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Making Roads Safer and Congestion-free in Aligarh city for Pedestrians and Two-wheeler users

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Abstract: ***We Indians live in a developing country due to this reason we face lots of issues related to road congestion and safety on road for pedestrians as well as for 2-wheelers and motor vehicles due to which accidents happened for this, we need to make our infrastructure and planning in a good manner. In this paper, I will suggest ideas that can change the existing road infrastructure with a few changes and additions that will result in a reduction in trip time, congestion and road accidents. These changes will increase the LOS (Level of Service). Civil engineering branches deal with safe and efficient movements of people and goods along roadways in a multimodal system. This study will help us to make our existing roads safer for two-wheelers as well as for pedestrians.***

Key Words: ***Developing, Congestion, Trip time, accidents, LOS***

I. INTRODUCTION & LITERATURE REVIEW

In urban areas of developing countries like India, there has been a rapid increase in traffic congestion. As the population of the country is also increasing steadily.

So, at the same time motor vehicles on the roads are also increasing rapidly and due to this congestion is also increasing on the roads and private ownership of vehicles is increasing rapidly in urban areas. The increase in population and motor vehicles leads to making roads unsafe for users without changing their old infrastructure. The change is a must for a city but in Aligarh, some roads or streets are not changed for years according to the increase in population and motor vehicles. So, in this paper, I will tell you how you can make Aligarh roads safe. Within a city population of the city is dived into two parts one is densely populated and the other is less populated also there is an economic difference between them that may result in the difference in the type of vehicles in both the regions. The congestion can be reduced by adding and reducing a few hurdles in traveling on roads and also accidents can be reduced. The main cause of congestion and accidents is unplanned Urban areas also in unplanned urban areas congestion is high and accidents are low as compared to planned urban areas so we need to add a few features in our
unplanned urban areas to reduce the congestion and accidents in Aligarh city. This paper will study, the problems of road congestion and accident-causing issues and will give ideas for solving them.

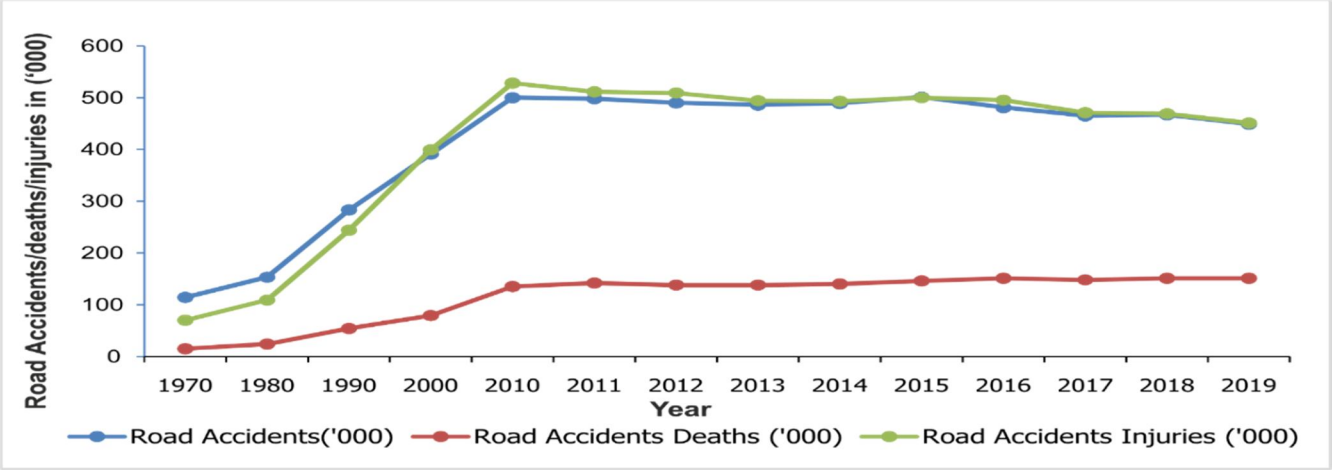


Figure 1 Trends of Road Accidents, Deaths, and Injuries

In 2019, India recorded around 4.5 lakhs road accidents and 1.5 lakhs road fatalities: Road safety is a major public health hazard.

