City Traffic Jam Solution

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Abstract

Traffic jams are a significant challenge in urban areas, affecting the daily lives of crores of people. For people living in cities, frequent traffic congestion disrupts routines, wastes time, and hampers productivity. The impact is felt across all sections of society—office workers struggle to reach their workplaces on time, students face delays in attending classes or exams, and ambulances are often unable to reach hospitals promptly, putting lives at risk. Additionally, individuals commuting from nearby towns and villages for work face severe difficulties, as delays due to traffic jams become a burden to their already tight schedules.

This persistent issue not only affects individuals but also poses a broader challenge to the nation's progress, as efficient transportation systems are essential for economic growth and urban livability. The current state of traffic congestion highlights systemic inefficiencies and the lack of effective solutions to address growing urbanization and vehicular density.

The need for practical, sustainable strategies to mitigate traffic jams is urgent. Solutions must ensure smooth vehicular flow, minimize disruptions, and prioritize unhindered transit on city roads. This research emphasizes the importance of understanding the underlying causes of traffic congestion and explores innovative approaches to transform urban transportation. By addressing these challenges, the study aims to alleviate the burden on individuals and contribute to a more efficient, productive transit on city roads.

This research, conducted in the National Capital Region (NCR) with New Delhi as a focus, proposes new traffic laws and system-based strategies to tackle these challenges. The study aims to bring relief to commuters by helping them reach their destination without facing halts on the way due to jamming or traffic gridlocks. It brings to light methods of traffic regulation, and ensures efficient traffic movement. Although done in Delhi NCR, the findings of the research can be adapted to other cities facing a traffic quagmire. This research holds promise for reducing traffic jams, ensuring smoother transit, and improving the quality of life for urban residents.

Keywords

City Traffic Jam Solution, removing city traffic snarls, traffic jam mitigation, traffic congestion solution, traffic gridlock solution, unhindered traffic movement

Introduction

Background

Traffic congestion is a persistent issue in urban areas, significantly impacting daily life and economic productivity. Despite various efforts, such as constructing flyovers and underpasses and introducing mass transit systems like metro rails, traffic jams continue to disrupt the flow of vehicles on roads. While metro systems have brought some relief by offering faster and uninterrupted travel, they are limited in scope, with issues like overcrowding, inadequate last-mile connectivity, and restricted coverage to major junctions. These limitations have left a considerable gap in addressing the broader problem of traffic congestion.

Problem Statement

Despite the development of modern infrastructure and transport systems, traffic congestion remains a critical challenge, especially in metropolitan areas like the National Capital Region (NCR). Rainy days worsen the situation, with waterlogging further slowing down traffic and causing gridlocks. The current approaches to alleviating congestion, such as penalizing specific vehicle categories like autos or tempos and altering their routes, have proven ineffective. The lack of comprehensive traffic management strategies and systemic inefficiencies continue to hinder smooth vehicular movement, leading to wasted time and resources.

Objectives

This research aims to :

1. Identify the systemic and operational causes of traffic congestion.
2. Propose innovative traffic management strategies and new regulations to address these challenges.
3. Offer practical, adaptable solutions that can be implemented in New Delhi and other cities with similar traffic issues.

The ultimate goal is to improve traffic flow, enhance commuter experience, and provide a blueprint for sustainable urban transportation management.

Methods

Type of Research: This research is 'observational' in nature. It gives an effective solution to the traffic jam issue in cities.

Information:

Necessary information is prepared and given out of 'Observation' as the source of data. The survey method is solely observational, and the findings are made from comparisons. It is based on analysis of traffic movement and the traffic rules that vehicles follow while plying on roads.

Research Evaluation and Preparation Instrument

- The report is supported with photographs, and findings about traffic movement are explained in detail. Photographs are included in original research paper and not in the research article.
- Diagrams are also drawn for better understanding and explanation.
- Issues related to pedestrians, red lights, green lights, and how to do 'overtakes' are addressed with care.
- Camera is used for taking pictures of traffic jams.

Data Sources

Information is collected and prepared using primary sources of data. The evaluation is done following 'observational method' to understand the cause of traffic jam and its impact on daily life.

Hypotheses

Empirical or Abstract Level

Concept A	Concept B
Left side Traffic to ply on right side	**Right side Traffic to ply on left side**

This working hypothesis, when applied to roads in big cities, can bring noticeable changes.

Source of Hypotheses

Personal Experiences: The researcher travelled on the roads of Delhi in buses and autos. While commuting to different places, he had some observations of traffic movement in Delhi. He could make out that interchanging both sides of vehicle movement can bring in visible change and can reduce traffic jams.

Results

Placing Barricade

A solution to the problem of 'halts' is blocking one side of traffic flow completely by placing a 'bar shaped barricade' at the centre of a junction. Then what happens is traffic flow gets streamlined and becomes free flowing. This is what the researcher could make out from his studies. Again, a pair of U-turns should also be created aligning the barricade on both sides that will allow traffic to change directions. This will completely solve the jamming problem on junctions.

Initially, two U-turns are placed aligning a barricade. But, at a later phase of the research, it is shown how three or four U-turns can be placed on a junction depending on the number of roads that meet at the junction. The requirements vary from junction to junction and from place to place.

