A simulation on intersection based on Vissim

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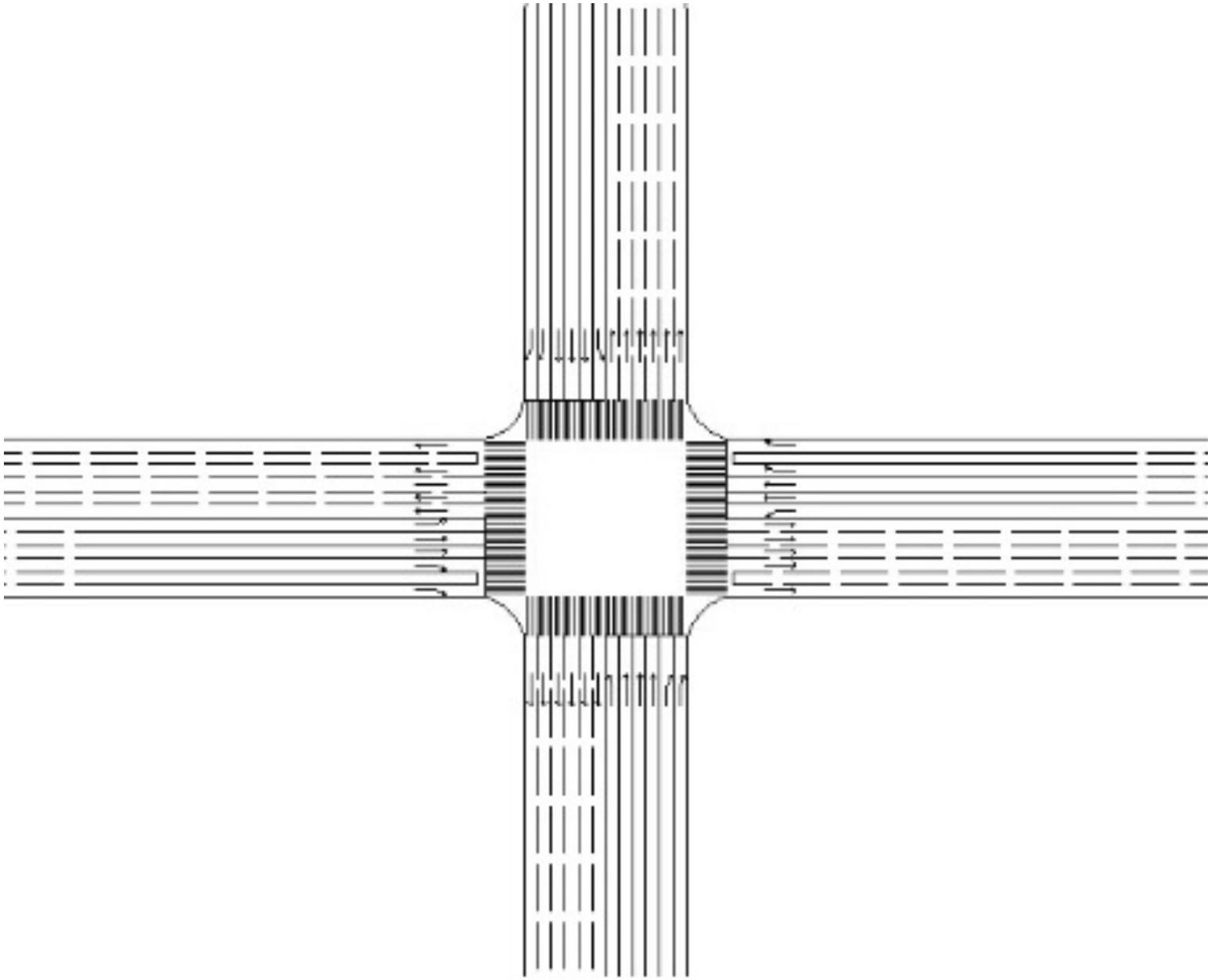
Introduction

