ABSTRACT

TAGLIAFERRI, ANTHONY PAUL. Use and Comparison of Traffic Simulation Models in the Analysis of Emergency Evacuation Conditions. (Under the direction of Dr. Billy M. Williams).

The evacuation of vulnerable coastal areas in the event of an emergency such as an impending hurricane has become a significant safety issue due to the rapid growth of both permanent and tourist populations in these areas. Highway capacity has often not been upgraded in line with this demand growth. In the case of Hurricane Floyd in 1999, evacuations of areas of North and South Carolina resulted in several highly congested primary highways and, as a result, several states created Lane Reversal Plans for interstates and/or divided highways along evacuation routes. However, these plans were created with little data to rely on as to their efficiency. A major research study was funded by the North Carolina Department of Transportation (NCDOT) to use simulation modeling to investigate the effects of the Interstate 40 Lane Reversal Plan on the evacuation of Wilmington and New Hanover County, North Carolina. In addition to the analysis of the effects of lane reversal, a side-by-side comparison of the CORSIM and VISSIM simulation models was performed on the highway network based on demand estimates provided by a demand study performed for the United States Army Corps of Engineers and the Federal Emergency Management Agency (FEMA). Analysis using CORSIM and VISSIM showed lane reversal to provide considerable capacity increases to traffic attempting to exit New Hanover County via Interstate 40, which had significantly increased throughput and decreased queues within New Hanover County in the event of large-scale evacuations.

Use and Comparison of Traffic Simulation Models in the Analysis of Emergency Evacuation Conditions

BY
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BIOGRAPHY

Anthony P. Tagliaferri was born on January 26, 1981 in Rochester, New York to Paul O. and Jamie L. Tagliaferri and resided in the town of Avon, New York from birth to age 18 where he attended Avon Primary, Middle, and Junior High schools and the McQuaid Jesuit High School in Rochester. Upon graduation from McQuaid in June, 1999, the author moved to North Carolina and received his Bachelor of Science in Civil Engineering degree at Duke University in Durham. Upon graduation from Duke, Anthony headed to Raleigh to complete the necessary requirements for the Master of Science in Civil Engineering degree at the North Carolina State University. His focus was centered generally on transportation, and more specifically in traffic operations. During his time at NCSU, Anthony served as Vice President of the student chapter of the Institute of Transportation Engineers. As an undergraduate, Anthony spent a total of four summers as an intern with two transportation consulting firms in Rochester, NY as well as one firm in Raleigh, NC. The author will move on to a full-time position in transportation engineering in the southeastern United States upon completion of the Master's Program at NCSU.

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1.0 INTRODUCTION

1.1 Background and Problem Statement

The Atlantic and Gulf of Mexico coasts of the United States are the site of some of the most picturesque scenery in the world. Millions of tourists flock to these regions annually and permanent residential population growth has grown exponentially in the past quarter century. However, highway capacity has not kept pace with this population growth. In many cases, coastal communities are beginning to experience previously unseen congestion in morning and afternoon peak periods on typical weekdays or on weekends in high tourist occupancy situations.

Hurricanes are extremely dangerous, even fatal weapons of nature that target the Atlantic and Gulf coasts more than any other area of the United States. Major hurricanes, those registering Categories Three through Five on the Saffir-Simpson Hurricane Rating Scale (winds 111 miles per hour (mph) and stronger), produce severely damaging winds and serious storm surge-related flooding to coastal regions within a large radius of a particular storm's center. Floods are particularly damaging to low-lying areas along the coast, while winds are particularly damaging right near the coast as well as for mobile homes in the storm's path.

One of the primary goals of emergency management agencies in the event of an approaching hurricane is to ensure all vulnerable inhabitants of a jurisdiction are in a position of safety when the storm makes landfall. In order to provide for this safety, officials will send out evacuation orders in advance of a storm, sometimes two or more days before the storm makes landfall. While meteorologists' forecasting methods are improving annually, it is still not a certainty that a storm will make landfall where an evacuation has been ordered. In the case of Hurricane Floyd in 1999, evacuation orders were given from the central Atlantic coast of Florida northward to the outer banks of North Carolina. However, the storm took an unexpected turn in its final hours at sea and eventually made landfall at Cape Fear, North Carolina several days after the initial evacuations were ordered in areas left unaffected by the storm. The progressive northward evacuations resulted in an extreme period of congestion from northern Florida to southern Virginia due in part to the combination of these multiple evacuations. Several trips that normally take a few hours took up to a day in this situation. Since so many areas that were evacuated were not affected by Floyd, many of these coastal residents may be more likely not to evacuate if the order is given in the future. For this reason, emergency managers are often reluctant to issue mandatory evacuations unless the situation is especially ominous. In addition, since storms may take unexpected paths, rather than making an evacuation order days in advance of a storm's landfall, managers may be more likely to order an evacuation with less time available before landfall.

However, as mentioned previously, the highway network is sometimes inadequate for commuter traffic during typical weekday morning and evening peak periods, so in some emergency evacuations, long queues and extremely lengthened travel times may be the rule rather than the exception.

In order to facilitate evacuations so that residents are in positions of safety as quickly as possible, transportation and emergency management officials in most Atlantic and Gulf coastal states have developed lane reversal plans for major federal or Interstate highways viewed as the keys to evacuating the most inhabited coastal urban areas. Most of these plans were developed in the wake of Hurricane Floyd, since the evacuation from this storm enveloped several states and caused major traffic congestion on several U.S. and Interstate highways from Florida to Virginia. In addition, the State of Georgia executed a lane reversal from Savannah inbound to Macon on Interstate 16 in the evacuation of Hurricane Floyd, and the level of congestion found in this evacuation was not as severe as in neighboring states, especially those along the Interstate 95 corridor.

1.2 Project Scope and Objectives

As of the end of the 2004 hurricane season, only a handful of evacuation lane reversal plans had been triggered in the southeastern United States. These plans were as follows:

- Georgia, Interstate 16 westbound, during the evacuation for Hurricane Floyd in 1999
- South Carolina, Interstate 26 westbound, during the evacuation for Hurricane Floyd in 1999 (improvised, unplanned reversal)
- South Carolina, US Highway 501 northbound, during the evacuation for Hurricane Charley in 2004
- Louisiana, Interstate 10 westbound, during the evacuation for Hurricane Ivan in 2004
- Alabama, Interstate 59 northbound, during the evacuation for Hurricane Ivan in 2004

Since contraflow has been executed in so few situations, and most of these evacuations occurred in late 2004, accurate performance data on the on the effectiveness of lane reversal on large-scale evacuations are not available to this point. Consequently, several teams of researchers in coastal regions have begun efforts to evaluate existing contraflow plans using traffic simulation models. Both macroscopic and microscopic models have been utilized in these efforts; however advancements in computer technology have led researchers to tend toward the simulation of evacuations with microscopic models. Microscopic simulation models more rigorously analyze a network by tracking individual vehicle trajectories stochastically with varying random number seeds, resulting in greater detail and performance measures aggregated over the entire sample of drivers and vehicles. Macroscopic models analyze platoons of uniform vehicles throughout a network, which could be advantageous in oversaturated conditions.

In early 2000, the Intelligent Transportation Systems (ITS) unit of the North Carolina Department of Transportation (NCDOT) was authorized to produce a lane reversal plan for the evacuation of the City of Wilmington, the communities of Wrightsville Beach, Carolina Beach and Kure Beach, and other vulnerable areas of southeastern North Carolina via Interstate 40. In 2003, NCDOT authorized North Carolina State University and the University of North Carolina at Wilmington to conduct a two-year research project utilizing simulation modeling to analyze the effectiveness of the Interstate 40 lane reversal plan since it had not been triggered by any pending storms since its creation. The research sought to determine first whether traffic evacuating vulnerable areas can be effectively delivered to the contraflow lanes without experiencing bottlenecks upstream. This inability to efficiently fill the excess capacity in the reversed lanes was also documented in research by Theodoulou and Wolshon in the case of Interstate 10 in New Orleans, Louisiana (2004). Two microscopic simulation models were ultimately chosen for analysis: CORridor SIMulation (CORSIM) model, developed by the Federal Highway Administration (FHWA), and the German-based VISSIM model, developed by PTV-Vision, Incorporated. The Synchro/SimTraffic software package developed by Trafficware, Incorporated was also pegged for analysis, but due to scalability issues, the Synchro/SimTraffic package was removed from consideration of this research analysis.

This analysis is unique because the Interstate 40 lane reversal begins along an arterial surface street, whereas other states' reversal plans are generally located solely on interstate highways. In this vein, the transition to contraflow is unique in that it occurs at a signalized intersection where turning movements can occur concurrently and feed all lanes more efficiently.

The objectives of this research were to generate and compare several measures of effectiveness (MOEs) from the simulation models to investigate the effects of lane reversal on this evacuation network. The MOEs analyzed in this modeling effort were queue lengths, average link speeds and throughput at key nodes. Thus the primary goals of the research in were to determine:

1. Whether the lane reversal increased throughput and average link speeds while reducing queue lengths as opposed to a do-nothing alternative;

2. Whether the current storm severity threshold set for triggering the lane reversal is appropriate (through the use of several evacuation scenarios); and

3. Whether there were key bottleneck points in the City of Wilmington that could starve the transition to contraflow by creating traffic congestion upstream.

4. Whether the CORSIM and VISSIM models produce similar results for the chosen MOEs for this emergency evacuation situation.

In addition, the characteristics of the New Hanover County analysis will be compared to other geographical areas in an attempt to determine whether the lessons learned from this lane reversal plan can be applied elsewhere.

The following is an outline of this document, created in an attempt to address these objectives:

- Chapter 2, a thorough review of the literature related to this research;
- Chapter 3, a detailed description of the methodology related to this process;
- Chapter 4, a synthesis of the simulation results; and
- Chapter 5, a summary of the research, conclusions based on the results, and recommendations for future consideration.

2.0 LITERATURE REVIEW

2.1 Review of Current Evacuation Plans and Procedures

Hurricane Georges in 1998 and Hurricane Floyd in 1999 produced two of the largest hurricane evacuation orders in U.S. history. The number of residents affected by the evacuations due to Hurricanes Georges and Floyd was higher than ever due to two primary factors: erratic storm tracks and coastal population growth.

In the cases of both Georges and Floyd, landfall occurred at a location a significant distance from that which was forecast 48 hours prior to the storm's arrival. This caused evacuation orders to progress in a manner which, especially for Floyd, caused evacuation traffic to encounter traffic from other evacuations that were previously ordered from areas no longer targeted by the storm. Floyd evacuations stretched from Florida northward to North Carolina. As a result, traffic leaving Florida and Georgia heading northward on major thoroughfares such as Interstate 95 became entangled with traffic later ordered to leave coastal areas of Charleston, South Carolina along I-26 (Dow and Cutter, 2002). Traffic continuing northbound on Interstate 95 encountered yet more conflicting evacuation traffic as the Wilmington, North Carolina, area was evacuated along Interstate 40. As a result, anecdotal accounts claim that the approximately 100-mile distance from Charleston to Columbia took upwards of 18 hours to complete during the evacuation's peak along Interstate 26, and Interstate 40 backups stretched for miles as Wilmington traffic moved inland.

These traffic backups were exacerbated by the fact that there were simply more people to evacuate in coastal areas than there had ever been. A research study estimated that property values, a primary indicator of development and growth, in coastal areas increased nearly 50 percent between 1988 and 1993 alone (Dow and Cutter, 2002). Since 1993, this growth rate is believed to have continued or even increased along the Gulf of Mexico and Atlantic coastlines. This growth has overburdened highway infrastructure to the point where, in some areas, even the summer tourist season traffic has exceeded the capacity of the existing highways. Since many of these highways are in areas that are sparsely populated in the tourism off-season, capacity increases in these areas have been overlooked in many states in order for traffic problems in other inland areas to be addressed. In hurricane evacuation scenarios the demand on these highways is exacerbated. In addition, according to Dow and Cutter (2002), 25 percent of South Carolina residents evacuating in advance of Floyd took more than one vehicle with them, and another significant number of residents attached trailers or tied belongings to their vehicles, making them "heavy vehicles" from a traffic standpoint and bogging down the performance of the evacuating traffic stream. The troubles encountered by evacuees have not gone unnoticed by state Departments of Transportation (DOTs). DOTs in every Atlantic or Gulf coastal state have enacted or evaluated plans to better evacuate its coastal residents. Wolshon et al. compiled a review of these policies and procedures in 2001.

2.2 Contraflow Implementation

One of the most recent developments in hurricane evacuation procedures is the use of lane reversal, or contraflow. Contraflow involves closing one or more lanes on a divided highway in the inbound direction in order to create more capacity for outbound traffic by allowing it to travel on the closed lanes. While lane reversal is a new and relatively untested system for hurricane evacuations, contraflow has been used for many years in more everyday scenarios, such as reversible High Occupancy Vehicle (HOV) facilities in urban areas, or as a means of accommodating traffic exiting from sporting events at large venues, such as North Carolina State University football and basketball games in Raleigh, NC and auto races at the Lowe's Motor Speedway in Charlotte, NC. However, these cases are familiar to the drivers using the facility and these travelways have been designed with contraflow in mind. For the special case of hurricane evacuations, the contraflow plans have been developed for highways that were not originally designed for lane reversal to take place, and the setting of the evacuation (driver behavior, level of confusion) is much different than in the morning commute or leaving a football game. According to Wolshon et al. (2001), the costs and benefits of lane reversal for hurricane evacuations are largely unknown.

The U.S. states with borders on the Atlantic Ocean or Gulf of Mexico have produced evacuation plans showcasing a total of four different contraflow scenarios. The most common case, and the case included in the I-40 Lane Reversal, is to reverse both inbound lanes and provide four total outbound lanes. No inbound traffic is permitted on I-40 if lane reversal is enacted; all inbound traffic must follow a U.S. Highway 421, a major (two-lane) thoroughfare that runs parallel to I-40 in the study area. Other contraflow configurations include: three outbound lanes for evacuation traffic and one inbound lane for emergency vehicles only; three outbound lanes for evacuation and one for all inbound traffic; and three outbound lanes plus one shoulder for evacuation and one inbound lane for all traffic

(Wolshon et al. 2001). Figure 2-1 depicts these cases graphically. Previous research (FEMA, 2000) has produced the following estimates for contraflow capacity increases:

a) All four lanes outbound: 70% increase over two lanes outbound, two lanes inbound
b) Three lanes outbound, one lane inbound: 30% increase over two lanes outbound, two lanes inbound
c) Three lanes plus one shoulder outbound, one lane inbound: 40% increase over two lanes (8% increase over scenario (b))

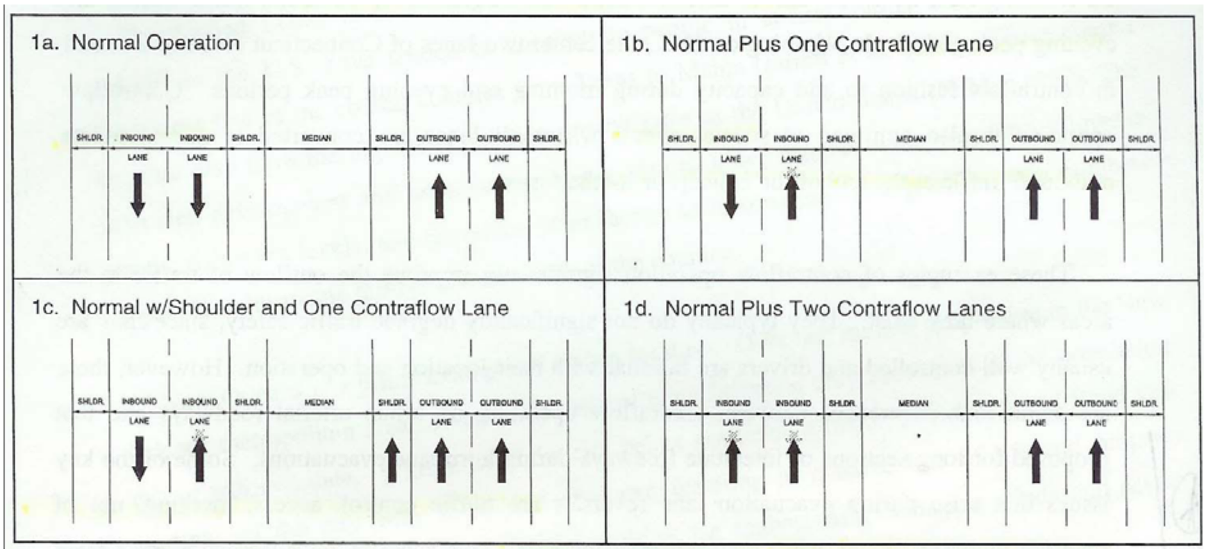


Figure 2-1. Contraflow Cases for Divided Highways (Wolshon, 2001).

If only one inbound lane is reversed, the probability of head-on collisions is introduced (Wolshon et al., 2001). In these cases fatalities, injuries, and incidents that could severely hinder capacity become an increased possibility. The risks of collision and discomfort are also increased with shoulder use, due to the possibility of hindrances occurring in the shoulder that the driver would not normally have to encounter. Shoulder use is only possible on stretches of highway where the shoulder maintains a width capable of carrying a vehicle at a significant rate of speed.

Several methods have been devised to merge the traffic from all lanes back into the normal lanes. The most common procedure (and that utilized in the existing I-40 Lane Reversal) is the median crossover (Wolshon et al., 2001). The median crossover at the western terminus (end) of the North Carolina plan involves a capacity drop from two lanes to one on each side of the highway before joining the traffic back together on the outbound lanes. Wolshon et al. suggest that lane reversals that terminate in this manner must rely on a significant number of vehicles to leave the evacuation at one of the many exits along the way in order for this capacity reduction not to produce congestion. In another method common in plans that terminated where two Interstate highways intersect, the outbound lanes are directed onto the ramp to the intersecting highway and the inbound lanes routed to the empty outbound lanes downstream of the interchange.

As of late 2004, the following states had lane reversal plans of some sort on file (Wolshon et al., 2001, confirmed 2004):

- New Jersey
- Maryland
- Virginia
- North Carolina
- South Carolina
- Georgia
- Florida
- Alabama
- Texas

As observed in the case of Hurricane Isabel in September, 2003, contraflow is expected to be utilized sparingly in an evacuation of New Hanover County, due to the manpower and cost necessary for implementation as well as the confusion, restrictions, and implications that are carried with it. Most states only plan to implement lane reversal when major (Saffir-Simpson Categories 3, 4 or 5) storms threaten (Wolshon, 2001). North Carolina's plan is a bit more lenient, with implementation possible (but not necessarily required) when storm winds of strong Category 2 or higher status threaten Wilmington. The timing of lane reversal varies by state. Most states will not utilize contraflow in darkness. Therefore, contraflow must be ordered in a manner which will allow all evacuation traffic to clear the highway before darkness falls or (in North Carolina's case) three hours before tropical storm-force winds are expected (Wolshon et al., 2001) This procedure can encounter some problems, such as the uncertainty of the hurricane's track and the cost of evacuating a particular area. According to Wolshon (2002), an evacuation can cost between $200,000 and $1 million per mile of coastline. Therefore, many emergency managers hesitate to trigger a mandatory evacuation for assurance that they are in the storm's path before issuing any order. Floyd's erratic path and the resulting traffic congestion throughout the southeastern US was an example of the impact of too many unnecessary evacuation orders. Government officials also wish to avoid the "Cry Wolf" scenario, where an unnecessary evacuation order leads to the unwillingness of the residents of that area to leave when a future storm threatens.

2.3 Determining Evacuation Demand

The vast majority of evacuation demand research has been performed for the U.S. Army Corps of Engineers and the Federal Emergency Management Association's hurricane evacuation analyses. These analyses are performed and updated on a regular basis for each coastal state in the southeastern United States, both along the Atlantic Ocean and Gulf of Mexico coasts. The North Carolina Hurricane Evacuation Restudy was performed by Post, Buckley, Schuh and Jernigan, Incorporated (2000). This study created a network of evacuation zones based on Geographical Information Systems (GIS) and created a matrix of evacuating vehicle demand based on Saffir-Simpson storm category and the expected related storm surge and flooding with this Category storm. However, as Hurricane Floyd demonstrated, hurricane strength is sometimes not directly related to coastal vulnerability, since Floyd was a Category 1 storm on the Saffir-Simpson scale and caused what climatologists sometimes refer to as a "500-year flood" in eastern North Carolina. Wilmot and Meduri (2005) analyzed different procedures for accurately determining hurricane evacuation demand in the New Orleans area and determined that storm category alone may not be sufficient as a means of determining evacuation demand.

> "In the past, hurricane evacuation zones have been established manually using professional judgment. The resulting zones have typically been classified into categories 1 to 5 to correspond to the category storm that would be needed to flood the zone. However, other factors such as the track, speed, and size of a storm are also important in establishing flood levels. Thus, flooding of a particular hurricane evacuation zone is best described in terms of a scenario rather than as a function of the category of a storm alone. Using a system of zones of homogeneous elevation that are overlaid on a surge map to identify those that will be flooded in each scenario is, in our opinion, a more appropriate way to identify which evacuation zones need to be evacuated" (Wilmot and Meduri, 2005).

This research provides a recommendation for future research to be performed in determining evacuation demand for particular areas; however since these conclusions are quite recent and the Hurricane Evacuation Restudy demand values have been utilized by Emergency Management agencies for years, the Restudy values were incorporated into the Interstate 40 lane reversal analysis.

2.4 Contraflow Crossovers

Due to the results of research such as that performed by Theodoulou and Wolshon (2004), it was expected that a median break crossover could in fact reduce network capacity rather than providing additional throughput. In order to obtain a better estimate of the characteristics of a median break, a review of research on work zone capacity, speed, and saturation flow rates was conducted. Jiang (1999) performed speed and volume data collection at several freeway work zone locations in Indiana, using standard collection equipment as well as Global Positioning Systems (GPS). One of these locations was a median crossover. Capacity, speed and flow distributions were obtained and analyzed with the ANOVA statistical test. The mean capacity of the median crossover zone was 1,612 passenger cars per hour, the mean speed of this zone was 25.24 mph, and the mean saturation flow rate was 1,587 passenger cars per hour. However, the "uncongested" mean speed in the zone was estimated at 57 mph, higher than the expected free-flow speed of a median crossover transition to contraflow. In addition, this data collection took place at locations upstream and downstream of the crossover as well as the crossover itself, making the data set not directly applicable to crossover conditions. Therefore, while this data set provides some input on the necessary capacity and saturation flow parameters for the I-40 model, the crossover analyzed appears to have been designed with higher speeds in mind.

2.5 Modeling Lane Reversal Plans

Since most states have not implemented their respective lane reversal plans to this point, simulation models have been used in several cases to attempt to estimate the performance of specific lane reversal plans.

The Texas Transportation Institute (TTI), Texas Department of Transporation (TxDOT), and the City of Corpus Christi recently used the CORSIM model to optimize a lane reversal it developed. This lane reversal plan is "modeled after the reverse-flow method used in the Carolinas" (Henk, 2002). This plan reverses approximately 90 miles of Interstate 37 from Corpus Christi to San Antonio.

A lane reversal plan developed for traffic headed westbound out of New Orleans, Louisiana, on Interstate 10 was recently modeled in detail with CORSIM at the Louisiana State University by Theodoulou and Wolshon (2004). The researchers attempted to allow the number of vehicles expected to be produced in a Category 4/5 evacuation (as determined by PBS&J) to proceed through the carefully-coded contraflow model network produced with the aid of GIS in order to determine if the reversed lanes could accommodate the evacuation demand expected in a major storm (Theodoulou and Wolshon, 2004). The researchers chose a heavy vehicle composition of fifteen percent to account for travelers securing cargo to their vehicles or towing trailers with their vehicles. Free-flow speeds on the contraflow lanes and in the median crossover were coded at a value lower than that on the regular I-10 outbound lanes due to the impacts of confusion and design constraints on the median crossover. The model was run thirty times with varied random number seeds. The resulting analysis produced outputs that suggested to the researchers that the capacity of the contraflow system was not being fully utilized under the current plan. Further study showed that the opening of two on-ramps to I-10 from I-310 would allow significantly more evacuees to access the contraflow system without constraining the capacity of the four lanes. The small adjustments to the existing plan that were analyzed in the model increased the total number of vehicles processed by the contraflow network from approximately 88,000 to 114,000 over the course of a 19-hour evacuation period. This ability to better feed the network through multiple entrance points is suggested as a possible consideration in amending the New Orleans and other contraflow plans (Theodoulou and Wolshon, 2004).

Overall, the simulation model produced a 53 percent increase in capacity for the reversed system as opposed to a two lanes outbound-two lanes inbound system. However, the median crossover and its included speed reduction produced a bottleneck that extended for miles upstream of the entrance to contraflow. The researchers report that the model "suggests that the segment itself does little good if adequate capacity is not provided at the point where vehicles enter the segment" (Theodoulou and Wolshon, 2004). This concern will be analyzed in detail in this research project.

A follow-up presentation by Wolshon at the 84th Annual Meeting of the Transportation Research Board (TRB, 2005) explained that the traffic measures of effectiveness demonstrated in the models were similar to those found in the field implementation of the plan in 2004, and the bottlenecks demonstrated in the modeling procedure were in fact observed in the field.

2.6 Evaluating and Comparing Simulation Models

Initially, efforts were made to develop evacuation traffic models on a macroscopic scale. In 1985, Hobeika et al. developed the macroscopic MASSVAC 3.0 model to simulate the evacuation of a nuclear disaster. This model was enhanced in 1998 with the addition of the user-equilibrium (UE) assignment algorithm. This algorithm was not truly a dynamic assignment but was a major step in origin-destination mapping (Hobeika, 1985). Another such model is the Hurricane and Evacuation (HURREVAC) model, first developed in 1988 (http://www.hurrevac.com). This model uses Geographic Information Systems (GIS) technology to compile demographic data and correlate this data with proximity to evacuation routes in order to better determine factors such as evacuation traffic volume on the highway network (Wolshon et al., 2001). The consultant Post, Buckley, Schuh and Jernigan (PBS&J) developed another macroscopic model, the Evacuation Travel Demand Forecasting System (2000). This model attempts to simulate and determine the impact of the inter-state evacuation traffic encountered in situations such as that produced by Hurricane Floyd.

In an effort to better analyze evacuation systems, further work was performed to investigate evacuation traffic patterns on a microscopic scale. The ability to evaluate microscopically is unique in that microscopic models track individual driver behavior whereas macroscopic models view all vehicles in the traffic stream as platoons exhibiting identical individual behavioral characteristics. Macroscopic models analyze platoons of uniform vehicles throughout a network, which could be advantageous in oversaturated conditions. However, it was decided to focus on microscopic simulation in this analysis. The Oak Ridge Evacuation Modeling System (OREMS), developed by the Oak Ridge National Laboratory (ORNL), utilized the traffic modeling capabilities of the microscopic simulation model CORridor SIMulation (CORSIM) in conjunction with unique evacuation-related performance measures (such as clearance times) in order to analyze traffic flow in a defense-related emergency (Wolshon et al., 2001). This model can be loosely translated to hurricane evacuations, but the nature of the evacuation is a bit different in the two cases: hurricane evacuations often occur a day or two before the storm occurs and in good weather conditions, whereas defense-related emergency evacuations would occur after a disaster has taken place and most likely would exhibit a more panicked group of participants. Microscopic simulation models are preferred in this type of analysis due to their ability to model individual driver behaviors, but the I-40 lane reversal encompasses approximately 90 miles so their use in modeling the entire lane reversal may be difficult. This research has examined the capabilities of several microscopic and macroscopic models in order to produce the most accurate results possible for the particular case of Interstate 40 westbound from Wilmington, NC, inland.

Alsnih and Stopher (2004) performed a canvas of the state of the art in emergency evacuation modeling in order to determine the capability of existing models to accurately depict the deficiencies of a highway network in an evacuation scenario. The researchers determined that current modeling procedures "do not incorporate all aspects of evacuation behavioral analyses, and some of the models used do not contain a dynamic traffic assignment, a critical feature that will more accurately depict evacuee behavior on the transport network." In addition, "to develop microsimulation models that incorporate dynamic traffic assignment, more accurate relationships expressing human travel behavior are needed. To date, no microsimulation model is able to incorporate a dynamic traffic assignment while also adapting to the emergency-evacuation scenario." To this point, the VISSIM model has been used sparingly, if at all, in evacuation simulation. This German microscopic simulation model adds the capability of Dynamic Traffic Assignment (DTA) to its standard static traffic assignment algorithms. CORSIM does not contain this capability. In addition, VISSIM models traffic flow based on a series of routing decisions rather than the link-node analysis found in CORSIM. The lane reversal research project included the task of evaluating available modeling tools and selecting the appropriate tool or tools for each modeling phase. The following software packages were initially considered for the New Hanover County component of the lane reversal plan modeling:

- OREMS
- CORSIM
- Synchro/SimTraffic
- VISSIM

Existing speed limits, geometry and phasing data were obtained through field observation and identically coded into all models.

2.6.1 OREMS

The Oak Ridge Evacuation Modeling System (OREMS) was designed to analyze evacuation measures of effectiveness such as clearance time. The package is based on the CORSIM platform but with abridged traffic control modeling capabilities. For example, actuated signal control is not included in OREMS. For this reason, OREMS will not be used to model the New Hanover County network. However, traffic volumes for the Martin Luther King, Jr. (MLK) Parkway/College Road intersection approaches derived from the countywide CORSIM and VISSIM models could be loaded onto an OREMS model of the 90-mile freeway section of the lane reversal in future research.

2.6.2 CORSIM

The CORSIM model was created using the Traffic Software Integrated System (TSIS) Version 5.1 software package, developed by FHWA.

<u>CORSIM Advantages</u>

CORSIM is readily available and well known throughout the traffic engineering community. CORSIM models freeway and surface street links using separate algorithms. This allows roadway facilities with vastly different characteristics to be modeled with relatively little effort. CORSIM also produces a simulation run relatively quickly.

CORSIM Disadvantages

TSIS 5.1 is the final version of CORSIM that will be created by FHWA. No software updates are expected from FHWA. In addition, observation of the TRAFVU program shows the animation TRAFVU reader has a .tsd file size limit of 2 gigabytes (although the CORSIM simulation file will run to completion regardless of this TRAFVU limitation). This was not considered a fatal error for this analysis, since the .tsd files were created to completion and the only error was observed in the TRAFVU animation viewer itself.

2.6.3 Synchro/SimTraffic

The New Hanover County network was coded in the Trafficware, Incorporated, Synchro/SimTraffic package (version 6) for the purpose of simulation using SimTraffic.

Synchro/SimTraffic Advantages

As with CORSIM, the Synchro/SimTraffic package is widely used and well known. In addition, this software has a very user-friendly graphical user interface that allows new users to become proficient with less extensive effort. Finally, SimTraffic has the capability of reading of uniform traffic data format (UTDF) databases for volumes and signal timings. This feature is useful when small changes must be made to large-scale networks.

Synchro/SimTraffic Disadvantages

A primary obstacle to this research is the scalability of the SimTraffic model. The package took over 24 hours to complete a single 14-hour simulation run of the New Hanover County network and created an animation file with a size of approximately 50 gigabytes. A report on the SimTraffic measures of effectiveness could not be created due to these scalability issues. In addition to the scalability issues, in the Synchro/SimTraffic package traffic demand must be entered as link turning volumes or percentages, i.e. the software cannot accept origin-destination based demand estimates and has no dynamic traffic assignment capabilities.

2.6.4 VISSIM

The VISSIM model was created using the German-based PTV-Vision, Incorporated, VISSIM software package, version 4.0.

VISSIM Advantages

VISSIM has the ability to model origin/destination based traffic demand and assign vehicles statically or dynamically. This feature makes VISSIM very attractive for evacuation modeling and will allow analysis of the effect of lane closures due to incidents or flooding. Scalability issues such as those faced with Synchro/SimTraffic were not encountered with the VISSIM platform.

VISSIM Disadvantages

The primary disadvantage of VISSIM is that it is not currently as widely known and accepted as CORSIM or Synchro/SimTraffic, at least in the southeastern United States. Also, VISSIM's Graphical User Interface (GUI) was not as user-friendly as those of the other software tools.

In terms of model robustness and effort in coding, research performed by Bloomberg and Dale (2000) comparing VISSIM and CORSIM on a congested network in the Seattle metropolitan area drew the following conclusions:

- Relative travel times were consistent between the models and lead to the same conclusions about the design options analyzed in this study. However, there were differences in the absolute predictions of the two models for some scenarios.
- Both models are appropriate for modeling congested arterial street conditions.

- Although the parallel modeling effort added credibility to the analysis results, either model alone was adequate for the analysis. A specific model cannot be recommended based on this research – both were appropriate for this study. Each has specific strengths and limitations that should be evaluated on a case-by-case basis.

- On a selected section upstream of a signalized intersection, both models produced similar throughput.

- It is estimated that coding the network took approximately the same amount of time in CORSIM and VISSIM.

Based on this research, it was believed that the two models should produce similar results when the Interstate 40 reversal network was coded under the static assignment conditions. However, the research was performed several years ago when the latest versions of the simulation models were not in existence. In addition, the event of an emergency evacuation was not considered in this previous model comparison. Therefore, comparisons should be conducted in order to determine whether the simulation models do in fact produce similar outputs in a large-scale emergency evacuation condition.

2.7 Summary

Along the Atlantic and Gulf coasts from New Jersey to Texas, hurricane evacuation plans have become more advanced following Hurricanes Georges and Floyd in the late 1990s. The most common aspect of these evacuation plans in most states (Mississippi being a notable exception) is lane reversal, or contraflow. Among the various evacuation plans, four different contraflow scenarios are utilized: reverse both inbound lanes; reverse one inbound lane with emergency access only on the other inbound lane; reverse one inbound lane with full access on the other inbound lane; and same as previous but with shoulder use on the outbound side. Prior to the hurricane season of 2004, Georgia was the only state to execute its lane reversal plan, during Hurricane Floyd evacuations in 1999. South Carolina executed an impromptu lane reversal on Interstate 26, but that plan was superseded by an official plan following the storm. Due to the recent nature of these evacuations, sufficient data are not available at this time to analyze the performance of the plans recently field-tested. Since there are very little data available on contraflow operations, simulation models have been viewed as the best means with which to determine whether the performance of the lane reversal will demonstrate a capacity increase over existing conditions, and whether the transition to contraflow will occur without causing an exacerbation to upstream congestion due to the possibly confusing crossover maneuver. Several models have been utilized in hurricane evacuation analysis, with CORSIM being used in evacuation models for both the Oak Ridge National Laboratory (ORNL) and for the City of New Orleans (per the Louisiana State Police evacuation plan). CORSIM analysis of the New Orleans model has shown that contraflow can provide a capacity gain; however the median crossover has been shown to cause a long upstream queue and the capacity of the highway in contraflow conditions is not met. Further analysis showed that multiple access points to the contraflow better utilizes the capacity of the system and alleviates some of the congestion upstream of the primary transition to reversed lanes. While VISSIM and CORSIM have been used in concert in order to obtain a comparison between the two models in the past, these models have not been compared in the context of their latest versions and in emergency evacuation conditions. Finally, since the transition to contraflow in this lane reversal plan is so unique, in order to better determine the transition speed to contraflow in this lane reversal network, a review of work zone crossover research was conducted but this review did not reveal a situation similar to that expected when the Interstate 40 reversal is enacted.

3.0 METHODOLOGY

3.1 Outline of Research Methods

This research aims to analyze a case study in emergency evacuation conditions with traffic simulation modeling in order to produce measures of effectiveness that can be investigated to determine the efficiency of the implementation of lane reversal. Demand is estimated using historical studies because there is a dearth of empirical data available for emergency evacuation conditions. A simplified flow chart of this methodology is shown in Figure 3-1.

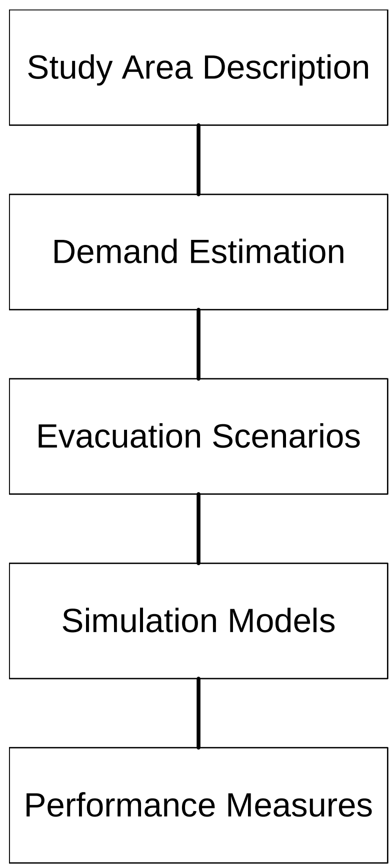


Figure 3-1. Research Methodology.

3.2 Study Area Background

The simulation modeling analysis for the southern terminus of the lane reversal plan was performed in two phases. The first phase focused solely on the transition to contraflow by feeding all evacuating traffic directly to this transition and evaluating the original plan as well as alternative methods to feed the reversed lane network. Since this analysis was focused on making fast-track policy decisions, the highway network analyzed was confined to a small selection of intersections near the transition to contraflow and only one simulation model was utilized in this analysis. Figures 3-2(a-d) depict the four alternatives originally considered for the transition to contraflow. Case (a) was considered as the “do-nothing” alternative (no lane reversal). Case (b) represents the original transition to contraflow written into the I-40 Lane Reversal Plan from 2000-2003. Case (c) shows a second transition to contraflow considered to be paired with that of case (b). However, this alternative was removed from consideration when it was learned that safety improvements to the intersection of College Road and Spring View Drive prevented a transition to contraflow from being implemented here. Case (d) shows the lane-based evacuation routing that would be established with the Martin Luther King intersection transition that was ultimately chosen by NCDOT for addition to the official lane reversal plan in 2004.

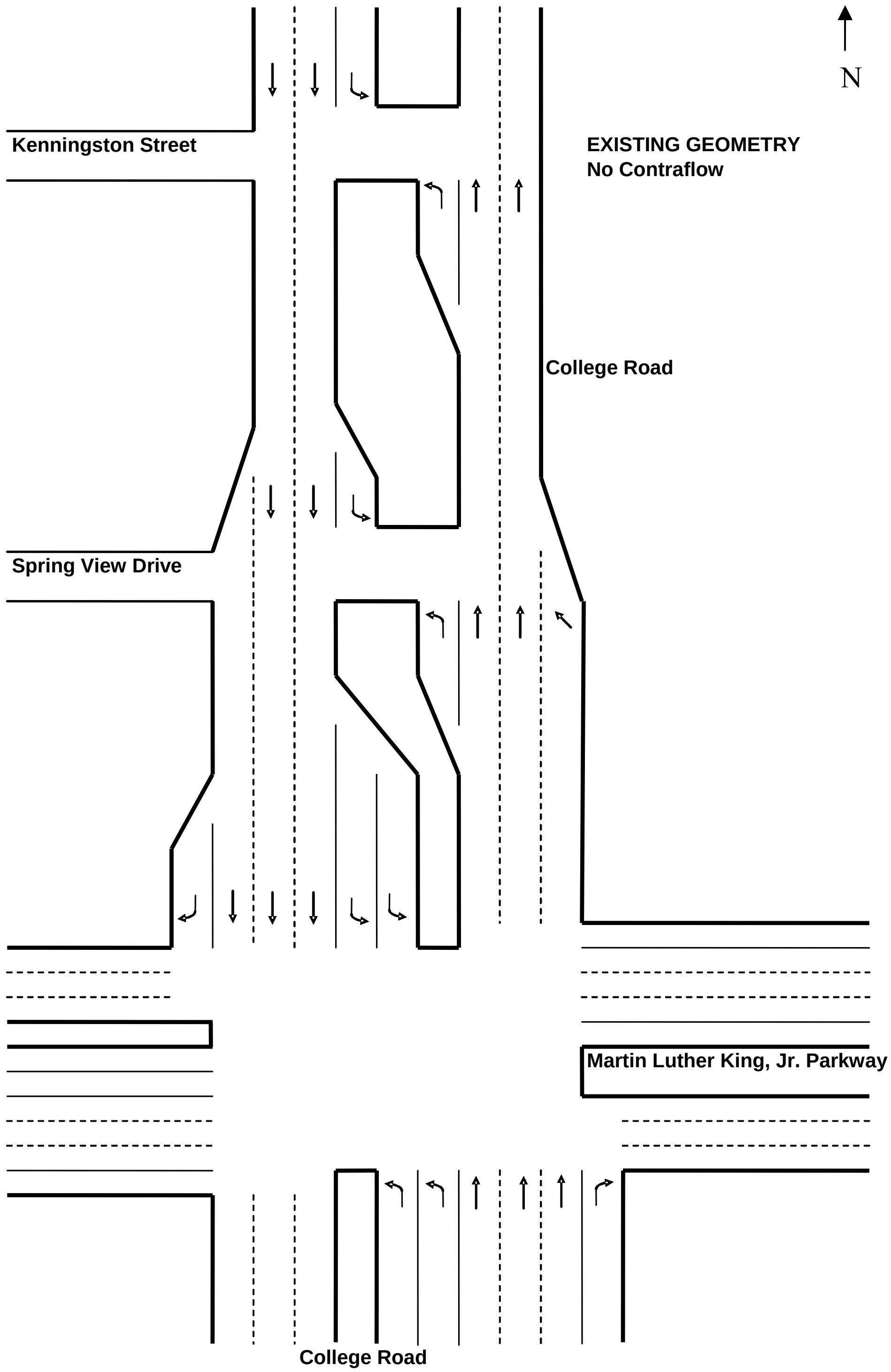


Figure 3-2 (a). Schematic - No Implementation of Contraflow.

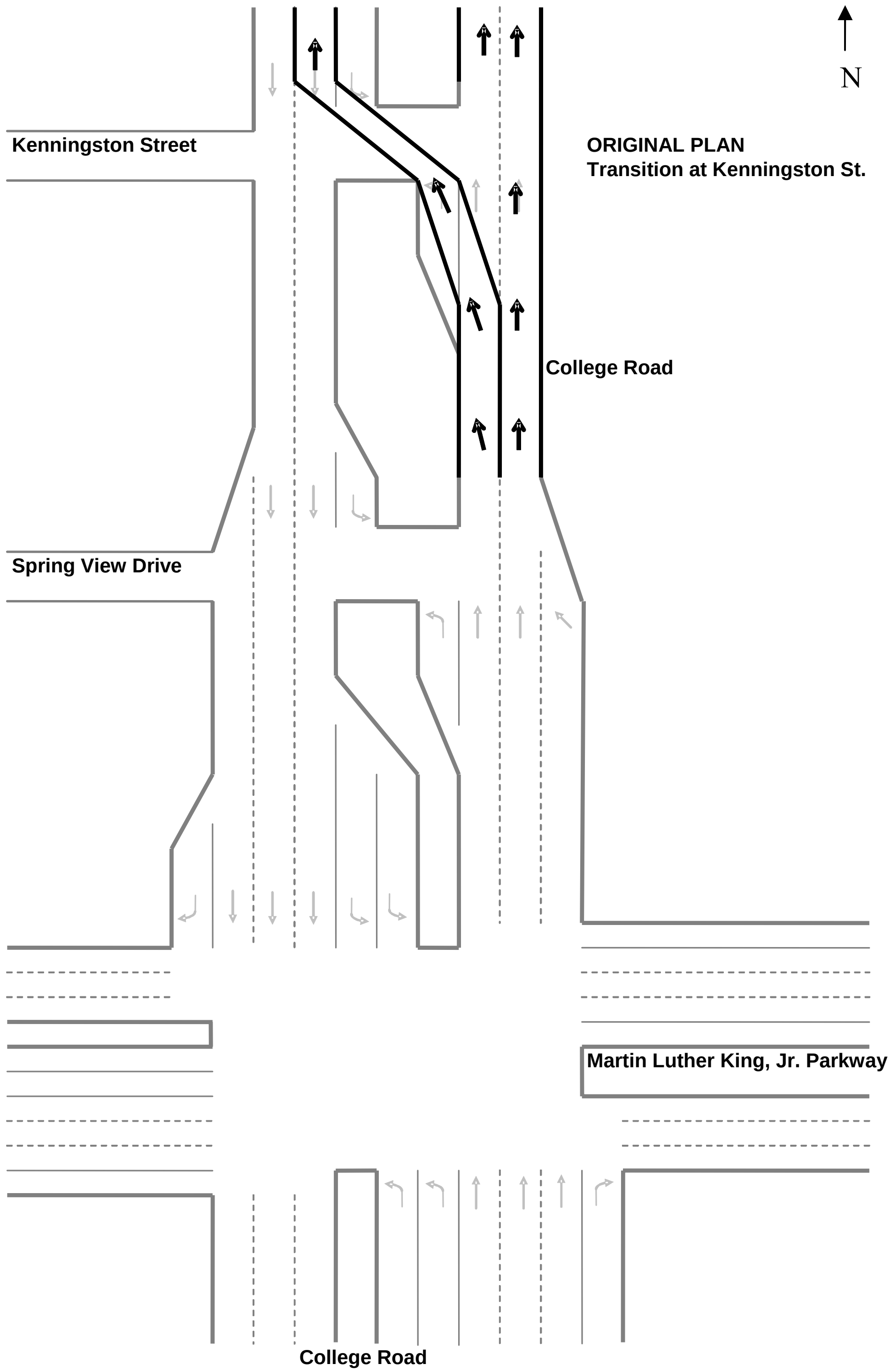


Figure 3-2 (b). Schematic - Original (2000-2003) Transition to Contraflow.

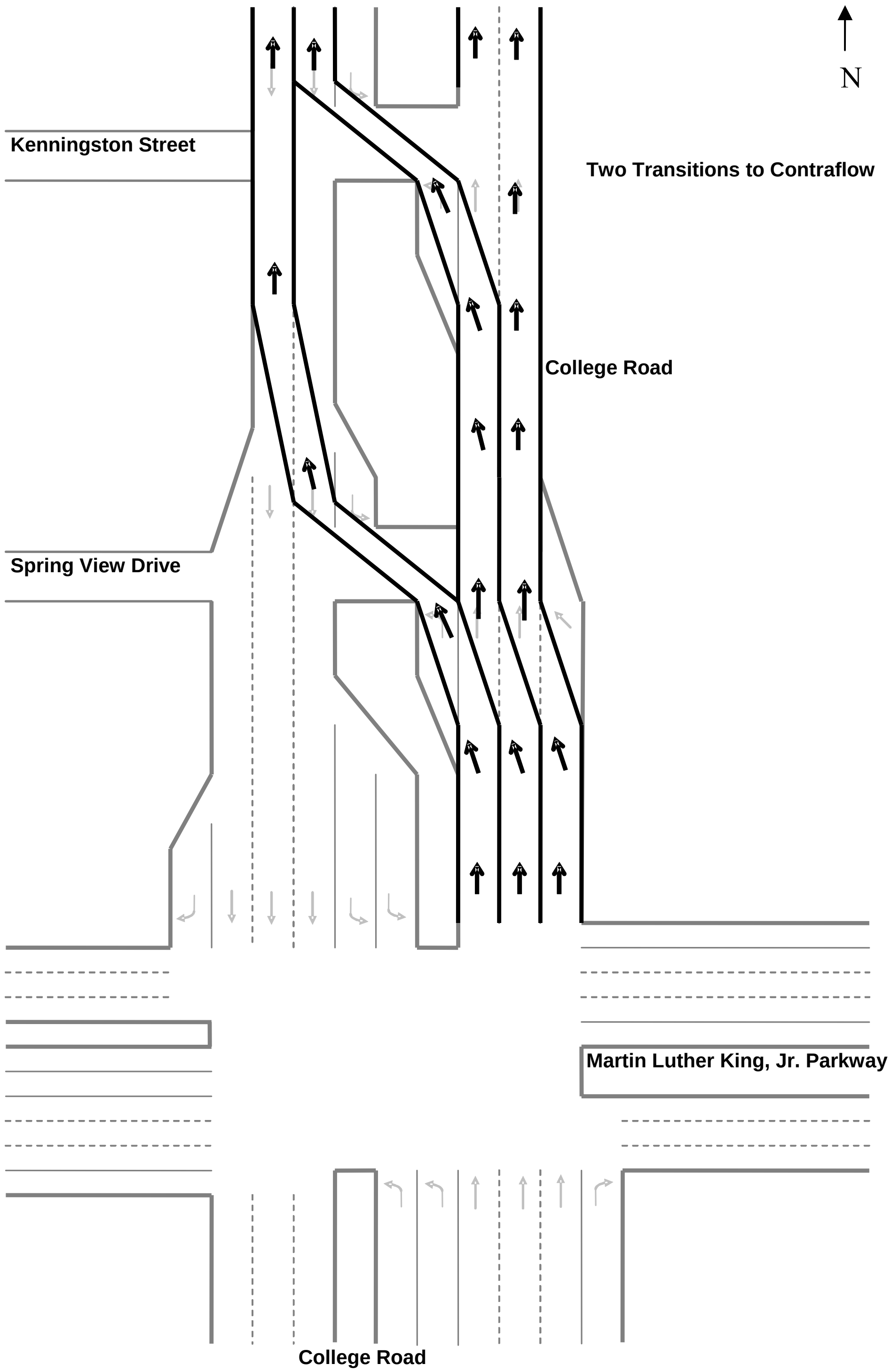


Figure 3-2 (c). Schematic – Possible Second Transition to Contraflow.

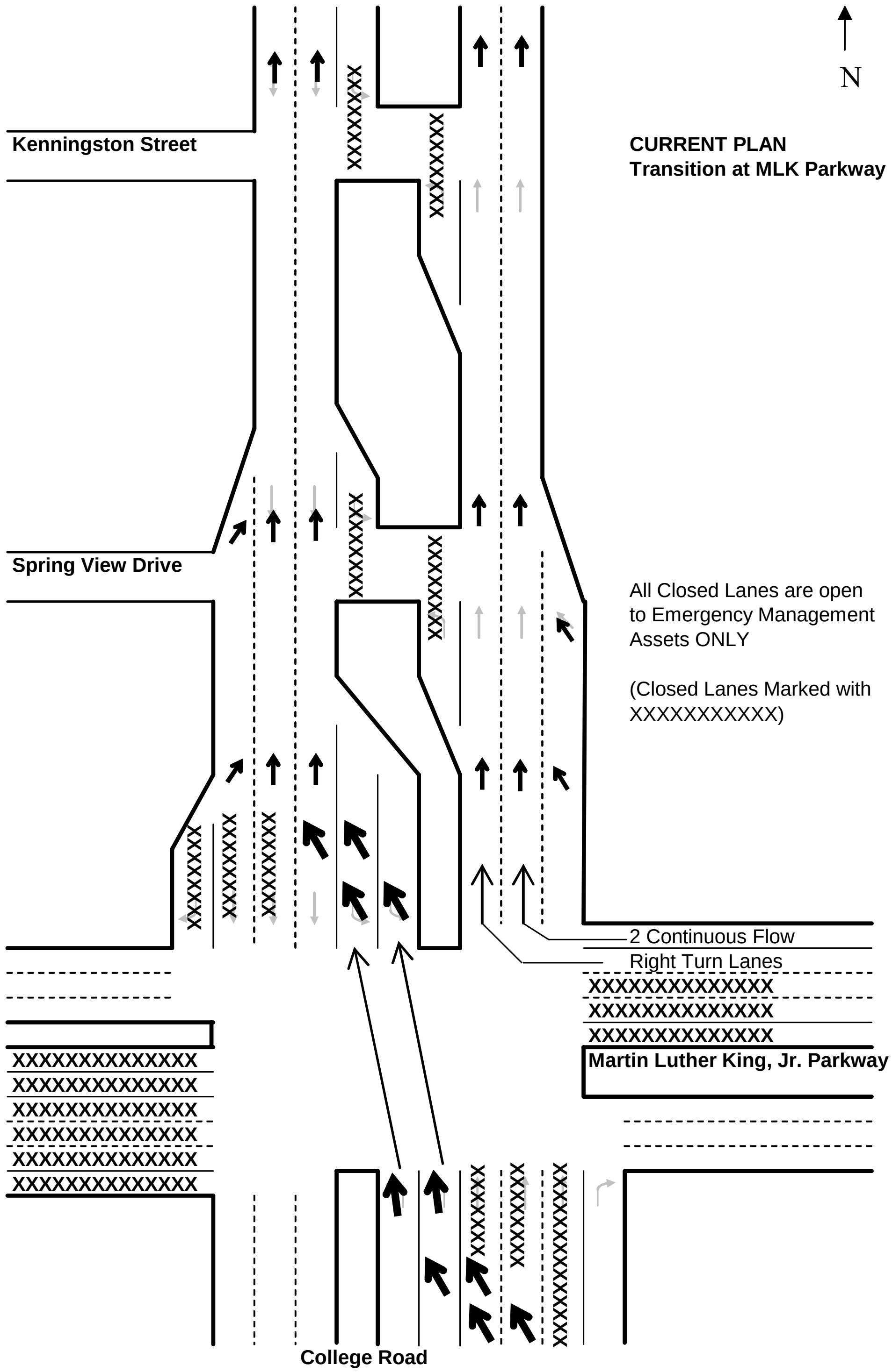


Figure 3-2 (d). Schematic – Revised (and Current) Location of Transition to Contraflow.

Figure 3-3 represents an aerial photograph of the location of the original transition to contraflow. The transition was located at a median break for the unsignalized intersection of College Road and Kenningston Street, approximately three-quarters of a mile north of the Martin Luther King, Jr. Parkway/College Road intersection. Coincidentally, the aerial photo was taken at the same time a vehicle is performing a movement that essentially mimics the crossover to contraflow. All aerial photography utilized in this analysis was provided by New Hanover County Geographic Information Systems (GIS) and is from 2002.

Approximate Scale: 1" = 120'

Figure 3-3. Original Plan (2000-2003) Transition to Contraflow (New Hanover County, 2002).

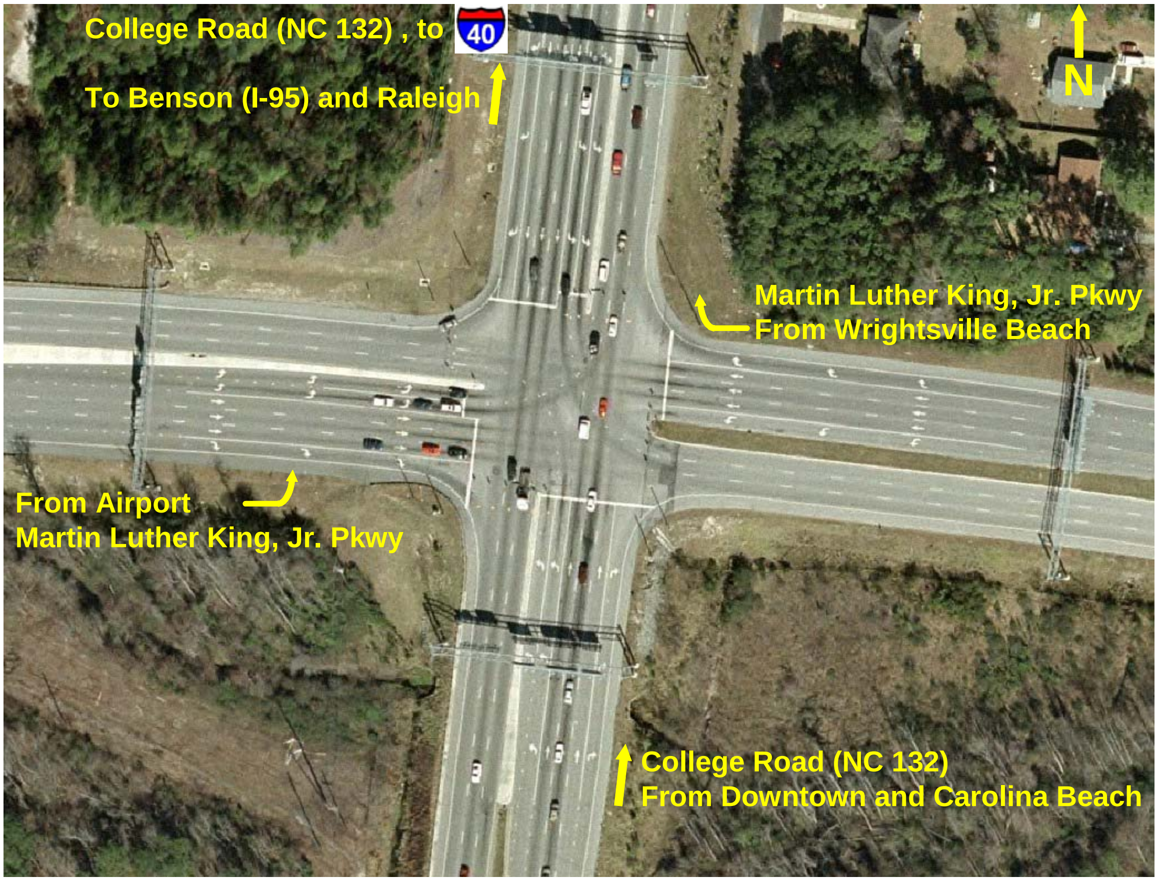
Figure 3-4 depicts a median break at the intersection of Spring View Drive and College Road, approximately one thousand (1000) feet north of the Martin Luther King, Jr.

Parkway/College Road intersection. This location was considered as a possible second transition to contraflow in order to better utilize the existing pavement. However, consideration of this alternative was discontinued after it was learned that NCDOT planned (and eventually constructed) a "left over" system at this median break with concrete islands that would prevent a crossover at this location.

Approximate Scale: 1" = 165'

Figure 3-4. Possible Transition at Spring View Drive (New Hanover County, 2002).

The second phase of analysis was performed after the 2004 policy changes were made and the transition to contraflow was shifted approximately one mile upstream of the original transition to the signalized intersection of College Road (NC Highway 132/US 117) and Martin Luther King, Jr. Parkway. Figure 3-5 depicts an aerial photo of this intersection.



Approximate Scale: 1" = 155'

Figure 3-5. MLK Parkway/College Road Intersection (New Hanover County, 2002).

This move of the transition to contraflow was assumed to alleviate two possible bottlenecks: one at this intersection itself and one approximately 1000 feet downstream of the signalized intersection where a three outbound lanes drop to two.

Upon the completion of this preliminary modeling, the full countywide model was prepared with the transition to contraflow taking place at the College Road/MLK parkway intersection. The scope of this phase of analysis increased to encompass all major arterials in

New Hanover County. The principal New Hanover County routes included in the model are as follows:

- **Interstate 40.** I-40 is a four-to six-lane freeway extending from approximately a mile north of the intersection of College Road and Martin Luther King, Jr. Parkway to the county line and beyond. There are two interchanges in New Hanover County, both of which will be closed to the contraflow lanes in the event of a lane reversal. The speed limit on I-40 is 70 miles per hour (mph) through the network.

- **College Road (NC Highway 132/US 117).** College Road is a four-to six-lane arterial facility serving as the primary north-south arterial in New Hanover County. The land use on College Road is primarily commercial, but also includes the University of North Carolina at Wilmington. The speed limit on College Road varies between 45 and 55 mph through the network.

- **Martin Luther King, Jr. Parkway.** MLK Parkway is a six-lane divided arterial with a speed limit of 55 mph. This highway is still under construction, and once completed will serve as a primary east-west arterial in New Hanover County. The Wilmington International Airport is served by MLK Parkway.

- **Market Street (US 17/74).** Market Street is a four-to six-lane arterial that serves as the primary east-west access in New Hanover County. This highway provides service to downtown Wilmington as well as the beaches of Pender County to the northeast of Wilmington and points south and west via US 17 and US 74. Land uses along Market Street vary from residential to commercial and speed limits vary from 35 to 55 mph.

- **Carolina Beach Road (US 421).** Carolina Beach Road is a four-lane arterial that serves the beaches south of Wilmington, connects with College Road, and continues north to downtown Wilmington. This arterial provides service north of Wilmington via US 421 (inbound traffic is directed to US 421 in the event of a lane reversal). The speed limit on Carolina Beach Road varies from 40 to 55 mph.

- **Oleander Drive (US 76).** Oleander Drive is a four-to six-lane east-west arterial that serves the Wrightsville Beach area as well as downtown Wilmington. This highway also provides access to points west via US 76. The speed limit on Oleander Drive varies from 35 to 55 mph.

3.3 Evacuation Demand Estimation

Recent evacuation demand data was not readily available for this analysis. The demand estimation for this analysis was extracted from the *North Carolina Hurricane Evacuation Restudy* and *Evacuation Travel Demand Forecasting System,* conducted by Post, Buckley, Schuh and Jernigan, Inc. (PBS&J). This was done in order to establish an accurate estimation of both evacuation demands and clearance times for all coastal areas of North Carolina in the event of storm landfall. These estimations are categorized first by region of the state (either by county or groups of counties) and then further by manually generated evacuation analysis zones. These zones are similar in nature to Transportation Analysis Zones found in other transportation demand modeling. The edition of PBS&J's *Restudy* utilized in this analysis was published in 2001.

New Hanover County was considered by itself in the *Restudy*, providing detailed data for this analysis based on only the county involved in the scope of the project. Therefore, all demand for New Hanover County was considered in this research. However, local traffic and emergency management officials suggested that a fraction of the demand expected from Brunswick and Pender counties (other coastal counties neighboring New Hanover) would also feed the New Hanover County highway network and ultimately Interstate 40. Therefore, 10% of the *Restudy* demand for Brunswick and Pender Counties was added to the New Hanover County demand values for consideration. Figure 3-6 is a graphical representation of the Evacuation Demand Zones for New Hanover County. Since evacuations vary in demand and concentrated location, the PBS&J demand models, evacuation zones and clearance times are categorized in terms of Category of storm (on the Saffir-Simpson scale), storm movement, and tourist occupancy. Table 3-1 shows the New Hanover County demand values based on High Tourist Occupancy from the *Restudy*.

Table 3-1. New Hanover County High Tourist Occupancy Volumes (vehicles).

	Total	**Evacuees to**	**Vehicles to**				**Total**
County	**Evacuated Population**	**Shelters**	Shelters	Friends/ Relatives	Hotel/ Motel	Out of County	**Evacuating Vehicles**
New Hanover							
Category 1-3	45,230	3,965	1,762	6,630	581	11,467	20,438
Category 4-5	61,110	7,649	3,358	6,617	581	16,735	27,290

Source: PBS&J, 2001.

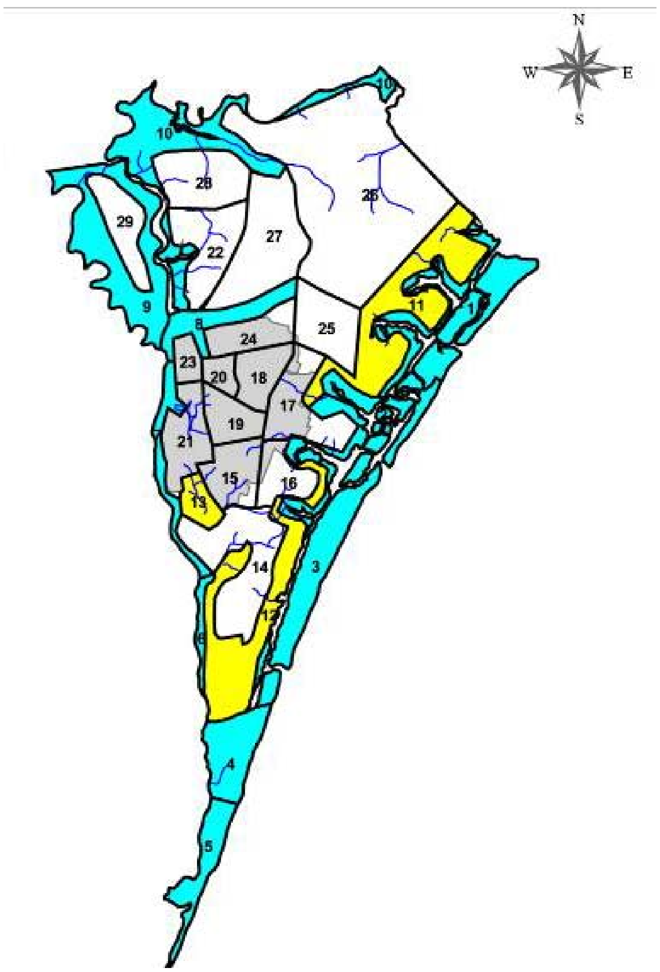


Figure 3-6. Evacuation Demand Zones for New Hanover County (PBS&J, 2001)

3.3.1 Response Time Curves

Another variable considered in the evacuation demand analysis was the behavioral reactions of evacuees. Perhaps the most important of these reactions is response time. The *Restudy* also developed "evacuation response curves" based on response time of the particular evacuation. These curves have been developed individually for all coastal areas studied in these FEMA analyses. The New Hanover County "evacuation response curves" based on evacuation response time (which is related to storm movement speed) are depicted in Figure 3-7.

Figure 3-7. Evacuation Response Curves (PBS&J, 2001)

3.3.2 Evacuation Trip Distribution

The data provided in the *Restudy* were broken down by evacuation zone and expected destination. However, detailed trip distributions were not provided. Therefore, it was necessary to manually distribute trips throughout the highway network. In order to do this, all demand for each evacuation zone that was not expected to travel “out of county” was not loaded into the network. Internal New Hanover County trips were assumed to be accounted for in background traffic additions (explained in the next section). All “out of county” trips were then distributed on a origin-destination level based on where the evacuation zone was located and where these vehicles would be expected to go based on knowledge of the highway network and the area where the zone was located. For instance, if the evacuation zone was located in the northern part of New Hanover County near Interstate 40, a vast majority of the trips were labeled to be destined to leave New Hanover County via the interstate. If the evacuation zone was located in the western section of the county nearer downtown and US 17/74/76, a greater proportion of trips would be labeled to exit the county westbound via US 17/74/76. However, great care was taken to be conservative in terms of feeding Interstate 40. In other words, in most cases the proportion of trips destined for I-40 from most zones was somewhat overestimated in order to provide a more conservative estimate of demand destined toward the intersection of College Road and Martin Luther King, Jr. Parkway. These traffic distributions were cross-checked with origin-destination survey data conducted by the University of North Carolina at Wilmington and with the City of Wilmington Traffic Engineering Department.

Once this high level origin-destination distribution was established, routing distributions were created based again on knowledge of the highway network. Since this was a manual trip distribution and assignment, engineering judgment was used and “all-or-nothing” assignment was not implemented since this did not seem realistic. For example, if two routes from an origin to a destination seemed similarly feasible, trips were split (not necessarily equally) between the two routes rather than assigning all trips to one absolutely shortest route.

Once routing proportions were completed, raw evacuation counts were aggregated to and from each evacuation zone to generate link-node flows. This created detailed intersection turning movement evacuation counts for the entire highway network to be combined with the established background traffic. Appendix A depicts the resulting volumes of this distribution for the example of the Severe Event case.

3.3.3 Background Traffic

In order to effectively capture internal trips within New Hanover County as well as non-evacuees on the highway network, background traffic volumes were established through the utilization of available turning movement counts provided by the City of Wilmington as well as a uniform value of fifty (50) vehicles per turning movement at locations where counts were not available. In addition, for the final four hours of simulation where evacuation demand is minimal or zero, the uniform value of 50 vehicles per movement is applied to all locations. This was done both because it is expected that these hours will be very near the time when tropical-storm-force winds (39 mph or higher) are approaching the area, and in order to give an accurate estimation of the time evacuation queues will clear. This background traffic was combined with the evacuating traffic to produce turning movement counts at all study area intersections and interchanges in New Hanover County.

3.4 Demand Scenarios

Based on the estimated demand data, three unique evacuation demand scenarios were analyzed. These scenarios are as follows:

- Severe Event Demand Case:
  - Storm Strength: Category 4 or stronger (winds of 131 mph or higher)
  - Evacuation Demand: Largest potential evacuation population
  - Response Time: Fast (storm forward speed of 15 to 35 mph)

- Moderate Event Demand Case:
  - Storm Strength: Category 2 or 3 (winds between 100 mph and 130 mph)
  - Evacuation Demand: Average evacuation population
  - Response Time: Fast (storm forward speed of 15 to 35 mph)

- Minimal Event Demand Case:
  - Storm Strength: Category 2 at the plan threshold (winds approximately 103 mph)
  - Evacuation Demand: Average evacuation population
  - Response Time: Slow (storm forward speed of 0 to 15 mph)

Table 3-2 shows an example of the anticipated clearance times for New Hanover County from the *North Carolina Hurricane Evacuation Restudy*.

Table 3-2. New Hanover County Clearance Times (hours).

	Low Seasonal Occupancy	High Seasonal Occupancy
Category 1-2		
Fast Response	5 1/2	7
Medium Response	6 1/2	8 1/4
Slow Response	9 1/2	10 1/4
Category 3-5		
Fast Response	6 1/2	7 3/4
Medium Response	7 1/4	9 1/4
Slow Response	9 1/2	11 1/4

Source: PBS&J, 2001.

All scenarios were analyzed in each model for both the "no contraflow" and "MLK contraflow" alternatives. Therefore, multiple simulation runs were performed in both CORSIM and VISSIM for the following scenarios:

- No Contraflow, Severe Event Case
- With Contraflow, Severe Event Case
- No Contraflow, Moderate Event Case
- With Contraflow, Moderate Event Case
- No Contraflow, Minimal Event Case
- With Contraflow, Minimal Event Case

The following measures of effectiveness were output in both models:

- Maximum Queue Length at Key Nodes
- Throughput on Key Links
- Average Speeds on Key Links

The official storm criteria (from the NCDOT I-40 Lane Reversal Plan) for implementation of contraflow are as follows:

- Strong Category II or higher on the Saffir-Simpson Hurricane Rating Scale (winds of 103 mph or higher)

- Forecast landfall within 50 nautical miles north or 100 nautical miles south of the City of Wilmington

3.5 Simulation Model Parameters and Calibration

As mentioned previously, evacuation lane reversal plans have been enacted in very few cases. Several of these were executed in just the past several months. Therefore, data are not readily available to analyze from previous evacuation lane reversal efforts. For this reason, several behavioral parameters such as saturation headways, driver reaction times, vehicle types, free flow speeds, and acceleration/deceleration data are not easy to calibrate for any simulation model in this context. In addition, this research placed an emphasis on a comparison of two prominent microscopic simulation models. Therefore, editing of default simulation parameters may produce biases that could be detrimental to a comparison of simulation models in identical evacuation conditions. However, several edits to default parameters were considered. A literature review of work zone crossovers was conducted in order to attempt to obtain an accurate saturation flow in work zone crossover situations. The thinking behind this review was to compare work zone crossovers to the transition to contraflow. However, once the transition was moved to its current location at the intersection of Martin Luther King, Jr. Parkway and College Road, similarities between the transition and work zone crossovers were effectively eliminated. Since the contraflow will begin at a signalized intersection, some semblance of normal saturation flow at typical signalized intersections is assumed at the transition. Driver behaviors should differ from a typical time, but it is also expected that the lane reversal plan's logistics and Intelligent Transportation Systems (ITS) deployments account for more than adequate driver information before vehicles reach the crossover point.

3.5.1 Parameter Comparison Between Models

As previously noted, the default simulation parameters were retained in each model in order to provide a side-by-side comparison of the two simulation models. Table 3-3 details some of the key parameters inherent to the two simulation models.

Table 3-3. Comparison of Key Default Simulation Parameters.

Simulation Parameter	CORSIM Value	VISSIM Value
Free Flow Speed	Distribution based on Driver Type: 75% to 127% of Posted Speed Limit on each link	Distribution based on Driver Type: 90% to 110% of Posted Speed Limit on each link
Saturation Flow/Headways	Distribution based on mean 2000 vphpl Saturation Flow (1.8 sec. Discharge Headways)	HCM Value of 1900 vphpl Saturation Flow (1.89 sec. Discharge headways)
Headway Distribution	Uniform	Erlang
Percent Heavy Vehicles	User Defined - 15%	User Defined - 15%

Signal Type	Actuated Control - internal algorithms	Actuated Control - NEMA software algorithm
Lane Widths	12 feet	12 feet
Perception Reaction Time	Distribution based on Driver Type: mean 2.0 Seconds	Distribution based on Driver Type: mean 1.59 Seconds
Definition of "In Queue"	Acceleration Less than 2 ft/sec^2, Speed Less than 9 ft/sec	From the time Speed falls below 4.5 ft/sec until the time Speed rises above 9 ft/sec

Model coding in CORSIM was completed using the Synchro translation algorithm, the TSIS TRAFED network editor, and manual editing of the record cards. The VISSIM model utilized the Synchro model and VISSIM's import algorithm. Measures of effectiveness were recorded and averaged over the ten runs. Ten unique model runs were completed for each of two alternatives: 1) no contraflow and 2) contraflow beginning at the Martin Luther King, Jr. Parkway/College Road intersection. A 15 percent heavy vehicle proportion was assumed because this percentage was used in previous contraflow research such as Theodoulou's thesis from the Louisiana State University (2003) related to contraflow out of New Orleans. Commercial vehicle rates are not expected to fill the fifteen percent proportion, but many drivers have been known to haul many personal belongings along with their vehicles through the use of trailers, or tied down to the vehicle itself. This procedure also allows for the models to be run with default parameters for a more direct comparison of MOEs between them. Demand inputs (detailed in the next chapter) were identical based on link and node flows and turning movements. Origin-destination values and trip distribution was done completely by hand so that turning movements at all nodes would be identical among models.

3.5.2 Sample Size

When microscopic traffic simulation is performed, the question of the number of simulation runs to perform becomes a significant point of discussion. It is often mentioned in the statistical community that a minimum thirty runs of a single particular simulation are necessary in order to produce robust results. However, the scope of this research was quite extensive, both in terms of the number of scenarios analyzed and the size of the network being modeled itself. Therefore, for the sake of computing resources, time, and labor efficiency, it was decided that ten simulation runs of each case modeled for both the No Contraflow and with Contraflow scenarios would be performed in both CORSIM and VISSIM. If a more detailed investigation of the necessary sample size was performed (assuming a normal distribution of output performance measures), it would follow the equation

$$N_r = \frac{z^2\sigma^2}{\delta^2}$$

where N_r = the required number of runs;
z = the desired z-score (2 standard deviations = 1.96)
σ^2 = sample variance;
and δ^2 = the square of the tolerance desired.

The standard iterative procedure for this process is to perform an initial number of runs (in this case, ten could be used as a starting point since this is how many runs were performed) with its variability and the selected tolerance to estimate N_r for the sample. Once N_r runs have been performed, that new value and the new variability are again put into the equation to produce a new N_r. Once the N_r output from iteration is less than the number of runs performed, the sample size is considered statistically sufficient for the tolerance chosen. Conversely, with a fixed number of runs and a calculated variability over those runs, the tolerance for a sample can be determined. Since the scope of this analysis contained several MOEs on several links in several cases, and each of these would produce its own sample size calculation, one example of this analysis is provided to give an idea of how the process would take place if all MOEs for all links were to be investigated. The example tolerance calculation provided is for the queue length in CORSIM for the No Contraflow, Severe Event Case (Section 4.4.1). The number of runs is 10 and the standard deviation is 29.9 ft. Therefore, the tolerance for this sample is

$$\delta^2 = \frac{(1.96)^2 (29.9)^2}{10} = 343.4\, ft^2$$

$$\delta = +/- \ 18.5 \text{ feet}$$

Therefore, in only 10 runs, a margin of error (tolerance) of 18.5 feet in the queue length has been attained, assuming the queues are normally distributed. For the example above, if a tolerance of +/- 20 feet (approximately 1 vehicle) was desired, the required sample size would be

$$N_r = \frac{(1.96)^2 (29.9)^2}{(20)^2} = 8.6 \text{ runs}$$

Since 10 runs were performed, the sample is considered statistically sufficient for this performance measure (assuming a normal distribution).

3.5.3 Effectiveness of Dynamic Traffic Assignment in VISSIM

The original modeling efforts for the New Hanover County phase of analysis included another consideration of VISSIM using its Dynamic Traffic Assignment (DTA) algorithms. DTA is very desirable in emergency evacuation analysis since incidents and subsequent re-routing of evacuation trips is at times more common in evacuation conditions than in typical traffic conditions. However, in the New Hanover County analysis, scalability issues again became an issue when DTA was considered. Detailed origin-destination volumes were created from the high-level analysis performed in determining evacuation demand (see Chapter 4 for more information). These volumes were input into the New Hanover County VISSIM model and routing decisions were left up to the simulation to create. Default parameters were again retained in this analysis. However, after fifteen (15) runs of the Severe Event Case in both the No Contraflow and With Contraflow scenarios, convergence of the routing decisions along the highway network had not occurred. In addition, observation of the vehicles during the simulation by the author showed, for the most part, evacuees choosing only one or two of the paths available for their route while several additional paths remained lightly traveled. The result was severe congestion at a few nodes and free flow at several other nodes. This was considered unrealistic since it was assumed that a majority of the evacuees will be familiar with the network and those who are not will be aided by ITS deployments such as variable message signs and highway advisory radio channels. This unrealistic scenario continued throughout the fifteen runs. It appeared that the DTA algorithm in VISSIM had difficulty assigning trips to the complex New Hanover County network due to the scale of the network.

3.6 Performance Measures

The Measures of Effectiveness analyzed in this modeling effort were queue lengths, average link speeds and throughput at key nodes. Queue lengths and throughput allow for an investigation of the ability of the lane reversal to move more vehicles through New Hanover County more efficiently, and provide the ability to pinpoint key nodes where bottlenecks may occur. Average link speeds allow for an estimate of the travel times through the county throughout the simulation. These travel times through the county can be extrapolated to reflect clearance times through further analysis.

3.7 Summary

Traffic simulation modeling was performed on a study area that encompassed all of New Hanover County, North Carolina. Major arterials in the county were modeled in addition to College Road (NC Highway 132/US Highway 117) and Interstate 40. Several simulation models were pegged as candidates for this analysis, but due to scalability and model limitations, all but CORSIM and VISSIM were eliminated from this analysis. Ten simulation runs were performed in each model for each demand scenario in the "no contraflow" and "MLK contraflow" cases. Measures of effectiveness from the two models were compared with each other to produce a detailed comparison of the two simulation models in emergency evacuation conditions. Data are not readily available to analyze from previous evacuation lane reversal efforts. For this reason, several behavioral parameters such as saturation headways, driver reaction times, vehicle types, free flow speeds, and acceleration/deceleration data are not easy to calibrate for any simulation model in this context. In addition, this research placed an emphasis on a comparison of two prominent microscopic simulation models. Therefore, editing of default simulation parameters could produce biases that would be detrimental to this rigorous comparison of simulation models in identical evacuation conditions. All traffic volumes were entered on a link-node basis identically in each simulation model. Signal timings for the network were created with assistance from the City of Wilmington Traffic Engineering department. The city Traffic Engineer guided the analysis by confirming that along the College Road arterial, green time would be maximized during the evacuation to provide maximum progression to the north-south evacuees on College Road at the expense of the intersecting streets. This guidance was followed throughout the modeling process. A fifteen percent heavy vehicle proportion was assumed for the analysis based on previous research as well as expectations of drivers adding weight to their vehicles and being a bit distracted, resulting in lowered reaction times and acceleration/deceleration. The measures of effectiveness analyzed in this modeling effort were queue lengths, average link speeds and throughput at key nodes. Figures 3-8 and 3-9 graphically represent screenshots of the CORSIM and VISSIM link-node diagrams, respectively.

