

# 5

## TRANSPORT

### ROADS

In 2001, the National Highways Authority of India (NHAI) kick-started the highway capacity development programme to connect four metropolitan cities of India, namely, New Delhi, Mumbai, Chennai, and Kolkata. Since then the National Highway Development Programme (NHDP) has expanded in scope and coverage as the economy has grown. The economic betterment of the people with the development of highways is now palpable. With the expansion of the programme the mode of delivery has changed from budgetary resources to Public Private Partnership (PPP) and competitive bidding as all stretches of highways do not have the same traffic levels.

Roads are the biggest of India's PPP infrastructure projects. Indeed, among other projects, roads have elicited maximum interest and optimism among private players for PPP. Even the government has outlined some policy initiatives in order to attract private investments in road infrastructure projects. As per NHAI, some of these incentives are as follows:

- Government will carry out all preparatory work including land acquisition and utility removal. Right of way to be made available to the concessionaires free from all encumbrances.
- NHAI/Government of India will provide capital grant of upto 40 per cent of project cost to enhance viability on a case-to-case basis.
- 100 per cent tax exemption for ten years.
- Concession period allowed up to thirty years.
- In BOT projects, the entrepreneur is allowed to collect and retain tolls.
- Duty free import of specified modern high capacity equipment for highway construction.

As per the NHAI, over the next ten years, about 32,000 km of national and 25,000 km of state highways need to be widened, at a cost of Rs 1700 bn; highway maintenance will require over Rs 950 bn. NHAI is also preparing the four-laning of 10,000 km of national highways outside the NHDP. The current thinking suggests that most sections would be toll-based BOT, with less viable routes awarded through cash contracts or annuities. Public support will be capped at 40 per cent of project cost (25 per cent during construction and 15 per cent over the concession period). The future of companies in this business thus appears bright. Project execution skills and scalability will, however, be very critical in differentiating successful companies from the rest.

In the first paper of this chapter, Anupam Rastogi and Shreemoyee Patra argue for shadow tolling, especially on those highways where traffic is not high at present but where the government would like to capitalize on the increased efficiencies of the private sector and network externalities. It is well established that private developers deliver greater value for money at the construction stage. Under these circumstances, 'shadow toll' may prove to be a good model. This approach was initially adopted in the UK, where governments award concessions to build-operate-maintain toll-free highways and then compensate the investors based on roadway usage and/or availability of those facilities. Shadow toll roads are currently operating in the UK, Finland, Spain, and Portugal.

A project to provide all-weather road connectivity to unconnected villages and hamlets was also taken up by the central government and financed through budgetary resources. There is perceptible change in the lives of people who, for the first time were connected through these roads. The roads are well standardized and there is fairly sophisticated machinery to ensure technical standards, but

lacunae exist in terms of maintenance of these roads after the defect liability period expires. Jyoti Gujaral's paper on rural roads attempts to provide a long-term solution to this drawback within the framework of the PMGSY. The model, initially based on a nominated party being ready to take over the O&M responsibility of a cluster of roads may evolve into one that can be concessioned on the basis of minimum subsidy bidding.

## RAILWAYS

The fortunes of the Railways have turned with growing freight volumes, implying that for the first time in decades the railways are earning more than their cost of capital. Investors are also attracted by property development opportunities near rail lines. Indian Railways (IR) is keen to hook private sector efficiency to provide better and greater services to its customers. Customer focus which was missing earlier, seems to have infused the railways administration with renewed energy.

Railways have been a monolithic engineering oriented organization, not only in India, but the world over. Closed access network coupled with strong emphasis on safety standards meant that railways were organized to do everything in-house. Indian Railways took pride in doing all this and wore the crown of national integration. For them customers came second and understanding of business logistics was far removed from the decision-making process. All this changed as railways found themselves running short of funds and competition emerged from newly laid highways and a new class of trucks which could compete with train services in terms of time. Indian Railways found an urgent demand for rail based transport in suburban rails systems, connectivity to ports, and capacity addition to some crucial routes. Railways were forced to partner with state government, private parties and so on. While the basic model and structure of the railways did not change drastically, it was tweaked in several places to yield the desired results. This chapter contains two papers on the endeavours by the Railways to cater to the demand for suburban rail and to expand freight business respectively.

The first paper by R.K. Jain presents the case of a partnership between the IR and a state government wherein the IR drew up an agreement with City and Industrial Development Corporation (CIDCO) in Mumbai for providing rail connectivity to Navi Mumbai in August 1986. The cost of construction of the railway line, station building, operational and commercial area was shared between CIDCO and IR. Ownership of the line and land remained with IR. CIDCO had the right to commercialize the air space and other parts of the station area. During operation, non-operational maintenance costs were to be borne by CIDCO and operational losses were to be borne by

Central Railway. Rolling stock was provided by the Central Railway. O&M responsibilities were fulfilled by Central Railway.

Rail fixed infrastructure is usually not built using PPP and it is generally owned by the State. Many countries allow competition in operations and services. Indian Railways has taken a different route where it is using PPP models to build fixed infrastructure. Ranjan Jain describes these PPP models used by the Railways to enhance their own capacity to meet the transport requirements of the country.

