

Growth and Development of Autorickshaws in Kolkata: An Enigma to Planners

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ABSTRACT: Transport mix is one of the important characteristics of Indian cities, under the given size, structure and socio-economic characteristics. The uniqueness of road networks, demographic, physical and societal requirements determine the selection of a particular transport system. Paratransit is one such mode of transport which is indispensable system in Kolkata due to various reasons. Size, pattern, structure, socio-economic conditions and network characteristics of the city and service flexibility of paratransit system make it a vital transport system. The popularity of the system is evident from the fact that it serves nearly 80 percent to 90 percent of the total passenger trips catered by public transport. Autorickshaws as a paratransit mode play its role as a leader or a follower. But it is informal in its planning and operations, which makes it a problem area for the medium sized cities. Informal drivers' training creates unsafe, inefficient and environmentally degrading condition in the city. The entire research work deals with the growth and expansion of the number of vehicles and the routes within the city. The development of transport system has been interesting in the city, which has been studied. Both primary and secondary data has been collected for the study. This paper tries to study the pattern of growth associated with this mode of transport.

KEYWORDS: transport system, paratransit, road network, planning and operation

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I. INTRODUCTION

Motorized paratransit have continued their dominant function as a feeder in several developing cities as their services satisfied captive riders in terms of mobility. However, the dissatisfaction with their services especially in the aspects of traffic safety and service images could hinder patronage of paratransit in the future, and this transport mode has not been systematically considered in the transportation plans. Therefore, more efforts are required in order to promote the solution of integrating paratransit as a feeder into urban transportation, particularly, on the rider side. Movement takes place between points of demand and supply, desire and fulfillment. With a view to facilitate the movement of men and material from one discrete node to another across space, some definite channels of transport are required. These channels consist of nodes and routes connecting each other. The term network may, thus, be considered as referring to spatial pattern of transportation facilities in a given region.

Over the last two decades, motorized paratransit, uncontrolled and unrestrained small to medium sized motorized vehicles have emerged as one of the transportation modes in the city of Kolkata. They have gradually become an outperforming mode of transportation. Paratransit modes provide a variety of services from door-to-door collectors to intermediate line-haul due to the advantages of vehicle size and unrestrained operation that make paratransit effectively response to the fluctuated demand. The landuse pattern of the city has been haphazard which has led to the difficulties in accessing public transport. Moreover, there are only few feeder system in the city of Kolkata. In the areas left by public transport modes, paratransit have shown outstanding performance of shuttling people up and down the narrow alley areas off the main streets especially from their residents to main streets and public transports, which it reflects the capability of feeder function. At present, a combination of paratransit as a feeder and public transports has become one of the typical choices for commuters in Kolkata. Therefore, an idea of integrating paratransit as a feeder system into urban transportation cannot be overlooked.

II. PHASES OF GROWTH OF AUTORICKSHAWS

The development of transport system from the very early phase shows diversion. From sledges to modern day transport system, every phase portrays its uniqueness. Human beings have overcome every barrier in the developmental process with hard work coupled with intelligence. The mid- 19th century saw the introduction of railways.

It was after the First World War, first cars appeared. Paratransit mode was introduced in the United States in the year 1914. Then on, this mode of transportation started gaining importance. With the increasing population and passenger load within the city private buses were forced to allow on the streets of Kolkata. With the introduction of rickshaws in the city made the traffic slow, especially in the narrow lanes. To speed up the transportation, paratransit mode of transport was introduced in the 80's. An informal public transport mode in developing countries, falling in between the conventional transport services (fixed route and scheduled bus and urban rail) and private automobiles. Vuchic defined paratransit as urban passenger transportation service usually in highway vehicles operated on public streets and highways in mixed traffic; it is provided by private or public operators and it is available to certain group of users or to the general public, but a adoptable in its routing and scheduling to individual user's desires in varying degrees (Vuchic, 1981).

