

# Traffic Management System in Emergency by Hydraulic Footpath

**Chanakya K. Tummewar, Rahul N. Bhujade, Rushabh S. Marbade, Mohammad Ashar Raza, Kasif A. Khan, Shahzad Zabi, Pawan S. Ghagare, Prof. Vijay B. Shrirame, Prof. Akash A. Ingale**

**Abstract**— India is one of the fastest growing economies in the world. The average income of Indians is growing and thereby the number of privately owned vehicles is rising. Hence traffic control problems are arising. Hydraulic Jack System Installed in Footpath for Reducing Traffic in Case of Emergency. This is the one of best solution to control the traffic. Highway paving materials, under normal operating conditions, are subjected to various forces. Motor vehicles, of necessity, have at least one set of driving wheels which exert tractive forces on the surface of the paving. The remaining wheels do not exert this tractive force but merely roll on the surface of the paving.

**Keywords** Solid Waste Management, Collection, Municipal Solid Waste, Municipal Corporation

## I. INTRODUCTION

Today scenario is people on the earth are rapidly increased and according to that the number of vehicles on the road is also increased. Therefore, the problem of traffic management is arising specially for emergency Vehicles, the idea behind this paper is to implement a system which would easily control the traffic and helps for the emergency vehicles to reach at their destination. This scheme relies completely on automatic intelligent control. Here the goal is to reduce the latency of emergency vehicles with minimum or less disruption to regular traffic flow is possible. However, there is still problem for an emergency vehicle to bypass near the traffic junction. The emergency vehicles could not be going as fast as it can. So, to overcome that problem we have to find the new methods.

Sometimes even if there is no traffic then also people have to wait because there is a certain time limit of Traffic signal. So, road users have to wait till the traffic signal turned to green light. Therefore, we have to find new methods which solve this problem. The emergency services began six years ago in India. Within starting total 14 ambulances are started in Ahmadabad and Gandhinagar. Which was slowly increased. Recently most of deaths are caused due to the

traffic congestion. And ambulance also could not fast as because of traffic jams near to the traffic junction Solution of this problem is to control the traffic system so that it would be helpful to protect someone's life by giving first priority to the ambulance. [1] In accordance with this now a day's turning to the manual control it will sometimes solve the problem. But to do this automatic control is a very big task in today's scenario Particularly in India. Most of people cannot give a way for an ambulance because of traffic 1101 The Indian ambulance experiment was done around 400 cars on the road, there was response to an Indian ambulance. Suppose someone has suffered a heart attack and needs ambulance immediately. But by this way the patient will die before the ambulance could reach to the hospital.

The Indian people could not do even an effort to pass the ambulance first. The person died before the ambulance reach to the hospital. Then who is responsible for him or her death?

On the other end in foreign, every people are giving a first priority to an ambulance. So why could not done with Indian peoples? The Indian peoples can also do the same thing while their family members are lying in this ambulance. At that time, they feel this situation. So why could we have to wait for this much time? Why we could not implement this from today itself? Just think this by giving the first priority to an ambulance, we can save someone's life and on him/her depends the life of them family. India has the highest number of deaths due to delay of ambulance. And remember we can overcome this by giving 'Right of Way' to the ambulance. Along with implementing traffic signals, 10 out of 10 lives can be saved. Also, you can save lives and save humanity Utilization of time after an accident is golden hours. so that Recovery action should be taken immediately. Also, we have to minimize the delay that is caused by traffic congestion.

## II. PROBLEMS BEHIND HEAVY TRAFFIC ON ROADS

### A. Traffic Condition In Nagpur City

Generally traffic is defined as the movement of a person vehicles or any type of goods or person in between the site locations, and includes pedestrians and all types of vehicle. Traffic condition which is day by day leading a severe or worst problem of Nagpur city. In Nagpur city heterogeneous traffic conditions. Nagpur is at present third largest city in Maharashtra which faces traffic congestion problems mostly in the different road intersection. In Nagpur rapidly, increasing population day by day. This used to reduce

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*Chanakya K. Tummewar et. al. Department of Civil Engineering, SSPACE, Wardha, India.*

*Prof. Vijay B. Shrirame et. al. Assistant Professor, Department of Civil Engineering, SSPACE, Wardha, India.*

congestion on the particular intersections the Bus Bay is to be provided for the city buses moving on the particular section. The Noise pollution, congestions and air pollution and the results in ill effects to the health. In this analysis respectively increase in demand for survey is to be taken for vehicle count and analysis is done to increase future development of transport network in Nagpur city.



