

Pricing and Financing of Infrastructure Projects; the Challenge Before the Indian Policymakers

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ABSTRACT: Ever since the economic reforms started two decades ago, India has been trying to lead the developing nations in terms of building their infrastructure. The challenge of government's fund constraint has been tried to put behind by allowing flow of funds from private sources with regulatory control in government own hand. However, with the global economic crisis that had knocked heavily at the doors of Indian economy too during last couple of years, it was found that developmental bottlenecks for infrastructure sector has escalated in spite of the best efforts by the government.

Arranging of Debt and equity capitals are major financial investment concerns for infrastructure developers today. While studies reveal that issues like land acquisition, utility shifting, discrepancies in DPR, state support agreements, dispute resolutions are still considered to be critical for an infrastructure development projects, more recently the loose ends at the financial structures of many projects are posing as more vulnerable threats. Especially in the period of economic recession, the financial organizations have tightened their hands and as a result project cash flows are affected at halfway round. As the investment retrieval periods are going to be prolonged, the investors are facing uncertainty on their assured return. The commercial banks which had already reached their sectarian limits; still tried to backed promoters with decent track records, with clearances in place and well defined business plans. However, very few projects could achieve financial closure during past two years. The participation rates in recent biddings of PPP projects are also not encouraging, especially in Highway sector. More recently, there have been reports of NHAI favoring for moving back to the old EPC mode.

Salient features of few case studies of Indian projects have highlighted that there is no project specific debt equity ratio and it may differ from project to project. Study by the authors also reveals that availability of debt in India is Sector specific and projects are still being supported with generous government grant varying upto 70% in case of Jawaharlal Nehru National Urban Renewal Mission (JnNURM) schemes. However, the principal concern remains for retrieval of at least 20% return on the investment by the private party. A fair bidding, a robust agreement and the well planned pre-constructional activities can be beneficial to all the stack holders of the infrastructure development project.

But whatever be the planning, with the complexity of multiple issues involved for choice of funds, one has to keep in mind that investments in infrastructures are non-recourse in nature. At the same time the sharing of responsibilities in a pre-framed manner proves to be successful in many occasions for the participants concerned and reflect a win-win situation for all.

Keywords: Infrastructure; Pricing; Financing; Debt; Equity; Mezzanine.

1. Introduction:

Government's fund crunch has been a major constrict for infrastructural development of developing countries like India. Traditionally, the onus of providing basic infrastructure has been with the Governments and users have been utilizing the facilities without any extra charge to the government for providing that particular infrastructure. However, with the entry of Private sector in the infrastructure development as a co-partner or in capacity of an individual developer, the user is compelled for paying the usages charges. In most of the cases, these charges directly value to the cost of developing and maintaining that special infrastructure which is being used by that particular user who is paying for it.

At this point, a primary question may arise as to why a particular user would spend or pay some extra charges for using a particular infrastructure even though primarily or traditionally it was the responsibility of government to provide such facility to the public or for that matter to that individual user out of the taxes paid by him. The answer to this question is rather simple, the infrastructure developer or the facilitator is facilitating the public with such a quality of infrastructure that the user would be bound to save some of his earnings by using that particular infrastructure and not choosing to use any other alternatives and thereby pays few extra charges to the facilitator out of his savings.

So, for an appropriate pricing, the quality of infrastructure is absolutely critical; otherwise the user may not be whole heartedly willing to pay and problems of revenue collection gets started there itself. Even after successful commissioning of a project, the problem of toll collection may jeopardize in achieving the ultimate goal. A golden example in this connection is Coimbatore Bypass Road Project in India [1], wherein unwillingness of the users to pay the toll has led to lengthy litigation with the developer L&T

A rational pricing mechanism on the other hand, has to take into consideration the basics of financing pattern of the infrastructure to be developed and the uncertainties involves in the same. As a matter of fact, pricing and financing of infrastructure particularly in a private participating environment is complementary to each other. While one must understand that financial viability of an infrastructure project is largely dependent on the effective pricing mechanism; the pricing structure itself has to adjust depending upon availability of funds.

In this paper, a brief assessment of the various issues relating to financing and charging of infrastructure facility is being presented along with brief findings of twelve (12) case studies.

2. Definition:

By definition pricing means the charges which the users pay directly to the facilitator of the particular infrastructure for using the facility availed to him. Charges are levied for (i) retrieving the investment made by the facilitator or in few other cases (ii) to limit the use of a particular infrastructure thereby encouraging for optimal use and reduce congestion. eg. Road Pricing, as a tool to mitigate traffic congestion is used mostly in developed countries for urban areas, where as in developing countries it is used a measure to recover the investment, partially or totally for both urban and rural areas. In urban areas pricing for parking facilities is basically aimed at reducing congestion [2]. However, in this present context the main focus is primarily retrieval of investment by the developer concerned.

By “Financing”, however focus is on some decisions relating to choice of funds, particularly debt and equity source of financing. The goal of the financing mechanism should be such that it allows the sponsors to borrow funds to finance a project without increasing their liabilities beyond their investment in the project.

3. Need:

It is the essential need of today’s world that an infrastructure project is developed through private participation. However, it must be noted that user will be willing to pay only and only if he gets a better quality infrastructure through which he can earn some savings. Traditionally, these investments were flowing through limited nozzles to other important social and primary sectors which otherwise could not be given due importance due to fund source crunch. Nevertheless, with availability of regulated private fund development process has been getting a push for overall advancement of the economy.

Conversely, the impact of global economic recession has already raised turbulence in Indian economy too. Therefore, it is felt to address the critical issues relating to pricing and financing mechanism of infrastructure in India on a priorities basis.

4. Infrastructure domestic market:

The pent up demand for infrastructure services is substantial in developing countries. It has been observed that in most of the Asian countries level of infrastructure services supply has been outpaced by demand. Given, the constraints on public budgets, focus is to increases in infrastructure investments through private sector participation. So, a balance pricing mechanism is also essentially required, which can be adopted basically for marketing these infrastructures. In most of the countries, the domestic market far exceeds the international market in case of infrastructure.

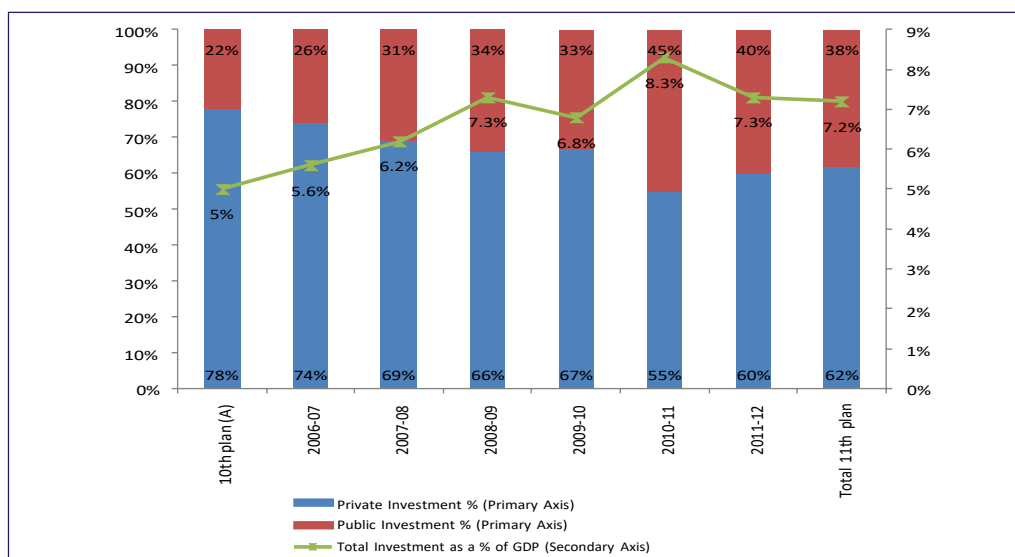


Exhibit 1: Total Infrastructure investment breakup into public and private investment – 11th Five Year Plan (Actual)

In India, sector-wise projected infrastructure Investment during the Twelfth Five Year Plan are tabulated in **Table 1**.

Table 1: Projected Infrastructure Investment during the Twelfth Five Year Plan
(Rs. Crore at 2006-07 prices)

Year	Base Year	2012-13	2013-14	2014-15	2015-16	2016-17	Total 12 th Plan
	(2011-12)						
GDP at market prices (Rs. Crore)	63,14,265	68,82,549	75,01,978	81,77,156	89,13,100	97,15,280	4,11,90,064
Rate of Growth of GDP (%)	9	9	9	9	9	9	9
Infrastructure GCF as % of GDP	8.37	9	9.5	9.9	10.3	10.7	9.95
Infrastructure GCF (Rs. Crore)	5,28,316	6,19,429	7,12,688	8,09,538	9,18,049	10,39,595	40,99,240
Infrastructure GCF (US \$ BILLION) @ Rs. 40/\$	132.08	154.56	178.17	202.38	229.51	259.88	1,024.81

Source : Planning Commission Conference, March 2010

As per preliminary assessment, investment in infrastructure during XIIth plan would be of the order of about Rs.40,99,240 crore (US \$ 1025 billion) to achieve a share of 9.95% as proportion of GDP. The provision of world-class infrastructure would not only be necessary for improving the competitiveness of the Indian economy but also for promoting inclusive growth and improving the quality of life of the common man. The on an average the investment in infrastructure development in XIth plan was 7.5% of GDP as

Table 2: Revised projected investment as percentage of GDP
(Rs. Crore at 2006-07 prices)

Years	Tenth Plan (Actual)	Base year of XI Plan (2006-07) (Actual)	2007-08 (Actual)	2008-09 (Actual/Est.)	2009-10 (RE/BE/Proj.)	2010-11 (BE/Projected)	2011-12 (Proj)	Total Eleventh Plan
GDP at market prices	1,78,40,877	42,83,979	47,17,187	50,03,545	53,63,800	57,92,904	63,14,265	2,71,91,700
Public Investment	6,94,006	1,73,676	1,99,539	2,38,054	2,62,963	2,90,832	3,19,904	13,11,293
Private Investment	2,25,220	70,819	1,04,268	1,21,138	1,39,866	1,69,227	2,08,413	7,42,912
Total Investment	9,19,225	2,44,495	3,03,807	3,59,192	4,02,829	4,60,059	5,28,316	20,54,205
Investment as percentage of GDP								
Public Investment	2.89	4.05	4.23	4.76	4.9	5.02	5.07	4.82
Private Investment	1.26	1.65	2.21	2.42	2.61	2.92	3.3	2.73
Total Investment	5.15	5.71	6.44	7.18	7.51	7.94	8.37	7.55

Source : GDP data for Tenth Plan, 2007-08 and 2008-09 are from CSO, GDP growth rates for 2009-10, 2010-11 and 2011-12 have been assumed as 7.2%, 8% and 9% respectively.

Foreign direct investment (FDI) in infrastructure, a comparatively new phenomenon that had presented tremendous opportunity for the investors and governments, has no more remained cheap. Many countries in past have successfully attracted and benefited from substantial efficiency gains by FDI. However, looking at the present economic environment there is need to take a cautious approach [3,4,5].