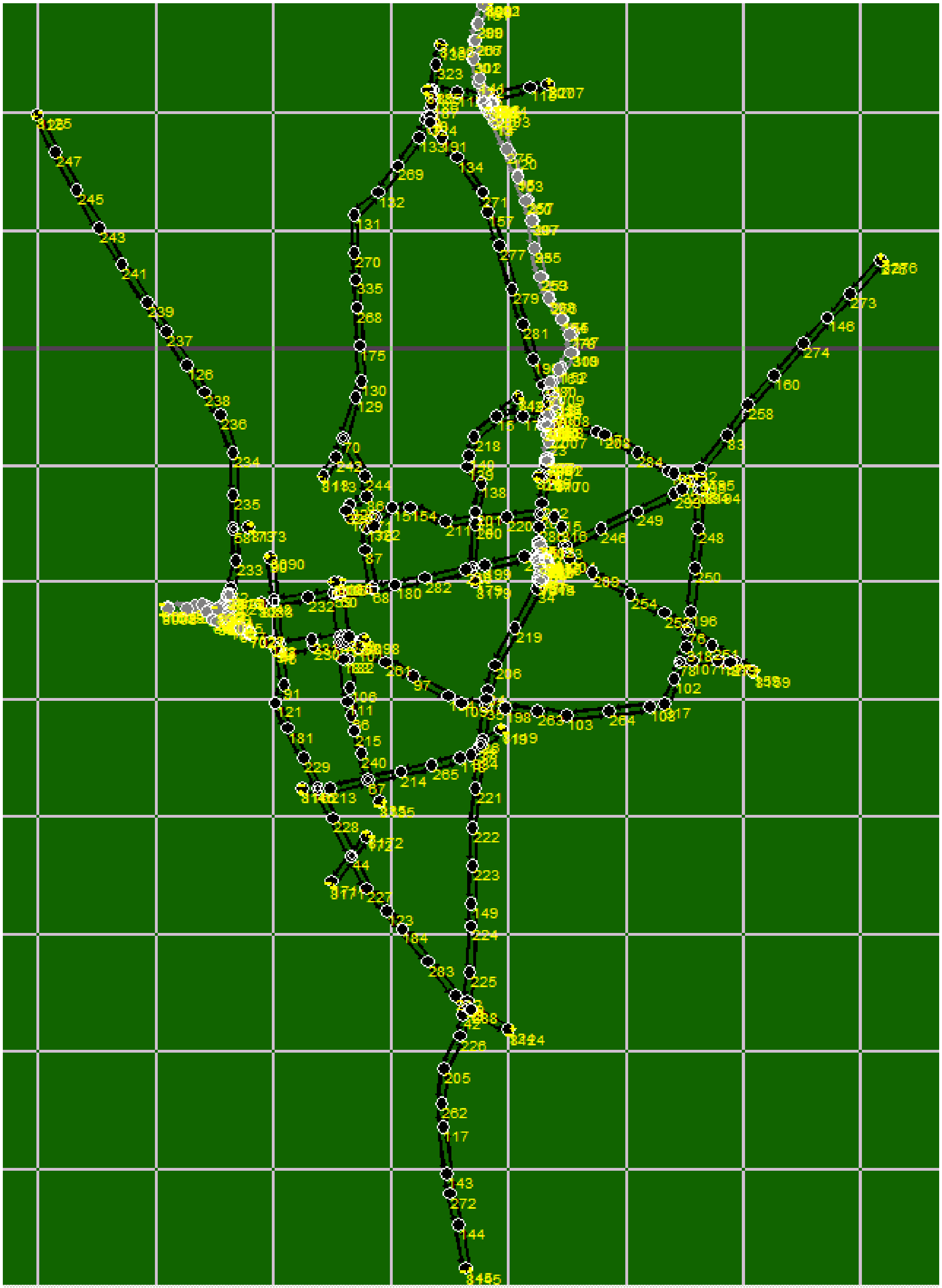


Figure 3-8. Link-Node Diagram of CORSIM New Hanover County Network.

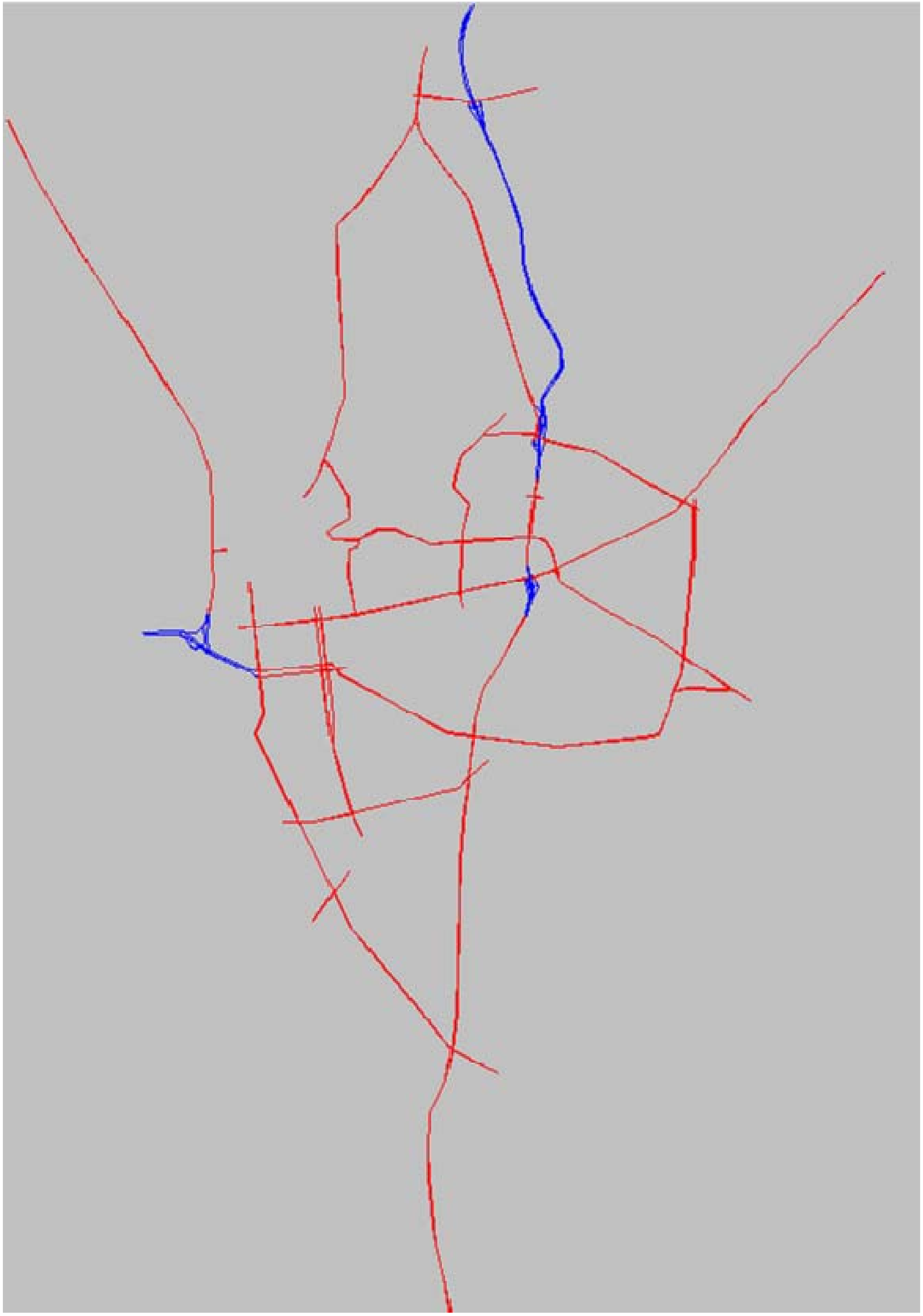


Figure 3-9. Link-Node Diagram of VISSIM New Hanover County Network.

4.0 ANALYSIS AND RESULTS

4.1 Outline of Analysis Procedures

In this chapter, the detailed results of each set of simulation runs will be shown. In addition, a discussion of each result with statistical analysis follows the output tables in each section. Section 4.2 details the simulation modeling focused on the transition to contraflow in northern New Hanover County. The result of this preliminary, focused modeling was the shift in the transition from the Kenningston Street median crossover to the College Road/Martin Luther King, Jr. intersection in the NCDOT Lane Reversal Plan beginning in 2004. The remainder of this chapter is devoted to the full New Hanover County analysis with this new transition in place. Section 4.3 outlines the key nodes analyzed in this phase. Six different models were prepared in both CORSIM and VISSIM, based on the following conditions:

- No Contraflow, Severe Event Case
- With Contraflow, Severe Event Case
- No Contraflow, Moderate Event Case
- With Contraflow, Moderate Event Case
- No Contraflow, Minimal Event Case
- With Contraflow, Minimal Event Case

First, the results of one simulation model in both the No Contraflow and Contraflow cases are summarized in the following sections:

- Section 4.4.1 – CORSIM Severe Event Case No Contraflow vs. Contraflow
- Section 4.4.2 – VISSIM Severe Event Case No Contraflow vs. Contraflow

- Section 4.5.1 – CORSIM Moderate Event Case No Contraflow vs. Contraflow
- Section 4.5.2 – VISSIM Moderate Event Case No Contraflow vs. Contraflow

- Section 4.6.1 – CORSIM Minimal Event Case No Contraflow vs. Contraflow
- Section 4.6.2 – VISSIM Minimal Event Case No Contraflow vs. Contraflow

Next, the simulation models were investigated based on side-by-side comparisons in all storm cases and both with and without contraflow, in the following sections:

- Section 4.7.1 – No Contraflow Severe Event Case CORSIM vs. VISSIM
- Section 4.7.2 – With Contraflow Severe Event Case CORSIM vs. VISSIM

- Section 4.8.1 – No Contraflow Moderate Event Case CORSIM vs. VISSIM
- Section 4.8.2 – With Contraflow Moderate Event Case CORSIM vs. VISSIM

- Section 4.9.1 – No Contraflow Minimal Event Case CORSIM vs. VISSIM
- Section 4.9.2 – With Contraflow Minimal Event Case CORSIM vs. VISSIM

4.2 Phase 1 (Detailed Contraflow Transition Investigation)

This analysis focused solely on traffic entering the transition to contraflow in both the original (2000-2003) and alternative configurations to the Lane Reversal Plan (see Figure 3-2a and 3-2d for a detailed description of these alternatives). CORSIM simulation was utilized in this analysis and eleven runs were performed for the "no contraflow, "original plan contraflow", and "Martin Luther King, Jr. Parkway contraflow" for the Severe Event case. One original run was performed once the models were calibrated, and then ten additional runs were performed once the decision on the number of runs was made. Rather than eliminating the original run, it was retained since it was considered more likely to be beneficial than detrimental to the robustness of the multiple-run average for this round of modeling. The maximum queue was the MOE in this analysis, as the primary goal was to determine whether an alternative location of the transition to contraflow would enhance the efficiency of the Plan. These model results are shown in Table 4-1.

Table 4-1. Phase I Modeling – Maximum Queue Length among All Lanes.

NB College Road Queues (feet)			
Run	No CF	Current CF	MLK
1	9513	14263	650
2	9963	14363	750
3	10563	13738	1215
4	9238	14313	1065
5	11063	13638	1315
6	10688	14263	1015
7	9013	14238	1215
8	12288	14388	700
9	11163	14363	990
10	9663	14463	1215
11	10288	12688	1465
Average	**10313**	**14065**	**1054**

WB MLK Queues (feet)			
Run	No CF	Current CF	MLK
1	8312	8225	175
2	8287	8100	325
3	8562	7875	275
4	8562	8025	525
5	8162	8150	200
6	8437	8075	250
7	8337	8000	175
8	8612	8275	175
9	8237	8075	225
10	8312	8275	225
11	8462	7875	200
Average	**8389**	**8086**	**250**

The raw numbers in this analysis were not the focus of the investigation as the highway network only included the intersection of College Road and Martin Luther King, Jr. Parkway and omitted other signalized intersections along College Road that would meter traffic progressing to this location. However, the ratios of queues among the alternatives were the results sought in order to determine whether a different transition location would be more efficient, since it was expected this metering at other intersections would be uniform across all alternatives. The analysis showed considerable improvement in the loading of the contraflow lanes by moving the transition to contraflow to the College Road/Martin Luther King, Jr. Parkway. In fact, the results showed that the original contraflow plan could in fact make northbound queues worse than if contraflow was not implemented at all. It was assumed that the reason for this is that there are no additional receiving lanes provided by the original lane reversal plan's transition to contraflow, and there was a restriction on commercial vehicles in the reversed lanes as a part of the original plan. This restriction caused lane changing by the commercial vehicles just downstream of the College Road/MLK Parkway intersection in order to make sure these drivers were in the normal lanes before the transition to contraflow. This commercial vehicle restriction was lifted as a part of the "MLK contraflow" configuration since all vehicles on College Road were forced to the contraflow lanes. ITS technologies were to be implemented upstream of the transition to recommend a route to commercial vehicles that would route them to Martin Luther King, Jr. Parkway and therefore to the normal lanes whenever possible. The two primary factors behind the vast improvements found when the transition was shifted to the College Road/MLK Parkway intersection were the fact that this intersection is a bottleneck in and of itself so shifting the transition (which will cause its own bottleneck) to this intersection essentially merges two bottlenecks into one, and also the fact that as previous research (Cova and Johnson, 2003) supports, lane-based routing at key nodes increases the efficiency of an evacuation (see Chapter 2 for a more detailed description of Cova and Johnson's research).

As a result of this Phase 1 focused modeling, the Lane Reversal Plan was revised in 2004 to move the transition to contraflow to the College Road/Martin Luther King, Jr. Parkway intersection. All subsequent New Hanover County analysis therefore was performed with contraflow beginning at this intersection.

4.3 Phase 2 (New Hanover County) Simulation Runs and Measures of Effectiveness

These results focus primarily on the College Road corridor and the College Road/Martin Luther King, Jr. Parkway intersection. Figure 4-1 depicts the key nodes of the analysis that appear in the following results.

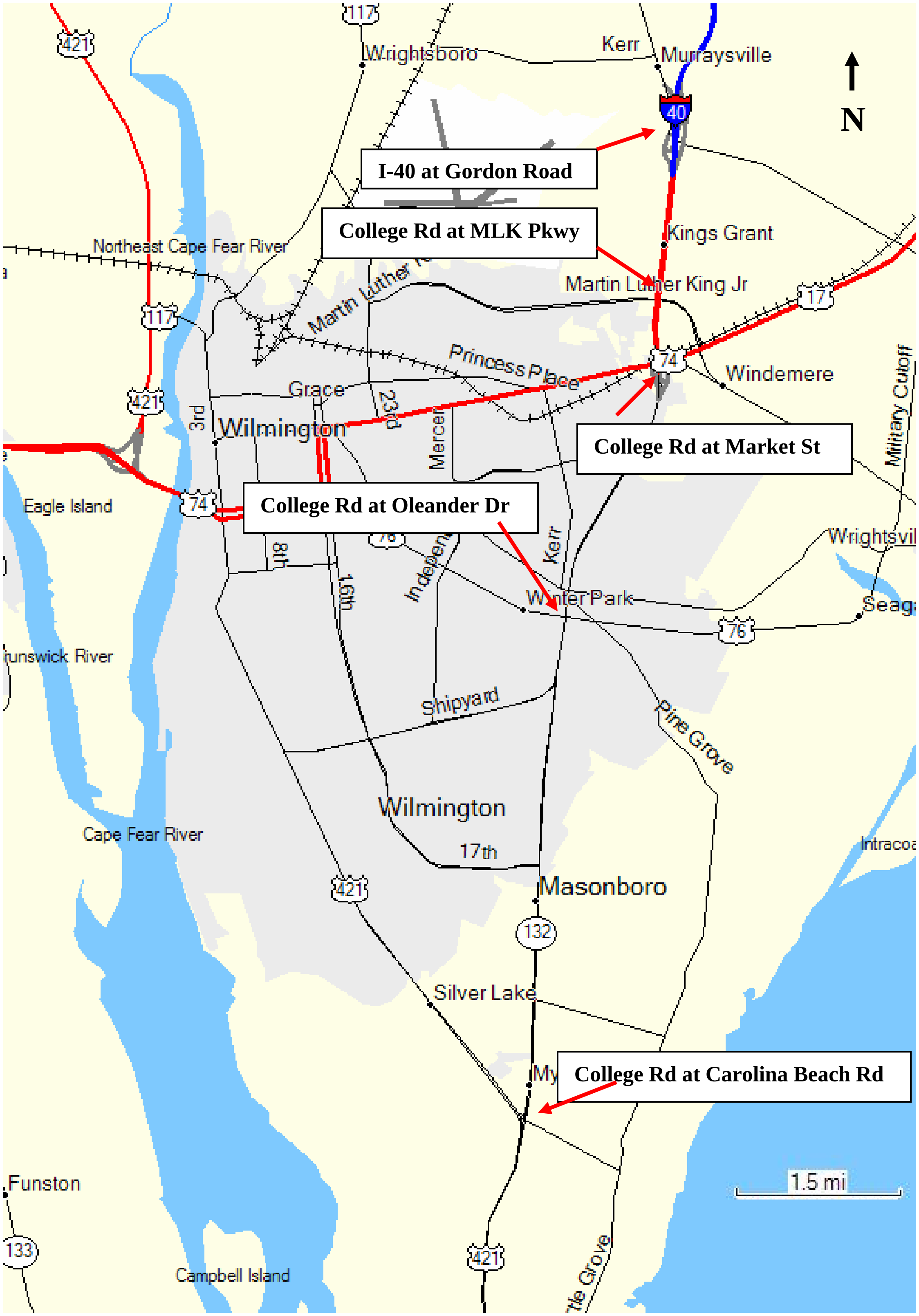


Figure 4-1. Key Nodes in New Hanover County Network (Navteq/Garmin, 2005).

Some limitations were encountered in the modeling procedures such that the node output results for certain MOEs differed slightly between models. These limitations were as follows:

- CORSIM does not report queues on freeway links, therefore Maximum Queue lengths could not be reported on the Interstate 40 sections (at the Holly Shelter Road on ramp and at the Gordon Road on ramp). The maximum queue for the Severe Event case, no contraflow scenario was reported because the queue stretched to the NETSIM links and therefore could be extrapolated.

- VISSIM appeared to incorrectly report average speeds for Interstate 40 at the Holly Shelter Road link. Therefore, these results were discarded. It is unknown why this anomaly took place and attempts to correct it were unsuccessful.

4.4 Severe Event Case No Contraflow versus Contraflow Results

4.4.1 CORSIM

The 10-run averages and standard deviations for the CORSIM analysis MOEs at key links/nodes are shown in Tables 4-2 through 4-6.

Table 4-2. CORSIM Average and Standard Deviation of Maximum Queue Lengths (ft).

Queue Location	No Contraflow 10-run CORSIM Average (s.d.)		With Contraflow 10-run CORSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	4066	(29.9)	479	(32.4)
WB Through Martin Luther King, Jr. Parkway at College Road	328	(77.0)	180	(5.2)
WB Right Martin Luther King, Jr. Parkway at College Road	926	(30.3)	87	(5.1)
NB College Road at Market Street on Ramp	2562	(90.1)	1881	(13.2)
NB College Road at Oleander Drive	2277	(25.9)	2049	(24.8)
NB College Road at Carolina Beach Road	1213	(73.9)	1040	(75.1)
Interstate 40 WB at Gordon Road on Ramp	7510	**	*	**

* Denotes Queue does not stretch beyond limits of FRESIM links -- Queue is shorter than 6693 feet
** Denotes Standard Deviation cannot be obtained since queue contains FRESIM links

Table 4-3. CORSIM 10-run Average Throughputs (Vehicles).

Location	No Contraflow CORSIM Average Throughput Hrs 1-5	With Contraflow CORSIM Average Throughput Hrs 1-5	No Contraflow CORSIM Average Throughput Hrs 6-10	With Contraflow CORSIM Average Throughput Hrs 6-10	No Contraflow CORSIM Average Throughput Hrs 11-14	With Contraflow CORSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	9514	10416	17646	19756	664	1622
NB Through College Road at Market Street Overpass	6894	6735	11822	11683	578	951
NB Through College Road at Market Street On Ramp	6184	6066	10506	10414	273	416
NB Through College Road at Oleander Drive	6456	6417	10158	10158	202	372
NB Through College Road at Carolina Beach Road	6940	6417	10261	10158	114	372
WB Right Martin Luther King, Jr. Parkway at College Road	1031	1054	2774	2799	178	419

Table 4-4. CORSIM 10-run Average Cumulative Throughput and Standard Deviation.

Location	No Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)	MLK Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)
Interstate 40 WB Leaving New Hanover County	27824 (114.5)	31794 (111.6)
NB Through College Road at Market Street Overpass	19295 (109.7)	19370 (74.4)
NB Through College Road at Market Street On Ramp	16963 (92.0)	16896 (57.5)
NB Through College Road at Oleander Drive	16817 (67.2)	16947 (66.1)
NB Through College Road at Carolina Beach Road	17315 (31.2)	16947 (47.0)
WB Right Martin Luther King, Jr. Parkway at College Road	3983 (56.1)	4273 (60.9)

Table 4-5. CORSIM 10-run Average Speeds and Overall Standard Deviation.

Location	No CF Avg. Speed Hrs 1-5 (mph)	With CF Avg. Speed Hrs 1-5 (mph)	No CF Avg. Speed Hrs 6-10 (mph)	With CF Avg. Speed Hrs 6-10 (mph)	No CF Avg. Speed Hr 11-14 (mph)	With CF Avg. Speed Hr 11-14 (mph)	No Contraflow Standard Deviation (mph)	With Contraflow Standard Deviation (mph)
Interstate 40 WB at Holly Shelter Road On Ramp	64.7	69.2	37.5	67.5	61.3	69.6	1.7	0.1
Interstate 40 WB at Gordon Road On Ramp	63.3	66.5	20.4	65.9	49.2	66.6	0.8	0.1
NB Through College Rd at MLK Parkway	25.3	41.1	11.2	32.7	23.5	40.8	0.6	0.7
NB Through College Rd at Market St Overpass	50.9	51.0	26.8	48.7	47.1	49.5	3.0	0.1
NB Through College Rd at Market St Ramp	41.4	41.8	19.2	34.9	37.4	43.4	3.5	0.3
NB Through College Rd at Oleander Dr	26.3	28.2	21.4	23.1	30.8	31.6	0.7	0.4
NB Through College Rd at Carolina Beach Rd	25.2	27.0	15.4	16.3	24.8	24.4	0.7	0.7
NB Through College Road Entering network	50.0	49.9	47.1	47.1	53.1	50.8	0.1	0.1
WB Right MLK Parkway at College Rd	23.7	15.3	8.1	21.5	16.7	17.1	0.6	0.4

4.4.2 VISSIM

The 10-run averages and standard deviations for the VISSIM analysis MOEs at key links/nodes are shown in Tables 4-6 through 4-9.

Table 4-6. VISSIM Average and Standard Deviation of Maximum Queue Lengths (ft).

Queue Location	No Contraflow 10-run VISSIM Average (s.d.)		MLK Contraflow 10-run VISSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	6269	(446.9)	778	(107.9)
WB Through Martin Luther King, Jr. Parkway at College Road	91	(26.8)	0	(0)
WB Right Martin Luther King, Jr. Parkway at College Road	1192	(139.0)	199	(56.0)
NB College Road at Market Street on Ramp	13548	(1.8)	3243	(525.9)
NB College Road at Oleander Drive	25755	(41.7)	8775	(691.7)
NB College Road at Carolina Beach Road	22727	(1.3)	1464	(285.1)
Interstate 40 WB at Gordon Road on Ramp	7550	(594.2)	889	(230.5)

Table 4-7. VISSIM 10-run Average Throughputs (Vehicles).

Location	No Contraflow VISSIM Average Throughput Hrs 1-5	With Contraflow VISSIM Average Throughput Hrs 1-5	No Contraflow VISSIM Average Throughput Hrs 6-10	With Contraflow VISSIM Average Throughput Hrs 6-10	No Contraflow VISSIM Average Throughput Hrs 11-14	With Contraflow VISSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	7733	9072	12125	17622	1780	1343
NB Through College Road at Market Street Overpass	6186	6404	6322	11338	1488	913
NB Through College Road at Market Street On Ramp	5531	5727	5062	9956	1033	502
NB Through College Road at Oleander Drive	6832	6714	5843	10376	2784	319
NB Through College Road at Carolina Beach Road	7905	7258	6851	10548	1246	283

Table 4-8. VISSIM 10-run Average Cumulative Throughput and Standard Deviation.

Location	No Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)		MLK Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)	
Interstate 40 WB Leaving New Hanover County	21638	(30.0)	28037	(45.6)
NB Through College Road at Market Street Overpass	13996	(38.7)	18655	(35.2)
NB Through College Road at Market Street On Ramp	11625	(34.4)	16185	(33.8)
NB Through College Road at Oleander Drive	15459	(52.4)	17409	(34.9)
NB Through College Road at Carolina Beach Road	16001	(50.6)	18089	(21.3)

Table 4-9. VISSIM 10-run Average Speeds and Overall Standard Deviation.

Location	No CF Avg. Speed Hrs 1-5 (mph)	With CF Avg. Speed Hrs 1-5 (mph)	No CF Avg. Speed Hrs 6-10 (mph)	With CF Avg. Speed Hrs 6-10 (mph)	No CF Avg. Speed Hr 11-14 (mph)	With CF Avg. Speed Hr 11-14 (mph)	No Contraflow Standard Deviation (mph)	With Contraflow Standard Deviation (mph)
NB Through College Road at MLK Parkway	18.9	17.6	12.8	14.2	35.3	36.0	1.1	1.2
NB Through College Rd at Market St Overpass	20.1	19.9	10.3	15.5	33.1	33.7	1.0	1.0
NB Through College Rd at Market St Ramp	22.0	21.2	8.8	14.4	39.5	41.4	1.3	1.3
NB Through College Rd at Oleander Dr	17.3	16.0	11.3	14.6	13.1	25.3	0.8	1.4
NB Through College Rd at Carolina Beach Rd	35.9	34.4	14.8	19.0	20.6	38.7	1.7	1.0
NB Through College Rd Entering network	41.7	41.7	18.0	25.5	34.6	43.1	0.4	0.4

4.4.3 Discussion

The 10-run averages for both CORSIM and VISSIM show a considerable increase in throughput and average speeds and a considerable decrease in maximum queue lengths when the lane reversal is implemented for the Severe Event Case. The benefits of this implementation are more considerable in VISSIM due to the fact that the queues in the no contraflow case are much more extreme. These queues in fact essentially stretch from intersection to intersection, creating a long queue of several miles from the I-40/Gordon Road interchange all the way back to upstream of the intersection of College Road with Carolina Beach Road. This queue begins at the merge of the Gordon Road on ramp with Interstate 40, downstream of any signalized intersections.

Statistical t-tests were performed on several of these performance measures in order to determine the significance of these differences at the 95% confidence interval (5% Type I error rate). Table 4-10 represents these statistical tests. All differences investigated were shown to be significant at the 95% confidence level. Appendix B contains detailed t-test calculations.

Table 4-10. Statistical t-tests of Selected Severe Event Case MOEs.

Performance Measure	Measured Difference (Contraflow Value Minus No Contraflow Value)	Does t-test (95% Confidence) reject the Null Hypothesis?
CORSIM Throughput on I-40	3970 veh	YES
VISSIM Throughput on I-40	6399 veh	YES
CORSIM Queues - NB College at MLK Pkwy	-3587 ft	YES
VISSIM Queues - NB College at MLK Pkwy	-5490 ft	YES
CORSIM Queues - WB MLK Parkway at College	-839 ft	YES
VISSIM Queues - WB MLK Parkway at College	-993 ft	YES
CORSIM Queues - NB College at Oleander Dr	-227 ft	YES
VISSIM Queues - NB College at Oleander Dr	-16980 ft	YES

4.5 Moderate Event Case No Contraflow versus Contraflow Results

4.5.1 CORSIM

The 10-run averages and standard deviations for the CORSIM analysis MOEs at key links/nodes are shown in Tables 4-11 through 4-14.

Table 4-11. CORSIM Average and Standard Deviation of Maximum Queue Lengths (ft).

Queue Location	No Contraflow 10-run CORSIM Average (s.d.)		With Contraflow 10-run CORSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	706	(68.6)	404	(34.0)
WB Through Martin Luther King, Jr. Parkway at College Road	101	(7.3)	148	(4.7)
WB Right Martin Luther King, Jr. Parkway at College Road	364	(10.9)	85	(6.3)
NB College Road at Market Street on Ramp	1790	(5.5)	1804	(10.8)
NB College Road at Oleander Drive	1867	(27.0)	1782	(15.9)
NB College Road at Carolina Beach Road	595	(19.6)	578	(26.4)
Interstate 40 WB at Gordon Road on Ramp	6903	**	*	**

* Denotes Queue does not stretch beyond limits of FRESIM links -- Queue is shorter than 6693 feet
** Denotes Standard Deviation cannot be obtained since queue contains FRESIM links

Table 4-12. CORSIM 10-run Average Throughputs (Vehicles).

Location	No Contraflow CORSIM Average Throughput Hrs 1-5	With Contraflow CORSIM Average Throughput Hrs 1-5	No Contraflow CORSIM Average Throughput Hrs 6-10	With Contraflow CORSIM Average Throughput Hrs 6-10	No Contraflow CORSIM Average Throughput Hrs 11-14	With Contraflow CORSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	8823	9694	14501	16122	613	724
NB Through College Road at Market Street Overpass	6497	6414	9838	9802	551	505
NB Through College Road at Market Street On Ramp	5815	5769	8747	8741	248	244
NB Through College Road at Oleander Drive	6149	6112	8726	8713	189	191
NB Through College Road at Carolina Beach Road	6637	6112	8900	8713	110	191
WB Right Martin Luther King, Jr. Parkway at College Road	1071	1039	2300	2238	175	157

Table 4-13. CORSIM 10-run Average Cumulative Throughput and Standard Deviation.

Location	No Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)	MLK Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)
Interstate 40 WB Leaving New Hanover County	23937 (146.1)	26541 (89.3)
NB Through College Road at Market Street Overpass	16886 (129.5)	16721 (105.7)
NB Through College Road at Market Street On Ramp	14810 (90.3)	14754 (90.5)
NB Through College Road at Oleander Drive	15064 (67.7)	15016 (64.2)
NB Through College Road at Carolina Beach Road	15647 (32.8)	15016 (24.6)
WB Right Martin Luther King, Jr. Parkway at College Road	3546 (62.0)	3434 (47.2)

Table 4-14. CORSIM 10-run Average Speeds and Overall Standard Deviation.

Location	No CF Avg. Speed Hrs 1-5 (mph)	With CF Avg. Speed Hrs 1-5 (mph)	No CF Avg. Speed Hrs 6-10 (mph)	With CF Avg. Speed Hrs 6-10 (mph)	No CF Avg. Speed Hr 11-14 (mph)	With CF Avg. Speed Hr 11-14 (mph)	No Contraflow Standard Deviation (mph)	With Contraflow Standard Deviation (mph)
Interstate 40 WB at Holly Shelter Road On Ramp	65.0	69.4	59.2	68.3	62.3	69.2	0.4	0.1
Interstate 40 WB at Gordon Road On Ramp	63.5	66.6	61.5	66.1	62.6	66.5	0.5	0.1
NB Through College Rd at MLK Parkway	24.8	42.0	20.0	37.2	25.5	40.4	0.3	0.5
NB Through College Rd at Market St Overpass	51.0	51.1	49.7	49.7	49.8	49.9	0.1	0.1
NB Through College Rd at Market St Ramp	41.8	42.1	37.3	38.0	41.9	42.1	0.3	0.2
NB Through College Rd at Oleander Dr	26.9	28.3	23.8	24.9	28.5	29.6	0.4	0.2
NB Through College Rd at Carolina Beach Rd	26.5	27.7	19.9	21.7	22.4	24.0	0.4	0.5
NB Through College Road Entering network	50.3	50.2	48.3	48.3	49.3	49.2	0.1	0.2
WB Right MLK Parkway at College Rd	24.5	14.6	15.4	19.2	18.0	16.8	0.3	0.4

4.5.2 VISSIM

The 10-run averages and standard deviations for the VISSIM analysis MOEs at key links/nodes are shown in Tables 4-15 through 4-18.

Table 4-15. VISSIM Average and Standard Deviation of Maximum Queue Lengths (ft).

Queue Location	No Contraflow 10-run VISSIM Average (s.d.)		MLK Contraflow 10-run VISSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	4170	(79.9)	650	(79.1)
WB Through Martin Luther King, Jr. Parkway at College Road	96	(15.1)	0	(0)
WB Right Martin Luther King, Jr. Parkway at College Road	921	(102.7)	142	(35.8)
NB College Road at Market Street on Ramp	13543	(7.5)	2406	(408.4)
NB College Road at Oleander Drive	25526	(535.7)	2714	(674.1)
NB College Road at Carolina Beach Road	18644	(5737.3)	757	(90.8)
Interstate 40 WB at Gordon Road on Ramp	7204	(106.2)	521	(82.8)

Table 4-16. VISSIM 10-run Average Throughputs (Vehicles).

Location	No Contraflow VISSIM Average Throughput Hrs 1-5	With Contraflow VISSIM Average Throughput Hrs 1-5	No Contraflow VISSIM Average Throughput Hrs 6-10	With Contraflow VISSIM Average Throughput Hrs 6-10	No Contraflow VISSIM Average Throughput Hrs 11-14	With Contraflow VISSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	7127	8759	11936	15546	1543	1103
NB Through College Road at Market Street Overpass	5912	6119	7595	10136	1147	718
NB Through College Road at Market Street On Ramp	5299	5500	6509	9010	735	385
NB Through College Road at Oleander Drive	6596	6449	7855	9489	1946	252
NB Through College Road at Carolina Beach Road	7538	6929	8876	9367	631	249

Table 4-17. VISSIM 10-run Average Cumulative Throughput and Standard Deviation.

Location	No Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)		MLK Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)	
Interstate 40 WB Leaving New Hanover County	20607	(28.6)	25408	(42.5)
NB Through College Road at Market Street Overpass	14654	(38.8)	16973	(38.2)
NB Through College Road at Market Street On Ramp	12543	(38.3)	14895	(33.7)
NB Through College Road at Oleander Drive	16397	(66.4)	16189	(30.7)
NB Through College Road at Carolina Beach Road	17045	(41.8)	16545	(20.3)

Table 4-18. VISSIM 10-run Average Speeds and Overall Standard Deviation.

Location	No CF Avg. Speed Hrs 1-5 (mph)	With CF Avg. Speed Hrs 1-5 (mph)	No CF Avg. Speed Hrs 6-10 (mph)	With CF Avg. Speed Hrs 6-10 (mph)	No CF Avg. Speed Hr 11-14 (mph)	With CF Avg. Speed Hr 11-14 (mph)	No Contraflow Standard Deviation (mph)	With Contraflow Standard Deviation (mph)
NB Through College Road at MLK Parkway	18.9	17.9	14.2	14.4	36.1	37.5	1.2	1.2
NB Through College Rd at Market St Overpass	20.7	20.4	12.2	15.9	32.2	33.8	1.1	1.0
NB Through College Rd at Market St Ramp	23.0	21.6	11.6	15.6	39.7	42.2	1.4	1.5
NB Through College Rd at Oleander Dr	17.3	16.1	13.6	14.9	18.3	28.9	0.9	1.1
NB Through College Rd at Carolina Beach Rd	37.3	34.7	18.3	28.4	35.6	38.8	0.7	1.4
NB Through College Rd Entering network	41.8	41.8	22.9	41.5	35.9	43.1	1.5	0.1

4.5.3 Discussion

The differences portrayed by the simulation models were again quite considerable in the Moderate Event case when comparing the implementation of contraflow to the do-nothing alternative. However, it should be noted that the differences, especially in the CORSIM model runs, were not as substantial as those found in the Severe Event case. Again, VISSIM produced extreme queuing in the no contraflow scenario, with a long queue of several miles again forming (although just a bit shorter than that from the Severe Event case).

Similar statistical t-tests to those in the Severe Event Case were performed on the same selection of performance measures in this storm case. Table 4-19 shows that, again, all differences investigated were determined to be significant at the 95% confidence level.

Table 4-19. Statistical t-tests of Selected Moderate Event Case MOEs.

Performance Measure	Measured Difference (Contraflow Value Minus No Contraflow Value)	Does t-test (95% Confidence) reject the Null Hypothesis?
CORSIM Throughput on I-40	2604 veh	YES
VISSIM Throughput on I-40	4802 veh	YES
CORSIM Queues - NB College at MLK Pkwy	-303 ft	YES
VISSIM Queues - NB College at MLK Pkwy	-3520 ft	YES
CORSIM Queues - WB MLK Parkway at College	-279 ft	YES
VISSIM Queues - WB MLK Parkway at College	-780 ft	YES
CORSIM Queues - NB College at Oleander Dr	-85 ft	YES
VISSIM Queues - NB College at Oleander Dr	-22812 ft	YES

4.6 Minimal Event Case No Contraflow versus Contraflow Results

4.6.1 CORSIM

The 10-run averages and standard deviations for the CORSIM analysis MOEs at key links/nodes are shown in Tables 4-20 through 4-24.

Table 4-20. CORSIM Average and Standard Deviation of Maximum Queue Lengths (ft).

Queue Location	No Contraflow 10-run CORSIM Average (s.d.)		With Contraflow 10-run CORSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	498	(69.2)	328	(31.8)
WB Through Martin Luther King, Jr. Parkway at College Road	79	(0)	125	(3.2)
WB Right Martin Luther King, Jr. Parkway at College Road	136	(5.4)	55	(3.5)
NB College Road at Market Street on Ramp	1771	(2.5)	1779	(2.2)
NB College Road at Oleander Drive	1387	(18.0)	1339	(16.9)
NB College Road at Carolina Beach Road	404	(11.1)	396	(9.1)
Interstate 40 WB at Gordon Road on Ramp	34	(9.9)	0	(0)

Table 4-21. CORSIM 10-run Average Throughputs (Vehicles).

Location	No Contraflow CORSIM Average Throughput Hrs 1-5	With Contraflow CORSIM Average Throughput Hrs 1-5	No Contraflow CORSIM Average Throughput Hrs 6-10	With Contraflow CORSIM Average Throughput Hrs 6-10	No Contraflow CORSIM Average Throughput Hrs 11-14	With Contraflow CORSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	8287	8877	10020	10725	3929	4423
NB Through College Road at Market Street Overpass	6126	6008	7122	7006	2368	2291
NB Through College Road at Market Street On Ramp	5508	5420	6365	6277	1827	1809
NB Through College Road at Oleander Drive	5836	5803	6547	6509	1474	1479
NB Through College Road at Carolina Beach Road	6305	5803	6922	6509	1321	1479
WB Right Martin Luther King, Jr. Parkway at College Road	812	786	1142	1107	1012	991

Table 4-22. CORSIM 10-run Average Cumulative Throughput and Standard Deviation.

Location	No Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)		MLK Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)	
Interstate 40 WB Leaving New Hanover County	22235	(128.3)	24025	(97.5)
NB Through College Road at Market Street Overpass	15615	(113.9)	15305	(102.7)
NB Through College Road at Market Street On Ramp	13700	(73.9)	13505	(88.5)
NB Through College Road at Oleander Drive	13856	(73.3)	13791	(69.7)
NB Through College Road at Carolina Beach Road	14547	(23.1)	13791	(26.5)
WB Right Martin Luther King, Jr. Parkway at College Road	2966	(51.5)	2884	(61.0)

Table 4-23. CORSIM 10-run Average Speeds.

Location	No CF Avg. Speed Hrs 1-5 (mph)	With CF Avg. Speed Hrs 1-5 (mph)	No CF Avg. Speed Hrs 6-10 (mph)	With CF Avg. Speed Hrs 6-10 (mph)	No CF Avg. Speed Hr 11-14 (mph)	With CF Avg. Speed Hr 11-14 (mph)	No Contraflow Standard Deviation (mph)	With Contraflow Standard Deviation (mph)
Interstate 40 WB at Holly Shelter Road On Ramp	65.4	69.4	64.5	69.1	68.7	69.6	0.1	0.1
Interstate 40 WB at Gordon Road On Ramp	63.6	66.6	63.0	66.4	70.0	66.4	0.1	0.1
NB Through College Rd at MLK Parkway	25.8	42.0	24.7	41.3	34.7	44.8	0.3	0.4
NB Through College Rd at Market St Overpass	51.2	51.2	50.8	50.9	51.6	51.3	0.1	0.1
NB Through College Rd at Market St Ramp	42.3	42.4	41.4	41.6	52.8	43.8	0.2	0.1
NB Through College Rd at Oleander Dr	26.9	28.2	26.0	27.5	39.0	33.8	0.4	0.2
NB Through College Rd at Carolina Beach Rd	26.8	27.8	25.1	26.1	27.4	29.6	0.3	0.3
NB Through College Road Entering network	50.6	50.5	50.1	49.9	51.9	53.4	0.1	0.2
WB Right MLK Parkway at College Rd	25.0	13.6	24.0	15.4	25.0	18.1	0.4	0.3

4.6.2 VISSIM

The 10-run averages and standard deviations for the VISSIM analysis MOEs at key links/nodes are shown in Tables 4-24 through 4-27.

Table 4-24. VISSIM Average and Standard Deviation of Maximum Queue Lengths (ft).

Queue Location	No Contraflow 10-run VISSIM Average (s.d.)		MLK Contraflow 10-run VISSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	3244	(504.1)	599	(108.8)
WB Through Martin Luther King, Jr. Parkway at College Road	79	(25.8)	0	(0)
WB Right Martin Luther King, Jr. Parkway at College Road	481	(84.5)	80	(33.2)
NB College Road at Market Street on Ramp	935	(178.8)	1207	(251.6)
NB College Road at Oleander Drive	2362	(348.8)	838	(177.9)
NB College Road at Carolina Beach Road	872	(516.4)	419	(72.2)
Interstate 40 WB at Gordon Road on Ramp	2250	(492.5)	232	(63.4)

Table 4-25. VISSIM 10-run Average Throughputs (Vehicles).

Location	No Contraflow VISSIM Average Throughput Hrs 1-5	With Contraflow VISSIM Average Throughput Hrs 1-5	No Contraflow VISSIM Average Throughput Hrs 6-10	With Contraflow VISSIM Average Throughput Hrs 6-10	No Contraflow VISSIM Average Throughput Hrs 11-14	With Contraflow VISSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	6945	8471	10137	11362	5446	4690
NB Through College Road at Market Street Overpass	5640	5890	7293	7611	3112	2627
NB Through College Road at Market Street On Ramp	5114	5312	6562	6819	2540	2101
NB Through College Road at Oleander Drive	6367	6267	7700	7575	2228	1645
NB Through College Road at Carolina Beach Road	7188	6658	8281	7581	2121	1628

Table 4-26. VISSIM 10-run Average Cumulative Throughput and Standard Deviation.

Location	No Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)	MLK Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)
Interstate 40 WB Leaving New Hanover County	22527 (52.3)	24523 (57.3)
NB Through College Road at Market Street Overpass	16045 (41.8)	16127 (43.2)
NB Through College Road at Market Street On Ramp	14215 (40.6)	14231 (42.6)
NB Through College Road at Oleander Drive	16295 (48.9)	15487 (40.4)
NB Through College Road at Carolina Beach Road	17590 (29.5)	15867 (21.5)

Table 4-27. VISSIM 10-run Average Speeds.

Location	No CF Avg. Speed Hrs 1-5 (mph)	With CF Avg. Speed Hrs 1-5 (mph)	No CF Avg. Speed Hrs 6-10 (mph)	With CF Avg. Speed Hrs 6-10 (mph)	No CF Avg. Speed Hr 11-14 (mph)	With CF Avg. Speed Hr 11-14 (mph)	No Contraflow Standard Deviation (mph)	With Contraflow Standard Deviation (mph)
NB Through College Road at MLK Parkway	19.5	18.0	16.3	15.2	24.6	24.0	1.4	1.4
NB Through College Rd at Market St Overpass	21.0	20.4	17.6	17.7	28.8	28.5	1.6	1.4
NB Through College Rd at Market St Ramp	23.2	22.0	19.6	18.5	33.5	32.8	1.9	1.8
NB Through College Rd at Oleander Dr	17.5	16.1	16.7	15.6	22.6	21.0	1.3	1.1
NB Through College Rd at Carolina Beach Rd	37.7	35.1	35.8	34.1	41.3	38.4	1.1	0.8
NB Through College Rd Entering network	41.8	41.9	41.6	41.7	42.7	42.7	0.2	0.1

4.6.3 Discussion

In the Minimal Event case, the differences between the performance measures in both models when comparing the implementation of contraflow to a do-nothing alternative are statistically significant at the 95% confidence level (see Table 4-28), but when investigated empirically, are not nearly as considerable as those found in the Severe and Moderate Event cases. In fact, these differences are small enough that the benefit of implementing the Plan – and the cost, resources and effort that go along with it in this storm scenario – is not as concrete. The ability to get evacuees to safety does not seem to be hindered nearly as much with the Minimal Event case evacuation demand than it does in the Severe and Moderate Event cases.

Table 4-28. Statistical t-tests of Selected Minimal Event Case MOEs.

Performance Measure	Measured Difference (Contraflow Value Minus No Contraflow Value)	Does t-test (95% Confidence) reject the Null Hypothesis?
CORSIM Throughput on I-40	1790 veh	YES
VISSIM Throughput on I-40	1996 veh	YES
CORSIM Queues - NB College at MLK Pkwy	-170 ft	YES
VISSIM Queues - NB College at MLK Pkwy	-2645 ft	YES
CORSIM Queues - WB MLK Parkway at College	-81 ft	YES
VISSIM Queues - WB MLK Parkway at College	-401 ft	YES
CORSIM Queues - NB College at Oleander Dr	-47 ft	YES
VISSIM Queues - NB College at Oleander Dr	-1523 ft	YES

4.7 Severe Event Case Model Comparison

4.7.1 No Contraflow

The CORSIM and VISSIM runs for the no contraflow case were compared side-by-side for the MOEs at key links/nodes in a similar format to that of the one-model analysis. Comparisons are shown in Tables 4-29 through 4-32.

Table 4-29. No Contraflow Maximum Queue Length Model Comparison (ft).

Queue Location	No Contraflow 10-run CORSIM Average (s.d.)		No Contraflow 10-run VISSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	4066	(29.9)	6269	(446.9)
WB Through Martin Luther King, Jr. Parkway at College Road	328	(77.0)	91	(26.8)
WB Right Martin Luther King, Jr. Parkway at College Road	926	(30.3)	1192	(139.0)
NB College Road at Market Street on Ramp	2562	(90.1)	13548	(1.8)
NB College Road at Oleander Drive	2277	(25.9)	25755	(41.7)
NB College Road at Carolina Beach Road	1213	(73.9)	22727	(1.3)
Interstate 40 WB at Gordon Road on Ramp	7510	**	7550	(594.2)

** Denotes Standard Deviation cannot be obtained since queue contains FRESIM links

Table 4-30. No Contraflow Average Throughput Model Comparison (Vehicles).

Location	No Contraflow CORSIM Average Throughput Hrs 1-5	No Contraflow VISSIM Average Throughput Hrs 1-5	No Contraflow CORSIM Average Throughput Hrs 6-10	No Contraflow VISSIM Average Throughput Hrs 6-10	No Contraflow CORSIM Average Throughput Hrs 11-14	No Contraflow VISSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	9514	7733	17646	12125	664	1780
NB Through College Road at Market Street Overpass	6894	6186	11822	6322	578	1488
NB Through College Road at Market Street On Ramp	6184	5531	10506	5062	273	1033
NB Through College Road at Oleander Drive	6456	6832	10158	5843	202	2784
NB Through College Road at Carolina Beach Road	6940	7905	10261	6851	114	1246

Table 4-31. No Contraflow Average Cumulative Throughput Model Comparison.

Location	No Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)	No Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)
Interstate 40 WB Leaving New Hanover County	27824 (114.5)	21638 (30.0)
NB Through College Road at Market Street Overpass	19295 (109.7)	13996 (38.7)
NB Through College Road at Market Street On Ramp	16963 (92.0)	11625 (34.4)
NB Through College Road at Oleander Drive	16817 (67.2)	15459 (52.4)
NB Through College Road at Carolina Beach Road	17315 (31.2)	16001 (50.6)

Table 4-32. No Contraflow Average Speed Model Comparison (mph).

Location	No CF CORSIM Average Speeds Hrs 1-5	No CF VISSIM Average Speeds Hrs 1-5	No CF CORSIM Average Speeds Hrs 6-10	No CF VISSIM Average Speeds Hrs 6-10	No CF CORSIM Average Speeds Hrs 11-14	No CF VISSIM Average Speeds Hrs 11-14	CORSIM Standard Deviation (mph)	VISSIM Standard Deviation (mph)
NB Through College Rd at MLK Parkway	25.3	18.9	11.2	12.8	21.0	30.8	0.6	1.1
NB Through College Rd at Market St Overpass	50.9	20.1	26.8	10.3	43.0	28.6	3.0	1.0
NB Through College Rd at Market St Ramp	41.4	22.0	19.2	8.8	33.8	33.4	3.5	1.3
NB Through College Rd at Oleander Dr	26.3	17.3	21.4	11.3	28.9	12.8	0.7	0.8
NB Through College Rd at Carolina Beach Rd	25.2	35.9	15.4	14.8	22.9	19.5	0.7	1.7
NB Through College Road Entering network	50.0	41.7	47.1	18.0	51.9	31.3	0.1	0.4

4.7.2 With Contraflow

The CORSIM and VISSIM runs for the with contraflow case were compared side-by-side for the MOEs at key links/nodes in a similar format to that of the one-model analysis. Comparisons are shown in Tables 4-33 through 4-36.

Table 4-33. With Contraflow Maximum Queue Length Model Comparison (ft).

Queue Location	MLK Contraflow 10-run CORSIM Average (s.d.)		MLK Contraflow 10-run VISSIM Average (s.d.)	
NB College Road at Martin Luther King, Jr. Parkway	479	(32.4)	778	(107.9)
WB Through Martin Luther King, Jr. Parkway at College Road	180	(5.2)	0	(0)
WB Right Martin Luther King, Jr. Parkway at College Road	87	(5.1)	199	(56.0)
NB College Road at Market Street on Ramp	1881	(13.2)	3243	(525.9)
NB College Road at Oleander Drive	2049	(24.8)	8775	(691.7)
NB College Road at Carolina Beach Road	1040	(75.1)	1464	(285.1)
Interstate 40 WB at Gordon Road on Ramp	*	**	889	(230.5)

* Denotes Queue does not stretch beyond limits of FRESIM links -- Queue is shorter than 6693 feet

** Denotes Standard Deviation cannot be obtained since queue contains FRESIM links

Table 4-34. With Contraflow Average Throughput Model Comparison (Vehicles).

Location	With Contraflow CORSIM Average Throughput Hrs 1-5	With Contraflow VISSIM Average Throughput Hrs 1-5	With Contraflow CORSIM Average Throughput Hrs 6-10	With Contraflow VISSIM Average Throughput Hrs 6-10	With Contraflow CORSIM Average Throughput Hrs 11-14	With Contraflow VISSIM Average Throughput Hrs 11-14
Interstate 40 Leaving New Hanover County	10416	9072	19756	17622	1622	1343
NB Through College Road at Market Street Overpass	6735	6404	11683	11338	951	913
NB Through College Road at Market Street On Ramp	6066	5727	10414	9956	416	502
NB Through College Road at Oleander Drive	6417	6714	10158	10376	372	319
NB Through College Road at Carolina Beach Road	6417	7258	10158	10548	372	283

Table 4-35. With Contraflow Average Cumulative Throughput Model Comparison.

Location	MLK Contraflow 10-run Average Total CORSIM Throughput (Standard Deviation) (Vehicles)		MLK Contraflow 10-run Average Total VISSIM Throughput (Standard Deviation) (Vehicles)	
Interstate 40 WB Leaving New Hanover County	31794	(111.6)	28037	(45.6)
NB Through College Road at Market Street Overpass	19370	(74.4)	18655	(35.2)
NB Through College Road at Market Street On Ramp	16896	(57.5)	16185	(33.8)
NB Through College Road at Oleander Drive	16947	(66.1)	17409	(34.9)
NB Through College Road at Carolina Beach Road	16947	(47.0)	18089	(21.3)

Table 4-36. With Contraflow Average Speed Model Comparison (mph).

Location	With CF CORSIM Average Speeds Hrs 1-5	With CF VISSIM Average Speeds Hrs 1-5	With CF CORSIM Average Speeds Hrs 6-10	With CF VISSIM Average Speeds Hrs 6-10	With CF CORSIM Average Speeds Hr 11-14	With CF VISSIM Average Speeds Hr 11-14	CORSIM Standard Deviation (mph)	VISSIM Standard Deviation (mph)
NB Through College Rd at MLK Parkway	41.1	17.6	32.7	14.2	39.2	31.6	0.7	1.2
NB Through College Rd at Market St Overpass	51.0	19.9	48.7	15.5	49.4	30.1	0.1	1.0
NB Through College Rd at Market St On Ramp	41.8	21.2	34.9	14.4	41.7	36.0	0.3	1.3
NB Through College Rd at Oleander Dr	28.2	16.0	23.1	14.6	29.9	23.2	0.4	1.4
NB Through College Rd at Carolina Beach Rd	27.0	34.4	16.3	19.0	22.8	34.8	0.7	1.0
NB Through College Rd Entering network	49.9	41.7	47.1	25.5	50.0	39.5	0.1	0.4

4.7.3 Discussion

In the no contraflow scenario, the VISSIM results paint a much more pessimistic picture of the New Hanover County network than do the CORSIM results, except when traffic is flowing freely (only the last one to two hours of simulation). CORSIM queues are considerable, but do not become so severe that they stretch from intersection to intersection creating one several-mile long queue. VISSIM does produce this queue, as determined both from measuring the queue lengths output as well as in observing the models as they ran. Anecdotal accounts of previous evacuations point toward the results of the CORSIM simulation being more realistic for this evacuating traffic, but if the VISSIM model queues were to be realized, delays getting out of New Hanover County would be significant without a lane reversal in the Severe Event case. The VISSIM queue begins at the merge point of the Gordon Road on ramp with Interstate 40. Therefore, it appears lane changing and other characteristics of the model at this merge point in the VISSIM model produce this initial queue that stretches upstream through the New Hanover County network along the College Road arterial.

When contraflow is implemented, again VISSIM shows a longer queue than does CORSIM, but the scale of this difference is much less and traffic is flowing more freely. As a result, VISSIM places a greater benefit in the implementation of contraflow in the Severe Event case.

4.8 Moderate and Minimal Event Cases Model Comparison

Model comparison analysis was performed for the Moderate and Minimal Event cases in the same manner as that performed for the Severe Event case. A discussion on the model comparison results for each of these cases follows.

4.8.1 Moderate Event Case Discussion

In the Moderate Event case, the discrepancies between the two simulation models when contraflow is not implemented remains considerable, except when traffic is flowing freely in the last one to two hours of simulation. VISSIM again produces a queue that stretches several miles from the I-40/Gordon Road merge south to the College Road/Carolina Beach Road intersection. Again, the key bottleneck and start of this queue is at the freeway merge downstream of all signals. As would be expected, this queue is not quite as long as that found in the Severe Event case, but nevertheless it remains quite substantial. CORSIM again is much more optimistic in its depiction of queues in the no contraflow scenario. Again, however, both models show a considerable benefit when the lane reversal is implemented in the Moderate Event case, with VISSIM again showing this benefit to the network as greater.

4.8.2 Minimal Event Case Discussion

The Minimal Event case does not result in the extreme differences between the two models that are shown in the Severe and Moderate Event cases in the no contraflow scenario. Queues do not compound to form a single long queue, and the differences between the individual intersection queues are not nearly as substantial. The two models' throughputs and average speeds are also more in agreement in this case. It appears that the models (when calibrated with default parameters) are in better agreement when traffic is moving more freely, since the Minimal Event case as well as the final (free-flowing) hours of the Severe and Moderate Event Cases produce outputs that are much more comparable.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The objectives of this research were to obtain several measures of effectiveness (MOEs) from the CORSIM and VISSIM simulation models to investigate the effects of lane reversal on an evacuation network. The MOEs analyzed in this modeling effort were queue lengths, average link speeds and throughput at key nodes. The primary goals of the research were to determine:

1. Whether the lane reversal increased throughput and average link speeds while reducing queue lengths as opposed to a do-nothing alternative;
2. Whether the current threshold set for triggering the lane reversal was appropriate (through the use of the three evacuation scenarios); and
3. Whether there were key bottleneck points in the city of Wilmington that could starve the transition to contraflow by creating traffic congestion upstream.
4. Whether the CORSIM and VISSIM models produce similar results for the chosen MOEs for this emergency evacuation situation.

The following conclusions relate to the effectiveness of this research to satisfy these objectives.

5.2 Effectiveness of the Lane Reversal Plan

Regardless of whether either simulation model produced an “optimistic” or “pessimistic” depiction of what would actually be observed in the field in the event of a large-scale emergency evacuation of New Hanover County, North Carolina, both the CORSIM and VISSIM models were consistent in that the implementation of contraflow produces a more efficient means of evacuating New Hanover County. This efficiency is shown in a significant increase in throughput on Interstate 40 and a significant decrease in queue lengths along the College Road corridor from the start of I-40 upstream several miles to the Carolina

Beach Road intersection in the southern section of the county. This result suggests contraflow will increase the safety of evacuees considerably by progressing them along the highway network to safety in less time than if no lane reversal takes place.

The results of the simulation analysis in both CORSIM and VISSIM show differences in both the reduction of the maximum queues and the increase in throughput on Interstate 40 leaving New Hanover County that statistical t-tests have assessed as statistically significant at the 95% confidence level for all event cases (see Appendix B for detailed t-test calculations). However, these differences are most stark in the Severe and Moderate Event cases. In these cases, throughput is considerably higher when the lane reversal plan is triggered and the capacity of the Interstate 40 network leaving New Hanover County is increased from two lanes to four. As a result of this increased capacity and the implementation of the Plan at the intersection of College Road at Martin Luther King, Jr. Parkway, queues are also considerably reduced on College Road from the intersection of Carolina Beach Road in southern New Hanover County to the Martin Luther King, Jr. Parkway intersection in central New Hanover County in the Severe and Moderate Event cases. In the Minimal Event case, queues and the subsequent improvement in queue lengths when contraflow is triggered are not nearly as considerable in the outputs of either simulation model, even though some marginal improvements are shown when the lane reversal plan is triggered.

5.3 Storm Threshold for Plan Implementation

This collection of outputs is significant in that it suggests that not only does the implementation of lane reversal for this highway network provides a considerable improvement in throughput, queue lengths, and therefore clearance times in New Hanover

County in larger scale evacuations, but the resources and effort necessary to enact the plan would not be as efficiently utilized in smaller-scale evacuations. Therefore, the current implementation threshold of a "Strong Category II storm or stronger" (winds 103 mph or higher) looks to be on target in order to maximize the effectiveness of the Lane Reversal Plan.

5.4 Key Bottlenecks in New Hanover County Network

The following conclusions were drawn from analysis of the simulation output of the New Hanover County network:

- The key bottlenecks identified in New Hanover County for vehicles intending to utilize Interstate 40 for evacuation occur at
    - The merge of the Gordon Road on ramp with Interstate 40;
    - The College Road/Martin Luther King, Jr. Parkway intersection; and
    - The College Road/Oleander Drive intersection.

- Contraflow eliminates the bottleneck at the merge of the Gordon Road on ramp to Interstate 40 as there are two additional lanes of capacity on I-40 when contraflow is enabled.

- Contraflow begins at the intersection of College Road and Martin Luther King, Jr. Parkway, a node that will cause a bottleneck whether or not the Plan is enacted. Therefore, any bottleneck directly caused by implementing contraflow is alleviated by the fact that the reversal begins at this key node.

Based on assumptions derived from previous evacuation research, the transition to contraflow was expected to produce a bottleneck in the traffic stream evacuating New Hanover County. However, since this transition occurs at the signalized intersection of College Road with Martin Luther King, Jr. Parkway, queues accumulate at this intersection regardless of the implementation of the lane reversal. In fact, this node becomes much less of a bottleneck when contraflow is in place due to the fact that the addition of receiving lanes and reduction of conflicts at the intersection allow for traffic to flow freely both from

Carolina Beach and from Wrightsville Beach provided there are no emergency management assets attempting to enter the intersection. Improvements are currently being analyzed by the NCDOT for the College Road/Oleander Drive intersection. It is hoped that these improvements will alleviate congestion at this intersection in both typical peak hour as well as evacuation conditions. In addition, improvements are being considered for widening and/or intersection improvements in selected locations along the entire College Road corridor. It is again hoped that these improvements will only aid in the evacuation of New Hanover County in conjunction with the Interstate 40 Lane Reversal Plan.

5.5 Simulation Model Comparison

In all event scenarios analyzed in the No Contraflow scenario, VISSIM appeared to depict a much more pessimistic view on the traffic impacts of the evacuation of New Hanover County. In the Severe Event case with no contraflow, queues stretched from the merge of westbound Interstate 40 and the Gordon Road on ramp south to a significant distance upstream of the intersection of College Road and Carolina Beach Road in southern New Hanover County. If realized, this queue would stretch over nine miles and cause significant traffic impacts throughout the evacuating network. In the Moderate Event case with no contraflow, queues were again observed from the Gordon Road on ramp to Interstate 40 back to Carolina Beach Road, but with some gaps observed at certain locations. Again, however, if realized this would cause significant impacts throughout the County.

Subsequently, when contraflow was enabled in VISSIM, the improvements observed along the College Road arterial are more considerable for the Severe and Moderate Event cases than what was observed in CORSIM. The difference between the two models in queue lengths and throughputs with contraflow in place was much less considerable.

In the Minimal Event case, the models agreed better in both the no contraflow and with contraflow scenarios, even though VISSIM again was a bit more pessimistic in its outputs.

Evacuation experiences among emergency management and traffic engineering officials of New Hanover County suggest that the CORSIM values are closer to what has been observed in prior evacuations. However, since time has passed and traffic has grown since the last large-scale evacuation (in 1999), the VISSIM results must be noted since if these output queue lengths and average speeds were to be realized in the field a very difficult evacuation of New Hanover County could take place without an increase in network capacity using methods such as contraflow.

These results suggest that in VISSIM when queues begin to build, they escalate much more rapidly than in CORSIM. This would help cause VISSIM's significantly more pessimistic outlook than CORSIM in the Severe and Moderate Event cases while the outlook is much more similar to that of CORSIM in the Minimal Event case. This more rapid escalation in queue accumulation may be due to several factors, such as the lane-changing and car-following algorithms included as well as decision algorithms included (i.e. the distance upstream where a decision to change lanes, choose lanes, etc. is made). In addition, this more rapid escalation may be due to the fact that the two models define whether a vehicle is "in the queue" in different ways (see Table 3-3).

The severe VISSIM queue found in the Severe and Moderate Event cases with no contraflow, the queue that causes the most concern in this analysis, begins at the merge of the Gordon Road on ramp to Interstate 40. This merge is downstream of all signalized intersections of the College Road arterial. The queue from this merge in these cases stretches back to the intersection of College Road with MLK Parkway and beyond. Therefore, the saturation flow possible at these intersections is not realized because flow is limited by the bottleneck VISSIM demonstrates at the Gordon Road merge. In the Severe Event case with no contraflow in CORSIM, the maximum queue at this merge is similar to that found in VISSIM. However, from observation of the animation files, the VISSIM queue is realized for a much longer period, resulting in the spillover to the MLK Parkway and points upstream in New Hanover County, while in CORSIM this queue does not cause spillover. Since the bottleneck appears to begin at this merge, the manner in which VISSIM treats lane-changing in the area of a freeway merge may be the cause of the large model discrepancy in the Severe and Moderate Event cases with no contraflow. This possibility may be confirmed by the fact that in other cases where the flow is less congested, the models are in better agreement, even with the default parameters in place.

The default parameters were retained for both models, and these parameters differ in several characteristics (see Table 3-3). Since the default parameters were retained in order to produce this side-by-side comparison, subsequent adjustments to simulation parameters in the two models when used together to model an identical network could lead to a better agreement between models and help explain this discrepancy found between CORSIM and VISSIM. Research by Park and Qi (2005) suggests that VISSIM models operating with default parameters tend to produce results not verified in field observation. Their research, on a single signalized intersection in central Virginia, showed that "the…calibrated parameters yielded the distribution of simulation output covering multiple days of field travel times while the default parameters and best-guessed parameters resulted in significant discrepancies between simulated and field data. Therefore, the importance of model calibration is manifested" (Park and Qi, 2005). Additional research by Fang and Elefteriadou (2004) suggested that "delays resulting from the pre-calibrated simulations, using their respective default values deviate widely from field measures" (Fang and Elefteriadou, 2004).

5.6 Lessons Learned

The uniqueness of the Interstate 40 lane reversal plan's transition to contraflow provided for challenges not encountered in other contraflow research. First, Interstate 40 is the only interstate-quality highway outbound from Wilmington, whereas many other large coastal cities, especially along the Gulf coast, have crossing interstates to provide other choices for evacuating traffic (for example, Mobile, AL may evacuate northbound via Interstate 65, or east/westbound via Interstate 10). More importantly, the bottlenecks encountered in the I-40 lane reversal plan occur on surface streets whereas in other states' plans, interstate-to-interstate merges and high-speed median crossovers provide primary bottlenecks. One aspect of other contraflow research that has come to the forefront is the necessity to adequately fill all lanes of the reversed network. This has been shown to be difficult where interstate median crossovers provide the transition to contraflow. Therefore, locating the transition to contraflow at the College Road/Martin Luther King, Jr. Parkway intersection provides the Interstate 40 plan with a unique advantage in filling the network. Since this intersection will be operating at free-flow conditions as long as emergency vehicles do not need to access the network, two approaches can feed the network at once (northbound traffic fills the reversed lanes at the same time westbound traffic fills the normal lanes). This allows for the network to be efficiently filled at a location that would act as a bottleneck if contraflow was not implemented. In addition, since the northbound College Road approach to this transition is expected to have a higher volume than the westbound MLK Parkway approach, vehicles that may only enter the normal lanes at the next two downstream interchanges will help balance the flow and again more efficiently fill all lanes.

The transferability of this research to other coastal cities and other lane reversal plans is related to the characteristics of the location in question. If the city has a lane reversal plan in place for an Interstate highway that transitions to an arterial street, or has a plan in place to reverse a four-lane divided non-interstate highway (South Carolina has such cases), the concept of transitioning to contraflow at a major signalized intersection may provide advantages for filling the reversed lanes that could not be realized at a median crossover (provided the intersection can be closed to cross traffic as the College Road/MLK Parkway intersection will be).

5.7 Recommendations for Further Research

This research showed that in oversaturated conditions, the use of default parameters can produce widely variable results between simulation models. The use of default parameters and the actions of VISSIM at freeway merges appeared to help cause discrepancies between the two chosen simulation models in this analysis. Further calibration of the parameters of one of the models to more closely match those of the other model, especially in the areas of saturation flow rates, perception-reaction times, and the definition of "in queue" may allow for better agreement between models.

Observation of the queue clearance, especially in the VISSIM model, showed that while evacuation demand may wane before the end of a 14-hour simulation, queues take some time to clear while only background traffic is entering the network. Therefore, an investigation of New Hanover County clearance times could be estimated by an analysis of the individual vehicles from CORSIM .tsd files, and an investigation of the point of analysis where queues have cleared throughout the county could be considered in order to determine when the county has been successfully "cleared" from an emergency management standpoint.

Upon completion of the New Hanover County modeling that confirmed that lane reversal operations will considerably improve evacuation conditions and allow coastal areas of Wilmington and New Hanover, Brunswick, and Pender Counties to progress to safety more rapidly, work has begun at North Carolina State University to model the entire ninety mile Interstate 40 Lane Reversal Plan to the western terminus near Benson, North Carolina. The primary focus of this research will be on the operations of the one-lane median crossover at the termination of contraflow and operations at the interchanges along the reversed lane corridor. All interchanges will remain open to traffic in both the reversed and normal lanes along the entire corridor with the exceptions of Exit 420 (Gordon Road) and Exit 414 (Castle Hayne Road) in New Hanover County. These are the first two interchanges heading westbound along Interstate 40 from the transition to contraflow; therefore, it is expected that few vehicles entering the reversed lanes would plan to exit at one of these first two interchanges. The CORSIM and VISSIM models that have been created for the New Hanover County analysis will be updated with this additional ninety-mile segment and the following model analyses will be considered:

- OREMS: The limitations of the OREMS model that made New Hanover County analysis infeasible are not applicable to the freeway analysis. Therefore, throughputs from the CORSIM and/or VISSIM models at the College Road/Martin Luther King, Jr. Parkway intersection will be input and the OREMS network would stretch from this intersection westbound to the western terminus of the reversed lanes.

- VISSIM Dynamic Traffic Assignment (DTA): Since there are fewer paths available in the ninety-mile reversed lane freeway corridor modeling, it is believed that the scalability issues found in the New Hanover County VISSIM DTA modeling would not be encountered and a VISSIM network similar to that created in OREMS can be created using DTA to help account for incidents or other interruptions to the highway network.

One disadvantage to the CORSIM model being produced is that the FHWA is no longer updating the program and is no longer providing technical support. It is recommended that future research related to this modeling effort targets the new FHWA Next Generation SIMulation (NGSIM) module and determines whether the CORSIM model will be transferable to this new module.

It is expected that this full analysis will produce a simulation tool for NCDOT to utilize for analysis of future evacuations. In addition, this tool can be revised in the future with the addition of several highway network and capacity improvements in southeastern North Carolina that are planned and will likely come to fruition in the next decade. Another advantage this tool is expected to provide NCDOT is the ability to produce a detailed data collection plan in the event of the next major storm that prompts a large-scale evacuation of New Hanover County in a manner that maximizes the use of available data collection resources and provides a robust data set for use in future evacuation demand and origin-destination research. It is also expected that this tool could serve as a foundation for future research on the evacuation of other coastal areas of the state. Further north in eastern North Carolina, the Outer Banks area has experienced rapid growth in the last decade similar to that experienced in Wilmington and its vicinity. U.S. Highway 64 is currently being upgraded to a four-lane divided controlled-access facility from Raleigh east to the coast. This project is still in the early to middle stages, but once completed, a lane reversal plan similar to that produced for Wilmington may also be beneficial to this area based on the results of this analysis of the New Hanover County network. It is hoped that the modeling analysis tool produced as a result of this research can provide a foundation for analysis of the U.S. 64 corridor if such an analysis was deemed feasible.

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APPENDIX A: DEMAND ESTIMATION CALCULATIONS

The following the results of hand calculations performed to distribute the *Hurricane Evacuation Restudy* demand volumes for the Severe Event case. Similar tables were produced for the Moderate and Minimal Event cases. In order to determine the turning movement volumes for these other cases, a ratio was determined from the *Restudy* volumes as compared to the Severe Event case and applied to the turning movement counts to produce the correct volumes.

Table A-1 depicts these Severe Event case total evacuation and background volumes.

Table A-1. Severe Event Case Total Volumes from Hand Distribution.

SEVERE EVENT CASE
Total Evacuation Volumes
Turning Movement Count
60 Minute Counts

DATE	TIME	INTID	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
9/15/2005	700	1	0	277	350	45	0	0	0	0	0	0	0	0
9/15/2005	700	2								350				
9/15/2005	700	3										10		
9/15/2005	700	4												
9/15/2005	700	5												
9/15/2005	700	6			511									
9/15/2005	700	7			116									
9/15/2005	700	8		116										
9/15/2005	700	9		116					511					
9/15/2005	700	10												
9/15/2005	700	11												
9/15/2005	700	12		14450										
9/15/2005	700	13												
9/15/2005	700	14		14450										
9/15/2005	700	15			223	54								
9/15/2005	700	16					88							
9/15/2005	700	17		13193										
9/15/2005	700	18							365					892
9/15/2005	700	19				88				277				
9/15/2005	700	20		13193										
9/15/2005	700	21												
9/15/2005	700	22												
9/15/2005	700	23		13193										
9/15/2005	700	24			13193									
9/15/2005	700	25		13193										
9/15/2005	700	26		8480					422					4291
9/15/2005	700	27		7409										
9/15/2005	700	28												
9/15/2005	700	29		7409										
9/15/2005	700	30												
9/15/2005	700	31		7409										
9/15/2005	700	32								1071			410	
9/15/2005	700	33											410	
9/15/2005	700	34			7409									
9/15/2005	700	35		5898					653					858
9/15/2005	700	36		5898										
9/15/2005	700	37								311				
9/15/2005	700	38		5489					311					98
9/15/2005	700	39								107				
9/15/2005	700	40		5489										

9/15/2005	700	41												
9/15/2005	700	42		6462										
9/15/2005	700	43	1080	5382					107					
9/15/2005	700	44		1080			34		48		73			
9/15/2005	700	45		1128					1042	86		34		27
9/15/2005	700	46		2029	391					986				
9/15/2005	700	47	2029					246					483	
9/15/2005	700	48										246		
9/15/2005	700	49											1649	1129
9/15/2005	700	50			101		75							
9/15/2005	700	51		1129										
9/15/2005	700	52		1230				80						
9/15/2005	700	53				75	5							
9/15/2005	700	54											1649	
9/15/2005	700	55								911	101			
9/15/2005	700	56								911				
9/15/2005	700	57								101				75
9/15/2005	700	58		1230										55
9/15/2005	700	59				26	26	246				439		
9/15/2005	700	60			969								439	
9/15/2005	700	61						465					18	
9/15/2005	700	62		826									18	35
9/15/2005	700	63								1377				
9/15/2005	700	64							826	551				
9/15/2005	700	65		43							551			
9/15/2005	700	66												
9/15/2005	700	67	57		225			4		86				
9/15/2005	700	68							31	938			439	
9/15/2005	700	69				107		29		938			410	
9/15/2005	700	70		245	320									
9/15/2005	700	71			102					320				
9/15/2005	700	72								422				
9/15/2005	700	73	298	2033									112	2058
9/15/2005	700	74					2204	441					451	
9/15/2005	700	75	451											
9/15/2005	700	76										334	2165	229
9/15/2005	700	77										281	2447	
9/15/2005	700	78					334					281		
9/15/2005	700	79												

Background Volumes
Turning Movement Count
60 Minute Counts

DATE	TIME	INTID	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
9/15/2005	700	1	10	182	50	50	50	10	10	10	10	50	10	50
9/15/2005	700	2	50		50					50		10	10	
9/15/2005	700	3	50		50					50		10	10	
9/15/2005	700	4				50		50						
9/15/2005	700	5					50					50		
9/15/2005	700	6			50		50							
9/15/2005	700	7			182		50							
9/15/2005	700	8	25	182										
9/15/2005	700	9		182					50					
9/15/2005	700	10					50							
9/15/2005	700	11					353	50						
9/15/2005	700	12		1655										
9/15/2005	700	13					353				50			
9/15/2005	700	14		1655	30									
9/15/2005	700	15		50	50	50	50					50		50
9/15/2005	700	16		50			50							
9/15/2005	700	17		1422										
9/15/2005	700	18	10	10	10				50	50			182	182
9/15/2005	700	19	50	50	50	50	50	50	50	50	50	50	50	182
9/15/2005	700	20		1422	50									
9/15/2005	700	21					353	50						
9/15/2005	700	22					353				50			
9/15/2005	700	23		1422	30									
9/15/2005	700	24			1422		353							
9/15/2005	700	25	10	1422	10	10	353	10	10	10	10	10	10	10
9/15/2005	700	26	35	1034	23	57	261	36	168	91	32	11	93	220
9/15/2005	700	27		1092				304						
9/15/2005	700	28					304	53						
9/15/2005	700	29		1092										
9/15/2005	700	30					304							
9/15/2005	700	31		1092	258									
9/15/2005	700	32	40		13					557		146	177	
9/15/2005	700	33	49		209					502		32	293	
9/15/2005	700	34			1350		498							
9/15/2005	700	35	65	1126	77	93	641	170	282	381	73	193	368	103
9/15/2005	700	36		1268			907	50						
9/15/2005	700	37						50		50			50	
9/15/2005	700	38	50	1268	50	50	907		50	50		50	50	
9/15/2005	700	39								50	50		50	
9/15/2005	700	40		1268			907	50						50

9/15/2005	700	41								50			50	50
9/15/2005	700	42		1268			907							
9/15/2005	700	43	50	1268	50	50	907		50	50		50	50	
9/15/2005	700	44	50	50	50	50	50	50	50	50	50	50	50	50
9/15/2005	700	45	50	50	50	50	50	50	50	50	50	50	50	50
9/15/2005	700	46		50	50	50	50		250	685	50			
9/15/2005	700	47	50	250			50	300				50	859	50
9/15/2005	700	48	50	50	250	50	50	50	50	50	50	300	62	50
9/15/2005	700	49											1159	50
9/15/2005	700	50			50		50							
9/15/2005	700	51		50										
9/15/2005	700	52		50				50						
9/15/2005	700	53				50	50							
9/15/2005	700	54											1159	
9/15/2005	700	55								935	50			
9/15/2005	700	56								935				
9/15/2005	700	57								50				50
9/15/2005	700	58		50	50	50	50					50		50
9/15/2005	700	59				50	50	50		300	50	255	362	
9/15/2005	700	60	50	50	304				50	300			217	50
9/15/2005	700	61					50	255				50	604	
9/15/2005	700	62	50	304									604	50
9/15/2005	700	63				50	50			685	50			
9/15/2005	700	64		50	50				304	381				
9/15/2005	700	65		604	50				50	50	381			50
9/15/2005	700	66			50		50							
9/15/2005	700	67	50	50	50	50	50	50	50	50	50	50	50	50
9/15/2005	700	68				50		50	50	604			217	50
9/15/2005	700	69	50	50	50	50	50	50	50	604	50	50	217	50
9/15/2005	700	70		50	50	50	50					50		50
9/15/2005	700	71	50		50					50	50	50	50	
9/15/2005	700	72	50	50	50	50	50	50	50	50	50	50	50	50
9/15/2005	700	73	270	318	133	91	175	12	52	591	111	86	212	140
9/15/2005	700	74	215	536	44	81	193	414	264	182	144	85	100	34
9/15/2005	700	75	83	10	10	10	10	10	10	10	100	10	10	10
9/15/2005	700	76	101	414	59	152	430	84	107	253	106	247	493	232
9/15/2005	700	77	50		50					465	50	50	50	
9/15/2005	700	78		574	50	50	782					50		50
9/15/2005	700	79		50				50						

APPENDIX B: STATISTICAL T-TESTS OF SAMPLE MEANS

In order to better determine whether the differences between the means of the Measures of Effectiveness (MOEs) were statistically significant based on the 10-run procedure of each simulation model. The sample means and standard deviations from each 10-simulation-run for the following MOEs were tested in both CORSIM and VISSIM:

- Throughput Westbound on Interstate 40 leaving New Hanover County
- Maximum Queues Northbound on College Road at Martin Luther King, Jr. Parkway
- Maximum Queues Westbound on Martin Luther King, Jr. Parkway at College Road
- Maximum Queues Northbound on College Road at Oleander Drive

These statistical tests were performed for the Severe, Moderate, and Minimal Event cases described previously in the analysis. Tables B-1 through B-3 depict these statistical tests at the 95 percent confidence interval (Type I error rate of +/- 5%). All tests performed showed differences between the tested sample means to be statistically significant at the 95% confidence level. This statistical significance supports the ten run procedure performed in the analysis. However, it was desired to perform several more runs of each model in each storm case for both the No Contraflow and Contraflow conditions. At least thirty (30) runs would be preferable if more computing resources and time were available.

