

ATAL SARIGE: AN EFFECTIVE MODEL FOR PUBLIC TRANSPORT FOR THE URBAN POOR IN BANGALORE ?

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A public transport system needs to address the travel demand of all sections of the society. Urban poor in most cities face problem in using public transport because it is either expensive or stops far from their residence or does not provide them point-to-point service. A new initiative of Bangalore Metropolitan Transport Corporation has been able to address all these issues in providing an exclusive service to the poor, called Atal Sarige.

1.0 INTRODUCTION

The NUTP (National Urban Transport Policy) announced by the Government of India in 2006, was formulated to promote sustainability of transport services in Indian cities. One of the visions of the NUTP is to recognize that people occupy centre stage in our cities and all plans would be for their common benefit and well-being[1]. With the urban poor constituting a major portion of the population, it is essential that their interests are included during the planning process. Walking and public transport are the two main modes of transport for the urban poor [CSTEP data]. With increasing traffic volumes and poor pedestrian facilities, walking is becoming increasingly risky. Allied with increasing travel distances, access to livelihood is a cause of concern to the urban poor. This makes the need for inclusive public transport planning more pressing. As per NUTP, the travel for the urban poor must be subsidized and the subsidy must be borne by other

sections of the society. To achieve this mandate, Bangalore Metropolitan Transport Corporation (BMTTC), the public transport operator in Bangalore operates an exclusive service for the poor called *Atal Sarige*.

Atal Sarige was introduced to provide fast, reliable and direct connections to the urban poor to their work destinations. The service operates uniquely designed buses. The seats in the bus are all along the sides and corners with a large aisle space where passengers (vegetable vendors, construction workers etc.) can store their belongings. The buses also have a unique colour. The service charges 50 per cent of the ordinary fares. For mobility of urban poor, although fare subsidy is important but other factors like access to transport, buses at regular intervals and at the required time etc are equally important. A World Bank report has defined 'adequate' public transport in terms of four components: affordability, accessibility, acceptability, and availability [2]. In this paper we analyze the adequacy of the *Atal Sarige* bus service.

2.0 SETTING THE CONTEXT

The population in Bangalore is growing at a rapid rate. Between 2001 and 2011 the population growth rate was 45.68 per cent [3]. The population of slum dwellers also seems to be growing at a rapid



Figure 1: Atalsarige bus interior

rate and the provisional figures of Census of India 2011 indicate that about 30-40 per cent of the population in Bangalore are slum dwellers, as compared to 23 per cent in 2001 [4]. According to a Government of Karnataka report on urban development in Karnataka, the monthly per capita expenditure of slum dwellers in Karnataka is much lower than in other comparable cities (10th in India) [5]. The reason for this is that while the employment opportunities in the informal sector have grown in urban regions, it has not been accompanied by growth in

the housing stock for this section of the society. Due to this reason, their access to health, sanitation, employment and education facilities is poor. Public transport can play a key role in increasing their accessibility to new layouts in distant areas with better civic facilities and social infrastructure.

According to a survey conducted by a Bangalore based think tank, CSTEP (Center for Science, Technology and Policy), 70 per cent of the slum dwellers travel for less than 30 minutes to work [6]. The two major modes of travel to work for the slum dwellers are walk and public transport (52 per cent and 33 per cent respectively) [6]. A 30 minute travel would approximately be equivalent of 8 km¹. An 8 km. travel by Public Transport (PT) in Bangalore² would cost Rs 11/-. According to the CTTS, the per capita trip rate for Bangalore is 0.924 [7]. The average household size in the slums is around 5 persons [6]. Using these numbers the average total travel cost per household³ works out to be between Rs. 1200-1500. According to a survey conducted by The Energy Research Institute (TERI), the average household income varied between Rs. 2000-4000 [8]. Another study (of slums around JC Road in Bangalore) found that 62 per cent of the households in those slums depended wholly or partially on incomes ranging from Rs 1386



Figure 2: Uniquely branded service

¹ According to the CTTS, the average speed of buses in Bangalore is 17.5 kmph.

² BMTC: 8 km is approximately 4 stages (2 km is one stage) and the fare (ordinary service) for 4 stages is Rs.11.

