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Safety Message Dissemination using VANET

Deepak.D.M[1], Dayanand Lal[2], Santhosh Kumar.K.L[3],Tanveer Ahmed[4],Manikanta.K.B[5]
Assistant Professor[1,2,3,4,5],Department of CSE, GITAM School of Technology, Bengaluru.
Mail Id: dmanjuna@gitam.edu, dnarayan@gitam.edu,
skamsaga@gitam.edu,tahmed@gitam.edu,mkbreddy@gitam.edu

Abstract__ Vehicle-to-vehicle (V2V) correspondences moreover notable as Vehicular Ad-hoc Networks (VANETs) grant vehicle towards working together toward growing driving execution just as street wellbeing. During late occasions vehicular traffic is a prime issue. Providing genuine moment traffic information to drivers alongside route framework encourages to choose a great way. In the proposed framework suggests half and half VANET engineering. Crossover Architecture utilizes the elements of the multi-bounce bunching calculation. Proposed half breed Intelligent Transportation System (ITS), that is the Hybrid-VANET-better ITS, which use each Vehicular Ad-hoc Networks (VANETs) and versatile framework about broad open transportation framework to permit prompt correspondences between vehicles just as Road-Side Units (RSUs), besides vehicles-traffic workers into the viable way. In the proposed half breed design, explicitly VMaSC-LTE (Vehicular Multi-jump calculation for Stable Clustering), abilities of the multi-bounce grouping calculation was utilized. The essential objective is to upgrade the entire spatial utilization of a street organize anyway decrease normal vehicle travel costs for dodging vehicles from getting captured due to congestion.

Index Terms — Clustering Algorithm; Long-term Evolution; Message Dissemination; Multi-hop Communication; Safety Applications; Vehicular Ad-hoc Networks.

1. INTRODUCTION

VANET stands for**V**ehicular **A**d-hoc **NET**work and was the technology to the port vehicle like mutual networks to build portable networks. Contributed vehicles' are switched to a wireless connection or router via VANET and enable vehicles to connect almost a hundred to three hundred meters apart and therefore a network can be created wide, different vehicles are connected yes, mobile internet can be connected. The main networks that include this technology are firefighters and police cell phones to communicate with each other for protection reasons.

1.1 Vehicular Ad-Hoc Networks (VANET)

Vehicular Ad-hoc networks are made utilizing applying norms of Mobile Ad-hoc Network (MANET) to the unconstrained formation of a remote organization for data trade to the territory of vehicles. VANET enables a broad scope of uses from single-to jump data to multi-bounce spread of pictures over colossal separations.

From the presentation of ongoing innovation comprising of IEEE 802.11, the business execution of the impromptu organization is made conceivable. One of the helpful highlights of such organizations is adaptability and it very well may be actualized without issues. Accordingly, it is fitting for a crisis. In any case, on the elective side, it is likewise exceptionally hard to deal with the activity of impromptu organizations.

Each node is responsible for managing it independently. Topology changes are very frequent and as a result, efficient routing protocol may be required, the creation of which is a complicated mission. TCP performance is also very negative in ad-hoc mobile networks. In the following sections, we will discuss in more detail the TCP work mechanism and demanding situations for TCP in ad hoc networks.

2. EXISTING SYSTEM

The proposed plans are conveyed and rely upon the GPS information (or the got signal quality, while a vehicle can't acquire a GPS signal), yet don't need any earlier data on the organization geography. In the mutual remote medium, daze transmission bundles can likewise prompt basic clashes and crashes in transmission between neighboring hubs. Be that as it may, the customary transmission component can likewise prompt the realized transmission storm issue, a situation where there can be a lot of conflict and impact at the exchanging layer because of an inordinate number of transmission bundles.

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DISADVANTAGES

• The present services are very expensive.
• Systemcannot make a short response to an emergency as a result of an accident/incident.

3. RELATED WORK

Chen, W.-T.(2010). "Fuel-Saving Navigation System in VANETs", 2010 IEEE 72nd VehicularTechnology Conference-Fall.DOI:10.1109/vetecf.2010.5594424. A route framework to find fuel-sparing route steered by the perspective about real time traffic information. Aiming to assess the traffic load later on heading, we keep a table of notable traffic information by utilizing savvy transport frameworks (ITS). Additionally, the framework can progressively trade the route steered by method of refreshing traffic information.But, individual path planning may also result in new congestion if carried out uncoordinated.

Zhao, Y., Triantis, K., Teodorović, D., & Edara, P. (2010). A travel demand management strategy: The downtown space reservation system. European Journal of Operational Research, 205(3), 584–594.DOI:10.1016/j.ejor.2010.01.026. A voyaging call for the board approach alluded to as the Downtown space Reservation framework (DSRS) is included. In view of the most productive answer, a "keen" module has built the use of fake neural organizations that grant the transportation position to make choices progressively on whether to acknowledge an approaching solicitation. Furthermore, how communications in VANETs can affect at the route-planning algorithm is still not clear.

