Exit 4	SB	2329	2333	4	0.2%	0.1
	Exit 4 offramp and Exit 4 onramp	SB	1412	1395	-17	-1.2%	0.5
	Exit 4 onramp and Exit 3W	SB	3430	3378	-52	-1.5%	0.9
	Exit 3W onramp and Exit 3E	SB	3383	3302	-81	-2.4%	1.4
	Exit 3W off and onramps	SB	3073	3020	-54	-1.7%	1.0
	Exit 3E off and onramps	SB	1535	1523	-12	-0.8%	0.3
	Exit 3E onramp and Exit 2	SB	1904	1882	-21	-1.1%	0.5
	Exit 3E onramp and Exit 2	SB	1904	1880	-24	-1.2%	0.5
	Exit 2 off and onramps	SB	1218	1200	-18	-1.5%	0.5
	Exit 2 onramp and Exit 1	SB	1472	1452	-20	-1.4%	0.5
	I-81 North offramp and E. Brighton Av onramp	SB	131	125	-6	-4.4%	0.5
	I-81 North and I-81 South ramps	SB	740	722	-19	-2.5%	0.7
	I-81 North offramp and E. Brighton Av onramp	SB	658	647	-11	-1.6%	0.4
	Rock Cut Rd offramp	NB	353	342	-11	-3.0%	0.6
	Rock Cut Rd onramp	NB	369	360	-10	-2.6%	0.5
	Jamesville Rd offramp	NB	454	436	-18	-4.0%	0.9
	Jamesville Rd onramp	NB	522	517	-5	-1.0%	0.2
	EB US 5 offramp	NB	250	242	-9	-3.5%	0.6
	WB US 5 onramp	NB	1352	1342	-10	-0.8%	0.3
	EB US 5 onramp	NB	353	351	-2	-0.5%	0.1
	WB US 5 offramp	NB	226	224	-2	-0.9%	0.1
	WB I690 offramp	NB	1251	1238	-13	-1.1%	0.4
	EB I690 onramp	NB	1496	1463	-33	-2.2%	0.8
	EB Kirkville Rd onramp	NB	250	247	-3	-1.2%	0.2
	EB Kirkville Rd offramp	NB	474	475	1	0.3%	0.1
	WB Kirkville Rd offramp	NB	329	326	-3	-0.9%	0.2
	WB Kirkville Rd onramp	NB	157	155	-3	-1.6%	0.2
	I90 offramp	NB	1092	1068	-24	-2.2%	0.7
	I90 onramp	NB	387	383	-4	-1.1%	0.2
	US 298 offramp	NB	472	466	-6	-1.3%	0.3
	US 298 onramp	NB	483	479	-4	-0.9%	0.2
	Northern Blvd offramp	NB	386	374	-12	-3.2%	0.6
	Northern Blvd onramp	NB	1142	1133	-9	-0.8%	0.3
	Brighton Ave offramp	SB	732	727	-5	-0.7%	0.2
	Jamesville Rd offramp	SB	686	682	-3	-0.5%	0.1
	Jamesville Rd onramp	SB	254	251	-3	-1.2%	0.2
	WB US 5 offramp	SB	356	347	-9	-2.6%	0.5
	EB US 5 onramp	SB	369	367	-2	-0.6%	0.1
	EB US 5 offramp	SB	1848	1792	-57	-3.1%	1.3
	WB US 5 onramp	SB	310	307	-2	-0.7%	0.1
	EB I690 onramp	SB	2017	1994	-24	-1.2%	0.5
	WB I690 offramp	SB	917	939	22	2.4%	0.7
	EB Kirkville Rd onramp	SB	578	575	-3	-0.5%	0.1
	EB Kirkville Rd offramp	SB	248	246	-2	-0.8%	0.1
	WB Kirkville Rd onramp	SB	129	126	-4	-2.8%	0.3
	WB Kirkville Rd offramp	SB	131	135	3	2.7%	0.3
	I90 offramp	SB	340	347	7	1.9%	0.4
	I90 onramp	SB	622	619	-3	-0.4%	0.1
	US 298 offramp	SB	130	126	-4	-3.2%	0.4
	US 298 onramp	SB	563	558	-5	-0.9%	0.2
	Northern Blvd onramp	SB	235	232	-4	-1.6%	0.3
	Northern Blvd offramp	SB	310	306	-4	-1.1%	0.2

Table F-3: Freeway Traffic Volume Comparison – PM Post-Peak

Route	Segment	Direction	Traffic Volume		Difference		GEH
			Observed	Modeled	Actual	Percent	
I-81 Highway	Exit 16 onramp and Exit 16A	NB	1143	1179	35	3.1%	1.0
	Exit 16A off and onramps	NB	789	804	16	2.0%	0.6
	Exit 16A onramp and Exit 17	NB	1635	1359	-276	-16.9%	7.1
	Exit 17 off and onramps	NB	1515	1297	-218	-14.4%	5.8
	Exit 17 Brighten Ave onramp and Exit 17 Colvin St onramp	NB	1769	1815	47	2.6%	1.1
	Exit 17 onramp and Exit 18	NB	2385	2421	36	1.5%	0.7
	Exit 18 off and onramps	NB	1702	1786	84	4.9%	2.0
	Exit 18 onramp and I-690 East offramp	NB	3682	3798	116	3.2%	1.9
	I-690 EB on ramp and I-690 WB on ramp	NB	2900	3043	143	4.9%	2.6
	Exit 19 onramp and Exit 20 onramp	NB	1966	2028	62	3.1%	1.4
	WB I-690 onramp and Salina St onramp	NB	2944	2991	47	1.6%	0.9
	Salina St onramp and Butternut St onramp	NB	3868	4016	147	3.8%	2.3
	Butternut St onramp and Genant Dr offramp	NB	4699	4825	125	2.7%	1.8
	Exit 22 off and onramps	NB	4343	4500	157	3.6%	2.4
	Exit 22 onramp and Exit 23 /Exits 24A and 24B	NB	4789	4972	183	3.8%	2.6
	Exit 23 off and onramps	NB	2937	3096	159	5.4%	2.9
	Exit 23 onramp and Exit 25	NB	3789	4001	212	5.6%	3.4
	Exit 25 off and onramps	NB	3496	3694	198	5.7%	3.3
	Exit 25 onramp and Exit 25A	NB	3882	4103	221	5.7%	3.5
	I-90 onramp and US 11 offramp	NB	4025	4271	246	6.1%	3.8
	Exit 25A off and onramps	NB	3581	3815	233	6.5%	3.8
	Exit 25A onramp and Exit 26	NB	4025	4271	246	6.1%	3.8
	Exit 26 and Exits 27-28	NB	3003	3199	195	6.5%	3.5
	Exit 27-28 and Exit 27 onramp	NB	2299	2482	183	8.0%	3.7
	Exit 27 onramp and Exit 28 onramp	NB	2855	3059	204	7.2%	3.8
	Airport Blvd onramp and E Taft Rd onramp	NB	2855	3050	195	6.8%	3.6
	Exit 28 onramp and Exit 29S	NB	3273	3485	211	6.5%	3.6
	Exit 29S and Exit 29N onramp	NB	3071	3265	194	6.3%	3.4
	Exit 29N on and offramps	NB	3208	3432	224	7.0%	3.9
	Exit 29N and Exit 29S onramp	NB	1902	2057	155	8.2%	3.5
	Exit 29S onramp and Exit 30	NB	2533	2645	112	4.4%	2.2
	Exit 30 onramp and Exit 29N	SB	1513	1527	14	0.9%	0.4
	Exit 29N and Exit 29S onramp	SB	1389	1400	11	0.8%	0.3
	Exit 29S and Exit 29N onramp	SB	1262	1295	33	2.6%	0.9
	Exit 29S on and offramps	SB	1524	1564	39	2.6%	1.0
	Exit 29N onramp and Exit 28	SB	2072	2131	60	2.9%	1.3
	Exit 28 and Exits 27-26	SB	1815	1885	71	3.9%	1.6
	Airport Blvd onramp and Airport Blvd offramp	SB	1479	1549	70	4.7%	1.8
	Exit 27 onramp and Exit 26 onramp	SB	2069	2151	83	4.0%	1.8
	NY 370 onramp and Old Liverpool Rd onramp	SB	2207	2274	67	3.0%	1.4
	Exit 26 onramp and Exit 25A	SB	3009	3109	100	3.3%	1.8
	Exit 25A off and onramps	SB	2551	2659	108	4.2%	2.1
	Exit 25 off and onramps	SB	2346	2412	66	2.8%	1.4
	Exit 25 onramp and Exits 23A and 23B and Exit 22	SB	2734	2834	100	3.7%	1.9
	Exit 25A onramp and Exit 25	SB	2820	2890	70	2.5%	1.3
	Exits 23A and 23B and Exit 22 and Old Liverpool Rd onramp	SB	1864	1968	104	5.6%	2.4
	Onondaga Lake Pkwy onramp and Exit 22 onramp	SB	2615	2709	94	3.6%	1.8
	Exit 21 off and onramps	SB	2781	2879	98	3.5%	1.8
	Exit 21 onramp and Exit 20	SB	3068	3157	89	2.9%	1.6
	Clinton St offramp and Butternut St offramp	SB	2722	2819	97	3.5%	1.8
	I-690 East off and onramps	SB	2307	2404	96	4.2%	2.0
	EB I-690 onramp and Adams St offramp	SB	2026	2075	49	2.4%	1.1
	Adams St offramp and Adams St onramp	SB	1971	2056	84	4.3%	1.9
	Exit 18 and I-690 West onramp	SB	1549	1625	76	4.9%	1.9
	I-690 West onramp and Exit 18 onramp	SB	1971	2077	106	5.4%	2.4
	Exit 18 and Exit 17	SB	2756	2884	128	4.7%	2.4
	Exit 17 off and onramps	SB	1589	1695	106	6.6%	2.6
	Exit 16A off and onramps	SB	1190	1276	87	7.3%	2.5
	Exit 17 onramp and Exit 16A offramp	SB	1927	2056	129	6.7%	2.9
	Exit 16A onramp and Exit 16 offramp	SB	1684	1815	130	7.7%	3.1
	I-481 Offramp	NB	355	384	29	8.1%	1.5
	I-481 onramp	NB	534	545	11	2.1%	0.5