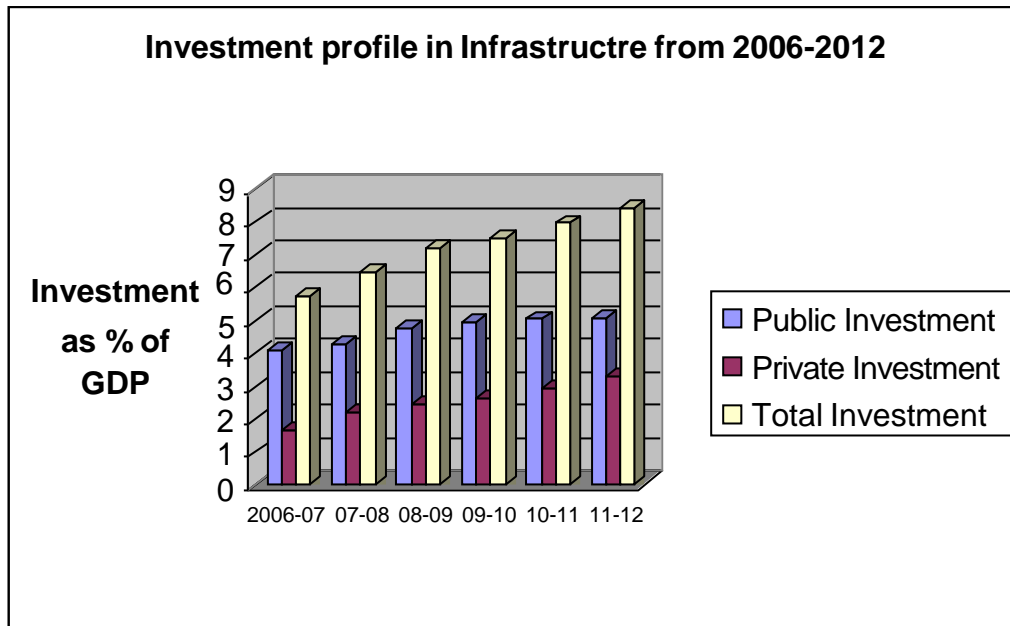


Exhibit 2: Investment Profile in Infrastructre from 2006-2012.

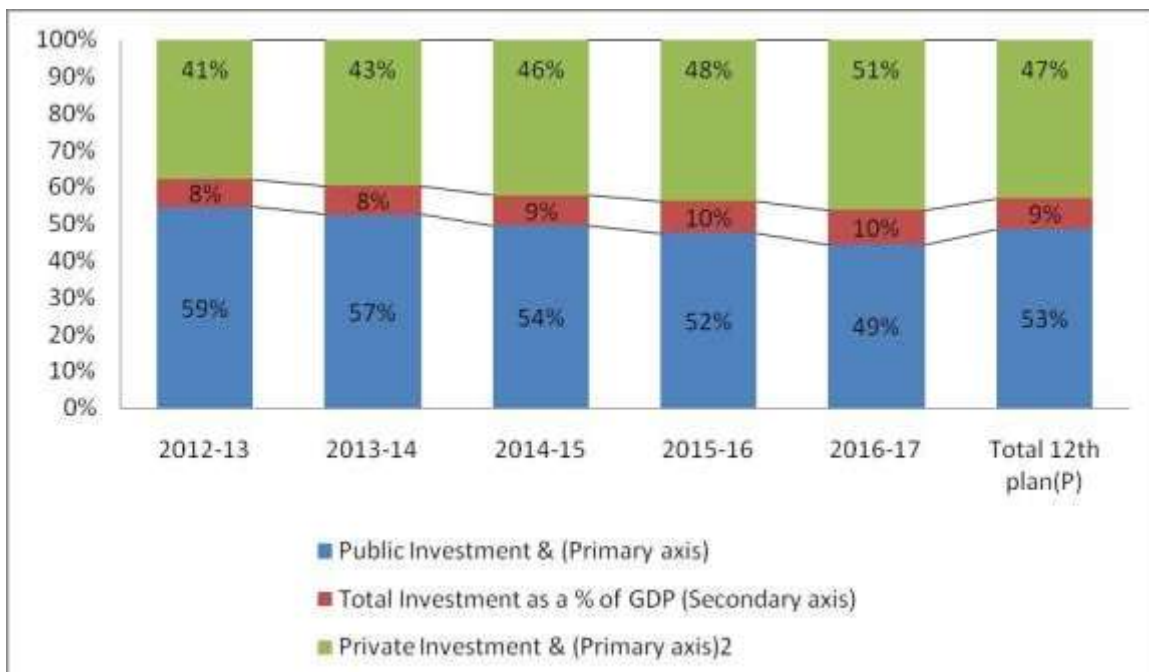


Exhibit 3: Total Infrastructure investment breakup into public and private investment – 12th Five Year Plan (Projected)

5. Project Cost Appraisal:

As in any construction related project, an infrastructure development project has following principal cost components, namely (i) Pre-Investment costs, (ii) Bidding and Procurement Related Costs, (iii) Project Development cost (iv) Construction Cost, (v) Operating and Maintenance Costs and (vi) Termination Costs [9]. However, in a particular project all the above components may involve or may not also depending upon situation and project proposal. Once the total project cost has been set forth, based on the above expenditures to be incurred in various phases of project development, the detailed Cost Benefit analysis is dealt with along with sensitivity analysis.

Based on the results, the most likely IRR and NPV for the project for a particular schedule of investments can be gathered and a decision may be taken for either to for the investment or to back track. In other words going by Sorkin's view "A typical decision rule is that one should undertake the investment if the IRR is equal to or higher than the market rate of interest. Those projects with the highest IRR may be given priority in terms of funding." However, from the investor's point of view he will see that there is maximum cushion between market rate of interest and his IRR [6,7].

For a typical Indian highway road project on annuity basis, where government takes the revenue risk, the project IRR is expected at around 12-14% and equity IRR would be 14-16%; while for full toll basis projects where concessionaire are taking the revenue risk the project IRR is expected at 14-16% and equity IRR around 18-20% [8].

6. Financing Structure of an Infrastructure Project:

It is worthy to understand at this point that an appropriate pricing mechanism will have to take care of both (i) project cost-benefit as well as (ii) uncertainties in project financing so that a project can reflect a win-win situation for all the parties and hence, how the financial structure of the project is framed is a matter of great importance. Particularly, in private party participating environment, it becomes a more concerning factor.

In case of private participation in infrastructure development, the basic model adopted is BOT (Build Operate and Transfer), in which a contractual agreement is made between the host/ government and the contractor /concessionaire for undertaking construction, financing, operating and maintaining the infrastructure facility within a specified period of time called concession period. Within that concession period the concessionaire is allowed to levy/ collect charge from the user which is called toll. After the specified period of concession, he has to transfer the right of the infrastructure to the host/ government. Exhibit: 4 depict the main parties involved in a PPP, BOT project.

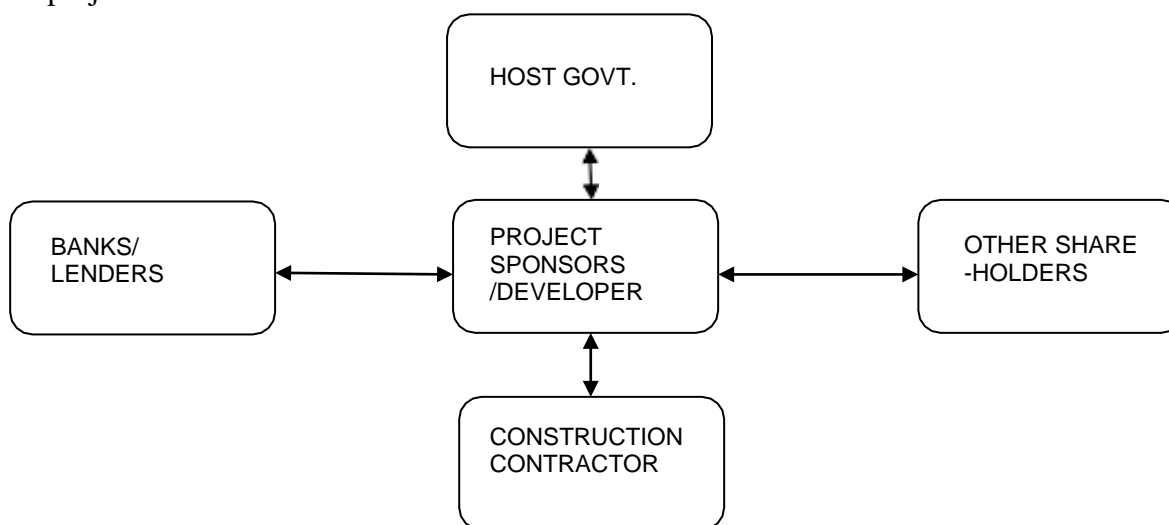


Exhibit 4: Main parties involved BOT/ PPP basic model

BOT financing, like other project financing, involves the funding of the project on the merit of the project itself but to a much greater degree than the conventional project financing. Typically, in such financing, a separate project company namely Special Purpose Vehicle (SPV) is established by the project sponsors to implement the project. The SPV allows the sponsors to borrow funds to finance a project without increasing their liabilities beyond their investment in the project. Thus, their balance sheet shows equity capitals at risk and nothing more.

BOT financing is essentially a contract financing, which focuses on viability and security of a given project's revenue stream. It is important to notice that the lenders will provide / arrange capitals for the project keeping in view the likely revenue earnings of the project. In most of the cases, flexibility towards revenue earnings means becomes limited and hence, the lenders are left with no other choice but to play with their borrowing interest rates; which at times if not girded by proper contractual frame-work may pose as a serious threat to the whole project.

7. Types of Capitals:

Broadly speaking, there are three types of capital available to all projects: **Equity, Debt and Mezzanine capital**. Each plays a specific role in project financing and has got its own risk characteristics and eventually determines the return on it.

7.1 Equity Capital:

It is the lowest ranking capital of all, in terms of its claims on the assets of a project. It represents the fund injected by the owners of the project. If somehow, the project fails, all other claims must be made before any claims of equity investors. Equity investors are the biggest risk taker of the project and thus, the terms of contracts must compensate these investors fairly.

7.2 Debt Capital:

In contrast to equity capital, debt capitals of the project have highest rankings among all capitals. Senior debt has first claim over all the assets of a project and must be repaid first, according to a predetermined schedule. Only after the claims of senior debt are satisfied can the claims of others be considered. As such, senior debt bears the lowest risk of all capital. Correspondingly, the returns to senior debt are usually limited to just the interest payments on the loans; irrespective of how successful the project may be i.e. lower risk is born by lower returns.

7.3 Mezzanine Capital:

Mezzanine capital is a more flexible instrument than either pure equity or debt. The key characteristic of mezzanine capital is that it has both debt and equity features and as such, has a risk profile that is somewhere in-between debt and equity capital. Examples of mezzanine financing are subordinated loans and preferential shares. Both have the characteristics of debt, in that regular payments of interest and / or capital are involved. However, payments are subordinated to senior debt and need only be made when project funds are available. When they are not available, mezzanine financing is treated like equity and no payments are made; to that end, mezzanine financing provides projects with an additional equity cushion. However, when funds are available, mezzanine payments take precedence over any distributions to equity capital, such as dividend payments. Thus, while mezzanine financing is sub-ordinate to senior debt, it is still senior to equity capital.

7.4 Choice of Capitals:

All things being equal, equity investors would prefer a debt/equity ratio as high as possible, while creditors would prefer a debt/equity ratio as low as possible. A higher ratio reduces the risks exposure of equity investors, while increasing the potential returns to their capital, while a lower ratio increases the certainty that loans will be repaid and hence lowers the risk to creditors. From the standpoint a project company, however, the higher the debt/equity ratio, the less sound would be its financial structure and the more vulnerable it would be to deterioration in the business environment.

There are no hard and fast rules as to the correct or best debt / equity ratio. This will change from sector to sector and from country to country. Suffice it to say that the higher the risks, the lower should be the debt/equity ratio. But whatever the ratio, care must be taken to ensure that it is prudent, in the light of prevailing project and market conditions [9].

8. Sources of Financing:

Debt, equity and mezzanine capital are usually provided by different sources. Where a single source provides more than one type of capital, the different types of capital may be handled by separate departments. In the first instance, equity capital for a project will come from the project sponsors, or other investors that have an active interest in the project. Additional equity, if needed, would be sought from passive sources, such as institutional investors and possibly the general public through local or international capital markets.