Table B-1. Severe Event Case Statistical t-tests.

Table B-1.1. t-test of CORSIM Severe Case Throughputs on I-40

	No Contraflow	Contraflow		
			Sp (pooled variance)	14651.88886
t-95%	2.2622	2.2622		
Mean (X_bar)	27824	31794	**Assume Equal Variance**	
Std. dev.	129.8000183	111.6052551	Sx1-x2 (assume equal var.) =	54.13296383
n	10	10	df (equal var.) =	18
std. error	41.04636982	35.2926805	*t* _equal var =	-73.34161017
margin error	92.8533393	79.83758983	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	27731.44744	31714.66192	*p* _equal var =	4.74225E-24
upper CI	27917.15412	31874.3371	**Significant Difference?**	**YES**

Table B-1.2. t-test of VISSIM Severe Case Throughputs on I-40

	No Contraflow	Contraflow		
			Sp (pooled variance)	1585.075896
t-95%	2.2622	2.2622		
Mean (X_bar)	21638	28037	**Assume Equal Variance**	
Std. dev.	33.02700219	45.60009778	Sx1-x2 (assume equal var.) =	17.80492008
n	10	10	df (equal var.) =	18
std. error	10.44405512	14.42001705	*t* _equal var =	-359.4175159
margin error	23.62609405	32.6203448	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	21614.07391	28004.4798	*p* _equal var =	1.83398E-36
upper CI	21661.32609	28069.72049	**Significant Difference?**	**YES**

Table B-1.3. t-test of CORSIM Severe Case Queues NB College Road at MLK Parkway

	No Contraflow	Contraflow		
			Sp (pooled variance)	969.8775675
t-95%	2.2622	2.2622		
Mean (X_bar)	4066	479	**Assume Equal Variance**	
Std. dev.	29.85116558	32.38306731	Sx1-x2 (assume equal var.) =	13.92750923
n	10	10	df (equal var.) =	18
std. error	9.439767406	10.24042503	*t* _equal var =	257.571108
margin error	21.35423741	23.16545079	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	4044.645763	455.5105643	*p* _equal var =	7.37126E-34
upper CI	4087.354237	501.8414659	**Significant Difference?**	**YES**

Table B-1.4. t-test of VISSIM Severe Case Queues NB College Road at MLK Parkway

	No Contraflow	Contraflow		
			Sp (pooled variance)	105698.3444
t-95%	2.2622	2.2622		
Mean (X_bar)	6269	778	**Assume Equal Variance**	
Std. dev.	446.9454478	107.8724041	Sx1-x2 (assume equal var.) =	145.3948723
n	10	10	df (equal var.) =	18
std. error	141.3365605	34.11224935	*t* _equal var =	37.76199197
margin error	319.725512	77.16726904	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	5948.974488	701.132731	*p* _equal var =	6.77844E-19
upper CI	6588.425512	855.467269	**Significant Difference?**	**YES**

Table B-1.5. t-test of CORSIM Severe Case Queues WB MLK Parkway at College Road

	No Contraflow	Contraflow		
			Sp (pooled variance)	470.4032122
t-95%	2.2622	2.2622		
Mean (X_bar)	926	87	**Assume Equal Variance**	
Std. dev.	30.25295082	5.056223	Sx1-x2 (assume equal var.) =	9.69951764
n	10	10	df (equal var.) =	18
std. error	9.566823054	1.5989181	*t* _equal var =	86.46533203
margin error	21.64165725	3.61700403	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	904.0623579	83.4149979	*p* _equal var =	2.46952E-25
upper CI	947.3456724	90.6490059	**Significant Difference?**	**YES**

Table B-1.6. t-test of VISSIM Severe Case Queues WB MLK Parkway at College Road

	No Contraflow	Contraflow		
			Sp (pooled variance)	11226.56111
t-95%	2.2622	2.2622		
Mean (X_bar)	1192	199	**Assume Equal Variance**	
Std. dev.	138.9788153	56.0179535	Sx1-x2 (assume equal var.) =	47.38472562
n	10	10	df (equal var.) =	18
std. error	43.9489603	17.7144323	*t* _equal var =	20.94978892
margin error	99.41945513	40.0728298	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	1092.580545	159.22717	*p* _equal var =	2.15875E-14
upper CI	1291.419455	239.37283	**Significant Difference?**	**YES**

Table B-1.7. t-test of CORSIM Severe Case Queues NB College Road at Oleander Drive

	No Contraflow	Contraflow		
			Sp (pooled variance)	640.9390073
t-95%	2.2622	2.2622		
Mean (X_bar)	2277	2049	**Assume Equal Variance**	
Std. dev.	25.8626008	24.7589154	Sx1-x2 (assume equal var.) =	11.32200519
n	10	10	df (equal var.) =	18
std. error	8.178472476	7.82945652	*t* _equal var =	20.09097217
margin error	18.50099005	17.7114611	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	2258.177086	2031.49652	*p* _equal var =	4.45313E-14
upper CI	2295.179066	2066.91945	**Significant Difference?**	**YES**

Table B-1.8. t-test of VISSIM Severe Case Queues NB College Road at Oleander Drive

	No Contraflow	Contraflow		
			Sp (pooled variance)	240104.3667
t-95%	2.2622	2.2622		
Mean (X_bar)	25755	8775	**Assume Equal Variance**	
Std. dev.	41.73208198	691.713211	Sx1-x2 (assume equal var.) =	219.1366545
n	10	10	df (equal var.) =	18
std. error	13.19684306	218.738924	*t* _equal var =	77.48680859
margin error	29.85333299	494.821822	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	25724.84667	8279.67818	*p* _equal var =	1.768E-24
upper CI	25784.55333	9269.32182	**Significant Difference?**	**YES**

Table B-2. Moderate Event Case Statistical t-tests.

Table B-2.1. t-test of CORSIM Moderate Case Throughputs on I-40

	No Contraflow	Contraflow		
			Sp (pooled variance)	14655.69513
t-95%	2.2622	2.2622		
Mean (X_bar)	23937	26541	**Assume Equal Variance**	
Std. dev.	146.0792847	89.28736115	Sx1-x2 (assume equal var.) =	54.13999471
n	10	10	df (equal var.) =	18
std. error	46.19432585	28.23514275	*t* _equal var =	-48.0956943
margin error	104.4988249	63.87233028	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	23832.10078	26476.62791	*p* _equal var =	9.07827E-21
upper CI	24041.09843	26604.37257	**Significant Difference?**	**YES**

Table B-2.2. t-test of VISSIM Moderate Case Throughputs on I-40

	No Contraflow	Contraflow		
			Sp (pooled variance)	1311.53102
t-95%	2.2622	2.2622		
Mean (X_bar)	20607	25408	**Assume Equal Variance**	
Std. dev.	28.5505685	42.51972574	Sx1-x2 (assume equal var.) =	16.19586996
n	10	10	df (equal var.) =	18
std. error	9.028482497	13.44591788	*t* _equal var =	-296.4706984
margin error	20.42384631	30.41677939	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	20586.27615	25377.8841	*p* _equal var =	5.86496E-35
upper CI	20627.12385	25438.71766	**Significant Difference?**	**YES**

Table B-2.3. t-test of CORSIM Moderate Case Queues NB College Road at MLK Parkway

	No Contraflow	Contraflow		
			Sp (pooled variance)	2926.726527
t-95%	2.2622	2.2622		
Mean (X_bar)	706	404	**Assume Equal Variance**	
Std. dev.	68.55049731	33.9747314	Sx1-x2 (assume equal var.) =	24.1939105
n	10	10	df (equal var.) =	18
std. error	21.67757062	10.74375341	*t* _equal var =	12.50868571
margin error	49.03807156	24.30405869	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	657.1079435	379.2079338	*p* _equal var =	1.28959E-10
upper CI	755.1840866	427.8160511	**Significant Difference?**	**YES**

Table B-2.4. t-test of VISSIM Moderate Case Queues NB College Road at MLK Parkway

	No Contraflow	Contraflow		
			Sp (pooled variance)	6320.583333
t-95%	2.2622	2.2622		
Mean (X_bar)	4170	650	**Assume Equal Variance**	
Std. dev.	79.93532108	79.06649803	Sx1-x2 (assume equal var.) =	35.55441838
n	10	10	df (equal var.) =	18
std. error	25.27776801	25.00302204	*t* _equal var =	98.99472864
margin error	57.18228385	56.56076528	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	4112.717716	593.6392347	*p* _equal var =	2.17203E-26
upper CI	4227.082284	706.7607653	**Significant Difference?**	**YES**

Table B-2.5. t-test of CORSIM Moderate Case Queues WB MLK Parkway at College Road

	No Contraflow	**Contraflow**	Sp (pooled variance)	79.47224882
t-95%	2.2622	2.2622		
Mean (X_bar)	364	85	**Assume Equal Variance**	
Std. dev.	10.90030165	6.33466033	Sx1-x2 (assume equal var.) =	3.986784389
n	10	10	df (equal var.) =	18
std. error	3.44697804	2.00319549	*t* _equal var =	69.95562434
margin error	7.797606047	4.53154301	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	356.1543864	80.5224584	*p* _equal var =	1.10728E-23
upper CI	371.7495985	89.5855444	**Significant Difference?**	**YES**

Table B-2.6. t-test of VISSIM Moderate Case Queues WB MLK Parkway at College Road

	No Contraflow	**Contraflow**	Sp (pooled variance)	5913.427778
t-95%	2.2622	2.2622		
Mean (X_bar)	921	142	**Assume Equal Variance**	
Std. dev.	102.7035107	35.7609346	Sx1-x2 (assume equal var.) =	34.39019563
n	10	10	df (equal var.) =	18
std. error	32.47770175	11.3086005	*t* _equal var =	22.66634387
margin error	73.4696655	25.5818315	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	847.8303345	116.218169	*p* _equal var =	5.49482E-15
upper CI	994.7696655	167.381831	**Significant Difference?**	**YES**

Table B-2.7. t-test of CORSIM Moderate Case Queues NB College Road at Oleander Drive

	No Contraflow	**Contraflow**	Sp (pooled variance)	491.7423953
t-95%	2.2622	2.2622		
Mean (X_bar)	1867	1782	**Assume Equal Variance**	
Std. dev.	27.04247464	15.8804709	Sx1-x2 (assume equal var.) =	9.917080168
n	10	10	df (equal var.) =	18
std. error	8.551581343	5.02184583	*t* _equal var =	8.576511955
margin error	19.34502095	11.3602045	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	1847.88698	1770.81784	*p* _equal var =	4.48591E-08
upper CI	1886.577022	1793.53825	**Significant Difference?**	**YES**

Table B-2.8. t-test of VISSIM Moderate Case Queues NB College Road at Oleander Drive

	No Contraflow	**Contraflow**	Sp (pooled variance)	370707.8278
t-95%	2.2622	2.2622		
Mean (X_bar)	25526	2714	**Assume Equal Variance**	
Std. dev.	535.6668222	674.148879	Sx1-x2 (assume equal var.) =	272.2894885
n	10	10	df (equal var.) =	18
std. error	169.3927225	213.184594	*t* _equal var =	83.7781147
margin error	383.1929598	482.257055	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	25142.30704	2231.34294	*p* _equal var =	4.35348E-25
upper CI	25908.69296	3195.85706	**Significant Difference?**	**YES**

Table B-3. Minimal Event Case Statistical t-tests.

Table B-3.1. t-test of CORSIM Minimal Case Throughputs on I-40

	No Contraflow	Contraflow	Sp (pooled variance)	15132.64462
t-95%	2.2622	2.2622		
Mean (X_bar)	22235	24025	**Assume Equal Variance**	
Std. dev.	144.060791	97.5283432	Sx1-x2 (assume equal var.) =	55.01389755
n	10	10	df (equal var.) =	18
std. error	45.55602211	30.84117009	*t* _equal var =	-32.53177446
margin error	103.0548815	69.76757369	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	22132.2459	23955.23291	*p* _equal var =	9.56163E-18
upper CI	22338.35566	24094.76806	**Significant Difference?**	**YES**

Table B-3.2. t-test of VISSIM Minimal Case Throughputs on I-40

	No Contraflow	Contraflow	Sp (pooled variance)	3379.21562
t-95%	2.2622	2.2622		
Mean (X_bar)	22527	24523	**Assume Equal Variance**	
Std. dev.	58.90343477	57.34820496	Sx1-x2 (assume equal var.) =	25.99698298
n	10	10	df (equal var.) =	18
std. error	18.62690159	18.13509474	*t* _equal var =	-76.77430284
margin error	42.13697876	41.02443438	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	22484.56302	24481.57581	*p* _equal var =	2.08684E-24
upper CI	22568.83698	24563.62468	**Significant Difference?**	**YES**

Table B-3.3. t-test of CORSIM Minimal Case Queues NB College Road at MLK Parkway

	No Contraflow	Contraflow	Sp (pooled variance)	2898.926038
t-95%	2.2622	2.2622		
Mean (X_bar)	498	328	**Assume Equal Variance**	
Std. dev.	69.16760839	31.83856194	Sx1-x2 (assume equal var.) =	24.07872936
n	10	10	df (equal var.) =	18
std. error	21.87271828	10.06823731	*t* _equal var =	7.064658812
margin error	49.47952623	22.77593511	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	448.9764889	305.5720724	*p* _equal var =	6.86538E-07
upper CI	547.9355413	351.1239427	**Significant Difference?**	**YES**

Table B-3.4. t-test of VISSIM Minimal Case Queues NB College Road at MLK Parkway

	No Contraflow	Contraflow	Sp (pooled variance)	132953.7833
t-95%	2.2622	2.2622		
Mean (X_bar)	3244	599	**Assume Equal Variance**	
Std. dev.	504.0615152	108.7637603	Sx1-x2 (assume equal var.) =	163.0667246
n	10	10	df (equal var.) =	18
std. error	159.3982469	34.39412094	*t* _equal var =	16.21851427
margin error	360.5838852	77.80490689	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	2883.116115	521.1950931	*p* _equal var =	1.73253E-12
upper CI	3604.283885	676.8049069	**Significant Difference?**	**YES**

Table B-3.5. t-test of CORSIM Minimal Case Queues WB MLK Parkway at College Road

	No Contraflow	Contraflow		
			Sp (pooled variance)	20.42025475
t-95%	2.2622	2.2622		
Mean (X_bar)	136	55	**Assume Equal Variance**	
Std. dev.	5.363295771	3.47499179	Sx1-x2 (assume equal var.) =	2.020903498
n	10	10	df (equal var.) =	18
std. error	1.69602304	1.09888889	*t* _equal var =	40.12957714
margin error	3.836670661	2.48585937	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	132.6453312	52.8981397	*p* _equal var =	2.29647E-19
upper CI	140.3186725	57.8698584	**Significant Difference?**	**YES**

Table B-3.6. t-test of VISSIM Minimal Case Queues WB MLK Parkway at College Road

	No Contraflow	Contraflow		
			Sp (pooled variance)	4116.405556
t-95%	2.2622	2.2622		
Mean (X_bar)	481	80	**Assume Equal Variance**	
Std. dev.	84.46228613	33.1501634	Sx1-x2 (assume equal var.) =	28.69287562
n	10	10	df (equal var.) =	18
std. error	26.70932005	10.4830021	*t* _equal var =	13.95816876
margin error	60.42067955	23.7141983	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	420.4793204	56.6858017	*p* _equal var =	2.13597E-11
upper CI	541.3206796	104.114198	**Significant Difference?**	**YES**

Table B-3.7. t-test of CORSIM Minimal Case Queues NB College Road at Oleander Drive

	No Contraflow	Contraflow		
			Sp (pooled variance)	305.5713065
t-95%	2.2622	2.2622		
Mean (X_bar)	1387	1339	**Assume Equal Variance**	
Std. dev.	18.02587336	16.917757	Sx1-x2 (assume equal var.) =	7.817561084
n	10	10	df (equal var.) =	18
std. error	5.700281664	5.34986451	*t* _equal var =	6.072481129
margin error	12.89493297	12.1022343	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	1373.68306	1327.00377	*p* _equal var =	4.85929E-06
upper CI	1399.472926	1351.20824	**Significant Difference?**	**YES**

Table B-3.8. t-test of VISSIM Minimal Case Queues NB College Road at Oleander Drive

	No Contraflow	Contraflow		
			Sp (pooled variance)	76662.78333
t-95%	2.2622	2.2622		
Mean (X_bar)	2362	838	**Assume Equal Variance**	
Std. dev.	348.811713	177.921206	Sx1-x2 (assume equal var.) =	123.8247014
n	10	10	df (equal var.) =	18
std. error	110.3039488	56.2636255	*t* _equal var =	12.30206884
margin error	249.5248673	127.277163	*t* _crit (alpha=0.05, *df* =18) =	1.734063592
lower CI	2111.975133	710.922837	*p* _equal var =	1.68925E-10
upper CI	2611.024867	965.477163	**Significant Difference?**	**YES**

APPENDIX C: EXPANDED MODEL OUTPUTS

The following is a more expansive relation of all model outputs displaying all measures of effectiveness for all cases in both models. The CORSIM output coding in the analysis procedure included a triggering of the Microsoft Excel spreadsheet algorithm that produced mean and standard deviation values automatically over all cases. This methodology allowed for time savings, as the researcher did not have to sift through sixty runs worth of CORSIM output files extracting single link measures of effectiveness. However, VISSIM did not have this algorithm available. Therefore, the analysis procedure included indexing of all measures of effectiveness for all runs before calculating an average and standard deviation. Therefore, the following tables provide, in order:

- VISSIM full tables of MOEs for all runs in all cases; and
- CORSIM tables of average MOEs for all links in all runs in all cases.

VISSIM Maximum Queues – No Contraflow, Severe Event Case

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	Max
	1	NB Coll @ MLK	3980	5586	5804	6438	6862	3980	113	0	17	6862
	2	WBT MLK	32	0	17	0	56	56	76	36	49	76
	3	WBR MLK	552	1255	1290	929	623	333	42	40	112	1290
	4	NB Coll @ Mkt	3577	13530	13548	13549	13538	13531	3632	0	0	13549
	5	NBT @ Oleander	4159	6151	25729	25769	25780	25809	25832	25728	16795	25832
	6	EBL Oleander	2547	3644	5417	7337	8493	8625	6308	3238	832	8625
	7	EBT Oleander	234	324	194	106	158	243	338	228	0	338
1	8	WBTR Oleander	158	253	211	316	161	177	137	164	96	316
	9	NBT Coll @ Mky Jct	1408	1791	16347	22724	22726	22682	9375	6623	52	22726
	10	EBL CB	265	426	274	468	597	74	798	558	271	798
	11	EBL Mkt @ MLK	23	65	39	72	44	543	197	168	146	543
	12	NBT MLK	96	186	97	104	73	37	91	32	80	186
	13	WBR Mkt	987	1075	1156	1226	1269	274	107	105	90	1269
	14	Ramp @ Gordon	6969	6955	7115	7074	7076	6831	0	0	0	7115
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	4002	5365	6319	5934	5401	3980	54	46	0	6319
	2	WBT MLK	16	15	15	0	59	124	37	0	27	124
	3	WBR MLK	459	1089	990	924	766	354	45	41	44	1089
	4	NB Coll @ Mkt	3402	13543	13547	13542	13531	13529	2870	0	0	13547
	5	NBT @ Oleander	2548	6085	25729	25731	25729	25729	25728	25728	15814	25731
	6	EBL Oleander	1816	3567	5611	7920	8673	8674	6041	3070	597	8674
	7	EBT Oleander	326	224	146	129	192	416	171	210	0	416
2	8	WBTR Oleander	111	361	249	188	133	178	254	147	135	361
	9	NBT Coll @ Mky Jct	1211	1309	21879	22728	22726	22700	8746	1588	0	22728
	10	EBL CB	214	335	267	380	541	233	674	699	305	699
	11	EBL Mkt @ MLK	63	186	42	60	81	397	143	105	102	397
	12	NBT MLK	97	175	268	202	88	37	35	31	30	268
	13	WBR Mkt	977	1190	1433	1115	1465	211	109	201	175	1465
	14	Ramp @ Gordon	7002	7328	7484	6996	7392	6675	0	0	0	7484
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	3980	4952	5865	5886	5548	3980	135	90	45	5886
	2	WBT MLK	15	0	44	29	36	37	19	0	0	44
	3	WBR MLK	549	1181	1185	881	562	223	41	20	21	1185
	4	NB Coll @ Mkt	5148	13530	13544	13544	13539	13522	3411	0	0	13544
	5	NBT @ Oleander	1875	5372	25729	25729	25729	25729	25729	25729	9772	25729
	6	EBL Oleander	2634	3491	5223	6689	8205	8243	5814	2582	385	8243
	7	EBT Oleander	182	219	150	197	130	197	213	149	0	219
3	8	WBTR Oleander	199	291	410	215	156	184	143	220	178	410
	9	NBT Coll @ Mky Jct	874	2357	17361	22729	22726	22689	8998	3495	0	22729
	10	EBL CB	223	266	285	605	607	254	755	627	158	755
	11	EBL Mkt @ MLK	44	67	61	42	111	232	211	65	111	232
	12	NBT MLK	96	141	185	115	57	0	35	76	33	185
	13	WBR Mkt	607	1075	955	1592	1048	264	170	85	58	1592
	14	Ramp @ Gordon	6977	7495	7218	7344	6930	6868	0	0	0	7495
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	4044	4298	5642	5741	5461	3980	47	31	0	5741
	2	WBT MLK	82	0	0	14	0	66	36	18	0	82
	3	WBR MLK	597	1174	1014	1117	709	222	12	40	64	1174
	4	NB Coll @ Mkt	4334	13531	13547	13549	13535	13522	2294	0	0	13549
	5	NBT @ Oleander	2892	7251	25729	25729	25730	25729	25729	25729	6613	25730
	6	EBL Oleander	1873	3014	5079	6438	7672	7803	5360	2492	89	7803
	7	EBT Oleander	1870	3012	5077	6436	7670	7801	5358	2490	23	7801
4	8	WBTR Oleander	250	338	272	259	154	159	152	95	96	338
	9	NBT Coll @ Mky Jct	870	1739	19154	22723	22725	22701	9552	6727	0	22725
	10	EBL CB	168	182	223	240	201	347	851	879	187	879
	11	EBL Mkt @ MLK	104	79	93	59	42	332	160	91	112	332
	12	NBT MLK	63	255	158	266	57	42	36	31	35	266
	13	WBR Mkt	839	1325	1620	1051	745	457	57	37	154	1620
	14	Ramp @ Gordon	6773	7111	7034	7220	7261	6754	0	0	0	7261

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	3980	4729	6111	5851	5631	3980	70	29	0	6111
	2	WBT MLK	53	0	59	17	78	125	38	40	50	125
	3	WBR MLK	578	1338	1217	1043	709	153	62	45	65	1338
	4	NB Coll @ Mkt	3295	13531	13531	13531	13550	13516	2041	0	0	13550
	5	NBT @ Oleander	2079	2945	25728	25729	25729	25728	25729	25729	16585	25729
	6	EBL Oleander	2557	3475	5423	7385	8777	8969	6322	3294	844	8969
5	7	EBT Oleander	2555	3473	5421	7383	8775	8967	6320	3292	47	8967
	8	WBTR Oleander	191	259	262	302	210	255	191	73	98	302
	9	NBT Coll @ Mky Jct	672	1698	14713	22724	22727	22693	9145	3877	0	22727
	10	EBL CB	196	298	216	340	290	352	887	870	281	887
	11	EBL Mkt @ MLK	41	62	107	108	145	264	106	103	126	264
	12	NBT MLK	119	139	116	249	52	94	32	42	0	249
	13	WBR Mkt	815	1399	1525	1623	696	253	191	71	58	1623
	14	Ramp @ Gordon	6943	7134	6994	7207	7299	6798	0	0	0	7299

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	4124	5115	5769	5650	5349	3980	95	45	72	5769
	2	WBT MLK	55	0	17	32	59	102	101	20	0	102
	3	WBR MLK	461	1104	1267	935	553	354	126	0	26	1267
	4	NB Coll @ Mkt	3904	13548	13538	13540	13531	13498	3769	0	0	13548
	5	NBT @ Oleander	1976	3122	25729	25793	25729	25729	25729	24993	8257	25793
	6	EBL Oleander	1901	2848	4553	6108	7674	7682	4929	2193	275	7682
6	7	EBT Oleander	341	275	129	173	261	210	168	91	0	341
	8	WBTR Oleander	139	245	229	392	92	174	184	109	133	392
	9	NBT Coll @ Mky Jct	683	1979	16946	22725	22728	22691	7607	0	39	22728
	10	EBL CB	213	304	274	508	389	320	598	209	177	598
	11	EBL Mkt @ MLK	88	70	84	79	68	453	149	110	69	453
	12	NBT MLK	70	138	224	245	59	38	39	29	0	245
	13	WBR Mkt	789	1438	903	1585	683	360	80	89	82	1585
	14	Ramp @ Gordon	7331	7000	7153	9175	6885	6654	0	0	0	9175

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	3980	5599	7028	6784	5586	3980	69	0	0	7028
	2	WBT MLK	21	41	0	31	76	96	118	52	54	118
	3	WBR MLK	457	964	970	811	477	178	61	74	0	970
	4	NB Coll @ Mkt	4618	13531	13544	13547	13530	13490	2011	0	0	13547
	5	NBT @ Oleander	1594	8610	25729	25729	25729	25729	25729	25727	15208	25729
	6	EBL Oleander	1841	2729	4853	6996	7945	7968	5647	2615	799	7968
7	7	EBT Oleander	217	168	80	127	126	174	215	142	25	217
	8	WBTR Oleander	100	263	302	282	200	381	203	138	50	381
	9	NBT Coll @ Mky Jct	877	1671	22017	22727	22727	22704	7321	2794	0	22727
	10	EBL CB	252	227	342	415	218	217	939	1073	338	1073
	11	EBL Mkt @ MLK	85	176	107	86	81	318	126	106	127	318
	12	NBT MLK	117	185	121	137	51	38	57	0	34	185
	13	WBR Mkt	716	1057	1046	1045	664	587	67	138	84	1057
	14	Ramp @ Gordon	6981	7031	7261	6975	7125	6883	0	0	0	7261

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	4062	5165	5958	5999	5918	3980	58	25	35	5999
	2	WBT MLK	17	0	32	15	29	65	35	21	38	65
	3	WBR MLK	512	1139	950	946	696	244	61	41	45	1139
	4	NB Coll @ Mkt	2438	13529	13532	13550	13531	13543	2511	0	0	13550
	5	NBT @ Oleander	2842	5396	25729	25729	25728	25728	25729	25729	8598	25729
	6	EBL Oleander	2246	3436	5232	7198	8731	8773	6216	3450	1057	8773
8	7	EBT Oleander	344	191	151	107	127	260	131	206	42	344
	8	WBTR Oleander	178	263	194	225	86	153	144	193	146	263
	9	NBT Coll @ Mky Jct	969	1532	20140	22727	22724	22720	7378	2761	0	22727
	10	EBL CB	228	191	325	566	726	568	830	773	317	830
	11	EBL Mkt @ MLK	86	103	125	84	55	224	130	151	102	224
	12	NBT MLK	103	422	117	181	75	35	43	41	35	422
	13	WBR Mkt	931	1551	1458	1555	623	247	130	45	62	1555
	14	Ramp @ Gordon	7091	7125	6995	7588	6921	6759	0	0	0	7588

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
9	1	NB Coll @ MLK	3980	5428	6493	5752	5639	3980	130	49	48	6493
	2	WBT MLK	98	36	18	18	80	74	58	18	35	98
	3	WBR MLK	617	987	1030	1046	609	130	27	0	43	1046
	4	NB Coll @ Mkt	2310	13530	13531	13549	13531	13530	2792	0	0	13549
	5	NBT @ Oleander	2942	4926	25729	25816	25729	25728	25729	25729	17883	25816
	6	EBL Oleander	2201	2963	4330	6113	7438	7549	4802	1865	132	7549
	7	EBT Oleander	410	195	190	172	116	270	259	132	0	410
	8	WBTR Oleander	170	287	206	239	135	144	151	110	112	287
	9	NBT Coll @ Mky Jct	822	1681	13390	22725	22725	22709	9766	7508	36	22725
	10	EBL CB	254	211	279	780	717	242	803	815	244	815
	11	EBL Mkt @ MLK	64	42	92	61	59	365	129	104	91	365
	12	NBT MLK	113	190	144	138	137	73	34	0	35	190
	13	WBR Mkt	1000	1518	1687	1187	912	324	82	104	65	1687
	14	Ramp @ Gordon	7169	7223	7215	7211	7115	6732	0	0	0	7223

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
10	1	NB Coll @ MLK	3980	5340	5638	6319	6479	3980	132	66	0	6479
	2	WBT MLK	23	0	19	34	55	80	0	55	33	80
	3	WBR MLK	754	957	1422	915	861	95	110	39	41	1422
	4	NB Coll @ Mkt	2963	13525	13548	13549	13548	13527	2718	0	0	13549
	5	NBT @ Oleander	2817	2384	25729	25729	25729	25729	25729	25729	10975	25729
	6	EBL Oleander	2294	2817	5214	6747	7974	8055	5458	2175	88	8055
	7	EBT Oleander	419	283	211	154	178	317	247	93	0	419
	8	WBTR Oleander	141	261	242	299	241	340	123	123	189	340
	9	NBT Coll @ Mky Jct	989	2019	15187	22725	22728	22700	8786	4584	0	22728
	10	EBL CB	167	229	240	727	664	287	923	765	283	923
	11	EBL Mkt @ MLK	49	86	38	52	59	303	257	112	86	303
	12	NBT MLK	100	226	115	142	72	32	31	37	29	226
	13	WBR Mkt	1200	1642	1154	978	619	319	93	61	141	1642
	14	Ramp @ Gordon	6872	7599	7277	7132	6907	6851	0	0	0	7599

	#	Location	Avg Max Queue
Avg	1	NB Coll @ MLK	6268.7
	2	WBT MLK	91.4
	3	WBR MLK	1192
	4	NB Coll @ Mkt	13548
	5	NBT @ Oleander	25755
	6	EBL Oleander	8234.1
	7	EBT Oleander	1947.2
	8	WBTR Oleander	339
	9	NBT Coll @ Mky Jct	22727
	10	EBL CB	825.7
	11	EBL Mkt @ MLK	343.1
	12	NBT MLK	242.2
	13	WBR Mkt	1509.5
	14	Ramp @ Gordon	7550

	#	Location	StdevMax Queue
Std Dev	1	NB Coll @ MLK	446.95
	2	WBT MLK	26.78
	3	WBR MLK	138.98
	4	NB Coll @ Mkt	1.8135
	5	NBT @ Oleander	41.732
	6	EBL Oleander	498.86
	7	EBT Oleander	3404.4
	8	WBTR Oleander	47.7
	9	NBT Coll @ Mky Jct	1.3333
	10	EBL CB	129.54
	11	EBL Mkt @ MLK	100.32
	12	NBT MLK	71.728
	13	WBR Mkt	198.13
	14	Ramp @ Gordon	594.24

VISSIM Maximum Queues, With Contraflow, Severe Event Case

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	Max
	1	NB Coll @ MLK	592	677	687	680	486	225	25	0	0	687
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	52	126	208	241	83	49	67	0	0	241
	4	NB Coll @ Mkt	817	2562	2525	2938	2888	491	0	0	0	2938
	5	NBT @ Oleander	796	1163	1684	2051	1506	9148	3331	0	0	9148
	6	EBL Oleander	2481	3815	4764	6300	7024	7000	5053	2555	418	7024
	7	EBT Oleander	2468	3802	4751	6287	7011	6987	5040	2542	0	7011
1	8	WBTR Oleander	90	212	216	145	154	179	0	53	0	216
	9	NBT Coll @ Mky Jct	379	1543	1764	990	1277	174	0	0	0	1764
	10	EBL CB	210	230	282	195	195	166	384	233	312	384
	11	EBL Mkt @ MLK	57	39	89	43	45	341	75	85	87	341
	12	NBT MLK	70	281	134	145	51	0	0	0	0	281
	13	WBR Mkt	933	841	1106	1029	723	251	113	138	80	1106
	14	Ramp @ Gordon	261	545	1441	579	309	97	0	0	0	1441
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	455	615	823	762	766	296	125	63	0	823
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	21	161	97	119	155	0	0	0	0	161
	4	NB Coll @ Mkt	1207	2147	3003	3369	3566	522	0	0	0	3566
	5	NBT @ Oleander	319	1204	3079	1874	2164	9046	4083	17	0	9046
	6	EBL Oleander	2892	3919	5172	6809	7937	7932	5445	3120	1078	7937
2	7	EBT Oleander	202	182	161	121	128	237	150	142	72	237
	8	WBTR Oleander	141	222	164	287	150	179	104	54	72	287
	9	NBT Coll @ Mky Jct	355	1248	1190	1540	1140	183	0	0	0	1540
	10	EBL CB	173	202	165	160	208	191	171	187	272	272
	11	EBL Mkt @ MLK	103	38	55	74	58	227	73	85	108	227
	12	NBT MLK	33	251	53	108	92	0	0	0	0	251
	13	WBR Mkt	677	915	828	927	1691	140	88	96	34	1691
	14	Ramp @ Gordon	210	818	699	255	129	0	0	0	0	818
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	324	539	539	664	646	308	23	50	24	664
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	51	170	288	307	231	0	50	0	0	307
	4	NB Coll @ Mkt	905	1542	2886	2802	2664	1337	0	0	0	2886
	5	NBT @ Oleander	850	1000	1364	2364	1596	8635	3470	97	21	8635
	6	EBL Oleander	3268	4610	5965	7443	8180	8115	6222	3691	1109	8180
3	7	EBT Oleander	197	172	236	190	188	192	169	205	111	236
	8	WBTR Oleander	45	176	211	201	121	143	90	52	37	211
	9	NBT Coll @ Mky Jct	404	718	1000	1064	1187	197	0	0	0	1187
	10	EBL CB	162	177	227	195	172	169	203	202	213	227
	11	EBL Mkt @ MLK	126	45	126	74	119	258	72	79	68	258
	12	NBT MLK	19	94	210	196	70	18	0	0	0	210
	13	WBR Mkt	624	831	948	748	656	401	120	133	87	948
	14	Ramp @ Gordon	111	554	831	980	326	0	0	0	0	980
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	644	426	678	798	624	331	139	0	0	798
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	69	165	64	70	70	0	0	0	0	165
	4	NB Coll @ Mkt	2044	1433	3924	3460	3367	2528	0	0	0	3924
	5	NBT @ Oleander	718	1362	6126	4255	1408	8592	2979	128	36	8592
	6	EBL Oleander	3493	4693	6087	7217	8248	8251	6169	3456	1181	8251
4	7	EBT Oleander	218	147	191	211	169	195	208	193	75	218
	8	WBTR Oleander	60	300	219	148	115	69	69	33	18	300
	9	NBT Coll @ Mky Jct	360	905	921	751	1085	208	0	0	0	1085
	10	EBL CB	178	132	201	139	198	186	430	251	202	430
	11	EBL Mkt @ MLK	75	70	61	89	84	180	74	126	71	180
	12	NBT MLK	39	114	74	73	38	0	0	0	0	114
	13	WBR Mkt	649	913	1004	626	563	160	84	173	94	1004
	14	Ramp @ Gordon	124	495	614	555	533	0	0	0	0	614

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	610	418	828	620	597	125	170	37	0	828
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	50	179	190	133	21	0	0	0	0	190
	4	NB Coll @ Mkt	997	2220	1698	1815	2095	549	50	0	0	2220
	5	NBT @ Oleander	627	1200	1381	4970	1842	9106	3649	0	88	9106
	6	EBL Oleander	3165	4675	6430	7629	8485	8483	6342	3757	1189	8485
5	7	EBT Oleander	278	230	217	153	158	171	176	105	222	278
	8	WBTR Oleander	81	188	175	385	152	142	117	83	68	385
	9	NBT Coll @ Mky Jct	336	699	1095	865	1368	78	0	0	0	1368
	10	EBL CB	267	203	252	214	245	245	180	148	217	267
	11	EBL Mkt @ MLK	86	109	101	72	85	149	132	60	73	149
	12	NBT MLK	54	92	137	67	49	0	0	0	0	137
	13	WBR Mkt	531	990	1343	990	744	256	114	101	71	1343
	14	Ramp @ Gordon	97	656	478	564	457	0	0	0	0	656

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	398	376	507	637	519	326	25	0	0	637
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	49	113	107	159	49	0	0	0	0	159
	4	NB Coll @ Mkt	1031	2696	2672	2962	2730	622	72	0	0	2962
	5	NBT @ Oleander	932	1483	1721	1648	1842	9572	3457	49	58	9572
	6	EBL Oleander	3401	5187	6608	7934	8497	8507	6368	3906	1121	8507
6	7	EBT Oleander	244	165	164	171	188	161	146	202	208	244
	8	WBTR Oleander	81	215	189	150	219	122	63	86	39	219
	9	NBT Coll @ Mky Jct	543	877	1293	931	1085	253	0	0	0	1293
	10	EBL CB	154	224	170	232	279	199	231	251	243	279
	11	EBL Mkt @ MLK	57	72	53	56	58	234	57	79	91	234
	12	NBT MLK	52	130	93	73	49	0	0	0	0	130
	13	WBR Mkt	662	970	787	791	422	169	144	69	88	970
	14	Ramp @ Gordon	176	641	518	772	116	0	0	0	0	772

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	376	633	790	593	903	214	32	22	24	903
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	50	129	89	86	50	0	0	69	0	129
	4	NB Coll @ Mkt	1546	2528	3378	3147	1916	552	0	0	0	3378
	5	NBT @ Oleander	792	1305	1342	2188	1392	7037	1642	75	0	7037
	6	EBL Oleander	4023	5082	6650	8191	8932	8929	6431	3829	1044	8932
7	7	EBT Oleander	200	220	144	175	225	233	158	163	0	233
	8	WBTR Oleander	124	182	176	187	177	109	52	50	37	187
	9	NBT Coll @ Mky Jct	376	1075	955	1091	1945	128	0	0	0	1945
	10	EBL CB	172	223	149	304	202	242	146	199	162	304
	11	EBL Mkt @ MLK	43	75	89	69	57	201	55	69	42	201
	12	NBT MLK	53	86	195	98	39	36	0	0	0	195
	13	WBR Mkt	672	1375	995	757	903	146	176	64	125	1375
	14	Ramp @ Gordon	416	554	996	403	467	0	0	0	0	996

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	279	584	684	824	631	276	233	44	0	824
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	81	108	166	267	127	35	0	0	0	267
	4	NB Coll @ Mkt	1667	1672	3404	3730	2229	211	0	0	0	3730
	5	NBT @ Oleander	788	1199	1535	1825	1910	9273	4740	0	26	9273
	6	EBL Oleander	4108	5507	6905	8154	8959	8965	6755	4118	1650	8965
8	7	EBT Oleander	288	174	126	245	174	160	157	138	158	288
	8	WBTR Oleander	104	178	168	235	177	116	138	44	85	235
	9	NBT Coll @ Mky Jct	303	695	979	1775	1037	211	0	0	0	1775
	10	EBL CB	179	115	327	276	171	155	363	174	152	363
	11	EBL Mkt @ MLK	142	71	67	107	73	396	111	70	53	396
	12	NBT MLK	72	107	130	104	68	0	0	0	0	130
	13	WBR Mkt	748	785	1112	941	908	310	88	48	63	1112
	14	Ramp @ Gordon	117	723	841	654	400	101	0	0	0	841

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
9	1	NB Coll @ MLK	670	545	491	586	614	304	0	0	0	670
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	168	156	155	0	42	0	0	0	168
	4	NB Coll @ Mkt	1153	2774	3775	3441	3417	308	0	0	0	3775
	5	NBT @ Oleander	835	1241	1499	2055	1254	8714	2952	0	136	8714
	6	EBL Oleander	3840	4893	6478	8098	9239	9255	7037	4407	1930	9255
	7	EBT Oleander	253	308	197	193	173	224	199	127	142	308
	8	WBTR Oleander	68	232	176	247	146	142	91	63	34	247
	9	NBT Coll @ Mky Jct	420	615	1221	1245	1145	128	0	0	0	1245
	10	EBL CB	167	164	186	216	138	181	99	235	197	235
	11	EBL Mkt @ MLK	70	77	68	96	59	489	90	54	69	489
	12	NBT MLK	53	138	143	84	33	0	0	0	0	143
	13	WBR Mkt	717	900	946	823	724	137	110	49	49	946
	14	Ramp @ Gordon	258	646	658	851	395	231	0	0	0	851

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
10	1	NB Coll @ MLK	595	508	610	949	778	226	24	0	23	949
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	50	173	206	195	116	37	0	0	0	206
	4	NB Coll @ Mkt	1052	2094	3052	2887	3023	206	0	0	0	3052
	5	NBT @ Oleander	640	2374	1715	1618	1443	8622	2343	0	0	8622
	6	EBL Oleander	4015	5047	6652	7911	8823	8819	6980	4490	2185	8823
	7	EBT Oleander	220	174	148	218	184	109	223	151	174	223
	8	WBTR Oleander	97	291	209	210	81	89	16	155	36	291
	9	NBT Coll @ Mky Jct	459	964	985	1435	994	429	0	0	0	1435
	10	EBL CB	125	302	177	194	165	181	187	132	126	302
	11	EBL Mkt @ MLK	169	33	89	117	93	232	102	53	24	232
	12	NBT MLK	38	137	89	59	39	0	0	0	0	137
	13	WBR Mkt	609	837	802	1233	653	408	98	77	50	1233
	14	Ramp @ Gordon	349	923	538	507	209	0	0	0	0	923

	#	Location	Avg Max Queue
Avg	1	NB Coll @ MLK	778.3
	2	WBT MLK	0
	3	WBR MLK	199.3
	4	NB Coll @ Mkt	3243.1
	5	NBT @ Oleander	8774.5
	6	EBL Oleander	8435.9
	7	EBT Oleander	927.6
	8	WBTR Oleander	257.8
	9	NBT Coll @ Mky Jct	1463.7
	10	EBL CB	306.3
	11	EBL Mkt @ MLK	270.7
	12	NBT MLK	172.8
	13	WBR Mkt	1172.8
	14	Ramp @ Gordon	889.2

	#	Location	StdevMax Queue
Std Dev	1	NB Coll @ MLK	107.87
	2	WBT MLK	0
	3	WBR MLK	56.018
	4	NB Coll @ Mkt	525.88
	5	NBT @ Oleander	691.71
	6	EBL Oleander	640.86
	7	EBT Oleander	2137.7
	8	WBTR Oleander	58.697
	9	NBT Coll @ Mky Jct	285.09
	10	EBL CB	66.178
	11	EBL Mkt @ MLK	105.99
	12	NBT MLK	57.996
	13	WBR Mkt	240.78
	14	Ramp @ Gordon	230.45

VISSIM Throughput – No Contraflow, Severe Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	381	1293	1952	1863	2197	2369	2431	2414	2431	2446	1596	225	153	168
	2	40 @ Gordon	390	1389	1350	1558	1772	1874	1786	1729	1748	1830	485	110	65	68
	3	NB Coll @ MLK	419	1209	1340	1333	1414	1754	1027	995	985	1455	545	208	130	112
1	4	MB Coll @ MKT Br	528	1270	1341	1447	1555	1861	1034	985	1028	1463	849	408	237	240
	5	NB Coll @ Mkt Rmp	469	1158	1221	1241	1398	1630	835	715	741	1154	659	291	164	160
	6	NB Coll @ Oleander	790	1466	1373	1491	1602	1985	1753	561	648	928	579	558	812	557
	7	NB Coll @ Shipyard	790	1466	1373	1491	1602	1985	1753	561	648	928	579	558	812	557
	8	NB Coll @ CB	1346	1504	1495	1618	1932	2050	2083	1461	572	681	979	425	518	167
	9	NB Coll S of CB	1445	1500	1489	1612	2008	2019	2427	1900	554	619	808	152	136	168
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	343	1461	1875	1881	2092	2420	2423	2426	2418	2422	1602	266	160	161
	2	40 @ Gordon	321	1421	1434	1421	1748	1861	1796	1766	1703	1843	519	84	72	61
	3	NB Coll @ MLK	406	1276	1283	1306	1453	1576	1046	944	1082	1414	547	152	134	124
2	4	MB Coll @ MKT Br	538	1302	1324	1329	1588	1688	1083	928	1092	1434	901	340	240	237
	5	NB Coll @ Mkt Rmp	491	1159	1214	1181	1433	1519	825	665	787	1179	694	227	148	146
	6	NB Coll @ Oleander	865	1412	1432	1414	1764	1851	1743	523	668	947	671	569	712	562
	7	NB Coll @ Shipyard	865	1412	1432	1414	1764	1851	1743	523	668	947	671	569	712	562
	8	NB Coll @ CB	1347	1514	1482	1585	1954	2074	2132	1326	625	612	1114	622	218	161
	9	NB Coll S of CB	1428	1528	1479	1606	2012	1996	2508	1785	535	631	830	133	141	157
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	363	1384	1974	1863	2247	2418	2424	2430	2422	2404	1610	230	196	170
	2	40 @ Gordon	418	1398	1456	1555	1786	1898	1821	1717	1713	1713	517	88	81	66
	3	NB Coll @ MLK	439	1309	1257	1372	1504	1644	1121	872	1042	1426	594	182	140	114
3	4	MB Coll @ MKT Br	491	1400	1341	1368	1638	1676	1196	887	1021	1466	905	349	265	247
	5	NB Coll @ Mkt Rmp	445	1290	1209	1188	1463	1499	918	641	756	1183	684	238	172	144
	6	NB Coll @ Oleander	813	1424	1482	1476	1641	1913	1771	502	692	928	625	484	972	419
	7	NB Coll @ Shipyard	813	1424	1482	1476	1641	1913	1771	502	692	928	625	484	972	419
	8	NB Coll @ CB	1348	1490	1492	1634	2011	1960	2131	1463	557	689	1037	562	341	156
	9	NB Coll S of CB	1435	1477	1521	1608	2065	1953	2506	1908	467	682	806	148	146	156
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	352	1371	1857	1957	2198	2436	2441	2425	2410	2440	1667	257	175	171
	2	40 @ Gordon	430	1344	1418	1497	1832	1895	1835	1731	1717	1781	529	94	66	63
	3	NB Coll @ MLK	437	1277	1266	1349	1574	1572	1118	956	969	1425	612	151	121	108
4	4	MB Coll @ MKT Br	558	1247	1396	1409	1610	1737	1146	968	998	1406	982	304	250	249
	5	NB Coll @ Mkt Rmp	463	1124	1260	1254	1444	1543	877	699	744	1130	751	185	164	161
	6	NB Coll @ Oleander	822	1412	1422	1586	1668	1859	1749	599	660	920	620	498	924	569
	7	NB Coll @ Shipyard	822	1412	1422	1586	1668	1859	1749	599	660	920	620	498	924	569
	8	NB Coll @ CB	1312	1493	1513	1627	1935	2060	2114	1366	618	662	1052	384	562	148
	9	NB Coll S of CB	1394	1501	1529	1618	1977	2037	2505	1780	580	674	812	156	145	149

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	361	1473	1832	1987	2221	2404	2434	2418	2430	2421	1658	201	214	152
	2	40 @ Gordon	443	1380	1452	1454	1867	1900	1766	1722	1704	1807	531	97	61	65
	3	NB Coll @ MLK	517	1231	1269	1344	1587	1641	1065	966	1015	1500	601	151	118	107
5	4	MB Coll @ MKT Br	563	1310	1315	1398	1649	1750	1155	951	1007	1533	957	270	230	211
	5	NB Coll @ Mkt Rmp	482	1223	1168	1209	1446	1557	922	680	744	1224	778	166	146	143
	6	NB Coll @ Oleander	873	1321	1433	1522	1669	1801	1864	576	698	950	658	548	798	522
	7	NB Coll @ Shipyard	873	1321	1433	1522	1669	1801	1864	576	698	950	658	548	798	522
	8	NB Coll @ CB	1400	1440	1502	1626	1939	2035	2084	1571	637	675	1052	542	377	134
	9	NB Coll S of CB	1477	1441	1513	1634	1966	2029	2427	1984	613	666	835	168	139	126
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	314	1489	1924	1895	2177	2424	2454	2422	2409	2429	1678	241	217	147
	2	40 @ Gordon	389	1474	1384	1486	1766	1912	1781	1717	1755	1860	523	102	74	57
	3	NB Coll @ MLK	443	1349	1265	1309	1549	1565	1065	912	1044	1530	587	208	128	120
6	4	MB Coll @ MKT Br	488	1384	1325	1432	1587	1709	1123	932	1067	1531	923	395	236	210
	5	NB Coll @ Mkt Rmp	450	1209	1223	1273	1418	1542	869	677	759	1279	685	294	157	124
	6	NB Coll @ Oleander	846	1400	1457	1487	1638	1887	1749	522	629	1035	679	656	889	254
	7	NB Coll @ Shipyard	846	1400	1457	1487	1638	1887	1749	522	629	1035	679	656	889	254
	8	NB Coll @ CB	1324	1503	1511	1613	1970	2044	1957	1547	553	660	1162	667	136	154
	9	NB Coll S of CB	1400	1518	1519	1627	1979	2026	2366	1937	535	636	823	151	136	150
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	238	1517	1936	1911	2167	2391	2430	2400	2416	2439	1630	225	161	187
	2	40 @ Gordon	335	1516	1455	1481	1785	1836	1718	1755	1741	1803	503	85	87	66
	3	NB Coll @ MLK	420	1308	1354	1282	1492	1614	951	1016	1056	1491	606	135	145	124
7	4	MB Coll @ MKT Br	467	1359	1387	1354	1623	1682	1029	999	1077	1518	931	262	285	204
	5	NB Coll @ Mkt Rmp	417	1237	1232	1233	1418	1467	807	712	769	1268	708	184	186	128
	6	NB Coll @ Oleander	832	1474	1387	1504	1610	1861	1739	492	737	1027	646	529	870	427
	7	NB Coll @ Shipyard	832	1474	1387	1504	1610	1861	1739	492	737	1027	646	529	870	427
	8	NB Coll @ CB	1345	1520	1479	1606	1964	2035	2112	1285	662	705	1137	485	306	155
	9	NB Coll S of CB	1420	1518	1493	1609	1989	2036	2487	1688	605	717	793	139	155	157
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	376	1319	1920	1877	2120	2442	2457	2414	2430	2433	1627	246	201	188
	2	40 @ Gordon	350	1382	1424	1437	1758	1908	1766	1720	1778	1825	514	99	82	67
	3	NB Coll @ MLK	459	1213	1267	1353	1502	1639	994	944	1036	1508	596	161	133	120
8	4	MB Coll @ MKT Br	517	1304	1316	1357	1604	1785	1040	957	1057	1508	980	294	251	230
	5	NB Coll @ Mkt Rmp	486	1162	1194	1206	1438	1600	775	687	767	1228	783	201	160	138
	6	NB Coll @ Oleander	813	1388	1474	1478	1667	1845	1791	560	582	1042	615	572	885	326
	7	NB Coll @ Shipyard	813	1388	1474	1478	1667	1845	1791	560	582	1042	615	572	885	326
	8	NB Coll @ CB	1339	1501	1492	1619	1930	2036	2086	1418	610	688	1078	515	304	152
	9	NB Coll S of CB	1424	1499	1506	1616	1963	2037	2434	1860	572	635	776	161	138	158

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	352	1356	1919	1878	2188	2417	2396	2434	2418	2452	1590	221	207	163
	2	40 @ Gordon	534	1285	1311	1588	1802	1893	1762	1711	1800	1814	501	82	77	69
	3	NB Coll @ MLK	483	1241	1255	1332	1572	1656	990	987	1086	1474	559	159	129	109
	4	MB Coll @ MKT Br	539	1329	1332	1390	1646	1735	1063	987	1127	1471	897	303	268	212
9	5	NB Coll @ Mkt Rmp	458	1220	1202	1283	1419	1581	815	718	835	1201	702	212	168	124
	6	NB Coll @ Oleander	862	1438	1374	1499	1713	1804	1789	617	779	941	535	544	913	544
	7	NB Coll @ Shipyard	862	1438	1374	1499	1713	1804	1789	617	779	941	535	544	913	544
	8	NB Coll @ CB	1397	1449	1491	1600	1946	2048	1911	1698	615	709	1025	386	581	144
	9	NB Coll S of CB	1489	1433	1510	1609	1968	2054	2237	2108	613	705	849	160	129	149
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	377	1306	1904	1947	2143	2423	2441	2441	2433	2443	1628	243	206	148
	2	40 @ Gordon	415	1313	1463	1515	1799	1905	1763	1735	1726	1801	548	74	71	53
	3	NB Coll @ MLK	495	1178	1304	1312	1558	1661	1125	946	970	1440	579	156	127	102
	4	MB Coll @ MKT Br	539	1325	1307	1419	1612	1766	1160	956	1021	1425	960	304	281	218
10	5	NB Coll @ Mkt Rmp	465	1188	1186	1270	1385	1624	912	682	736	1138	773	212	187	142
	6	NB Coll @ Oleander	790	1488	1437	1441	1649	1916	1852	583	621	940	640	560	843	477
	7	NB Coll @ Shipyard	790	1488	1437	1441	1649	1916	1852	583	621	940	640	560	843	477
	8	NB Coll @ CB	1371	1482	1493	1612	1956	2039	2087	1547	579	636	1029	529	401	134
	9	NB Coll S of CB	1451	1495	1495	1601	2040	1991	2448	1959	537	652	791	158	147	137
	#	Location														
	1	40 @ HS	345.7	1396.9	1909.3	1905.9	2175	2414.4	2433.1	2422.4	2421.7	2432.9	1628.6	235.5	189	165.5
	2	40 @ Gordon	402.5	1390.2	1414.7	1499.2	1791.5	1888.2	1779.4	1730.3	1738.5	1807.7	517	91.5	73.6	63.5
	3	NB Coll @ MLK	451.8	1259.1	1286	1329.2	1520.5	1632.2	1050.2	953.8	1028.5	1466.3	582.6	166.3	130.5	114
	4	MB Coll @ MKT Br	522.8	1323	1338.4	1390.3	1611.2	1738.9	1102.9	955	1049.5	1475.5	928.5	322.9	254.3	225.8
Avg	5	NB Coll @ Mkt Rmp	462.6	1197	1210.9	1233.8	1426.2	1556.2	855.5	687.6	763.8	1198.4	721.7	221	165.2	141
	6	NB Coll @ Oleander	830.6	1422.3	1427.1	1489.8	1662.1	1872.2	1780	553.5	671.4	965.8	626.8	551.8	861.8	465.7
	7	NB Coll @ Shipyard	830.6	1422.3	1427.1	1489.8	1662.1	1872.2	1780	553.5	671.4	965.8	626.8	551.8	861.8	465.7
	8	NB Coll @ CB	1352.9	1489.6	1495	1614	1953.7	2038.1	2069.7	1468.2	602.8	671.7	1066.5	511.7	374.4	150.5
	9	NB Coll S of CB	1436.3	1491	1505.4	1614	1996.7	2017.8	2434.5	1890.9	561.1	661.7	812.3	152.6	141.2	150.7
	#	Location														
	1	40 @ HS	42.646	81.9505	43.5407	43.3806	46.5331	21.5056	17.349	11.6447	8.88257	14.28636	30.53304	18.97513	24.34018	14.4626
	2	40 @ Gordon	61.8048	69.2753	50.9968	55.0188	35.939	24.0638	33.073	17.6701	32.3703	40.23003	17.72005	10.81409	8.275801	5.126185
	3	NB Coll @ MLK	36.1902	53.6438	35.2231	26.8775	57.233	55.9003	60.3891	41.5179	42.7402	40.11941	24.33653	24.8643	8.072587	7.67391
	4	MB Coll @ MKT Br	31.6361	47.7749	30.1043	37.8125	29.5025	56.3608	60.6052	33.2198	41.4682	45.48321	42.13273	49.29154	19.48247	16.75841
StdDev	5	NB Coll @ Mkt Rmp	21.9757	48.5318	25.6967	36.5173	23.399	53.2975	51.6274	24.2313	29.4498	51.41379	45.28932	43.21265	13.83875	13.14872
	6	NB Coll @ Oleander	30.178	48.6439	38.9371	45.9995	47.848	55.5134	44.9988	42.0773	57.7662	48.51071	43.58338	46.84917	74.02972	108.3821
	7	NB Coll @ Shipyard	30.178	48.6439	38.9371	45.9995	47.848	55.5134	44.9988	42.0773	57.7662	48.51071	43.58338	46.84917	74.02972	108.3821
	8	NB Coll @ CB	28.5986	26.2772	11.0151	14.3759	24.3084	30.1236	74.7024	125.884	36.0426	30.24364	56.32692	94.50461	145.777	10.75226
	9	NB Coll S of CB	30.4049	31.8817	15.9597	10.0664	34.2606	29.7501	83.1561	119.524	45.5081	32.91082	22.34104	10.52193	7.299924	11.85139

VISSIM Throughput – With Contraflow, Severe Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	131	569	713	652	781	946	1168	1557	1306	1416	442	129	101	80
	2	40 @ Gordon	118	198	193	231	355	404	659	737	760	452	116	42	50	23
	3	NB Coll @ MLK	546	1339	1320	1357	1750	1925	2248	2457	2505	2277	702	249	144	133
	4	MB Coll @ MKT Br	586	1322	1358	1433	1722	1900	2304	2487	2503	2244	681	296	158	155
1	5	NB Coll @ Mkt Rmp	497	1200	1247	1271	1505	1699	1974	2211	2141	2049	523	170	85	88
	6	NB Coll @ Oleander	858	1363	1329	1552	1662	1851	2020	2204	2121	2259	956	78	65	53
	7	NB Coll @ Shipyard	858	1363	1329	1552	1662	1851	2020	2204	2121	2259	956	78	65	53
	8	NB Coll @ CB	1253	1422	1346	1483	1796	1839	2124	2219	2201	2233	203	64	53	44
	9	NB Coll S of CB	1418	1522	1490	1604	1975	2054	2839	2501	2503	2022	205	153	152	143
	10	WBR MLK (CF only)	158	223	226	272	416	421	749	782	756	493	275	174	144	104
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	185	468	775	546	873	937	1162	1577	1351	1258	434	104	85	75
	2	40 @ Gordon	101	219	199	213	313	441	681	759	677	396	90	55	31	27
	3	NB Coll @ MLK	512	1294	1330	1427	1651	2004	2169	2477	2480	2285	636	271	161	145
	4	MB Coll @ MKT Br	532	1297	1381	1472	1692	1954	2227	2486	2481	2240	638	292	163	167
2	5	NB Coll @ Mkt Rmp	480	1166	1234	1337	1474	1720	1924	2162	2169	2031	469	184	80	94
	6	NB Coll @ Oleander	774	1433	1367	1451	1608	1827	2022	2193	2170	2198	864	115	50	64
	7	NB Coll @ Shipyard	774	1433	1367	1451	1608	1827	2022	2193	2170	2198	864	115	50	64
	8	NB Coll @ CB	1265	1339	1385	1487	1734	1824	2164	2136	2196	2266	221	50	46	53
	9	NB Coll S of CB	1482	1453	1490	1619	1985	2025	2840	2475	2484	2031	224	127	145	159
	10	WBR MLK (CF only)	158	216	218	265	351	481	762	762	691	422	260	176	111	106
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	219	595	606	591	738	1105	1065	1620	1489	1205	434	121	105	83
	2	40 @ Gordon	137	209	191	214	327	387	644	753	665	431	79	49	36	25
	3	NB Coll @ MLK	491	1388	1399	1459	1646	2009	2053	2442	2440	2208	734	251	146	170
	4	MB Coll @ MKT Br	566	1357	1416	1479	1670	1959	2167	2449	2431	2225	674	277	165	183
3	5	NB Coll @ Mkt Rmp	509	1207	1248	1359	1486	1718	1808	2156	2113	2007	503	165	95	90
	6	NB Coll @ Oleander	762	1503	1372	1388	1735	1822	1929	2203	2168	2228	891	76	46	55
	7	NB Coll @ Shipyard	762	1503	1372	1388	1735	1822	1929	2203	2168	2228	891	76	46	55
	8	NB Coll @ CB	1235	1407	1374	1485	1782	1773	2119	2187	2237	2197	204	46	44	57
	9	NB Coll S of CB	225	1516	1479	1616	2055	1966	2813	2500	2518	2014	225	138	143	162
	10	WBR MLK (CF only)	171	232	227	248	383	400	784	715	709	400	289	180	117	106
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	198	530	582	737	779	973	1097	1467	1508	1208	516	124	90	79
	2	40 @ Gordon	106	189	197	245	375	358	652	693	747	428	85	53	28	34
	3	NB Coll @ MLK	506	1339	1455	1356	1724	1908	2195	2457	2490	2216	781	224	177	153
	4	MB Coll @ MKT Br	561	1318	1445	1382	1747	1954	2218	2460	2511	2221	719	257	191	174
4	5	NB Coll @ Mkt Rmp	485	1216	1274	1225	1561	1723	1888	2128	2174	2045	565	147	105	100
	6	NB Coll @ Oleander	855	1345	1436	1438	1688	1784	2017	2115	2196	2295	921	73	64	52
	7	NB Coll @ Shipyard	855	1345	1436	1438	1688	1784	2017	2115	2196	2295	921	73	64	52
	8	NB Coll @ CB	1246	1386	1366	1497	1767	1839	2167	2200	2210	2213	213	54	54	55
	9	NB Coll S of CB	1441	1510	1472	1628	1973	2043	2814	2517	2495	2031	202	161	144	154
	10	WBR MLK (CF only)	145	189	224	284	402	387	748	764	784	396	236	163	131	113

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	147	676	514	654	693	1004	1044	1614	1455	1295	436	123	92	83
	2	40 @ Gordon	134	193	194	199	308	404	662	763	688	420	78	48	33	32
	3	NB Coll @ MLK	554	1310	1327	1453	1652	2017	2171	2280	2434	2261	701	243	153	125
	4	MB Coll @ MKT Br	575	1336	1310	1528	1693	2006	2205	2272	2447	2229	688	274	173	142
5	5	NB Coll @ Mkt Rmp	517	1186	1166	1395	1469	1774	1885	1975	2153	2013	501	157	101	78
	6	NB Coll @ Oleander	852	1292	1397	1528	1617	1840	1851	2152	2145	2201	904	78	58	55
	7	NB Coll @ Shipyard	852	1292	1397	1528	1617	1840	1851	2152	2145	2201	904	78	58	55
	8	NB Coll @ CB	1216	1402	1354	1479	1796	1818	1924	2217	2226	2192	215	65	51	51
	9	NB Coll S of CB	1441	1501	1490	1616	2001	2016	2617	2494	2511	2020	211	161	146	152
	10	WBR MLK (CF only)	164	213	228	223	363	422	780	799	710	399	254	176	118	105
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	180	606	577	643	834	910	1132	1461	1433	1253	465	137	99	88
	2	40 @ Gordon	112	199	192	218	307	438	690	670	766	376	91	59	30	42
	3	NB Coll @ MLK	452	1398	1320	1444	1698	1947	2246	2423	2489	2233	769	251	138	167
	4	MB Coll @ MKT Br	518	1362	1356	1433	1766	1946	2264	2444	2490	2242	728	275	162	194
6	5	NB Coll @ Mkt Rmp	476	1211	1186	1294	1589	1683	1938	2126	2166	2076	541	178	82	103
	6	NB Coll @ Oleander	846	1392	1374	1442	1693	1794	1935	2151	2187	2249	946	90	63	61
	7	NB Coll @ Shipyard	846	1392	1374	1442	1693	1794	1935	2151	2187	2249	946	90	63	61
	8	NB Coll @ CB	1224	1390	1385	1478	1761	1836	2080	2182	2209	2247	196	56	51	43
	9	NB Coll S of CB	1397	1517	1524	1613	1973	2037	2746	2489	2503	2021	221	152	153	146
	10	WBR MLK (CF only)	142	220	205	250	371	461	762	760	737	405	251	198	123	127
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	161	664	543	582	778	933	1157	1556	1413	1178	547	102	99	78
	2	40 @ Gordon	139	233	173	246	327	380	638	771	702	387	78	42	38	26
	3	NB Coll @ MLK	489	1313	1320	1483	1701	1879	2236	2450	2493	2208	714	219	148	151
	4	MB Coll @ MKT Br	509	1345	1311	1544	1694	1941	2238	2461	2498	2185	677	237	169	170
7	5	NB Coll @ Mkt Rmp	449	1201	1197	1361	1524	1702	1920	2119	2173	1995	516	129	101	84
	6	NB Coll @ Oleander	784	1366	1406	1527	1701	1821	1977	2185	2194	2263	868	36	56	44
	7	NB Coll @ Shipyard	784	1366	1406	1527	1701	1821	1977	2185	2194	2263	868	36	56	44
	8	NB Coll @ CB	1235	1394	1427	1513	1733	1846	2129	2168	2196	2237	197	54	47	67
	9	NB Coll S of CB	1406	1506	1515	1638	1940	2057	2827	2504	2502	2024	221	149	142	160
	10	WBR MLK (CF only)	173	266	180	300	376	420	759	749	794	368	265	169	128	102
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	205	620	602	596	830	913	1137	1669	1458	1222	500	125	99	87
	2	40 @ Gordon	121	174	206	218	368	410	675	806	629	419	93	54	39	30
	3	NB Coll @ MLK	495	1268	1320	1339	1669	1908	2175	2454	2511	2248	705	236	151	131
	4	MB Coll @ MKT Br	524	1272	1353	1418	1634	1948	2185	2477	2515	2241	637	255	181	152
8	5	NB Coll @ Mkt Rmp	492	1136	1224	1267	1475	1731	1875	2151	2203	2033	452	166	91	86
	6	NB Coll @ Oleander	836	1362	1383	1378	1654	1879	1927	2181	2146	2213	855	159	63	50
	7	NB Coll @ Shipyard	836	1362	1383	1378	1654	1879	1927	2181	2146	2213	855	159	63	50
	8	NB Coll @ CB	1261	1332	1391	1456	1748	1803	2139	2166	2212	2198	209	60	51	49
	9	NB Coll S of CB	1488	1464	1479	1618	1977	2022	2814	2490	2504	2011	222	153	148	148
	10	WBR MLK (CF only)	158	198	221	260	404	454	732	831	726	382	250	192	126	113

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	169	539	648	601	767	981	1057	1546	1450	1238	461	140	85	78
	2	40 @ Gordon	110	184	209	214	369	372	711	761	716	353	92	60	31	41
	3	NB Coll @ MLK	501	1311	1410	1442	1576	1927	2177	2494	2508	2189	770	237	154	165
	4	MB Coll @ MKT Br	515	1422	1360	1391	1689	1889	2225	2516	2496	2193	728	264	176	185
9	5	NB Coll @ Mkt Rmp	449	1274	1246	1234	1478	1709	1920	2177	2183	2017	531	156	96	106
	6	NB Coll @ Oleander	847	1343	1374	1470	1660	1822	2071	2170	2147	2256	952	51	55	67
	7	NB Coll @ Shipyard	847	1343	1374	1470	1660	1822	2071	2170	2147	2256	952	51	55	67
	8	NB Coll @ CB	1242	1380	1361	1493	1783	1826	2158	2177	2229	2189	219	37	58	66
	9	NB Coll S of CB	1432	1505	1491	1618	1974	2038	2819	2496	2509	2011	220	139	151	162
	10	WBR MLK (CF only)	130	207	220	256	426	433	777	751	761	378	252	159	122	119
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	144	581	643	631	766	960	1136	1608	1404	1238	436	115	94	104
	2	40 @ Gordon	102	205	187	237	381	440	644	761	689	403	71	48	36	36
	3	NB Coll @ MLK	533	1293	1387	1468	1641	1996	2095	2507	2491	2260	721	219	155	156
	4	MB Coll @ MKT Br	568	1288	1462	1438	1690	1952	2165	2534	2487	2264	682	228	177	174
10	5	NB Coll @ Mkt Rmp	511	1146	1334	1263	1538	1708	1856	2201	2181	2080	456	144	97	92
	6	NB Coll @ Oleander	847	1339	1391	1456	1667	1786	1993	2184	2209	2210	893	49	56	48
	7	NB Coll @ Shipyard	847	1339	1391	1456	1667	1786	1993	2184	2209	2210	893	49	56	48
	8	NB Coll @ CB	1266	1372	1378	1502	1772	1795	2150	2175	2194	2222	213	53	44	52
	9	NB Coll S of CB	1465	1467	1497	1630	2004	1977	2844	2496	2487	1999	213	151	157	166
	10	WBR MLK (CF only)	126	235	203	272	430	481	761	788	697	394	260	156	126	113
	#	Location														
	1	40 @ HS	173.9	584.8	620.3	623.3	783.9	966.2	1115.5	1567.5	1426.7	1251.1	467.1	122	94.9	83.5
	2	40 @ Gordon	118	200.3	194.1	223.5	343	403.4	665.6	747.4	703.9	406.5	87.3	51	35.2	31.6
	3	NB Coll @ MLK	507.9	1325.3	1358.8	1422.8	1670.8	1952	2176.5	2444.1	2484.1	2238.5	723.3	240	152.7	149.6
	4	MB Coll @ MKT Br	545.4	1331.9	1375.2	1451.8	1699.7	1944.9	2219.8	2458.6	2485.9	2228.4	685.2	265.5	171.5	169.6
Avg	5	NB Coll @ Mkt Rmp	486.5	1194.3	1235.6	1300.6	1509.9	1716.7	1898.8	2140.6	2165.6	2034.6	505.7	159.6	93.3	92.1
	6	NB Coll @ Oleander	826.1	1373.8	1382.9	1463	1668.5	1822.6	1974.2	2173.8	2168.3	2237.2	905	80.5	57.6	54.9
	7	NB Coll @ Shipyard	826.1	1373.8	1382.9	1463	1668.5	1822.6	1974.2	2173.8	2168.3	2237.2	905	80.5	57.6	54.9
	8	NB Coll @ CB	1244.3	1382.4	1376.7	1487.3	1767.2	1819.9	2115.4	2182.7	2211	2219.4	209	53.9	49.9	53.7
	9	NB Coll S of CB	1319.5	1496.1	1492.7	1620	1985.7	2023.5	2797.3	2496.2	2501.6	2018.4	216.4	148.4	148.1	155.2
	10	WBR MLK (CF only)	152.5	219.9	215.2	263	392.2	436	761.4	770.1	736.5	403.7	259.2	174.3	124.6	110.8
	#	Location														
	1	40 @ HS	28.6568	62.7071	78.1481	52.8185	51.226	57.1057	46.2151	65.9111	61.3334	66.40524	40.35247	12.40967	6.822349	8.289887
	2	40 @ Gordon	14.3604	17.1985	10.0383	15.4866	29.5259	29.5492	23.3771	39.1981	43.8848	29.37592	12.52597	6.306963	6.338594	6.619836
	3	NB Coll @ MLK	30.201	41.4837	49.6091	52.2171	49.4341	50.2151	63.0771	62.6923	26.6435	32.57555	43.09176	16.51935	10.688	15.84088
	4	MB Coll @ MKT Br	28.5587	43.2909	51.495	53.8141	37.5264	32.1712	43.0473	71.4986	27.0532	24.01944	32.63536	21.93551	10.09125	16.13278
StdDev	5	NB Coll @ Mkt Rmp	23.9084	39.3589	47.7032	58.6026	41.6985	24.3587	46.7566	65.8233	24.9586	28.30862	37.32455	16.56771	8.551153	8.824839
	6	NB Coll @ Oleander	37.2483	58.2386	27.9938	58.1187	38.1496	29.7404	64.0587	27.6518	28.2215	32.02707	37.47295	35.55043	6.310485	7.218033
	7	NB Coll @ Shipyard	37.2483	58.2386	27.9938	58.1187	38.1496	29.7404	64.0587	27.6518	28.2215	32.02707	37.47295	35.55043	6.310485	7.218033
	8	NB Coll @ CB	17.1532	28.4808	22.8524	15.4995	23.1651	23.173	72.0743	24.9	15.1658	26.05635	8.730534	8.372574	4.581363	8.04225
	9	NB Coll S of CB	385.756	25.0175	16.0696	9.62635	30.0187	30.4677	69.1537	10.9321	10.4796	9.868018	8.140434	10.7207	4.954235	7.771744
	10	WBR MLK (CF only)	16.195	21.5327	15.1056	21.1555	27.3244	32.2869	16.0014	31.7226	36.1209	34.81076	14.68786	13.49115	8.996296	7.800285

VISSIM Average Speeds – No Contraflow, Severe Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	29.2	17.2	17.3	16.2	15.9	16.6	11.8	12	11.8	12.8	22.1	36.5	43.4	43.2
	4	MB Coll @ MKT Br	28.6	18.8	20.8	19.4	16.1	12.6	9.1	9.2	9.1	10.7	19.9	36.3	39.4	37.9
	5	NB Coll @ Mkt Rmp	29	21.2	24.9	22.9	17.6	11.4	8.3	7	7.1	9.2	24.1	41.5	45.7	46
1	6	NB Coll @ Oleander	17.1	16.8	16.6	16	16	15.2	15	7.5	8.1	8.8	9.3	11.3	12.9	18.8
	7	NB Coll @ Shipyard	17.1	16.8	16.6	16	16	15.2	15	7.5	8.1	8.8	9.3	11.3	12.9	18.8
	8	NB Coll @ CB	38.5	37.6	37.7	36.2	18.4	23.3	15.9	14.4	6.5	6.7	8.5	7.9	16.9	42.5
	9	NB Coll S of CB	41.8	41.9	41.9	41.7	41.4	41.4	25	11.9	5.3	5.7	7.7	43	43	43
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	23.9	16.2	16.6	15.7	16.2	14.6	12.3	11.9	12.3	12.8	25.3	36.7	40.6	41.8
	4	MB Coll @ MKT Br	26	20.5	18	18.3	16.5	11.6	9.8	8.7	9.8	10.5	22.1	36.4	37.4	37.5
	5	NB Coll @ Mkt Rmp	28.4	23.8	19.8	20	17.1	12.2	8.1	6.8	7.6	9.7	25.6	44	46.6	45.8
2	6	NB Coll @ Oleander	18.4	17.5	17	16.2	16.5	15.5	15	7.6	7.8	9.8	9.7	10.2	11.8	17.2
	7	NB Coll @ Shipyard	18.4	17.5	17	16.2	16.5	15.5	15	7.6	7.8	9.8	9.7	10.2	11.8	17.2
	8	NB Coll @ CB	38.9	37.9	38.7	37.9	26.2	20.9	16.9	14.7	6.6	6.5	10.2	8.2	27.9	42.6
	9	NB Coll S of CB	41.8	41.8	41.8	41.7	41.3	41.4	27	11.9	5.7	5.7	9.1	43.3	43.4	43
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	31.5	16.2	17.5	15.5	16.1	15.3	12.3	11.6	11.4	11.9	24.9	31.8	35.9	38.5
	4	MB Coll @ MKT Br	31.4	16.9	18.3	19.2	15	12.6	10	8.7	9.3	10.4	21.8	32	36.7	37.3
	5	NB Coll @ Mkt Rmp	32.8	19	21.6	21.4	16.3	11.2	7.9	6.6	7.1	9	26.1	36.7	45	45.5
3	6	NB Coll @ Oleander	19.8	16.1	16.7	15.6	17.3	15.7	15.7	7.4	8.1	9.3	9.5	9.8	14.2	20.3
	7	NB Coll @ Shipyard	19.8	16.1	16.7	15.6	17.3	15.7	15.7	7.4	8.1	9.3	9.5	9.8	14.2	20.3
	8	NB Coll @ CB	38.1	38.3	37.6	36.4	31.1	28.3	19	16.4	6.4	6.9	9.9	8.4	18.8	42.7
	9	NB Coll S of CB	41.7	41.8	41.8	41.8	41.4	41.5	27.9	11.7	5.8	5.9	9	43.2	43.1	43.3
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	27.8	15.9	17.9	15.9	15.7	15.2	12.6	11.8	11.5	12.1	22.1	43.3	40.4	40.4
	4	MB Coll @ MKT Br	25.4	17.2	17.3	18.1	15.4	12.8	9.9	9.3	9.2	10.1	22.4	36.9	39.7	37.2
	5	NB Coll @ Mkt Rmp	26.9	19	19.6	18.6	16.8	12.7	8.3	7	7.2	9.1	24.4	46.8	46.9	45.7
4	6	NB Coll @ Oleander	18.6	16.4	16.1	18.6	16.6	16.6	14	7.6	7.7	9	10.5	10.1	12.7	18
	7	NB Coll @ Shipyard	18.6	16.4	16.1	18.6	16.6	16.6	14	7.6	7.7	9	10.5	10.1	12.7	18
	8	NB Coll @ CB	37.5	36.7	38.5	36.1	34.5	25.3	18	14.4	6.7	6.5	9.2	6.6	15.1	42.7
	9	NB Coll S of CB	41.7	41.7	41.9	41.7	41.6	41.4	28.9	11	5.7	5.7	8.6	43.1	43.2	43.3
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28.7	17.4	16.3	16.1	15.9	14.9	12	11.9	12	12.5	24.6	36.1	40.8	39.8
	4	MB Coll @ MKT Br	28.7	20	18.5	17.8	16.1	12.5	10.1	9	9.4	10.6	21.4	37.1	35.8	37.7
	5	NB Coll @ Mkt Rmp	31.6	23.5	19.2	18.6	16.7	12	8.3	6.8	7.4	9.2	25.7	43.6	44.1	42.9
5	6	NB Coll @ Oleander	19.8	17.4	17	17.3	16.6	16.7	14.9	7.5	7.9	9.1	9.6	10.9	13.1	15.8
	7	NB Coll @ Shipyard	19.8	17.4	17	17.3	16.6	16.7	14.9	7.5	7.9	9.1	9.6	10.9	13.1	15.8
	8	NB Coll @ CB	38.2	37.1	37.1	36.5	33.2	30.9	19.3	15.3	6.7	6.7	9.1	8.9	18.5	43
	9	NB Coll S of CB	41.8	41.8	41.8	41.6	41.6	41.4	25.3	12.1	5.7	5.6	9	43.2	42.9	43.6
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.5	15.6	16.4	17.8	15.1	14.3	12.2	12.4	11.9	13.3	23.8	35	42.4	36.1
	4	MB Coll @ MKT Br	31.7	18.4	19.7	18.1	14.9	13.2	9.7	9.3	9.6	10.8	18.2	36.1	40.1	34.9
	5	NB Coll @ Mkt Rmp	33.9	21.5	22	19.7	15.5	13.1	8.2	7.4	7.36	9.6	21.3	42.6	47.1	43.3
6	6	NB Coll @ Oleander	20.1	18.2	17.1	17.7	15.6	16.6	15.9	7.7	7.8	9.5	10.1	10.6	13.8	26.2
	7	NB Coll @ Shipyard	20.1	18.2	17.1	17.7	15.6	16.6	15.9	7.7	7.8	9.5	10.1	10.6	13.8	26.2
	8	NB Coll @ CB	37.2	36.4	38.2	36.3	32.4	32.4	19.8	16.1	6.6	6.5	11.3	10.4	42.9	42.9
	9	NB Coll S of CB	41.8	41.8	41.9	41.7	41.4	41.5	20.6	11.6	5.9	5.6	10.1	43	43.3	43.1