1) India ranks 1st among 199 countries in road accidents.

2) Each year about 3% to 5 % of the country's (India) GDP is lost due to road accidents.

3) The objective of safe travel is always number one and is never finished for the traffic engineer.

Making use of appropriate awareness or signboards with a telecellsmartphone extensive range that is operational 24/7 is probably useful in assisting the road authorities and vehicular about the pothole's information.

Tips for the drivers: When stable to do so, prevent and test your wheels and tires after hitting a pothole. If vibration is noticed, the steerage wheel is now not at the center or pulling to one side, it's miles useful to get the auto checked as steerage damage can bring about a later fee or perhaps an accident.

Avoid pointless braking: Do not apply your brakes while using over a pothole. When you wreck you tilt the auto in advance putting more pressure on the front suspension. Drive over potholes with care: If you need to stress over a pothole, allow the wheel to roll freely into the hole. Hold the steering wheel correctly: Make sure you are maintaining the steering wheel nicely with the "10 to 2" arms feature while used on a road with potholes. Failure to perform that can additionally advise you to lose control of your automobile.

II. METHODOLOGY

Initially, an area was selected with heavy rush hour traffic, more pedestrians and 2-wheelers users were there due to these roads connecting to main roads, main market areas (Dodhpur, Amir Nisha), Schools, Hospitals, and Aligarh Muslim University nearby. A stretch of road from Ahmad Apartment to Dodhpur main road and New Friends Colony Apartments to Dodhpur main road which connects to JNMC (Jawaharlal Nehru Medical College, AMU), AMU (Aligarh Muslim University), and Schools, Aligarh was taken for survey. The evaluation targeted pedestrian perception, pedestrian street protection, and 2-wheelers street protection. Visit at the ground, the sections along the way, the photographic documentation, and the interviews had been triumphing over later.

A. Field Visit

How roads are safe for pedestrians and for 2-wheelers users Each section of the venue visited and different factors inclusive of security, renovation and fashionable have been studied there at the side of this the general visitors of that location with the sections have been additionally studied.

B. Drawings and Sections

These helped alongside the sector visit to investigate the issues of the pedestrians and 2-wheelers in that space or facility.

C. Photographic Documentation

Photography ended up completed to end up tuning in to the problem. The photographic documentation was completed at a specific quantity of a while i.e., morning, night-time, and at a few degrees in the top hours of traffic.

D. Interviews

This technique enclosed the reaction from pedestrians and 2-wheelers who use those roads on the facet of various centers for special security, accessibility at the side of the design, lights, and maintenance. For those various capabilities and to acquire those dreams an interview kind turned created to induce all important information from the pedestrians or the customers of these centers. a whole of thirty pedestrians and fifty 2-wheelers victimizations on those roads have been interviewed inside the approach throughout those avenue patches.



Figure 2 Methodology flow chart

III. STUDY AREA

The area selected is Sir Syed Nagar Road, and Nagla Road, roads which are of 2.5 Kilometres distance. These roads are important because connecting to main roads, main market areas (Dodhpur, Amir Nisha), Schools, Hospitals, and Aligarh Muslim University nearby. A stretch of road from Ahmad Apartment to Dodhpur main road and New Friends Colony Apartments to Dodhpur main road which connects to JNMC (Jawaharlal Nehru Medical College, AMU), AMU (Aligarh Muslim University) and different Schools of Aligarh was taken for survey.



Figure 3 Study Area

IV. STATISTICAL ANALYSIS AND OBSERVATIONS

A. *The bad condition of roads*

When the users had been interviewed approximately the situation of the roads mainly for pedestrians and 2-wheelers customers, 30% of humans stated that it's far common and 5% stated it is right while 65% stated it can improve.

