Nomination Award Theme : Urban Transport (Mass Public Transport)

Nomination Entry Title : Indore BRTS

HUDCO BEST PRACTICES AWARDS - 2013-14

Submitted by: Urban Administration and Development Department, GoMP

11. SUMMARY

Purpose:

Indore, is the largest city in state of Madhya Pradesh, and is experiencing rapid growth. In the past decade (2001 – 2011), population in Indore increased at an annualised rate of 3.4%. During the same period, the vehicle ownership has more than doubled to 11.8 lakhs from 5.5 lakhs, an annual growth rate of 8%, more than double the rate of growth of population. This has happened because of migration of people from surrounding rural areas and also increased economic power of individuals. As a result, there has been increased traffic congestion, reduced speed of travel, increased traffic accidents and fatalities. Data from the traffic police shows that 223 fatal accidents occurred in the year 2011, an increase of 57.04% from the year 2001.

The Per Capita Trip Rate (PCTR), which is the average number of trips made by a person in one day, in Indore, is 1.12 trips/person/day. However, due to improvement in economic conditions, entry of women into work force, increase in school trips due to higher enrolment in schools, etc., PCTR is projected to grow to 1.23 by 2021.

Initiative

The combined effect of all the above will result in an exponential growth in traffic in the city. AB Road, being one of the most important arterial in the city that has extensive commercial development, is expected to be the prime affected. With a view to reduce congestion, and address the growing traffic issues, Atal Indore City Transport Services Ltd (AICTSL) was set up in 2006, with the objective of regulating and monitoring formal public transport services in Indore. Subsequently, employing a first-of-its-kind innovative public private partnership (PPP)

model, AICTSL started city bus services with negligible investment from the government. This model of city bus operations rapidly gained popularity across the country, and cam to be popularly known as the 'Indore model of bus operations'. Presently about 95 city buses cater to about 80,000 passengers per day, which is approximately 4% of the total trips.

Indore City Bus
Atal Indore City Transport Service Co. Ltd

Achievement:

A comprehensive BRT master plan was developed in the year 2007, with proposal for a 120 KM network, to be built over 3 phases, as illustrated in the map below.

As a pilot project for the BRT master plan, an 11.45 KM long corridor was chosen for implementation. The chosen corridor was along AB Road, one of the busiest arterials of Indore, from Rajiv Gandhi to Niranjanpur. Construction commenced in 2007, and after facing numerous challenges, was completed in March 2013.

The BRT project has enabled the development of the entire corridor of AB Road, benefitting all road users. It is by virtue of this project, that the city received funding from the central government for comprehensive development of the new cross section. The development of the corridor has also significantly improved the safety, with segregation of different modes, lighting of streets at night time, street furniture etc.

12. KEY DATES

AICTSL- 2006

BRT Master plan- 2007

Construction started - 2008

Dry Run -April 2013

Pilot Passanger Operations - May 2013

Paid service - 12th June- 2013

Situation Before Initiative

1. Central area suffered from inadequate circulation pattern
2. Inter-mixing of traffic
3. Misuse of road space and narrow width
4. Accidents
5. Lack of traffic regulation and enforcement
6. Parking problems
7. lack of engineering measures
8. inefficient and inadequate mass transport system

PRIORITIES

- To increase the accessibility in the city
- To increase the speed of transportation
- To reduce the cost of public transportation and make it accessible to people of all the economic classes.
- To reduce the traffic congestion
- To popularize public transport and reduce the dependability over private vehicles
- To improve the traffic management in the city
- To improve the environmental conditions by reducing pollution.

STRATEGY

Planning, development, operation and management of the transport system of Indore to meet the increasing travel demands of the city in an efficient, convenient, safe and economical manner is important to sustain the economic viability, productivity and competitiveness of Indore City.

A Comprehensive Traffic and Transportation Plan for Indore (CTTPI) have been prepared in 2004. The CTTPI has estimated the travel demand by 2025 to be 5.5 million person trips per day. In addition are the inter-city passenger trips on intra-city system, movement of goods modes and movement of through traffic. The plan has proposed development of an extensive road network system of radial and ring corridors, development and operation of Light Rail Transit System of 44.75 km, development and operation of bus system, development of passenger and goods terminals, a parking policy, traffic management particularly in the CBD and establishment of metropolitan transport authority.