Unlike transporting passengers, freight business is a lucrative side of the railways business. Indian Railways used this to subsidize the passenger business. However, in the competitive arena of logistics, Railways is trying aggressively to become competitive as well as to provide more facilities to freight business users. Ranjan Jain explains a number of PPP models being used by the Railways to keep their lead in the logistics business.

Indian Railways had lost its market share in high rated freight commodities, especially cement, POL, and iron and steel. IR was missing an overall strategy for freight business, which was overcharged without any sensitivity to competition. Over time, other transport modes, especially road (and pipeline in the case of POL) captured a very significant share of freight due to their faster service and door-to-door deliveries. G. Raghuram and Rachna Gangwar's paper on the 4P model for freight business argues that IR still has tremendous potential in the freight business, but it needs to be examined within an appropriate framework for segmentation of the market. Like in any other transport business, an origin and destination (OD) based systems perspective could be used. The primary categorization of origins would be industry/collection centre, mine, and port. The primary categorization of destinations would be industry, port, and distribution centre. The authors have done an OD analysis on the 666.5 mt of freight traffic of 2005–6 to show the freight potential which Railways have in India.

## AIRPORTS

Airport modernization is the latest reform move which India has made in the midst of severe capacity constraints, Delhi and Mumbai airports have been privatized. The reform has been more than welcomed by airline operators and passengers.

India's civil aviation sector is growing the fastest in the world. Between April and September 2006, amid a flurry of new entrants to the sector, domestic traffic growth accelerated to more than 45 per cent. The Centre for Asia-Pacific Aviation, a consultancy firm, predicts that domestic traffic will grow 25–30 per cent per year until 2010, with international traffic growth at 15 per cent, taking the

overall market to more than 100 m passengers. Indian carriers have 480 aircraft on order for delivery by 2012, which compares handsomely with a fleet size of 310 aircraft operating in the country today.

The government's preparation for such expansion has been woefully inadequate. Poor airport infrastructure is probably the biggest problem for the airlines. They have welcomed the planned investment and awarding of contracts to develop Mumbai and Delhi airports. An airport modernization plan, which proposes a US\$ 9bn investment by 2010, has been slow to get underway. In January 2006, joint venture companies with 74 per cent private sector participation won contracts to upgrade New Delhi and Mumbai airports. Rekha Jain, G. Raghuram, and Rachna Gangwar explore the business models applied to the modernization of the Delhi and Mumbai airports and draw attention to certain key questions regarding the ideal bidding process that have remained unanswered.

The success of low-cost carriers has changed India's aviation profile as well as the outlook of both the government and airport operators. Changes in the policy are being considered to encourage greater investment in the sector and to augment the inadequate infrastructure. The government is planning to introduce a new policy on merchant airports, which will allow development and operation of airports completely by the private sector. According to the new policy, airports will be developed on the basis of commercial viability. Merchant airports have been conceptualized as airport infrastructure entirely in the private sector with private resources and with no government funding. Though the airports will be built and operated by the private sector, they would be subject to the safety and security norms of the government. Another key measure that will be dealt with by December 2007 is the draft Model Concession Agreement for developing airports.

## 5.1 Shadow Tolling and Availability Payment Mechanism Model for Roads

*Anupam Rastogi and Shreemoyee Patra*

The conventional Design, Build, Finance, and Operate (DBFO) model of private public partnership takes a new form in shadow tolling arrangements wherein the state agency offering the road construction contract to the private entrepreneur pays 'toll' rather than the motorists who use the road. Under shadow tolling contracts, a concession is awarded to a private player who has then the responsibility to design, build, finance, and operate a designated road section for a predetermined time period. The term 'shadow tolling' is used, because instead of collecting user charges at tolling points, the concessionaire seeks payment from the sponsoring public agencies based on traffic volumes and service levels.

The majority of shadow toll projects are undertaken in order to upgrade existing roads. Private contractors in such cases can have ready access to historic traffic data which reduces traffic risk. They no longer need to depend on inaccurate or unreliable forecasts for revenue projections and project feasibility outcomes. The concessionaire can explore private financing options not just by leveraging its equity but also the future shadow toll revenues pledged by the concessioning authority (CA). It is hoped that the private partner who operates and

maintains the shadow toll road for a pre-defined concession period will be able to recover costs and earn a reasonable return on investment. At the end of that period, the shadow toll payments end and the responsibility for maintaining the road reverts to the CA.

### PAYMENT STRUCTURE

On the basis of usage of roadways, such concessions usually have a telescopic structure of payments comprising multiple bands, with varying vehicle rates per band, such as, \$ 4.00 per vehicle for the first 20,000 vehicles, \$ 2.00 per vehicle for the next 20,000 vehicles, and finally, \$ 1 for the third lot of 20,000 vehicles, after which there would be no further payments for vehicles using the facility. Further incentives, penalties or bonus payments on the basis of the concessionaire's performance, assessed against pre-determined parameters such as safety/accident occurrence and roadway availability may be subsequently built into the concession.

In order to obtain pre-specified compensation levels from the government for different traffic increments, candidates for bidding in shadow toll projects need to

define their own banding structures. As per precedents in the UK, it has been observed that bidders tend to cover different elements of the project's cost profile by means of the various bands, such as, Band 1 to cover fixed operating and maintenance costs and senior debt service, Band 2 to cover variable operating and maintenance costs and subordinated debt service, Band 3 to pay dividends and for quasi-equity debt service, and so on. Band 4 usually defines the cap to toll payments as well as the concessionaire's potential returns, since any traffic above the agreed level in this band receives no toll.

