CRISIL Risk and Infrastructure Solutions Limited

Bangalore Development Authority (BDA)

Development of Peripheral Ring Road

Pre-feasibility report

April 2012

Abbreviations

Acronym	Definition
BBMP	Bruhat Bangalore Mahanagar Palike
BDA	Bangalore Development Authority
BMA	Bangalore Metropolitan Area
BOOT	Build, Operate, Own, Transfer
BOT	Build, Operation, Transfer
CAGR	Compounded Annual Growth Rate
CDP	City Development Plan
CITB	City Improvement Trust Board
CRIS	CRISIL Risk and Infrastructure Solutions Limited
CRISIL	Credit Rating and Information Services India Limited
CRRI	Central Road Research Institute
DPR	Detailed Project Report
IRR	Internal Rate of Return
KTCP	Karnataka Town and Country Planning Act
NHAI	National Highways Authority of India
NPV	Net Present Value
ORR	Outer Ring Road
PCU	Passenger Car Unit
PPP	Public Private Partnership
PRR	Peripheral Ring Road
SPC	Special Purpose Company
SPV	Special Purpose Vehicle

Acronym	Definition
VGF	Viability Gap Funding

Contents

List of Tables

List of Figures

1. Executive Summary

The growth of Bangalore has been unprecedented in the past couple of decades. This fact is laid bare from the growth in population in the last century. Bangalore continues to attract throngs of people due to the economic opportunities it offers. This is also supported by a salubrious weather which makes Bangalore an obvious choice for not only businesses but also for people.

Bangalore has grown at average compounded annual growth rate (CAGR) of 3.58% in the last three decades. It is projected that Bangalore's population will cross the 10 million mark by 2021. This explosive growth has meant that the infrastructure in Bangalore has been put under tremendous pressure.

BDA being the planning authority prepared the Comprehensive Development Plan (CDP) for Bangalore Metropolitan Area (BMA), first time in 1983-84 and revised once during 1995. The ORR & IRR's implemented by BDA were part of the CDP, indicating the tentative alignment.

The BDA observes that the outer ring road (ORR) acts as a bypass for more than 10000 trucks which are headed towards various other destinations. However, with the immense growth in intra-city traffic, the ORR is under tremendous pressure already. The city has already extended beyond the ORR which is a key factor in the increasing pressure on ORR.

In order to relieve the traffic pressure on the ORR and the major road networks of the city, a *peripheral ring road* (PRR) of 116 kms is planned outside of the ORR. This stretch will not only improve connectivity of areas beyond the ORR, but will also ease the congestion on the ORR. The current report has been prepared focused upon the first phase of the project from Hosur Road to Tumkur Road. The total stretch is approximately 67 kms.

The current report examines the viability of the project on an annuity basis. The annuity model has been chosen for the following reasons:

- The PRR will be classified as an urban road and will have high demand for free use due to increasing urbanization along its stretches. Urban roads are typically not tolled in the country and no such examples exist. Event the ORR of Hyderabad is being proposed under the Annuity model
- The BDA, under the current policy framework does not have the authority to levy tolls on the road it may develop. The Karnataka State Road Policy talks about levy of tolls on State Highways but is currently in a draft form and cannot be invoked for this project.

The financial assessment of the project has been developed for a concession period of 20 and 25 years. The results of the financial viability indicate that the project will be attractive for a private developer on in the case of a 25 year concession period which will allow the developer to make reasonable returns on the investments in the project.

The execution of the project can be undertaken through a Special Purpose Company which will be formed by equity participation from the developer.

The way ahead for the project has been analyzed and it is recommended that the key task for the BDA is to commission the preparation of a Detailed Project Report (DPR) for the project which would allow development of realistic cost estimates. Once the DPR has been prepared, the BDA may appoint a transaction advisor who will conduct a detailed feasibility for the project and facilitate selection of the private developer.

The procurement plan for the proposed project envisages that the entire process of selection of technical consultant and transaction advisor can be completed within 8 months while the selection of developer can be achieved within 9 to 10 months after the selection of the transaction advisor.

2. Introduction

CRISIL Infrastructure Advisory, a division of CRISIL Risk and Infrastructure Solutions Limited (CRIS), has been appointed by the Infrastructure Development Department, Government of Karnataka to work closely with the Bangalore Development Authority for the assignment “Institutional Strengthening and Sector Specific Inventory for PPP Mainstreaming in Sectors”. Under this BDA has identified a set of nine projects for which pre-feasibility assessments are to be carried out.

Development of peripheral ring road (PRR) around Bangalore is one of the nine projects that CRIS has been entrusted to study. The current pre-feasibility report has been developed based on data provided by BDA.

2.1 Project idea

Bangalore city in the process has earned sobriquet “Asia's fastest growing City”. While the entire infrastructure systems are under enormous pressure in Bangalore, transportation infrastructure is one of the worst hit. The city has a ring radial road pattern. All highways and district roads are radially converging into core area. More than 2 lakh vehicles enter the city from major highways (NH4, NH7, NH209, SH17) and another 1 lakh from other radial roads (Varthur road, Magadi road, Bannerghatta road, Tannery road).

The road system in Bangalore has developed only by 11% in the past six years, which is a relatively small growth when compared with the spatial growth of the city. Even though Bangalore has three ring roads, 5 major radial roads and 5 secondary radial roads, the road facilities have not been able to keep pace with the immensely fast paced growth of the city. The BDA estimates that the traffic on national highways around Bangalore grows by an average 10% to 12%, while on the state highways the growth is pegged higher from 12% to 15%.