Luan, T. H., Ling, X., & Shen, X. (Sherman). (2012). Provisioning QoS controlled media access in vehicular to infrastructure communications. Ad Hoc Networks, 10(2), 231–242. DOI:10.1016/j.adhoc.2010.06.005. A total investigative model that contemplates everything about QoS elements of expanded appropriated channel access (EDCA) and vehicle quality (speed and moving bearings) upheld the model, analyze the out turn execution, and mean transmission deferral of separated help traffic, and are looking for answers for ideally adjust the boundaries of EDCA the reasonable QoS arrangement to vehicles.The average travel value or the drivers' preference isn't taken into thought.

Guha, R. K., & Chen, W. (2009). A distributed traffic navigation system using vehicular communication. 2009 IEEE Vehicular Networking Conference (VNC). DOI:10.1109/vnc.2009.5416381 The proposed workcontrolsthe multi-hop vehicular networks to accumulate localized data. Those data can be obscure the traffic service providers concerning aptnessas well asexactness. The proposed work could feature unaccompanied or complements a current infrastructure-based system and may capture the dependence between path selections of various vehicles in a given region. The software of multimedia delivery which but may still revel in huge transmission delay.

Khosroshahi, A. H., Keshavarzi, P., KoozehKanani, Z. D., & Sobhi, J. (2011). Acquiring real-time traffic information using VANET and dynamic route guidance. 2011 IEEE 2nd International Conference on Computing, Control, and Industrial Engineering. DOI:10.1109/ccieng.2011.6007944 Another strategy for acquiring genuine time traffic information on between city courses which can be founded on a combination of VANET networks with each between vehicle correspondence (IVC) and vehicle street side gadget correspondence (VRC) and customary frameworks, is proposed. The proposed framework is joined of sensors on vehicles and different sensors introduced on the side of the road, between vehicle correspondence (IVC), and vehicle to side of the road correspondence (VRC).The hassle which can occur via this scheme is that, while no vehicles travel the road segment, there are no data available for it.

4. PROPOSED SYSTEM

This proposed framework proposes half breed engineering meaning to accomplish a high information parcel transport proportion and low idleness while keeping up the utilization of the phone structure at an insignificant level. Each the organization spatial utilization and vehicle go costs are considered to ideally adjust the overall organization perfection and the drivers' decisions IEEE 802.11p and Long-Term Evolution (LTE). A half breed VANET-improved ITS system, misusing each the VANETs and furthermore the public office dependent on the extended crossover, ITS structure, a multi-bounce message sending instrument is proposed along with the real time traffic

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information or the early alert messages. The bundle conveyance extent connection of the insurance application, that is illustrated due to the greatness connection of the hubs that with progress gain parcels inside the first scattering separation.

4.1. ADVANTAGES

- It may discover alternative paths for vehicles to skip congestion regions at the same time as decreasing the average travel cost in an efficient, well-timed, and coordinated way.
- It presents better overall performance than the prevailing system

5. LIST OF MODULES

1. Communication model
2. Vehicle tracking
3. The grid-based on-road Localization system
4. Path Discovery

5.1 THE PHASES OF LEACH

The wireless sensor network is a wireless network together with sensor nodes with the functionality of sensing and transmitting data. Every sensor collects information from the monitored region and sends it to the base station. The sensors can be positioned randomly in the area. Sensor nodes are prepared with small, irreplaceable batteries with constrained power potential. The design of WSN is motivated by many challenging elements.

Those elements should be overcome so that efficient communication may be done. Several hard elements are security, privacy, high-quality service, small storage size, fault tolerance, and energy efficiency. Out of that energy efficiency is a vital component to be taken into consideration. The operation of the sensor node which includes processing and transmitting are energy-consuming and changing or recharging the node batteries is hard.

There are numerous strategies for retaining energy efficiency, which are information reduction, protocol overhead reduction, responsibility cycling, solar aware routing, and energy-efficient routing. Among these types of strategies, energy-efficient routing is a better manner to preserve energy efficiency. This routing makes use of a clustering scheme and is assumed to be the most energy-efficient protocol for WSN.

5.2 CLUSTER

After every hub has resolved to that group it has a place, it should illuminate the bunch head hub that it will be an individual from the group. Every hub sends this information back to the bunch head again utilizing a CSMA MAC convention.

During this segment, all group head hubs should save their collectors on Schedule creation. The group head hub gets all the messages for hubs that will wish to be encased at spans the bunch. Upheld the amount of hubs inside the bunch, the group head hub makes a TDMA plan telling every hub though it will communicate. This timetable is communicated back to the hubs at spans the group.

5.3 DATA TRANSMISSION

When the bunches are made and in this way the TD MA plan is steady, information transmission will start. Pompous hubs regularly have data to send, that send it all through their allotted transmission time to the bunch head. This transmission utilizes a base measure of vitality.

5.4 ADVERTISEMENT PHASE

Each hub that has elective itself a group head for the present circular, reports an advert message to the remainder of the hubs. For this bunch head-promotion part, the group heads utilize a CSMA MAC convention, and each one bunch heads send their publicizing abuse a comparable communicate vitality. The non-group head hubs should keep up their beneficiaries all through this piece of set-up to think to the notices of all the bunch head hubs. When this part is finished, each non-bunch head hub settles on a decision the group to that it will be long for this round. This determination is predicated on the got signal quality of the advert.