Commercial banks are the most traditional source of debt financing. To a lesser extent, they are also providers of mezzanine capital. However, one key characteristic of commercial banks (as compared to universal banks which combine the functions of both commercial and merchant banking) are primarily short to medium term floating rate deposits. To avoid problems of interest rate and term miss-match, most commercial bank loans are primarily short to medium term floating rate credits (normally three to five year terms and rarely longer than seven years). Long term credits in excess of seven to eight years account for a fairly small percentage of a bank's asset portfolio, while equity investments are negligible to non-existing, either by choice or regulation. For this reason, the activities of commercial banks are focused primarily on earning a margin between the interest rate they receive on loans and the interest rate they pay on deposits. They have little or no interest in equity investments. If the creditworthiness of borrowers, or the mortgage provided on loans is found less than satisfactory, commercial banks used to seek assurances from more creditworthy third parties, such as guarantees from parent companies, governments, or quasi-government agencies. For these reason, sponsors are increasingly looking to sources beyond commercial banks to meet their long term funding needs and using commercial banks primarily to meet their shorter term funding needs, such as working capital and construction financing [9].

9. The Indian Scenario:

In the first three years of eleventh plan, budgetary support constituted ~45% of total infrastructure spending. The debt from Commercial banks, NBFCs, Insurance companies and external sources constitute ~41% of funding while the balance 14% funding through equity and FDI.

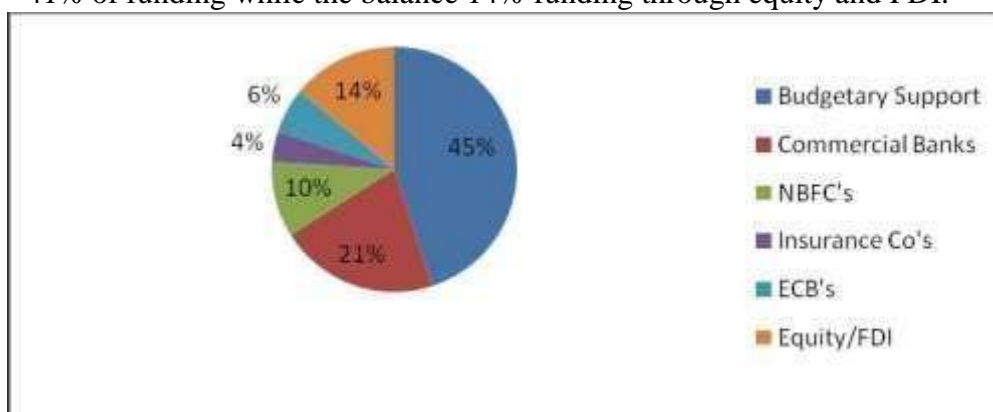


Exhibit 5: Sources of funding for Infrastructure investment in eleventh plan.

A survey conducted by World Bank for 104 no. projects (1995-2007), reveals that senior debt accounted for 68% of project financing, while 3% is from subordinated debt, 25% from equity and 4% viability gap funding on an average. Out of these, about 70% of senior debt is provided by commercial banks, four-fifths by public sector banks. Rest around 23% debt financing came from institutional lenders and 5% from International finance Corporations.

On the equity side about 80% comes from project developers with next largest contributor being the public sector. Strategic investors (Foreign direct investment) made direct equity investment in the Special purpose vehicle established to implement the PPPs for only limited projects. Though FDI in PPP infrastructure projects is very low, it may be noted that ports sector has been high in attracting FDI (in terms of value) followed by Airports, Road & Bridges and Solid Waste Management. It may also be noted that FDI cases are more in those sectors like Ports & Airports where operational expertise doesn't exist with Indian developers and FDI has come from Strategic Foreign Investors.

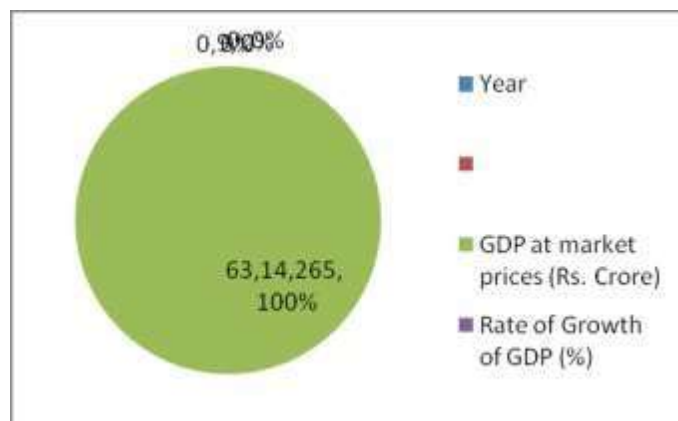


Exhibit 6: FDI in various sector of infrastructure in India upto 2007.

However, for twelfth five year plan, planning commission is projecting an investment of Rs. 51 lakh crores. About 53% of this is expected to be funded through budgetary support and rest will need to come from private sector funding. For the huge funding gap of twelfth plan, it needs to channelize an additional private sector investment of about Rs. 6.08 lakh crores over the duration of the plan. This is a big challenge and will not be possible without the radical reforms and public awareness [10,26].

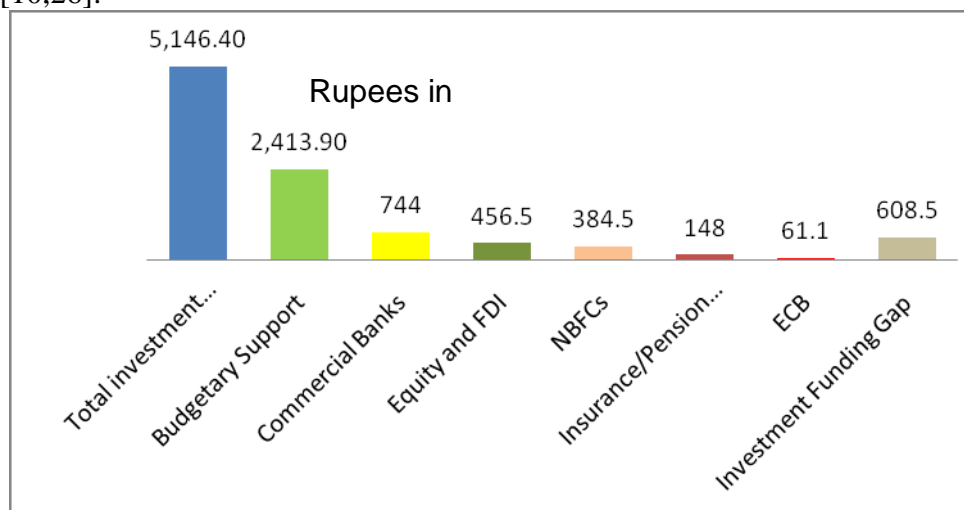


Exhibit 7: Estimate funding gap for Twelfth Plan

10. Few Case Studies:

In order to understand the financing and pricing and other issues relating to an infrastructure project development in a better way, case study findings of following 12 (Twelve) projects are highlighted in brief hereunder.

10.1 Terminal T3 of Delhi Airport:

The GMR's Terminal T3 of Delhi Airport, which was inaugurated in July, 2010 has been considered as a successful project execution model for Public-Private Partnership in India. The building having 502,000sqm floor area, nine levels, 78 aerobridges, 63 elevators, 34 escalators and with a passenger handling capacity of 34 million per year was completed in a record time of 37 months and significantly before schedule time. It cost Rs.127 billion and the work was undertaken by a Joint Venture (JV) Company namely Delhi International Airport (Private) Limited (DIAL). The Bengaluru based India's leading infrastructure firm, GMR group has got the leading share of 54% followed by Airport Authority of India (AAI) with 26%, Frankfurt Airport Services Worldwide and Eraman Malaysia with 10% each. The project was executed under Build Own Operate and Transfer (BOOT) scheme with 30 years concession period extendable to another 30 years.

In the sideline of T3 construction DIAL has set up a 10MW power plant to generate power from solid waste under a partnership between GMR energy Ltd. and SELCO International Ltd. This was expected to put an end to blackout of the Airport as well as solve the problem of disposal of municipal solid waste of Municipal Corporation of Delhi (MCD). DIAL has also set up 300 rainwater harvesting structure in the airport area to recharge the ground water resources which would fulfill the water requirement of the Airport.

The T3 housed 163 check-in counters and 95 immigration counters with state of art baggage handling and security system in place; these can handle large number of domestic and foreign passengers at a time. The baggage handling system could handle 12800 begs per hour. It has got comfortable lounges, nap and shower rooms, massage and SPA services, gambling zone and a 100 room transit hotel. It has housed world renowned restaurants, bars, food centers, coffee shops etc. It has also got premium class sopping area of around 20,000 sqm retail area.

The terminal is well connected with eight lane road leading to NH-8 and Delhi Metro express service in 18 minutes time. The multi level car parking facility of the terminal is another important aspect, which reduces the entry and exit time considerably.

Summing up T3 has created a global bench mark in construction of Airport terminal. It has become the world 8th largest Airport in terms of floor area, yet constructed in a record time of 37 months. The construction activities were carried out by 200 contractors at the peak level and as many as by 37000 workers, who came from different parts of India and abroad [11].

However, the initiation for developing this Airport with private participation was not smooth; it saw stiff opposition first from Government's left partners in 2006 and similar resistance from majority of AAI employees. Never the less, with Government shear motive towards facilitating the National capital with a world class Air terminal, T3 has come up within a short span. In the financial front also everything has been arranged and running smoothly except some recent concerning repots of default by few Private Airlines. However, the government got a severe jolt when CAG reported non-fair allocation of the bid as well as low concessional lease of the land to the DIAL. Where as, CAG has estimated potential earnings of Rs163557 Crore, GMR led consortium would get Rs. 88,337 crore.

10.2 Cochin International Airport:

It was the novel venture in the history of civil aviation in India. It was the first Airport in India, which was built outside the ambit of Government of India. A company named Cochin International Airport Limited (CIAL) with major share holding by Government of Kerala (GOK). Initially GOK was supposed to participate upto an equity share of 51%. However, hitch off at arranging the funds have restricted them in mere 39.85% till now.

GOK initially relied heavily on investment and donations from interested NRIs as well as from schemes like Kisan Vikas Patrika (KVP). CIAL issued shares at Rs10/- , but insisted that individual share holders apply for at least 250 shares worth Rs2500/-. Around 10000 NRIs invested in the Airport; single largest investment being Rs80/- million. The inflow of funds to this new airport showed credibility, though it has got competition from Kozhikode airport which has adopted the same model on suggestion of AAI. Through shares, a sum of only Rs40 million could be arranged as against expected Rs.20000 million.

Land acquisition created initial hurdle in this project. However, court ruling favours CIAL and 1300 acres of land was acquired from around 2600 landowners. 822 families were rehabilitated to their complete satisfaction @ Rs20,000/- per family for shifting of their personal belongings. Each family was given „six cents” land free of cost and the colony become known as “six cent colony”. The land losers have been accommodated in CIAL jobs as per norms. Over the time infrastructure of the area also developed along with the local economy.

CIAL has faced great financial hardship right from its inception. Established in March, 1994 with an authorization capital of Rs900 million, it was to raise project equity capital of Rs7000 million and loan funds of Rs 1300 million. In March, 1995 HUDCO sanctioned a term loan of Rs250 million @16.5% interest. GOK sanctioned Rs.270 million and after lot of persuasion Federal Bank Limited sanctioned a bridge loan of Rs100 million @15% for six months. GOK further sanctioned Rs.50 million towards equity, while Rs150 million came as private equity. However, the fund was still well short than required. On the other hand GOK did not want to loose its stake and instead decided to have 51% equity. For that they approach public sector oil companies, State Bank of Travancore, Federal Bank and HUDCO. This way, another Rs200 million was arranged. Meanwhile, CIAL entered into some memorandum of understanding (MOUs) with AAI/ Air Traffic Control (ATC) in some technical issues relating to equipment supply and installation at the airport. These resulted in easy payment terms and conditions for CIAL and in few cases revenue sharing terms.

