Scientific Journal of Impact Factor (SJIF): 4.14
e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 3, Issue 5, May -2016

Literature Review on Impact Study of IPT Modes In Modasa Region

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Abstract: *Intermediate Public Transport (IPT) is a sub-set of public transport, and deals with low technology vehicles that occupy less space and provide for short distance travel. They are a part of the transport system of most of the small towns and cities in India. In fact, the three-wheeler auto-rickshaw, one of the IPT modes, is extremely popular even in Metropolitan cities in India. They provide affordable travel to low-income groups. Since they are in inalienable part of towns and cities in the less developed countries, an understanding of their potentialities and problems associated with them is necessary for a Traffic Engineer. Besides the conventional forms of public transport systems like buses and trains all the cities of any description in India have inherited the IPT forms of public transport namely auto- rickshaws, cycle- rickshaws and animal drawn vehicles called Tonga.*

Key words*; mass transit service, feasibility of public transportation system, urban transportation city bus service.*

I. INTRODUCTION

The cities in the developing countries have exhibited a radically different character during the past few decades from those in the developed countries in terms of urban expansion and urban sprawl. The pace of socio-economic development being rather slow in the third world countries, the urban magnate has been able to create and maintain an illusion image of higher employment potential and other socio-economic benefits. The Intermediate Public Transport system otherwise called as Para Transit is defined to be that form of public transport falling between the conventional buses and taxi transport systems. This is the most commonly recognized definition although there are many forms of definitions offered to suite to the circumstances. Hence for the Intermediate Public Transport shall be mentioned as IPT in short for convenience.

II. PROBLEM STATEMENT

Following problems generally found in growing town of India.

- Lack of integration between land use and transport.
- Lack of public transportation system.
- High growth rate of vehicles.
- Lack of traffic control and regulation.
- No organized parking space.
- Traffic congestion due to IPT modes, pedestrians, stray animals.

In absence of proper mass transportation system, people use IPT modes for intra city and intercity trips. Owners of IPT modes try to maximize their profit by over loading the passengers and goods. This may be dangerous for the people and causes the accidents. Haphazard parking, stopping and taking the passengers create many problems to the traffic. These vehicles also attracting people from using the GSRTC bus transit service. Hence, it is interesting to carry out the study to quantify the impacts due to IPT modes.

III. AIM OF THE STUDY

The main aim of study is to evaluate impact study of IPT modes of Modasa region which provide a high level of mobility with a risk of accidents to a large section of population.

IV. LITERATURE REVIEW

1. Defining IPT the Indian Way

Para-transit vehicles are a for-hire flexible passenger transportation that does not necessarily follow fixed routes and schedules. They provide two types of services: one involving trips along a more or less defined00 route with stops to pick up

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or drop passengers on request. The other is a demand-responsive transport, which can offer a door-to-door service from any place of origin to any destination in a service area.
IPT systems across the world cater to different segments of the population and have been considered an informal means of transit. In a country with a billion populations; IPTs such as share autos, share taxis, maxi cabs, cycle rickshaws etc. has been moving people across short distances in an effective manner. They have been found to be an efficient, accessible and safe transit system facilitating as feeder systems and solving the last mile issue. The definition and scope of the Para-transit system differs in developed and developing countries. In developed countries, the Para-transit mode is usually "Demand Responsive Transit", which works by a "Dial- a- Ride" system managed by single or multiple operators through a call center. Even in India innovative systems like the Eco Cabs or dial-a-cycle-rickshaw scheme in Fazilika in the state of Punjab has been successful. This mode of transportation complements the main public transportation system.
In developing countries, on the other hand, the supply deficit of public transportation has led to the mushrooming of a bewildering range of varying modes of transit, in a bid to bridge the gap between public transportation and private vehicles. In several Asian, African and Latin American cities, it is perhaps the most common and widely used form of public transport. Some of the major Para-transit systems include the Angkots in Indonesia, Tuk-Tuk in Thailand, Mini-buses in Dakar, Senegal and Matatus, Dallas in Uganda and Kenya.