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
7	3	NB Coll @ MLK	28.8	16.5	17.5	17.6	15.6	14.7	11.5	12.3	12.5	12.5	22.2	39.9	40.1	41.4
	4	MB Coll @ MKT Br	29.5	19.8	18.9	19.3	15.9	12.3	9.5	9.7	9.3	10.5	18.9	38.3	38.2	37.6
	5	NB Coll @ Mkt Rmp	28.3	22.6	20.9	21.4	16.7	11.4	7.8	6.9	7.2	9.6	24.1	43.3	44.1	44.3
	6	NB Coll @ Oleander	19.3	17.2	17.5	16.4	16.5	16.2	15.4	7.5	7.9	9.9	11.1	11	13.8	16.6
	7	NB Coll @ Shipyard	19.3	17.2	17.5	16.4	16.5	16.2	15.4	7.5	7.9	9.9	11.1	11	13.8	16.6
	8	NB Coll @ CB	37.8	37.1	38.5	36.2	26.6	25.6	19.3	14.2	6.6	6.5	10.4	7.8	22	42.7
	9	NB Coll S of CB	41.7	41.7	41.9	41.6	41.4	41.4	26.6	11.3	5.7	5.6	9.5	43	43.4	43.2
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
8	3	NB Coll @ MLK	28.8	15.9	16.1	16.6	15.7	15.5	12.3	11.5	11.7	13.2	24	36	38.2	40.8
	4	MB Coll @ MKT Br	28.3	18	17.6	17.2	16.7	13.8	9.8	9	9.6	10.9	23.3	36.1	37.8	36.1
	5	NB Coll @ Mkt Rmp	27.2	20.7	19.5	18.9	18.7	15	7.5	6.7	7	9.3	27.2	42.7	45.8	45
	6	NB Coll @ Oleander	18.2	16.6	16.4	16.6	16	17.1	15.7	7.6	7.6	9.4	10	10.4	14.4	17.9
	7	NB Coll @ Shipyard	18.2	16.6	16.4	16.6	16	17.1	15.7	7.6	7.6	9.4	10	10.4	14.4	17.9
	8	NB Coll @ CB	37.9	38.3	37.2	36.4	30.8	29.3	16.8	15.2	6.7	6.6	10.2	8.1	23.5	42.8
	9	NB Coll S of CB	41.8	41.7	41.8	41.8	41.5	41.4	22.5	12.1	5.5	5.7	8.7	43.4	43.1	43.4
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
9	3	NB Coll @ MLK	31.3	17.1	17.4	16.7	15.2	15.1	12	11.7	11.5	13.5	23.8	30.5	41.9	41.9
	4	MB Coll @ MKT Br	30.2	16.8	17.9	18.9	16.1	12.7	9.8	9.3	9.3	10.8	23	32.6	38.4	36.7
	5	NB Coll @ Mkt Rmp	33.8	19.2	19.9	21.8	16.6	14.8	7.7	6.9	7.6	9.5	26.4	41.1	47	43.4
	6	NB Coll @ Oleander	22.1	16.1	16.7	16.2	15.9	15.7	14.9	8.7	8.1	9.5	9.2	10.4	13.4	17.4
	7	NB Coll @ Shipyard	22.1	16.1	16.7	16.2	15.9	15.7	14.9	8.7	8.1	9.5	9.2	10.4	13.4	17.4
	8	NB Coll @ CB	37.6	37.9	38.3	35.3	30.2	31.7	19.1	15.3	6.9	6.6	9	7.5	14.7	42.6
	9	NB Coll S of CB	41.8	41.9	41.8	41.7	41.4	41.4	26.7	12.5	5.7	5.8	7.9	42.7	43.4	42.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
10	3	NB Coll @ MLK	30.7	16.1	16.4	17.1	16	15.7	12.3	11.9	12	12.2	25.4	37.2	39.8	42.6
	4	MB Coll @ MKT Br	33.2	16.9	18.3	17.7	15.7	13	10	9.1	9.5	10.3	22.7	35.6	38.9	38.3
	5	NB Coll @ Mkt Rmp	36	20	19.8	20.4	17.4	13.8	8.3	6.9	6.9	8.7	26.5	39.7	46.6	46.9
	6	NB Coll @ Oleander	20.8	17.2	16.7	17.1	17	15.4	16.1	8.6	8.1	9.2	9.9	10.9	13.3	18.8
	7	NB Coll @ Shipyard	20.8	17.2	16.7	17.1	17	15.4	16.1	8.6	8.1	9.2	9.9	10.9	13.3	18.8
	8	NB Coll @ CB	38.1	38.2	38.5	37.3	30.2	25.6	18.1	14.3	6.8	6.7	9.8	8.6	18.3	42.4
	9	NB Coll S of CB	41.7	41.7	41.8	41.7	41.3	41.5	25.6	11.4	5.8	5.7	8.9	43.1	42.7	42.8
	#	Location														
Avg	3	NB Coll @ MLK	28.72	16.41	16.94	16.52	15.74	15.19	12.13	11.9	11.86	12.68	23.82	36.3	40.35	40.65
	4	MB Coll @ MKT Br	29.3	18.33	18.53	18.4	15.84	12.71	9.77	9.13	9.41	10.56	21.37	35.74	38.24	37.12
	5	NB Coll @ Mkt Rmp	30.79	21.05	20.72	20.37	16.94	12.76	8.04	6.9	7.246	9.29	25.14	42.2	45.89	44.88
	6	NB Coll @ Oleander	19.42	16.95	16.78	16.77	16.4	16.07	15.26	7.77	7.91	9.35	9.89	10.56	13.34	18.7
	7	NB Coll @ Shipyard	19.42	16.95	16.78	16.77	16.4	16.07	15.26	7.77	7.91	9.35	9.89	10.56	13.34	18.7
	8	NB Coll @ CB	37.98	37.55	38.03	36.46	29.36	27.33	18.22	15.03	6.65	6.62	9.76	8.24	21.86	42.69
	9	NB Coll S of CB	41.76	41.78	41.84	41.7	41.43	41.43	25.61	11.75	5.68	5.7	8.85	43.1	43.15	43.14
	#	Location														
Std Dev	3	NB Coll @ MLK	2.2987	0.61905	0.64153	0.78571	0.36271	0.65226	0.31287	0.28284	0.35653	0.53707	1.292543	3.631345	2.133464	2.105152
	4	MB Coll @ MKT Br	2.45357	1.40242	1.04462	0.75865	0.59479	0.57629	0.29078	0.30203	0.21318	0.250333	1.771409	1.961405	1.359085	0.994205
	5	NB Coll @ Mkt Rmp	3.22678	1.80262	1.74279	1.47501	0.8501	1.3906	0.29515	0.21602	0.23908	0.314289	1.718656	2.711703	1.153208	1.341475
	6	NB Coll @ Oleander	1.43124	0.67371	0.39101	0.9056	0.52493	0.65328	0.62397	0.47152	0.18529	0.343996	0.576291	0.464758	0.769126	2.919665
	7	NB Coll @ Shipyard	1.43124	0.67371	0.39101	0.9056	0.52493	0.65328	0.62397	0.47152	0.18529	0.343996	0.576291	0.464758	0.769126	2.919665
	8	NB Coll @ CB	0.49621	0.68678	0.58319	0.70111	4.6505	3.80148	1.30877	0.76891	0.14337	0.131656	0.823542	0.990174	8.411394	0.179196
	9	NB Coll S of CB	0.05164	0.07888	0.05164	0.06667	0.10593	0.0483	2.48124	0.44284	0.16865	0.094281	0.699603	0.194365	0.236878	0.275681

VISSIM Average Speeds – Severe Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	25	17.1	15.4	14.7	14.6	14.2	14.5	14.1	14.2	14.2	22.8	42	40.3	42.7
	4	MB Coll @ MKT Br	27.1	19	18.3	18.4	16	15.9	15.1	15.5	15.1	15.2	27.1	37.1	34.9	37
	5	NB Coll @ Mkt Rmp	29.7	19.3	19.2	20.2	17.4	15.9	13.7	14.2	13.8	14.3	30.7	45.4	41.6	44
1	6	NB Coll @ Oleander	16	15.7	15.4	16.3	16.3	15.6	14.4	14.1	13.4	15.1	10.7	24	31.1	34.9
	7	NB Coll @ Shipyard	16	15.7	15.4	16.3	16.3	15.6	14.4	14.1	13.4	15.1	10.7	24	31.1	34.9
	8	NB Coll @ CB	37	34.9	33.9	34.4	32.3	32.2	18.1	15.3	15.7	14.8	35.1	40.3	41.3	40.3
	9	NB Coll S of CB	42	41.7	41.8	41.7	41.6	41.5	34.5	13.2	13.2	27.6	42.7	43	43.4	43.1
	10	WBR MLK (CF only)	19.1	18.9	19	17.8	17.7	18.2	16.6	15.7	15.7	17.1	18.3	18.5	18.8	19
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	32.9	14.3	14	14.4	16.8	14.6	14.8	13.4	13.5	13.6	22.7	40.3	35	41.9
	4	MB Coll @ MKT Br	31.1	18.1	18.4	16.7	16.7	15.9	16.1	15.1	15.2	15.1	26.6	38.6	33.4	36.7
	5	NB Coll @ Mkt Rmp	31.3	22.5	19.8	17.9	16.7	16.4	15	13.6	13.7	14.4	30.2	48.2	40.9	45.8
2	6	NB Coll @ Oleander	17	15.7	16	15.5	15.7	15.1	14.8	13.6	14.4	14.8	9.8	17.3	34.7	29.9
	7	NB Coll @ Shipyard	17	15.7	16	15.5	15.7	15.1	14.8	13.6	14.4	14.8	9.8	17.3	34.7	29.9
	8	NB Coll @ CB	34.4	34.6	35	29.2	33.1	32.8	17.3	14.9	14.8	14.6	28.4	41	40	40.2
	9	NB Coll S of CB	41.9	41.8	41.9	41.4	41.5	41.4	33.8	13	12.9	25.5	42.4	43.4	43.1	42.8
	10	WBR MLK (CF only)	18.6	18.6	18.8	18.5	18.3	17.7	15.2	16.7	16.8	17.1	18.2	18.7	18.7	18.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	27.4	16.4	14.8	14.1	14.5	14.6	14.3	13.9	14.2	14	22.5	40	40.5	42.3
	4	MB Coll @ MKT Br	25.1	18.1	17.1	16.6	16.5	17.5	15.4	15.6	15.3	15.3	28.6	38.3	35.5	37.1
	5	NB Coll @ Mkt Rmp	26.3	19.2	17.7	18.2	17.4	16.4	14.7	13.6	13.9	14.9	35.2	46.4	44	47
3	6	NB Coll @ Oleander	18.4	15	16.9	15.2	14.6	16.2	14.5	14.4	14.6	14	11.3	25.3	31.6	29.4
	7	NB Coll @ Shipyard	18.4	15	16.9	15.2	14.6	16.2	14.5	14.4	14.6	14	11.3	25.3	31.6	29.4
	8	NB Coll @ CB	35.9	34.6	34	35.6	32.9	32.5	18.6	15	15.1	15.8	36.4	41	39.8	40.9
	9	NB Coll S of CB	41.9	41.8	41.7	41.7	41.5	41.6	36.4	13.1	13.1	28.1	43	43.6	43	43
	10	WBR MLK (CF only)	19.5	19	19.2	18.7	18.1	18.3	15.7	15.3	15.7	16.8	18.5	18.5	18.7	18.6
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	30.3	15.3	15.8	15.9	15.3	13.7	14.8	13.8	14.2	13.8	21.5	38.5	44	42.2
	4	MB Coll @ MKT Br	28.4	18.7	18.4	20	17.9	15.5	16	14.9	15.5	15.2	22.4	36.1	38.3	36.6
	5	NB Coll @ Mkt Rmp	31.7	19.9	21	21.2	18.7	15.6	15	13.6	14	14.7	24.6	46.5	48.3	45.8
4	6	NB Coll @ Oleander	19.1	15.9	16.5	14.8	15.2	14.8	15.2	13.5	14.5	14.8	11.6	30.4	31.6	35
	7	NB Coll @ Shipyard	19.1	15.9	16.5	14.8	15.2	14.8	15.2	13.5	14.5	14.8	11.6	30.4	31.6	35
	8	NB Coll @ CB	35.3	34.4	35.4	34.6	32.5	31.4	17.6	15.1	14.8	15	35.9	39.2	41.2	40.1
	9	NB Coll S of CB	41.7	41.9	41.9	41.7	41.5	41.5	32.9	13.1	12.9	28.3	42.7	42.7	43.3	43.5
	10	WBR MLK (CF only)	19.2	18.9	18.6	18.3	17.2	17.6	16.5	16.6	16.4	17.9	18.5	19.1	19.1	18.8

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.6	15.7	14.9	15.6	14.8	14.5	14.4	14.3	14.4	13.9	23	37.6	36.7	41.7
	4	MB Coll @ MKT Br	29.4	18	17.4	18	16.8	16.5	16.1	15.2	15.2	15.4	23.3	34.4	36.4	38.4
	5	NB Coll @ Mkt Rmp	31.2	18.9	21.7	19.2	16.2	15.2	14.6	14	14.2	14.4	27.2	45	43.9	47.8
5	6	NB Coll @ Oleander	17.9	15.4	15.6	15.6	15.5	15.7	15.5	14.5	14.1	14	10.7	23.6	33.9	32
	7	NB Coll @ Shipyard	17.9	15.4	15.6	15.6	15.5	15.7	15.5	14.5	14.1	14	10.7	23.6	33.9	32
	8	NB Coll @ CB	37	34.7	34.1	35.5	32.8	32.4	18.9	15.2	15.2	15	37.7	40.7	39.9	39.9
	9	NB Coll S of CB	41.7	41.9	41.9	41.7	41.5	41.5	24.5	13	13.3	27.5	42.4	43.1	43.4	43.1
	10	WBR MLK (CF only)	18.8	18.7	18.6	18.8	18	17.8	15.8	15.8	16.1	17.9	18.2	19	19	19.2
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28.4	14.9	15.8	14.5	14.8	14.2	14.5	14	14.2	13.9	21.8	39.8	39.9	44
	4	MB Coll @ MKT Br	28.6	18.5	19.5	18.7	16.2	16	15.1	15.1	15.5	15.3	25.9	37	34.6	36.8
	5	NB Coll @ Mkt Rmp	28.6	19.9	21.1	22.6	15.7	15.3	14.6	13.7	13.7	14.8	31.6	46.3	42.5	46.8
6	6	NB Coll @ Oleander	17.1	15.8	15.7	15.3	15.2	15.8	14.8	13.9	13.9	14.2	10	19.6	38.2	29.4
	7	NB Coll @ Shipyard	17.1	15.8	15.7	15.3	15.2	15.8	14.8	13.9	13.9	14.2	10	19.6	38.2	29.4
	8	NB Coll @ CB	34.8	34.9	34.5	34.7	34.6	30.5	18.7	14.9	14.8	14.8	35.9	40	39.9	39.5
	9	NB Coll S of CB	41.8	41.8	41.8	41.7	41.6	41.5	29.2	13.3	12.9	27.1	42.9	43.2	43.2	43.2
	10	WBR MLK (CF only)	19.5	18.8	18.4	18.9	18.7	18.3	16.4	16.8	16.3	18.2	18.3	18.7	19.3	18.4
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	25.4	16.7	16.5	14.1	15.2	14.9	14.2	14.4	13.6	14.2	20.9	39.4	43.9	43
	4	MB Coll @ MKT Br	28.7	20.5	19.2	16.4	17.4	16.1	15.6	15.5	15.1	15.3	24.6	36.2	37.5	36.5
	5	NB Coll @ Mkt Rmp	32.7	21	20.9	17.7	18.1	15.5	14.1	13.9	14.1	14.5	27.6	46.8	46.2	44
7	6	NB Coll @ Oleander	17.9	15.4	16.4	15.9	16.1	16	14.3	14.5	15.2	15.1	12.1	30.7	37.1	31.1
	7	NB Coll @ Shipyard	17.9	15.4	16.4	15.9	16.1	16	14.3	14.5	15.2	15.1	12.1	30.7	37.1	31.1
	8	NB Coll @ CB	34.9	35.4	34	33.8	32.3	31	18.1	15.2	15.3	15.3	34.7	41.5	40.2	38.3
	9	NB Coll S of CB	41.8	41.8	41.8	41.8	41.6	41.5	35.6	13.3	13	27.4	42.9	43.2	43.2	43.3
	10	WBR MLK (CF only)	18.6	18.5	18.6	19	18.5	17.8	16.3	16.3	17	17.5	18.7	19.2	18.9	19
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	23.8	16	15	14.7	15.3	14.2	14.4	13.9	14	14.6	20.5	39.2	45.4	45.7
	4	MB Coll @ MKT Br	26.6	17.6	18.3	19.8	16.9	15.3	16	15.2	15.1	15.1	24.8	37.2	37.6	38.2
	5	NB Coll @ Mkt Rmp	26.1	19.9	19.2	21.3	18.1	14.5	14.3	13.6	13.7	14.2	28.7	43.9	47.9	45.5
8	6	NB Coll @ Oleander	16.5	16.6	15	14.7	15.5	15.1	14.5	15	13.7	13.8	10.6	16	29.5	33.3
	7	NB Coll @ Shipyard	16.5	16.6	15	14.7	15.5	15.1	14.5	15	13.7	13.8	10.6	16	29.5	33.3
	8	NB Coll @ CB	36.2	35.3	34.7	36	31.5	33.7	17	15.2	15.7	15.3	35.9	39.7	40.4	39.7
	9	NB Coll S of CB	41.9	41.9	41.9	41.8	41.4	41.4	30.8	13.1	13.4	27.4	42.7	42.9	43.2	43.1
	10	WBR MLK (CF only)	19.4	18.5	18.6	18	18.6	17.2	16.8	15.6	15.9	17.6	17.7	18.4	18.8	19.2

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	24.6	15.5	15.6	14.2	16.3	14.4	14.6	13.6	14	14.4	19.6	35.9	42.7	43.1
	4	MB Coll @ MKT Br	26.9	19.1	19.8	16.7	17.4	15.6	15.2	14.8	15	15.2	23.2	34.4	36.5	37.2
	5	NB Coll @ Mkt Rmp	24.8	19.8	20.2	18.6	19	15.7	14.6	13.3	14	14.7	28.6	42.6	46.1	45.3
9	6	NB Coll @ Oleander	19.1	15.2	16.4	15.7	14.4	14.6	14.3	14.6	13.9	14.4	10	33.6	30.5	26.1
	7	NB Coll @ Shipyard	19.1	15.2	16.4	15.7	14.4	14.6	14.3	14.6	13.9	14.4	10	33.6	30.5	26.1
	8	NB Coll @ CB	34.6	35.3	33.9	36.1	31.7	28.5	18	15	15.5	14.8	37.5	40	40.9	39.7
	9	NB Coll S of CB	41.9	41.8	41.8	41.8	41.4	41.4	35.4	13.1	12.9	27	42.8	43	42.9	43.1
	10	WBR MLK (CF only)	19.4	18.8	19	19	17.6	17.6	16	16	15.9	18.1	18.4	18.9	18.8	19
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	29.2	15.9	14	14.2	14.7	14.6	13.7	14.2	13.8	13.6	23.5	36.6	41.5	34.5
	4	MB Coll @ MKT Br	28.8	19.1	15.9	17.1	16.6	16.4	14.8	15.5	15.1	15	26.1	37.6	37.3	32.9
	5	NB Coll @ Mkt Rmp	27.5	20.2	17.8	18.2	17.5	15.7	14	13.8	13.8	14.2	30.1	45.3	47.6	42.1
10	6	NB Coll @ Oleander	17.6	15.8	16.1	15.1	15.6	15.4	13.9	13.4	13.9	14.2	11.1	35.8	31.9	36.5
	7	NB Coll @ Shipyard	17.6	15.8	16.1	15.1	15.6	15.4	13.9	13.4	13.9	14.2	11.1	35.8	31.9	36.5
	8	NB Coll @ CB	35.3	36.1	34.8	32.8	33.9	30.7	17	15	15	14.8	27.1	39.6	39	40.1
	9	NB Coll S of CB	41.8	41.9	42	41.8	41.4	41.5	31.2	12.8	12.9	28.2	42.7	43.4	43.2	43.3
	10	WBR MLK (CF only)	19.1	18.8	19.2	19.1	18	18.1	16.5	15.7	16.6	16.8	18	18.6	18.8	19.2
	#	Location														
	3	NB Coll @ MLK	27.36	15.78	15.18	14.64	15.23	14.39	14.42	13.96	14.01	14.02	21.88	38.93	40.99	42.11
	4	MB Coll @ MKT Br	28.07	18.67	18.23	17.84	16.84	16.07	15.54	15.24	15.21	15.21	25.26	36.69	36.2	36.74
	5	NB Coll @ Mkt Rmp	28.99	20.06	19.86	19.51	17.48	15.62	14.46	13.73	13.89	14.51	29.45	45.64	44.9	45.41
Avg	6	NB Coll @ Oleander	17.66	15.65	16	15.41	15.41	15.43	14.62	14.15	14.16	14.44	10.79	25.63	33.01	31.76
	7	NB Coll @ Shipyard	17.66	15.65	16	15.41	15.41	15.43	14.62	14.15	14.16	14.44	10.79	25.63	33.01	31.76
	8	NB Coll @ CB	35.54	35.02	34.43	34.27	32.76	31.57	17.93	15.08	15.19	15.02	34.46	40.3	40.26	39.87
	9	NB Coll S of CB	41.84	41.83	41.85	41.71	41.5	41.48	32.43	13.1	13.05	27.41	42.72	43.15	43.19	43.15
	10	WBR MLK (CF only)	19.12	18.75	18.8	18.61	18.07	17.86	16.18	16.05	16.24	17.5	18.28	18.76	18.89	18.91
	#	Location														
	3	NB Coll @ MLK	2.86907	0.83772	0.80111	0.62929	0.76019	0.33149	0.31903	0.30984	0.29231	0.329309	1.247041	1.827597	3.271918	2.920217
	4	MB Coll @ MKT Br	1.68526	0.82334	1.17762	1.34759	0.58348	0.62725	0.4858	0.27568	0.17288	0.119722	1.954027	1.440255	1.562761	1.495326
	5	NB Coll @ Mkt Rmp	2.73555	1.03623	1.38259	1.70974	1.05388	0.56332	0.4274	0.25408	0.1792	0.25144	2.858224	1.581279	2.6965	1.680906
StdDev	6	NB Coll @ Oleander	1.03623	0.44284	0.57735	0.49318	0.59339	0.52292	0.46857	0.53593	0.52111	0.476562	0.746027	6.837649	2.882688	3.202846
	7	NB Coll @ Shipyard	1.03623	0.44284	0.57735	0.49318	0.59339	0.52292	0.46857	0.53593	0.52111	0.476562	0.746027	6.837649	2.882688	3.202846
	8	NB Coll @ CB	0.94775	0.50947	0.52926	2.05537	0.94422	1.47878	0.68969	0.13984	0.35418	0.355278	3.667939	0.731817	0.70899	0.676675
	9	NB Coll S of CB	0.09661	0.06749	0.08498	0.11972	0.08165	0.06325	3.62861	0.14907	0.19003	0.806157	0.198886	0.267706	0.159513	0.190029
	10	WBR MLK (CF only)	0.34897	0.17159	0.28284	0.44833	0.47621	0.35963	0.49396	0.51908	0.45753	0.524934	0.282056	0.275681	0.191195	0.276687

VISSIM Maximum Queues – No Contraflow, Moderate Event Case

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	Max
	1	NB Coll @ MLK	3969	4017	3980	4259	3980	3980	29	0	0	4259
	2	WBT MLK	55	0	55	44	62	81	40	43	18	81
	3	WBR MLK	389	827	794	1107	496	90	0	0	24	1107
	4	NB Coll @ Mkt	800	6029	13534	13531	13530	13318	1931	0	0	13534
	5	NBT @ Oleander	1788	4040	11138	15786	24283	25658	24729	16664	4566	25658
	6	EBL Oleander	1865	2492	3455	4862	5653	5763	3087	498	23	5763
	7	EBT Oleander	260	260	148	220	163	295	264	0	41	295
1	8	WBTR Oleander	134	230	223	169	104	183	203	151	68	230
	9	NBT Coll @ Mky Jct	365	1651	1565	5769	13235	5336	37	0	0	13235
	10	EBL CB	194	358	214	392	282	157	353	225	253	392
	11	EBL Mkt @ MLK	61	124	21	66	22	269	145	104	102	269
	12	NBT MLK	51	100	65	139	98	57	52	40	0	139
	13	WBR Mkt	514	1313	810	1212	808	718	85	101	79	1313
	14	Ramp @ Gordon	3108	6907	7318	7192	7129	6632	0	0	0	7318

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	3980	3980	4229	4016	3980	3980	98	84	48	4229
	2	WBT MLK	35	0	34	38	87	58	62	0	0	87
	3	WBR MLK	369	806	662	640	745	130	20	37	0	806
	4	NB Coll @ Mkt	687	3751	13524	13531	13543	13137	2733	32	0	13543
	5	NBT @ Oleander	1306	1651	2583	22236	25729	25342	23827	17086	5259	25729
	6	EBL Oleander	1321	1947	3299	4899	5607	5646	2485	39	88	5646
	7	EBT Oleander	292	273	299	173	188	293	199	0	0	299
2	8	WBTR Oleander	136	201	193	204	151	154	134	155	71	204
	9	NBT Coll @ Mky Jct	909	1534	1241	8138	22715	16576	0	23	0	22715
	10	EBL CB	217	181	158	185	177	149	372	343	320	372
	11	EBL Mkt @ MLK	109	124	111	104	78	294	251	69	62	294
	12	NBT MLK	93	121	77	71	55	51	32	3	0	121
	13	WBR Mkt	684	1028	1065	788	999	276	127	62	43	1065
	14	Ramp @ Gordon	2604	6910	7069	7215	7177	6434	0	0	0	7215

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	3849	3980	3980	4001	4030	3980	29	0	69	4030
	2	WBT MLK	34	17	56	0	61	99	27	17	0	99
	3	WBR MLK	472	738	944	693	410	125	63	0	0	944
	4	NB Coll @ Mkt	786	4980	13545	13531	13550	13072	0	0	0	13550
	5	NBT @ Oleander	1950	2958	9128	25729	25729	25721	24463	17934	4152	25729
	6	EBL Oleander	1797	2399	2847	4223	5222	5186	2117	46	85	5222
	7	EBT Oleander	257	313	289	134	117	261	312	0	0	313
3	8	WBTR Oleander	117	251	297	182	210	140	219	77	89	297
	9	NBT Coll @ Mky Jct	504	2250	1755	13590	22726	21850	0	17	0	22726
	10	EBL CB	228	236	290	455	260	275	217	270	393	455
	11	EBL Mkt @ MLK	151	87	40	67	23	238	169	68	84	238
	12	NBT MLK	98	148	137	114	89	58	32	0	0	148
	13	WBR Mkt	683	611	891	683	807	736	86	91	50	891
	14	Ramp @ Gordon	1946	6773	7364	7164	6839	6612	0	0	0	7364

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	3964	3980	4105	4073	3980	2150	27	51	0	4105
	2	WBT MLK	0	52	0	36	88	111	99	0	0	111
	3	WBR MLK	525	832	847	732	878	122	41	0	60	878
	4	NB Coll @ Mkt	1262	4131	13540	13548	13548	13329	2127	0	0	13548
	5	NBT @ Oleander	2824	2934	8552	25728	25730	25724	24610	16260	4380	25730
	6	EBL Oleander	1467	2313	2670	3701	4407	4399	1816	115	50	4407
	7	EBT Oleander	233	150	218	240	211	349	234	0	0	349
4	8	WBTR Oleander	179	230	224	224	171	178	115	90	73	230
	9	NBT Coll @ Mky Jct	709	1776	1873	10049	22723	18837	0	0	19	22723
	10	EBL CB	176	198	345	234	168	216	343	325	217	345
	11	EBL Mkt @ MLK	39	61	103	41	87	337	188	85	61	337
	12	NBT MLK	75	115	96	338	60	52	98	0	33	338
	13	WBR Mkt	700	804	834	1114	537	201	76	62	58	1114
	14	Ramp @ Gordon	2046	6883	7162	7132	7006	6943	0	0	0	7162

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	3159	3980	4109	4066	3980	3980	236	27	0	4109
2	WBT MLK	21	49	0	77	61	94	37	0	0	94
3	WBR MLK	406	756	847	838	500	85	70	0	0	847
4	NB Coll @ Mkt	619	3366	13524	13537	13549	13175	2191	0	0	13549
5	NBT @ Oleander	2110	1935	2739	18948	25729	25716	24436	19158	123	25729
6	EBL Oleander	1903	2434	3261	4662	5931	6141	2979	382	43	6141
7	EBT Oleander	192	334	248	175	172	310	233	0	0	334
8	WBTR Oleander	134	160	139	249	118	322	217	64	68	322
9	NBT Coll @ Mky Jct	401	1608	1868	5101	22698	22575	41	0	0	22698
10	EBL CB	297	206	377	239	275	182	210	149	233	377
11	EBL Mkt @ MLK	49	42	82	85	124	202	131	102	58	202
12	NBT MLK	91	160	103	100	95	54	54	0	33	160
13	WBR Mkt	660	983	870	766	1011	659	216	184	63	1011
14	Ramp @ Gordon	3758	6828	6958	7005	6846	6846	0	0	0	7005

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	1871	3980	4260	4094	3980	3978	68	0	0	4260
2	WBT MLK	75	18	50	41	90	91	42	0	39	91
3	WBR MLK	457	975	819	822	284	284	62	0	39	975
4	NB Coll @ Mkt	1028	4873	13530	13531	13531	13471	2153	0	0	13531
5	NBT @ Oleander	1907	4254	6320	25729	25729	24938	23421	17011	5026	25729
6	EBL Oleander	1597	1618	2624	3937	4780	4706	1641	103	68	4780
7	EBT Oleander	440	272	207	110	210	265	167	22	0	440
8	WBTR Oleander	167	203	228	176	88	200	187	120	181	228
9	NBT Coll @ Mky Jct	569	2386	2351	7070	22721	21578	0	20	68	22721
10	EBL CB	224	413	323	335	180	188	322	217	303	413
11	EBL Mkt @ MLK	99	89	81	119	132	338	313	93	60	338
12	NBT MLK	113	142	137	96	54	95	64	29	32	142
13	WBR Mkt	667	626	1077	1116	484	448	91	64	115	1116
14	Ramp @ Gordon	2450	7034	7007	7137	6815	6608	0	0	0	7137

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	3559	4102	4130	4029	3980	4250	119	27	0	4250
2	WBT MLK	54	0	0	0	80	58	36	80	0	80
3	WBR MLK	494	763	800	739	448	210	23	86	0	800
4	NB Coll @ Mkt	524	5248	13532	13532	13532	12843	0	0	0	13532
5	NBT @ Oleander	1924	2739	12525	25729	25729	2227	114	138	65	25729
6	EBL Oleander	1512	1953	3235	5130	5810	5599	3173	498	46	5810
7	EBT Oleander	224	344	188	120	272	217	273	0	0	344
8	WBTR Oleander	137	288	156	202	159	202	189	97	106	288
9	NBT Coll @ Mky Jct	773	1978	1561	15527	22710	17186	40	0	0	22710
10	EBL CB	275	197	193	169	235	200	321	325	206	325
11	EBL Mkt @ MLK	99	126	84	103	80	464	120	123	83	464
12	NBT MLK	77	156	140	90	74	50	33	35	0	156
13	WBR Mkt	593	974	893	897	770	247	141	157	22	974
14	Ramp @ Gordon	3173	6992	7070	7102	6835	6569	0	0	0	7102

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	1676	3990	4195	3984	3980	3980	90	51	0	4195
2	WBT MLK	0	0	42	0	80	119	54	0	0	119
3	WBR MLK	377	1049	763	704	378	170	70	45	41	1049
4	NB Coll @ Mkt	685	5822	13549	13531	13535	12812	2402	0	0	13549
5	NBT @ Oleander	2201	4098	11553	22341	21977	24018	22025	8608	4586	24018
6	EBL Oleander	1701	2266	2973	4560	5646	5647	2847	329	42	5647
7	EBT Oleander	346	234	286	213	237	198	180	0	0	346
8	WBTR Oleander	228	174	179	146	112	173	242	59	97	242
9	NBT Coll @ Mky Jct	395	1876	1707	6037	11145	6058	40	0	0	11145
10	EBL CB	467	208	218	263	282	166	211	170	306	467
11	EBL Mkt @ MLK	60	103	77	68	64	585	106	40	84	585
12	NBT MLK	80	150	180	124	37	76	28	34	0	180
13	WBR Mkt	813	979	876	723	559	179	168	106	22	979
14	Ramp @ Gordon	2487	7009	7275	7033	6995	6331	0	0	0	7275

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	2008	3980	4032	4117	4116	3978	203	0	0	4117
2	WBT MLK	56	32	60	58	76	80	35	17	0	80
3	WBR MLK	402	793	855	638	690	86	64	42	0	855
4	NB Coll @ Mkt	898	5362	13530	13531	13542	12955	2360	0	0	13542
5	NBT @ Oleander	1343	1596	6886	14594	11406	25476	23818	17395	4082	25476
6	EBL Oleander	1870	2115	2821	4160	5362	5492	2715	247	72	5492
7	EBT Oleander	306	388	194	169	168	301	354	0	0	388
8	WBTR Oleander	167	206	176	217	134	182	178	153	72	217
9	NBT Coll @ Mky Jct	531	1782	1703	7773	8144	3133	22	0	0	8144
10	EBL CB	133	154	390	390	394	176	174	305	210	394
11	EBL Mkt @ MLK	85	111	192	85	93	341	128	123	62	341
12	NBT MLK	76	115	101	121	71	51	38	31	0	121
13	WBR Mkt	257	783	1042	963	1068	143	100	116	68	1068
14	Ramp @ Gordon	2461	7028	7233	7130	6838	6731	0	0	0	7233

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	3980	4057	4009	4070	4145	3980	72	0	0	4145
2	WBT MLK	73	0	31	54	117	63	0	81	0	117
3	WBR MLK	444	952	660	908	566	102	46	85	24	952
4	NB Coll @ Mkt	579	3667	13533	13547	13532	13446	1920	0	0	13547
5	NBT @ Oleander	2806	2009	5597	11951	25728	25710	25112	18287	4525	25728
6	EBL Oleander	1783	1808	2726	4124	4652	4634	1639	29	61	4652
7	EBT Oleander	1781	1806	2724	4122	4650	4632	1636	26	0	4650
8	WBTR Oleander	132	221	285	201	152	227	163	75	50	285
9	NBT Coll @ Mky Jct	508	1456	2800	4520	17194	17622	0	0	0	17622
10	EBL CB	244	230	399	346	337	194	323	304	169	399
11	EBL Mkt @ MLK	64	40	60	44	63	251	166	62	59	251
12	NBT MLK	96	144	95	101	77	51	33	52	0	144
13	WBR Mkt	785	722	880	922	961	443	113	86	136	961
14	Ramp @ Gordon	2756	6891	7018	7206	7228	6830	0	0	0	7228

Avg

#	Location	Avg Max Queue
1	NB Coll @ MLK	4169.9
2	WBT MLK	95.9
3	WBR MLK	921.3
4	NB Coll @ Mkt	13543
5	NBT @ Oleander	25526
6	EBL Oleander	5356
7	EBT Oleander	775.8
8	WBTR Oleander	254.3
9	NBT Coll @ Mky Jct	18644
10	EBL CB	393.9
11	EBL Mkt @ MLK	331.9
12	NBT MLK	164.9
13	WBR Mkt	1049.2
14	Ramp @ Gordon	7203.9

Std Dev

#	Location	StdevMax Queue
1	NB Coll @ MLK	79.935
2	WBT MLK	15.096
3	WBR MLK	102.7
4	NB Coll @ Mkt	7.5019
5	NBT @ Oleander	535.67
6	EBL Oleander	569.72
7	EBT Oleander	1361.9
8	WBTR Oleander	40.042
9	NBT Coll @ Mky Jct	5737.3
10	EBL CB	43.938
11	EBL Mkt @ MLK	115.13
12	NBT MLK	63.304
13	WBR Mkt	117.24
14	Ramp @ Gordon	106.16

VISSIM Maximum Queues, With Contraflow, Moderate Event Case

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	Max
	1	NB Coll @ MLK	303	423	454	661	624	441	0	0	50400;	661
	2	WBT MLK	0	0	0	0	0	0	0	0	50400;	0
	3	WBR MLK	0	72	132	54	163	0	0	0	50400;	163
	4	NB Coll @ Mkt	900	1626	2705	2042	747	138	0	0	50400;	2705
	5	NBT @ Oleander	476	1016	1732	1230	675	2343	0	66	50400;	2343
	6	EBL Oleander	2296	3435	4279	5179	5814	5856	3469	993	50400;	5856
	7	EBT Oleander	236	154	286	187	192	208	114	28	50400;	286
1	8	WBTR Oleander	86	104	132	193	200	145	66	39	50400;	200
	9	NBT Coll @ Mky Jct	424	686	649	361	635	76	52	0	50400;	686
	10	EBL CB	210	117	218	197	253	151	241	289	50400;	289
	11	EBL Mkt @ MLK	121	76	90	58	68	195	72	57	50400;	195
	12	NBT MLK	52	98	55	87	19	0	0	0	50400;	98
	13	WBR Mkt	503	763	899	762	586	405	80	66	50400;	899
	14	Ramp @ Gordon	256	345	443	490	442	0	0	0	50400;	490

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	347	380	672	564	531	101	0	39	0	672
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	51	69	48	0	89	34	0	0	0	89
	4	NB Coll @ Mkt	890	1982	2956	1421	1356	247	0	0	0	2956
	5	NBT @ Oleander	722	1380	981	1111	638	2645	0	0	30	2645
	6	EBL Oleander	2542	3349	4214	5448	6365	6446	4272	1475	67	6446
2	7	EBT Oleander	187	170	177	257	169	191	257	148	0	257
	8	WBTR Oleander	86	214	95	181	116	116	54	50	51	214
	9	NBT Coll @ Mky Jct	251	728	639	578	321	184	0	0	0	728
	10	EBL CB	219	234	233	185	211	258	217	168	180	258
	11	EBL Mkt @ MLK	60	57	98	38	94	243	61	100	24	243
	12	NBT MLK	54	92	37	59	40	14	0	19	0	92
	13	WBR Mkt	638	1060	394	562	670	121	131	79	90	1060
	14	Ramp @ Gordon	232	391	445	312	480	0	0	0	0	480

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	532	429	731	488	406	443	0	64	0	731
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	50	136	61	0	0	69	0	0	136
	4	NB Coll @ Mkt	1128	1364	1314	2004	930	0	0	0	0	2004
	5	NBT @ Oleander	646	1121	2239	1673	528	2196	0	19	0	2239
	6	EBL Oleander	2589	3558	4539	5998	6679	6656	4448	1941	66	6679
3	7	EBT Oleander	190	181	224	209	169	170	238	141	0	238
	8	WBTR Oleander	66	115	272	171	68	141	19	34	0	272
	9	NBT Coll @ Mky Jct	280	685	659	462	514	138	0	0	0	685
	10	EBL CB	204	91	235	184	137	140	166	203	272	272
	11	EBL Mkt @ MLK	73	59	143	43	102	157	77	71	72	157
	12	NBT MLK	32	103	86	45	47	0	0	0	0	103
	13	WBR Mkt	553	649	838	707	673	571	81	112	37	838
	14	Ramp @ Gordon	121	699	251	328	164	0	0	0	0	699

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	388	608	440	401	585	227	24	0	0	608
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	49	50	167	74	51	50	0	0	0	167
	4	NB Coll @ Mkt	1150	1131	2654	2091	765	122	0	0	0	2654
	5	NBT @ Oleander	349	1247	2119	968	1055	2643	0	0	84	2643
	6	EBL Oleander	2890	3760	4793	5699	6480	6624	4373	1919	116	6624
4	7	EBT Oleander	223	273	182	184	159	187	159	209	0	273
	8	WBTR Oleander	98	167	203	136	51	170	55	66	62	203
	9	NBT Coll @ Mky Jct	276	739	611	489	514	180	0	0	0	739
	10	EBL CB	114	121	266	165	182	276	217	184	188	276
	11	EBL Mkt @ MLK	102	75	41	92	74	181	56	95	74	181
	12	NBT MLK	21	143	166	50	19	0	0	0	0	166
	13	WBR Mkt	552	736	886	856	401	261	110	33	84	886
	14	Ramp @ Gordon	0	400	307	325	124	0	0	0	0	400

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	467	797	405	460	574	103	0	51	0	797
2	WBT MLK	0	0	0	0	0	0	0	0	0	0
3	WBR MLK	51	198	49	50	0	0	0	0	0	198
4	NB Coll @ Mkt	839	1385	1542	1528	1426	73	0	0	0	1542
5	NBT @ Oleander	845	639	1507	1165	1302	3039	54	76	64	3039
6	EBL Oleander	2853	3875	4993	6353	7008	7076	4788	1944	22	7076
7	EBT Oleander	222	260	221	171	172	205	188	150	0	260
8	WBTR Oleander	119	156	166	152	182	131	17	168	100	182
9	NBT Coll @ Mky Jct	370	822	431	527	318	0	0	0	0	822
10	EBL CB	203	227	200	161	184	151	207	156	213	227
11	EBL Mkt @ MLK	88	71	68	57	72	237	116	73	105	237
12	NBT MLK	22	88	53	54	17	0	0	0	0	88
13	WBR Mkt	553	682	582	667	564	179	96	88	67	682
14	Ramp @ Gordon	222	283	304	509	104	0	0	0	0	509

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	313	367	505	476	448	353	0	0	15	505
2	WBT MLK	0	0	0	0	0	0	0	0	0	0
3	WBR MLK	44	120	112	143	49	0	0	0	0	143
4	NB Coll @ Mkt	1174	2258	2068	1409	609	370	0	0	0	2258
5	NBT @ Oleander	805	716	1709	1333	748	4381	0	0	64	4381
6	EBL Oleander	2777	3585	4776	5924	6687	6631	4300	1660	16	6687
7	EBT Oleander	258	221	215	152	201	216	207	117	0	258
8	WBTR Oleander	152	169	128	198	51	164	45	112	0	198
9	NBT Coll @ Mky Jct	346	561	645	344	189	159	0	0	0	645
10	EBL CB	192	310	158	173	171	257	277	143	177	310
11	EBL Mkt @ MLK	70	54	59	88	50	204	56	43	57	204
12	NBT MLK	21	86	36	47	35	0	0	0	0	86
13	WBR Mkt	425	761	809	1007	600	154	116	103	68	1007
14	Ramp @ Gordon	110	479	402	442	214	0	0	0	0	479

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	429	649	474	634	278	302	53	0	0	649
2	WBT MLK	0	0	0	0	0	0	0	0	0	0
3	WBR MLK	18	156	71	142	60	0	0	0	0	156
4	NB Coll @ Mkt	1006	1352	1225	2284	976	620	0	0	0	2284
5	NBT @ Oleander	1218	951	1361	860	945	2067	0	0	0	2067
6	EBL Oleander	3068	4178	5338	6208	6985	6993	4286	1721	19	6993
7	EBT Oleander	179	206	229	233	211	296	171	204	0	296
8	WBTR Oleander	103	138	148	134	113	181	19	38	0	181
9	NBT Coll @ Mky Jct	397	630	336	838	317	268	0	0	0	838
10	EBL CB	152	217	160	262	190	145	152	156	176	262
11	EBL Mkt @ MLK	63	86	135	91	81	255	101	80	81	255
12	NBT MLK	74	94	68	67	56	0	0	0	0	94
13	WBR Mkt	494	587	943	802	520	156	82	83	83	943
14	Ramp @ Gordon	21	106	377	534	92	0	0	0	0	534

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#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
1	NB Coll @ MLK	537	413	617	542	476	179	0	0	0	617
2	WBT MLK	0	0	0	0	0	0	0	0	0	0
3	WBR MLK	71	71	98	159	68	0	0	0	0	159
4	NB Coll @ Mkt	807	974	2653	2529	940	561	0	0	0	2653
5	NBT @ Oleander	1187	1531	1503	932	950	2488	0	0	42	2488
6	EBL Oleander	3550	4830	6002	6821	6908	6953	4826	2049	32	6953
7	EBT Oleander	288	227	261	194	171	268	222	108	0	288
8	WBTR Oleander	78	154	151	172	84	141	40	66	0	172
9	NBT Coll @ Mky Jct	261	665	552	655	382	183	0	0	43	665
10	EBL CB	188	125	165	264	182	234	169	198	148	264
11	EBL Mkt @ MLK	91	66	104	69	72	136	79	54	55	136
12	NBT MLK	34	40	82	76	20	22	0	0	0	82
13	WBR Mkt	598	609	838	848	786	212	164	64	67	848
14	Ramp @ Gordon	231	444	184	459	218	0	0	0	0	459

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
9	1	NB Coll @ MLK	473	422	477	669	285	115	23	70	0	669
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	58	81	50	49	0	0	0	0	81
	4	NB Coll @ Mkt	1079	1196	2305	2389	1208	174	0	0	0	2389
	5	NBT @ Oleander	1123	1467	1733	1310	745	2225	0	0	0	2225
	6	EBL Oleander	3460	4092	5407	6745	7579	7477	5497	2638	413	7579
	7	EBT Oleander	244	210	224	42	296	141	172	173	0	296
	8	WBTR Oleander	87	255	142	114	108	36	48	0	0	255
	9	NBT Coll @ Mky Jct	232	630	473	891	612	42	0	0	0	891
	10	EBL CB	152	198	190	456	276	332	140	227	185	456
	11	EBL Mkt @ MLK	75	71	62	84	103	192	90	124	57	192
	12	NBT MLK	52	69	71	19	35	0	0	0	0	71
	13	WBR Mkt	594	832	850	844	244	159	105	79	68	850
	14	Ramp @ Gordon	196	389	371	583	72	0	0	0	0	583

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
10	1	NB Coll @ MLK	267	471	493	593	319	228	0	40	0	593
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	49	69	126	62	126	0	0	0	0	126
	4	NB Coll @ Mkt	1348	884	2610	2481	821	162	0	0	0	2610
	5	NBT @ Oleander	458	1135	1591	598	1160	3066	55	42	0	3066
	6	EBL Oleander	3179	4039	5262	6047	6746	6713	4658	2469	266	6746
	7	EBT Oleander	229	158	210	201	190	199	133	216	0	229
	8	WBTR Oleander	98	149	147	149	102	168	45	38	78	168
	9	NBT Coll @ Mky Jct	370	871	525	794	348	238	0	0	0	871
	10	EBL CB	231	179	308	271	138	164	241	181	228	308
	11	EBL Mkt @ MLK	73	70	93	91	95	189	67	41	60	189
	12	NBT MLK	55	80	73	71	49	0	0	0	0	80
	13	WBR Mkt	581	704	752	699	643	161	54	11	38	752
	14	Ramp @ Gordon	272	141	260	301	576	0	0	0	0	576

	#	Location	Avg Max Queue
Avg	1	NB Coll @ MLK	650.2
	2	WBT MLK	0
	3	WBR MLK	141.8
	4	NB Coll @ Mkt	2405.5
	5	NBT @ Oleander	2713.6
	6	EBL Oleander	6763.9
	7	EBT Oleander	268.1
	8	WBTR Oleander	204.5
	9	NBT Coll @ Mky Jct	757
	10	EBL CB	292.2
	11	EBL Mkt @ MLK	198.9
	12	NBT MLK	96
	13	WBR Mkt	876.5
	14	Ramp @ Gordon	520.9

	#	Location	StdevMax Queue
Std Dev	1	NB Coll @ MLK	79.066
	2	WBT MLK	0
	3	WBR MLK	35.761
	4	NB Coll @ Mkt	408.41
	5	NBT @ Oleander	674.15
	6	EBL Oleander	448.26
	7	EBT Oleander	23.624
	8	WBTR Oleander	34.494
	9	NBT Coll @ Mky Jct	90.76
	10	EBL CB	62.544
	11	EBL Mkt @ MLK	37.658
	12	NBT MLK	26.276
	13	WBR Mkt	111.58
	14	Ramp @ Gordon	82.836

VISSIM Throughput – No Contraflow, Moderate Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	309	1227	1801	1764	1963	2194	2414	2401	2416	2440	1550	231	148	129
	2	40 @ Gordon	382	1329	1325	1470	1758	1793	1873	1860	1854	1963	499	77	63	51
	3	NB Coll @ MLK	440	1196	1244	1298	1383	1663	1361	1263	1356	1612	578	151	117	53
1	4	MB Coll @ MKT Br	498	1285	1303	1385	1459	1730	1508	1275	1394	1608	935	284	224	125
	5	NB Coll @ Mkt Rmp	450	1155	1169	1258	1255	1554	1316	1048	1120	1437	745	167	137	53
	6	NB Coll @ Oleander	782	1383	1380	1471	1576	1732	1754	1693	1176	1456	656	691	598	95
	7	NB Coll @ Shipyard	782	1383	1380	1471	1576	1732	1754	1693	1176	1456	656	691	598	95
	8	NB Coll @ CB	1318	1461	1442	1544	1788	1800	2105	2164	1510	1268	1324	149	138	167
	9	NB Coll S of CB	1403	1469	1439	1532	1816	1810	2420	2228	1708	1269	634	152	136	168
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	239	1346	1776	1778	1904	2309	2416	2407	2407	2422	1593	271	159	124
	2	40 @ Gordon	350	1367	1369	1397	1647	1892	1926	1852	1828	1967	502	98	55	54
	3	NB Coll @ MLK	443	1209	1209	1171	1428	1623	1505	1264	1349	1592	534	195	90	74
2	4	MB Coll @ MKT Br	529	1249	1268	1232	1542	1699	1551	1315	1342	1652	866	303	182	162
	5	NB Coll @ Mkt Rmp	471	1133	1155	1128	1382	1511	1296	1046	1099	1473	649	197	117	79
	6	NB Coll @ Oleander	796	1426	1359	1420	1620	1706	1467	1970	1167	1448	682	579	703	127
	7	NB Coll @ Shipyard	796	1426	1359	1420	1620	1706	1467	1970	1167	1448	682	579	703	127
	8	NB Coll @ CB	1299	1475	1449	1511	1810	1818	1761	2169	1761	1231	1326	133	145	161
	9	NB Coll S of CB	1380	1489	1444	1525	1805	1814	2155	2165	1985	1204	654	133	141	157
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	269	1298	1775	1783	2074	2221	2434	2423	2403	2387	1584	215	159	149
	2	40 @ Gordon	346	1367	1478	1363	1704	1918	1929	1795	1817	1923	512	79	59	53
	3	NB Coll @ MLK	455	1182	1245	1281	1408	1673	1458	1180	1313	1674	626	108	89	73
3	4	MB Coll @ MKT Br	484	1293	1265	1414	1441	1702	1601	1159	1332	1730	975	232	195	160
	5	NB Coll @ Mkt Rmp	412	1199	1185	1246	1303	1504	1378	919	1071	1575	741	130	113	75
	6	NB Coll @ Oleander	800	1429	1339	1532	1488	1709	1829	1741	1019	1493	611	540	744	102
	7	NB Coll @ Shipyard	800	1429	1339	1532	1488	1709	1829	1741	1019	1493	611	540	744	102
	8	NB Coll @ CB	1299	1453	1459	1555	1839	1737	2151	2120	1484	1256	1249	151	144	156
	9	NB Coll S of CB	1387	1433	1492	1529	1863	1755	2445	2198	1785	1060	664	148	146	156
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	338	1245	1745	1825	2005	2320	2397	2428	2400	2435	1592	269	204	134
	2	40 @ Gordon	428	1255	1408	1458	1752	1954	1896	1824	1860	1929	490	81	75	58
	3	NB Coll @ MLK	488	1154	1244	1322	1439	1616	1491	1244	1334	1615	554	139	126	67
4	4	MB Coll @ MKT Br	555	1221	1325	1339	1547	1671	1619	1280	1308	1662	956	282	236	133
	5	NB Coll @ Mkt Rmp	456	1138	1177	1184	1373	1450	1448	1004	1035	1508	708	181	150	63
	6	NB Coll @ Oleander	783	1383	1454	1462	1592	1666	1845	1745	1097	1468	670	742	571	99
	7	NB Coll @ Shipyard	783	1383	1454	1462	1592	1666	1845	1745	1097	1468	670	742	571	99
	8	NB Coll @ CB	1278	1463	1456	1552	1769	1841	2084	2166	1530	1253	1325	154	143	148
	9	NB Coll S of CB	1358	1464	1481	1541	1787	1827	2442	2219	1753	1183	665	156	145	149

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	269	1394	1721	1804	2087	2271	2406	2401	2404	2430	1528	282	197	150
	2	40 @ Gordon	414	1405	1314	1481	1677	1925	1881	1834	1832	1960	495	90	70	55
	3	NB Coll @ MLK	490	1216	1200	1325	1424	1641	1450	1339	1264	1683	560	137	122	78
	4	MB Coll @ MKT Br	516	1291	1243	1408	1501	1650	1626	1294	1375	1660	931	265	237	147
5	5	NB Coll @ Mkt Rmp	450	1202	1112	1199	1331	1450	1425	1026	1116	1477	728	169	163	73
	6	NB Coll @ Oleander	890	1232	1413	1500	1542	1621	1601	1918	1109	1548	659	490	824	113
	7	NB Coll @ Shipyard	890	1232	1413	1500	1542	1621	1601	1918	1109	1548	659	490	824	113
	8	NB Coll @ CB	1369	1379	1470	1553	1747	1842	1811	2161	1829	1218	1333	162	140	134
	9	NB Coll S of CB	1441	1385	1484	1553	1761	1832	2202	2171	1987	1205	698	168	139	126

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	254	1379	1752	1808	2005	2309	2429	2418	2405	2426	1586	260	186	134
	2	40 @ Gordon	423	1342	1365	1407	1740	1926	1897	1870	1877	1966	500	90	45	42
	3	NB Coll @ MLK	466	1248	1176	1316	1440	1567	1566	1206	1358	1690	583	159	111	75
	4	MB Coll @ MKT Br	500	1309	1284	1294	1555	1643	1717	1252	1376	1700	897	279	213	136
6	5	NB Coll @ Mkt Rmp	422	1185	1159	1199	1345	1500	1485	1017	1083	1549	679	178	141	50
	6	NB Coll @ Oleander	841	1384	1364	1434	1573	1669	1832	1767	1090	1487	648	693	588	75
	7	NB Coll @ Shipyard	841	1384	1364	1434	1573	1669	1832	1767	1090	1487	648	693	588	75
	8	NB Coll @ CB	1281	1465	1477	1537	1779	1836	2091	2141	1555	1259	1295	147	136	154
	9	NB Coll S of CB	1359	1480	1473	1552	1783	1818	2435	2215	1782	1148	675	151	136	150

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	317	1284	1733	1851	1970	2307	2417	2379	2422	2433	1560	212	162	163
	2	40 @ Gordon	361	1389	1448	1435	1676	1907	1861	1814	1873	1970	482	75	85	49
	3	NB Coll @ MLK	436	1283	1258	1229	1398	1608	1478	1231	1346	1685	593	114	107	61
	4	MB Coll @ MKT Br	472	1335	1314	1331	1504	1622	1570	1264	1409	1680	929	215	234	134
7	5	NB Coll @ Mkt Rmp	442	1161	1226	1184	1322	1432	1336	996	1160	1542	720	118	144	72
	6	NB Coll @ Oleander	831	1372	1339	1473	1558	1669	1808	1621	1241	1490	588	533	799	104
	7	NB Coll @ Shipyard	831	1372	1339	1473	1558	1669	1808	1621	1241	1490	588	533	799	104
	8	NB Coll @ CB	1302	1480	1438	1532	1777	1830	2083	2135	1509	1299	1294	138	154	155
	9	NB Coll S of CB	1378	1471	1457	1534	1803	1822	2439	2181	1685	1259	656	139	155	157

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	208	1323	1787	1751	1967	2302	2400	2404	2438	2445	1568	248	196	149
	2	40 @ Gordon	327	1374	1357	1410	1667	1893	1918	1838	1873	1986	488	103	63	51
	3	NB Coll @ MLK	459	1161	1225	1206	1492	1537	1523	1272	1310	1726	574	145	102	55
	4	MB Coll @ MKT Br	490	1280	1249	1317	1486	1652	1651	1290	1308	1747	929	321	202	104
8	5	NB Coll @ Mkt Rmp	473	1111	1140	1219	1303	1507	1385	1036	1051	1587	705	210	109	45
	6	NB Coll @ Oleander	813	1335	1420	1454	1541	1668	1833	1677	1203	1508	798	816	248	116
	7	NB Coll @ Shipyard	813	1335	1420	1454	1541	1668	1833	1677	1203	1508	798	816	248	116
	8	NB Coll @ CB	1310	1447	1460	1539	1738	1857	2115	2137	1513	1317	1269	155	144	152
	9	NB Coll S of CB	1389	1457	1461	1537	1771	1825	2491	2175	1696	1245	660	161	138	158

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
9	1	40 @ HS	263	1326	1732	1776	2019	2311	2370	2390	2423	2440	1554	263	164	154
	2	40 @ Gordon	393	1360	1325	1494	1678	1891	1926	1852	1907	1966	485	108	60	54
	3	NB Coll @ MLK	470	1240	1156	1296	1458	1615	1495	1269	1452	1626	564	136	134	66
	4	MB Coll @ MKT Br	500	1372	1245	1339	1496	1665	1591	1326	1467	1673	857	295	258	135
	5	NB Coll @ Mkt Rmp	426	1271	1113	1222	1315	1496	1327	1108	1206	1507	674	191	163	56
	6	NB Coll @ Oleander	843	1375	1337	1496	1563	1657	1835	1818	1234	1528	652	619	647	100
	7	NB Coll @ Shipyard	843	1375	1337	1496	1563	1657	1835	1818	1234	1528	652	619	647	100
	8	NB Coll @ CB	1371	1392	1461	1513	1767	1846	2118	2163	1611	1420	1201	161	131	144
	9	NB Coll S of CB	1458	1385	1469	1529	1778	1847	2459	2199	1822	1297	633	160	129	149
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
10	1	40 @ HS	283	1316	1722	1756	1952	2217	2432	2437	2404	2417	1559	254	176	124
	2	40 @ Gordon	339	1370	1418	1373	1651	1892	1904	1846	1848	1935	509	82	58	32
	3	NB Coll @ MLK	456	1212	1203	1292	1421	1551	1515	1321	1295	1614	574	119	108	57
	4	MB Coll @ MKT Br	521	1237	1299	1351	1445	1691	1623	1334	1285	1667	984	272	224	120
	5	NB Coll @ Mkt Rmp	465	1099	1157	1230	1275	1537	1362	1070	1045	1477	788	158	135	59
	6	NB Coll @ Oleander	830	1425	1413	1338	1560	1710	1734	1825	1176	1487	581	677	694	114
	7	NB Coll @ Shipyard	830	1425	1413	1338	1560	1710	1734	1825	1176	1487	581	677	694	114
	8	NB Coll @ CB	1331	1452	1448	1529	1815	1793	1995	2059	1750	1261	1317	150	158	134
	9	NB Coll S of CB	1416	1457	1448	1523	1854	1769	2399	2067	1890	1251	683	158	147	137
	#	Location														
Avg	1	40 @ HS	274.9	1313.8	1754.4	1789.6	1994.6	2276.1	2411.5	2408.8	2412.2	2427.5	1567.4	250.5	175.1	141
	2	40 @ Gordon	376.3	1355.8	1380.7	1428.8	1695	1899.1	1901.1	1838.5	1856.9	1956.5	496.2	88.3	63.3	49.9
	3	NB Coll @ MLK	460.3	1210.1	1216	1273.6	1429.1	1609.4	1484.2	1258.9	1337.7	1651.7	574	140.3	110.6	65.9
	4	MB Coll @ MKT Br	506.5	1287.2	1279.5	1341	1497.6	1672.5	1605.7	1278.9	1359.6	1677.9	925.9	274.8	220.5	135.6
	5	NB Coll @ Mkt Rmp	446.7	1165.4	1159.3	1206.9	1320.4	1494.1	1375.8	1027	1098.6	1513.2	713.7	169.9	137.2	62.5
	6	NB Coll @ Oleander	820.9	1374.4	1381.8	1458	1561.3	1680.7	1753.8	1777.5	1151.2	1491.3	654.5	638	641.6	104.5
	7	NB Coll @ Shipyard	820.9	1374.4	1381.8	1458	1561.3	1680.7	1753.8	1777.5	1151.2	1491.3	654.5	638	641.6	104.5
	8	NB Coll @ CB	1315.8	1446.7	1456	1536.5	1782.9	1820	2031.4	2141.5	1605.2	1278.2	1293.3	150	143.3	150.5
	9	NB Coll S of CB	1396.9	1449	1464.8	1535.5	1802.1	1811.9	2388.7	2181.8	1809.3	1212.1	662.2	152.6	141.2	150.7
	#	Location														
StdDev	1	40 @ HS	38.5788	53.0865	28.5665	31.9833	55.8196	47.4118	19.3922	17.7626	12.2002	16.64832	21.19329	23.90374	19.49045	13.67073
	2	40 @ Gordon	36.8964	41.357	55.5099	45.7622	41.2607	42.5427	23.9372	22.6041	27.0327	20.38109	10.01998	11.48961	11.12605	7.607745
	3	NB Coll @ MLK	18.6372	39.7644	33.2131	53.0811	30.9819	45.4953	54.5829	47.8573	50.1709	44.89754	24.62609	25.16192	14.68332	9.036346
	4	MB Coll @ MKT Br	24.2315	45.2372	29.8301	54.3936	41.307	32.7049	57.1335	49.718	55.404	39.79796	42.15171	31.6291	22.74618	17.59545
	5	NB Coll @ Mkt Rmp	21.0557	50.8816	33.8199	37.1886	39.7973	39.1051	61.2351	50.0533	54.0107	48.85989	40.22727	28.6994	19.29191	11.7213
	6	NB Coll @ Oleander	33.2012	58.0042	41.0008	53.2604	34.8235	32.8432	125.559	107.974	70.7292	30.81504	60.89745	103.4032	163.2157	14.21462
	7	NB Coll @ Shipyard	33.2012	58.0042	41.0008	53.2604	34.8235	32.8432	125.559	107.974	70.7292	30.81504	60.89745	103.4032	163.2157	14.21462
	8	NB Coll @ CB	32.5604	33.9249	12.1106	15.6223	31.1607	35.509	135.896	33.3941	126.949	57.53608	42.4658	9.128709	8.01457	10.75226
	9	NB Coll S of CB	33.0537	36.8872	17.9864	10.4163	34.0505	28.4036	113.847	45.7087	111.642	69.47973	20.13179	10.52193	7.299924	11.85139

VISSIM Throughput – With Contraflow, Moderate Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	218	497	660	682	766	899	1015	1196	1269	945	502	128	122	96
	2	40 @ Gordon	91	171	157	229	270	362	507	602	476	356	79	43	37	19
	3	NB Coll @ MLK	534	1290	1328	1301	1567	1663	2012	2322	2198	2005	496	169	145	111
	4	MB Coll @ MKT Br	576	1313	1302	1310	1613	1703	2002	2367	2187	1979	487	188	161	125
1	5	NB Coll @ Mkt Rmp	503	1190	1195	1149	1438	1522	1772	2137	1937	1776	347	97	83	59
	6	NB Coll @ Oleander	787	1381	1357	1422	1562	1655	1974	2165	1981	1782	541	41	52	66
	7	NB Coll @ Shipyard	787	1381	1357	1422	1562	1655	1974	2165	1981	1782	541	41	52	66
	8	NB Coll @ CB	1215	1381	1317	1421	1625	1675	2134	2043	1996	1527	193	57	53	57
	9	NB Coll S of CB	1369	1484	1456	1525	1780	1842	2449	2247	2276	1612	203	153	152	143
	10	WBR MLK (CF only)	146	223	224	272	365	368	667	577	592	376	252	155	113	80
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	184	606	567	695	743	921	1009	1287	1098	1092	407	138	116	99
	2	40 @ Gordon	103	160	162	219	278	313	513	556	498	331	77	37	22	19
	3	NB Coll @ MLK	510	1257	1304	1325	1525	1739	1969	2392	2198	1948	534	149	151	122
	4	MB Coll @ MKT Br	530	1312	1305	1368	1568	1726	1986	2397	2205	1884	530	167	172	144
2	5	NB Coll @ Mkt Rmp	452	1204	1161	1262	1371	1525	1744	2112	1980	1701	376	95	99	62
	6	NB Coll @ Oleander	771	1368	1310	1421	1535	1614	1972	2101	2050	1756	566	55	55	61
	7	NB Coll @ Shipyard	771	1368	1310	1421	1535	1614	1972	2101	2050	1756	566	55	55	61
	8	NB Coll @ CB	1242	1306	1336	1425	1602	1628	2162	1991	2071	1512	194	45	46	48
	9	NB Coll S of CB	1444	1421	1441	1541	1799	1805	2443	2277	2259	1611	222	127	145	159
	10	WBR MLK (CF only)	164	193	229	274	327	371	627	608	505	371	241	115	133	83
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	245	581	611	582	683	995	988	1341	1225	994	445	140	120	93
	2	40 @ Gordon	131	179	167	186	261	275	552	535	567	282	74	36	38	29
	3	NB Coll @ MLK	496	1325	1379	1329	1476	1836	1830	2252	2186	1989	509	176	151	112
	4	MB Coll @ MKT Br	554	1323	1373	1384	1516	1751	1897	2267	2185	1949	528	206	171	130
3	5	NB Coll @ Mkt Rmp	475	1204	1258	1246	1358	1541	1628	2036	1885	1755	363	117	98	61
	6	NB Coll @ Oleander	749	1436	1363	1349	1578	1678	1825	2156	1998	1797	550	52	53	50
	7	NB Coll @ Shipyard	749	1436	1363	1349	1578	1678	1825	2156	1998	1797	550	52	53	50
	8	NB Coll @ CB	1209	1360	1348	1423	1634	1589	2069	2065	2014	1548	171	54	60	67
	9	NB Coll S of CB	1401	1466	1440	1537	1872	1743	2435	2258	2274	1612	217	138	143	162
	10	WBR MLK (CF only)	163	251	216	242	341	345	643	582	568	320	254	136	128	78
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	183	532	663	617	769	970	910	1297	1100	1130	475	118	104	100
	2	40 @ Gordon	87	164	167	224	277	332	510	486	582	343	66	39	34	30
	3	NB Coll @ MLK	475	1305	1397	1320	1555	1675	1984	2355	2210	1932	546	159	147	112
	4	MB Coll @ MKT Br	494	1301	1421	1372	1572	1641	2056	2364	2230	1911	492	186	163	130
4	5	NB Coll @ Mkt Rmp	431	1198	1265	1229	1422	1439	1771	2124	1954	1726	353	90	91	63
	6	NB Coll @ Oleander	806	1337	1351	1423	1590	1600	1936	2114	2011	1788	596	52	55	56
	7	NB Coll @ Shipyard	806	1337	1351	1423	1590	1600	1936	2114	2011	1788	596	52	55	56
	8	NB Coll @ CB	1205	1350	1341	1429	1606	1661	2172	2014	2047	1515	187	61	58	51
	9	NB Coll S of CB	1394	1472	1436	1549	1775	1829	2471	2209	2281	1620	199	161	144	154
	10	WBR MLK (CF only)	140	191	236	289	341	361	610	550	606	379	217	139	116	92

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	210	521	612	643	705	907	991	1215	1265	1068	430	145	112	110
	2	40 @ Gordon	111	157	184	179	265	305	504	610	519	300	97	42	36	25
	3	NB Coll @ MLK	557	1205	1287	1443	1554	1673	1943	2327	2141	1987	540	147	146	105
	4	MB Coll @ MKT Br	565	1255	1279	1487	1572	1717	1954	2346	2141	1965	484	174	163	126
5	5	NB Coll @ Mkt Rmp	481	1149	1182	1319	1389	1530	1707	2078	1925	1801	311	81	101	51
	6	NB Coll @ Oleander	812	1308	1370	1371	1531	1730	1870	2102	2080	1723	566	61	54	52
	7	NB Coll @ Shipyard	812	1308	1370	1371	1531	1730	1870	2102	2080	1723	566	61	54	52
	8	NB Coll @ CB	1192	1365	1320	1409	1625	1675	2114	2039	2055	1508	174	53	49	60
	9	NB Coll S of CB	1408	1463	1437	1542	1795	1816	2435	2261	2269	1611	203	161	146	152
	10	WBR MLK (CF only)	159	219	237	209	332	373	609	596	622	311	211	144	121	94
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	220	551	730	532	731	955	934	1233	1125	1182	394	136	119	111
	2	40 @ Gordon	101	171	160	197	294	308	520	534	546	286	87	53	36	32
	3	NB Coll @ MLK	481	1319	1294	1343	1637	1644	2026	2280	2310	1958	486	204	145	107
	4	MB Coll @ MKT Br	497	1369	1276	1343	1690	1689	2030	2301	2289	1915	487	224	158	128
6	5	NB Coll @ Mkt Rmp	445	1231	1148	1224	1471	1525	1750	2068	2055	1723	353	124	87	49
	6	NB Coll @ Oleander	790	1328	1364	1416	1555	1601	1958	2111	2091	1703	615	58	58	58
	7	NB Coll @ Shipyard	790	1328	1364	1416	1555	1601	1958	2111	2091	1703	615	58	58	58
	8	NB Coll @ CB	1189	1361	1347	1411	1612	1662	2095	2089	2002	1516	197	59	49	51
	9	NB Coll S of CB	1360	1474	1482	1529	1786	1826	2435	2276	2257	1605	218	152	153	146
	10	WBR MLK (CF only)	146	214	215	250	338	358	619	579	598	321	246	149	108	108
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	236	565	604	561	730	867	1007	1297	1174	1088	425	147	119	86
	2	40 @ Gordon	111	192	146	213	266	267	553	490	593	297	57	45	26	31
	3	NB Coll @ MLK	447	1224	1407	1407	1568	1664	1954	2309	2165	1868	525	153	154	105
	4	MB Coll @ MKT Br	457	1298	1346	1441	1620	1650	2012	2316	2167	1840	521	175	170	121
7	5	NB Coll @ Mkt Rmp	418	1152	1242	1289	1447	1451	1744	2085	1906	1661	358	99	96	44
	6	NB Coll @ Oleander	783	1363	1364	1458	1532	1642	1951	2154	1933	1788	536	48	63	45
	7	NB Coll @ Shipyard	783	1363	1364	1458	1532	1642	1951	2154	1933	1788	536	48	63	45
	8	NB Coll @ CB	1206	1359	1384	1450	1579	1668	2119	2056	1970	1513	187	54	49	54
	9	NB Coll S of CB	1366	1467	1476	1558	1744	1854	2434	2271	2251	1610	218	149	142	160
	10	WBR MLK (CF only)	176	249	197	290	337	329	595	605	621	332	225	139	115	98
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	241	592	593	677	776	755	1064	1305	1158	1056	491	138	129	98
	2	40 @ Gordon	108	160	164	198	308	291	509	566	546	329	76	50	33	24
	3	NB Coll @ MLK	447	1299	1288	1300	1525	1652	1932	2399	2157	1959	557	153	154	121
	4	MB Coll @ MKT Br	470	1305	1299	1293	1604	1690	1944	2416	2166	1855	591	182	172	136
8	5	NB Coll @ Mkt Rmp	447	1140	1180	1173	1462	1489	1722	2119	1927	1689	436	101	88	59
	6	NB Coll @ Oleander	842	1279	1392	1345	1504	1673	1921	2047	2039	1805	529	74	49	51
	7	NB Coll @ Shipyard	842	1279	1392	1345	1504	1673	1921	2047	2039	1805	529	74	49	51
	8	NB Coll @ CB	1218	1302	1372	1399	1599	1639	2164	1946	2073	1517	195	50	56	53
	9	NB Coll S of CB	1440	1426	1446	1538	1765	1838	2475	2217	2275	1611	216	153	148	148
	10	WBR MLK (CF only)	141	230	222	269	346	367	610	589	594	349	213	151	104	96

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	204	613	552	695	684	896	928	1272	1176	1046	524	130	129	99
	2	40 @ Gordon	92	159	178	163	319	324	522	552	541	328	84	37	40	35
	3	NB Coll @ MLK	504	1279	1340	1302	1490	1733	1926	2327	2298	1893	524	167	152	135
	4	MB Coll @ MKT Br	536	1305	1310	1391	1505	1695	1950	2372	2290	1853	501	196	177	156
9	5	NB Coll @ Mkt Rmp	464	1208	1155	1265	1350	1549	1703	2097	2028	1708	370	97	109	74
	6	NB Coll @ Oleander	814	1339	1316	1410	1564	1649	1936	2173	2015	1773	533	48	54	61
	7	NB Coll @ Shipyard	814	1339	1316	1410	1564	1649	1936	2173	2015	1773	533	48	54	61
	8	NB Coll @ CB	1220	1340	1321	1423	1624	1650	2143	2044	2027	1521	188	51	52	60
	9	NB Coll S of CB	1401	1463	1444	1540	1777	1823	2454	2281	2226	1624	215	139	151	162
	10	WBR MLK (CF only)	122	212	228	240	371	380	622	596	572	333	224	130	146	98
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	152	571	689	581	754	963	869	1268	1234	1157	409	141	101	101
	2	40 @ Gordon	92	189	155	214	283	385	530	521	520	355	67	26	34	29
	3	NB Coll @ MLK	481	1300	1301	1421	1537	1757	1917	2350	2145	1937	548	164	145	122
	4	MB Coll @ MKT Br	591	1250	1361	1416	1555	1736	1963	2372	2150	1891	543	181	171	138
10	5	NB Coll @ Mkt Rmp	522	1137	1227	1270	1403	1535	1726	2109	1911	1718	391	99	97	68
	6	NB Coll @ Oleander	854	1294	1391	1353	1549	1610	1936	2141	1969	1812	589	58	60	49
	7	NB Coll @ Shipyard	854	1294	1391	1353	1549	1610	1936	2141	1969	1812	589	58	60	49
	8	NB Coll @ CB	1242	1335	1350	1426	1537	1691	2165	1989	2046	1539	188	59	54	56
	9	NB Coll S of CB	1424	1428	1456	1548	1805	1782	2474	2209	2273	1623	203	151	157	166
	10	WBR MLK (CF only)	139	223	214	259	358	424	642	579	553	387	224	98	122	89
	#	Location														
	1	40 @ HS	209.3	562.9	628.1	626.5	734.1	912.8	971.5	1271.1	1182.4	1075.8	450.2	136.1	117.1	99.3
	2	40 @ Gordon	102.7	170.2	164	202.2	282.1	316.2	522	545.2	538.8	320.7	76.4	40.8	33.6	27.3
	3	NB Coll @ MLK	493.2	1280.3	1332.5	1349.1	1543.4	1703.6	1949.3	2331.3	2200.8	1947.6	526.5	164.1	149	115.2
	4	MB Coll @ MKT Br	527	1303.1	1327.2	1380.5	1581.5	1699.8	1979.4	2351.8	2201	1904.2	516.4	187.9	167.8	133.4
Avg	5	NB Coll @ Mkt Rmp	463.8	1181.3	1201.3	1242.6	1411.1	1510.6	1726.7	2096.5	1950.8	1725.8	365.8	100	94.9	59
	6	NB Coll @ Oleander	800.8	1343.3	1357.8	1396.8	1550	1645.2	1927.9	2126.4	2016.7	1772.7	562.1	54.7	55.3	54.9
	7	NB Coll @ Shipyard	800.8	1343.3	1357.8	1396.8	1550	1645.2	1927.9	2126.4	2016.7	1772.7	562.1	54.7	55.3	54.9
	8	NB Coll @ CB	1213.8	1345.9	1343.6	1421.6	1604.3	1653.8	2133.7	2027.6	2030.1	1521.6	187.4	54.3	52.6	55.7
	9	NB Coll S of CB	1400.7	1456.4	1451.4	1540.7	1789.8	1815.8	2450.5	2250.6	2264.1	1613.9	211.4	148.4	148.1	155.2
	10	WBR MLK (CF only)	149.6	220.5	221.8	259.4	345.6	367.6	624.4	586.1	583.1	347.9	230.7	135.6	120.6	91.6
	#	Location														
	1	40 @ HS	29.4884	37.7225	55.993	60.2297	34.0928	68.2329	59.024	44.5707	63.87	71.77248	44.9711	8.659613	9.314863	7.334091
	2	40 @ Gordon	13.2585	12.7087	10.9949	21.3791	19.3244	36.663	17.8637	41.3489	36.6084	27.5683	11.45232	7.685484	5.541761	5.396501
	3	NB Coll @ MLK	35.0232	39.8917	46.2919	53.9041	45.0708	61.1777	55.3635	45.6071	59.2374	42.78162	23.325	16.86186	3.771236	9.612492
	4	MB Coll @ MKT Br	45.8233	33.4779	46.6138	58.3538	53.7075	35.115	46.9827	45.274	53.2875	48.54276	33.70526	16.92762	6.08824	10.44775
StdDev	5	NB Coll @ Mkt Rmp	32.1344	33.5627	43.5432	51.3878	43.4932	38.094	41.9922	30.2701	54.7962	41.60876	32.38244	12.34684	7.709302	8.969083
	6	NB Coll @ Oleander	31.7098	46.087	27.0875	39.0834	25.3333	41.3247	46.7795	38.6557	49.5245	35.49664	29.65899	8.982081	4.056545	6.573516
	7	NB Coll @ Shipyard	31.7098	46.087	27.0875	39.0834	25.3333	41.3247	46.7795	38.6557	49.5245	35.49664	29.65899	8.982081	4.056545	6.573516
	8	NB Coll @ CB	17.9493	25.571	21.9859	13.6561	28.6591	29.2529	34.2217	42.5368	34.1645	12.80798	8.656404	4.877385	4.477102	5.578729
	9	NB Coll S of CB	29.6762	22.5842	16.1603	9.59224	33.8388	32.5365	17.1156	28.768	16.4887	6.226288	8.369256	10.7207	4.954235	7.771744
	10	WBR MLK (CF only)	15.7706	19.968	11.9425	24.9096	14.4545	24.7485	21.1566	16.8157	35.3568	28.20343	16.1524	17.50048	12.47397	9.287985