For the economic viability of the project as a whole, CIAL had to take up several initiatives in its operational front. The old airport had to be closed down to divert air traffic to the new one. Similarly, the cargo complex which was biggest in India, had to be ultimately converted into a 80 acre land cargo village in line with Dubai cargo village, to take care of large scale international cargo operations. The management of this cargo village was transferred from AI to CIAL [12].

The CIAL saw operational hurdles also in the form of breaking down of the MOU with AI, which resulted in delay in up gradation of navigational facilities. The issue of deployment of security staff /agency was another standoff. Similarly, adequate board representation by different quarters was another issue to be resolved. But above all failure of GOK to pay up its share capital of 51% led to diminishing the confidence of the investors and the NRIs, who felt that GOK should contribute its full share before others.

However, the positive hope is that with a major share of India’s air traffic handling to Gulf countries and if proper restructuring of the financing is done it could evolve as a successful model as the debt service was feasible from the second year of operation.

10.3 East West Metro Corridor Project of Kolkata Metro:

The EWMC of Kolkata metro was conceived as comprising an underwater metro tunnel, 15 meter below river bed of Hooghly, few underground sections, and few elevated sections at median verge of roads. It is estimated that the entire project would require 22.60 hectare of land which includes 21.52 hectare as government land and the rest as private land. The land acquisition and rehabilitation, which is a problematic affair for Indian projects and particularly in state like West Bengal, has been seen as a critical issue for successful implementation of this project. The project proposal includes 4 numbers vehicular coaches of around 260 passengers each and the same to be

increased to 6 numbers in due course. The stations are to be made automated for all functions like fare collections, entry, exit and ticket checking etc.

The KMRC suggested minimum fare of Rs.8 for a journey upto 2 Km and maximum being Rs.16, which is to be operated between 2 Km to 12 Km. This fare would be subjected to 12% escalation in every 2 years.

Since, the project was for larger benefit to the society, the West Bengal govt. agreed to supply electricity on cost to cost basis with no profit charge. It was proposed that the state govt. would fix up electricity charge for this purpose. Thus, for calculating the financial internal return (FIRR) of the project, the power tariff has been taken as Rs.3.25 per unit. The project finance is proposed to come from state govt. (27.5%), Govt. of India (22.5%) and by raising 50% senior debt. With the estimated project cost and operational and maintenance cost to be incurred over time, the KMRC estimated that economic rate of return (ERR) would be in the range of 13.15% to 15.78%. The internal rate of return is expected in the range of 4.61% to 5.59%. However, going by the price sensitivity that commuters had shown in North South Corridor, some of the observer felt this project as a big gamble, which otherwise would take only 6 years to complete as against the 22 years for the earlier (old) metro project in Kolkata [13].

10.4 The Delhi Metro Project:

As of early 2006, around 4,50,000 passengers were travelling by Delhi Metro. The phase-I comprising of 3 (three) destinations lines, 59 stations and totaling around 65 Km route came into existence within 8 years of starting of constructions and remarkably before schedule. It is not that this project did not face technical and systematic challenges; however, thank goes to through planning, an effective project design, and a „we mean business“ culture. Above all this culture was coupled with punctuality, honesty, and a strict adherence to the schedule deadlines.

For the implementation of the project, Govt. of India (GOI) and Govt. of National Capital Territory of Delhi (GNCTD) set up a joint venture company 50:50 share, namely Delhi Metro Rail Corporation (DMRC).

The phase-I of the project which was targeted to be completed within 10 years at the time of approval, was to cover 340 hectares of land which includes 58% government land, 39% private agricultural land and 3% private urban land. The total project cost was estimated at Rs. 60 billion initially and was later on revised to Rs.89.27 billion. Initially, for Phase-I to become viable, it was estimated that it would have to transport 2.2 million passengers per day and later on this was revised to 1.5 million per day. The EIRR of the project worked out to be 21.4% while the FIRR was less than 3%. In view of the low FIRR, initially some ministers in the GOI even suggested for dropping the project. However, others who had the views that this be treated as „social sector“ project and likely to benefit the regional economy in more than one ways. Today, they appeared to be correct.

The financial plan for Phase-I was approved by GNCTD and GOI in 1996. Of the project cost, 28% was to be financed by equity, subscribed to equally by the GOI and GNCTD. The two governments also agreed to give interest-free subordinated loans to cover the cost of land acquisition, which was expected to be 5% of the total project cost. Funding of major share of @ 64% of project cost was to be provided by Overseas Economic Corporation Fund (OECF), which later become Japan Bank International Corporation (JBIC) through a time –sliced soft loan. JBIC disbursed the loan in tranches with each tranche treated as separate loan, with its own moratorium and repayment period. The repayment period of each tranche was set at 30 years, which includes 10 years grace period. Property development at the highly lucrative sites around the metro stations was to generate remaining 3% of the project cost. The debt –equity ratio was fixed at 2:1. The GOI and GNCTD also decided to bear the exchange rate risk equally.

The DMRC planned to repay OECF loan through surpluses from revenue, property development around the stations and its corridors, levies/taxes on the residents of Delhi. Further, the project was

exempted from custom and excise duties. It had already earned Rs. 1.5 billion revenue in the financial year ending 2006 and started repaying to JBIC as early as in 2007. However, the core factor behind the success storey of DMRC was the competent leadership of its first Managing Director, Mr. E. Sreedharan, who not only crated a dedicated team, but also taught them that what he means “business”. Delhi Metro is not only easing out the traffic scene in Delhi, but to a large extent it has benefited in reducing the environmental pollutions [14].

10.5 Delhi Noida Bridge:

The Delhi Noida Bridge is one of the three bridges across the river Yamuna connecting Noida with Delhi and the only one that is tolled. Popularly known as the DND flyway, the bridge is 552.5 meter long and includes approach roads on both ends. It has got 8 (eight) lanes with capacity around 2,22,000 vehicles per day, which providing the commuters with saving of times, distance as well as fuel consumption limits.

The bridge, which was opened for traffic in February 2001, was among the pioneer projects in the field of Public Private Partnership (PPP) in India. The project was structured as a Rs. 408.2 crore 30 year BOOT concession, which was financed through equity of Rs. 122.4 crore and debt of Rs. 285.8 crore. Debt financing consisted of term loans from various Indian banks and financial institutions totaling Rs. 235.8 crore and issue of deep discounted bonds totaling Rs. 0.50 crore by the Noida Toll Bridge Company Limited (the concessionaire). This project is often presented as a path breaking project which showed that private capital be indeed attracted to provide public better infrastructure services in India. Despite having to deal with multiple authorities and fragile political environment, the project was completed within budget and ahead of schedule. It was also successful in raising investment funds from capital markets including an issue of GDRs overseas. It is the only toll road in country listed on stock exchange.

However, following the significant shortfall of projected traffic and revenues, it had to undergo financial restructuring for its debts in the first year of operations itself. Many termed it as an opportunistic favour to the private partner owing too much flexibility in the concession agreement which was actually among the first of its kind in India. On the other hand, the bidding process was not competitive in this case. The same party acted as project adviser as well as took the role of developer, thereby showed conflicting interest at different point of time. One of the major draw back in this concession agreement was not providing any role for the authority in assessing the reasonableness of capital and operational cost reported by the concessionaire. It also provided for guaranteed annual return of 20% on the total project costs, and not on equity alone. Shortfall in returns for previous years resulted in a corresponding increase in project cost, on which further returns were payable. As a result initial project cost of Rs. 408 crore has been escalated to Rs. 953 crore as determined by the concessionaire as on 31st March, 2006. Further, since the contract provides for extension till recovery of the total project cost and return thereon; the concessionaire noted that they are entitled for atleast 70 years concession as against initial 30 years. Moreover, they have received in-principle approval for right of developing of prime urban land (30.50 acres) in NOIDA as a supplementary source of returns. The lenders too had to reschedule their repayments and interest as well as lowered down few loan rates [15].

10.6 Vadodara Halol Toll Road:

The Vadodara Halol Toll Road (VHTR) was one of the first state Highway widening projects developed on a Public Private Partnership basis in India and it has subsequently paved the way for a large number of projects to be undertaken in similar format in Gujrat as well as rest of the country. The project, which was a part of vision 2010 of govt of Gujrat, involved widening of 32 km of the existing two lane state highway (SH 87) connecting Vododara to the industrial town of Halol into a four lane tolled express highway.

A SPV, namely Vadodara Hoalol Toll Road Limited (VHTRL) was constituted for this purpose with principal share holdings by govt. of Gujrat and IL &FS. Other share holders are O&M

operators and the financial institutions associated with the project development. Later on VHTRL has merged with the Ahmedabad Mehsana Toll Road Company Limited to form the Gujrat Road and Infrastructure Company Limited (GRICL) in 2005 as part of a financial restructuring.

VHTRL was promoted by IL&FS and Govt of Gujrat (GOG). It entered into a concession agreement with GOG to design, finance, built, operate and maintain and transfer the facility after recovery of the predetermined return. Thus a 30 years concession period from the date of operation was agreed upon with 20% return on the project cost. It is extendable for further period of two years basis for shortfall in returns if duly certified by "Independent Auditor". The project cost was estimated at Rs. 161 crores of which Rs. 119 crores is construction cost. Equity shares by GOG, IL &FS, American insurance groups etc. amounts to Rs. 67.90 crores. IL & FS raised debts through various banks (including IDBI) and financial institutions to the tune of Rs. 93.20 crores. The debt equity ratio is 58:42, while the project IRR was worked out as 20% and Equity IRR as 32%.

The concessionaire has allotted the constructional work to a consortium of M/s Punj Lloyd Limited and IRCON international Ltd. They have also got equity stakes in VHTRL. The development of the 31.7 Km stretch was achieved in a single phase with all required road works and related facility being developed. The schedule completion of 18 months was achieved 4 months ahead. One of the key features of this project was its Environmental and social mitigation plan, which was effectively implemented in letter and spirit.

The project, which was started in March, 1999 was completed in September, 2000 and tolling started from October, 2000. The Operation and Maintenance has got the following provisions: (i) Routine Maintenance (continuous); (ii) Periodic overlay (every five years); (iii) Periodic Renewal (Every fifteen years); (iv) Toll Operation and Management (once a year). Toll has to be determined, levied, collected, retained and appropriated from all the user of the facility. Toll rates are based on fixed formula and are allowed to increase annually based on consumer price index (CPI).

Due to lower than projected toll collection and slippage of traffic, financial condition of VHTRL started deteriorating and it was unable to service its debt obligations. This resulted in the company resorting to corporate debt restructuring (CDR) in 2004. As per this the earlier SPV has merged with Ahmedabad Mehsana Toll Road Company Limited (AMTRL) to form a single entity Gujrat Road and Infrastructure Company Limited. GOG and IL &FS infused Rs. 30 crore each as fresh capital in 2005 and 2006 respectively. IL & FS further provided irrevocable line of credit amounting Rs. 100 crore as per CDR scheme for meeting shortfalls in debt services. IDFC as well as IL &FS component of the deep discounted bonds (DDBs) were restructured and some were converted to term loans under new entity. Interest on all term loans and other outstanding debts were reduced from contracted rates to 10% p.a. payable monthly.

The Vododara Halol Toll Road was not awarded through competitive bidding and instead initiated from the signing of a Memorandum of Understanding between Govt. of Gujrat and IL & FS. The pre-development market study in this case is also proved to be not accurate. Hence, in spite of saving time and cost over run in construction, recovery of developmental cost has been proving as a major hurdle [16].