Four acre et al. (1979) have studied that Public transport in Third World cities is an expanding industry. The relative importance of the taxi and bus service (and the magnitude and quality of service provided) is probably determined largely by city size, land use/operating environment and per capita income. (Of course, political and pressure group activities often distort the situation to be found at any one place and at any one time. For example, some major Indian cities with over one million populations still rely almost exclusively on cycle rickshaws for their public transport; political factors dominate the supply patterns.) Many of those factors are working simultaneously and it makes comparative assessment between cities difficult. However, the following general observations can be made to indicate some of the relationships between provisions of public transport and demand/operating environment factors:

- Small cities involve shorter passenger journeys which can be handled at reasonable rates by cycle rickshaws and horse-drawn taxis.
- The mass movement of passengers in large cities, often involving long journeys, are more suited to bus service networks (or for that matter suburban train). The physical problems of providing a service for peak demand are likely to make the use of large vehicles a necessity.
- Sharing of taxi services is more likely to be a feasible proposition the smaller the city size.
- The operating environment of parts of many cities in the Third World makes the use of large vehicles difficult. Heavy concentrations of cycle rickshaws, cycles, pedestrians, street traders etc. can reduce the speeds of conventional buses to5 km/h even on wide roads. Under such conditions it is a struggle to achieve economically viable utilisation from the vehicle. Studies in Delhi show that rising incomes affect modal choice with people changing from walking to private personal transport modes. There is probably also a distinction to be made between richer and poorer cities in that the lower quality vehicles are gradually discarded with increasing city prosperity.

2. Previous studies on Intermediate Public Transport system

Siva Raman (1998) has studied that Sustainable Transport has often been the buzzword for transport planners and policy makers; the systemic design of a transportation network which fully integrates, involves and evolves various modes of transport for providing a seamless, affordable and efficient service for the people. This also takes into regard the cultural, social and economic scenarios of regions and the behavioral patterns of the commuters. This means, the transport plan for a particular region shall cater to the realities and requirements of the people living or commuting there. This is a market-driven mechanism where the operation of services is designed to cater to the demands of the commuting segment. Developing of Metro Rail/Light networks, introduction of buses and boats shall presuppose a market analysis which generates information on the number of passengers, origin and destination, type and preferred mode of service etc. This would mean recognizing those transport modes which are considered as an integral part of a daily commuter's life. Cycles of Amsterdam[1], walking in Great Britain[2], and suburban trains in Mumbai are fine examples of this proposition. It is in this context that the role of Intermediate Para-Transit systems (IPT) exist which acts as a bridge between the people and their destinations. This paper is aimed at highlighting the role of IPTs in the mobility requirements of the vast population in India and inquiries into the barriers facing the sector. (source:[1]http://iamsterdam.com/en/visiting/planyourtrip/gettingaround/cycling, 2OECD (1998), Safety of vulnerable road users Organization for Economic Co-operation and Development.)

Jain and Khare (2014) have studied that the transport system in India is dependent on the old model of transportation planning and development established during the colonial era. Being the second most populous country in the world today, it is expected to take over the title from China in the upcoming future. The economy of a country is influenced by its people.

The work which they perform everyday add up to the benefit of the country as a whole. Transportation in its very essence has been developed over the years to reflect the changing nature of the needs of people. It is transportation which facilitates for the easy and convenient movement of both- the people and goods-effectively.
This calls for the need to have a well-developed and efficient transportation system which can cater to the needs of its growing population with much ease. An efficient system is characterized by its ability to perform even under adverse circumstances. It comprises of not only one but a complete network of well devised subsidiary systems. Multi modal transportation provides a framework of transportation facilities to meet the demands of the public which consist of-a primary transportation and Para transit system. Primary transportation comprises of the major transit facilities including Bus Rapid Transport (BRTS), Light Rail Transport (LRT), Metro Rail Transit (MRT), etc. Para transit system is the intermediary network of transportation which serves as a feeder to the main system. In Indore, maruti vans and tata magic serve as an important part of the Para transit system.