Since the preparation of CTTPI, Indore City Transport Services Ltd (ICTSL) has been established, a Special Purpose Vehicle (SPV) to provide a dependable and good public transport service. ICTSL, in a short period of time, has introduced innovative schemes to improve the bus services in the city through promoting private sector participation in terms of investment on and operation of high quality buses under the overall planning and control of ICTSL. It is proposed to operate 500 buses by end of the Project.

To meet the large demand and improve the capacity and productivity of buses, ICTSL has proposed to plan, to develop and operate Bus Rapid Transit System (BRTS) in Indore.

In the context of rapid growth of the city, increasing mobility, high travel demand, increasing congestion, delays, accidents, need for conservation of energy, growing community consciousness towards environmental quality and to address a host of such other problems and objectives, public mass transport system of the city stands out as the most critical element. It needs to be rationally planned, efficiently operated and diligently managed to be effective and productive by itself and in turn enable the city to be productive and competitive.

PROCESS

On the basis of socioeconomic factors, travel demand pattern, road network characteristics and corridors are identified for developing the bus rapid transit system extending to a length of 89 Kms. with in the city. These corridors are:

Full Section Development of Roads with Barrier Segregated Bus Lanes for BRT

- o A.B. Road Corridor (Mangliya to Rau) -23.80 Kms
- o Eastern Ring Road Corridor -23.65 Kms
- o M.R.10 Corridor (Bypass to Ujjain Road) -8.71 Kms
- o River Side Road Corridor -14.50 Kms
- o Western Ring Road Corridor -15.90 Kms
- o RW-2 (Ujjain Road to Airport) -9.50 Kms

The cross section of proposed BRTS corridor has been done with design considerations for Bus lanes, Cycle/Cycle rickshaw paths, Pedestrian paths, Motorized vehicles, Segregated service lane, Parking of MV/service vehicles:

Proposed Road Section for 75 m exclusive bus lanes and bicycle tracks

Proposed Road Section for 60 m exclusive bus lanes and bicycle tracks

Implementation Agency

Atal Indore City Transport Services Ltd. (AICTSL) has been established as a Special Purpose Vehicle (SPV) to provide a dependable and good public transport service. AICTSL, in a short period of time, has introduced innovative schemes to improve the bus services in the city through promoting private sector participation in terms of investment and on operation of high quality buses under the overall planning and control of AICTSL.

The authorized capital of the company is Rs 25 lacs divided into 2.50 lacs equity shares of Rs. 10/- each. The initial paid up capital of Rs. 25 lacs is being held by the Indore Municipal Corporation and Indore Development Authority in equal proportion.

Phasing of the project

Project is phased in two phases, Phase 1 and Phase 1 A. In Phase 1, A.B. road corridor, eastern ring road corridor and River side corridors have been included, while phase 1 A consists of M.R. 10 corridor, Western Ring Road Corridor and M.G. Road Corridors and the feeder roads.

Implementation Mechanism

Atal Indore City Transport Services Ltd. (AICTSL) is the Nodal Implementation and Execution Agency for the Development of Bus Rapid Transit System in the City. The AICTSL will implement the project with Other Agencies such as Indore Development Authority, Indore Municipal Corporation and Madhya Pradesh Public Works Department.

The AICTSL will collaborate with the respective custodian agency of the Road Corridor for different Corridors. The construction and development of work will be carried out by AICTSL in co-ordination with the respective custodian agency of the respective Road Corridor and Operation and maintenance of the Bus Rapid Transit Service will be done by AICTSL itself.

Financial Mechanism

AICTSL Proposes to generate its 30% Share through Public Private Partnership by way of incorporating Private Bus Operators, Advertising Agencies, Vendors for Ticketing and GPS System.

A.B. Road before implementation of BRT

A.B. Road after implementation of BRT

Outreach Materials

For wider information dissemination, informative pamphlets and videos were created that could effectively communicate the need for the BRTS, how it will function and how it will benefit all users within the city. The pamphlet highlighted the significant improvement brought about by the BRTS project along the AB Road corridor, and also demonstrated the other physical improvements, such as the pedestrian and cycle paths, that were benefiting all users of the road. In addition, a comprehensive video was produced, which apprised the public of all the details of the project. The video, which included an animated rendering of the iBus in action, was aired on regional bus services, local cable channels and during focus groups sessions.