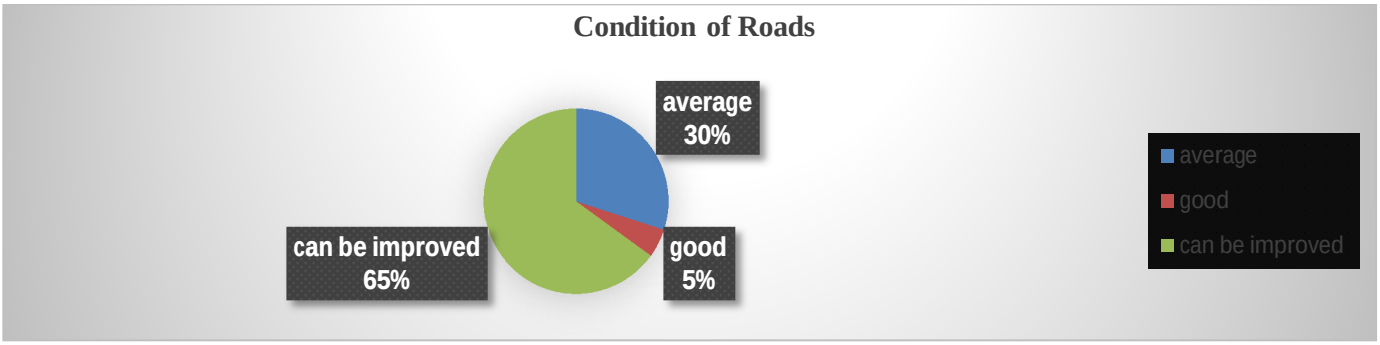


Figure 4 The bad condition of Roads

1) *Observation-* The situation of roads and the construction materials used for the street production must be modified as in the case of the use of interlocking bricks for the motion of HMV, the roads aren't secure from the rain and therefore the water begins off evolved gathering making the potholes.





Figure 5 Uneven path for road users causes accidents Figure 6 Users traveling in the wrong hand may cause accidents



Figure 7 Interlocking Bricks Roads Settlement

The above images taken from different locations show that the condition of the roads is not good.

B. Hygiene Condition on Roads

Condition of roads, in terms of hygienic roads when the users were interviewed what is the situation of the hygiene on roads, especially for pedestrians and 2-wheelers users, 25% people said that it is average and 5% said it is good while 70% said it can improve.

