

The Mumbai Pune Expressway: A Case study

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**In Partial Fulfilment of the requirements of the course
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Submitted to:

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THE MUMBAI –PUNE EXPRESSWAY

As the first car on the first section of the Mumbai Pune Expressway (MPE) went through, Mr P.L Bongirwar, the joint MD of the Maharashtra State Roads Development Corporation(MSRDC) started thinking. “Its been a long way, from conceptualising the project to the position we are in today, and our claim of being able to halve the journey time from Mumbai to Pune should come true.”

Background of the Mumbai Pune Expressway:

The Mumbai Pune Corridor – a part of the National Highway NH4 is was identified by a study conducted by the Ministry of Surface Transport (MoST) during the seventh five year plan as amongst the three most congested national highway corridors in the country. MoST proposed that this corridor be developed as part of the “National Expressway System”. This corridor had been unable to develop because of high traffic volumes, high growth rates and restrictions on widening because of the topography of the Ghats and the lack of sufficient funds with the Government. Because of this, the corridor was unable to grow and match the needs of traffic. Handling around 20000 PCU’s¹ a day in 1990, it was projected that the traffic volumes would rise to around 100,000 PCU’s, necessitating a ten lane corridor between Mumbai and Pune. Exhibit 1 shows the traffic projections.

The GoM, in 1990, decided to construct a new expressway between the cities of Mumbai and Pune as a long-term solution to the problem and accordingly appointed RITES along with Scott Wilson Kirkpatrick (UK) to conduct a techno-economic viability study for the expressway.

The RITES recommendations:

RITES submitted its report in 1995 and recommended that a new expressway be constructed starting at Kon near Panvel and ending at Dehu road near Pune to be operated as an access-controlled tolled road. The road was to be constructed with the latest technology and incorporate features such as guard rails, dual carriageways, and speed monitoring equipment which would make it much more safer than the existing road.

In addition, the width of the road would ensure that congestion did not take place. Some of the salient features of the RITES report are as shown.

¹ Passenger Car Units

1. The construction of a dual three-lane expressway taking off from Kon near Panvel and ending on the Westerly Bypass outside Pune at Dehu Road. The total length of the Proposed road is 85 km.
2. The estimated project cost at 1994 prices is Rs 11,464 mn
3. Diversion of traffic to the new expressway is estimated to be between 40-45%.
4. The EIRR for the project is 17.81% as opposed to the Planning Commission's cut-off rate of 12%. Hence the project is economically viable.
5. Property development on the land in the vicinity of the expressway is a possible source of subsidy for the project.

(Source: The RITES-SWP Report, Volume 1)

The New Government's Role:

The GoM was had been newly elected in 1995. Because of the prestige value attached to the project, the GoM was very keen on early completion of the early completion of the Mumbai Pune Expressway. In July 1996, a policy decision was taken to implement the project as a BOT project.² Accordingly, appropriate tenders were prepared. Only one bid was submitted by Reliance India Limited. The bid was not acceptable to the Government on financial grounds.

Establishment of the MSRDC:

In order to accelerate the process of road development in Maharashtra, the MSRDC was established by the Government of Maharashtra through a resolution issued on 9th July, 1996 and incorporated as a limited company on 2nd August, 1996 under the Indian Companies Act, 1956.

MSRDC had been constituted with the following objectives³:

- To promote and operate road projects
- To plan, investigate, design, construct and manage identified road projects and their area development.
- To enter into a contract in respects of the works and any other matters transferred to the Corporation along with assets and liabilities.

² The Government of India had already declared this as a policy and this was adopted by making suitable changes at the state level.

³ Source: 1. MSRDC charter; MSRDC profile, www.msrdc.org

2. Source: Memorandum for private placement of Bonds, "Profile of the Organization", Jun 99.

- To invite tenders, bids, offers and enter into contracts for the purposes of all the activities of the Corporation.
- To promote participation of any person or body or association of individuals, whether incorporated or not, in planning, investigation, designing, construction and management of transport projects and area development.
- To undertake schemes or works, either jointly with other corporate bodies or institutions, or with Government or local authorities, or on agency basis in furtherance of the purposes for which the Corporation is established and all matters connected therewith.
- To undertake any other project and other activities entrusted by the State Government in furtherance of the objectives for which the Corporation is established.

MSRDC's mandate was to accelerate transport infrastructure development in the state by overseeing the completion of existing and new projects with the active participation of the private sector through a time bound program.

Because of unavailability of any private sector player and because of its mandate, the work of the MPE had been awarded to the MSRDC in March 1997.

Workforce:

Most of the workforce for the MSRDC came from the Public Works Department and CIDCO. The CIDCO employees had extensive experience in the development of large scale projects. Employees from the revenue department were also taken on deputation to help with the land acquisition process.

The top organizational structure of the MSRDC is as shown in the following exhibit 5:

Political Commitment:

In order to speed up the process of implementation of the project, the GoM constituted a High Powered Steering Committee under the chairmanship of the MD and VC of MSRDC, Mr. P.L. Bongirwar, for proper coordination among different Government departments and to obtain the requisite clearances.

Project required 646 ha of land for Rights of Way, 455 ha for quarrying and dumping area, and 1338 ha for real estate development.

The Chief Minister also convened a meeting of Secretaries of all departments in the GoM where an announcement was made that the MPE was a project not just of MSRDC, but of the GoM. This meeting proved to be very useful as can be seen by the fact that there were very few hindrances to the project.

A Steering Committee was also set up under the chairmanship of Mr. R.T. Atre, retired PWD Secretary, to recommend different technical standards to be adopted, to prepare geometric standards, and to help MSRDC in deciding upon various provisions of tender documents and related matters.