³ Travel expenditure/month/household = number of persons in household x travel cost/trip x trips/day*number of days. We have used Per capita trip rate as the indicator for trips/day and the number of days varies between 24 and 30 days (working days). The numbers here are a rough estimation.

to Rs 3374 [9]. Using either of these income ranges, it is clear that a large portion of the income will be spent on travel. According to Armstrong-Wright [10], for equity, not more than 10 per cent of the population should spend more than 15 per cent of their income on travel. If this is used as a standard for comparison, the existing situation in Bangalore is not equitable.

3.0 ATAL SARIGE: AN ADEQUATE PUBLIC TRANSPORT?

To assess the effectiveness of *Atal Sarige*, a methodology developed by the World Bank [2] was used by Embarq. The authors identified four steps in developing a comprehensive index for adequate transport:

- Defining adequate transport and its attributes
- Determining attributes that are most valued by low-income groups
- Selecting and describing indicators that represent each attribute
- Determining the weights for each indicator

In this study, authors used different components of adequacy to qualitatively analyze the service.

3.1 What is adequate transport?

According to the World Bank report on public transport and urban poverty[2], adequate transport is referred to transport which is affordable, accessible, available and acceptable.

- Affordability refers to whether a user can pay for the travel journey or not. Affordability is closely related to the fares on the

Table 1: Concerns of respondents in slums

Concerns	%
Bus stop is not nearby	49%
Ticket price	31%
Buses are not on time/need more buses/large waiting time	12%
Crowded buses	3%
Pick pocketing	2%
Service hours	1%
Difficulty boarding/alighting	1%

- service and can be determined by the percentage of income spent on transport.
- Accessibility refers to the ease with which people can use public transport. The indicators for accessibility include the distance to the bus stop, information about services at the bus stop, accessibility for the physically disadvantaged etc.
- Availability refers to the service offered; the service hours and route possibilities. The indicators for availability can include waiting time at bus stop, availability of night and weekend services, service hours etc.
- Acceptability refers to the quality of service. Some indicators include behavior of drivers, age and condition of bus fleet, security, comfort etc.

3.2 What do the poor value the most?

In 2010, the CSTEP conducted a survey to understand the relationship between mobility, shelter and livelihoods and explore the relationship between slums and the broader city around them in economic and

Table 2: Indicators for concerns of the poor

Category	Concern	Indicator
Affordability	Ticket price is too high	Ratio of total monthly expenditure on transport to total monthly household income
Accessibility	Bus stop is not nearby	Number of slums within a 400m walking radius from the bus network Walking distance to bus stop
	Difficulty boarding/alighting	Rating of service based on physical accessibility
Availability	Buses are not on time	Schedule adherence
	Need more buses	Frequency
	Long waiting time	Headway
	Service hours	Total service hours of the service per 24 hours
Acceptability	Crowded buses	Capacity of buses
	Pick pocketing/Harassment	Security

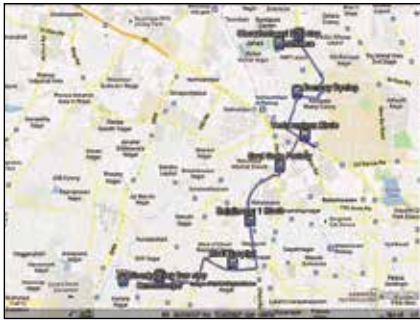


Figure 3: AS-8



Figure 4: AS-14

spatial terms. The survey covered 1080 households in a spread of 36 slums. A part of the survey had collected information about the travel behaviour of slum dwellers. The respondents were asked to give their concerns about public transport. Table 1 summarizes the main concerns of the respondents.

The walking time to a bus stop is clearly the most significant concern among the respondents. For the daily wage earners, getting to their work on time is crucial and being late could mean that someone else is hired and they lose their job for that

day. Having to walk 2 km to take a bus is obviously not desirable.

The second most reported concern is the ticket fare. As discussed in the introductory section, the fare consumes a large portion of the household income.

The waiting time at bus stops is the next most reported concern. Long waiting time can be caused by delay due to congestion etc. or due to insufficient number of buses on a route (scheduled waiting times are sometimes large). Improving the reliability as well of regularity of bus services can benefit the urban poor.