	S. Salina St, Brighton Av offramp	NB	90	66	-24	-26.9%	2.7
	S. Salina St, Brighton Av onramp	NB	518	512	-5	-1.0%	0.2
	E Colvin St onramp	NB	616	610	-6	-1.0%	0.2
	Adams St, Harrison St offramp	NB	683	695	11	1.7%	0.4
	Adams St, Harrison St onramp	NB	1979	2044	66	3.3%	1.5
	EB I-690 offramp	NB	782	785	3	0.3%	0.1
	EB I-690 onramp	NB	664	665	1	0.1%	0.0
	WB I-690 offramp	NB	934	977	43	4.6%	1.4
	WB I-690 onramp	NB	977	1015	39	3.9%	1.2
	Salina St onramp	NB	924	923	-1	-0.1%	0.0
	Butternut St onramp	NB	830	799	-31	-3.8%	1.1
	Genant Dr offramp	NB	357	377	20	5.7%	1.1
	Sunset St onramp	NB	445	460	16	3.5%	0.7
	Hiawatha offramp	NB	1852	1891	39	2.1%	0.9
	7th N St offramp	NB	294	294	0	0.0%	0.0
	7th N St onramp	NB	386	385	-2	-0.4%	0.1
	I-90 offramp	NB	280	329	49	17.3%	2.8
	I-90 onramp	NB	444	441	-2	-0.5%	0.1
	US 11 offramp	NB	1022	1088	66	6.5%	2.0
	Airport Blvd offramp	NB	704	750	45	6.4%	1.7
	Airport Blvd onramp	NB	556	553	-3	-0.5%	0.1
	E Taft Rd onramp	NB	419	413	-6	-1.4%	0.3
	EB I-481 offramp	NB	202	228	26	12.8%	1.8
	EB I-481 onramp	NB	137	152	16	11.6%	1.3
	WB I-481 offramp	NB	1306	1384	78	6.0%	2.1
	WB I-481 onramp	NB	631	653	22	3.6%	0.9
	I-481 Offramp	SB	737	776	39	5.3%	1.4
	I-481 onramp	SB	494	520	25	5.1%	1.1
	S. Salina St, Brighton Av offramp	SB	1167	1194	27	2.3%	0.8
	S. Salina St, Brighton Av onramp	SB	337	346	9	2.6%	0.5
	Adams St, Harrison St offramp	SB	477	490	13	2.7%	0.6
	Adams St, Harrison St onramp	SB	784	773	-11	-1.4%	0.4
	WB I-690 onramp	SB	422	428	6	1.5%	0.3
	EB I-690 onramp	SB	664	665	1	0.1%	0.0
	EB I-690 offramp	SB	947	985	38	4.0%	1.2
	Clinton St offramp	SB	416	407	-8	-2.0%	0.4
	Butternut St offramp	SB	346	357	11	3.3%	0.6
	Genant Dr onramp	SB	286	279	-7	-2.4%	0.4
	Genant Dr offramp	SB	264	260	-4	-1.3%	0.2
	Genant Dr onramp	SB	429	436	7	1.7%	0.4
	NY 370 onramp	SB	408	382	-26	-6.5%	1.3
	Old Liverpool Rd onramp	SB	343	326	-16	-4.8%	0.9
	Onondaga Lake Pkwy off-ramp	SB	870	888	18	2.0%	0.6
	7th N St offramp	SB	474	487	14	2.9%	0.6
	7th N St onramp	SB	388	385	-3	-0.8%	0.2
	I-90 onramp	SB	269	265	-4	-1.4%	0.2
	I-90 offramp	SB	458	461	2	0.5%	0.1
	US 11 onramp	SB	941	936	-5	-0.5%	0.2
	Airport Blvd onramp	SB	589	590	1	0.2%	0.0
	Airport Blvd offramp	SB	335	335	0	0.0%	0.0
	E Taft Rd offramp	SB	257	256	-1	-0.3%	0.1
	EB I-481 onramp	SB	810	809	-1	-0.1%	0.0
	EB I-481 offramp	SB	262	268	6	2.3%	0.4
	WB I-481 onramp	SB	135	160	24	18.0%	2.0
	WB I-481 offramp	SB	124	127	2	1.9%	0.2
I-690 Highway	Exit 7 and Exit 8 onramp	EB	1922	1939	17	0.9%	0.4
	Willis Ave onramp and Hawthawa Blvd offramp	EB	2128	2149	20	1.0%	0.4
	Exit 8 and Exit 9	EB	1584	1629	45	2.9%	1.1
	Exit 9 and Exit 10 onramp	EB	1388	1433	44	3.2%	1.2
	Geddes St onramp and West St offramp	EB	1893	1958	65	3.4%	1.5
	West St offramp and West St onramp	EB	1737	1778	40	2.3%	1.0
	I-81 South off and onramps	EB	1511	1577	66	4.4%	1.7
	McBride onramp and I-81 onramp	EB	3243	3381	139	4.3%	2.4
	I-81 North onramp and Exit 14	EB	4025	4064	39	1.0%	0.6
	Exit 14 off and onramps	EB	3393	3563	170	5.0%	2.9
	Teal Ave onramp and S Midler Ave offramp	EB	3775	3969	193	5.1%	3.1
	Exit 15 off and onramps	EB	3144	3300	157	5.0%	2.8
	Exit 15 onramp and Exits 16S-N and Exit 17	EB	3398	3593	195	5.7%	3.3
	Exit 16S-N off and onramps	EB	2024	2171	148	7.3%	3.2

	Exit 16S-N onramp and Exit 17 onramp	EB	2422	2580	158	6.5%	3.2
	Bridge St onramp and EB I690 onramp	EB	2853	3013	160	5.6%	3.0
	Bridge St offramp and WB I690 offramp	WB	1761	1870	110	6.2%	2.6
	Exit 17 and Exits 16N-S	WB	1417	1487	70	4.9%	1.8
	Exit 16N-S off and onramps	WB	1129	1191	62	5.5%	1.8
	S Midler Ave offramp and Thompson Rd onramp	WB	3037	3096	59	1.9%	1.1
	Exit 15 off and onramps	WB	2700	2766	67	2.5%	1.3
	Teal Ave offramp and S Midler Ave onramp	WB	3295	3361	66	2.0%	1.1
	Exit 14 off and onramps	WB	2923	2979	56	1.9%	1.0
	Exit 14 onramp and I-81 South offramp	WB	3720	3706	-14	-0.4%	0.2
	Townsend St offramp and WB I-690 onramp	WB	3298	3357	59	1.8%	1.0
	Exit 13 and I-81 North offramp	WB	2806	2855	49	1.7%	0.9
	I-81 North off and onramps	WB	1830	1843	13	0.7%	0.3
	West St offramp and WB I-690 offramp	WB	2765	2668	-97	-3.5%	1.9
	Exit 11 off and onramps	WB	2188	2239	51	2.4%	1.1
	Exit 11 onramp and Exit 10	WB	3078	3178	101	3.3%	1.8
	Exit 10 and Exit 9 onramp	WB	2455	2564	109	4.5%	2.2
	Exit 9 onramp and Exit 8 onramp	WB	3198	3357	159	5.0%	2.8
	Exit 8 onramp and Exit 7	WB	3616	3812	195	5.4%	3.2
	Hawthawa Blvd offramp	EB	544	519	-25	-4.7%	1.1
	Bear St offramp	EB	196	201	5	2.5%	0.4
	Geddes St onramp	EB	505	507	2	0.4%	0.1
	West St offramp	EB	156	157	0	0.2%	0.0
	West St onramp	EB	438	445	8	1.8%	0.4
	McBride onramp	EB	783	757	-26	-3.3%	0.9
	Teal Ave offramp	EB	633	664	31	4.9%	1.2
	Teal Ave onramp	EB	382	380	-3	-0.7%	0.1
	S Midler Ave offramp	EB	632	652	21	3.2%	0.8
	S Midler Ave onramp	EB	255	251	-3	-1.3%	0.2
	Thompson Rd offramp	EB	1375	1456	81	5.9%	2.2
	Thompson Rd onramp	EB	398	393	-5	-1.2%	0.2
	Bridge St onramp	EB	431	427	-4	-0.9%	0.2
	Willls Ave onramp	EB	206	203	-3	-1.5%	0.2
	Hawthawa Blvd onramp	WB	418	412	-6	-1.5%	0.3
	Bear St onramp	WB	743	782	39	5.2%	1.4
	Geddes St offramp	WB	623	641	18	2.9%	0.7
	West St onramp	WB	889	924	35	3.9%	1.2
	West St offramp	WB	578	604	27	4.6%	1.1
	Townsend St offramp	WB	493	482	-11	-2.2%	0.5
	Teal Ave onramp	WB	796	736	-60	-7.6%	2.2
	Teal Ave offramp	WB	372	370	-2	-0.6%	0.1
	S Midler Ave onramp	WB	595	591	-5	-0.8%	0.2
	S Midler Ave offramp	WB	337	362	24	7.2%	1.3
	Thompson Rd onramp	WB	1908	1900	-8	-0.4%	0.2
	Thompson Rd offramp	WB	288	306	18	6.2%	1.0
	Bridge St offramp	WB	344	390	47	13.6%	2.4
I-481 Highway	I-81 onramps and Exit 1	NB	1092	1169	77	7.0%	2.3
	Exit 1 off and onramps	NB	805	894	89	11.1%	3.1
	Exit 1 and Exit 2	NB	1105	1212	107	9.7%	3.1
	Exit 2 off and onramps	NB	736	808	72	9.8%	2.6
	Exit 3E onramp and Exit 3W	NB	1244	1301	57	4.6%	1.6
	Exit 2 onramp and Exit 3E	NB	1161	1240	79	6.8%	2.3
	Exit 3E off and onramps	NB	957	1023	66	6.9%	2.1
	Exit 3W off and onramps	NB	1060	1114	54	5.1%	1.7
	Exit 3W onramp and Exit 4	NB	2158	2236	78	3.6%	1.7
	Exit 4 offramp and Exit 4 onramp	NB	1142	1170	28	2.4%	0.8
	Exit 4 onramp and Exit 5E	NB	2357	2484	127	5.4%	2.6
	Exit 5E off and onramps	NB	1972	2088	116	5.9%	2.6
	Exit 5E onramp and Exit 5W	NB	2175	2299	124	5.7%	2.6
	WB Kirkville Rd onramp and I90 offramp	NB	2035	2153	118	5.8%	2.6
	Exit 5W off and onramps	NB	1907	2020	113	5.9%	2.5
	Exit 5W onramp and Exit 6	NB	2035	2153	118	5.8%	2.6
	Exit 6 off and onramps	NB	1148	1227	79	6.9%	2.3
	I90 onramp and US 298 offramp	NB	1462	1541	79	5.4%	2.0
	Exit 7 off and onramps	NB	1078	1145	67	6.2%	2.0
	Exit 7 onramp and Exit 8	NB	1471	1558	87	5.9%	2.2
	Exit 8 off and onramps	NB	1157	1241	84	7.3%	2.4
	Exit 8 onramp and Exit 9N	NB	2084	2177	93	4.5%	2.0
	Exit 9N off and onramps	NB	1454	1540	86	5.9%	2.2