Appointment of Project Management Consultants:

The Steering Committee proposed that Project Management Consultants (PMCs) be appointed for preparing and ensuring consistency in design standards, cost estimates and tender documents, and to supervise the construction work as and when it began.

In addition it was also thought that if the technical aspects of the projects were taken care of by PMC's, then MSRDC could concentrate on the task of coordinating the various administrative requirements such as getting clearances, raising finances etc.

The Project Management consultants were to have the following functions:

- preparing estimates and detailed designs
- issuing tender papers & bid evaluation
- supervision: ensuring quality and correctness of work

Committees were to be formed to perform each of the aforementioned tasks by drawing personnel from each of the PMCs to ensure consistency.

A list of prospective PMCs was drawn up from the lists available with MoST and NHAI, and bids were invited from them. Because the most important skill for a PMC was considered to be Technical Skill, the selection criteria were such that 80% weightage was assigned to the technical bid and 20% to the financial bid. A condition was imposed that 1 PMC could work on only 1 section of the Expressway to avoid excess load on a PMC. Presence of a minimum number of technical supervisory staff at the project site was insisted upon before awarding the contract.

April 1997 – Bids for PMCs called for.

May 1997 – Receipt of bids from prospective PMCs.

June 1997 – Fixing of 6 PMCs – 1 each for Sections A, B, C and D; I for the Panvel Bypass; 1 for the Ghat section.

The following table shows the final section wise details of the PMC's and Contractors involved:

Section Description	Technical Consultants	Estd Cost in Crores	Tender Amount in Crores	Contractor
Section 'A' (Kon to Chowk) 13.232 km.	Stup Consultants with Hyder Consulting Ltd. U.K.	127.33	136.82	IJM/SCL Joint Venture
Section 'B' (Chowk to Adoshi) 16.629 km.	Intercontinental Consultants & Technocrats Pvt. Ltd. India	183.73	194.00	Hindustan Construction Co. Mumbai
Section 'C' (Kusgaon to Ozarde) 22.995 km.	Frishmann Prabhu (India) Pvt. Ltd.	177.46	163.56	Larsen and Toubro Ltd. Mumbai
Section 'D' (Ozarde to Dehu Road) 16.150 km.	Sir Owen Williams Innovestment	132.70	133.47	V.M. Jog Engineering Ltd. Pune
Ghat Section Package - I Adoshi to long tunnel 7.13 km	Consulting Engg. Service (India) Ltd.	86.46	93.15	Shapoorji Pallonj & Co. with Lighten Asai Jt. Venture Larson & Toubro Ltd. Chennai
Ghat Section Package - II Long tunnel to Lonavala bypass 8.28 km.	Consulting Engg. Service (India) Ltd.	108.96	104.35	Shapoorji Pallonj & Co. with Lighten Asai Jt. Venture Larson & Toubro Ltd. Chennai
Panvel Bypass Package - I 0/0 to 8/200, 8.20 km.	Technogem Consultants Thane	108.00	88.89	PBA - PCEC (JV) M. Venkat Rao Visakhapatnam
Panvel Bypass Package - II 8/200 to 9/750, 1.550 km	Technogem Consultants Thane	64.50	49.99	PBA - PCEC (JV) M. Venkat Rao Visakhapatnam
Tunnel Work 5 Twin Tunnel 5724 m. Tunnel Length		200.00	200.00	Kokan Railway Corp. Ltd.

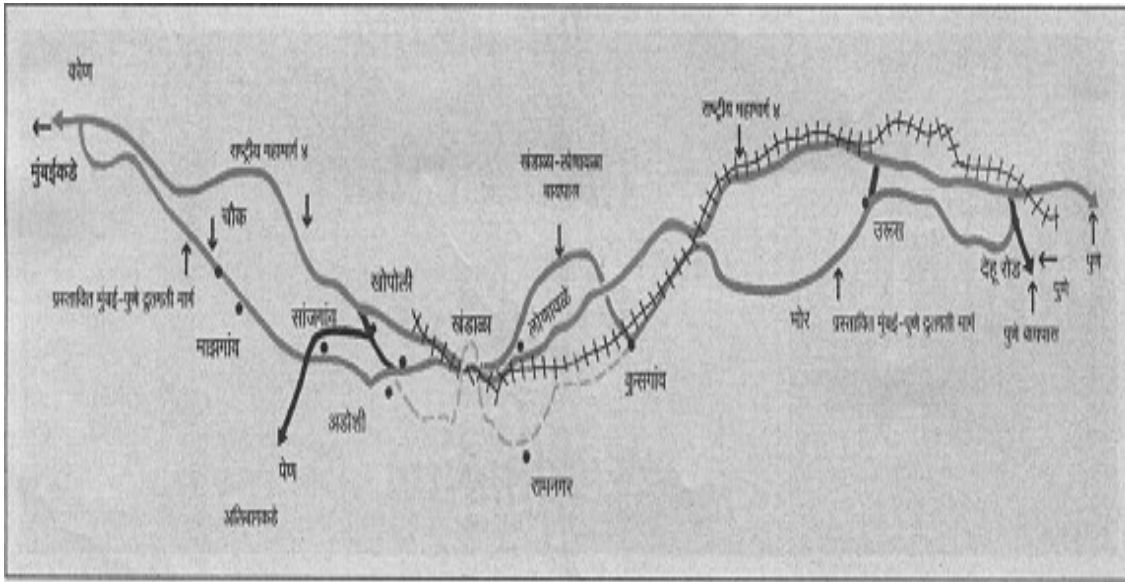
Other Exp. Tollplaza, Building, fencing sign boards, Technical consultants fees, etc			324.00	
	Total	1200.46	1488.00	

Source: MSRDC documents

Modifications to the Project:

In October 1997, forest and environmental clearances had been received. However, the Ministry of Environment and Forests did not permit construction of the new alignment in the Ghat area. The reason was that there was a danger to endangered species of flora (800 species of rare medicinal herbs found exclusively in the Ghats) and rare species of wildlife such as the mousedeer, the giant Malabar squirrel and some species of butterfly. The environmental management plan proposed was deemed not to sufficiently protect them.