These two methods of placing a 'barricade' and 'U-turns' can really help overcome traffic jamming problem in big cities like 'Delhi.' It is also a very economical method as no huge expenses are required to bring in these changes. Only thing is new traffic rules will be implemented, but that is essential to overcome the traffic jamming problem. People will become used to these changes and will learn the new rules as they drive their vehicles on road. Initially, on implementation of the new rules, people may also be guided by the traffic police. So, the traffic police should also be trained and given accurate knowledge about the new traffic rules so that they can guide people well.

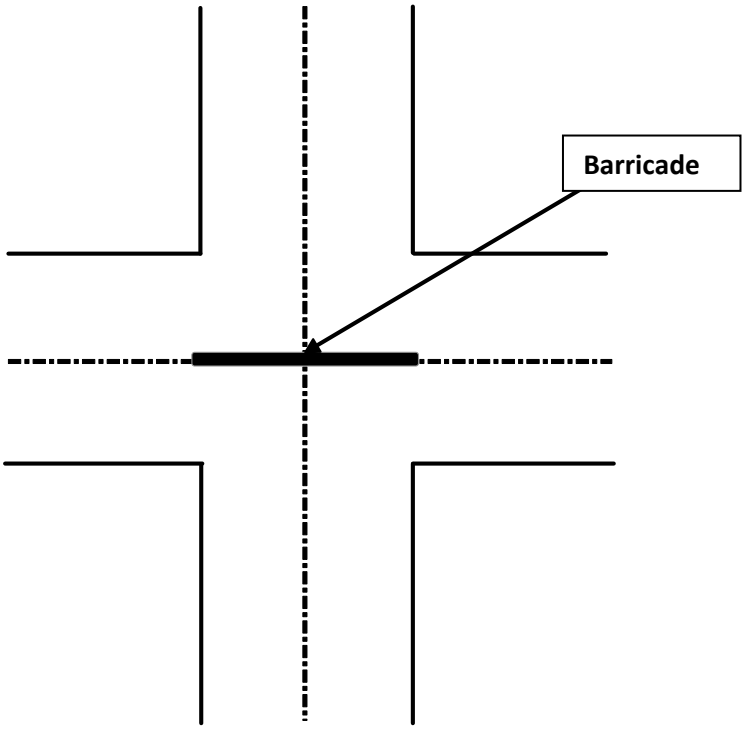
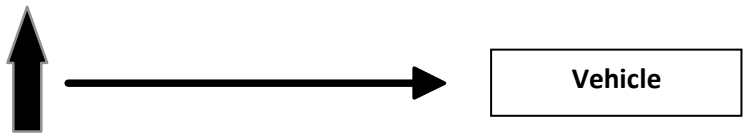


Fig 9 (Numbering same as in original research paper)

Unit of Diagram



Here an 'arrow' is considered to be a 'vehicle' that is driven on roads.

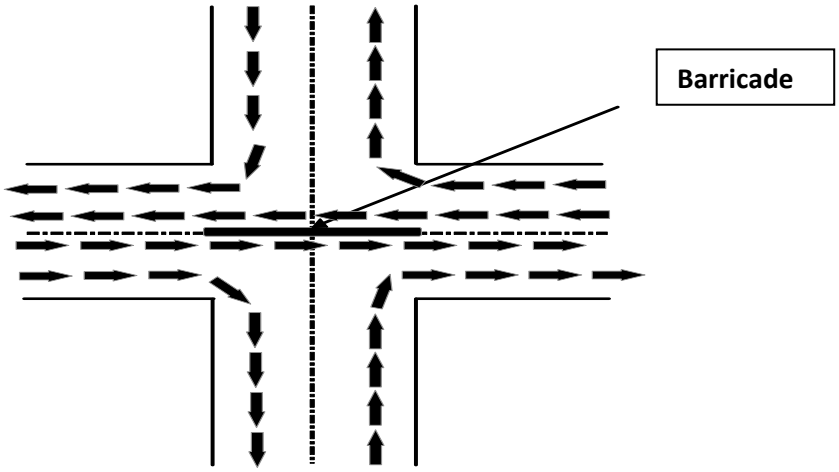


Fig 11 (Numbering same as in original research paper)

In the above diagram, it can be seen that traffic starts to flow without any stoppages or brakes. However, there is one issue. How does traffic from the bottom reach the upper side and vice versa?

For this, U-turns should be created on both sides, aligning the barricade. Then traffic from the bottom can take a U-turn and reach out for the upper side as in the diagram below. The same is true with upper-side traffic. The traffic from the top side can take a U-turn and reach out for the bottom side as in the diagram below. Presence of a U-turn on the left side allows traffic to reach out for the bottom side.

It is explained diagrammatically below.

