RWR 4015

Traffic Simulation for Planning Applications

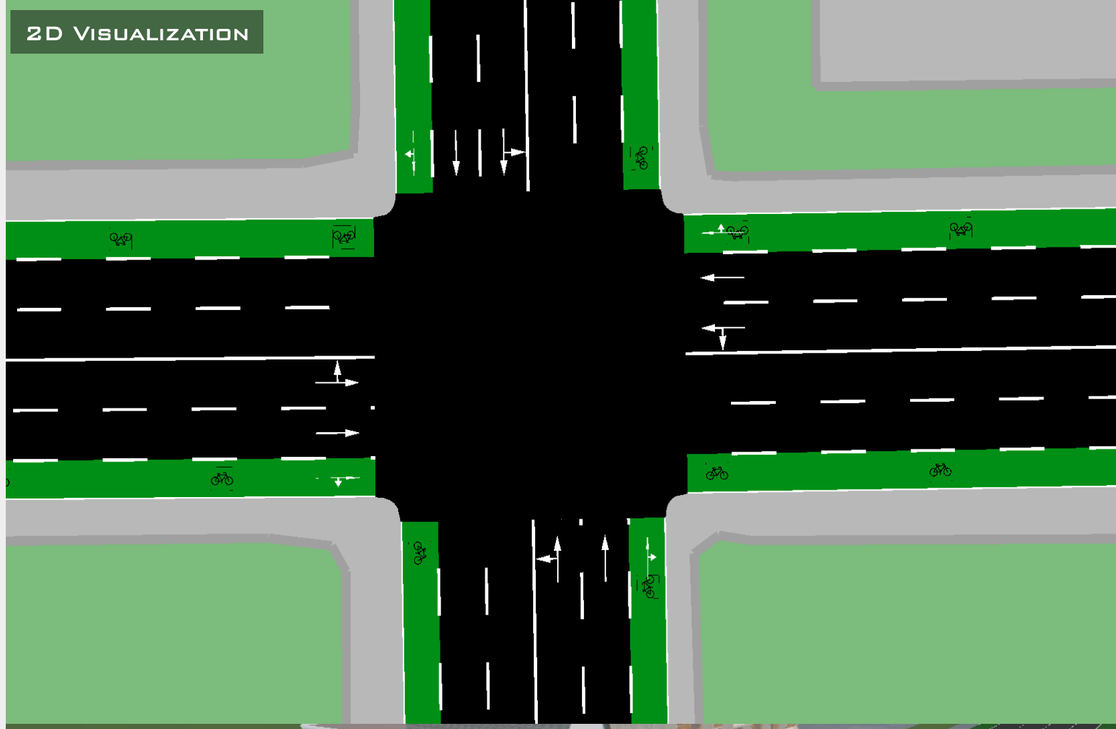
Dr. Ahmad Mohammadi

Week 4 | Hands-on:
Traffic Signal Planning in Simulation

Fall 2026

RoadwayVR

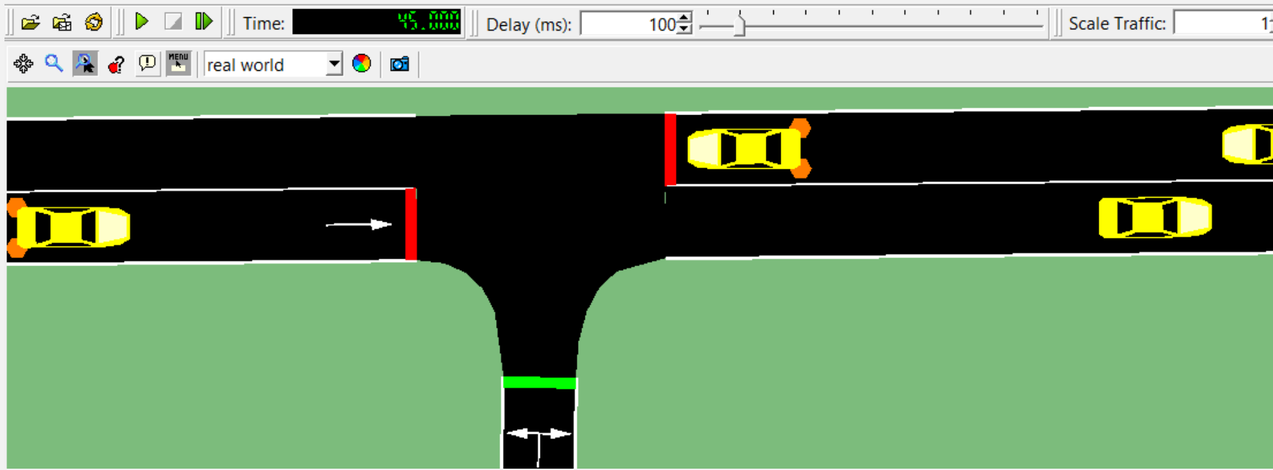
roadwayvr.github.io/TrafficSimulationforPlanningApplications



