

# Public-Private Partnership for Road Infrastructure Development

**Documented by:**

Urban Management Centre (UMC) as a part of Mega Cities...Poised For Change - Leading Practices Catalogue - 2007

**Contact:**

Urban Management Centre,  
3rd Floor, AUDA Building,  
Usmanpura, Ashram Road,  
Ahmedabad - 380014

Telefax: 079-27546403/ 5303/1599

Email: [info@umcasia.org](mailto:info@umcasia.org)

Until recently, city road development was considered to be in public domain with the government bearing the prime responsibility for development and maintenance of roads. Implementation of road projects and their maintenance suffered as it became solely dependent on the availability of funds from the government budget. Thus, it was important to explore alternative means of financing infrastructure projects. The Sardar Patel Ring Road in Ahmedabad demonstrates how public-private partnership (PPP) models can be used effectively for city infrastructure development. Ahmedabad Urban Development Authority (AUDA) has been working with the private sector to realize this prestigious project. AUDA has managed to implement a major part of this large scale project in a brief time period. The case study highlights the key features of the project, which are reflected in its financing model, land development mechanism, project management and aspects of PPP.

Public-Private Partnership for Road Infrastructure Development

## Situation Before The Initiative

The peripheral areas of Ahmedabad have been expanding after 1980s. Population growth in these areas has been more rapid than the areas within the city limits. This is partly due to the saturation of population within the city area and the consequent large-scale housing development in the peripheral areas. However, in absence of proper infrastructure and road network, the outer city areas were becoming prone to haphazard development. Ahmedabad has become a mega city and development in outer areas is expected to accelerate further. The Revised Development Plan (2011) proposes an additional 64 sq. km of urbanizable land over the next ten years. As per the plan, the population is expected to reach 46 lakhs and 60 lakhs in the former Ahmedabad Municipal Corporation (AMC) and AUDA areas respectively within a period of 10 years. It was therefore important to ensure planned growth with good road network and infrastructure in the developing areas of the city.

Further, there is the worsening problem of traffic congestion within the city due to mixing of the regional and city traffic. This is most prominent on the eastern (Naroda- Narol Highway) and the western (Gandhinagar Sarkhej Highway) bypasses, which have become part of the city as it has grown rapidly in the past few years. To ease the traffic congestion on the inner radial roads, the '132 feet ring road' was constructed but over time, traffic volume on the same has increased beyond predictions. In this situation, it was important to divert the regional traffic out of the city.

The western part of Ahmedabad has developed mainly as a residential area and the eastern part has industrial estates. Because of this, there is heavy traffic flow from west to east in the mornings and vice-versa in the evening. This causes serious traffic congestion and frequent traffic jams on the city roads during peak hours, besides air pollution. Traffic volumes on major roads have been studied and it has been observed that traffic volumes exceed the carrying capacities at many places. According to projections, an additional population projected for the Ahmedabad urban complex area for the year 2011, will generate substantial additional traffic volumes. There was thus a felt need to plan road network so as to accommodate the future growth in traffic.

## Implementation Strategies

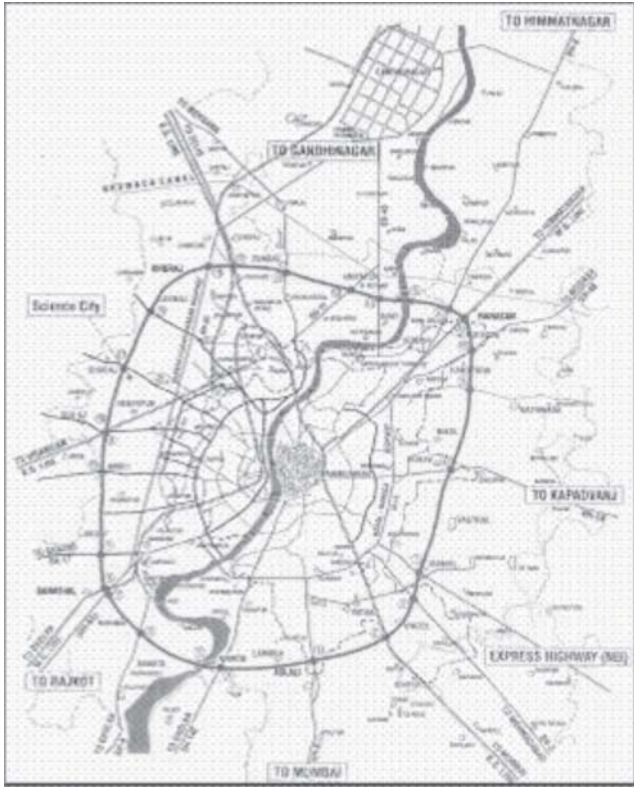
### Conceptualizing the Ring Road

The Sardar Patel (SP) Ring Road was conceptualized in the Revised Development Plan of 2011 of AUDA. However, AUDA took up the task of implementing the Road even before the Development Plan was sanctioned.