However the MoEF allowed widening of the existing Ghat portion of NH4, along with the Lonavala and Khandala bypasses in lieu of the original expressway alignment. Hence the MoST clearance had to be obtained to widen NH4 and use it. The new expressway alignment would use the same corridor through the Ghats as the existing NH4, instead of the original alignment from Adoshi to Kusgaon. This would entail the construction of a bypass around the town of Lonavla to reduce congestion and increase the average speed on the road. However this also resulted in increase of the total km of the road by around 8km. The final alignment for the road is as shown:



(Source: MSRDC documents)

The dotted line shown the original alignment through the Ghats while the dark line shows the final alignment.

As a final modification in 1998, GoM decided that the Panvel Bypass be included as part of the Expressway, and GoI was requested to transfer work on the bypass to MSRDC. Then necessary clearance for this was obtained. The length of the project now was 95 km.

Issuing Tenders:

The Tender Committee was formed, in the manner stated above. In consultation with the Joint MD of MSRDC, it proposed the draft tender document. This was then discussed at length with the Steering Committee headed by Mr. R.T. Atre and the tender document for contractors was then finalized.

Stringent criteria had to be specified by selected constructors. Stringent qualification criteria were specified, so only those contractors having minimum experience in their main items of work, minimum number of required key personnel, and minimum financial assets and credit facilities could succeed. Although bidders could bid for more than 1 section, they would be eligible to get work for only 1 section. This was done to harness resources from 4 agencies for the work, and to finish the work within the tight schedule.

There was transparency in the bidding process. It was clearly specified in the tender document how the technical evaluation would be carried out on the basis of the

information provided. The maximum marks allotted to the various aspects were clearly specified in the tender document. If a bidder scored less than 75% on the technical evaluation, his financial bid would not be opened.

However, once the technical bid was qualified, a 75 % weightage would be given to the financial bid so that only financially viable and less expensive bidder was awarded with the final contracts. As a result of this the final bids were less than the estimated costs.

The criteria used for evaluation of the contractors were as shown in exhibit 6:

November 10, 1997 – Calling of bids for civil construction.

November 27, 1997 – Receipt of tenders.

January 1998 – Fixing of construction agencies after assessment, and issuance of work orders. Construction work started. The contract specified project completion time as 27 months from commencement of work (January 1998). The contract also required substantial completion in 24 months. It was proposed to open the Expressway to traffic by January-end 2000.

July 1998 – Tenders invited for widening the Khandala Ghat and the Khandala-Lonavala bypass.

Facilities given by MSRDC to consultants and Contractors:

To ensure quick and efficient working, and to ensure that the project was completed on time, MSRDC and GoM provided several facilities to contractors and consultants. These facilities include sops to the project partners, and also included completion of tasks that the consultants/contractors would normally have to do themselves. The expenditure on extra services/facilities did not, however, increase production costs – it reduced them by 8-10% as a result of speedy project completion and reduction in delay-induced cost overruns.

To PMCs:

- On-site facilities given to PMCs. Site offices constructed for PMCs by contractors at MSRDC's expense, and standard equipment like Xerox, printer, telephone provided.

To contractors:

Financial sops

- Running Account bills to be cleared within 10 days. Beyond that 16% interest to be paid.
- Materials to be provided at the project site at 75% of the market value.
- Escalation of steel, cement and bitumen prices to be absorbed.
- Mobilization advances and machine advances (up to 15% of project cost) granted to ease cash flow situation in the initial stage.
- Reimbursement granted for increase in sales tax or other taxes.
- For new construction machinery imports, customs duties to be reimbursed, to a limit of \$0.7 million.
- Bonus clause (Rs. 2 million / week) for early project completion. Penalty clause (Rs. 3 million / week) for delayed completion. Also, 4 milestones along the way, stipulated in terms of physical completion of important items in specified time. For non-achievement of milestones, compensation, subject to a maximum of 10% of contract value, was stipulated. Compensation was Rs. 2 million, Rs. 1.5 million, Rs. 3 million, and Rs. 3 million per week for milestones 1, 2, 3, and 4 respectively.

Land:

- Land for RoW acquired for almost the entire alignment so that the construction could begin immediately (1000 ha of land acquired in 8-9 months by liaising with the revenue department).
- Land for contractors' camps, site plants, crushers, quarries, muck dumping made available immediately at suitable locations.
- All this land was provided at no cost to the contractor.

Other services:

- MSRDC facilitated setting up of 8 substations through MSEB at suitable locations (*locations specified in tender document – so complete information disclosure and good advance planning*), from where the constructors could buy power supply.
- Explosives magazines set up at various locations to facilitate rock-blasting.
- MSRDC prompted HP and IOCL to set up petrol/diesel pumps adjacent to alignment.

- MSRDC took action to remove/divert utility services like power lines (cost Rs. 300 million, time taken 4-6 months), telephone lines, water lines, sewer lines etc. coming in the alignment.
- Took necessary tree cutting permission.
- Survey instruments and laboratory testing equipment procured at MSRDC's cost.

Construction Work Starts:

Construction work started in right earnest with the issue of the order to proceed with the works in Jan/Feb 1998. The contract completion date was specified as 27 months requiring substantial completion in 24 months when it was proposed to open the expressway to traffic by Jan 2000. The scale and time schedule of the work was unprecedented in the highway sector but Indian Contractors rose up to the occasion . Most of the technologies were being tried out in the country for the first time. The consultants also showed remarkable skills in adapting to new technology and monitoring techniques.

