

Role of low cost means of transport, case study: Gwalior

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ABSTRACT: In developing countries, there is abundance of low cost means of transport or non-motorised transport (NMT) namely hand-rickshaw, cycle-rickshaw, horse cart (tonga), bullock carts, etc. for passengers and goods mobility specially for short distance trips. They are quite popular mode mainly due to low fare and easy accessibility despite their some drawbacks This Paper discusses in detail physical, operational, route and operators characteristics as well as role of low cost means of transport viz. cycle-rickshaw and horse cart (tonga) in Gwalior city in India. Institutional issues concerning with these modes are also discussed at length. Further, problems and issues including traffic management connected with these modes are discussed.

1 INTRODUCTION

Since the early days (iron age) of human being, men had evolved many transportation modes (non mechanised) to move from one settlement to another settlement mainly for the search of food. Slowly, with the improvement in technical skills, transportation modes were modified to cope up higher speeds to reduce travel time and also to cater the need for long journey. Majority of the early days transportation modes such as horse-cart (also called as tonga in India), bullock/camel carts, hand-cart (also called thela in India), cycle-rickshaws are catering to both passengers as well as goods transport and they fall in the category of Intermediate Public Transport (IPT). India, being a developing country, with vast geographical area with heterogeneous climatic conditions across the country has abundance of low cost transport means of modes in almost each town/city. Some of dry areas in India, camel cart is still quite popular mode of transport for both passengers as well as goods, whereas in plain areas especially in old towns/cities, tongas and cycle-rickshaws are serving the short-distance intra-city travel needs of middle-income/economically weaker section of society. Hand-carts are primarily providing mobility for goods at extremely low travel cost. In Kolkata (earlier called as Calcutta) hand-rickshaws are also catering to passenger travel needs.

2 PROFILE OF GWALIOR CITY

Gwalior city, located on latitude 26.2 degree North and longitude 76.3 degree East, being the formal capital for Scindhia raj has key status in Madhya Pradesh state (central part of India). Apart from being headquarter of Madhya Pradesh, Gwalior is well known for excellent educational and commercial activities in the region. The city consists of three distinct settlements viz. Lashkar, Gwalior and Morar, which form the Gwalior urban area. The city admeasures an area of 2069 ha. The population of Gwalior city has increased from 1.4 lacs in 1901 to 7.21 lacs in 1991 with the growth rate being above 3 per cent per annum in the last decade. The projected population for 2001 for Gwalior city is 9.5 lacs. The city is well connected by road and rail with all major cities in India. On few domestic routes, air services are also available from Gwalior. National Highway (NH) number 3 i.e. Agra-Mumbai (earlier known as Agra- Bombay) road passes through Gwalior. The city is exposed to rapidly growing industrial and commercial activities. Gwalior city road network plan is shown in Figure 1.

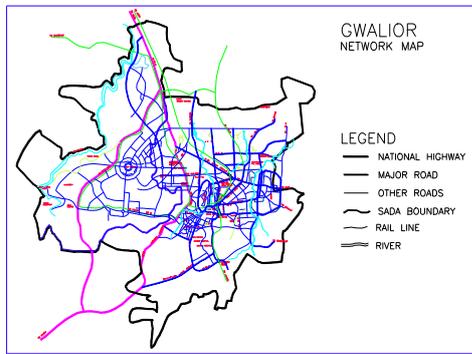


Figure 1. Gwalior city road network plan

3 TRANSPORT SYSTEM CHARACTERISTICS

The travel needs of Gwalior urban area are primarily catered by personalized modes (two-wheelers / bicycles) and IPT mode (six-seater tempos). In addition to the above, the following modes do cater to passenger travel needs too:

- personalized modes (cars/jeeps/vans)
- PT mode (mini buses on one route)
- IPT mode (auto-rickshaws, cycle-rickshaws, tongas).
- Maxi-cabs (jeeps) for inter-city passenger travel

3.1 Vehicle Composition

As per the vehicle registration data available with the Regional Transport Office (RTO) at Gwalior approximately 2 lacs vehicles were plying in the city during 2000-01. Approximately 80 per cent of the total vehicles were 2-wheelers, 5 per cent were cars. However, it is also observed as per the past data that the growth of 2-wheelers in the city is high (annual growth rate of 14 per cent). About 2,500 auto-rickshaws were plying in the city. At few pockets/localities in Gwalior and Morar, approximately 350 cycle-rickshaws and about 300 tongas were catering to short distance trips. The traffic in the city was mixed with slow moving non-motorised vehicles viz. cycle-rickshaws, tongas, thelas, etc.