The rapid growth of population led to the inception of autorickshaws in Kolkata in the year 1982. The migration pressure from the nearby suburban areas along with a huge refugee population was alarming which led to the gradual increase in the number of wards to accommodate the growing population. Thus the number of wards increased from 100 to 141 in 1994. The refugee areas were characterized by small and narrow lanes. This phase of the city saw setbacks in the development of the roads. Thus buses which played a dominant role in the early period started to lose its importance. Thus communication system suffered. The inadequate road infrastructure and availability of public transport, shared journey is again a special feature of Kolkata. Introduction of small vehicles were necessary for the daily commuting. This was the prime time for the growth of autorickshaws. The city of Kolkata did see the prominence of rickshaws both hand pulled and cycle. The hand pulled rickshaws were referred to as elegance until the introduction of the cycle rickshaws. These dominated the added areas. Though the narrow lanes were favourable for the movement of the rickshaws, but were time consuming. Thus autorickshaws gained importance in the added areas of the city. Moreover, the rickshaw pullers mainly hailed from Uttar Pradesh and Bihar. The development in these states with time led to the decrease in the number of rickshaws in the city which in turn favoured the growth of autorickshaws. Coupled with the closing of industries and increasing travel demand the paratransit became more prominent in the eighties.

Growth of Autorickshaws within Kolkata Municipal Corporation Area

There has been a constant rise in the vehicular and pedestrian population within the city of Kolkata, while the road space remained constant. However, through modernization, improvisation and traffic engineering measures the movement of traffic within the city has been kept flowing. The installation of autorickshaws as a paratransit mode gained importance since its inception in the year 1982-83. During 1990's roughly 5000 autorickshaws plied through the city which increased to more than 20,000 in 2010. The first autorickshaw rolled out on to city's road in 1981 was a metered vehicle, charging a minimum of 20 paise for a ride. The uncontrolled growth of autorickshaws includes a huge number of illegal autorickshaws plying throughout the city. In 2006 almost 70,000 autorickshaws plied through the city of which roughly 30,000 were illegal. The big bullies on the road are being elbowed out inch by inch. The tough competition from autorickshaws and taxis have pushed buses to the brink. The rising fuel and maintenance cost are also responsible for the withdrawal of the buses. Autorickshaws should complement the buses rather than compete with them. The rapid growth of the paratransit mode within the city owes to the increased local demand for transport. In 2004 there were more than 16000 registered autorickshaws plying through the city.

Pre LPG Scenario

The paratransit system is an integral part of Kolkata's daily life. Starting from employment creation to traffic load distribution significance of autorickshaw is manifold in Kolkata. Till 2009 the unchecked growth of autorickshaws not only disturbed the traffic scenario of Kolkata it ruled over the streets of the city. The uncontrolled growth of the autorickshaws is mainly because of the unplanned and arbitrary introduction of this mode of operation alongside the banning of the autorickshaws in different times. The West Bengal government in 1991 banned any further permit to the auto drivers to control the growth. However, since its inception the paratransit mode had become convenient mode of transport for passengers and profitable business for the owners. Therefore, to meet the demand for the autorickshaws, the supply increased from the illegal domain without holding legal permits. The illegal vehicles were mostly financed by the private financiers instead of public and private banks.

