

Traffic Control Management System

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Abstract:-

In cities, where the number of vehicles continuously increases faster than the available traffic infrastructure to support them, congestion is a difficult issue to deal with and it becomes even worse in case of car accidents. This problem affects many aspects of the modern society, including economic development, traffic accidents, increase in greenhouse emissions, time spent, and health damages. In this context, modern societies can rely on traffic management system to minimize traffic congestion and its negative effects. Traffic management systems are composed of a set of application and management tools to improve the overall traffic efficiency and safety of the transportation systems. Furthermore, to overcome such issue, traffic management system gathers information from heterogeneous sources, exploits such information to identify hazards that may potentially degrade the traffic efficiency, and then provides services to control them.

Keywords :- Introduction, History, Features, Advantages, Disadvantages, Scope, conclusion.

I. Introduction

In modern society, quick mobility is one of the most basic needs. Therefore, people are able to use different transportation facilities such as automotive vehicles, subways, and bicycles. However, among all these transportation facilities, automotive vehicles are still the most adopted due to its comfort and practicality. In this way, assuming a continuous population growth, the number of vehicles in large cities will increase as well, but much faster than transportation infrastructure; consequently, traffic congestion will become a pressing issue. It creates several negative concerns for the environment and society such as increasing in number of traffic accidents, economical impacts, and high levels of greenhouse emissions.

1.1 What is Traffic Signal?

A set of automatically operated colored lights typically red, amber and green for controlling traffic at road junctions, pedestrian crossings and roundabouts.



I Figure of traffic Signal Lights.

With economy growth, the number of vehicles is increasing in many countries. Newly built road networks increase the capacity, but in some cities (and in the future in many more cities), building new roads will no longer be possible. Hence, road networks have difficulties when trying to adapt to needed demands (number of vehicles). One of the most popular ways to partly alleviate this problem consists in increasing capacity by better control of road flow; that is, using traffic lights and similar actuators. Traffic control consists of methods for monitoring traffic (sensors, vehicle detection on images, communication among vehicles), methods for processing available data and generating commands that can change the traffic state, and finally using traffic lights or other methods to control the traffic flow.

II. History

In Old times, there were no traffic signals. There were no traffic signals. All the traffic was managed by traffic policeman. He/She used to stand in the middle of the road or square and direct vehicles. The old manual system was suffering from a series of drawbacks.

There are too many vehicles in our cities, and the numbers are increasing every day. This is a big challenge for the traffic police officers, and they need cooperation from the people, the pedestrians, and the motorists, to be able to manage traffic. Our lack of patience and lack of empathy disrupt the balance the traffic police try to maintain on roads. If one person stops, the people behind try to overtake, blocking vehicles coming from the opposite direction. Just because one person decides is impatient, the entire stretch of road gets blocked.

III. Features

1. Vehicle Routes

You need to think of vehicle routes as more than just lanes for moving vehicles, your routes also involve vehicles stopping rapidly, sitting at rest, passing and reversing. To deal with all this traffic you should attempt to keep your lanes one-way if possible, and design them with separate entry and exit points for larger vehicles. You also need to ensure the route surface is a well-drained material such as bitumen or concrete in order increase grip and prevent slippage.

2. Signage

Consider signage as something that does not tell drivers and operators what to do but reminds them of things they already know. Reflective markers and lines will help guide them on the correct path and easy to read signs will alert them to things of importance in that area. Remember when choosing your signs that they will need to be legible at high speed and often they will be far above eye level.



Figure. Signage

3. Protection

Just as employees wear protective clothing for different situations, you should consider the activities your warehouse endures and protect its areas of vulnerability and most wear.

4. Safe Crossings and Pedestrian Zones

Pedestrian zones should be clearly demarcated and physically separated so that vehicles cannot enter. If it is not possible to physically separate pedestrian and vehicle zones you should be aware of other options such as vision panels in doors, mirrors for pedestrian and vehicle use, natural pedestrian routes that people would follow anyway and clearly marked footpaths that are obvious to both the people walking them and the vehicles avoiding them.

