

# Vehicle Assisted Data Delivery Technique To Control Data Dissemination In Vehicular AD - HOC Networks (Vanets)

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**Abstract:** Multi-hop data delivery through vehicular ad hoc networks is complicated by the fact that vehicular networks are highly mobile and frequently disconnected. To address this issue, the idea of helper node is opted, where a moving vehicles carries the packet until a new vehicle moves into its vicinity and forwards the packet. Different from existing helper node solution, use of the predicable vehicle mobility is made, which is limited by the traffic pattern and the road layout. Based on the existing traffic pattern, a vehicle can find the next road to forward packet; a vehicle can find the next road to forward the packet to reduce the delay. Several vehicle-assisted data delivery (VADD) protocol is proposed to forward the packet to the best road with the road with the lowest data delivery delay. Experiment results are used to evaluate the proposed solutions. Results show that the proposed VADD protocol outperform existing solution in terms of packet delivery ratio, data packet delay and protocol overhead. Among the proposed VADD protocols, the Hybrid probe (HVADD) protocol has much better performance. In this Solution the helper node technique is provider with which the helper node will contain destination node path and the path in routine table continuously changes with the help of helper node technique.

**KEYWORDS:** TRAFFIC ISSUE, CTIS, VANETS, TLO, VADD.

## 1 INTRODUCTION

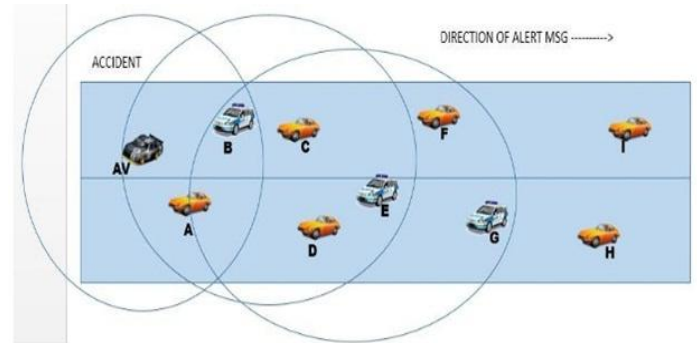
Traffic congestion is the most crucial problem in these days. There is a rush of vehicle available on the roads causes the various negative impacts like:

- 1 Gallon of the fuel wasted due to the traffic congestion. 2 Its impact on the health environment as well as the economy of the Nation. The communication between the vehicles is used for the safety and for entertainment as well. The Data dissemination is used for the convey the message from the source vehicles to the destination vehicles. Data dissemination used to improve the quality of driving in the term of the time, safety and the distance. The flow of traffic and traffic congestion will be reducing by the Traffic information system. The purpose of the (TIS) traffic information system is to collect, evaluate and data dissemination traffic related information to the VANET. But there is a some limitation over TIS. It has a very limited bandwidth. But the data will be send over the large amount and the long range vehicles. That limitation covered by CTISs (Cooperative traffic information System. In this system the information which is collected by the vehicles is exchange by them using wireless VANETs.
2. Recently the promises of the wireless communication are the support vehicular safety applications have led to the several research projects over the world. It is clear that VANETs has become the most relevant and realization of mobile ad hoc network. In the case of the VANETs it is possible to strategically place assess point along the side of the road and in turn allow vehicles access the service available from the infrastructure. VANETs (vehicular ad hoc networks) use cars or vehicles as the mobile nodes through MANET. Which allowing approximately 100 to 300 meters of each connection range. When a car falls out to the signal range then the other car will be join it. {3} VANET have the various components. OBU (On-Board Unit) are installed in vehicles the for providing the wireless communication. RSU (Road Side Unit) deploy the hotspot or the intersection to provide the information.AU (Authentication Server) that provides the proper security to the user. Section {1} IEEE 802.11 provide

the short range communication system {},so we use IEEE802.11A standard instead of that. In 2001 faster relative started shipping.The 802.11a standard uses the 5GHZ band, and operates at a raw speed of 54 Mbps. [1] although a 2003 world radio communication Conference made it easier for the use of worldwide. [2]802.11b is has a range up to a several hundred meters with the low-gain Omni directional antennas. Vanets can be utilized for a broad range of safety and the non safety applications used for the vehicle safety, toll payments, traffic management fondest the closest fuel station or restaurant etc.ITS include application such as co operative traffic monitoring, control of traffic flows.