Dry Run phase

On 19th !pril 2013, 'Dry Run' phase of the Indore BRT was initiated, without carrying any passengers.

During this phase, all aspects related to infrastructure, manpower requirement, operations etc. were verified, issues identified,

and subsequently resolved. While this phase provided valuable insights to the planners and engineers assosciated with the project on numerous challenges for making the system operational, it also played a great role in reassuring the general public on the much anticipated commencement of the system.

Invited Group phase

Post the dry run period, when most of the infrastructure related issues were satisfactorily resolved, groups of people from various professional and social sections of the society were invited to experience the iBus first hand. These groups were given guided tours of the corridor aboard an iBus, and shown the awareness video of the system, post which queries were answered by the AICTSL team. Each group was also accompanied by at least one iBus team member in order to answer any queries and record feedback while on the bus. Groups were handed out feedback forms to raise any queries, suggestions etc. which have later been analysed to identify common concerns and suggestions for improvements.

The invited group tours were conducted from 7th to 9th May 2013, during which period, about 21 groups, covering more than 800 people from various groups of the society, such as resident groups, college students, trade communities, social communities, slum residents, public representatives etc. were reached out to. By and large, the invitees went back with a much greater understanding of what the project is,

what it aims to achieve, and what its benefits are. A majority of the invitees expressed satisfaction with the system and felt that the project *'will give a new dimension to the development of Indore'*.

Most of the common queries and apprehensions raised by the common public, such as reasons for median bus lanes, intersection management, pedestrian crossing facilities, bus fleet etc. were due to the lack of information and awareness. However, nearly 80% of the respondents of the invited group tours responded that their understanding of the project had improved positively post the tour, while 74% agreed that the project would help reduce traffic congestion on AB Road.

Trial Run phase

Following the dry run phase, once all significant operational issues had been resolved, on 10th May 2013, the BRT commenced passenger operations, at first without charging a fare. Subsequently the system moved to a paid service a month later, from 12th June 2013.

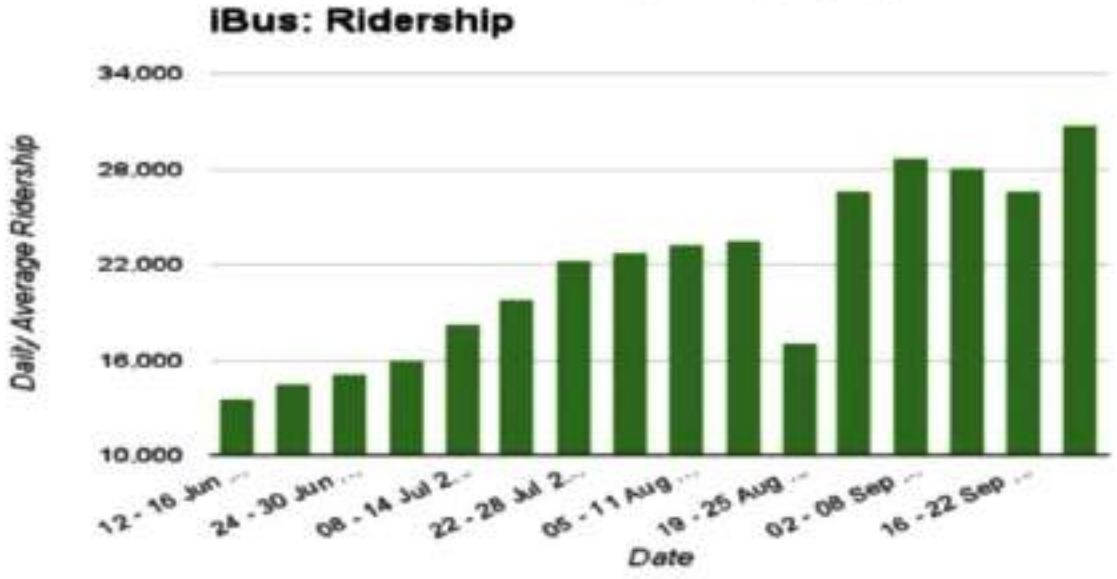
Use of Social Media

To enable continued public engagement and information dissemination, social media was also widely used, which proved a significant success, especially with the younger citizens of Indore. This also facilitated a more open forum between the press and municipal agencies, which not only resulted in more positive stories, but most

importantly, facilitated public acceptance of the project. While the city has also learned lessons from construction and development delays, it should be appreciated that even the best-executed plans may encounter public resistance. Thus, it is important to make focused efforts to inform and engage the public.