Environmental Problems:

Because of the large scale nature of the project, there was a significant impact to the environment. Hence an environmental impact assessment had to be carried out to estimate the effects of the project on the environment. The EIA was conducted by RITES. The EIA had identified the following components of concern:

- The water quality in the river Patalganga, Pauna and Indrayani which was used for drinking and industrial Purposes
- Drainage of the entire are along the alignment and in paticular, the low lying area around Panvel.
- Loss of forest are in general and loss of exclusive and rare flora.
- Effect on the wild life in ghat are and on endangered species. (Giant Squirrel and Mousedeer in Paticular)
- Land slides
- Severance suffered by the inhabitants of villages close to alignment
- Land Use and Grazing Pattern
- Landscaping in the Ghat section

Adverse impacts on other parameters such as air quality, noise, vibration, fisheries, navigation, land use, public health and places of archaeological and historical values were not expected to be appreciable, though ,mitigative measures to minimise their adverse impacts had to be implemented.

The EIA also had identified certain positive impacts:

- Travel between Mumbai and Pune would be economical , safe and fast.
- Traffic Volume on NH4 would decrease because of diversion to the expressway, reducing the traffic intensity and hence the air and noise pollution on NH4.
- Inconvenience faced by the people at Panvel , Khopoli, Khandal and Lonavla, because of the traffic intensity would be reduced.
- Industrial activity at Panvel, Rasayani and Pimpri would be enhanced.
- Commercial activity would come up at the point of access to the proposed expressway
- Job Opportunities would be created during construction and operation of the expressway.

However in order to mitigate the impact on the environment, an environment management plan was formulated. The objectives of the plan were as follows:

- To mitigate adverse effects on environmental resources identified in EIA
- Protect Environmental resources where possible
- Enhance the value of environmental components where possible
- Monitoring to evaluate success or failure of measures

The Environment Management Plan is shown in Exhibit 9.

The costs because of the plan were estimated to be as follows:

Total Capital Cost:	
Afforestation	Rs 30 lakh
Minimisation of Severance	Rs 3874 lakh
Development of Grazing lands	Rs 80 lakh
Annual Recurring Costs:	
Monitoring Costs	Rs 6.0 lakh
Ecology Survey	Rs 3.0 lakh

Source: Environmental Impact Report, RITES, Volume 3

Litigation:

From the beginning itself MSRDC had adopted a very proactive stand towards litigation in the project. There was a realization that litigation could induce substantial delays in the project. The MSRDC could appoint a panel of legal experts for handling cases. Also there was a policy that the organization would respond to any court order in the fastest possible time. This ensured that the problem of re-seeking appropriate dates was minimised. Political influence was also used to make sure that there would be little legal problems. In addition to this there was a dispute redressal mechanism for contractors, because of which contractors involved themselves in little litigation. During the award of the bid itself care had been taken that the contractor did not have a poor history of litigation.

Jan 1998: Construction starts (exhibit 6)

April 8, 1998: Groups in Pune start opposing the project saying that it is a sheer waste of taxpayers money.

July 6, 1998: The sole objection to be raised by a private party against the proposed Mumbai-Pune Expressway squashed. (All the other objections were raised by Public Interest Groups) (Refer exhibit 7)

Dec 9, 1998: Mumbai high court admits writ petition, restrains the state government and MSRDC from further acquisition and displacement of tribals and villagers affected by the controversial Mumbai Pune expressway, till the pendency and final disposal of the case

Jan 4, 1999: Stay on acquisition released.

The protests against construction continue throughout the execution of the project.

Financial structuring of the MSRDC and the MPE:

The MSRDC was raised with an equity contribution of Rs 150 crore from the GoM and s 125 cr from the Bombay Municipal Corporation.

The means of finance for the MSRDC as of July 12, 1999 were as follows.

- Budgetary Support from BMC and GoM: Rs 275 cr
- Loan from MMRDA: Rs 548 cr
- Bank Loans: Rs 107 cr
- Capital Market borrowings:
- Bonds(rated AA) of over Rs 1897.6 crores

The details of these bonds are shown in the exhibit 9:

The Government of Maharashtra had guaranteed the bonds. As a result the rate of interest in these bonds was low (~14%). The bonds had been rated as AA. Exhibit 8 shows details of two series of bonds.

It was proposed that the toll collections from the MSRDC's projects would be used to pay the interest obligations on the bonds. In case of the Mumbai Pune Expressway, it was estimated that during the initial years when the toll collections were not high enough to service the interest obligations, alternative revenue source such as the sale of land along the highway would be considered. They had even laid telecom ducts along the sides of the expressway hoping that these could be leased and would serve as an additional source of revenue.

The toll rates proposed were as follows:

Type of Vehicle	Toll for full Length	Toll for Interchanges	Panvel Bypass
Car	80	50	15
LMV	135	80	20
Truck	190	115	40
Bus	270	160	40
2/3 axle container	450	270	90
Trailer Truck	600	360	120

The toll collections were estimated considering that around 40 -50 % of the traffic on the NH4 would divert to the expressway. The majority of users were expected to be trucks and Multi axle vehicles and they would contribute a significant amount of revenue. Accordingly the toll rates for the expressway had been designed. There was a lot of risk involved especially if the traffic growth did not match up to the expectations. But MSRDC was optimistic on this count, and it was widely perceived that in addition to the current users of the roads, there would be growth on account of extensive containerization at the JNPT and that most MAV's would use the expressway instead of the existing road. This would further the MSRDC's goal of increasing the efficiency of transportation in the sector, since with the encouragement to MAV's, lesser number of vehicles could carry larger loads.