10.7 Mumbai-Pune Expressway:

The Mumbai Pune Expressway, officially the Yashwantarao Chavan Expressway is India's first six-lane concrete, high-speed, access controlled toll expressway. Its need was established with a study undertaken in seventh five year plan (1985-90) by MOST of GOI through RITES and Scott Wilson Kirkpatrick (UK). It spans a distance of 93 Km connecting Mumbai, the financial capital of India with the industrial and cultural hub of Maharashtra, Pune. This expressway introduced new levels of speed and safety in automobile transportation to Indian roads. It has reduced travel time between Mumbai and Pune by approximately 2 hours.

The expressway has two carriageways with three lanes each separated by a central divider and a tarmac or concrete shoulder on either side. Vehicles with fewer than four wheels and agricultural tractors are not permitted, although tractor-trailers are permitted. The expressway handles about 30,000 PCU daily, and is designed to handle 10,00,000 PCUs.

Corridor planning was also done and road side facilities in a profitable environmentally sensitive manner have been undertaken with a view to maximize commercial utilization. The corridor belonged to NH-4. It has got adequate number of underpass and overpasses at required locations, provisions of subways for villagers at every 300 to 500 meter distances, five tunnels of international standards among others. It has also got provisions for 7000 trees plantation on both sides along with compound walls/ fencings on both sides of the expressway for safety of traffics.

The original cost estimated for the project by RITES was Rs. 1146 crores. However, later on it is seen that with escalation the project cost would be Rs. 1630 crores. The government proposed to adopt 40% grant and 20% returns on the investment in this case. After poor participations in biddings and much higher quotes of M/s Reliance Corporation (Rs.3600 crore); Govt. of Maharastra decided to execute it through Maharastra State Road Development Corporation (MSRDC) in BOT mode. Accordingly, 30 years concession was fixed for collection of tolls.

The means of finance for MSRDC as on July, 1999 was: Rs 275 crores budgetary support from GOM and BMC, Rs. 548 crore loan from MMRDA, Rs. 107 crores bank loans, capital market borrowings and Bonds (rated AA) of Rs. 1897.6 crores. The GOM had guaranteed the bonds. As a result, the rate of interest in those bonds was low (~14%). The bonds were rated AA. It was proposed that toll collected from MSRDC's projects would be used to pay the interest obligations of the bonds. It was estimated that during initial years since toll collections would be lower, alternative revenue source need to be considered such as sale of land along highway considered. For the purpose, MSRDC even laid telecom ducts along the sides of the expressway hoping that the same could be leased and additional revenue generated. This proved to be correct.

The Mubai Pune Expressway is considered as a success storey and other state governments are also looking at activities of MSRDC. The other aspects which are dealt effectively by MSRDC are land acquisition of around 1000 ha land in project alignment apart from 1338 ha for real estate development. The utility shifting along the project alignment was also done in a time bound manner through MSEB. Environmental clearance was also obtained in timely manner baring a single instance of Ghat region where re-alignment had to be done due to objection from forest department. The project was completed before the stipulated time of 2 years 3 months [17,18].

10.8 Coimbatore Bypass Road Project:

The Coimbatore Bypass was the first road project in South India on BOT basis. The road runs between Neelambur on the Salem side of NH-47 in Tamilnadu & Kerala, Madukkarai on the Palghat side. It involved construction of 28 Km long two way bypass road, the 32.2 m new Athupalam Bridge across river Noyal, The railway over bridge at Chettipalayam and maintenance of the old bridge at Athupalam; all in the state of Tamilnadu.

The bypass was expected to reduce congestion of traffic in Coimbatore city as well as Salem and Cochin highway running between Tamilnadu and Kerala. The shippers mostly export oriented units lying in the Cochin port for shipments, were other major beneficiaries in terms of time saving.

The govt. of Tamilnadu planned for the bypass as early as in 1970 to ease the traffic congestion in Coimbatore and in NH-47. However, due to paucity of funds the proposal was dropped at that time. After, 1995 as the GOI liberalized the policies and opened up road sector for private investments, MOST invited tenders for the this bypass on BOT basis. As the project was not viable of its own, after careful study GOI widen the scope with inclusion of the new bridge construction over river Noyal on NH-47.

The concession agreement for the integrated project involving the bypass and the bridge, was signed between MOST, Govt. of Tamilnadu and M/s L&T in October, 1997. L &T set up SPV namely L&T Transportation Infrastructure Limited. (LTTIL) with 100% equity shares. LTTIL implemented the project in BOOT basis, with revenue accruing directly to it. The project was financed by share capital of Rs. 416 mn and term loan of Rs. 620 mn, with a debt equity ratio 1.5:1. As per the concession agreement Tamilnadu government had to hold a minimum equity of 26% at the end of 30 years. The debt financing was done by State Bank of India (SBI), L&T Finance, HUDCO, HDFC and IDBI. IDBI has sanctioned Rs.300 mn for the project in the form of infrastructure bonds. The loan was given in two tranches Rs. 150 mn each @ 15% interest each. Principal repayment was to start from eight years onwards. SBI has loaned Rs. 300 mn to the project and it has got a "liquidity support" arrangement with IDFC.

The project which has reduced the overall distance by 2.5 km was completed in 22 months time. However, in the revenue collection front L & T has been facing lot of hurdles. The user first refused to pay the tolls at the old Athupalam Bridge. Tamilnadu government also backtracked and sought concession rates for state transport buses. It was willing to pay only Rs 0.50 per bus for making more than three trips as against planned Rs. 15 per bus per trip.

The local transporter association also went to High court against toll rates and even after court directives they were not paying the tolls. Since, December 1998 L&T was unable to collect the toll which has resulted loss of Rs.74.1 mn as on June 2000. This includes Rs. 11.4 mn out standings from Tamilnadu government towards reimbursement of their state transport buses.

In view of the above L&T was forced to request the state government to invoke force majeure clause and to take over the project. It was also under pressure from the financial institutions to create additional securities and enter into a financial restructuring. L & T tried to enforce toll collection strictly with the help of local police too, but lack of whole hearted motivation at governmental level, complicated the whole issue with political and vested interest [1].

10.9 Source to Tap Integrated Management Water Supply Contract in LATUR:

It was India's 1st source to tap integrated management water supply scheme covering a total area of 32.56 sq. Kms with of population about 4 lakhs. The transmission network of the existing scheme included 3 water sources, 3 Water Treatment Plants (WTP) of 109 MLD capacity (2 were inefficient, total used capacity was only 35 MLD), 4 pump stations (one for raw water), 2 MBRs, 10 ESRs, 1 GSR. A total of 31,000 house connections were available which would expect rise to 80,000 as per survey. Some of the problem areas in the existing scheme were (i) Inequitable water supply, (ii) Poor demand coverage (Twice per week covering 80% of population), (iii) Poor asset maintenance, (iv) Poor management of water supply account (Improperly-maintained records-Poor collection efficiency), (v) Lack of meters, (vi) Many illegal connections, (vii) High NRW, (viii) Latur Municipal Corporation (LMC) was not able to meet O&M costs and (ix) Lack of customer services and complaint redressal system.

In view of the above, Latur Municipal Corporation (LMC) formed a SPV named Latur Water Management Company in 2007. Maharashtra Jeevan Pradikaran (MJP) was chosen as the PMC. It was stipulate in the bidding criteria for paying of upfront premium by operator over a period of 10 years for use of the assets. SPML Infra Ltd. has begged the contract in September 2007. The capital cost of the project was approximately Rs. 130/- Crores. The Management Contract involves: (i) Operations & maintenance of water works for a period of 30 years (ii) Both bulk supply and distribution networks, (iii) Manage new connections including collection of applications, connection Charges, (iv) Manage regularisation of illegal connections and impose penalties as specified by MJP, (v) Implement Hydraulic Modelling and integrated MIS, (vi) Investments in metering, billing and collections for 10 years, (vii) Provide and install EEC marked water meters and recover expenditure from consumers establishing meter workshops, (viii)

Develop Customer Information System including 24x7 Call Centre, (ix) Bulk water transmission over 65 km and Distribution network over 600 km.

Table 3: Tariff structure as fixed for the project

Sl. No.	Consumer Category	2007-08 2008-09	2008-09 2009-10	2010-11 2011-12	2012-13 2013-14	2014-15 2015-16	2016-17 onwards
1	Domestic (Rs.)	8.80	9.60	10.60	11.15	11.17	12.30
2	Institutions (Rs.)	17.00	18.70	20.50	21.50	22.60	23.75
3	Industrial & Commercial (Rs.)	40.00	42.00	44.00	46.20	48.50	50.90

The proposed tariffs were to be increased in every 2 years. Collecting system-related data and reporting performance to MJP. The contract provides for Concessionaire paying a fixed sum per month to MJP.

Now a properly zoned, optimized network automatically reduces existing leakage, minimises future leaks, makes leakage control easier and prolongs the effective lifespan of the network where as the zoning analysis carried out to define static head zones (pressure zones) and rezoning through remedial work was recommended. Zoning plan was drawn up and fieldwork commenced for commissioning of the new zones. The tariff structure for the project also includes Special concessions offered to slums, unmetered connections in social functions. Some of the other important features of the project were working for variable cost calculation based on actual costs incurred by LMC over a period divided by actual volumes of water produced and pumped. Escalation in variable costs would be borne by the client and not the operator. Old debts of LMC towards electricity and raw water would be cleared by LMC. Supply to SPV will not be stopped. So far this project is running smoothly and proving to be a successful model for other cities [25].

10.10 Nagpur Water Supply Scheme:

When this project was conceived in 2006-07, the population of Nagpur was 2.5 million spread across 217 sq. Km which was set to double in next 25 years. The existing system had total pipe network 2,100 km in 10 Water Distribution Zones with 3 Raw Water Pumping stations and was catering a total 2,25,000 supply connections. The Water supply demand was 500 ML/day with losses 291 ML/day (54%). The operating cost at the WTP was Rs 3.30/ 1000 ltrs. and annual expenditure was Rs 106/- crores. Total demand from consumers in terms of monetary value was Rs 70.7 crores while recovery on water bill was Rs 50.0 crores. Thus, some major problem faced by the existing system such as Water Losses and UFW, Equitable distribution (Alternate day / 20 hrs/day), acute shortage for Water to Slums (inefficient system). Moreover, Water supply management during summer peak demand, Water network coverage and inadequacy of network, Capacity augmentation delay for future from limited water sources, Old and inefficient assets. These were coupled with Low water tariff and Poor billing mechanism, Lack of professional approach and Capital availability.

Fortunately, one water supply project under PPP was already underway in Nagpur City with 15,000 Connection including 10 slum areas covering a population of 1.5-1.75 lakhs. The contract had got penalty & bonus for targets in UFW, quality, customer services and continuity of supply. The rehabilitation plan included (i) Replacement of 100% House service connection & Meters, (ii) Replacement of old conservancy GI pipe, (iii) Rehabilitation of Tertiary network, (iv) Hydraulic modelling as per Master plan, (v) Installation of new billing system & Customer Facility centre, (vi) Continuity of Supply 2 to 24 hours depending on area of supply 24x7 throughout the zones, (vii) Complaint handling within 3 days.

Based on good results of the PPP water supply scheme thus far, proposal for entire city supply under PPP had been proposed and RFQ invited in Aug 2008 on behalf of the SPV created for the purpose, Nagpur Environmental Services Ltd. 10 bidders applied for Rs. 6.5 billion estimated cost project. For this purpose NMC has received Rs. 615 crores JnNURM sanctions for water supply expansion and would apply for Rs. 350 crores JnNURM grant for rehabilitation of distribution

network. It was proposed for a Performance-based contract for 25 years. The actual funding pattern would be 70% grant and 30% from operator Orange City Water Private Limited (OCW). The proposal includes Proposal to collect full user charges for assets created under JnNURM and rationalization of tariff for full cost recovery as well as subsidy to urban poor. It is worth mentioning that JnNURM funding are for better viability and reduced capital cost.

