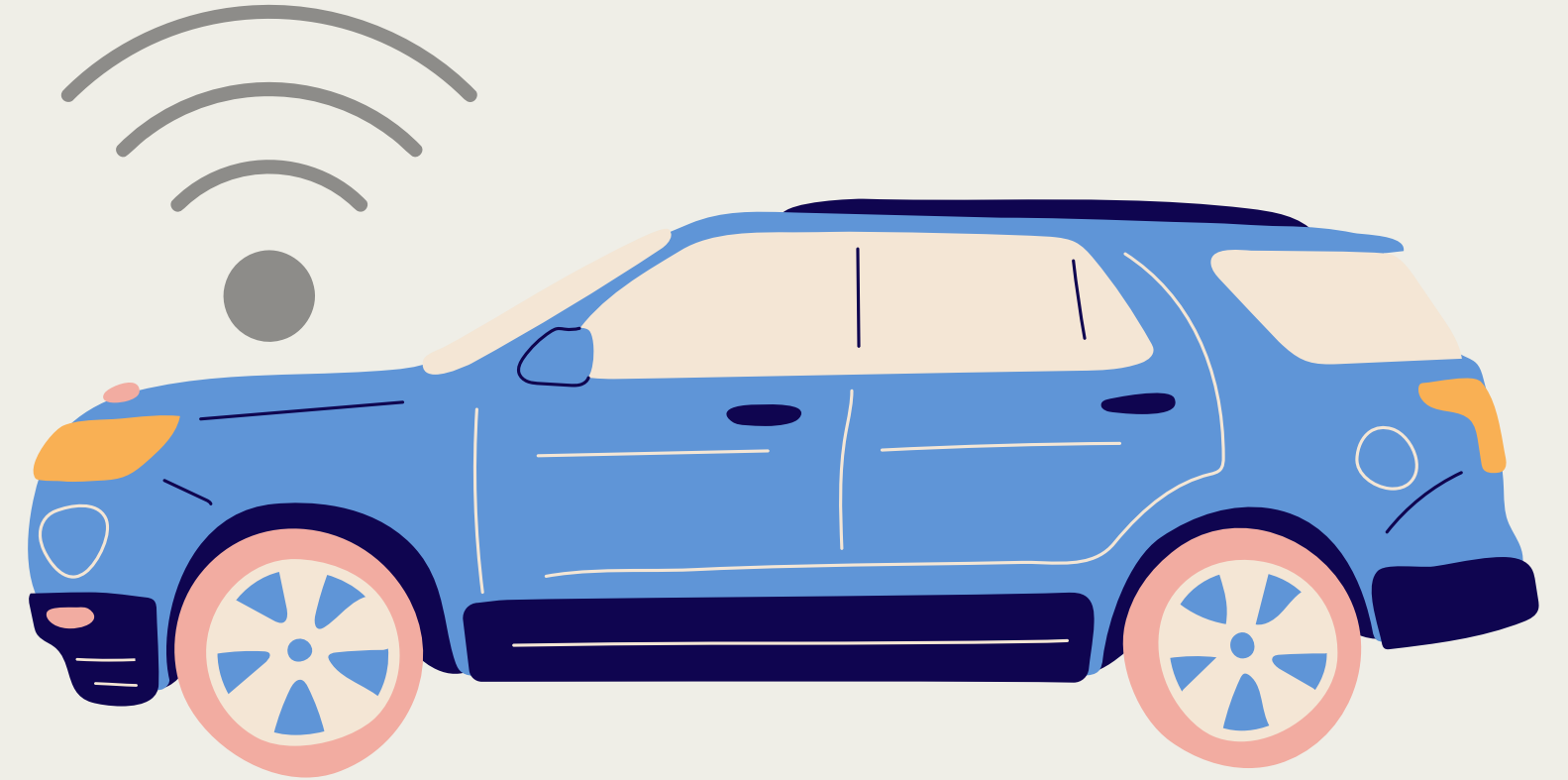


VANETS



VEHICLE TO VEHICLE COMMUNICATION (V2V)