	Exit 9N onramp and Exit 9S	NB	2759	2933	174	6.3%	3.3
	Exit 9S off and onramps	NB	2624	2785	161	6.1%	3.1
	Before WB I-481 offramp	NB	2748	2873	124	4.5%	2.3
	Before EB I-481 onramp	SB	1587	1615	28	1.8%	0.7
	Exit 9S onramp and Exit 9N	SB	1039	1078	38	3.7%	1.2
	Exit 9S off and onramps	SB	777	805	28	3.6%	1.0
	Exit 9N off and onramps	SB	903	929	26	2.9%	0.9
	Exit 9N onramp and Exit 8	SB	1105	1167	62	5.6%	1.8
	Exit 8 off and onramps	SB	854	904	51	6.0%	1.7
	Exit 8 onramp and Exit 7	SB	1045	1114	69	6.6%	2.1
	Exit 7 off and onramps	SB	939	1008	68	7.3%	2.2
	Exit 7 and Exit 6	SB	1397	1482	86	6.2%	2.3
	Exit 6 off and onramps	SB	1120	1193	72	6.5%	2.1
	Exit 6 and Exit 5W	SB	1625	1704	79	4.9%	1.9
	Exit 5W off and onramps	SB	1518	1593	75	4.9%	1.9
	Exit 5W onramp and Exit 5E	SB	1623	1696	72	4.4%	1.8
	Exit 5E off and onramps	SB	1422	1500	78	5.5%	2.0
	Exit 5E onramp and Exit 4	SB	1892	1982	90	4.8%	2.1
	Exit 4 offramp and Exit 4 onramp	SB	1147	1198	52	4.5%	1.5
	Exit 4 onramp and Exit 3W	SB	2785	2957	172	6.2%	3.2
	Exit 3W onramp and Exit 3E	SB	2747	2928	181	6.6%	3.4
	Exit 3W off and onramps	SB	2496	2656	160	6.4%	3.2
	Exit 3E off and onramps	SB	1246	1295	48	3.9%	1.4
	Exit 3E onramp and Exit 2	SB	1546	1601	55	3.5%	1.4
	Exit 3E onramp and Exit 2	SB	1546	1607	61	4.0%	1.5
	Exit 2 off and onramps	SB	989	1025	36	3.7%	1.1
	Exit 2 onramp and Exit 1	SB	1195	1240	44	3.7%	1.3
	I-81 North offramp and E. Brighton Av onramp	SB	107	120	13	12.4%	1.2
	I-81 North and I-81 South ramps	SB	601	636	35	5.9%	1.4
	I-81 North offramp and E. Brighton Av onramp	SB	534	545	11	2.1%	0.5
	Rock Cut Rd offramp	NB	287	279	-8	-2.6%	0.5
	Rock Cut Rd onramp	NB	300	293	-7	-2.4%	0.4
	Jamesville Rd offramp	NB	369	408	40	10.8%	2.0
	Jamesville Rd onramp	NB	424	420	-4	-1.0%	0.2
	EB US 5 offramp	NB	203	221	18	8.8%	1.2
	WB US 5 onramp	NB	1098	1103	5	0.5%	0.2
	EB US 5 onramp	NB	286	284	-2	-0.8%	0.1
	WB US 5 offramp	NB	184	196	13	6.8%	0.9
	WB I690 offramp	NB	1016	1072	56	5.5%	1.7
	EB I690 onramp	NB	1215	1289	74	6.1%	2.1
	EB Kirkville Rd onramp	NB	203	201	-1	-0.7%	0.1
	EB Kirkville Rd offramp	NB	385	406	22	5.6%	1.1
	WB Kirkville Rd offramp	NB	267	288	21	7.8%	1.3
	WB Kirkville Rd onramp	NB	128	124	-4	-2.8%	0.3
	I90 offramp	NB	887	929	42	4.7%	1.4
	I90 onramp	NB	314	311	-3	-0.9%	0.2
	US 298 offramp	NB	384	404	20	5.2%	1.0
	US 298 onramp	NB	392	389	-4	-0.9%	0.2
	Northern Blvd offramp	NB	314	329	16	5.0%	0.9
	Northern Blvd onramp	NB	927	919	-8	-0.9%	0.3
	Brighton Ave offramp	SB	594	623	29	4.9%	1.2
	Jamesville Rd offramp	SB	557	595	38	6.9%	1.6
	Jamesville Rd onramp	SB	206	204	-2	-1.2%	0.2
	WB US 5 offramp	SB	289	323	33	11.5%	1.9
	EB US 5 onramp	SB	300	296	-3	-1.1%	0.2
	EB US 5 offramp	SB	1501	1674	173	11.5%	4.3
	WB US 5 onramp	SB	251	248	-3	-1.2%	0.2
	EB I690 onramp	SB	1638	1730	92	5.6%	2.2
	WB I690 offramp	SB	745	794	49	6.6%	1.8
	EB Kirkville Rd onramp	SB	469	465	-4	-0.9%	0.2
	EB Kirkville Rd offramp	SB	201	200	-1	-0.4%	0.1
	WB Kirkville Rd onramp	SB	105	102	-3	-3.1%	0.3
	WB Kirkville Rd offramp	SB	107	114	7	6.5%	0.7
	I90 offramp	SB	276	295	19	6.8%	1.1
	I90 onramp	SB	505	505	0	0.0%	0.0
	US 298 offramp	SB	105	122	17	16.0%	1.6
	US 298 onramp	SB	457	457	0	0.0%	0.0
	Northern Blvd onramp	SB	191	189	-3	-1.4%	0.2
	Northern Blvd offramp	SB	251	268	17	6.7%	1.0

APPENDIX G:
ROUTE TRAVEL TIME VALIDATION SUMMARY – AM PEAK PERIOD

Table G-1: Route Travel Time Validation Summary – AM Pre-Peak

Route Name	Dir	Length	Travel Time (min)		Difference	
		(mi)	Observed	Modeled	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	12.18	12.30	13.28	0.98	8%
	SB	11.65	11.63	12.92	1.29	11%
I-481 from Exit 2 to Exit 8	NB	13.99	12.78	13.24	0.46	4%
	SB	14.06	12.89	13.33	0.44	3%
I-690 from Exit 8 to Exit 17	EB	8.05	8.12	9.15	1.03	13%
	WB	8.13	7.78	8.93	1.15	15%
Fayette St from West St to Walnut Ave	EB	1.37	4.71	5.70	0.99	21%
	WB	1.27	5.35	6.31	0.96	18%
Adams St from West St to Comstock Ave	EB	1.45	6.22	8.02	1.80	29%
Harrison St from Comstock Ave to S West St	WB	1.45	6.68	7.59	0.91	14%
State St from Adams St to Butternut St	NB	1.09	5.94	5.69	-0.25	-4%
Clinton St from Webster Landing to Adams St	SB	0.85	5.08	4.21	-0.87	-17%
West St from Genesee St To Adams St	NB	0.76	2.35	2.64	0.29	12%
	SB	0.77	1.47	2.30	0.83	56%
Irving Ave from E Raynor St to Fayette St	NB	0.84	4.00	3.84	-0.16	-4%
	SB	0.85	3.40	3.75	0.35	10%
Almond St from Van Burn St to Burnet St	NB	1.00	4.27	4.24	-0.03	-1%
	SB	1.03	7.50	6.45	-1.05	-14%

Table G-2: Route Travel Time Validation Summary – AM Peak Hour

Route Name	Dir	Length	Travel Time (min)		Difference	
		(mi)	Observed	Modeled	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	12.18	12.17	11.93	-0.24	-2%
	SB	11.65	12.70	14.15	1.45	11%
I-481 from Exit 2 to Exit 8	NB	13.99	12.80	13.29	0.49	4%
	SB	14.06	12.72	13.39	0.67	5%
I-690 from Exit 8 to Exit 17	EB	8.05	13.19	11.42	-1.77	-13%
	WB	8.13	7.76	8.81	1.05	13%
Fayette St from West St to Walnut Ave	EB	1.37	4.62	6.14	1.52	33%
	WB	1.27	6.23	6.59	0.36	6%
Adams St from West St to Comstock Ave	EB	1.45	7.29	7.97	0.68	9%
Harrison St from Comstock Ave to S West St	WB	1.45	8.47	7.75	-0.72	-9%
State St from Adams St to Butternut St	NB	1.09	6.54	5.65	-0.89	-14%
Clinton St from Webster Landing to Adams St	SB	0.85	3.88	4.47	0.59	15%
West St from Genesee St To Adams St	NB	0.76	1.58	2.33	0.75	47%
	SB	0.77	1.63	2.21	0.58	36%
Irving Ave from E Raynor St to Fayette St	NB	0.84	4.33	3.83	-0.50	-12%
	SB	0.85	4.10	4.01	-0.09	-2%
Almond St from Van Burn St to Burnet St	NB	1.00	4.80	4.28	-0.52	-11%
	SB	1.03	4.50	5.45	0.95	21%