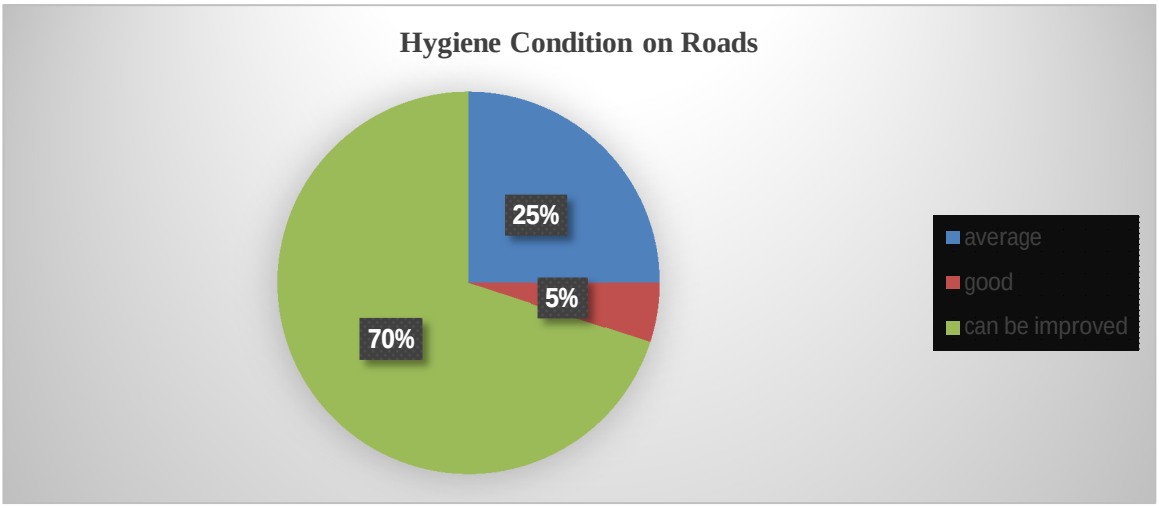


Figure 8 Hygiene Condition on Roads

Observation- It is located that the roads which aren't hygienic and aren't selected via way of means of the pedestrian, however, those roads end up obligatory to apply via way of means of the area people due to the fact they don't need to apply principal street at some points of the height hours aren't viable and reasons site visitor's congestion at grade. Due to the presence of trash on the street animals may be visible across the trash and customers keep away from applying that region and the opportunity of injuries increases.

Heaps of rubbish, especially plastic waste, have been dumped on the street in lots of residential regions and have been now no longer eliminated for lots of weeks. In the absence of boxes, citizens sell off the waste on roads as puppies and livestock squatter upon the waste and additionally eat it. Garbage is eliminated through conservancy employees as soon as every week after it receives piled up. Also, particles from homes and waste from motels are dumped on the street. It now no longer handiest ends in environmental issues, however the width of the street that may be used receives reduced, says citizens in Aligarh.

They stated that human beings from different streets additionally sell off the rubbish on the street main to it getting piled up. "Either boxes have to be positioned or rubbish has to be cleared regularly," stated the citizens.



Figure 9 Transh at intersection



Figure 10 Trash on the road and animals around that at intersection

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C. Time-Saving by Using these Roads

When interviewed about whether or not the that these roads are time-saving or not, 85% of users aforesaid NO voice communication that the roads are unhealthiest and don't save their time however 15% of users said that they need to require an extended route to achieve the destination

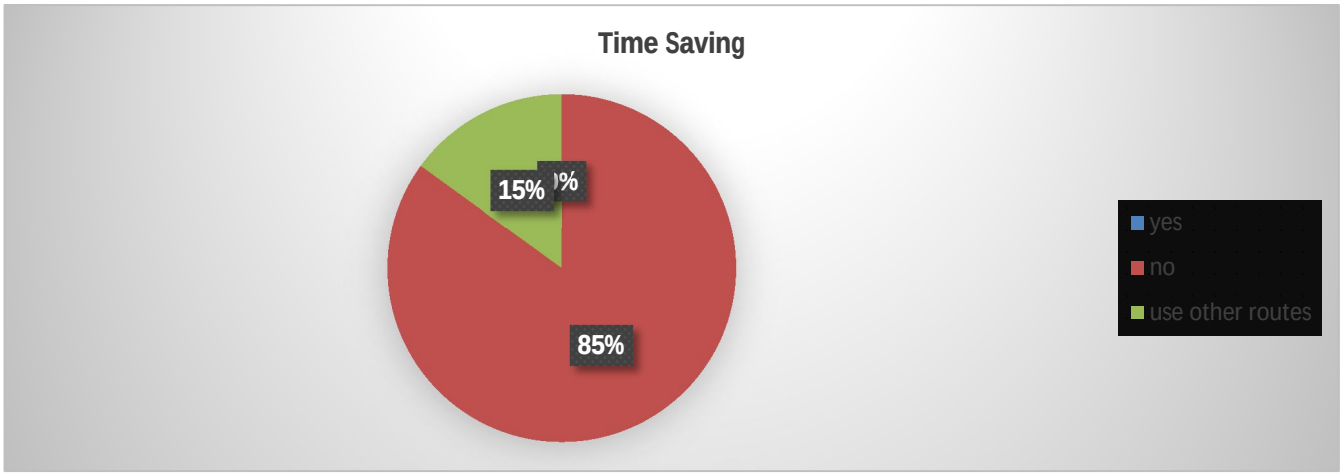


Figure 11 Time-saving by using these Roads

1) *Observation*- It was determined and studied that these roads are unhealthy in condition and avoid these roads to avoid wasting their time by taking longer distances briefly time.