### B. Traffic Condition At Signalized Intersection

Transportation is carrying civilization to a brighter future. Currently transportation is one of the most valuable problem in every area of the world. Every country try to resolve transportation issues as per the capability and resources. The traffic volume are steady. Traffic volume is simply the number of vehicle passing a section of a roadway during specified unit of time. In signal number of vehicle are staying one line back to back is known as queue, and their distance between first to last vehicle of the length is known as queue length.



### C. Pedestrian Traffic At Intersection

The definition of a pedestrian is a person who is walking along a road or some development area to get where he needs to go. The traditional way of designing public transfer station is based on rules of thumb. There rules deliver experience about the behavior of passenger in transfer station. However, they only consider constant or still situation. Different type of

pedestrian such as elderly people or parents with children needs different transfer time. The factor affecting the walking speed of pedestrian age, gender, size, health, etc. characteristics of the trip walking purpose trip length. The walking speed also depend on the pedestrian volume.



### III. LITERATURE REVIEW

P. K. Vaha And M. J. Skibniewski (1993), He have described the kinematics of the excavator with the coordinate frame To describe the position of the points on the mechanism of an excavator, coordinate systems are first defined. A fixed Cartesian coordinate system is assigned to the body of the excavator. the local coordinate frames are assigned to each link of the mechanism. A systematic method to define the local coordinate systems for the serially connected links upper structure, boom, um, and bucket of the excavator is accomplished by applying the Davit and Hardenberg procedure. The kinematic model of an excavator presented here provides a useful computational platform for investigating the machine behaviour of a typical excavator. In particular. the model can serve as a basis for computer simulation of excavator behaviour during the motion. Moreover, it is useful in designing a controller to make the excavator motion track a specified path for a given digging task.

Medanic, M. Yuan, and B. Medanic (1997), The dynamical model obtained can be used as the basis for automating the operations of excavators. a design model and a nonlinear polar controller are developed for the Caterpillar 325 excavator modelled as a two-link system. They have described the 8th order model of excavator dynamics, the structural properties of this model, and the order design model of the link dynamics employed in the development! of the polar controlled. The dynamic equations of motion arc obtained from Lagrange equations. The results provide strong indication that this design approach can solve the tracking problem for the full dynamics.

F. Malaguti, and S. Zaghi (2000), They have used the Newton-Euler notation to describe the parameters affecting the dynamic equations of the excavator arm. The test results show that the parameters identified in dynamic conditions and considering cylinder friction are more accurate with respect to static conditions. They also note that the estimated torques follows the trend of measured torques, bulk it is evident that the errors on the torque related to the bucket are large with respect to the crore of stick torque, they were

unable during the course of the research to find the reasons for these discrepancies

E. Bosilkov, Radoslav Dimitrov, Tzvetan Damianov (2003), He have carried out study on kinematics of working mechanism of hydraulic excavator The mechanism of this manipulator is plane multilineage, which consists of arms joined and hydraulic cylinders. They have considered the working mechanism as conjunction of jib, arm and bucket, which are joined by the cy landrail joints and hydraulic cylinders. The equation for the length of the Simulation of such a mechanism is made by using Lagrange cylinder is derived equation of the first type with unknown multipliers. The results can be used for creation of a control system of the working process of the hydraulic excavator

Torres-Rodriguez, V. Parra-Vega, and F. J. Ruiz-Sanchez (2004), He complete non linear excavator model was presented. This model consider the was presented. This model consider the actuator dynamics effects. And is used for simulation in a virtual environment developed in java 3d. The dynamic model of the excavator obtained from the virtual environment euler lagrange equations, innovates precredit models, introducing the dynamics of the hydraulic actuators.

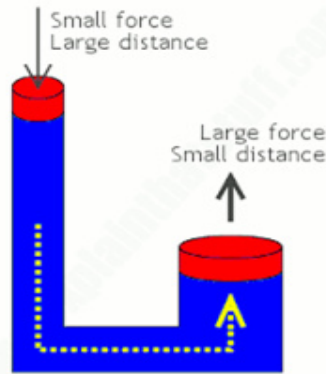
Jun-Yong Park, Wan-Suk Yoo and Ileui-Won Kim (2004), They have presented a three dimensional modeling and simulation of a hydraulic excavator using flexible multibody dynamics code ADAMS. To increase the modeling accuracy, the flexible multibody dynamic analysis is carried out to predict the dynamic behavior of the excavator.

