HYDRAULIC TRAFFIC REDUCE SYSTEM

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Abstract- *The problem of urban traffic congestion is constantly spreading. The increase in traffic is due to the growing number of vehicles and the limited expansion of roads. We propose a system for reducing traffic congestion using hydraulic traffic reduce system. The system will detect vehicles through images instead of using electronic sensors embedded in the pavement. We also plan to provide a suitable solution for emergency vehicles stuck in traffic to clear the route by using GPS, thus assuring timely help to those inneed.*

Traffic congestion in urban road and freeway networks leads to a strong degradation of the network infrastructure and accordingly reduced through put, which can be countered via suitable control measures and strategies. After illustrating the main reasons for infrastructure deterioration due to traffic congestion, a comprehensive overview of proposed and implemented control strategies is provided for three areas: urban road networks, freeway networks, and route guidance. are briefly outlined to illustrate the impact of various control actions and strategies.

I. INTRODUCTION

Traffic congestion cause by vehicle is an alarming problem at glade scale and it has been growing exponentially. The traffic problem is major contributor and has been still a major problem with increasing vehicle numbers in urban cities. Traffic reduce system is a system of decreasing the traffic generally in peak hour helping the traffic reduce system.
The hydraulic traffic reduce system is a new idea for reducing traffic in urban area. Hydraulic TRS provide movable footpath so, footpath work as emergency lane. the main benefit is no need extra space required. The hole system is very flexible and control by controller .the system is very helpful in future and help for saving time and urbanization. And improving the traffic reduce system.

Our project focuses on the severe impact caused by traffic congestion on the emergency vehicle transportation system. In place such as India and Thailand where the road width and length prove to be impossible to create a separate lane for emergency vehicle, it is difficult for ambulances to navigate through the traffic.

II. HYDRAULIC TRAFFIC REDUCE SYSTEM

Evaluating the efficacy of Intelligent Transportation Systems (ITS) technologies in reducing accidents that affect research development of models (such as incident delay and congestion models) that can accurately predict incident duration along with the magnitude of nonrecurring congestion.

An analysis of freeway traffic flows under congestion was conducted, based on the principle of traffic dynamics, using the example of recurring congestion.

Traditional incident-detection algorithms were developed to distinguish between congested and uncongested operation by comparing measured traffic- stream parameters with predefined threshold values.

Risk management is a key issue in project management. The first step of risk management is risk identification. It includes the recognition of potential risk causative factors and the clarification of risk.

Intelligent Transportation Systems are undergoing a transition from demonstration projects to becoming part of the mainstream set of options available to transportation planners. Hence, evaluation of it is one of the most critical and important steps to be taken before any ITS technique can be deployed. Safety has been recently emerging as an area of increased concerns, attention and awareness within transportation engineering.

Even though recent studies shed some light on driving speed factors as well as on the direction of the effects, knowledge is still insufficient to allow for specific quantifications.

Congestion leads to risk and finally may lead to accidents where urban accidents have the highest percentage impact (75%) which potentially may lead to disastrous consequences. Artificial Intelligence may be helpful for providing more powerful techniques to understand the main causes of accidents and congestion. Accident prediction models or the before-and-after study approach is commonly used to

estimate the reduction in number of accidents resulting from highway improvements.

A study on exploring and accomplishing road traffic safety and rescue system based on 3S technology, which will provide effective instruction platform for traffic instruction department.They aim at improving highway safety and locations, they identified as accident prone based on the total number of accidents.

Incidents, defined as unplanned events that temporarily reduce roadway capacity, contribute significantly to urban freeway congestion. Transportation agencies have developed incident management programs in order to support the effective identification and response to incidents.
Traffic research still cannot fully predict under which conditions a "traffic jam" (as opposed to heavy, but smoothly flowing traffic) may suddenly occur. Traffic congestion is a universal constant. Some cities have managed to break free of their dependence of the automobile. Many more haven't, and have lost themselves to congestion. The approach each city takes to the problem of urban congestion and transport is an insight into their priorities and a gauge of how successful their efforts will be. The urban growth and future trends in urban development should be major factors in any urban congestion and transport decision.

Now-a-days urban transport planning is not taking into account the increasing number of motor vehicles, the growth of the city or the environment. Given the enormous benefit to the health of every citizen, in terms of cost and in terms the benefits arising from inner- city accessibility one would think that network functionality and successive planning of public transport wouldbeone of the provincial government's primary areas of interest. The provincial government is interested, and committees are being set up and meetings are held. But these seek to "solve" congestion when, in reality, it can only be dealt with and this approach to the issue, glaring oversights arecommon.

For the present study, risk analysis has been proposed to be achieved through Principal component analysis followed by causal techniques to identify the factors contributing to risk generation and the major links which are leading to congestion.

Development of traffic reduce system

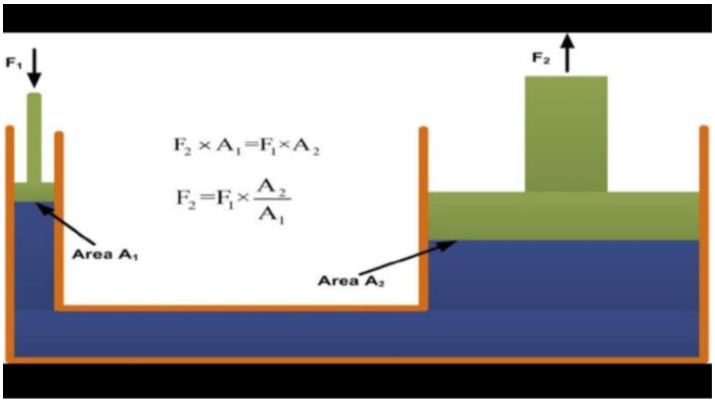
This chapter is based on the development of a traffic reduce system for the controlling of traffic and provide the emergency lane for the emergency vehicle. The hydraulic traffic reduce system is based on the hydraulic system. In the hydraulic system is provide under the footpath for up down surface of the footpath.