Placing U-turns

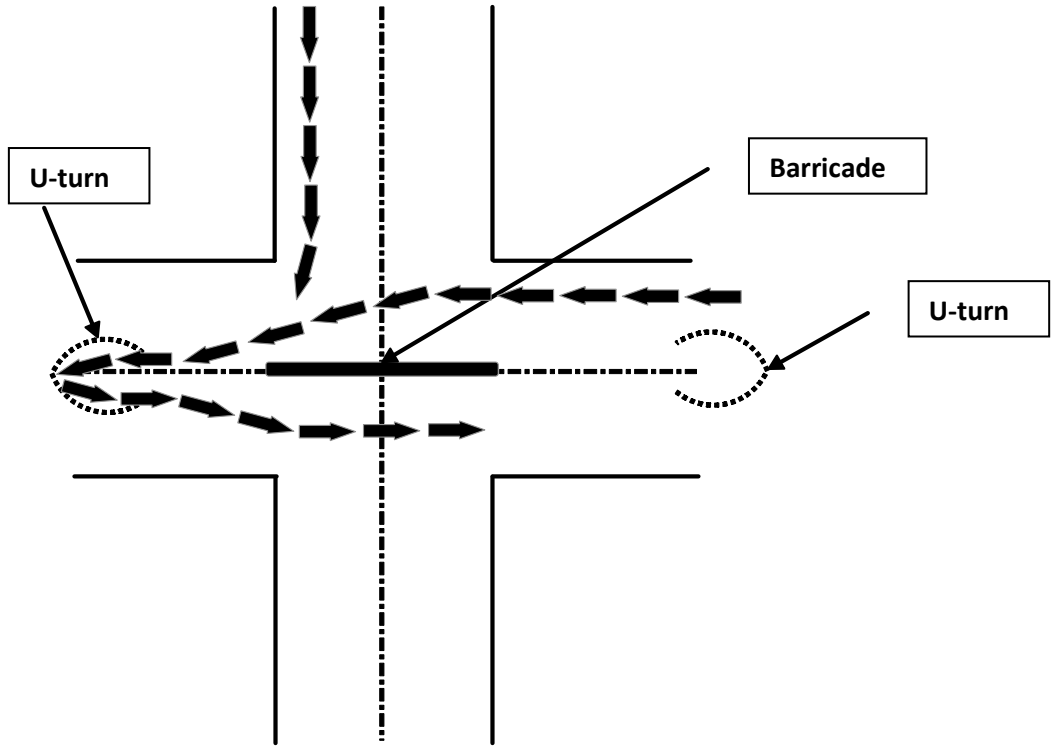


Fig 12 (Numbering as in original research paper)
U-turn allows traffic from the upper side of the diagram to reach the lower side.

A 'U-turn' allows traffic coming from the upper side of the diagram to reach the lower side. It happens in a flow without any 'halts' to be seen anywhere on the junction.

The concepts of 'barricade' and 'U-turns' can completely solve problems such as halts and traffic jams. So, these two concepts need to be applied at every junction where roads meet. This will help the traffic find a free road and a better driving experience. Then there will no longer be unnecessary blockades and stoppages at road junctions. So, the entire route would subsequently remain free from traffic jams.

Similarly,

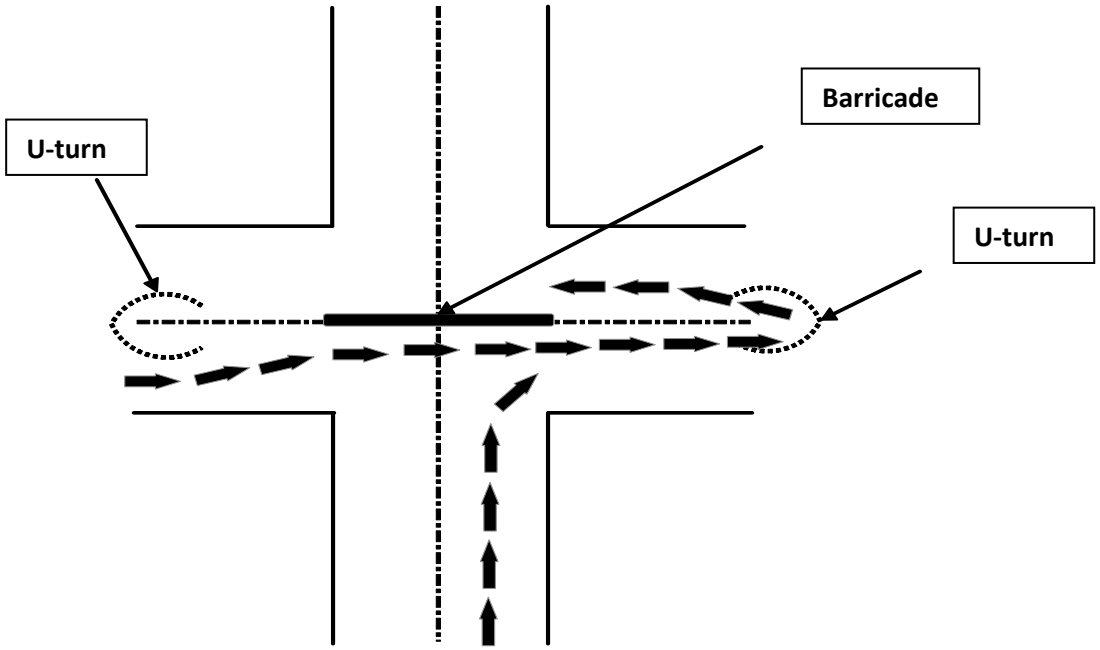


Fig 13 (Numbering as in original research paper)

U-turns allow traffic coming from the lower side of the diagram to reach the upper side.

So, when brought to application, the entire phenomenon can be described as in the diagram below.