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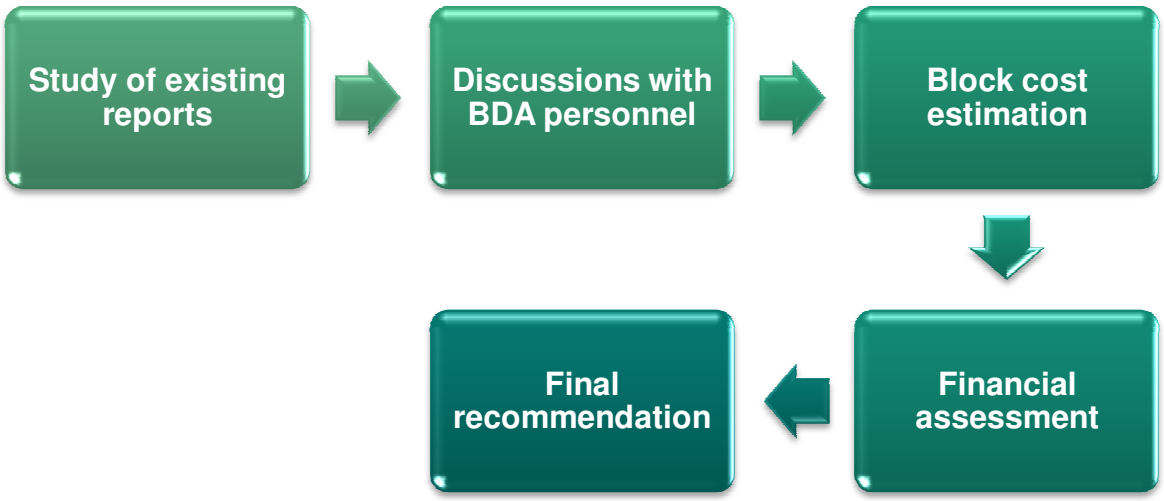
In order to relieve the traffic pressure on the ORR and the major road networks of the city, a peripheral ring road (PRR) of 116 kms is planned outside of the ORR. This stretch will not only improve connectivity of areas beyond the ORR, but will also ease the congestion on the ORR.

2.2 Approach and methodology

The broad approach and methodology followed for study of these projects has been depicted graphically below:



2.3 Review of previous studies

The BDA had commissioned STUP Consultants for preparing a report on feasibility and preliminary design for the development of the PRR. STUP Consultants have submitted the Draft Feasibility Report to BDA. We have reviewed the draft feasibility report and have the following observations:

- The traffic analysis carried out as part of the draft feasibility report are only for traffic volumes along the proposed alignment and do not provide dual side traffic analysis or demand elasticity of the users which are typically the key inputs in case of a BOT/BOOT toll based development model. The traffic analysis carried out is geared more towards a BOT/BOOT Annuity model.
- The cost estimates provided in the draft feasibility report amount to a total project cost of Rs. 2165 crores which is higher than the estimated cost indicated by BDA which is Rs. 1750 crores.
- Based on the cost estimates provided in the report, the per km cost works out to be roughly Rs. 33 .4 crores. In our view this is on the higher side since typically cost per km of road in the Indian context is somewhere around Rs. 10 crores per km.

Based on the analysis of the report and the costs indicated by BDA, we have developed the financial assessment based on the Annuity model.

We have chosen to develop the pre-feasibility on the Annuity model in view of the fact that the PRR will largely act as a city road and not a highway per se. The fact that urban development has reached beyond the ORR and along the periphery of the PRR necessitates that access is provided for the residents around the PRR alignments free of cost.

For the purpose of drawing a parallel, we studied the outer ring road (ORR) being developed by Hyderabad city. The ORR is also based on BOT Annuity model. Hence, we are of the view that the PRR should also be based on the BOT/BOOT Annuity model.

3. Sector Profile

The city of Bangalore has witnessed very rapid growth. The city today is home to over 8.4 million people (2011 Census). The salubrious weather and the rapid concentration of economic activities in Bangalore have fuelled the growth of Bangalore. As one of the world's fastest growing cities, Bangalore is experiencing a steady growth in population.

Bangalore has been substantially affected by globalization and rapid urbanization over the last decade. The demand for services and quality of life is not confined to the central core or the erstwhile Bangalore Mahanagra Palike jurisdiction but spreads beyond into the peri-urban areas, the Metropolitan Area and outwards, into Bangalore Metropolitan Region. With the emergence of the Bangalore-Mysore Infrastructure Corridor, the Bangalore International Airport and the planned ring roads, urbanization has sprawled out.

Banaglore has incontestable advantages to develop into an international metropolis but at the same time faces significant constraints. The city is embedded in its histors and depicts the greatness of a truly Indian city established before the invasions and colonization. It has a diverse set of activities, from silk to aeronautics, from clothing to information technology and is a gauge of dynamism and solidity of the city. Natural drainage, climatic advantage and the availability of water in the Cauvery baisn are factors assisting in improving the quality of life.

3.1 Bangalore Development Authority

Bangalore Development Authority (BDA) is one of the premier urban planning and development agencies that oversee the growth of the city. The BDA came into being with effect from 6th January 1976 under a separate Act of the State Legislature viz. the BDA Act 1976. This Authority combined in itself the Planning functions of the City Planning Authority and the developmental functions of the erstwhile City Improvement Trust Board (CITB).

The key objects of the authority as per the BDA Act shall be to promote and secure the development of the Bangalore Metropolitan Area (BMA) and for that purpose the Authority shall have the power to acquire, hold, manage and dispose of moveable and immoveable property, whether within or outside the area under its jurisdiction, to carry out building, engineering and other operations and generally to do all things necessary or expedient for the purposes of such development and for purposes incidental thereto.