It will provide one lane for emergency vehicle for cross the intersection. When the traffic is produced at intersection and ambulance or any emergency vehicle are stuck in traffic, the footpath is down to the road level by operator, and provide the emergency lane so emergency vehicle can pass without any obstruction.

II. WORKING PRINCIPLE

The high magnitude controlled force can also be applied by using these systems. This kind of enclosed fluid based systems using pressurized incompressible liquids as transmission media are called as hydraulic systems. The hydraulic system works on the principle of Pascal's law which says that the pressure in an enclosed fluid is uniform in all the directions. The Pascal's law is illustrated in the figure.

The force given by fluid is given by the multiplication of pressure and area of cross-section. As the pressure is same in all the direction, the smaller piston feels a smaller force and a large piston feels a large force. Therefore, a large force can be generated with smaller force input by using hydraulic systems.



Working:

The hydraulic systems consists a number of parts for its proper functioning. The schematic of a simple hydraulic system is shown.

It consists of:
• a movable piston connected to the output shaft in an enclosed cylinder
• storage tank
• filter
• electric pump
• pressure regulator

• control valve
• leak proof closed loop piping.

The output shaft transfers the motion or force, however, all other parts help to control the system.The storage/fluid tank is a reservoir for the liquid used as a transmission media.

The liquid used is generally high-density incompressible oil. It is filtered to remove dust or any other unwanted particles and then pumped by the hydraulic pump.

The capacity of the pump depends on the hydraulic system design. These pumps generally deliver constant volume in each revolution of the pump shaft. Therefore, the fluid pressure can increase indefinitely at the dead end of the piston until the system fails.

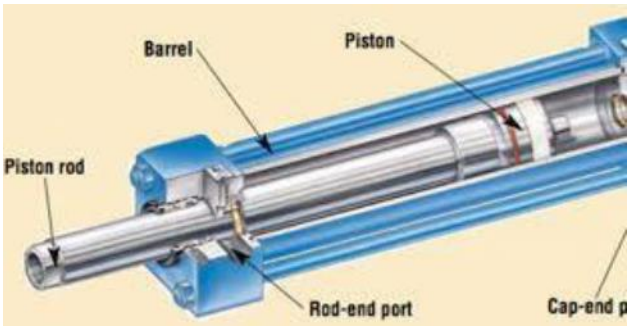
The pressure regulator is used to avoid such circumstances which redirect the excess fluid back to the storage tank. The movement of piston is controlled by changing liquid flow from port A and port B. The cylinder movement is controlled by using control valve which directs the fluid flow. The fluid pressure line is connected to the port B to raise the piston and it is connected to port A to lower down the piston. The valve can also stop the fluid flow in any of the port.

The leak-proof piping is also important due to safety, environmental hazards and economical aspects.

III. INTRODUCTION OF HYDRULIC JACK

Before directly jumping on to Hydraulic Jack, let's first understand 'Jack'. A jack is a device which is used to lift heavy loads.A jack could be Mechanical, Electrical or Hydraulic, based on the method of force generation.A hydraulic jack works on the basis of Pascal's law.

A small force is applied on a smaller area of hydraulic fluid and that force generates some pressure in the fluid. That pressure is then applied to a wider area at output so that adequate force is generated to lift the load.



ADVANTAGES OF HRTS

- Remove obstruction for the emergency vehicle.
- Provide a way during a heavy traffic for emergency vehicle.
- Reduce delay of emergency vehicle.
- Speed of emergency vehicle can be maintain.
- Extra spaces is not required.
- Increase road efficiency.
- Maintenance cost of vehicle can be reduce.
- Easily reduce traffic during peak hour.
- Chances of accident can be reduce.

DIS-ADVANTAGES OF HRTS

- Maintenance cost is high.
- Initial cost is high.

WORKING PROCESS OF HYDRAULIC TRAFFIC REDUCE SYSTEM

- Whenever operator receive signal from satellite for ambulance is coming .it close the barrier gate for pedestrian movement .
- Operator provide a signal or siren to the pedestrian which is already on a movable footpath for standing in one line at outer side of a footpath .
- This footpath is work as a emergency lane so, ambulance can easily pass the cross section.
- After passing ambulance operator opened barrier gate, starts all the signal and lift thefootpath at normal level.
- This process taking 30-40 seconds.

EFFECTONROAD GEOMETRY

- Provide movable footpath.
- Provide underground space for hydraulic system.
- Provide maintenance room for survey and control the hydraulic system.

IV. CONCLUSION

The project eyes on the reduce the traffic and remove obstruction to the emergency vehicle is successful by applying the hydraulic traffic reduce system without any extra space. The safety of pedestrian can maintain during the process. the loss of life due to the delay of ambulance as well as fire brigade can decrease. Well maintain the utility service under the hollow section of footpath so avoid the excavation of road. Around the global problem of traffic developing the hydraulic traffic reduce system become a bright future perspectives

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