Agenda

1. Intersection – Unsignalized

2. Intersection - Signalized



Intersection – Unsignalized

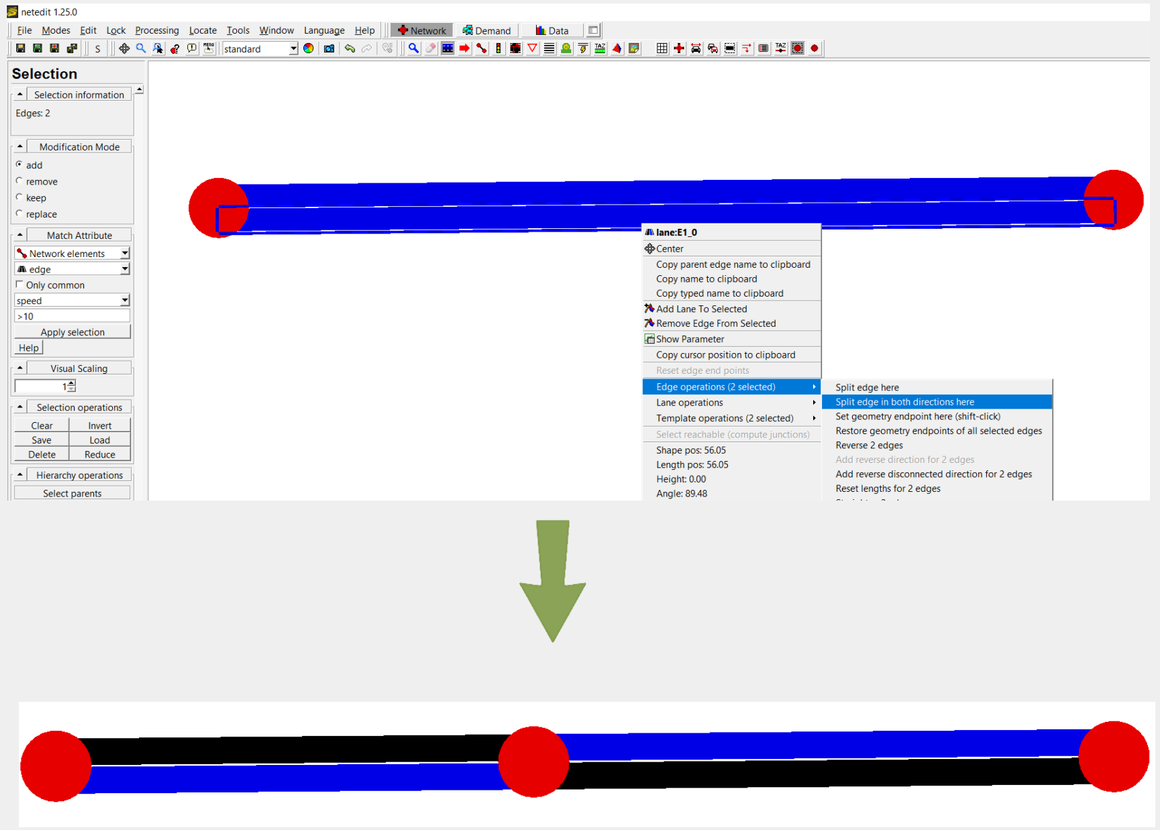
- Open netedit (Exercise1.netecfg) and do the following actions:

1. Select “ Selecting element”

2. Select both edges → and in the middle of it →

Right Click → Split edge in both direction

3. Output would be the image

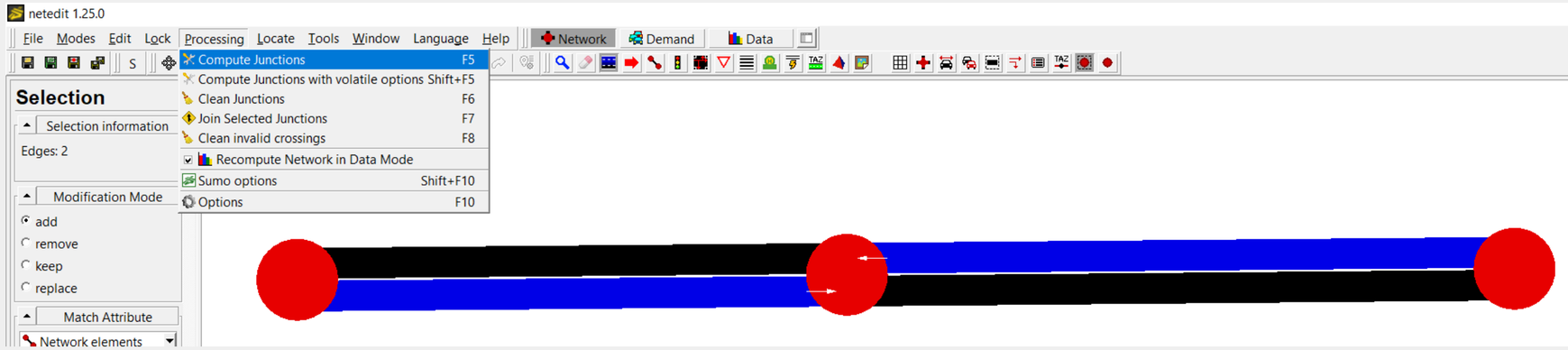


Intersection – Unsignalized

4. Processing → Compute Junctions

Now you will see two white arrows from one link

to another link

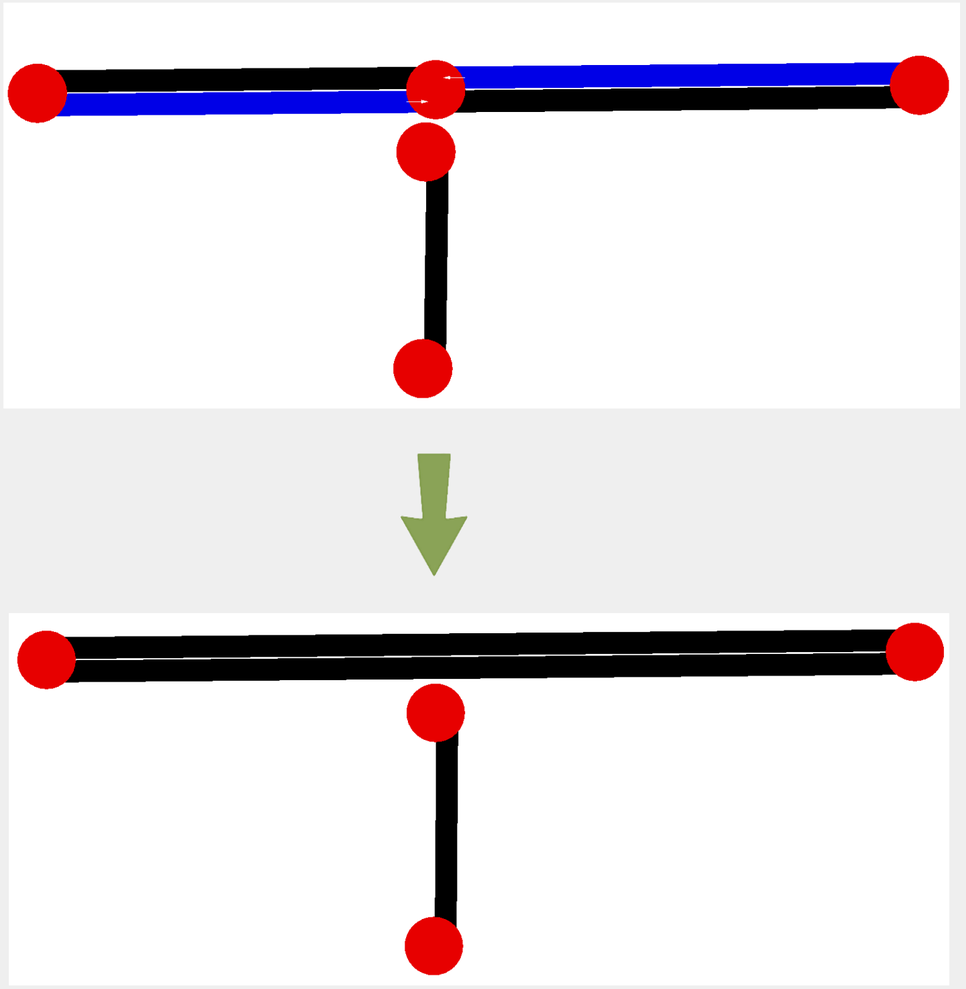


Intersection – Unsignalized

5. Now, create another road vertically

6. Select “ Selecting elements”

7. Press “Escape”

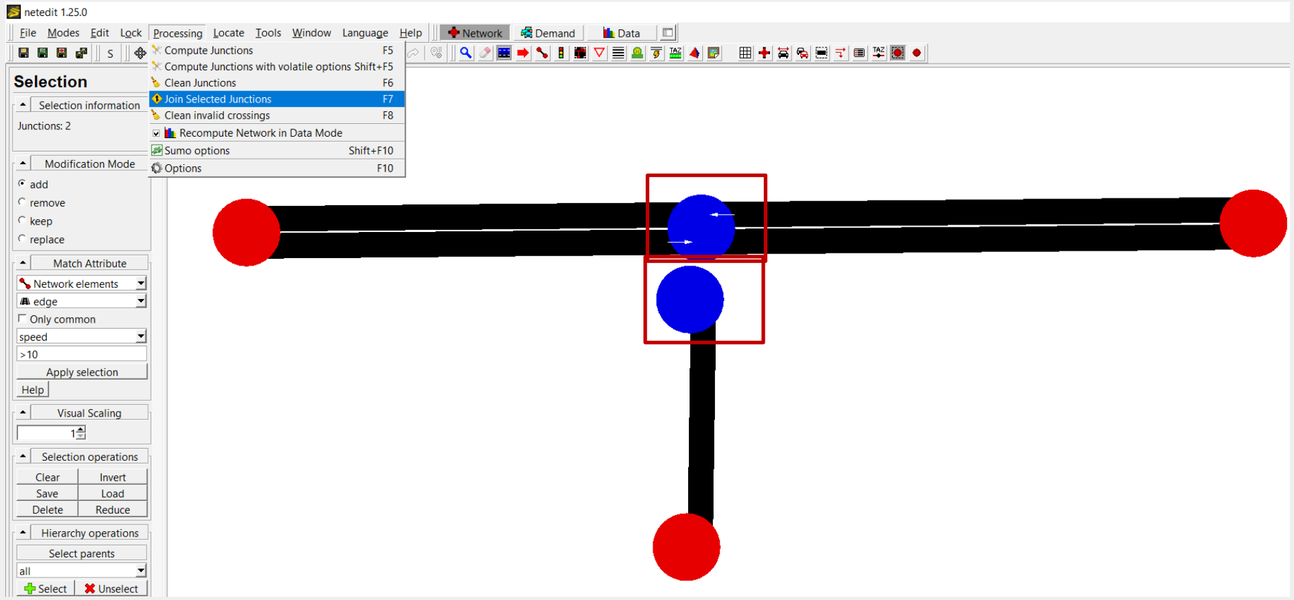


Intersection – Unsignalized

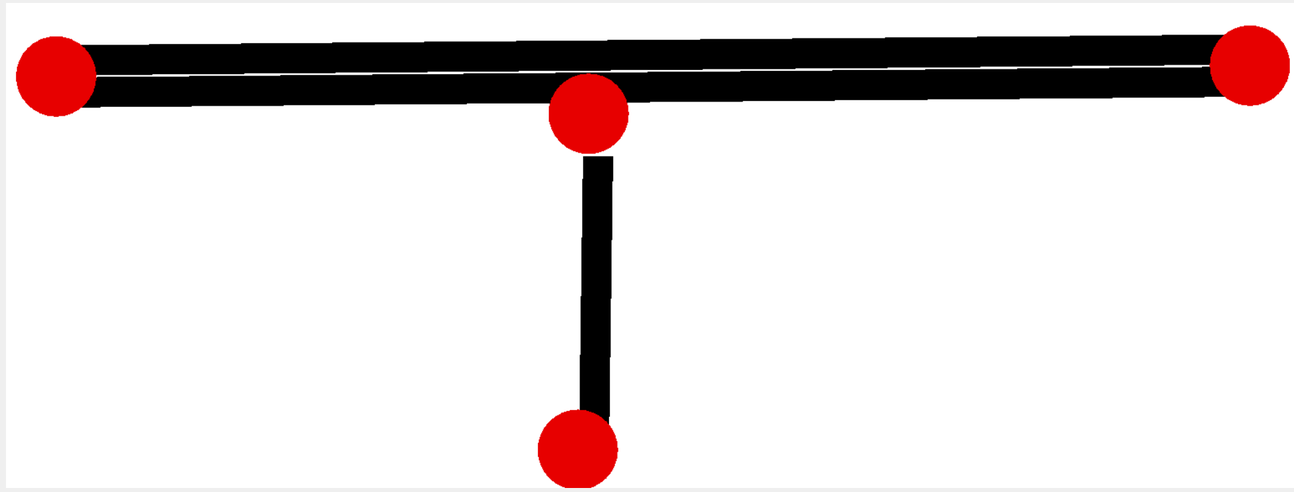
8. Select “ Selecting elements”