The Bangalore Development Authority is designated as the Planning Authority under the Karnataka Town and Country Planning Act, 1961. The BDA performs the following functions:

- Planning
  - Preparation of development plan for Bangalore
  - Preparation of Scheme Plans
  - Approval of Development Plans for Group Housing and Layouts
  - Approval of building plans
  - Other statutory functions under KTCP Act
- Development
  - Planning and implementation of schemes to provide for Residential sites, Commercial sites, Industrial sites, Civic Amenity sites, Parks and playgrounds
  - Construction of Commercial complexes

- Construction of houses for Economically Weaker Sections, Low Income Group, Middle Income Group, High Income Group
- Development of major infrastructure facilities

BDA has a jurisdiction of 1219 sq. kms which also includes the area under the jurisdiction of the Bruhat Bengaluru Mahanagar Palike (BBMP). As is evident from the set of functions for BDA, the BDA, apart from planning and regulation, also develops key infrastructure facilities like roads and other transportation infrastructure.

3.2 Key issues

BDA has been investing significantly in developing the transport infrastructure for the area under its jurisdiction. However, the ever increasing size of population has put immense pressure on the demand for land for not only residential facilities but also for developing adequate transportation infrastructure. The limited resources available with BDA are most of the times not adequate to undertake improvements of existing transport infrastructure and development of new infrastructure facilities.

While the country is increasingly moving towards the public private partnership model in infrastructure facilities, BDA has had limited avenues to do so given the nature of infrastructure facilities it has been developing or improving. Hence the actual experience of BDA in developing infrastructure facilities through the PPP mode is very limited.

4. Project

4.1 Description of the Project

The project envisages development of a peripheral ring road (PRR) outside of the outer ring road (ORR). The total length of the PRR is around 116 kms. However, the pre-feasibility as been carried out for only 64.74 kms of stretch based on BDA suggestions. The PRR will be developed starting from Hosur Road to Tumkur Road via K R Puram, Bellary Road, Old Madras road and Sarjapur road.

The PRR takes off at CH 17 on Bangalore Pune (NH4) about 150 mts from major bring across Arkavathy River. The project is being undertaken in two phases:

- Phase I – 64.74 kms
- Phase II – covering the remaining length

The PRR will link major highways and the district roads from Tumkur Road, Mysore Road, Old Madras Road and Hosur Road.

4.2 Components of the Project

The construction of elevated corridor along the identified alignment will include the following:

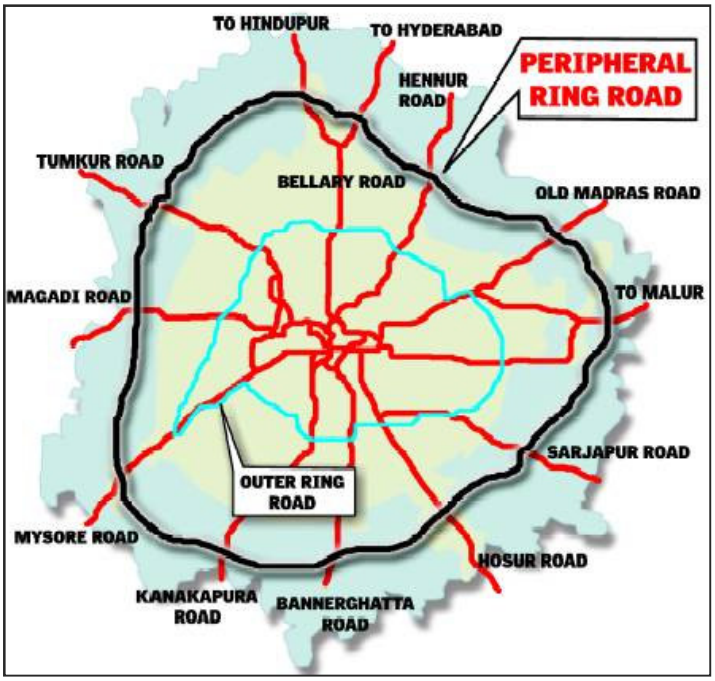
- Widening of roads,
- Improvement of junctions,
- Pavement improvement
- Provision and relocation of concealed drainage under the pavements on either side of the roads
- Upgrade of 4 lane carriageways
- Overlay treatment
- Provision of crash barriers
- Road and overhead signage

4.3 Description of the alignment

The stretch starts at Makali, adjacent to Tumkur road, moves north-east towards Thammenahalli and Soladevanahalli, which are mainly agricultural areas, but with the exception of a mixed residential area in Kuduregere and some protected land in some areas. The road intersects SH-39 at Soladevanahalli, and some protected land in Kuduregere, Thammenahalli and Soladevanahalli.

Further up in Kempapura and Dodda Bylakere, the road goes along the borders of the green belt area. After Dodda Bylakere, the road enters agricultural land in the green belt area. It goes through the green belt area, passing through Mavallipura sewage treatment plant, before entering Jarakabandekaval forest. It also intersects one primary urban road.

It then intersects Doddballapur road near BMS Institute of Technology, around 3 km from the periphery of Yelahanka Satellite Town. Passing through KEB layout, the road goes further east through residential areas, intersecting Bellary road (NH 7) at Hosahalli.



The road then enters agricultural areas in Kogilu, and moves south along residential and industrial areas in Agrahara, Thirumalenahalli, Bellahalli and Doddagubbi. In Ramapura, the road again moves along the border of green belt, separating agricultural and residential areas.

Further south-east, the road traverses residential areas in Hirandahalli, intersects Old Madras Road (NH 4) near Sree Mahalakshmi Venkateswara School in Avalahalli. The road passes through commercial areas in Avalahalli for about 2.5 kms, passes through residential areas near Weavers Colony, and goes further down to intersect SH-35 near Govt Primary School in Shigehalli. It then goes through Kumbena Agrahara towards Kadugodi.

In Kadugodi, the PRR intersects the railway line near Kadugodi Milk Federation Society. Most areas around the alignment here are agricultural, with some mixed residential areas in between.

