

<b>Sector</b>	Urban Development
<b>Sub - sector</b>	Urban Development
<b>Profile No.</b>	UD-02
<b>Project Title</b>	Bus Rapid Transit System - Ahmedabad

## Project Rationale

Ahmedabad is a Mega city having present population of 5 million, which is likely to be 11 million by the year 2035. This would lead to agglomeration of surrounding settlements like Gandhinagar and other smaller villages, which ultimately increases the area of the city, which may become 1,000 sq. kms in the year 2035. Moreover, about 1/3<sup>rd</sup> of total as well as student population reside within walking distance from the proposed BRTS network. Thus, there is a growing need for greater accessibility to basic amenities and opportunities for mobility in the city.

In such a state of rapid urbanization, it is very essential to have an efficient and rapid transit system, which will sustain and accelerate the growth of the city.

In order to cater this future demand, the city and State Government has initiated a Plan for Integrated Public Transit System, in which Bus Rapid Transit System (BRTS) is one of the components. This will facilitate the major mobility need of the people.

The proposed system will have special buses, which will be convenient for people to board and alight, preferably with low floor and air conditioning facility.

These buses will also be accessible to physically challenged.

BRTS is a system consisting of several components which will generate a better and efficient mode of transportation, which will be an environment and user friendly system and ensure secure and fast moving services to the users.

## Project Components

BRTS is designed to make Ahmedabad an accessible city in terms of physical as well as economical aspects. Keeping these factors and future travel demand in mind, an arterial road network of about 155 kilometers in length has been identified for developing the Bus Rapid Transit System within Ahmedabad. Two exclusive circular BRTS routes have been designed, clockwise and anti-clockwise, covering outer and inner rings. The estimated demand and fleet size for 2006 has been presented below:

Year	Service population	Trips	Target trips	Fleet requirements
2007	51	55	20	1215
2011	55	61	30	1565
2015	60	69	40	2336

The project is conceptualized in 5 phases. In the first phase, 58 kms of roadway is being constructed. Development of other corridors has been scheduled in 4 phases. A phasing plan has been worked out, as presented below:

Road section	%age Expenditure			
	2006	2007	2008	2009
Shivranjani cross road – RTO		25	75	
RTO - Sabarmati			50	50
Sabarmati – Sardar nagar			25	75
Sardar nagar – Narol circle		75	25	
Narol circle – Chandola Lake		25	50	25
Chandola lake – Shivranjani cross road		25	50	25
Dani Limda to Maninagar		25	50	25
Shahalam Tollnaka to Kalupur via S.T.		25	50	25
Kalupur to Soni ni Chaal		25	50	25
Sub total – Roadway development				
IT & ITS applications			50	50
Depot cum terminal			50	50
Sub total – operational infrastructure				
Rail overbridge			50	50
River bridge on Sabarmati (North 6 lane)			50	50
River bridge on Sabarmati (south 4 lane)	50	50		
Split flyover – AEC junction		50	50	
Split flyover – Memnagar junction		50	50	
Split flyover – Shivranjani junction		50	50	
Split flyover – Soni ni Chaal junction		50	50	
Split flyover – Thakkarbapa nagar junction		50	50	
Shreyas rail overbridge	60	40		
Sub total – bridges/flyovers				
Demand surveys and system designing including periodic demand assessment surveys (5 years) etc.	25	25	25	25
<b>Grand Total (phase – I)</b>	<b>3.7</b>	<b>39.3</b>	<b>41.0</b>	<b>16.0</b>

Other major components of BRTS:

- Bus Stations - About 82 bus stations, 3 terminals and 23 interchange stations has been proposed along the identified corridor
- Bridges and Flyovers - Rail over bridges, 2 river bridges and 5 flyovers has been proposed at various locations in the project corridor
- Vehicles - Introduction of special buses with low floor and AC
- Services - Users will be facilitated by wide range of transit services under BRTS and AMTS
- ITS applications - Automatic vehicle location information, use of smart cards, signal priority, surveillance and security systems etc.
- Introduction of Bicycle and pedestrian facilities.

The proposed services are grouped into three categories:

1. BRT exclusive buses
2. BRT mixed services
3. AMTS services.

The proposed mix would include AC (1/3<sup>rd</sup>) / Non-AC buses, express and ordinary buses as well as ladies special, school special services, etc.

- Procurement of buses will be from private operators, as per the specifications decided by the authorities and operating services under supervision and regulation of the SPV (special purpose vehicle to be constituted by AMC).
- The SPV will include AMC, AUDA, State as well as Central Governments and subject experts and institutions with expertise in the field.
- Selection of private operators is envisaged to be through competitive bidding for carrying out bus operations. A kilometer scheme is presently in operation, which is being contemplated for the proposed system.
- Ticketing, maintenance of systems will be carried out through outsourcing to private agencies selected on a competitive basis.
- For periodic demand assessment, services planning and service quality monitoring, professional services will be obtained from CEPT / Gujarat Urban Institute and other such institutions.

