

# INTELLIGENT TRANSPORTATION SYSTEM

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# Presentation Outline

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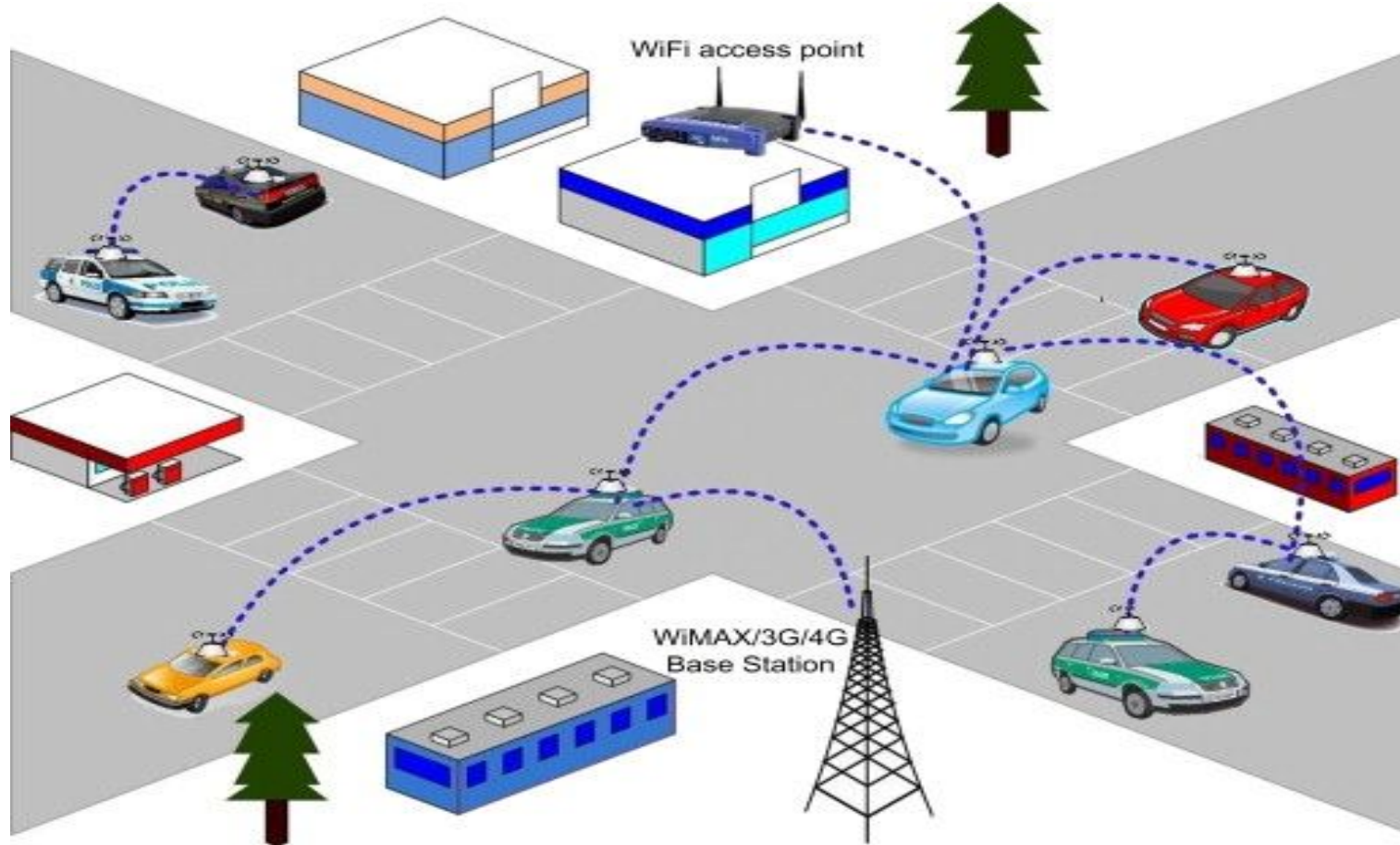
# Introduction

## Description

- A Vehicular Ad-Hoc Network (VANET) is used to create network of vehicles.
- VANET provide safety,traffic,internet connection.
- VANET architecture is to allow the connection between vehicles or between vehicles and fixed road side units leading to the following three possibilities
  - Vehicle to Vehicle
  - Vehicle to Infrastructure
  - Infrastructure to Infrastructure

Domain : Wireless Network

# VANET



# Abstract

- Intelligent Transportation System (ITS) includes making the transportation system to the future using VANET.
- Dedicated Short Range Communication(DSRC) and Global Position System(GPS) can be combined to implement VANET.
- Analyze the delay and the different Key Performance Indicators of the vehicle to vehicle communication using VANET in Simulation of Urban Mobility (SUMO) and Network Simulator(NS3)
- Generating a Traffic using SUMO and analyzing them with NS3 in the different traffic scale

# Literature Survey

Paper details	Journal details	Methodology	Advantages/ Disadvantages
1.Ahmad Yusri Dak ,Saadiah Yahya , Murizah Kassim (Universiti Teknologi MARA )	A Literature Survey on Security Challenges in VANETs -2012	Vehicle ad-hoc networks (VANETs), mobile ad-hoc networks (MANETs), security, technique.	<p>Advantages:-</p> <ul style="list-style-type: none"> <li>● Authentication</li> <li>● Confidentiality</li> </ul> <p>DisAdvantages:-</p> <ul style="list-style-type: none"> <li>● Sending False Information</li> <li>● Node Impersonation</li> </ul>