The Future:

May 1, 2000:

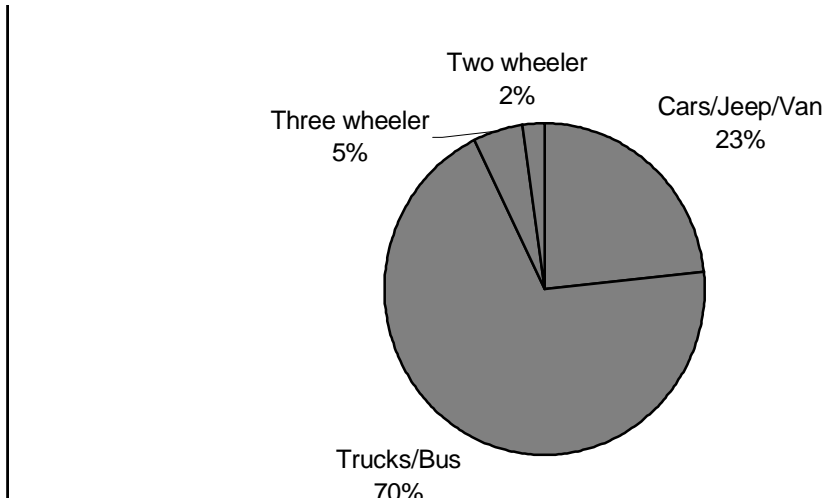
As he watched the first car zoom away into the distance, Mr Bongirwar had several things on his mind. Had they taken the correct decision when they decided to use the existing alignment through the Ghats?

Would they be able to collect enough toll to make the project financially viable in the long run? And because of the tremendous economic impact of the project and the extremely long-term nature of these benefits, did it even matter if the project was not financially viable? Did it make sense for MSRDC to charge the BMC and the PMC for contributing to the economic development of the cities?

The whole basis of executing the project had been to speed up those activities that typically impede a project. But would they be able to replicate these methods elsewhere, where there was little political support? One thing gave him satisfaction though, that his claim that they could manage the project in far lesser time at a lesser cost had materialized. Now the only thing that remained was opening the remaining sections of the expressway to traffic. Once this was done they would charge the full toll rates. Till then, they would do with one third the rates. He just hoped that a sufficient number of vehicles would take the new road once the entire stretch was completed.

Exhibit 1:

Traffic Profile on existing NH4:



Source: RITES report on the feasibility of the MPE, Volume 1, Average traffic count on the basis of surveys at Panvel, Khopoli, Lonavla and Shedung (1992 data)

Exhibit 2:

Traffic projections, 1992- 2004:

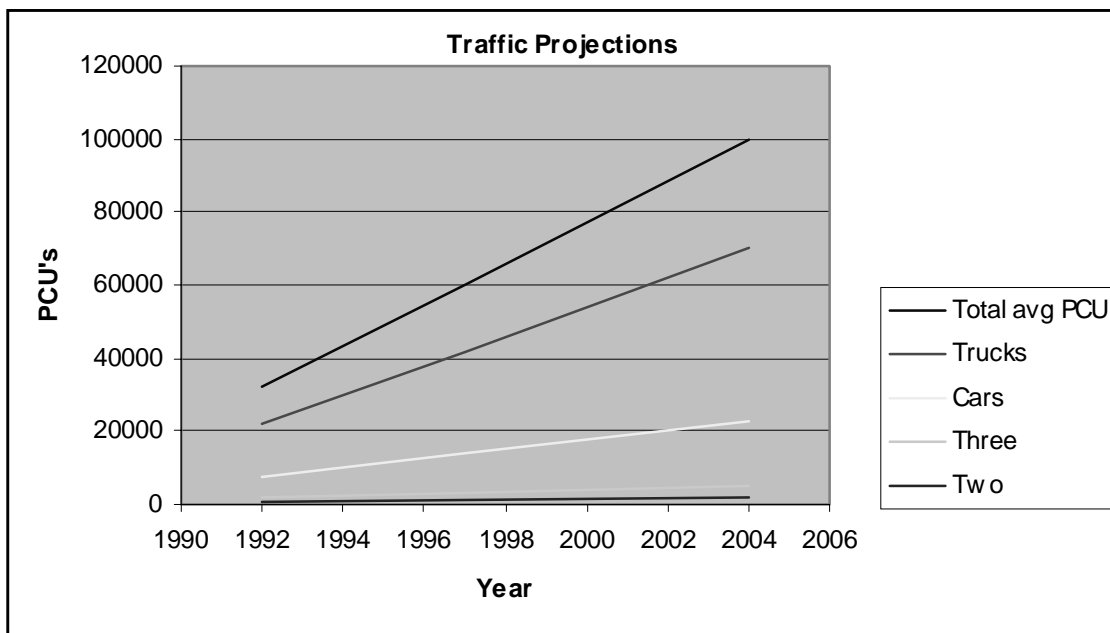


Exhibit 3: Accidents on the Existing NH4:

Year	Total accidents	Head on Accidents	Fatal Accidents	Persons killed	Insurance @
1990	2109	1687	246	287	21
1991	2342	1874	257	301	23
1992	2670	2136	288	365	27
1993	2670	2136	306	352	27
1994	2901	2321	324	359	29
1995	3576	2861	393	486	36
1996	3613	2890	366	316	36
1997	3870	3096	386	NA	39
1998	4128	3302	406	(est)	41
1999	4385	3508	426	(est)	44
2000	4642	3714	446	(est)	46
2001	4900	3920	466	(est)	49
(Source: IMC)				Total	Rs.418 cr

@ Rs. 1 lakh per accident

Exhibit 4:

Estimated Savings on account of the MPE:

1. Savings in annual fuel consumption because of reduction in congestion:
Rs 80-90 crore
2. Reduction in Vehicle operating costs as compared to a similar distance elsewhere with lower traffic congestion: Rs 100 (from Rs 160 - Rs 60)
3. Reduction in Journey time between Mumbai and Pune: 2 hrs
4. Reduction in the accident rate. (currently 410 accidents p. a.). Reduction in insurance cost : 49 cr per annum.