Moving down, it cuts across Channasandra main road in Channasandra, and curves west through the residential areas in Nagondanahalli and Hagaduru. It then goes through green belt border in Sorahunase and Varthur.

In Varthur, the road passes along mixed residential areas and Varthur lake, and goes further down through agricultural areas. It intersects SH-35 near Kachamaranahalli. Around 3.5 kms further south-west, it cuts across Sarjapur road in Sulikunte. All areas around this stretch are agricultural lands.

The road then curves south-west towards Gattihalli, Huskuru and Chikkanagamangala. It cuts across both residential and agricultural land here. Going further south-west, the road moves along the periphery of the industrial areas of Electronic City. It enters Electronic City and intersects with Hosur Road (NH-7) near Suvidya College in Hebbagodi.

4.4 Development Needs, Public needs & Planning Considerations

Bangalore had a population of 24.75 Lakh in 1981, 65.00 Lakh in 2001 and 84 lakhs in 2011. The extent of Developed Area has also increased considerably, in 1971 the Area was 174.7 Sq. km. and today it is about 800 Sq. km. In absence of adequate mass transportation systems, the use of personal motor vehicles for intra – city travel has increased substantially. This has resulted in growth of motor vehicles, which is four times the rate of population growth in the last two decades (1.91 Lakh vehicles in 1981 and over 36 Lakh vehicles in 2009). The public transport system is overstressed carrying about 50 lakh commuters on a daily basis. Congested streets and longer route length due to urban sprawl have only served to reduce bus frequencies further. In a recent study done by Central

Road Research Institute (CRRI), it has been reported that annual traffic growth rates vary in the range of 2 – 4% in the central zone, 5 – 7% in the intermediate zone and 8 – 9% on the regional roads in Bangalore. CRRI study also reported delays of 26.8 sec per km of travel and 9.9 seconds per minute of travel.

While the city centre is crowded, the BDA had developed the ORR in a bid to divert the heavy load traffic to ease the traffic situation in the city. The ORR for a long while has been serving this need. However, the expansion of urban areas has meant that the ORR is also increasingly stressed in terms of the traffic volumes it handles. The vehicle composition using ORR consists of different classes covering cars, vans, buses, trucks, auto-rickshaws, two wheeler, pedal cycles, bullock carts, etc.

The capacity of urban road for 6-lanes (two ways) is specified as 6000 PCU by Indian Road Congress. In most of the stretches of ORR, the existing traffic volumes are far higher than the specified intensity.

In order to provide increased options for road users beyond the ORR (since the intra-city traffic has been rapidly growing), the PRR will be a key development that will positively impact the traffic situation along the ORR.

4.5 Best Case Studies for similar projects in India/ world

4.5.1 Tuni Anakapalli Annuity Road Project

The Tuni Anakapalli project is a road expansion project undertaken by the National Highways Authority of India (NHAI) as one of the several projects under the Golden Quadrilateral programme. The project's scope was to strengthen the existing two lanes and widen it to a four lane dual carriageway of an aggregate 59 kilometre stretch between Tuni and Anakapalli on National Highway (NH) 5 (Chennai to Kolkata) in Andhra Pradesh on PPP basis. Keeping in mind the lack of attractiveness in tolling the road, NHAI decided to take up the project on the Build Own Transfer (BOT) Annuity model.

4.5.1.1 PPP structure of the project

The GMR Group, in consortium with United Engineers Malaysia (UEM) Berhad Group, were awarded the project contract. An SPV with the name GMR Tuni Anakapalli Expressways Private Limited (GTAEPL) was formed to execute the project. The construction (expansion) of the road started in May 2002 and ended in December 2004 after a month's time overrun due to delays in handing over of land by NHAI. The total project cost was Rs. 295 crores.

The NHAI pays the concessionaire a fixed annuity of Rs. 29.48 crores semi annually from May 9, 2005 to November 9, 2019.

The Project has been awarded by NHAI on a BOT (Annuity) basis. The annuity model involves the payment of a fixed semi-annual sum by the NHAI to the concessionaire during the concession period to compensate him for the capital cost and operational and maintenance expenses of the project plus a certain percentage of returns thereon.

If due to the concessionaire's failure, the actual availability of carriageway in any annuity payment period is less than the assured availability then the annuity is proportionately reduced. NHAI secures the annuity payment by providing a revolving letter of credit from a schedule bank in India throughout the operations period.

The GMR Group (that included GMR Power Corporation Private Limited, GMR Infrastructure Limited and GMR Technologies and Industries Limited), in consortium with UEM Group of Malaysia, won the

project contract to develop, operate and maintain the road for a 17.5 years concession period including the construction period of 2.5 years. An SPV - GTAEPL was formed to execute the project in which the GMR group had 74% stake and UEM had 26% stake.

GTAEPL has also entered into a State Support Agreement dated March 18, 2003 with the State of Andhra Pradesh and NHAI, under which the Government has agreed to extend continued support and to grant certain rights, authorities to facilitate the implementation and operation of the project, including all infrastructural facilities, applicable permissions, dedicated team of police personnel, highway patrols and to generally support the project implementation.

GTAEPL does not have any right to toll, levy charges or allow any kind of other developments or advertising options on the road. The annuity is the only project revenue for the developer. However, NHAI has the right to levy and collect a toll or fee or permit any advertisements.

GTAEPL has entered into an operations and maintenance agreement with UEM Limited (O&M Contractor) to operate and maintain and to take full risk in the care of the project facilities against:

- An O&M fee of Rs. 0.125 crore per month; and
- A periodic fee of Rs. 7.5 crore.

The O&M fee and the periodic fee are escalated by 1.5% per annum, 1 year from the date of commencement of operations.

At the end of the concession period in November 2019, the concessionaire shall handover the project assets free of cost to NHAI.