Figure 5: Map showing 400m buffer zones around AS-8 and the slums which fall within this zone

Finally respondents raised concerns regarding comfort, security, physical accessibility, etc. These concerns are not often revealed because of the importance assigned to other concerns which are bus stop location and fare.

3.3 Indicators for each attribute

Table 2 lists the indicators chosen in this study related to the concerns of the slum dwellers expressed in the survey analyzed. The indicators have also been arranged according to the four components of adequate transport, as defined in the World Bank Report on Public Transport and Urban Poverty[2].

4.0 EVALUATION

In order to get a better sense of the adequacy of *Atal Sarige*, we conducted a qualitative survey on board the *Atal Sarige* buses in April-May 2012. In addition to capturing the mobility patterns/issues of the travelers we also wanted to capture some socio-economic information. We selected two routes (AS-8 and AS-14) for conducting these surveys.

AS-8 runs from Choudeshwari bus station in Mattikere to Shankar Nag bus stand [Figure 3]. The bus passes through Basaveshwarnagar, which is a residential pocket, and also through Yeshwantapur market. Basaveshwarnagar has a large concentration of slums⁴ which are within 400 meters of the bus line [Figure 5]. In spite of many slums being close to this bus line, the bus does not seem to be a

⁴ Slum locations were mapped by the authors on Google Maps using information from Karnataka Slum Clearance Board (KSCB) and Bruhat Bangalore MahanagaraPalike (BBMP)



Figure 6: Map showing 400m zone around AS-14 and BBMP slums in this zone

large attractor for these people. The reason could be that the bus does not connect them to their work destinations.

AS-14 runs from Banashankari bus station to Thalगतपुरा [Figure-4]. From Jaraganahalli until Thalगतपुरा there are many factories and small scale industries. This service caters to workers who are employed in these industries. In addition maid servants, construction workers, street vendors also frequent this service. Thalगतपुरा bus stop is also a switching point for people residing in the villages near kagalipura as BMTC has very little coverage beyond Thalगतपुरा; most villagers ride on this bus for this reason.

Some of the findings from the qualitative survey are discussed in this section.

4.1 Affordability

The people interviewed in our qualitative survey can be broadly classified into three income groups based on monthly household income: those earning less than Rs. 10,000, Rs. 10,000-20,000 and greater than Rs. 20,000. Majority of the respondents were in the first two income bands. The average percentage of income spent on transport was around 14 per cent. For those earning below Rs. 10000, this increased to 20 per cent and rose further for an income of less than Rs. 4,000. There is clearly a divide between the spending of different income groups. People belonging to a higher income group seem to be able to afford passes⁵ and thus reduce their transport expenditure; whereas people in the lowest income group seem to travel

by buying tickets every day. Even with the cheaper tickets on the *Atal Sarige*, they seem to be spending a large portion of their income on conveyance.

4.2 Accessibility

Most of the people surveyed live within 10 minutes (500m) walk from a bus stop and almost all of them walk to the bus stop. According to the CSTEP data, around 49 per cent of the respondents mentioned that there is no bus stop near their home. This seems to contradict with the data we collected from the *Atal Sarige* buses. This can be explained either by self selection (people who access the service are a biased sample of the broader population) or from the network design of the BMTC. The BMTC operates mainly destination based services and every transfer would require the passenger to buy a new ticket. Combined with poor schedule integration, this could force people to walk to the bus from where they can get a direct route rather than get to the nearest bus stop. This seems to tie in with the reasons people mentioned for using the *Atal Sarige* bus to many of the passengers this was the only direct route between their origin and destination and a more important reason than the reduced fare.

When queried about the buses, people mentioned a couple of issues with accessibility including the steps being too high, the buses starting to move while passengers still on the steps to get in, etc. This is especially an issue for older passengers or those carrying baggage (such as students).

⁵ BMTC has multiple pass options: The day pass for ordinary services is Rs. 45 and for A/C services is Rs. 90. If the passenger owns a travel card (costs Rs. 25 for 5 years), the passenger can avail a Rs. 5 discount on these passes. The monthly pass for black board buses (city buses) is Rs. 550 and for suburban buses (and city buses) it is Rs. 725. The monthly pass for city/suburban A/c services Rs. 1450 and Rs 1500 for normal A/C services and Airport service. There are discounts for senior citizens and students.