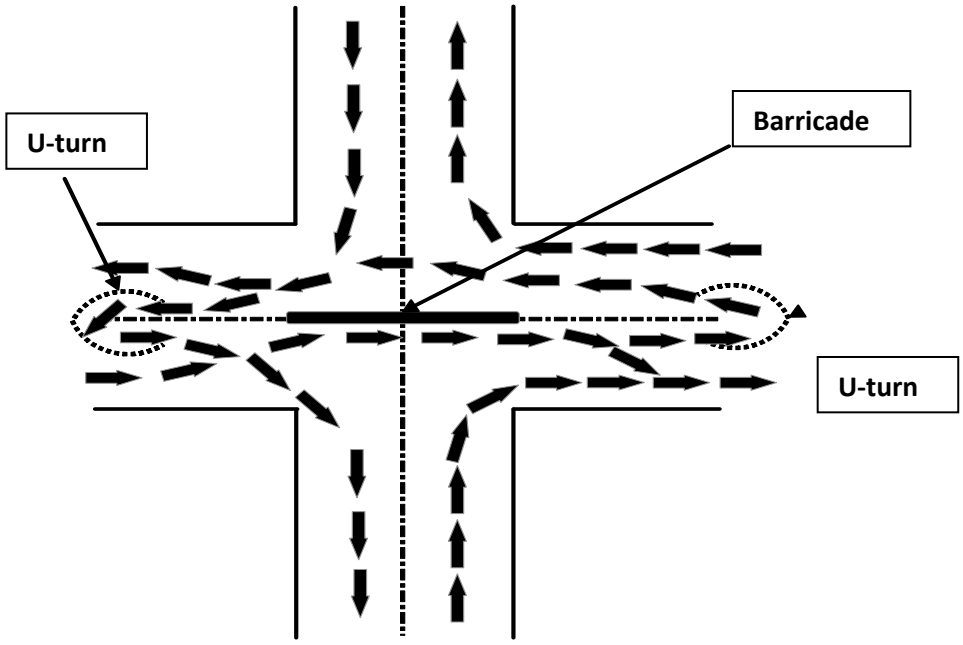


Fig 14 (Numbering as in original research paper)

U-turns allow traffic to easily change sides

It is just that the U-turns should be placed at quite a distance from the junction so that traffic can easily describe their routes. Another important aspect is roads near a junction should be kept as wide as possible. Then traffic will be free-flowing, and there will remain no halts. So, when traffic starts to move without stoppages, then, obviously, there will no longer remain traffic jams.

Another important aspect of this research is the barricade can be placed in any direction at the centre, either from Left to Right, or from Top to Bottom.