VISSIM Average Speeds – No Contraflow, Moderate Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	25.9	16.3	17.1	16	17.3	15.4	14.4	12.9	12.9	13.4	23.4	39.7	42.6	43.4
	4	MB Coll @ MKT Br	28.1	20.4	18.5	17.1	16.7	14.3	13.1	10.1	10.7	11.2	20.9	35.5	39.6	34.6
1	5	NB Coll @ Mkt Rmp	34.1	22.9	20.2	20.2	19.2	16.4	13.2	8.8	9.1	10.3	26.7	44.5	47.2	46.8
	6	NB Coll @ Oleander	19	17.1	18.5	17.4	16.3	17	16.5	13.5	9	11.3	10.3	12.4	17.8	37.7
	7	NB Coll @ Shipyard	19	17.1	18.5	17.4	16.3	17	16.5	13.5	9	11.3	10.3	12.4	17.8	37.7
	8	NB Coll @ CB	38.8	37.5	38.3	37.5	34.2	36.5	17.8	16.3	12	9.1	13.8	42.7	42.7	42.7
	9	NB Coll S of CB	41.8	41.9	41.9	41.7	41.5	41.6	41.2	19.3	9.9	6.8	13.2	43	43	43
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.6	18.7	17.6	17.6	16.1	16.3	15.1	13.1	12.8	13.5	22.5	32.4	37.8	39.3
	4	MB Coll @ MKT Br	25.7	20	20.1	20.6	15.8	15	12	10.2	10.1	11.6	21.8	34.5	36	33.5
2	5	NB Coll @ Mkt Rmp	26.7	21.7	21.8	22.4	16.7	16.8	11	8.8	8.8	10.5	25.6	42.9	41.4	40.6
	6	NB Coll @ Oleander	18.3	17.1	17.3	16.4	16.2	16	15.5	15.4	9.3	11.4	11.1	11.2	15	28.6
	7	NB Coll @ Shipyard	18.3	17.1	17.3	16.4	16.2	16	15.5	15.4	9.3	11.4	11.1	11.2	15	28.6
	8	NB Coll @ CB	39.1	38.6	38.6	37.9	36.4	32.7	19.8	16.5	15.1	8.7	14.7	42.7	42.8	42.6
	9	NB Coll S of CB	41.9	41.8	41.9	41.8	41.6	41.6	15.7	12.4	11.5	6.5	14.3	43.3	43.4	43
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	25.5	16.5	18.4	16.1	17.4	15.6	16.1	12.8	13.2	14	22.7	42.1	41.8	36.3
	4	MB Coll @ MKT Br	29.9	17.8	20.2	19.8	18.1	15.9	12.9	9.7	10.6	11.5	20.2	36.6	35	33.2
3	5	NB Coll @ Mkt Rmp	30.7	20.9	23.8	23.1	20.2	16	11.9	8	8.8	10.8	24.9	46.9	43.5	44.6
	6	NB Coll @ Oleander	18.9	18.2	16.7	17.3	17.8	16.1	15.4	14.6	9.1	11.8	11.5	11.3	14.8	34.5
	7	NB Coll @ Shipyard	18.9	18.2	16.7	17.3	17.8	16.1	15.4	14.6	9.1	11.8	11.5	11.3	14.8	34.5
	8	NB Coll @ CB	38	37.9	37.9	37.9	35.6	32.9	21.7	15.8	13	9.5	14	42.7	42.8	42.8
	9	NB Coll S of CB	41.8	41.8	41.8	41.8	41.6	41.6	41.2	24	10.6	6.3	16	43.2	43.1	43.3
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28.3	16.6	15.9	16.7	16.2	15.9	15	11.9	13.8	14	26.2	42.7	38.9	44.1
	4	MB Coll @ MKT Br	29.9	19.2	18.1	17.5	16.6	16.9	12.8	9.8	10.3	11.4	20.3	37.6	35.3	35.4
4	5	NB Coll @ Mkt Rmp	35.3	21.2	20.1	20.4	17.5	17.7	12.7	8	8.6	10.5	25.7	46.1	42.7	45.5
	6	NB Coll @ Oleander	18.3	16.4	17.2	17.1	16.8	16.8	15.8	14.4	9	10.9	10.8	11.4	16.8	34.2
	7	NB Coll @ Shipyard	18.3	16.4	17.2	17.1	16.8	16.8	15.8	14.4	9	10.9	10.8	11.4	16.8	34.2
	8	NB Coll @ CB	38.3	37.7	38.8	36.5	35.5	32.1	18.4	16.5	12.5	8.8	13	42.8	42.8	42.6
	9	NB Coll S of CB	41.8	41.8	41.8	41.8	41.7	41.6	41.1	19.7	10.4	6.5	13.6	43.1	43.2	43.3
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.9	18.4	16.9	16.5	15.4	16.4	15.6	13.4	12.7	14.8	23	35.6	38.7	40.6
	4	MB Coll @ MKT Br	31.6	20.7	18.8	17.4	17.3	17.9	13	10.2	10.7	11.6	19.1	32.6	37.8	35.7
5	5	NB Coll @ Mkt Rmp	32.8	21.6	21	21.3	19.5	18	13.4	8.9	9	11	23.5	38.9	44.3	44.9
	6	NB Coll @ Oleander	19.5	16.8	17.6	16.1	17.4	17.4	15.9	15.2	9.7	12.1	10.4	10.5	17.5	35.9
	7	NB Coll @ Shipyard	19.5	16.8	17.6	16.1	17.4	17.4	15.9	15.2	9.7	12.1	10.4	10.5	17.5	35.9
	8	NB Coll @ CB	38	38.4	38.1	37.6	35.5	34.6	20.9	16.4	14.7	9	14.6	43	42.6	42.6
	9	NB Coll S of CB	41.7	41.9	41.8	41.8	41.7	41.6	17.3	12.6	11.4	6.5	14.2	43.2	42.9	43.6
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	27	17.6	16.9	16.5	16.1	16.1	15.7	13	13.5	14.1	25.3	40	37.5	41.4
	4	MB Coll @ MKT Br	31	19.4	20.1	18.1	17.9	15.7	13.4	10.5	10.9	11.3	23.9	36.6	37.2	33.8
6	5	NB Coll @ Mkt Rmp	36.8	20	22.4	20.3	20.2	16.5	12.5	9.1	9.3	10.8	28	42.8	43.1	47.1
	6	NB Coll @ Oleander	20.4	16.6	18.2	16.8	17	17.1	16.4	13.8	9.3	12	11.2	12.4	20.1	33.5
	7	NB Coll @ Shipyard	20.4	16.6	18.2	16.8	17	17.1	16.4	13.8	9.3	12	11.2	12.4	20.1	33.5
	8	NB Coll @ CB	37.5	36.9	37.6	37.2	33.7	35.2	18.6	16	13.3	9.2	15.3	42.8	43	42.5
	9	NB Coll S of CB	41.8	41.9	41.9	41.7	41.6	41.7	41.2	27.6	10.5	6.4	14.2	43	43.3	43.1

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
7	3	NB Coll @ MLK	30	16.7	18.4	18.7	15.9	15.3	14.7	12.4	13.8	14.1	24.4	41.5	40.9	45.9
	4	MB Coll @ MKT Br	29.5	19.3	22.2	19.9	16.8	16	12	10.7	10.9	11.5	21.2	38.1	36.1	38.9
	5	NB Coll @ Mkt Rmp	34.7	21.2	24.2	22.1	19.5	19	12.2	8.8	9.2	10.7	26	47.5	43.8	46.9
	6	NB Coll @ Oleander	18.3	16.6	17	16.7	16.8	16.4	15.7	13.8	10.5	11.8	10.9	10.9	16.6	34.5
	7	NB Coll @ Shipyard	18.3	16.6	17	16.7	16.8	16.4	15.7	13.8	10.5	11.8	10.9	10.9	16.6	34.5
	8	NB Coll @ CB	38	38.9	37.9	36.5	33.5	32.2	19	15.9	12.2	8.9	13.3	42.4	42.7	42.8
	9	NB Coll S of CB	41.9	41.8	41.9	41.7	41.6	41.6	41.1	16.7	10.1	6.8	12.9	43	43.4	43.2
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
8	3	NB Coll @ MLK	26.4	19.6	16.6	16.9	15.8	15.8	15.6	12.8	12.8	14.5	25.1	34.5	40.8	44.4
	4	MB Coll @ MKT Br	27.8	21.2	19.6	17.5	17.4	16.6	13.8	10.6	10.3	11.4	21.1	33	34.2	34.2
	5	NB Coll @ Mkt Rmp	30.4	23	22.8	20.5	17.9	18.4	13	8.7	8.4	10.7	26.6	36.1	45.1	46.3
	6	NB Coll @ Oleander	17.8	16.9	16.7	16.5	16.5	16.6	15.4	14.5	9	11.7	11.2	14	19.6	26.3
	7	NB Coll @ Shipyard	17.8	16.9	16.7	16.5	16.5	16.6	15.4	14.5	9	11.7	11.2	14	19.6	26.3
	8	NB Coll @ CB	38.2	36.7	37.4	36.2	34.3	35.2	17.7	16.3	11.7	9.6	15.9	42.8	42.5	42.7
	9	NB Coll S of CB	41.8	41.7	41.9	41.8	41.6	41.6	40.9	15.5	9.9	6.7	14.1	43.4	43.1	43.4
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
9	3	NB Coll @ MLK	28.4	17	15.8	15.6	15.9	15.9	15.2	12.4	13.9	14.9	22.6	36.7	41	42.7
	4	MB Coll @ MKT Br	30.2	17.8	16.6	17.8	18.6	15.8	12.6	10.1	11.1	11.7	24.3	36.5	37.1	34.4
	5	NB Coll @ Mkt Rmp	31.9	20.4	19	21.3	20.1	16.6	13.7	9.1	9.6	10.9	28.2	43.7	44.9	47.9
	6	NB Coll @ Oleander	17.2	16.6	16.6	16.8	16.1	16.2	16.3	15.1	10.3	11.8	11.1	11.7	16.6	34.4
	7	NB Coll @ Shipyard	17.2	16.6	16.6	16.8	16.1	16.2	16.3	15.1	10.3	11.8	11.1	11.7	16.6	34.4
	8	NB Coll @ CB	38.9	38	38.7	37.2	34.5	33.5	19.3	15.6	12.9	10	13.6	42.5	42.8	42.7
	9	NB Coll S of CB	41.8	41.9	41.7	41.7	41.6	41.6	41.1	36.8	12	7	16	42.7	43.4	42.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
10	3	NB Coll @ MLK	25.3	17.6	16.3	16.3	15.6	15.8	15.2	13.3	12.3	13.8	24.2	37.9	40.2	41.4
	4	MB Coll @ MKT Br	27.8	17.7	17.7	17.3	18.3	15.3	13.1	10.9	10.1	11.4	22	35.3	36.8	36.1
	5	NB Coll @ Mkt Rmp	29.5	18.4	19.7	19.5	18.7	16.3	13.3	9	8.8	10.7	26	41.6	44.2	46.4
	6	NB Coll @ Oleander	19.2	17.8	17.1	17.5	16.6	16.5	16.6	13.4	9.4	11.7	10.7	10.9	18.8	31
	7	NB Coll @ Shipyard	19.2	17.8	17.1	17.5	16.6	16.5	16.6	13.4	9.4	11.7	10.7	10.9	18.8	31
	8	NB Coll @ CB	38.9	38.7	38.6	39	34.2	35.6	18.2	15.4	13.8	9.1	13.9	42.6	42.4	42.2
	9	NB Coll S of CB	41.8	41.7	41.9	41.8	41.5	41.6	37.1	11.5	10.8	6.8	14.3	43.1	42.7	42.8
	#	Location														
Avg	3	NB Coll @ MLK	27.03	17.5	16.99	16.69	16.17	15.85	15.26	12.8	13.17	14.11	23.94	38.31	40.02	41.95
	4	MB Coll @ MKT Br	29.15	19.35	19.19	18.3	17.35	15.94	12.87	10.28	10.57	11.46	21.48	35.63	36.51	34.98
	5	NB Coll @ Mkt Rmp	32.29	21.13	21.5	21.11	18.95	17.17	12.69	8.72	8.96	10.69	26.12	43.1	44.02	45.7
	6	NB Coll @ Oleander	18.69	17.01	17.29	16.86	16.75	16.61	15.95	14.37	9.46	11.65	10.92	11.67	17.36	33.06
	7	NB Coll @ Shipyard	18.69	17.01	17.29	16.86	16.75	16.61	15.95	14.37	9.46	11.65	10.92	11.67	17.36	33.06
	8	NB Coll @ CB	38.37	37.93	38.19	37.35	34.74	34.05	19.14	16.07	13.12	9.19	14.21	42.7	42.71	42.62
	9	NB Coll S of CB	41.81	41.82	41.85	41.76	41.6	41.61	35.79	19.61	10.71	6.63	14.28	43.1	43.15	43.14
	#	Location														
Std Dev	3	NB Coll @ MLK	1.47275	1.09646	0.91948	0.89125	0.66675	0.35668	0.50376	0.45704	0.55388	0.499889	1.298033	3.46649	1.715161	2.794141
	4	MB Coll @ MKT Br	1.77717	1.26161	1.58637	1.28755	0.88349	1.01456	0.56382	0.38816	0.35292	0.150555	1.613691	1.82942	1.550233	1.671859
	5	NB Coll @ Mkt Rmp	3.05558	1.35405	1.78139	1.13671	1.22225	1.02529	0.81711	0.40222	0.3534	0.2079	1.384678	3.561211	1.561196	2.060205
	6	NB Coll @ Oleander	0.90976	0.57629	0.64023	0.45995	0.538	0.46056	0.46488	0.72273	0.54406	0.356682	0.376534	1.026374	1.776513	3.445835
	7	NB Coll @ Shipyard	0.90976	0.57629	0.64023	0.45995	0.538	0.46056	0.46488	0.72273	0.54406	0.356682	0.376534	1.026374	1.776513	3.445835
	8	NB Coll @ CB	0.52504	0.74692	0.48637	0.83166	0.94892	1.56436	1.32178	0.38887	1.12921	0.401248	0.907316	0.169967	0.172884	0.175119
	9	NB Coll S of CB	0.05676	0.07888	0.07071	0.05164	0.06667	0.03162	10.2508	7.96499	0.71562	0.221359	1.027186	0.194365	0.236878	0.275681

VISSIM Average Speeds – With Contraflow, Moderate Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	23.6	16.1	16.1	16.3	15	15.7	14.8	14	14.2	14.7	21.3	42	41.9	43
	4	MB Coll @ MKT Br	27	18.1	20.2	20.2	17.1	17.1	15.4	15.5	15.3	16	26.3	36.2	34.8	35.5
	5	NB Coll @ Mkt Rmp	26.1	19.7	21.9	22.1	17.9	17.3	14.9	14.9	14.6	16.9	33.7	45.7	42.3	46.6
1	6	NB Coll @ Oleander	18.5	15.3	15.9	15.6	15.3	15.7	14.3	13.9	14.7	15.1	19	33.1	30.6	30.4
	7	NB Coll @ Shipyard	18.5	15.3	15.9	15.6	15.3	15.7	14.3	13.9	14.7	15.1	19	33.1	30.6	30.4
	8	NB Coll @ CB	36.5	34.3	34.7	35.4	33.9	32.6	23.7	27	30.1	29.8	34.9	38.5	40.5	40.9
	9	NB Coll S of CB	42	41.7	41.8	41.9	41.6	41.6	41.2	41.3	41.3	41.6	42.6	43	43.4	43.1
	10	WBR MLK (CF only)	19	18.8	18.1	18.2	18.5	18.1	16.5	17.4	16.7	16.9	18.6	18.7	19.3	18.9
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28.9	15.1	16.4	17.3	14.6	15.3	14.1	14	14.2	13.6	25.5	39.5	38.2	45.4
	4	MB Coll @ MKT Br	27.7	18.8	18.6	19.2	17.7	15.5	16	15	15	16.3	26.8	37.9	35.1	35.6
	5	NB Coll @ Mkt Rmp	30.5	22	20.3	19.1	18.3	15.8	14.9	14.1	14.2	16.1	32.6	47.8	44.1	46.7
2	6	NB Coll @ Oleander	17.6	15.5	15	15.8	14.9	15.3	14.6	14.5	14.5	15.4	16.6	33.2	30.9	31
	7	NB Coll @ Shipyard	17.6	15.5	15	15.8	14.9	15.3	14.6	14.5	14.5	15.4	16.6	33.2	30.9	31
	8	NB Coll @ CB	34.1	34.3	35	35.8	33.7	35.4	25.5	26.9	22.2	33.3	35.3	39.8	40.3	40.1
	9	NB Coll S of CB	41.8	41.9	41.8	41.8	41.7	41.5	41.2	41.3	41.3	41.7	42.6	43.4	43.1	42.8
	10	WBR MLK (CF only)	19.4	18.5	18.9	18	18.3	18.6	17.2	17.5	17.8	17.2	18.9	19.3	18.5	18.6
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	33.9	15.8	15.7	14.5	15	14.9	13.9	14	14.3	15.1	28.1	42	38.5	45
	4	MB Coll @ MKT Br	32.6	19.3	19.2	18.5	17	16.4	17.1	15.3	15	17.9	27.9	36	35.3	35.8
	5	NB Coll @ Mkt Rmp	35.1	20.2	20.3	19.9	18.5	16.3	16	14.6	14.6	16.9	37.2	44.4	41.6	45.4
3	6	NB Coll @ Oleander	18.3	14.8	15.8	15.4	15.6	14.4	15.5	15.3	14.7	15.6	18	33.7	37.9	30.7
	7	NB Coll @ Shipyard	18.3	14.8	15.8	15.4	15.6	14.4	15.5	15.3	14.7	15.6	18	33.7	37.9	30.7
	8	NB Coll @ CB	36.3	34.9	34.8	35.4	34.2	33.6	24.2	22.9	28.4	32.2	38.3	39.6	39.5	40
	9	NB Coll S of CB	41.9	41.9	41.8	41.7	41.6	41.7	41.3	41.4	41.1	41.8	43.2	43.6	43	43
	10	WBR MLK (CF only)	19	18.7	18.9	18.9	18.4	18.2	17.1	16.4	18	17.5	18.2	19.1	18.4	19.2
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.1	14.3	15.5	15.8	15.3	14.3	14.2	14.4	14	14.9	23.4	40.3	44.7	44.2
	4	MB Coll @ MKT Br	25.5	20.8	18.4	17.1	17.5	16.3	16.2	15.2	15.7	16.6	27.8	34.7	38.2	36.2
	5	NB Coll @ Mkt Rmp	24	23.4	19	17	19	16.9	15.2	14.4	14.9	16.5	34.8	45.3	46.6	44.8
4	6	NB Coll @ Oleander	17.3	15.5	14.9	15.8	15.6	15.3	15.1	13.9	14.7	14.4	18.4	33.4	32.5	36.8
	7	NB Coll @ Shipyard	17.3	15.5	14.9	15.8	15.6	15.3	15.1	13.9	14.7	14.4	18.4	33.4	32.5	36.8
	8	NB Coll @ CB	35.7	35.1	35.2	34.6	32.8	32.6	19.6	27	26.9	33.6	35.1	40.2	40	40.6
	9	NB Coll S of CB	41.8	41.9	42	41.7	41.7	41.6	41.2	41.5	41.4	41.7	42.7	42.7	43.3	43.5
	10	WBR MLK (CF only)	19.1	18.5	18.5	18.4	18.4	18.4	17.6	17.1	17.5	17.8	18.3	19.2	18.8	19.1

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	24.1	14.6	16.8	16.1	14.9	14.4	14.4	14.3	14.5	14.1	27.7	41.2	40.6	42
	4	MB Coll @ MKT Br	30	17.5	20.1	18.3	16.7	16.9	16.3	15.3	15.2	15.5	30.6	34.7	36.9	35
	5	NB Coll @ Mkt Rmp	32.5	17.8	21.6	20	18.8	17.5	16.6	14.3	14.1	14.6	42.3	42.9	44.3	46.9
5	6	NB Coll @ Oleander	17.8	15.1	15.9	15.2	15.7	16.3	15.2	15.1	14.5	15.4	14.9	33	33.8	32.7
	7	NB Coll @ Shipyard	17.8	15.1	15.9	15.2	15.7	16.3	15.2	15.1	14.5	15.4	14.9	33	33.8	32.7
	8	NB Coll @ CB	37.1	35.4	33.9	35.7	33.3	32.1	18.8	26.5	26.8	34.9	39.5	39.6	40.1	41.2
	9	NB Coll S of CB	41.7	41.9	41.9	41.8	41.6	41.6	41.2	41.2	41.4	41.8	42.5	43.1	43.4	43.1
	10	WBR MLK (CF only)	19.1	18.3	18.7	18.8	18.3	18.1	16.7	17.3	17.2	18.2	18.5	18.8	19	19.2
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28.8	15.6	15.1	16.6	14.4	14.8	14.5	14.1	14.4	13.8	25.7	39.6	40.4	43.5
	4	MB Coll @ MKT Br	27.2	18.1	18.7	18.3	17.3	16.4	15.5	15.2	15.3	15.2	28.4	34.9	34.7	35.1
	5	NB Coll @ Mkt Rmp	27.1	19.6	21.1	18.5	17.7	16.3	15.8	14.3	14.8	15	31.8	44.1	42	47.4
6	6	NB Coll @ Oleander	17.4	16.5	16.6	17.4	15.6	15.1	15.1	14.3	14.5	14.3	14.5	34.7	32.7	34.4
	7	NB Coll @ Shipyard	17.4	16.5	16.6	17.4	15.6	15.1	15.1	14.3	14.5	14.3	14.5	34.7	32.7	34.4
	8	NB Coll @ CB	34.5	33.5	35.5	36.2	33.5	33.4	24.2	21.9	29.2	35.2	34.1	40.3	40.2	38.5
	9	NB Coll S of CB	41.9	41.9	41.9	41.7	41.7	41.6	41.3	41.3	41.4	41.7	43	43.2	43.2	43.2
	10	WBR MLK (CF only)	19.8	18.3	18.9	18.6	18.7	18.5	17.4	17.3	16.7	18.3	18.4	18.4	18.9	19
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	24.6	16.4	16.7	15	15.6	14.8	15.3	14.2	14.4	13.8	25.9	40.3	38.6	46.4
	4	MB Coll @ MKT Br	30.2	20.7	21.2	17.6	17.7	17	16.4	15.4	16.4	16.7	26.8	37.7	35.5	36.1
	5	NB Coll @ Mkt Rmp	31.9	24	20.8	17.1	17.5	18.1	16.8	14.7	14.6	16.1	31	45.8	44	47.3
7	6	NB Coll @ Oleander	19.4	15.4	16	15.6	15.9	16	14.7	14.1	15.5	14.5	18.4	36.9	32.3	30.8
	7	NB Coll @ Shipyard	19.4	15.4	16	15.6	15.9	16	14.7	14.1	15.5	14.5	18.4	36.9	32.3	30.8
	8	NB Coll @ CB	35.5	35	35.5	34.7	34.4	32.6	25.3	28.4	29.6	34.2	32.9	39.2	39	40.9
	9	NB Coll S of CB	41.9	41.9	41.9	41.7	41.6	41.6	41.1	41.4	41.4	41.8	42.9	43.2	43.2	43.3
	10	WBR MLK (CF only)	18.8	19.1	19	18.5	18.1	18.3	17.2	17.3	17	18	18.9	18.7	18.6	18.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	25	15.1	15.8	14.8	14.5	14.8	13.8	14.1	14.4	15	21.2	43.5	40.9	47
	4	MB Coll @ MKT Br	26.1	19.3	18.7	18.6	16.4	17.8	15.1	15.6	15.7	16.2	23.7	37.8	34.3	36.8
	5	NB Coll @ Mkt Rmp	28.3	21	20.4	20.1	17.3	18.2	14.9	14.5	14.4	17	25.1	46.6	42	50.1
8	6	NB Coll @ Oleander	17.2	17	15.4	17	16.6	15.2	14.1	15.2	14.9	14.9	15.6	24.8	33.3	32.9
	7	NB Coll @ Shipyard	17.2	17	15.4	17	16.6	15.2	14.1	15.2	14.9	14.9	15.6	24.8	33.3	32.9
	8	NB Coll @ CB	35.3	36.7	35.9	35.7	32.7	35.3	24.2	28.4	22.9	33.4	36.3	39.7	39.4	39.4
	9	NB Coll S of CB	41.8	41.9	41.9	41.8	41.6	41.5	41.2	41.3	41.3	41.8	42.7	42.9	43.2	43.1
	10	WBR MLK (CF only)	19.5	18.9	19.2	18.7	18.1	18	17.2	16.1	16.9	18.3	18.6	19	18.9	19.2

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	24.3	17.4	17.4	15.6	14.4	15.3	14.2	13.9	13.9	13.9	26.7	39.5	37.8	43
	4	MB Coll @ MKT Br	28.7	19.3	18.7	18.7	17.7	16.4	16	15.3	15.4	16.1	27.8	36	37.6	34.5
	5	NB Coll @ Mkt Rmp	30.4	20.3	19.9	19.7	18.7	17.7	15.1	14.2	14.5	16.1	30.6	48.2	43.8	43.9
9	6	NB Coll @ Oleander	17.3	15	15	15.1	15.5	15.3	15.3	14.1	14.4	15.1	17	29.1	33.5	32.1
	7	NB Coll @ Shipyard	17.3	15	15	15.1	15.5	15.3	15.3	14.1	14.4	15.1	17	29.1	33.5	32.1
	8	NB Coll @ CB	33.5	34.8	34.6	35.2	33.5	31.8	24.1	26.3	26.4	31.8	38.8	38.9	40.7	39.8
	9	NB Coll S of CB	41.9	41.9	41.8	41.8	41.6	41.6	41.4	41.3	41.3	41.8	42.9	43	42.9	43.1
	10	WBR MLK (CF only)	19.3	18.9	18.7	19	18.1	17.9	16.9	16.3	17	18.5	18.8	18.7	18.9	19
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	32.7	15.2	14.9	16	16.1	14.7	14.4	13.8	14.4	13.7	26.5	37.2	40.1	43.1
	4	MB Coll @ MKT Br	28.5	17.3	17.6	16.6	17	17.6	15.2	15.1	16.1	15	30.4	35.1	35	36.2
	5	NB Coll @ Mkt Rmp	27.6	18.8	20.3	17.9	17.6	17.8	15.6	14.2	15.5	15.1	34.7	44.8	44.5	44.6
10	6	NB Coll @ Oleander	16.2	15.6	16.4	14.8	14.7	15.1	14.7	13.9	15.3	14.8	15.7	34.5	35.2	35
	7	NB Coll @ Shipyard	16.2	15.6	16.4	14.8	14.7	15.1	14.7	13.9	15.3	14.8	15.7	34.5	35.2	35
	8	NB Coll @ CB	35.3	35.8	34	33.3	28.9	29.5	19.3	26.8	24.4	32.6	32.8	39.1	38.7	39.6
	9	NB Coll S of CB	41.8	42	41.9	41.8	41.4	41.6	41.3	41.4	41.4	41.8	42.7	43.4	43.2	43.3
	10	WBR MLK (CF only)	19.2	18.6	18.2	18.6	18	17.8	16.5	16.6	17.8	17.6	18.9	19	18.5	19.3
	#	Location														
	3	NB Coll @ MLK	27.2	15.56	16.04	15.8	14.98	14.9	14.36	14.08	14.27	14.26	25.2	40.51	40.17	44.26
	4	MB Coll @ MKT Br	28.35	18.92	19.14	18.31	17.21	16.74	15.92	15.29	15.51	16.15	27.65	36.1	35.74	35.68
	5	NB Coll @ Mkt Rmp	29.35	20.68	20.56	19.14	18.13	17.19	15.58	14.42	14.62	16.03	33.38	45.56	43.52	46.37
Avg	6	NB Coll @ Oleander	17.7	15.57	15.69	15.77	15.54	15.37	14.86	14.43	14.77	14.95	16.81	32.64	33.27	32.68
	7	NB Coll @ Shipyard	17.7	15.57	15.69	15.77	15.54	15.37	14.86	14.43	14.77	14.95	16.81	32.64	33.27	32.68
	8	NB Coll @ CB	35.38	34.98	34.91	35.2	33.09	32.89	22.89	26.21	26.69	33.1	35.8	39.49	39.84	40.1
	9	NB Coll S of CB	41.85	41.89	41.87	41.77	41.61	41.59	41.24	41.34	41.33	41.75	42.78	43.15	43.19	43.15
	10	WBR MLK (CF only)	19.22	18.66	18.71	18.57	18.29	18.19	17.03	16.93	17.26	17.83	18.61	18.89	18.78	19.02
	#	Location														
	3	NB Coll @ MLK	3.71753	0.91311	0.7919	0.85894	0.55737	0.42687	0.4402	0.18135	0.19465	0.594792	2.446767	1.756543	2.08276	1.637885
	4	MB Coll @ MKT Br	2.13711	1.20812	1.05851	1.02897	0.4508	0.6802	0.62325	0.1792	0.46296	0.834333	1.994576	1.294433	1.33766	0.68443
Std	5	NB Coll @ Mkt Rmp	3.33875	1.96061	0.83825	1.56361	0.60562	0.82926	0.70836	0.25298	0.39384	0.860297	4.510186	1.644655	1.545459	1.792608
Dev	6	NB Coll @ Oleander	0.8705	0.67995	0.59526	0.82199	0.52324	0.52715	0.45265	0.56578	0.3653	0.450309	1.599618	3.369866	2.110845	2.138951
	7	NB Coll @ Shipyard	0.8705	0.67995	0.59526	0.82199	0.52324	0.52715	0.45265	0.56578	0.3653	0.450309	1.599618	3.369866	2.110845	2.138951
	8	NB Coll @ CB	1.11235	0.8804	0.64713	0.82731	1.56876	1.71364	2.58906	2.14188	2.77347	1.594435	2.381409	0.566569	0.660303	0.825967
	9	NB Coll S of CB	0.08498	0.07379	0.06749	0.06749	0.08756	0.05676	0.08433	0.08433	0.09487	0.070711	0.214994	0.267706	0.159513	0.190029
	10	WBR MLK (CF only)	0.28983	0.2675	0.35103	0.3093	0.21833	0.26013	0.37133	0.52292	0.4812	0.52504	0.260128	0.276687	0.278089	0.229976

VISSIM Maximum Queues – No Contraflow, Minimal Event Case

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	Max
	1	NB Coll @ MLK	2007	1116	1251	1814	3191	1908	1275	366	298	3191
	2	WBT MLK	0	89	0	0	57	0	0	0	0	89
	3	WBR MLK	165	318	249	339	348	485	162	138	164	485
	4	NB Coll @ Mkt	720	397	444	694	380	629	515	92	210	720
	5	NBT @ Oleander	1836	1398	2745	2976	1202	800	244	179	200	2976
	6	EBL Oleander	1462	1518	1540	1392	1579	1644	103	110	196	1644
	7	EBT Oleander	255	348	297	350	199	201	0	0	0	350
1	8	WBTR Oleander	117	30	72	120	75	259	172	113	134	259
	9	NBT Coll @ Mky Jct	281	386	346	793	514	412	100	123	110	793
	10	EBL CB	116	192	223	369	151	217	152	279	95	369
	11	EBL Mkt @ MLK	43	49	60	59	103	132	86	61	42	132
	12	NBT MLK	57	49	55	78	133	76	51	74	37	133
	13	WBR Mkt	454	710	646	712	701	697	107	319	103	712
	14	Ramp @ Gordon	825	1865	1134	1292	2305	1542	449	139	174	2305

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	1356	1669	2453	1894	1958	2543	184	306	670	2543
	2	WBT MLK	55	53	82	62	40	36	0	0	0	82
	3	WBR MLK	184	235	318	308	354	354	273	143	109	354
	4	NB Coll @ Mkt	735	619	858	368	491	743	134	0	0	858
	5	NBT @ Oleander	689	1115	1264	2635	1832	2460	175	497	508	2635
	6	EBL Oleander	1230	1627	1718	2255	2370	1956	169	126	90	2370
2	7	EBT Oleander	217	238	280	304	222	307	0	0	0	307
	8	WBTR Oleander	0	0	138	132	70	186	132	114	113	186
	9	NBT Coll @ Mky Jct	531	366	467	535	797	231	87	81	102	797
	10	EBL CB	255	195	122	286	266	256	169	171	193	286
	11	EBL Mkt @ MLK	128	65	65	80	62	240	112	40	61	240
	12	NBT MLK	96	37	77	50	53	64	34	35	34	96
	13	WBR Mkt	421	612	493	598	618	766	150	104	163	766
	14	Ramp @ Gordon	1172	2078	1773	1281	2071	2373	623	108	665	2373

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	1504	1176	1110	1993	2935	1541	910	188	326	2935
	2	WBT MLK	35	16	38	0	33	0	0	0	0	38
	3	WBR MLK	185	204	339	384	612	441	164	111	103	612
	4	NB Coll @ Mkt	383	624	415	736	654	788	44	189	0	788
	5	NBT @ Oleander	1471	1331	1081	2234	2155	2112	510	869	677	2234
	6	EBL Oleander	1482	1471	1481	1754	1844	1597	312	101	90	1844
3	7	EBT Oleander	253	281	361	270	322	283	0	0	0	361
	8	WBTR Oleander	0	30	94	157	108	355	130	96	172	355
	9	NBT Coll @ Mky Jct	305	432	366	487	344	449	91	65	165	487
	10	EBL CB	124	423	158	216	190	271	382	112	260	423
	11	EBL Mkt @ MLK	94	67	64	81	64	82	24	23	24	94
	12	NBT MLK	58	53	66	54	94	80	32	42	35	94
	13	WBR Mkt	623	517	513	603	389	842	192	144	61	842
	14	Ramp @ Gordon	1035	1142	1434	1746	1952	1064	245	268	131	1952

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	2053	1258	1464	2766	1656	1767	252	375	246	2766
	2	WBT MLK	35	0	61	20	0	36	0	0	0	61
	3	WBR MLK	367	389	368	455	299	325	183	124	178	455
	4	NB Coll @ Mkt	492	597	894	456	675	963	73	0	16	963
	5	NBT @ Oleander	2319	944	1554	2389	1460	1505	871	430	451	2389
	6	EBL Oleander	1190	1267	1495	1231	1557	1661	279	102	106	1661
	7	EBT Oleander	1188	1265	1493	1229	1555	1658	0	0	0	1658
4	8	WBTR Oleander	47	0	70	166	119	71	20	198	72	198
	9	NBT Coll @ Mky Jct	668	454	551	617	743	126	69	81	86	743
	10	EBL CB	229	239	156	152	152	109	249	462	152	462
	11	EBL Mkt @ MLK	59	66	59	106	71	84	61	42	22	106
	12	NBT MLK	36	33	39	72	76	54	33	54	44	76
	13	WBR Mkt	600	495	310	813	765	460	43	79	36	813
	14	Ramp @ Gordon	1382	1649	1068	2550	3316	2148	69	497	80	3316

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	1531	1227	1485	1921	3630	3767	431	375	575	3767
	2	WBT MLK	61	72	35	31	111	118	0	0	0	118
	3	WBR MLK	266	195	358	356	362	510	201	189	146	510
	4	NB Coll @ Mkt	775	625	830	507	468	852	154	26	39	852
	5	NBT @ Oleander	1803	2083	1194	1588	2344	2410	187	197	267	2410
	6	EBL Oleander	1663	1795	1618	1737	1553	1392	234	90	86	1795
5	7	EBT Oleander	150	378	256	256	286	168	0	0	0	378
	8	WBTR Oleander	95	79	163	133	102	263	132	219	68	263
	9	NBT Coll @ Mky Jct	757	368	438	1842	2281	171	104	86	19	2281
	10	EBL CB	166	175	185	212	117	193	259	197	138	259
	11	EBL Mkt @ MLK	45	123	120	104	88	96	28	66	47	123
	12	NBT MLK	71	53	73	74	73	161	32	34	50	161
	13	WBR Mkt	270	610	732	710	812	560	88	148	126	812
	14	Ramp @ Gordon	2413	791	1183	2338	2382	1542	134	206	570	2413

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	2169	1567	1935	2211	3980	2260	565	425	288	3980
	2	WBT MLK	75	21	51	52	40	84	0	0	0	84
	3	WBR MLK	260	200	398	374	413	579	258	147	144	579
	4	NB Coll @ Mkt	618	838	757	467	1050	479	450	119	0	1050
	5	NBT @ Oleander	1073	1375	1255	1566	1705	1913	597	110	249	1913
	6	EBL Oleander	1323	1320	1569	1944	2522	2503	436	109	103	2522
6	7	EBT Oleander	301	264	146	282	174	276	0	0	0	301
	8	WBTR Oleander	28	94	106	115	86	154	262	85	184	262
	9	NBT Coll @ Mky Jct	506	559	582	975	619	416	92	87	107	975
	10	EBL CB	203	150	313	149	175	230	170	182	172	313
	11	EBL Mkt @ MLK	47	80	82	40	90	101	22	123	66	123
	12	NBT MLK	57	33	33	53	73	52	78	69	36	78
	13	WBR Mkt	664	591	762	710	778	236	189	103	146	778
	14	Ramp @ Gordon	1118	949	1484	1558	1778	2335	242	349	325	2335

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	1221	1434	1216	1676	1287	3979	327	707	620	3979
	2	WBT MLK	0	58	39	0	0	62	0	0	0	62
	3	WBR MLK	220	177	327	320	300	405	133	121	128	405
	4	NB Coll @ Mkt	663	758	399	879	637	290	111	0	157	879
	5	NBT @ Oleander	2166	1506	1031	2449	2718	1770	1039	619	340	2718
	6	EBL Oleander	1556	1407	1796	2280	2593	2618	878	233	61	2618
7	7	EBT Oleander	1554	1405	1794	2278	2591	2615	876	0	0	2615
	8	WBTR Oleander	64	52	167	147	140	202	176	74	141	202
	9	NBT Coll @ Mky Jct	448	398	372	446	607	115	103	102	117	607
	10	EBL CB	237	151	156	221	267	332	174	150	237	332
	11	EBL Mkt @ MLK	45	61	150	63	121	103	71	86	131	150
	12	NBT MLK	35	33	72	58	53	95	35	33	36	95
	13	WBR Mkt	486	491	312	452	630	325	111	60	40	630
	14	Ramp @ Gordon	1001	1703	1271	1131	1513	1515	1220	176	508	1703

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	1801	1410	1155	1706	2467	3029	434	403	471	3029
	2	WBT MLK	0	25	21	15	14	78	0	0	0	78
	3	WBR MLK	141	358	279	538	369	358	129	156	137	538
	4	NB Coll @ Mkt	476	735	565	767	549	878	109	184	44	878
	5	NBT @ Oleander	1361	1664	1072	1838	2080	1159	173	586	326	2080
	6	EBL Oleander	1707	1258	1788	1752	1525	1298	249	215	83	1788
8	7	EBT Oleander	254	332	204	231	341	211	0	0	0	341
	8	WBTR Oleander	56	0	72	146	89	371	181	32	129	371
	9	NBT Coll @ Mky Jct	377	407	480	561	470	376	137	101	89	561
	10	EBL CB	137	156	309	153	128	217	292	151	238	309
	11	EBL Mkt @ MLK	63	110	61	63	83	122	38	44	168	168
	12	NBT MLK	57	83	59	50	77	63	52	33	44	83
	13	WBR Mkt	570	246	773	587	620	295	100	105	122	773
	14	Ramp @ Gordon	1143	1035	1426	1559	1720	1312	651	72	70	1720

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	766	1515	1285	1730	2986	2564	432	169	432	2986
	2	WBT MLK	0	0	19	40	54	58	0	0	0	58
	3	WBR MLK	171	368	378	376	369	368	296	107	173	378
	4	NB Coll @ Mkt	420	229	956	553	640	1000	0	156	40	1000
	5	NBT @ Oleander	1411	1507	1417	2363	1679	2044	380	586	367	2363
	6	EBL Oleander	1417	1680	1679	1285	1797	1619	551	204	157	1797
9	7	EBT Oleander	277	337	411	220	257	195	0	0	22	411
	8	WBTR Oleander	55	0	55	211	140	183	189	134	76	211
	9	NBT Coll @ Mky Jct	369	524	528	847	445	282	104	100	105	847
	10	EBL CB	150	133	190	445	255	195	221	188	256	445
	11	EBL Mkt @ MLK	125	107	87	65	44	129	46	43	41	129
	12	NBT MLK	31	0	92	74	52	107	30	37	43	107
	13	WBR Mkt	398	686	850	889	681	551	121	85	98	889
	14	Ramp @ Gordon	1047	1146	1793	1015	1691	1102	476	507	122	1793

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	1943	1893	1971	2725	1795	3261	364	466	202	3261
	2	WBT MLK	44	58	119	15	103	51	0	0	0	119
	3	WBR MLK	374	319	403	368	352	493	148	112	126	493
	4	NB Coll @ Mkt	706	639	1362	783	542	407	211	200	60	1362
	5	NBT @ Oleander	1288	1753	1505	1897	1642	1203	568	145	234	1897
	6	EBL Oleander	1531	1264	1382	1301	1604	1564	67	101	152	1604
10	7	EBT Oleander	411	271	234	224	312	346	0	0	0	411
	8	WBTR Oleander	115	0	80	109	145	203	154	48	178	203
	9	NBT Coll @ Mky Jct	571	502	627	517	620	233	125	122	137	627
	10	EBL CB	309	250	215	127	418	163	293	191	272	418
	11	EBL Mkt @ MLK	65	64	62	25	63	173	86	84	64	173
	12	NBT MLK	56	53	53	75	73	74	33	51	41	75
	13	WBR Mkt	575	652	629	546	715	574	78	107	81	715
	14	Ramp @ Gordon	986	1338	1719	1104	2592	1791	562	0	177	2592

	#	Location	Avg Max Queue
	1	NB Coll @ MLK	3243.7
	2	WBT MLK	78.9
	3	WBR MLK	480.9
	4	NB Coll @ Mkt	935
	5	NBT @ Oleander	2361.5
	6	EBL Oleander	1964.3
Avg	7	EBT Oleander	713.3
	8	WBTR Oleander	251
	9	NBT Coll @ Mky Jct	871.8
	10	EBL CB	361.6
	11	EBL Mkt @ MLK	143.8
	12	NBT MLK	99.8
	13	WBR Mkt	773
	14	Ramp @ Gordon	2250.2

	#	Location	StdevMax Queue
	1	NB Coll @ MLK	504.06
	2	WBT MLK	25.8
	3	WBR MLK	84.462
	4	NB Coll @ Mkt	178.76
	5	NBT @ Oleander	348.81
	6	EBL Oleander	384.35
Std	7	EBT Oleander	784.14
Dev	8	WBTR Oleander	65.73
	9	NBT Coll @ Mky Jct	516.42
	10	EBL CB	71.716
	11	EBL Mkt @ MLK	41.984
	12	NBT MLK	27.708
	13	WBR Mkt	73.746
	14	Ramp @ Gordon	492.5

VISSIM Maximum Queues, With Contraflow, Minimal Event Case

Run	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	Max
	1	NB Coll @ MLK	225	398	429	391	504	403	217	93	176	504
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	0	70	97	70	0	69	0	0	97
	4	NB Coll @ Mkt	419	1131	394	1063	901	1555	170	278	73	1555
	5	NBT @ Oleander	335	297	370	1005	680	1099	59	48	143	1099
	6	EBL Oleander	1444	1871	2438	2912	3062	2972	823	101	250	3062
	7	EBT Oleander	195	323	211	221	244	212	0	0	0	323
1	8	WBTR Oleander	32	124	92	71	85	125	86	51	78	125
	9	NBT Coll @ Mky Jct	390	354	244	282	300	152	93	93	90	390
	10	EBL CB	267	158	278	169	233	207	233	186	312	312
	11	EBL Mkt @ MLK	57	102	134	74	78	117	80	73	41	134
	12	NBT MLK	0	33	37	34	36	34	0	0	0	37
	13	WBR Mkt	431	418	358	567	341	375	218	203	84	567
	14	Ramp @ Gordon	121	0	101	139	185	198	116	0	0	198
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	563	698	626	352	510	502	239	149	296	698
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	165	0	68	71	0	0	69	0	165
	4	NB Coll @ Mkt	863	812	928	673	1071	735	46	46	75	1071
	5	NBT @ Oleander	611	146	477	529	1190	106	114	71	60	1190
	6	EBL Oleander	2077	2320	2653	3381	3788	3894	1788	156	141	3894
2	7	EBT Oleander	308	244	222	189	174	201	130	0	0	308
	8	WBTR Oleander	56	81	64	104	137	51	85	70	32	137
	9	NBT Coll @ Mky Jct	232	282	446	423	242	257	78	67	91	446
	10	EBL CB	105	239	252	410	108	316	258	194	167	410
	11	EBL Mkt @ MLK	70	58	86	88	104	82	72	56	22	104
	12	NBT MLK	0	29	39	17	19	147	0	0	18	147
	13	WBR Mkt	333	343	245	469	278	493	143	158	242	493
	14	Ramp @ Gordon	0	0	0	147	272	47	20	0	141	272
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	592	546	475	400	835	365	133	120	231	835
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	25	0	48	71	54	23	50	0	0	71
	4	NB Coll @ Mkt	687	745	1221	379	506	786	536	24	0	1221
	5	NBT @ Oleander	291	746	637	926	816	322	54	44	61	926
	6	EBL Oleander	2245	2812	3047	4208	4350	4650	2744	583	112	4650
3	7	EBT Oleander	2232	2799	3034	4195	4337	4637	2731	0	0	4637
	8	WBTR Oleander	51	65	54	50	100	174	162	0	129	174
	9	NBT Coll @ Mky Jct	265	263	497	288	270	229	94	53	59	497
	10	EBL CB	299	166	400	163	199	226	225	204	279	400
	11	EBL Mkt @ MLK	110	41	53	61	85	55	71	41	60	110
	12	NBT MLK	0	0	21	18	40	41	49	0	0	49
	13	WBR Mkt	454	444	272	525	819	517	163	94	145	819
	14	Ramp @ Gordon	179	0	0	216	184	0	122	150	0	216
	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	473	395	415	379	345	271	60	166	249	473
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	69	49	0	0	50	0	0	0	0	69
	4	NB Coll @ Mkt	875	549	851	1214	1633	343	65	242	69	1633
	5	NBT @ Oleander	461	477	374	691	113	122	111	60	73	691
	6	EBL Oleander	2278	2597	3017	3335	3650	3721	2079	160	119	3721
	7	EBT Oleander	236	234	218	245	275	160	203	0	0	275
4	8	WBTR Oleander	71	68	57	71	70	195	102	92	104	195
	9	NBT Coll @ Mky Jct	246	341	286	518	432	79	75	59	73	518
	10	EBL CB	138	154	222	275	205	202	202	165	246	275
	11	EBL Mkt @ MLK	92	88	56	83	120	120	60	39	67	120
	12	NBT MLK	15	21	0	20	39	0	58	22	0	58
	13	WBR Mkt	499	232	278	552	581	196	137	133	370	581
	14	Ramp @ Gordon	23	159	0	0	323	177	134	128	0	323

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	595	262	529	402	518	529	246	204	48	595
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	28	69	69	0	0	0	0	0	0	69
	4	NB Coll @ Mkt	1144	776	641	1072	1089	1030	205	153	0	1144
	5	NBT @ Oleander	379	718	182	479	519	766	133	117	68	766
	6	EBL Oleander	1929	2389	2770	3137	3882	3915	1752	227	97	3915
5	7	EBT Oleander	195	246	188	292	211	209	229	0	0	292
	8	WBTR Oleander	55	36	45	87	54	142	27	74	130	142
	9	NBT Coll @ Mky Jct	408	215	371	444	331	139	91	52	57	444
	10	EBL CB	288	148	197	153	172	186	255	288	225	288
	11	EBL Mkt @ MLK	78	69	89	48	72	126	90	48	126	126
	12	NBT MLK	32	0	50	19	18	0	25	21	20	50
	13	WBR Mkt	387	447	341	440	442	238	131	202	171	447
	14	Ramp @ Gordon	41	22	115	119	241	0	123	0	0	241

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	339	561	518	627	592	482	230	75	235	627
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	0	0	0	49	49	69	0	48	69
	4	NB Coll @ Mkt	453	1423	942	905	491	697	303	46	100	1423
	5	NBT @ Oleander	240	599	633	738	569	528	98	74	8	738
	6	EBL Oleander	2371	3211	3171	3721	4079	4109	2038	413	83	4109
6	7	EBT Oleander	249	278	356	215	155	199	153	0	0	356
	8	WBTR Oleander	86	30	39	79	85	139	165	118	52	165
	9	NBT Coll @ Mky Jct	349	255	321	345	421	120	43	64	55	421
	10	EBL CB	228	357	141	215	212	335	272	186	205	357
	11	EBL Mkt @ MLK	93	101	73	42	55	79	54	42	75	101
	12	NBT MLK	35	0	23	39	0	20	21	110	32	110
	13	WBR Mkt	224	449	520	595	255	378	235	103	149	595
	14	Ramp @ Gordon	54	0	45	237	248	174	84	66	0	248

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	555	319	601	603	509	560	212	231	53	603
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	0	49	0	0	38	0	0	0	49
	4	NB Coll @ Mkt	1028	650	497	970	923	678	134	114	19	1028
	5	NBT @ Oleander	287	406	430	341	758	594	58	34	36	758
	6	EBL Oleander	2407	3147	3344	3989	4165	4098	1870	273	166	4165
7	7	EBT Oleander	167	267	238	244	254	232	163	0	0	267
	8	WBTR Oleander	119	57	51	75	81	176	93	98	127	176
	9	NBT Coll @ Mky Jct	238	287	256	238	275	247	49	50	74	287
	10	EBL CB	184	251	219	289	131	200	117	198	117	289
	11	EBL Mkt @ MLK	81	74	95	40	59	115	43	84	60	115
	12	NBT MLK	36	0	0	0	38	49	22	0	15	49
	13	WBR Mkt	344	387	566	531	338	559	318	217	167	566
	14	Ramp @ Gordon	27	0	53	153	20	0	108	0	0	153

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
	1	NB Coll @ MLK	376	383	337	613	405	471	40	180	75	613
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	88	68	0	0	49	50	63	0	88
	4	NB Coll @ Mkt	402	762	683	826	888	1135	60	153	0	1135
	5	NBT @ Oleander	373	446	506	582	757	441	79	147	63	757
	6	EBL Oleander	3138	3810	4201	4678	4890	4905	2673	573	130	4905
8	7	EBT Oleander	260	219	224	273	224	252	150	0	0	273
	8	WBTR Oleander	71	51	74	71	126	103	200	160	123	200
	9	NBT Coll @ Mky Jct	272	278	245	477	349	96	59	56	56	477
	10	EBL CB	263	103	178	181	205	217	181	186	212	263
	11	EBL Mkt @ MLK	60	57	72	58	92	118	28	61	22	118
	12	NBT MLK	0	0	38	21	23	18	0	76	0	76
	13	WBR Mkt	653	199	585	371	570	310	304	296	193	653
	14	Ramp @ Gordon	38	0	0	117	331	191	0	115	82	331

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
9	1	NB Coll @ MLK	483	353	473	442	409	394	77	88	95	483
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	0	0	48	0	48	50	0	0	50
	4	NB Coll @ Mkt	552	674	867	763	633	808	93	190	41	867
	5	NBT @ Oleander	365	653	546	240	329	340	55	97	57	653
	6	EBL Oleander	2638	2983	3385	4200	4972	4989	2984	826	50	4989
	7	EBT Oleander	242	207	250	200	223	226	170	0	0	250
	8	WBTR Oleander	39	57	124	90	114	205	145	118	51	205
	9	NBT Coll @ Mky Jct	279	255	284	367	339	207	58	76	85	367
	10	EBL CB	154	154	165	286	233	170	179	168	192	286
	11	EBL Mkt @ MLK	103	54	74	70	42	140	77	84	41	140
	12	NBT MLK	20	37	16	0	51	21	16	0	30	51
	13	WBR Mkt	505	445	484	599	236	212	357	217	185	599
	14	Ramp @ Gordon	0	67	102	0	158	73	131	148	82	158

	#	Location	Hr6	Hr7	Hr8	Hr9	Hr10	Hr11	Hr12	Hr13	Hr14	
10	1	NB Coll @ MLK	540	504	403	559	323	473	343	162	138	559
	2	WBT MLK	0	0	0	0	0	0	0	0	0	0
	3	WBR MLK	0	0	0	50	0	77	71	0	0	77
	4	NB Coll @ Mkt	414	995	357	792	800	440	0	15	424	995
	5	NBT @ Oleander	478	317	624	636	804	533	43	47	49	804
	6	EBL Oleander	2627	2807	3123	3359	4097	4098	2127	286	94	4098
	7	EBT Oleander	238	183	264	303	187	180	180	0	0	303
	8	WBTR Oleander	73	18	88	22	111	135	220	68	84	220
	9	NBT Coll @ Mky Jct	333	286	307	346	328	189	70	40	50	346
	10	EBL CB	177	241	262	251	146	180	295	164	89	295
	11	EBL Mkt @ MLK	56	79	40	114	56	122	55	38	34	122
	12	NBT MLK	36	0	26	19	34	54	16	17	31	54
	13	WBR Mkt	454	504	320	443	560	509	261	269	181	560
	14	Ramp @ Gordon	169	0	166	151	0	177	110	0	134	177

	#	Location	Avg Max Queue
Avg	1	NB Coll @ MLK	599
	2	WBT MLK	0
	3	WBR MLK	80.4
	4	NB Coll @ Mkt	1207.2
	5	NBT @ Oleander	838.2
	6	EBL Oleander	4150.8
	7	EBT Oleander	728.4
	8	WBTR Oleander	173.9
	9	NBT Coll @ Mky Jct	419.3
	10	EBL CB	317.5
	11	EBL Mkt @ MLK	119
	12	NBT MLK	68.1
	13	WBR Mkt	588
	14	Ramp @ Gordon	231.7

	#	Location	StdevMax Queue
Std Dev	1	NB Coll @ MLK	108.76
	2	WBT MLK	0
	3	WBR MLK	33.15
	4	NB Coll @ Mkt	251.59
	5	NBT @ Oleander	177.92
	6	EBL Oleander	578.99
	7	EBT Oleander	1373.7
	8	WBTR Oleander	31.751
	9	NBT Coll @ Mky Jct	72.191
	10	EBL CB	52.61
	11	EBL Mkt @ MLK	12.347
	12	NBT MLK	34.417
	13	WBR Mkt	99.118
	14	Ramp @ Gordon	63.397

VISSIM Throughput – No Contraflow, Minimal Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	267	1299	1797	1725	1760	1849	1965	1940	2159	2299	2266	1387	888	832
	2	40 @ Gordon	429	1261	1281	1494	1442	1378	1638	1461	1794	1901	1697	775	691	654
	3	NB Coll @ MLK	436	1176	1221	1289	1221	1273	1373	1307	1455	1604	1323	548	483	574
1	4	MB Coll @ MKT Br	489	1253	1286	1311	1293	1376	1402	1436	1525	1651	1350	574	556	587
	5	NB Coll @ Mkt Rmp	449	1107	1216	1159	1189	1264	1245	1294	1372	1469	1152	439	424	457
	6	NB Coll @ Oleander	793	1361	1379	1403	1377	1493	1447	1553	1607	1640	979	480	373	404
	7	NB Coll @ Shipyard	793	1361	1379	1403	1377	1493	1447	1553	1607	1640	979	480	373	404
	8	NB Coll @ CB	1255	1498	1456	1489	1487	1565	1541	1667	1804	1677	696	539	523	546
	9	NB Coll S of CB	1339	1470	1486	1491	1485	1571	1538	1675	1791	1705	612	543	517	557

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	238	1431	1763	1690	1785	1836	1946	1955	2156	2183	2412	1453	814	1046
	2	40 @ Gordon	332	1401	1352	1352	1330	1485	1493	1679	1694	1789	1629	971	593	713
	3	NB Coll @ MLK	449	1133	1238	1183	1219	1281	1341	1456	1452	1498	1312	627	442	516
2	4	MB Coll @ MKT Br	494	1250	1214	1273	1320	1288	1394	1532	1518	1554	1338	662	491	566
	5	NB Coll @ Mkt Rmp	433	1187	1087	1181	1217	1160	1267	1315	1361	1390	1129	530	387	479
	6	NB Coll @ Oleander	843	1392	1310	1408	1437	1451	1424	1554	1607	1657	1052	382	398	534
	7	NB Coll @ Shipyard	843	1392	1310	1408	1437	1451	1424	1554	1607	1657	1052	382	398	534
	8	NB Coll @ CB	1312	1489	1426	1418	1544	1550	1556	1676	1704	1775	700	517	550	544
	9	NB Coll S of CB	1387	1494	1431	1422	1545	1557	1559	1654	1723	1797	612	518	557	531

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	280	1278	1790	1864	1777	1779	1957	2022	2168	2257	2271	1430	899	956
	2	40 @ Gordon	314	1417	1453	1437	1400	1343	1618	1487	1794	1829	1652	809	712	617
	3	NB Coll @ MLK	438	1227	1242	1241	1255	1242	1351	1364	1446	1549	1306	585	498	495
3	4	MB Coll @ MKT Br	461	1332	1300	1268	1288	1354	1342	1427	1527	1586	1345	623	542	542
	5	NB Coll @ Mkt Rmp	401	1231	1184	1161	1163	1221	1212	1281	1417	1387	1150	502	416	421
	6	NB Coll @ Oleander	768	1474	1384	1342	1369	1492	1440	1532	1556	1646	1034	391	445	404
	7	NB Coll @ Shipyard	768	1474	1384	1342	1369	1492	1440	1532	1556	1646	1034	391	445	404
	8	NB Coll @ CB	1332	1462	1479	1442	1486	1574	1528	1657	1726	1774	668	566	547	510
	9	NB Coll S of CB	1422	1469	1455	1447	1483	1591	1522	1658	1756	1757	612	555	542	520

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	306	1323	1718	1782	1813	1791	2074	1858	2224	2335	2308	1300	891	936
	2	40 @ Gordon	367	1319	1358	1471	1420	1500	1573	1554	1757	1915	1730	655	709	695
	3	NB Coll @ MLK	447	1223	1180	1353	1192	1403	1243	1390	1526	1505	1337	453	556	462
4	4	MB Coll @ MKT Br	559	1262	1208	1404	1289	1399	1341	1394	1576	1640	1330	521	581	526
	5	NB Coll @ Mkt Rmp	467	1172	1067	1278	1157	1268	1208	1288	1381	1472	1128	399	470	430
	6	NB Coll @ Oleander	776	1388	1459	1401	1387	1489	1454	1572	1569	1729	880	454	457	449
	7	NB Coll @ Shipyard	776	1388	1459	1401	1387	1489	1454	1572	1569	1729	880	454	457	449
	8	NB Coll @ CB	1259	1474	1474	1492	1467	1582	1558	1639	1731	1793	674	534	554	531
	9	NB Coll S of CB	1349	1472	1486	1477	1480	1577	1542	1659	1730	1796	610	537	543	530

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	315	1327	1797	1754	1868	1911	1845	2033	2169	2056	2370	1392	974	917
	2	40 @ Gordon	423	1350	1353	1431	1463	1385	1601	1537	1772	1649	1810	770	679	716
	3	NB Coll @ MLK	508	1175	1208	1283	1260	1278	1356	1315	1522	1428	1422	513	555	504
5	4	MB Coll @ MKT Br	557	1266	1255	1267	1366	1283	1442	1424	1479	1562	1416	562	592	553
	5	NB Coll @ Mkt Rmp	495	1162	1116	1126	1258	1176	1271	1309	1327	1385	1200	443	466	455
	6	NB Coll @ Oleander	791	1331	1368	1445	1430	1398	1491	1539	1288	1868	1047	467	386	436
	7	NB Coll @ Shipyard	791	1331	1368	1445	1430	1398	1491	1539	1288	1868	1047	467	386	436
	8	NB Coll @ CB	1322	1385	1486	1504	1494	1574	1567	1633	1589	1890	693	571	506	539
	9	NB Coll S of CB	1397	1412	1475	1500	1490	1598	1544	1641	1728	1775	605	567	518	532
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	273	1364	1806	1773	1798	1834	1953	1927	2164	2220	2327	1440	967	910
	2	40 @ Gordon	389	1433	1300	1392	1425	1465	1439	1611	1800	1793	1846	721	743	683
	3	NB Coll @ MLK	453	1287	1230	1147	1261	1321	1279	1424	1439	1564	1350	575	571	472
6	4	MB Coll @ MKT Br	538	1325	1258	1275	1214	1397	1346	1504	1480	1660	1354	625	620	548
	5	NB Coll @ Mkt Rmp	465	1189	1162	1180	1071	1275	1239	1329	1341	1485	1169	511	489	425
	6	NB Coll @ Oleander	814	1461	1298	1431	1366	1452	1421	1541	1635	1653	983	471	394	431
	7	NB Coll @ Shipyard	814	1461	1298	1431	1366	1452	1421	1541	1635	1653	983	471	394	431
	8	NB Coll @ CB	1351	1386	1484	1500	1473	1517	1591	1670	1710	1783	674	551	498	573
	9	NB Coll S of CB	1421	1403	1497	1474	1479	1526	1604	1664	1703	1799	596	557	504	560
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	346	1260	1858	1814	1763	1790	1962	2033	2123	2278	2231	1444	980	871
	2	40 @ Gordon	345	1377	1523	1334	1393	1518	1468	1612	1720	1820	1697	809	675	632
	3	NB Coll @ MLK	420	1275	1253	1203	1254	1289	1313	1395	1477	1479	1380	524	476	547
7	4	MB Coll @ MKT Br	546	1277	1291	1234	1318	1356	1396	1416	1507	1568	1434	557	523	611
	5	NB Coll @ Mkt Rmp	488	1200	1156	1100	1214	1228	1238	1291	1311	1399	1237	425	426	479
	6	NB Coll @ Oleander	832	1449	1341	1350	1389	1468	1489	1504	1598	1622	1031	367	469	386
	7	NB Coll @ Shipyard	832	1449	1341	1350	1389	1468	1489	1504	1598	1622	1031	367	469	386
	8	NB Coll @ CB	1320	1468	1467	1456	1483	1570	1539	1651	1767	1747	661	542	534	556
	9	NB Coll S of CB	1396	1476	1471	1451	1474	1574	1565	1642	1764	1746	607	535	536	552
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	263	1314	1761	1781	1777	1791	1939	1975	2144	2244	2305	1356	911	893
	2	40 @ Gordon	418	1317	1351	1377	1281	1498	1560	1587	1735	1892	1649	743	688	642
	3	NB Coll @ MLK	452	1219	1162	1240	1213	1241	1422	1290	1474	1572	1302	534	473	532
8	4	MB Coll @ MKT Br	506	1275	1246	1311	1227	1311	1451	1349	1536	1678	1338	551	504	602
	5	NB Coll @ Mkt Rmp	474	1133	1182	1148	1129	1211	1299	1194	1416	1501	1114	447	391	482
	6	NB Coll @ Oleander	821	1322	1477	1361	1382	1461	1496	1469	1642	1618	996	403	367	509
	7	NB Coll @ Shipyard	821	1322	1477	1361	1382	1461	1496	1469	1642	1618	996	403	367	509
	8	NB Coll @ CB	1368	1437	1463	1476	1442	1604	1523	1637	1760	1775	659	520	542	539
	9	NB Coll S of CB	1455	1443	1451	1479	1448	1612	1514	1638	1777	1767	593	513	546	539

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	366	1255	1720	1735	1782	1831	1970	1928	2117	2241	2312	1314	854	922
	2	40 @ Gordon	382	1328	1387	1418	1360	1454	1509	1611	1686	1836	1656	746	705	675
	3	NB Coll @ MLK	475	1207	1190	1254	1245	1206	1329	1348	1449	1598	1279	566	518	478
9	4	MB Coll @ MKT Br	537	1253	1277	1253	1366	1275	1352	1434	1480	1683	1297	603	555	532
	5	NB Coll @ Mkt Rmp	470	1189	1127	1148	1219	1190	1218	1266	1351	1503	1127	481	449	417
	6	NB Coll @ Oleander	862	1351	1366	1396	1435	1405	1453	1563	1590	1667	1012	440	434	483
	7	NB Coll @ Shipyard	862	1351	1366	1396	1435	1405	1453	1563	1590	1667	1012	440	434	483
	8	NB Coll @ CB	1366	1431	1434	1446	1497	1539	1568	1672	1744	1797	650	524	570	516
	9	NB Coll S of CB	1451	1418	1458	1453	1482	1535	1596	1673	1739	1773	605	514	570	519
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	314	1250	1688	1885	1753	1743	1919	1993	2157	2322	2253	1379	850	954
	2	40 @ Gordon	392	1285	1412	1359	1399	1375	1577	1576	1740	1881	1611	856	676	663
	3	NB Coll @ MLK	342	1280	1268	1223	1239	1159	1418	1388	1439	1571	1316	527	501	484
10	4	MB Coll @ MKT Br	416	1349	1274	1301	1263	1323	1378	1440	1542	1618	1390	554	565	555
	5	NB Coll @ Mkt Rmp	345	1246	1164	1162	1113	1249	1229	1296	1398	1424	1151	429	439	468
	6	NB Coll @ Oleander	750	1451	1472	1308	1369	1453	1524	1539	1628	1613	962	459	447	420
	7	NB Coll @ Shipyard	750	1451	1472	1308	1369	1453	1524	1539	1628	1613	962	459	447	420
	8	NB Coll @ CB	1303	1482	1467	1491	1457	1567	1520	1677	1765	1783	620	550	536	540
	9	NB Coll S of CB	1384	1478	1469	1486	1443	1590	1531	1683	1769	1756	576	546	536	543
	#	Location														
	1	40 @ HS	296.8	1310.1	1769.8	1780.3	1787.6	1815.5	1953	1966.4	2158.1	2243.5	2305.5	1389.5	902.8	923.7
	2	40 @ Gordon	379.1	1348.8	1377	1406.5	1391.3	1440.1	1547.6	1571.5	1749.2	1830.5	1697.7	785.5	687.1	669
	3	NB Coll @ MLK	442	1220.2	1219.2	1241.6	1235.9	1269.3	1342.5	1367.7	1467.9	1536.8	1332.7	545.2	507.3	506.4
Avg	4	MB Coll @ MKT Br	510.3	1284.2	1260.9	1289.7	1294.4	1336.2	1384.4	1435.6	1517	1620	1359.2	583.2	552.9	562.2
	5	NB Coll @ Mkt Rmp	448.7	1181.6	1146.1	1164.3	1173	1224.2	1242.6	1286.3	1367.5	1441.5	1155.7	460.6	435.7	451.3
	6	NB Coll @ Oleander	805	1398	1385.4	1384.5	1394.1	1456.2	1463.9	1536.6	1572	1671.3	997.6	431.4	417	445.6
	7	NB Coll @ Shipyard	805	1398	1385.4	1384.5	1394.1	1456.2	1463.9	1536.6	1572	1671.3	997.6	431.4	417	445.6
	8	NB Coll @ CB	1318.8	1451.2	1463.6	1471.4	1483	1564.2	1549.1	1657.9	1730	1779.4	669.5	541.4	536	539.4
	9	NB Coll S of CB	1400.1	1453.5	1467.9	1468	1480.9	1573.1	1551.5	1658.7	1748	1767.1	602.8	538.5	536.9	538.3
	#	Location														
	1	40 @ HS	39.8017	56.0762	50.5037	60.6594	33.4073	46.7672	56.0119	56.1233	29.2896	80.52777	54.84372	53.90166	56.4167	57.1879
	2	40 @ Gordon	39.3967	57.1291	71.3364	52.7494	54.4795	63.5932	66.87	64.4847	41.3059	77.9291	77.51996	85.23986	39.08808	33.52611
	3	NB Coll @ MLK	42.5258	50.4112	33.8356	58.4488	23.4637	65.7285	55.9687	53.2521	32.2299	57.01228	41.9922	47.19652	42.10582	35.84597
StdDev	4	MB Coll @ MKT Br	46.3898	36.8565	31.1963	47.1759	51.1321	46.7162	40.189	51.4419	31.4713	49.30405	41.77134	43.3482	39.74488	28.98965
	5	NB Coll @ Mkt Rmp	45.5316	41.4573	46.3116	46.7025	57.2616	40.1547	28.9567	36.9686	36.1855	49.24824	37.80079	42.82834	33.51965	25.91032
	6	NB Coll @ Oleander	35.4871	56.8956	64.3984	42.8466	28.6102	33.2292	34.1775	30.1964	103.482	76.64355	51.32294	41.5938	37.36308	48.55512
	7	NB Coll @ Shipyard	35.4871	56.8956	64.3984	42.8466	28.6102	33.2292	34.1775	30.1964	103.482	76.64355	51.32294	41.5938	37.36308	48.55512
	8	NB Coll @ CB	39.1771	40.4552	20.0953	29.0945	27.4388	24.0361	22.8544	16.9407	57.8696	52.02179	24.13043	18.45234	21.98484	18.112
	9	NB Coll S of CB	38.475	32.0494	19.6494	24.0046	27.4568	27.2619	29.8152	15.3916	27.7008	28.61798	11.51617	18.82227	19.67203	14.53005

VISSIM Throughput – With Contraflow, Minimal Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	218	594	611	638	561	751	791	633	820	898	736	519	468	418
	2	40 @ Gordon	94	172	173	190	175	223	244	245	277	314	339	253	217	235
	3	NB Coll @ MLK	539	1327	1280	1376	1307	1334	1528	1445	1579	1760	1471	609	595	616
	4	MB Coll @ MKT Br	582	1299	1348	1362	1295	1415	1505	1455	1617	1680	1482	631	589	623
1	5	NB Coll @ Mkt Rmp	502	1172	1249	1192	1161	1309	1339	1324	1459	1514	1242	495	453	500
	6	NB Coll @ Oleander	779	1428	1376	1334	1393	1446	1476	1497	1635	1582	933	438	349	424
	7	NB Coll @ Shipyard	779	1428	1376	1334	1393	1446	1476	1497	1635	1582	933	438	349	424
	8	NB Coll @ CB	1259	1333	1371	1348	1376	1424	1448	1518	1597	1620	508	376	383	404
	9	NB Coll S of CB	1431	1437	1506	1413	1486	1543	1564	1659	1741	1786	605	504	548	563
	10	WBR MLK (CF only)	152	224	222	263	257	246	300	283	357	389	408	313	291	319
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	208	538	700	652	597	608	830	723	830	897	688	546	409	473
	2	40 @ Gordon	96	170	162	178	186	191	220	236	278	329	291	236	204	230
	3	NB Coll @ MLK	500	1269	1360	1259	1390	1352	1510	1452	1645	1567	1551	637	610	572
	4	MB Coll @ MKT Br	525	1326	1317	1292	1411	1409	1432	1485	1657	1594	1515	639	594	590
2	5	NB Coll @ Mkt Rmp	452	1208	1169	1175	1276	1270	1287	1305	1517	1411	1300	511	474	453
	6	NB Coll @ Oleander	765	1429	1360	1301	1368	1397	1433	1524	1576	1703	882	344	378	410
	7	NB Coll @ Shipyard	765	1429	1360	1301	1368	1397	1433	1524	1576	1703	882	344	378	410
	8	NB Coll @ CB	1221	1338	1345	1370	1376	1441	1381	1523	1619	1594	495	381	392	388
	9	NB Coll S of CB	1417	1460	1442	1483	1469	1593	1534	1660	1791	1710	579	565	544	547
	10	WBR MLK (CF only)	156	206	220	237	230	234	295	290	320	381	365	288	320	273
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	255	553	626	569	710	648	707	862	707	819	922	493	538	459
	2	40 @ Gordon	132	176	160	177	162	187	201	275	285	313	323	248	267	210
	3	NB Coll @ MLK	471	1339	1408	1293	1390	1368	1373	1438	1603	1705	1359	679	558	573
	4	MB Coll @ MKT Br	562	1295	1425	1287	1370	1396	1418	1503	1552	1700	1335	710	539	602
3	5	NB Coll @ Mkt Rmp	478	1148	1302	1195	1217	1241	1297	1343	1378	1501	1114	579	421	502
	6	NB Coll @ Oleander	757	1376	1445	1316	1393	1348	1473	1529	1507	1643	958	342	390	408
	7	NB Coll @ Shipyard	757	1376	1445	1316	1393	1348	1473	1529	1507	1643	958	342	390	408
	8	NB Coll @ CB	1190	1356	1383	1373	1336	1386	1457	1497	1573	1633	508	393	386	369
	9	NB Coll S of CB	1371	1459	1503	1464	1464	1534	1589	1667	1725	1772	616	537	557	540
	10	WBR MLK (CF only)	183	231	228	211	224	216	264	327	351	359	396	333	307	251
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	181	474	721	593	691	732	731	709	697	936	890	425	439	472
	2	40 @ Gordon	87	165	189	184	164	204	227	260	244	357	321	252	215	225
	3	NB Coll @ MLK	443	1343	1323	1320	1335	1455	1465	1529	1511	1705	1467	688	594	595
	4	MB Coll @ MKT Br	545	1326	1323	1391	1329	1346	1542	1483	1596	1662	1433	693	604	599
4	5	NB Coll @ Mkt Rmp	480	1194	1200	1251	1215	1190	1388	1302	1434	1478	1187	564	474	468
	6	NB Coll @ Oleander	799	1351	1317	1448	1434	1313	1482	1475	1621	1625	897	418	337	503
	7	NB Coll @ Shipyard	799	1351	1317	1448	1434	1313	1482	1475	1621	1625	897	418	337	503
	8	NB Coll @ CB	1226	1336	1344	1396	1330	1444	1451	1531	1624	1602	489	374	366	393
	9	NB Coll S of CB	1396	1468	1460	1492	1444	1552	1575	1658	1808	1736	574	555	519	547
	10	WBR MLK (CF only)	138	192	242	260	212	244	303	287	324	393	415	320	287	293

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	228	610	608	499	654	695	694	691	813	910	837	423	549	446
	2	40 @ Gordon	115	164	176	153	178	174	212	255	263	321	320	258	243	207
	3	NB Coll @ MLK	513	1300	1285	1407	1265	1387	1536	1376	1609	1601	1460	597	688	469
	4	MB Coll @ MKT Br	555	1310	1334	1384	1336	1391	1438	1456	1640	1567	1451	625	654	477
5	5	NB Coll @ Mkt Rmp	517	1147	1227	1248	1201	1269	1248	1290	1472	1441	1253	470	534	377
	6	NB Coll @ Oleander	848	1323	1323	1346	1360	1480	1447	1484	1579	1640	919	368	409	344
	7	NB Coll @ Shipyard	848	1323	1323	1346	1360	1480	1447	1484	1579	1640	919	368	409	344
	8	NB Coll @ CB	1246	1314	1318	1355	1393	1489	1396	1495	1633	1582	486	406	367	390
	9	NB Coll S of CB	1452	1421	1449	1457	1485	1615	1521	1660	1775	1744	566	570	503	565
	10	WBR MLK (CF only)	162	228	223	188	218	227	277	326	306	382	403	331	297	271

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	155	629	697	620	523	715	647	838	757	822	870	477	438	500
	2	40 @ Gordon	90	172	163	197	153	203	214	243	275	288	361	253	217	235
	3	NB Coll @ MLK	462	1381	1271	1343	1377	1381	1473	1527	1610	1605	1500	640	597	584
	4	MB Coll @ MKT Br	545	1391	1270	1362	1354	1405	1464	1568	1547	1664	1447	671	601	585
6	5	NB Coll @ Mkt Rmp	492	1236	1157	1217	1228	1243	1330	1415	1369	1498	1220	534	484	462
	6	NB Coll @ Oleander	842	1345	1316	1390	1394	1402	1455	1482	1605	1534	1016	360	432	408
	7	NB Coll @ Shipyard	842	1345	1316	1390	1394	1402	1455	1482	1605	1534	1016	360	432	408
	8	NB Coll @ CB	1238	1346	1332	1370	1374	1426	1418	1516	1602	1587	511	358	378	384
	9	NB Coll S of CB	1427	1458	1440	1480	1461	1545	1574	1662	1768	1741	579	552	538	552
	10	WBR MLK (CF only)	152	210	217	236	208	249	259	311	344	343	434	304	290	293

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	195	571	641	672	585	661	739	667	817	834	748	614	415	460
	2	40 @ Gordon	123	187	150	199	155	186	204	238	288	304	312	273	223	218
	3	NB Coll @ MLK	472	1321	1286	1382	1327	1394	1483	1447	1574	1745	1339	672	578	488
	4	MB Coll @ MKT Br	486	1345	1329	1366	1327	1469	1448	1530	1488	1748	1337	668	589	492
7	5	NB Coll @ Mkt Rmp	447	1197	1196	1214	1210	1308	1281	1400	1324	1555	1114	547	446	389
	6	NB Coll @ Oleander	785	1365	1363	1368	1425	1438	1443	1543	1530	1606	951	365	376	352
	7	NB Coll @ Shipyard	785	1365	1363	1368	1425	1438	1443	1543	1530	1606	951	365	376	352
	8	NB Coll @ CB	1215	1328	1396	1368	1419	1424	1466	1507	1568	1574	547	372	368	377
	9	NB Coll S of CB	1384	1432	1485	1454	1524	1550	1570	1649	1757	1768	623	554	505	533
	10	WBR MLK (CF only)	177	254	203	261	208	236	265	279	360	346	418	352	309	291