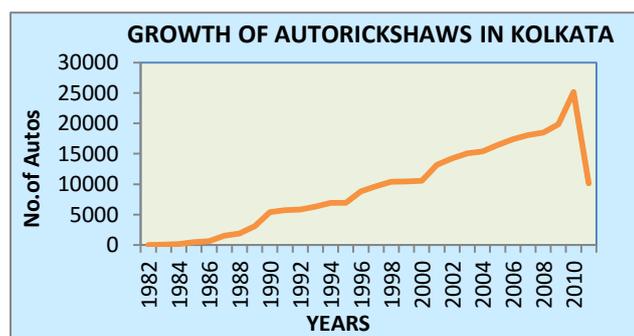


Fig I

Source: PVD, Kolkata

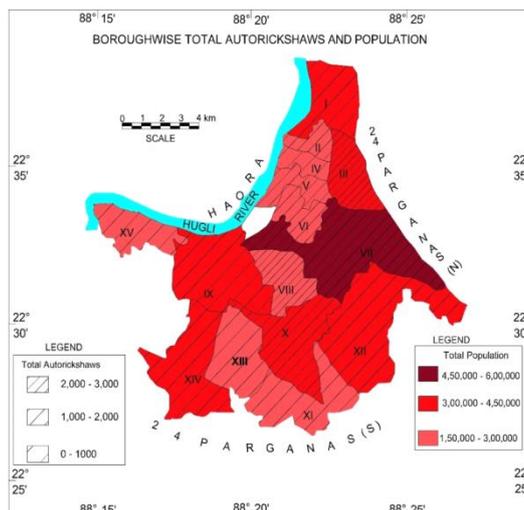
It was found in the survey that many people, during this phase, bought the autorickshaws either from their savings or on personal loan basis. The survey in the Garia-Golpark route (Rt No. 28) revealed that only 50 autorickshaws plied through the route in the eighties which increased to more than 600 by the end of 2000. Similarly in route number 44 (Kadapara-Mechua) around 500 vehicles plied whereas only 185 autorickshaws were given the permit in the year 2000. The increase in the number post 1991 is mainly due to governmental seizing of permits. The main reason behind the increasing number of illegal autorickshaws is their price, it costs nearly half the price of the autorickshaws with permit. The primary survey revealed that the number of illegal autorickshaws were more in the south suburban area than in proper Kolkata. Throughout from 1991 to 2000 all the trade unions demanded legalisation of the permit less autorickshaws. Responding to these demands the government in 2000 decided to provide permit to all the illegal autorickshaws bought upto year 2000 (Ghosh and Goswami 2014). The vehicles during this phase were petrol driven. The high cost of petrol often substituted with 'katatel', a highly polluting chemical.

Post LPG Scenario

July 31, 2009 was the phase out deadline of all pre-1993 commercial vehicles plying in Kolkata. This was also the last date for replacement of two-stroke and non-LPG four-stroke autorickshaws to four-stroke LPG autorickshaws. The Calcutta High Court had on July 18, 2008 set a December 31, 2008, deadline for phasing out of polluting two stroke autorickshaws and to ensure that only four-stroke autorickshaws on clean fuel operate. The city faced a dilemma about phasing out of the two-stroke engines powered three-wheelers. Initially there were attempts to make the post-2000 two stroke autos survive by converting them to LPG. The state government announced on August 2, 2009 that the nine year old two stroke autorickshaws could be allowed to ply if they were converted to LPG. Out of 70,000 two-stroke autorickshaws, that were banned under the High Court order, an estimated 10,000-plus were registered after the year 2000 within the city (Fig I). In the meantime, there were reports that hundreds of two-stroke autorickshaws had infiltrated south Kolkata and the northern fringes, particularly Shyambazar, Dunlop and Ariadaha and the Chetla-Behala route and most of these were plying late in the evening, when vigil was relaxed. With the replacement of the old vehicles the number drastically decreased. The already registered vehicles are fitted with embossed high security plates which restricted the growth of illegal autorickshaws.