Table G-3: Route Travel Time Validation Summary – AM Post-Peak

Route Name	Dir	Length	Travel Time (min)		Difference	
		(mi)	Observed	Modeled	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	12.18	12.54	12.86	0.32	3%
	SB	11.65	12.04	13.87	1.83	15%
I-481 from Exit 2 to Exit 8	NB	13.99	12.87	13.25	0.38	3%
	SB	14.06	12.89	13.32	0.43	3%
I-690 from Exit 8 to Exit 17	EB	8.05	7.68	8.63	0.95	12%
	WB	8.13	7.73	8.60	0.87	11%
Fayette St from West St to Walnut Ave	EB	1.37	4.62	5.73	1.11	24%
	WB	1.27	6.23	6.19	-0.04	-1%
Adams St from West St to Comstock Ave	EB	1.45	7.29	7.44	0.15	2%
Harrison St from Comstock Ave to S West St	WB	1.45	8.47	7.80	-0.67	-8%
State St from Adams St to Butternut St	NB	1.09	6.54	5.59	-0.95	-15%
Clinton St from Webster Landing to Adams St	SB	0.85	3.88	4.53	0.65	17%
West St from Genesee St To Adams St	NB	0.76	1.58	2.39	0.81	51%
	SB	0.77	1.63	2.21	0.58	36%
Irving Ave from E Raynor St to Fayette St	NB	0.84	4.33	3.68	-0.65	-15%
	SB	0.85	4.10	3.72	-0.38	-9%
Almond St from Van Burn St to Burnet St	NB	1.00	4.80	3.97	-0.83	-17%
	SB	1.03	4.50	5.24	0.74	16%

APPENDIX H:
ROUTE TRAVEL TIME VALIDATION SUMMARY – PM PEAK PERIOD

Table H-1: Route Travel Time Validation Summary – PM Pre-Peak

Route Name	Dir	Length	Travel Time (min)		Difference	
		(mi)	Observed	Modeled	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	12.18	12.52	13.61	1.09	9%
	SB	11.65	12.03	13.17	1.14	9%
I-481 from Exit 2 to Exit 8	NB	13.99	12.96	13.36	0.40	3%
	SB	14.06	12.69	13.29	0.60	5%
I-690 from Exit 8 to Exit 17	EB	8.05	8.06	9.41	1.35	17%
	WB	8.13	8.20	9.05	0.86	10%
Fayette St from West St to Walnut Ave	EB	1.37	6.30	6.10	-0.20	-3%
	WB	1.27	6.96	7.01	0.05	1%
Adams St from West St to Comstock Ave	EB	1.45	7.35	8.37	1.02	14%
Harrison St from Comstock Ave to S West St	WB	1.45	7.08	6.79	-0.29	-4%
State St from Adams St to Butternut St	NB	1.09	6.48	5.56	-0.92	-14%
Clinton St from Webster Landing to Adams St	SB	0.85	4.24	4.93	0.69	16%
West St from Genesee St To Adams St	NB	0.76	1.97	2.43	0.46	24%
	SB	0.77	1.45	2.03	0.58	40%
Irving Ave from E Raynor St to Fayette St	NB	0.84	3.67	4.18	0.51	14%
	SB	0.85	4.92	4.86	-0.06	-1%
Almond St from Van Burn St to Burnet St	NB	1.00	6.67	5.61	-1.05	-16%
	SB	1.03	4.90	5.43	0.53	11%

Table H-2: Route Travel Time Validation Summary – PM Peak Hour

Route Name	Dir	Length	Travel Time (min)		Difference	
		(mi)	Observed	Modeled	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	12.18	12.42	13.73	1.31	11%
	SB	11.65	12.27	13.13	0.86	7%
I-481 from Exit 2 to Exit 8	NB	13.99	13.38	13.36	-0.02	0%
	SB	14.06	13.37	13.47	0.11	1%
I-690 from Exit 8 to Exit 17	EB	8.05	8.59	9.50	0.91	11%
	WB	8.13	8.89	9.55	0.66	7%
Fayette St from West St to Walnut Ave	EB	1.37	5.89	5.27	-0.62	-11%
	WB	1.27	7.78	6.65	-1.13	-14%
Adams St from West St to Comstock Ave	EB	1.45	7.93	8.35	0.42	5%
Harrison St from Comstock Ave to S West St	WB	1.45	7.90	6.98	-0.92	-12%
State St from Adams St to Butternut St	NB	1.09	8.89	6.77	-2.12	-24%
Clinton St from Webster Landing to Adams St	SB	0.85	4.28	5.08	0.80	19%
West St from Genesee St To Adams St	NB	0.76	2.31	2.48	0.17	7%
	SB	0.77	1.20	2.09	0.89	74%
Irving Ave from E Raynor St to Fayette St	NB	0.84	4.22	3.93	-0.29	-7%
	SB	0.85	6.01	5.37	-0.64	-11%
Almond St from Van Burn St to Burnet St	NB	1.00	5.62	5.52	-0.10	-2%
	SB	1.03	5.72	5.54	-0.18	-3%

Table H-3: Route Travel Time Validation Summary – PM Post-Peak

Route Name	Dir	Length	Travel Time (min)		Difference	
		(mi)	Observed	Modeled	Actual	Percent
I-81 from Exit 17 to Exit 29N	NB	12.18	12.46	13.26	0.80	6%
	SB	11.65	12.69	12.83	0.14	1%
I-481 from Exit 2 to Exit 8	NB	13.99	12.92	13.30	0.38	3%
	SB	14.06	13.44	13.32	-0.12	-1%
I-690 from Exit 8 to Exit 17	EB	8.05	8.43	9.26	0.83	10%
	WB	8.13	9.18	9.31	0.13	1%
Fayette St from West St to Walnut Ave	EB	1.37	5.66	4.84	-0.82	-14%
	WB	1.27	8.08	7.19	-0.89	-11%
Adams St from West St to Comstock Ave	EB	1.45	7.81	8.67	0.86	11%
Harrison St from Comstock Ave to S West St	WB	1.45	6.42	5.87	-0.55	-9%
State St from Adams St to Butternut St	NB	1.09	6.42	5.22	-1.20	-19%
Clinton St from Webster Landing to Adams St	SB	0.85	5.38	4.91	-0.47	-9%
West St from Genesee St To Adams St	NB	0.76	1.92	2.36	0.44	23%
	SB	0.77	1.69	2.43	0.74	44%
Irving Ave from E Raynor St to Fayette St	NB	0.84	3.63	3.42	-0.21	-6%
	SB	0.85	6.48	5.58	-0.90	-14%
Almond St from Van Burn St to Burnet St	NB	1.00	4.98	5.00	0.02	0%
	SB	1.03	5.17	5.16	-0.01	0%

APPENDIX I:
FREEWAY LINK TRAVEL TIME VALIDATION SUMMARY – AM PEAK PERIOD

Table I-1: Freeway Link Travel Time Validation Summary – AM Pre-Peak

Route Name	Segment	Length (mi)	Travel Time (min)		Difference	
			Observed	Modeled	Actual	Percent
I-81 NB	from Exit 16A to Exit 17	0.76	0.85	0.73	-0.12	-14%
	from Exit 17 to Exit 18	1.82	1.96	2.13	0.17	9%
	from Exit 18 to I-690 Exit	0.71	0.87	0.97	0.10	11%
	from I-690 Exit to Exit 22	1.17	1.48	1.50	0.02	1%
	from Exit 22 to Exit 23	0.75	0.81	0.88	0.07	9%
	from Exit 23 to Exit 25	1.50	1.51	1.59	0.08	5%
	from Exit 25 to Exit 25A	0.54	0.50	0.51	0.01	2%
	from Exit25A to Exit 26	0.98	0.90	0.92	0.02	3%
	from Exit 26 to Exit 27	0.57	0.52	0.54	0.02	4%
	from Exit 27 to Exit 29S	2.26	2.09	2.14	0.05	3%
	from Exit 29S to Exit 29N	0.61	0.57	0.58	0.01	2%
	from Exit 29N to after merge from I-481	0.29	0.24	0.27	0.03	14%
I-81 SB	before exit ramp to I-481 NB to Exit 29N	0.29	0.25	0.28	0.03	11%
	from Exit 29N to Exit 29S	0.44	0.40	0.42	0.02	6%
	from Exit 29S to Exit 28	0.98	0.91	0.93	0.02	2%
	from Exit 28 to Exit 27	0.74	0.68	0.71	0.03	4%
	from Exit 27 to Exit 25A	2.11	1.94	2.01	0.07	3%
	from Exit 25A to Exit 25	0.43	0.40	0.41	0.01	2%
	from Exit 25 to Exit 23A	0.67	0.62	0.64	0.02	3%
	from Exit 25 to Exit 21	1.50	1.41	1.79	0.38	27%
	from Exit 21 to Exit 20	0.60	0.65	0.72	0.07	11%
	from Exit 20 to Exit 19	0.13	0.14	0.16	0.02	12%
	from Exit 19 to Exit 18	0.83	0.96	1.15	0.19	19%
	from Exit 18 to Exit 17	1.73	2.09	2.20	0.11	5%
	from Exit 17 to Exit to I-481	1.08	1.18	1.24	0.06	5%
I-481 NB	before Exit 1 to Exit 2	2.45	2.24	2.32	0.08	4%
	from Exit 2 to Exit 3	1.87	1.70	1.77	0.07	4%
	from Exit 3 to Exit 4	1.64	1.50	1.57	0.07	5%
	from Exit 4 to Exit 5	1.41	1.29	1.46	0.17	13%
	from Exit 5 to Exit 6	1.68	1.53	1.61	0.08	5%
	from Exit 6 to Exit 7	0.65	0.60	0.62	0.02	3%
	from Exit 7 to Exit 8	3.06	2.80	2.89	0.09	3%
	from Exit 8 to Exit 9N	1.23	1.12	1.16	0.04	4%
I-481 SB	from Exit 9N to Exit 8	0.80	0.72	0.78	0.06	8%
	from Exit 8 to Exit 7	3.14	2.87	2.99	0.12	4%
	from Exit 7 to Exit 6	0.71	0.65	0.68	0.03	4%
	from Exit 6 to Exit 5	1.20	1.10	1.14	0.04	4%
	from Exit 5 to Exit 4	1.44	1.36	1.38	0.02	2%
	from Exit 4 to Exit 3	1.81	1.71	1.71	0.00	0%
	from Exit 3 to Exit 2	1.54	1.42	1.46	0.04	3%
	from Exit 2 to Exit 1	3.37	3.06	3.21	0.15	5%
I-690 EB	from Exit 7 to Exit 8	0.81	0.79	0.77	-0.02	-3%
	from Exit 8 to Exit 9	0.37	0.35	0.35	0.00	1%
	from Exit 9 to Exit 12	1.03	1.03	1.08	0.05	5%
	from 12 to Exit to I-81 South	0.47	0.48	0.60	0.12	24%
	to Exit 14	1.36	1.43	1.63	0.20	14%
	from Exit 14 to Exit 15	0.87	0.85	1.00	0.15	18%
	from Exit 15 to Exit 16N	1.07	1.00	1.22	0.22	22%
	from Exit 16N to exit 16 S	0.15	0.13	0.17	0.04	30%
	from Exit 16S to Exit 17	0.34	0.31	0.38	0.07	24%
	from Exit 17 to merge to I-481	1.53	1.75	1.86	0.11	6%
I-690 WB	from I-481 Exit to Exit 17	1.02	1.00	1.27	0.27	27%
	from Exit 17 to Exit 16N & 16S	0.30	0.30	0.29	-0.01	-3%
	from Exit 16N & 16S to Exit 15	1.26	1.24	1.20	-0.04	-3%
	from Exit 15 to Exit 14	1.03	0.97	0.98	0.01	1%
	from Exit 14 to Exit 13	1.60	1.53	1.57	0.04	3%
	from Exit 13 to Exit 11	0.28	0.31	0.36	0.05	17%
	from Exit 11 to Exit 10	0.63	0.64	0.71	0.07	11%
	from Exit 10 to route end	1.88	1.79	2.24	0.45	25%