D. Safety on Roads

The condition-This factor of safety on roads was especially for pedestrians,2-wheelers, and bicycle users, where only 20% of users found it safe for them to use these roads while 80% of users said these roads are not safe for pedestrians,2-wheelers, and bicycle users.

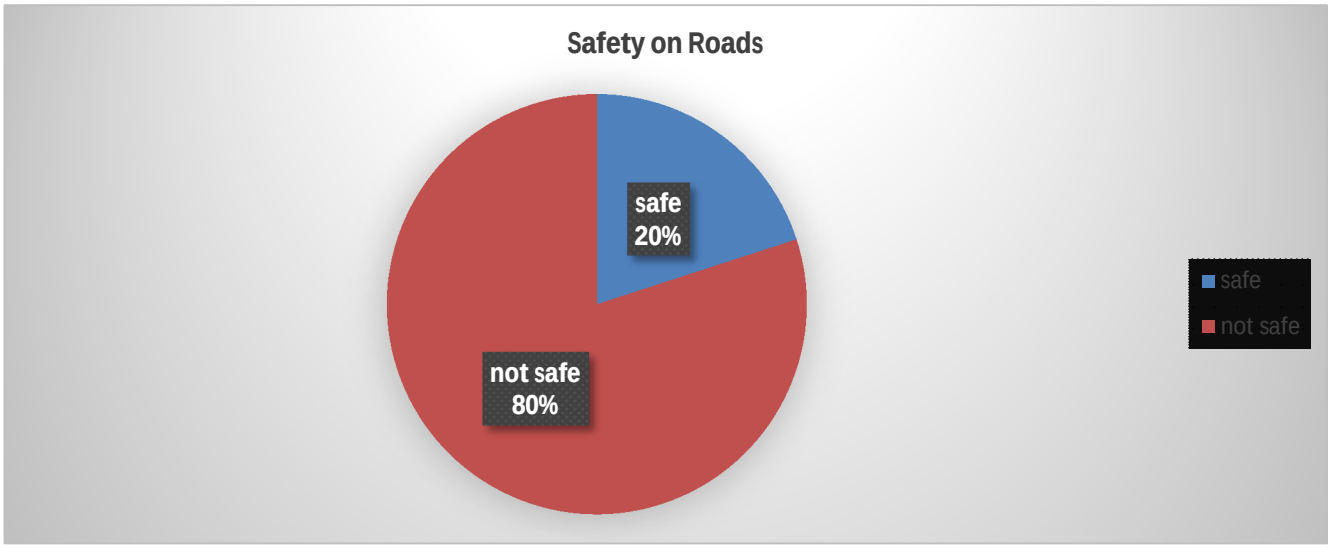


Figure 12 Safety on roads

1) *Observation*- As a pedestrian, the 2-Wheeler user needs protection on the road during traffic. As for pedestrians, there are no footpaths so they walk on these same roads along with other road users the safety on the road is not proper due to bad conditions of roads like pot-holes, interlocking bricks settlement, and improper encasement work.

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Figure 13 Eroded encasement surfaces



Figure 14 Pot holes at tuns



Figure 15 Less path for moving vehicles and moving on wrong hand



Figure 16 Sharp speed brakers



Figure 17 Encroachment and trash on the road



Figure 18 Due to encroachment and trash there will be congestion



Figure 19 Encroachment and illegal construction



Figure 20 Pole and users moving on wrong hand

Ministry of Road Transport and Highways (MoRTH) says 4,775 and 3,564 accidents occurred in the years 2019 & 2020, respectively, due to potholes.