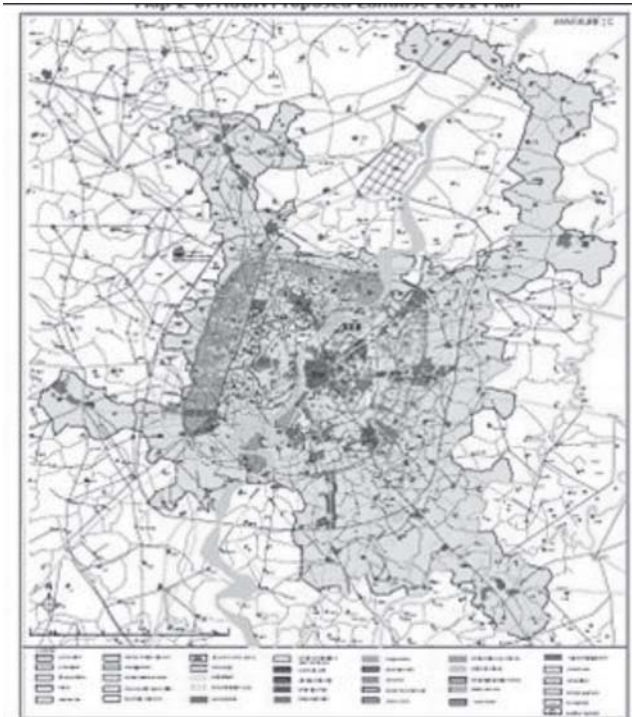
This road was planned with a long-term vision considering the road network and growth structure of Ahmedabad. The road network in Ahmedabad consists of rings and radials. A 76.3 km road was planned around the developing areas of Ahmedabad to strengthen the existing road network within the city. It encircles the newly extended areas of AMC. An additional 645 sq.km urbanizable land proposed under the Revised Development Plan has been contained within the ring road. The Revised Development Plan proposes an additional 64 sq. km of urbanizable land over the next ten years. This urbanizable area has been contained within the ring road (This area is now part of the Ahmedabad Municipal Corporation). The road provides good infrastructure support to the growing areas. The alignment was designed to contain the proposed development and expansion of Ahmedabad over a larger area.

The SP Ring Road is an arterial road, facilitating traffic movement within the city by providing easy access in and from the city outskirts. It also facilitates the movement of through traffic going north and south to the city, thereby reducing the congestion on western and eastern bypass. In summary, the 60m wide ring road was conceptualized to:

- reduce traffic congestion on peripheral roads
- segregate regional and urban traffic
- increase connectivity
- guide the development and expansion of Ahmedabad in a larger region



Plan of Sardar Patel ring road



AUDA Proposed Land use Plan 2011

Source: Revised Draft Development Plan of AUDA 2011 Part I, Vol 2

## Description of the project

Conceived as the outer most 'ring' encircling Ahmedabad urban agglomeration, the ring road encompasses an area of about 400 sq km which includes most of the developed and developing areas and covers a population of 40 lakhs. The entire length of this road is 76.313 km. Radiating from the city, there are 19 major roads of various categories either connecting or crossing this road. The entire road is divided into four links to facilitate investigation and preliminary design.