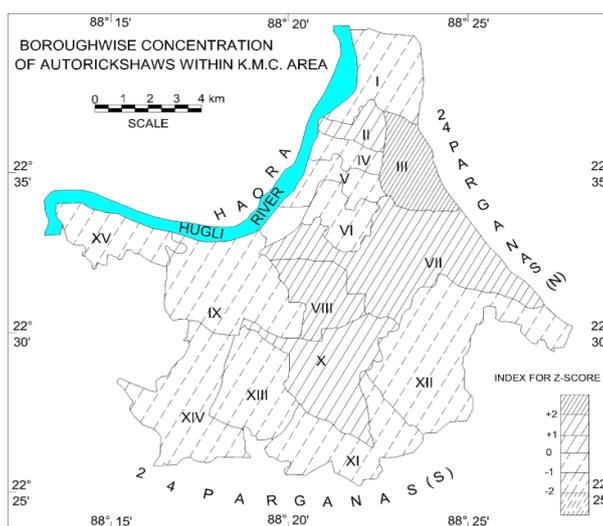
Expansion of the Paratransit Mode

Kolkata's solution lies in its inherent character. Kolkata is a mega city with a difference. Its highly concentrated population, compact city design, limited road infrastructure and a substantial network of public transport and inter-mediate public transport has worked to its advantage. Its compact city design has enabled dense walking network that is highly permeable. Its early investments in trams, buses, metro have already created extensive public transport network. It has excellent feeders in low cost taxis and three-wheelers that have reduced dependence on personal vehicles especially for short distances. Limited parking spaces in many parts of the city have also dampened car ownership. This city has an enormous opportunity to set an example in the country by thinking differently, and acting differently. Very high level of walking, cycling and public transport trips are a reflection of the way the city is designed. Dense and closely built forms reduce travel distances and make the city more walkable. It is therefore not a surprise that 60 percent of the total trips generated in the Kolkata Municipal Corporation Area have an average distance of less than 3-4 kilometers. This makes walking, cycling, paratransit and public transport extremely attractive and feasible. The rapidly changing world of today is in threshold of a survival crisis. About 70 percent people of the world will be living in urban areas.



Map No 1 *Data Source: PVD and Census of India*

As the cities begin to grow, there is a rising concern about their sizes. Cities quickly lose control over their own rapid growth, a phenomenon that is extremely detrimental to a sustainable and healthy urban situation. The demand for more living space shows no sign of abating as cities continue to expand in the fringes through suburban sprawl. Generally city expands along its peripheries because it is much more difficult to expand in the already dense central districts. The sprawl often curtails opportunities of future improvements or value additions. This is certainly a major deterrent for future sustainability of big cities. The case of Kolkata is one of them. The growing population within the city automatically increased the demand for the transport needs. The failure of the mass transit to meet the travel demands increased the paratransit population within the city. Interestingly the boroughs having the highest population share show the maximum concentration of autorickshaws (Map No.1).



Map No 2 *Data Source: PVD and Census of India*

Borough III and Borough VIII representing Ultadanga and Gariahat region respectively has the maximum number of autorickshaws plying through followed by borough II, V, VI, VII and X. The concentration of autorickshaws shows a positive relationship with the population concentration. However, the constant strive by the government to check the growth of this mode of transportation have proved to be futile. If noticed (Map No.2) the concentration of the autorickshaws tend to be within the core of the city. The peripheral

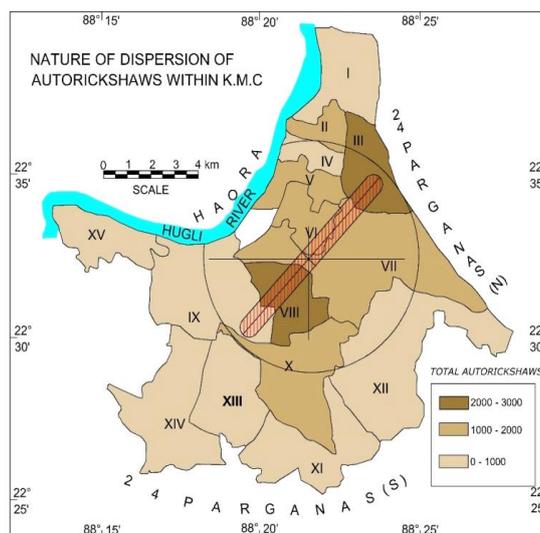
boroughs show a negative concentration. This indicates the movement of the share of peripheral population towards the core of the city which induces the traffic snarls in the major traffic corridors. This in turn identifies the user ability and willingness to avail this fast and easy mode of transportation. As a derived demand, a proper transport infrastructure on developing the paratransit mode can help in reducing pressure at the core. The paratransit system has a potential to link residential areas to main streets, and can be complementary mode by carrying people to public transit services. But, existing paratransit systems are considered informal, not well organized and people still dissatisfied their service quality (Mohan, 2003). Despite the obvious merits, paratransit system has tended to be ignored by policymakers in the formulation of infrastructure policy and positively discouraged as a service provider. The lack of good road hierarchy and substandard bus services, make paratransit vehicles flourish on the streets of Kolkata city.