Exhibit 5: Organisational structure:

Mr. Vikramsinh Patankar – *Chairman*
Minister - P.W. (P.U)

Mr. Chandrakant Shivarkar - *Co – Chairman*
Minister of State - P.W. (P.U) & Excise

Mr. Ajit M. Nimbalkar - *Vice Chairman & Managing Director*

Mr. P.L. Bongirwar - *Jt. Managing Director*

Mr. M.V. Patil – *Director*
Secretary (Roads), P.W.D., Govt. of Maharashtra

Mr. A.B. Pawar - *Director*
Secretary (Works), P.W.D., Govt. of Maharashtra

Dr. P.S. Rana - *Director*
Director (Corporate Affairs), HUDCO

Mr. V.P. Raja - *Director*
Secretary (Water Supply & Sanitation Dept), Govt. of Maharashtra

Mr. A.K.T. Chari - *Director*
Chief Operational Officer, IDFC

Mr. Sailesh Mahimtura - *Director*

Mr. Sanjay Kirloskar - *Director*

Executive Committee:

- **Mr. Ajit M. Nimbalkar** - *Vice Chairman & Managing Director*
- **Mr. P.L. Bongirwar** - *Jt. Managing Director*
- **Mr. R.K. Jha** - *Executive Director (Projects)*
- **Mr. Jayant Deshpande** - *Vice President (Development)*
- **Mr. K.S. Pandav** - *Secretary & Financial Advisor*

In addition there are chief engineers in charge of each project followed by Superintending Engineers and Executive engineers.

Exhibit 6: Criteria for technical evaluation of Contractors

Annexure III: Award of Contract

Award Criteria:

Subject to clause 29.0 of the ITB, the employer will award the contract to the bidder whose bid has been determined to be substantially responsive in accordance with clause 28.2 of the ITB.

Criterion	Maximum Marks
1. Structure and Organisation	20
2. Financial Strength	40
3. Work Experience:	
a. General	10
b. Similar Works	30
4. Plant and Equipment	40
5. Quality of Works Executed	20
6. Timely Completion/Litigation record	40
Sub total A	200
1. Personnel available	40
2. Work Plan	40
3. Quality assurance	20
Sub Total B	100
Total	300

Bidders who score not less than 60 % of the marks separately and not less than 75% on the aggregate will be deemed to have qualified in the technical evaluation and cover 3, the proce bid of only such beidders will be opened. Provided however, that bidders who otherwise

qualify as aforesaid shall be liable to be disqualified if they have:

- Made misleading or false representations in any of the forms, statements, and attachments submitted in proof of the qualification requirements
- A record of poor performance such as abandoning works, not completing contracts, inordinate delays in completion, bad quality of work, litigation history or financial failures.

Source: MSRDC internal documents

Exhibit 7:

02 Jan 1998

Malaysian firm, two others bag Mumbai-Pune expressway deals

OUR INFRASTRUCTURE BUREAU

MUMBAI, January 1: Maharashtra State Road Development Corporation (MSRDC) on Thursday gave away work orders worth Rs 494.38 crore to three developers for the construction of three sections on the ambitious 84-km Mumbai-Pune expressway. The Rs 127.33-crore contract for the 13-km Kon-Chowk section has been awarded to IJM-Sathyam joint venture. IJM, a Rs 1,000-crore Malaysian company involved in highways, ports, airways and power house construction, has a majority holding in the Secunderabad-based Sathyam company, a leading player in computer software and construction. Sathyam's turnover is Rs 200 crore. Indian construction major Hindustan Construction Company (HCC) has been given work order for the development of a 16.65-km section between Chowk and Adoshi at the cost of Rs 194 crore. Larsen and Toubro has bagged a contract worth Rs 163.56 crore for the construction of a 23-km section between Kusgaon to Ozarde. Public works minister Nitin Gadkari told reporters that the Rs 100-crore contract for the construction of tunnels has already been awarded to the Konkan Railway Corporation, adding that the MSRDC has signed a memorandum of understanding with the latter. Gadkari said that the tender submitted by the Hyderabad-based Nagarjun Construction Company (NCC) for the Rs 132.70-crore Ozarde-Dehuroad section (16.65 km) was below 15 per cent (Rs 112 crore). He stated that NCC's bid has been referred to the ICICI for scrutiny.

The minister said that the construction would be completed by January 1, 2000, and the Mumbai-Pune expressway would be made open for vehicular transportation. He informed that the contractors would be given a bonus of Rs 20 lakh a week if they complete work before two years, while a penalty of Rs 30 lakh would be charged on them if they fail to meet the deadline.

He gave a pat to the MSRDC for awarding contracts in record time. Bids were invited on November 11, 1997, while pre-bid meeting of all the prospective bidders took place on November 27, 1997, and clarification to bid the document on December 2, 1997.

He said that detailed discussions with various lowest bidder in each section took place on December 30, 1997, while the final bid approval was given on December 31 by the steering committee appointed by the MSRDC. MSRDC had received 55 bids for these four sections, he said. Gadkari said that contractors were entitled for extension in custom duties on construction material imported from outside, while they would be given exemption of excise duty on ready-mix concrete.