ITS(Intelligent transport System) in this system each vehicle play the role of the sender and receiver and route to the broadcast information to the vehicular network provide safe and the free flow of the traffic.IVC(Inter Vehicle Communication) uses multi hops multicast –broadcast to transmitted traffic related information over multiple hopes to a group of a receiver. Upon receipt of the messages vehicle ignore the message if it has comes from the behind it. This limitation is covered by the IVC.V2R (Vehicle to Roadside) communication will provide a high bandwidth link between the vehicle and the roadside units. Routing based communication configure the multi hop unicast where a message is propagated in a multi Routing based communication hop until the vehicle carrying the desired data is reached. Data Dissemination in VANETs can be used to inform the derivers for the jam of the traffic jams and provide the warning to the drivers to avoid the collision.Vanets is used for improve the efficiency of traffic system. In Vanets the delivery is not single but the multihop, in these situation vehicles can forward their request to other vehicle and get respond in back in fraction of second. Throughout the world millions of hours and gallon of fuel are wasted everyday by vehicle stuck in the traffic. The improvement of the traffic flow and the congestion reduction can be achieved by the means of Traffic Information Systems(TISs) the purpose of the TIS is to capture, dissemination and evaluate the traffic related information. But TIS perform the restricted bandwidth; therefore traffic information can be limited in detail. This drawback can be overcome by the CTIS (Cooperative Traffic information System) where traffic related information is collected individually by

vehicles and exchange between themselves using wireless networks. We can use the wireless technology here like GSM, GPRS, or UMTS .which have the lowest bandwidth. Instead WLAN have the higher bandwidth. We can use the WLAN for the communication for the various networks here. The MAC layer is a set of protocols, which is responsible for the maintaining order and management in the use of a shared medium. [ ] The DFWMAC-DCF CSMA/CA is a carrier sense multiple Access with Collision Avoidance protocol.[ ] next one is DFWMAC-DCF w/RTS/CTS It is the extension of the CSMA/CA. it is avoids the hidden terminal problem and offer an easy method to transit segments IP data packet closer together. [ ] for LAN the third access method is DFWMAC-PCF. If there is the two packet ratio at the same time it will be avoid the problem for the two DCF access method .They grant to access the priority based packet for the data dissemination. The Physical layer is the bits of the pipe that is used to connect the one sender with the possible multiple receiver. The bits may be some time loss or the corrupted that will be covered by that layer.802.11, 802.11b 802.11a are the various types of that layer which is further discussed in section {1} HCTIS (Hybrid Cooperative traffic information system) is used in the existing approach which we are followed by us but the various limitations will be come out in this. Data delay, communication range issue, buffering of data, broadcast storm problem, simulation time, throughput, packet delivery ratio and end to end delay vehicular network comes in existing approach. No data dissemination control in the approach is crucial problem. Result is the data packet will be loss and it doesn't reach at the final destination where it will require. The IEEE 802.11 WLAN protocol is standardizes the LAN and MAN. The MAC layer it's a set of the protocol, which is responsible for the maintaining order and the management in the used of the Data shared system. our contribution is to involve the three different co-ordination functions for access the method. These limitation covered by the TLO (The Last One Algorithm) and the VADD (Vehicle Assisted Data Delivery Technique with the carry Forward technique). TLO is a position based algorithm which provides proper data dissemination in the ad-hoc networks. Which provide the proper solution to reduce the end to end delay and broadcast storm problem. In this approach the vehicle will know the each other geographical location of the each other. In this approach it provides the proper communication range to the each vehicle. In this approach the data packet will be forward with the carry approach technique and there will be no problem for losing the data packets and the buffering of the data. When the accident take place the accident vehicle send a broadcast alert message to other vehicle. The vehicle which is in the range of the TLO algorithm after receiving the message it will not rebroadcast it immediately. It will wait for some time and perform the TLO algorithm. In this algorithm each vehicles calculate distance from the emergency initiator vehicle and also compared their neighbor distance. In the range of 0-300 meters the 250 m is farther away from the emergency initiator. The vehicles A, B, C, D is knew that vehicle E is the farthest one. Now the last one is selected by the TLO algorithm will retransmit the alert message to the next set of the vehicles and when the threshold waiting time expires and the other nodes didn't receive the alert message, it thinks there is no relay behind them and TLO is run again to find the next last node. Until a successful broadcast is carried out, this process is repeated.