In accordance to the population growth the city of Kolkata witnessed a tremendous growth in vehicular population especially after 1981. The rapid process of urbanization along with the politically influenced socio – economic transformation supported the expansion of transport services that itself accelerated the degree of demographic mobility. The significant fact can be observed regarding the degree of expansion of paratransit service. It has growth at a much faster rate compared to the total vehicular growth. Urban population in this city has increased from 3.3 million in 1981 to 4.47 million in 2011 whereas the paratransit services increased from 19 in 1981 to more than 20,000 in 2010 in relation to total vehicular growth from 1,53,834 to 6,72,567 for the same period. The continuous growth of economic activities and passenger mobility with the geographical expansion of this city resulted into rapid rising trend of total vehicular population to meet the increasing travel demand. The last thirty years after independence of India was characterized by substantial growth of urban population supported by vehicular population which was the outcome of economic pull factor of this city in the global perimeter. (Table 1)

Table No.1 Population and Vehicular Growth in Kolkata (1981-2011)

Year	Population	Growth Index	Total vehicles	Growth Index	Total Autorickshaw	Growth Index
1971	31,36,391		92,043		—	
1981	32,88,149	112.82	1,53,834	167.13	19	100
1991	43,85,176	150.47	4,13,260	268.64	5,705	30026.31
2001	45,72,876	156.91	6,72,567	162.75	13,156	230.6
2011	44,86,679	98.11	6,32,129	94	10,109	76.84

Source: Computed by author from Census of India and PVD



Map No 3 Data Source: PVD and Computed by Author

The growth of autorickshaws shows an interesting trend (Map No.3). As already mentioned, the peripheral areas do not have much concentration of auto route and number of autorickshaws. The growth pattern shows a linear trend in a north east and south west direction. This highlights the fact that growth in the number of vehicles has not shown much dispersion at the same time the growth has been centred along the core of the

city. The added areas facing the problem of migrant population compromise for space. These small vehicles are therefore an important mode of transport. Borough XV in the extreme western part needs a special mention in this regard. This dock area is characterised by extremely narrow lanes. Mass transit is not prominent in these areas. A huge portion of this borough is occupied by the factories. Thus heavy goods vehicle are common in this area. The autorickshaws provide the best mode of transport in this region leading to a high route density. The Theil Index calculated for the city of Kolkata for determining the distributional pattern of the autorickshaws. It is the average of inequality. Thus it is an important tool for the positive analysis of regional inequality as it suggests the relative importance of spatial dimension of inequality. For 2003 and 2013 the index value remains almost same indicating an almost even distribution of vehicles throughout the city.

Table No.2 Theil Index Value for 2003 and 2013

Year	Theil Index Values
2003	0.0974
2013	0.0976

Growing Demand of Autorickshaws

Around 20 to more than 50 percent of travel demand from captive riders and car dependent users are handled by motorized paratransit (Shimazaki and Rahman, 1996; Joewono and Kubota,2007; Cervero and Golub, 2007; Vuchic, 2007). Taking advantage of vehicle size and unrestrained operation, paratransit can admirably respond to fluctuated markets, fill voids of areas left by public transports at relatively low fare, and substitute for public transit without subsidies. Besides, they were recognized as efficient road-utilizing carriers, low cost service, fleet-footedness, and users’ gratifying mode (Cervero and Golub, 2007).

