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Paratransit Modes in the North Eastern Regions of India

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Abstract—*Paratransit plays a significant role in medium and small sized cities and its hinterland. It acts as the major source of connectivity between various regions within the influence zone of the urban area. It is normally flexible in scheduling and routing (door to door) but it may also be fixed route and flexible schedule (shared mode). It provides transportation services to regional passengers within the influence zone similar to conventional bus services. Paratransit vehicles are also widely used as a mass transit system in some of the small and medium cities in place of conventional city bus services. In fringe area, they are the only means of connectivity and thus play a pivotal role where the public transportation facility is absent. Auto-rickshaw, cycle-rickshaw, Tata Magic, Tata Max, Winger, Van are the major paratransit modes available in the north eastern region of India. The study is essential to ascertain the role played by the paratransit in the regional passenger transportation. Moreover, the study will help the planners and policy makers in terms of developing and regulating transportation system.*

Keywords*: paratransit, flexible, schedule, routing, central business district.*

1. INTRODUCTION

The north eastern states of India comprise of eight states viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. The total area covered by these states is 262753 km^2 which is about 8% of India's total area. Having a total population of 38,857,769 with a population density of 184/km^2. Most parts of these regions are covered by hilly areas with occasional steep gradients. The areas covered under valley and plain are not large. As the region is mostly hilly and landlocked, the road connectivity and transportation network are not fully developed, hence, the transportation between the states are a big hurdle. The air connectivity is also very poor other than Guwahati, Agartala and Imphal. Due to the lack of efficient public transport system in this region, the regional paratransit plays an important role in serving the urban population.

Mostly, particularly in the hilly areas, people do not have their own vehicles to suffice their day to day transportation needs. In order to meet their demand, automated paratransit is in operation in these areas. In some parts of north-eastern states, a few state-run city buses are in operation. However, due to the unplanned and narrow street system with poor geometric features, makes the operation of the city buses not only difficult but also economically unviable. Moreover, because of the scattered urban population, the operations of public vehicles such as large buses are not economically feasible, thus, making it almost impossible for the free flow of large transportation modes. Thus making the small sized paratransit vehicles the best option for such condition. Not only they are operating in the urban areas of the region but also it operates in the hinterland as regional transit modes. It serves the regional passenger as a replacement for earlier regional buses which are far more convenient for the passenger as they plied on fixed routes but flexible schedule system. Adding to its advantages, as mentioned above is the high frequency of availability as the capacity of the vehicle is low. Paratransit services help the people to reach their desired destination within the least possible time at a reasonable cost.

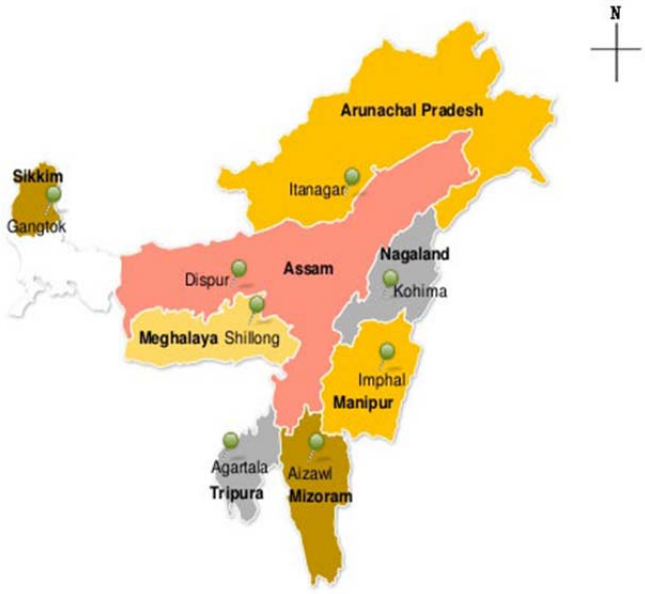

Fig. 1: Map of North-East India

2. PARATRANSIT

Paratransit, also known as intermediate public transport (IPT), is the intermediate mode between the privately owned automobiles and the conventional transit. It is normally flexible in scheduling and routing (door-to-door) but some it may also be fixed route and flexible schedule (shared mode). It includes not only taxi, jitney, dial-a-ride, and subscription commuting services but also car rentals and carpools. However, in Indian context, paratransit consists of vehicles such as Cycle-rickshaw, Auto-rickshaw, Tata Magic, Tata Sumo, Max, Winger, Maruti Van etc. which provide services in the hinterlands of the urban area.

2.1 Regional Paratransit

Regional paratransits are the vehicles which give its services in the urban areas and its hinterland. The main function of the regional paratransit is to serve the passenger from the fringe and urban agglomeration towards the central business district (CBD) area, regional market center, shopping center and vice versa. The regional paratransits such as Tata magic, Tata Sumo, Winger, Max, excluding auto-rickshaw, are grouped as the "Other Paratransit (OP)" vehicles and it works as the regional paratransit in urban areas and its hinterland. The OP serves as the substitute of the regional bus. The carrying capacity of the OP vehicles is 8 to 12 persons.