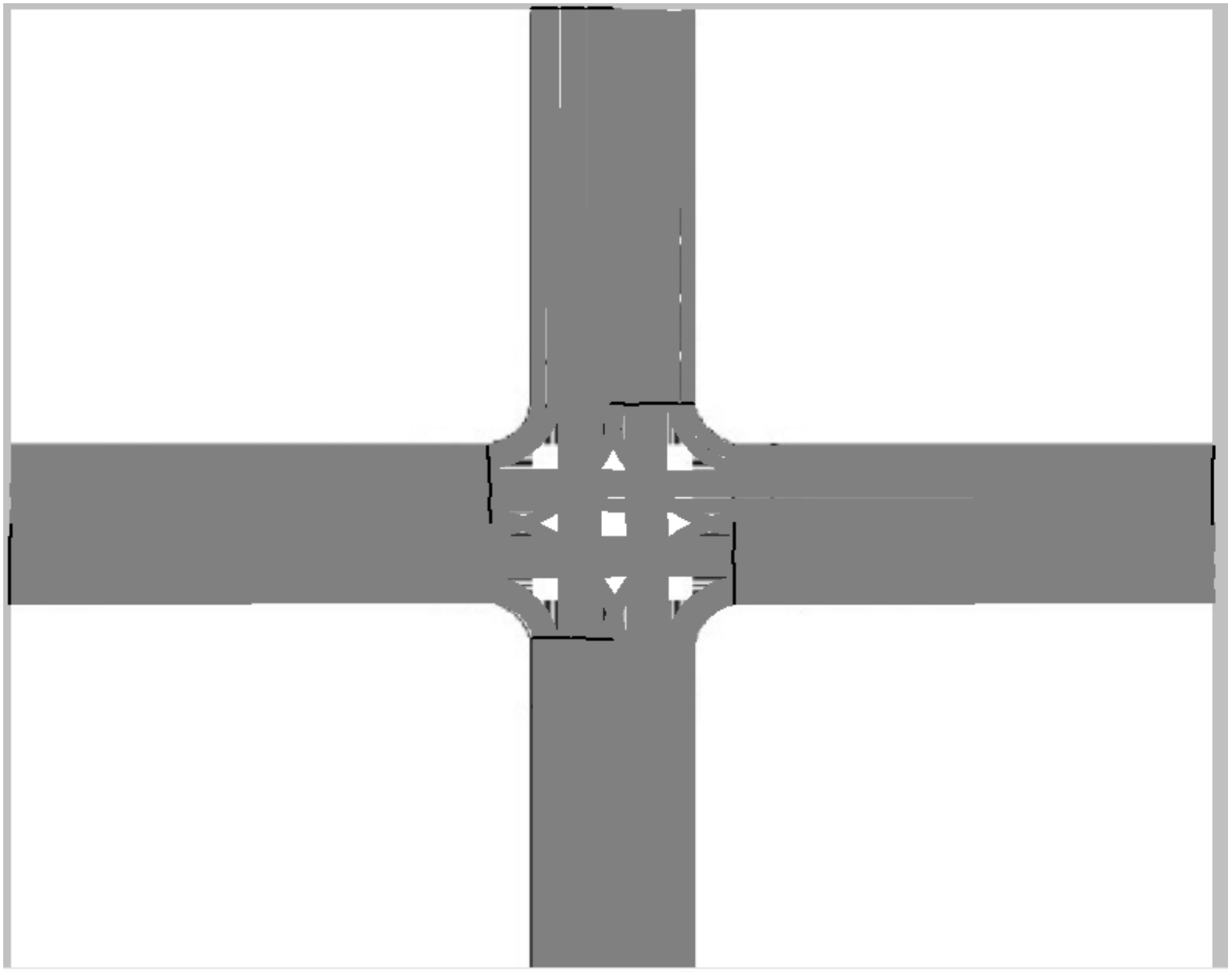
- **Topic--Intersection simulation**
- **Aim1: Trying to simulate a 12-line bothway intersection**
- **Aim2: Also trying to find a good signal cycle assignment to avoid any potential traffic delay or traffic collision on intersection and get a larger throughput.**

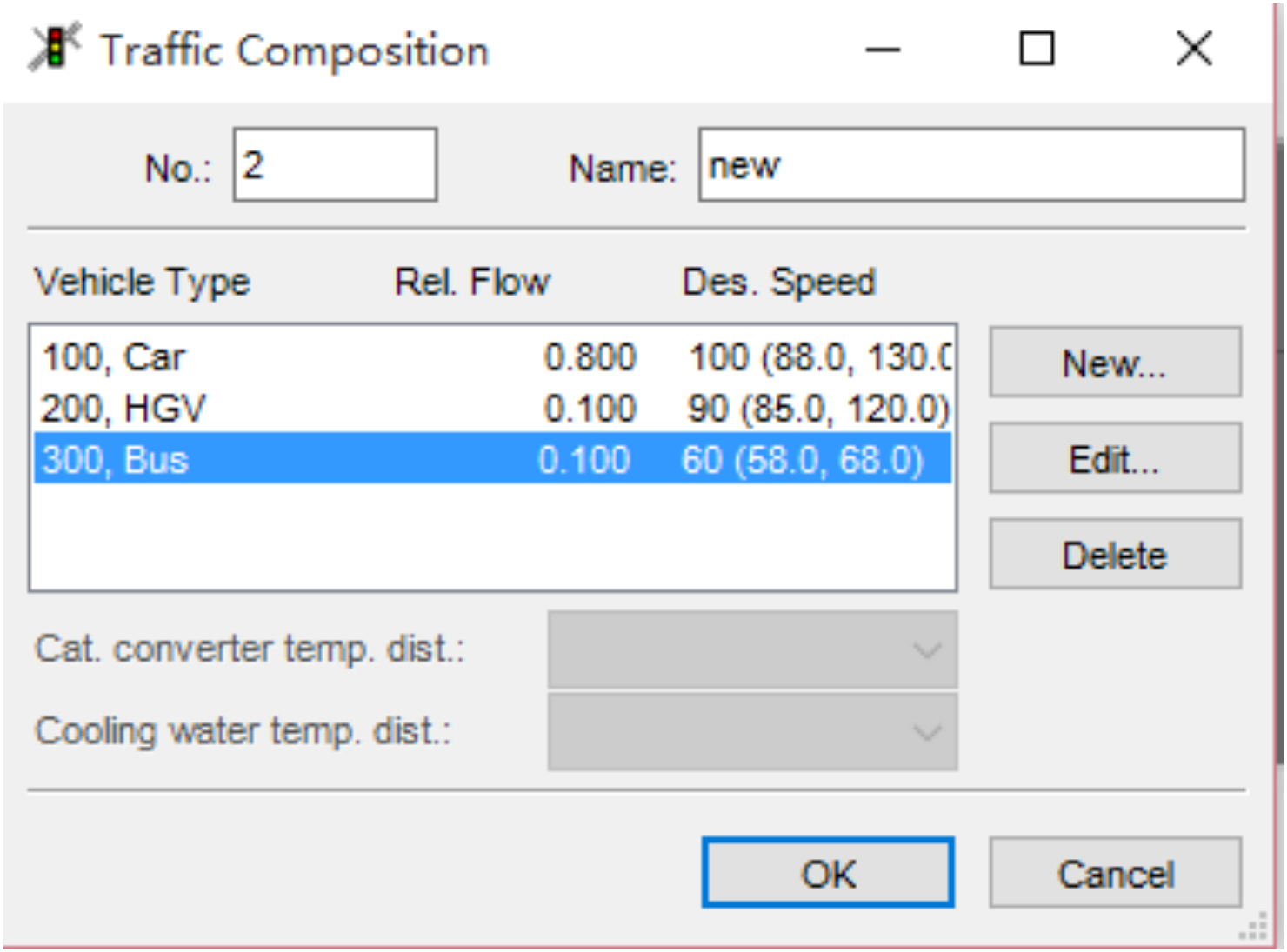
- **For each direction, there will be one left turn line and three**
- **straight lines and two right lines.**