The hold-up caused by potholes may result in Wastage of fuel and increasing air pollution, cathartic CO (carbon monoxide), and different waste by full automobile account for environmental and pathological states that vary from nose running to world warming. Wear and tear on vehicles attributable to idleness in traffic and frequent acceleration and braking, resulting in additional frequent repairs and replacements. Frustration that comes from the slow, stop-and-go condition of the traffic congestion cause discomfort and weakness in Vehicular. Congestion will increase the tendency of collision which can lead to a series of injuries and fatality

Potholes have fee some valuable lives, and people have a terrible effect on the monetary machine and take approximately visitors' congestion. Motorists have claimed that they may be losing pretty some coins due to charges of retaining their automobiles. The most massive kinds of damage that have been as a result of potholes on automobiles are alignment problems, damages to the beneath carriage, mufflers, shocks, axles, tires, and rims.

At low speeds, hitting a deep pothole can motive damage to tires, wheels, and steerage alignment but the rate of repair likely would possibly now not justify an insurance claim. At higher speeds, can motive excessive damage and risks loss of the supervisor of the auto that can result in impact with exceptional vehicles, the curb, or roadside objects.

V. CONCLUSIONS

In Aligarh city, many prominent roads are constructed with these interlocking bricks but they have many issues:

1) These roads should not be used for the movement of heavy motor vehicles because settlement will take place, then potholes will appear and it will lead to accidents.

2) These roads are not comfortable for the movement of 2-wheelers because at the time of riding you may feel jerks, uncomfortable riding experience, and leads to health damage.

3) While riding 2-wheelers we face an issue of deviating the path of the vehicle from its original path and you may feel a sudden jerk on the handle of the vehicle and then to the shoulders and will apply extra force to control the vehicle's original path.

4) Proper installation of bricks is not done properly after finishing the work after removing the bricks. There remains unsatisfied interlocking and will cause accidents.

5) After the work of underground amenities, there will be improper encasement.

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The condition of Aligarh city Roads is too bad due to the following reasons:

a) Settlements of interlocking bricks. Figures 7
b) Trash on the road due to this animal moving around it may lead to accidents. Due to trash, there will be a slippery surface and it may lead to accidents. Also, there will be hygiene issues. Figures 9 & 10
c) There must be proper trash management. Figures 9 &10
d) The roads are having potholes that may lead to accidents. Figures 13 & 14
e) Sharpen speed breakers are on the road due which sudden jerks faced by the users and may lead to accidents. Figure 16
f) Road width is becoming shorter due to encroachment on-road and entrance of the house are on the road. Figures 17, 18 & 19
g) People use only one side of the road just because the side is in bad condition and they choose the wrong side and due to these accidents may leads and congestion may happen. Figure 20
h) There will be no road construction of interlocking bricks where HVM (Heavy Motor Vehicle) moves.
i) These interlocking brick roads are only used for street road construction and footpaths were only for pedestrians.
j) For HMV (Heavy Motor Vehicle) there should be concrete roads.

