Roundabout Software Evaluation

Software Types:
HCM2010, Chapter 21 Roundabouts
RODEL, V1 for Windows – 1.36
ARCADY Version 7
Synchro/SimTraffic 8
VISSIM Version 5.40.04

Generic Inputs:
Lanes –
      Two approach lanes each, one left/through lane and one through/right turn lane

Volumes –
      Actual vehicle counts from the site, no rounding
      Negligible pedestrian activity
      Volumes entered for one hour, no 15 minute breakdown
      25 feet length for one vehicle

Volume Characteristics, from Highway Capacity Manual –
      0.92 peak hour factor
      3 percent Heavy Trucks

Roundabout Characteristics, from MnDOT Road Design Manual –
      160-foot diameter
      Phi/Entry Angle – 30 degrees
      Circulatory Roadway Width – 30 feet (14-foot inside lane, 16-foot outside lane)
      Entry Radius – 80 feet
      Half Width (travel lane) – 12-foot each for two lanes
      Entry Width (approach lane) – 14-foot each for two lanes
      Flare Length (transition from half width to entry) – 75 feet
      Negligible elevation

Specific Inputs:
HCM –
      Percentage of flow in left lane – 47%
      Percentage of flow in right lane – 53%

RODEL –
      Confidence level 50
      Exit Geometry – 14-foot each for two lanes on exit, 12-foot each for two lanes beyond
      Peak hour factor mode
      7.5 time slice

Synchro/SimTraffic –
      Link Length – 500 feet beyond intersection for each leg
      Speeds – 55 mph on Bailey Road & to south on Radio Drive, 50 mph to north on Radio Drive
      Circulatory Speed – 18 mph (default)

Turning Speed – 15 mph (default-left), 9 mph (default-right)
15 min seeding, 1 hour recording – no PHF adjust
Average of 5 runs, starting seed number 1

VISSIM –
North American default traffic composition and desired speed
Link Length – 500 feet beyond intersection for each leg
Speeds – 55 mph on Bailey Road & to south on Radio Drive, 50 mph to north on Radio Drive
– 50 mph corresponds to 80 km/h speed distribution (range 46.6-68.4)
– 55 mph corresponds to 90 km/h speed distribution (range 52.8-74.6)
Approach & Exit Speeds – corresponds to 50 km/h speed distribution (range 29.8-36.0)
Entry Speed – corresponds to 25 km/h speed distribution (range 15.5-18.6) for cars
corresponds to 20 km/h speed distribution (range 12.4-15.5) for trucks
Circulatory Speed – corresponds to 30 km/h speed distribution (range 18.6-21.7) for cars
corresponds to 25 km/h speed distribution (range 15.5-18.6) for trucks
Priority rules (not conflict rules) – 3.0 second gap time, 65-foot headway for cars
5.0 seconds gap time, 100-foot headway for trucks
15 min seeding, 1 hour recording – no PHF adjust
Average of 5 runs, starting seed number 1