### BENEFITS OF SHADOW TOLLING

In spite of not generating any new revenue for governments, shadow tolling can nevertheless capture certain benefits of toll projects, such as efficiencies gained by transferring risks and responsibilities to private partner with profit incentives. Other benefits of shadow tolling include:

- Minimizing traffic risks, thus facilitating more advantageous financing for private investment partners.
- Expediting construction and implementation of capital projects, thus adhering to time schedules.
- Harnessing the profit-seeking motives of the private sector to usually realize capital construction costs savings.
- Leveraging cost efficiencies of asset management analysis life-cycle costing in order to meet maintenance requirements.
- Transferring operating and maintenance risk to the concessionaire.
- Eliminating the possibility of super-profitability for the concessionaire by capping the public sector's exposure.
- Reducing both public equity as well as debt requirements.
- Obviating the need for toll plazas.

### DEMERITS OF SHADOW TOLLING<sup>1</sup>

The benefits of shadow tolling enumerated above, however, need to be evaluated against some undeniable adverse aspects and disadvantages for the public sector.

The first disadvantage is the implied transfer of costs from users to the public purse, and ultimately, to the taxpayer. Second, in order to reduce the traffic risk or to create additional sources of profit, shadow tolling necessarily provides some guarantees to concessionaires. For

example, the shadow tolling regime in Portugal granted local 'monopoly' to concessionaires, wherein the government agreed in the year 2000 to contractually freeze the Road Plan for thirty years in terms of service levels in the vicinity of the road concessions.

The possible conditions contained in shadow toll contracts pertaining to future enlargements also assume immense significance when payment is made according to shadow toll, as against payment according to availability.

### AVAILABILITY PAYMENT MECHANISM<sup>2</sup>

An availability payment mechanism is a fairly flexible instrument wherein the concessionaire is paid on the basis of the number of lanes it keeps open, and is thus a definite improvement over the shadow toll payment mechanism. This mechanism is readily amenable to fine-tuning in line with policy objectives as well as improvement of incentives to the DBFO company, thus facilitating optimum availability of road space as well as improvement of service to the public.

Payments to the concessionaire under this mechanism would be based on a number of factors which can be adapted to the specific requirements of the road being constructed. For instance, in the case of the A13 Thames Gateway, London, the following factors were taken into consideration while structuring the availability payments mechanism:

#### AVAILABILITY

The payments structure was based on factors such as the number of available carriageway lanes and the time of the day (payments for keeping the road available during peak hours would be higher than the payments for off-peak hours), thus building in an incentive for the DBFO company to maintain the road well in order to avoid disruption to road users during busy hours. Further, separate payments were envisaged for footway and cycleway availability in order to ensure that the needs of the non-motorised user by the concessionaire are addressed.

#### HGV/BUS SHADOW TOLLS

Shadow toll payment structures for heavy goods vehicles and public transport could be designed to ensure effective management of HGVs and public transport while providing no incentive to increased car commuting.

<sup>1</sup> [http://ec.europa.eu/regional\\_policy/sources/docgener/guides/pppresourcebook.pdf](http://ec.europa.eu/regional_policy/sources/docgener/guides/pppresourcebook.pdf)

<sup>2</sup> <http://www.highways.gov.uk/roads/2999.aspx>

### SAFETY PAYMENT MECHANISM

This component would be used to provide appropriate incentives to reduce accident rates and to ensure proactive investment by the concessionaire in road furniture and other safety-enhancing features.

### BUS JOURNEY TIME RELIABILITY

An availability payment based on this criterion would encourage the concessionaire to keep bus lanes available during their hours of operation, to assist in the reliability of bus journey times.

### BEIRAS LITORAL AND ALTA SHADOW TOLL ROAD, PORTUGAL<sup>3</sup>

The Portuguese Government initiated a programme of new motorways on a project finance basis on the heels of the launch of the National Road Programme in 1996, with an aggregate investment cost of EUR 5 billion. The first phase of the programme included two real toll and six shadow toll (SCUT or Sem Cobranca ao Utilizador meaning toll system) road concessions (an additional SCUT was included later). Some of these highways provide main transit corridors between Portugal and Spain, constituting a vital part of the national motorway network.

### PROJECT DESCRIPTION

The project entailed widening and upgradation of 167 kilometres of the existing two-lane (2x1) IP5 highway between Aveiro, in the Coastal West, and the Spanish border at Vilar Formoso (East), via the cities of Viseu and Guarda, which traverses hilly terrains with gradients of as much as 8 per cent, and 9000 and between 12,000 vehicles per day, varying with location and season. Trucks account for about one third of the total traffic flow and the accident rate has been observed to be notably high. It was the

absence of non-tolled alternative routes, despite the heavy traffic, that induced the government to adopt a shadow toll regime for the concession, with expected construction costs under € 250 m.

On the basis of the number of vehicle kilometres of usage and determined with reference to a pre-defined banding system, the concessionaire received tariff payments directly from the CA.