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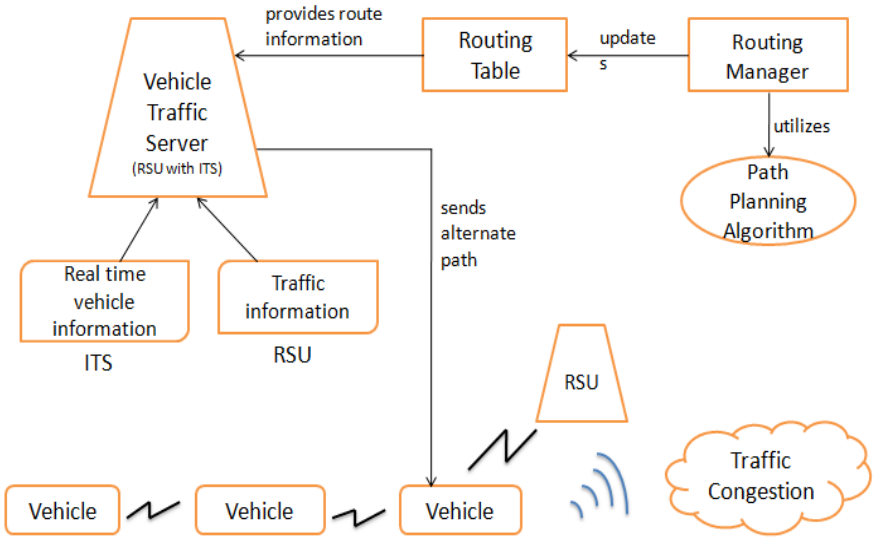
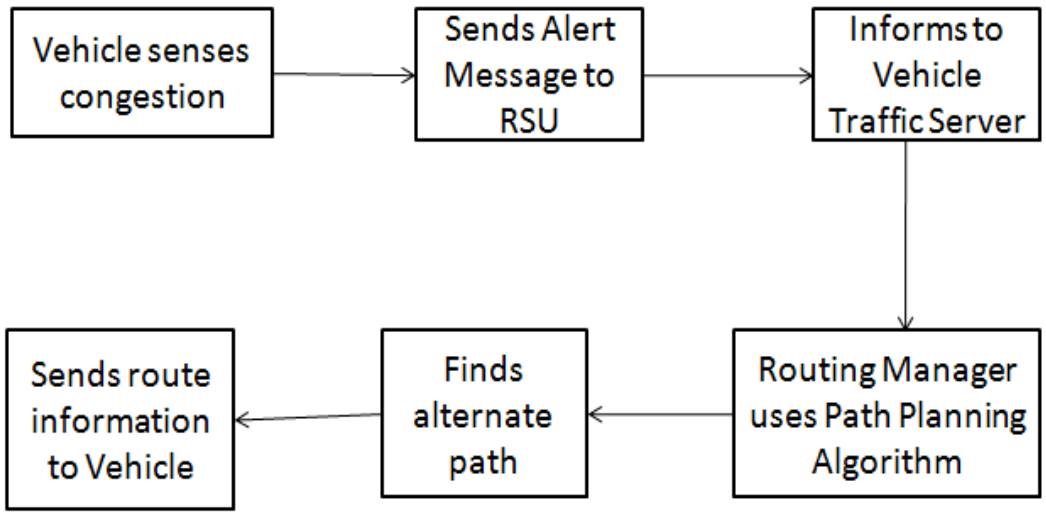
5.5 ARCHITECTURE DIAGRAM



PATH FLOW



ALTERNATE PATH PLAN

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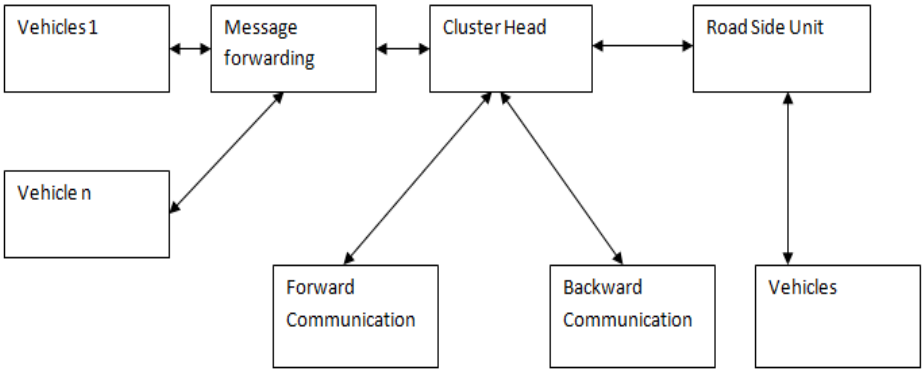
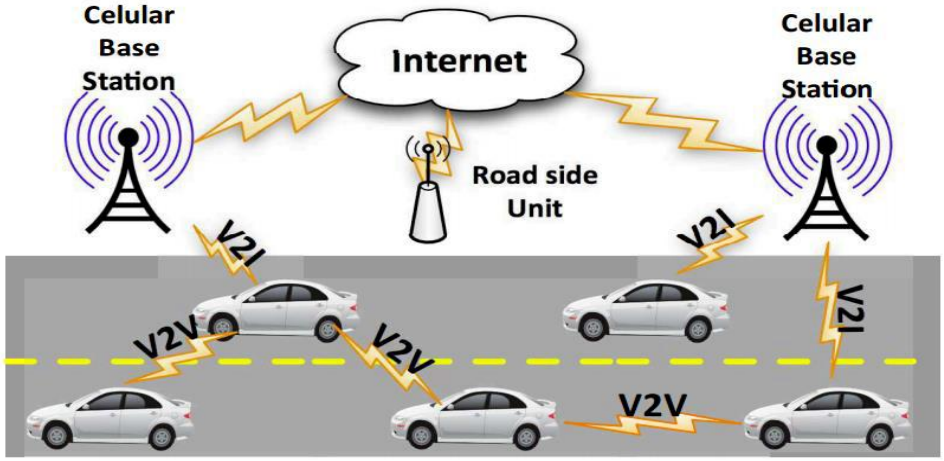