The MSRDC would give 15 per cent advance to these contractors, while it had already acquired the necessary land for roadway and quarries and received permissions for explosives. He said that MSRDC had appointed STUP Consultants Ltd, ICT Pvt Ltd, Frischmann Prabhu (India) Pvt Ltd and Sir Owen Williams (India) Pvt Ltd for these four sections for the purpose of detailed engineering and for construction supervision of works.

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Source: Indian Express (www.indianexpress.com)

Exhibit 8:

Monday, July 6, 1998

Acquire private land for expressway: HC

Express News Service

The Mumbai Pune Expressway: A case study

MUMBAI, JUNE 3: The sole objection to be raised by a private party against the proposed Mumbai-Pune Expressway was squashed today when the Bombay High Court vacated a stay on the acquisition of an acre of private land near Lonavala. The rest of the objections to the expressway were raised by groups as public interest issues. The plot of land, owned by Nanikram Murlimal Devnani, is situated in village Dongargaon in Pune district. The plot (survey 386/2), measuring barely an acre, was located bang in the middle of the expressway, which made it crucial to acquire it. Devnani challenged the acquisition in High Court, claiming that the acquisition procedure was not adhered to, and that he was not given due notice and adequate hearing before the land was taken into possession. The division bench of Justice A A Desai and Justice T K Chandrashekhar Das had admitted Devnani's petition in January this year. They ordered status quo on the land until final disposal of the petition. However, the state government filed an affidavit to clarify the situation today before the division bench of Chief Justice M B Shah and Justice R M S Khandeparkar. State Advocate General C J Sawant, appearing for the government, claimed that it had complied with every possible procedure of acquisition. Devnani was given notice as well as paid adequate compensation, the government claimed. Copyright © 1998 Indian Express Newspapers (Bombay) Ltd.

Source: Indian Express (www.indianexpress.com)

Learning Note:

Following are the issues that can be raised through the case:

1. Was the Expressway really needed?

Typical performance indicators for roads are as follows:

- Safety indicators:
 - The aggregate number of transportation-related fatalities
 - The aggregate number of transportation-related fatalities divided by 100 million passenger-miles.
 - The aggregate number of transportation incidents.
- Mobility Indicators:
 - Percent of km of pavements with poor ride quality (International Roughness Index more than 170 inches/mile).
 - Percent of bridges on the NHS and percent of all bridges structurally or functionally deficient.
 - Measure of time between system disruption and restoration.
- Economic Indicators:
 - Expenditure on passenger transportation per passenger-mile.
 - Expenditure on freight transportation per ton-mile.
 - Comparison of actual costs to projected costs in transportation improvement projects.
 - Hours of delay per 1000 vehicle miles traveled.
- Indicators related to the Natural and Social Environment
 - Emission Levels of CO₂, CO, No_x, So_x and greenhouse gases
 - Noise Levels within 50 mts of the road
 - Wildlife, Destruction of Fauna, Harm to Endangered species because of a project
 - Severance, Loss of Grazing land etc.

As the case says, in terms of the traffic volumes and the safety record of NH4, there was a case for developing the road. A qualitative evaluation of the NH4 on the basis of the above indicators reveals that NH4 was a poor performer. In comparison, the benefits from the expressway are as follows:

- Reduce time of travel to 2 hours
- Reduce VOCs from Rs.160 to Rs 60
- **Reduce accident risks**
- Reduced vehicular pollution
- Improved efficiency of freight movement
- Externalities

The reduction in time lost itself is a significant advantage, though it is difficult to quantify it. The time that would have otherwise been wasted on the road, can be used for value adding economic activity elsewhere. This signifies a tremendous benefit. As far as the vehicle operating costs are concerned, most of them are related to fuel consumption. A reduction in fuel consumed on the road means reduced pollution and has tremendous economic advantages for a country like India which is not self sufficient in Petroleum. One of the main reasons for the delays that occur on NH4 is accidents because they tend to block traffic on the narrow road. In terms of the human costs of accidents NH4 serves very poorly. One of the performance measures used by the US Department of transportation is the average time required to remove impediments on the road. Because of the narrowness of the road, this meant higher time to required for help to reach the accident site.

2. Why was the Private Bid rejected?

The most obvious answer to this question is because the bid amount was significantly higher than the estimates prepared by RITES. (Rs 3000 cr as opposed to Rs 1600 cr)

The reasons behind this need to be investigated. We can identify the following reasons:

- The cost of capital for Reliance industries would have been much higher than for the MSRDC. MSRDC raised most of its capital through private bond placements at a very low rate. The reason for this is the guarantee that was given by the GoM which enjoys a good rating, because of which the bonds were AA rated.
- Raising such a large amount of debt would have significantly affected the company's balance sheet, the alternative would have been going through the project financing route by floating an SPV.
- The risks involved in the project are very high. Firstly there is the technical risk that construction of the road would be very difficult and there would be

significant cost overruns when the construction would actually start. There is also the financial risk that the company would not be able to collect toll because of various reasons: Political reasons, the risk that the courts would stop toll collection or because the traffic did not match upto expectations. Because of this, any private sector bidder would have preferred to have its cash inflows in the beginning i.e. by making a profit during the actual construction of the road and this was only possible by making bids at significantly higher amounts than the estimated costs.

- The implication of this is that in a large scale risky project such as this one, only the Government or a government back body could have implemented without making a profit during construction. A private sector player would have come in only if the Government had guaranteed a good return on his investment if toll did not materialise. Since the cost of capital for the Government was lower than that for a private player, it made sense for the Government to hand over the project to the MSRDC.