### Box1: Four Links of the Ring Road

**Link 1:** Rajkot Highway Junction (NH-8A) to Vadodara Highway Junction (NH-8) of 14.106 km

**Link 2:** Vadodara Highway Junction (NH-8) to Himatnagar Highway junction (NH-8) of 25.518 km

**Link 3:** Gandhinagar Highway Junction (NH-8C) to Rajkot Highway Junction (NH-8A) of 22.862 km

**Link 4:** Himatnagar Highway junction (NH-8) to Gandhinagar Highway Junction (NH-8C) of

## Project components and phasing

The SP ring road has been planned as a four lane divided road with envisaged facilities like exclusive bus lane for Bus Rapid Transit System (BRTS), service road, footpath, utilities and plantations on either sides. With continuous plantation along the road, it is visualized to develop a “green fort” around Ahmedabad. The overall project has been systematically divided into three phases. The key features of the three phases are as described below:

Phase 1 includes two laning of the entire stretch and four-laning of major stretches. It also included earthwork for four lane configuration. The total cost for this phase was Rs. 230 crores, which was met from AUDA's internal funds and through loans from financial institutions. The two-lane ring road started in 2001. Many portions of the road have been operational since 2003 and the entire ring road was completed in 2006.

In Phase 2, the existing two lanes are being extended to four lanes. This is being done on Build, Operate and Transfer (BOT) basis. The total cost of

construction of four-lane road is estimated at Rs.378 crores. The BOT document was floated in February, 2006. The work of four-laning on BOT basis has been awarded to a joint venture.

Phase 3 will include extension of the ring road with facilities like control access, flyover and underpasses at major junctions crossing national highway, state highway, major district roads and important roads. It is proposed that 17 flyovers, 5 underpasses and 2 railway over-bridges will be built. There will be service roads, bicycle tracks, and exclusive bus lanes for Bus based Rapid Transit System (BRTS) and walkways on both sides. It has been proposed to develop 60 mt right of way (ROW) on western side and 78 mt ROW on the eastern side. The total cost is estimated at Rs. 460 crores.

**Box2: The salient features of the ring road**

Total length - 76.313 km

Right of Way .- 60 m

Road way configuration - It is a four-lane divided roadway with two 7.5 m carriageway, 5m central median and 2.5 m shoulders for each direction

Junctions - Ring road crosses the national highway at five locations. It crosses the Ahmedabad- Vadodra Expressway at one point and meets the State Highway and other major road at thirteen locations

Bridges on river Sabarmati - The ring road crosses Sabarmati River twice. One crossing is near Bhat village in north and the second is near Kamod in south of Ahmedabad city

Railway crossings - There are five railway crossings. There are two railway over bridges, railway underpass and two level crossings

Villages en route - The ring road passes through a total of 23 villages

stipulated time for the entire 76.313 km road length within vicinity of Ahmedabad city area. AUDA used a combination of Town Planning Scheme and land acquisition method for ensuring speedy implementation.

AUDA declared most part of the ring road as a Town Planning (TP) Scheme area. The TP schemes were formulated in such a manner that the ring road could traverse through the proposed scheme. The land owners and tenants who possessed their valuable land along the road stretch were assured final plots in rectangular shape at the end or nearby the ROW of the ring road. This unique idea inspired land owners and tenants to hand over their land for development of the ring road. The land for 60mt ROW was taken from them “by consent” without giving any financial reward. Areas which have been designated as agricultural zone in the master plan and where TP schemes cannot be declared, were acquired by the conventional land acquisition method as per procedure of the Revenue Department. Out of the total 76.3 km, only 13.1km had to be acquired.

### Public consultations

Taking possession of land for the required ROW was a challenging task for AUDA. Extensive public consultations were organized by AUDA in all villages falling en-route this ring road. In the meetings, AUDA explained to the land owners and villagers the importance of the project and showed them the financial gain by appreciation of land value on development of ring road. These personal interactions were instrumental in convincing the stakeholders to hand over their land and helped AUDA implement the project faster.

### Project Financing

#### Phase 1

Rs 230 crores were required for constructing the two-lane road in Phase 1. As a local body, AUDA initially had limited fund for this project. It approached various financial institutions for loans. After a rigorous follow-up with various financial institutions, AUDA succeeded in getting loan of Rs 100 crores from consortium of six nationalized banks. The balance amount of Rs 130 crores was spent by AUDA from its general fund. In order to repay the loan as per promised schedule to the financial institutions, AUDA started toll collection, which currently stands at Rs 1 crore per month.

### Strategies adopted

The success of this large scale city road project initiated by AUDA is based on its partnership developed with the private sector and citizens during various stages of planning, design, implementation and maintenance. These partnerships have been crucial in realizing this project in a planned manner and have been successfully built in its land development and project financing mechanism.