## DIAGRAMATIC TLO ALGORITHM EXPLANATION

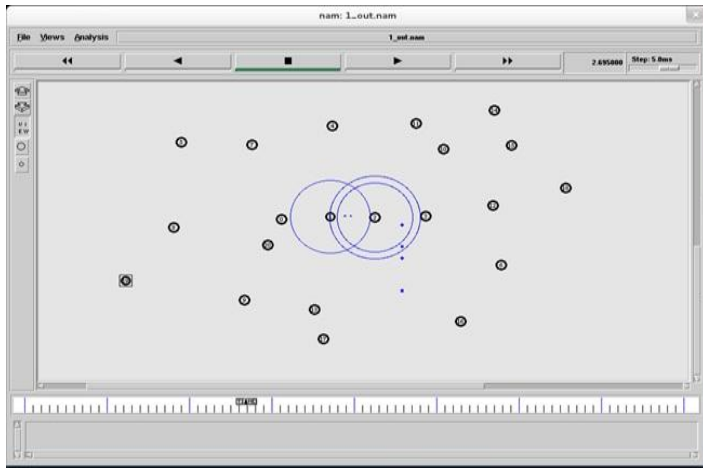
2 VADD (Vehicle Assisted Data Delivery Technique with carry forward technique) we will develop the vehicle assisted data delivery method. This method adopt the idea of storing and carry forward, where nodes carry the packet when there is no route and forward the packet to the new receiver that moves into its direction. The data forwarding path computed by vehicle assisted data delivery method takes densely populated roads with high probability, which makes a suitable approach for the forwarding data over sparsely connected VANETs. Therefore, even without end-to-end connection, the data packet can still be efficiently routed between and the road side unit with high success rate and reasonable delay. For the reason why the author will be take this proposed algorithms because of it will carry the data from one node to the other without end to end delay and the problem which occur is the data packet loss end to end delay and the data buffering during the passes of the data will be overcome by the proposed approach and the simulation technique. { } Simulation tool is the very important and the integral part of the technology. Simulation can be used for the different application and for the different purpose. Computerized simulation is performed to study the behavior of the performance of the any system. Different variable are used to measure the performance of any system during the simulation. Many natural systems are used to analyzed the using the simulation performance using the computer. The main application in which the simulation is performed includes the social science, chemistry, biology, finance and the physics. Simulation is also widely used in the all type of the engineering. The applications for simulation are increasingly very rapidly and simulation is becoming the part of the network traffic control design systems as well final submission. Simulation is very important in the research area of the computer and communication. The communication between all the network components or nodes can be studies using the formulas and simulations. Various types of components to be simulates can include end users, routers, switch, server, data centers, link between the components and communication packet. The simulation tool is performed in the offline mode. The networks parameters are updated and changed during the simulation to identify the end result that can be achieved by the use f given setup in a network. The results from simulation test help to identify the complete communication across the network. So the end to end delay, data buffering, throughput and the data packet delivery may be overcomes by the proposed techniques which we are used in this paper.NS2 is an powerful simulation tool which provide an the proper reliability, direction and the genuine work for the communication of the various network and helpful for the dissemination of the various data in the Vanets. In today date whole the world there is a millions of vehicles are available

and the traffic problem become the more crucial problem millions of the gallon fuel and the number of the accident cases may be occur due to the traffic issue. So the communication between the various vehicles may aware the driver about the traffic problem. And the traffic rush issues.

**2 METHODOLOGY.**

To attain the objective step by step methodology used in this dissertation. Subsequent are the different steps which are used to accomplish this work. Following the various steps used to accomplish the objectives of the dissertation.

**STEP 1 =** The Snapshot for the data packet is losses during the data will be forwarded from source to the destination in HCTIS existing approach



**FIG 1.1 THE DATA PACKET LOSS**

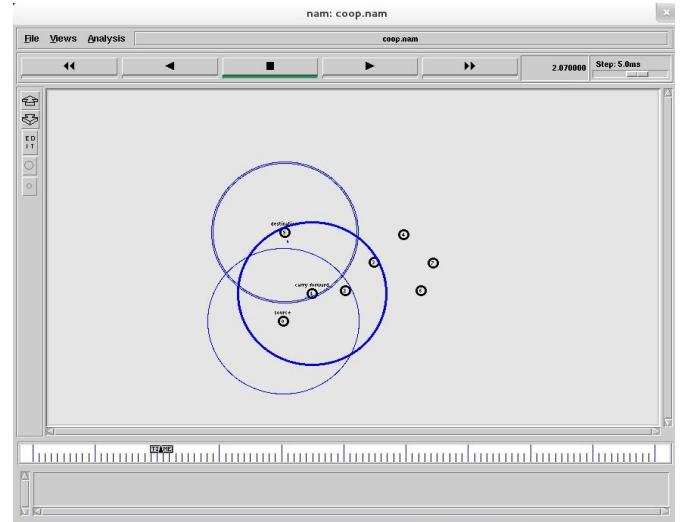
The given figure show that how the data packets will be losses during the forwarding the packet and the result is data will be not reaches at the destination in the proper time and the data packets will be loss.