# Literature Survey

Paper details	Journal details	Methodology	Advantages/ Disadvantages
Aditya Upadhyay, Manoj Sindhwani (Lovely Professional University)	Literature Survey on issues and challenges of clustering in VANET -2015	VANET, clustering, clustering issues, clustering based routing protocols, Issues and challenges of clustering in VANET.	<p>Advantage:-</p> <ul style="list-style-type: none"> <li>● Wireless</li> <li>● Communication Scheme</li> </ul> <p>DisAdvantage:-</p> <ul style="list-style-type: none"> <li>● Collision and Congestion</li> </ul>

# Literature Survey

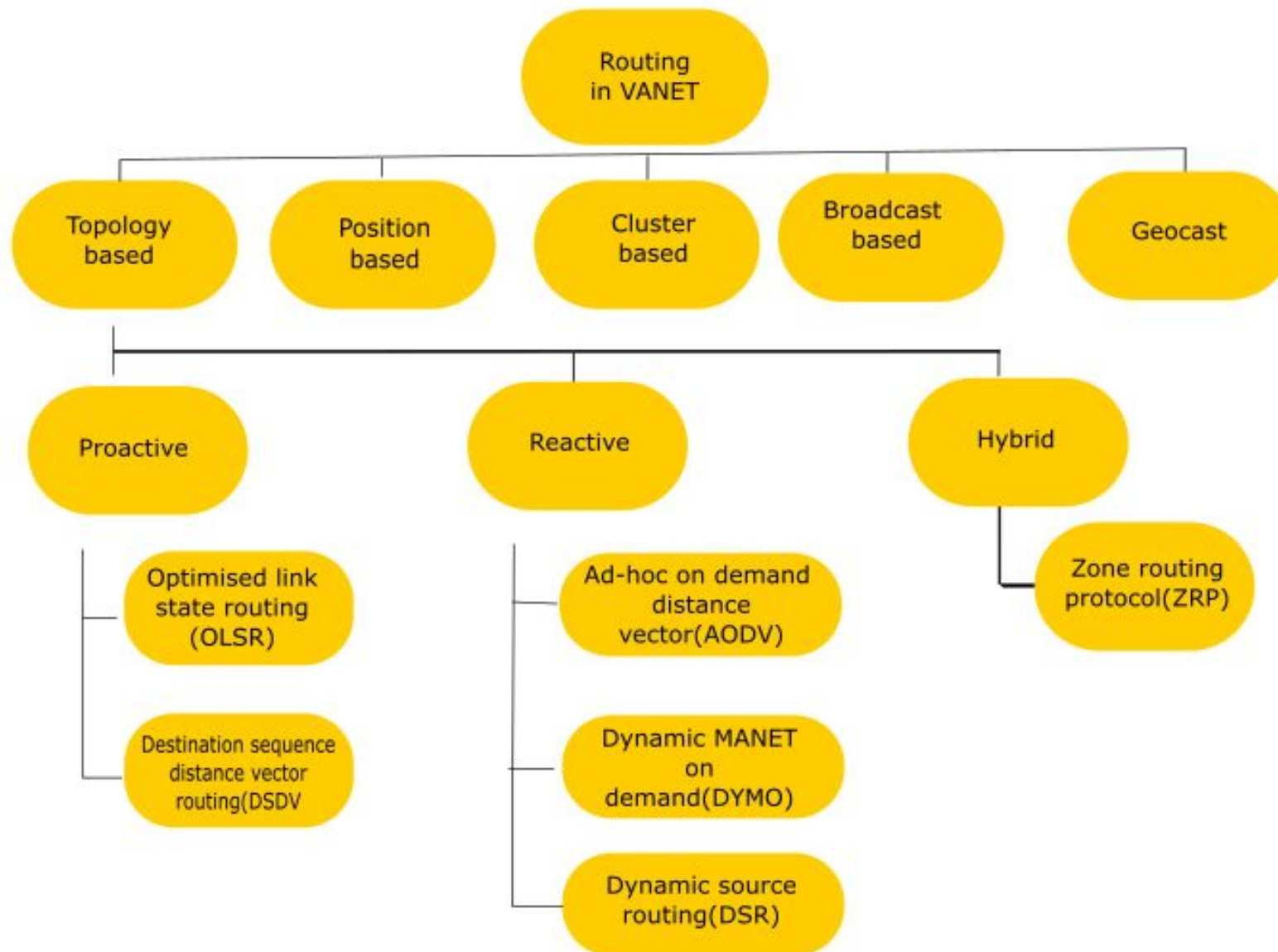
Paper details	Journal details	Methodology	Advantages/ Disadvantages
Jin Tian, IOP Conference Series Earth and Environmental Science	Improved Delay Performance in VANET-2015	Low delay performance in VANT	<p>Advantages:-</p> <ul style="list-style-type: none"> <li>● Delay improvement</li> <li>● Increase accuracy</li> </ul> <p>DisAdvantages:-</p> <ul style="list-style-type: none"> <li>● Collision of Nodes</li> <li>● Cluster of Network</li> </ul>



# Objective

- The main objective of this project is to analyze the delay and different characteristic performance of the vehicle to vehicle communication using VANET in Simulation of Urban Mobility (SUMO) and Network Simulator(NS3)
- Intelligent Transportation System (ITS) targets to provide innovative services relating to different modes of transport and traffic management.
- Message deliveries using different routing protocols Optimized Link State Routing(OLSR)Ad-hoc On-Demand Distance Vector (AODC) Destination Sequenced Distance Vector (DSDV).
- Traffic Generation and analyzing the routing performance of the different above used routing protocols.