#### Land development through innovative use of town planning scheme mechanism

It was a challenge for AUDA to acquire land in the



## Phase 2

### *BOT Model*

Implementation of Phase II for providing additional two lanes is in progress using the Build-Operate-Transfer (BOT) model. BOT will bring forth an integrated partnership between AUDA and the private party, enabling AUDA to transfer responsibility of design, procurement, construction, operation and maintenance of the road and its facilities to the private party. Under the BOT contract, the private party will get a concession period of 20 years.

Under the BOT contract, the private party will be responsible for designing, engineering, financing, procuring and constructing the road during the construction period, which is 18 months. And during the operation period, it will be responsible for managing operation and maintenance of the project road till the end of the concession period. The private company will generate revenue from toll tax and advertisement rights. The private party will take charge of toll collection from date of commencement of the concession period. The toll rates will be same as the prevailing toll rates upto the construction period and as per the toll rates defined in the NHAI Act, 1997 during the operation period. The BOT structure is explained in the following figure.

Under the BOT agreement, the concessionaire will provide a performance security of Rs 700 lakhs for the construction period and Rs 350 lakhs for the operation period in the form of a bank guarantee for due and punctual performance of obligations as mentioned in the agreement.

The main features of this BOT structure is that AUDA will receive Rs. 230 crores from the concessionaire in 18 equated, monthly installments. This payment is for the existing facility of the two lanes which are being handed over to the BOT operator for the entire concession period. As viability gap funding, AUDA will have to pay Rs 36 crores as grant to the concessionaire in two years period.

The concessionaire will be given toll collection and advertisement rights. The revenue from this is estimated at Rs12 crores per year in 2006 to Rs 220 crores per year in 2026. Total revenue over the period of 20 years is estimated at Rs 2,350 crores.

The viability of the BOT package has been established after analyzing the capital cost, traffic forecast, user fee structure and operation and maintenance expenses. The financial evaluation was carried out taking into consideration financial assumptions as shown in Table 1.

### **Box 3: What is Public-Private Partnership?**

Public Private Partnership refers to contractual agreements formed between a public agency and private sector entity that allows for greater private participation in the delivery of transportation projects.

Traditionally, private sector participation has been limited to separate planning, design or construction contracts on a fee for service basis- based on public agency's specifications.

Expanding the private sector role allows the public agencies to tap private sector technical, management and financial resources in new ways to achieve certain public agency objectives such as greater cost and schedule certainty, supplementing in-house staff, innovative technology applications, specialized expertise or access to private capital.

*Source: <http://www.fhwa.dot.gov/PPP/defined.htm>*

### **Box 4: Incentives for private sector participation in the road sector in India**

Government bears expenses for land acquisition and pre-construction activities;

Foreign direct investment up to 100 per cent;

Capital subsidy up to 40 per cent to meet the viability of a project;

Government equity up to 30 per cent;

100 per cent tax exemption in any consecutive 10 years;

Duty-free import of road construction equipment;

Bond exempted from capital gains tax;

Tax benefits for property development activities;

Transparent and well defined procurement procedure;

Equitable dispute resolution mechanism.



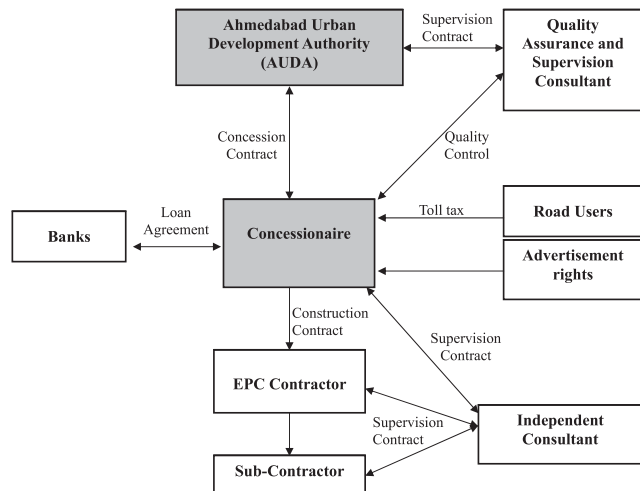
Assumptions related to traffic	
Total number of days considered for collection of toll per year	<b>365</b>
Toll rates are revised once in every year	
Rate of inflation in traffic per year	<b>5%</b>
Rate of inflation in user fee rates per year	<b>6%</b>
Assumptions related to finance	
Construction period	<b>18 months</b>
Concession period including construction period	<b>20 years</b>
Estimated total project cost on COD	<b>INR 459 Crores</b>
Debt - equity ratio	<b>20% : 80%</b>
Equity capital	<b>INR. 91.80 Crores</b>
Debt funding	<b>INR 367.20 Crores</b>
Loan repayment period	<b>14 years</b>
Interest rate during construction	<b>11%</b>
Project IRR before financing and tax	<b>14.91</b>
Annual debt service coverage ration to senior lender	<b>1.67</b>

