

# Traffic Flow Characteristics on the Staggered Intersection

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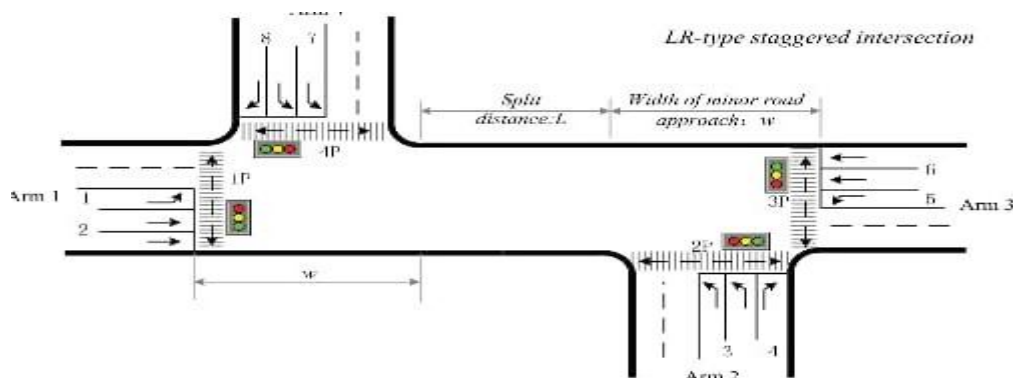
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**Abstract** - The staggered sort crossing intersection point is an exceptional kind of convergence on a road arrange. Its topographical qualities contain two T-legged convergences because of that the lost time per cycle to end up being longer than at cross-intersection focuses under customary sign control, as needs be provoking low intersection point viability. This article shows that the issue can be shed at the left-right sort of dazed union by channelization and sign organizing, in perspective on a masterminding method and pre-signal, which diminish the proportion of lost time during the marked cycle using the split division as the orchestrating district. VISSIM was used to appear and research the proposed system similarly as the conventional methodology for connection purposes. The entertainment revealed that the proposed strategy diminished the ordinary delays and most extraordinary line lengths in each advancement and for the entire union, both in the peak hours and in off peak hour.

**Key Words:** Staggered intersection, LR-RL type intersection, Signals

## 1. INTRODUCTION

The staggered intersection is an exceptional convergence in a street arrange. When in doubt, ventured crossing points are comprised of two T-formed convergences and enter the left and right (LR) type and left and right (RL) the fundamental street (LR or RL). The crossing point of parts ought not be mistaken for the convergence of the crossing points. The last partitions the bigger convergence into two convergences if the principal street is isolated into two separate streets just before the crossing point so two littler crossing points formed. intersections, every convergence with convergence geometry (four legs) cross-moulded. A great part of the writing on existing crossing points centre around their security and execution without sign control. Amazed convergence traffic-clogged when no sign is available there. AS with ordinary crossing points, a bent cross isn't controlled when the traffic stream is low. As the traffic stream on the principle street builds, the traffic holes are not exactly the convergence. In this way, signal control is required to spread the way. Because of its remarkable topographical highlights, it is hard to plan the sign gauge for mutilation intersections. a ventured crossing point ought to be considered as two T-formed convergences, which ought to be controlled when the partition separation is more prominent than 50 m (Fig.1, 2), and the rest as a crossing point. In this, we can stamp the territory between the two T-crossing points as an arranging region", include street markings and stop lines and introduce cautioning lights. This region is utilized to put the moving line for LV traffic from an optional street and TVs from the Fundamental street upstream. The convergence has 13 vehicle developments after this directing. We mean sign for developments 3 and 7 as primer sign and others as crossing point signal.



Geometric depiction of the cut LR-type cut, motorizing travel nets can extend travel convey ability and road prosperity. We propose the possibility of visual needing to give fundamental, capable and secure traffic flows through robotized suggests. The genuine report is described by demonstrating a virtual region between the vehicles running on different lines. Such a structure can be used by the Catalyst Traffic Control System (CACC) to turn, make and require safe "vehicles" to experience vehicles. Stress for decreasing head and neck advancement was evaluated at the hour of the T crossing point Minimum data was obtained concerning the security of drivers and measurement data on the limit of drivers with physical issues.