VEHICLE COMMUNICATION



RSU- VEHICLE COMMUNICATION

6. SYSTEM IMPLEMENTATION

6.1 LIST OF MODULES

1. Communication Model
2. Vehicle Monitoring
3. Grid-Based on-road Localization System
4. Route Discovery

6.2 MODULES DESCRIPTION

6.2.1 COMMUNICATION MODEL

For a practical interpretation of the signal transmission between vehicles, it's necessary to recreate the $64000 body radio transmission method for a given setting supported the radiation pursuit approach. The ray-tracing methodology generates advanced channel impulse reactions by determining routes or potential rays from the transmitter to the receiver consistent with the laws of geometric optics. Such a model, however, isn't sensible as a result, it needs an in-depth description of the site's exactness propagation setting. Random models, again, verify the physical parameters of the vehicle channel during a very precise approach while not considering any basic pure mathematics. Distance-dependent, large-scale and small-scale fade route loss weakening distribution's area unit the expected parameters in these random models thanks to important measure campaigns. Path loss refers to the native signal strength related to transmitting to power as a characteristic of the space between the transmitters and receiver. The route loss layer of N = one.8–2.7 was determined on the roads. Large-scale weakening patterns result in encompassing disturbances on the average signal perception at a given distance.

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Surrounding barriers may be mobile (for example, different vehicles) or stationary (for example, buildings in urban settings). Most channel modeling activities aim to draw in extra attention thanks to these limits, leading to Associate in nursing uneven distribution around the average signal strength received in urban areas and roads.

Although these models estimate the unique values for the variation of this massive attenuation distribution at many high and low traffic densities, a mechanism has been developed to combine the impact of vehicles and fixed barriers on the recently acquired signal strength in the roads.

Finally, small-scale fading models model the impact of receiving more than one copy of the transmitted signal at the receiver. Numerous deliveries have been proposed for small-scale attenuation with deliveries of rice, nagagami, and weif. Although signal transmission has a significant impact on the performance of communication protocols, the most recent work on the analysis of topographic properties of VANET uses a drive disk because the signal transmission model can communicate with each other if all Vehicles are within an entry distance and cannot communicate with anything else. Although such analysis currently uses more sophisticated random signal transmission models including large-scale fading and small-scale fading, none of these models covers the impact of vehicles on signal propagation.

Above all else, in VANET, all the vehicles discuss along with a type of vehicle to vehicle discussion or vehicle to foundation correspondence. Source hub sends RREQ to all the neighbors, while the objective hub gets the RREQ it will send RREP to the source. At that point it will refresh the steering table. It advances the data inside the indistinguishable way.

6.2.2 VEHICLE MONITORING

VANET, all the autos have GPS for finding the locale of the vehicle. Drivers can undoubtedly acknowledge precisely where he's. GPS with the guide is helping to drive the vehicle. Be that as it may, by and large, the GPS beneficiaries lose satellite alarms and ascertain wrong situations because of sign hindering, reflection, and impedance. subsequently utilized an Adaptive information assortment scheme(ADCS), where vehicles with or without precise GPS signal self-arrange into the vehicular impromptu organization (VANET), trade area and separation information, and help each other to figure a right situation for all the vehicles inside the organization.

In a remote sensor organization (WSN), countless sensor hubs need to gather and forward information jump by-bounce to a sink. This paper gives a versatile information assortment (ADC) conspire with dynamic lattice length changes for portable sinks in a matrix based WSN. In the proposed ADC, a versatile sink gathers information along the X-and Y-hub of the matrix. Due to concurrent assortments of two or three portable sinks, traffic circulation may get lopsided and network blockage could happen. The proposed ADC can mitigate the traffic by adaptively modifying the transmission run between essential lattice hubs (PGN); at least one transitory matrix hubs (TGN) are distributed among PGN, and powerfully changing the essential information assortment hub related to the moving bearing of a sink.

6.2.3 GRID BASED ON-ROAD LOCALISATION SYSTEM

GPS guides were generally utilized by drivers. Notwithstanding, on account of the reasonableness of GPS signs to territory, vehicles can't get their areas while they're inside a passage or on a street encompassed with the guide of elevated structures wherein satellite sign is impeded. This brings about wellbeing and solace issues. To address the issue, we introduced a special Grid-dependent on street limitation framework (,), where vehicles with and without exact GPS signals self-sort out into a Vehicular impromptu organization (VANET), interchange locale and separation information and help each other to compute a right situation for all the vehicles inside the organization. The territory information can be traded.