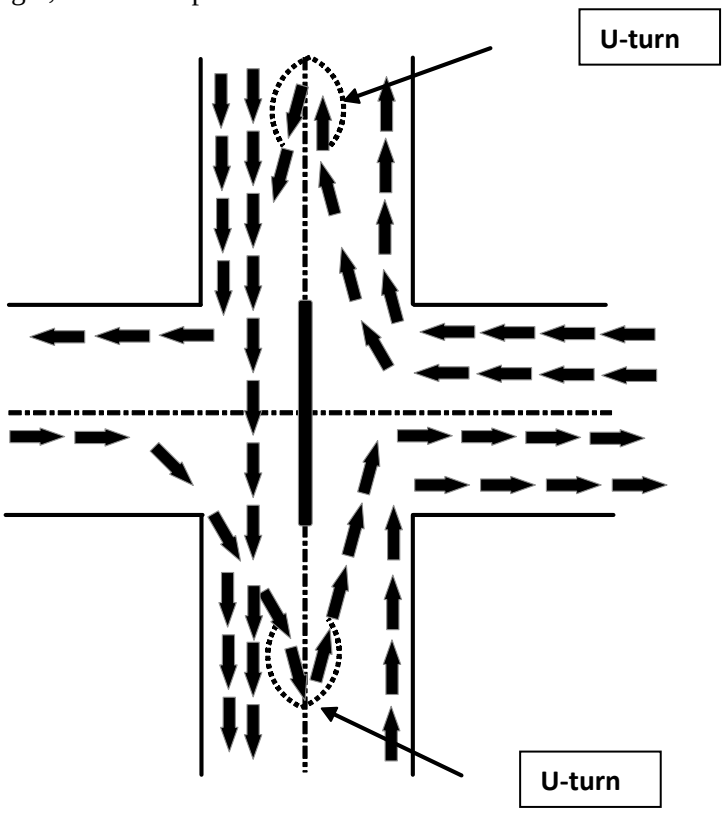


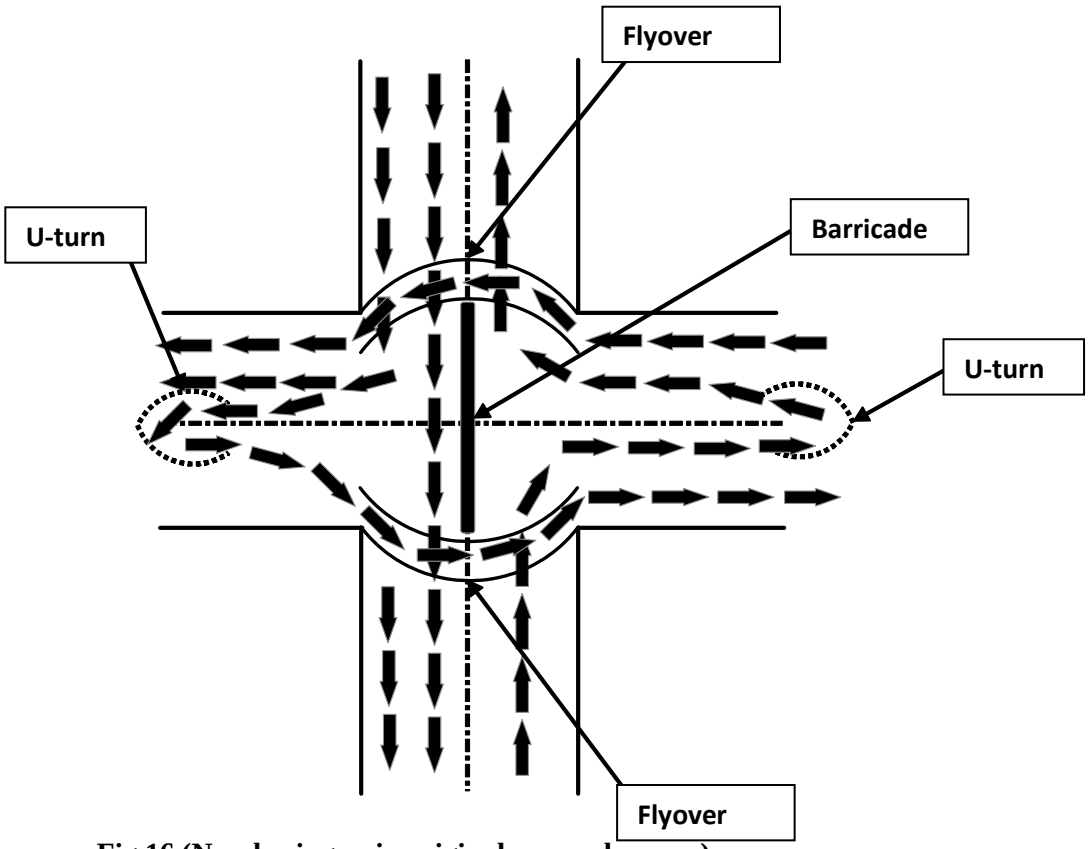
Fig 15 (Numbering as in original research paper)

U-turns, when placed on opposite roads, increase convenience.

Another good thing that can be done is building flyovers and under-ways, instead of the U-turns, so as to help the traffic find an easy exit to the other side. However, it all depends on space availability and suitability.

The flyovers and under-ways are small structures to be built connecting two points of a junction so that traffic can easily find a safe passage. However, it is suggested that such structures should be built for junctions that are very wide and stretched far apart. One such example can be the Dhaula Kuan junction, where roads from Gurgaon (Gurugram), Uttam Nagar, and AIIMS meet.

Example :



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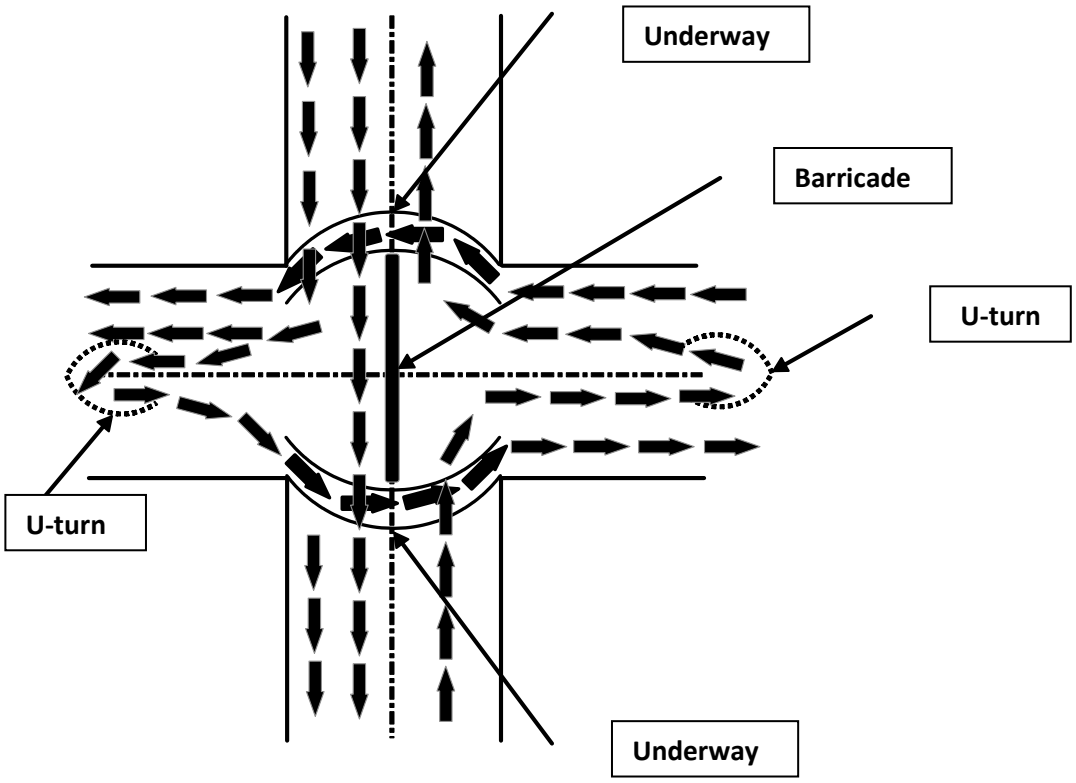

Fig 17 (Numbering as in original research paper)

This will definitely solve the traffic jamming problem, as stoppages at junctions will no longer be there after the introduction of U-turns, barricade, flyovers, and underways at junctions on roads.

This research, however, does not guarantee road clearances due to traffic snarls arising as a result of unexpected vehicle breakdowns or accidents.

Traffic Policing

The role of traffic police has to change now. From traffic movement controllers, they may now become 'pedestrian helpers' too. That means their job shall be to make sure that pedestrians safely cross roads and traffic movement is halted whenever it is necessary for people's safety. So, their role shall be 'people-centric' rather than 'traffic-centric'.