Concessionaire was to finance „Capex“ to rehabilitate, repair, maintain and provide proper backup ownership for refurbishing and replacing water supply infrastructure assets with NMC. For that, exclusive rights of operating water supply services, including collection of water charges assigned to Concessionaire on behalf of NMC were proposed.

However, all operational risk would rest with Operator. Concessionaire will retain fee in proportion of water quantum supplied & sold. Charge will depend on performance-related factors, limiting physical & commercial losses below certain levels and ensuring adequate collection efficiency. Regulator in place also ensured consumers receive expected service level at reasonable cost and protect short term and long term interests of consumers. It provided certainty for public and private investment and enhanced accountability and transparency as well as Control the financial performance. Regulatory Office set as an SPV created by NMC .The other stakeholders are the participant in the constitution of the SPV. Initial set up and annual operating budgets approved by the Parties chargeable to the Operating Cash Flow. Key Staff selected on the basis of merit references.

Regulator was to appointed for 5-year (extensible) contract. Regulator would be personally accountable for prejudice to the Parties. Public access to all resolutions and statements of the Regulator on the RO Web Site has to be displayed. Independent Regulatory Office would adjust rates, and monitor contract performance. Operator would be penalized on breach of its obligations under the Contract.

Performance bond in favour of NMC was obtained. Operator got Power of Attorney to act against illegal connections and disconnect bad payers, thereby getting rid of illegal connections. This model has been quite successful and gradually being adopted for many other cities of the country [25].

10.11 Integrated SWM- Guwahati:

Guwahati Metropolitan Area (GMA) covers a jurisdiction of 264 sq. km. and comprises of Guwahati Municipal Corporation Area, North Guwahati Town Committee, Amingaon. As per 2001 census itself its population was near 10 lakhs. With the onset of population explosion in Guwahati, the quantum of MSW generation has also increased. The previous system has displayed an array of problems, including low collection coverage, irregular collection service, open dumping, burning and handling issues among others. So it was felt to introduce a more scientific and integrated approach for this MSW of Guwahati.

It was proposed that door to door collection will be implemented in closed / covered vehicles. These would be transported to the processing and disposal site at Boragaon. It was expected that there would be 125 incoming trucks to bring in 500 TPD of mixed MSW and about 12-15 trucks for bringing 57 TPD of biomass at the project site. The project site was to develop in a 24.12 ha of land and includes construction of 8 meter high retaining walls, soil fill with necessary slopes of 1:3, over which processing plants and power plants would come up. It would have provisions for Refuse derived fuel plant (RDF plant) to handle 500 TPD of mixed MSW, Compost plant to handle 50 TPD of organic waste to produce manure. A power plant was proposed, boiler of which was to be fed with 180 TPD of RDF having calorific value of 2500-2800 Kcal/kg and 57 TPD of biomass. It was expected to generate 6MW power/ electricity.

A Special Purpose Vehicle (SPV) was formed namely Guwahati Waste Management Company Private Limited (GWMCL) to develop the project of MSWM system. It was agreed that equity shareholding of the consortium members/ sole applicant, in the issued paid up capital of the SPV

shall not be less than 76% during construction period and for 10 years following Commercial operation date and 51% during balance remaining operation period. M/s Ramkey Enviro Engineers Ltd. was the preferred bidders and final power tariff was fixed at INR 4.00. The concession period was fixed as 20 years from COD and construction period was 2 years maximum (Landfill and processing of waste 1 year each and power generation 2 year). Out of the estimated cost of Rs. 102 crore at the time of implementation, Rs. 36.34 crore was availed through a grant of JnNURM (70% of original DPR estimated cost) and rest (Rs.65.66 crore) developer was arranging @ 20% of the differential cost of DPR and actual implementation. There was agreed terms for monthly statements and bills of activities as well as disbursement procedure based on the above. Further, few additional support for capital raising by GWMCL was also agreed by GMC in terms of additional cells of sanitary landfills, bills for which need to be raised along with monthly tipping fee statement. GMC would pay Rs.130 per ton of waste for transportation with 4% annual escalations.

In spite of having well defined obligations for all the parties, Termination and Force Majeure clauses, defaulting clauses etc. this project has run into controversy after months of initial operations by the party concerned, leading to filing of PIL in the Guwahati High Court. As per the latest status the party has not yet started up the RDF, Power Plant etc. which was originally scheduled within 2 years of operations [27].

10.12 Integrated SWM – Hyderabad:

Hyderabad Urban Agglomeration (HUA) is the sixth largest in India with population of 57.5 lakhs in the year 2001 itself. It spread over an area of 778.17 sq. km. and consist of Municipal Corporation of Hyderabad (MCH), 12 peripheral municipalities, Secunderabad Cantonment, Osmania University and few other areas. As the city is a one million plus covered under JnNURM scheme, it is entitled to get 35% grant from Government of India, 15% from grant from state and to arrange its own 50% to avail the benefits. The DPR for the MSWM system, estimated cost of Rs.434.51 crore which includes cost of tools, equipments, vehicles and construction of treatment and disposal facilities.

To bring in the capital investment from the private sector and obtained efficiencies, the Greater Hyderabad Municipal Corporation (GHMC) has floated the idea of engaging private developer on suitable PPP format for 50% capital investment requirement.

The key features of this PPP model was 25 years of concession period from the date of commercial operation date (COD). The concessionaire has certain post-closer obligations for Landfill, which it shall continue for 15 years after the expiry of the active landfill period of 25 years.

The two stage bidding process was adopted in which two firms namely M/s Ramkey Enviro Engineers Ltd. and M/s Gujrat Environment Ltd. were qualified after going through stringent qualifying criteria. Bidder quoting the lowest tipping fee was to be selected. The various component of tipping fee were 40% for primary and secondary collection & transfer of waste to transfer station, 20% for transfer station management and transfer of waste to transfer station to processing facilities and rest 40% for treatment and disposal. M/s Ramkey was awarded the work based on their tipping fee of Rs.1449 per ton MSW. There is a provision of annul increase of 5% (without compounding) to the tipping fee. In addition on, 1st April each year base tipping rate to be adjusted based on variation in WPI. It is also agreed that this adjustment would reflect 60% of the inflation rate occurring during the period. There were agreed clauses (with provision for rate change or with original rates) for allocation of new sites for processing and disposal.

The GHMC has agreed to arrange for the concessionaire 35% of JnNURM grant from GOI as well as 15% share of Govt. of Andhra Pradesh (GoAP), provide power connections to transfer stations, treatment and disposal facilities, road connectivity to the above, hand over existing infrastructure to the concessionaire. It has got well defined dispute resolution mechanism, termination measures and role for independent Engineer and Auditor.

The concession agreement was signed on 21st February 2009 and the integrated SMW project was supposed to take off in July 2009. However, before that the workers of GHMC went for strikes opposing the move inviting entry to private party in their operational domain. After initial put off, the government had issued a memo permitting pre-construction works in January 2010. Another issue that stuck the project implementation was refusal of GOI to release Rs. 152 crore under JnNURM on the ground that the state has already exhausted its allocation for seven years apart from additional allocation of Rs. 100 crore as per Planning Commission's directive. Good news is however that the state govt. is coming forward to bail out GHMC with additional funds if GOI does not allocate under JnNURM [27].

11.1 Salient findings of the case studies:

Some of the salient features of the above case study projects are depicted in **Table:4**. It is interesting to see that most of the project concession period ranges from 20 years to 30 years and the construction period are normally restricted to 2 to 3 year term i.e. within 10% of the concession period. However, Metro Rail projects do not reflect the same scenario, in which case construction is little prolonged.

It is also revealed that there is no project specific Debt. Equity Ratio and same is chosen based on availability and arrangements of fund from various sources. However, for a stable financial structure Debt. Equity Ratio of around 2.3:1 have been preferred by most of the Project Developing agencies.

The government, in its part is still providing generous grants to Public infrastructure projects through various project development schemes like Jawaharlal Nehru National Urban Renewal Mission (JnNURM) and similar other schemes for Viability gap funding. It is worth mentioning that normal 20% VGF funding cap is enhanced to 40% in case of SARDP scheme of NHDP.

11.2 Performance of the case study projects:

It was also intended in the study to see the performance level of the case study projects with respect to six critical parameters of i) Financial Closer, ii) Land Acquisition, iii) Other Pre-Constructional activities, iv) Demand Revenue Generation, v) Debt Service repayment and vi) Service Condition. A survey among some of the associated stack-holders of the case study projects have been conducted, taking not less than 10 samples per project. The respondents are advised to mark their choice in a five point Link cart scale for evaluating the success ratings. These rating are HS for Highly Success (more than 100% target achieved), S for Success (100% target achieved), SWS for Some What Success (80-100% target achieved), PP for Poor Performance (80-50% targeted achievements), F for failed (Below 50% target). The responses of the survey participants are further subjected to statistical t-test at 5% confidence level to see the significance in difference of opinion. Those opinions which stand on basis on results of above t-test with no significant difference have only been accepted for reporting purpose. **Table5** depict the performance ratings for the case study projects based on the above responses obtained.

12. Looking Forward:

The trends in Public Private Partnership (PPP) financing in India from the recent past has signalled few concerns viz, over dependency of Private parties on borrowings from commercial banks, risk of assets and liability miss-match of the banks for long term exposes, concession agreements not having provision of interest rate alteration etc. In number of occasions bank has to restructure their terms of lending on behest of government intervention or on fresh regulatory conditions. Few examples are Punjab National Bank's restructuring in case of loan to Tamil Nadu Electricity Board, Allahabad Bank's to TNEB and Rajasthan Electricity Boards, few other banks like Dena Bank, Indian overseas bank, Bank of India are also in process of consultation with concerned state utilities [19].

Well defined contractual provisions can always be helpful with pre-determined guidelines for tackling project risk eventualities. NHAH has thus set the following for concession period adjustments in case of revenue shortfall due to reduction in traffic as in Table 6:

Table5: Performance ratings of case study projects

Performance parameters		Financial Closure (FC)	Land Acquisition (LA)	Other Pre-constructional activities (PCA)	Demand & Revenue generation (DRG)	Debt Service repayments (DSR)	Service conditions (SC)
Sl. No.	Name of the Project						
1	Terminal T3 of Delhi Airport	HS	S	S	SWS	SWS	S
2	Cochin International Airport	PP	SWS	SWS	S	SWS	S
3	East West Metro Corridor Project of Kolkata Metro	PP	PP	SWS	-	-	-
4	Delhi Metro Project	HS	S	HS	HS	HS	HS
5	Delhi Noida Bridge	SWS	S	S	PP	PP	S
6	Vadodara Halol Toll road (State Highway 87 of Gujrat)	S	S	HS	PP	F	SWS
7	Mumbai - Pune Expressway	SWS	S	HS	HS	S	S
8	Coimbatore Bypass	SWS	S	S	PP	F	SWS
9	Source to Tap Integrated Management Water Supply Contract in LATUR	SWS	-	S	S	SWS	S
10	Nagpur Water Supply Scheme	S	S	S	S	S	S
11	Integrated SWM- Guwahati	S	SWS	SWS	S	SWS	PP
12	Integrated SWM – Hyderabad	SWS	S	S	SWS	SWS	SWS