Vehicles at least one than one jump away. We're investigating the fluffy mathematical relationship among vehicles, and apply an interesting network based component to survey the mathematical connections and figure vehicle places. The reproduction demonstrates about got framework is amazing and effective in figuring vehicular positions.

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Framework dependent on street Localization System in which vehicles with (VANET), substitute district and separation information, and help each other to figure a right situation for all the vehicles inside the organization. A vehicle acquires spot and separation information in its neighborhood through correspondence.

The data could be disposed of if its separation to the comparing hub is greater than the correspondence limit. On the off chance that a vehicle just knows the locale of its neighbors and separations to them, it should comprehend at any rate 3 area cognizant neighbors to empower the area count.

6.2.4 SYSTEM ROUTE DISCOVERY

On-request directing conventions explicitly contain two techniques course Discovery and course assurance. While a flexibly hub that has no steering information at stretches the directing table must set up a way to the objective hub, the path revelation system is actuated. The gracefully hub promotes directing solicitation bundles all through the organization by flooding. While a way demand bundle arrives at the objective hub, the objective hub sends a way reaction parcel to the gracefully hub. This could have discovered an opposite course among the provisions hub and furthermore the objective hub. While the hub changes, sure connection at the initiated course may break, at that point the path support strategy is begun. Impromptu On-request Distance Vector (AODV) steering convention is the most by and large utilized geography based directing convention for VANET. AODV might be a receptive sensibly convention any place the course from gracefully to the objective is framed exclusively while it's required and it keeps up these courses as long as they are fitting by the sources. AODV utilizes grouping numbers to ensure the newness of courses and uses welcoming messages to sight and screen connects to neighbors. Each dynamic hub irregularly communicates a welcome message to any or every one of its neighbors. Therefore, the welcome messages square measure inconsistently sent, though a hub neglects to get differed welcoming messages from a neighbor, it distinguishes a connection disappointment. Each hub of the organization proceeds with a steering table that stores directing information. Impromptu On-request Distance Vector characterizes three types of the board messages for course disclosure and upkeep, course demand (RREQ) message, course answer (RREP) message, and course mistake message (RERR).

RREQ
A source hub that has no directing information to the objective in its steering table uses the course demand message. Each RREQ comprises of a chance to live (TTL) esteem that showed the life of the message that it states for the number of bounces this message ought to be sent. This worth is set to a predefined esteem at the main transmission and improved at retransmissions. Retransmissions happen if no answers are gotten.

RREP
A moderate hub getting the RREQ answers with a course answer message on the off chance that it has a genuine way to the mentioned address or it is simply the objective. The course answer message is bind together projected back to the originator of a RREQ, this develops a contrary course between the source and the objective.
RERR

A course blunder message is utilized when a hub identifies a connection breakage in a functioning course. Each hub keeps an antecedent rundown, containing the IP address for each it neighbors which can be conceivable to utilize it as a resulting jump nearer to each destination.When a connection breakage in a functioning way is recognized, a RERR message is utilized to advise different hubs of the loss of the connection.
In the event that the source vehicle has no course to the objective vehicle, at that point the source vehicle starts the course disclosure in an on-request style. In the wake of creating RREQ, the hub shows up its neighbor table to find on the off chance that it has any closer neighbor vehicle toward the objective vehicle.

While vehicles sense mishap related clog, the admonition message might be created to caution the rising mishap information and afterward be shared not just among vehicles anyway with the closest RSU through V2R correspondences.

Accordingly, the taxicabs or transports can legitimately transfer the got cautioning message to the closest cell BS, and the BS will convey the message to the vehicle traffic worker.

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Here, the way arranging calculation is first proposed to help vehicles to pass clog and parity traffic equitably in the entire organization.

6.2.5 PATH PLANNING ALGORITHM

The route planning algorithm incorporates important features such asGET ROUTE and SEND ALERT.

- GET ROUTE function discover all paths from source to the destination once the driver sets the source and destination. From this list,the driver can choose a path for his journey. So it's going to maintain the driver's choices.
- SEND ALERT feature, whilst any of the vehicles in the road come upon with an accident/congestion, an alert might be sent to RSUs. The sample program for the path planning algorithm is given below

ALGORITHM

Input: Set of all paths from source to destination
Output: Congestion free area with the new route
Begin
Step 1: Initialize the set of intersections Ic
Step 2: Calculate the range WiJi (T) for each intersection i in Ic do
Step 3: Assign the set Ic ← Ic {i}. if WiJi (T) = 0 // vehicles information updation
Step 4: while intersection Ic _= do //Chance of congestion
Step 5: Schedule intersection i = argmax
Step 6: Identify congestion area and Send an alert message to the emergency vehicle for each destination d
Step 7: Reach the destination by finding a new route
Step 8: end while
End