By switching on red lights in a junction from all directions simultaneously would halt traffic movement and shall enable people to safely cross roads without facing any problems or encountering any confusion. The traffic police would ensure that they make safe crossing of roads possible for pedestrians, especially during the peak hours of traffic movement. This is absolutely necessary, as now there will be no halts in a junction, and traffic movement will take place continuously from all sides until the red light is lit. So, traffic police should always keep a vigil and make arrangements for the safety of pedestrians on roads. The other activities of traffic police shall be to ensure that traffic moves on the correct routes and there is no over-speeding or too much overtaking. For this reason, regular patrolling and deployment of traffic police in vital areas would be required.

Moreover, their job shall also be to ensure that, in case of an accident or a breakdown, swift action is taken and the broken-down vehicle is removed off the road so as to clear the lane for other vehicles to ply freely. So, a team should always be ready with cranes and other heavy vehicles to remove debris and to keep the lanes clear all the time. A rapid action medical team may also be deployed to hospitalize people who have met with an accident.

It is suggested that helicopters be introduced for traffic police in a city to keep track of what is happening on the roads. Again, a central control room is necessary that should be supported with the latest IT equipment and accessories. The traffic movement should be monitored with installed cameras and satellite views. In this way, the traffic policing role will be much broader than it is presently.

Red Light, Yellow Light, and Green Light

At a junction, there should be a single red light and a single green light for one particular direction. That means four red and four green lights for the four directions at a junction. However, a Yellow light may also be kept just as an indicator for vehicles to become ready to start and go immediately when the green light is lit. The red lights should be lit 'ON' simultaneously for all directions, thus ensuring a safe passage for road crossers (pedestrians). So, when the red lights are kept ON, the traffic would be at a standstill for a while. After that, when the green lights are lit up, then again the traffic flow shall resume from all directions. This should repeat alternately after an interval of time, and hence safe crossing of pedestrians and sound traffic movement can take place without facing any problems.

Traffic Police Signaling

Just in case lights at a junction are not functioning or there may be an absence of red and green lights at a junction, then manual traffic police signaling can be used for the purpose of traffic movement and traffic halt. In such a situation, the traffic policeman may raise one hand for 'traffic halt' from all directions and lower the hand for 'traffic movement' from all directions. The person on duty can make use of the 'police whistle' as well. (The present manual traffic signaling system is applicable for this purpose.)

This will eliminate all confusion related to traffic movement. 'STOP' would mean halt for all directions in a junction, and 'GO' would mean drive for all directions of traffic in a junction.

Pedestrian foot over-bridges and under-ways

It is for the safety of people that it is recommended that more **foot-walkers** and under-ways be built for pedestrians near major junctions. This will allow people to cross roads safely without coming into direct interaction with traffic. So, construction of pedestrian **foot over-bridges** and **under-ways** shall help solve a lot of purposes.

Overtakes

The researcher, during the course of his research, has found that overtakes should take place in the same way as overtakes happen now. It should be on the right side of the driver's seat. This remains the same even when the new system (new direction) of traffic movement is implemented. The reason is in India the driver's seat is on the right side of vehicles. So, overtakes should always be on the right side, even when the direction of traffic flow changes. If overtakes are done on the other side, i.e., the left side of vehicles, then the driver won't be able to see the traffic coming from the other direction, and so obviously the vehicle shall meet with an accident. So, it is compulsory that overtakes should take place on the side of the driver's seat, i.e., the right-hand side of the vehicle.

Retention of Original Traffic Rule – Coming Back to Original Rule

After doing all the above analysis, the researcher rethinks about retaining the original traffic flow rule while simultaneously incorporating the new findings. The researcher could make out from the research that by implementing the new findings, it would be possible to ease traffic flow in the original rule of traffic movement.

Original Rule or Present Rule

Concept A	Concept B
Left side Traffic to ply on left side	**Right side Traffic to ply on right side**

With the introduction of one 'barricade' in the centre and four U-turns on four roads of a junction, the diagram of the new model is as follows:

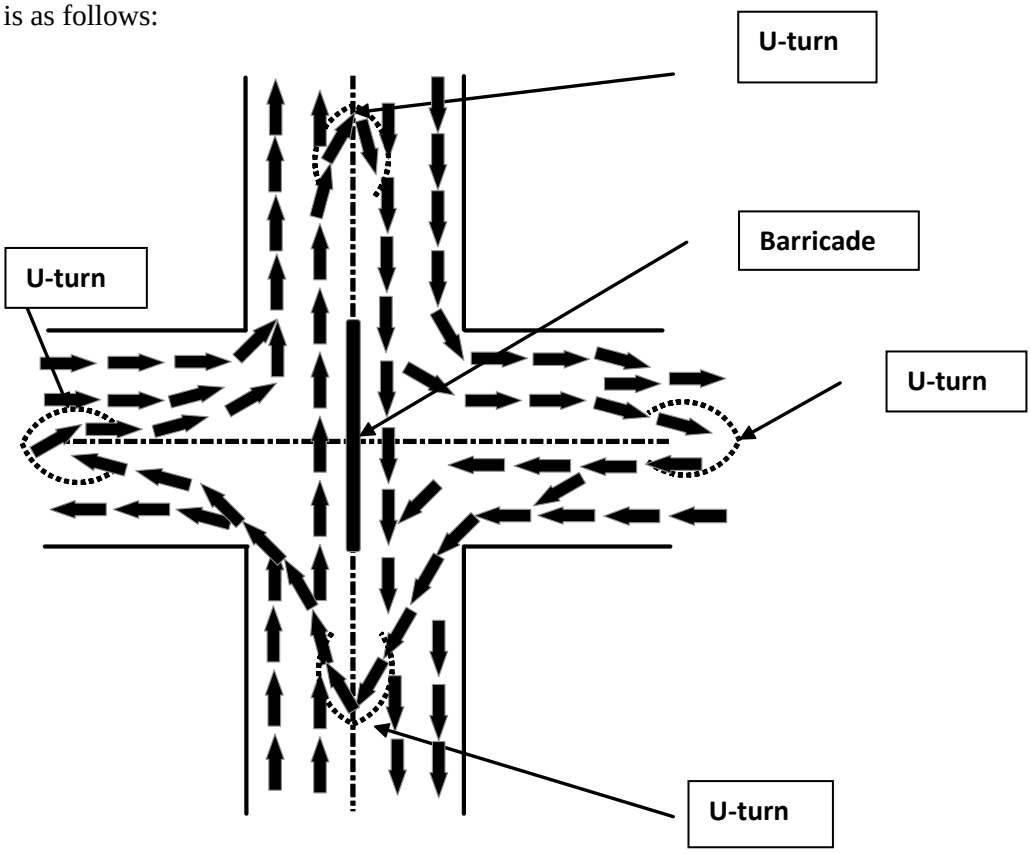

Fig 20 (Numbering as in original research paper)

Discussion

As this research work has reached a stage where it points to the fact that traffic jams can be solved on city roads, so it is highly recommended that the present-day traffic movement system be retained while we keep implementing the major findings of this research. In this way, it will be possible to mitigate the traffic jamming problem on roads while maintaining our present-day traffic movement rules. Of-course, it's true that some present-day rules will change, as

otherwise the traffic-jamming problem cannot be solved. One major change in rule is red lights should be lit simultaneously from all sides at a junction in order to remove all confusions relating to road crossings and halting traffic movement. U-turns, building over-ways, building under-ways, and placing barricade in the middle of roads at every junction can certainly help to attain free-flow of traffic. It is also necessary to build pedestrian foot-walkers (foot over bridge) wherever required for safe crossing of roads. With the use of U-turns, it is possible to retain free-flow of traffic and alleviate traffic jams.

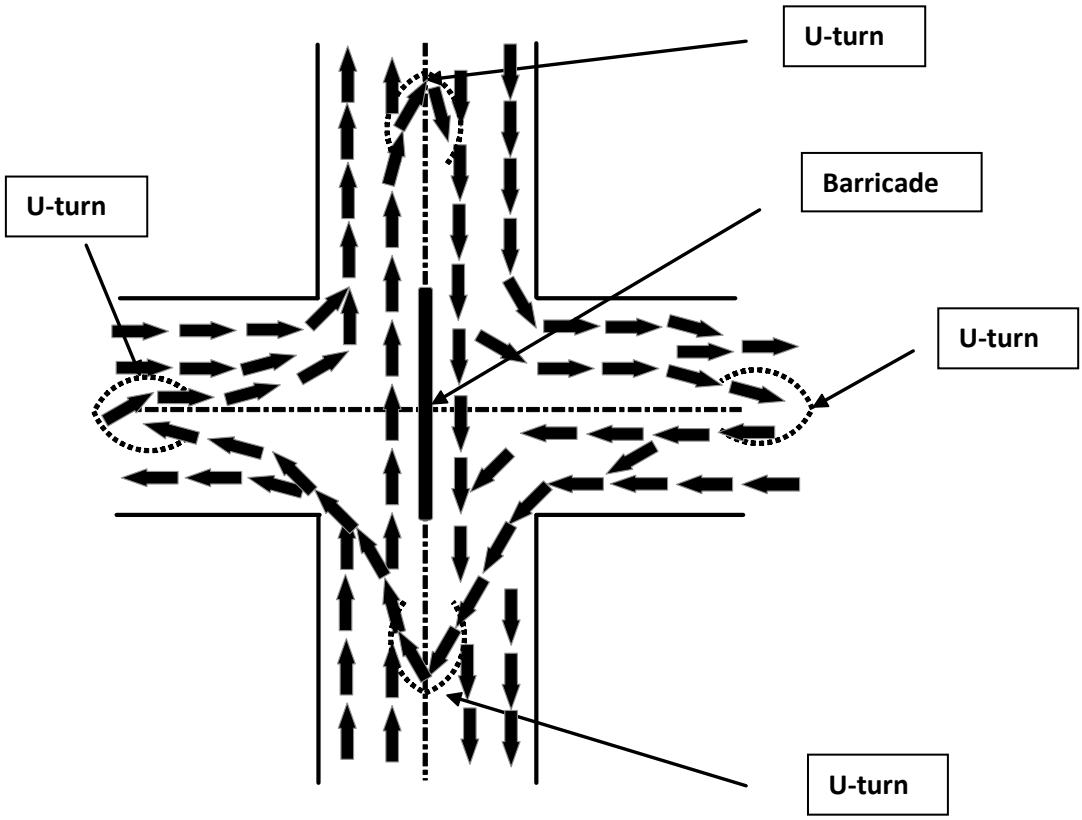

Fig 23 (Numbering as in original research paper)

Figure comprises one barricade and four U-turns

Solution for a Three-Road Junction

Three road junctions are most often seen in Tier 2 and Tier 3 cities, but they are also found in Tier 1 cities as well. Now the solution for a three-road junction, after deep introspection and observation by the researcher, has come to the conclusion of placing a T-shaped barricade in the middle of a three-road junction and also simultaneously placing U-turns at all three arms.