### INSTITUTIONAL AND MANAGEMENT STRUCTURE

In February 2001, the consortium Lusoscut—Auto Estradas das Beiras Litoral e Alta S.A. was awarded the concession for a thirty year period, including five years for the construction with phased opening. The project encompassed construction of large new sections of highway rather than enlarging the existing ones for the twin purposes of reducing costs and increasing road safety. The concessionaire was incorporated under Portuguese law as a limited liability SPV company whose shareholders comprised several Portuguese contractors and financial institutions with concomitant commercial interests as lenders in the project.

### FINANCIAL STRUCTURE

Structured as a non-recourse loan, with repayment entirely dependent on the SPV's revenue performance as per the level of motorway usage and the resulting revenue stream, the commercial bank loan was repayable in annuities over a period of twenty-five years, commencing on the completion date of the project. The loan from the European Investment Bank, on the other hand, had a slightly longer maturity of twenty-seven years and was guaranteed by a commercial bank syndicate, with the possibility for guarantee release during the loan life—50 per cent after the eighth year and 50 per cent after the sixteenth year—in the event of agreed covenants, including debt servicing ratios, meeting certain contractually defined tests.

TABLE 5.1.1  
Use and Sources of Funds of Beiras Litoral and Alta Shadow Toll Road, Portugal

Use of Funds	EUR Million	Percentage	Sources of Funds	EUR Million	Percentage
Construction Costs	693.4	60.5	Equity	102.0	8.9
Start-Up Costs	75.5	6.5	EIB Loan	470.0	41.0
Financing Costs	164.9	14.4	Commercial Bank Loan	448.4	39.1
Other start-up costs (incl. fees and reserves)	51.5	4.5	Net VAT cash flow	126.2	11.0
VAT, Working Capital Build-up and Operating cash flow	161.3	14.1			
<b>Total</b>	<b>1146.6</b>	<b>100.0</b>	<b>Total</b>	<b>1146.6</b>	<b>100.0</b>

Source: [http://ec.europa.eu/regional\\_policy/sources/docgener/guides/pppresourcebook.pdf](http://ec.europa.eu/regional_policy/sources/docgener/guides/pppresourcebook.pdf)

<sup>3</sup> [http://ec.europa.eu/regional\\_policy/sources/docgener/guides/pppresourcebook.pdf](http://ec.europa.eu/regional_policy/sources/docgener/guides/pppresourcebook.pdf)

Heavy traffic, and the fact that around 81 per cent of the traffic flow forecast in the SPV business case at full completion in 2005 was already achieved on the existing IP5 route in 2000, served to mitigate the revenue risk under the shadow toll regime and this risk profile was reflected in the interest rate margins charged by the commercial banks, starting at 125 basis points during construction and progressing towards 100 basis points thereafter, depending on the project performance.

#### SHADOW TOLL REGIME

Based on four categories of potential traffic volumes, the first category of shadow tolling for IP5 was intended to cover the concessionaire's fixed operating and maintenance costs plus interest and principal payments on senior debt. The second category covered variable operating and maintenance costs plus interest and principal payments on subordinated debt. Revenues derived from the third category were used to pay dividends.

While the government paid only fixed amounts based on the availability of the motorway during the first six years of the project (including the construction period plus the first operational year), shadow toll payments thereafter were to be made three times a year: May and September payments were set at one third of the respective year's

estimated traffic and the January payment was adjusted to reflect actual traffic volumes achieved in the preceding twelve months.

#### GOVERNMENT RESPONSE TO INCREASE IN TRAFFIC VOLUME

A significant burden was created upon public accounts due to a dramatic increase in projected costs of Beiras Litoral e Alta concession to the public purse as a result of delays in the project. The expected amount of shadow tolls in 2007 is higher than the current highways agency budget for construction and maintenance of national roads in the entire country, which, coupled with the fact that traffic prospects are very good in this concession, prompted the government to announce in May 2004 that this highway (as well as several other SCUT roads) would have real tolls upon completion.

To sum up, it can be said that shadow tolling or availability payment mechanism facilitates provision of infrastructure of a certain standard by the concessioning authority on the basis of a deferred payment mechanism. Furthermore, since the concessioning authorities generally retain the right to toll the facility, they can toll it without renegeing on the shadow toll payment contract.

## 5.2

### A PPP Model for Rural Roads under PMGSY

*Jyoti Gujral*

Rural road connectivity is a desirable objective not only from an economic perspective but also from a social standpoint. However, development of rural roads network has suffered on account of lack of vision, shortage of funds, weak implementation mechanisms, and absence of initiative. In spite of the efforts made at the state and central levels only about 40 per cent of the rural habitations in the country are connected by roads, most of which cannot be categorized as all-weather roads on account of poor serviceability conditions.

Studies have indicated positive benefits of rural roads as they provide vital linkages between production and marketing centres. Lack of accessibility entrenches poverty. By reducing transport costs, rural roads will open new markets and expand existing ones, subsequently encouraging higher agricultural production, ensuring

larger rural income streams, and reducing consumer prices. In addition, reduced transport costs will improve the mobility of the rural poor and their access to basic social services, economic opportunities, and remunerative employment (Mohapatra and Chandrasekhar, 2007).