7. RESULTS AND DISCUSSION

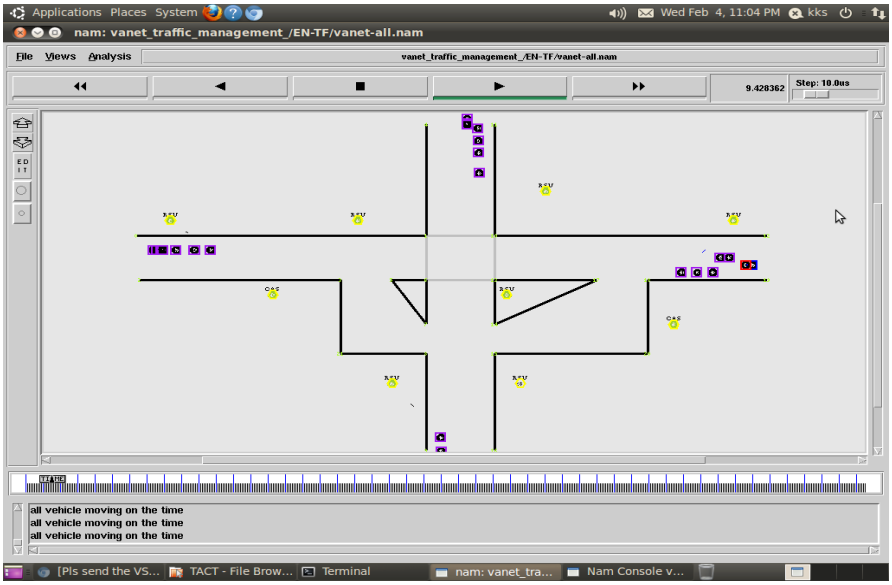

FIG 10.1 NODE CREATION

Emergency nodes (red and indigo) at an initial position of the road without motion. The roadside unit acts as a base station system and it communicates with all the nodes.

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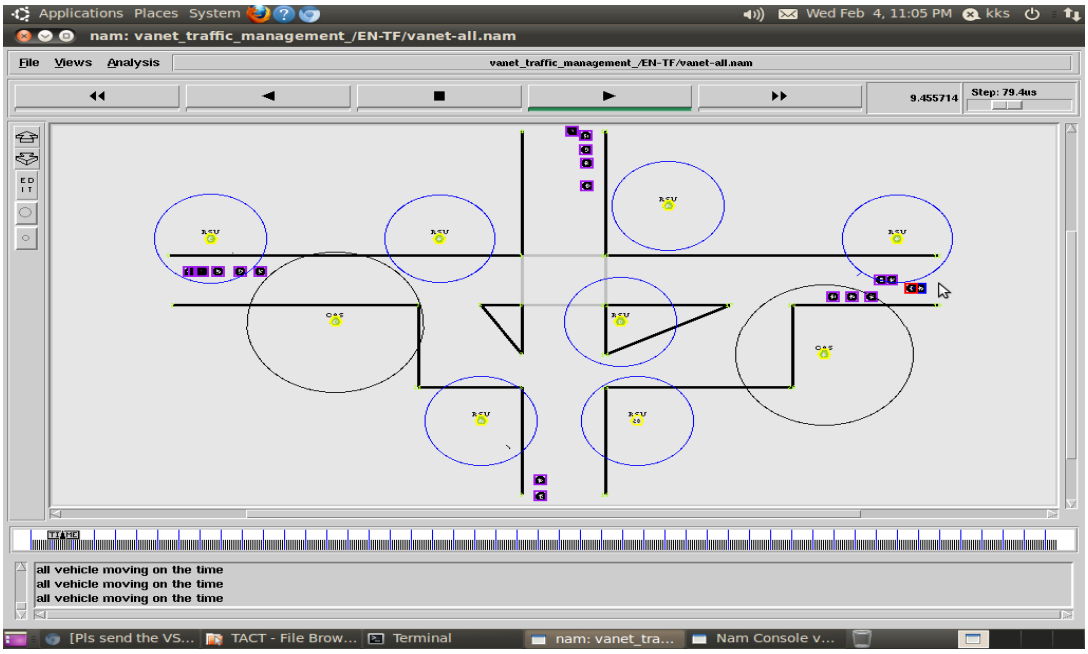

FIG 10.2 RSU STARTS COMMUNICATION

Nodes began moving from the initial position and the roadside unit covers all the nodes which are crossing them. The coverage area of each roadside unit is five hundred meters. roadside units are located every five hundred meters.