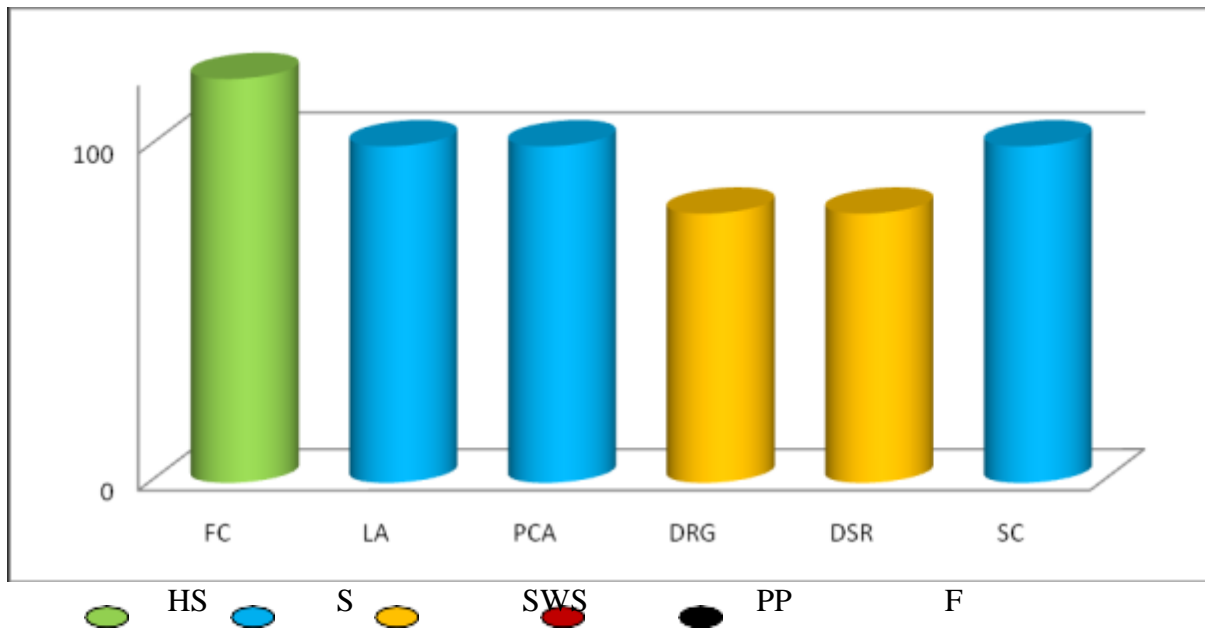


Exhibit 8: Performance rating in Different front of Project Development for Terminal of DIAL T3

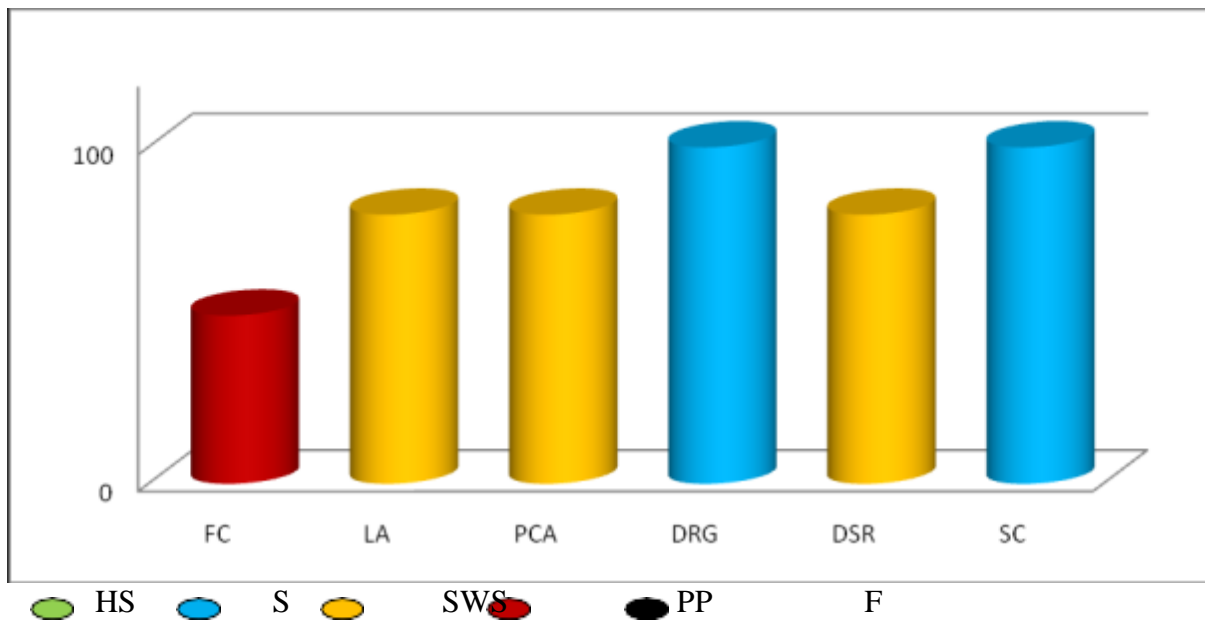


Exhibit 9: Performance rating in Different front of Project Development for Cochin International Airport

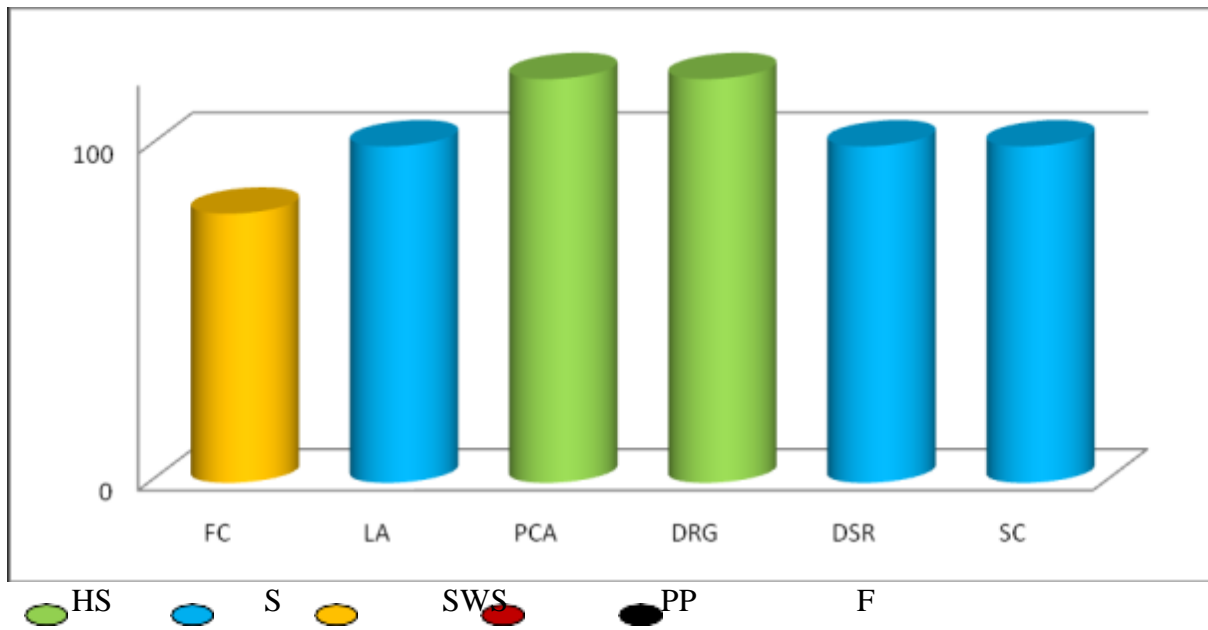


Exhibit 10: Performance rating in Different front of Project Development for Mumbai Pune Expressway

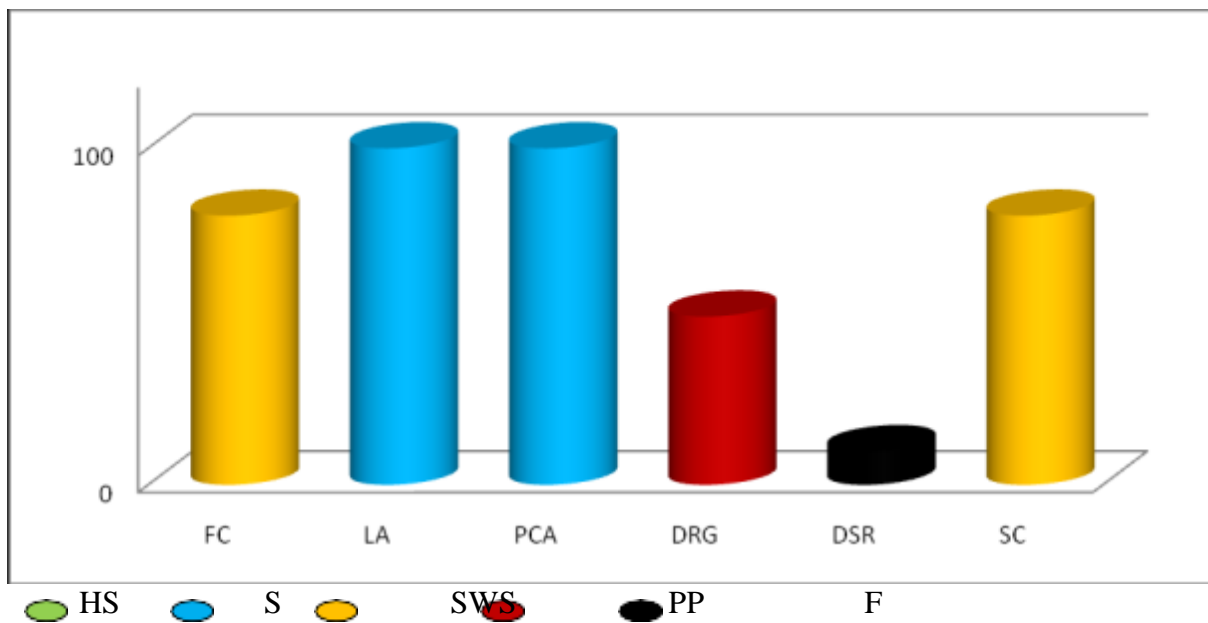


Exhibit 11: Performance rating in Different front of Project Development for Coimbatore Bypass

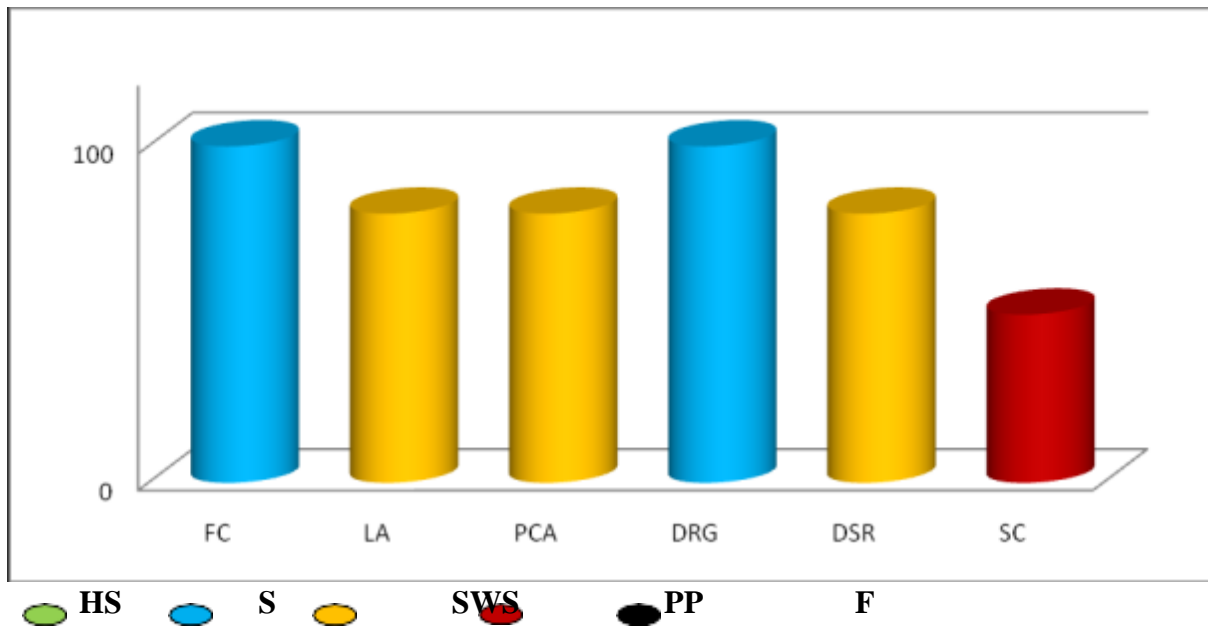


Exhibit 12: Performance rating in Different front of Project Development for Integrated SWM Guwahati