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	235	629	639	594	637	510	873	659	887	745	818	542	439	446
	2	40 @ Gordon	107	166	161	184	156	213	209	228	263	322	336	254	242	233
	3	NB Coll @ MLK	457	1305	1328	1266	1307	1364	1500	1430	1567	1753	1349	588	627	615
	4	MB Coll @ MKT Br	512	1330	1293	1322	1285	1386	1499	1408	1670	1658	1357	623	627	616
8	5	NB Coll @ Mkt Rmp	475	1198	1146	1187	1216	1202	1361	1277	1507	1447	1161	497	499	493
	6	NB Coll @ Oleander	837	1351	1332	1371	1281	1415	1457	1474	1612	1652	905	357	337	425
	7	NB Coll @ Shipyard	837	1351	1332	1371	1281	1415	1457	1474	1612	1652	905	357	337	425
	8	NB Coll @ CB	1218	1362	1329	1379	1337	1412	1416	1521	1654	1567	472	400	353	395
	9	NB Coll S of CB	1432	1455	1448	1490	1442	1553	1579	1653	1813	1725	551	554	533	560
	10	WBR MLK (CF only)	153	221	210	239	208	250	264	312	306	376	428	330	307	291

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	199	568	641	604	666	713	641	743	759	898	680	567	530	458
	2	40 @ Gordon	94	153	183	163	180	225	207	217	291	305	323	262	263	226
	3	NB Coll @ MLK	491	1316	1320	1308	1364	1268	1447	1463	1648	1653	1437	687	590	544
	4	MB Coll @ MKT Br	513	1324	1366	1309	1338	1359	1357	1511	1632	1725	1362	710	577	571
9	5	NB Coll @ Mkt Rmp	468	1178	1257	1172	1208	1232	1239	1366	1437	1575	1124	586	457	456
	6	NB Coll @ Oleander	835	1300	1410	1353	1380	1364	1458	1591	1571	1576	1015	367	373	339
	7	NB Coll @ Shipyard	835	1300	1410	1353	1380	1364	1458	1591	1571	1576	1015	367	373	339
	8	NB Coll @ CB	1222	1331	1392	1341	1361	1409	1482	1525	1585	1624	524	382	339	394
	9	NB Coll S of CB	1426	1451	1483	1455	1454	1519	1605	1657	1736	1778	600	557	493	565
	10	WBR MLK (CF only)	131	214	228	216	236	281	266	289	345	348	380	320	310	298
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	1	40 @ HS	163	614	631	653	579	647	690	737	895	860	735	571	444	424
	2	40 @ Gordon	85	191	171	183	185	230	215	240	309	291	309	271	191	225
	3	NB Coll @ MLK	468	1375	1289	1402	1416	1303	1480	1454	1622	1714	1439	630	571	599
	4	MB Coll @ MKT Br	531	1353	1378	1325	1414	1409	1418	1537	1591	1676	1422	638	575	615
10	5	NB Coll @ Mkt Rmp	453	1245	1222	1231	1290	1252	1283	1380	1393	1507	1204	520	459	496
	6	NB Coll @ Oleander	851	1335	1372	1379	1324	1404	1475	1482	1574	1694	867	391	382	416
	7	NB Coll @ Shipyard	851	1335	1372	1379	1324	1404	1475	1482	1574	1694	867	391	382	416
	8	NB Coll @ CB	1269	1318	1387	1392	1318	1445	1419	1514	1606	1587	505	353	364	393
	9	NB Coll S of CB	1474	1398	1509	1472	1424	1591	1534	1642	1814	1723	589	513	528	574
	10	WBR MLK (CF only)	141	214	229	220	246	277	264	306	365	344	425	331	259	268
	#	Location														
	1	40 @ HS	203.7	578	651.5	609.4	620.3	668	734.3	726.2	798.2	861.9	792.4	517.7	466.9	455.6
	2	40 @ Gordon	102.3	171.6	168.8	180.8	169.4	203.6	215.3	243.7	277.3	314.4	323.5	256	228.2	224.4
	3	NB Coll @ MLK	481.6	1327.6	1315	1335.6	1347.8	1360.6	1479.5	1456.1	1596.8	1680.8	1437.2	642.7	600.8	565.5
	4	MB Coll @ MKT Br	535.6	1329.9	1338.3	1340	1345.9	1398.5	1452.1	1493.6	1599	1667.4	1414.1	660.8	594.9	577
Avg	5	NB Coll @ Mkt Rmp	476.4	1192.3	1212.5	1208.2	1222.2	1251.6	1305.3	1340.2	1429	1492.7	1191.9	530.3	470.1	459.6
	6	NB Coll @ Oleander	809.8	1360.3	1361.4	1360.6	1375.2	1400.7	1459.9	1508.1	1581	1625.5	934.3	375	376.3	402.9
	7	NB Coll @ Shipyard	809.8	1360.3	1361.4	1360.6	1375.2	1400.7	1459.9	1508.1	1581	1625.5	934.3	375	376.3	402.9
	8	NB Coll @ CB	1230.4	1336.2	1359.7	1369.2	1362	1430	1433.4	1514.7	1606.1	1597	504.5	379.5	369.6	388.7
	9	NB Coll S of CB	1421	1443.9	1472.5	1466	1465.3	1559.5	1564.5	1656.7	1772.8	1748.3	588.2	546.1	526.8	554.6
	10	WBR MLK (CF only)	154.5	219.4	222.2	233.1	224.7	246	275.7	301	337.8	366.1	407.2	322.2	297.7	284.8
	#	Location														
	1	40 @ HS	31.7387	48.2678	39.7667	50.4649	60.5769	71.0258	76.2322	74.2306	67.5834	57.2741	86.26084	63.03976	52.4308	23.9824
	2	40 @ Gordon	16.1799	11.1275	11.8115	14.2033	12.808	18.9748	12.632	16.4658	17.9199	19.92319	18.91648	10.83205	24.8274	9.912954
	3	NB Coll @ MLK	29.0142	33.9123	42.8304	54.6488	47.2694	51.5109	46.6172	44.7721	40.8624	69.69585	69.1099	37.4286	36.24852	50.78768
	4	MB Coll @ MKT Br	28.0167	28.1443	44.0506	37.7183	42.9792	33.4008	52.9265	46.61	56.5744	54.47364	63.09684	34.36342	30.8309	51.29869
StdDev	5	NB Coll @ Mkt Rmp	22.7117	32.6974	48.8154	28.5688	36.7992	39.3593	48.1411	48.1936	62.5282	50.6207	63.76249	38.54593	31.12859	44.4852
	6	NB Coll @ Oleander	36.5811	41.6948	42.2327	41.5323	45.6138	49.1913	16.1895	38.1589	39.872	52.7178	51.4005	31.42186	30.25833	48.7293
	7	NB Coll @ Shipyard	36.5811	41.6948	42.2327	41.5323	45.6138	49.1913	16.1895	38.1589	39.872	52.7178	51.4005	31.42186	30.25833	48.7293
	8	NB Coll @ CB	23.119	15.2228	29.2273	17.6308	31.6368	27.5116	32.3117	11.8044	27.0738	22.21611	21.03568	16.91975	15.93877	9.933669
	9	NB Coll S of CB	30.8437	21.7585	27.7819	23.4094	28.1387	30.1044	26.7384	7.08755	33.0178	26.0898	22.7391	21.69716	21.25925	12.88582
	10	WBR MLK (CF only)	16.3248	16.688	10.83	24.5875	17.308	20.3306	17.0232	17.6887	22.0998	20.06905	21.88251	17.68741	17.21143	19.17637

VISSIM Average Speeds – No Contraflow, Minimal Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	30.8	18	17.4	17	17.1	16	16.7	16.7	15.5	15.6	17.3	23.1	25.2	24.6
	4	MB Coll @ MKT Br	34	20.3	20.9	17.8	20.2	18.1	18.9	18.7	16.9	16.4	19	26.8	31.2	26.4
1	5	NB Coll @ Mkt Rmp	33.1	23.3	21.9	21.9	22.2	17.9	22	20.5	17.3	16.8	21.8	32.8	37.9	31.2
	6	NB Coll @ Oleander	17.1	17.6	17.2	17.7	16.6	16.6	17.3	17.5	16.8	16.4	18.3	23.2	26.9	25.5
	7	NB Coll @ Shipyard	17.1	17.6	17.2	17.7	16.6	16.6	17.3	17.5	16.8	16.4	18.3	23.2	26.9	25.5
	8	NB Coll @ CB	39.1	37.8	37.5	38	37.4	37.6	38.3	36.3	35.2	34.8	39.8	42	41.5	41.7
	9	NB Coll S of CB	41.8	41.8	41.8	41.7	41.9	41.7	41.8	41.6	41.6	41.6	42.6	42.9	42.7	42.6
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	21.4	17.5	20	17.8	17.1	16	16.1	16.6	15.7	16.3	18.4	26.9	29.5	28.7
	4	MB Coll @ MKT Br	22.8	17	21.7	19.4	17.6	18.3	17.8	17.4	16.4	18.7	19.8	31.4	34.6	34.9
2	5	NB Coll @ Mkt Rmp	23.7	18.4	25.2	21.6	20	19.7	18.4	21.4	19	19.8	23	38.2	40.6	40.6
	6	NB Coll @ Oleander	16.7	16.7	18.9	16.1	16.4	17.6	16.6	17.5	16.8	16.9	17.6	34.7	21.9	21.3
	7	NB Coll @ Shipyard	16.7	16.7	18.9	16.1	16.4	17.6	16.6	17.5	16.8	16.9	17.6	34.7	21.9	21.3
	8	NB Coll @ CB	38.9	38.7	38.1	38.1	36.9	36.4	37.7	37.4	36.1	34.7	40.5	41.9	41.6	41.5
	9	NB Coll S of CB	41.9	41.7	41.8	41.9	41.9	41.8	41.7	41.7	41.7	41.6	42.7	42.6	42.6	42.8
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.3	16.5	16.2	16.8	16.4	16.7	15.9	16.9	16.1	16	19.1	22.6	29.5	33.7
	4	MB Coll @ MKT Br	27.5	18.1	18.3	21.6	18.1	18.8	17.1	19.7	16.9	17.1	20.5	31.2	31.4	37.1
3	5	NB Coll @ Mkt Rmp	29.4	21.6	19.6	21.3	21.3	20.8	19.1	22	18.8	19.7	22.9	37.2	37.6	40.6
	6	NB Coll @ Oleander	18.3	16.9	16.7	17.8	18.2	16.2	16.1	17.3	17.1	16.4	18.4	20	26.2	23.4
	7	NB Coll @ Shipyard	18.3	16.9	16.7	17.8	18.2	16.2	16.1	17.3	17.1	16.4	18.4	20	26.2	23.4
	8	NB Coll @ CB	36.9	36.9	38.1	37.6	37.8	39	37.5	36.2	36.2	36.8	39	41.4	41.5	41.6
	9	NB Coll S of CB	41.8	41.9	41.9	41.8	41.8	41.8	41.8	41.7	41.7	41.5	42.6	42.7	42.6	42.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	25.4	17.4	15.8	16.4	16.5	16.4	17.3	15.8	16.2	15.8	17.5	29.5	28.2	28.3
	4	MB Coll @ MKT Br	25.5	18.4	18.8	18.4	18.8	19.9	18.7	15.5	16.4	16.5	18.5	29.7	36.8	33.5
4	5	NB Coll @ Mkt Rmp	26.5	20.8	20.7	22.4	22.6	20.9	21.3	17.5	18	18.3	20.6	36.7	39.7	37.5
	6	NB Coll @ Oleander	20.2	17.7	17.6	16.5	17.2	17.2	16.7	17.1	16.8	16.2	20.5	20.5	20.8	29.1
	7	NB Coll @ Shipyard	20.2	17.7	17.6	16.5	17.2	17.2	16.7	17.1	16.8	16.2	20.5	20.5	20.8	29.1
	8	NB Coll @ CB	38.5	38.8	38.6	36.9	37.4	36.9	37.4	36.1	35.6	32	40.7	41.6	41.5	41.7
	9	NB Coll S of CB	41.8	41.7	41.8	41.7	41.8	41.7	41.8	41.8	41.5	41.5	42.6	42.8	42.6	42.6
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28	18.3	18	17.1	17	18.4	16.3	16.3	15.6	16	17.6	24.1	25	27.6
	4	MB Coll @ MKT Br	31.6	18.4	19.5	20.9	17.9	19.8	18.8	18.6	16.5	16.3	18.2	29.4	32.1	34.3
5	5	NB Coll @ Mkt Rmp	35.9	21.4	21.6	22.3	19.9	23.2	19.9	19.6	21.4	20	20.1	32	37.2	39.3
	6	NB Coll @ Oleander	20.9	17.3	17.5	16.2	16.6	16.8	17.6	17.2	17.3	15.8	18.3	19.9	22.1	20
	7	NB Coll @ Shipyard	20.9	17.3	17.5	16.2	16.6	16.8	17.6	17.2	17.3	15.8	18.3	19.9	22.1	20
	8	NB Coll @ CB	38.3	38.9	38.1	38.3	38.3	35.8	37.9	37.3	27.4	25.7	39.3	41.7	41.1	41.4
	9	NB Coll S of CB	41.8	41.9	41.7	41.8	41.8	41.7	41.8	41.7	39.4	41.5	42.5	42.7	42.6	42.9
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28.9	17.3	17.8	20.1	17	17.5	17.1	16.8	15.8	15.5	17.5	23.3	29.8	26.2
	4	MB Coll @ MKT Br	31.2	18.9	20	18	19.6	17.6	19.8	17.1	17.3	15.2	20.9	28.6	31	33.8
6	5	NB Coll @ Mkt Rmp	31.7	23.4	23.6	19.8	21.4	20	21.9	19.5	18.1	17.1	23.3	34.7	32.9	38.4
	6	NB Coll @ Oleander	21.1	17.5	16.2	17.7	16.8	16.9	16.2	17.5	17.2	16	18.7	22.5	26.1	23.3
	7	NB Coll @ Shipyard	21.1	17.5	16.2	17.7	16.8	16.9	16.2	17.5	17.2	16	18.7	22.5	26.1	23.3
	8	NB Coll @ CB	37.7	39	37.8	37.3	37.6	36.7	36.9	34.5	33.1	34.8	40	41.5	41.9	41.2
	9	NB Coll S of CB	41.7	42	42	41.9	41.8	41.7	41.8	41.7	41.7	41.6	42.4	42.6	42.7	42.6

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
7	3	NB Coll @ MLK	28.8	15.6	18.1	17.5	17.5	17.1	16.6	16.7	16	16	17.1	28.6	27.1	26.7
	4	MB Coll @ MKT Br	27.1	17	18	18.4	19.6	19.9	17.6	17.8	19.3	17.2	17.4	34.6	35.3	30.1
	5	NB Coll @ Mkt Rmp	28.1	19.3	19.6	21.4	22.8	20.7	20.5	20.4	21.1	18.6	20.2	37.9	40.6	37.1
	6	NB Coll @ Oleander	19.3	17	17.7	17.2	16.5	17	16.4	16.6	16.6	15.8	18.9	25	26.9	25.5
	7	NB Coll @ Shipyard	19.3	17	17.7	17.2	16.5	17	16.4	16.6	16.6	15.8	18.9	25	26.9	25.5
	8	NB Coll @ CB	38.5	38.8	38.3	37.8	37.2	37.2	38	37.3	35.1	34.6	40.8	41.9	41.6	41.9
	9	NB Coll S of CB	41.8	41.8	41.8	41.8	41.8	41.6	41.7	41.7	41.6	41.6	42.6	42.8	42.8	42.8
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
8	3	NB Coll @ MLK	24.1	18	17.3	18.8	17.3	16.5	16.2	16.3	16.5	15.3	17.5	23.4	25.8	21.9
	4	MB Coll @ MKT Br	28.8	19.5	19.4	20	17.6	17.6	17.8	17	16.9	16.3	20.7	31.6	27.5	30.9
	5	NB Coll @ Mkt Rmp	26	23	21.5	22.2	19.8	20.2	18.5	19.8	18.8	17.8	25	35.6	31.3	37.1
	6	NB Coll @ Oleander	18.2	17.5	16.9	16.9	16	15.9	16.9	16.1	16.3	16	17.3	28.7	23.7	22.8
	7	NB Coll @ Shipyard	18.2	17.5	16.9	16.9	16	15.9	16.9	16.1	16.3	16	17.3	28.7	23.7	22.8
	8	NB Coll @ CB	35.8	37.9	38.1	38.4	37.8	37.6	38.5	37.1	34.1	35.8	39.8	41.8	41.9	41.8
	9	NB Coll S of CB	41.5	41.7	41.9	42	41.9	41.7	41.8	41.7	41.6	41.5	42.6	42.9	43	42.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
9	3	NB Coll @ MLK	28.4	17.4	17.8	17.6	16.5	17.1	16.1	16.3	15.7	15.8	17.9	23.5	32.7	27
	4	MB Coll @ MKT Br	29.2	18.2	19.9	20.6	17.2	18.4	19.7	16.7	17.3	16.4	20.8	32.9	33.9	32.9
	5	NB Coll @ Mkt Rmp	31.7	20	21.3	22.6	19.3	21.4	21.6	19.3	19.2	17.5	23	37.4	39.4	38.3
	6	NB Coll @ Oleander	20	16.1	16.4	17.4	16.2	16.1	18.1	16.7	15.9	16.5	20.7	23.1	21.1	24.7
	7	NB Coll @ Shipyard	20	16.1	16.4	17.4	16.2	16.1	18.1	16.7	15.9	16.5	20.7	23.1	21.1	24.7
	8	NB Coll @ CB	38.1	37.4	37.5	38	37.7	38	37.2	36.3	33	35.9	40.4	41.6	41.6	41.9
	9	NB Coll S of CB	41.8	42	41.8	41.9	41.7	41.7	41.7	41.7	41.6	41.6	42.6	42.6	42.8	42.8
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
10	3	NB Coll @ MLK	38	17.7	16.3	16.5	17.3	16	18.1	16.1	15.7	16.4	17.5	26.2	32.5	26.4
	4	MB Coll @ MKT Br	33.5	19.5	18.6	17.9	20	17.7	17.4	17	16.1	16.3	18.9	31.7	32.5	30.8
	5	NB Coll @ Mkt Rmp	37.1	21.2	21.7	19.7	21.7	19.5	19	20.2	17.1	19.4	24.9	38.7	38.2	36.9
	6	NB Coll @ Oleander	20.6	16.5	16.9	18.1	16.6	16.7	16.2	17	16.1	15.9	17.3	23.8	21.3	23.7
	7	NB Coll @ Shipyard	20.6	16.5	16.9	18.1	16.6	16.7	16.2	17	16.1	15.9	17.3	23.8	21.3	23.7
	8	NB Coll @ CB	26.7	38.1	38.6	36.7	38	36.3	36.6	35	34.1	34.6	41.2	41.8	41.5	41.7
	9	NB Coll S of CB	40.1	41.7	41.8	41.8	41.9	41.6	41.8	41.6	41.6	41.6	42.7	42.7	42.6	42.6
	#	Location														
Avg	3	NB Coll @ MLK	28.01	17.37	17.47	17.56	16.97	16.77	16.64	16.45	15.88	15.87	17.74	25.12	28.53	27.11
	4	MB Coll @ MKT Br	29.12	18.53	19.51	19.3	18.66	18.61	18.36	17.55	17	16.64	19.47	30.79	32.63	32.47
	5	NB Coll @ Mkt Rmp	30.32	21.24	21.67	21.52	21.1	20.43	20.22	20.02	18.88	18.5	22.48	36.12	37.54	37.7
	6	NB Coll @ Oleander	19.24	17.08	17.2	17.16	16.71	16.7	16.81	17.05	16.69	16.19	18.6	24.14	23.7	23.93
	7	NB Coll @ Shipyard	19.24	17.08	17.2	17.16	16.71	16.7	16.81	17.05	16.69	16.19	18.6	24.14	23.7	23.93
	8	NB Coll @ CB	36.85	38.23	38.07	37.71	37.61	37.15	37.6	36.35	33.99	33.97	40.15	41.72	41.57	41.64
	9	NB Coll S of CB	41.6	41.82	41.83	41.83	41.83	41.7	41.77	41.69	41.4	41.56	42.59	42.73	42.7	42.71
	#	Location														
StdDev	3	NB Coll @ MLK	4.44558	0.79449	1.20651	1.13647	0.3802	0.77467	0.68508	0.34721	0.31198	0.34335	0.592921	2.494349	2.7849	3.028916
	4	MB Coll @ MKT Br	3.54865	1.06254	1.16471	1.39682	1.11674	0.94569	0.95359	1.19559	0.89938	0.902096	1.241907	2.231815	2.642411	3.007786
	5	NB Coll @ Mkt Rmp	4.36522	1.69063	1.69709	1.02719	1.26579	1.37764	1.42423	1.22909	1.43201	1.182277	1.778139	2.299179	3.127015	2.664165
	6	NB Coll @ Oleander	1.58339	0.53083	0.77889	0.70585	0.61545	0.52281	0.66742	0.46248	0.46774	0.357305	1.188837	4.548309	2.565151	2.508231
	7	NB Coll @ Shipyard	1.58339	0.53083	0.77889	0.70585	0.61545	0.52281	0.66742	0.46248	0.46774	0.357305	1.188837	4.548309	2.565151	2.508231
	8	NB Coll @ CB	3.70023	0.72119	0.38601	0.57822	0.40401	0.93838	0.60185	0.98911	2.57874	3.163349	0.693221	0.193218	0.226323	0.222111
	9	NB Coll S of CB	0.53748	0.12293	0.08233	0.09487	0.06749	0.06667	0.0483	0.05676	0.70553	0.05164	0.08756	0.11595	0.133333	0.11005

VISSIM Queues – With Contraflow, Minimal Event Case

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	27.7	15.7	17	16.3	15.4	14.8	15.4	14.5	14.5	14.4	17.9	21.8	23.1	23.7
	4	MB Coll @ MKT Br	31.1	20.7	20	20.6	20	17.7	17.5	17.7	17	15.8	19.8	30.3	26.9	31.6
	5	NB Coll @ Mkt Rmp	34.2	24.7	22.8	23.2	21.5	18.5	19.3	18.9	17.5	15	20.7	34.8	32.1	36.7
1	6	NB Coll @ Oleander	17.7	16	16.8	15.9	15.1	14.9	15.3	15.6	15.9	15.2	17.8	23.2	22.8	19.9
	7	NB Coll @ Shipyard	17.7	16	16.8	15.9	15.1	14.9	15.3	15.6	15.9	15.2	17.8	23.2	22.8	19.9
	8	NB Coll @ CB	35.9	36	35.7	35.4	34	34.4	33.7	33.1	33.7	33.6	37.1	38.4	38.4	37.7
	9	NB Coll S of CB	41.9	41.8	41.8	41.8	41.9	41.8	41.8	41.7	41.6	41.5	42.6	42.7	42.8	42.6
	10	WBR MLK (CF only)	19.3	19	18.2	18.4	18.3	18.5	18.4	18.3	17.7	18.4	18.4	18.4	19	18.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	24	15.8	16.8	14.9	16.3	16.9	15.6	16.9	15.3	15.3	16.4	22.1	26.7	30.2
	4	MB Coll @ MKT Br	25.2	17.4	19.8	19.1	17.8	19.9	17.6	19.3	17.2	15.3	19.9	29.6	31.2	33.9
	5	NB Coll @ Mkt Rmp	25.4	16.8	22.4	21.3	18.6	21.2	18.9	20.6	18.1	15.7	21.2	34.4	33.9	41.3
2	6	NB Coll @ Oleander	16.4	17.4	15.9	14.9	15.2	15.9	16.9	15	15.9	15.7	16.4	19.5	22.9	17.8
	7	NB Coll @ Shipyard	16.4	17.4	15.9	14.9	15.2	15.9	16.9	15	15.9	15.7	16.4	19.5	22.9	17.8
	8	NB Coll @ CB	34.2	35.3	36.2	35.5	34.2	35.2	34	34.6	31.6	32.9	35	38.2	38.7	38
	9	NB Coll S of CB	41.9	41.8	41.8	42	41.9	41.8	41.9	41.8	41.6	41.7	42.6	42.7	42.6	42.6
	10	WBR MLK (CF only)	18.9	18.7	18.1	18.7	18.6	18.6	18	18.5	18.7	18.1	17.9	18.7	18.4	18.4
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	24.5	15.9	15	16	17	16.7	15.7	14.7	15.3	15.4	16.9	27.9	22.1	27
	4	MB Coll @ MKT Br	25.4	18.3	16.5	18.6	20.2	17.2	17.8	17.6	17.3	18.9	17.3	29.4	30.7	31.2
	5	NB Coll @ Mkt Rmp	27	20	17.5	20.5	21.7	17.5	17.4	18	18.2	19.7	19.6	31.8	37.4	39.4
3	6	NB Coll @ Oleander	19.9	15.2	15.7	14.9	16.7	15.3	16.5	16.3	15.3	16.2	16.7	19.1	19.2	24.8
	7	NB Coll @ Shipyard	19.9	15.2	15.7	14.9	16.7	15.3	16.5	16.3	15.3	16.2	16.7	19.1	19.2	24.8
	8	NB Coll @ CB	34.4	34.2	35.7	34.4	34.6	35.3	35	33.2	34	35.4	36.2	39.3	39.5	39.5
	9	NB Coll S of CB	41.9	41.9	41.7	41.9	41.8	41.8	41.6	41.7	41.6	41.7	42.5	42.8	42.7	42.8
	10	WBR MLK (CF only)	19.4	18.6	18.5	18.6	19.1	18.7	18.9	18.4	17.9	18.3	18.2	17.9	18.7	19.2
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	27	15.1	14.9	16.4	15.9	16.5	14.7	15.3	14.9	14.4	14.6	27.9	21.2	26
	4	MB Coll @ MKT Br	25.4	18.4	18.4	19.1	20.1	18.5	16.5	20.3	19	16.8	17.9	32.6	27.7	33.6
	5	NB Coll @ Mkt Rmp	26.5	19.4	19.1	20.7	21.7	20.1	18.8	20.8	19.6	16.4	19.7	38.3	32	38.8
4	6	NB Coll @ Oleander	16.6	16.4	15.6	15.3	15.4	15.5	15.6	16.7	15	15.2	16.6	18.2	24.4	26.7
	7	NB Coll @ Shipyard	16.6	16.4	15.6	15.3	15.4	15.5	15.6	16.7	15	15.2	16.6	18.2	24.4	26.7
	8	NB Coll @ CB	35.8	35.5	36.2	34.7	35	36.2	34.7	34.5	33.9	33.8	39.5	38.8	39	38.6
	9	NB Coll S of CB	41.8	41.9	41.9	41.8	41.8	41.8	41.7	41.7	41.6	41.6	42.7	42.7	42.7	42.9
	10	WBR MLK (CF only)	19.3	18	18.4	18.7	18.6	18.6	18.1	19	18.6	17.3	18.4	18.3	18.5	18.7

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	23.5	15	15.1	16	16.4	15.9	15.3	16.6	16.8	14.4	15.8	27.1	23.5	31.4
	4	MB Coll @ MKT Br	25.9	16.5	18.7	17.6	19.1	20	17.9	17.5	17.8	16	18.4	29.9	30.7	34.8
	5	NB Coll @ Mkt Rmp	27.8	19	20.4	19.4	21.2	22.3	19.2	19.3	18.7	15.8	19.1	36.3	35.5	39.8
5	6	NB Coll @ Oleander	18.2	16.6	15.2	15.9	16.5	15.7	15.8	15.5	15.8	14.3	17.8	23.7	19.3	22.4
	7	NB Coll @ Shipyard	18.2	16.6	15.2	15.9	16.5	15.7	15.8	15.5	15.8	14.3	17.8	23.7	19.3	22.4
	8	NB Coll @ CB	35.1	36.8	34.3	34.6	34.7	33.5	35.1	33.1	32.8	33.7	39	38.1	38.9	38.4
	9	NB Coll S of CB	41.8	41.8	41.9	41.9	41.9	41.8	41.8	41.7	41.5	41.6	42.7	42.7	42.8	42.6
	10	WBR MLK (CF only)	19.2	18.9	19	19.2	18.8	18.6	18.2	17.8	18.7	18	18.6	18.4	19.1	18.5
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.4	14.5	17	15.4	15.6	15.9	14.8	14.8	15.3	15	16.9	28.7	28.3	24.3
	4	MB Coll @ MKT Br	23.3	18.9	20.9	18.1	19.6	16.3	17.2	18.5	19.4	17.4	18.9	29.7	31.9	33.1
	5	NB Coll @ Mkt Rmp	22.3	21.7	23.6	19.4	20.2	16.7	17.8	20.4	18.9	18.2	18.6	34.5	36.7	38.9
6	6	NB Coll @ Oleander	18.2	15.6	16.2	16.2	16.2	15.9	15.5	15.2	15	16.6	15.5	20.4	19.4	21.7
	7	NB Coll @ Shipyard	18.2	15.6	16.2	16.2	16.2	15.9	15.5	15.2	15	16.6	15.5	20.4	19.4	21.7
	8	NB Coll @ CB	34.8	34.7	34	35.4	34.4	34.1	34.7	33.4	34.1	32.9	37.1	39.5	38.6	38.5
	9	NB Coll S of CB	41.9	41.9	41.8	41.9	41.9	41.7	41.8	41.8	41.6	41.6	42.6	42.7	42.7	42.7
	10	WBR MLK (CF only)	19.1	18.3	18.8	18.7	18.3	18.8	18.6	18.5	18.5	18.2	18.1	18.8	18.6	18.8
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.6	17.6	16.4	15	17	15	14.7	14.5	15.3	13.9	14.7	24.7	23.4	38
	4	MB Coll @ MKT Br	26.4	20.3	18.9	18.7	18.7	17.9	17.6	17.5	17	16.1	17.6	29.3	32.8	39.4
	5	NB Coll @ Mkt Rmp	30.1	24.1	19.1	18.9	19.3	19.4	20.5	18.1	17.6	15.8	19.3	34	39.4	44.7
7	6	NB Coll @ Oleander	16.9	15.2	15.5	15.4	15.3	15.2	15.4	16.1	14.9	15.4	15.7	20.9	24.7	25
	7	NB Coll @ Shipyard	16.9	15.2	15.5	15.4	15.3	15.2	15.4	16.1	14.9	15.4	15.7	20.9	24.7	25
	8	NB Coll @ CB	34.4	35.4	35.1	35.5	34.1	35.5	35.9	34.7	33.8	35.2	36.2	38.6	40	38.1
	9	NB Coll S of CB	41.8	41.9	41.9	41.9	41.8	41.9	41.8	41.7	41.6	41.7	42.5	42.6	43.1	42.7
	10	WBR MLK (CF only)	19.2	19	18.6	18.6	18.8	18.7	18.6	18.5	18.1	18.1	17.9	18.2	18.8	18.7
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	26.7	16.9	16.9	16.3	17.2	15.3	15.6	17.6	13.8	15.1	15.1	31.1	29.3	29.3
	4	MB Coll @ MKT Br	26.5	18.9	18.7	21.2	19.7	20.5	19	19.1	16.7	17.2	18.4	29.9	33.6	35.5
	5	NB Coll @ Mkt Rmp	28.2	20.5	20.7	22.9	21.9	23.1	21	18.4	18.1	18.4	19	34.1	37.5	41.2
8	6	NB Coll @ Oleander	19.7	15.2	15.5	15.3	15.1	15.7	16.3	14.4	15.8	16	18	23.4	17.8	27
	7	NB Coll @ Shipyard	19.7	15.2	15.5	15.3	15.1	15.7	16.3	14.4	15.8	16	18	23.4	17.8	27
	8	NB Coll @ CB	35.8	34.7	36.3	35.7	35	35.5	34	36.3	32.4	33	38.4	39.3	39.5	38.3
	9	NB Coll S of CB	42	41.9	41.9	41.9	41.9	41.7	41.9	41.6	41.6	41.7	42.5	42.7	42.7	42.5
	10	WBR MLK (CF only)	19	18.3	18.8	18.7	18.6	18.2	18.9	18.4	18.5	18.2	18.3	18.5	18.3	18.6

	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	28.8	15.1	15.7	16.2	16.8	15.5	15.3	15.6	14.7	13.8	15.5	24.8	28.6	28.2
	4	MB Coll @ MKT Br	27.3	18.6	17.9	18.6	19.4	17.7	18.1	18.1	17.4	15.9	18.3	30.4	33.6	33.6
	5	NB Coll @ Mkt Rmp	27.2	19.9	20	21.1	21.6	19	18.4	19.2	18.7	16.2	18.9	36.7	39.1	39.5
9	6	NB Coll @ Oleander	17.6	16.2	15.3	15.7	15.9	15.6	15.4	15.6	15.7	17.1	18.5	26.4	23.1	22.2
	7	NB Coll @ Shipyard	17.6	16.2	15.3	15.7	15.9	15.6	15.4	15.6	15.7	17.1	18.5	26.4	23.1	22.2
	8	NB Coll @ CB	35.2	34.7	35.4	36.8	34.9	33.1	34.2	33.6	32.6	33.1	36.8	39.3	38.3	39.3
	9	NB Coll S of CB	41.8	41.7	41.8	41.9	41.9	41.8	41.8	41.7	41.7	41.7	42.7	42.6	42.7	42.8
	10	WBR MLK (CF only)	19.1	18.7	18.5	18.6	18.6	18.6	18.5	18.7	18.5	18.5	18.3	18.9	18.4	19
	#	Location	Veh Hr1	Veh Hr2	Veh Hr3	Veh Hr4	Veh Hr5	Veh Hr6	Veh Hr7	Veh Hr8	Veh Hr9	Veh Hr10	Veh Hr11	Veh Hr12	Veh Hr13	Veh Hr14
	3	NB Coll @ MLK	27.8	14.9	17.5	14.9	15.3	15.7	14.4	15.3	14.2	13.8	16.6	26.1	27.2	24.9
	4	MB Coll @ MKT Br	28.2	16.8	19.4	15.7	19.6	19.1	16.5	17.1	15.9	16.4	20.3	32.7	32.6	30.4
	5	NB Coll @ Mkt Rmp	29	17.5	20.1	18.9	19.4	20.2	17.5	19.9	14.9	15.3	21.7	38	40.6	36.8
10	6	NB Coll @ Oleander	16.6	15.3	15.8	15.2	16.1	16.2	15.4	14.6	14.6	15.7	17.5	22	23.8	28.8
	7	NB Coll @ Shipyard	16.6	15.3	15.8	15.2	16.1	16.2	15.4	14.6	14.6	15.7	17.5	22	23.8	28.8
	8	NB Coll @ CB	34.6	35.6	34.1	34.8	34.6	34.2	34.5	34.2	33.6	33	37.3	37.6	39.7	39.3
	9	NB Coll S of CB	41.7	42	41.9	41.8	42	41.8	41.8	41.8	41.6	41.8	42.6	42.7	43.1	42.8
	10	WBR MLK (CF only)	19.2	18.7	18.5	19	19.1	18.7	18.4	18.6	18.2	18.7	18	18	18.9	18.8
	#	Location														
	3	NB Coll @ MLK	26.3	15.65	16.23	15.74	16.29	15.82	15.15	15.58	15.01	14.55	16.04	26.22	25.34	28.3
	4	MB Coll @ MKT Br	26.47	18.48	18.92	18.73	19.42	18.48	17.57	18.27	17.47	16.58	18.68	30.38	31.17	33.71
	5	NB Coll @ Mkt Rmp	27.77	20.36	20.57	20.63	20.71	19.8	18.88	19.36	18.03	16.65	19.78	35.29	36.42	39.71
Avg	6	NB Coll @ Oleander	17.78	15.91	15.75	15.47	15.75	15.59	15.81	15.5	15.39	15.74	17.05	21.68	21.74	23.63
	7	NB Coll @ Shipyard	17.78	15.91	15.75	15.47	15.75	15.59	15.81	15.5	15.39	15.74	17.05	21.68	21.74	23.63
	8	NB Coll @ CB	35.02	35.29	35.3	35.28	34.55	34.7	34.58	34.07	33.25	33.66	37.26	38.71	39.06	38.57
	9	NB Coll S of CB	41.85	41.86	41.84	41.88	41.88	41.79	41.79	41.72	41.6	41.66	42.6	42.69	42.79	42.7
	10	WBR MLK (CF only)	19.17	18.62	18.54	18.72	18.68	18.6	18.46	18.47	18.34	18.18	18.21	18.41	18.67	18.74
	#	Location														
	3	NB Coll @ MLK	1.75056	0.96408	0.96845	0.62218	0.70781	0.70836	0.46007	1.09219	0.81847	0.615088	1.0793	2.929467	2.984851	4.26901
	4	MB Coll @ MKT Br	2.09234	1.3563	1.2182	1.51881	0.72999	1.36366	0.73944	1.01549	1.04249	1.043285	1.021763	1.24615	2.303644	2.558407
	5	NB Coll @ Mkt Rmp	3.10091	2.55177	1.88093	1.5442	1.22243	2.02045	1.19703	1.03193	1.26583	1.560805	1.05704	2.009118	3.002517	2.328781
StdDev	6	NB Coll @ Oleander	1.24882	0.74603	0.46963	0.43982	0.60415	0.38137	0.55867	0.73182	0.48637	0.791903	1.016803	2.527537	2.534298	3.430921
	7	NB Coll @ Shipyard	1.24882	0.74603	0.46963	0.43982	0.60415	0.38137	0.55867	0.73182	0.48637	0.791903	1.016803	2.527537	2.534298	3.430921
	8	NB Coll @ CB	0.64083	0.75785	0.88944	0.70048	0.36591	0.99107	0.65115	1.0089	0.8436	0.928799	1.372913	0.636745	0.583476	0.60928
	9	NB Coll S of CB	0.08498	0.08433	0.06992	0.06325	0.06325	0.05676	0.08756	0.06325	0.04714	0.084327	0.08165	0.056765	0.172884	0.124722
	10	WBR MLK (CF only)	0.14944	0.32931	0.27568	0.22509	0.27809	0.1633	0.30623	0.30569	0.34705	0.373571	0.233095	0.328126	0.275076	0.2319

CORSIM Max. Queues – No Contraflow, Severe Event Case

MaximumQueue Lane 1(vehicles)
Mean over 10 runs
Link/Aggregation

	Veh	Queue Length (ft)
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	26.2	518
Link (26, 202)	28.4	562
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	25.8	510
Link (35, 114)	1.7	34
Link (36, 35)	67.8	1341
Link (38, 36)	1.1	22
Link (40, 225)	0.2	4
Link (42, 43)	36.5	722
Link (43, 40)	0.7	14
Link (72, 220)	1.2	24
Link (73, 316)	1	20
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	79.4	1571
Link (204, 73)	4.2	83
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	14	277
Link (220, 26)	2.3	45
Link (221, 38)	45.2	894
Link (222, 221)	0	0
Link (223, 222)	0.1	2
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	24.8	491
Link (246, 73)	16.9	334
Link (249, 246)	0.1	2
Link (262, 205)	0	0
Link (285, 7002)	15.1	299
Link (286, 26)	55.3	1094
Link (315, 26)	45.7	904
Link (316, 315)	0.1	2
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	9	178
Link (7014, 757)	0	0

Queue Location	Avg Max Queue Length
NB Coll @ MLK	4066
WBT MLK	328.348
WBR MLK	925.7040151
NB Coll @ Mkt	2561.869986
NBT @ Oleander	2276.678076
NBT Coll @ Mky Jct	1212.513985
Ramp @ Gordon	7509.914023

Std. Dev. over 10 runs
Link/Aggregation

	50400	
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	9.461031	187
Link (26, 202)	4.812022	95
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	11.83967	234
Link (35, 114)	0.674949	13
Link (36, 35)	6.828047	135
Link (38, 36)	0.316228	6
Link (40, 225)	0.421637	8
Link (42, 43)	2.068279	41
Link (43, 40)	0.483046	10
Link (72, 220)	0.632456	13
Link (73, 316)	0	0
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	3.339993	66
Link (204, 73)	0.788811	16
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	12.97861	257
Link (220, 26)	0.483046	10
Link (221, 38)	4.638007	92
Link (222, 221)	0	0
Link (223, 222)	0.316228	6
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	16.39648	324
Link (246, 73)	3.446415	68
Link (249, 246)	0.316228	6
Link (262, 205)	0	0
Link (285, 7002)	1.197219	24
Link (286, 26)	1.494434	30
Link (315, 26)	5.396501	107
Link (316, 315)	0.316228	6
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Std Deviation
NB Coll @ MLK	29.85116558
WBT MLK	76.95473803
WBR MLK	30.25295082
NB Coll @ Mkt	90.09951446
NBT @ Oleander	25.8626008
NBT Coll @ Mky Jct	73.91698279
Ramp @ Gordon	102.2619478

CORSIM Max. Queues – With Contraflow, Severe Event Case

MaximumQueue Lane 1(vehicles)
Mean over 10 runs
Link/Aggregation

		Queue Length (ft)
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	0	0
Link (26, 202)	0.5	10
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	5.4	107
Link (35, 114)	1.7	34
Link (36, 35)	55.8	1104
Link (38, 36)	1	20
Link (40, 225)	0.1	2
Link (42, 43)	36.3	718
Link (43, 40)	0.7	14
Link (72, 220)	1	20
Link (73, 316)	1	20
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	0.1	2
Link (204, 73)	4.3	85
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	3.7	73
Link (221, 38)	46	910
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	16.3	322
Link (246, 73)	13.2	261
Link (249, 246)	0.2	4
Link (262, 205)	0	0
Link (285, 7002)	0	0
Link (286, 26)	7.2	142
Link (315, 26)	3.4	67
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Max Queue Length
NB Coll @ MLK	478.6760151
WBT MLK	179.9980005
WBR MLK	87.03200189
NB Coll @ Mkt	1881.438003
NBT @ Oleander	2049.207985
NBT Coll @ Mky Jct	1040.428045
Ramp @ Gordon	0

Std. Dev. over 10 runs

Link/Aggregation	50400	
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	0	0
Link (26, 202)	0.527046	10
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	4.221637	84
Link (35, 114)	0.674949	13
Link (36, 35)	6.106463	121
Link (38, 36)	0.471405	9
Link (40, 225)	0.316228	6
Link (42, 43)	5.034327	100
Link (43, 40)	0.483046	10
Link (72, 220)	0	0
Link (73, 316)	0	0
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	0.316228	6
Link (204, 73)	0.674949	13
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	0.674949	13
Link (221, 38)	5.849976	116
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	14.30656	283
Link (246, 73)	2.573368	51
Link (249, 246)	0.421637	8
Link (262, 205)	0	0
Link (285, 7002)	0	0
Link (286, 26)	0.788811	16
Link (315, 26)	0.966092	19
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Std Deviation
NB Coll @ MLK	32.38306731
WBT MLK	5.193122209
WBR MLK	5.056222996
NB Coll @ Mkt	13.15612229
NBT @ Oleander	24.75891545
NBT Coll @ Mky Jct	75.06143488
Ramp @ Gordon	0

CORSIM Throughput – No Contraflow, Severe Event Case

Discharge Through(vehicles)
Mean over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (20, 17)	1150	2527	3899	5430	7493	9727	12761	16008	19277	22036	22182	22215	22251	22284
Link (23, 20)	1194	2609	4025	5598	7700	9973	13137	16423	19732	22464	22667	22735	22808	22876
Link (25, 285)	1249	2685	4117	5715	7855	10153	13468	16802	20171	22769	22993	23099	23211	23317
Link (26, 202)	1268	2707	4154	5765	7893	10168	13545	16899	20253	22688	22947	23070	23195	23317
Link (29, 351)	1140	2433	3725	5125	6894	8772	11478	14145	16775	18717	18981	19081	19187	19295
Link (31, 29)	1029	2188	3348	4610	6184	7850	10235	12646	14979	16690	16842	16882	16924	16963
Link (34, 7014)	1249	2650	4043	5533	7335	9235	11847	14563	17142	19060	19330	19410	19490	19564
Link (35, 114)	1312	2700	4103	5599	7436	9336	11994	14719	17313	19134	19325	19403	19483	19557
Link (36, 35)	1147	2350	3561	4862	6456	8108	10419	12774	15025	16615	16719	16752	16786	16817
Link (38, 36)	1308	2657	4015	5446	7179	8998	11441	13936	16335	18050	18261	18359	18461	18564
Link (40, 225)	1358	2716	4078	5535	7307	9109	11621	14015	16372	17999	18153	18239	18327	18413
Link (42, 43)	1290	2574	3869	5248	6940	8666	11094	13402	15671	17201	17269	17284	17299	17315
Link (43, 40)	1326	2648	3979	5400	7136	8906	11392	13758	16078	17652	17762	17812	17864	17914
Link (72, 220)	87	182	276	381	501	619	770	930	1084	1209	1330	1425	1519	1614
Link (73, 316)	207	421	642	906	1314	1740	2591	3349	4090	4436	4588	4676	4757	4836
Link (84, 206)	1295	2694	4083	5586	7403	9318	11958	14692	17283	19113	19329	19408	19488	19562
Link (114, 84)	1307	2697	4098	5597	7429	9332	11986	14713	17305	19131	19325	19404	19484	19558
Link (117, 262)	1395	2791	4190	5708	7600	9512	12332	14913	17474	19123	19257	19307	19357	19407
Link (149, 223)	1359	2714	4074	5527	7280	9079	11550	13964	16321	17985	18209	18293	18382	18469
Link (202, 25)	1235	2647	4058	5637	7761	10039	13363	16677	20029	22569	22765	22852	22943	23030
Link (204, 73)	58	118	176	254	389	526	825	1092	1345	1451	1502	1536	1568	1599
Link (205, 226)	1396	2796	4192	5708	7587	9500	12295	14885	17452	19123	19292	19341	19392	19442
Link (206, 219)	1269	2674	4062	5563	7379	9286	11909	14636	17243	19095	19330	19410	19490	19564
Link (209, 204)	125	261	390	553	799	1058	1535	1966	2383	2588	2735	2829	2922	3013
Link (219, 34)	1253	2653	4047	5537	7341	9246	11858	14579	17188	19067	19330	19410	19490	19564
Link (220, 26)	26	56	84	115	146	181	217	254	296	332	381	418	452	489
Link (221, 38)	1244	2523	3808	5163	6793	8507	10800	13144	15401	17024	17143	17171	17199	17229
Link (222, 221)	1338	2709	4062	5504	7249	9047	11481	13917	16263	17967	18231	18317	18404	18491
Link (223, 222)	1347	2711	4071	5521	7265	9069	11518	13939	16298	17978	18220	18304	18393	18479
Link (224, 149)	1354	2714	4080	5533	7283	9093	11585	13986	16343	17996	18190	18276	18363	18451
Link (225, 224)	1356	2715	4081	5533	7286	9105	11600	13999	16357	17995	18178	18264	18351	18438
Link (226, 42)	1394	2788	4191	5706	7585	9495	12277	14874	17441	19122	19299	19349	19399	19449
Link (246, 73)	127	261	388	520	679	845	1033	1231	1428	1593	1650	1685	1719	1753
Link (249, 246)	290	592	884	1213	1667	2135	2911	3628	4342	4746	4913	5016	5112	5211
Link (262, 205)	1396	2791	4189	5708	7594	9506	12317	14897	17452	19124	19272	19323	19372	19422
Link (285, 7002)	1247	2683	4116	5715	7852	10150	13453	16786	20155	22766	22993	23099	23211	23318
Link (286, 26)	1070	2301	3527	4868	6571	8401	10973	13539	16121	18122	18264	18313	18366	18418
Link (315, 26)	48	99	153	201	250	305	368	438	507	568	642	682	720	758
Link (316, 315)	207	420	642	906	1313	1739	2588	3347	4087	4435	4588	4676	4757	4836
Link (336, 23)	1238	2673	4108	5709	7836	10139	13390	16694	20029	22727	22994	23100	23212	23319
Link (351, 7012)	1140	2432	3724	5124	6892	8771	11475	14136	16766	18715	18981	19081	19187	19295
Link (757, 31)	1245	2644	4038	5530	7332	9230	11832	14529	17098	19053	19330	19410	19490	19564
Link (7002, 336)	1246	2681	4115	5715	7851	10147	13439	16749	20082	22740	22993	23100	23212	23318
Link (7012, 27)	1139	2432	3723	5124	6891	8770	11472	14127	16758	18714	18981	19081	19187	19295
Link (7014, 757)	1247	2648	4042	5532	7334	9232	11842	14553	17126	19058	19330	19410	19490	19564

Std. Dev. over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (20, 17)	26.55	25.59	43.63	53.10	46.48	27.37	48.63	61.47	78.42	127.34	125.75	125.90	126.80	129.80
Link (23, 20)	28.81	23.30	41.83	50.47	44.73	30.85	51.88	61.59	70.89	117.39	117.64	117.19	117.97	122.90
Link (25, 285)	22.51	29.29	40.92	49.68	39.12	37.97	57.63	95.60	188.75	119.17	116.38	117.06	117.49	125.58
Link (26, 202)	23.94	31.79	40.83	47.11	40.52	39.56	55.90	69.41	166.44	114.14	112.38	112.10	111.38	119.11
Link (29, 351)	27.61	34.80	35.02	48.99	52.21	28.24	66.61	84.42	132.67	108.59	114.40	108.51	106.32	109.67
Link (31, 29)	22.95	23.69	30.19	46.66	41.42	34.48	52.57	63.06	98.00	89.75	90.17	89.89	89.66	91.97
Link (34, 7014)	13.81	31.98	39.34	63.71	58.13	55.06	68.05	70.73	79.33	74.19	77.85	77.91	81.45	81.59
Link (35, 114)	19.77	26.23	36.50	63.58	45.06	51.80	47.55	65.72	79.12	74.15	77.29	76.00	81.48	80.73
Link (36, 35)	16.91	20.78	35.84	61.42	43.23	49.20	49.34	61.63	74.33	66.68	68.23	65.13	68.81	67.24
Link (38, 36)	23.20	22.86	29.19	47.99	42.36	41.08	36.09	56.04	63.33	66.68	69.09	61.71	64.95	66.55
Link (40, 225)	14.16	23.39	14.85	14.55	17.64	20.66	42.72	52.97	60.63	55.56	50.25	48.64	44.46	43.84
Link (42, 43)	8.90	16.38	16.98	16.04	19.29	31.83	21.90	35.00	36.75	35.78	33.24	33.43	32.72	31.16
Link (43, 40)	6.90	15.84	18.50	22.83	23.63	27.33	36.88	40.32	46.99	47.12	40.46	40.02	40.62	38.93
Link (72, 220)	9.28	14.45	13.08	15.24	16.98	26.48	31.92	36.45	38.57	38.71	41.09	41.31	42.47	44.82
Link (73, 316)	17.31	20.05	26.99	26.49	35.91	41.56	63.86	71.12	57.53	54.48	53.48	51.68	52.11	56.72
Link (84, 206)	17.66	26.29	39.21	57.35	61.68	54.11	41.31	71.94	89.64	67.22	77.73	77.35	82.01	81.39
Link (114, 84)	21.51	27.63	36.55	62.12	49.32	52.01	45.10	67.87	81.56	71.90	77.36	76.51	81.97	81.14
Link (117, 262)	5.46	6.20	7.07	3.41	7.07	6.48	10.83	9.89	7.08	6.85	4.26	3.94	4.03	3.83
Link (149, 223)	18.22	25.98	23.44	25.34	14.13	26.58	26.29	41.02	48.00	45.23	46.17	45.25	42.75	40.21
Link (202, 25)	25.26	28.58	40.07	52.17	39.41	41.84	58.51	95.74	186.32	119.68	117.52	117.78	117.74	126.03
Link (204, 73)	9.48	8.03	9.40	11.91	15.37	15.02	28.54	37.73	30.67	32.74	33.96	29.30	27.83	28.11
Link (205, 226)	8.90	9.13	9.24	11.46	16.27	13.04	15.50	12.90	12.30	8.31	7.57	7.55	7.62	7.36
Link (206, 219)	13.89	25.71	37.70	59.27	53.54	59.43	55.63	70.22	89.14	68.67	77.03	76.36	80.57	80.26
Link (209, 204)	11.80	16.11	20.39	19.32	24.12	22.26	33.76	37.41	32.74	35.68	42.33	43.51	45.94	45.73
Link (219, 34)	13.48	31.59	38.82	64.31	58.52	59.05	62.89	77.53	74.23	73.45	77.86	77.96	81.61	81.39
Link (220, 26)	5.95	9.35	11.29	14.73	17.50	19.94	21.12	24.41	26.39	22.99	23.97	22.16	23.29	24.35
Link (221, 38)	24.05	25.77	33.65	37.64	35.62	34.45	42.42	38.70	52.43	57.48	57.23	57.70	57.83	59.87
Link (222, 221)	17.88	23.28	18.21	27.53	26.14	28.58	43.18	30.94	57.75	55.15	51.91	50.68	47.10	45.50
Link (223, 222)	15.69	23.53	17.41	22.25	17.49	19.64	29.21	37.15	52.20	41.83	45.91	45.13	42.14	39.70
Link (224, 149)	14.75	23.15	19.44	16.35	20.45	29.28	36.48	54.84	52.10	45.74	50.09	49.28	46.58	43.81
Link (225, 224)	10.16	17.62	18.52	19.42	24.67	27.98	36.88	48.08	55.29	51.66	52.73	51.93	49.00	46.85
Link (226, 42)	5.87	10.57	10.06	11.21	13.26	10.72	18.58	12.63	14.62	7.43	6.83	7.15	7.17	6.95
Link (246, 73)	13.71	16.39	24.60	23.79	28.19	35.16	31.76	27.67	28.95	27.51	27.81	24.82	25.86	24.95
Link (249, 246)	13.63	18.23	28.86	32.22	32.39	40.89	43.48	46.88	46.47	47.33	46.50	48.26	42.45	44.42
Link (262, 205)	5.38	3.57	4.57	6.31	3.41	7.60	12.54	9.31	9.50	4.16	1.64	1.58	1.77	1.78
Link (285, 7002)	21.48	30.40	41.98	49.55	40.32	38.11	59.03	97.10	193.72	119.33	116.71	117.37	117.82	125.92
Link (286, 26)	30.58	32.65	32.54	44.35	51.52	36.54	68.66	73.00	159.21	108.90	103.88	100.36	100.70	105.09
Link (315, 26)	5.00	12.04	11.81	13.87	19.36	24.76	26.72	26.57	27.80	29.39	31.03	29.50	32.70	32.72
Link (316, 315)	17.07	19.07	26.06	26.45	35.72	40.68	62.68	70.95	56.21	53.79	53.01	51.17	51.60	56.48
Link (336, 23)	24.50	25.01	41.85	51.38	43.70	37.33	60.07	65.64	72.76	123.19	116.85	117.51	118.27	126.12
Link (351, 7012)	28.14	35.39	35.25	49.83	52.28	28.60	64.71	84.45	135.17	108.97	114.40	108.51	106.48	109.82
Link (757, 31)	16.59	31.05	37.70	62.42	57.88	53.03	62.18	68.57	81.86	76.25	77.75	78.14	81.43	81.52
Link (7002, 336)	21.72	28.96	42.73	49.54	42.04	39.12	56.66	64.92	72.46	121.41	116.67	117.36	117.95	126.02
Link (7012, 27)	28.16	35.07	36.22	49.82	52.13	28.85	63.02	85.49	137.45	108.05	114.40	108.51	106.61	109.80
Link (7014, 757)	14.61	31.60	39.34	63.22	57.66	53.86	65.87	70.86	81.99	73.99	77.85	77.96	81.45	81.53

CORSIM Throughput – With Contraflow, Severe Event Case

Discharge Through(vehicles)
Mean over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	467	1017	1574	2188	3019	3906	5253	6609	7890	8687	8971	9198	9421	9643
Link (20, 17)	140	283	430	627	961	1319	2054	2733	3381	3648	3695	3736	3773	3811
Link (23, 20)	163	332	505	727	1087	1470	2240	2947	3624	3918	4003	4083	4161	4235
Link (25, 285)	180	363	554	792	1172	1571	2365	3087	3785	4092	4217	4343	4462	4578
Link (26, 202)	156	315	480	693	1053	1429	2203	2902	3576	3852	3966	4081	4188	4292
Link (29, 351)	1128	2377	3630	4996	6735	8562	11237	13995	16633	18419	18726	18940	19147	19370
Link (31, 29)	1023	2150	3277	4506	6066	7692	10055	12513	14870	16479	16636	16721	16807	16896
Link (34, 7014)	1249	2618	3980	5442	7233	9095	11683	14369	16964	18828	19123	19293	19467	19638
Link (35, 114)	1315	2681	4046	5523	7324	9187	11825	14516	17085	18892	19120	19292	19466	19636
Link (36, 35)	1149	2344	3540	4837	6417	8054	10375	12730	14983	16575	16700	16784	16865	16947
Link (38, 36)	1307	2649	3997	5414	7142	8932	11397	13900	16299	18011	18340	18595	18847	19094
Link (40, 225)	1354	2716	4068	5524	7279	9078	11600	13997	16363	17993	18512	18997	19482	19981
Link (42, 43)	1286	2572	3856	5233	6916	8640	11084	13376	15653	17197	17628	18043	18455	18877
Link (43, 40)	1322	2645	3966	5383	7110	8876	11377	13729	16064	17650	18126	18578	19028	19491
Link (72, 220)	83	172	269	364	482	593	749	905	1058	1167	1308	1431	1557	1689
Link (73, 316)	209	423	642	914	1333	1770	2619	3388	4127	4466	4714	4947	5171	5396
Link (84, 206)	1301	2669	4031	5496	7297	9160	11787	14475	17059	18876	19123	19295	19469	19638
Link (114, 84)	1314	2678	4041	5517	7320	9181	11816	14508	17077	18890	19121	19293	19467	19637
Link (117, 262)	1396	2791	4190	5710	7598	9515	12333	14914	17473	19125	20413	21678	22949	24217
Link (149, 223)	1351	2711	4069	5514	7264	9057	11529	13945	16302	17976	18549	19033	19520	20017
Link (202, 25)	151	304	464	673	1024	1393	2158	2849	3519	3793	3888	3983	4073	4159
Link (204, 73)	62	125	192	278	421	566	882	1166	1430	1538	1614	1687	1756	1824
Link (205, 226)	1396	2797	4192	5707	7584	9509	12294	14882	17443	19123	20420	21690	22954	24225
Link (206, 219)	1275	2651	4003	5471	7273	9133	11744	14436	17020	18852	19123	19294	19468	19639
Link (209, 204)	128	269	416	593	849	1107	1602	2059	2492	2704	2937	3151	3362	3573
Link (219, 34)	1253	2624	3983	5447	7243	9102	11693	14378	16974	18832	19122	19293	19467	19638
Link (220, 26)	25	52	81	110	142	170	202	240	279	310	365	409	456	506
Link (221, 38)	1244	2520	3799	5140	6764	8457	10765	13123	15381	17004	17240	17402	17560	17720
Link (222, 221)	1349	2700	4056	5500	7228	9032	11474	13905	16250	17969	18571	19050	19537	20035
Link (223, 222)	1354	2712	4065	5512	7256	9052	11507	13925	16289	17976	18563	19043	19533	20029
Link (224, 149)	1355	2719	4070	5519	7276	9067	11568	13969	16331	17987	18538	19022	19508	20006
Link (225, 224)	1355	2717	4069	5521	7279	9070	11574	13976	16340	17987	18530	19014	19499	19997
Link (226, 42)	1397	2796	4189	5707	7579	9503	12281	14879	17433	19123	20418	21691	22953	24225
Link (246, 73)	127	258	395	528	683	846	1033	1225	1417	1577	1708	1839	1966	2097
Link (249, 246)	289	583	887	1225	1677	2155	2914	3616	4315	4721	5110	5506	5899	6292
Link (262, 205)	1396	2795	4193	5709	7591	9510	12315	14906	17461	19123	20415	21684	22952	24221
Link (285, 7002)	180	363	553	792	1172	1571	2364	3086	3784	4092	4217	4343	4462	4578
Link (286, 26)	1063	2252	3445	4757	6437	8215	10818	13528	16114	17839	18008	18118	18225	18341
Link (315, 26)	42	90	139	191	246	300	360	421	485	543	659	757	857	960
Link (316, 315)	209	422	642	914	1333	1769	2617	3385	4125	4465	4714	4947	5171	5395
Link (336, 23)	179	362	553	791	1170	1569	2359	3083	3781	4091	4217	4343	4462	4578
Link (351, 7012)	1127	2376	3629	4995	6734	8561	11234	13994	16630	18418	18726	18939	19147	19370
Link (757, 31)	1246	2615	3977	5440	7224	9085	11668	14361	16947	18824	19123	19293	19467	19638
Link (7002, 336)	180	363	553	792	1172	1571	2364	3085	3784	4092	4217	4343	4462	4578
Link (7012, 27)	1127	2376	3629	4995	6734	8560	11232	13993	16629	18417	18725	18939	19147	19370
Link (7014, 757)	1248	2617	3979	5441	7230	9092	11679	14367	16959	18827	19123	19293	19466	19637

Std. Dev. over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	24.64	33.54	35.62	36.32	47.24	41.87	50.32	52.40	71.09	86.32	87.60	103.01	107.09	111.61
Link (20, 17)	13.21	18.31	23.16	26.30	33.45	27.66	39.79	37.18	39.66	44.86	42.74	44.59	44.37	48.98
Link (23, 20)	13.74	18.14	24.42	28.26	33.96	26.81	42.61	44.54	44.83	54.53	50.10	51.26	50.59	54.70
Link (25, 285)	16.07	21.19	27.39	31.04	31.66	28.09	46.94	45.15	43.97	54.08	50.70	53.51	55.10	57.09
Link (26, 202)	16.65	20.18	28.13	30.30	32.61	28.39	47.96	44.26	43.91	52.84	52.57	55.23	58.21	60.27
Link (29, 351)	29.03	37.62	57.98	70.56	77.53	91.34	98.36	78.31	80.11	79.86	74.39	74.21	76.16	74.43
Link (31, 29)	32.66	31.73	43.31	52.50	46.81	57.55	65.51	46.93	46.75	54.23	52.40	51.69	53.98	57.47
Link (34, 7014)	33.56	34.95	38.05	47.69	41.91	56.60	60.17	86.05	88.59	96.91	85.18	84.25	74.46	71.78
Link (35, 114)	32.43	42.23	33.11	36.30	43.24	59.05	60.24	82.69	85.07	86.38	85.41	83.06	74.86	72.26
Link (36, 35)	25.03	37.31	26.95	28.91	37.41	46.26	41.66	51.35	66.08	66.50	68.55	66.01	67.21	66.10
Link (38, 36)	23.74	40.34	28.57	29.30	32.83	28.18	60.99	61.51	67.42	72.53	63.27	69.01	69.04	68.20
Link (40, 225)	17.41	19.65	17.89	23.65	33.19	25.01	41.31	36.47	36.96	41.75	42.91	48.90	53.07	50.46
Link (42, 43)	15.20	13.99	20.28	24.43	37.49	29.87	34.36	35.61	31.61	35.68	36.18	48.14	48.56	47.03
Link (43, 40)	15.58	14.83	20.28	24.59	35.71	36.72	36.33	37.27	34.80	39.22	43.51	52.59	54.97	49.86
Link (72, 220)	9.48	16.61	21.30	23.70	25.22	25.23	24.11	30.27	32.43	33.86	38.22	40.30	45.25	41.28
Link (73, 316)	21.27	24.12	32.33	34.44	40.65	35.83	48.96	42.01	41.02	49.20	53.16	58.85	63.33	59.59
Link (84, 206)	28.14	33.91	30.47	38.96	49.03	55.72	67.15	86.74	85.86	93.19	83.95	82.82	73.74	72.02
Link (114, 84)	33.41	42.66	30.34	36.32	41.23	59.67	61.13	81.99	85.75	86.18	84.75	82.69	74.64	72.10
Link (117, 262)	6.77	5.30	3.31	7.53	6.72	6.58	9.19	6.39	7.07	5.50	4.48	7.32	5.22	4.74
Link (149, 223)	17.27	25.14	18.12	29.34	29.86	21.80	33.49	46.19	40.92	40.07	38.50	42.61	48.53	48.16
Link (202, 25)	16.48	21.14	27.23	30.74	31.58	27.41	46.43	44.80	44.32	53.55	50.46	53.21	54.78	56.89
Link (204, 73)	9.73	9.02	7.79	10.02	14.16	12.42	15.35	24.56	27.95	30.23	26.86	24.93	24.31	26.52
Link (205, 226)	8.57	7.52	8.24	10.13	10.25	9.43	8.02	14.85	13.26	10.61	8.41	11.01	11.91	8.15
Link (206, 219)	28.37	40.37	35.53	44.38	45.86	54.63	72.60	98.31	89.45	98.54	83.77	83.51	73.82	71.33
Link (209, 204)	10.23	16.50	19.27	25.49	31.03	35.53	36.92	37.43	39.97	48.25	48.00	47.61	39.60	40.00
Link (219, 34)	33.40	34.43	38.24	47.65	42.02	53.92	58.05	89.65	90.76	95.84	84.86	83.76	74.06	71.38
Link (220, 26)	4.64	7.25	9.78	11.66	14.93	17.20	17.86	21.18	23.67	25.81	30.39	31.97	34.96	36.85
Link (221, 38)	27.20	30.82	29.80	33.97	39.69	30.30	56.75	50.38	56.66	56.20	46.11	54.65	53.79	52.86
Link (222, 221)	15.79	25.58	23.86	33.52	36.80	25.96	38.39	44.05	52.50	41.03	43.34	47.12	49.24	49.02
Link (223, 222)	15.22	22.46	17.94	33.54	38.15	19.66	47.50	56.14	45.23	44.07	44.18	49.44	51.85	51.15
Link (224, 149)	17.86	17.20	17.59	23.90	27.16	30.69	39.64	45.15	48.19	42.82	42.82	48.25	54.45	50.34
Link (225, 224)	17.70	16.98	20.44	23.67	30.05	27.43	40.88	46.33	44.33	41.15	42.35	47.33	51.82	50.72
Link (226, 42)	7.29	8.43	8.27	6.15	9.80	8.82	10.96	12.65	11.21	6.55	7.22	8.71	9.54	6.31
Link (246, 73)	8.93	9.49	18.25	20.53	26.22	32.33	31.26	37.79	25.44	27.96	32.36	38.77	40.60	46.32
Link (249, 246)	13.55	21.46	26.44	34.22	40.92	48.48	61.33	48.94	42.66	51.99	52.32	60.18	62.42	66.01
Link (262, 205)	5.40	7.64	7.23	10.86	9.70	9.52	7.99	8.98	12.30	10.00	6.13	5.27	4.86	6.74
Link (285, 7002)	16.18	21.47	27.16	30.89	31.68	27.85	47.42	45.68	44.08	54.04	50.70	53.52	55.10	57.17
Link (286, 26)	27.39	40.33	56.29	61.60	79.25	89.26	96.86	86.95	91.28	100.50	96.13	94.79	99.00	99.87
Link (315, 26)	5.54	7.08	8.58	9.59	10.00	12.52	11.93	11.98	14.28	14.77	23.07	30.32	36.01	33.37
Link (316, 315)	21.60	24.24	32.52	34.77	40.29	36.05	49.11	42.08	40.27	48.63	52.91	58.52	63.61	59.40
Link (336, 23)	16.94	21.80	27.44	31.14	31.58	27.30	45.30	45.39	43.56	53.48	50.97	53.20	54.82	57.47
Link (351, 7012)	29.24	38.18	58.26	70.58	77.18	91.52	98.65	78.17	80.04	80.05	74.26	73.65	76.01	74.44
Link (757, 31)	33.87	35.48	39.34	48.04	40.85	57.13	65.44	81.16	83.26	97.14	85.44	84.06	74.30	71.45
Link (7002, 336)	16.32	21.60	27.41	31.03	31.79	27.85	47.65	46.53	44.17	54.29	51.06	53.75	55.10	57.41
Link (7012, 27)	29.48	38.46	58.20	70.30	76.47	91.59	97.73	78.20	80.69	80.12	74.45	73.61	76.02	74.44
Link (7014, 757)	33.51	34.71	38.23	47.30	40.26	56.17	62.32	84.21	86.88	96.58	85.16	84.02	74.25	71.47

CORSIM Average Speeds – No Contraflow, Severe Event Case

Average Speed (mph)
Mean over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	66.11905	65.72845	65.50816	65.36713	64.4822	63.78796	58.93814	52.29394	47.64846	45.96562	46.1669	46.2178	46.26629	46.31385
Link (20, 17)	63.87493	63.723	63.69725	63.60184	63.23064	62.90688	48.71749	34.41771	28.94338	28.04029	28.1404	28.16446	28.19025	28.21511
Link (23, 20)	53.00202	52.92493	52.89242	52.80739	52.59327	52.42984	46.96196	32.9097	27.61405	26.86794	26.98424	27.02523	27.06884	27.10964
Link (25, 285)	45.06155	44.93005	44.87947	44.7571	44.24843	43.84433	38.99796	28.91624	25.23539	24.72215	24.83093	24.88441	24.9404	24.99343
Link (26, 202)	37.53413	37.44449	37.45841	37.3472	37.2495	37.16018	36.83436	28.99416	25.30482	25.04334	25.13277	25.17789	25.22408	25.26931
Link (27, 286)	51.62849	51.54429	51.43208	51.30073	51.07399	50.8726	44.22043	25.96951	19.21467	18.77019	18.94542	19.0096	19.07755	19.14643
Link (29, 351)	51.20384	51.21942	51.18975	51.11253	50.83719	50.61684	49.31609	35.6252	25.2966	24.65915	24.83081	24.89476	24.96245	25.03056
Link (31, 29)	42.53601	42.3547	42.18674	41.96703	41.26003	40.56142	38.1386	31.29926	23.45857	22.96026	23.05435	23.07979	23.10715	23.1329
Link (34, 7014)	42.25657	42.12549	41.99433	41.89802	41.70227	41.51517	41.0019	38.59793	29.40417	28.62802	28.73508	28.76983	28.80495	28.83871
Link (35, 114)	33.34641	33.3766	33.34465	33.27026	33.23245	33.25972	33.22153	33.22956	33.25003	33.2694	33.26068	33.25972	33.25868	33.25789
Link (36, 35)	27.26704	26.9142	27.04477	26.85591	26.2145	25.75877	24.39728	23.37525	23.02062	23.10788	23.16753	23.21405	23.2625	23.3098
Link (38, 36)	32.28314	32.36289	32.39309	32.41671	32.41957	32.441	32.47159	32.48583	32.48723	32.50583	32.48114	32.46624	32.45225	32.43585
Link (40, 225)	47.26547	47.25264	47.22331	47.1636	46.89574	46.73051	46.277	46.01258	45.82914	45.84842	45.86847	45.88021	45.89291	45.90294
Link (42, 43)	27.65362	26.84187	26.41604	26.22292	24.96713	24.13355	19.85234	18.67778	18.26492	18.57832	18.61737	18.6347	18.65252	18.67066
Link (43, 40)	33.34461	33.22754	33.13012	33.18251	33.21637	33.19085	33.06707	33.04824	33.0319	33.03169	33.01536	33.00591	32.99445	32.98244
Link (72, 220)	46.45566	46.40752	46.35118	46.23373	46.22326	46.18953	46.14133	46.12411	46.09608	46.09883	46.09147	46.09103	46.10624	46.09185
Link (73, 316)	41.43388	41.36428	41.42549	41.49081	41.56673	41.59251	41.62857	41.65154	41.66433	41.65187	41.63103	41.62883	41.63133	41.63204
Link (84, 206)	39.23507	39.06857	38.96909	38.82416	38.55815	38.36441	38.00168	37.7883	37.6438	37.66209	37.70106	37.72322	37.74698	37.76858
Link (114, 84)	39.72693	39.6201	39.514	39.39193	39.19745	39.08125	38.74242	38.56279	38.43344	38.4561	38.48782	38.50529	38.52448	38.54174
Link (117, 262)	50.60623	50.54806	50.52024	50.35005	49.87279	49.58718	48.65792	48.22387	47.94408	48.06033	48.07955	48.09468	48.10962	48.12452
Link (149, 223)	40.20775	40.0763	40.08368	39.97953	39.6295	39.41533	38.77256	38.36294	38.11056	38.17131	38.1982	38.21933	38.24228	38.26263
Link (202, 25)	44.34024	44.13086	44.09662	44.02936	43.47956	42.92482	39.50147	27.34716	22.93624	22.29511	22.4233	22.48546	22.5488	22.60985
Link (204, 73)	25.86781	25.48372	25.45135	25.35026	25.27256	25.19205	24.13575	23.74278	23.48859	23.48287	23.71331	23.90124	24.08654	24.2625
Link (205, 226)	50.64599	50.53695	50.52852	50.3483	49.85131	49.52886	48.51567	48.04174	47.75544	47.85443	47.87848	47.89428	47.91061	47.92612
Link (206, 219)	41.44104	41.30004	41.21675	41.10233	40.92755	40.79344	40.58974	40.45787	40.37061	40.38382	40.4069	40.42005	40.43519	40.44883
Link (209, 204)	55.31966	54.96079	54.8691	54.80616	54.6904	54.58204	54.11895	53.91531	53.85131	53.93687	53.95735	53.97763	54.00519	54.04703
Link (219, 34)	42.00956	41.90011	41.77367	41.67044	41.46704	41.30021	40.96184	40.55398	40.047	40.03322	40.06263	40.07594	40.0918	40.10563
Link (220, 26)	33.16722	32.42588	32.33363	32.02178	30.84774	29.96523	26.06745	22.42635	20.44545	20.36064	21.26239	21.9633	22.60548	23.21012
Link (221, 38)	32.89046	32.97701	32.84722	32.77138	32.25387	31.81198	31.00683	30.50869	30.18487	30.27166	30.27609	30.30161	30.32927	30.35548
Link (222, 221)	39.99537	39.92001	39.90318	39.7813	39.36868	39.16031	38.51873	38.08903	37.82562	37.88503	37.90993	37.93187	37.95523	37.97648
Link (223, 222)	40.05828	39.97949	39.97783	39.86683	39.50535	39.29934	38.67803	38.26822	38.00708	38.07034	38.09821	38.11946	38.14272	38.16364
Link (224, 149)	40.39655	40.22913	40.2333	40.12225	39.76085	39.50891	38.88351	38.48814	38.23755	38.29871	38.3287	38.34939	38.37227	38.3922
Link (225, 224)	40.17325	40.09394	40.06663	39.95876	39.61867	39.38335	38.82765	38.49184	38.26131	38.3112	38.34139	38.36362	38.38787	38.40927
Link (226, 42)	50.7754	50.67629	50.6308	50.4394	49.88717	49.54787	46.57875	45.93679	45.78249	46.03236	46.07227	46.09144	46.111	46.12978
Link (246, 73)	37.67728	37.44658	37.49515	37.3368	37.03117	36.77835	35.76364	35.40795	35.22356	35.30214	35.34955	35.42463	35.49537	35.55634
Link (249, 246)	43.80169	43.88101	43.93925	43.86449	43.68472	43.5117	42.91174	42.72031	42.57793	42.63012	42.66461	42.70334	42.74156	42.76943
Link (262, 205)	50.73267	50.67809	50.64175	50.44096	49.92908	49.63851	48.63926	48.18842	47.90131	48.01005	48.03337	48.04913	48.06485	48.08025
Link (285, 7002)	48.07715	47.85606	47.84133	47.61879	46.89712	46.43677	38.6951	26.69336	22.7196	22.1611	22.28277	22.34155	22.40266	22.46064
Link (286, 26)	26.96924	26.4527	26.35435	26.00238	25.09219	24.4224	20.63969	15.97517	13.84285	13.73188	13.82674	13.86904	13.91307	13.95852
Link (315, 26)	26.09885	25.46376	25.15594	24.81018	23.08492	21.82625	12.23695	7.306221	6.243382	6.336245	6.504788	6.602368	6.690916	6.777363
Link (316, 315)	53.41089	53.29381	53.24546	53.25906	53.16682	53.13361	52.83703	52.79519	52.78631	52.80444	52.80469	52.81491	52.82637	52.83468
Link (336, 23)	52.35459	52.31508	52.28506	52.12256	51.69506	51.32624	48.39554	34.32639	29.18805	28.5751	28.72518	28.78825	28.85393	28.9164
Link (351, 7012)	53.96629	53.90047	53.8749	53.80972	53.70138	53.58825	51.80975	33.66952	24.71342	24.15215	24.33994	24.4106	24.48513	24.56071
Link (757, 31)	41.62196	41.40682	41.14964	41.04156	39.87727	38.94835	34.2224	28.53504	21.56506	21.21156	21.34809	21.39084	21.43393	21.47393
Link (7002, 336)	47.46027	47.4422	47.47832	46.94621	45.38579	44.19901	38.69174	28.63615	24.13622	23.5213	23.65298	23.71017	23.76942	23.82591
Link (7012, 27)	110.9017	110.5365	110.39	109.9937	109.3017	108.7348	101.1977	50.10007	33.12687	32.24139	32.57132	32.69565	32.82644	32.9598
Link (7014, 757)	42.72601	42.72831	42.57968	42.48314	42.21117	41.77892	38.01043	32.40634	22.77269	22.20716	22.33903	22.37973	22.42045	22.45844