map



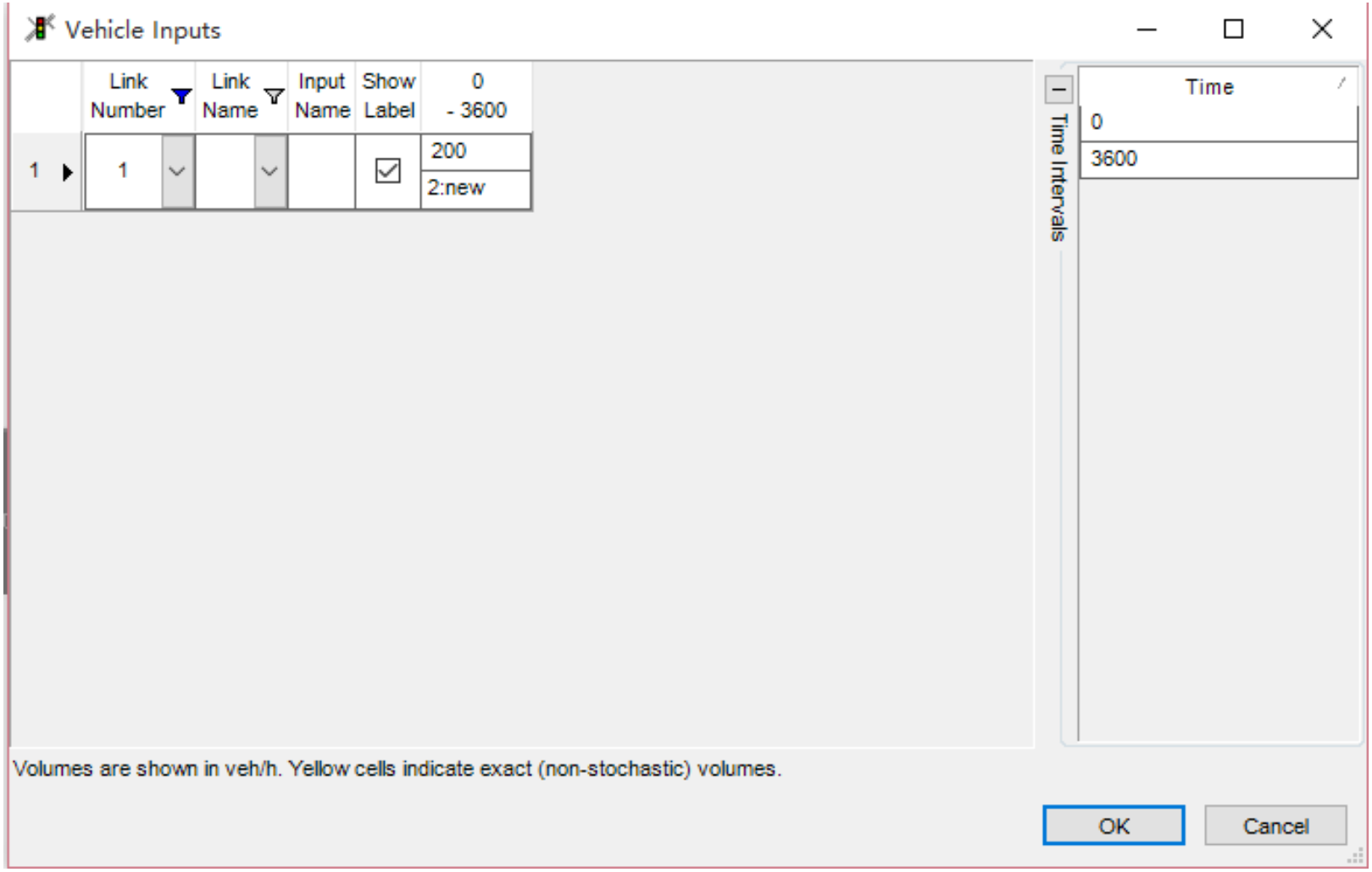
1,Print links and define routes



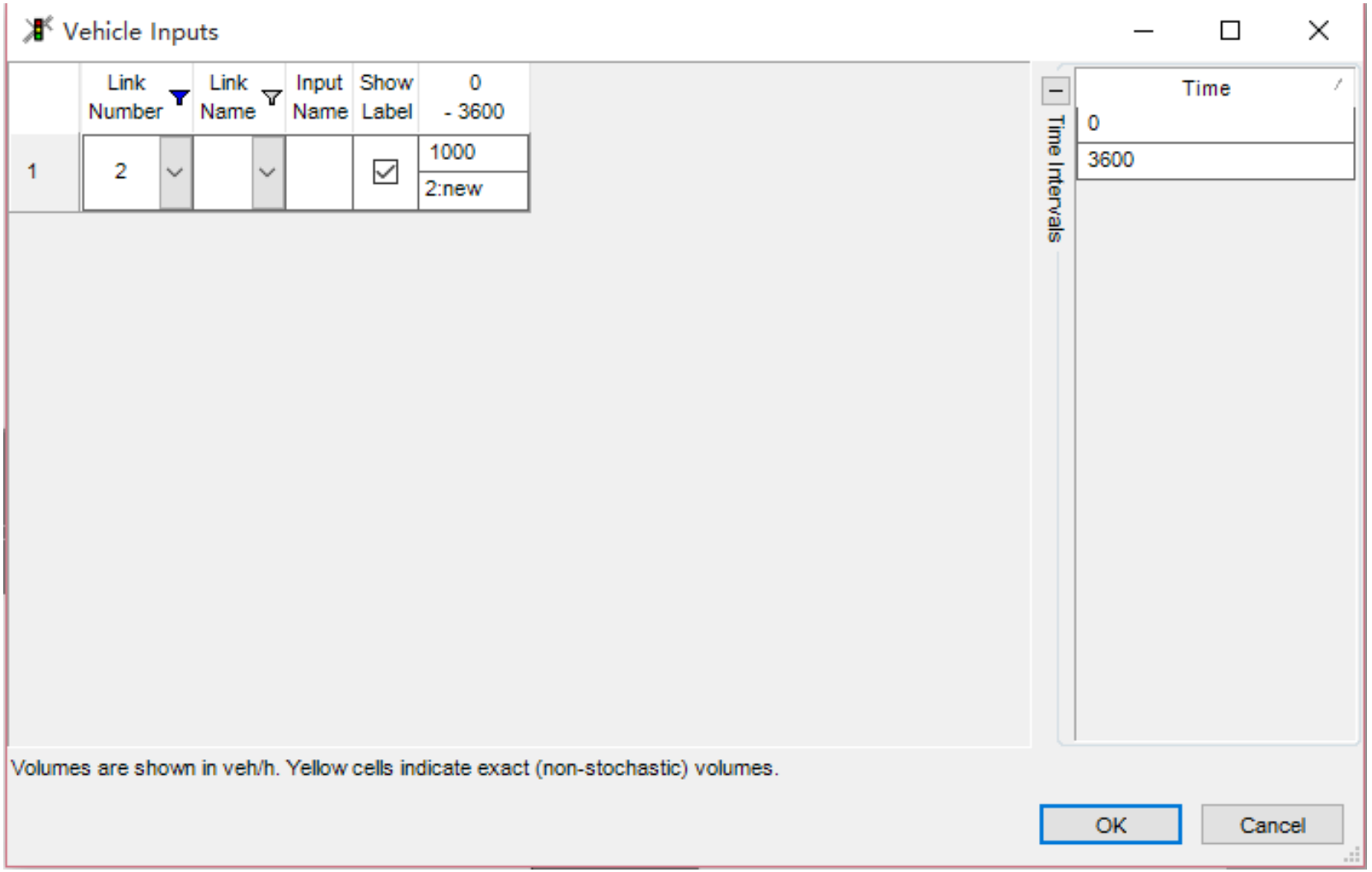