4.5.1.2 Financing information

The estimated project cost of the project was Rs. 315 crores. The project achieved financial closure on 26 June 2002. The project was funded on a debt-equity ratio of 3:1. The term loan component was Rs. 154 crores, the non convertible debentures component was Rs. 82 crores and the equity component was Rs. 78.69 crores.

ICICI Bank was the lead banker and the lending consortium included several public sector banks such as State Bank of India, Union Bank of India, Indian Overseas Bank, Jammu & Kashmir Bank, Bank of India, Punjab National Bank, Industrial Investment Bank of India and State Bank of Mysore. The average spread of the loan ranged from 12.5% to 12.75%. The loan tenure was 13.5 years, including a construction period of 2.5 years.

The equity funding for the project was primarily through the issue of preference shares.

In May 2005, GTAEPL raised further debt of about Rs. 372 crores from a consortium of lenders through securitisation of future annuity receivables (68% of annuity receivables) to be received from NHAI over a period of fifteen years. These funds were raised at a cost lower than the cost of project debt by about 3% and were used for prepayment of the project debt.

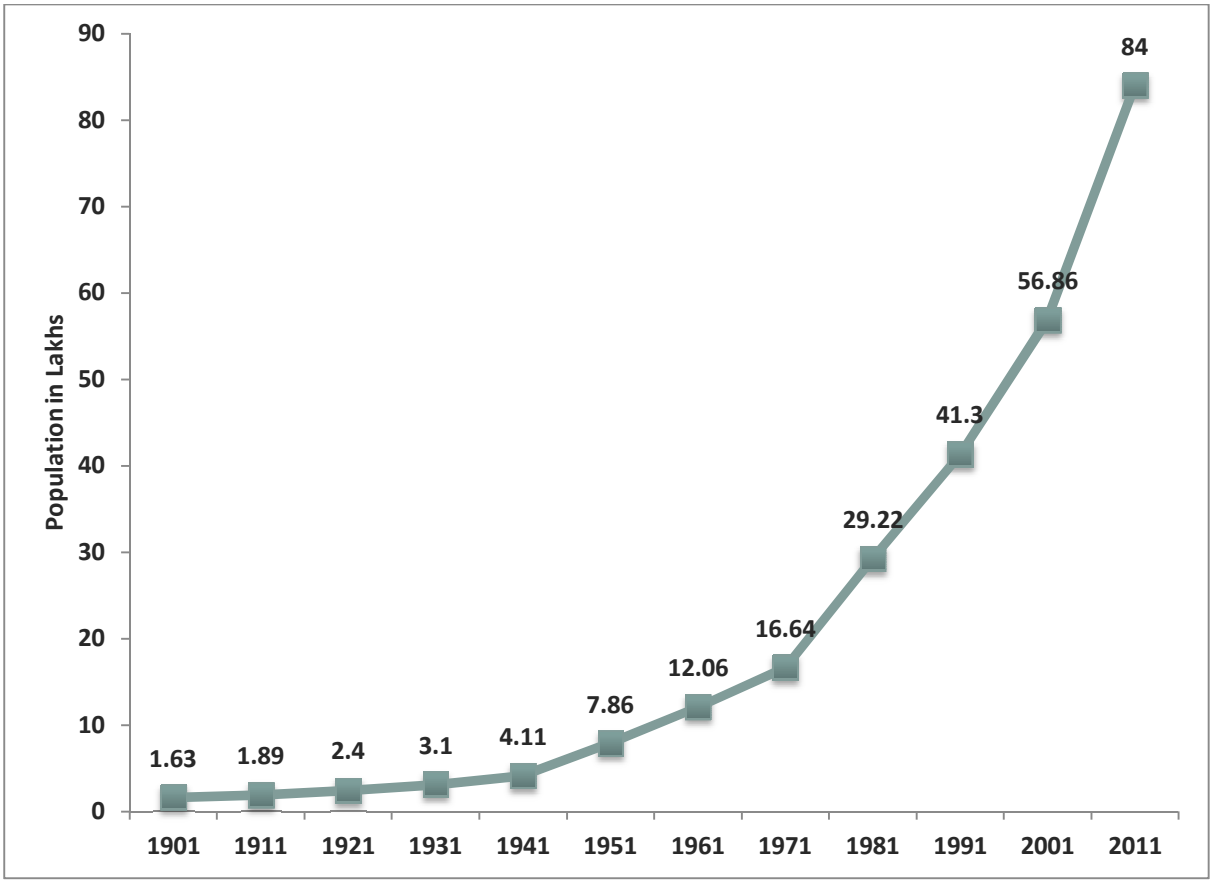
5. Market Assessment

5.1 Bangalore growth overview

The growth of Bangalore has been unprecedented in the past couple of decades. This fact is laid bare from the growth in population in the last century. Bangalore continues to attract throngs of people due to the economic opportunities it offers. This is also supported by a salubrious weather which makes Bangalore an obvious choice for not only businesses but also for people.

Bangalore has grown at average compounded annual growth rate (CAGR) of 3.58% in the last three decades. It is projected that Bangalore's population will cross the 10 million mark by 2021. This explosive growth has meant that the infrastructure in Bangalore has been put under tremendous pressure.

Figure 5-1: Population growth in Bangalore between 1901 and 2011



Source: City Development Plan, Bangalore Development Authority and Census of India

The stress on infrastructure is often most prominently evident in the transport infrastructure of the city. To gauge the extent of pressure on the transport infrastructure, the number of vehicles registered in Bangalore was analysed. The average year on year growth of registered vehicles in Bangalore has been found to be 10% in the last 20 years.

The Central Road Research Institute (CRRI) found that the annual rate of traffic growth rates vary in the range of 2 – 4% in the central zone, 5 – 7% in the intermediate zone and 8 – 9% on the regional

roads in Bangalore. CRRI study also reported delays of 26.8 sec per km of travel and 9.9 seconds per minute of travel.