Std. Dev. over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	0.52044	0.42339	0.377105	0.355484	0.518355	0.542381	0.958881	1.903697	1.773874	1.692943	1.713228	1.709501	1.707563	1.705911
Link (20, 17)	0.357698	0.154514	0.12865	0.133015	0.102925	0.107939	1.2908	0.69971	0.502244	0.716469	0.755823	0.75679	0.757663	0.758861
Link (23, 20)	0.237462	0.12256	0.127167	0.119333	0.087307	0.066934	1.406219	0.588664	0.408721	0.815317	0.860979	0.862259	0.862134	0.862239
Link (25, 285)	0.908555	0.506434	0.394671	0.288488	0.249438	0.243273	1.552009	0.851654	1.917904	2.352786	2.347435	2.345688	2.344195	2.343829
Link (26, 202)	0.604611	0.351684	0.27915	0.249563	0.146015	0.159357	0.123708	0.675209	1.686242	1.928858	1.922079	1.918253	1.915079	1.910721
Link (27, 286)	0.39954	0.186836	0.209705	0.183625	0.132623	0.114275	3.699532	3.103178	1.486285	1.776584	1.789628	1.789694	1.791496	1.79025
Link (29, 351)	0.314526	0.178307	0.160962	0.108617	0.087286	0.079476	1.596447	5.973079	2.901965	2.961268	2.96203	2.959052	2.957933	2.953312
Link (31, 29)	0.583715	0.551602	0.374601	0.26572	0.18091	0.3059	0.442156	4.19543	3.627272	3.509465	3.504233	3.502084	3.501901	3.501118
Link (34, 7014)	0.307367	0.222289	0.21269	0.154988	0.107754	0.133525	0.192518	4.625914	7.961164	8.454148	8.397624	8.383419	8.369912	8.357017
Link (35, 114)	0.216799	0.151878	0.136957	0.108127	0.095551	0.067483	0.077493	0.068797	0.066508	0.070679	0.072113	0.071641	0.073105	0.07466
Link (36, 35)	0.914897	0.747608	0.7497	0.421211	0.389285	0.506305	0.570375	0.601751	0.655323	0.706932	0.70483	0.702283	0.702251	0.69892
Link (38, 36)	0.28484	0.171021	0.159578	0.116704	0.108647	0.112981	0.117283	0.09272	0.066425	0.058821	0.055682	0.055405	0.05639	0.055533
Link (40, 225)	0.312919	0.217017	0.132879	0.118221	0.117383	0.122379	0.081231	0.072393	0.060593	0.064634	0.067455	0.067566	0.068671	0.067436
Link (42, 43)	0.63651	0.605608	0.691538	0.404474	0.555241	0.560068	0.956582	0.794401	0.735466	0.700892	0.703003	0.702416	0.702706	0.703155
Link (43, 40)	0.30436	0.224601	0.213276	0.138403	0.16476	0.129533	0.082157	0.08404	0.083386	0.086626	0.087098	0.083705	0.083092	0.084702
Link (72, 220)	1.040706	0.446131	0.251527	0.20403	0.183284	0.246489	0.156795	0.13253	0.137189	0.151361	0.155548	0.12795	0.140673	0.151501
Link (73, 316)	0.54037	0.368361	0.246259	0.206817	0.193426	0.155585	0.146408	0.158063	0.103299	0.101784	0.096937	0.089657	0.086686	0.085801
Link (84, 206)	0.402515	0.360794	0.274773	0.22436	0.116968	0.118213	0.112343	0.098056	0.077303	0.071056	0.073066	0.073126	0.072345	0.072025
Link (114, 84)	0.344276	0.286571	0.239851	0.184152	0.110066	0.110904	0.133754	0.10219	0.079171	0.079312	0.07975	0.080603	0.078367	0.078187
Link (117, 262)	0.339215	0.277398	0.188578	0.11086	0.173581	0.145746	0.100743	0.132396	0.124732	0.117759	0.116496	0.117681	0.118077	0.11835
Link (149, 223)	0.523435	0.372564	0.197889	0.213273	0.18262	0.168884	0.132065	0.102996	0.11677	0.108374	0.109687	0.109616	0.109435	0.108389
Link (202, 25)	0.792036	0.663527	0.616112	0.48799	0.476812	0.468538	1.257676	0.741228	2.188721	2.66533	2.659218	2.657561	2.657018	2.656211
Link (204, 73)	1.36696	0.569297	0.511721	0.567424	0.382538	0.35	0.580156	0.488829	0.491616	0.450795	0.43072	0.426865	0.416217	0.414056
Link (205, 226)	0.333278	0.213735	0.20252	0.121695	0.170791	0.167105	0.091077	0.087398	0.14077	0.133357	0.136439	0.137151	0.137033	0.136971
Link (206, 219)	0.356469	0.231585	0.196648	0.139389	0.068876	0.056338	0.05108	0.049911	0.043534	0.051757	0.053315	0.052755	0.053525	0.053973
Link (209, 204)	1.045602	0.639745	0.50582	0.559922	0.321262	0.281556	0.311989	0.228649	0.210895	0.243176	0.220946	0.211824	0.2021	0.203504
Link (219, 34)	0.385399	0.230804	0.189518	0.127764	0.065539	0.085515	0.070424	0.525827	0.768355	0.745935	0.734987	0.732664	0.730695	0.728404
Link (220, 26)	1.551957	0.721588	0.828723	0.623261	0.533243	0.538087	0.684305	0.401104	0.410215	0.524759	0.557067	0.566895	0.596561	0.60515
Link (221, 38)	0.715132	0.437158	0.29255	0.29081	0.367908	0.388044	0.400601	0.43667	0.380309	0.329798	0.315407	0.314642	0.316565	0.316433
Link (222, 221)	0.603022	0.463255	0.26965	0.236484	0.16753	0.201697	0.131816	0.116394	0.106524	0.123428	0.124383	0.123688	0.123107	0.123224
Link (223, 222)	0.568695	0.453492	0.230575	0.232902	0.1631	0.157737	0.123483	0.093601	0.110219	0.115055	0.117573	0.117366	0.117009	0.116603
Link (224, 149)	0.523896	0.305154	0.158125	0.183996	0.209971	0.206212	0.159015	0.131364	0.114827	0.098534	0.100032	0.099296	0.099387	0.09862
Link (225, 224)	0.442399	0.237288	0.14027	0.144654	0.143463	0.152408	0.121185	0.100812	0.07648	0.064904	0.068586	0.06772	0.068368	0.066868
Link (226, 42)	0.309527	0.288172	0.235838	0.137934	0.204505	0.195934	1.923107	1.631676	1.380985	1.293956	1.29049	1.288334	1.284675	1.282646
Link (246, 73)	0.752913	0.361872	0.234613	0.168967	0.135128	0.208064	0.189934	0.227932	0.205416	0.204129	0.203316	0.199484	0.194628	0.193234
Link (249, 246)	0.398953	0.24807	0.193763	0.178303	0.138011	0.163359	0.199347	0.194727	0.173469	0.161462	0.170534	0.164764	0.160654	0.162464
Link (262, 205)	0.296845	0.249145	0.206335	0.128495	0.192651	0.174949	0.100114	0.11528	0.150601	0.128789	0.129212	0.130265	0.130824	0.130457
Link (285, 7002)	0.562554	0.248057	0.258264	0.200125	0.299207	0.254269	1.705088	0.685204	2.085601	2.637564	2.638199	2.638397	2.639961	2.641209
Link (286, 26)	1.381749	0.430697	0.449369	0.652762	0.705001	0.73527	0.962919	0.697566	0.475397	0.593287	0.598555	0.598225	0.59894	0.597606
Link (315, 26)	1.020385	0.791588	0.603444	0.493635	0.584932	0.425957	1.325361	1.237387	0.721716	0.624845	0.636314	0.641028	0.645754	0.645926
Link (316, 315)	0.782838	0.350118	0.268915	0.234898	0.163651	0.178407	0.146688	0.137181	0.094859	0.091658	0.098155	0.096736	0.101068	0.100977
Link (336, 23)	0.225149	0.134821	0.16294	0.151564	0.186578	0.18072	1.514524	0.664514	0.812243	1.476058	1.518551	1.518364	1.518783	1.518914
Link (351, 7012)	0.27407	0.083966	0.096008	0.089606	0.070725	0.080209	2.866194	4.658807	2.253075	2.517881	2.52492	2.523398	2.523285	2.519845
Link (757, 31)	0.98311	0.890025	0.84014	0.644704	0.483843	0.708888	0.724622	3.786778	4.714031	4.79156	4.789176	4.786131	4.785594	4.782227
Link (7002, 336)	1.030027	0.656396	0.428561	0.542652	0.675786	0.73168	1.171435	5.452903	7.893609	7.860413	7.85504	7.873065	7.891638	7.909438
Link (7012, 27)	2.024478	1.0139	1.097578	0.988288	1.024872	0.957815	10.32776	9.338616	3.616755	4.223488	4.257723	4.262288	4.269651	4.271437
Link (7014, 757)	0.430324	0.28969	0.270606	0.190656	0.135513	0.328483	1.494753	5.581545	7.991967	7.975526	7.955257	7.949232	7.944993	7.938348

CORSIM Average Speeds – With Contraflow, Severe Event Case

AverageSpeed (mph)
Mean over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	69.57082	69.46468	69.36845	69.3162	69.07417	68.91389	68.32734	68.03908	67.90732	67.96124	68.01136	68.0523	68.0892	68.12745
Link (20, 17)	66.61851	66.59944	66.57803	66.53503	66.4399	66.34378	66.01749	65.93734	65.89121	65.92867	65.93797	65.94632	65.95293	65.95823
Link (23, 20)	55.13986	55.13206	55.08389	55.04781	54.98798	54.94216	54.75342	54.69374	54.66099	54.67843	54.67882	54.68688	54.68952	54.69161
Link (25, 285)	50.41058	50.49412	50.46623	50.65001	51.06078	51.27966	51.39499	51.47213	51.56078	51.57466	51.47369	51.3887	51.30992	51.23597
Link (26, 202)	36.32389	36.23687	36.27158	36.27216	36.29575	36.22165	36.13221	36.13623	36.1144	36.13327	36.16138	36.18434	36.21028	36.2317
Link (27, 286)	51.63137	51.50878	51.33239	51.13617	50.88902	50.70176	50.12859	49.71838	49.50234	49.52119	49.57153	49.61547	49.65625	49.70001
Link (29, 351)	51.46977	51.39777	51.30645	51.20158	50.90685	50.7156	49.96325	49.49885	49.28271	49.35075	49.35764	49.35858	49.35961	49.36078
Link (31, 29)	42.91659	42.76778	42.69205	42.36451	41.55611	40.92359	38.73551	37.41882	36.79438	36.99662	37.05301	37.08549	37.11834	37.15208
Link (34, 7014)	42.25878	42.20541	42.07841	41.92478	41.72303	41.53935	41.06181	40.74477	40.5872	40.60981	40.64241	40.66848	40.69412	40.71789
Link (35, 114)	33.57166	33.47607	33.3963	33.39187	33.35838	33.36042	33.34801	33.32842	33.31976	33.31263	33.30498	33.29799	33.29124	33.2859
Link (36, 35)	29.20727	29.08607	28.80295	28.74235	28.13495	27.67127	26.37215	25.37505	24.91595	24.93578	25.02522	25.12236	25.2163	25.30997
Link (38, 36)	32.51526	32.44146	32.40316	32.42039	32.43803	32.46222	32.46617	32.47953	32.48333	32.48112	32.45699	32.43935	32.42472	32.40606
Link (40, 225)	47.43017	47.48232	47.36647	47.20872	46.93537	46.73262	46.29808	46.03946	45.88987	45.93504	46.04442	46.14968	46.25065	46.346
Link (42, 43)	29.07067	28.60294	28.3933	27.8161	26.75565	25.70741	21.46273	20.10707	19.44436	19.81899	20.0914	20.3604	20.57814	20.78451
Link (43, 40)	33.84737	33.59568	33.49771	33.44018	33.38456	33.33945	33.26228	33.21901	33.19162	33.20461	33.22049	33.24048	33.25397	33.25808
Link (72, 220)	46.44828	46.37458	46.37959	46.3561	46.24264	46.24014	46.1852	46.20425	46.23605	46.20309	46.21952	46.23871	46.2473	46.24722
Link (73, 316)	41.75591	41.6554	41.64798	41.63473	41.68018	41.63865	41.65591	41.67986	41.6627	41.66207	41.68182	41.69088	41.70383	41.71391
Link (84, 206)	39.49232	39.31833	39.14796	38.93452	38.6386	38.45048	38.08453	37.82205	37.65557	37.67162	37.72892	37.77848	37.82877	37.87618
Link (114, 84)	39.7891	39.6579	39.52837	39.40003	39.18303	39.05611	38.75306	38.54206	38.42699	38.44738	38.49388	38.5339	38.57391	38.61212
Link (117, 262)	50.49818	50.54608	50.41403	50.25077	49.79473	49.50549	48.59483	48.16702	47.89362	48.01993	48.18224	48.32658	48.47097	48.59393
Link (149, 223)	40.14085	40.11509	39.96737	39.8469	39.54205	39.32503	38.71835	38.34962	38.10553	38.16153	38.27742	38.38314	38.48976	38.58804
Link (202, 25)	53.07117	53.07041	52.95916	52.97112	52.90095	52.79453	52.45012	52.31942	52.27059	52.32456	52.28477	52.26583	52.25316	52.24093
Link (204, 73)	21.15664	21.11027	21.00116	21.05059	21.25427	21.31127	21.69161	21.79402	21.84594	21.79914	21.87534	21.95214	22.03939	22.09159
Link (205, 226)	50.48807	50.50914	50.3856	50.20784	49.71079	49.36176	48.47185	47.98553	47.69944	47.82665	47.98962	48.14103	48.2909	48.42368
Link (206, 219)	41.57975	41.48837	41.33449	41.1754	41.01214	40.87098	40.64906	40.47904	40.38198	40.38034	40.4154	40.44577	40.4772	40.50644
Link (209, 204)	55.19503	54.94658	54.83702	54.73259	54.57898	54.5429	54.09516	53.95993	53.88239	53.92538	53.94295	53.98723	54.01678	54.04654
Link (219, 34)	42.15273	42.05929	41.91451	41.74035	41.51538	41.34248	40.99711	40.74612	40.60327	40.60819	40.64088	40.66877	40.69646	40.72275
Link (220, 26)	23.26127	23.40928	23.68425	23.77405	23.92352	24.17133	24.81294	24.85698	25.01436	24.9473	24.33154	24.02762	23.68586	23.42775
Link (221, 38)	33.81465	33.36171	33.19719	32.93254	32.49508	32.15491	31.20298	30.62677	30.34951	30.4095	30.5139	30.62652	30.74185	30.84599
Link (222, 221)	40.10148	40.00018	39.85183	39.68366	39.30857	39.06536	38.47202	38.05652	37.81632	37.86537	37.98281	38.08921	38.19607	38.29182
Link (223, 222)	40.13827	40.04581	39.90751	39.77805	39.44571	39.23443	38.63727	38.25776	38.0096	38.06605	38.18128	38.28591	38.39176	38.48941
Link (224, 149)	40.26139	40.27563	40.13719	40.01843	39.69374	39.45708	38.85474	38.50235	38.25832	38.31959	38.43605	38.54262	38.64738	38.74425
Link (225, 224)	40.2052	40.25527	40.12305	39.96608	39.64258	39.39239	38.85861	38.53876	38.32324	38.37959	38.50061	38.61016	38.71848	38.82088
Link (226, 42)	50.53541	50.55571	50.44164	50.25174	49.72104	49.34183	47.03132	46.39001	46.16431	46.39105	46.6446	46.86935	47.08411	47.28014
Link (246, 73)	39.16656	38.97454	38.90965	38.70934	38.33612	38.08003	36.93602	36.42911	36.18712	36.26312	36.36687	36.45764	36.55721	36.65149
Link (249, 246)	43.81188	43.81468	43.75447	43.73662	43.54725	43.43475	42.88808	42.62641	42.48998	42.5458	42.60962	42.65803	42.69667	42.74442
Link (262, 205)	50.59301	50.58581	50.4979	50.32761	49.85072	49.52943	48.60527	48.14854	47.86385	47.99445	48.1589	48.31277	48.46279	48.59317
Link (285, 7002)	53.62298	53.59748	53.52127	53.4436	53.23097	53.08297	52.51559	52.30092	52.21257	52.27719	52.29517	52.32663	52.35631	52.38473
Link (286, 26)	42.95892	42.19115	42.11554	41.77867	40.90663	40.28513	37.66975	35.7801	34.95676	35.22364	35.3136	35.37658	35.43684	35.50069
Link (315, 26)	14.99349	14.61659	14.15581	14.50149	15.74795	16.72961	18.65138	19.54081	20.13323	19.83465	18.40069	17.42778	16.61942	15.92925
Link (316, 315)	53.36766	53.27056	53.25396	53.22886	53.13165	53.05272	52.83986	52.77314	52.72834	52.75884	52.78227	52.81624	52.83509	52.8596
Link (336, 23)	55.15353	55.15001	55.09191	55.05328	54.99775	54.95467	54.78193	54.70701	54.67838	54.69804	54.69638	54.69965	54.70114	54.70704
Link (351, 7012)	53.9837	53.92453	53.84197	53.74796	53.63746	53.569	53.26688	53.05891	52.94529	52.94421	52.9672	52.98837	53.00824	53.02946
Link (757, 31)	42.23823	41.92047	41.75573	41.24326	40.0062	39.12167	34.95953	32.91916	31.77341	32.0636	32.19035	32.26467	32.3395	32.41236
Link (7002, 336)	54.84786	54.85141	54.80906	54.74635	54.6309	54.54698	54.13743	53.9763	53.91928	53.96497	53.98149	54.00349	54.02308	54.04562
Link (7012, 27)	111.9533	111.0415	110.5733	109.9334	109.2739	108.7904	107.2624	106.2283	105.5898	105.5761	105.7451	105.8834	106.0203	106.1631
Link (7014, 757)	42.84187	42.83402	42.75864	42.55464	42.11578	41.77087	39.10202	37.69005	37.02016	37.2685	37.35406	37.40723	37.45987	37.51058

Std. Dev. over 10 runs

Link/Aggregation	Interval 3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	0.295006	0.242013	0.177534	0.153446	0.142873	0.118582	0.146768	0.138715	0.129407	0.13044	0.133019	0.133333	0.131438	0.129506
Link (20, 17)	0.328079	0.185183	0.158177	0.119585	0.108752	0.078225	0.144265	0.189253	0.153434	0.149553	0.14636	0.147152	0.144721	0.14522
Link (23, 20)	0.184594	0.17182	0.126971	0.09954	0.106473	0.085764	0.12405	0.147718	0.125968	0.120946	0.113548	0.113567	0.111551	0.110832
Link (25, 285)	0.627842	0.333452	0.238566	0.242768	0.238087	0.173077	0.209532	0.204108	0.200955	0.202911	0.197185	0.201871	0.205007	0.203161
Link (26, 202)	0.473445	0.198228	0.233027	0.156178	0.107467	0.111475	0.103479	0.085059	0.062666	0.059618	0.055818	0.052941	0.057287	0.058656
Link (27, 286)	0.366753	0.200874	0.151652	0.158382	0.143689	0.136679	0.123631	0.125888	0.085566	0.077429	0.073087	0.073342	0.074673	0.073511
Link (29, 351)	0.131726	0.107646	0.097205	0.129799	0.12155	0.115458	0.186853	0.143452	0.150222	0.14797	0.146503	0.145202	0.144769	0.14306
Link (31, 29)	0.631642	0.283563	0.214108	0.252903	0.263189	0.270167	0.287061	0.329024	0.272017	0.260359	0.261007	0.26011	0.259721	0.258308
Link (34, 7014)	0.296457	0.147743	0.161427	0.170352	0.149526	0.136445	0.196861	0.200553	0.164817	0.165167	0.16354	0.161836	0.161372	0.161058
Link (35, 114)	0.170662	0.172898	0.139418	0.126653	0.097241	0.100495	0.091982	0.078231	0.075776	0.063947	0.061803	0.063545	0.065358	0.063428
Link (36, 35)	0.7796	0.684	0.514924	0.491911	0.650369	0.563448	0.440119	0.425455	0.488721	0.43431	0.428086	0.427874	0.424357	0.422428
Link (38, 36)	0.484737	0.32179	0.283687	0.206144	0.177918	0.140694	0.111112	0.092619	0.077351	0.081327	0.073627	0.074971	0.075031	0.072056
Link (40, 225)	0.259638	0.13488	0.113357	0.116976	0.143703	0.133111	0.157997	0.16704	0.145914	0.131049	0.12665	0.125027	0.116787	0.117801
Link (42, 43)	0.678921	0.524441	0.48158	0.395606	0.503434	0.521558	1.038003	0.938066	0.799564	0.780883	0.753658	0.744229	0.707074	0.682688
Link (43, 40)	0.356682	0.341242	0.282564	0.244881	0.234481	0.224908	0.165216	0.143653	0.150769	0.166512	0.15683	0.149873	0.139077	0.135548
Link (72, 220)	0.563064	0.507155	0.289687	0.216022	0.173246	0.224218	0.243888	0.252196	0.23273	0.212883	0.212075	0.206423	0.196218	0.178494
Link (73, 316)	0.333078	0.31234	0.283505	0.228451	0.173482	0.136479	0.138412	0.154473	0.11159	0.118332	0.108372	0.106253	0.107678	0.109056
Link (84, 206)	0.400053	0.340309	0.298689	0.198629	0.139952	0.124115	0.110053	0.101766	0.078128	0.074765	0.072549	0.070743	0.071338	0.074487
Link (114, 84)	0.311348	0.252313	0.212852	0.14919	0.114355	0.087365	0.106054	0.102214	0.076693	0.07336	0.071779	0.071735	0.07369	0.076122
Link (117, 262)	0.193922	0.188038	0.16791	0.16385	0.18291	0.196622	0.227695	0.241592	0.197043	0.175592	0.170866	0.156009	0.143296	0.14304
Link (149, 223)	0.245875	0.269623	0.169594	0.114633	0.1617	0.164692	0.167809	0.193136	0.195101	0.196238	0.196392	0.194007	0.18913	0.188881
Link (202, 25)	0.49905	0.286895	0.299209	0.222625	0.186363	0.11031	0.175012	0.213931	0.18369	0.186124	0.17597	0.160466	0.158573	0.156204
Link (204, 73)	1.009253	0.585185	0.410646	0.446078	0.486819	0.348972	0.337223	0.284823	0.297931	0.265895	0.240069	0.239409	0.237584	0.199614
Link (205, 226)	0.209355	0.260208	0.190427	0.177193	0.254375	0.298161	0.327939	0.306383	0.287128	0.256001	0.249511	0.235922	0.222591	0.211125
Link (206, 219)	0.301613	0.227008	0.194725	0.155446	0.155981	0.136825	0.114372	0.104976	0.082463	0.067404	0.066909	0.066964	0.065475	0.067442
Link (209, 204)	0.920385	0.537766	0.286308	0.305625	0.177284	0.224976	0.250274	0.334089	0.306516	0.292139	0.283393	0.277572	0.250192	0.263632
Link (219, 34)	0.354874	0.215369	0.193043	0.170987	0.168663	0.15058	0.11644	0.11701	0.085813	0.081973	0.080826	0.079786	0.077988	0.080179
Link (220, 26)	2.109633	1.599371	1.233717	1.109636	0.893935	0.783556	0.722775	0.797318	0.859884	0.85576	0.876344	0.776634	0.739271	0.7316
Link (221, 38)	1.00442	0.563595	0.580885	0.400285	0.384267	0.422037	0.365099	0.266099	0.280278	0.262027	0.263758	0.25903	0.25851	0.25531
Link (222, 221)	0.345836	0.395765	0.261852	0.183306	0.176159	0.201382	0.194892	0.194066	0.198874	0.212991	0.217314	0.215146	0.208217	0.207855
Link (223, 222)	0.250025	0.307665	0.182069	0.147357	0.15984	0.171263	0.183512	0.19648	0.200334	0.209478	0.210272	0.208239	0.202658	0.202223
Link (224, 149)	0.343847	0.26649	0.149165	0.124748	0.171953	0.165534	0.158024	0.170933	0.18459	0.189048	0.18502	0.181801	0.17551	0.174928
Link (225, 224)	0.361609	0.21485	0.105894	0.094102	0.145929	0.138258	0.133339	0.143387	0.158406	0.150753	0.149567	0.1463	0.140283	0.141754
Link (226, 42)	0.258732	0.344514	0.225298	0.191085	0.244487	0.315706	2.015382	1.729192	1.521993	1.420138	1.363845	1.300025	1.239787	1.19384
Link (246, 73)	0.46273	0.342341	0.218926	0.198124	0.122041	0.146145	0.204662	0.265538	0.24681	0.259376	0.248931	0.246068	0.207486	0.209769
Link (249, 246)	0.423641	0.306886	0.217132	0.105266	0.118509	0.121836	0.109146	0.134829	0.118961	0.130405	0.127464	0.126545	0.123116	0.132239
Link (262, 205)	0.253305	0.194367	0.163276	0.127976	0.21038	0.231509	0.26977	0.266361	0.234306	0.213026	0.210848	0.195605	0.180671	0.175123
Link (285, 7002)	0.430617	0.44257	0.2992	0.231542	0.258752	0.206347	0.251229	0.266008	0.244133	0.235285	0.223561	0.227914	0.228603	0.229232
Link (286, 26)	1.490144	1.10042	0.662975	0.773739	0.628773	0.766766	1.186737	1.032715	0.752557	0.708039	0.708231	0.70035	0.698272	0.69002
Link (315, 26)	1.152261	0.767946	0.764589	0.463991	0.412256	0.487733	0.542404	0.46991	0.492487	0.509006	0.435456	0.400298	0.377994	0.353421
Link (316, 315)	0.531506	0.317727	0.235619	0.234582	0.145155	0.106079	0.150363	0.174276	0.154747	0.155602	0.166839	0.164617	0.171081	0.175337
Link (336, 23)	0.145833	0.178352	0.107466	0.094096	0.106343	0.083602	0.118067	0.130274	0.119747	0.115755	0.107919	0.105368	0.106067	0.105828
Link (351, 7012)	0.179562	0.182404	0.180592	0.139459	0.117187	0.116068	0.129745	0.098219	0.073135	0.080317	0.079589	0.079674	0.080207	0.078899
Link (757, 31)	1.021937	0.540363	0.619734	0.843	0.757922	0.739089	0.543649	0.644822	0.608409	0.666331	0.659659	0.656264	0.649974	0.645612
Link (7002, 336)	0.158176	0.173124	0.136581	0.125714	0.132558	0.105788	0.142919	0.160293	0.145666	0.142622	0.136176	0.136124	0.135392	0.136818
Link (7012, 27)	1.152668	1.352194	1.040908	0.940333	0.596246	0.724388	0.644686	0.660742	0.488447	0.42616	0.412486	0.409571	0.412409	0.412141
Link (7014, 757)	0.527099	0.250663	0.255673	0.36108	0.333675	0.267227	1.150145	0.998582	1.146277	1.158929	1.145244	1.138701	1.131271	1.122934

CORSIM Max. Queues – No Contraflow, Moderate Event Case

MaximumQueue Lane 1(vehicles)
Mean over 10 runs
Link/Aggregation

		Queue Length (ft)
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	1.7	34
Link (26, 202)	1.4	28
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	0.4	8
Link (35, 114)	1.3	26
Link (36, 35)	52.6	1040
Link (38, 36)	1.1	22
Link (40, 225)	0.2	4
Link (42, 43)	28.7	568
Link (43, 40)	0.6	12
Link (72, 220)	1	20
Link (73, 316)	1	20
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	24.6	487
Link (204, 73)	3.5	69
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	2	40
Link (221, 38)	39.9	789
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	0.9	18
Link (246, 73)	12	237
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	8.9	176
Link (286, 26)	35.4	700
Link (315, 26)	17.4	344
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Max Queue Length
NB Coll @ MLK	706.1460151
WBT MLK	100.8779981
WBR MLK	363.9519925
NB Coll @ Mkt	1790.450001
NBT @ Oleander	1867.232001
NBT Coll @ Mky Jct	595.377984
Ramp @ Gordon	6902.667993

Std. Dev. over 10 runs
Link/Aggregation

	50400	
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	1.494434	30
Link (26, 202)	0.699206	14
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	0.699206	14
Link (35, 114)	0.483046	10
Link (36, 35)	7.805981	154
Link (38, 36)	0.316228	6
Link (40, 225)	0.421637	8
Link (42, 43)	4.24395	84
Link (43, 40)	0.699206	14
Link (72, 220)	0	0
Link (73, 316)	0	0
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	2.796824	55
Link (204, 73)	0.527046	10
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	0.471405	9
Link (221, 38)	4.532598	90
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	1.449138	29
Link (246, 73)	2	40
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	3.071373	61
Link (286, 26)	3.596294	71
Link (315, 26)	1.577621	31
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Std Deviation
NB Coll @ MLK	68.55049731
WBT MLK	7.255995477
WBR MLK	10.90030165
NB Coll @ Mkt	5.493779516
NBT @ Oleander	27.04247464
NBT Coll @ Mky Jct	19.55946073
Ramp @ Gordon	38.21537979

CORSIM Max. Queues – With Contraflow, Moderate Event Case

MaximumQueue Lane 1(vehicles)
Mean over 10 runs

Link/Aggregation	Interval	
	50400	Queue Length (ft)
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	0	0
Link (26, 202)	0.4	8
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	1.9	38
Link (35, 114)	1.3	26
Link (36, 35)	50.2	993
Link (38, 36)	0.9	18
Link (40, 225)	0.2	4
Link (42, 43)	27.2	538
Link (43, 40)	0.9	18
Link (72, 220)	1	20
Link (73, 316)	1.1	22
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	0	0
Link (204, 73)	3.7	73
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	3.2	63
Link (221, 38)	37.9	750
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	1.2	24
Link (246, 73)	10.7	212
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	0	0
Link (286, 26)	4.8	95
Link (315, 26)	3.2	63
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Max Queue Length
NB Coll @ MLK	403.5119925
WBT MLK	148.35
WBR MLK	85.05400141
NB Coll @ Mkt	1804.295999
NBT @ Oleander	1782.178044
NBT Coll @ Mky Jct	577.5760151
Ramp @ Gordon	0

Std. Dev. over 10 runs
Link/Aggregation

	50400	
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	0	0
Link (26, 202)	0.516398	10
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	3.478505	69
Link (35, 114)	0.483046	10
Link (36, 35)	4.263541	84
Link (38, 36)	0.316228	6
Link (40, 225)	0.421637	8
Link (42, 43)	4.442222	88
Link (43, 40)	0.316228	6
Link (72, 220)	0	0
Link (73, 316)	0.316228	6
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	0	0
Link (204, 73)	0.674949	13
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	0.632456	13
Link (221, 38)	2.469818	49
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	1.619328	32
Link (246, 73)	2.626785	52
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	0	0
Link (286, 26)	1.316561	26
Link (315, 26)	0.788811	16
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Std Deviation
NB Coll @ MLK	33.9747314
WBT MLK	4.662190631
WBR MLK	6.334660335
NB Coll @ Mkt	10.83401346
NBT @ Oleander	15.8804709
NBT Coll @ Mky Jct	26.35689372
Ramp @ Gordon	0

CORSIM Throughput – No Contraflow, Moderate Event Case

Discharge Through(vehicles)
Mean over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	1342	3060	4782	6610	8823	11202	14341	17760	20967	23324	23668	23759	23847	23937
Link (20, 17)	1137	2498	3849	5303	7143	9076	11822	14643	17336	19163	19271	19305	19338	19372
Link (23, 20)	1183	2586	3978	5475	7356	9330	12134	14987	17719	19583	19758	19829	19896	19963
Link (25, 285)	1228	2654	4079	5600	7518	9518	12354	15229	17988	19861	20086	20195	20301	20406
Link (26, 202)	1244	2684	4113	5642	7548	9522	12372	15215	17948	19817	20083	20205	20323	20445
Link (29, 351)	1107	2362	3613	4930	6497	8113	10339	12594	14757	16335	16575	16678	16784	16886
Link (31, 29)	995	2119	3240	4421	5815	7252	9218	11221	13141	14561	14693	14734	14773	14810
Link (34, 7014)	1222	2579	3941	5365	6994	8655	10842	13082	15242	16930	17173	17254	17334	17409
Link (35, 114)	1280	2644	3996	5429	7058	8740	10964	13189	15338	16997	17166	17249	17328	17403
Link (36, 35)	1118	2307	3479	4727	6149	7624	9571	11527	13421	14874	14962	14995	15031	15064
Link (38, 36)	1277	2611	3928	5317	6881	8483	10592	12674	14716	16294	16486	16585	16689	16790
Link (40, 225)	1327	2664	3997	5400	6987	8609	10744	12780	14782	16297	16444	16530	16620	16706
Link (42, 43)	1263	2530	3794	5120	6637	8184	10236	12186	14106	15537	15598	15615	15631	15647
Link (43, 40)	1296	2600	3898	5265	6821	8409	10511	12512	14477	15950	16052	16103	16156	16208
Link (72, 220)	91	193	292	399	520	634	781	923	1064	1187	1310	1406	1495	1590
Link (73, 316)	233	479	730	1012	1403	1803	2481	3095	3713	4051	4205	4287	4365	4442
Link (84, 206)	1259	2626	3982	5411	7049	8717	10933	13152	15304	16982	17170	17252	17331	17407
Link (114, 84)	1275	2640	3992	5427	7055	8733	10958	13181	15332	16995	17168	17250	17329	17404
Link (117, 262)	1354	2711	4063	5505	7201	8907	11242	13413	15563	17093	17218	17267	17318	17367
Link (149, 223)	1325	2658	3997	5397	6974	8582	10700	12752	14751	16292	16499	16584	16674	16761
Link (202, 25)	1213	2619	4022	5522	7420	9401	12225	15078	17817	19660	19859	19948	20033	20118
Link (204, 73)	88	182	275	385	541	704	974	1218	1463	1592	1645	1675	1703	1734
Link (205, 226)	1355	2709	4068	5505	7190	8905	11219	13388	15544	17089	17248	17299	17349	17399
Link (206, 219)	1245	2609	3969	5392	7022	8688	10896	13118	15288	16959	17172	17255	17334	17409
Link (209, 204)	194	408	618	850	1152	1460	1929	2358	2785	3049	3204	3295	3388	3477
Link (219, 34)	1226	2584	3943	5369	6999	8660	10849	13090	15252	16933	17173	17255	17334	17409
Link (220, 26)	28	61	92	124	158	188	228	267	305	343	393	431	464	500
Link (221, 38)	1217	2482	3732	5047	6519	8037	10028	11988	13918	15413	15523	15552	15581	15608
Link (222, 221)	1312	2646	3983	5384	6952	8561	10640	12686	14706	16273	16522	16608	16696	16784
Link (223, 222)	1318	2651	3993	5391	6961	8579	10667	12731	14730	16282	16511	16597	16686	16774
Link (224, 149)	1325	2665	3995	5399	6977	8597	10707	12759	14758	16292	16480	16565	16655	16742
Link (225, 224)	1330	2666	3996	5401	6984	8604	10715	12764	14759	16294	16467	16552	16642	16729
Link (226, 42)	1356	2710	4066	5504	7190	8902	11209	13383	15536	17086	17258	17308	17358	17408
Link (246, 73)	134	276	409	546	701	864	1043	1226	1402	1564	1619	1652	1686	1718
Link (249, 246)	291	597	895	1211	1625	2043	2665	3242	3816	4191	4353	4454	4552	4649
Link (262, 205)	1354	2712	4066	5507	7196	8908	11229	13398	15555	17091	17233	17284	17334	17384
Link (285, 7002)	1226	2653	4077	5598	7517	9515	12349	15226	17984	19859	20086	20195	20301	20406
Link (286, 26)	1034	2230	3418	4668	6175	7750	9922	12112	14206	15729	15863	15914	15966	16017
Link (315, 26)	58	117	177	234	293	354	415	479	543	611	682	721	759	796
Link (316, 315)	232	478	729	1011	1402	1801	2478	3094	3711	4050	4205	4286	4364	4442
Link (336, 23)	1218	2648	4071	5588	7502	9497	12325	15208	17964	19849	20087	20196	20301	20407
Link (351, 7012)	1106	2362	3612	4929	6496	8111	10338	12593	14756	16334	16575	16678	16784	16886
Link (757, 31)	1217	2576	3939	5362	6988	8650	10834	13077	15232	16927	17173	17254	17334	17409
Link (7002, 336)	1225	2652	4076	5595	7514	9509	12344	15221	17979	19857	20086	20195	20301	20406
Link (7012, 27)	1105	2361	3612	4928	6495	8110	10337	12592	14756	16333	16576	16678	16784	16886
Link (7014, 757)	1221	2578	3941	5364	6993	8654	10840	13081	15239	16929	17173	17254	17334	17409

Std. Dev. over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	35.96	46.45	64.18	60.11	91.30	75.52	79.67	108.99	116.21	143.01	138.38	140.14	142.54	146.08
Link (20, 17)	23.41	38.04	55.03	63.46	82.11	61.90	81.13	95.21	118.03	133.94	135.83	139.70	139.95	144.22
Link (23, 20)	24.51	38.16	50.61	49.71	76.08	57.30	71.41	86.04	112.22	127.52	127.20	130.03	129.04	132.66
Link (25, 285)	28.06	41.34	55.99	58.69	71.41	64.07	73.51	85.75	106.41	120.85	126.08	130.82	132.38	139.59
Link (26, 202)	26.60	43.20	52.26	60.58	70.48	60.22	66.02	65.44	99.94	112.25	116.56	118.67	123.07	130.30
Link (29, 351)	27.08	37.72	48.27	60.36	65.68	68.72	78.33	86.19	106.48	118.60	122.68	120.86	122.70	129.49
Link (31, 29)	24.89	28.03	36.67	52.23	59.25	61.87	63.40	68.48	77.57	85.93	88.45	89.58	89.31	90.33
Link (34, 7014)	19.21	15.07	35.18	47.60	61.26	68.87	60.36	69.34	64.66	85.00	88.08	86.56	85.57	88.39
Link (35, 114)	18.62	23.46	26.45	52.00	56.42	63.87	69.24	72.55	63.38	85.15	88.57	86.83	83.72	88.12
Link (36, 35)	21.22	23.81	28.48	45.76	47.60	62.04	64.08	70.86	61.68	69.89	71.59	70.48	68.77	67.71
Link (38, 36)	21.34	27.51	37.43	42.47	38.48	53.55	49.84	68.82	73.50	73.02	73.36	75.55	74.27	74.16
Link (40, 225)	17.38	18.42	20.82	17.24	19.17	26.69	28.82	47.03	44.82	46.75	49.62	47.87	43.48	43.55
Link (42, 43)	9.29	17.44	14.06	11.12	14.28	22.39	35.44	34.65	40.89	31.98	33.19	32.46	32.01	32.80
Link (43, 40)	7.92	15.64	13.25	16.26	20.50	28.62	32.48	31.92	36.41	32.53	33.96	33.13	32.06	32.83
Link (72, 220)	9.21	16.66	13.21	15.71	18.90	23.33	29.28	29.93	31.60	31.45	35.75	39.77	41.30	42.76
Link (73, 316)	22.45	20.44	28.85	25.11	26.27	31.90	41.70	52.22	58.10	50.06	46.81	50.46	50.72	52.23
Link (84, 206)	12.66	18.55	27.71	43.57	58.11	68.83	65.09	72.11	59.48	84.61	89.36	87.40	85.07	88.57
Link (114, 84)	16.13	24.47	28.81	51.41	57.26	60.56	68.42	72.30	62.68	85.25	88.83	87.03	84.09	88.14
Link (117, 262)	4.40	3.14	3.94	3.01	7.71	7.63	6.20	3.91	8.48	4.81	2.07	2.11	2.07	2.12
Link (149, 223)	16.56	24.90	22.20	21.30	25.18	25.36	29.72	38.67	43.40	48.42	48.69	47.42	44.36	42.96
Link (202, 25)	26.59	42.11	56.68	58.58	70.41	63.72	74.48	78.74	107.44	112.21	122.46	126.18	128.64	136.74
Link (204, 73)	11.87	9.41	15.99	20.64	25.16	27.59	34.00	26.09	23.84	18.41	13.98	12.67	17.00	16.03
Link (205, 226)	6.81	8.30	3.95	6.42	9.51	4.45	5.65	8.78	10.60	7.50	3.09	3.03	3.16	3.13
Link (206, 219)	12.66	21.27	26.76	52.13	52.38	67.49	69.52	80.70	75.92	85.92	88.41	87.11	84.90	88.21
Link (209, 204)	13.88	16.23	26.53	34.21	34.16	27.63	33.23	27.26	22.31	16.96	21.32	22.37	22.43	23.57
Link (219, 34)	20.91	16.23	35.39	47.62	60.49	66.41	63.41	68.21	67.51	85.72	88.49	87.08	86.03	88.75
Link (220, 26)	6.07	9.28	9.80	13.63	16.29	17.39	20.68	19.56	20.83	16.55	19.17	21.87	22.53	22.61
Link (221, 38)	20.34	19.76	32.78	34.89	33.45	39.74	35.84	50.70	61.39	57.22	59.03	57.24	58.45	59.29
Link (222, 221)	20.13	22.96	22.04	25.46	26.99	39.25	34.09	46.54	56.24	52.93	51.06	49.37	46.16	46.18
Link (223, 222)	20.43	20.08	20.24	24.36	33.39	31.24	28.53	36.59	40.88	51.87	49.86	48.62	45.31	44.75
Link (224, 149)	11.69	28.24	21.14	20.09	28.37	30.18	29.59	42.62	52.56	49.51	49.79	48.01	44.62	42.40
Link (225, 224)	14.69	21.53	19.61	20.77	25.53	34.66	32.65	41.94	51.79	48.68	48.71	46.64	44.04	41.96
Link (226, 42)	7.57	9.78	8.18	7.96	9.46	8.14	9.07	9.61	11.81	9.14	5.96	5.89	6.25	6.17
Link (246, 73)	11.95	12.55	22.63	23.02	28.31	32.91	29.16	29.36	29.30	24.88	26.21	27.28	29.47	27.98
Link (249, 246)	14.72	17.45	20.99	22.04	25.71	38.23	47.01	47.10	53.30	52.51	44.09	44.57	41.84	37.46
Link (262, 205)	8.17	8.33	4.39	7.21	9.54	7.46	9.13	13.46	8.91	8.60	6.13	6.26	6.18	6.22
Link (285, 7002)	26.84	41.02	55.62	58.37	72.27	62.64	73.95	86.94	106.82	121.72	125.92	130.88	132.38	139.55
Link (286, 26)	27.59	33.87	41.96	55.63	62.84	62.18	74.15	81.40	108.54	117.60	121.45	120.67	123.43	129.88
Link (315, 26)	6.00	8.60	11.64	13.57	17.77	19.69	18.63	15.92	17.30	18.48	15.66	17.34	18.59	17.75
Link (316, 315)	22.50	20.59	28.45	25.23	26.36	31.62	41.43	52.01	58.85	50.00	46.90	50.51	50.38	52.34
Link (336, 23)	23.46	41.22	54.23	58.96	75.25	59.90	75.70	84.29	109.66	129.90	126.67	131.44	132.69	139.92
Link (351, 7012)	27.11	37.94	48.20	60.81	65.82	69.49	78.04	85.89	107.35	118.91	122.68	120.86	122.70	129.55
Link (757, 31)	19.17	14.33	34.75	47.01	58.66	68.84	59.21	69.63	67.13	85.36	88.10	86.63	85.54	88.23
Link (7002, 336)	25.88	40.75	55.60	59.63	74.19	60.94	74.83	85.35	107.02	123.07	125.80	130.62	131.92	139.29
Link (7012, 27)	26.91	38.07	48.18	60.45	66.19	69.83	78.35	84.69	107.52	119.06	122.61	120.80	122.74	129.47
Link (7014, 757)	19.08	14.91	35.13	47.43	61.02	69.28	60.01	70.09	65.51	85.27	88.08	86.56	85.57	88.14

CORSIM Throughput – With Contraflow, Moderate Event Case

Discharge Through(vehicles)
Mean over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	431	928	1429	1971	2659	3374	4429	5479	6492	7160	7322	7393	7465	7535
Link (20, 17)	146	297	448	632	921	1217	1772	2292	2799	3031	3063	3080	3096	3114
Link (23, 20)	170	348	527	740	1058	1386	1976	2527	3063	3327	3385	3422	3456	3495
Link (25, 285)	190	388	586	819	1156	1502	2114	2683	3236	3517	3606	3662	3717	3778
Link (26, 202)	166	339	514	723	1038	1361	1951	2494	3021	3276	3343	3375	3408	3444
Link (29, 351)	1110	2340	3564	4873	6414	8025	10236	12486	14643	16216	16444	16540	16631	16721
Link (31, 29)	1007	2113	3219	4389	5769	7209	9167	11178	13095	14511	14641	14680	14719	14754
Link (34, 7014)	1235	2574	3921	5322	6933	8592	10776	13032	15185	16854	17094	17171	17249	17328
Link (35, 114)	1292	2641	3974	5383	6998	8671	10892	13123	15282	16929	17086	17162	17241	17320
Link (36, 35)	1130	2305	3469	4699	6112	7580	9525	11482	13372	14825	14911	14945	14981	15016
Link (38, 36)	1295	2603	3915	5284	6847	8450	10549	12638	14680	16254	16454	16560	16665	16766
Link (40, 225)	1329	2658	3991	5389	6975	8588	10724	12757	14754	16277	16433	16523	16607	16697
Link (42, 43)	1259	2517	3786	5104	6625	8158	10210	12152	14073	15513	15580	15597	15612	15628
Link (43, 40)	1295	2587	3890	5248	6806	8383	10485	12481	14449	15936	16044	16098	16148	16203
Link (72, 220)	88	180	282	378	494	598	743	882	1020	1125	1237	1322	1413	1503
Link (73, 316)	230	468	707	983	1367	1758	2420	3034	3629	3950	4080	4144	4218	4291
Link (84, 206)	1275	2627	3962	5364	6983	8649	10859	13090	15250	16899	17089	17165	17244	17322
Link (114, 84)	1284	2636	3970	5382	6996	8661	10883	13115	15277	16925	17087	17163	17242	17320
Link (117, 262)	1354	2709	4066	5506	7203	8911	11243	13408	15565	17091	17218	17267	17318	17367
Link (149, 223)	1332	2664	3995	5383	6975	8573	10675	12729	14727	16271	16489	16578	16663	16753
Link (202, 25)	160	328	497	700	1007	1323	1907	2445	2968	3218	3276	3302	3328	3358
Link (204, 73)	86	178	269	373	523	668	931	1170	1409	1533	1577	1602	1632	1660
Link (205, 226)	1354	2712	4067	5503	7191	8903	11222	13393	15541	17087	17249	17299	17349	17399
Link (206, 219)	1256	2599	3940	5347	6963	8620	10834	13066	15218	16875	17092	17168	17246	17325
Link (209, 204)	177	375	575	800	1087	1373	1821	2240	2656	2907	3047	3128	3217	3303
Link (219, 34)	1239	2577	3926	5325	6939	8596	10780	13038	15190	16858	17094	17171	17250	17328
Link (220, 26)	29	58	90	120	151	180	214	251	287	319	362	392	426	460
Link (221, 38)	1234	2480	3726	5026	6501	8014	9989	11965	13892	15395	15509	15539	15569	15599
Link (222, 221)	1321	2653	3981	5374	6941	8554	10628	12681	14684	16259	16515	16604	16689	16777
Link (223, 222)	1327	2662	3987	5378	6965	8566	10654	12703	14703	16264	16503	16591	16676	16765
Link (224, 149)	1337	2666	3999	5389	6980	8586	10699	12741	14738	16280	16473	16562	16647	16736
Link (225, 224)	1333	2664	3996	5392	6978	8584	10701	12750	14748	16275	16460	16549	16634	16723
Link (226, 42)	1353	2707	4067	5501	7188	8899	11211	13384	15534	17087	17256	17306	17356	17406
Link (246, 73)	132	272	417	551	701	857	1040	1214	1393	1547	1593	1619	1647	1675
Link (249, 246)	291	590	901	1220	1627	2056	2669	3241	3802	4163	4295	4374	4460	4543
Link (262, 205)	1353	2710	4065	5505	7196	8908	11227	13397	15551	17090	17233	17283	17333	17383
Link (285, 7002)	190	387	586	819	1156	1502	2113	2683	3235	3516	3605	3662	3717	3778
Link (286, 26)	1043	2220	3380	4626	6115	7682	9835	12033	14123	15625	15753	15799	15845	15892
Link (315, 26)	53	109	168	228	286	346	407	469	532	601	658	684	721	752
Link (316, 315)	230	467	707	982	1365	1756	2418	3032	3628	3950	4081	4144	4219	4291
Link (336, 23)	188	387	586	818	1154	1500	2110	2680	3232	3515	3606	3662	3718	3778
Link (351, 7012)	1110	2340	3564	4873	6413	8024	10235	12486	14643	16215	16445	16540	16631	16722
Link (757, 31)	1231	2572	3918	5320	6927	8589	10771	13025	15176	16852	17094	17171	17249	17328
Link (7002, 336)	189	387	586	819	1155	1502	2112	2682	3234	3516	3606	3662	3717	3778
Link (7012, 27)	1109	2339	3563	4872	6412	8023	10233	12484	14641	16214	16445	16540	16631	16722
Link (7014, 757)	1234	2573	3920	5321	6930	8591	10775	13030	15182	16853	17094	17171	17249	17328

Std. Dev. over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	16.64	28.92	32.06	36.96	48.48	50.09	62.03	60.78	84.18	85.79	90.64	92.38	91.28	89.29
Link (20, 17)	10.33	14.16	24.01	28.98	35.34	34.63	45.98	52.51	54.69	49.27	51.33	52.40	51.97	50.97
Link (23, 20)	12.53	18.68	26.87	28.86	36.55	34.00	43.80	52.14	55.11	48.99	51.00	51.65	50.75	51.78
Link (25, 285)	14.67	22.04	29.94	29.12	38.29	35.54	45.83	48.81	50.69	47.91	48.54	47.93	44.82	46.41
Link (26, 202)	15.66	21.53	30.58	29.24	36.73	35.86	45.73	47.14	49.90	45.16	46.89	45.61	43.62	45.59
Link (29, 351)	36.05	43.89	59.17	70.51	83.01	89.09	98.55	105.77	96.06	107.00	103.54	101.36	104.53	105.73
Link (31, 29)	33.14	37.46	49.05	51.41	56.95	62.38	75.70	86.63	94.49	91.51	94.48	92.23	94.55	90.52
Link (34, 7014)	48.59	45.65	52.79	58.86	50.48	52.93	60.91	70.95	85.05	85.81	84.43	84.67	87.95	83.86
Link (35, 114)	40.89	46.40	45.05	52.90	44.34	55.99	46.84	70.98	79.80	89.04	83.75	84.25	84.65	81.80
Link (36, 35)	35.32	44.46	42.84	46.67	34.27	57.28	42.16	54.31	63.97	71.56	63.85	63.30	63.63	64.19
Link (38, 36)	30.66	38.13	28.57	36.57	36.68	49.04	41.58	56.37	74.53	61.21	68.43	70.46	69.41	67.98
Link (40, 225)	14.60	19.28	16.97	25.65	26.31	24.48	31.00	44.69	33.33	33.19	31.01	30.59	32.89	36.02
Link (42, 43)	15.64	19.15	16.23	28.91	24.26	17.59	31.11	41.25	31.27	25.12	23.89	24.54	25.57	24.59
Link (43, 40)	15.96	19.26	17.96	28.08	28.52	25.56	35.27	49.75	35.80	28.51	30.69	28.91	32.22	31.93
Link (72, 220)	6.81	14.75	21.68	24.12	27.66	26.87	26.06	28.92	30.52	32.20	34.86	35.88	42.52	44.33
Link (73, 316)	20.51	26.03	36.90	40.01	47.24	44.57	52.38	55.29	56.03	41.62	49.43	49.32	52.72	53.01
Link (84, 206)	45.12	39.29	46.41	54.09	38.50	51.28	50.77	74.36	76.43	85.24	83.53	84.16	84.58	81.01
Link (114, 84)	40.94	41.78	43.71	52.17	42.57	56.42	48.97	71.43	79.12	87.59	83.60	83.96	84.57	81.60
Link (117, 262)	2.32	5.08	4.37	5.79	4.61	4.67	7.89	11.26	7.51	4.92	3.44	3.27	3.17	2.72
Link (149, 223)	17.44	16.60	20.74	26.55	13.47	16.90	24.06	30.53	28.50	30.10	28.63	27.01	28.83	31.14
Link (202, 25)	14.60	21.84	30.23	29.21	37.89	35.36	46.08	49.11	49.82	47.61	48.49	47.86	44.77	46.33
Link (204, 73)	13.14	14.80	17.44	18.34	24.37	28.43	27.59	32.32	33.95	33.54	33.84	33.76	35.07	31.54
Link (205, 226)	7.63	5.70	7.06	7.99	9.81	11.51	6.26	7.47	8.18	6.24	4.39	3.77	4.22	4.18
Link (206, 219)	44.36	42.19	47.15	55.63	46.61	50.13	53.20	71.21	71.23	86.42	82.99	84.31	85.56	81.48
Link (209, 204)	11.20	16.26	23.58	23.23	31.15	30.74	29.93	34.96	38.05	39.74	44.24	48.95	50.48	45.11
Link (219, 34)	48.76	43.74	52.53	58.44	50.35	52.08	59.05	74.05	84.27	87.84	84.26	84.59	87.64	83.43
Link (220, 26)	4.24	7.32	9.80	11.94	15.67	18.99	21.34	24.81	27.36	29.29	32.96	33.08	36.22	38.11
Link (221, 38)	27.52	23.82	23.90	31.75	28.38	39.52	35.99	51.29	62.42	40.22	43.86	42.92	42.51	40.83
Link (222, 221)	11.93	15.58	22.80	19.86	24.05	20.78	35.04	42.60	43.72	33.59	30.33	26.95	30.59	32.49
Link (223, 222)	17.60	15.14	23.04	23.20	22.34	13.17	34.84	40.01	37.94	35.57	28.70	26.50	29.45	31.15
Link (224, 149)	24.99	18.06	21.03	29.03	24.98	21.04	33.75	35.44	27.97	31.58	29.40	29.18	31.57	33.81
Link (225, 224)	16.91	18.79	13.20	17.65	24.31	20.32	18.68	36.17	31.51	33.44	30.47	31.07	32.11	34.59
Link (226, 42)	5.59	10.84	6.62	6.44	7.89	9.50	7.95	12.94	10.61	5.13	3.74	3.65	3.74	3.81
Link (246, 73)	11.97	14.87	24.96	24.70	30.28	37.86	40.76	45.76	47.75	41.08	44.55	45.11	46.46	47.45
Link (249, 246)	14.31	27.71	32.90	41.70	45.87	52.46	53.26	53.21	50.92	48.75	47.61	47.71	47.33	46.13
Link (262, 205)	7.65	7.40	7.54	7.76	9.43	5.32	10.08	8.66	3.51	9.60	5.60	6.01	5.75	5.60
Link (285, 7002)	14.92	22.10	29.92	29.12	38.02	35.35	45.92	48.86	50.97	47.64	48.71	47.93	44.82	46.29
Link (286, 26)	38.32	45.15	60.17	69.47	78.25	93.20	98.52	107.87	100.21	103.59	107.44	103.83	105.33	107.95
Link (315, 26)	7.61	6.24	8.65	13.42	15.30	17.46	16.11	19.00	16.47	17.62	21.44	23.24	23.97	24.21
Link (316, 315)	20.59	26.90	37.20	40.28	47.95	45.56	52.26	54.00	55.36	41.75	49.61	49.42	52.76	53.24
Link (336, 23)	14.82	22.26	30.00	28.92	37.63	34.91	45.81	48.90	51.55	47.50	48.65	47.98	44.62	46.38
Link (351, 7012)	36.79	44.00	59.73	71.21	82.64	89.39	98.28	106.42	96.20	106.38	103.53	101.23	104.43	105.78
Link (757, 31)	48.85	46.64	53.95	57.76	49.22	53.45	60.37	70.53	84.69	84.40	84.30	84.44	87.60	83.56
Link (7002, 336)	15.00	22.20	30.06	29.28	37.97	35.53	45.74	48.82	51.06	47.80	48.86	48.06	44.95	46.41
Link (7012, 27)	36.29	43.93	59.82	71.49	82.62	89.58	98.90	106.60	96.61	106.41	103.53	101.23	104.43	105.78
Link (7014, 757)	48.58	45.65	52.94	58.17	50.93	53.16	60.52	69.08	84.48	84.77	84.24	84.38	87.68	83.59

CORSIM Average Speeds – No Contraflow, Moderate Event Case

AverageSpeed (mph)
Mean over 10 runs

Link/Aggregation	Interval 3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	66.31548	65.90762	65.6848	65.50253	64.81071	64.43809	62.62612	61.14089	60.58921	60.75236	60.82372	60.85324	60.88217	60.91225
Link (20, 17)	64.00609	63.85009	63.74432	63.67499	63.3032	63.16137	62.19785	61.75382	61.60898	61.70274	61.71751	61.72497	61.7328	61.74058
Link (23, 20)	53.09546	52.93151	52.8782	52.82453	52.63261	52.5386	52.3166	52.1298	52.03749	52.05517	52.07013	52.07895	52.08759	52.09653
Link (25, 285)	45.46761	45.08654	44.98767	44.88978	44.34949	44.09407	42.93685	42.29266	41.99361	42.14515	42.18069	42.2019	42.22469	42.24995
Link (26, 202)	37.52838	37.21589	37.11999	37.07635	36.95404	36.91244	36.78301	36.73326	36.67214	36.70327	36.71023	36.72046	36.7326	36.74508
Link (27, 286)	51.6088	51.45799	51.35073	51.27434	51.10303	51.0064	50.45244	50.14377	50.04172	50.09089	50.12921	50.15052	50.175	50.19664
Link (29, 351)	51.28255	51.18737	51.18988	51.14672	50.96929	50.87797	50.43593	50.18814	50.05124	50.08471	50.08646	50.08184	50.07703	50.07183
Link (31, 29)	42.35055	42.3088	42.34235	42.20661	41.68274	41.41808	39.8575	39.0072	38.58658	38.67985	38.72271	38.73716	38.75137	38.76523
Link (34, 7014)	42.12248	42.04735	41.99376	41.94177	41.80161	41.74624	41.41271	41.20802	41.08369	41.08975	41.11424	41.12409	41.13783	41.14945
Link (35, 114)	33.35053	33.27604	33.23528	33.22927	33.24941	33.27378	33.26639	33.26696	33.27335	33.28583	33.2771	33.27287	33.27232	33.27252
Link (36, 35)	28.03186	27.52426	27.37839	27.30329	26.80888	26.52773	25.77637	25.15351	24.81838	24.87935	24.94038	24.98849	25.03903	25.08843
Link (38, 36)	32.51181	32.51825	32.39602	32.36798	32.39891	32.43409	32.49203	32.51344	32.50667	32.51448	32.49251	32.47515	32.4599	32.4443
Link (40, 225)	47.38775	47.29246	47.27436	47.21243	47.04708	46.94005	46.58353	46.36528	46.24466	46.291	46.30796	46.3172	46.32902	46.3391
Link (42, 43)	27.47634	27.22685	27.08262	26.97424	26.34702	25.53924	23.39095	22.57677	21.94837	22.13079	22.15134	22.16743	22.1819	22.19674
Link (43, 40)	33.39587	33.24013	33.14439	33.17447	33.20394	33.11103	33.0847	33.07798	33.05304	33.05875	33.04156	33.02851	33.01611	33.00344
Link (72, 220)	46.23618	46.04983	46.13042	46.16873	46.11403	46.06016	46.07557	46.08726	46.07961	46.09129	46.08697	46.08501	46.08947	46.10195
Link (73, 316)	41.52174	41.37414	41.42522	41.43231	41.49986	41.57235	41.64188	41.65601	41.66988	41.67226	41.65612	41.65396	41.65166	41.65072
Link (84, 206)	39.27522	39.0192	38.94933	38.83998	38.67797	38.60612	38.2867	38.10857	38.01662	38.00621	38.0492	38.07303	38.09815	38.12181
Link (114, 84)	39.7112	39.50277	39.45135	39.3721	39.31313	39.27108	38.99464	38.86724	38.80173	38.79637	38.8292	38.84764	38.86732	38.88618
Link (117, 262)	50.75952	50.68873	50.69493	50.55354	50.238	50.0812	49.40445	49.08943	48.89105	48.97381	48.99103	49.00604	49.02051	49.03504
Link (149, 223)	40.14394	40.09082	40.07837	40.05409	39.83097	39.71502	39.17884	38.87161	38.7508	38.79111	38.81923	38.84007	38.86231	38.88263
Link (202, 25)	44.58699	44.38084	44.39326	44.12735	43.54116	43.20118	42.14185	41.14904	40.7986	40.96148	40.9948	41.02609	41.05891	41.09388
Link (204, 73)	25.97658	25.62469	25.55247	25.43277	25.44567	25.35446	24.94172	24.63723	24.5362	24.53413	24.69426	24.84588	24.99029	25.12997
Link (205, 226)	50.75144	50.67129	50.63407	50.51876	50.21429	50.02601	49.34209	48.9602	48.74501	48.8298	48.84871	48.86475	48.87983	48.89542
Link (206, 219)	41.42443	41.24856	41.19182	41.13797	41.02792	40.97379	40.76813	40.6313	40.56188	40.56364	40.59282	40.6066	40.62257	40.63771
Link (209, 204)	54.65152	54.40207	54.47663	54.47338	54.39555	54.32014	54.04726	53.9082	53.81897	53.86358	53.87755	53.90936	53.93481	53.97023
Link (219, 34)	42.00558	41.85257	41.80084	41.73104	41.57491	41.51011	41.22727	41.02583	40.91899	40.92192	40.95106	40.96236	40.97703	40.99002
Link (220, 26)	32.50008	32.12947	32.13117	31.98283	31.08348	30.63235	28.54112	27.2231	26.53445	26.68839	27.48257	28.1077	28.63146	29.15827
Link (221, 38)	33.44508	33.17695	32.75434	32.59055	32.42935	32.23883	31.56231	31.22938	30.98512	31.05281	31.06552	31.09145	31.11784	31.14426
Link (222, 221)	40.00133	39.99263	39.87106	39.84881	39.61092	39.46646	38.91845	38.6191	38.4835	38.52695	38.55547	38.57707	38.59978	38.62088
Link (223, 222)	40.14899	40.06167	40.00929	39.98761	39.7697	39.63911	39.10522	38.80401	38.68563	38.72236	38.75081	38.77184	38.79406	38.81467
Link (224, 149)	40.29956	40.19289	40.20708	40.17424	39.9417	39.8094	39.30669	38.99397	38.85026	38.89818	38.92651	38.94683	38.96872	38.98898
Link (225, 224)	40.19633	40.14494	40.14701	40.07972	39.8562	39.7168	39.25093	38.96027	38.8054	38.85218	38.8814	38.90375	38.92775	38.94973
Link (226, 42)	50.75563	50.75382	50.75478	50.64766	50.34019	50.1254	49.2679	48.80637	48.56291	48.67201	48.69296	48.70903	48.72459	48.74072
Link (246, 73)	37.04723	36.98698	37.00595	36.90685	36.70388	36.6059	36.01688	35.81676	35.74116	35.74811	35.75819	35.82652	35.89738	35.96125
Link (249, 246)	43.75041	43.79423	43.92652	43.87285	43.78176	43.70462	43.35609	43.22929	43.19863	43.21601	43.2313	43.25891	43.28984	43.31451
Link (262, 205)	50.94376	50.83135	50.82084	50.69078	50.36988	50.17895	49.48759	49.1361	48.91337	48.99441	49.01395	49.02966	49.04455	49.05954
Link (285, 7002)	48.60287	48.02798	47.87204	47.75023	47.19202	46.93849	44.40417	43.43713	42.99284	43.23254	43.30346	43.34209	43.38071	43.42093
Link (286, 26)	26.52781	25.86032	25.64898	25.34846	24.59666	24.24878	22.544	21.72064	21.28777	21.42962	21.48537	21.53187	21.58043	21.62682
Link (315, 26)	25.80225	25.38979	25.23141	24.98047	24.12071	23.42615	19.48866	17.82854	17.29521	17.54436	17.80219	17.94658	18.07884	18.20545
Link (316, 315)	53.3694	53.05618	53.14753	53.12012	53.06839	53.07177	52.93466	52.91159	52.91211	52.92169	52.90302	52.90852	52.91704	52.92683
Link (336, 23)	52.71721	52.45009	52.38422	52.27523	51.82581	51.62463	50.89519	50.48837	50.26747	50.32403	50.35831	50.37912	50.39993	50.4216
Link (351, 7012)	53.86894	53.82644	53.76571	53.74632	53.68676	53.61873	53.44873	53.33754	53.30097	53.32043	53.33593	53.34492	53.35604	53.36562
Link (757, 31)	41.92924	41.81082	41.75075	41.5104	40.5749	40.23368	37.19155	35.696	35.12764	35.29245	35.37672	35.40759	35.43836	35.46722
Link (7002, 336)	48.87355	47.94088	47.64442	47.39944	45.83723	45.17236	41.49482	39.62934	38.73192	39.00772	39.11575	39.17454	39.23199	39.2894
Link (7012, 27)	110.8165	110.4032	109.8709	109.8201	109.3023	108.9357	108.0467	107.4359	107.1816	107.2871	107.4245	107.4994	107.5813	107.6588
Link (7014, 757)	42.62824	42.64617	42.62896	42.52933	42.26411	42.18675	40.50754	40.0311	39.83654	39.93488	39.98176	39.99961	40.01896	40.03678

Std. Dev. over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	0.484964	0.195986	0.173382	0.194208	0.219367	0.231893	0.582303	0.475125	0.543338	0.436662	0.432995	0.433448	0.430377	0.427864
Link (20, 17)	0.312439	0.211232	0.168288	0.158183	0.146983	0.115931	0.341903	0.616798	0.577066	0.532621	0.52931	0.528802	0.528534	0.528279
Link (23, 20)	0.084089	0.131891	0.09404	0.075365	0.084561	0.077076	0.061475	0.080717	0.065356	0.049259	0.05066	0.051254	0.050935	0.051615
Link (25, 285)	0.627838	0.515556	0.381155	0.29982	0.281321	0.220318	0.303403	0.311329	0.309501	0.333952	0.332929	0.332422	0.335259	0.336675
Link (26, 202)	0.490849	0.469575	0.307704	0.235736	0.231396	0.192537	0.152516	0.110786	0.124378	0.137233	0.135465	0.136663	0.135828	0.134648
Link (27, 286)	0.39713	0.265454	0.208243	0.128499	0.126072	0.153688	0.161543	0.206741	0.197121	0.157968	0.153695	0.153061	0.152662	0.153439
Link (29, 351)	0.332766	0.189798	0.142634	0.101757	0.091335	0.080575	0.100165	0.112818	0.108345	0.102198	0.103379	0.101705	0.101286	0.10053
Link (31, 29)	0.682271	0.416334	0.360259	0.283673	0.243997	0.207564	0.272795	0.35831	0.313939	0.302893	0.303004	0.301204	0.301966	0.301285
Link (34, 7014)	0.320461	0.171825	0.191159	0.151456	0.092164	0.11602	0.084644	0.105533	0.116281	0.125734	0.123624	0.12267	0.122218	0.121872
Link (35, 114)	0.420373	0.199082	0.191968	0.132892	0.123188	0.108641	0.112769	0.106528	0.088785	0.079043	0.078306	0.077896	0.077172	0.075327
Link (36, 35)	1.164398	0.837493	0.520587	0.498738	0.490198	0.425732	0.478514	0.452304	0.429369	0.392053	0.396718	0.395664	0.392034	0.390177
Link (38, 36)	0.186815	0.216866	0.139746	0.158572	0.094077	0.066494	0.084636	0.078411	0.085303	0.084506	0.085273	0.085507	0.082045	0.08296
Link (40, 225)	0.2658	0.259548	0.147667	0.127203	0.138741	0.123369	0.125431	0.123601	0.143403	0.136515	0.134288	0.133589	0.133641	0.130893
Link (42, 43)	0.883939	0.60614	0.64827	0.510115	0.505014	0.602742	0.434882	0.500854	0.423076	0.449431	0.442045	0.44284	0.44005	0.439425
Link (43, 40)	0.28136	0.202251	0.209481	0.138142	0.174742	0.175206	0.130331	0.088948	0.101211	0.108912	0.106402	0.108544	0.108929	0.109119
Link (72, 220)	1.017834	0.65987	0.444521	0.357386	0.285249	0.232626	0.242251	0.225181	0.196574	0.17161	0.158062	0.160114	0.155947	0.156545
Link (73, 316)	0.21436	0.350713	0.294941	0.262804	0.165145	0.106292	0.097984	0.097526	0.090452	0.087703	0.081444	0.096932	0.094165	0.089774
Link (84, 206)	0.338478	0.233075	0.243094	0.211787	0.171713	0.160192	0.119824	0.125974	0.122027	0.118265	0.119512	0.11915	0.118695	0.119668
Link (114, 84)	0.211414	0.145611	0.147481	0.164435	0.14491	0.129694	0.126474	0.114506	0.107758	0.096925	0.097414	0.097332	0.096361	0.096538
Link (117, 262)	0.343271	0.296424	0.139569	0.094455	0.15761	0.143402	0.112374	0.107295	0.11606	0.103776	0.104207	0.102907	0.10235	0.102022
Link (149, 223)	0.624019	0.335465	0.179314	0.179648	0.181382	0.207794	0.128431	0.162899	0.157421	0.13291	0.137903	0.137093	0.134745	0.133843
Link (202, 25)	0.728956	0.51126	0.379154	0.5515	0.387891	0.39085	0.41165	0.509044	0.437437	0.41131	0.396075	0.395283	0.395401	0.396644
Link (204, 73)	1.301615	0.897815	0.665599	0.559449	0.642558	0.470021	0.274778	0.38351	0.299662	0.279365	0.29248	0.300666	0.300681	0.301296
Link (205, 226)	0.259383	0.238098	0.172019	0.088924	0.109582	0.136277	0.101462	0.133212	0.131077	0.124262	0.126115	0.12436	0.122735	0.122127
Link (206, 219)	0.443756	0.228088	0.177688	0.125474	0.09638	0.104699	0.082971	0.086069	0.0984	0.10433	0.106769	0.106718	0.105959	0.106788
Link (209, 204)	0.401232	0.46308	0.365668	0.291981	0.292414	0.22691	0.213689	0.286208	0.198816	0.179414	0.157771	0.139616	0.143171	0.150504
Link (219, 34)	0.391239	0.197099	0.166261	0.146894	0.106481	0.120271	0.095661	0.109831	0.123487	0.125073	0.127291	0.126625	0.126001	0.126504
Link (220, 26)	1.124868	1.312229	0.936548	0.743827	0.536419	0.470533	0.662034	0.519022	0.433869	0.411534	0.414907	0.40909	0.413774	0.427831
Link (221, 38)	1.081968	0.479316	0.508702	0.353504	0.331146	0.271264	0.228904	0.216926	0.202205	0.183466	0.165583	0.16482	0.163684	0.162314
Link (222, 221)	0.745185	0.292674	0.175595	0.161801	0.196902	0.242299	0.170822	0.178192	0.189733	0.168479	0.167765	0.167982	0.166383	0.165561
Link (223, 222)	0.643621	0.24169	0.09272	0.135724	0.164526	0.206591	0.130429	0.169352	0.169498	0.14759	0.148858	0.14901	0.146993	0.146069
Link (224, 149)	0.631473	0.372791	0.216628	0.203672	0.208105	0.209994	0.143881	0.153093	0.145173	0.127491	0.130713	0.129857	0.128087	0.126836
Link (225, 224)	0.506512	0.360612	0.217416	0.206683	0.198986	0.198381	0.13425	0.142629	0.137663	0.127536	0.12684	0.12612	0.124273	0.122871
Link (226, 42)	0.309938	0.271358	0.158383	0.074757	0.126286	0.158248	0.128198	0.133691	0.133794	0.135603	0.13605	0.13425	0.132813	0.132941
Link (246, 73)	0.385214	0.317889	0.332999	0.305553	0.239918	0.216502	0.173105	0.223846	0.197476	0.187989	0.178506	0.178576	0.167258	0.159511
Link (249, 246)	0.491558	0.236241	0.245151	0.23971	0.19302	0.141668	0.063804	0.067761	0.065922	0.056041	0.062341	0.062667	0.058955	0.052546
Link (262, 205)	0.318476	0.317214	0.195467	0.121929	0.141371	0.141829	0.088536	0.112647	0.120078	0.104465	0.10328	0.101541	0.100117	0.099768
Link (285, 7002)	0.472217	0.404438	0.305964	0.227804	0.210987	0.252649	0.897424	1.002419	0.962481	0.933485	0.921989	0.917538	0.916828	0.914131
Link (286, 26)	1.183853	0.948848	0.493646	0.461467	0.394384	0.378039	0.468317	0.376679	0.404651	0.331173	0.323926	0.325414	0.32372	0.321624
Link (315, 26)	0.862813	0.571051	0.368822	0.321986	0.393019	0.316183	0.393301	0.293307	0.294561	0.289278	0.27078	0.275001	0.272598	0.270611
Link (316, 315)	0.389971	0.253494	0.212557	0.217267	0.179324	0.185632	0.154589	0.162869	0.10114	0.118136	0.119718	0.120717	0.125381	0.12807
Link (336, 23)	0.213695	0.19095	0.13088	0.112768	0.072635	0.075786	0.111957	0.11519	0.084377	0.090827	0.087892	0.087176	0.087256	0.08606
Link (351, 7012)	0.343119	0.22085	0.183297	0.137771	0.115614	0.169626	0.12284	0.126547	0.132075	0.116594	0.115242	0.11492	0.113096	0.113034
Link (757, 31)	0.839176	0.493609	0.508491	0.578862	0.254627	0.538097	0.828271	0.594684	0.578663	0.525827	0.526348	0.524902	0.524515	0.523679
Link (7002, 336)	1.094087	0.778455	0.551264	0.448565	0.640866	0.747983	1.167526	1.020992	0.795626	0.777327	0.771958	0.768136	0.765305	0.764714
Link (7012, 27)	1.672589	1.089895	0.983303	0.604339	0.701421	0.868936	0.581329	0.660986	0.761191	0.668075	0.679764	0.678721	0.67118	0.668313
Link (7014, 757)	0.448396	0.234513	0.259015	0.268993	0.245088	0.258967	0.993508	0.791676	0.661261	0.60769	0.602135	0.599612	0.597854	0.596282

CORSIM Average Speeds – With Contraflow, Moderate Event Case

AverageSpeed (mph)
Mean over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	69.71322	69.58372	69.50275	69.4472	69.33981	69.19157	68.87489	68.67365	68.58339	68.62058	68.63961	68.65336	68.66316	68.67917
Link (20, 17)	66.86639	66.68938	66.66704	66.61219	66.54169	66.46002	66.2873	66.19143	66.15116	66.16507	66.17069	66.17408	66.17497	66.18061
Link (23, 20)	55.294	55.21769	55.19262	55.14312	55.09484	55.03949	54.92425	54.84464	54.81406	54.82096	54.82302	54.8222	54.82104	54.82537
Link (25, 285)	50.87443	50.84915	50.86528	50.95655	51.24381	51.35771	51.53185	51.6013	51.68588	51.67025	51.53323	51.37395	51.22394	51.09032
Link (26, 202)	36.50723	36.29752	36.24353	36.25031	36.24923	36.2196	36.16396	36.14068	36.13073	36.13593	36.15881	36.1681	36.18382	36.19559
Link (27, 286)	51.64655	51.36609	51.28388	51.19138	51.04136	50.88749	50.56068	50.30173	50.14448	50.1567	50.18998	50.21053	50.23177	50.24917
Link (29, 351)	51.37995	51.28204	51.25375	51.16105	51.03652	50.9163	50.50279	50.22667	50.07964	50.11129	50.11193	50.1081	50.10652	50.10242
Link (31, 29)	42.51708	42.57949	42.58274	42.41658	42.05008	41.69213	40.4061	39.64057	39.21482	39.29098	39.32632	39.33918	39.35221	39.36402
Link (34, 7014)	42.17922	42.09109	42.01487	41.94826	41.84864	41.73056	41.44053	41.22204	41.11263	41.11889	41.13602	41.14918	41.15985	41.17295
Link (35, 114)	33.27333	33.27412	33.20996	33.23754	33.30024	33.2899	33.28163	33.29047	33.31475	33.32114	33.31544	33.31553	33.31668	33.31744
Link (36, 35)	28.81858	28.63373	28.44659	28.39145	28.24595	27.87189	26.96892	26.38449	26.05565	26.08103	26.13501	26.18498	26.23562	26.28316
Link (38, 36)	32.37831	32.32262	32.33044	32.3381	32.37077	32.37831	32.41069	32.43412	32.43062	32.42402	32.40481	32.38921	32.37225	32.35597
Link (40, 225)	47.40738	47.49176	47.38499	47.30596	47.12842	47.01825	46.63712	46.44808	46.31576	46.34229	46.36313	46.37429	46.384	46.39496
Link (42, 43)	29.0628	28.76275	28.78065	28.45819	27.53205	26.80088	25.17391	24.22803	23.55356	23.73761	23.7429	23.75719	23.77136	23.78382
Link (43, 40)	33.61862	33.48264	33.43914	33.4441	33.37591	33.31388	33.28592	33.23726	33.19807	33.18779	33.16897	33.15533	33.1423	33.12971
Link (72, 220)	46.32335	46.17749	46.25557	46.26226	46.22622	46.21156	46.22559	46.23632	46.23053	46.23479	46.24715	46.25348	46.27217	46.26741
Link (73, 316)	41.82599	41.64709	41.55469	41.55999	41.6342	41.61028	41.65101	41.6625	41.66311	41.65924	41.66431	41.66415	41.66998	41.67611
Link (84, 206)	39.35074	39.19371	39.07656	38.98294	38.83828	38.69769	38.42055	38.22195	38.07395	38.07957	38.11546	38.14034	38.16381	38.18859
Link (114, 84)	39.63567	39.57743	39.51044	39.42721	39.33917	39.28446	39.0632	38.9234	38.82652	38.83472	38.86311	38.88275	38.90132	38.92083
Link (117, 262)	50.68507	50.67958	50.57516	50.43062	50.17159	49.97475	49.37571	49.05524	48.80763	48.89581	48.90825	48.92193	48.93771	48.95292
Link (149, 223)	40.26787	40.36683	40.19685	40.09208	39.88643	39.75145	39.28599	38.98172	38.77386	38.81631	38.84669	38.86772	38.88982	38.90986
Link (202, 25)	53.50322	53.18623	53.15012	53.14215	53.09935	52.98965	52.74987	52.62357	52.58131	52.59541	52.57563	52.56566	52.55017	52.5466
Link (204, 73)	21.3793	21.29653	21.33696	21.29162	21.46831	21.54807	21.72415	21.8264	21.9166	21.90435	21.94675	21.94073	21.94201	21.93694
Link (205, 226)	50.73124	50.68132	50.56516	50.39459	50.08893	49.86019	49.24837	48.90081	48.62724	48.71527	48.72913	48.74405	48.76066	48.77673
Link (206, 219)	41.50077	41.3861	41.26623	41.188	41.10502	41.00422	40.83146	40.69206	40.59633	40.59656	40.61547	40.63173	40.64591	40.66194
Link (209, 204)	55.08961	54.84685	54.69811	54.55887	54.48735	54.50351	54.24291	54.12536	54.04671	54.05639	54.06557	54.09034	54.11156	54.13515
Link (219, 34)	41.96702	41.85504	41.77754	41.71039	41.60791	41.4995	41.27949	41.07921	40.96251	40.96029	40.97472	40.98919	41.00126	41.0155
Link (220, 26)	22.01322	22.17452	22.39784	22.78256	23.27363	23.46387	24.01366	24.13243	24.22377	24.148	23.90225	23.69707	23.52524	23.32483
Link (221, 38)	33.2259	33.36661	33.40137	33.26476	32.89341	32.62689	32.04087	31.62494	31.34257	31.30447	31.32308	31.34863	31.37513	31.40061
Link (222, 221)	39.90803	40.03725	39.98222	39.8637	39.65174	39.49443	39.06796	38.77573	38.54253	38.57797	38.60864	38.63005	38.65241	38.67363
Link (223, 222)	40.16949	40.25439	40.14286	40.03001	39.81869	39.66198	39.21707	38.92667	38.70284	38.73897	38.77007	38.79136	38.81326	38.83398
Link (224, 149)	40.37376	40.51185	40.34659	40.23952	40.03694	39.89007	39.47209	39.11608	38.90855	38.95045	38.97939	39.00054	39.0219	39.04183
Link (225, 224)	40.31474	40.40688	40.25195	40.14515	39.93159	39.77879	39.3327	39.07151	38.89005	38.9295	38.95984	38.98275	39.00563	39.02745
Link (226, 42)	50.76536	50.83252	50.70046	50.51157	50.18499	49.94958	49.19291	48.79591	48.49499	48.60232	48.61766	48.6332	48.65002	48.66631
Link (246, 73)	38.7486	38.54878	38.58501	38.39712	38.17075	37.96574	37.42672	37.1191	36.92089	36.99001	37.05034	37.10929	37.16563	37.22624
Link (249, 246)	43.88078	43.82507	43.86725	43.79723	43.69804	43.57994	43.26829	43.10382	43.00698	43.06374	43.08591	43.11589	43.14031	43.17168
Link (262, 205)	50.85559	50.78695	50.66614	50.51178	50.22314	50.01068	49.40153	49.06357	48.79772	48.88781	48.9006	48.91538	48.9316	48.94725
Link (285, 7002)	53.77907	53.63116	53.68066	53.59332	53.4423	53.30153	52.94835	52.7583	52.66998	52.69309	52.69429	52.69132	52.69119	52.69849
Link (286, 26)	42.87996	42.5423	42.32615	42.06491	41.88977	41.58803	40.18769	39.38585	38.63109	38.69707	38.72884	38.74475	38.76404	38.78117
Link (315, 26)	13.95753	13.93332	13.77112	14.06933	14.9055	15.50411	16.95047	17.69515	18.2288	17.89825	17.24727	16.98747	16.6232	16.34583
Link (316, 315)	53.45683	53.20503	53.23774	53.20335	53.20664	53.1454	52.99988	52.89144	52.84809	52.8639	52.87593	52.881	52.88328	52.89891
Link (336, 23)	55.2637	55.18	55.16274	55.12328	55.08094	55.03452	54.92565	54.8462	54.81004	54.81544	54.81403	54.81293	54.81066	54.81396
Link (351, 7012)	53.92963	53.8075	53.72396	53.71469	53.68229	53.62011	53.47209	53.34332	53.25919	53.26758	53.28323	53.29262	53.30294	53.31085
Link (757, 31)	41.77304	41.64518	41.61697	41.45258	40.95289	40.32221	38.06033	36.67025	35.97282	36.1141	36.17683	36.20488	36.23262	36.2603
Link (7002, 336)	54.94851	54.9035	54.90488	54.85355	54.76111	54.68159	54.43854	54.30849	54.24862	54.26941	54.2782	54.27903	54.28001	54.28885
Link (7012, 27)	111.0531	110.2548	109.7629	109.7973	109.5673	109.0218	108.2655	107.5994	107.1843	107.1869	107.3144	107.3801	107.452	107.5115
Link (7014, 757)	42.65119	42.58124	42.57851	42.56438	42.39322	42.17228	41.23552	40.7255	40.52965	40.57524	40.60887	40.6262	40.64212	40.65894

