

Analysis Procedure Manual – April 2006

Change Sheet - September 2006

TABLE OF CONTENTS

As reads:

8 Network or Corridor Simulation Models

8.1 Purpose	8-1
8.2 Traffic Simulation Modeling	8-2
8.3 SimTraffic	8-4
8.4 VISSIM	8-8
8.5 CORSIM	8-9

Changed to:

8 Network or Corridor Simulation Models

8.1 Purpose	8-1
8.2 Traffic Simulation Modeling	8-2
8.3 SimTraffic	8-4
8.4 VISSIM	8-8
8.5 CORSIM	8-10

Acknowledgements

As Reads:

DKS Associates, Inc.

John Bosket, P.E.

Carl Springer, P.E.

Changed To:

DKS Associates, Inc.

John Bosket, P.E.

Carl Springer, P.E.

Bob Schulte

Analysis Procedure Manual – April 2006

Change Sheet - September 2006

Page 4-24, Table 4-11 Example External Trip Attractions and Productions Probabilities

As Reads:

Total New Trips (From Table 4-8)
Trip Attractions (From Table 4-8)
Attraction Probability
Trip Productions (From Table 4-8)

Changed To:

Total New Trips (From Table 4-9)
Trip Attractions (From Table 4-9)
Attraction Probability
Trip Productions (From Table 4-9)

Page 7-29, Sheet 8 – Table 5 Time Clock Control

As Reads:

Table 5 shows the times that various timing plans and max greens are in effect for a particular intersection. In the absence of timing sheets from an on-street master controller, the analyst will have to contact Region Traffic to verify which timing plan on Sheet 7 is in effect during the desired analysis period.

Changed To:

Table 5 shows the times that various timing plans and max greens are in effect for a particular intersection. In the absence of timing sheets from an on-street master controller (noted as “OSM” on the front of the timing sheet), the analyst will have to contact Region Traffic to verify which timing plan on Sheet 7 is in effect during the desired analysis period. Generally, during the PM peak plan #2 is in effect.

Page 8-8, Section 8.4 VISSIM

As Reads:

VISSIM is a simulation program that can model multi-modal traffic flows including cars, trucks, buses, heavy rail and light rail transit (LRT) as well as model traffic management systems (ramp meters, toll roads and special lanes) and transit priority systems. VISSIM can also model trip assignment, over fixed routes or

Analysis Procedure Manual – April 2006

Change Sheet - September 2006

dynamically, where vehicles change routes in response to specified events, and can animate traffic movements in 3-D.

Other advantages of VISSIM include the rail-roadway interface, which requires the rail element of VISSIM to be purchased in order to model the effect of rail crossing blockages on queues and roadway operations. Another advantage is that VISSIM has the capability of “dynamic traffic assignment” (DTA), which will reroute a vehicle on the network in case of a crossing blockage or an overcapacity situation. Study areas need to be large enough to ensure any rerouting doesn't cause a problem elsewhere.

VISSIM has disadvantages as well. It does not produce signal coordination timing, and is very data intensive and time consuming to construct and calibrate. Some issues to consider when using VISSIM version 4.1 for analysis are:

1. Turn bays cannot extend greater than halfway between intersections, which means that the turn bays are likely cut short.
2. The flexibility of the program means the analyst is required to write their own reports. This would require exporting the queuing data to Excel; using Excel to calculate the maximum queues for each time period, calculating averages and standard deviations and then calculating the 95th percentile queue on each approach for each run.
3. When creating an intersection VISSIM does not assume the legs are connected together, and will assume no turning movements or traffic control until the analyst draws in: all the turn movements, where vehicle slow down when turning the corners, when they need to yield to peds, where the signal heads are, where the detectors are, relate the signal heads to the detectors, design the ring/barrier signal controller, tell where you want queues, speeds or other data measured, etc.

In addition, VISSIM requires the use and knowledge of VISUM, the travel demand modeling software from PTV, and, therefore, is effectively out of the capable review range of most Region analysts.

Changed To:

VISSIM is a simulation program that can model multi-modal traffic flows including cars, trucks, buses, heavy rail and light rail transit (LRT) as well as model traffic management systems (ramp meters, toll roads and special lanes) and transit priority systems. VISSIM can also model trip assignment, over fixed routes or dynamically, where vehicles change routes in response to specified events, and can animate traffic movements in 3-D. VISSIM is a program that can stand alone, but is data intensive to create files for use on its own. Alternatively, the files can be created in VISUM (a travel demand program) that can then import the files

Analysis Procedure Manual – April 2006

Change Sheet - September 2006

into VISSIM for analysis. Because most regions do not perform travel demand modeling, it is important to note issues both with and without VISUM.

Other advantages of VISSIM include the rail-railway interface, which requires VISSIM Level 3 or 4 in order to model the effect of rail crossing blockages on queues and roadway operations. Another advantage is that VISSIM has the capability of “dynamic traffic assignment” (DTA), which will reroute a vehicle on the network in case of a crossing blockage or an overcapacity situation. Study areas need to be large enough to ensure any rerouting doesn't cause a problem elsewhere.

VISSIM has disadvantages as well. It does not produce signal coordination timing, and can be very data intensive and time consuming to construct and calibrate a scenario, especially from scratch.

When importing a Synchro network to VISSIM through the Pre-Synchro converter or a network from VISUM to VISSIM, note that turn bay lengths cannot extend greater than halfway between adjacent intersections in VISUM. The analyst will need to shorten the turn bays before importing into VISUM, and later extend them to the proper length in VISSIM. Impacts (in the travel demand model) from long queues that would be outside a turn lane are not easily discernible, since the turn lanes are modified outside of the demand model program. Some issues to consider when using VISSIM version 4.1 for analysis are:

1. The flexibility of the program means the analyst is required to write their own reports. This would require exporting the queuing data to Excel; using Excel to calculate the maximum queues for each time period, calculating averages and standard deviations and then calculating the 95th percentile queue on each approach for each run.
2. When creating an intersection, VISSIM does not assume the legs are connected together, and will assume no turning movements or traffic control until the analyst draws in: all the turn movements, where vehicles slow down when turning the corners, when they need to yield to pedestrians, where the signal heads and detectors are, the relationships between the signal heads and the detectors, design the ring/barrier signal controller, tell where queues, speeds or other data is to be measured, etc.
3. VISSIM does not do signal coordination/progression, so the network must be exported to Synchro to develop the timing and progression and then imported back into VISSIM. Turn bay limitations with the import process as mentioned above will still apply.
4. VISSIM should not be used in a TIS process as there are too many parameters to change and is likely out of the capable review range of most Region analysts.
5. VISSIM has the capability of performing analysis directly on VISUM traffic volume assignments, and includes a post-processing function. The

Analysis Procedure Manual – April 2006

Change Sheet - September 2006

results of this type of analysis may be acceptable for certain applications, such as sketch planning and alternative screening. However, for most types of analysis, DHVs are required. The function in VISSIM does not create DHVs, therefore the post-processing procedures outlined in Chapter 4 are still necessary.

6. Most ODOT offices do not own the VISSIM software. VISSIM submittals by consultants should include the VISSIM model translated into Synchro files to enable effective ODOT review. The ODOT Synchro defaults should be implemented in the VISSIM model to the extent possible.
7. Most region offices are unlikely to have the knowledge base to use VISUM.

Currently, VISSIM is not practical enough for most ODOT applications. Model development is data intensive, requires detailed knowledge on many input parameters, and has limited standardized output reports. Use of Synchro or VISUM can speed up some of the work but requires an import/export process which can be very time consuming.