Different types of paratransit mode are operated in the north-eastern region of India for urban passenger transportation. The common regional paratransit vehicles operating in the region ranges from non-motorize (driven human energy) to motorize paratransit. These paratransits comprise of manually operated cycle-rickshaw and fast moving automated vehicles such as auto-rickshaw, Tata Sumo, Winger, Van, Max and Magic etc. However, manually operated paratransit such as cycle-rickshaw is almost absent in the hilly areas, as it is not feasible to operate in such terrain.

Therefore, paratransit services are taking a significant role in both urban and rural areas by connecting city through National Highways (NHs), state highways, major district roads, other district roads as well as other major Corridors.

2.2 Classification of Paratransit

Broadly, paratransit can be classified into motorized and non-motorized modes. It can be further sub-divided into three groups viz. individual type (seating capacity less than 4), shared type (seating capacity between 5-10) and collective type (seating capacity between 11-20) (Shimazaki and Rahman, 1996). Both motorized and non-motorized modes are operated in developing countries in various forms. In all cities, individual types of motorized and non-motorized paratransit modes are used for door to door service (Shimazaki and Rahman, 1996). However, shared types of motorized paratransit are generally operated on fixed routes with no fixed stops (Shimazaki and Rahman, 1996).

In addition, the classification can also be made according to its usage, ownership, and services type depending on the area where it operates. The different types of motorized and non-motorized regional paratransit operating in the north-eastern region have been discussed in Chapter 3.

2.2.1 Motorized Paratransit:

The motorized paratransits are comprised of minibuses, minivans, taxis, auto rickshaws, tempos etc. Some of the important motorized paratransit include Angkots in Indonesia, Silor in Thailand, Xelam in Vietnam, Tata Magic and Auto-rickshaw in India, Dolmus in Turkey, Daladalas in the city of Dar-Es-Salaam (Tanzania), Fast Buses in Dakar (Senegal). The seating capacity of motorized paratransit varies from 2 to 18.

Angkots are typically minivans and they are considered as the formal mode of intermediate paratransit (IPT). Their patterns of operation are informal and have no designated or pre-determined stops. Therefore, they pick up and drop off passengers at any point along its route.Dolmuses are minibuses operated by private owners. They have a normal seating capacity of 14 passengers and operate on fixed routes within cities. They also extend their services to the outskirts and connect other towns and villages. They work on a fixed fare system and also have dedicated stops for Dolmus like the buses.

Fast buses in Senegal were operated in a very poor condition. They were very old, slow and had frequent breakdowns. Also, drivers were not given any formal training, and they sometimes did not follow the fixed routes. They have a dense network of services and charge a relatively low fare. However, their service quality is very poor and disorganized.

Daladalas are cheap minibuses and operated on fixed routes. These minibuses are marked and stripe with a specific colour which enables to identify their origin and destination. The routes are fixed by the Surface and Marine Transport Regulatory Authority. Daladalas carry 1.4 million passengers per day and the average distance travel by this particular mode is between 10 and 20 km.

The Silor in Thailand and Xelam in Vietnam provide door to door service. Sometimes, when it operates on sharing basis, they altered their routes according to the demands of the passengers.

2.2.2 Non-motorized Paratransit:

The non-motorized paratransits are human powered and animal powered transportation system. The examples of human powered paratransit include cycle-rickshaws and Pedicabs which are commonly operated in developing countries. The cycle rickshaw is the most popular individual type of non-motorized paratransit which is known by various local names in different countries such as cycle rickshaw in India and Bangladesh, hand-pulled rickshaws in Kolkata,

becak in Indonesia, a pedal tricycle in Philippines and xiclos in Vietnam and so on (Shimazaki and Rahman, 1996). The animal powered paratransit includes Tonga in India and Pakistan, Calesa in Philippines, Dokar or Delman in Indonesia.

All non-motorized paratransit are operated based on individual type, not on sharing basis. These types of modes mostly have a seating capacity of 2 except, Tonga (seating capacity 2-4) in Pakistan (Shimazaki and Rahman, 1996).

3. PARATRANSIT IN THE NORTH EASTERN REGION

The various paratransit operated in the regions are discussed below:

3.1. Auto-Rickshaw

It is a three-wheeled motorized commercial vehicle built by Edward Butler for the first time in Great Britain in the year 1884. In India, auto-rickshaw is one of the important mode of passenger transportation which operates across the country. The auto-rickshaw operated in northeastern regions of Indian cities are available in two variants i.e. powered by diesel and petrol engine.

Fig. 2: Eight seated Auto-Rickshaw

Fig. 3: Three seated Auto-Rickshaw

A large fleet of petrol driven auto rickshaws is also operating as auto taxis under the permits system granted by the respective Secretary or RTs (DTOs). However, this fleet of auto taxis is not fitted with meters, thus, creating inconveniences to the general public as the fares are charged randomly at the wish of the driver or operator.

