To Check Feasibility Of   ERP (ELECTRONIC ROAD PRICING) System at C G Road, Ahmedabad

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Abstract - *In recent times rapid development of vehicles causes the traffic congestion. so, it's the time to enable the Intelligent transport system. This thesis is for finding the justification and feasibility of the ERP (Electronic road pricing) System at C G Road, Ahmedabad. Study area is C G Road, which covers four circles. These four Links of C G Road are 1) Stadium circle, 2)Navarangpura circle ,3)Panchavati circle and 4)Mithakali circle. Study area is from stadium circle to panchavati circle on C G Road. After we counted traffic volume at four circles in morning as well as evening for two-two hours. We found that possible locations for ERP Gantries are at Stadium circle and Panchvati circle. We found two distributary Roads at panchvati circle for traffic distribution. Then, we collect 50 questionnaire sample survey on C G Road on the basis of questionnaire survey, we decided the rates and also feasibility of the ERP. After all, we conclude that ERP is Fissible at C G Road, by that reduces of traffic level is 63.63 %.*

Key Words: ELECTRONIC ROAD PRICING System, Volume Count, Feasibility, Questionnaire Survey, traffic congestion

1. INTRODUCTION

Problem identification in Ahmedabad city: It is the city where the number of vehicles grows faster than humans. With newly-found money and need for speedier transport, the citizen's added nearly 14 lakh vehicles between 2001 and 2011, which was the total number of vehicles in the city in 2001. While the vehicles grew at 100% rate, during the same period, the city's population grew at 58%.

At the moment, the city has vehicular population of 31.51 lakh against a population of 65 lakh - meaning every second person owns a vehicle. More than half the vehicles are two-wheelers (19.74 lakh) as 12% of the vehicles consist of privately-owned four-wheelers.An intelligent transportation system (ITS)[1] is an advanced application which, without embodying intelligence as such, aims to provide innovative services relating to different modes of transport and traffic management and enable various users to be better informed and make safer, more coordinated, and 'smarter' use of transport networks.

In the developing world,[2] the migration from rural to urbanized habitats has progressed differently. Many areas of the developing world have urbanized without significant motorization and the formation of suburbs. A small portion of the population can afford automobiles, but the automobiles greatly increase congestion in these multimodal transportation systems. They also produce considerable air pollution[3], pose a significant safety risk, and exacerbate feelings of inequities in the society.

Road pricing[4] is now being advocated as an efficient means of managing traffic demand and of meeting other objectives, such as reducing the environmental impact of road traffic and improving public transport. This paper shows how a network toll pattern could be determined so as to reduce network travel demand to a desirable level.[5] The demand between each origin and destination pair is described as a function of the generalized travel cost. When there is no toll charge, higher values of potential demand might cause congestion and queuing at bottleneck links of the road network.[6] Queuing delay at saturated links may grow to choke off enough potential demand to reduce realized demand to the capacity of the network. thus leading to a queuing equilibrium where travel demand and travel cost match each other.

1.1 Electronic Road Pricing (ERP) system

The Electronic Road Pricing (ERP) system[7] is an electronic toll collection scheme adopted in Singapore to manage traffic by way of road pricing and as a usage-based taxation mechanism to complement the purchase-based Certificate of Entitlement system. [8]Singapore was the first city in the world to implement an electronic road toll collection system for purposes of congestion pricing. The system uses open road tolling. Vehicles do not stop or slow down to pay tolls. This system is currently successfully working in many countries Singapore, London, England, Stockholm, Sweden, Jakarta etc.

1.1.1 Benefits of ERP[9]:

Minimises traffic volume in heavily used roads in the CBD and Orchard areas, as well as major expressways.

Optimises usage of the road network by encouraging motorists to consider alternatives.

Provides a fair price for motorists. Charges are based on usage—those who use the roads pay more; while those who use the roads less frequently or who travel during non-ERP hours pay less or don't need to pay at all.

No more monthly/daily licences. Motorists no longer need to buy paper licences to drive through high traffic areas in the CBD.

No human error. ERP's reliable and fully automated system operates 24 hours. Its central computer system ensures gantries are always working properly

Traffic congestion[10] is costly to the individual and society. It results in the loss of productive hours, environmental pollution, wasted fuel and adverse health effects. To keep traffic moving, ERP is a holistic and integrated approach using all the tools available, including building more roads, regulating vehicle growth, implementing traffic engineering solutions and promoting the use of public transport. In addition to the various measures, we also need to manage traffic demand through ERP.

With more vehicles on the road, ERP[11] remains effective in addressing current and future traffic conditions and ensuring motorists continue to have a smooth journey.