Group 14

19ECE436 - Wireless Sensor Networks

Akshith Vinukonda - CB.EN.U4CCE20004

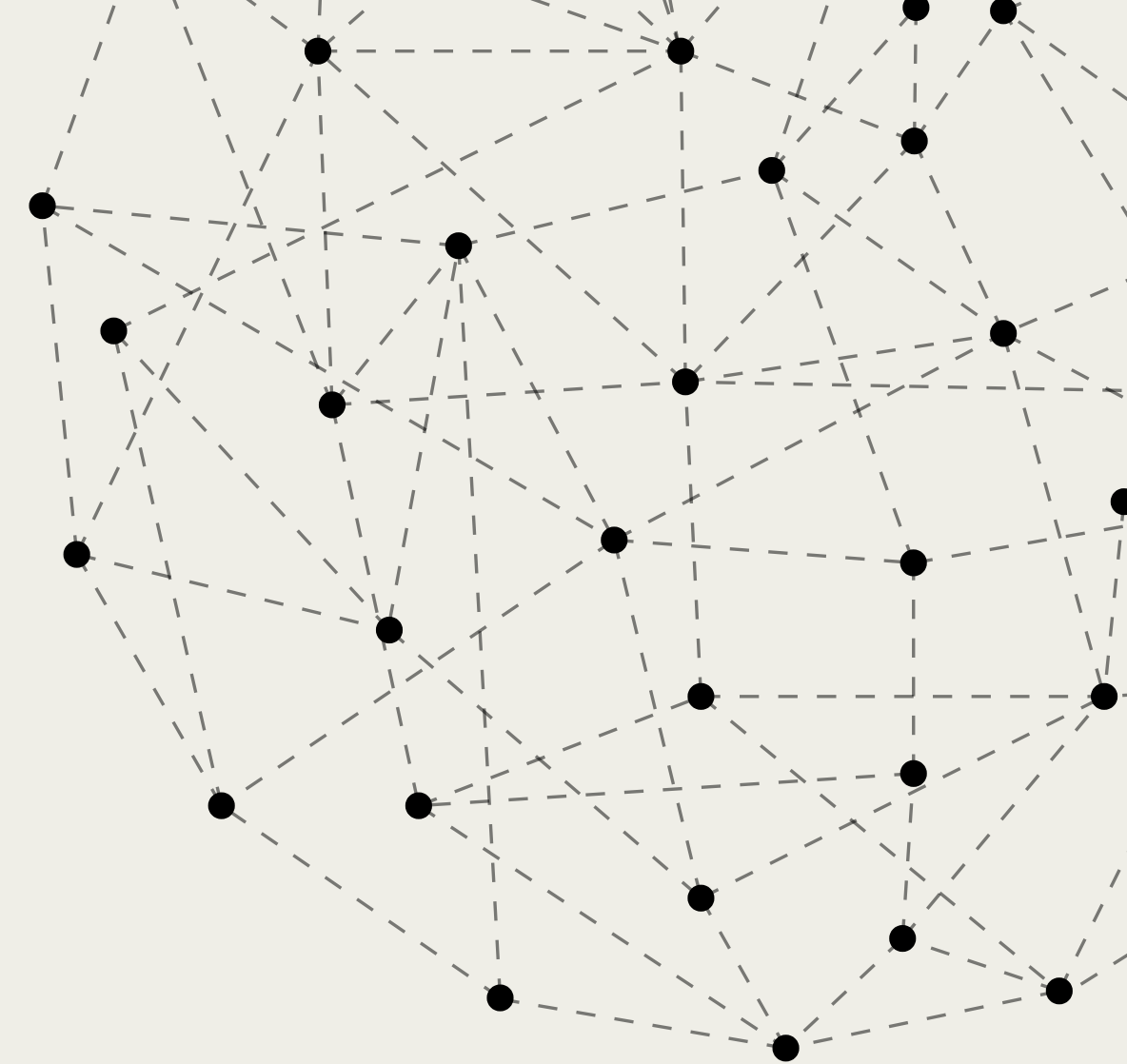
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Vehicular Adhoc Networks