R. K. Mittal, I. J. Nagnath (2008), The kinematic modeling helpful to follow the defined trajectory as well as digging operation can be carried out successfully at required location of the terrain using proper position ad position of the bucket and ultimately digging task can be automated there are mane research arrayed out thee recharge work in the filled of the backhoe attachment to understand relation between the position and orientation of the bucket spatial position of joint links as well as helpful to understand and improving the opening the performance of the the backhoe excavator attachment.

#### IV. METHODOLOGY

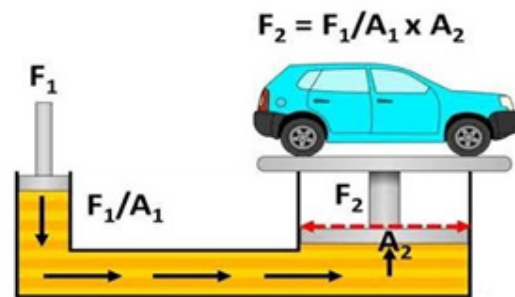
##### A. Hydraulic Machine

The word hydraulics is based on water, originally covered the study of the physical behavior of water at rest and in motion. Hydraulics includes different types of manner or style in which liquids act in tanks and pipes, deals with their properties, and explores or find out the ways to take advantage or benefit of these properties. Although the modern development of hydraulics has many principles and their applications. Hydraulic jack is based on the Pascal's law which states that increase in pressure on the surface of a confined fluid is transmitted undiminished throughout the confined vessel or system.



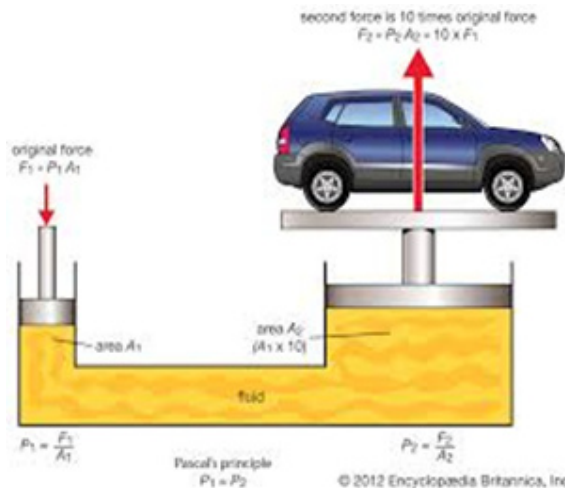
##### B. Hydraulic Jack System Based of 'Pascal's Law'

"Pascal's law basically states that any pressure applied to a fluid inside a closed system will transmit that pressure equally in all directions throughout the fluid.



##### C. Working Principle

The working principle of a hydraulic jack may be explained with the help of figure. Consider a ram and plunger, operating in two cylinders of different diameters, which are interconnected at the bottom, through a chamber, which is filled with some liquid.



V = Volume of Water

A = Cross-Section Area

F = External Force Applied

P = Pressure Created

D = Distance Moved

**Solution:**

$V_1 = A_1 V_1$  (Input force) ----1

$V_2 = A_2 V_2$  (Output force) ----2

**Now we can say,**

$A_1 D_1 = A_2 D_2$

**Calculate work (IN) and work (OUT)**

Work = force x displacement

$W(\text{IN}) = W(\text{OUT})$

$F_1 D_1 = F_2 D_2$

$F_1 D_1$  ---- (a)

$F_2 D_2$  ---- (b)

**Therefore, calculate D1 & D2 from eqn 1 & 2**

$V_1 = A_1 D_1$  ----1

$D_1 = V_1 / A_1$

$V_2 = A_2 D_2$  ----2

$D_2 = V_2 / A_2$

**Put value of D1 & D2 in eqn (a) & (b)**

$F_1 D_1$  ---- (a)

$F_1 \times V_1 / A_1$

$F_2 D_2$  ---- (b)

$F_2 \times V_2 / A_2$

Therefore,

$F_1 \times V_1 / A_1 = F_2 \times V_2 / A_2$

↓

Force / Area = Pressure = P1 & P2

$P_1 V_1 = P_2 V_2$

**$P_1 = P_2$**

## V. CONCLUSION

During our study we have conclude that the hydraulic jack system in footpath with less area of construction is very innovative idea in construction world and importantly there is no need to construct any special type of construction to installation of hydraulic jack system which will helps to

reduce construction cost, it will also save the cost of land. this system helps during emergency such as road accident, traffic jam.

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