3.2 Physical and Operational Characteristics

Owing to non-availability of State Transport buses for intra city passenger travel demand, at present only on one route i.e. Bara to Morar mini buses was plying by the private operators.

The predominant IPT mode in Gwalior was observed tempo (seating capacity 6+1), which is operating presently on 13 routes out of 22 routes allocated by the Regional Transport Office (RTO), followed by auto-rickshaw (seating capacity 3+1). The other IPT modes viz. cycle-rickshaw (seating capacity 3+1) and tonga (seating capacity 6+1) were plying in certain pockets/locations of city. Tonga and cycle rickshaw were catering to short trips (1 to 4 km) only. The operation period of various IPT modes was noticed between 7 to 21 hours except for auto rickshaws, which operate round the clock. The

average number of trips per day by almost each IPT mode was observed ten. The average age of tempo and tonga was varying between 7 to 8 years whereas for auto rickshaws and cycle-rickshaws the average age of the vehicle was observed 5 years.

3.3 Route Characteristics

Tempos and tongas ply on fixed routes identified by RTO and Gwalior Nagar Nigam respectively. Tongas were plying pre-dominantly at Bara in Lashkar; and cover short trip length during daytime. Owing to short trip distances (3 to 5 kms) of tonga routes, the total no. of stops vary between 3-5 along each route; and, passengers' boarding/alighting at intermediate request stops were limited to 1-2 passenger(s) only. Majority of trips catered by cycle-rickshaws and tongas are social and education purpose. About 10 tonga stands (with about 5-10 tonga parking capacity) were observed in Gwalior. The average travel time for each tonga trip is observed 30 min. Cycle-rickshaws were playing on flexible routes in certain localities in Gwalior and cater to short distance travel needs.

3.4 Operators Characteristics

The average monthly expenditure on fuel for tempo was Indian Rupees (INR) 3,500/-, followed by auto rickshaws INR 2,200/- and finally average monthly expenditure incurred on fodder by tonga operators was INR 1,200/-. The average monthly maintenance expenditure for tempo was INR 750/-, followed by auto rickshaws INR 500/- and for tongas INR 300/-. In case of cycle-rickshaws, most of the operators ply these on hire basis, and expenditure on maintenance was borne by the owners. In case of tempos/auto-rickshaws also some operators ply on hire basis. The average monthly vehicle rent for tempos was INR 4,000/-, followed by auto rickshaws INR 2,500/- and for cycle-rickshaws INR 750/-.

The average net profit of auto rickshaw operators was observed INR 4,500/-, followed by tempo operators INR 3,500/-. For rest of the modes namely tongas and cycle rickshaws, the average monthly net profit of operators were observed below INR 2,500/- The fare structure of tonga in Gwalior was fixed by the Gwalior Nagar Nigam. In case of cycle-rickshaw, operators charge on their own taking into account travel distance, luggage, timings of day, etc. with minimum fare per passenger INR 3 to 5.

The earning per km (EPKM) for auto-rickshaws worked out to INR 7.5, for tempos INR 3.2. Similarly for cycle-rickshaw EPKM is INR 3.8 and for tonga EPKM worked out to INR 8.

4 SOCIAL & ECONOMIC ASPECTS

The low cost means of transport viz. cycle rickshaw/tonga operators represent the poorest section among transport operators category mainly due to poor background and very low/negligible profits in its operation.

Majority of the cycle rickshaw operators do not own the cycle-rickshaw as the cost of new cycle-rickshaw (approximately INR 4,000 to 5,000) was beyond their purchasing capacity. Therefore, they get cycle rickshaws on rent basis. On an average per day rent (for 8 hrs) was varying between INR 30-50 depending upon age of cycle-rickshaw, etc.

Considering the high unemployment rate in developing countries, they are one of the biggest generators of employment especially for weaker section of society.