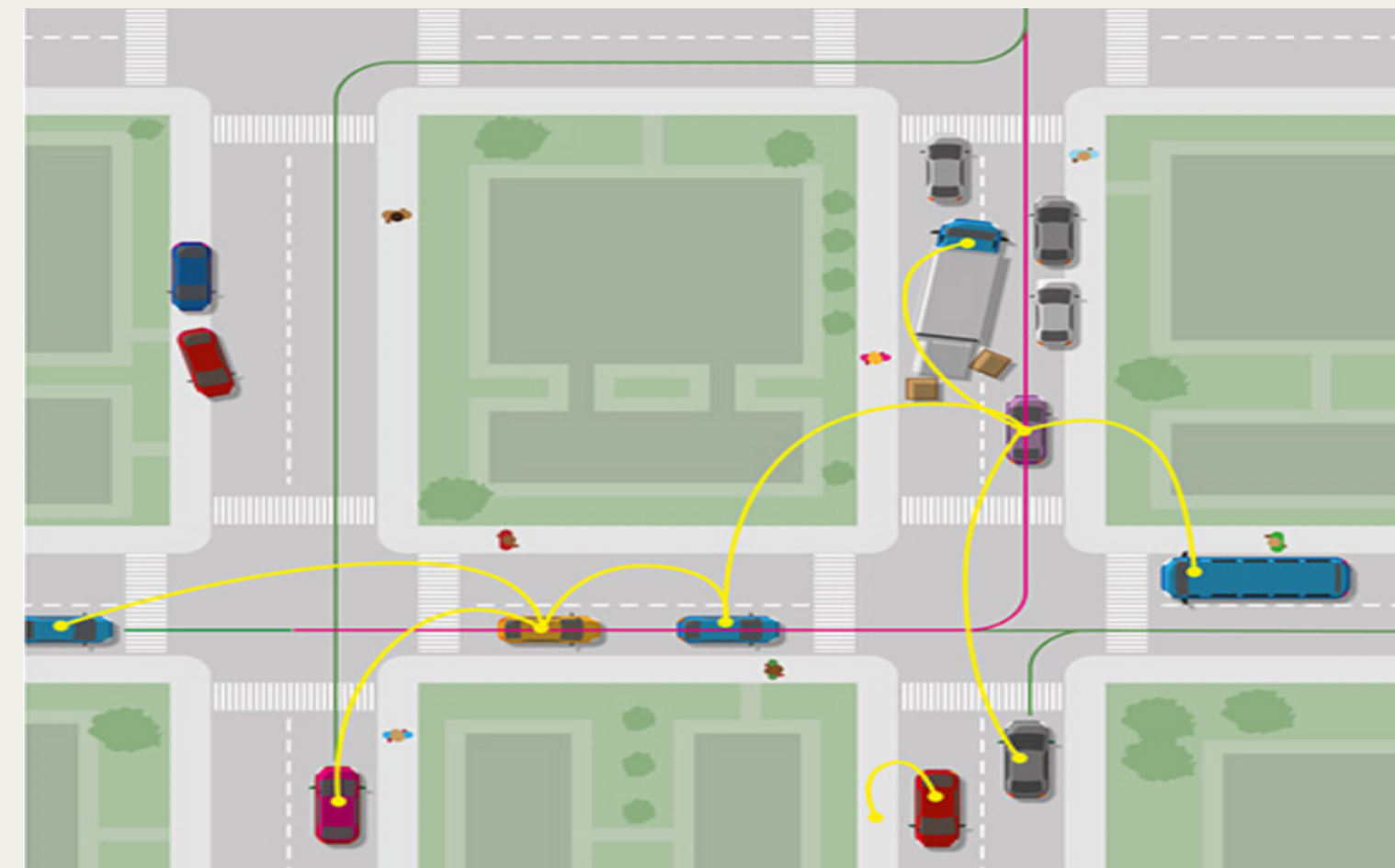
WHAT ARE VANETS?

- A Wireless Ad Hoc Network that provides communication among vehicles with OBU's and nearby RSU's
- The purpose is to provide
 - Ubiquitous Connectivity while on Road to Mobile Users
 - Efficient V2V Communications that enable ITS



Vehicle 2 Vehicle Communication (V2V)

- V2V (vehicle-to-vehicle) is a communication technique that aids in crash avoidance. It makes use of VANETs (vehicular ad hoc networks), which are wireless networks that allow vehicles to communicate and share information about their driving habits.
- This technology is critical for improving road safety by sending out incident notifications before a driver notices them
- Vehicle-To-Vehicle communication technology allows vehicles to transmit data using a mesh network that is wireless, to send and receive signals