5.2 Demand projections

Revised Master Plan-2015 for the BMA has been published. This document gives the likely growth to take place in various areas of the BMA. The population of the BMA is expected to grow from 61 lakh in 2001 to 122 lakh in 2025. The proposed growth of population and economy is expected to generate high travel demand. As per travel demand modelling exercise, daily travel demand is expected to grow from 57.2 lakh person trips in year 2006 to 127 lakh in year 2025. Thus while population is expected to become 1.74 times in 19 years, the travel demand is likely to become 2.25 times. Similarly inter-city travel demand from/ to Bangalore and through traffic are also expected to more than double of present levels. Transport network will also need to be augmented to cater to the expected travel demand.

6. Project financials

The project costs have been largely derived from the costs indicated by the Bangalore Development Authority (BDA).

6.1 Cost Estimation

The estimated cost of the project is approximately Rs. 196,000 lakhs. The costs have been outlined below:

Particular	Amount (in Rs. Lakhs)
Site clearance and dismantling	200
Civil works	85,000
Drainage and protective works	22,000
Road furniture and appurtenances	17,000
Structures	50,800
Total hard costs	175,000
Contingencies	5,200
Preliminary and preoperative expenses	8,800
Interest during construction	6,600
Total project cost	**195,600**

6.2 Revenue streams

The revenues to the developer will accrue in the form of an annuity payment spaced over the concession period. The estimated base annuity amount works out to be approximately Rs. 15100 lakhs. This annuity amount would be escalated by 5% every year. The cash flow statement has been provided in Annexure 1.

6.3 Viability assessment

The viability assessment has been carried out over two concession period i.e. 20 years and 25 years. The debt to equity ratio has been assumed to be 1.5:1. Additionally, it is assumed that the project will be able to access the central and state government viability gap funding (VGF) to the tune of 40% of the project cost (20% from central and 20% from state).

The viability based on the annuity structure has been depicted below. The project level internal rate of return (IRR), IRR of equity and the net present value of the equity have been worked out:

Table 6-1: Viability assessment for PRR

Concession Period	Project IRR	Equity IRR	NPV of Equity
20 years	13.84%	16.14%	404
25 years	14.97%	17.54%	5,086

It is evident that for the concession period of 25 years, the project would be more attractive for a private developer since the project level IRR is roughly 15% while the equity IRR is pegged at 18%.

6.4 Funding available under various schemes

The funding available from central and state government will be under the VGF scheme. It is assumed that the developer would access both these funding mechanism and would be able to fund 40% of the project cost through funding available under these schemes.

6.5 Ranking of options based on commercial viability

Having assessed the project for two concession periods of 20 years and 25 years, we are of the view that the 25 year concession option will be more suitable since it allows the developer to make reasonable returns on the projects and his own investments.

6.6 Discussions on the report

While we have developed the report and have provided recommendations based on our assessment of the project, we would like to further discuss the recommendations with the BDA officials and factor in their suggestions and recommendations as well.

7. Regulatory & Legal Framework

7.1 Applicable laws & act and legal cover for the project

The BDA for the purpose of development of the PRR had initiated land acquisition under the powers conferred on it by the BDA Act, 1976. The BDA Act does not have any provisions relating to the levy of Toll on roads developed by the BDA. If the PRR is to be developed based on the Toll model, the BDA will have to initiate the process of bringing about an amendment in the act.

The current BDA Act, 1976 does not have provisions relating to the tolling of roads developed by BDA. This is a critical aspect since under the current framework no tolling is possible and the road user may choose not to pay toll. The BDA will not be able to force the users to pay tolls.

However, should the BDA decide to adopt the Toll model for the development of the PRR, the Karnataka Road Sector Policy will be applicable. However, currently, the policy is in a draft form. As and when the policy is adopted formally, the Toll levy will have to be in accordance with the policy. Also, the policy talks about Tolling of State Highways only. Since the PRR is not designated as a State Highway, the tolling rules may not apply.

7.2 Key Issues

The key issue currently plaguing the project is that of land acquisition. The issue of compensation is currently sub-judice and it is difficult to assess how soon the issue will be addressed. Till the time the BDA does not possess the land fully in its name, it is unlikely that any developer would be willing to bid for the project. Further, even before the transaction advisor is appointed, the BDA will need the land under its possession.

The second issue envisaged is that in case the BDA intends to develop the road on a toll model, the existing policy framework will need to be modified. The BDA Act may need to be amended to include provisions for tolls or the state government may have to notify a toll policy for BDA which can mandate tolling of roads.

8. Indicative environmental & social impacts

8.1 Environmental Impacts

The potential environment impact that the elevated corridors might have are in terms of air pollution due to construction activity. The air pollution will also increase due to slow movement of traffic during the construction period since the access roads may be blocked. The air pollution issue may also come upon in other areas since many of the vehicles might choose an alternative route to avoid delays along the construction site.

The constant construction activity may also account for noise pollution on two counts i.e. noise from construction activity and noise due to vehicle congestion which can often lead to increased honking.

8.2 Social Impacts

The social impacts anticipated are in terms of formal and informal businesses that may need to be shifted along the alignment due to land acquisition. In case there are any residential units along with alignment which need to be razed, it may also result in displacement of people. With the land acquisition along the entire stretch, many agricultural lands would also be acquired. This will result in the farmers losing their livelihoods.

8.3 Mitigation Measures

It is necessary that the impacts are identified early and action plans are prepared for their mitigation in advance. For instance, for air pollution, the BDA may insist on the developer to use clean and green technologies.

It is also necessary that the project development plan is also accompanied by a Relocation and Rehabilitation plan which will layout detailed action points with the requisite intervening entity.