5 ENVIRONMENTAL & ENERGY BENEFITS

As discussed in ante-para, almost all low cost means of transport serve the basic travel needs of city inhabitants no pollution. In addition to the above, they also do not require the most scarce energy resource viz. oil for its operation unlike other mechanized modes. Due to said reason, these modes also called as eco-friendly modes and are highly energy efficient modes.

6 INSTITUTIONAL CO-ORDINATION & ISSUES

The concerned departments with PT/IPT system in the city are:

- Gwalior Nagar Nigam (GNN)
- Motor Vehicle (MV) department
- Traffic Police department
- Gwalior Development Authority (GDA)

GNN deals with the operation of cycle-rickshaws and tongas by issuing licenses to the operators, and MV department identify routes and issues permits to operators for operation of mini-buses, and tempos on the given route in the city. In addition to the above, MV department deals with issue/renewal of permits to auto-rickshaw operators.

Traffic Police helps in smooth flow of traffic on major roads of the city. GDA authority plans and executes the works related with infrastructure including PT/IPT system.

It was observed that as far as operation of cycle-rickshaws and tongas are concerned, GNN was supposed to not only issue licenses to operators but also look into the problems of these operators for making said modes more and more effective.

Unfortunately, these operators were plying these modes without any assistance (such as providing passengers amenities/parking bays/stands, etc) from the departments concerned. There is no focused attention towards improving the services of these modes by departments concerned. Even the Gwalior Development Plan 2005 prepared by the state Town Planning department had missed to appreciate the role of said IPT modes in catering to travel needs of economically weaker/middle class people of the society.

The following figures show unplanned parking stand for tongas and cycle-rickshaws in Gwalior city.



Figure 2. Tonga stand at Bara in Gwalior city



Figure 3. Tonga carrying school children in Gwalior



Figure 4. Un planned cycle-rickshaw stand in Gwalior

7 TRAFFIC MANAGEMENT ASPECTS/ ISSUES

In comparison with other IPT modes, traffic management problems are of serious concern in both cycle-rickshaws and tongas operation mainly due to their low speed (5-10 km per hour) and high passenger car unit (PCU) values 1.5 and 4 for cycle-rickshaw and tonga respectively as per Indian Roads Congress (IRC) code. Due to the above reason, many places are facing regular traffic jams/congestion at intersection(s), etc. Owing to non-availability of parking places or planned stands, especially cycle rickshaw operators wait for passengers at intersections/on-streets. This further accentuates the smooth traffic flow. Road accidents also take place especially on mixed traffic roads. Due to rapid increase of light personalized modes (scooter/motorcycle/car) on roads, said IPT modes are becoming unsafe mode.

It also observed that many a times they were over-regulated, their entry was restricted and their area of operations constrained. In addition, they are subject to high degree of enforcements.

8 CONCLUSIONS

The predominant IPT mode in Gwalior was tempo plying on 13 routes. Cycle-rickshaws and tongas are plying on few pockets of city and catering to short distance travel (2-5 kms) needs of the people. The average net monthly profit for cycle-rickshaw and tonga operators worked out to meager INR 2,500.

These modes by providing mobility to the poorest sections of society plays extremely valuable role in transport sector especially in medium size cities.

At present, these IPT modes are very much neglected and their contribution to cater large number of short trips in especially medium size cities is not appreciated. There is urgent need to appreciate the merits of said eco-friendly modes in current scarce energy situation.

As they also provide job opportunities for weaker sections of the society in Gwalior as well as in other towns/cities, there is a need to assist them by providing basic infrastructure facilities such as parking/boarding stands, etc. along with soft loans to operators for purchase of vehicles.

In order to avoid traffic congestion and increase safety, the concerned authorities should identify certain roads (mainly feeder roads) for its operation especially in peak hours. At present, about 5-10 cycle-rickshaws in Gwalior were observed near each intersection in few pockets to pickup passengers. It had reduced intersection capacity drastically. To overcome the same, there is a need to plan and execute parking areas and passenger boarding/alighting stands for cycle-rickshaws/tongas about 100 metres away from intersections as well as at shoulder of roads with proper sign boards. Further, there is a need to put these modes operators under less severe enforcement by traffic police.

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