Std. Dev. over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	0.235923	0.215988	0.180624	0.145196	0.124893	0.111894	0.096155	0.119013	0.140334	0.124158	0.12193	0.122145	0.121305	0.121305
Link (20, 17)	0.356228	0.169368	0.138509	0.164219	0.103992	0.100887	0.090163	0.113734	0.116677	0.107194	0.106774	0.105118	0.105856	0.105783
Link (23, 20)	0.21831	0.171204	0.142211	0.132094	0.116183	0.089741	0.084085	0.087288	0.098981	0.09587	0.09365	0.092649	0.093708	0.094522
Link (25, 285)	0.731277	0.609131	0.385442	0.362531	0.324378	0.239139	0.210821	0.263293	0.269642	0.251396	0.247257	0.247548	0.243228	0.245169
Link (26, 202)	0.491806	0.191062	0.233372	0.211357	0.180523	0.161747	0.150103	0.15368	0.1339	0.119035	0.117858	0.119963	0.120618	0.117157
Link (27, 286)	0.342309	0.248358	0.17703	0.176585	0.163664	0.163485	0.165094	0.179697	0.142586	0.112802	0.118856	0.117662	0.116731	0.115947
Link (29, 351)	0.153204	0.141622	0.118091	0.086217	0.070931	0.073809	0.127789	0.123054	0.098765	0.089394	0.086244	0.086485	0.085425	0.085984
Link (31, 29)	0.445491	0.355154	0.288512	0.295256	0.241698	0.184665	0.163443	0.275785	0.218725	0.187238	0.187013	0.187572	0.188241	0.188465
Link (34, 7014)	0.346443	0.188394	0.154934	0.151078	0.159293	0.115778	0.245996	0.203944	0.176983	0.164631	0.164739	0.163544	0.164245	0.162868
Link (35, 114)	0.384352	0.244232	0.185411	0.168466	0.146361	0.132839	0.108818	0.103111	0.085525	0.081433	0.081996	0.082205	0.080586	0.081446
Link (36, 35)	1.001994	0.525127	0.430195	0.444687	0.413457	0.393382	0.406202	0.330049	0.317078	0.252283	0.250023	0.248007	0.246965	0.247769
Link (38, 36)	0.261748	0.127098	0.110439	0.135871	0.136802	0.106727	0.117829	0.13218	0.090828	0.077816	0.075424	0.073504	0.075937	0.076508
Link (40, 225)	0.37129	0.27909	0.196792	0.175671	0.158996	0.135247	0.169166	0.153601	0.128299	0.128202	0.132005	0.132366	0.132833	0.132246
Link (42, 43)	1.114795	1.00843	0.819897	0.840372	0.678738	0.530342	0.535782	0.538362	0.519164	0.482005	0.480111	0.47871	0.478153	0.477419
Link (43, 40)	0.337093	0.223503	0.219777	0.229682	0.259802	0.205541	0.189135	0.139984	0.131076	0.13022	0.132704	0.128843	0.128466	0.125827
Link (72, 220)	0.614032	0.443359	0.340494	0.329063	0.233399	0.258356	0.26753	0.244559	0.214044	0.185124	0.186653	0.172352	0.156332	0.144071
Link (73, 316)	0.372692	0.249776	0.260387	0.246722	0.204744	0.185613	0.169228	0.158906	0.164238	0.136077	0.137846	0.136782	0.13399	0.135391
Link (84, 206)	0.369842	0.206415	0.238161	0.187331	0.161133	0.128696	0.124725	0.134873	0.115406	0.126827	0.12793	0.127111	0.129057	0.127548
Link (114, 84)	0.269073	0.124515	0.128566	0.101611	0.11036	0.124011	0.115227	0.150846	0.137139	0.128171	0.129023	0.128367	0.130159	0.129632
Link (117, 262)	0.194151	0.175766	0.198206	0.181524	0.171391	0.170407	0.207072	0.221254	0.217902	0.20934	0.206141	0.206325	0.207481	0.205896
Link (149, 223)	0.391359	0.305954	0.216483	0.122133	0.155803	0.128428	0.153201	0.160025	0.142853	0.173834	0.179234	0.178326	0.17942	0.178373
Link (202, 25)	0.558552	0.250545	0.26238	0.308528	0.268252	0.214606	0.206761	0.230925	0.235905	0.211158	0.202505	0.200583	0.196552	0.196452
Link (204, 73)	1.071668	0.74228	0.477439	0.406486	0.289431	0.273398	0.237887	0.237721	0.208936	0.18433	0.193223	0.204327	0.190031	0.188104
Link (205, 226)	0.313313	0.246174	0.232148	0.192805	0.199325	0.20921	0.245883	0.25983	0.266738	0.264557	0.266023	0.265939	0.26714	0.264407
Link (206, 219)	0.302162	0.17377	0.177811	0.166049	0.153482	0.116887	0.124763	0.130621	0.109877	0.116906	0.118445	0.117846	0.119561	0.1191
Link (209, 204)	0.879344	0.368279	0.350518	0.290681	0.290727	0.241552	0.176499	0.194683	0.178273	0.191051	0.190329	0.185308	0.175694	0.182894
Link (219, 34)	0.32195	0.215936	0.188903	0.182428	0.161303	0.111412	0.121701	0.122047	0.095536	0.100655	0.099373	0.098605	0.099819	0.099398
Link (220, 26)	2.000176	1.240854	1.023682	0.892236	1.000325	1.012872	1.070765	1.032073	1.029066	0.957555	0.881859	0.73434	0.717147	0.719354
Link (221, 38)	0.709132	0.687555	0.562179	0.545217	0.394989	0.381853	0.410267	0.364269	0.334309	0.336563	0.33232	0.330325	0.331901	0.330352
Link (222, 221)	0.44465	0.381096	0.25328	0.187407	0.189894	0.147279	0.129594	0.181708	0.159269	0.193159	0.197047	0.196275	0.197529	0.196035
Link (223, 222)	0.486746	0.3875	0.221958	0.167254	0.177221	0.131111	0.130045	0.161762	0.15049	0.182424	0.186429	0.185384	0.186833	0.185574
Link (224, 149)	0.385724	0.311577	0.205907	0.145498	0.139927	0.118831	0.122509	0.134372	0.121362	0.144397	0.148782	0.147759	0.149117	0.148466
Link (225, 224)	0.319526	0.304884	0.202247	0.17917	0.156759	0.142308	0.147075	0.14927	0.126224	0.132483	0.135201	0.134723	0.135917	0.135626
Link (226, 42)	0.460058	0.347085	0.278296	0.227808	0.198685	0.187504	0.253333	0.27583	0.285898	0.272953	0.27544	0.275115	0.27617	0.273605
Link (246, 73)	0.277868	0.348441	0.289589	0.219579	0.182108	0.235129	0.220271	0.216634	0.209129	0.208727	0.205031	0.203858	0.202936	0.20321
Link (249, 246)	0.363073	0.284904	0.242342	0.168243	0.165206	0.174451	0.093877	0.104605	0.095875	0.113592	0.113195	0.113216	0.113333	0.115055
Link (262, 205)	0.216074	0.144447	0.181622	0.143925	0.186239	0.203122	0.231047	0.239144	0.235865	0.230602	0.230914	0.230842	0.232058	0.229678
Link (285, 7002)	0.716179	0.546364	0.352103	0.414587	0.299125	0.248707	0.256175	0.288405	0.303402	0.287272	0.283922	0.280136	0.271799	0.273295
Link (286, 26)	1.136622	0.686702	0.722607	0.652944	0.521167	0.502255	0.626394	0.611703	0.526148	0.530065	0.527547	0.524929	0.522339	0.522028
Link (315, 26)	1.282006	0.546035	0.384007	0.401441	0.562765	0.599045	0.537868	0.552369	0.439393	0.395923	0.419065	0.394464	0.389435	0.369715
Link (316, 315)	0.511525	0.424052	0.331032	0.370708	0.29651	0.206841	0.154977	0.162838	0.161239	0.151015	0.146381	0.14993	0.147561	0.14749
Link (336, 23)	0.20382	0.179425	0.169473	0.157781	0.139753	0.10407	0.093548	0.111369	0.115268	0.110594	0.107232	0.103114	0.102761	0.104131
Link (351, 7012)	0.357139	0.204092	0.161483	0.12304	0.131618	0.136387	0.103516	0.140617	0.143651	0.113398	0.117583	0.116192	0.11577	0.11475
Link (757, 31)	0.998684	0.787023	0.569923	0.531089	0.502293	0.384585	0.657971	0.439315	0.475465	0.395864	0.394974	0.393169	0.393426	0.392715
Link (7002, 336)	0.234126	0.244552	0.196512	0.192835	0.137901	0.114369	0.133277	0.159154	0.161342	0.153092	0.149505	0.146355	0.144994	0.147495
Link (7012, 27)	1.52037	1.088036	0.732396	0.669509	0.771146	0.68973	0.748197	0.830436	0.74801	0.608666	0.633241	0.628021	0.621481	0.613768
Link (7014, 757)	0.601015	0.361172	0.283703	0.283376	0.277619	0.284723	0.814558	0.618484	0.501052	0.498543	0.49196	0.489841	0.488977	0.489324

CORSIM Max. Queues – No Contraflow, Minimal Event Case

MaximumQueue Lane 1(vehicles)
Mean over 10 runs

Link/Aggregation	Interval	
	50400	Queue Length (ft)
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	1	20
Link (26, 202)	1.4	28
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	0	0
Link (35, 114)	1.3	26
Link (36, 35)	37.5	742
Link (38, 36)	1.1	22
Link (40, 225)	0.2	4
Link (42, 43)	19.6	388
Link (43, 40)	0.4	8
Link (72, 220)	1	20
Link (73, 316)	1	20
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	18.8	372
Link (204, 73)	1.9	38
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	2.1	42
Link (221, 38)	30.9	611
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	0	0
Link (246, 73)	7.2	142
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	0.7	14
Link (286, 26)	25.2	498
Link (315, 26)	5.9	117
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Max Queue Length
NB Coll @ MLK	498.4560151
WBT MLK	79.12
WBR MLK	136.4820019
NB Coll @ Mkt	1770.67
NBT @ Oleander	1386.577993
NBT Coll @ Mky Jct	403.5119849
Ramp @ Gordon	33.62599976

Std. Dev. over 10 runs
Link/Aggregation

	50400	
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	0	0
Link (26, 202)	0.516398	10
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	0	0
Link (35, 114)	0.483046	10
Link (36, 35)	4.062019	80
Link (38, 36)	0.567646	11
Link (40, 225)	0.421637	8
Link (42, 43)	2.221111	44
Link (43, 40)	0.516398	10
Link (72, 220)	0	0
Link (73, 316)	0	0
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	3.994441	79
Link (204, 73)	0.567646	11
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	0.316228	6
Link (221, 38)	4.840799	96
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	0	0
Link (246, 73)	0.788811	16
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	1.05935	21
Link (286, 26)	3.794733	75
Link (315, 26)	0.994429	20
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Std Deviation
NB Coll @ MLK	69.16760839
WBT MLK	0
WBR MLK	5.363295771
NB Coll @ Mkt	2.469993784
NBT @ Oleander	18.02587336
NBT Coll @ Mky Jct	11.13681525
Ramp @ Gordon	9.929724253

CORSIM Max. Queues – With Contraflow, Minimal Event Case

MaximumQueue Lane 1(vehicles)
Mean over 10 runs

Link/Aggregation	Interval	
	50400	Queue Length (ft)
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	0.1	2
Link (26, 202)	0.3	6
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	0	0
Link (35, 114)	1.3	26
Link (36, 35)	35.1	694
Link (38, 36)	0.9	18
Link (40, 225)	0.2	4
Link (42, 43)	20	396
Link (43, 40)	0.8	16
Link (72, 220)	1	20
Link (73, 316)	0.9	18
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	0	0
Link (204, 73)	2.4	47
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	3.2	63
Link (221, 38)	30.2	597
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	0	0
Link (246, 73)	6.4	127
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	0	0
Link (286, 26)	4.3	85
Link (315, 26)	1.9	38
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Max Queue Length
NB Coll @ MLK	328.3480075
WBT MLK	124.6140038
WBR MLK	55.38399906
NB Coll @ Mkt	1778.582
NBT @ Oleander	1339.106001
NBT Coll @ Mky Jct	395.6
Ramp @ Gordon	0

Std. Dev. over 10 runs
Link/Aggregation

	50400	
Link (20, 17)	0	0
Link (23, 20)	0	0
Link (25, 285)	0.316228	6
Link (26, 202)	0.483046	10
Link (29, 351)	0	0
Link (31, 29)	0	0
Link (34, 7014)	0	0
Link (35, 114)	0.483046	10
Link (36, 35)	3.034981	60
Link (38, 36)	0.316228	6
Link (40, 225)	0.421637	8
Link (42, 43)	1.563472	31
Link (43, 40)	0.632456	13
Link (72, 220)	0	0
Link (73, 316)	0.316228	6
Link (84, 206)	0	0
Link (114, 84)	0	0
Link (117, 262)	0	0
Link (149, 223)	0	0
Link (202, 25)	0	0
Link (204, 73)	0.516398	10
Link (205, 226)	0	0
Link (206, 219)	0	0
Link (209, 204)	0	0
Link (219, 34)	0	0
Link (220, 26)	0.632456	13
Link (221, 38)	4.104198	81
Link (222, 221)	0	0
Link (223, 222)	0	0
Link (224, 149)	0	0
Link (225, 224)	0	0
Link (226, 42)	0	0
Link (246, 73)	0.843274	17
Link (249, 246)	0	0
Link (262, 205)	0	0
Link (285, 7002)	0	0
Link (286, 26)	0.948683	19
Link (315, 26)	0.316228	6
Link (316, 315)	0	0
Link (336, 23)	0	0
Link (351, 7012)	0	0
Link (757, 31)	0	0
Link (7002, 336)	0	0
Link (7012, 27)	0	0
Link (7014, 757)	0	0

Queue Location	Avg Std Deviation
NB Coll @ MLK	31.83856194
WBT MLK	3.184882672
WBR MLK	3.474991794
NB Coll @ Mkt	2.239493148
NBT @ Oleander	16.91775702
NBT Coll @ Mky Jct	9.063064696
Ramp @ Gordon	0

CORSIM Throughput – No Contraflow, Minimal Event Case

Discharge Through(vehicles)
Mean over 10 runs

Link/Aggregation	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	1358	3085	4822	6553	8287	10006	11834	13908	16038	18306	19711	20554	21394	22235
Link (20, 17)	1133	2477	3824	5166	6510	7841	9298	10973	12662	14493	15580	16280	16978	17683
Link (23, 20)	1176	2565	3947	5332	6711	8085	9584	11301	13034	14903	16049	16792	17532	18278
Link (25, 285)	1221	2641	4043	5450	6857	8255	9781	11530	13298	15183	16345	17112	17880	18653
Link (26, 202)	1241	2666	4077	5487	6899	8312	9844	11575	13327	15198	16338	17101	17867	18633
Link (29, 351)	1114	2374	3624	4877	6126	7379	8716	10197	11697	13248	14071	14591	15105	15615
Link (31, 29)	1003	2134	3258	4388	5508	6634	7831	9155	10493	11873	12528	12922	13315	13700
Link (34, 7014)	1224	2601	3966	5328	6690	8058	9498	11058	12628	14244	14949	15383	15818	16242
Link (35, 114)	1286	2656	4019	5388	6751	8116	9576	11120	12690	14323	14962	15394	15828	16250
Link (36, 35)	1120	2305	3479	4671	5836	7026	8277	9611	10965	12383	12879	13207	13535	13856
Link (38, 36)	1278	2606	3924	5253	6571	7896	9280	10749	12240	13792	14380	14790	15199	15607
Link (40, 225)	1333	2663	3996	5335	6664	7991	9405	10892	12393	13953	14431	14821	15210	15594
Link (42, 43)	1257	2514	3779	5047	6305	7557	8900	10314	11737	13227	13615	13929	14240	14547
Link (43, 40)	1292	2588	3891	5197	6492	7779	9163	10614	12076	13604	14038	14392	14746	15096
Link (72, 220)	91	194	292	398	499	597	702	814	929	1054	1191	1304	1416	1529
Link (73, 316)	211	435	662	886	1118	1339	1599	1907	2203	2561	2917	3201	3481	3771
Link (84, 206)	1271	2639	4004	5368	6741	8104	9560	11104	12672	14300	14958	15393	15826	16251
Link (114, 84)	1279	2655	4017	5382	6750	8112	9573	11116	12688	14318	14962	15393	15828	16250
Link (117, 262)	1364	2726	4093	5459	6827	8193	9649	11208	12770	14424	14931	15373	15816	16258
Link (149, 223)	1321	2663	3990	5329	6660	7992	9402	10881	12377	13933	14469	14859	15250	15634
Link (202, 25)	1203	2606	3984	5370	6758	8136	9640	11373	13122	14985	16118	16867	17614	18368
Link (204, 73)	54	111	167	224	286	347	418	505	588	689	837	957	1081	1204
Link (205, 226)	1365	2730	4095	5461	6831	8195	9651	11203	12762	14418	14955	15397	15839	16281
Link (206, 219)	1252	2626	3992	5353	6720	8087	9546	11081	12657	14277	14956	15389	15823	16248
Link (209, 204)	121	252	378	508	646	778	924	1096	1266	1463	1717	1919	2123	2335
Link (219, 34)	1228	2606	3968	5332	6694	8061	9508	11063	12633	14249	14950	15385	15819	16243
Link (220, 26)	28	62	92	124	156	187	221	253	286	325	370	407	440	478
Link (221, 38)	1217	2473	3726	4983	6234	7494	8812	10201	11611	13074	13559	13869	14181	14495
Link (222, 221)	1312	2646	3977	5316	6645	7979	9381	10861	12359	13914	14487	14877	15266	15653
Link (223, 222)	1323	2657	3987	5324	6660	7991	9394	10874	12369	13930	14479	14870	15259	15646
Link (224, 149)	1326	2661	3993	5327	6662	7990	9399	10884	12385	13939	14456	14844	15235	15621
Link (225, 224)	1328	2660	3988	5328	6659	7989	9399	10885	12386	13938	14444	14833	15222	15608
Link (226, 42)	1364	2728	4094	5463	6828	8194	9649	11203	12758	14418	14961	15401	15844	16285
Link (246, 73)	150	310	461	613	773	935	1096	1258	1420	1588	1650	1702	1749	1795
Link (249, 246)	327	670	1008	1342	1689	2026	2398	2798	3194	3642	3933	4169	4395	4634
Link (262, 205)	1365	2730	4095	5458	6828	8194	9650	11204	12768	14422	14943	15387	15828	16270
Link (285, 7002)	1221	2641	4041	5448	6853	8253	9780	11528	13293	15181	16344	17111	17879	18653
Link (286, 26)	1044	2241	3430	4619	5802	6997	8270	9687	11128	12635	13405	13881	14355	14826
Link (315, 26)	49	104	161	213	270	324	380	432	484	540	590	631	668	705
Link (316, 315)	210	434	662	885	1118	1338	1598	1906	2202	2559	2917	3200	3480	3770
Link (336, 23)	1212	2630	4032	5440	6843	8246	9772	11517	13272	15169	16342	17108	17876	18648
Link (351, 7012)	1114	2373	3623	4876	6125	7379	8715	10196	11695	13247	14071	14590	15105	15615
Link (757, 31)	1221	2596	3960	5326	6687	8055	9489	11052	12623	14237	14948	15382	15817	16241
Link (7002, 336)	1220	2640	4041	5445	6850	8251	9779	11527	13287	15179	16344	17111	17879	18652
Link (7012, 27)	1113	2372	3622	4875	6124	7378	8715	10195	11694	13245	14070	14590	15105	15615
Link (7014, 757)	1224	2599	3965	5328	6689	8057	9495	11056	12626	14242	14949	15382	15818	16241

Std. Dev. over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	23.42	17.64	43.44	36.55	54.38	56.22	47.47	70.45	81.13	89.18	100.62	113.75	127.31	128.28
Link (20, 17)	22.74	26.75	42.23	49.43	61.84	57.43	36.93	53.83	73.06	83.98	102.88	120.12	134.57	144.06
Link (23, 20)	24.15	19.92	37.99	43.92	53.82	52.98	33.78	42.15	68.25	75.29	92.24	108.36	122.61	128.26
Link (25, 285)	19.27	28.31	46.68	43.03	54.23	55.82	36.22	51.19	68.25	77.74	96.38	113.86	126.09	134.32
Link (26, 202)	22.05	27.73	49.86	51.92	59.23	49.02	39.89	40.04	59.87	69.76	87.94	103.10	119.76	127.79
Link (29, 351)	25.93	16.44	38.20	42.89	47.05	49.86	52.88	50.66	63.72	67.12	76.30	94.10	100.16	113.88
Link (31, 29)	23.14	13.68	31.73	43.53	44.77	51.75	53.35	52.87	52.74	52.98	53.16	63.67	70.26	73.93
Link (34, 7014)	23.43	15.60	30.61	40.85	51.57	56.71	64.88	52.40	57.68	61.49	66.30	73.09	71.85	80.40
Link (35, 114)	16.00	21.84	28.86	33.80	50.89	54.24	45.22	52.20	56.13	65.04	66.94	71.47	69.48	76.89
Link (36, 35)	19.06	19.14	31.37	37.91	53.81	55.92	38.33	48.45	61.34	69.38	73.02	71.04	69.85	73.32
Link (38, 36)	27.68	29.43	37.84	38.26	26.05	43.76	44.72	45.37	48.67	65.67	68.60	71.99	67.69	73.11
Link (40, 225)	11.39	17.02	19.61	13.01	20.18	20.24	17.79	24.85	30.36	32.56	42.07	46.49	41.88	45.55
Link (42, 43)	10.95	21.10	17.72	13.41	17.55	20.75	23.86	21.21	19.09	24.77	18.47	17.46	16.52	23.11
Link (43, 40)	12.54	24.00	17.63	17.15	21.89	26.88	20.86	24.77	24.70	30.72	27.41	29.90	32.17	36.37
Link (72, 220)	10.12	17.59	14.25	16.08	20.04	22.24	25.62	25.04	27.17	27.94	32.65	36.28	40.66	37.64
Link (73, 316)	20.05	19.39	26.52	26.69	28.84	33.63	38.25	44.92	45.07	53.59	66.11	60.30	53.71	53.21
Link (84, 206)	14.96	21.18	26.89	38.59	51.00	57.96	52.73	54.08	53.44	64.18	66.87	71.24	69.67	77.57
Link (114, 84)	16.47	21.70	27.51	33.59	49.73	52.84	45.38	52.22	55.54	63.44	67.07	71.13	70.45	77.39
Link (117, 262)	4.25	3.51	3.77	5.00	3.95	3.50	3.98	3.08	6.71	6.79	2.50	2.73	1.90	2.42
Link (149, 223)	20.19	26.04	22.32	16.68	20.21	19.24	17.00	31.03	32.39	31.02	42.80	48.21	40.09	45.28
Link (202, 25)	20.47	27.46	43.54	42.76	54.75	53.48	37.68	45.20	64.68	77.57	95.36	109.08	124.11	131.51
Link (204, 73)	8.17	6.54	10.03	8.92	9.91	13.18	14.11	16.08	17.01	19.40	23.74	21.96	27.09	33.09
Link (205, 226)	5.74	5.22	4.33	7.74	5.09	3.75	4.36	7.64	12.49	7.60	4.58	4.07	3.80	4.24
Link (206, 219)	20.18	18.75	28.62	36.31	50.23	63.22	58.83	53.15	55.05	68.90	67.37	73.54	71.87	79.78
Link (209, 204)	12.31	20.67	24.45	24.59	26.64	25.58	22.88	24.29	27.37	30.26	38.40	36.72	34.34	40.61
Link (219, 34)	23.08	15.53	30.42	40.46	52.10	56.75	60.42	54.25	56.52	62.94	67.04	74.72	72.42	80.79
Link (220, 26)	6.10	9.53	10.54	14.07	15.58	16.52	21.25	24.46	24.68	20.67	26.78	32.99	30.44	29.01
Link (221, 38)	26.35	28.34	32.84	30.57	23.56	29.85	36.71	41.58	45.58	55.33	62.99	64.97	60.31	62.97
Link (222, 221)	20.91	23.19	19.44	25.39	23.10	24.98	20.22	27.87	31.10	38.66	45.48	49.14	45.36	48.35
Link (223, 222)	20.67	25.48	21.27	24.08	16.31	21.62	22.19	30.88	28.31	38.47	45.87	50.86	45.42	50.63
Link (224, 149)	11.29	22.56	21.63	16.79	25.88	23.04	19.70	30.17	31.69	36.00	45.00	49.31	40.31	46.27
Link (225, 224)	13.74	21.10	20.18	12.61	19.82	18.96	18.16	26.12	31.24	34.22	43.18	47.59	39.83	44.75
Link (226, 42)	6.03	8.38	10.45	7.99	4.82	8.30	6.36	6.52	13.87	9.72	5.93	4.45	5.63	7.54
Link (246, 73)	12.75	13.27	22.38	26.29	28.26	35.03	37.98	38.58	43.44	41.96	38.22	38.96	39.42	36.84
Link (249, 246)	14.68	13.61	23.76	26.41	33.25	39.75	48.04	47.61	59.03	58.94	58.81	57.59	52.13	47.18
Link (262, 205)	5.64	4.11	6.23	5.64	5.46	7.38	5.33	7.80	7.39	6.23	4.27	4.06	4.64	5.95
Link (285, 7002)	19.23	28.01	46.33	42.09	54.50	55.66	36.83	51.88	70.16	76.79	96.60	114.10	125.75	134.42
Link (286, 26)	23.90	21.06	34.55	37.62	41.95	44.59	51.04	55.35	64.72	73.84	84.89	96.53	105.28	117.76
Link (315, 26)	6.46	11.76	14.77	16.19	16.30	21.33	21.56	21.13	19.06	20.93	21.34	22.07	24.09	28.92
Link (316, 315)	19.54	18.66	26.95	26.12	28.87	33.15	37.57	44.15	44.40	53.82	65.78	59.93	53.72	53.36
Link (336, 23)	24.64	23.95	40.64	41.06	55.42	54.20	39.41	49.85	72.83	79.60	97.57	112.68	125.32	132.78
Link (351, 7012)	25.88	15.91	38.48	42.84	47.54	49.88	52.91	50.51	64.61	67.52	76.31	94.17	100.15	113.79
Link (757, 31)	23.00	17.46	28.63	39.49	51.51	55.88	66.75	48.54	57.46	58.03	66.43	73.72	72.57	80.17
Link (7002, 336)	19.51	27.32	46.08	42.22	55.29	54.93	38.67	51.81	70.17	77.04	96.69	113.37	125.43	133.85
Link (7012, 27)	25.96	16.18	38.67	42.44	47.44	49.60	52.99	51.10	64.50	67.73	76.25	94.00	99.84	113.90
Link (7014, 757)	22.98	16.60	30.50	40.72	51.74	56.19	67.09	52.24	57.24	61.06	66.17	73.33	72.00	80.65

CORSIM Throughput – With Contraflow, Minimal Event Case

Discharge Through(vehicles)
Mean over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	429	940	1451	1964	2475	2988	3541	4156	4785	5460	5921	6255	6597	6929
Link (20, 17)	131	273	415	560	701	842	1020	1233	1455	1716	1955	2149	2355	2557
Link (23, 20)	153	319	484	655	822	987	1188	1426	1679	1964	2244	2475	2712	2948
Link (25, 285)	172	352	536	725	909	1093	1313	1567	1838	2142	2451	2705	2964	3226
Link (26, 202)	149	305	464	627	786	944	1140	1370	1613	1892	2178	2409	2645	2883
Link (29, 351)	1101	2328	3550	4783	6008	7235	8572	10020	11474	13014	13808	14312	14815	15305
Link (31, 29)	999	2105	3206	4315	5420	6521	7722	9021	10319	11697	12338	12732	13125	13505
Link (34, 7014)	1226	2577	3913	5257	6608	7950	9393	10931	12465	14072	14769	15203	15635	16055
Link (35, 114)	1285	2634	3978	5324	6672	8018	9465	11003	12536	14163	14784	15217	15648	16067
Link (36, 35)	1114	2286	3456	4624	5803	6969	8222	9561	10892	12312	12802	13137	13467	13791
Link (38, 36)	1275	2586	3900	5219	6534	7849	9223	10695	12170	13715	14315	14729	15138	15549
Link (40, 225)	1326	2654	3981	5314	6647	7976	9377	10873	12352	13917	14400	14789	15177	15568
Link (42, 43)	1258	2515	3766	5025	6291	7545	8880	10295	11713	13201	13590	13900	14212	14525
Link (43, 40)	1292	2587	3876	5173	6475	7766	9141	10593	12045	13578	14014	14369	14722	15078
Link (72, 220)	88	181	283	377	480	570	669	776	891	1000	1130	1235	1346	1457
Link (73, 316)	205	418	634	858	1077	1295	1548	1842	2143	2487	2825	3098	3378	3660
Link (84, 206)	1272	2620	3958	5306	6652	8002	9447	10982	12521	14138	14779	15215	15646	16064
Link (114, 84)	1281	2630	3974	5320	6666	8013	9461	10996	12531	14156	14782	15217	15649	16066
Link (117, 262)	1361	2729	4095	5461	6827	8193	9653	11207	12769	14425	14932	15375	15818	16259
Link (149, 223)	1328	2656	3980	5312	6646	7974	9375	10855	12348	13902	14443	14829	15218	15609
Link (202, 25)	143	293	447	606	760	913	1104	1329	1569	1843	2122	2345	2575	2806
Link (204, 73)	52	105	159	216	273	329	394	476	560	659	800	918	1038	1165
Link (205, 226)	1366	2735	4102	5463	6835	8197	9653	11210	12765	14419	14958	15401	15840	16284
Link (206, 219)	1247	2600	3943	5285	6631	7984	9425	10961	12496	14112	14776	15210	15643	16062
Link (209, 204)	109	230	350	479	603	724	857	1028	1198	1387	1621	1820	2019	2226
Link (219, 34)	1231	2580	3916	5263	6610	7957	9399	10936	12468	14077	14770	15204	15637	16055
Link (220, 26)	29	59	90	122	154	181	209	240	273	305	348	380	413	448
Link (221, 38)	1217	2461	3708	4962	6216	7464	8763	10161	11559	13022	13513	13825	14135	14448
Link (222, 221)	1313	2647	3973	5299	6634	7965	9353	10844	12330	13877	14462	14849	15235	15628
Link (223, 222)	1327	2649	3980	5309	6643	7973	9375	10854	12343	13895	14455	14841	15229	15621
Link (224, 149)	1328	2659	3986	5311	6649	7977	9378	10866	12347	13909	14429	14816	15204	15595
Link (225, 224)	1326	2659	3983	5314	6646	7975	9378	10864	12353	13915	14419	14807	15196	15586
Link (226, 42)	1366	2734	4098	5464	6833	8196	9650	11204	12765	14418	14963	15405	15846	16289
Link (246, 73)	143	298	458	610	764	921	1079	1240	1393	1558	1616	1661	1703	1747
Link (249, 246)	318	650	995	1335	1667	2006	2370	2766	3158	3591	3868	4087	4309	4531
Link (262, 205)	1365	2731	4098	5461	6829	8197	9650	11209	12768	14423	14944	15388	15830	16270
Link (285, 7002)	172	352	536	725	909	1093	1312	1567	1838	2142	2450	2704	2964	3226
Link (286, 26)	1037	2206	3369	4540	5701	6873	8141	9531	10931	12426	13167	13626	14088	14539
Link (315, 26)	45	97	148	204	257	307	359	414	469	526	571	605	640	677
Link (316, 315)	205	418	633	858	1076	1295	1548	1840	2142	2485	2824	3096	3377	3659
Link (336, 23)	170	351	535	724	908	1093	1311	1566	1837	2139	2450	2702	2962	3224
Link (351, 7012)	1100	2327	3549	4782	6008	7234	8572	10019	11472	13013	13808	14312	14815	15305
Link (757, 31)	1222	2572	3909	5255	6605	7947	9388	10926	12459	14068	14768	15202	15634	16053
Link (7002, 336)	172	351	536	725	909	1093	1312	1567	1838	2141	2450	2704	2964	3225
Link (7012, 27)	1099	2326	3548	4781	6007	7234	8571	10018	11471	13012	13808	14312	14815	15305
Link (7014, 757)	1225	2575	3911	5256	6606	7950	9392	10929	12463	14071	14769	15202	15635	16054

Std. Dev. over 10 runs
Link/Aggregation

	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	23.16	38.56	42.53	45.20	42.71	41.89	53.57	57.67	60.81	72.53	79.37	87.46	91.07	97.53
Link (20, 17)	10.49	18.35	24.70	27.33	32.29	36.44	30.15	35.63	37.64	40.30	43.17	42.75	49.24	56.32
Link (23, 20)	13.80	20.75	28.59	28.17	28.47	29.15	27.20	34.50	33.58	39.42	40.45	40.48	47.02	52.20
Link (25, 285)	12.89	19.69	31.19	31.48	31.36	34.58	36.63	44.25	43.94	49.79	46.80	49.17	54.25	59.69
Link (26, 202)	14.14	19.88	31.89	32.02	33.69	36.30	36.40	44.70	44.87	51.92	46.40	49.80	55.03	61.30
Link (29, 351)	23.05	29.35	46.57	54.39	63.33	72.32	72.62	84.48	103.39	86.19	86.34	88.70	100.74	102.68
Link (31, 29)	23.17	30.59	37.13	41.28	42.10	43.94	44.09	59.38	74.89	66.32	71.80	75.72	84.94	88.53
Link (34, 7014)	23.84	27.65	33.32	39.35	44.09	46.85	51.14	61.36	75.83	70.18	80.87	80.37	83.98	88.49
Link (35, 114)	25.89	31.04	31.25	39.58	27.53	48.66	49.35	56.46	75.93	72.70	76.59	79.65	83.14	88.99
Link (36, 35)	20.89	33.22	32.73	34.22	31.12	42.18	42.27	53.19	66.05	70.14	67.98	66.12	71.10	69.75
Link (38, 36)	17.59	32.97	29.19	27.89	30.59	40.09	41.42	44.43	55.44	63.58	60.84	61.53	62.84	55.66
Link (40, 225)	16.29	21.95	15.66	24.72	27.44	27.56	23.71	29.24	34.96	37.01	34.89	33.36	30.20	28.82
Link (42, 43)	16.31	14.03	20.52	28.58	30.01	26.42	24.43	28.52	33.08	31.09	32.09	32.07	24.94	26.45
Link (43, 40)	17.24	20.48	24.37	32.97	31.74	30.45	29.97	30.12	38.83	38.66	35.46	37.62	33.28	30.89
Link (72, 220)	7.12	15.29	21.21	25.58	26.83	32.05	31.17	30.11	32.60	39.01	43.21	44.12	50.19	54.70
Link (73, 316)	17.78	23.39	34.94	34.96	39.06	42.74	38.40	39.31	40.59	47.02	39.92	40.08	46.23	52.05
Link (84, 206)	25.62	34.86	31.87	49.04	42.23	50.09	57.19	59.06	77.89	72.22	77.11	79.69	83.71	88.76
Link (114, 84)	25.67	33.44	29.71	40.29	28.15	48.90	52.97	56.86	76.87	72.33	77.93	79.21	82.98	88.71
Link (117, 262)	6.71	4.17	5.10	5.90	5.85	3.44	4.60	7.49	5.25	5.33	4.07	4.10	4.01	3.59
Link (149, 223)	13.14	19.17	15.39	22.77	28.33	25.82	24.28	25.46	33.19	40.38	33.82	32.77	31.91	25.78
Link (202, 25)	13.35	19.86	31.77	31.80	31.53	34.43	36.43	44.39	43.46	49.96	46.40	48.52	54.14	59.59
Link (204, 73)	8.13	6.55	8.13	8.53	12.39	14.36	16.39	14.84	15.33	18.71	18.77	22.82	23.30	24.50
Link (205, 226)	10.44	9.12	6.44	7.85	6.76	4.06	9.15	8.17	13.41	8.54	6.58	7.58	7.68	7.29
Link (206, 219)	25.25	28.81	30.22	37.84	43.83	51.86	64.12	62.15	69.38	65.04	78.27	79.68	84.60	88.79
Link (209, 204)	10.76	17.55	21.44	24.31	32.07	31.11	30.52	27.49	27.27	33.31	30.39	40.65	41.42	44.93
Link (219, 34)	22.76	26.94	33.88	40.57	41.91	46.79	53.09	59.20	75.99	70.05	81.05	80.08	84.59	88.49
Link (220, 26)	4.66	7.04	10.03	11.05	14.29	16.91	18.29	23.74	23.69	27.22	27.87	28.39	31.37	35.10
Link (221, 38)	16.02	31.81	31.70	32.69	30.74	41.91	44.41	35.81	49.60	52.83	47.19	48.93	43.92	38.21
Link (222, 221)	16.16	23.85	29.92	27.70	34.35	32.91	31.23	33.25	30.83	40.72	34.66	35.28	33.67	29.19
Link (223, 222)	21.55	23.14	29.94	29.09	32.93	38.43	24.64	31.59	33.45	44.95	35.42	36.50	35.13	30.02
Link (224, 149)	14.77	21.76	20.52	23.82	31.13	30.41	23.91	29.13	29.39	38.52	32.66	34.34	33.27	28.55
Link (225, 224)	14.23	20.15	24.19	20.44	29.49	27.33	23.74	26.61	36.56	33.59	30.28	32.62	29.90	27.79
Link (226, 42)	10.13	6.18	10.00	6.48	5.59	4.81	10.94	6.01	11.26	8.91	4.97	5.78	5.91	5.88
Link (246, 73)	10.43	15.20	24.31	27.08	30.47	34.64	40.17	37.37	41.23	42.45	41.60	38.20	35.81	34.96
Link (249, 246)	17.35	30.12	38.86	44.98	50.56	54.07	55.73	48.79	49.48	46.54	44.82	41.86	44.09	43.07
Link (262, 205)	9.98	7.07	6.70	11.61	6.04	5.14	12.28	7.63	10.62	12.16	6.06	5.74	6.24	5.70
Link (285, 7002)	13.02	20.02	31.19	31.55	31.04	34.48	36.73	44.17	44.02	49.57	47.13	49.00	54.10	59.69
Link (286, 26)	24.43	29.93	48.32	48.64	55.27	66.24	69.06	74.24	99.14	81.54	84.28	89.35	96.58	96.54
Link (315, 26)	5.01	8.56	9.35	12.94	15.59	20.20	18.66	17.92	14.48	16.36	18.48	22.73	24.05	22.33
Link (316, 315)	18.04	23.28	34.85	35.42	39.66	42.83	38.31	39.27	41.26	47.23	39.31	40.21	45.74	52.13
Link (336, 23)	13.22	20.71	31.60	31.26	31.40	34.21	36.12	43.97	43.35	48.33	47.01	48.49	53.75	59.41
Link (351, 7012)	23.09	28.71	46.68	53.90	62.45	72.29	72.84	84.57	103.39	86.11	86.30	88.54	100.31	102.56
Link (757, 31)	24.40	26.71	32.94	38.72	43.61	45.72	49.12	60.53	76.93	70.48	81.07	80.69	83.85	88.10
Link (7002, 336)	13.15	20.24	31.31	31.55	31.12	34.48	36.40	44.33	44.10	49.57	47.15	49.10	54.16	59.63
Link (7012, 27)	23.44	28.64	47.02	53.65	61.64	72.30	73.11	84.47	103.28	86.41	86.30	88.28	100.20	102.39
Link (7014, 757)	24.31	27.24	33.40	39.18	43.75	46.46	50.36	61.01	76.01	70.36	80.85	80.29	83.68	88.25

CORSIM Average Speeds – No Contraflow, Minimal Event Case

AverageSpeed (mph)
Mean over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	65.89922	65.53383	65.4537	65.46196	65.39864	65.39931	65.35757	65.13148	65.01915	64.8284	64.83205	64.96028	65.07957	65.19017
Link (20, 17)	63.89574	63.70679	63.6623	63.63171	63.60786	63.63965	63.61543	63.49487	63.39914	63.27882	63.31686	63.40361	63.48264	63.55951
Link (23, 20)	52.99531	52.85188	52.81704	52.80342	52.78511	52.79193	52.79593	52.74094	52.69344	52.63695	52.66526	52.72715	52.78467	52.83944
Link (25, 285)	45.4021	44.87369	44.75819	44.73377	44.75922	44.78812	44.79299	44.67456	44.5383	44.40463	44.38188	44.50121	44.61242	44.71523
Link (26, 202)	37.61823	37.43711	37.34813	37.29596	37.30201	37.31538	37.27099	37.25293	37.21534	37.17092	37.10977	37.1334	37.15629	37.16116
Link (27, 286)	51.67263	51.52235	51.45471	51.40629	51.37877	51.36802	51.33222	51.29144	51.24199	51.16774	51.19544	51.25817	51.32334	51.38109
Link (29, 351)	51.21082	51.19744	51.18551	51.17794	51.17528	51.18981	51.15872	51.10165	51.0478	50.97529	50.95786	50.97184	50.98832	50.99918
Link (31, 29)	42.58095	42.36948	42.30272	42.32732	42.27378	42.28036	42.25647	42.09947	41.94879	41.73313	41.76221	41.83693	41.90951	41.97262
Link (34, 7014)	42.23529	42.10089	42.03711	42.01472	41.98817	41.98154	41.9557	41.91993	41.86206	41.79296	41.81861	41.8587	41.8991	41.93111
Link (35, 114)	33.32054	33.2417	33.23742	33.20215	33.17903	33.19947	33.18055	33.16784	33.14726	33.15308	33.15884	33.18872	33.22514	33.25699
Link (36, 35)	27.6084	27.13026	26.98878	26.96718	26.83844	26.84971	26.78714	26.65306	26.50602	26.35605	26.47551	26.67921	26.86947	27.05238
Link (38, 36)	32.37379	32.37447	32.35601	32.35971	32.36551	32.38892	32.40914	32.41275	32.40549	32.40644	32.36777	32.33545	32.31343	32.29251
Link (40, 225)	47.30235	47.36712	47.24346	47.24556	47.19175	47.22353	47.20971	47.15144	47.08466	47.01028	47.09712	47.18903	47.27466	47.35574
Link (42, 43)	27.59224	27.35575	26.88269	26.78524	26.83622	26.68872	26.65314	26.41976	26.24202	25.8925	25.90031	26.00818	26.1145	26.21258
Link (43, 40)	33.45941	33.45984	33.33914	33.30891	33.25811	33.1925	33.226	33.20432	33.19661	33.16518	33.16094	33.17337	33.19013	33.2017
Link (72, 220)	46.2991	46.12784	46.2326	46.21405	46.19369	46.17665	46.14556	46.23925	46.23188	46.17772	46.17573	46.18292	46.17411	46.16763
Link (73, 316)	41.51355	41.3267	41.38574	41.38979	41.34368	41.39126	41.35856	41.38863	41.38953	41.41294	41.41265	41.44846	41.47878	41.50769
Link (84, 206)	39.13028	38.97372	38.96572	38.92744	38.89177	38.91527	38.85258	38.81477	38.75804	38.68008	38.77264	38.8872	38.99355	39.09344
Link (114, 84)	39.66819	39.50869	39.50844	39.46593	39.45423	39.45892	39.42442	39.41164	39.36378	39.31347	39.38548	39.47203	39.55485	39.63227
Link (117, 262)	50.69992	50.70739	50.62916	50.60284	50.59646	50.62027	50.5725	50.49299	50.42099	50.3112	50.39215	50.48201	50.56547	50.64654
Link (149, 223)	40.10147	39.99146	40.00436	40.02621	39.99438	40.06479	40.04967	40.01869	39.95137	39.85898	39.92956	40.01768	40.09579	40.17201
Link (202, 25)	44.79187	44.20974	44.12794	44.14982	44.15646	44.19204	44.20673	44.06033	43.92369	43.73866	43.67536	43.84592	43.98997	44.1311
Link (204, 73)	25.46111	25.15257	25.13476	25.07538	24.90042	24.87275	24.8732	24.81343	24.83743	24.84326	25.31331	25.74384	26.12171	26.42898
Link (205, 226)	50.76643	50.71038	50.61269	50.6143	50.59639	50.64352	50.58441	50.48691	50.38667	50.27063	50.34674	50.43536	50.51998	50.60104
Link (206, 219)	41.41778	41.25808	41.17902	41.17049	41.14124	41.15207	41.11871	41.09952	41.05936	41.0087	41.05409	41.12001	41.18146	41.24026
Link (209, 204)	55.13041	54.86942	54.79832	54.7182	54.76223	54.75157	54.78284	54.77774	54.78134	54.75415	54.69847	54.68529	54.64021	54.61157
Link (219, 34)	42.05943	41.88565	41.80059	41.78655	41.74617	41.74712	41.70893	41.67799	41.62782	41.5551	41.59045	41.64202	41.69316	41.73745
Link (220, 26)	33.16938	32.50742	32.50517	32.49057	32.42305	32.25601	32.15498	31.93977	31.70685	31.37814	31.70954	32.1679	32.58301	32.9418
Link (221, 38)	33.2517	32.91905	32.89491	32.84156	32.74166	32.76329	32.71356	32.62185	32.53628	32.46315	32.50409	32.60204	32.69805	32.79006
Link (222, 221)	39.8419	39.78187	39.76154	39.76939	39.71676	39.76482	39.76469	39.72771	39.68672	39.58536	39.65625	39.74407	39.82235	39.8999
Link (223, 222)	39.96301	39.90559	39.89503	39.90611	39.87029	39.92616	39.92542	39.89037	39.83782	39.74809	39.81992	39.90816	39.98593	40.06266
Link (224, 149)	40.32153	40.22665	40.21061	40.25101	40.20562	40.26846	40.22676	40.17203	40.07457	39.98261	40.05564	40.14008	40.21919	40.29705
Link (225, 224)	40.18372	40.18838	40.10841	40.12291	40.08146	40.1251	40.07785	40.01434	39.91687	39.82518	39.91034	40.00675	40.09655	40.1833
Link (226, 42)	50.85224	50.8134	50.7338	50.73966	50.72322	50.77402	50.71159	50.60759	50.50073	50.36491	50.43559	50.52213	50.60651	50.6843
Link (246, 73)	37.42643	37.19175	37.28971	37.24488	37.24078	37.25658	37.15667	37.07756	37.02717	36.97115	36.95075	37.01268	37.04476	37.06343
Link (249, 246)	43.73545	43.66279	43.78894	43.77058	43.7937	43.82021	43.75995	43.71609	43.70208	43.68383	43.67389	43.6959	43.70323	43.70132
Link (262, 205)	50.8752	50.84055	50.78203	50.74072	50.70879	50.74508	50.69693	50.59798	50.49964	50.38741	50.46546	50.55626	50.64305	50.72554
Link (285, 7002)	48.41766	47.79563	47.67772	47.62746	47.62906	47.63395	47.62148	47.45815	47.28695	47.12502	47.18149	47.32631	47.46449	47.58636
Link (286, 26)	26.19687	25.61739	25.85407	25.6755	25.75986	25.77654	25.66282	25.49336	25.3203	25.11738	25.06697	25.24033	25.39377	25.5241
Link (315, 26)	25.91409	25.30809	25.05525	25.00908	24.98367	24.89784	24.90657	24.5986	24.28336	24.00713	24.28558	24.80321	25.25427	25.66302
Link (316, 315)	53.4048	53.23922	53.24548	53.22674	53.18204	53.18912	53.14416	53.12082	53.1212	53.14167	53.08527	53.10644	53.10622	53.09975
Link (336, 23)	52.51968	52.19976	52.1931	52.15707	52.16305	52.1618	52.13362	52.01366	51.89962	51.81021	51.84679	51.93968	52.02163	52.09873
Link (351, 7012)	53.97794	53.92328	53.86308	53.85818	53.84346	53.82162	53.80471	53.76646	53.73954	53.69104	53.70588	53.73736	53.7685	53.79743
Link (757, 31)	42.10513	41.71351	41.55891	41.62224	41.55669	41.50015	41.39811	41.21276	40.93333	40.61656	40.6979	40.79026	40.87982	40.96103
Link (7002, 336)	48.23096	47.13743	47.02394	46.94465	47.02689	46.98293	46.94788	46.60226	46.30054	45.88094	46.03157	46.28067	46.51455	46.73016
Link (7012, 27)	111.0097	110.8765	110.4181	110.4356	110.2507	110.1655	110.0047	109.7861	109.6368	109.3544	109.5064	109.7318	109.9267	110.13
Link (7014, 757)	42.89628	42.74965	42.68422	42.6363	42.60857	42.59798	42.55327	42.50855	42.39217	42.27701	42.32909	42.37758	42.42593	42.46655

Std. Dev. over 10 runs

Link/Aggregation	Interval 3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	0.857309	0.586453	0.412702	0.26758	0.214193	0.22585	0.167627	0.211103	0.174416	0.168427	0.159013	0.14605	0.140783	0.139536
Link (20, 17)	0.20749	0.170088	0.112561	0.097843	0.124782	0.12024	0.115003	0.110896	0.104239	0.100808	0.090526	0.090841	0.089096	0.088013
Link (23, 20)	0.188915	0.147088	0.079686	0.072023	0.072441	0.076365	0.083673	0.084077	0.066282	0.06417	0.060381	0.057822	0.052007	0.048304
Link (25, 285)	0.455826	0.527177	0.288724	0.305436	0.25102	0.273104	0.206188	0.107819	0.174737	0.170688	0.180325	0.178724	0.176798	0.16534
Link (26, 202)	0.390054	0.132129	0.248765	0.193224	0.22659	0.190802	0.171423	0.177141	0.129118	0.11405	0.119197	0.110085	0.120131	0.114799
Link (27, 286)	0.441752	0.333275	0.213579	0.15168	0.124807	0.127366	0.104423	0.107708	0.101422	0.109091	0.117729	0.108332	0.101902	0.097497
Link (29, 351)	0.230224	0.098738	0.06839	0.062369	0.07164	0.070151	0.05581	0.057081	0.062876	0.054112	0.058499	0.054057	0.052389	0.052129
Link (31, 29)	0.599813	0.210781	0.16195	0.166469	0.11616	0.164154	0.199767	0.191772	0.217315	0.241539	0.243245	0.235563	0.227228	0.220051
Link (34, 7014)	0.340432	0.264239	0.134305	0.1123	0.143873	0.149082	0.125551	0.10669	0.10967	0.112556	0.116635	0.111071	0.104186	0.099153
Link (35, 114)	0.198988	0.111843	0.15059	0.163903	0.118991	0.095292	0.083916	0.091062	0.07916	0.065731	0.063997	0.061022	0.056515	0.059345
Link (36, 35)	0.978947	0.575252	0.563154	0.511587	0.491971	0.397616	0.399948	0.388973	0.304414	0.348384	0.382318	0.374551	0.369915	0.364221
Link (38, 36)	0.288145	0.224737	0.154177	0.135157	0.082919	0.083478	0.086795	0.094564	0.073862	0.087666	0.087073	0.089521	0.090495	0.098627
Link (40, 225)	0.424573	0.203427	0.171111	0.135374	0.151411	0.135184	0.125287	0.103105	0.082895	0.091756	0.085462	0.079151	0.076213	0.07333
Link (42, 43)	1.445381	0.683582	0.549256	0.62513	0.617384	0.433254	0.415646	0.378177	0.326351	0.268537	0.262116	0.274041	0.264619	0.265927
Link (43, 40)	0.384393	0.254909	0.270711	0.28868	0.300037	0.261188	0.19779	0.186689	0.198062	0.197134	0.197882	0.201238	0.198502	0.203585
Link (72, 220)	0.816985	0.58694	0.383718	0.363494	0.243459	0.197474	0.170338	0.178368	0.202962	0.158324	0.160491	0.156893	0.160413	0.151979
Link (73, 316)	0.371982	0.306287	0.222792	0.197282	0.129856	0.128152	0.145209	0.134807	0.139831	0.112963	0.114346	0.109474	0.099084	0.103136
Link (84, 206)	0.539483	0.458978	0.294032	0.195619	0.200628	0.16629	0.143956	0.14652	0.118615	0.113831	0.108289	0.106458	0.104331	0.100558
Link (114, 84)	0.444199	0.315382	0.187782	0.14435	0.139949	0.112357	0.081415	0.084941	0.075209	0.069878	0.07043	0.06955	0.068795	0.069987
Link (117, 262)	0.328557	0.262953	0.178841	0.12171	0.167298	0.168797	0.15633	0.135601	0.129967	0.125231	0.126521	0.119893	0.116151	0.112282
Link (149, 223)	0.436084	0.28224	0.242151	0.17027	0.197293	0.201689	0.209307	0.161537	0.146017	0.142337	0.13533	0.125493	0.11944	0.11305
Link (202, 25)	1.027206	0.758707	0.350219	0.403092	0.31399	0.336765	0.243813	0.159951	0.288936	0.298208	0.292025	0.276084	0.266236	0.252287
Link (204, 73)	0.855662	0.782898	0.851298	0.653183	0.599703	0.510831	0.473541	0.31011	0.310302	0.318151	0.309312	0.289037	0.282618	0.270209
Link (205, 226)	0.296772	0.222359	0.19221	0.118969	0.163489	0.14728	0.14494	0.161834	0.105298	0.085671	0.091856	0.081278	0.078936	0.076912
Link (206, 219)	0.451215	0.328637	0.21112	0.143283	0.139836	0.134909	0.119975	0.116203	0.115255	0.120582	0.119526	0.11606	0.115322	0.108612
Link (209, 204)	0.712243	0.563625	0.328965	0.337831	0.352029	0.312205	0.26392	0.283873	0.293642	0.267736	0.267699	0.246584	0.179145	0.182303
Link (219, 34)	0.413483	0.351773	0.201984	0.147477	0.162688	0.147609	0.130866	0.10611	0.111239	0.121967	0.12434	0.121008	0.118532	0.112391
Link (220, 26)	1.027895	1.111351	0.747837	0.731629	0.544397	0.562188	0.430689	0.480614	0.425452	0.337791	0.286557	0.298271	0.276078	0.289615
Link (221, 38)	0.650721	0.618117	0.447046	0.342305	0.317933	0.24816	0.276542	0.296595	0.233876	0.190975	0.169428	0.157609	0.16374	0.169287
Link (222, 221)	0.513827	0.405474	0.28644	0.199505	0.229201	0.255809	0.285238	0.205759	0.166151	0.156968	0.15458	0.144086	0.137244	0.131973
Link (223, 222)	0.417574	0.325228	0.316263	0.218817	0.225183	0.249743	0.271244	0.201362	0.174881	0.171827	0.164023	0.15422	0.147893	0.142428
Link (224, 149)	0.463103	0.258237	0.150326	0.115926	0.15089	0.159079	0.171408	0.145238	0.101048	0.113568	0.108468	0.098055	0.092769	0.088386
Link (225, 224)	0.398892	0.240449	0.176425	0.141952	0.133591	0.17092	0.18125	0.154227	0.098914	0.091099	0.080322	0.071214	0.068089	0.065926
Link (226, 42)	0.327662	0.22485	0.192391	0.136066	0.176386	0.162425	0.161597	0.174956	0.098376	0.088373	0.098395	0.087762	0.082115	0.083658
Link (246, 73)	0.687845	0.39489	0.232097	0.293168	0.272316	0.209266	0.123385	0.119115	0.111171	0.14178	0.123174	0.118897	0.121274	0.124926
Link (249, 246)	0.348989	0.172186	0.176142	0.209951	0.200509	0.156076	0.144022	0.133785	0.117116	0.12924	0.115541	0.124737	0.136728	0.139769
Link (262, 205)	0.347779	0.292261	0.194623	0.1201	0.180549	0.177232	0.161172	0.132319	0.122979	0.116757	0.116391	0.110516	0.106641	0.10255
Link (285, 7002)	0.339083	0.349914	0.19499	0.20402	0.179733	0.163651	0.157565	0.152507	0.15913	0.173608	0.16498	0.159299	0.149865	0.141119
Link (286, 26)	1.260217	0.939915	0.780105	0.413708	0.3743	0.294988	0.302033	0.170048	0.230373	0.31621	0.304775	0.313573	0.295365	0.294673
Link (315, 26)	1.161086	0.821651	0.889447	0.720196	0.548796	0.505744	0.477243	0.498891	0.449488	0.482885	0.436806	0.428198	0.404114	0.375205
Link (316, 315)	0.528088	0.364658	0.294569	0.253875	0.239955	0.222222	0.176596	0.12449	0.153475	0.110441	0.109151	0.107455	0.1337	0.130721
Link (336, 23)	0.33526	0.257808	0.198415	0.087203	0.096198	0.087672	0.125552	0.149423	0.130739	0.143898	0.135243	0.124037	0.115184	0.110695
Link (351, 7012)	0.226825	0.139625	0.140702	0.077782	0.062213	0.113925	0.118691	0.111705	0.111704	0.117738	0.120581	0.113222	0.10833	0.104742
Link (757, 31)	0.912841	0.810745	0.454181	0.438216	0.444449	0.4928	0.479943	0.521125	0.455274	0.528071	0.537235	0.522916	0.507319	0.494358
Link (7002, 336)	0.778993	1.163138	0.775372	0.68308	0.638431	0.812718	0.68787	0.680977	0.487533	0.513496	0.476186	0.463435	0.443116	0.426499
Link (7012, 27)	1.813117	1.273063	0.845234	0.648875	0.500037	0.672183	0.606355	0.540023	0.639957	0.611548	0.64076	0.612379	0.594769	0.610885
Link (7014, 757)	0.462683	0.313653	0.141845	0.251893	0.234656	0.242186	0.184866	0.118901	0.144196	0.162027	0.15953	0.154494	0.146991	0.141506

CORSIM Average Speeds – With Contraflow, Minimal Event Case

AverageSpeed (mph)
Mean over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	69.60303	69.53285	69.48619	69.44016	69.42339	69.3956	69.35657	69.29939	69.2355	69.2195	69.20895	69.23806	69.26297	69.29642
Link (20, 17)	66.75566	66.68625	66.63123	66.6074	66.59277	66.54524	66.52256	66.5054	66.4793	66.45464	66.43282	66.42432	66.4236	66.4325
Link (23, 20)	55.20333	55.21454	55.19669	55.1419	55.09946	55.07179	55.06421	55.04013	55.01581	54.9996	54.97191	54.95567	54.95284	54.95515
Link (25, 285)	50.29849	50.42812	50.43459	50.45124	50.39227	50.35573	50.43239	50.56107	50.67737	50.81718	50.88741	50.89713	50.94739	50.98085
Link (26, 202)	36.58182	36.36916	36.27493	36.27507	36.30431	36.27633	36.27365	36.26545	36.26059	36.23597	36.24387	36.28407	36.2981	36.31453
Link (27, 286)	51.64575	51.44188	51.32784	51.27296	51.25487	51.24245	51.18037	51.12128	51.06981	51.03712	51.06429	51.13626	51.20049	51.25888
Link (29, 351)	51.43131	51.33534	51.26572	51.22515	51.22493	51.20461	51.17006	51.11368	51.07304	51.03071	51.0149	51.0344	51.05178	51.06496
Link (31, 29)	42.72329	42.5103	42.44241	42.38678	42.37947	42.36108	42.2975	42.15659	42.06671	41.92481	41.9402	42.01353	42.08168	42.14266
Link (34, 7014)	42.21789	42.14712	41.99825	41.95444	41.96651	41.95042	41.92134	41.88226	41.83781	41.81377	41.84135	41.88436	41.92321	41.95696
Link (35, 114)	33.32441	33.27058	33.2894	33.26104	33.24977	33.23159	33.21669	33.21141	33.21604	33.21907	33.24329	33.28412	33.31857	33.34971
Link (36, 35)	28.96855	28.5196	28.3783	28.17284	28.23611	28.1848	28.14527	28.05271	27.96135	27.85732	27.98836	28.17948	28.3527	28.52493
Link (38, 36)	32.30949	32.24215	32.23608	32.29475	32.28064	32.29122	32.31305	32.33043	32.33548	32.33549	32.31308	32.29142	32.26931	32.24159
Link (40, 225)	47.52223	47.49858	47.38295	47.35387	47.35434	47.35844	47.31926	47.27553	47.22702	47.15821	47.23433	47.32233	47.40239	47.48644
Link (42, 43)	28.74474	28.30451	28.10022	27.92565	27.83887	27.63605	27.45395	27.31971	27.09413	26.92508	26.91884	27.01294	27.10329	27.17468
Link (43, 40)	33.46253	33.28535	33.33469	33.34664	33.29271	33.24826	33.21589	33.21096	33.19136	33.19647	33.19429	33.20267	33.21365	33.22933
Link (72, 220)	46.32322	46.32692	46.40818	46.34161	46.28405	46.26773	46.22691	46.28643	46.25546	46.23386	46.255	46.26215	46.26823	46.29325
Link (73, 316)	41.83503	41.74197	41.67415	41.64842	41.67861	41.63424	41.62642	41.62753	41.62502	41.61855	41.612	41.64046	41.64598	41.6592
Link (84, 206)	39.49573	39.24064	39.12251	39.01804	39.00671	39.00188	38.97305	38.89895	38.83733	38.78547	38.87637	38.98836	39.09464	39.19283
Link (114, 84)	39.85366	39.68097	39.63731	39.52584	39.49382	39.49215	39.4552	39.41212	39.37984	39.3359	39.40867	39.49672	39.57959	39.65473
Link (117, 262)	50.68754	50.69291	50.55273	50.46643	50.51815	50.4889	50.43685	50.37085	50.29207	50.17716	50.26384	50.36045	50.4429	50.53323
Link (149, 223)	40.34936	40.26944	40.13049	40.08313	40.0825	40.09972	40.0555	39.99948	39.94767	39.86411	39.92768	40.01234	40.089	40.16886
Link (202, 25)	53.32364	53.11704	53.08986	53.06141	53.03476	52.99096	52.97593	52.95481	52.9458	52.94348	52.88114	52.86673	52.87786	52.88244
Link (204, 73)	20.83055	20.71798	20.65031	20.68427	20.71917	20.62161	20.70835	20.8549	20.87929	20.90903	21.04991	21.15565	21.17448	21.2239
Link (205, 226)	50.49249	50.57148	50.43531	50.37999	50.43235	50.40592	50.36162	50.31144	50.22771	50.09648	50.17711	50.27328	50.35767	50.44999
Link (206, 219)	41.54771	41.42075	41.29299	41.2245	41.2204	41.20162	41.19156	41.14928	41.10971	41.07635	41.12204	41.1877	41.24896	41.30353
Link (209, 204)	55.24731	55.05603	55.00471	54.88124	54.87806	54.83127	54.88319	54.85358	54.85105	54.80949	54.75705	54.74298	54.73226	54.72004
Link (219, 34)	42.07367	41.96704	41.8442	41.77916	41.77914	41.75606	41.73412	41.68495	41.64064	41.60758	41.63874	41.69201	41.74094	41.7833
Link (220, 26)	22.64634	22.79867	23.1407	22.97354	22.92934	22.97418	23.09661	23.20323	23.29614	23.37934	23.23097	23.26174	23.29862	23.30453
Link (221, 38)	33.53568	33.36061	33.11383	33.09779	33.00939	33.03711	33.01932	32.95819	32.85681	32.7291	32.77137	32.86819	32.95126	33.03476
Link (222, 221)	40.13901	40.04625	39.91982	39.87361	39.82788	39.86961	39.84536	39.77496	39.70632	39.61363	39.66561	39.75225	39.83022	39.911
Link (223, 222)	40.19398	40.15805	40.03908	39.98068	39.9576	39.9879	39.95527	39.90519	39.84041	39.7545	39.81812	39.90396	39.98178	40.06255
Link (224, 149)	40.48731	40.45306	40.2819	40.22836	40.21792	40.23433	40.17842	40.13828	40.09013	40.0114	40.07795	40.16432	40.24041	40.31908
Link (225, 224)	40.3839	40.38704	40.21638	40.16896	40.17372	40.17775	40.12989	40.08389	40.02412	39.94803	40.02374	40.11839	40.20377	40.29088
Link (226, 42)	50.63799	50.7432	50.5645	50.51345	50.55812	50.52245	50.46723	50.39552	50.3051	50.16914	50.24686	50.3419	50.42244	50.51217
Link (246, 73)	38.92446	38.77341	38.78736	38.76468	38.75055	38.75234	38.72266	38.62682	38.54582	38.42948	38.39074	38.40005	38.41705	38.43166
Link (249, 246)	43.83833	43.7823	43.79303	43.74231	43.72044	43.71505	43.71321	43.6597	43.61605	43.55683	43.5522	43.56966	43.58779	43.6135
Link (262, 205)	50.74595	50.76919	50.62661	50.54173	50.59559	50.57214	50.51256	50.44867	50.36913	50.2498	50.33276	50.43101	50.51492	50.60603
Link (285, 7002)	53.57006	53.67009	53.62835	53.54638	53.41553	53.36733	53.31737	53.27266	53.2053	53.17276	53.11373	53.08123	53.09469	53.10286
Link (286, 26)	42.22816	42.31822	41.89095	41.92878	41.96994	42.0783	41.99837	41.86018	41.82024	41.59405	41.61787	41.76253	41.89772	42.01904
Link (315, 26)	14.00729	13.5974	13.6703	13.58092	13.54392	13.57485	13.79518	14.12908	14.45074	14.68406	15.05828	15.31232	15.56975	15.78786
Link (316, 315)	53.2911	53.27475	53.31125	53.23557	53.22166	53.19053	53.18784	53.153	53.09719	53.08519	53.03683	53.04094	53.05866	53.076
Link (336, 23)	55.14064	55.18758	55.1679	55.12447	55.08281	55.05667	55.05194	55.02615	54.99352	54.98173	54.94894	54.93201	54.93279	54.9341
Link (351, 7012)	53.95536	53.85883	53.83029	53.80071	53.79525	53.79414	53.75562	53.72948	53.7043	53.6936	53.70426	53.73833	53.77005	53.79667
Link (757, 31)	41.96659	41.90672	41.83128	41.79303	41.81037	41.762	41.60435	41.38824	41.22879	41.12336	41.17435	41.25753	41.33567	41.40723
Link (7002, 336)	54.8433	54.89864	54.89754	54.85359	54.79401	54.7598	54.7405	54.71207	54.67331	54.64918	54.61302	54.5953	54.60307	54.60732
Link (7012, 27)	110.9393	110.4923	110.2981	110.0972	110.0119	109.9874	109.777	109.609	109.4485	109.4383	109.5406	109.7537	109.9773	110.1431
Link (7014, 757)	42.80692	42.75735	42.62632	42.60942	42.63945	42.62679	42.58492	42.52403	42.44859	42.41011	42.45142	42.49971	42.54231	42.5821

Std. Dev. over 10 runs

Link/Aggregation	Interval													
	3600	7200	10800	14400	18000	21600	25200	28800	32400	36000	39600	43200	46800	50400
Link (14, 12)	0.271708	0.1598	0.145793	0.190344	0.17359	0.152542	0.146616	0.110511	0.101455	0.097057	0.098843	0.085232	0.07927	0.075916
Link (20, 17)	0.303525	0.187295	0.167458	0.165256	0.160847	0.145597	0.133253	0.118851	0.127886	0.125846	0.123931	0.111152	0.093745	0.089929
Link (23, 20)	0.253807	0.198449	0.132386	0.15758	0.163455	0.16234	0.122356	0.117629	0.124969	0.114066	0.112814	0.097788	0.087556	0.091603
Link (25, 285)	0.753219	0.33355	0.236721	0.277063	0.273576	0.308136	0.257245	0.221277	0.199602	0.171347	0.174389	0.174542	0.176669	0.182305
Link (26, 202)	0.48015	0.2468	0.260092	0.157548	0.187476	0.171699	0.174894	0.138758	0.113297	0.108757	0.111231	0.095766	0.092355	0.084028
Link (27, 286)	0.398084	0.16519	0.141891	0.122736	0.152039	0.13676	0.126924	0.155489	0.162821	0.162585	0.168943	0.157627	0.153452	0.14834
Link (29, 351)	0.229176	0.096375	0.095206	0.090682	0.100622	0.079934	0.046753	0.039484	0.061308	0.065162	0.068336	0.064224	0.06109	0.059561
Link (31, 29)	0.53224	0.374869	0.262573	0.222031	0.272147	0.202843	0.173449	0.133555	0.196302	0.18729	0.163135	0.157968	0.151307	0.147365
Link (34, 7014)	0.276274	0.142497	0.151383	0.12467	0.140383	0.091658	0.101734	0.111638	0.129267	0.135147	0.125407	0.118199	0.115742	0.117647
Link (35, 114)	0.378265	0.172994	0.130568	0.138548	0.124766	0.117315	0.11575	0.111552	0.104218	0.084839	0.085108	0.083748	0.080256	0.086955
Link (36, 35)	0.577761	0.481247	0.443105	0.316245	0.207547	0.163298	0.211802	0.142793	0.181706	0.171377	0.203644	0.203596	0.210129	0.204816
Link (38, 36)	0.323996	0.272239	0.236365	0.223827	0.181514	0.159441	0.167941	0.19061	0.166819	0.13845	0.132848	0.132058	0.130199	0.12935
Link (40, 225)	0.423362	0.120972	0.191494	0.177877	0.197647	0.167596	0.183312	0.186473	0.180234	0.177539	0.178593	0.16944	0.166205	0.160932
Link (42, 43)	0.824439	0.406196	0.435103	0.500483	0.511493	0.399887	0.34632	0.370175	0.273193	0.318114	0.309084	0.291634	0.291959	0.277672
Link (43, 40)	0.341339	0.226841	0.24074	0.288264	0.241265	0.230435	0.173214	0.189203	0.150761	0.129561	0.133277	0.119744	0.122328	0.123373
Link (72, 220)	0.806261	0.470007	0.367559	0.293576	0.17066	0.169103	0.199233	0.199917	0.180504	0.18287	0.189172	0.204079	0.171195	0.175035
Link (73, 316)	0.432793	0.247541	0.238871	0.186207	0.14034	0.149903	0.149291	0.131499	0.144059	0.144073	0.136894	0.115158	0.114452	0.111655
Link (84, 206)	0.310362	0.287408	0.239337	0.214781	0.212968	0.163916	0.157254	0.172359	0.175834	0.172832	0.166216	0.156873	0.154832	0.155267
Link (114, 84)	0.210663	0.218939	0.201728	0.183749	0.181387	0.148565	0.154358	0.164086	0.161463	0.148813	0.143942	0.139329	0.137525	0.140251
Link (117, 262)	0.295753	0.216921	0.194884	0.166444	0.208742	0.170267	0.190668	0.193376	0.188294	0.195239	0.186328	0.179414	0.179262	0.175297
Link (149, 223)	0.365538	0.251194	0.223947	0.200383	0.21789	0.229037	0.248881	0.243004	0.259323	0.274664	0.27397	0.261369	0.25521	0.248765
Link (202, 25)	0.710688	0.379804	0.346215	0.320494	0.299869	0.239901	0.225752	0.210682	0.20729	0.183087	0.189925	0.159265	0.137521	0.151838
Link (204, 73)	1.20858	0.807041	0.529951	0.413377	0.450263	0.416831	0.385113	0.40149	0.368705	0.378733	0.349024	0.279089	0.224646	0.222781
Link (205, 226)	0.326971	0.240992	0.236125	0.178626	0.26127	0.241886	0.232997	0.228057	0.217028	0.217711	0.211581	0.201328	0.202266	0.196074
Link (206, 219)	0.209291	0.21015	0.172449	0.163934	0.167644	0.1232	0.108226	0.12828	0.125442	0.129061	0.122799	0.113705	0.112441	0.113537
Link (209, 204)	0.869346	0.346054	0.227996	0.248249	0.28373	0.30479	0.315513	0.259737	0.272648	0.270193	0.300797	0.318699	0.285246	0.286461
Link (219, 34)	0.280283	0.142438	0.156477	0.148975	0.154606	0.100981	0.096283	0.113545	0.131108	0.139909	0.131351	0.123719	0.121875	0.122242
Link (220, 26)	2.080581	1.389831	1.423655	0.898645	0.995332	0.962914	0.824056	0.94953	0.890614	0.91502	0.787941	0.755901	0.744249	0.782481
Link (221, 38)	0.724288	0.472899	0.229373	0.219724	0.282502	0.334153	0.277535	0.281181	0.309057	0.34085	0.328513	0.322459	0.31074	0.306072
Link (222, 221)	0.436513	0.299362	0.201325	0.19441	0.21903	0.239243	0.240561	0.21656	0.247429	0.281242	0.275875	0.26607	0.259669	0.254098
Link (223, 222)	0.486236	0.315075	0.266937	0.2586	0.246801	0.24138	0.239286	0.237378	0.268211	0.295924	0.293102	0.282161	0.274154	0.266353
Link (224, 149)	0.302847	0.185176	0.164227	0.164183	0.216928	0.198471	0.216755	0.223146	0.23501	0.240137	0.243008	0.230475	0.226231	0.219847
Link (225, 224)	0.389869	0.194827	0.186745	0.145798	0.203355	0.183005	0.199407	0.197312	0.198275	0.200018	0.199525	0.189274	0.186793	0.181977
Link (226, 42)	0.398932	0.324966	0.299121	0.190959	0.276131	0.25247	0.242448	0.228166	0.209593	0.226855	0.220818	0.211891	0.212035	0.20628
Link (246, 73)	0.47343	0.328913	0.22227	0.258244	0.271698	0.243436	0.253785	0.242296	0.230796	0.211961	0.194442	0.176624	0.170829	0.166975
Link (249, 246)	0.35465	0.220731	0.131177	0.128937	0.160309	0.172118	0.176845	0.159008	0.169443	0.125121	0.129643	0.12025	0.108048	0.107915
Link (262, 205)	0.305996	0.200426	0.19309	0.152304	0.243605	0.216483	0.226436	0.222416	0.222111	0.212116	0.206175	0.197706	0.197078	0.191264
Link (285, 7002)	0.439339	0.35148	0.234328	0.282939	0.193747	0.279436	0.219026	0.208097	0.20688	0.167156	0.166735	0.149034	0.163078	0.16475
Link (286, 26)	1.804765	1.079776	0.935738	0.60866	0.696387	0.65287	0.587906	0.526095	0.501649	0.439021	0.379439	0.384893	0.389628	0.377003
Link (315, 26)	1.276741	0.768551	0.695746	0.578025	0.462153	0.588625	0.482588	0.466655	0.323647	0.335451	0.32915	0.321249	0.368394	0.331122
Link (316, 315)	0.539346	0.228218	0.184658	0.20838	0.18403	0.193136	0.195346	0.18266	0.204567	0.160839	0.169587	0.141464	0.121439	0.138912
Link (336, 23)	0.233154	0.156469	0.090163	0.12294	0.111346	0.113458	0.093704	0.091837	0.106428	0.090867	0.095136	0.08213	0.076581	0.083171
Link (351, 7012)	0.182023	0.095749	0.082533	0.062541	0.06776	0.082464	0.095804	0.106842	0.113439	0.118326	0.117076	0.108752	0.104605	0.099726
Link (757, 31)	1.012867	0.566826	0.35543	0.370973	0.322351	0.336977	0.321046	0.286205	0.413046	0.423169	0.401299	0.388786	0.377445	0.370174
Link (7002, 336)	0.261004	0.169344	0.135109	0.15956	0.143401	0.161271	0.118688	0.111833	0.124089	0.101387	0.112628	0.100996	0.095834	0.097002
Link (7012, 27)	1.621139	0.519811	0.450575	0.628901	0.436502	0.470013	0.532598	0.618084	0.679707	0.73671	0.754731	0.685776	0.638688	0.621279
Link (7014, 757)	0.493579	0.327213	0.248363	0.224099	0.219118	0.179157	0.174113	0.137838	0.156072	0.178494	0.167136	0.161604	0.156877	0.155451