9. Select both nodes to create an intersection

10. Processing → Join selected Junctions



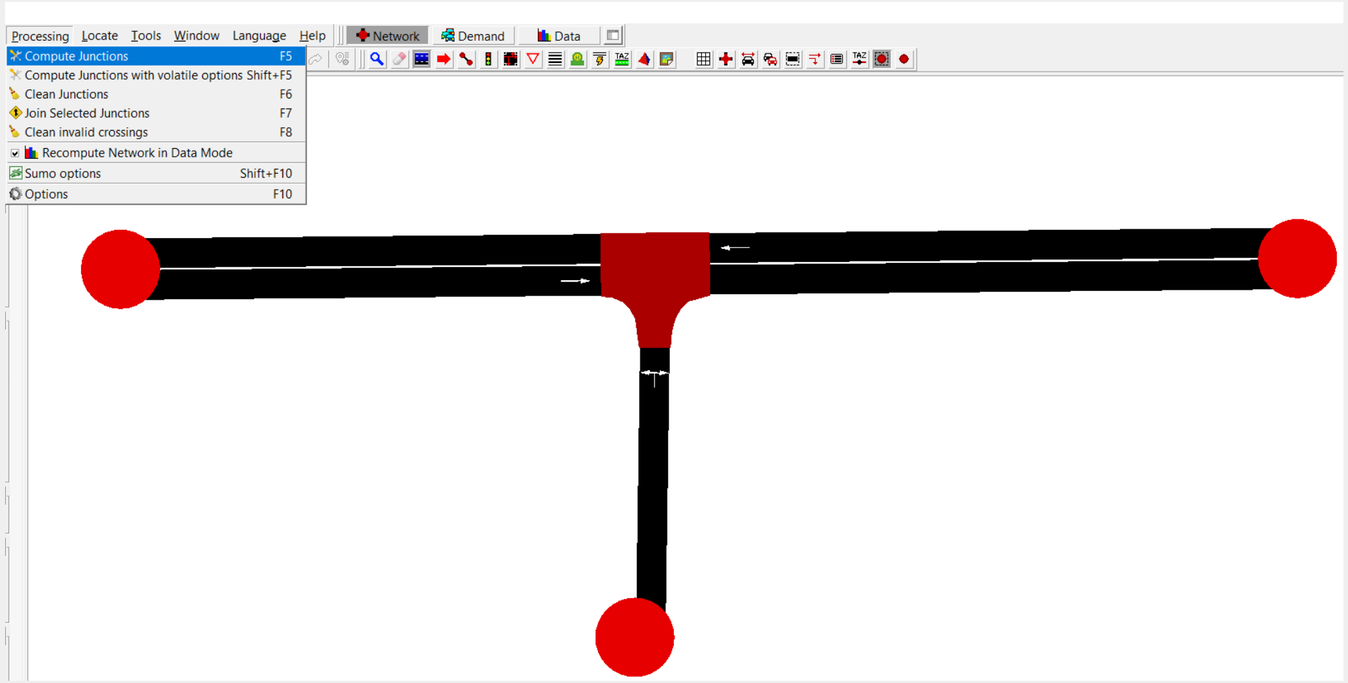
11. Output would be



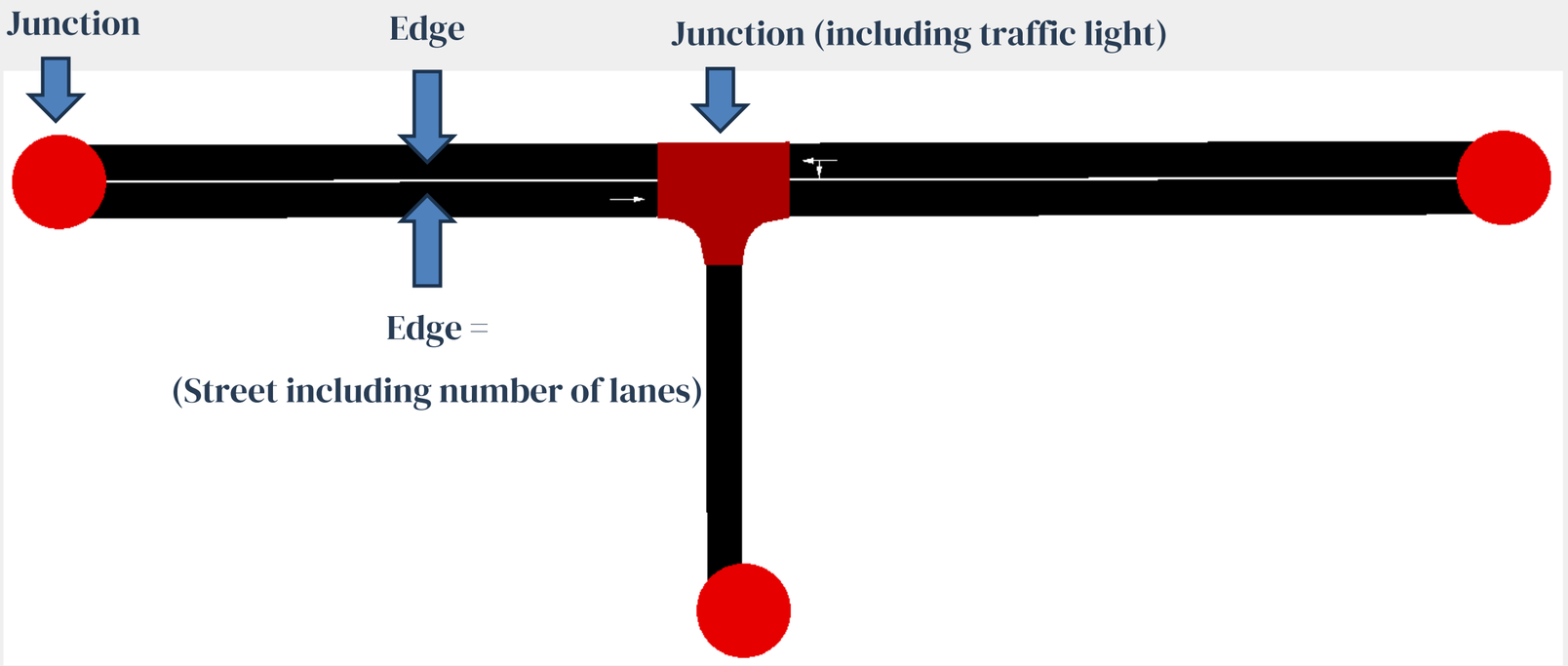
Intersection – Unsignalized

12. Processing → Compute Junction

13. Output would be an Intersection - Unsignalized



Edge vs Junction

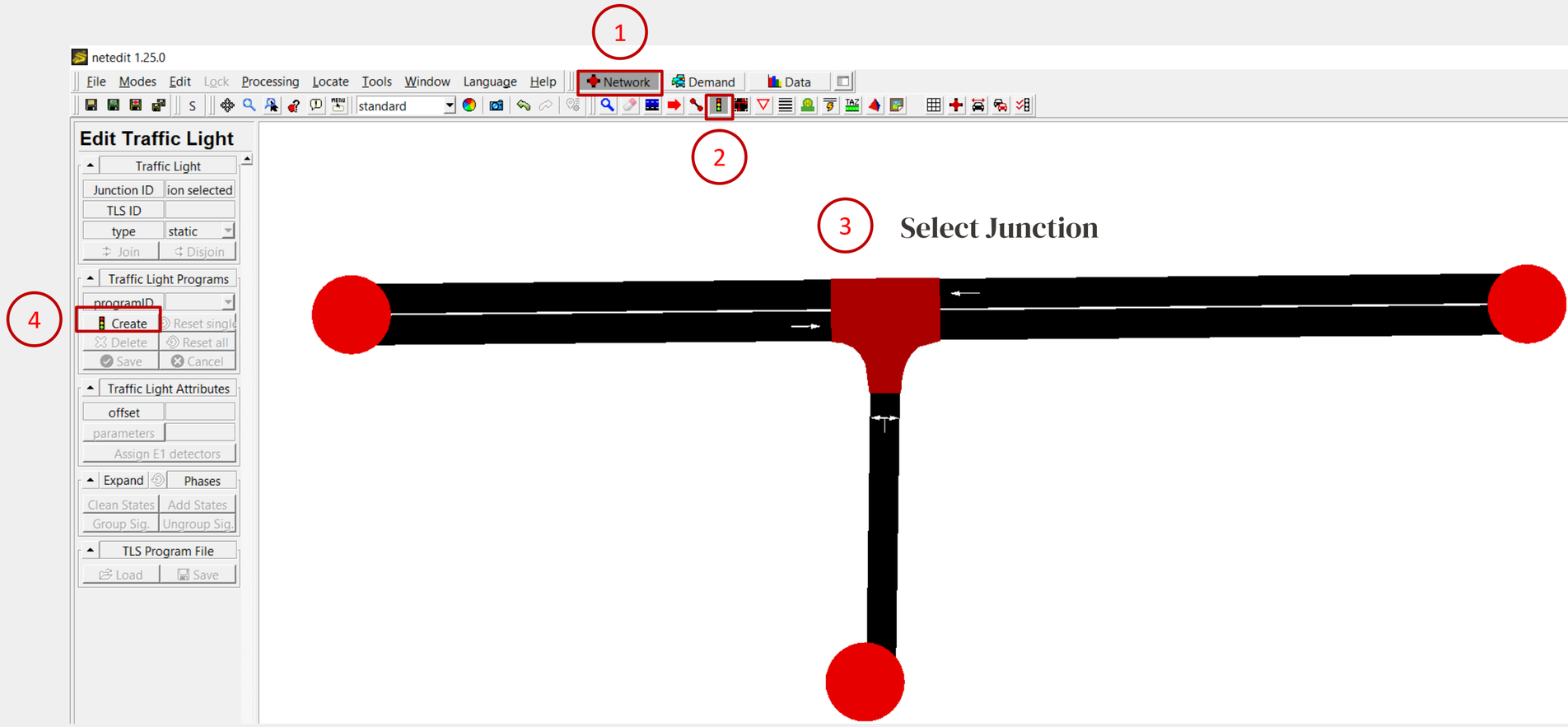


Intersection – Signalized

Traffic Light

➢ Open netedit (Exercise1.netecfg) and do the following actions:

1. Select Network
2. Select Traffic Light
3. Select Junction
4. Create Traffic light



Intersection – Signalized

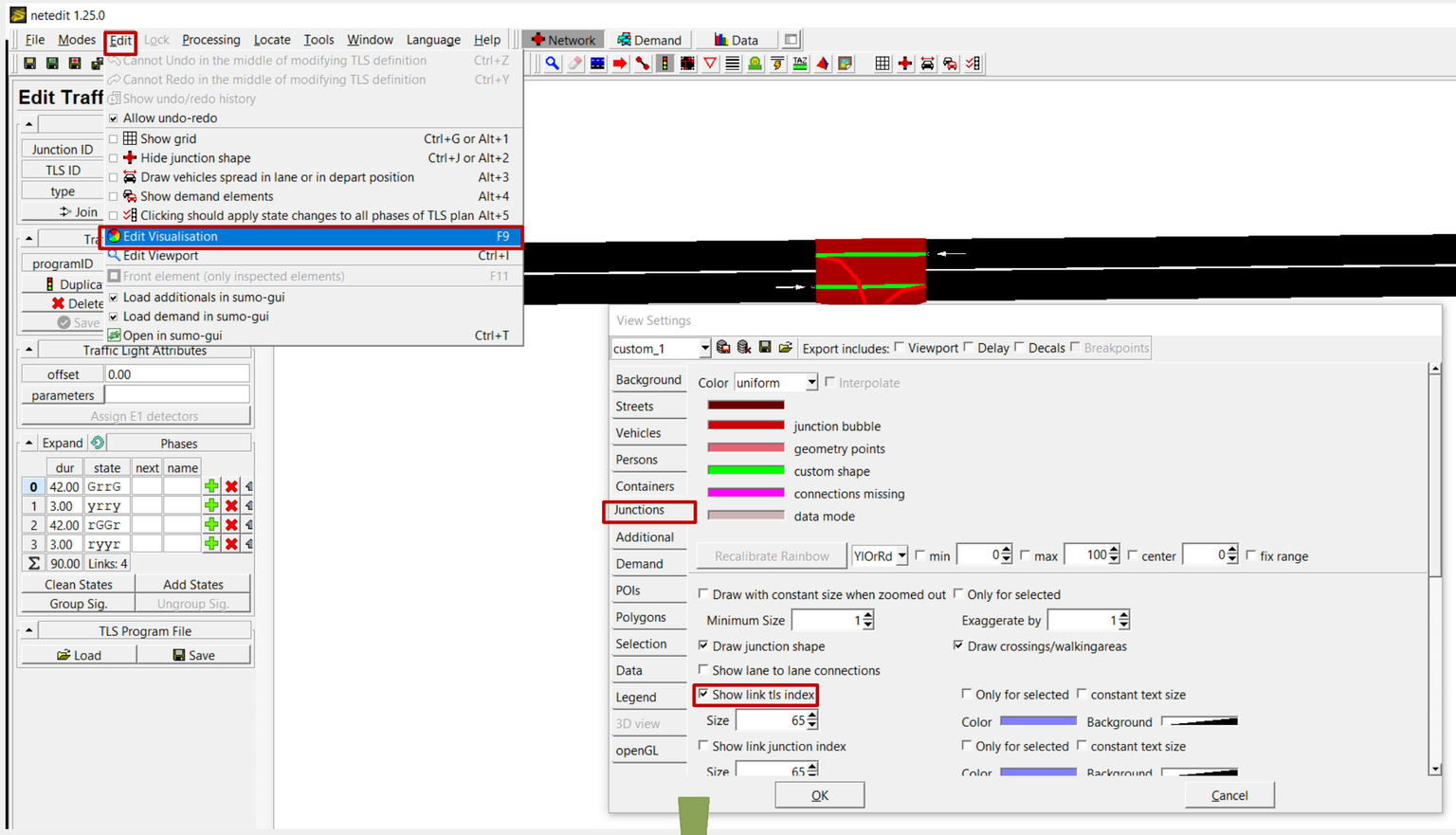
5. Edit → Edit Visualization

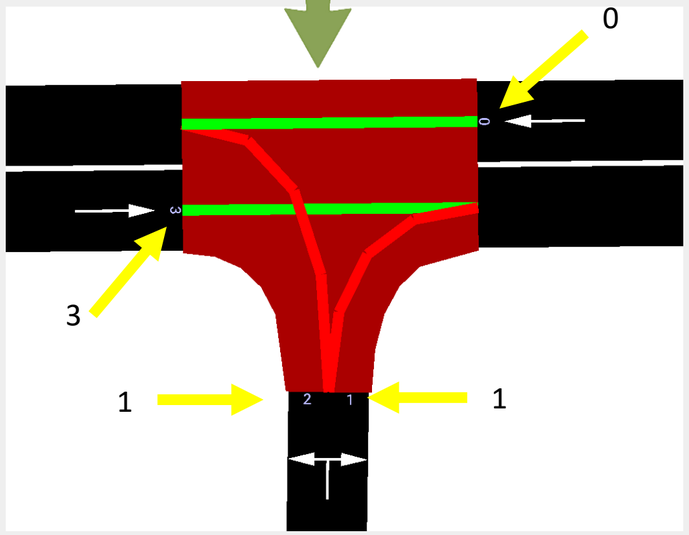
6. Select Traffic Light

7. Select Junction

8. Show link tls index

9. See each traffic signal head number



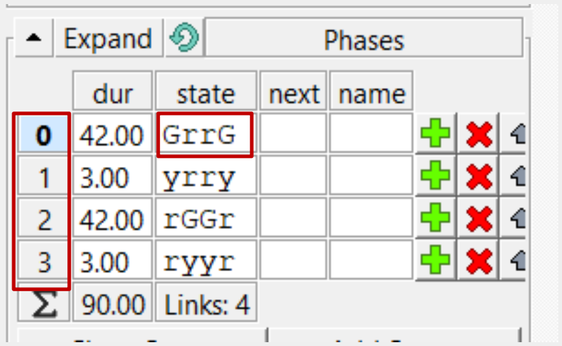


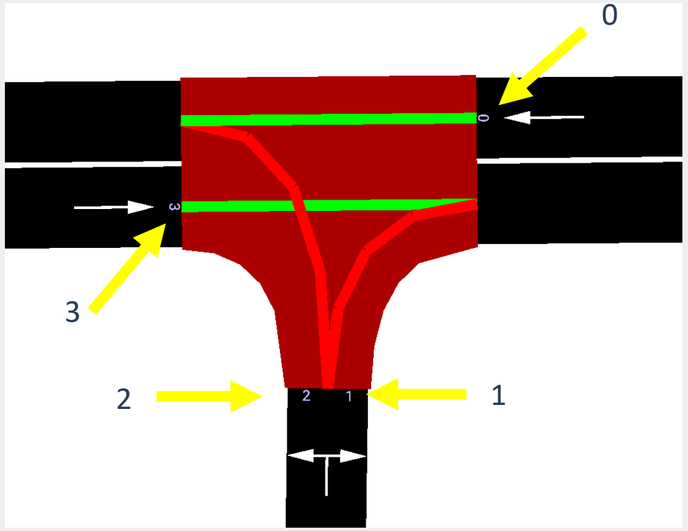
Intersection – Signalized

10. Observe the Four phases on the left Side in Window “Edit Traffic Light”

- Phase 1: 42 second
- Phase 2: 3 second