**3 OUR CONTRIBUTION**

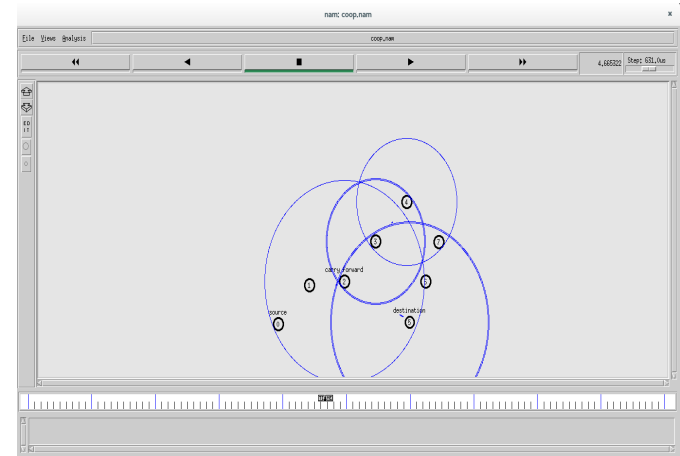
**STEP 1 =** Now the TLO (The last one) algorithm will be performed by us which will provide data dissemination and reduce the end to end delay and data buffering problem in the existing approach. The end to end delay, throughput and the data buffering problem issue may be occur in the existing HCTIS approach and the result formation is no proper delivery of the information from source to destination due to loss of data packets.

**STEP 2 =** The VADD (VEHICLE ASSISTED DATA DELIEVERY TECHINQUE WITH CARRY FORWAD TECHNIQUE) protocol in this proposed approach data will be start with the carry forward approach with the help of the NS2. In carry forward technique, a node will be generated which will contain forward path for destination node. The method adopt the idea of storing and carries and forward where node carry the packet when there is no route and forward it to the new receivers that moves into its direction.

**STEP 3 =** Now concatenate the result of each plane and get the fused image.



**FIG 1.2 = DATA TRANSMISSION WITH CARRY FORWARD BY VADD.**



**FIG 1.3 = DATA TRANSMISSION SENDER TO RECIEVER.**

**4 PERFORMANCE MATRICES**

The performance metrics are the metrics that are used to evaluate the performance of Energy based Fuzzy inference, genetic algorithm and hybrid of fuzzy and genetic algorithm. The following performance metrics has been taken in our research:-

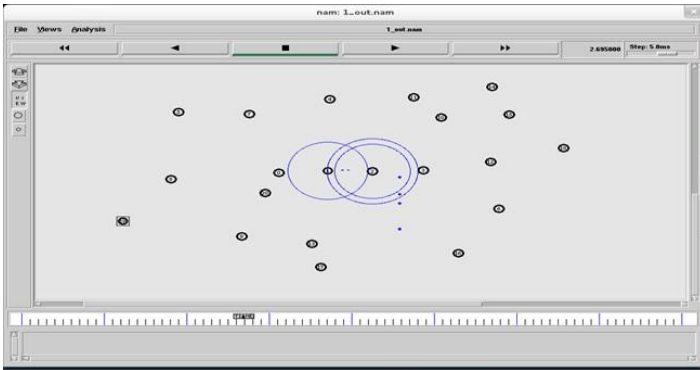
- Packet delivery Ratio (PDR) It is the ratio of add the received data packets at the destination to the number of the data packet sent by all the sources. It is calculated by dividing the number of packet received by destination through the no. of packet originated from the source.

$$PDR = (P_r / P_s) * 100,$$

Where,  $P_r$  is total packet received and  $P_s$  is total packet sent.