## **Expected Economic benefits**

The project envisions improvements from partially developed divided / undivided carriageways open for mixed traffic to a fully designed street with:

- Physically segregated road space for buses, bicycles, pedestrians and for mixed traffic
- Adequate lighting and other roadway operational infrastructure
- Road user amenities such as toilets, kiosks, telephone, etc.

- Space for parking to be operated as paid parking facility.

The other major advantages of BRTS would be in the form of operating cost of vehicles and savings in travel time. Apart from these advantages, the following city wide impact is also expected:

- BRT is a rapid, safe, reliable, flexible, quality service. Thus, there would be increased patronage to public transport.
- The city will become more accessible and well connected.
- The public transit operations would be efficient with increased vehicle utilization in terms of speed increment, rapid boarding and alighting and reduced turnaround time. The man power cost and operating costs are expected to decrease owing to improved manpower efficiency, fuel efficiency, etc.
- Accident rate is expected to reduce by 75-90%, owing to the factors like:
  1. Traffic segregation
  2. Exclusive pedestrian and bicycle facilities
  3. Better illumination
  4. Effective traffic regulation
  5. Overall training and public education
- Improvement of air quality, attributed mainly to shift from personalized and polluting three wheelers to buses.

The social benefits are significant and hence the project is justified.

## Project Cost

The cost of BRTS is estimated at INR 9,500 million (US \$ 211.10 million), based on 2005 workings. The estimates are based on detailed engineering design carried out for the first 10 kms stretch of BRTS corridor between Narol to Thakkarbapanagar.

The detailed cost break up for phase-I (circular corridor covering a length of 58 km) is given in the table below:

Road section	Length (km)/No.	ROW (m)	Unit rate (INR)	Total cost before escalation (INR million)	Total cost with escalation @ 6% (INR million)
Shivranjani Cross Road - RTO	8	40	614,613,39	491.7	535.6
RTO-Sabarmati	3	60	691,956,98	186.8	211.1
Sabarmati – Sardarnagar	3	24	427,222,65	141.0	161.3
Sardarnagar – Narol circle	24	60	691,956,98	1660.7	1765.5

Narol circle – Chandola lake	2	30	427,222,65	85.4	94.3
Chandola lake – Shivranjani cross road	8	35	491,690,71	368.8	406.8
Dani Limda to Maninagar	4	30	427,222,65	164.5	181.4
Shahalam Tollnaka to Kalupur via S.T	3	30	427,222,65	115.4	127.2
Kalupur to Soni ni Chaal	4	30	427,222,65	179.4	197.9
<b>Sub-Total Roadway</b>				<b>3393.7</b>	<b>3661.1</b>
IT and ITS applications	Lump sum	n/a		100.0	113.0
Depot cum terminal	3	n/a	300,000,00	90.0	101.7
<b>Sub-Total Operational Infrastructure</b>				<b>190.0</b>	<b>214.7</b>
	<b>Length (m)</b>	<b>Width (m)</b>	<b>INR/sq.m</b>		
Rail over bridge	800	23.5	12,000	225.6	254.9
River bridge on Sabarmati (North 6 lane)	820	28.7	17,500	412.4	466.1
River bridge on Sabarmati (south 4 lane)	829	20.1	17,500	291.5	298.8
Split flyover – AEC Junction	558	16.8	20,000	187.4	201.7
Split flyover – Memnagar Junction	387	16.8	20,000	130.1	140.1
Split flyover – Shivranjani Junction	558	16.8	20,000	187.4	201.7
Split flyover – Soni ni Chaal Junction	659	16.8	18,000	199.3	214.5
Split flyover – Thakkarbapa Nagar Junction	898	16.8	18,000	271.6	292.3
Shreyas Rail overbridge	800	16.5	10,000	132.0	134.6
<b>Sub Total – Bridges/Flyovers</b>				<b>2037.3</b>	<b>2204.7</b>
<b>TOTAL</b>				<b>5621.0</b>	<b>6080.5</b>

## **Present Status of the Project**

Tenders for stretch of road between Narol to Naroda (13.4 km) have been floated. The work includes Site clearance and Dismantling, Earthwork, Sub Base course, Bituminous course, Drainage and Protective works, Paving, Kerbing, Stones, Traffic signs, Marking and other Appurtenances, Existing Road Maintenance, Street Furniture, Electrical and Miscellaneous.

Similar tender has also been released for RTO Circle to Pirana (12 kms.), the estimated cost of which works out to be approx. INR 610 million.

## **Agencies to be contacted**

Ahmedabad Municipal Corporation

Gujarat Infrastructure Development Board (GIDB)

Industrial Extension Bureau

Mott MacDonald India