RESULTS ACHIEVED

Presently, 16 buses are operating on the corridor, from 07:00 AM to 10:30 PM daily. Approximately 30,700 passengers travel by the iBus on an average daily. The system has already exceeded ridership estimates, achieving 86% of the 1st year target ridership (of 35,000 passengers a day) in just 3 months. The system is already providing an average of 26% travel time saved, resulting in approximately 2,250 man hours saved every day, which will continue to increase as the system expands and the BRT services streamline further by reducing junction delays, boarding/alighting times etc. The



relatively high frequency of the service, the average wait times for passengers has dropped below 4 minutes from up to 20 minutes for the city-buses in Indore. The system, when fully operational , is expected to increase the public transport mode share of the city by 50%, and help save about 6 lives every year from road accidents.

The ridership of the iBus has risen dramatically from 2,164 on day-1 to over 24,000 on the 100th day. On an average, the ridership has grown by about 6-8% weekly. The chart illustrates the growth of ridership on the system.

With the success of the pilot corridor, the city administration is now looking to expand the BRT corridor to other busy corridors of the city. To this effect, the Municipal Corporation has already sanctioned works for a new BRT corridor, known as the 'Riverside Corridor', which will be integrated with a comprehensive riverfront development scheme. In addition, AICTSL is presently in the process of preparing detailed project reports for corridor extensions, with the view of receiving a government approval by March 2014.

Enforcement

When the project was nearing its operational stage, one of the biggest concerns of the city administration was ensuring traffic discipline and keeping the corridor clear of unauthorised encroachments. The present success story of iBus, can be to a great extent also attributed to the relentless efforts of the city administration to enforce both.

For ensuring traffic discipline, a team of traffic wardens have been deployed at all intersections and pedestrian crossing locations. These wardens have been given special training by AICTSL and Traffic Police Indore, and play a very important role in ensuring that no other traffic enters the bus lanes, and in facilitating safe

crossing of roads for pedestrians.

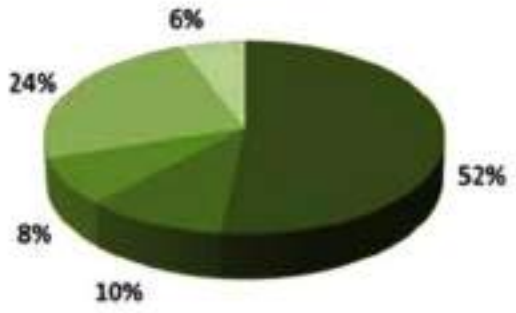
Another persistent practical issue faced by the administration along the AB Rad corridor has been the unauthorised encroachments. However, the city administration has taken active interest in dealing with this issue, and routinely inspects and removes any encroachments that are found, in order to ensure continuity in the corridor.

Continued Passenger Feedback

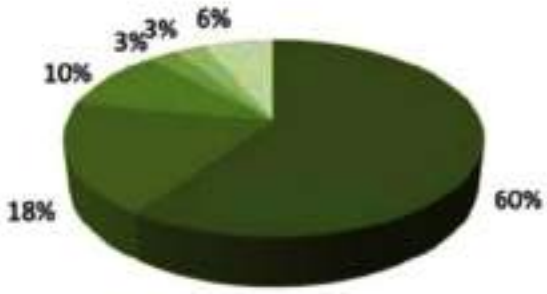
With the view of providing the highest levels of passenger satisfaction, AICTSL has undertaken user feedback surveys on the iBus, wherein approximately 1,600 passengers have provided their feedback, including suggestions for improvement. Some of the highlights of the analyses of these surveys are below:

- **78%** passengers travel more than thrice a week
- Out of these **39%** own a private car or 2-wheeler, but still choose to use iBus
- 5% commuters have shifted from personal vehicles to the iBus
- Commuters appreciated the disciplined service of the bus, the segregation of bus lanes, and above all the unmatched level of comfort for the commuters, especially owing to the fully air conditioned fleet of buses
- Female passengers have greatly appreciated the safety and security of the system
- Commuters also appreciated the reservation of seats for ladies, senior citizens and handicapped passengers, as well as the discipline and enforcement of the same
- In response to suggestions for improvement, nearly 90% of the commuters have suggested expansion of the BRT to other routes in the city
- 52% passengers expressed complete satisfaction with the system, with no suggestions for improvement specified.
- 10% suggested addition of more buses

Key themes from passenger suggestions



Frequency of use



Features of a BRT

The Indore BRT system has all the key features of a full BRT system, such as segregated corridor, large buses, stations with prepayment and level boarding, a distinct image and centralized control. All of these features together enable the BRT to provide a highly efficient service, capable of carrying large volumes of passengers, effecting significant journey time savings.

As discussed earlier, the BRT enables better and more efficient movement for all users of the road, by providing segregated space for movement of vehicles of different speeds. The image below illustrates how this is achieved.

Segregated Corridor

The 11.45 km corridor has segregated bus lanes throughout its length. Owing to site constraints, 2 right-of-way (ROW) sections have been developed on the corridor – 31.6m and 60m. Both the sections have segregated bus lanes, mixed traffic lanes, pedestrian footpaths and cycle tracks.

The segregation of the corridor enables segregation of traffic according to speed – cyclists, pedestrians, buses and other vehicles which operate at different speeds and lead to slower overall corridor speeds, are now segregated to move in dedicated lanes, thereby minimizing mix of traffic based on speed, thereby improving travel conditions for all users of the corridor.

Median Stations

The original design of the Indore BRT was to have staggered stations in the median lanes. However, with the success of the Ahmedabad BRT model of having median bus stations in 2010, the city administration in Indore decided to engage CEPT University, Ahmedabad for designing median stations for Indore BRT. In order to provide spacious and safe waiting areas for passengers, stations were carefully designed, giving due considerations to every functional and operational requirement of the system, expected passenger loads, and aesthetic values.

Median stations provide a practical advantage, firstly in terms of cost of construction as building a single station is cheaper than building 2 staggered stations. Moreover, ITS equipment and manpower requirements for a single station are far lower for a median station, thus also helping to keep operations costs low.

Level Boarding

One of the key features of BRT, level boarding, has been ensured across all the stations of Indore BRT. While some level mismatch issues

between the road and the platform levels were identified during the trial run period, these were subsequently rectified before the commencement of the passenger trial phase. Ensuring the level boarding across all stations has on one hand facilitated barrier free movement for the elderly, mobility impaired, ladies with pushcarts etc., it has significantly reduced the boarding-alighting time required by passengers, thereby enabling the buses to dwell at stations for shorter periods of time, thus increasing the overall speed of the system.

Station Screen Doors

The height of the station boarding platform is 900mm above the finished road level. Therefore, in order to ensure passenger safety while waiting at the stations, automatic screen doors have been provided at all 4 boarding points at stations. These doors are based on wireless radio frequency identification (RFID) technology, wherein the buses and stations are fitted with compatible RFID tags and detectors, which allow

the doors to open only when a designated bus arrives and docks at a particular door.

State-of-the-art Fleet

Following its tradition of innovation in public transport, Indore is the first city to introduce a fully air conditioned fleet of buses on a BRT corridor. 50 high quality custom designed buses are under procurement from Corona bus manufacturers. These buses feature advanced monocoque structures that ensure passenger safety at all times, also a first in urban public transport in India. Besides this, the buses are

equipped with high quality seats, separate space for wheelchair, on-board audio-visual passenger announcement system, GPS tracking unit and surveillance cameras.

Intelligent Transport Systems (ITS)

On the Indore BRT, ticketing is at present carried out using electronic ticketing machines (ETM's).

However, with assistance from MoUD's Sustainable Urban Transport Project, and World Bank's GEF scheme, iBus will be shortly introducing an integrated transit management system (ITMS), which will include advanced GPS tracking, automatic fare collection system, and a dedicated optical fibre based data network. The project is under tendering at present, and is expected to be completed by mid-2014.

