

Analysis of construction in terms of Sustainability in Sagar city ring road project

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Abstract - The concept of ring roads in big cities is trending rapidly. Ring roads are used to decongest the city from heavy traffics that is of no importance or have no business in the interior areas of the city. Here a study of Ring road is conducted for Sagar city. This ring road will be very useful after its full completion. A deep analysis has been done before proposing the concept of ring road in Sagar city. Provision of quality infrastructure services at reasonable cost, is a necessary condition for achieving sustained economic growth. In fact, one of the major challenges being faced by the Indian economy is enhancing infrastructure investment, improving the delivery system and quality of service. Government recognizes the critical importance of the infrastructure sector and accords high priority to development of various infrastructure services such as power, telecommunications, seaports, airports, railways, roads etc. Investments in these sectors involve high risk, low return, huge investment, high incremental capital output ratio, long payback periods and superior technology. Completion of this ring road will solve the traffic problem of the city and will improve the traffic handling capacity.

Key Words: Sustainability, ring road, PPP

1. INTRODUCTION

Sagar (Saugor), is a city in the state of Madhya Pradesh in central India. Situated on a spur of the Vindhya Range at 1,758 feet (536 m) above sea-level. The city is around 180 kilometers (110 mi) northeast of state capital, Bhopal.

The main purpose of a ring road is to distribute the traffic in and out of a city such that there is a free flow of traffic inside without any congestion. The heavy traffic that is coming from outside the city and which has no business inside the city has to be diverted in such a way that it does not disturb the free flow of traffic inside a city. It should promote hassle free access to the important points in the town besides diverting the heavy transport.

There have been in past years heavy traffic congestion in the town centres due to heavy transport causing traffic jams in the town roads. There was a very urgent need of a ring road to avoid the problems of logistics as well as to prevent the traffic jams during peak hours inside the town's arterial roads such as the Vijay talkies to motinagar road which sees frequent traffic jams due to heavy transport such as school buses and logistic trucks. It is well expected that by the completion of the ring road the travelling time will be considerably reduced and the important points in the town will be easily accessible.

1.1. CONCEPTUALIZING THE RING ROAD

Since the NH-26 from Lalitpur(U.P.) towards Lakhnadon and NH 86E from Bhopal to Sagar is completed by NHAH the traffic on these roads have increased a lot from then and is forced to pass through the city causing hindrance to public as well as authorities.

After vast studies and research of the area, data collection, detailed survey of the proposed road and preliminary surveys of alternate routes a final alignment was selected that was to include three national highways i.e. North-South corridor, NH-44(old NH-26), NH-146(old NH-86) and NH-934(old NH-26A) out of which two national highways i.e. NH-934 and NH-146 are passing through mid-town whereas NH-26 is bypassing the town.

2. METHODOLOGY

The main concern of this thesis is to employ PPP in road construction in India. In this regard it is proposed here to construct a Ring Road in Sagar city. The traffic of Sagar city has been observed and it is concluded that two ring roads in this city can be constructed for a better traffic system. And hence two ring roads (Inner ring road and Outer ring road) are proposed.

First of all study the traffic of whole city carefully. Determine the number of traffic signals in the city as it is well known that traffic signal affects the travel time inside the city everywhere. With the help of ring roads number of traffic signals can be minimized. After a brief survey on traffic of a city design map for the proposed ring roads so that maximum STOPS can be covered and smooth driving is possible. During designing of ring road important squares and important services should be kept in mind. Construction of road is done on the basis of engineering of road construction. As there are so many PPP model in existence but each one is not suited everywhere thus the selection of PPP model must be such that it should be best suited for the locality and it can be done by studying the significance of various PPP models. For Sagar city use of model Build-Own-Operate-Transfer is best suited because maintenance of roads is also a prime need after it is constructed. Here the technique which is introduced is a combination of good, planned and sustainable construction. The proposed methodology is explained with the help an algorithm shown below.

2.1. Steps adopted

The completion and success of this project always depended upon the Public-Private Partnerships that the government would adopt in near future for the execution of different parts of the project, the schemes and mechanism by which the government arranged for funds for this 24km stretch of ring road project was to be accurately adopted. The policies or modes of 'PPP' for construction of ROW.