4.3 Acceptability

Pick-pocketing seems to be the main issue raised by the male travelers whereas a couple of female travelers mentioned about harassment from drivers and conductors. In terms of capacity, it was not an issue as most

passengers could find a seat easily on the lines surveyed. This could be only in the case of *Atal Sarige* which was also mentioned by some of the passengers as the reason for choosing this service. When we travelled on this service we found that the load

did not exceed 60 persons. Safety was not mentioned as an issue by any passenger. In addition, people also mentioned that the buses do not stop at all bus stops, when it is full.

4.4 Availability

Most of the people surveyed were satisfied with the schedule adherence of the buses. They were a little critical of the service hours though. Low frequencies during the afternoon hours, no buses in the late evenings (after 8.00 PM) and on weekends were some of the concerns raised by commuters. One of the passengers mentioned that the bus does not run when the crew is on leave or during their weekly off. This was confirmed by the driver who mentioned that the bus runs only when he is on duty and no one else is assigned the service in his absence. There are only two buses on each of the routes, and hence very limited options for the passengers. However, it is still possible to achieve headway of 30 minutes with 2 buses, but this was not being achieved at present. For route 8, the headway varies between 35 minutes and 60 minutes whereas for route 14, it varies between 30 minutes and 55 minutes (Table 3 and Table 4). We can also see from the table that the two routes have service hours between 7 AM and 8 PM only.

Table 3: Schedule table, AS-8

Hours	Departure from CJP		Frequency (#/hour)	Headway (min)		Departure from SNB		Frequency (#/hour)	Headway (min)	
7-8	7:25		1					0		
8-9	8:10	8:40	2	45	30	8:00	8:45	2		45
9-10	9:25		1	45		9:20		1	35	
10-11	10:00		1	35		10:05		1	45	
11-12	11:10	11:50	2	50	40	11:10	11:50	2	65	40
12-13	12:30		1	40		12:30		1	40	
13-14	13:10	13:50	2	40	40	13:10	13:50	2	40	40
14-15	14:30		1	40		14:30		1	40	
15-16	15:10	15:50	2	40	40	15:10	15:50	2	40	40
16-17	16:55		1	65		16:55		1	65	
17-18	17:35		1	40		17:35		1	40	
18-19	18:15		1	40		18:15	18:55	2	40	40

Table 4: Schedule table, AS-14

Hours	Departure from BSK		Frequency (#/hour)	Headway (min)		Departure from TGP		Frequency (#/hour)	Headway (min)	
7-8	07:30		1					0		
8-9	08:00	08:30	2	30	30	08:00	08:30	2		30
9-10	09:00	09:30	2	30	30	09:00	09:30	2	30	30
10-11	10:00	10:55	2	30	55	10:25	10:55	2	55	30
11-12	11:25	11:55	2	30	30	11:25	11:55	2	30	30
12-13	12:25	12:55	2	30	30	12:25	12:55	2	30	30
13-14	13:25	13:55	2	30	30	13:25	13:55	2	30	30
14-15	14:25	14:55	2	30	30	14:25	14:55	2	30	30
15-16	15:25	15:55	2	30	30	15:25	15:55	2	30	30
16-17	16:25		1	30		16:50		1	55	
17-18	17:20	17:50	2	55	30	17:20	17:50	2	30	30
18-19	18:20	18:50	2	30	30	18:20	18:50	2	30	30
19-20						19:20		1	30	

5.0 DISCUSSION

Based on the surveys, secondary information and other information provided by the BMTC, we have summarized some of the issues facing the *Atal Sarige* in this section.