Figure 1 ERP Gantry in Singapore

2. Study Area and Data Collection

Chimanlal Girdharlal Road as a study Area, colloquially the C. G. Road, is one of the major roads of Ahmedabad. It has been ranked as the costliest retail location in the city. It is named after Chimanlal Girdharlal, one of the major businessmen of the 1960s in India.
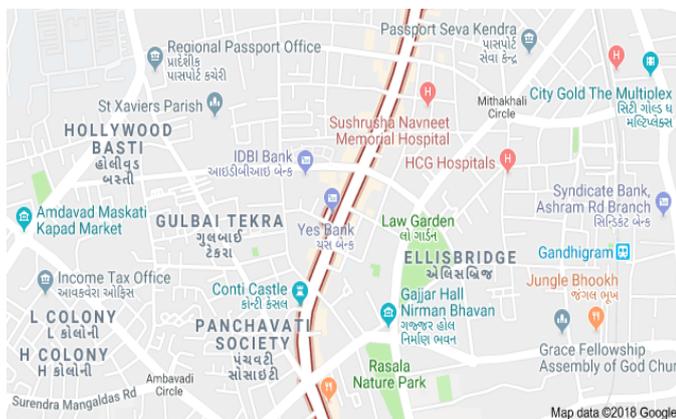

Figure 2 study area (C G Road)

C.G. Road was redesigned in the 1990s, which turned the road into a major financial hub of Ahmedabad. In 2010, it was ranked in "Main Streets Across the World 2010" by real estate firm Cushman & Wakefield on 3rd position for its strongest growth in Asia Pacific region behind Linking Road, Mumbai & Central, Hong Kong with annual Rental Growth 18.2%.

2.1 traffic volume count at four links:

Traffic Survey[12] counts may provide some precise information about numbers of vehicles and their type

Table -1: Traffic Volume count per hour on four Links:

LINKS	MORNING	EVENING	SUM
PANCHVATI CIRCLE	2215	3183	5398
STADIUM CIRCLE	2119	6807	8926
NAVARANGPURA CIRCLE	3677	3866	7543
MITHAKALI CIRCLE	2254	3060	5314
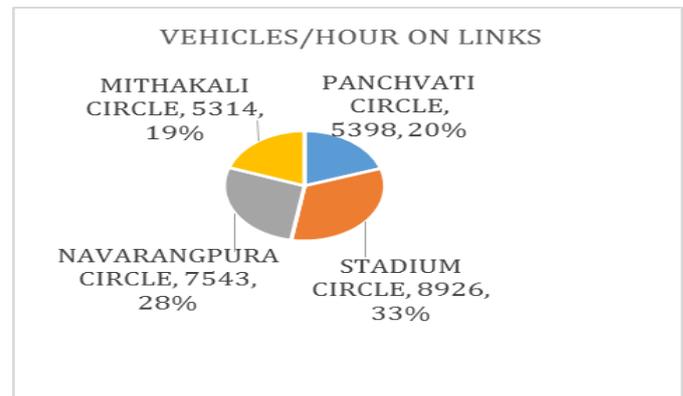
Figure 3 Vehicle Count on four links

2.2 Questionnaire survey

QUESTIONNAIRE SURVEY		
NAME: DATE: 23/2/2018		
TYPE OF VEHICLE: PLACE: C G ROAD		
Q1: Is there traffic problem or not?		
Ans : YES/NO		
Q2: How often are you delayed bad traffic on the C G Road?		
Ans :		
Q3:O/D of User?		
Ans :		
Q4: ERP (Electronic Road Pricing) is feasible or not?		
Ans : YES/NO		
Q5: Rates.		
4 Wheeler	3 Wheeler	2 Wheeler
20 / 25 / 30	5 / 10 / 15	5 / 10 / 15
Q6: Alternative traffic solution.		
Ans :_____		

Figure 4 Questionnaire survey format

Figure 5 Questionnaire survey on C G Road

We collect 50 Questionnaire survey Samples at C G Road. From that survey we decided the rates of vehicles. The rates for four wheelers, three wheelers and two wheelers are respectively 25-30, 5-10 and 5. We also ask people for suggestion rather than the Electronic road pricing for solve the traffic problem at c g road, which is the central business district of Ahmedabad.

3. CONCLUSIONS AND FUTURE SCOPE

1. On the basis of questionnaire survey, we can conclude that between the stadium circle and panchavati circle traffic reduced up to 63.63% by ERP System.

2. On the other hand the distributary or alternative road uses more than the important road as C G Road.

3. From the ERP Gantries we also the important information like real time traffic, Emergency situations , the behavior of users can recorded, guide the user for shortest path etc.

4. After the implementation of ERP, people should more conscious about traffic rules & regulations. Also, public transport user getting increased.beacause there is no charges for public transport in ERP System.

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