2, Traffic composition. give 80% cars and 10% HGVs and 10% buses (Similar to the real world)

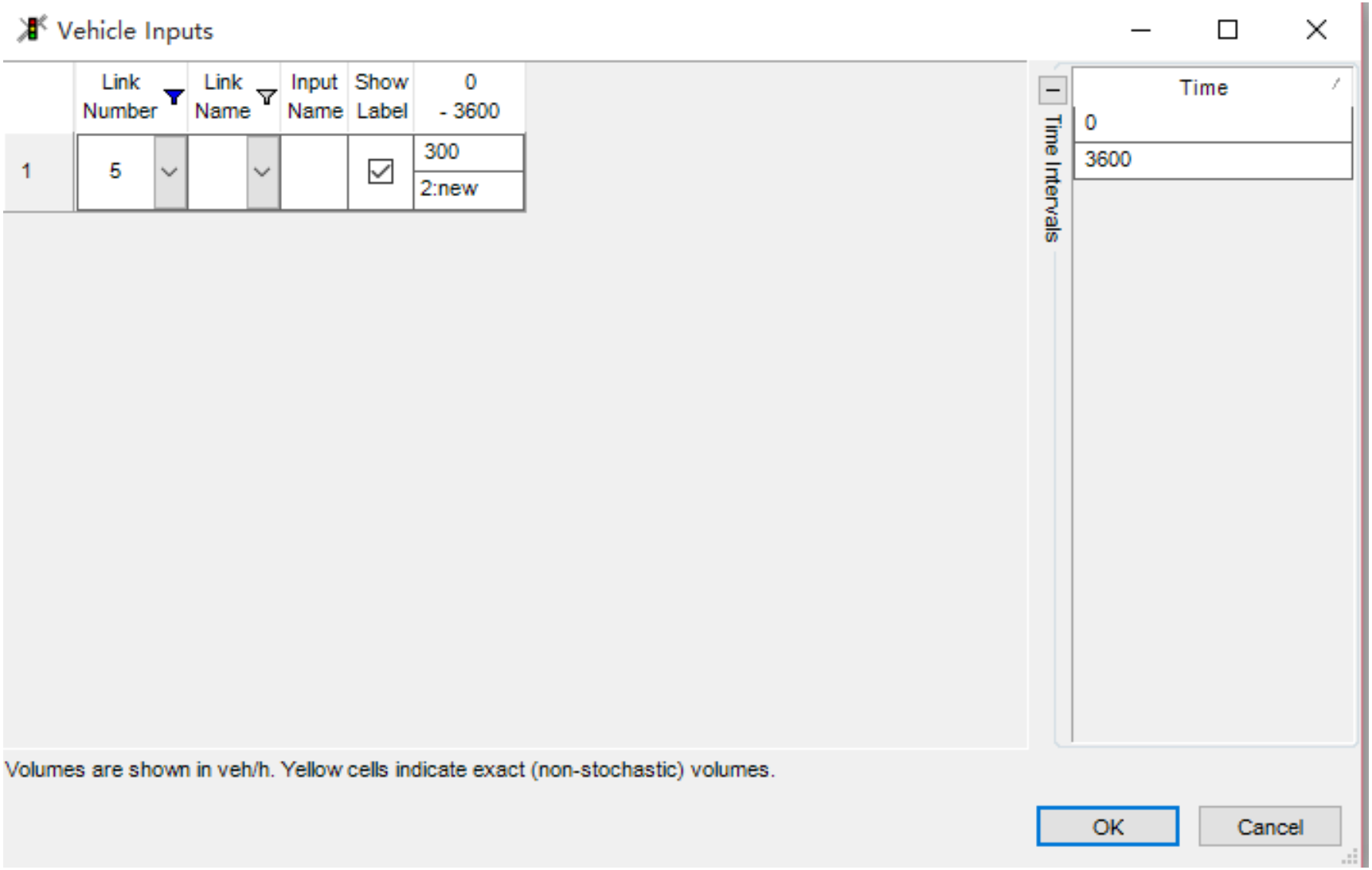
uts for one left line (ie.200)