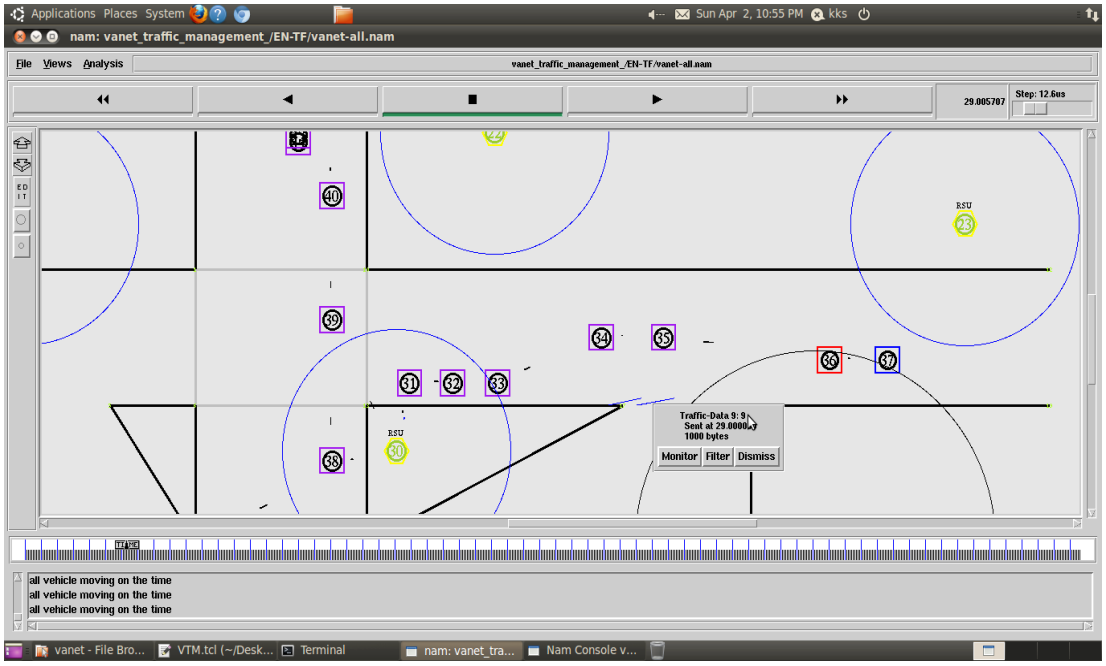

FIG10.3 TRAFFIC DATA

The primary roadside unit begins sending data i.e there may be traffic congestion on the straight road. So the emergency nodes select an alternate path to attain the destination easily by the use of the collision avoidance system method.

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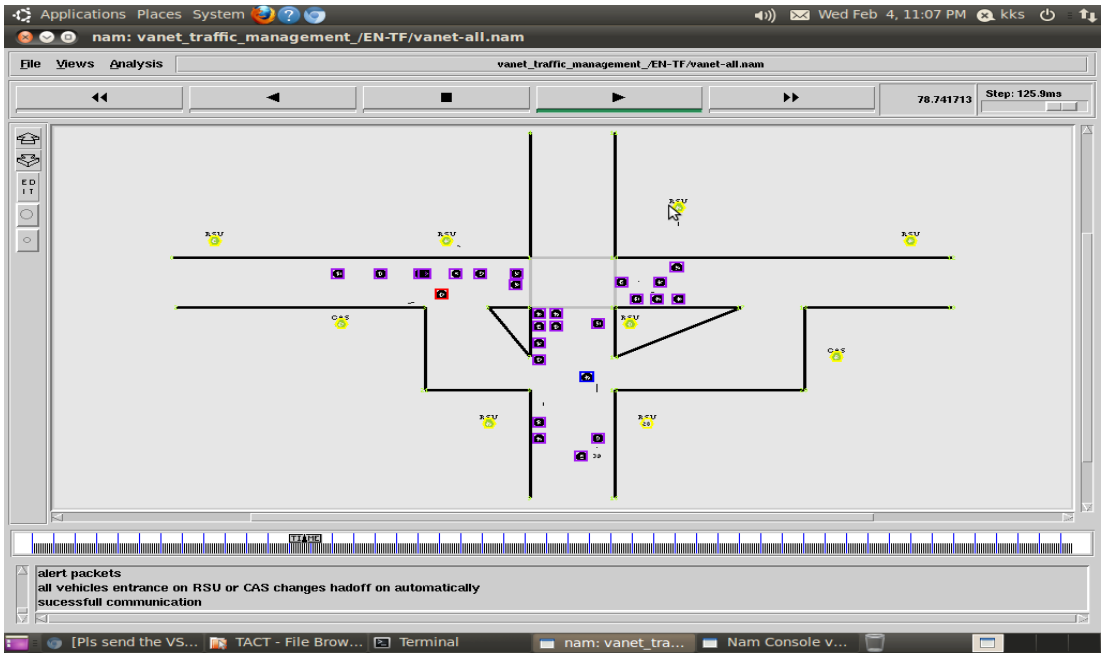

FIG10.4 NODES REACHING DESTINATION

Both the emergency nodes first started crossing the traffic which is followed via the node. Because of the congestion of nodes we're using a collision-avoidance system to avoid traffic. The nodes began moving on the road by deciding on the shortest route.