Table I-2: Freeway Link Travel Time Validation Summary – AM Peak Hour

	Segment		Travel Time (min)	Difference

Route Name		Length (mi)	Observed	Modeled	Actual	Percent
I-81 NB	from Exit 16A to Exit 17	0.76	0.85	0.73	-0.12	-14%
	from Exit 17 to Exit 18	1.82	1.96	2.08	0.12	6%
	from Exit 18 to I-690 Exit	0.71	0.78	0.99	0.21	27%
	from I-690 Exit to Exit 22	1.17	1.42	1.51	0.09	6%
	from Exit 22 to Exit 23	0.75	0.81	0.89	0.08	10%
	from Exit 23 to Exit 25	1.50	1.52	1.59	0.07	5%
	from Exit 25 to Exit 25A	0.54	0.50	0.51	0.01	3%
	from Exit25A to Exit 26	0.98	0.90	0.93	0.03	3%
	from Exit 26 to Exit 27	0.57	0.52	0.54	0.02	4%
	from Exit 27 to Exit 29S	2.26	2.10	2.15	0.05	2%
	from Exit 29S to Exit 29N	0.61	0.57	0.59	0.02	3%
	from Exit 29N to after merge from I-481	0.29	0.24	0.27	0.03	14%
I-81 SB	before exit ramp to I-481 NB to Exit 29N	0.29	0.25	0.28	0.03	11%
	from Exit 29N to Exit 29S	0.44	0.40	0.43	0.03	7%
	from Exit 29S to Exit 28	0.98	0.90	0.94	0.04	4%
	from Exit 28 to Exit 27	0.74	0.68	0.71	0.03	4%
	from Exit 27 to Exit 25A	2.11	1.93	2.01	0.08	4%
	from Exit 25A to Exit 25	0.43	0.40	0.41	0.01	3%
	from Exit 25 to Exit 23A	0.67	0.62	0.64	0.02	4%
	from Exit 25 to Exit 21	1.50	2.19	1.45	-0.74	-34%
	from Exit 21 to Exit 20	0.60	0.68	1.01	0.33	49%
	from Exit 20 to Exit 19	0.13	0.14	0.28	0.14	103%
	from Exit 19 to Exit 18	0.83	1.26	2.67	1.41	112%
	from Exit 18 to Exit 17	1.73	2.09	2.21	0.12	6%
	from Exit 17 to Exit to I-481	1.08	1.17	1.25	0.08	7%
I-481 NB	before Exit 1 to Exit 2	2.45	2.22	2.33	0.11	5%
	from Exit 2 to Exit 3	1.87	1.68	1.77	0.09	5%
	from Exit 3 to Exit 4	1.64	1.51	1.59	0.09	6%
	from Exit 4 to Exit 5	1.41	1.31	1.46	0.15	12%
	from Exit 5 to Exit 6	1.68	1.55	1.62	0.07	4%
	from Exit 6 to Exit 7	0.65	0.61	0.62	0.01	2%
	from Exit 7 to Exit 8	3.06	2.83	2.90	0.07	3%
	from Exit 8 to Exit 9N	1.23	1.11	1.17	0.06	5%
I-481 SB	from Exit 9N to Exit 8	0.80	0.71	0.78	0.07	9%
	from Exit 8 to Exit 7	3.14	2.83	3.00	0.17	6%
	from Exit 7 to Exit 6	0.71	0.65	0.68	0.03	4%
	from Exit 6 to Exit 5	1.20	1.09	1.15	0.06	5%
	from Exit 5 to Exit 4	1.44	1.31	1.40	0.09	7%
	from Exit 4 to Exit 3	1.81	1.69	1.71	0.02	1%
	from Exit 3 to Exit 2	1.54	1.40	1.46	0.06	4%
	from Exit 2 to Exit 1	3.37	3.04	3.21	0.17	6%
I-690 EB	from Exit 7 to Exit 8	0.81	1.28	0.77	-0.50	-39%
	from Exit 8 to Exit 9	0.37	0.68	0.36	-0.31	-46%
	from Exit 9 to Exit 12	1.03	1.03	1.13	0.10	10%
	from 12 to Exit to I-81 South	0.47	1.51	0.72	-0.78	-52%
	to Exit 14	1.36	1.60	1.68	0.09	6%
	from Exit 14 to Exit 15	0.87	0.82	1.01	0.19	23%
	from Exit 15 to Exit 16N	1.07	1.03	1.24	0.22	21%
	from Exit 16N to Exit 16 S	0.15	0.14	0.17	0.03	25%
	from Exit 16S to Exit 17	0.34	0.31	0.38	0.07	24%
	from Exit 17 to merge to I-481	1.53	1.76	1.85	0.10	6%
I-690 WB	from I-481 Exit to Exit 17	1.02	1.00	1.28	0.28	28%
	from Exit 17 to Exit 16N & 16S	0.30	0.29	0.30	0.01	5%
	from Exit 16N & 16S to Exit 15	1.26	1.16	1.21	0.05	5%
	from Exit 15 to Exit 14	1.03	1.00	1.00	0.00	0%
	from Exit 14 to Exit 13	1.60	1.64	1.59	-0.05	-3%
	from Exit 13 to Exit 11	0.28	0.30	0.36	0.06	19%
	from Exit 11 to Exit 10	0.63	0.62	0.72	0.10	16%
	from Exit 10 to route end	1.88	1.77	2.21	0.44	25%

Table I-3: Freeway Link Travel Time Validation Summary – AM Post-Peak

Route Name	Segment	Length (mi)	Travel Time (min)		Difference	
			Observed	Modeled	Actual	Percent
I-81 NB	from Exit 16A to Exit 17	0.76	0.85	0.73	-0.12	-14%
	from Exit 17 to Exit 18	1.82	2.00	2.07	0.07	3%
	from Exit 18 to I-690 Exit	0.71	0.78	0.95	0.17	22%
	from I-690 Exit to Exit 22	1.17	1.43	1.47	0.04	3%
	from Exit 22 to Exit 23	0.75	0.81	0.87	0.06	7%
	from Exit 23 to Exit 25	1.50	1.61	1.59	-0.02	-1%
	from Exit 25 to Exit 25A	0.54	0.59	0.51	-0.08	-13%
	from Exit25A to Exit 26	0.98	0.96	0.93	-0.03	-4%
	from Exit 26 to Exit 27	0.57	0.59	0.54	-0.05	-9%
	from Exit 27 to Exit 29S	2.26	2.10	2.14	0.04	2%
	from Exit 29S to Exit 29N	0.61	0.57	0.58	0.01	2%
	from Exit 29N to after merge from I-481	0.29	0.25	0.27	0.02	9%
I-81 SB	before exit ramp to I-481 NB to Exit 29N	0.29	0.25	0.28	0.03	10%
	from Exit 29N to Exit 29S	0.44	0.40	0.42	0.02	5%
	from Exit 29S to Exit 28	0.98	0.90	0.93	0.03	4%
	from Exit 28 to Exit 27	0.74	0.68	0.70	0.02	4%
	from Exit 27 to Exit 25A	2.11	1.93	2.01	0.08	4%
	from Exit 25A to Exit 25	0.43	0.40	0.41	0.01	2%
	from Exit 25 to Exit 23A	0.67	0.63	0.64	0.01	2%
	from Exit 25 to Exit 21	1.50	1.62	2.97	1.35	83%
	from Exit 21 to Exit 20	0.60	0.65	1.12	0.47	72%
	from Exit 20 to Exit 19	0.13	0.14	0.29	0.15	105%
	from Exit 19 to Exit 18	0.83	1.16	2.90	1.74	150%
	from Exit 18 to Exit 17	1.73	2.11	2.17	0.06	3%
	from Exit 17 to Exit to I-481	1.08	1.17	1.23	0.06	5%
I-481 NB	before Exit 1 to Exit 2	2.45	2.22	2.32	0.10	5%
	from Exit 2 to Exit 3	1.87	1.68	1.77	0.09	5%
	from Exit 3 to Exit 4	1.64	1.50	1.57	0.07	5%
	from Exit 4 to Exit 5	1.41	1.32	1.39	0.07	5%
	from Exit 5 to Exit 6	1.68	1.56	1.61	0.05	3%
	from Exit 6 to Exit 7	0.65	0.61	0.62	0.01	1%
	from Exit 7 to Exit 8	3.06	2.85	2.89	0.04	1%
	from Exit 8 to Exit 9N	1.23	1.13	1.16	0.03	3%
I-481 SB	from Exit 9N to Exit 8	0.80	0.72	0.77	0.05	7%
	from Exit 8 to Exit 7	3.14	2.87	3.00	0.13	4%
	from Exit 7 to Exit 6	0.71	0.65	0.68	0.03	4%
	from Exit 6 to Exit 5	1.20	1.10	1.14	0.04	4%
	from Exit 5 to Exit 4	1.44	1.36	1.38	0.02	1%
	from Exit 4 to Exit 3	1.81	1.71	1.71	0.00	0%
	from Exit 3 to Exit 2	1.54	1.42	1.46	0.04	3%
	from Exit 2 to Exit 1	3.37	3.06	3.21	0.15	5%
I-690 EB	from Exit 7 to Exit 8	0.81	0.73	0.77	0.04	5%
	from Exit 8 to Exit 9	0.37	0.33	0.36	0.03	8%
	from Exit 9 to Exit 12	1.03	0.94	1.08	0.14	15%
	from 12 to Exit to I-81 South	0.47	0.48	0.65	0.17	36%
	to Exit 14	1.36	1.43	1.62	0.19	13%
	from Exit 14 to Exit 15	0.87	0.74	1.01	0.27	36%
	from Exit 15 to Exit 16N	1.07	0.93	1.23	0.30	32%
	from Exit 16N to Exit 16 S	0.15	0.13	0.17	0.04	30%
	from Exit 16S to Exit 17	0.34	0.29	0.38	0.09	32%
	from Exit 17 to merge to I-481	1.53	1.68	1.85	0.17	10%
I-690 WB	from I-481 Exit to Exit 17	1.02	1.02	1.27	0.25	25%
	from Exit 17 to Exit 16N & 16S	0.30	0.27	0.29	0.02	8%
	from Exit 16N & 16S to Exit 15	1.26	1.19	1.20	0.01	1%
	from Exit 15 to Exit 14	1.03	0.98	0.98	0.00	0%
	from Exit 14 to Exit 13	1.60	1.56	1.55	-0.01	-1%
	from Exit 13 to Exit 11	0.28	0.34	0.33	-0.01	-2%
	from Exit 11 to Exit 10	0.63	0.64	0.71	0.07	12%
	from Exit 10 to route end	1.88	1.73	2.18	0.45	26%