# Routing in VANET



# Hardware / Software Details

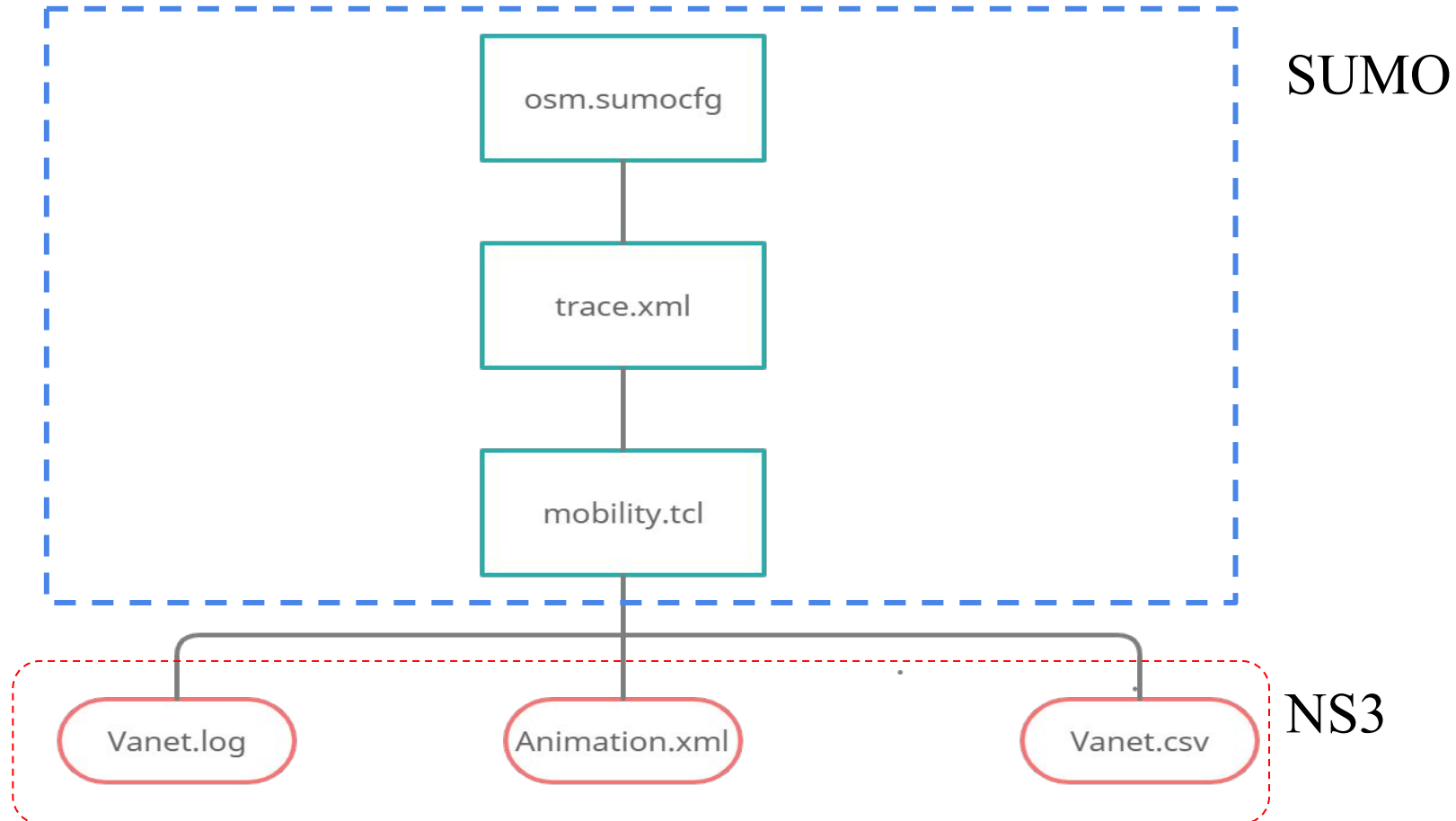
## Hardware

- Memory (RAM)-4GB
- CPU- i3
- Graphics - 2GB
- Disk - 8GB