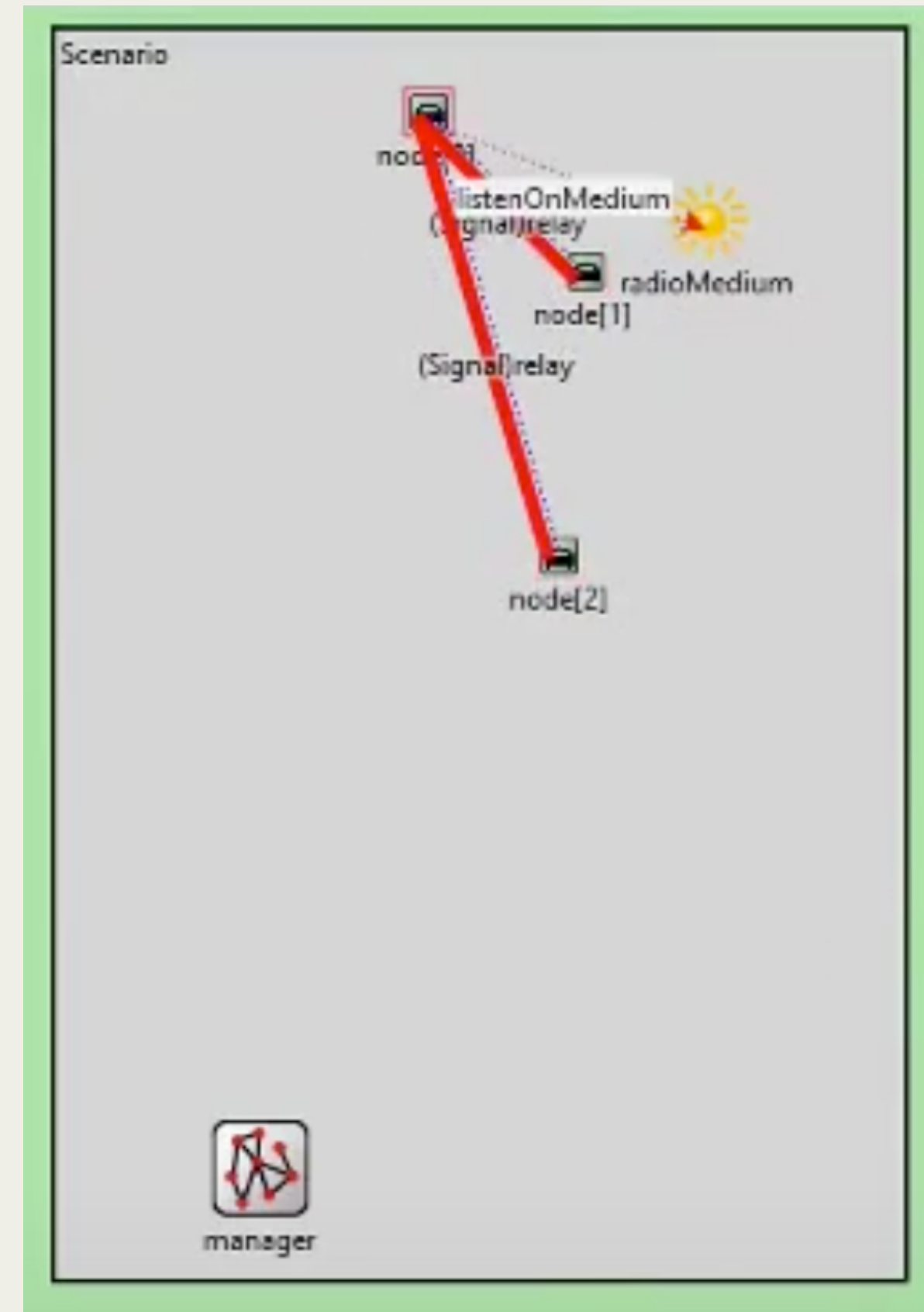


LITERATURE SURVEY

S.No.	Title of the Paper (Year)	Journal/Conference	Methodology & Results
1.	Implementation of In-Vehicle and V2V Communication with Basic Safety Message Format (2019)	International Conference on Inventive Research in Computing Applications (ICIRCA)	The paper focuses on the design and development of V2V communication system that will collect vehicle related data and transmit it over Wi-Fi to the vehicles in its vicinity.
2.	VANET Routing Protocols: Review, Implementation and Analysis (2020)	Journal of Physics: Conference Series	VANET gives a communication framework that has enhanced the traffic service and helped in reducing the road accidents.
3.	Collision Avoidance Predictive Motion Planning Based on Integrated Perception and V2V Communication (2022)	IEEE Transactions on Intelligent Transportation Systems (Volume: 23, Issue: 7, July 2022)	We design an AV motion planning strategy based on motion prediction and V2V communication. We propose the perception system and V2V communication module to provide real-time traffic and vehicular information to the participated AVs.