Most driver-related setbacks occur at constrained rates; Therefore, elective kinds of T-crossing focuses were picked for the assessment.

### Literature review

**B.Mahalel et al.(1987)** This paper presents an evaluation of two types of staggered intersections compared with a four-leg cross intersection, with the aim of analysing the safety and operational characteristics of the intersection layout. The advantages of the staggered intersection are advanced as an alternative layout to the cross intersection. Although the main advantage of a staggered intersection is in safety, this type also has operational advantages in some cases. The safety advantage manifests itself submitted in crossing major road traffic from the minor road to slow down, and in the lower number of conflict points and conflict streams. a better understanding of the priority regime at the intersection area; a lower number of conflict points and their dispersion over space; and lower critical gaps.

**K.Hunter- Zaworski (1990)** studied the drivers behaviour during crossing the intersection, the effect of restricted head and neck movement on driving performance was measured by decision time at simulated T-intersections. Little traffic safety and human factors literature concerning the performance of drivers with physical limitations was found. Most accidents involving drivers with diminished capacities occur at intersections.

A better understanding of the effects of physical limitations on driving behaviour and decision-making ability was sought. The behaviour of drivers at simulated T-intersections was investigated to determine the relationships between the range of movement of the head and neck, the visual field, and the decision time for a simulated traffic manoeuvre. The relationship between decision time and functional level, which is a combination of age and impairment, shows that younger drivers with impairments are able to compensate for their impairments in their driving behaviour. Older drivers, either with or without impairments, are not able to make the same compensations in their driving behaviour.

**J Crauss et al. (2000)** analyzed the staggered intersection in India and suggested four alternate algorithms for mid-block t-intersection in India. For these algorithms four measures were analyzed which are the percentage of vehicles crossing on the red man, pedestrian mean delay, mean cycle times and vehicle mean delay. During this research crossing facility provided in the city had flashing green light for pedestrians and flashing amber for vehicles which gives priority to the pedestrians, it creates more delay to the vehicles.

**AvishaiCeder and KobiEldar (2001)** in this paper study about the work examines the possibility of splitting an uncontrolled X intersection into two adjacent uncontrolled T intersections. This splitting aims to improve both the movement and safety of traffic. The problem addressed in this work is how to determine the optimal distance between the two adjacent T intersections. The best type of split, based on previous studies, is the one in which vehicles approach first the right turn and then the left turn in both directions of travel. With a medium level of traffic volume, the lengths of blocking queues are of the order of a few hundred meters and they are very sensitive to an increase of volume toward and beyond saturation flow. The optimal distance between the two adjacent T intersections has been determined using an optimization framework which can lead to practical implementation.

**Q-S.Wu et al.(2005)**In this paper, the traffic flow at an unsignalized T-shaped intersection in which there are three input directions of vehicles and two right-turnings and one left-turning has been investigated by using the cellular automata traffic model. The interactions between vehicles on different lanes and effects of traffic flow states of different roads on capacity of T-shaped intersection system are analysed. The traffic flow at an unsignalized T-shape intersection with three input direction by using a new cellular automata model. The phase diagram and the variation of intersection capacity with vehicle input probability, and the interaction between vehicles on different lanes are discussed.

**X.Fanet al.(2013)**studied that T-shaped intersections permit U-Turn movements, which make the traffic conditions of intersection complex. In this paper, a new cellular automation (CA) model is proposed to characterize the traffic flow at the intersection of this type. In present CA model, new rules are designed to avoid the conflicts among different directional vehicles and eliminate the gridlock-turn movement so the different direction of main road have asymmetrical influences on the traffic conditions of intersection. In this paper, a new CA model is proposed to characterize the non-signalized T-shaped Intersection with U-turn movements' this, new avoiding conflicts and gridlock avoiding rules are defined, and the average control delay is introduced as the performance measure. Simulations based on the present new CA model are executed. Three findings can be concluded from the simulation results.