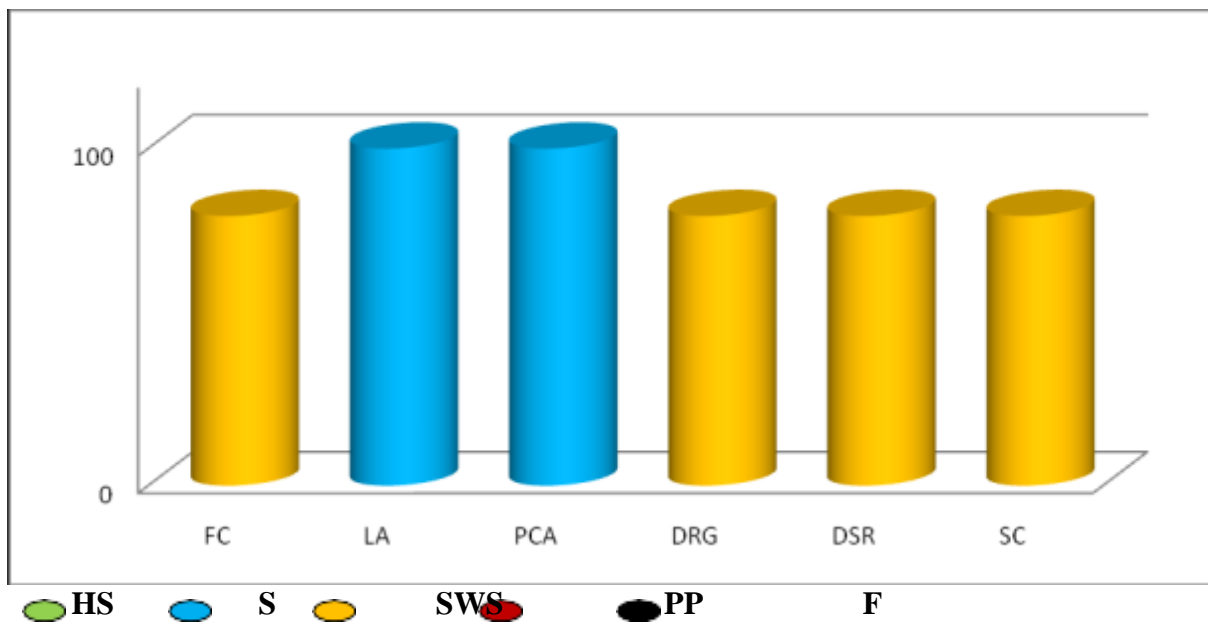


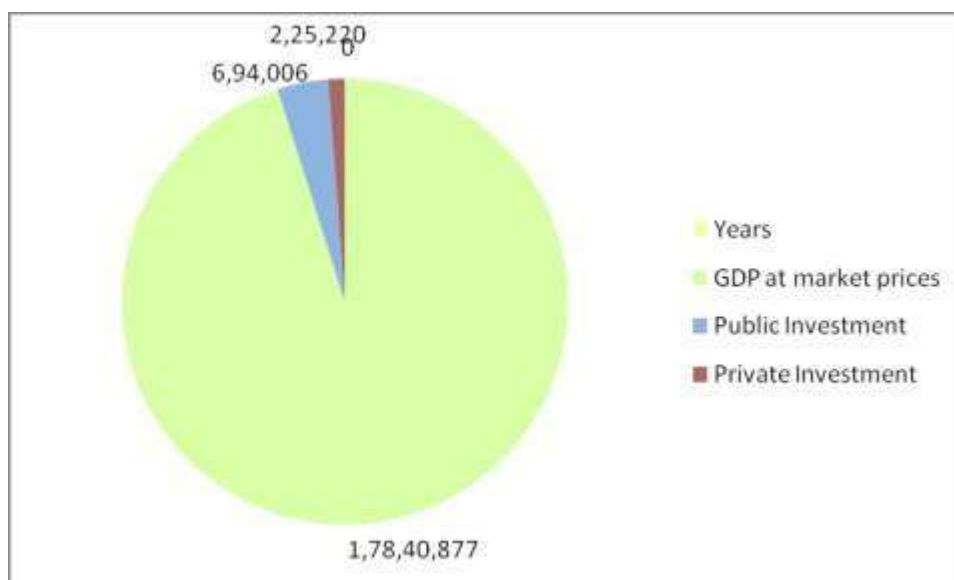
Exhibit 13: Performance rating in Different front of Project Development for Integrated SWM Hydrabad

Table 6: Adjustment of revenues by NHAI for shortfall in traffic

Type of Variation	Change in concession period	Cap on Concession period Variation
Actual Traffic < Target Traffic	For every 1% shortfall, concession period increase by 1.5%	20%
Actual Traffic > Target Traffic	For every 1% excess concession period reduction by 0.75%	10%

On the other hand, the National Highways fee rules (2008) amended in 2011 provides for increase in base rates of tolls by 3% per year as well as upto an extent of 40% based on increase in WPI. Further, toll charges for new structures (bridges, tunnels) to be determined based on construction cost. All, these flexibilities incorporated in the pricing mechanism only to pay back due return on the investment [8].

However, an active bond market can definitely increase the flow of long term funds and reduce excessive reliance on banks. Indian corporate bond market, though one of the largest in Asia, is still not matured enough to cope up the frequent changes regulatory, institutional or legal provisions. Nevertheless, government has provided a trading platform for the corporate bonds with a broad objective to invite sufficient funds for infrastructure developments in India. As part of that initiative, in 2011-12 union budget itself government had proposed to issue Rs30,000 crore tax free bonds[20]. NHAI has issued long term capital gains bonds, which is non-convertible redeemable taxable bond in nature of debentures. But, in light of current global financial crisis the government has to explore other innovative ways to ensure adequate flows of (private) financing to PPP projects. Estimates also suggest that closing the gap in service provision and meeting future needs will require infrastructure investment in the range of 7-8% of GDP a year [10, 22]. Private sector role is crucial here itself.

**Exhibit 15: Total distribution of Debt, Equity and Governmental Grant in 104 case studies (WB)**

The point of emphasis from the above discussion remains that if readily available finance can be arranged for the project at a lower rate of interest, the cost of development of the whole project will come down automatically to a substantial extent and in that case pricing or uses charge of the infrastructure too stands at a lower rate. If however, the financing is critically disturbed, the adverse effect will carry over to pricing part. In that case, pricing mechanism will have to be adjusted either in terms of enhancing the level of charges or in terms of extending the concession period. In most cases, second option is utilized. The cases in Delhi Noida toll Bridge, Cochin International Airport, Vadodara Halol Toll road did show us a trend in that line.

The focal point emerging out from all the above is that infrastructure finance is non-recourse in nature. Nevertheless, with careful financial structuring and with a proper pricing mechanism one can certainly hope to get back affluent returns on infrastructure investments.

References:

1. N. V. Ramana, S. Dutta, Coimbatore Bypass Road Project:Case Study No. FINC/010, IBS, Centre for Management Research, Hyderabad (2002), www.icmrindia.org
2. S. Seth, S. S. Sundaram, Road Pricing: An Assessment, Indian Highways, May (2006) 61-67
3. S. Sriraman, Foreign Involvement in Investment and Technology for Development, RITES Journal, April (2005), 16.1-16.8
4. K. K. Chitkara, Construction Project Management- Planning, Scheduling and Controlling, second edition, Tata McGraw Hill Ed. Pvt. Ltd., New Delhi, (2011).
5. Investment in infrastructure during Eleventh Five year plan, Secretariat for infrastructure, Planning Commission, New Delhi, Jan (2011), www.infrastructure.gov.in
6. K. C. Sarma, A Critical Study of Public Health Services in Assam : Cost – Benefit and Cost – Effectiveness Analysis, Ph. D. Thesis, G. U. (1993),112-131
7. Alan L. Sorkin, Health Economics in Developing countries, Lexington Books, London 1977
8. Guidelines for Investment in Road Sector, www.nhai.org
9. Financial Structuring of BOT project, Training modules for UNIDO BOT PROGRAMME, Investment and Technology Promotion Division, UNIDO.
10. C. Harris and S. K. Tadimalla, Financing the boom in public-private partnership in Indian infrastructure- Trends and policy implications, GRID LINES, PPIAF, C/O The World Bank, Washington D.C. 20433, USA, www.ppiaf.org , 45, Dec (2008)
11. M. Agarwal and D. Purkayastha, GMR’s Terminal 3 for Delhi Airport: A successful Execution Model for Public –Private Partnership Initiatives? : Case Study No. PROM/010, IBS, Centre for Management Research, Hyderabad, (2011), www.icmrindia.org
12. A. Indira, Cochin International Airport Limited –A case of Public- Private Partnership (B), : Case Study No. ECOA/129, IBS, Centre for Management Research, Hyderabad, (2005) , www.icmrindia.org
13. Anand and D. Purkayastha, Appraising Kolkata Metro Railway Corporation’s East West Metro Corridor Project, : Case Study No. FINC/068, IBS, Centre for Management Research, Hyderabad, (2011) , www.icmrindia.org

14. V. N. Prasad and S. Govind, The Delhi Metro Project: Effective Project Management in the Indian Public Sector, : Case Study No. PROM/005, IBS, Centre for Management Research, Hyderabad, (2006) , www.icmrindia.org
15. S. Pargal S., Concession for Delhi Noida Bridge, Secretariat for the Committee on Infrastructure, Planning Commission, New Delhi, (2007), 01-23.
16. Vadodara Halol Toll Road, Case Studies, PPP TOOLKIT for improving PPP decision making processes, Deptt. of Economic affairs, Ministry of Finance, Government of India, (2010-11), <http://toolkit.pppinindia.com>
17. H. Diwakar, Ramasamy, M. Patir, L. Sridhar and V. R. S. Kumar , Case Study of Mumbai-Pune Expressway And Coimbatore Bypass, Project Report submitted for partial fulfillment of course in Infrastructure Development and Financing, IIM Ahmedabad, (2001).
18. H. Maniar, Financial Viability of Project- A case study on Mumbai- Pune Express Highway, <http://www.financialexpress.com/fe/daily>
19. R. Ramdev, Credit Squeeze, Indian Infrastructure, 14, # 5, Dec. (2011),14-15
20. Key Features of Budget 2011-2012, <http://indiabudget.nic.in>
21. Infrastructure Public –Private Partnership (PPP) Financing in India, Draft Final Report, The World Bank, Pricewaterhouse Coopers, September, (2007).
22. C. Harris, India leads developing nations in private sector investment- But the region needs more investment to meet demand, GRID LINES, PPIAF, C/O The World Bank, Washington D.C. 20433, USA, www.ppiaf.org , Note 30, Mar. (2008)
23. Debt Financing, Indian Infrastructure, 14, # 5, Dec. (2011), 42-43
24. Position Paper on “The Solid Waste Management Sector in India”, Department of Economic Affairs, Ministry of Finance, November-2009.
25. Position Paper on “The Water and Sanitation Sector in India”, Department of Economic Affairs, Ministry of Finance, October-2009.
26. “Infrastructure investment in eleventh plan: Overview”, Interim report of the High level Committee (Planning Commission)-Aug 2012
27. “Toolkit for Public Private Partnership frameworks in Municipal Solid Waste Management Volume II – Case studies of PPP projects”, ICRA Management Consulting Services Limited INDIA, 2011
28. NHAI pushes for revival of highway sector, knocks at PM's office, “TIMES OF INDIA”, MAY 27th , 2013