APPENDIX J:
FREEWAY LINK TRAVEL TIME VALIDATION SUMMARY – PM PEAK PERIOD

Table J-1: Freeway Link Travel Time Validation Summary – PM Pre-Peak

Route Name	Segment	Length (mi)	Travel Time (min)		Difference	
			Observed	Modeled	Actual	Percent
I-81 NB	from Exit 16A to Exit 17	0.76	0.80	0.74	-0.06	-8%
	from Exit 17 to Exit 18	1.82	1.93	2.14	0.21	11%
	from Exit 18 to I-690 Exit	0.71	0.85	1.04	0.19	23%
	from I-690 Exit to Exit 22	1.17	1.48	1.63	0.15	10%
	from Exit 22 to Exit 23	0.75	0.83	0.93	0.10	12%
	from Exit 23 to Exit 25	1.50	1.47	1.60	0.13	9%
	from Exit 25 to Exit 25A	0.54	0.64	0.54	-0.10	-16%
	from Exit25A to Exit 26	0.98	1.02	0.94	-0.08	-8%
	from Exit 26 to Exit 27	0.57	0.55	0.54	-0.01	-1%
	from Exit 27 to Exit 29S	2.26	2.12	2.16	0.04	2%
	from Exit 29S to Exit 29N	0.61	0.58	0.59	0.01	2%
	from Exit 29N to after merge from I-481	0.29	0.25	0.27	0.02	10%
I-81 SB	before exit ramp to I-481 NB to Exit 29N	0.29	0.28	0.28	0.00	-1%
	from Exit 29N to Exit 29S	0.44	0.42	0.42	0.00	-1%
	from Exit 29S to Exit 28	0.98	0.95	0.93	-0.02	-2%
	from Exit 28 to Exit 27	0.74	0.70	0.71	0.01	1%
	from Exit 27 to Exit 25A	2.11	2.05	2.00	-0.05	-2%
	from Exit 25A to Exit 25	0.43	0.43	0.41	-0.02	-5%
	from Exit 25 to Exit 23A	0.67	0.69	0.64	-0.05	-7%
	from Exit 25 to Exit 21	1.50	1.55	1.78	0.23	15%
	from Exit 21 to Exit 20	0.60	0.64	0.72	0.08	12%
	from Exit 20 to Exit 19	0.13	0.15	0.15	0.00	1%
	from Exit 19 to Exit 18	0.83	1.02	1.12	0.10	10%
	from Exit 18 to Exit 17	1.73	1.95	2.32	0.37	19%
	from Exit 17 to Exit to I-481	1.08	1.20	1.28	0.08	6%
I-481 NB	before Exit 1 to Exit 2	2.45	2.25	2.32	0.07	3%
	from Exit 2 to Exit 3	1.87	1.73	1.77	0.04	2%
	from Exit 3 to Exit 4	1.64	1.52	1.56	0.04	3%
	from Exit 4 to Exit 5	1.41	1.32	1.43	0.11	8%
	from Exit 5 to Exit 6	1.68	1.54	1.66	0.12	8%
	from Exit 6 to Exit 7	0.65	0.61	0.62	0.01	2%
	from Exit 7 to Exit 8	3.06	2.84	2.91	0.07	2%
	from Exit 8 to Exit 9N	1.23	1.15	1.18	0.03	2%
I-481 SB	from Exit 9N to Exit 8	0.80	0.72	0.77	0.05	7%
	from Exit 8 to Exit 7	3.14	2.83	2.98	0.15	5%
	from Exit 7 to Exit 6	0.71	0.65	0.68	0.03	4%
	from Exit 6 to Exit 5	1.20	1.09	1.14	0.05	5%
	from Exit 5 to Exit 4	1.44	1.31	1.40	0.09	7%
	from Exit 4 to Exit 3	1.81	1.68	1.74	0.06	3%
	from Exit 3 to Exit 2	1.54	1.39	1.47	0.08	6%
	from Exit 2 to Exit 1	3.37	3.02	3.21	0.19	6%
I-690 EB	from Exit 7 to Exit 8	0.81	0.73	0.76	0.03	4%
	from Exit 8 to Exit 9	0.37	0.32	0.35	0.03	10%
	from Exit 9 to Exit 12	1.03	1.01	1.07	0.06	6%
	from 12 to Exit to I-81 South	0.47	0.47	0.64	0.17	36%
	to Exit 14	1.36	1.40	1.83	0.43	31%
	from Exit 14 to Exit 15	0.87	0.86	1.02	0.16	18%
	from Exit 15 to Exit 16N	1.07	1.03	1.25	0.22	22%
	from Exit 16N to Exit 16 S	0.15	0.13	0.17	0.04	31%
	from Exit 16S to Exit 17	0.34	0.31	0.39	0.08	25%
	from Exit 17 to merge to I-481	1.53	1.80	1.88	0.08	4%
I-690 WB	from I-481 Exit to Exit 17	1.02	1.04	1.16	0.12	12%
	from Exit 17 to Exit 16N & 16S	0.30	0.30	0.34	0.05	16%
	from Exit 16N & 16S to Exit 15	1.26	1.24	1.44	0.21	17%
	from Exit 15 to Exit 14	1.03	1.00	1.18	0.18	18%
	from Exit 14 to Exit 13	1.60	1.86	1.94	0.08	4%
	from Exit 13 to Exit 11	0.28	0.31	0.34	0.03	10%
	from Exit 11 to Exit 10	0.63	0.64	0.72	0.08	13%
	from Exit 10 to route end	1.88	1.82	2.26	0.44	24%

Table J-2: Freeway Link Travel Time Validation Summary – PM Peak Hour

Route Name	Segment	Length (mi)	Travel Time (min)		Difference	
			Observed	Modeled	Actual	Percent
I-81 NB	from Exit 16A to Exit 17	0.76	0.80	0.73	-0.07	-8%
	from Exit 17 to Exit 18	1.82	1.90	2.07	0.17	9%
	from Exit 18 to I-690 Exit	0.71	0.85	1.10	0.25	29%
	from I-690 Exit to Exit 22	1.17	1.46	1.66	0.20	14%
	from Exit 22 to Exit 23	0.75	0.93	0.95	0.02	2%
	from Exit 23 to Exit 25	1.50	1.51	1.60	0.09	6%
	from Exit 25 to Exit 25A	0.54	0.50	0.54	0.04	8%
	from Exit25A to Exit 26	0.98	0.92	0.94	0.02	2%
	from Exit 26 to Exit 27	0.57	0.56	0.54	-0.02	-3%
	from Exit 27 to Exit 29S	2.26	2.16	2.17	0.01	0%
	from Exit 29S to Exit 29N	0.61	0.57	0.59	0.02	4%
	from Exit 29N to after merge from I-481	0.29	0.26	0.27	0.01	6%
I-81 SB	before exit ramp to I-481 NB to Exit 29N	0.29	0.29	0.28	-0.01	-3%
	from Exit 29N to Exit 29S	0.44	0.41	0.42	0.01	3%
	from Exit 29S to Exit 28	0.98	0.95	0.93	-0.02	-2%
	from Exit 28 to Exit 27	0.74	0.72	0.71	-0.01	-1%
	from Exit 27 to Exit 25A	2.11	2.09	2.00	-0.09	-4%
	from Exit 25A to Exit 25	0.43	0.44	0.41	-0.03	-6%
	from Exit 25 to Exit 23A	0.67	0.69	0.64	-0.05	-7%
	from Exit 25 to Exit 21	1.50	1.62	1.78	0.16	10%
	from Exit 21 to Exit 20	0.60	0.68	0.72	0.04	6%
	from Exit 20 to Exit 19	0.13	0.16	0.15	-0.01	-5%
	from Exit 19 to Exit 18	0.83	1.06	1.14	0.08	8%
	from Exit 18 to Exit 17	1.73	2.03	2.31	0.29	14%
	from Exit 17 to Exit to I-481	1.08	1.16	1.28	0.12	10%
I-481 NB	before Exit 1 to Exit 2	2.45	2.31	2.32	0.01	0%
	from Exit 2 to Exit 3	1.87	1.76	1.77	0.01	0%
	from Exit 3 to Exit 4	1.64	1.62	1.56	-0.06	-4%
	from Exit 4 to Exit 5	1.41	1.50	1.44	-0.06	-4%
	from Exit 5 to Exit 6	1.68	1.66	1.66	0.00	0%
	from Exit 6 to Exit 7	0.65	0.60	0.63	0.03	4%
	from Exit 7 to Exit 8	3.06	2.79	2.91	0.12	4%
	from Exit 8 to Exit 9N	1.23	1.14	1.18	0.04	3%
I-481 SB	from Exit 9N to Exit 8	0.80	0.73	0.76	0.04	5%
	from Exit 8 to Exit 7	3.14	2.83	2.98	0.15	5%
	from Exit 7 to Exit 6	0.71	0.65	0.68	0.03	5%
	from Exit 6 to Exit 5	1.20	1.10	1.14	0.05	4%
	from Exit 5 to Exit 4	1.44	1.40	1.39	-0.01	-1%
	from Exit 4 to Exit 3	1.81	2.05	1.77	-0.28	-14%
	from Exit 3 to Exit 2	1.54	1.53	1.48	-0.04	-3%
	from Exit 2 to Exit 1	3.37	3.10	3.22	0.12	4%
I-690 EB	from Exit 7 to Exit 8	0.81	0.77	0.76	-0.01	-2%
	from Exit 8 to Exit 9	0.37	0.36	0.35	-0.01	-2%
	from Exit 9 to Exit 12	1.03	1.02	1.07	0.05	5%
	from 12 to Exit to I-81 South	0.47	0.49	0.64	0.16	32%
	to Exit 14	1.36	1.56	1.85	0.30	19%
	from Exit 14 to Exit 15	0.87	0.91	1.02	0.11	12%
	from Exit 15 to Exit 16N	1.07	1.09	1.26	0.17	15%
	from Exit 16N to Exit 16 S	0.15	0.14	0.17	0.03	19%
	from Exit 16S to Exit 17	0.34	0.33	0.39	0.06	18%
	from Exit 17 to merge to I-481	1.53	1.93	1.88	-0.05	-3%
I-690 WB	from I-481 Exit to Exit 17	1.02	1.05	1.16	0.12	11%
	from Exit 17 to Exit 16N & 16S	0.30	0.29	0.34	0.06	20%
	from Exit 16N & 16S to Exit 15	1.26	1.23	1.44	0.21	17%
	from Exit 15 to Exit 14	1.03	1.02	1.18	0.16	16%
	from Exit 14 to Exit 13	1.60	1.98	1.92	-0.05	-3%
	from Exit 13 to Exit 11	0.28	0.40	0.35	-0.05	-12%
	from Exit 11 to Exit 10	0.63	0.93	0.72	-0.21	-22%
	from Exit 10 to route end	1.88	2.01	2.24	0.23	12%