3. The importance of Political Will:

The most important factor that enabled the construction of the road is political will. According to internal sources of the MSRDC, "The project could achieve its present level of success only because of the active support and cooperation of all wings of the Government and above all the strong political will in favor of the project right at the top level" The fact that the CM himself intervened is also significant. In fact, the absence of large scale litigation and protests can be attributed to a general political consensus about the importance of the project.

4. The use of PMC's:

The functions of the PMC's were as given in the case. But what is important is that because of the PMC's MSRDC freed itself from the day to day monitoring of the construction work . It could then concentrate in the next level of project management-ensuring coordination with other departments for land acquisition, quarry permits, explosive permits, labor and environmental issues etc. The workforce structure is also significant because officials from the PWD could monitor the technical aspects while

officials from the revenue department could liason with their former department for land acquisition.

For PMC selections, more weightage was given to the technical competence of the bidder.

5. Contractual Issues:

While selection of contractor, it was ensured that only technically superior parties got through and out of these the best financial bid was selected. This prevented a technically inferior bidder from undercutting a technically superior bidder and ultimately resulting in poor quality of work. Another interesting aspect is the high weight given to the past history of the contractor. This ensure that contractors likely to delay the implementation are unlikely to win a bid.

Project split into 4 sections + Ghat section + Panvel bypass. This was done keeping in mind the short time frame for construction, and the present level of availability of constructors' and consultants' capabilities. Entry criteria specified above.

The bidding and consultant/contractor selection process was also speeded up so as to reduce the time required for project completion.

6. Speedy Implementation:

Speedy implementation of BOT projects is advantageous because of the following reasons:

- Savings due to reduction in cost escalation and the amount of interest to be paid during the construction period.
- Savings due to reduction in time overruns
- Cash inflows start before time which significantly improves the NPV of the project.

Typically projects of this size are faced with a huge number of impediments. There are a number of activities such as land acquisition, electricity, utility removal , availability of petrol etc without which the project cannot start. Hence these are on the critical path. Though seen by themselves, the investments required in improving these do not seem worthwhile, they are so because if these activities get delayed, the entire project gets delayed and the interest on the entire project has to be paid. Hence the facilities given by the MSRDC to the contractor are necessary if the contractor has to focus on his work. Also , MSRDC being essentially a government organization is in a far better position to

get the various clearances required, than a private party who will have to bribe his way through This will have a reflection on the project cost.

- Given the financial sops MSRDC granted to the contractors, the project was structured in such a way that MSRDC bore ALL the non-project risks of the project. This is also important in the process of speeding up the implementation because with all his risks taken away , he can focus exclusively on his work.
- There is also a policy of taking contractors into confidence – no animosity as in normal projects. The bonus and penalty clauses in the contract are also important because of the tremendous incentive to the contractor not to delay the work.
- The importance given to reducing the impact on the environment is also important. What is significant is that a 39 cr investment out of an investment of 1600 cr is sufficient to mitigate the impact of severance. This aspect is not taken care of in most infrastructure projects, leading to extensive litigation.

7. Financial Viability:

- The Government guaranteed repayment of all loans taken by MSRDC. Thus, with an equity base of Rs. 50 million, MSRDC was able to raise debt of Rs. 21208.1 million.
- In order to pay the interest obligations, sufficient toll has to be generated. However it is not necessary that all the interest be paid out of toll, or from the other sources of income. The money required for interest payment can again be borrowed. This can be explained as follows:
- In the Indian Capital Markets, Bonds of duration greater than 12 years cannot be issued. Hence after 12 years there will be a huge cash outflow which will anyway have to be financed through borrowing. Till then the difference between the interest outflow and the toll collection may also be borrowed. (Note that in such a project, almost all costs are incurred upfront and the choice of design technology in this case (i.e. rigid pavement technology) is such that operating costs are very low.)
- Traffic growth takes place on a compounded basis: Increase in number of vehicles with GDP * the increase in collection/ vehicle because of WPI inflation.

- The interest payments are fixed. Hence there is a certain breakeven rate in 30 yrs which makes the project viable. This rate turns out to be 14 % with the given data. The actual rate of growth is larger than this. Hence, even if MSRDC is unable to meet its interest obligation now, the project still remains financially viable.

8. Is Financial Viability Important:

It is practically very difficult to estimate the benefits due to the tremendous positive externalities associated with roads. The economic return to communities from such road development is substantially higher. This is mainly due to the many positive externalities that accompany road projects. These include increases in the overall efficiency of the economy and its rate of growth as well as increases in the value of land surrounding the road. These benefits, however, are usually difficult to measure and price since they accrue to the community as a whole. Only the Government can capture some of this value through an increase in the productivity of the economy and the consequent increase in tax revenues. Financial viability is not important in this sense because the financial rates of return of roads are very low. But given the tremendous benefits that have been listed for the MPE : Mobility, Safety, Environment and Economical, there is a case for constructing an expressway even if financial rates of return are very low. Alternative mechanisms such as petrol levies and taxation of the cities concerned may be used to subsidize this road. One possible alternative that is described is the subsidy from the PMC and the BMC, both of which will benefit in the long run because of the economic opportunities generated by the Mumbai Pune Expressway.

9. Problems of Toll roads:

As can be seen from the traffic profile, trucks and buses are the most important in order to increase toll revenues. However, in India, a typical problem that is faced is the mentality of Truck drivers to avoid toll. Car drivers tend to be much more flexible because the value of time tends to be high. It is hoped that over a period of time, the mentality of truck drivers changes and they pay much more attention to the vehicle operating cost and also the opportunity cost of time.

One problem that the MPE will continue to face is competition from NH4. In fact, because of diversion of traffic to the MPE, the congestion on NH4 has gone down, hence

there is a lower incentive for drivers to shift to the new road. This has had an adverse impact on the financial viability of the MPE.