- Phase 3: 42 second
- Phase 4: 3 second

11. State:
G mean Green
y means yellow
r means red





In phase 0:
GrrG

0,1,2,3

In phase 1:
yrry

0,1,2,3

In phase 3:
rGGr

0,1,2,3

In phase 4:
ryyr

0,1,2,3

Intersection – Signalized

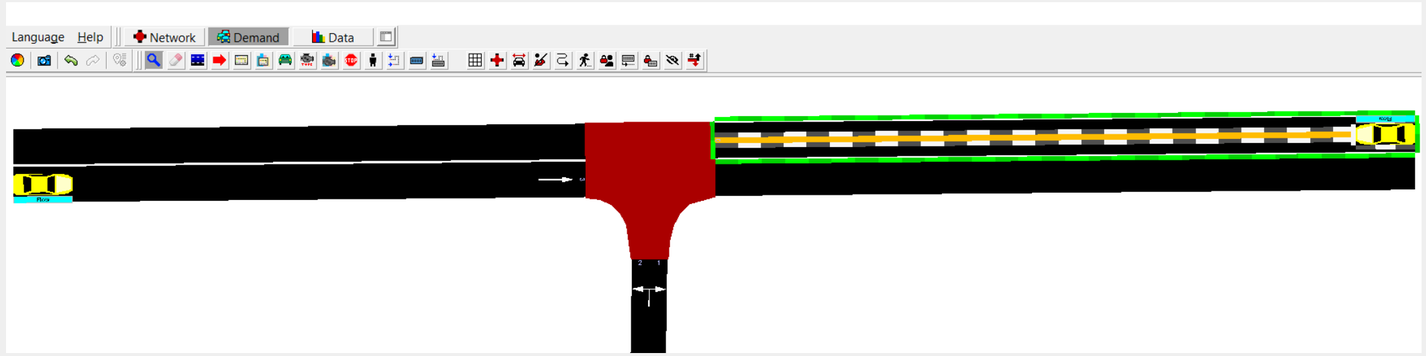
12. Run SUMO and Observe Changing Traffic Lights

13. What do you notice?

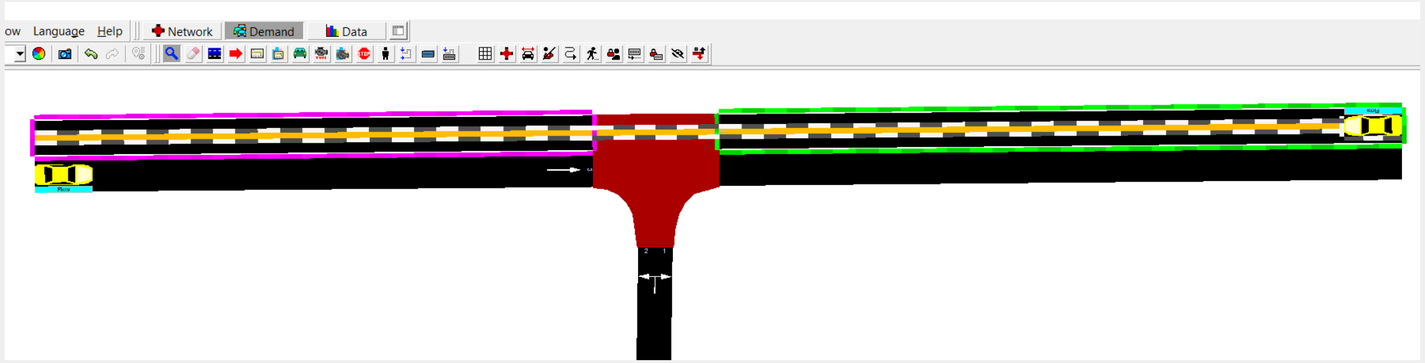
Intersection – Signalized

14. SUMO cars are disappearing before traffic light because we first add traffic light then modify the road network. So, we need to again check the traffic flow route