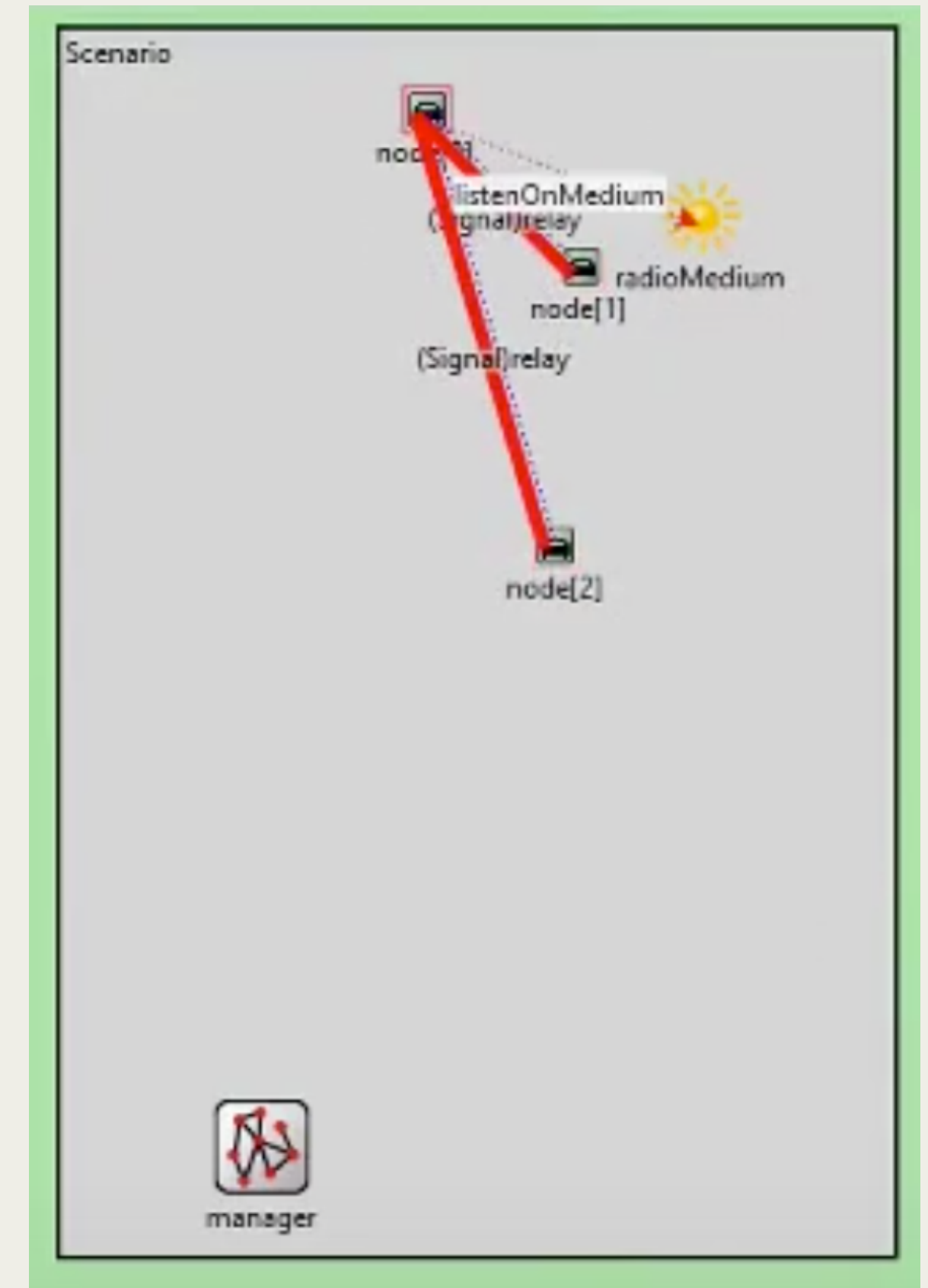
METHODOLOGY

- Define the network topology, including the number of vehicles, their initial positions, and destinations.
- Choose the communication protocol for V2V communication (e.g., AODV, DSDV).
- Configure traffic flow and vehicle mobility models in SUMO.
- Design the network configuration for OMNet++, including vehicle modules and channels.



DESIGN PARAMETERS

- Radio Band Name = 5.9 GHz
- Radio Channel Number = 3
- Radio Transmitter Power = 20mW
- Radio Bandwidth = 10 MHz
- RadioMedium: IEEE 802.11 Scalar Radio Medium
- IPv4 Configurator Interfaces: wlan0
- IPv4 Configurator MCast Groups = 224.0.0.1
- Routing Technique: Ad hoc On-Demand Distance Vector Routing (AODV)



FUTURE SCOPE AND CONCLUSION

- Future Scope
 - Advanced V2V Communication Protocols
 - Heterogeneous Networks
 - Develop frameworks for co-simulation of V2V communication with traffic flow and city models

V2V communication implemented through Veins and Sumo in OMNet++ demonstrates a feasible and flexible framework for simulating and analyzing connected vehicle performance. It facilitates key performance analysis, allows for modification and extension, and supports large-scale simulations, paving the way for further research, development, and ultimately, safer, more efficient, and sustainable transportation systems.

Thank you!