9. Operating Framework

9.1 Risks and mitigation

The risk framework for this project has been outlined below:

Table 9-1: Risk mitigation measures

Risk Category	Risk implication	Mitigation measure
Sponsor risk	BDA scraps the project	Termination payments in case of BDA scrapping the project
Environment risk	Adverse impact on surrounding environment	Penalty clauses in case of default on Concessionaire's part Environmental Impact Assessment to identify all risks in advance
Political risk	Change in government may put project in jeopardy	Termination payments in case of project being scrapped
Force majeure risk	Project is abandoned	Force majeure clauses in the concession agreement
Revenue risk	Annuity not paid to the concessionaire	Interest and penalty clauses on non-payment of annuity
Design risk	Overdesign of the project	Project design to be finalized in mutual agreement of concessionaire and BDA
Completion risk	Completion of project is delayed; inconvenience to users of road	Penalty clauses for time overrun in the concession agreement

9.2 Indicative Project Structure

The best approach for such a large ticket project would be for the BDA to become a key actor in the entire process of development. The BDA may ask the private sector partner to form a Special Purpose Company where the equity will be brought in by the private sector developer.

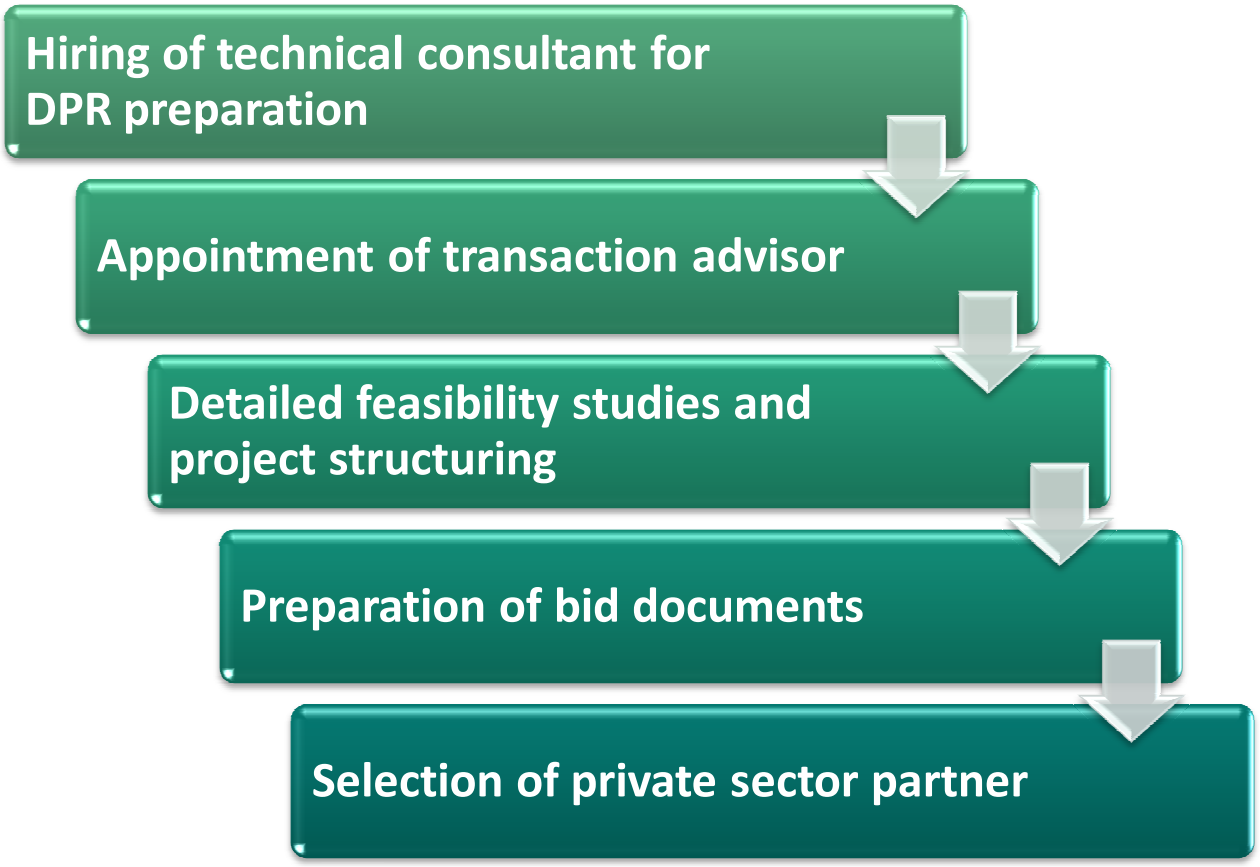
The SPC will develop and maintain the PRR throughout the concession period. The BDA will pay an annuity amount to the SPC which will be escrowed in a separate account and can be withdrawn after reserving a portion of the annuity as performance security.

10. Way Ahead

10.1 Project Development Framework

The key task for BDA is to first conduct a detailed technical investigation to determine the technical requirements and feasibility of the project in the form of a Detailed Project Report (DPR). Upon preparation of the DPR the BDA may then appoint a transaction advisor to carry out feasibility studies as well as to undertake bid process management on behalf of BDA.

Figure 10-1: Project development framework for PRR



The transaction advisor shall structure the project upon completion of the feasibility studies and shall also prepare the relevant bid documents. The transaction advisor shall undertake bid process management on behalf of BDA and will assist in appointment of the private sector partner.

10.2 Procurement Plan

The procurement plan assumes that the procurement window will open upon only upon the resolution of all issues related to land acquisition. It is imperative that the land is completely under the BDA's possession before any of the transaction advisory services are sought. Meanwhile, the BDA may appoint a technical consultant for the preparation of DPR for the development of PRR.

The first and foremost task for BDA will be to appoint a technical consultant for preparation of a DPR for the project. Upon the completion of the DPR preparation, the BDA shall appoint transaction advisor for conducting detailed feasibility, project structuring and bid process management.