15. Open Netedit → Select Demand → Select Magnifier → Select Car → Notice the route is finished before intersection



16. Remove the traffic flow in both direction and add new traffic flows with complete route

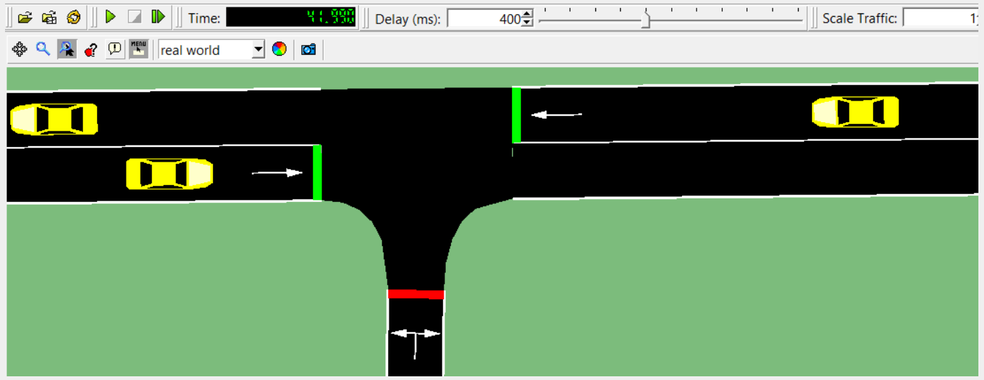


Intersection – Signalized

17. Run SUMO

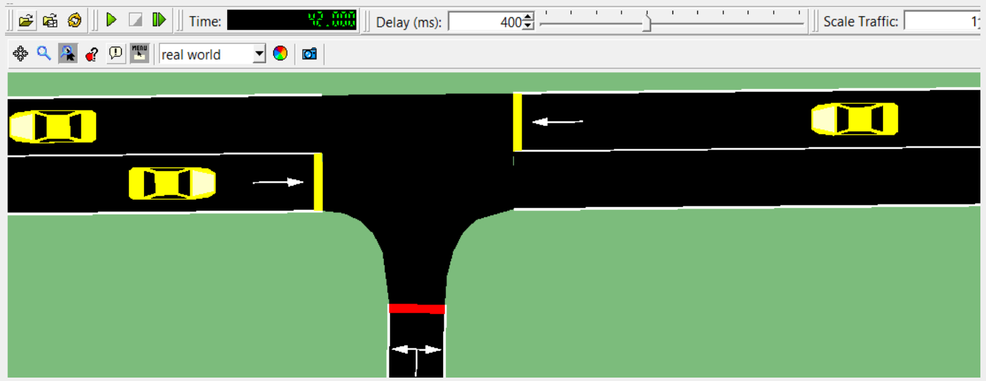
From Second 0 to 41.99,
it is phase 1

	dur	state
0	42.00	GrrG
1	3.00	yrry
2	42.00	rGGr
3	3.00	ryyr
Σ	90.00	Links: 4



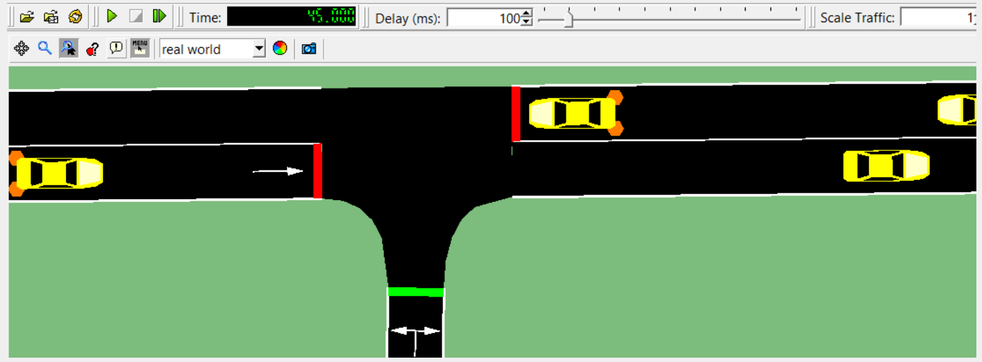
From Second 42 to 44.99,
it is phase 2

	dur	state
0	42.00	GrrG
1	3.00	yrry
2	42.00	rGGr
3	3.00	ryyr
Σ	90.00	Links: 4



From Second 45 to 86.99,
it is phase 3

	dur	state
0	42.00	GrrG
1	3.00	yrry
2	42.00	rGGr
3	3.00	ryyr
Σ	90.00	Links: 4

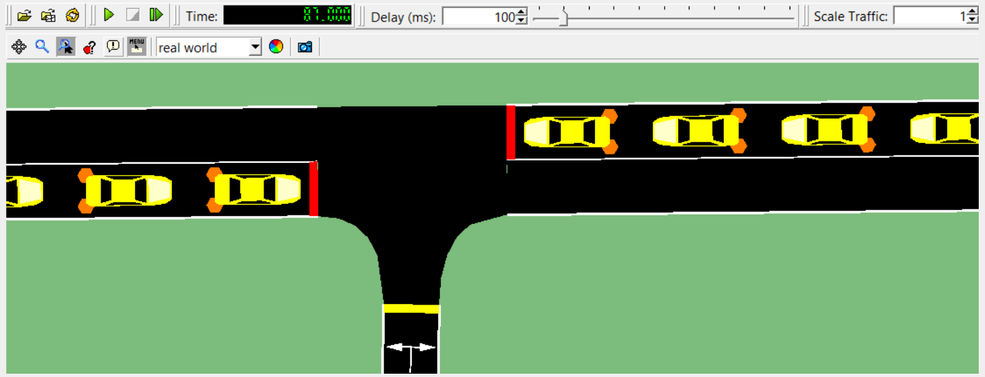