**Table 1:** Assumptions made for Financial Analysis of Sardar Patel Ring Road

The Government of India has taken a number of administrative, legal and fiscal measures to promote public-private partnerships in the road sector. The model concession agreement has been made investor-friendly through more equitable allocation of risks and provision of incentives in the form of grants and other measures. The main incentives for private sector participation are shown in box 4.



BOT structure for the SP Ring Road



### Private sector participation

AUDA has been closely working with the private sector from the initial stages of the project. Technical input was sought from private consultants in project planning, technical and financial feasibility studies, surveys and detailed design. They were also involved in construction, supervision and construction quality control. There were separate packages for construction of major bridges, road over bridges and road under bridges. The road was also divided in small packages with length varying from 3km to 10 km. All these were executed simultaneously facilitating faster completion of the entire stretch. Major portions of the ring road were completed in a time period of three years.

Private sector is coming forward to participate in activities like junction development and maintenance, plantation, toll tax collection and signage development along the ring road. Intersections are being developed and maintained by private companies and trusts. The Forest Department and various trusts have taken charge of plantation along the ring road.

### Advantages of private sector participation

The unique and participatory approach has made project implementation easy and rapid. Cost of land has been reduced, public consent has been ensured which has reduced opposition while implementation. Private sector expertise at various stages has made the project implementation efficient. A system of incentives for timely completion of tasks and penalties for delays was introduced to ensure timely completion of phase 1 of the ring road. Working with the private sector has also helped AUDA to build its managerial, administrative and technical capacities.

### Other PPP Initiatives of AUDA

- 1 Junction board and signage development
- 2 Pay and use toilet facilities
- 3 Housing for the poor
- 4 Mechanized parking
- 5 Intersection development
- 6 Garden maintenance
- 7 Crematorium by social organization
- 8 Sports complex and cattle pounds (Panjrapol ) maintenance

## Results And Impact

### Strategic importance of the ring road

SP Ring Road is of strategic importance to the city as it integrates land use planning with road network and other infrastructure facilities. It is essential for improving the functional efficiency and steady growth of urban and metropolitan areas of Ahmedabad city. It is planned to be part of an efficient Bus based Rapid Transit System (BRTS) for Ahmedabad. It acts as an effective mechanism for reducing economic and environmental costs of the congested traffic in the city. It also acts as a catalyst to the economic development of AUDA and surrounding villages. An important advantage of the ring road is that it helps to divert the regional traffic, which earlier passed through the city. This new road connects the NH 8, 8A, 8C, state highways and other important roads connecting Ahmedabad.

## Sustainability

The PPP model and its financial configurations as discussed above reflects the sustainability of the project. It is a win-win situation for all stakeholders AUDA, the BOT concessionaire, the city traffic, the transporters and above all the original land owners who consented to give away their lands.

## Lessons learnt

A participatory approach results in creation of urban infrastructure in a rapid and efficient manner.

Public-Private Partnership in infrastructure projects facilitates access to private investment, innovative finance and specialized expertise. The public sector and ULBs can use this effectively to develop city infrastructure as well as to augment their scarce resources.

Professional approach to planning and implementation is crucial for such infrastructure projects. Efficient project management facilitates timely implementation of large scale projects. Such projects should be conceptualized in totality and implemented by scaling up through stages.

Land development through TP Scheme mechanism leads to equitable, democratic and fair mechanism as compared to Land Acquisition model to create urban infrastructure

Strong political and administrative leadership is required to undertake large scale infrastructure projects

## Replicability

The PPP model with variations for development of road infrastructure is being used for several other infrastructure projects by urban local bodies in India such as, redevelopment of markets, and for design, construction, operation and maintenance of composting plants for municipal solid waste and landfills.