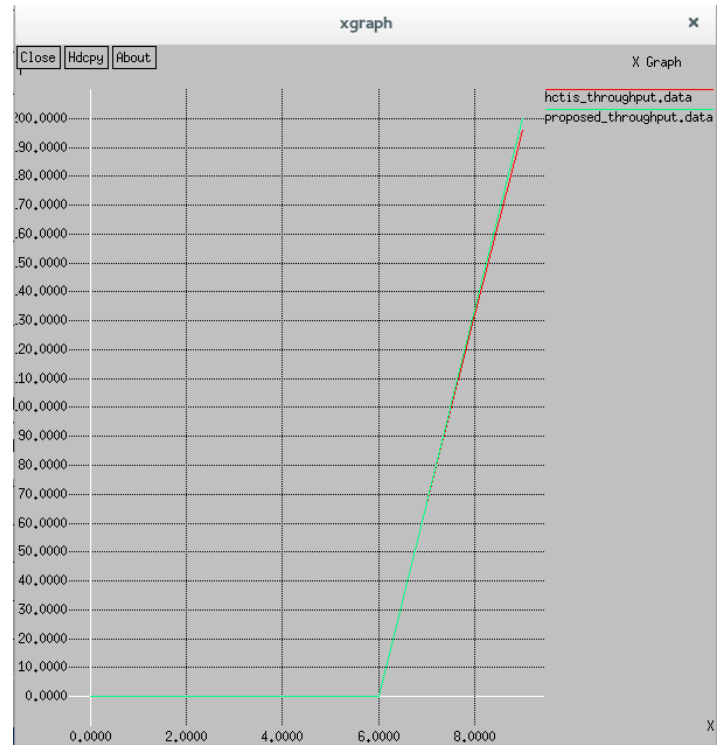
**5 EXPERIMENT RESULTS**

*FIG 1; The problem found in the existing approach is data packet loss, throughput, end to end delay. This will be given below*



This chapter contain the cross validation is the middle of existing and proposed procedures. The execution of the proposed algorithm is superior to the current technologies.

**1 THROUGHPUT OF PROPOSED TECHNIQUE**



**DATA PACKET LOSS**

- End to End delay: This include all possible delays caused by buffering during route discovery, latency, and retransmission by intermediate nodes, processing delay and propagation delay. It is calculated by

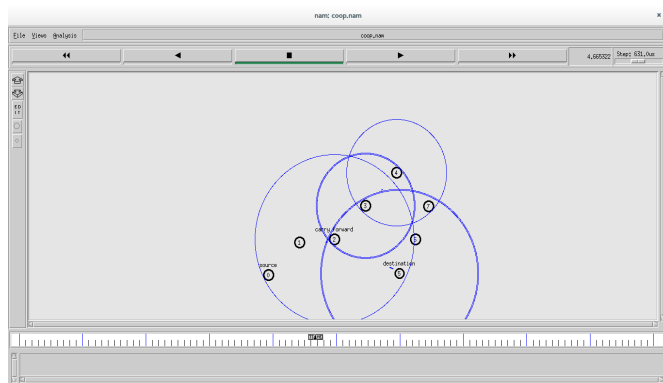
$$D = (T_r - T_s),$$

Where,  $T_r$  is receive time and  $T_s$  is sent time of the packet.

- Throughput: It is the average at which data packet is delivered successfully from one node to another over a communicating network. It is usually measured in bits per second.

Throughput = (no of delivered packet \* packet size) / total duration of simulation.

**FIG 2;** From figure it has demonstrated the output image taken by VADD proposed approach by replacing existing approach.



No of Nodes	Existing approach	Proposed Approach
5	62.00%	63.75%
20	70.75%	71.75%
35	73.67%	74.43%