Three straight lines vehicle inputs size inputs ie.1000)



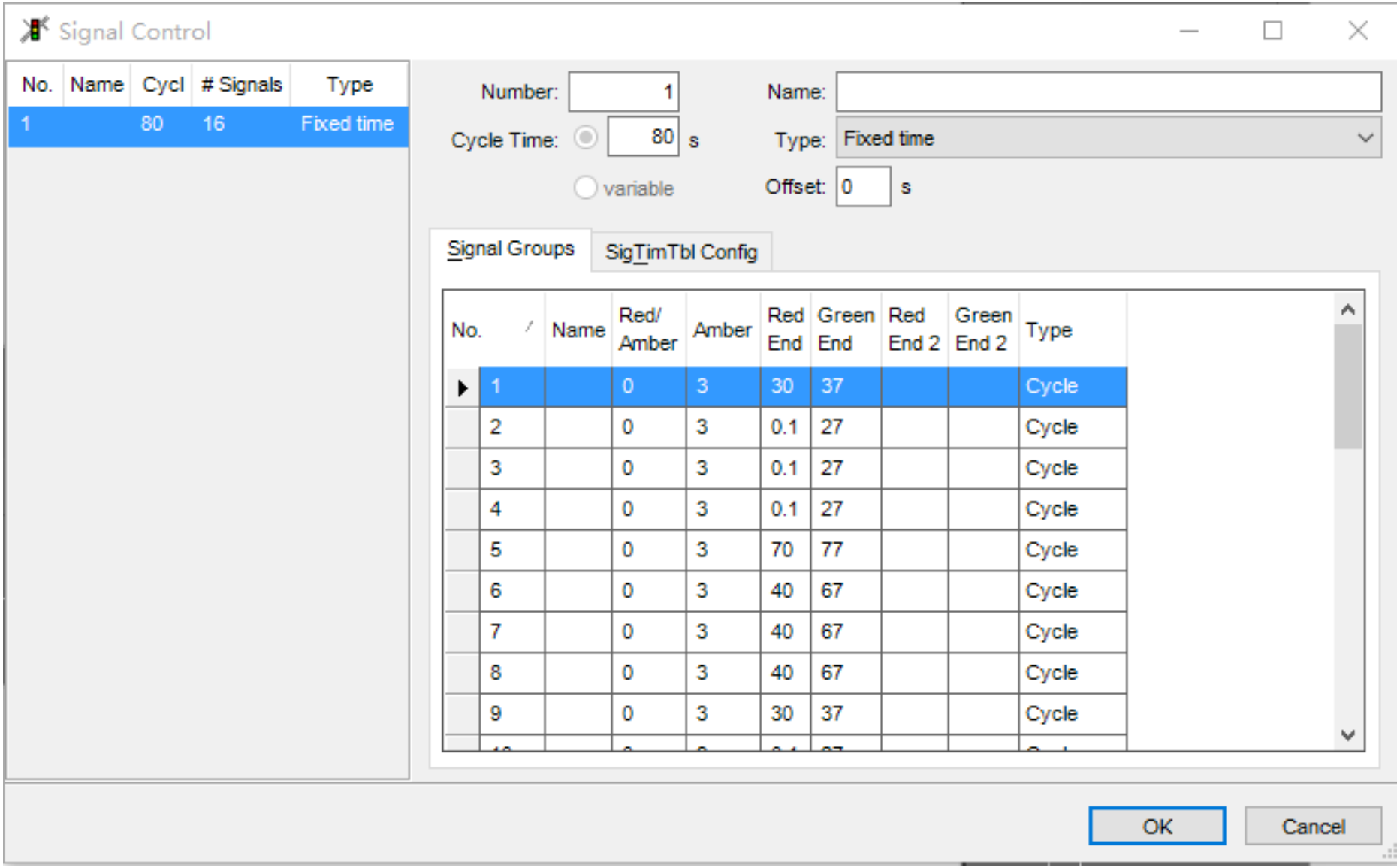
Two right lines vehicle inputs(ie.300)