One of the lacunae in the Pradhan Mantri Gram Sadak Yojana (PMGSY) is that operation and maintenance of the rural roads is not provided for in it. Therefore, it is quite probable that after the defect liability period is over, the condition of the roads may deteriorate due to lack of regular maintenance. The PPP model described below aims to address this shortfall in the design of the current PMGSY. Moreover, the model has integrated construction with O&M; the contractors may use material and construction technology to reduce life-time cost of the project.

Within the model, the Ministry of Rural Development (MoRD) and the concerned state government may offer a contract for development/upgradation and cross-drainage works for pre-specified stretches of rural roads that are eligible and form part of the core network as defined by the PMGSY guidelines to a pre-qualified entity. A likely concessionaire in the context of rural roads would be a local mill owner, manufacturer or entrepreneur whose direct business interests are furthered by all weather connectivity. The concessionaire would be expected to have some experience in the construction of roads and comprehensive knowledge of rural road imperatives. The concessionaire could also be an SPV floated by a co-operative society or not-for-profit organization active in the area of rural infrastructure, specifically road projects. The MoRD and the concerned state government will jointly grant a BOT concession for development of the project. The arrangement would be formalized by way of a tri-partite concession agreement (CA) between MoRD, the concessionaire, and the state government. The concession period could be fifteen years which would include two years of construction and thirteen years of operation and maintenance.

MoRD will constitute a Steering Committee to take the project from a conceptual stage through to signing of the CA. The Steering Committee would comprise representatives of MoRD, state government, the concessionaire and (potential) lenders.<sup>4</sup> The Committee would be required to play an important role in resolving project related issues during the project development phase till the signing of the CA.

On and after signing of the CA, the Steering Committee would be responsible for the overall monitoring and supervision of the project during the concession period (construction and operations period). An engineering consultant (EC) would be jointly appointed by MoRD and concessionaire to monitor construction of the project with reference to the approved detailed project report (explained later) and the project requirements enshrined in the CA. After the construction is over and the O&M period commences, the EC would be responsible for surveying the condition of the rural roads in line with the 'guidelines of evaluating and certifying compliance with the maintenance requirements' laid out in the CA. The EC would be expected to periodically report status and progress to the Steering Committee.

<sup>4</sup> See subsequent section on project financing for details on lenders.

<sup>5</sup> The concerned state government is expected to provide for the delivery of project site or right of way. It would have to provide a certificate to MoRD regarding availability of the necessary right of way.

<sup>6</sup> The concessionaire is responsible for procuring the requisite clearances/approvals for the project. However, state government can procure the environmental clearances.

<sup>7</sup> Designs with higher standards than those prescribed under the PMGSY guidelines. For instance, certain road sections may be developed with rigid pavements.

## THE RESPONSIBILITIES OF THE CONCESSIONAIRE

The concessionaire must prepare a detailed project report (DPR) at its own cost and get it approved as per the requirements outlined under the PMGSY Guidelines. Among other requirements, the DPR must provide information on:

- The eligibility of the proposed network under PMGSY.<sup>5</sup>
- Detailed engineering specifications including design as per PMGSY guidelines.
- Bill of Quantities (BOQ).
- Estimates for capital cost of construction.
- Estimated annual cost of the maintenance component.
- Implementation schedule with broad milestones.
- List of clearances/approvals required for the project.<sup>6</sup>

The concessionaire is expected to appoint a reputed engineering consultancy firm as an Engineering Consultant for the project with the prior approval of the Steering Committee. The role of the engineering consultant is to assist the concessionaire in preparation of the DPR, management of the bidding process for selection of the contractor(s), and any other technical matter pertaining to the maintenance component of the project. All expenses pertaining to the engineering consultant (including fees) shall be borne by the concessionaire.

For better operating performance and reduced costs of maintenance, the concessionaire can select certain sections for alternate<sup>7</sup> high-end designs. The bidder must identify stretches where it intends to adopt alternate designs at the DPR preparation stage and provide requisite details of the same (including the cost differential) to the MoRD. Any additional costs (as compared to the applicable PMGSY costs) on account of the alternate designs shall be borne by the concessionaire. MoRD may require the concessionaire to demonstrate availability of equity funds for meeting such additional expenditure. Once the DPR is approved by the MoRD, the project would be awarded under a concession framework.

The concessionaire shall appoint contractor/s to undertake the implementation of the project as per the design laid out in the approved DPR within the specified time. The selection of the contractor(s) would be based on the pre-qualification and bidding criteria approved by

the Steering Committee. The concessionaire would evaluate the bids submitted by various bidders and submit the evaluation report to the Steering Committee and award the contract to a contractor only after obtaining approval of the Steering Committee.

The concessionaire would need to provide a performance bank guarantee to the MoRD/state government of a suitable amount specified by MoRD for the construction period. This amount should be equivalent to the estimated maintenance expenses for the entire operation and maintenance period (thirteen years).

### CONSTRUCTION

The concessionaire would have the freedom to make construction arrangements on such commercial terms, as it may consider necessary, subject to following the above mentioned bidding process for appointment of the contractor. In any case, the concessionaire would be responsible at all times for such contractors' performance. All payments to contractors by the concessionaire shall be in arrears and shall be certified by EC and statutory auditors of the concessionaire.

In select circumstances, the concessionaire may be permitted to undertake construction of the project directly without inviting bids from contractors. However, this is possible only with prior written approval by MoRD/Steering Committee and lenders. Such approval shall be subject to MoRD/Steering Committee/lenders being satisfied of the technical capabilities of the contractor. Any cost escalation would have to be borne by the concessionaire.

