

CE 474 – Class 12

September 21, 2015

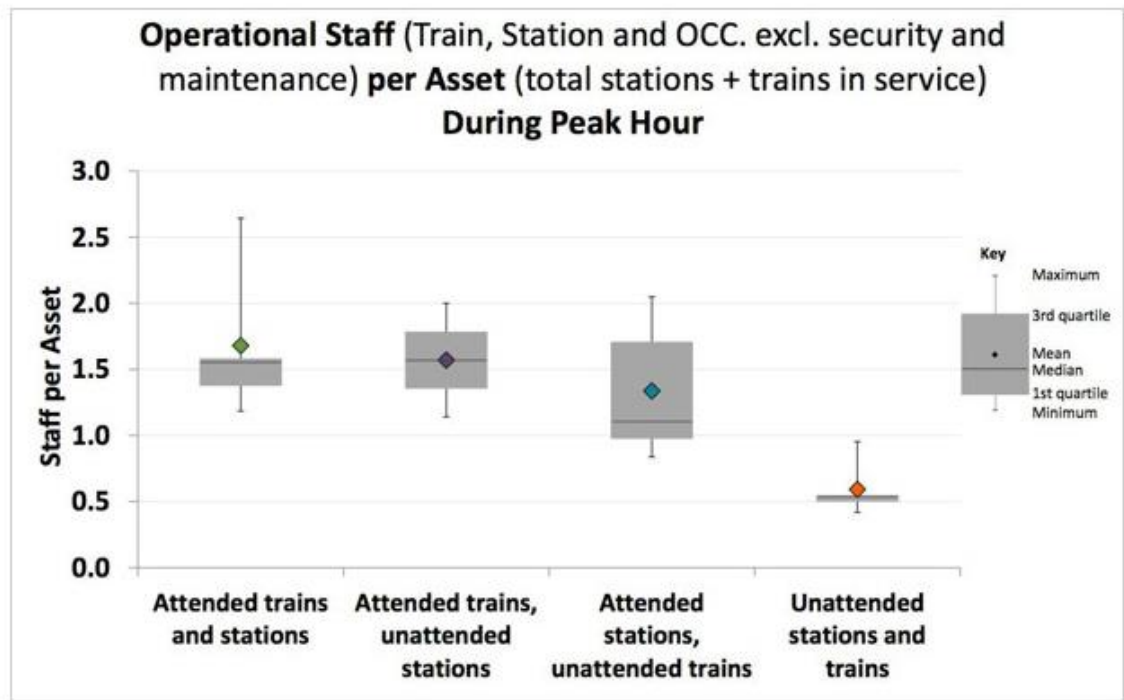


A rendering of a rail canopy at a new HART station, which is scheduled to begin operations in 2017. (Honolulu Authority for Rapid Transportation)

Honolulu Is Building America's First Fully Driverless Transit System

But there are doubts about whether it will inspire other U.S. cities to follow suit.

AMY CRAWFORD | [@amymcrawf](#) | Sep 17, 2014 | 17 Comments



Cohen et al (TRB, 2015)

For next time...

- Read: A26 (“Traffic Analysis Toolbox” readings, Companion Website)
- Complete critical thinking questions (submit to BBL as Word document and have copy available in class)
 - (individual) (Q1, Q2, Q3, Q5, and Q7 only)

Quiz

1. After the minimum green timer expires, and assuming that the passage timer has also expired, the phase will continue to time until the max green timer has expired. (True, False, Maybe) [Briefly explain your answer]
2. After the minimum green timer expires, and assuming that there is a queue of 20 vehicles still to be served, the phase will likely gap out. Assume that the max green time = 30 sec. (True, False, Maybe) [Briefly explain your answer]
3. Briefly contrast:
 - A deterministic model with a stochastic model
 - A microscopic model with a macroscopic model
4. Why do we use microscopic models in transportation? [Write a coherent one paragraph answer, not just a list]

Clock Time (sec)	Display/color indication
0	Red
30	Green
37	Yellow
40	Red
70	Green
90	Yellow
93	Red
123	Green
148	Yellow
153	Red
183	Green
213	Yellow
216	Red
246	Green
253	Yellow
256	Red
286	Green
296	Yellow