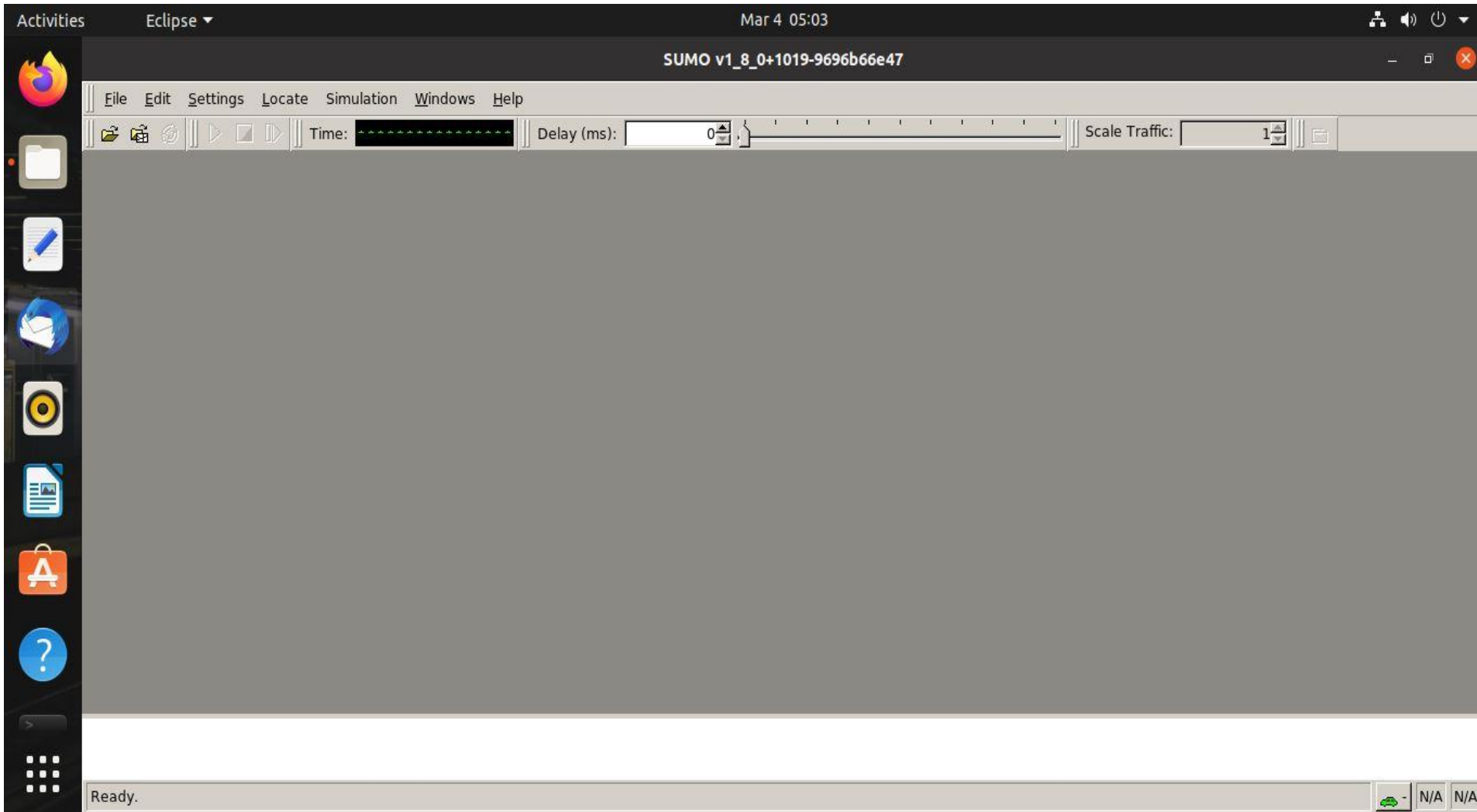
## Software

- VMware Workstation 16 Player
- Ubuntu
- SUMO(Simulation Of Urban Mobility)
- Ns3(Network Simulator)