### MAINTENANCE

The concessionaire would be required to maintain the project roads as per the maintenance requirements stipulated in the CA. These requirements would be based on the state government practices and Rural Roads Manual Provisions of the MoRD and would be closely monitored by the EC. The concessionaire would be expected to bear the cost of maintenance of the project.

### FINANCING OF THE PROJECT

The concessionaire would be responsible for making the financing arrangements—equity and debt, within a period of six months from the date of signing the CA. It would also be required to take stipulated insurance cover for the

project during the construction and operation period. The MoRD would provide a letter to the lenders (potential), confirming the total amount of its contribution for the project which shall be payable in a phased manner in accordance with the agreement with the concessionaire and its lenders. The state government would provide a letter accepting and confirming that the MoRD contribution specifically earmarked for this project shall not be mixed with the state's PMGSY account and shall be deposited directly to the designated project escrow account.

### CONSTRUCTION PERIOD

The project would be developed on project finance basis, under which the capital cost of the project would be funded through equity capital/promoter's debt from the concessionaire's (equity) funds, funds from MoRD (MoRD contribution), and project debt (debt) from commercial lenders (lenders). The amount of MoRD contribution for the project would be fixed based on the cost<sup>8</sup> of construction of rural roads. Upon finalization of DPR, the concessionaire would work out the amount of quarterly MoRD contribution and get the same approved from the MoRD.

The construction would thus be financed by equity, debt, and MoRD contribution. Disbursement of MoRD contribution would begin after precedent conditions stipulated in the CA have been complied with. MoRD is to disburse MoRD contribution during the construction period in quarterly instalments into a designated project escrow<sup>9</sup> account immediately upon certification by the EC that the concessionaire is meeting the various project construction milestones. However, MoRD must ensure that sufficient contribution is made to service interest dues of lenders providing the debt, during the construction period, even in circumstances where the concessionaire has not been able to meet project milestones and obtain the consequent certification thereof.

Prior to implementation of the project, MoRD shall obtain letter/s of comfort from Government of India, agreeing to specifically earmark and provide additional funds for the project, in addition to the normal allocation of funds to the state government under the PMGSY. MoRD, the state government, the concessionaire, and the lenders would enter into a quadripartite Direct Agreement in order to give effect to this arrangement and matters incidental and ancillary thereto. A schematic diagram of the model concession is given in Figure 5.1.1.

<sup>8</sup> This would comprise the capital cost of construction and the associated financing cost (inclusive of upfront financing charges, interest during construction and so on) taking into account the nature of the transaction.

<sup>9</sup> Charged to lenders.

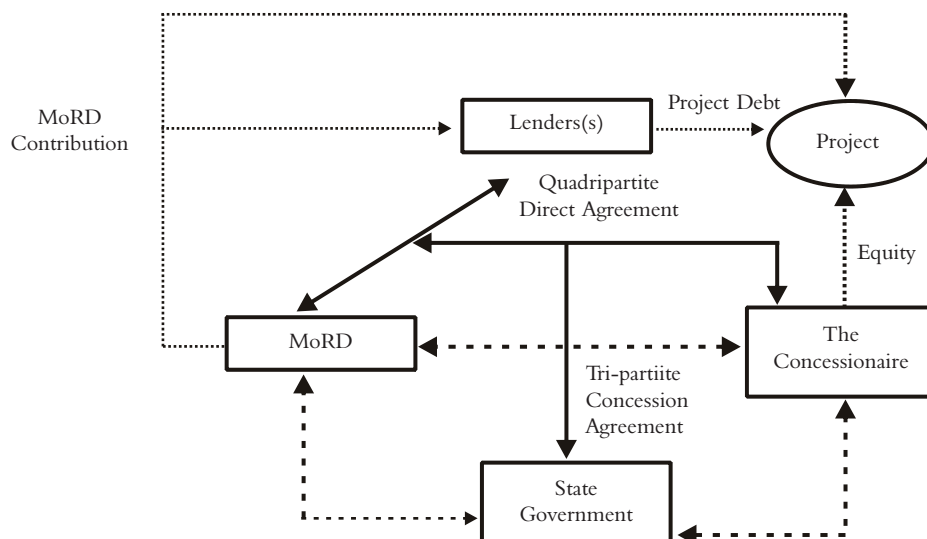


FIGURE 5.1.1: Schematic Diagram of the Model Concession

### OPERATION AND MAINTENANCE PERIOD

During operations period, MoRD Contribution shall continue to be disbursed into the escrow account on a quarterly basis in accordance with the schedule of servicing the debt provided by lenders. The said debt servicing schedule shall be set out in the direct agreement. MoRD contribution shall be applied solely to the repayment of principal amount of debt, interest, and other monies payable to the lenders under the financing agreement. Upon repayment of the entire debt,<sup>10</sup> MoRD contribution would cease. MoRD's obligation would be limited to bearing the capital cost (inclusive of associated financing cost) of construction on a deferred basis as described above. All other costs relating to the project, including costs of the maintenance component shall be borne by the concessionaire out of income from other activities, such as providing roadside facilities including advertisements. In case of a shortfall in its revenue, the concessionaire would arrange funds for meeting the maintenance costs from its own sources, given its direct impact on the concessionaire's connectivity to urban markets. In order to demonstrate assured availability of funds for undertaking maintenance of the project, the concessionaire shall be required to provide a performance bank guarantee as outlined above.