3.2. Cycle Rickshaw

Cycle-rickshaw, as shown in Fig. 1.3, is a non-motorized mode of transportation and it was first originated in Japan. In India, it first appeared in Shimla in 1880 as hand pulling a rickshaw. The three-wheeler cycle-rickshaw was first used in 1930s and 1940s in India. The advantage of cycle-rickshaw over the other paratransit vehicles is-it can manoeuvre even in the narrow streets. Moreover, cycle rickshaw is environment-friendly because it is run by manual power and does not pollute the environment by emitting carbon dioxide like other motorized vehicles.

Earlier, cycle-rickshaw was the only available transport facility for the passenger's service for short trips, shopping trips, etc. Nowadays, the percentage of passengers using cycle-rickshaw has been reduced as there are various motorized paratransit vehicles. Moreover, the trip cost is relatively higher compared to the other paratransit. Therefore, cycle-rickshaws are less preferred by the trip makers as its travel cost is comparatively higher, speed is low and not suitable for long trips. It operates maximum trip length of 1-3 km. in the study areas.

Fig. 4: Cycle-Rickshaw

3.3. Tata Magic

Tata Magic is a four wheeler motorized paratransit vehicle having a seating capacity of 10-12 people as shown in Fig. 1.4. It is now widely used regional paratransit. It is observed that often the seating arrangement of the vehicle is modified in order to accommodate more passengers. It is mainly used for the transportation of passengers from remote rural areas to Central Business Districts (CBDs) and major activity centres of the city. Therefore, such modes are less visible in the CBDs areas due to the restriction imposed by the government. They

are mainly operated in the fringe areas to serve the people therein. In general, such vehicles are mainly used for long distance trips. It can also be used in the hilly areas comfortably.

Fig. 1.4: Tata Magic

3.4. Maruti Van

Maruti vans are the four-wheeled motorized vehicle which falls under the category of light motor vehicle. The van services are observed to be limited. It is widely used for schools trips, feeder trips to the airport, trips made by tourist and ceremonial trips, particularly for wedding.

Depending on the demand, the usage of vans varies from place to place. In some parts of India, Maruti vans constitute an important fleet of paratransit services while in some other regions it is used as an ambulance, or even for goods transportation. The mode is extensively used in the narrow and congested streets of the cities in the region.

Fig. 5: Maruti Van

3.5. Maxi Cabs

The Maxi Cabs comprised of paratransit vehicles such as Tata Magic, Cruiser, Winger, Max and Sumo as shown in Fig. 1.6. These are the four wheeler vehicles operated under the All India permit for Tourist Transport Operators, Rules' 1993. It has a seating capacity of 12 persons, but operators accommodate more passengers to increase their earning. This type of mode is widely used for regional passenger transportation from town towards the fringe area and vice versa. Sometimes the vehicle carries the passengers on the back and top of the vehicle during the peak hours.

Many times the mode is found to operate for interstate passenger transportation. These vehicles are commonly used for long trips and hardly used for short hauls.

Fig. 1.6: Maxi Cabs

3.6. Taxi

Taxis are used for door-to-door or shared ride services. Taxis services are widely used in large cities and metropolis, where large numbers of trip makers are available. Taxis are mainly used for specialized trips such as trips to the airport, railway station and vice versa. The mode is also widely used by the tourists. Taxi services are not common in small or less developed cities instead old private cars are used as taxis. As a result identifying taxis from private cars is difficult in such cities as they do not have any colour code.

Taxi services in India can be broadly divided into two categories-conventional and modern services. The conventional taxis provide service by face to face contact whereas the modern taxis are usually booked by a phone call or online through an internet facility. The modern taxi services also include the radio taxi service.

Fig. 7: Taxi

4. ROLE OF PARATRANSIT

Paratransit is usually expected to fulfil the transportation need of the people which is not fulfilled by either public transport or personalized vehicles. Such mode generally provides services to a category of occasional trips like trips to airports or railway stations etc. with excessive baggage, or emergency trips that have to be undertaken immediately under the circumstances of having no time to wait for public transport. Literally, paratransit services are meant to fulfil the gap of public transportation system or regular commuters' trip. However, paratransit tends to substitute the public transport as the quality of public transport deteriorates or absent.

5. CONCLUSION

The paratransit available in the regions are auto-rickshaw, cycle-rickshaw, Tata Magic, Tata sumo, Max, Winger, Van, etc. Among these, Tata Magic, Tata Sumo, Max, Winger serves as regional paratransit vehicles and used for fringe areas. Auto-rickshaw and cycle-rickshaws are used in nearby CBD areas, retail market and business centre areas. The roads are found to be narrowed and congested in the study areas. Bus service is not found to be popular in the study areas as it is replaced by regional paratransit vehicles.

Over the past, paratransit system has been playing a major role in the transportation of urban passenger. Paratransit plays a vital role in the urban and suburban transport sectors of developing countries. In several cities, quite half the overall conveyance demands are carried by them. The rapid increase in urban population, inadequate existing transport infrastructure ends up in the additional usage of the paratransit vehicles. It has taken a lot of forms in the past and we are looking further into widely acceptable forms. Paratransit system has made an ease in transportation whether it may be in remote areas, or some other controlled system. Variant modes of paratransit are seen in the region but their main goal is door to door transport and maintaining flexibility. It also generates a considerable amount of employment opportunities.

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