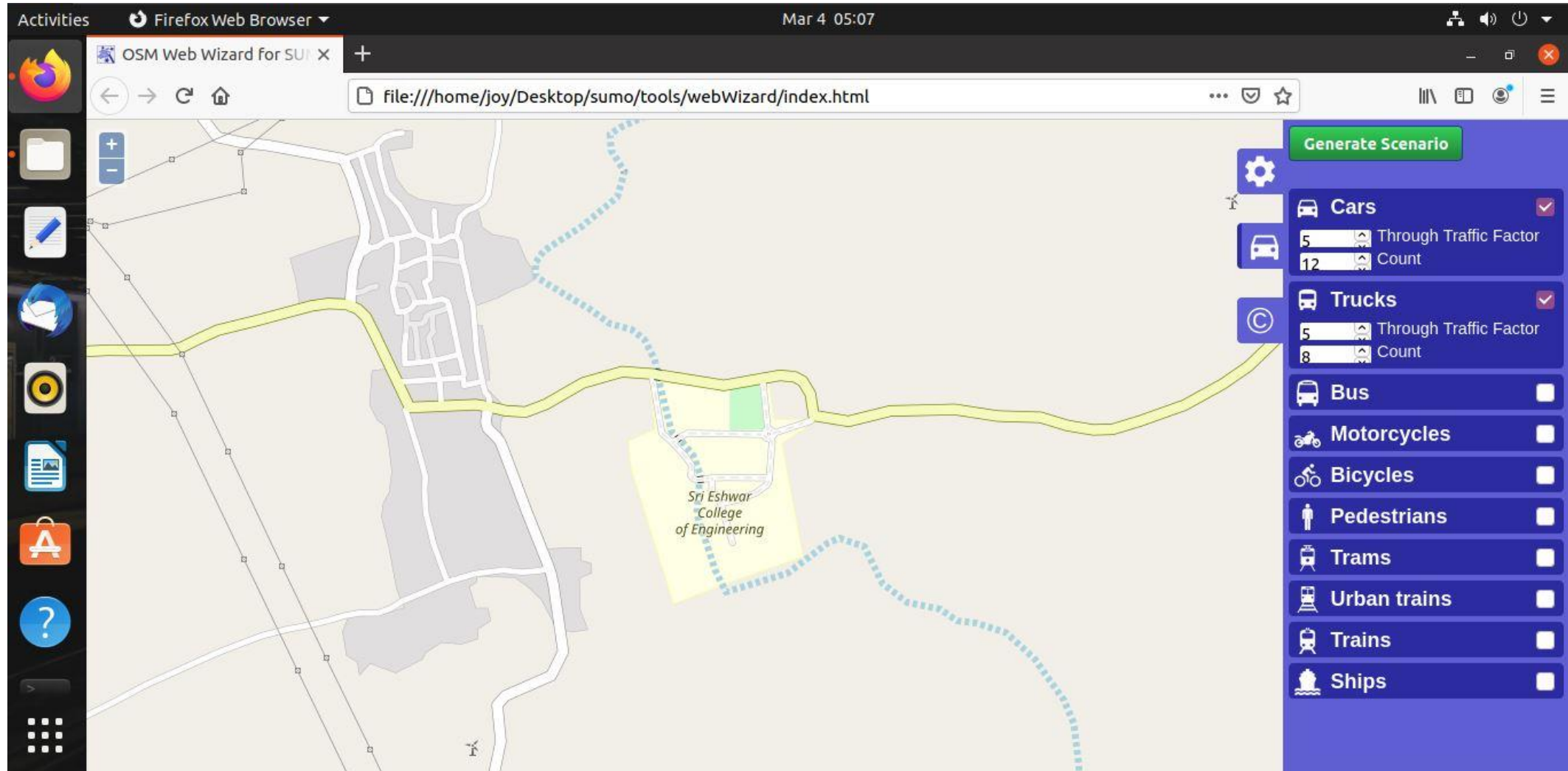
# Flow Diagram:-



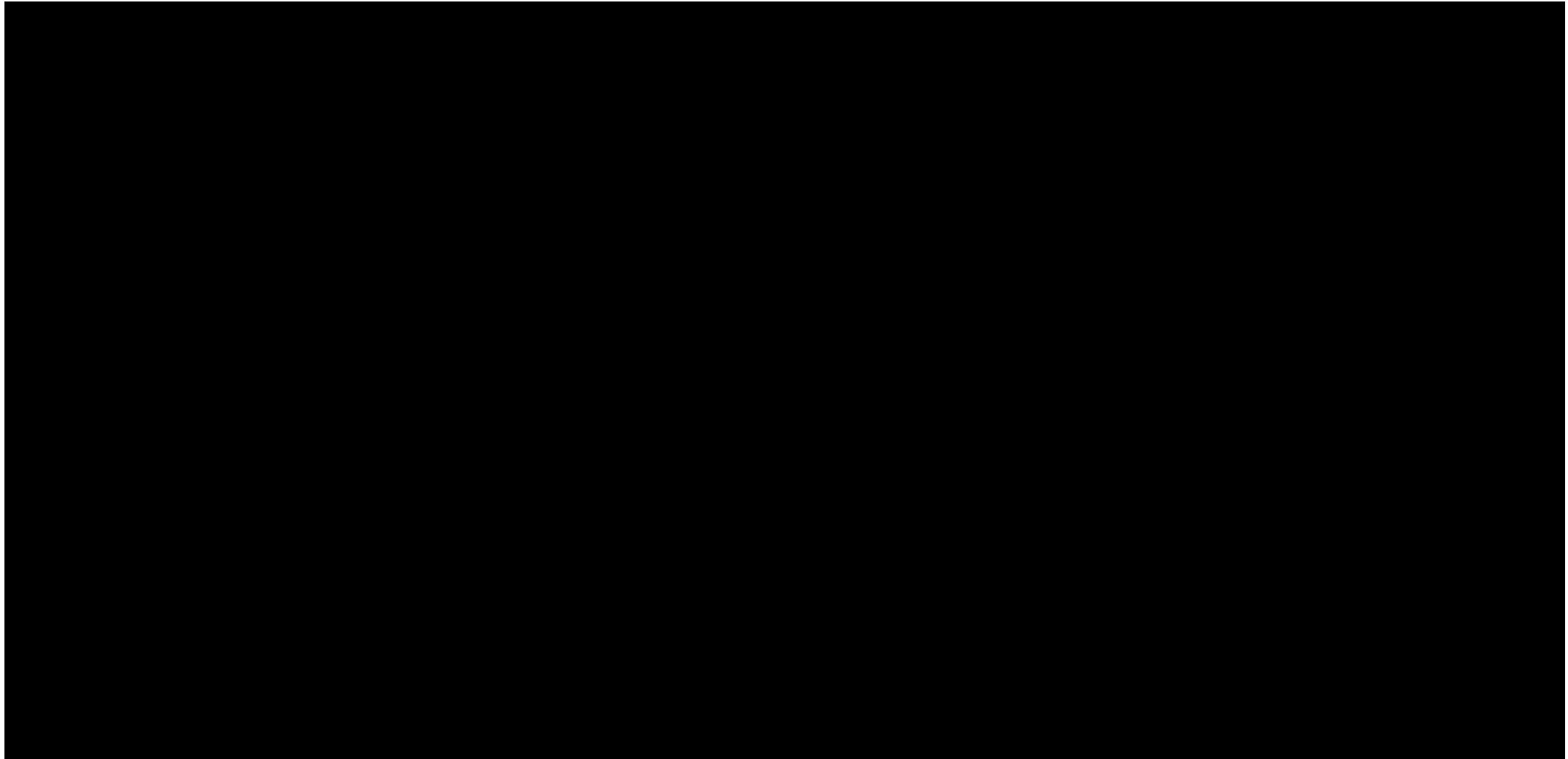
# Sumo Software:



# RoadMap And Vehicle Selection.

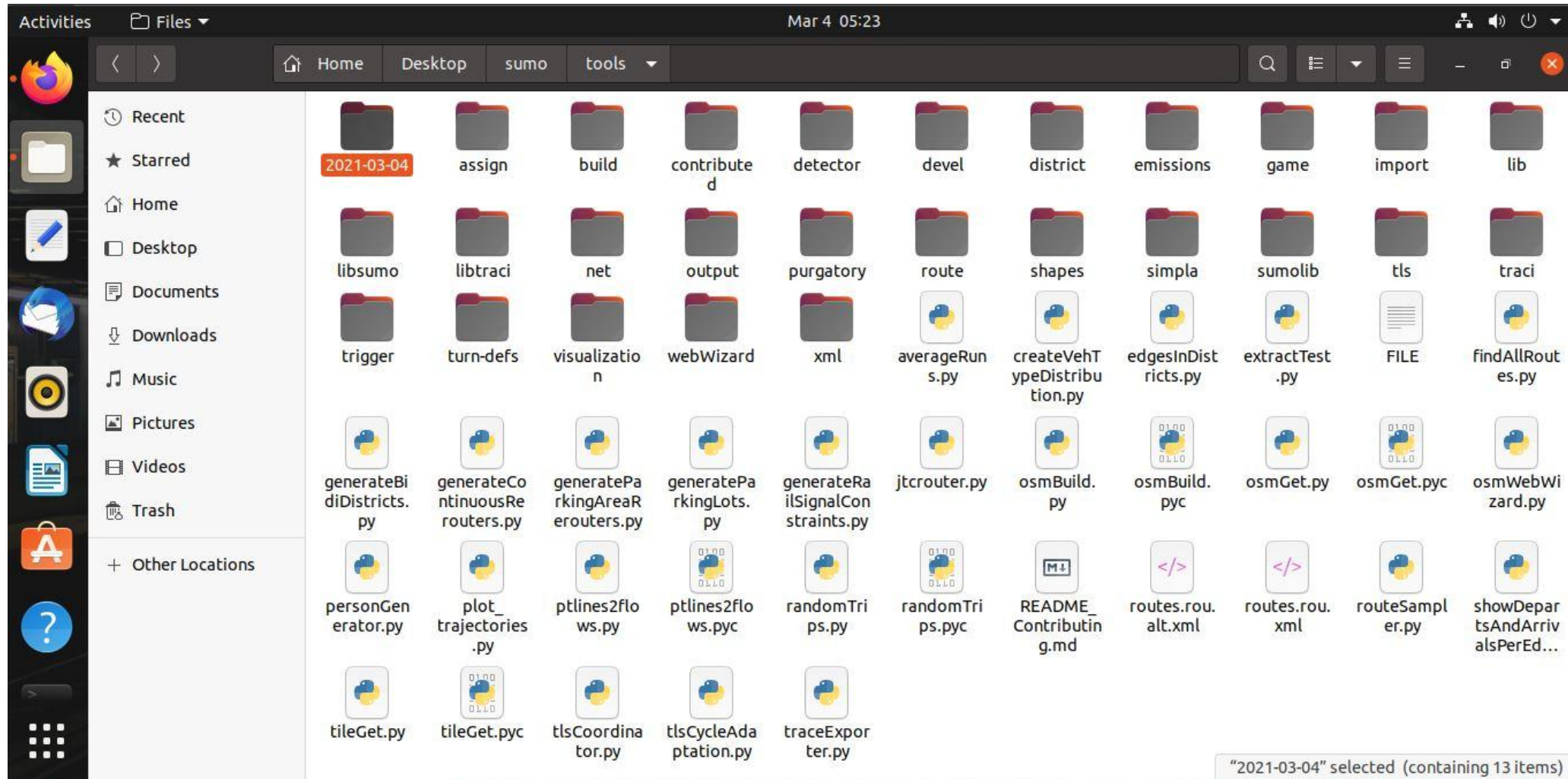


# RoadMap And Vehicle Selection:



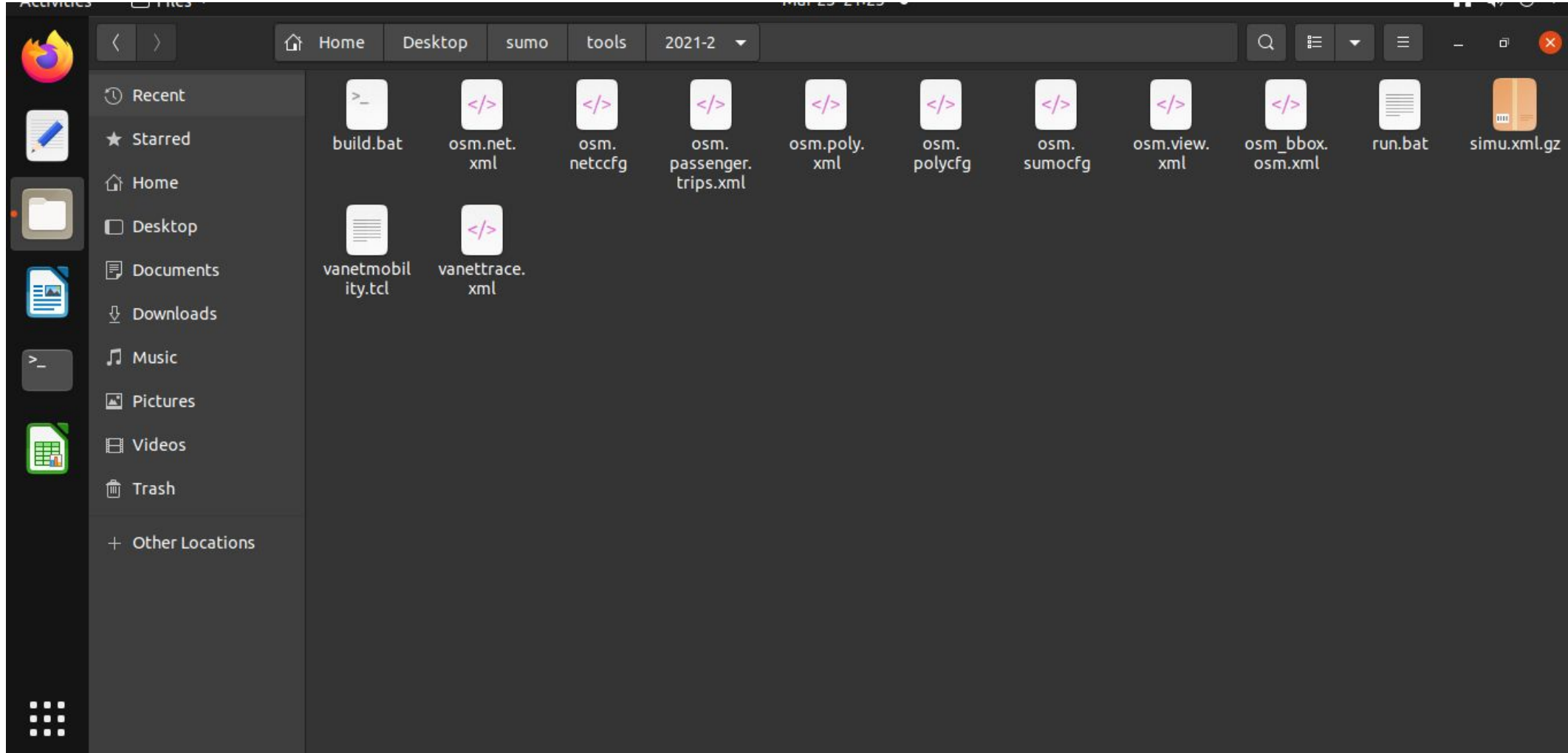


# Sumo Output:

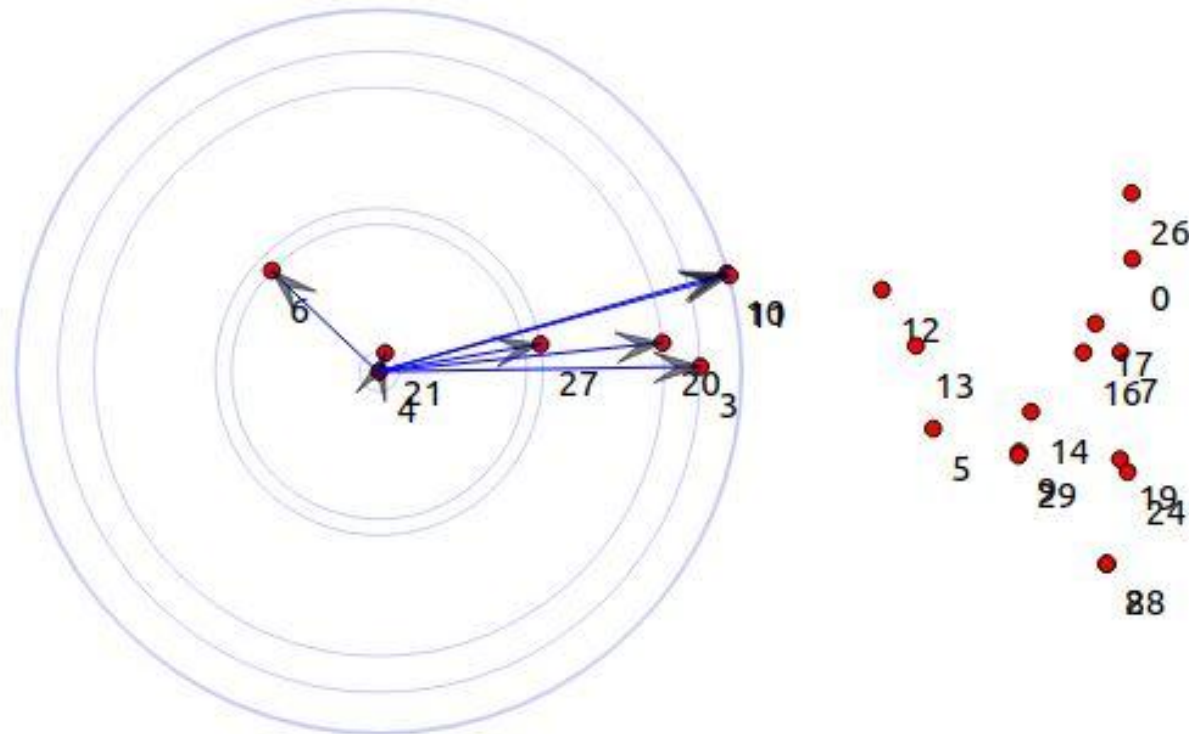




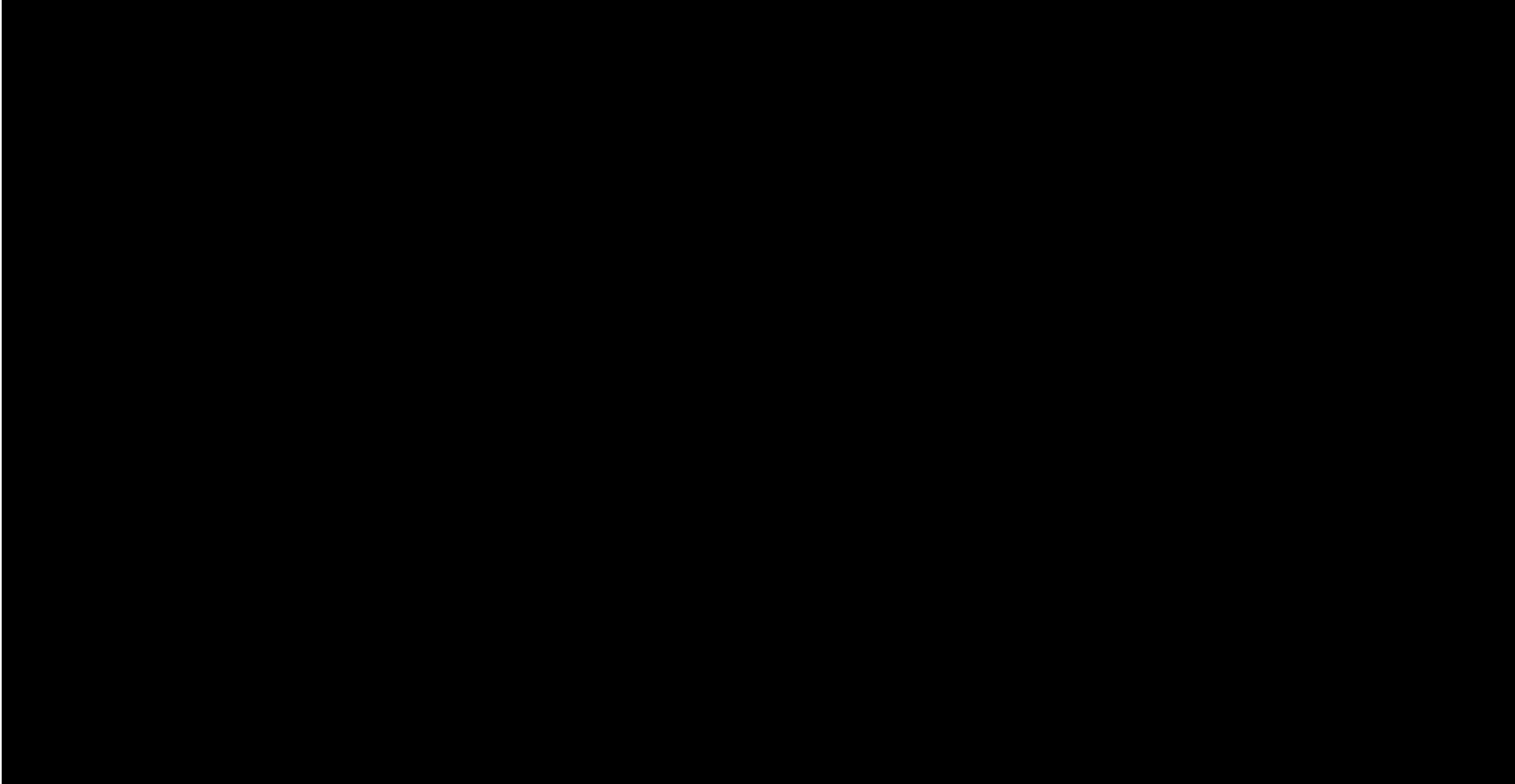
# File Translation



# SIMULATION:-



# NS3(Network Simulator):



# RESULT:

```
-----Total Results of the simulation-----  
  
Total sent packets =3942  
Total Received Packets =3527  
Total Lost Packets =415  
Packet Loss ratio =10%  
Packet delivery ratio =89%  
Average Throughput =2.55059Kbps  
End to End Delay =+13404257631.0ns  
End to End Jitter delay =+11357784759.0ns  
Total Flood id 9  