Table J-3: Freeway Link Travel Time Validation Summary – PM Post-Peak

Route Name	Segment	Length (mi)	Travel Time (min)		Difference	
			Observed	Modeled	Actual	Percent
I-81 NB	from Exit 16A to Exit 17	0.76	0.80	0.73	-0.07	-8%
	from Exit 17 to Exit 18	1.82	1.97	2.07	0.10	5%
	from Exit 18 to I-690 Exit	0.71	0.91	1.04	0.13	14%
	from I-690 Exit to Exit 22	1.17	1.45	1.61	0.16	11%
	from Exit 22 to Exit 23	0.75	0.82	0.91	0.09	11%
	from Exit 23 to Exit 25	1.50	1.48	1.60	0.12	8%
	from Exit 25 to Exit 25A	0.54	0.54	0.53	-0.01	-2%
	from Exit25A to Exit 26	0.98	0.95	0.93	-0.02	-2%
	from Exit 26 to Exit 27	0.57	0.56	0.54	-0.02	-3%
	from Exit 27 to Exit 29S	2.26	2.15	2.15	0.00	0%
	from Exit 29S to Exit 29N	0.61	0.58	0.59	0.01	1%
	from Exit 29N to after merge from I-481	0.29	0.25	0.27	0.02	10%
I-81 SB	before exit ramp to I-481 NB to Exit 29N	0.29	0.29	0.27	-0.02	-5%
	from Exit 29N to Exit 29S	0.44	0.41	0.42	0.01	1%
	from Exit 29S to Exit 28	0.98	0.97	0.93	-0.04	-4%
	from Exit 28 to Exit 27	0.74	0.73	0.70	-0.03	-4%
	from Exit 27 to Exit 25A	2.11	2.11	2.00	-0.11	-5%
	from Exit 25A to Exit 25	0.43	0.44	0.41	-0.03	-7%
	from Exit 25 to Exit 23A	0.67	0.71	0.64	-0.07	-10%
	from Exit 25 to Exit 21	1.50	1.66	1.77	0.11	7%
	from Exit 21 to Exit 20	0.60	0.71	0.71	0.00	0%
	from Exit 20 to Exit 19	0.13	0.17	0.15	-0.02	-13%
	from Exit 19 to Exit 18	0.83	1.15	1.10	-0.05	-4%
	from Exit 18 to Exit 17	1.73	2.13	2.26	0.13	6%
	from Exit 17 to Exit to I-481	1.08	1.21	1.25	0.04	4%
I-481 NB	before Exit 1 to Exit 2	2.45	2.25	2.32	0.07	3%
	from Exit 2 to Exit 3	1.87	1.72	1.77	0.05	3%
	from Exit 3 to Exit 4	1.64	1.56	1.56	0.00	0%
	from Exit 4 to Exit 5	1.41	1.33	1.39	0.06	4%
	from Exit 5 to Exit 6	1.68	1.54	1.65	0.11	7%
	from Exit 6 to Exit 7	0.65	0.60	0.62	0.02	4%
	from Exit 7 to Exit 8	3.06	2.81	2.90	0.09	3%
	from Exit 8 to Exit 9N	1.23	1.11	1.17	0.06	6%
I-481 SB	from Exit 9N to Exit 8	0.80	0.72	0.76	0.04	6%
	from Exit 8 to Exit 7	3.14	2.82	2.97	0.15	5%
	from Exit 7 to Exit 6	0.71	0.64	0.67	0.03	5%
	from Exit 6 to Exit 5	1.20	1.09	1.14	0.05	5%
	from Exit 5 to Exit 4	1.44	1.31	1.38	0.07	5%
	from Exit 4 to Exit 3	1.81	2.07	1.76	-0.31	-15%
	from Exit 3 to Exit 2	1.54	1.64	1.47	-0.17	-10%
	from Exit 2 to Exit 1	3.37	3.15	3.21	0.06	2%
I-690 EB	from Exit 7 to Exit 8	0.81	0.75	0.76	0.01	1%
	from Exit 8 to Exit 9	0.37	0.34	0.35	0.01	3%
	from Exit 9 to Exit 12	1.03	0.97	1.07	0.10	10%
	from 12 to Exit to I-81 South	0.47	0.48	0.64	0.16	32%
	to Exit 14	1.36	1.54	1.81	0.27	17%
	from Exit 14 to Exit 15	0.87	0.97	1.01	0.04	4%
	from Exit 15 to Exit 16N	1.07	1.09	1.24	0.15	14%
	from Exit 16N to Exit 16 S	0.15	0.14	0.17	0.03	22%
	from Exit 16S to Exit 17	0.34	0.33	0.39	0.06	17%
	from Exit 17 to merge to I-481	1.53	1.82	1.87	0.05	3%
I-690 WB	from I-481 Exit to Exit 17	1.02	1.03	1.16	0.13	13%
	from Exit 17 to Exit 16N & 16S	0.30	0.29	0.34	0.05	18%
	from Exit 16N & 16S to Exit 15	1.26	1.23	1.44	0.21	17%
	from Exit 15 to Exit 14	1.03	1.04	1.18	0.14	13%
	from Exit 14 to Exit 13	1.60	2.30	1.86	-0.44	-19%
	from Exit 13 to Exit 11	0.28	0.45	0.34	-0.11	-25%
	from Exit 11 to Exit 10	0.63	0.72	0.72	0.00	0%
	from Exit 10 to route end	1.88	2.12	2.20	0.08	4%

APPENDIX K:
MAXIMUM QUEUE LENGTH VALIDATION SUMMARY – AM PEAK PERIOD

Table K-1: Maximum Queue Length Validation Summary – AM Pre-Peak

Freeway / Intersection	Segment / Approach	Queue length (ft.)		Difference	
		Observed	Modeled	(%)	(veh.)
NB I-81	Northbound I-81 at Exit 18 (Harrison St/Adams St)	0	0	-	-
	Northbound I-81 at I-690 EB Split	-	95	-	-
SB I-81	Southbound I-81 at Exit 19 (Clinton St/Salina St)	200	9	-95%	-8
	Southbound I-81 at Harrison Street off-ramp	263	1	-100%	-10
EB I-690	Eastbound I-690 at Diverge to SB I-81	200	0	-	-8
EB I-690 Connector to SB I-81	EB I-690 Connector to SB I-81 at Merge onto SB 1-81	109	2	-99%	-4
WB I-690	Westbound I-690 at Diverge to I-81 SB	0	0	-	-
NB I-481	Northbound I-481 at Diverge to WB I-690	0	0	-	-
SB I-481	Southbound I-481 at Exit 3E (5/92)	-	42	-	-
Almond Street and Adams Street	Adams Street Eastbound	397	444	12%	2
	Almond Street Northbound	45	133	196%	4
	Almond Street Southbound	342	193	-44%	-6
	Northbound I-81 off-ramp	418	315	-25%	-4
Almond Street and Harrison Street	Almond Street Northbound	451	450	0%	0
	Almond Street Southbound	720	518	-28%	-8
	Harrison Street Westbound	179	308	72%	5
Erie Blvd and Crouse Ave	Crouse Avenue Northbound	17	181	940%	7
	Crouse Avenue Southbound	48	110	128%	2
	Erie Blvd Eastbound	13	92	594%	3
	Erie Blvd Westbound	13	104	724%	4
Genesee Street and Eastbound I-690 off-ramp/N. West St	EB I-690 off-ramp	107	287	168%	7
	Genesee Street Eastbound	62	310	401%	10
	Genesee Street Westbound	-	85	-	-
Almond Street and SB 1-81 off-ramp	SB I-81 off-ramp	337	502	49%	7
Salina Street and SB I-81 off-ramp	SB I-81 off-ramp	26	210	701%	7
Townsend Street and WB I-690 off-ramp	WB I-690 off-ramp	68	144	111%	3