**A.Medina et al.(2015)**in this study, the virtual platooning concept to ensure a smooth, efficient and safe traffic flow through an automated intersection. The virtual platoon is formed by defining a virtual intervehicle distance between vehicles driving on different lanes. Such distance is employed by a Cooperative Adaptive Cruise Control (CACC)system which, in turn, generates the required safe "gaps" for the vehicles to cross the intersection. This paper presents the

Cooperative Intersection Control methodology that generates virtual platoons of vehicles in an intersection, so that the vehicles can cross the intersection in a safe manner. This methodology relies on the definition of a virtual inter-vehicle distance between vehicles driving on different lanes.

The intention to take into account the overall flow of vehicles through the intersection such that we can efficiently regulate the desired vehicle flow of each lane of the intersection.

**Z.Cai et al.(2016)** This article shows that the problem can be eliminated at the left-right type of staggered intersection by channelization and signal to phase, based on a sorting strategy and pre-signal, which reduce the amount of lost time during the signal cycle using the split distance as the sorting area. VISSIM was used to model and analyse the proposed method as well as the conventional method for comparison purposes method reduced the average delays and maximum queue lengths in each movement and for the entire intersection, both in the peak hours and in the off-peak hour.

This method reduces the lost time of the signal cycle using the split distance as a staggering area, which holds the transient queues of vehicles released into the sorting area. The sorting area allows cycles to be shortened by decreasing the lost time per cycle compared with the conventional method. In this reducing the average delays and maximum queue lengths for each movement and the entire intersection, both in the off-peak hour and peak hours

**R.surisetty&S.sekhr.(2017)**The traffic signal design of the intersection has direct control of its safety and operation from a design and user-ability point of view. We identified Kothavalasa T-Intersection has been arising problems like road accidents, conflicts, and congestions. An efficient traffic signal control at the intersection for continuous movement of vehicles through the intersection. According to traffic signal, most traffic signal timing plans are designed to minimize vehicle delay based on the volumes seen in the past, not the present. Traffic count studies are to be made to determine the number, movement and classification of vehicles at an intersection. Signal timing is most important which is used to decide green time of the traffic light shall be provided at an intersection and how long the pedestrian walk signal should be provided. the calculations are done on the PCU values obtained from the traffic survey. By studying the road traffic of the city, we analysed that the major accident cause is collision of vehicles at the intersections. The collision may be rear shunt on approach to junction, right-angled collision, principle right turns collisions and pedestrian collision. These collisions can be avoided if proper design of the signal is done so that the main objective of the dissertation is to provide better and safe movement of traffic through signal design at the intersection.

**Zeng H et al. (2018)** collected data in five cities (Amritsar, Chandigarh, Kolkata Bangalore, and Indore) in which some locations were selected and analyzed. Data was collected separately for the main road, t-point and sideways and comparisons were made in between them. Data was collected with the help of a video camera in peak hours, i.e. 8 to 9:30 in the morning and 5 to 6:30 in evening. Relation, equations, and models were developed for flow, density and time of crossing.

**Ali shah and et al.(2016)**This research paper presents data collection and traffic analysis of Phase 3 and Iqra intersection Peshawar Pakistan. Inventory surveys including traffic control devices and traffic volume studies were conducted and data was collected. adopted the manual method to find the hourly traffic, there are traffic jams especially in peak hours and hence delays occur increasing the average trip time. One of the reasons of this traffic jam is poor traffic management.

## CONCLUSION

In this we, studied that staggers intersection is an important type of intersection, where vehicles need to slow down their speeds, and increases the chances of collisions of vehicles.by reading all the past studies on staggered intersection, we conclude that, collision main reason is due to improper traffic signaling timing accordingly actual condition of traffic, and types of vehicles which use that particular road. Due to all this the main problem occurs which we called time delay.

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## BIOGRAPHIES



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