BSM_PDR1=0.996161 BSM_PDR2=0.99444 BSM_PDR3=0.994307 BSM_PDR4=0.991549 BSM_PDR5=0.982836  
BSM_PDR9=0.868525 BSM_PDR10=0.868525 Goodput=12.038Kbps MAC/PHY-oh=0.455218  
joy@ubuntu:~/Desktop/ns-allinone-3.29/ns-3.29$
```

# RESULT:

Spec\Protocol	OLSR	AODC	DSDV
Total sent packets	3942	10568	5936
Total Received Packets	3527	8171	3504
Total Lost Packets	415	2397	2432
Packet Loss ratio	10.00%	22.00%	40.00%
Packet delivery ratio	89.00%	77.00%	59.00%
Average Throughput	2.55059kps	4.07215kbps	1.72772kbps
End to End Delay	13404257631	411298944083	14604725191
End to End Jitter delay	11357784759	149552736351	11563819227

# References

1. Balapgol, S., & Deshmukh, P. K. (2015, July). Broadcast protocol for V2V and V2RSU in VANET. *International Journal of Advanced Research in Computer and Communication Engineering*, 4(7). [\[Google Scholar\]](#)
2. Coutinho, B. V., Wille, E. C., & Del Monego, H. I. (2015, January). Performance of routing protocols for VANETs: A realistic analysis format. In *Proceedings of the 9th International Conference on Ubiquitous Information Management and Communication* (p. 1). ACM. [\[Google Scholar\]](#)
3. Da Cunha, F. D., Boukerche, A., Villas, L., Viana, A. C., & Loureiro, A. A. (2015, September). Data communication in VANETs: A survey, challenges and applications. [\[Google Scholar\]](#)





Any queries

*Thank  
you!*



Any queries