ADVANTAGES

- Traffic control signals provide for an orderly movement of traffic.
- They help in reducing the frequency of an accident of some special nature i.e. of right angles accidents.
- They intercept heavy traffic to allow other traffic to cross the road intersection safety.
- They provide authority to the drivers to move with confidence.
- They control the speed of vehicles on main as well as on secondary roads.
- They direct traffic on different routes without excessive congestion.
- They provide economy over manual control at the intersection.
- Signals offer the maximum degree of control at intersections. They relay messages of both what to do and what not to do. The primary function of any traffic signal is to assign right of way to conflicting movements

of traffic at an intersection, and it does this by permitting conflicting streams of traffic to share the same intersection by means of time separation.

- By alternately assigning right of way to various traffic movements, signals provide for the orderly movement of conflicting flows. They may interrupt extremely heavy flows to permit the crossing of minor movements that could not otherwise move safely through the intersection.
- When properly timed, traffic signals increase the traffic handling capacity of an intersection, and when installed under conditions that justify its use, it is a valuable device for improving the safety and efficiency of both pedestrian and vehicular traffic. In particular, signals may reduce certain types of accidents, most notably the angle (broadside) collision.

DISADVANTAGES

- The disadvantage of traffic control signals on the road
- Traffic control signals may result in a re-entrant collision of vehicles.
- They may cause a delay in the quick movement of traffic.
- While many people realize that traffic signals can reduce the number of angle collisions at an intersection, few realize that signals can also cause an increase in other types of accidents. For example, it has been well documented that other types of accidents, notably rear-end collisions, usually increase when a signal is installed.
- Normally, traffic engineers are willing to trade off an increase in rear-end collisions for a decrease in the more severe angle accidents; however, when there is no angle accident problem at an intersection, there is nothing to trade off, and the installation of traffic signals can actually cause a deterioration in the overall safety at the intersection. Traffic signals should not be considered a "cure-all" for traffic congestion, and the primary goal of all traffic engineers is to attain the safest and most efficient traffic flow feasible.
- In addition to an increase in accident frequency, unjustified traffic signals can also cause excessive delays, disobedience of signals and diversion of traffic to inadequate alternate routes.
- Traffic signals are much more costly than is commonly realized, even though they represent a sound public investment when justified.

IV. Scope

The primary task of traffic management is the appropriate optimization and matching of traffic supply and demand according to infrastructure constraints. Even now this is the primary task, but the importance of the supply/demand alignment will only grow in the coming years.

The first level of optimizing or matching transportation supply and demand occurs at the network planning level. The regular pattern of demand, insofar as it exists, will establish a "base load" for the

network, defining the quantity of traffic that needs to be accommodated. A certain degree of congestion is allowed due to the peaking phenomenon. What exactly is allowed, determines the necessity of road capacity. Once the network capacity has been established, then the balance between supply and demand is an operational issue with traffic management as an important initial instrument. Traffic management makes it possible to dynamically respond to the ever-changing traffic supply and demand. Traffic management is also particularly critical during nonrecurrent and unexpected situations, such as road construction, special events or incidents. This will lead to a better balance between individual interests and the interests of the road authority and society. Individual choices must be adjusted so that the entire network will benefit.

V. High Demands

If we want traffic management in high demand situations to be sufficiently effective, the measures must be powerful and impactful. With more flexible management of supply and demand, there will be greater opportunities for coordination and thus for combating congestion. This requires a high degree of instrumentation on routes where traffic can be guided and directed (including motorways, arterials and local roads). We must also consider what types of measures are required: the mechanisms for informing, controlling, and managing as well as the penalties and rewards that are available. The measures should be well coordinated and should be rapidly deployable. In addition, a transition from reactive traffic management to proactive traffic management is necessary.

This requires a greater role for route guidance and traffic control under normal and incident-related conditions. Prediction is an important component of this vision.

VI. Conclusion

In summary we can say that the trends and developments described here offer excellent opportunities for traffic management. But traffic management must meet a number of important requirements:

- Traffic management of the future must be more flexible in handling changes in supply and demand.
- Measures must be coordinated and used across the network.
- Traffic management must be pro active and can be used to achieve a range of policy objectives.
- Road authorities, private sector parties and research/education institutions will need to strengthen collaborations.

Only then can we continue to deliver traffic management as a constructive contribution to the quality of the transportation system.

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