Table K-2: Maximum Queue Length Validation Summary – AM Peak Hour

Freeway / Intersection	Segment / Approach	Queue length (ft.)		Difference	
		Observed	Modeled	(%)	(veh.)
NB I-81	Northbound I-81 at Exit 18 (Harrison St/Adams St)	218	86	-61%	-5
	Northbound I-81 at I-690 EB Split	-	167	-	-
SB I-81	Southbound I-81 at Exit 19 (Clinton St/Salina St)	5200	4366	-16%	-33
	Southbound I-81 at Harrison Street off-ramp	1240	1202	-3%	-2
EB I-690	Eastbound I-690 at Diverge to SB I-81	491	676	38%	7
EB I-690 Connector to SB I-81	EB I-690 Connector to SB I-81 at Merge onto SB 1-81	619	678	10%	2
WB I-690	Westbound I-690 at Diverge to I-81 SB	0	2	NA	0
NB I-481	Northbound I-481 at Diverge to WB I-690	0	0	NA	0
SB I-481	Southbound I-481 at Exit 3E (5/92)	-	71	-	-
Almond Street and Adams Street	Adams Street Eastbound	661	566	-14%	-4
	Almond Street Northbound	107	177	65%	3
	Almond Street Southbound	479	376	-22%	-4
	Northbound I-81 off-ramp	845	789	-7%	-2
Almond Street and Harrison Street	Almond Street Northbound	859	961	12%	4
	Almond Street Southbound	842	659	-22%	-7
	Harrison Street Westbound	374	381	2%	0
Erie Blvd and Crouse Ave	Crouse Avenue Northbound	40	207	423%	7
	Crouse Avenue Southbound	74	128	74%	2
	Erie Blvd Eastbound	19	103	451%	3
	Erie Blvd Westbound	45	113	150%	3
Genesee Street and Eastbound I-690 off-ramp/N. West St	EB I-690 off-ramp	203	432	112%	9
	Genesee Street Eastbound	151	417	177%	11
	Genesee Street Westbound	-	110	-	-
Almond Street and SB 1-81 off-ramp	SB I-81 off-ramp	547	764	40%	9
Salina Street and SB I-81 off-ramp	SB I-81 off-ramp	394	552	40%	6
Townsend Street and WB I-690 off-ramp	WB I-690 off-ramp	131	186	42%	2

Table K-3: Maximum Queue Length Validation Summary – AM Post-Peak

Freeway / Intersection	Segment / Approach	Queue length (ft.)		Difference	
		Observed	Modeled	(%)	(veh.)
NB I-81	Northbound I-81 at Exit 18 (Harrison St/Adams St)	375	0	-100%	-15
	Northbound I-81 at I-690 EB Split	-	127	-	-
SB I-81	Southbound I-81 at Exit 19 (Clinton St/Salina St)	2325	2986	28%	26
	Southbound I-81 at Harrison Street off-ramp	1950	1840	-6%	-4
EB I-690	Eastbound I-690 at Diverge to SB I-81	7	316	4646%	12
EB I-690 Connector to SB I-81	EB I-690 Connector to SB I-81 at Merge onto SB 1-81	525	485	-8%	-2
WB I-690	Westbound I-690 at Diverge to I-81 SB	0	3	-	0
NB I-481	Northbound I-481 at Diverge to WB I-690	0	0	-	0
SB I-481	Southbound I-481 at Exit 3E (5/92)	-	50	-	-
Almond Street and Adams Street	Adams Street Eastbound	423	491	16%	3
	Almond Street Northbound	116	165	43%	2
	Almond Street Southbound	352	341	-3%	0
	Northbound I-81 off-ramp	575	396	-31%	-7
Almond Street and Harrison Street	Almond Street Northbound	727	547	-25%	-7
	Almond Street Southbound	754	597	-21%	-6
	Harrison Street Westbound	254	343	35%	4
Erie Blvd and Crouse Ave	Crouse Avenue Northbound	37	189	413%	6
	Crouse Avenue Southbound	63	120	90%	2
	Erie Blvd Eastbound	28	93	229%	3
	Erie Blvd Westbound	36	123	238%	3
Genesee Street and Eastbound I-690 off-ramp/N. West St	EB I-690 off-ramp	98	310	215%	8
	Genesee Street Eastbound	231	315	36%	3
	Genesee Street Westbound	-	106	-	-
Almond Street and SB 1-81 off-ramp	SB I-81 off-ramp	500	675	35%	7
Salina Street and SB I-81 off-ramp	SB I-81 off-ramp	325	423	30%	4
Townsend Street and WB I-690 off-ramp	WB I-690 off-ramp	124	169	36%	2

APPENDIX L:
MAXIMUM QUEUE LENGTH VALIDATION SUMMARY – PM PEAK PERIOD

Table L-1: Maximum Queue Length Validation Summary – PM Pre-Peak

Freeway / Intersection	Segment / Approach	Queue length (ft.)		Difference	
		Observed	Modeled	(%)	(veh.)
NB I-81	Northbound I-81 at Exit 18 (Harrison St/Adams St)	0	31	-	1
	Northbound I-81 at I-690 EB Split	150	345	130%	8
SB I-81	Southbound I-81 at Exit 19 (Clinton St/Salina St)	-	0	-	-
	Southbound I-81 at Harrison Street off-ramp	-	31	-	-
EB I-690	Eastbound I-690 at Diverge to SB I-81	205	0	-	-8
EB I-690 Connector to SB I-81	EB I-690 Connector to SB I-81 at Merge onto SB 1-81	-	0	-	-
WB I-690	Westbound I-690 at Diverge to I-81 SB	0	29	-	1
NB I-481	Northbound I-481 at Diverge to WB I-690	-	0	-	-
SB I-481	Southbound I-481 at Exit 3E (5/92)	0	295	-	12
Almond Street and Adams Street	Adams Street Eastbound	562	764	36%	8
	Almond Street Northbound	688	449	-35%	-10
	Almond Street Southbound	560	365	-35%	-8
	Northbound I-81 off-ramp	-	725	-	-
Almond Street and Harrison Street	Almond Street Northbound	490	673	37%	7
	Almond Street Southbound	667	492	-26%	-7
	Harrison Street Westbound	689	653	-5%	-1
Erie Blvd and Crouse Ave	Crouse Avenue Northbound	97	233	140%	5
	Crouse Avenue Southbound	41	159	291%	5
	Erie Blvd Eastbound	97	113	17%	1
	Erie Blvd Westbound	60	117	95%	2
Genesee Street and Eastbound I-690 off-ramp/N. West St	EB I-690 off-ramp	-	61	-	-
	Genesee Street Eastbound	-	191	-	-
	Genesee Street Westbound	155	146	-6%	0
Almond Street and SB 1-81 off-ramp	SB I-81 off-ramp	-	203	-	-
Salina Street and SB I-81 off-ramp	SB I-81 off-ramp	-	73	-	-
Townsend Street and WB I-690 off-ramp	WB I-690 off-ramp	-	111	-	-

Table L-2: Maximum Queue Length Validation Summary – PM Peak Hour

Route	Observation Location	Queue length (ft.)		Difference	
		Observed	Modeled	(%)	(veh.)
NB I-81	Northbound I-81 at Exit 18 (Harrison St/Adams St)	0	123	-	5
	Northbound I-81 at I-690 EB Split	213	484	128%	11
SB I-81	Southbound I-81 at Exit 19 (Clinton St/Salina St)	-	0	-	-
	Southbound I-81 at Harrison Street off-ramp	-	105	-	-
EB I-690	Eastbound I-690 at Diverge to SB I-81	45	0	-100%	-2
EB I-690 Connector to SB I-81	EB I-690 Connector to SB I-81 at Merge onto SB 1-81	-	0	-	-
WB I-690	Westbound I-690 at Diverge to I-81 SB	0	40	-	2
NB I-481	Northbound I-481 at Diverge to WB I-690	-	2	-	-
SB I-481	Southbound I-481 at Exit 3E (5/92)	0	441	-	18
Almond Street and Adams Street	Adams Street Eastbound	689	830	20%	6
	Almond Street Northbound	718	512	-29%	-8
	Almond Street Southbound	728	484	-34%	-10
	Northbound I-81 off-ramp	-	881	-	-
Almond Street and Harrison Street	Almond Street Northbound	488	684	40%	8
	Almond Street Southbound	778	442	-41%	-12
	Harrison Street Westbound	1001	695	-31%	-12
Erie Blvd and Crouse Ave	Crouse Avenue Northbound	89	245	174%	6
	Crouse Avenue Southbound	39	172	342%	5
	Erie Blvd Eastbound	119	119	0%	0
	Erie Blvd Westbound	79	110	41%	1
Genesee Street and Eastbound I-690 off-ramp/N. West St	EB I-690 off-ramp	-	62	-	-
	Genesee Street Eastbound	-	199	-	-
	Genesee Street Westbound	154	158	2%	0
Almond Street and SB 1-81 off-ramp	SB I-81 off-ramp	-	219	-	-
Salina Street and SB I-81 off-ramp	SB I-81 off-ramp	-	89	-	-
Townsend Street and WB I-690 off-ramp	WB I-690 off-ramp	-	110	-	-

Table L-3: Maximum Queue Length Validation Summary – PM Post-Peak

Route	Observation Location	Queue length (ft.)		Difference	
		Observed	Modeled	(%)	(veh.)
NB I-81	Northbound I-81 at Exit 18 (Harrison St/Adams St)	0	82	-	3
	Northbound I-81 at I-690 EB Split	100	283	183%	7
SB I-81	Southbound I-81 at Exit 19 (Clinton St/Salina St)	-	0	-	-
	Southbound I-81 at Harrison Street off-ramp	-	45	-	-
EB I-690	Eastbound I-690 at Diverge to SB I-81	0	0	-	0
EB I-690 Connector to SB I-81	EB I-690 Connector to SB I-81 at Merge onto SB 1-81	-	0	-	-
WB I-690	Westbound I-690 at Diverge to I-81 SB	0	19	-	1
NB I-481	Northbound I-481 at Diverge to WB I-690	-	0	-	-
SB I-481	Southbound I-481 at Exit 3E (5/92)	0	301	-	12
Almond Street and Adams Street	Adams Street Eastbound	470	742	58%	11
	Almond Street Northbound	313	392	25%	3
	Almond Street Southbound	549	407	-26%	-6
	name	-	491	-	-
Almond Street and Harrison Street	Almond Street Northbound	463	707	53%	10
	Almond Street Southbound	513	371	-28%	-6
	Harrison Street Westbound	629	573	-9%	-2
Erie Blvd and Crouse Ave	Crouse Avenue Northbound	48	225	371%	7
	Crouse Avenue Southbound	24	153	528%	5
	Erie Blvd Eastbound	69	113	63%	2
	Erie Blvd Westbound	42	106	154%	3
Genesee Street and Eastbound I-690 off-ramp/N. West St	EB I-690 off-ramp	-	48	-	-
	Genesee Street Eastbound	-	157	-	-
	Genesee Street Westbound	123	151	23%	1
Almond Street and SB 1-81 off-ramp	SB I-81 off-ramp	-	198	-	-
Salina Street and SB I-81 off-ramp	SB I-81 off-ramp	-	58	-	-
Townsend Street and WB I-690 off-ramp	WB I-690 off-ramp	-	96	-	-