Figure 10-2: Procurement plan for PRR

Activity	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
Appointment of technical consultant																		
DPR preparation																		
Appointment of transaction advisors																		
Feasibility, project structuring and bid document preparation																		
Bid process management																		
Selection of Private sector partner																		

The appointment of technical consultant can be achieved within 2 months. The BDA will have to allow around 6 months for preparation of the DPR. While the DPR is under the finalization stages, the BDA should initiate the process of appointing a transaction advisor. This process can be completed in 2 months. Once the TA is in place, the BDA should allow at least 4 months for the preparation of feasibility, project structuring and bid documents.

Once the bid documents are in place, the BDA should initiate the process of selecting the private sector partner which can be completed over a 4 month period due to the technical complexity of the project.

The current procurement plan is spread over 17 months which can be shortened depending on the manner in which BDA makes decisions relating to appointment of technical consultants and DPR preparation timelines.

11. Annexure 1 – Cash-flow statement

Concession Period (years)	31-Mar-13	31-Mar-14	31-Mar-15	31-Mar-16	31-Mar-17	31-Mar-18	31-Mar-19	31-Mar-20	31-Mar-21	31-Mar-22
Cash from Operating Activities										
PAT	-	-	56	917	1,604	2,930	4,539	6,184	7,203	8,926
Add :Depreciation	-	-	1,611	6,535	6,535	6,535	6,535	6,535	7,365	7,365
Add :Interest on Term Loan	-	-	2,201	8,804	8,770	7,979	6,878	5,778	4,677	3,577
Total CF from Operating Act.	**-**	**-**	**3,868**	**16,255**	**16,908**	**17,444**	**17,952**	**18,496**	**19,245**	**19,868**
Cash from Investing Activities										
Less : Capex	(22,934)	(79,151)	(93,563)	-	-	-	-	-	-	-
Less : Increase in CA	-	-	-	-	-	-	-	-	-	-
Add : Increase in CL	-	-	-	-	-	-	-	-	-	-
Total CF from Investing Act.	(22,934)	(79,151)	(93,563)	-	-	-	-	(4,982)	-	-
Cash from Financing Activities										
Add : Equity Drawdown	13,760	10,740	22,455	-	-	-	-	-	-	-
Add : Debt Drawdown	-	36,750	33,683	-	-	-	-	-	-	-
Less : Debt Repayment	-	-	-	-	2,201	8,804	8,804	8,804	8,804	8,804
Less : Interest Payment on Term Loan	-	-	2,201	8,804	8,770	7,979	6,878	5,778	4,677	3,577
Total CF from Financing Act.	22,934	79,151	91,362	(8,804)	(10,971)	(16,783)	(15,682)	(14,582)	(13,481)	(12,381)
Cash generated for the year	**-**	**-**	**1,667**	**7,451**	**5,938**	**661**	**2,269**	**(1,067)**	**5,763**	**7,487**

Concession Period (years)	31-Mar-23	31-Mar-24	31-Mar-25	31-Mar-26	31-Mar-27	31-Mar-28	31-Mar-29	31-Mar-30	31-Mar-31
Cash from Operating Activities									
PAT	10,692	12,694	14,578	15,602	16,450	16,316	14,763	15,673	16,651
Add :Depreciation	7,365	7,365	7,365	7,365	7,647	7,647	7,647	7,647	7,647
Add :Interest on Term Loan	2,476	1,135	-	-	-	-	-	-	-
Total CF from Operating Act.	**20,533**	**21,194**	**21,943**	**22,966**	**24,098**	**23,963**	**22,410**	**23,321**	**24,298**
Cash from Investing Activities									
Less : Capex	-	-	-	-	-	-	-	-	-
Less : Increase in CA	-	-	-	-	-	-	-	-	-
Add : Increase in CL	-	-	-	-	-	-	-	-	-
Total CF from Investing Act.	-	-	-	(6,676)	-	-	-	-	-
Cash from Financing Activities									
Add : Equity Drawdown	-	-	-	-	-	-	-	-	-
Add : Debt Drawdown	-	-	-	-	-	-	-	-	-
Less : Debt Repayment	8,804	6,603	-	-	-	-	-	-	-
Less : Interest Payment on Term Loan	2,476	1,135	-	-	-	-	-	-	-
Total CF from Financing Act.	(11,280)	(7,738)	-	-	-	-	-	-	-
Cash generated for the year	**9,252**	**13,456**	**21,943**	**16,291**	**24,098**	**23,963**	**22,410**	**23,321**	**24,298**

Concession Period (years)	31-Mar-32	31-Mar-33	31-Mar-34	31-Mar-35	31-Mar-36	31-Mar-37
Cash from Operating Activities						
PAT	17,985	18,692	19,561	20,825	22,164	20,046
Add :Depreciation	7,647	8,026	8,026	8,026	8,026	6,047
Add :Interest on Term Loan	-	-	-	-	-	-
Total CF from Operating Act.	**25,633**	**26,718**	**27,587**	**28,851**	**30,189**	**26,093**
Cash from Investing Activities						
Less : Capex	-	-	-	-	-	-
Less : Increase in CA	-	-	-	-	-	-
Add : Increase in CL	-	-	-	-	-	-
Total CF from Investing Act.	(8,946)	-	-	-	-	-
Cash from Financing Activities						
Add : Equity Drawdown	-	-	-	-	-	-
Add : Debt Drawdown	-	-	-	-	-	-
Less : Debt Repayment	-	-	-	-	-	-
Less : Interest Payment on Term Loan	-	-	-	-	-	-
Total CF from Financing Act.	-	-	-	-	-	-
Cash generated for the year	**16,686**	**26,718**	**27,587**	**28,851**	**30,189**	**26,093**

Disclaimer

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