Vehicle #	Detector On (sec)	Detector Off (sec)
1	25	33
2	46	74
3	75	76
4	76	77
5	78	79
6	80	81
7	82	83
8	84	85
9	86	87
10	101	126
11	128	129
12	130	131
13	131	132
14	133	134
15	135	136
16	137	138
17	139	140
18	141	142
19	142	143
20	144	145
21	160	186
22	188	189
23	190	191
24	191	192
25	193	194
26	195	196
27	197	198
28	199	200
29	201	202
30	203	204
31	205	206
32	207	208
33	210	213
34	230	248
35	249	250
36	270	289
37	290	291
38	292	293

Quiz: Question #5
Cycle #1

- $\text{MinG} \leq 7s$
- $\text{PT} \leq 4s$
- $\text{MaxG} \geq 7s$
- Gap out

Clock Time (sec)	Display/color indication
0	Red
30	Green
37	Yellow
40	Red
70	Green
90	Yellow
93	Red
123	Green
148	Yellow
153	Red
183	Green
213	Yellow
216	Red
246	Green
253	Yellow
256	Red
286	Green
296	Yellow

Vehicle #	Detector On (sec)	Detector Off (sec)
1	25	33
2	46	74
3	75	76
4	76	77
5	78	79
6	80	81
7	82	83
8	84	85
9	86	87
10	101	126
11	128	129
12	130	131
13	131	132
14	133	134
15	135	136
16	137	138
17	139	140
18	141	142
19	142	143
20	144	145
21	160	186
22	188	189
23	190	191
24	191	192
25	193	194
26	195	196
27	197	198
28	199	200
29	201	202
30	203	204
31	205	206
32	207	208
33	210	213
34	230	248
35	249	250
36	270	289
37	290	291
38	292	293

Quiz: Question #5
Cycle #2

- $2s < PT \leq 3s$
- $MaxG \geq 20s$
- Gap out

Clock Time (sec)	Display/color indication
0	Red
30	Green
37	Yellow
40	Red
70	Green
90	Yellow
93	Red
123	Green
148	Yellow
153	Red
183	Green
213	Yellow
216	Red
246	Green
253	Yellow
256	Red
286	Green
296	Yellow

Vehicle #	Detector On (sec)	Detector Off (sec)
1	25	33
2	46	74
3	75	76
4	76	77
5	78	79
6	80	81
7	82	83
8	84	85
9	86	87
10	101	126
11	128	129
12	130	131
13	131	132
14	133	134
15	135	136
16	137	138
17	139	140
18	141	142
19	142	143
20	144	145
21	160	186
22	188	189
23	190	191
24	191	192
25	193	194
26	195	196
27	197	198
28	199	200
29	201	202
30	203	204
31	205	206
32	207	208
33	210	213
34	230	248
35	249	250
36	270	289
37	290	291
38	292	293

Quiz: Question #5
Cycle #3

- $2s < PT \leq 3s$
- $MaxG \geq 25s$

Clock Time (sec)	Display/color indication
0	Red
30	Green
37	Yellow
40	Red
70	Green
90	Yellow
93	Red
123	Green
148	Yellow
153	Red
183	Green
213	Yellow
216	Red
246	Green
253	Yellow
256	Red
286	Green
296	Yellow

Vehicle #	Detector On (sec)	Detector Off (sec)
1	25	33
2	46	74
3	75	76
4	76	77
5	78	79
6	80	81
7	82	83
8	84	85
9	86	87
10	101	126
11	128	129
12	130	131
13	131	132
14	133	134
15	135	136
16	137	138
17	139	140
18	141	142
19	142	143
20	144	145
21	160	186
22	188	189
23	190	191
24	191	192
25	193	194
26	195	196
27	197	198
28	199	200
29	201	202
30	203	204
31	205	206
32	207	208
33	210	213
34	230	248
35	249	250
36	270	289
37	290	291
38	292	293