A. Effect of Automobile Vibration on the Human Frame

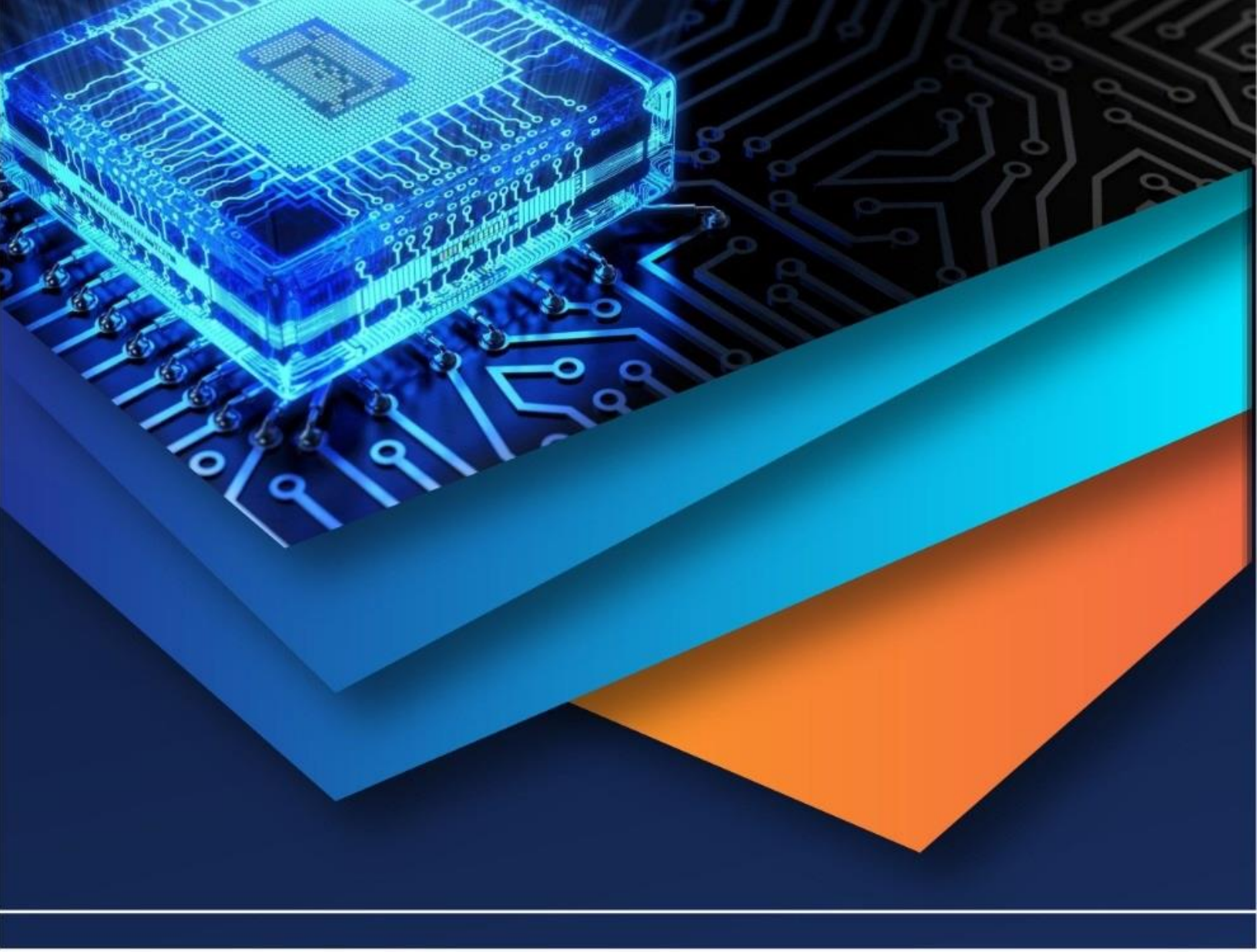
While handling the outcomes of automobile vibration on people it's miles essential to observe the bodily traits of the frame. The impact on the frame because of vibrations is mechanical, physiological & subjective responses. It additionally outcomes in the overall performance of humans.

B. Remedies for These Problems

1) The roads should be constructed with concrete rather than interlocking bricks.
2) The waste should not be thrown at the intersection, there must be a proper waste management system in the city.
3) The rules must be properly defined for waste dumping if someone doesn't follow these rules strict action should be taken by the authorities.
4) The transformers should be placed somewhere else not after the intersection.
5) The encroachment should be removed permanently and a fine must be imposed if someone does encroachment again.
6) The open channels must be coved by removable concrete covers so that the width of the road increases for parking.
7) Electric poles must be removed from the road as they become hurdles for road users, so electric wires should be underground

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