So long as the concessionaire undertakes the Maintenance Component as per the maintenance requirements laid down in the CA, the performance bank guarantee may be suitably released annually (on a pro-rata basis) by MoRD/state government. In case of material breach of maintenance requirements by the concessionaire,

MoRD and/or state government would have the option of undertaking the maintenance themselves and recovering their expenses by encashing the performance guarantee up to the requisite amount. In case of persistent and material breach of maintenance requirements by the concessionaire, MoRD and/or the state government would be entitled to terminate the CA and acquire all rights and title to the project. In case the CA is so terminated, the obligation to maintain the project roads would revert back to the state government. The (balance) performance guarantee would be encashable in the event of termination of the CA for the above-mentioned reasons. In such a scenario MoRD shall pay off the outstanding debt (including other overdues) to the lenders.

### OTHER CONTOURS OF THE CONCESSION

#### Change of Scope

If MoRD desires a change of scope in the project, the same (up to a level of 5 per cent of the project cost) may be approved by the Steering Committee on the recommendations of the EC. The payment for the increased scope would be directly disbursed by MoRD as a lump sum amount. This payment would be over and above the MoRD contribution.

For change of scope exceeding 5 per cent of the project cost, the proposal would have to be separately reviewed by MoRD, the concessionaire, and the lenders. The implementation and financing mechanism to give effect to proposed changes would be separately worked out.

<sup>10</sup> Including any other amounts due to the lenders pertaining to the project.

### *Default and Termination*

Appropriate provisions would be included in the CA, listing out the possible events which could lead to premature termination of the CA and the financial consequences thereof. Any party (MoRD or state government or the concessionaire) may terminate the CA on account of a persistent default of obligations by the other party. MoRD shall pay the entire outstanding debt (alongwith overdues, if any) to the lenders in the event of termination of the CA.

### *Dispute Resolution*

The CA would set out the mechanism to be followed by the parties in case of a dispute. The parties shall endeavour to resolve all the disputes in an amicable manner. Disputes which are not resolved amicably would be referred to Secretary, Ministry of Rural Development, Government of India. If the dispute remains unresolved, it would be settled as per the provisions of Arbitration & Conciliation Act, 1996.

Institutional and financial framework for rural roads is rarely sustainable. Development and maintenance of rural roads require decentralization of decisions to local levels and strong coordination at central government level. As an interim measure to total decentralization, this model provides for an option of combining the single rural road agency with a contract executing agency.

The Ministry of Rural Development had signed an MOU with the Maharashtra Government and The Cooperative Rural Roads Development & Maintenance Co-operative Society Limited for construction and maintenance of 1000 km of rural roads in the districts of Kolhapur, Sindhudurg, and Sangli in Maharashtra in January 2004, based on the model presented in this paper. Although the project was being conceived under the umbrella of PMGSY, MoRD agreed to allocate funds for the project over and above the normal allocation for the State of Maharashtra under PMGSY. However, the project was not implemented due to change in political leadership.

## 5.3

# Models of Suburban Rail Infrastructure in India

*Ranjan Kumar Jain*

Resource constraints faced by the Indian Railways (IR) in the last two decades led it to look for opportunities to mobilize funds outside its own budget through partnerships of various kinds. IR had to prioritize rail service connectivity to far flung areas of the country while trying to put together adequate resources to upgrade the suburban rail system in Mumbai, Chennai, Delhi, and Kolkata. State governments which were keen on the development of urban/suburban transport infrastructure in metropolitan cities came forward to offer financial partnership to IR in such projects compelled by a variety of factors:

1. Suburban transportation is a loss-making proposition. Financial resources for such projects are allotted by the Planning Commission to IR under the plan head 'Metropolitan Transport Project', which is free from dividend payment liabilities. However, such allocations are not enough to meet investment requirements.
2. Cost sharing enhances the volume of funds available for suburban transport projects.
3. Generally such projects do not generate operating surplus and depreciation reserve. Therefore, a partnership with the respective state governments with a view to integrating suburban rail transportation with other modes of transportation in the city can help to achieve multimodal integration. This is expected to improve ridership and in turn viability.
4. Transportation projects lead to increases in the value of land in erstwhile poorly developed areas. Such benefits are reaped by the state land development authorities.
5. State governments are in a better position to facilitate simultaneous real estate development/commercial development of the surrounding land and to generate additional financial resources. It is thus a partnership that can unlock the commercial potential of the land and air space in and around the station area.
6. Such a partnership helps in making a robust business plan for the suburban rail system, integrate it with the urban transport network, unlock business potential of land in and around railway system, and improve the overall urban transport planning.

## CIDCO MODEL

The first instance of a partnership between the IR and a state government came with the agreement with City and Industrial Development Corporation (CIDCO) in Mumbai for providing rail connectivity to Navi Mumbai in August 1986. The salient features of the model were:

1. Cost of construction of the railway line, station building, operational and commercial area was shared in 2:1 ratio between CIDCO and IR. Ownership of the line and land remained with IR.
2. CIDCO had the right to commercialize the air space and other parts of the station area. During operation, non-operational maintenance costs were to be borne by CIDCO.
3. IR levied a surcharge of Re. 1 per ticket for the journeys touching any part of the rail network so developed. Money so collected was transferred to CIDCO.
4. Rolling stock was provided by the Central Railway.
5. O&M responsibilities were fulfilled by Central Railway.
6. Operational losses were to be borne by Central Railway.