Quiz: Question #5
Cycle #4

- MaxG \geq 30s
- Max out

Clock Time (sec)	Display/color indication
0	Red
30	Green
37	Yellow
40	Red
70	Green
90	Yellow
93	Red
123	Green
148	Yellow
153	Red
183	Green
213	Yellow
216	Red
246	Green
253	Yellow
256	Red
286	Green
296	Yellow

Vehicle #	Detector On (sec)	Detector Off (sec)
1	25	33
2	46	74
3	75	76
4	76	77
5	78	79
6	80	81
7	82	83
8	84	85
9	86	87
10	101	126
11	128	129
12	130	131
13	131	132
14	133	134
15	135	136
16	137	138
17	139	140
18	141	142
19	142	143
20	144	145
21	160	186
22	188	189
23	190	191
24	191	192
25	193	194
26	195	196
27	197	198
28	199	200
29	201	202
30	203	204
31	205	206
32	207	208
33	210	213
34	230	248
35	249	250
36	270	289
37	290	291
38	292	293

Quiz: Question #5
Cycle #5

- $1s < PT \leq 3s$
- $MinG \leq 10s$
- Gap out

Clock Time (sec)	Display/color indication
0	Red
30	Green
37	Yellow
40	Red
70	Green
90	Yellow
93	Red
123	Green
148	Yellow
153	Red
183	Green
213	Yellow
216	Red
246	Green
253	Yellow
256	Red
286	Green
296	Yellow

Quiz: Question #5

Conclusions

- $\text{MinG} \leq 7s$
- $2s < \text{PT} \leq 3s$
- $\text{MaxG} = 30s$

Vehicle #	Detector On (sec)	Detector Off (sec)
1	25	33
2	46	74
3	75	76
4	76	77
5	78	79
6	80	81
7	82	83
8	84	85
9	86	87
10	101	126
11	128	129
12	130	131
13	131	132
14	133	134
15	135	136
16	137	138
17	139	140
18	141	142
19	142	143
20	144	145
21	160	186
22	188	189
23	190	191
24	191	192
25	193	194
26	195	196
27	197	198
28	199	200
29	201	202
30	203	204
31	205	206
32	207	208
33	210	213
34	230	248
35	249	250
36	270	289
37	290	291
38	292	293



- Meet with your group for 5 minutes. Review your results from your field work.
- Prepare to present your results to the rest of the class, considering the following questions:
 - What were your estimated values for the minimum green, passage time, and maximum green times?
 - Explain your process in deducing these values?
 - Prepare a sketch of Traffic Control Process Diagram showing one example of your data and results.