Jaiswal and Sharma (2012) have studied that Rapid growth in vehicles population has put enormous strains in all urban roads in all million plus cities in India, due to high vehicle ownership and poor supporting public transport facilities specially in the cities where the population is between 1 to 2 million. The major factor is very low ridership in public transport due to poor service quality and more traveling time. This study is concerned of assessment of public transport demand for Bhopal and identifies the major factors for poor ridership with estimation of the probable shift of personal vehicle users to bus due to the increase in its level of service also identifies ways to account for qualitative factors in the public transport project evaluation by adjusting travel time values to reflect comfort and convenience. This can help to find innovative solutions to the current problems such as increasing traffic congestion, energy-consumption etc. and can increase the efficiencies as well as support for alternative modes of public transport, making them more acceptable by the people & achieving their equity objectives and increased economic efficiency both also a new approach is required to estimate the actual public transport demand so that most feasible and suitable system can be selected to optimise the public transport demand.

Aparna Bhat (2012) has concluded that The way forward for the auto rickshaw sector in Mumbai is to conduct further research into and implement the measures of partial deregulation. Each of these measures have their own pitfalls, which also require due consideration. However, this paper proves the issues created due to the regulation in the economy, and thus necessitates further research into the measures of deregulation.
Encouraging the establishment of private auto rickshaw fleets is an achievable and beneficial measure, and so steps must be taken in this regard. This is an important market based solution which will ensure healthy competition to provide quality services at lesser prices. The idea of selling SIM cards to commuters innovated by drivers at the private auto rickshaw fleet "Rickshawale" is a significant success of market solutions. As opposed going on strike to demand a fare hike, these private auto rickshaw drivers themselves corrected the problem.
An idealistic measure would be to replace the existing three-seater auto rickshaws with larger ones which can promote shared travelling. This would ensure a further reduction in the fares to each individual commuter, while also not adding to the problem of congestion on the roads.
Another measure which enjoys a consensus and which can be made a reality is the share auto rickshaw stands across the city. Hence, effective steps should be taken in this direction so as to slowly but surely move away from the pitfalls of the political economy. Shankar Salvi, an auto rickshaw union leader, had proposed more than 450 routes for share auto rickshaws in the suburbs. However, only 80 have so far been approved, with only 40 being actually run. 49Undoubtedly, providing space for share and other auto rickshaw stands is a problem in as congested a city as Mumbai, but measures to solve this such as those suggested in the paper must be innovated.

Quadri (2014) has studied that India will supersede China in size of population by 2050 that signals very many problems. One such problem is the challenge of migration of rural population to cities and towns, leading to expansion of city fringes and establishment of neigbourhood settlements or suburban areas. As already being experienced by such population is growing distance between residential place and work place. Other things reaming the same, it in turn is increasing the demand for public transit many folds. In Aurangabad city two most popular modes of transport are auto rickshaws and Ape-both are three wheelers. However, this sector, particularly, auto rickshaw, is marred with many problems like in other cities of the nation. Though most popular, the auto drivers and passengers are involved in love-hate relationship. In this tug of war the most eloquent and vehemently reacting party is auto passengers. It has all the support from traffic police to RTO and the media. The objective of this small empirical study is an effort to understand 'the views of commuters about the drivers and the services they provide, in the city of Aurangabad. It came to the light that if the complaints of passengers are not unfounded. However, they also failed to realise that auto drivers are also working for wage or income. One thing emerged from the survey of city commuters what they want the cheapest mode of transit, whether it is provided with legal nuances or not.

V. METHODOLOGY

Types of survey carried out for research work

1 Roadside interview Survey

The vehicles are stopped at previously decided interview station by a group of persons and the answer to prescribe questionnaire are collected on the stop the information collected include the place and time of origin and destination, route, location of stoppages the purpose of the trip type of vehicle and number of passengers in each vehicle. The traffic may be filtered through a prescribed land by previews, warning signs and with the help of police so that each driver of the selected sample of vehicle is interviewed. The percentage of sample interviewed out of the total traffic in each selected period should also be noted from appropriate traffic volume study taken simultaneously.

2 Intermediate Public Transport Survey

Intermediate Public Transport vehicles; namely car, taxies, auto rickshaws, as well as cycle rickshaws under prevailing conditions; The format includes here; type of vehicle, registration number, name and address of the owner of the vehicle, day, date, trip number, origin, destination, time of start, time of finish, number of passengers is carried, because it is IPT, they are not carrying goods.