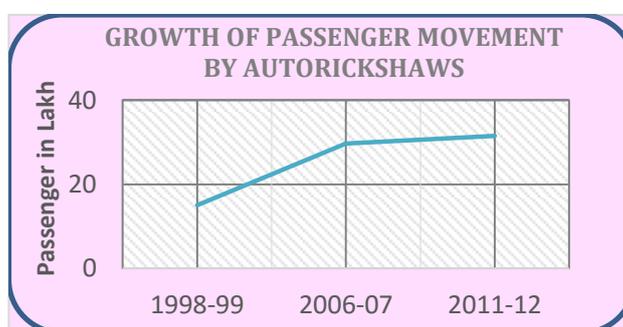


Fig II

Source: KMDA

Paratransit are still popular modes and seem to satisfy captive rider’s needs in terms of mobility especially in feeder function by shuttling people up and down the narrow alley areas off the main streets especially from their residents to main streets and public transits. Even though paratransit service qualities are only acceptable but not satisfy user’s needs, users or passengers are still willing to use paratransit. Autorickshaws as paratransit mode has gained importance as feeder service in the city of Kolkata. The fast and easy movement, low carrying capacity has attracted the passengers of the city. The passenger movement increased from 15 lakh in 1998-99 to about 29 lakh in the year 2006. The private vehicles (Cars and two-wheelers) cover nearly 90 percent of the fleet in Kolkata but meet only 12 percent of the travel demand (Comprehensive Mobility Plan, 2001-2025). Public transport covers only a mere 32 percent of the traffic but meet 54 percent of the travel needs. Buses, autorickshaws, cycles and walking play an important role in the daily public trips. Of all the modes of paratransit autorickshaws has the highest share of trips accounting for about 45 percent. The passenger movement has shown a rise from 1998-99 to 2006-07. However, the rise from 2006-07 to 2011-12 shows a low increase due to the decrease in the number of vehicles. The almost constant share of passenger also indicates the dominance of personalised vehicles.

III. CONCLUDING OBSERVATION

Just about all paratransit services that we are aware of have emerged or been instituted in situations where the demand has been quite apparent. It is not a question of doing elaborate feasibility and planning studies (although they may be useful if the effort is to develop comprehensive transportation systems), but a matter of filling obvious gaps and deficiencies. After defining the need, the principal question is the matter of identifying the agency that should be responsible for initiating and providing the service: private or public, already established organizations or newly created ones, as components of comprehensive systems or as freestanding local endeavors. The operational plans for these feeder systems are simple—it is a question of providing enough

capacity on a route to carry the load without discouraging patronage, and responsive vigilance and flexibility are indicated. The other critical matter is a serious effort to maintain at least base service, even during periods of low demand and on key corridors with limited patronage. The growth of paratransit has been haphazard in the city of Kolkata. The rapid growth of the autorickshaws was a menace for the city traffic. With governmental regulations the number could be controlled but the growth pattern has a linear trend which mainly covers the core of the city. The autorickshaws were introduced to make movement faster especially in the added areas where population pressure was high and is characterized by narrow lanes. However, this attempt failed with the growing wear and tear of the public and private mass transit system. The result showed lesser concentration of auto routes and numbers of autorickshaws in the peripheral areas of the city. The faster movement by this mode of transport gained importance amongst the passengers. Paratransit operations has higher share in urban transportation of many developing cities due to their flexibility and door-to-door service. Paratransit users seem to get used to with its services both access mode and intermediate line-haul mode, and still want to use it in the future, although they do not satisfy in quality of service. Today autorickshaws are an indispensable component of urban mobility for scores of people in our cities.

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