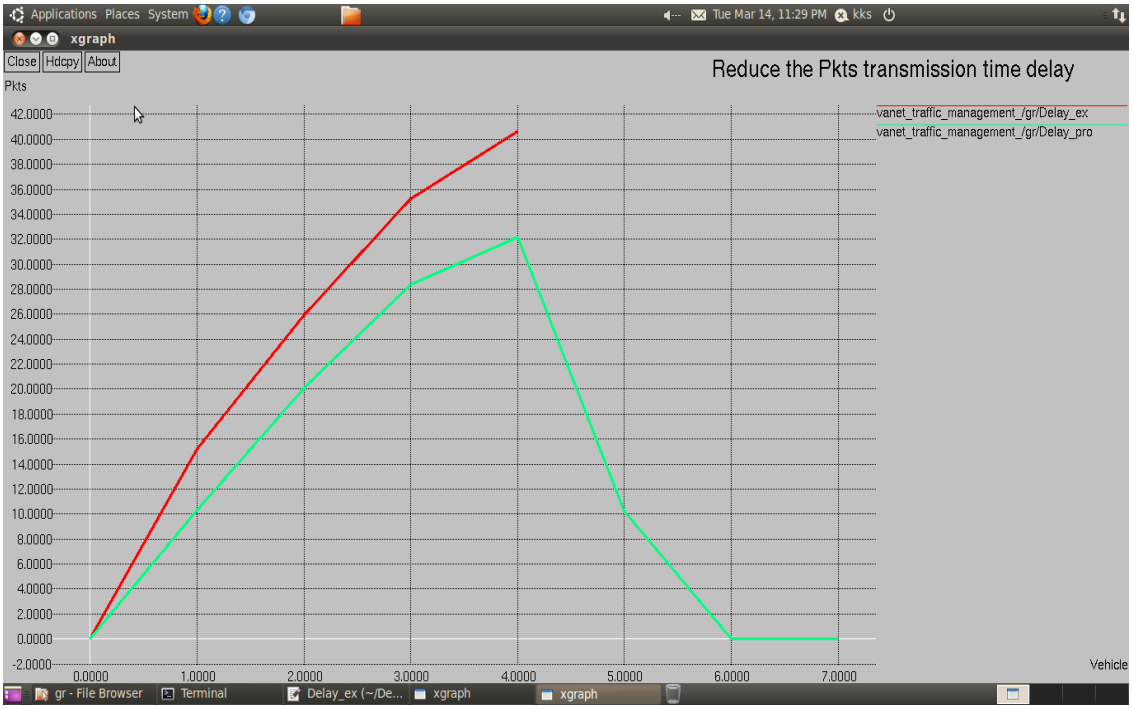

FIG 10.5 REDUCE PACKETS TRANSMISSION DELAY

The green line suggests the proposed system wherein the packet loss transmission is low when compared to the existing system indicated by the red line.

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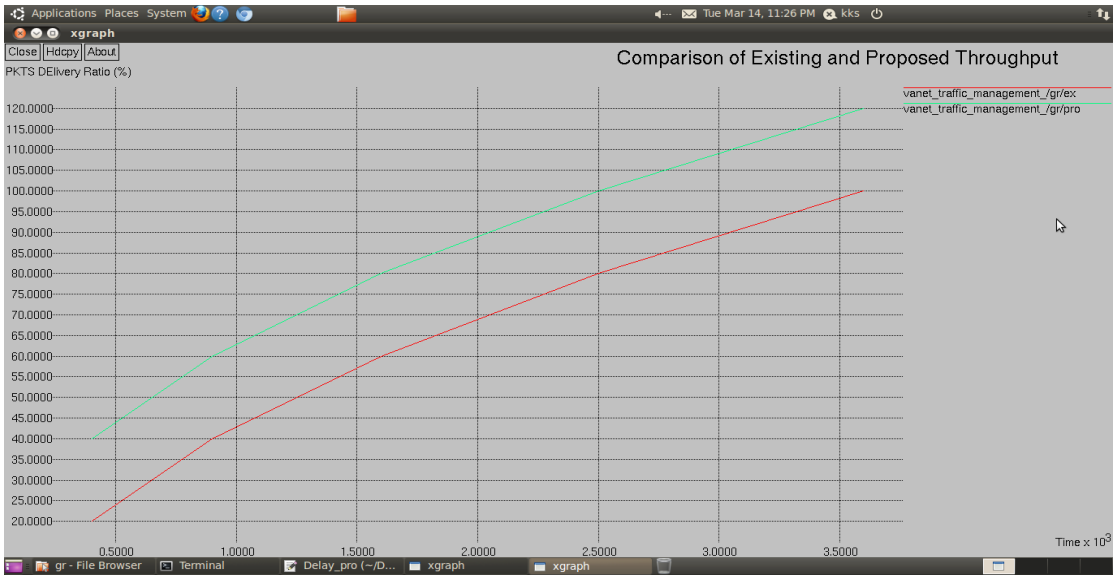

FIG10.6 COMPARISON OF EXISTING AND PROPOSED THROUGHPUT

The throughput of an existing system is low while compared to the proposed system

8. CONCLUSION

The proposed Hybrid VANET improved pragmatic course plan in the interest of vehicle on the way for abstaining from sticking inside ITS. So suggest Hybrid VANET design, especially VMaSC-LTE another application and these structures among usefulness about continuous traffic information combination, concerning commonly V2V just as V2R associations inside VANETs' notwithstanding cell communications inside the public transportation framework. At that point, an internationally ideal ongoing way arranging calculation is intended to improve the typical spatial use and reduction normal vehicle travel cost. Along these lines the proposed VMaSC-LTE and ITS based way arranging calculation can gain better than the current framework. Framework identified with the external condition incorporates side of the road base station. Base stations are the side of the road unit and situated at a devoted area like intersections or near parking spots. Their essential capacities are to expand the correspondence district of the impromptu organization by re-distributing the realities to other people and to run security applications like low extension cautioning, mishap cautioning, and numerous others.

9. FUTURE WORK

During future exploration, plan to discover huge scope genuine vehicle traffic follows to additionally approve the advantages of the proposed calculation in commonsense situations. Traffic design improved by control bundles and diminished overheads. To upgrade, start to finish deferral and correspondence speed. Later on, we will ready to locate the greatest most brief way while contrasted with the past strategy used in VANET innovation.

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