ACTIVITY
25

Microsimulation Models and the Traffic Control System



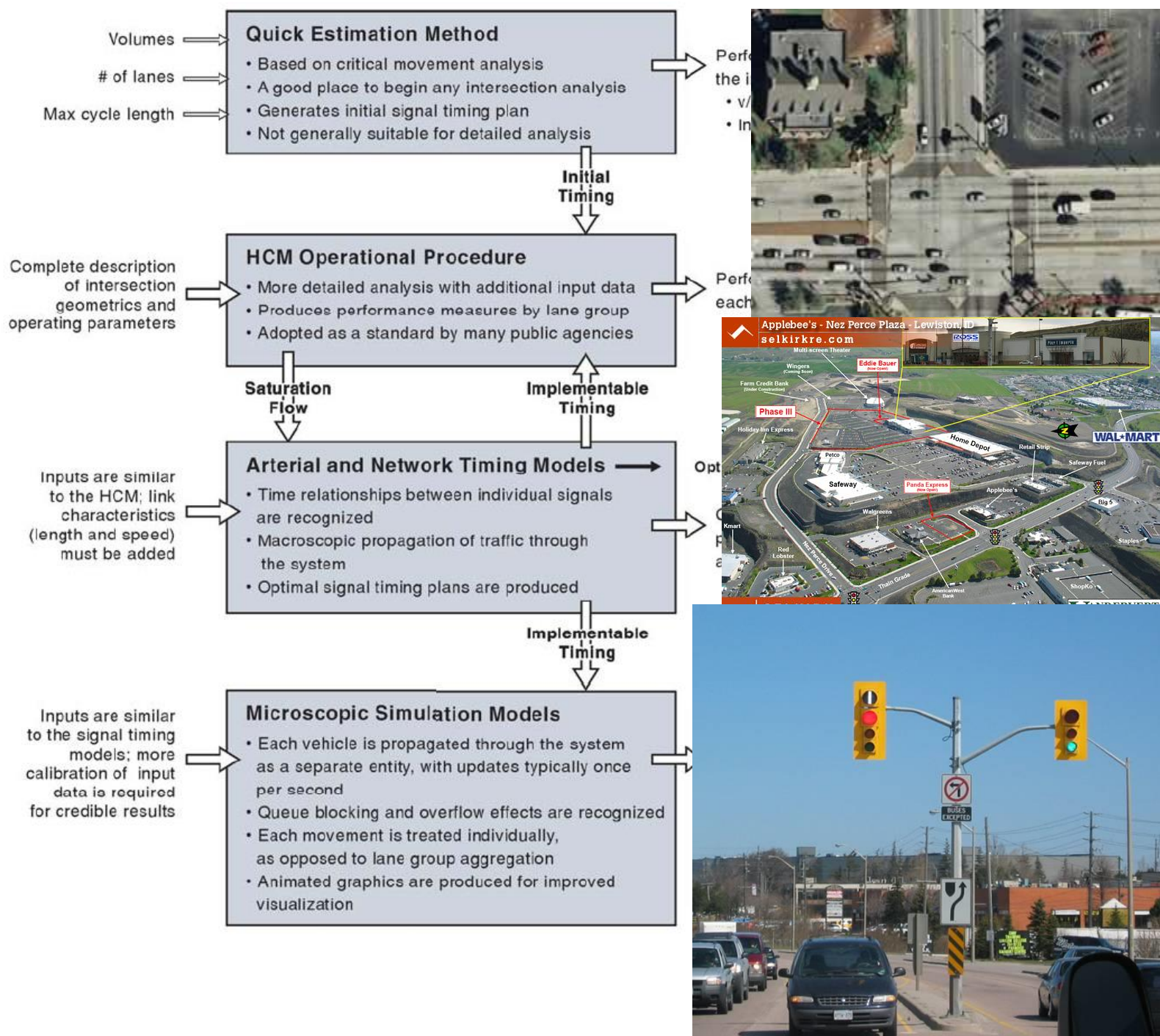
Key web sites

- [McTrans](#)
 - Highway Capacity Software
 - Transyt 7F
 - CORSIM
- [Trafficware](#)
 - Synchro
 - SimTraffic
- [PTV America](#)
 - VISSIM