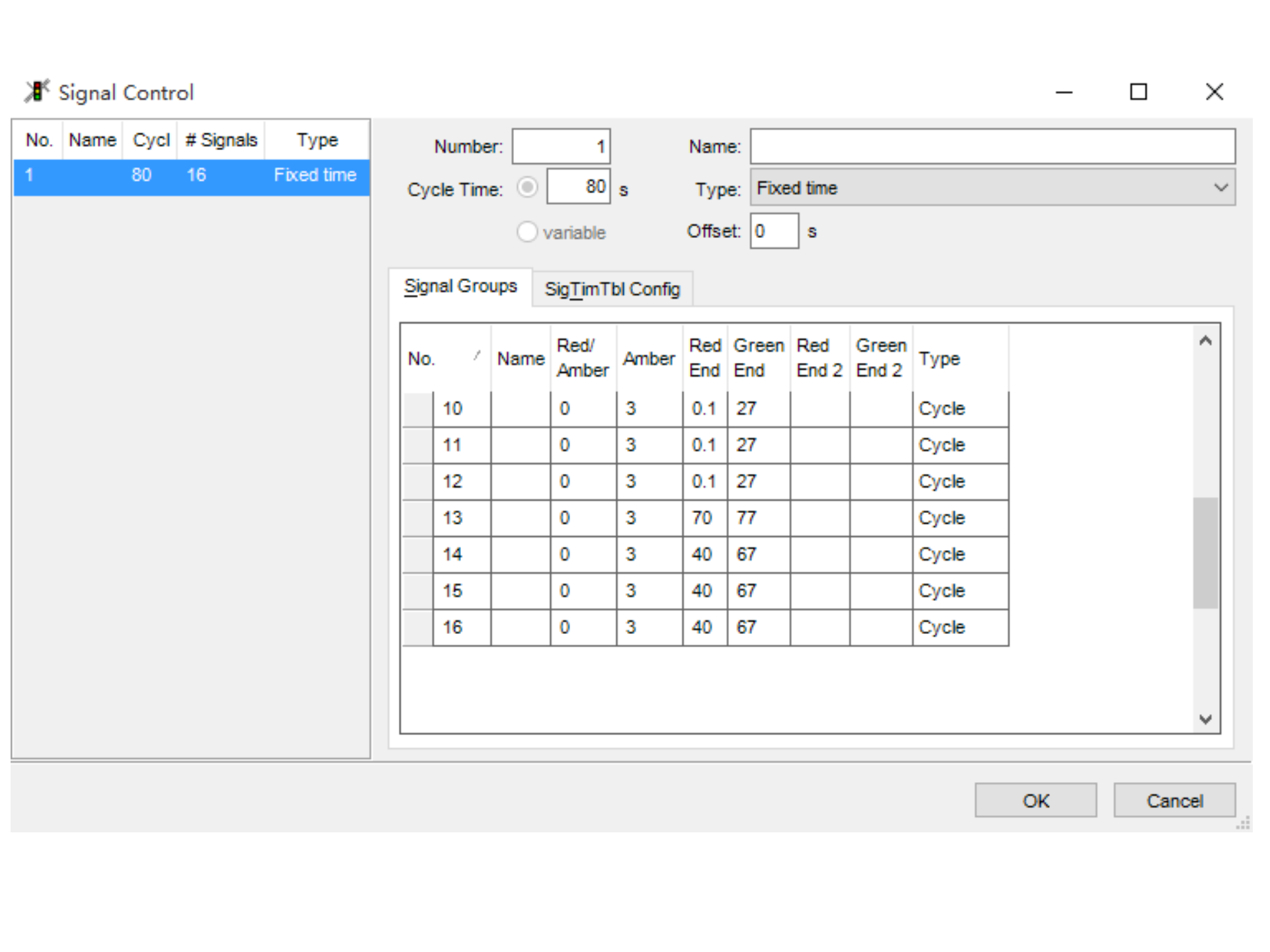


4, Signal cycle assignment

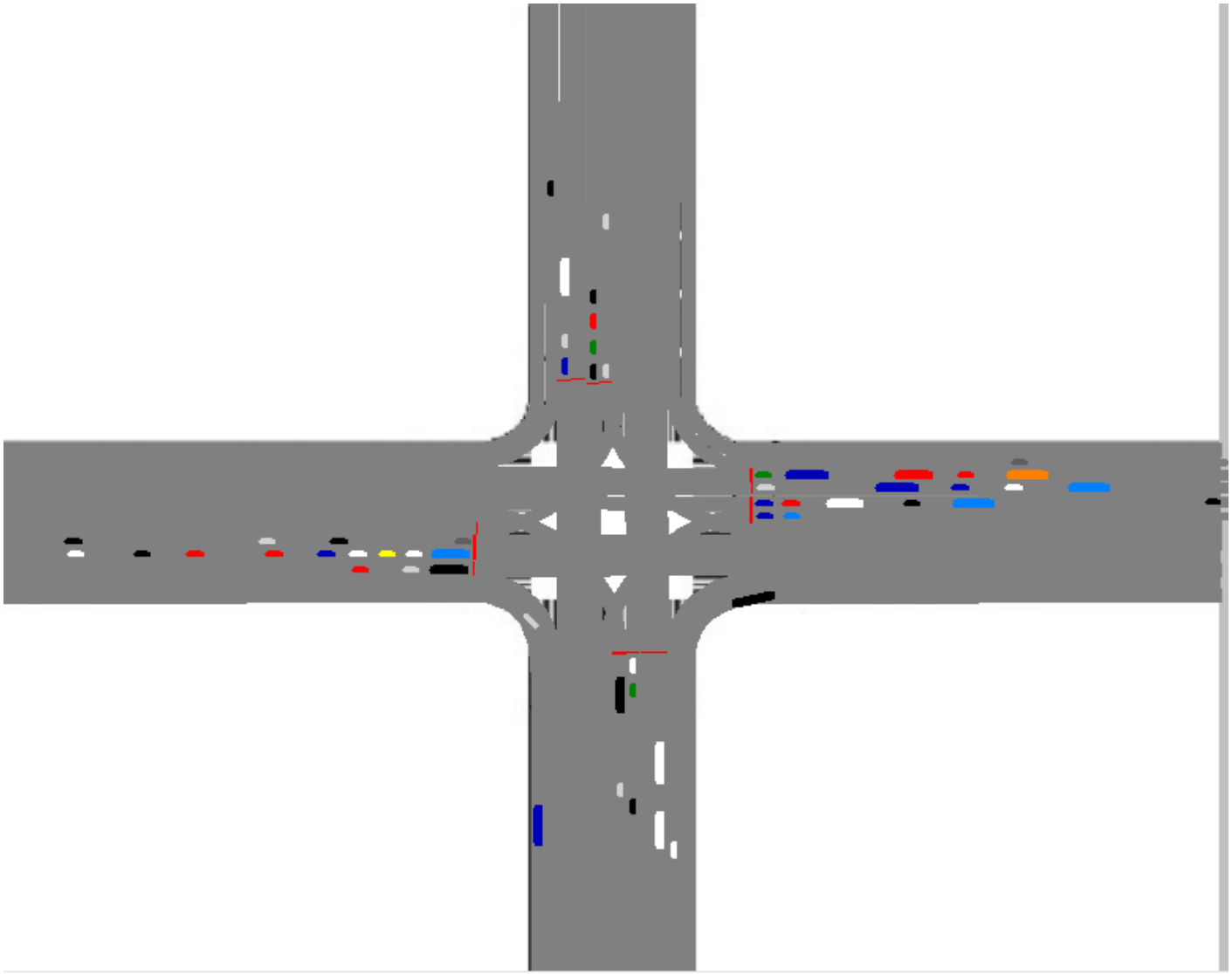
General rules: we assign one complete signal cycle to 80s including green cycle, amber cycle and red cycle.