Algorithm for construction of Ring Road

- 1) Alignment of proposed ring road
- 2) Study the traffic of city.
- 3) Design ring road.
- 4) Look for connectivity with the existing inner ring roads.
- 5) Determine the road components and construction quality.
- 6) Apply PPP model which is best suited for particular locality (i.e. Sagar city)

The best PPP model for road construction in the city is Build-Own-Operate-Transfer, as under this PPP model the private sector designs and builds an asset, operates it, and then transfers it to the government when the operating contract ends.

2.2. Alignment of Proposed Ring Road

Alignment options-

Sagar Bypass

Based on reconnaissance survey four options of bypass are selected for study:

1) Alignment-1

It is proposed from km191/10 of NH 26 to km 174/4 of NH 146 and it will cross NH-26A (sagar-bina road) at km17 near Naryawali town near sagar. The length of this road will be 23.5 km(approx).

2) Alignment-2

It is proposed from km 188 of NH-44 crosses NH-26A(sagar-bina road) at km 20 following the Narauli-Dhorra(Kanera Nikhar) bypass road and passing through Kishanpura bypass road ending near km 164 at NH-146.Its length will be 27 km (approx)

3) Alignment-3

It will be starting near km189 of NH-44 crossing NH-26A (sagar-bina road) near km17 passing village Jerai and ends near km166 at NH-146.Approximate length will be 25.5km.

4) Alignment-4

The proposed Alignment starts near km187 of NH-44 crossing the rail-crossing near Ishurwara village and passing through Kishanpura bypass road ending near km164 at NH-146.Length of this road was 29 km.

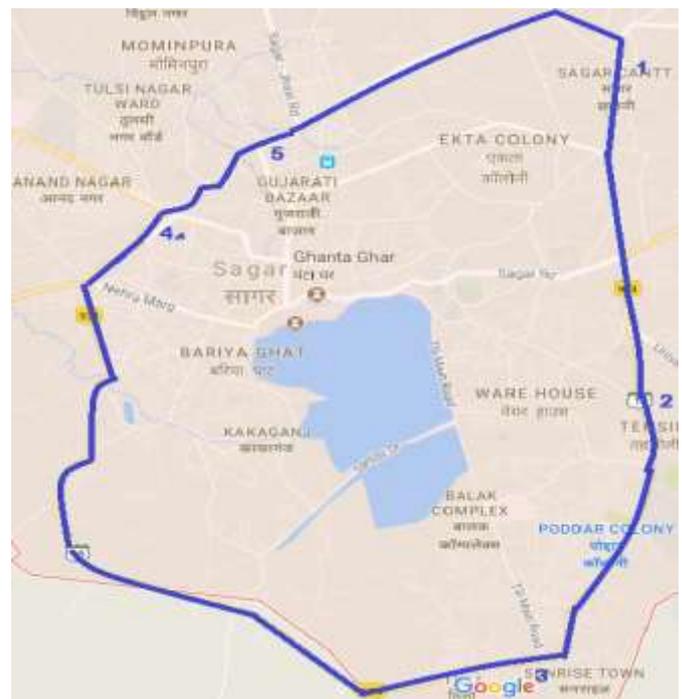


Fig -1: Inner Ring Road

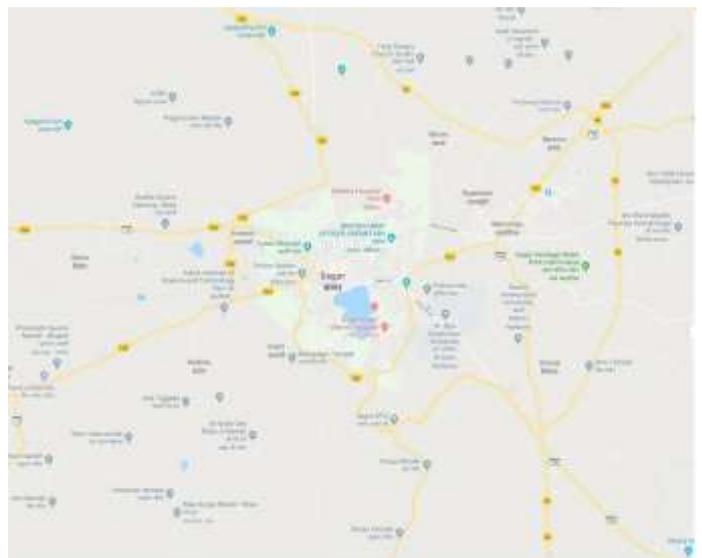


Fig -2: Outer Ring Road

2.3. Project Components and Phasing

The sagar ring road has been mainly divided in four parts:

- 1) A major part starting from NH146 (Bhopal road) crossing NH934 (sagar-bina road) to NH26 (Jhansi-lakhnadon road) near Ranipura. This road was built under NHAI (NATIONAL HIGHWAY AUTHORITY OF INDIA).
- 2) From Ranipura on NH 26(jhansi-lakhnadon road) the road bypasses to NH934 (Bhopal-Chatarpur) under NHAI four lane department. The road was built under BOT (built operate transfer) scheme of PPP by Sangyong Engineering and construction co. ltd.
- 3) From NH 934 near Baheria to Bamhori tikadda on NH 26 near Sironja. It was also constructed as a four lane road by Sangyong constructions.
- 4) This part of the road is under progress which is to be constructed from Motinagar
- 5) chauraha that will connect NH44 near Sironja.

3. CONCLUSION

After going through the concept of ring road in Sagar city some fruitful results has been obtained, on the basis of those results it can be concluded that the infrastructural design and planning of smart cities can't neglect a common and easy path like ring road within a city to improve the traffic quality of any particular city. Here due to the completion of a major part of the ring road its benefits can already be felt since the traffic jams in the arterial roads have been considerably reduced in major part of the town and also the important centres of the city are easily accessible without any hassle. It is also expected that a few problems that still exist due to congestion will also be eradicated when the stretch of road from Motinagar on NH86 to Sironja on NH26 will be completed. It will also aid in the economic development of the city as it is in the process of transformation into a smart city.

4. REFERENCES

- [1] LiYaning Tang, Qiping Shen, Eddie W.L. Cheng, "A review of studies on Public-Private Partnership projects in the construction industry", international journal of project management 28 (2010) 683-694.
- [2] Prof.Leni Stephen, Anjana Anna sunny, Aravind S, Dipesh P Nath, Marva T A, Sarath Raj,
- [3] "Planning & design of ring road", International Research Journal of Engineering and Technology. e-ISSN:2395-0056, p-ISSN:2395-0072.
- [4] Mahesh M Barad, Dr. k Ravi, "Public private Partnership in highway construction in India", international journal on recent and innovation trends in computing and communication, vol. 4, issue 4, ISSN 2321-8169.
- [5] Liyin Shen, Vivian W.Y. Tam, Lin Gan, Kunhui Ye and Zongnan Zhao, "Improving Sustainability Performance for Public-Private-Partnership (PPP) Projects", MDPI March 2016.
- [6] LiYaning Tang¹, Qiping Shen, Eddie W. L. Cheng, "A Review of Studies on Public Private Partnership Projects in the Construction Industry", International Journal of Project Management 2010, 28, 683-694.
- [7] Yongjian Ke, ShouQing Wang, Albert P. C. Chan, and Esther Cheung, "Research Trend of Public-Private Partnership in Construction Journals", Journal of construction engineering and management © asce / october 2009.
- [8] Yelin Xu, Yi Peng, Queena K. Qian and Albert P. C. Chan, "An Alternative Model to Determine the Financing Structure of PPP-Based Young Graduate Apartments in China: A Case Study of Hangzhou", Sustainability 2015, 7, 5720-5734; doi: 10.3390/su7055720, ISSN 2071*1050.
- [9] Ms. Ruchi Sharma, "PPP IN ROAD SECTOR: A STUDY ABOUT INDIA", International conference on technologies for sustainability, Non 2015.
- [10] Deepak Gatare¹, Abdul Attar², "Risk in Highway Project Based on Operation and Maintenance: Case Study of Mumbai-Pune Expressway", International Journal of Innovative Research in Science, Engineering and Technology, May 2017.
- [11] Hui Gao Yacheng Xiang Shiqing Xi, "Private Capital Rate of Return on Investment in PPP Projects Based on the Perspective of Government Regulation, Proceedings of the 20th International Symposium on Advancement of Construction Management and Real Estate", springer, May 2016.
- [12] Darrin Grimsey Mervyn K.Lewis, "Evaluating the risks of public private partnerships for infrastructure projects", International Journal of Project Management Volume 20, Issue 2, February 2002, Pages 107-118.