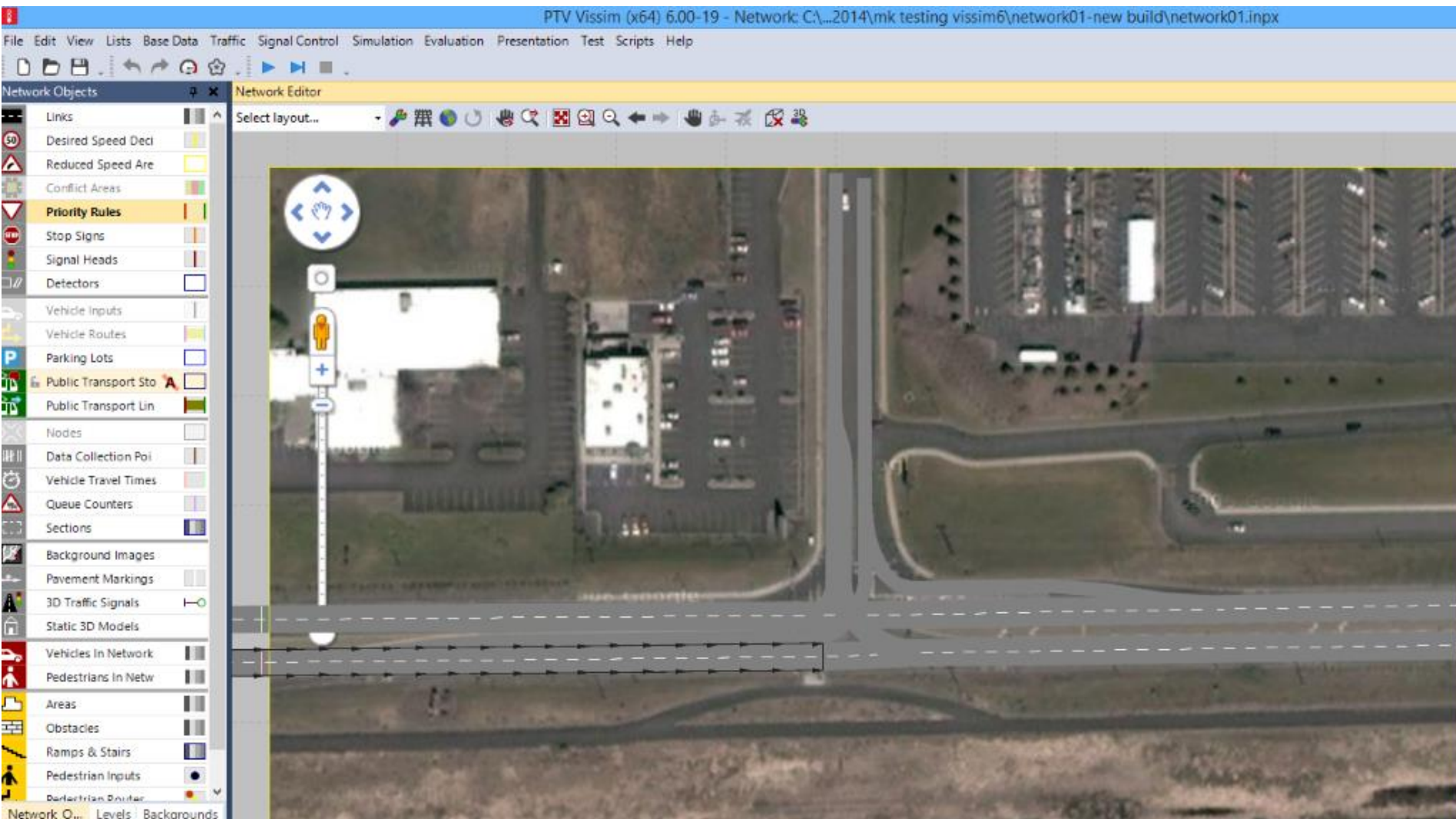
- VISSIM model demonstration
- Moscow downtown signal system demonstration

Table 11. Model categories (adapted from Byrne, de Laski, Courage, & Wallace, 1982)

Model categories	Attributes and contrasts
Computational or simulation	◦ Computational: Directly computes results from equations or tables
	◦ Simulation: Tracks events and processes
Empirical or analytical	◦ Empirical: Based on field data
	◦ Analytical: Based on theory
Deterministic or stochastic	◦ Deterministic: Produces same result for given set of inputs
	◦ Stochastic: Results can vary based on statistical distributions
Microscopic or macroscopic	◦ Microscopic: Individual driver decisions
	◦ Macroscopic: Aggregated flow characteristics
Event scan or time scan	◦ Event scan: Based on status of events of interest
	◦ Time scan: Updates made every time step
Evaluation or optimization	◦ Evaluation: Performance data produced
	◦ Optimization: Objective function optimized based on performance data



VISSIM Desktop





File View Help Notes Frequency 10

Pattern Schedule
 Sequence
 Conflict SGs
 Overlaps
 Detectors
 Vehicle
 Detector Number
 Delay
 Extend
 Carry Over
 Queue Limit
 Detector Mode
 Added Initial Mode
 Call
 Yellow Lock
 Red Lock
 Extend SGs
 XSwitch SGs

Basic

SG Number	2	4	5	6													
SG Name	EBT	SB	EBL	WBT													
Min Green	15	15	15	15													
Veh Extension	5	5	5	5													
Max 1	100	100	100	100													
Yellow	3	3	3	3													
Red Clearance	1	1	1	1													
Start Up	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dual Entry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sequence