Specific rules:
4.1 Two right turn lines doesn't need signal;
4.2 Only left turn line and straight lines need signal;
Give each straight line 27s green cycle and 3s amber cycle
Give left turn line 7s green cycle and 3s amber cycle
4.3 The opposite direction share the same rules. Opposite striaght lines and left line could work at the same time respectively.
Thus we could first let W-E straight lines consume 30s and then W-E left line.consume 10s and then N-S straight liines 30s and then N-S left line 10s.
4.3 we assigned signal number by anticlockwise from number 1-16

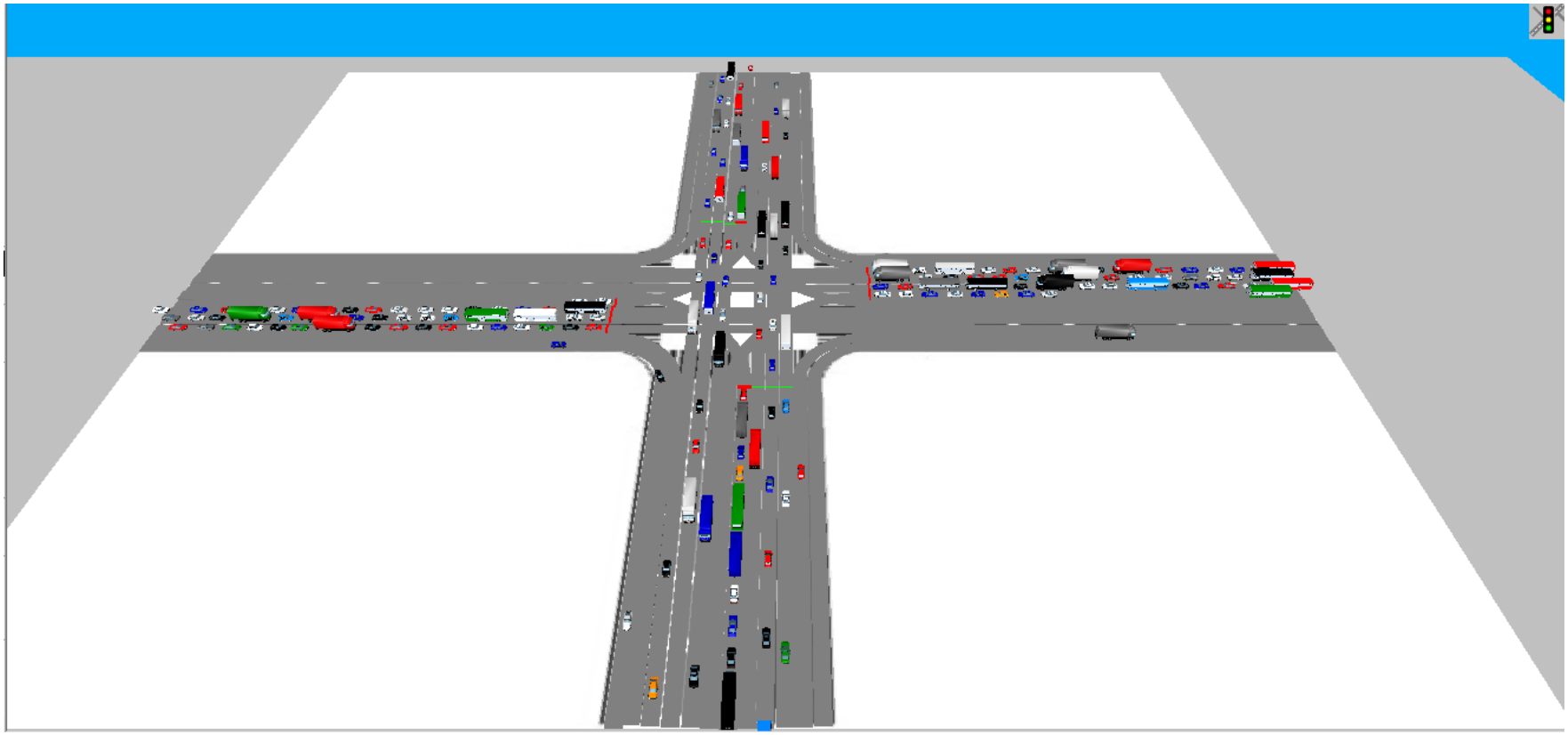

Signal Control
No.
Name
Cycl
Signals
Type
1
80
16
Fixed time
Number:
1
Name:
Cycle Time:
80
s
Type:
Fixed time
variable
Offset:
0
s
Signal Groups
SigTimTbl Config
No.
Name
Red/ Amber
Amber
Red End
Green End
Red End 2
Green End 2
Type
1 0 3 30 37 Cycle
2 0 3 0.1 27 Cycle
3 0 3 0.1 27 Cycle
4 0 3 0.1 27 Cycle
5 0 3 70 77 Cycle
6 0 3 40 67 Cycle
7 0 3 40 67 Cycle
8 0 3 40 67 Cycle
9 0 3 30 37 Cycle
OK
Cancel