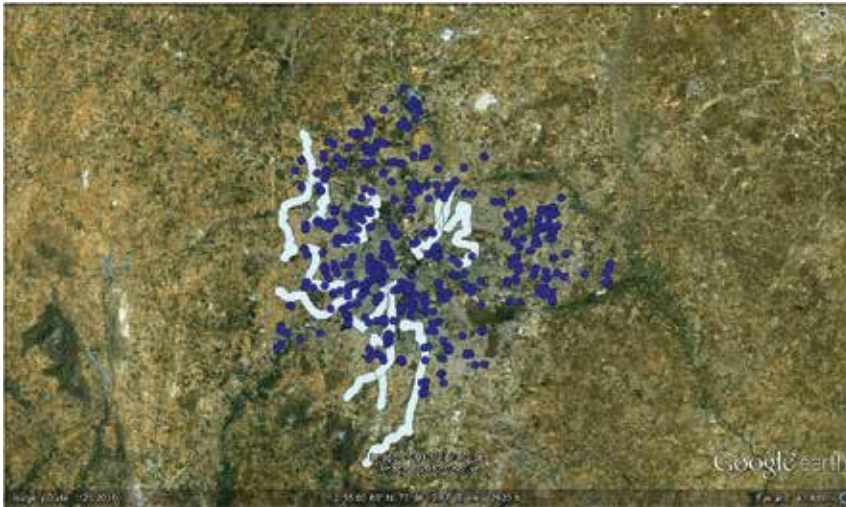


Figure 7: Map showing 400m buffer zones around the Atal Sarige routes and also the BBMP slum locations



Figure 8: Map showing the Atal Sarige routes and the ring roads in Bangalore (Inner, Outer, Peripheral)

5.1 Can all the urban poor access the Atal Sarige?

In order to answer this question, we digitized the BBMP slums in Bangalore Urban region. This list is not complete and does not include the BDA slums, railroad slums or other newer slums. Even with this

smaller list (500 slums) we see that not all of the slums are within 400 meters of the *Atal Sarige* network; in fact only 77 of the 500 are within this zone [Figure-7]. The different routes are also not interconnected [Figure-8]. A person who lives near one of the *Atal Sarige* routes can

only access destinations along that particular route. To go to a different part of the city, that person would need to use the regular service. The service also has some temporal issues, the buses usually operate between 7AM and 8 PM only (with some exceptions).

The key issue with the service is small number of routes and few buses in service. Increasing the coverage (acquiring and operating more buses) might be a difficult proposition for the operator without support from the state. One solution to address this issue can be to relax the retirement age of buses, which operate on this service. The operator can use older buses on this route and acquire buses for other profitable routes. The cost can also be brought down by engaging private operators to provide services on this route.

5.2 How do you determine the subsidy required for the service?

It is quite clear that the *Atal Sarige* would require some form of subsidy since it is not a profitable service. Subsidy can be provided in two ways – subsidy to the passenger in fares or subsidy to the operator to run these non-profitable routes. In the case of providing subsidies to the passengers, the issuing agency (Slum board etc.) can buy passes and distribute the same to the concessionees. The disadvantage of this method is the difficulty in administering these concessions and also the potential of abuse. Another method is to reduce the operating costs. These subsidies

to the operator could be in the form of grants to acquire buses, tax concessions, etc.

In order to determine the subsidy required for either of these methods, it is necessary to continuously monitor and report the cost and revenues on these routes separately. Currently, the balance sheet reports the costs and revenues for all the services operated by the BMTC. A more segmented information for individual services and information about the number of passengers on these *Atal Sarige* routes can be useful to determine the type of subsidy required.

5.3 What are the operational issues with the service?

There are some operational issues with the service, which can be immediately addressed. The scheduling of buses can be improved to reduce the schedule headway on these routes. As an example, the schedule headway for AS-14 varies between 30-55 minutes. This route currently has 2 buses running on it. The travel time on this route has been calculated as 25 minutes (by BMTC). Using these numbers it is possible to get two buses in each direction per hour. This makes the service regular and is easier for people to plan their trips.

The second operational issue is with respect to crew scheduling. As it has been discussed in a previous section, the crew on the *Atal Sarige* buses is fixed and on the day of exigency, no one else is assigned

these routes. This creates problems to regular users of this service (as was mentioned in our qualitative survey). Ensuring that the bus adheres to its schedule, without any cancellation, can improve the reliability of the service.

6.0 CONCLUSIONS

Atal Sarige was introduced as a service for the poor on the recommendation of the Transport Minister of Karnataka in 2009. While the service is a good start, there is scope for improvement. The operator must receive support from the state to retain efficiency in operation and benefit more number of urban poor in future. Making the operator bear the entire cost of operation is not a good solution, since it targets the disadvantaged section of the society. The service also has some small operational issues in terms of timetable and crew scheduling which can be fixed quite easily.

In conclusion, the service is a good start, but in its present state it is not enough to provide mobility to the urban poor.

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