The similar procedure can be adopted in this case also for collection of data. Get the addresses and ownership information from RTO's office, and then talk to the association people to convince them about the importance of data collection exercise, and get the data, required data in the format, and also the foot note is very important in this case. Treat each point of loading unloading of passengers as origin destination. An auto rickshaw may stop at different points, load people, unload people; it has been requested to the auto rickshaw driver to treat each loading unloading point as origins and destinations, so that complete information about the passenger's movement as well as the vehicle movement simultaneously can be obtained.

Data Analysis

After data collection from road side interview survey public willingness will be known, and demand of vehicles will be determined. From I.P.T. survey origin destination matrix will be generated. For the impact study following impacts can be determined:

1. Effect on traffic congestion due to IPT modes.
    - During peak hours travel time and delay study can be conducted in city area to quantify the effect of IPT modes.

2. Effect on intercity/town GSRTC bus trip ridership.
    - The time wise IPT vs. time wise GSRTC bus (obtained from IPT survey and from GSRTC bus depot information) can give the idea of percentage share of passengers using IPT modes and GSRTC bus service.

3. Effect on accidents occurrence due to IPT modes.
    - The data collected from traffic police regarding accidents can give the accident occurrence due to IPT modes.

4. Effect on passengers' travel time due to IPT modes.
    - From roadside interview survey, the details of travel times can be obtained.

VII. STUDY AREA

The study area of Modasa is a city and a municipality in Arvalli district in the Indian state of Gujarat. Modasa became headquarters of new Arvalli district, carved out from tribal-dominated areas of Sabarkantha. The new district was declared on January 26, 2013 and formed on August 15, 2013. Its brief description is given in following sections.

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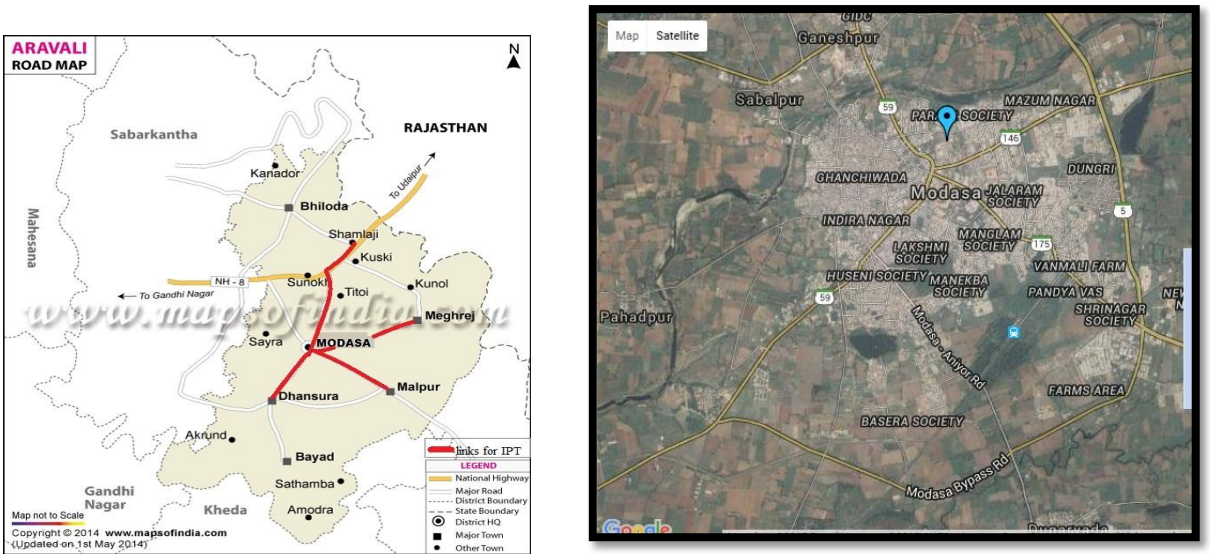

Fig 1: Map of study area

Fig 2: Ipt mode on meghraj and shamlaji road

Fig 3: Ipt mode on Dhansura road

Fig 4: traffic congestion in Modasa city

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