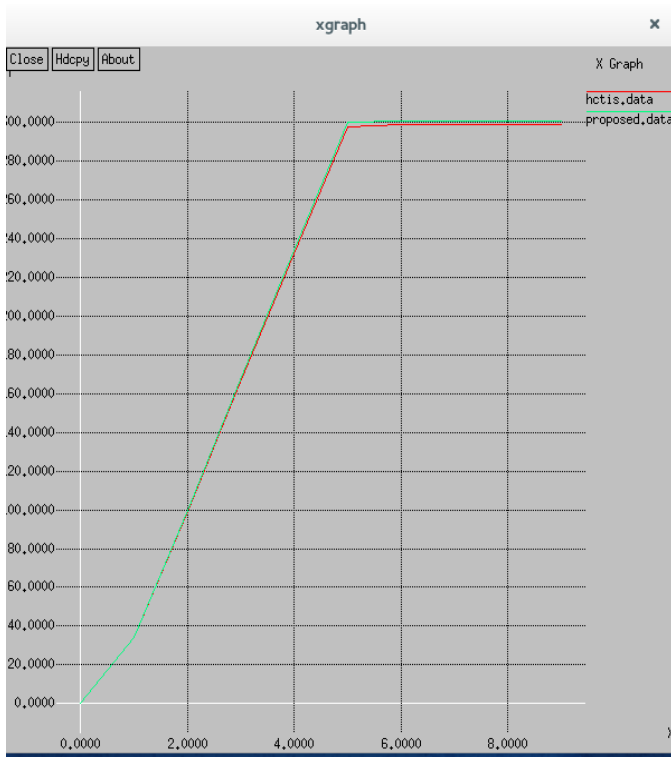
The comparison of throughput of existing and proposed approach. The proposed system i.e. VADD have better throughput over HCTIS.

**FINAL PROPOSED IMAGE**

THE FIG 2; IS OUR PROPOSED image which provide us the proper data delivery from source to the destination without data packet loss .proper throughput in which the data packet is delivered successfully from one node to another over a communication network and reduces end to end delay which is caused by the data buffering. The nature of the output image is great with our proposed strategy regarding all the procedures examined.

**2 PACKET DELIEVERY RATIO OF THE PROPOSED TECHNIQUE**

**6 PERFORMANCE ANALYSIS OF PROPOSED SYSTEM**



No of Nodes	Existing approach	Proposed Approach
5	37.86%	35.37%
20	57.75%	53.37%
35	60.64%	57.35%

Depicts the comparison of end to end delay of existing and proposed approach. End to end delay or latency is defined as the average time taken by the data packets to reach from source to destination. VADD has the less end to end delay as compared to the existing approach.

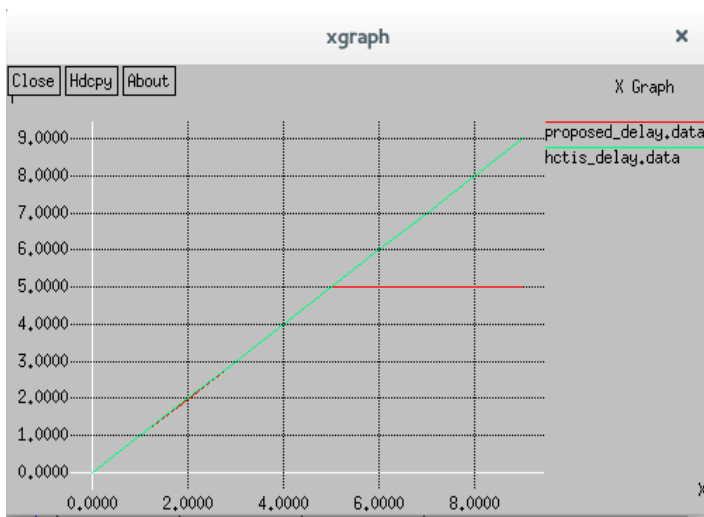
### 7 CONCLUSIONS AND THE FUTURE SCOPE.

Many researchers and industry players believe that the benefit of vehicular networks on traffic safety and many commercial applications should be able to justify the cost. With such a vehicular network, many delivery applications can be supported without extra hardware cost. However, existing protocols are not suitable for supporting delay tolerant application in sparsely connected vehicular networks. To address this problem, the idea of helper node is opted, where a moving vehicle carries the packet until a new vehicle moves into its vicinity and forwards the packet. Different from existing helper node solutions, predictable vehicle mobility is used, which is limited by the traffic pattern and road layout experiment results showed that the proposed VADD protocols outperform existing solutions in terms of packet delivery ratio, data packet delay and traffic overhead. Among the proposed VADD protocols, the helper node technique is better than the previous technique. As the future work, security feature should be taken by better experimental as securing something is a never ending process.

No of Nodes	Existing approach	Proposed Approach
5	70.44%	71.56%
20	79.46%	80.95%
35	87.94%	88.93%

Depicts the comparison of packet Delivery Ratio of existing and proposed approach. It defined the ratio of the entire received data packet at the destination to no. of data packets sent by all the sources. Packet delivery ratio of VADD is higher than the existing technique.

### 3 END TO END DELAY OF THE PROPOSED TECHNIQUE.



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