Advanced Traffic Signalling System

Indore BRT has also employed a first-of-its-kind pan-corridor wireless traffic signal system developed by the Centre for Development of Advanced Computing (CDAC), known as WiTrac. These signals are solar powered, and communicate with each other wirelessly, thereby minimizing the requirement for any underground conduits and tedious cabling work. This system also proved to be very quick in installation as each traffic signal pole could be taken up independently, irrespective of any cable work. The system, besides being a blessing for the project in terms of execution, is enabled with camera based virtual traffic detection technology, which is able to give priority to the BRT buses at intersections, thus enabling higher average speeds across the system, at a much lower cost as compared to traditional RFID based transit priority systems.

SUSTAINABILITY

Social Inclusion

The Indore BRT is designed to be socially inclusive at multiple levels.

Throughout the inception and development of Indore BRT project, one of the main ideologies followed by the administration was to make the system 'for the common man' and not just for the elite. This ideology is further cemented by the administration's decision to price the BRT fares at level lower than ordinary city buses in Indore, even while the level of service offered by the BRT is far greater than the city buses. Moreover, the entire front half of the BRT buses, including standing space, is reserved for use by ladies only.

Next steps

While the Indore BRT is charting a significant success story within a mere few months of its commencement, there are a number of further steps that need to be taken in order to ensure a high level of service, as well as the scalability and sustainability of the project. Some of the next steps that are already identified are as follows:

- Introduction of smart card based fare collection system, applicable across all city bus services as well as BRT
- Extension of BRT services (open corridor) to IPS Academy, Panchvati, Tejaji Nagar and Bapat Chouraha
- Expansion of fleet to run 40 buses in the present corridor
- Introduction of automatic fare collection system (AFCS), including fare gates and smart media
- Upgrading the existing GPS tracking and monitoring facility to make it more efficient and accurate
- Installation of passenger information system (PIS) displays at stations to provide real time bus arrival information to passengers
- Establishing a traffic management control centre (TMCC) to monitor and manage the system, along with all the ITMS infrastructure

LESSONS LEARNED

Public and Media negativity

During the initial stages of construction of the project, there was a lack of awareness among the public concerning the project details. During a public workshop held in June 2012, reactions among attendees ranged from strong opposition to enthusiastic support. However, it was clear that more educational outreach would be necessary to better inform the public. Moreover, numerous delays in the construction process, without much public engagement were setting the tone for negative press stories, tainting public opinion, before operations even began. It was apparent that involving the press in outreach efforts would be a key factor in winning the support of the public. The team also determined that a better understanding among potential users would boost ridership, justifying the need for higher service frequency and route expansion.

The iBus team, with support from EMBARQ India, developed a structured, multi-layered plan to reach out to the public and media, in order to restore the faith of the public in the project.

In order to keep the public informed and disseminate information easily, the city administration actively began engaging with the public and media, ensuring that all updates and details of the project were made available publicly.

Branding

Before launching, it was first necessary to brand the new product, with the idea of giving the BRT a name and recognizable image that the people of Indore could associate with. In August of 2012, an open competition was held to name the BRT. From over 800 entries received, 'iBus' was chosen, where the "i" stands for "Indore", "intelligent" and is also synonymous with the sense of ownership for the people. This was followed by an exercise to physically brand the iBus fleet and infrastructure. Along with the BRT system, AICTSL also underwent a branding overhaul, in line with the image of a modern and efficient agency capable of operating a state-of-the-art transit system.

AiCTSL

ibus

TRANSFERABILITY

iBus as a Tipping Point for other BRT systems in India

As the BRTS system extends its network, it will continue to improve traffic conditions in the city and enhance the overall quality of life for the residents of Indore. It demonstrates that affordable, high quality public transport is possible and is a necessity for rapidly growing cities, and is proving to be a model for other cities. As a result of the initial success of Indore BRT the city of Bhopal (capital of Madhya Pradesh, and second largest city in the state) has already fast tracked the implementation their BRT, which will serve more than 30,000 people per day.

Award Recognition
International

Sustainable Urban Transport Award 2013-14

विश्व की चार श्रेष्ठ लोक परिवहन सेवा में बीआरटीएस

भारत से सिर्फ इंदौर का नाम, वाशिंगटन डीसी में दिया जाएगा पुरस्कार

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