Intersection – Signalized

Run SUMO

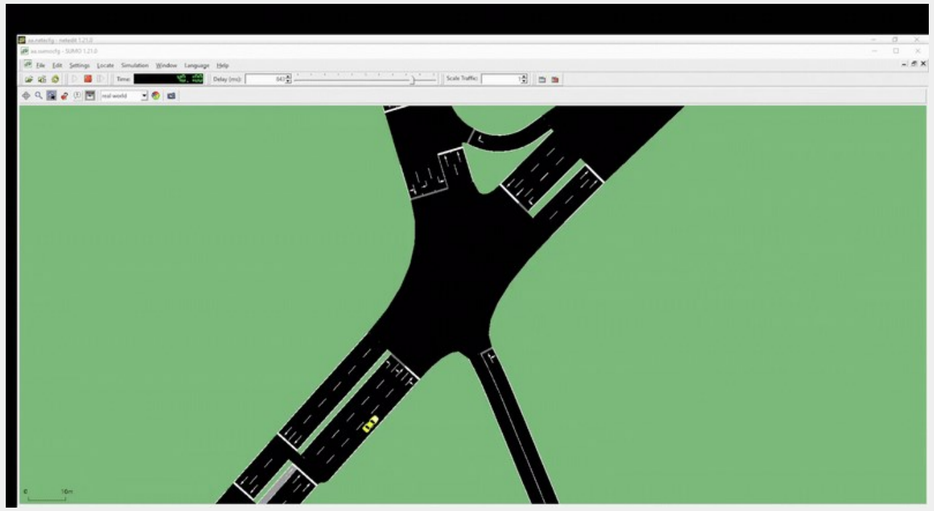
From Second 87 to 79.99, its phase 4

	dur	state
0	42.00	GrrG
1	3.00	yrry
2	42.00	rGGr
3	3.00	ryyr
Σ	90.00	Links: 4



It repeats

Fixing Possible Issue

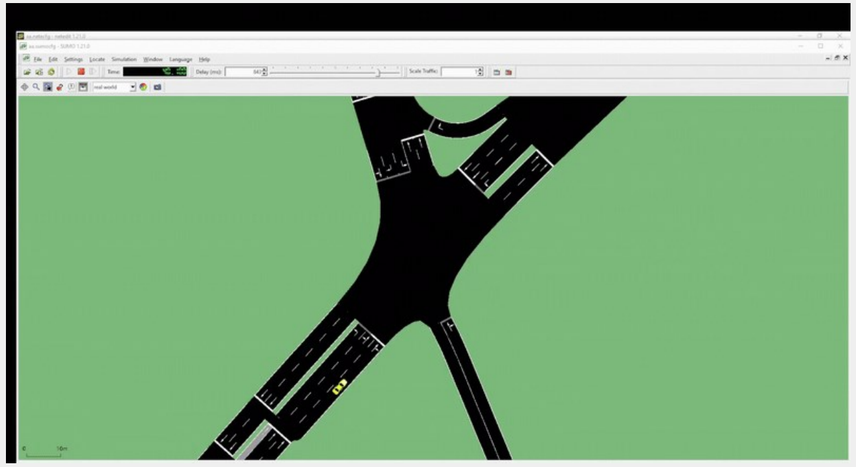


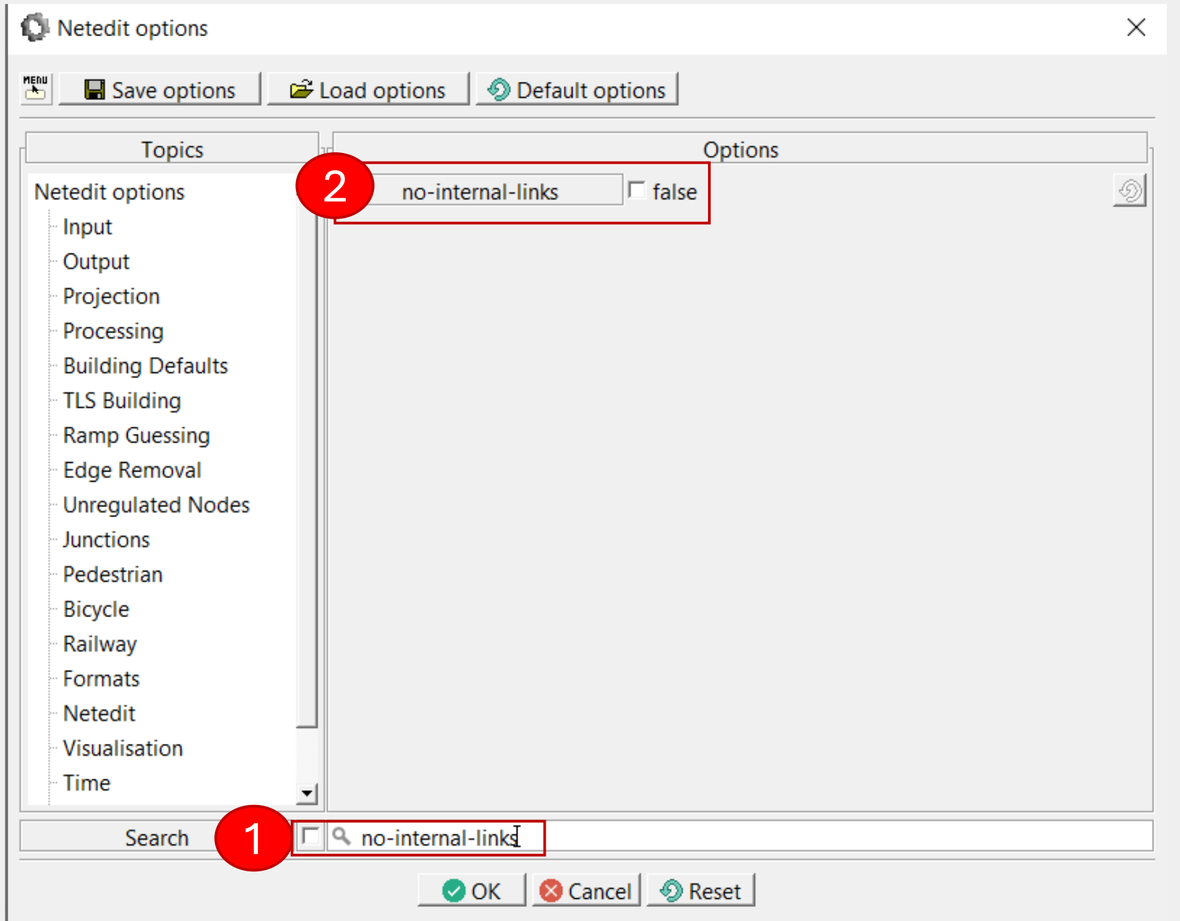
Before Network Creation

If you have not yet created your network

- ❑ Open netedit → Processing → Option → Search “no-internal-links”

→ Make sure it is like the image





After Network Creation

- If you created your network and there is no options to rebuild it again, then, in directory of your project:

- Write cmd then "netconvert --sumo-net-file=your_network.net.xml --output-file=your_network_fixed.net.xml --no-internal-links=false"