The solution emerges as below, where traffic jamming gets solved on its own.

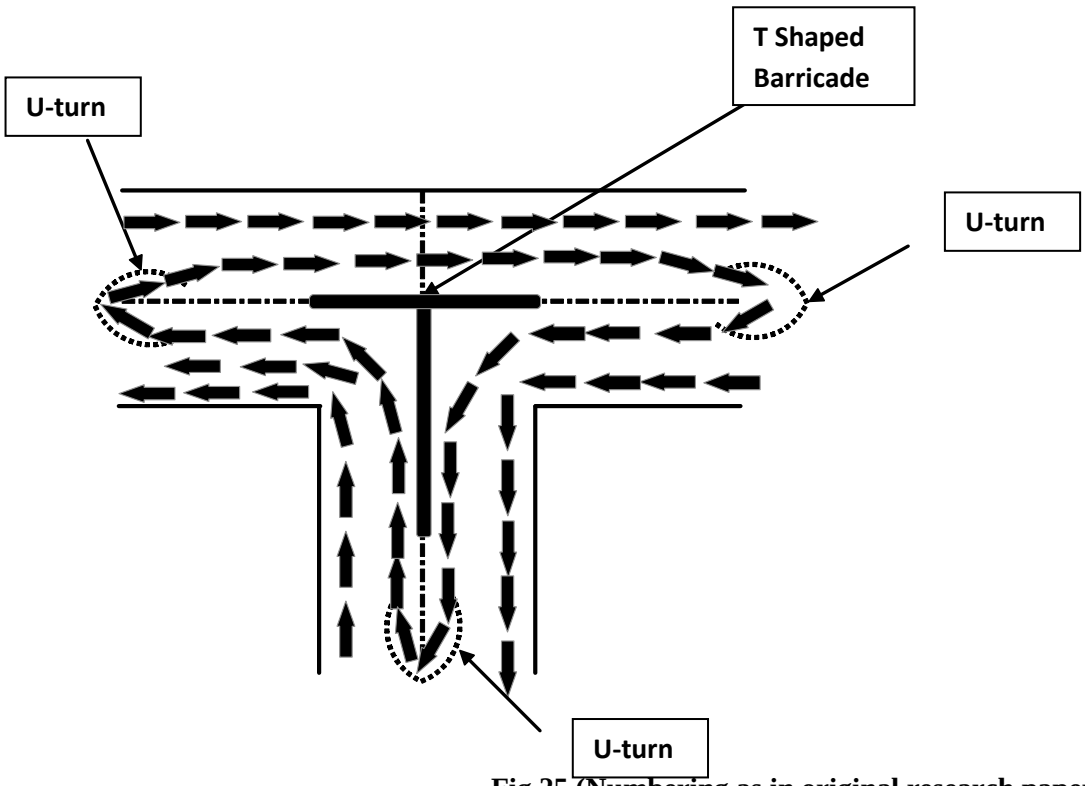

Fig 25 (Numbering as in original research paper)

Three-road junction jamming problem gets solved with a T-shaped Barricade

This finding is going to solve jamming problem in a three-road junction and will ease the traffic jam so that vehicles can move freely without halts. In Delhi, the Dhaula Kuan junction, where roads from Gurgaon (Gurugram), Uttam Nagar, and AIIMS meet, is a three-road junction. So, there too, a T-shaped barricade can be placed. This will solve the jamming problem at the junction.

This study has reached certain conclusions and the present findings can be implemented on city roads of 'New Delhi,' its sample city, and also in all other cities of India and the rest of the cities of the world. However, the research may be continued for discovering such innovative methods to bring in significant changes in traffic movement and ease traffic flow on roads so as to completely eradicate jamming-related inconveniences.

Conclusion

Some conclusions are drawn following the research performed that summarizes how it is possible to eradicate traffic jams and establish free flow of traffic on city roads.

1. Exchanging sides can help to restore **smooth** traffic flow, and traffic movement can take place without any stoppages. However, even without exchanging sides traffic flow without halts can take place by implementing the new system.

2. It is possible to retain the present-day traffic movement rule while introducing the new changes.

3. Placing barricades in the middle of road junctions can help to further regulate traffic movement and leverage an unhindered traffic flow.

4. Introducing U-turns in junctions will allow traffic to change routes as desired and will also ensure free flow of traffic movement.

5. Lit red lights to halt traffic coming from all sides simultaneously shall remove needless confusions.

6. Pedestrians can easily cross roads with the lighting of red lights simultaneously. Green lights shall resume traffic movement. However, construction of under-ways and foot-walkers (foot over bridges) is also required in sensitive areas.

7. Traffic police shall play a more responsible role by ensuring the safety of pedestrians, making sure that vehicle drivers follow the new city traffic rules with diligence, clearing wreckage in the event of accidents, ensuring that broken-down vehicles are cleared instantly, and carrying out Aerial patrolling of vehicle movement.

Reference

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*. Ahuja Ram, *Research Methods*, Rawat Publications, Covert Observation, (Pg- 247)

*. Ahuja Ram, *Research Methods*, Rawat Publications, Formulating Analysis, (Pg- 250)

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