Signal Control
No.
Name
Cycl
Signals
Type
1
80
16
Fixed time
Number:
1
Name:
Cycle Time:
80
s
Type:
Fixed time
variable
Offset:
0
s
Signal Groups
SigTimTbl Config
No.
Name
Red/ Amber
Amber
Red End
Green End
Red End 2
Green End 2
Type
10
0
3
0.1
27
Cycle
11
0
3
0.1
27
Cycle
12
0
3
0.1
27
Cycle
13
0
3
70
77
Cycle
14
0
3
40
67
Cycle
15
0
3
40
67
Cycle
16
0
3
40
67
Cycle
OK
Cancel

Run simulation:
2D results



Results: 3D



The results show that there is no traffic collision.

We dinamically modify vehicle inputs and signal cycle to avoid the traffic delay and traffic collision on intersection.

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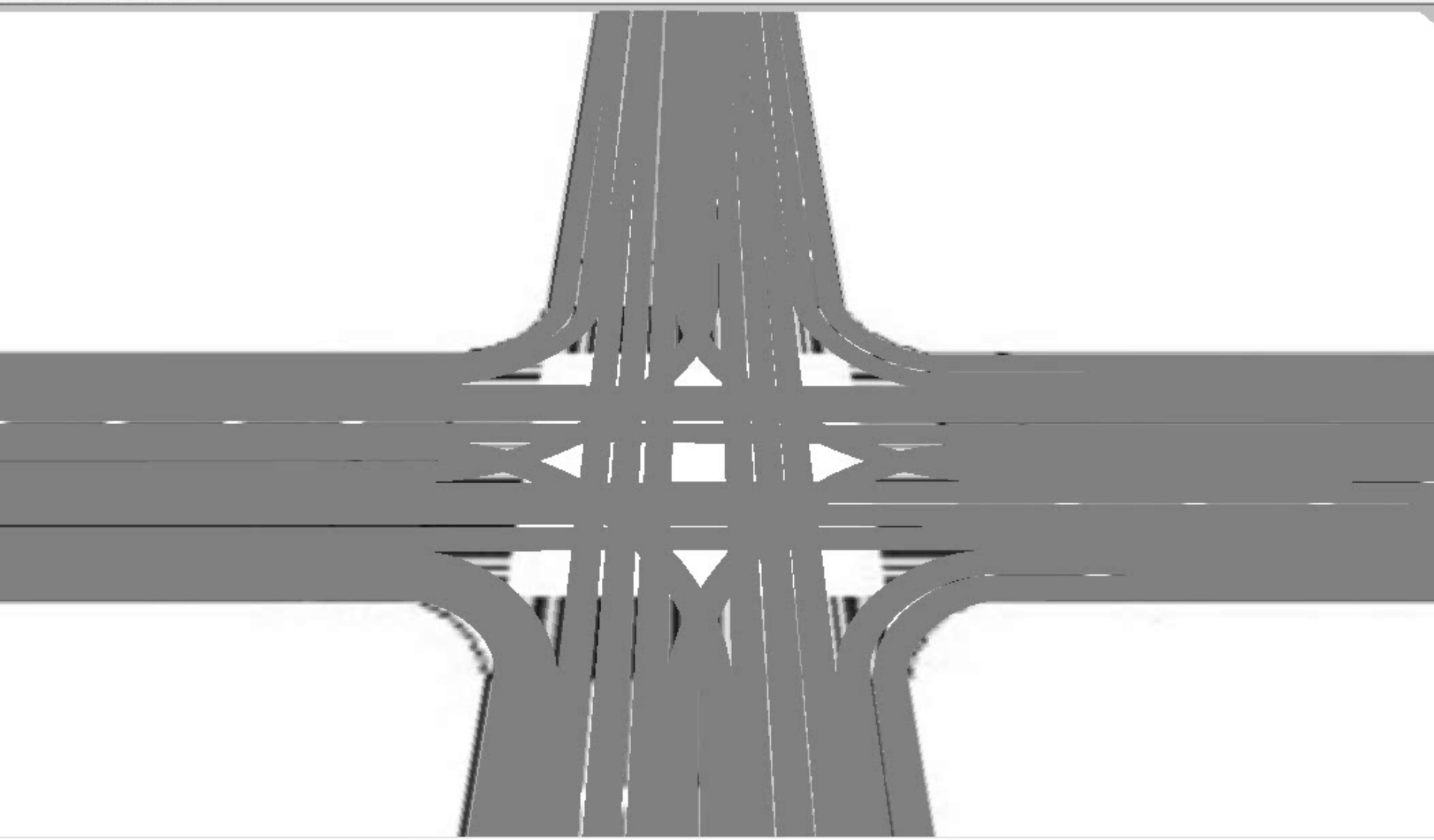
Traffic Signal Control Evaluation Simulation Presentation Test Scripts ?



Vehicle Input: select link

Conclusions and Future Work

- 1, use th real data in real world and solve real problem
- 2, adjust the signal cycle dynamically to achieve the best throughput
- 3, (perspective goal)maybe could design an adaptative algorithims(rules) to be applied to any map background.
- ie. according to the different line design and line inputs(dynamically maybe), to avoid any traffic delay or traffic collision and thus improve throughputs.