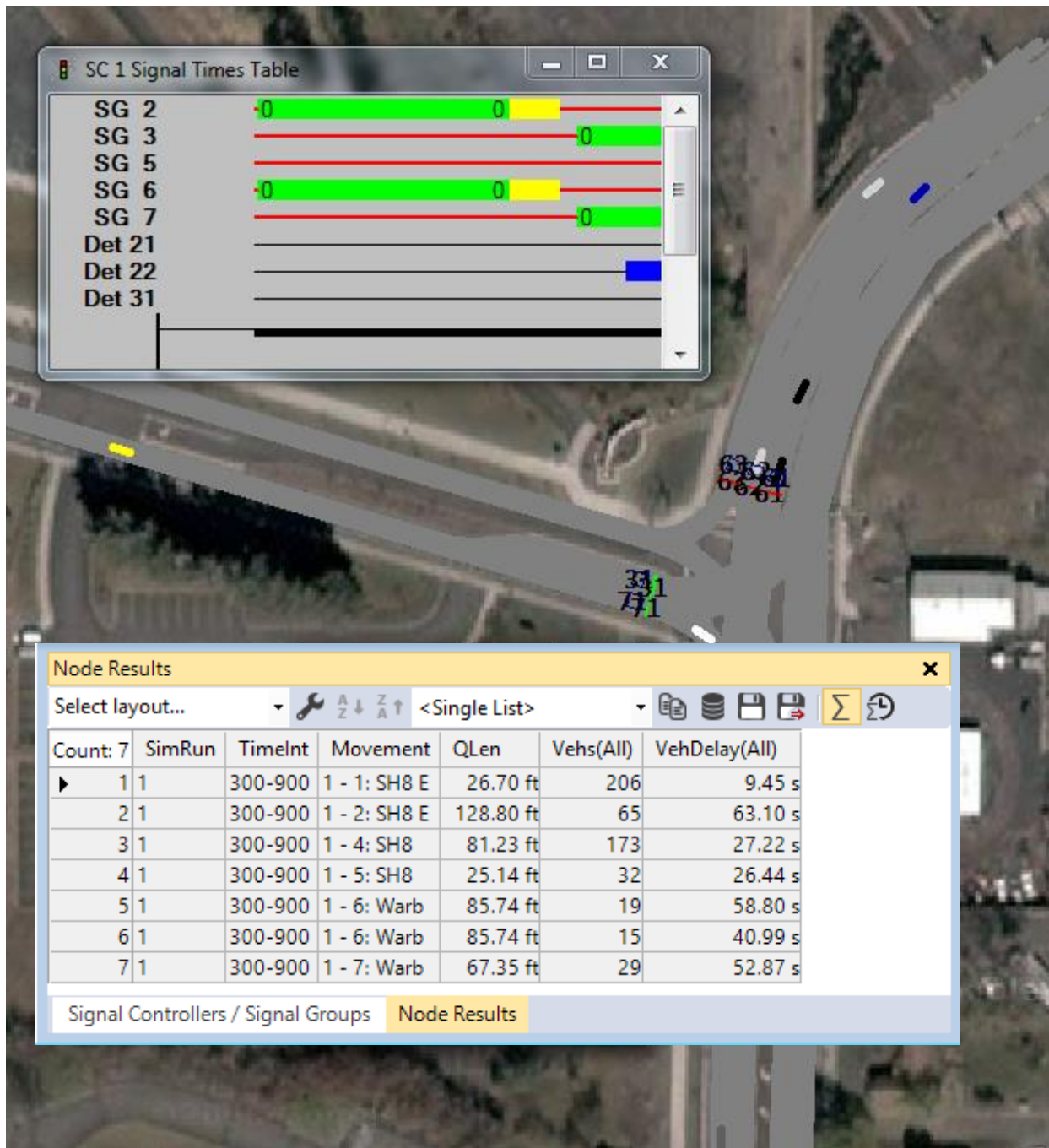
Ring 1		2		4													
Ring 2	5	6															
Ring 3																	
Ring 4																	

01 104sec EBT 04 104sec SB

05 104sec EBL 06 104sec WBT

Lock Diagram

Errors (0) Warnings (1) Messages (1)



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