

## Activity C04 - Evaluation of Base Network

### Purpose

The purpose of this activity is to generate a base simulation network for your system of four signalized intersections and to produce volume and baseline evaluation data that you will use in your signal timing design.

### Task List

1. Document detector numbers and create ring barrier diagram for each intersection.
2. Add signal timing data for each controller.
3. Check that coordination is running correctly.
4. Set simulation parameters.
5. Set evaluation parameters.
6. Collect data and prepare summaries.
7. Prepare report.

### Tasks

Task 1. Document detector numbers and create ring barrier diagram for each intersection.

- Prepare a sketch of each intersection showing the detector numbers for each approach and a ring barrier diagram that corresponds to these numbers.

Task 2. Add signal timing data for each controller.

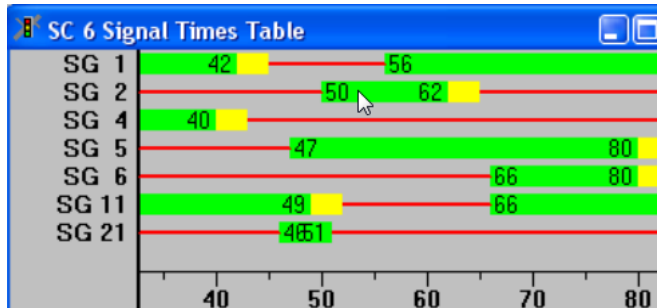
- Select “Signal Control”, then “Signal Controllers”. Select “Edit Signal Groups”.
- Add the parameters and values shown in the table below.
- Save the RBC file settings when done with the first intersection: in the RBC controller screen, select “View”, then “Save Settings”.

Basic timing	Timing by SG	Basic	SG number	Phase numbers from ring barrier diagram
			Minimum green	5 sec
			Vehicle extension	2 sec
			Max 1	10 sec for LT phases; 30 sec for TH phases
			Yellow	3 sec
			Red clearance	2 sec
			Max recall	Check box for all phases
			Dual entry	Check box for TH phases on major street
	Patterns/ Coordination	Pattern 1	Splits	Sum of Max 1, Yellow, Red clearance
			Coordination	Check box for TH coordinated phases on major street
			Max recall	Check box for all phases
	Pattern Schedule			Set pattern to 1
Sequence			Set phases numbers in ring barrier diagram	
Detectors	Vehicle		Detector number	Add number for each detector
			Call	Add phase number corresponding to each detector
			Extend SG	Add phase number corresponding to each detector

- On the left side of the screen: check that cycle length is 100 sec and the offset is zero.
- Check that the frequency is set to 10.
- Verify that the graphical ring barrier diagram correctly represents the timing and phasing settings.
- For a T-intersection, you will need to recalculate the Max1 and Split times so that the cycle length is 100 sec.

Task 3. Check that coordination has been correctly set.

- Start the simulation
- Verify that the offset is zero at all intersections by observing the animation.
- Use the Signal Times Table evaluation window to make sure that coordination has been set for all intersections in your system. If the coordinator is active, you will see “cycle seconds” on the x axis of this graph as shown in the figure below.



Task 4. Set simulation parameters.

- Period = 3600 sec
- Simulation resolution = 10
- Speed = maximum

Task 5. Set evaluation parameters.

- Select “Evaluation”, then “Configuration”. Select the “Result Attributes” tab.
- Check “Nodes” and “Vehicle Travel times”.
- Set for both:
  - From Time = 300
  - To Time = 3600
  - Interval = 3300
- Select “Evaluation”, then “Results List”. Select “Nodes” and “Vehicle Travel Times”.
- In the “Nodes List”, make sure that the following data columns (attributes) are visible:
  - Time Interval
  - Movement
  - Vehs (all)
  - VehDelay (all)
  - Stop Delay (all)
  - Stops(all)
- In the “Vehicle Travel Time List”, make sure that the following data columns (attributes) are visible:
  - Time Interval
  - Vehicle Travel Time Evaluation
  - Vehs (all)
  - Travel Time (all)

Task 6. Collect data and prepare summaries.

- Run the simulation.
- Export Node data and Travel Time data by selecting “Save to File” in both list windows. Each is stored in a file with a .att extension.
- Prepare summary tables for the delay data, the stop data, and the travel time data for each movement at each intersection and for each intersection as a whole.
- Prepare a summary table for the volume data for each movement at each intersection. Convert the number of vehicles to an hourly flow rate noting that your data are for 3300 seconds and not a complete hour.

Task 7. Complete evaluation and prepare report.

- Prepare answers to the following questions:
  - Describe the traffic operational problems based on your observation of the VISSIM animation.
  - Describe the traffic operational problems based on the delay and stops data.
- Prepare an Excel spreadsheet with the following information:
  - Tables prepared in Task 6.
  - Answers to the questions listed above.