The Mankhurd to Belapur New line (27 kms) was built using this model for the first time in 1993. Cost sharing in suburban projects became the norm and the suburban projects which are using this model or a variant of it with different cost sharing arrangements are Mankhurd–Belapur new line, Belapur–Panvel doubling of track, Thane–Turbhe–Nerul–Vashi new line, Belapur–Seawood–Uran line, and Mumbai Urban Transport Project (MUTP) Phase I and Phase II in Mumbai, Chennai Mass Rapid Transport System (MRTS) Phase II, gauge conversion of Chennai Suburban in Chennai, Kolkata metro extension to Gharia in Kolkata, and Hyderabad multi-modal transport system in Hyderabad.

Over a period of time as urban transportation requirements changed and state governments saw opportunities in integrating rail based urban mass transport system (UMTS) with city development plans, the CIDCO model evolved further. Some of the projects undertaken with the new evolved model are Mumbai Urban Transport Project (MUTP) I, MUTP II, and Hyderabad Multimodal Transport System Phase I.

## MUMBAI URBAN TRANSPORT PROJECT (MUTP) I

A major revamp and expansion of the suburban system was planned under MUTP in 1998 with the objectives:

(i) to segregate the suburban train operation from the main line passenger and freight services by providing a new corridor from Mumbai Central to Virar on Western Railway and from Chhatrapati Shivaji Terminus to Kalyan on Central Railway and (ii) to reduce peak hour peak direction crowding for a 9-car train to 3000 passengers as against the existing level of around 5000.

It is a programme for upgradation of suburban infrastructure in Mumbai in partnership with the State Government of Maharashtra (GOM) through the creation of an SPV by the name of Mumbai Rail Vikas Corporation (MRVC). MRVC is implementing Phase I of MUTP. The salient features of MUTP I are given as under:

1. AJV named Mumbai Rail Vikas Corporation (MRVC) was formed to implement the project.
2. Equity of Rs 25 crore was shared in a ratio of 51:49 between Ministry of Railways (MOR) and GOM to execute the suburban rail projects of MUTP.
3. Total cost of the rail components of MUTP was estimated at Rs 5618 crore. Total cost of the Phase-I project is Rs 3125 crores. World Bank is providing a loan to MOR and GOM of Rs 1613 crore, remaining project cost of Rs 1512 crore to be shared on a 50:50 basis between GOM and MOR.
4. IR levied a surcharge on Mumbai suburban commuters to realize Rs 2891 crore in fourteen years to repay the World Bank loan.
5. Phase I is expected to be completed by June 2009.

On completion of MUTP Phase I Mumbai Suburban rail will achieve:

1. Addition of 93 track kms over the existing 790 km, 101 new 9-car rakes—51 on additional account and 50 on retrofitment account—over the existing 199 rakes.
2. Lengthening of all platforms (excluding the harbour line) to handle twelve car rakes.
3. Re-spacing of signals to achieve 3 minutes headway on all the lines.
4. DC to AC conversion in all suburban section except Thane–Chhatrapati Shivaji Terminus which will be taken up in Phase II. This will allow additional as well as longer (12 car) EMU train operation.
5. On completion of MUTP Phase I, 26.5 per cent additional capacity would be created.

The works included in MUTP Phase I and their costs are presented in Table 5.3.1:

TABLE 5.3.1  
Works included in Mumbai Urban  
Transport Project (MUTP) Phase I

Name of the Project	Cost (in Rs crore)
5th & 6th lines Kurla–Thane	166.00
Optimization of Central Railway	99.50
Optimization of Harbour Line	19.70
5th line Mahim–Santacruz	59.00
Quadrupling of Borivili–Virar section	416.00
Optimization of Western Railway	50.10
DC to AC conversion	380.40
EMU procurement and manufacturing	1359.20
Stabling lines for EMUs	48.50
Maintenance facilities for EMUs	64.30
Virar car shed	93.00
Track machines	31.30
Institutional strengthening and studies	48.20
Resettlement and rehabilitation	290.00
Grand Total Phase I	3125.20

#### MUMBAI URBAN TRANSPORT PROJECT (MUTP) PHASE II

Under the new CIDCO model the MUTP Phase II is under consideration of MOR. The funding arrangement with GOM is yet to be finalized. The works included in MUTP Phase II and their costs are presented in Table 5.3.2:

TABLE 5.3.2  
Works included in Mumbai Urban  
Transport Project (MUTP) Phase II

Name of the Project	(Cost in Rs crore)
5th & 6th Lines CSTM–Kurla	581.00
5th & 6th Thane–Diwa	109.00
6th line Borivili–Mumbai Central	442.00
Extension of Harbour Line from Andheri to Goregaon	83.00
DC to AC Conversion (CSTM–Thane Section)	239.00
Station Improvement and Trespassing Control Scheme	107.00
Resettlement and Rehabilitation	105.00
EMU procurement and manufacture	2495.00
Maintenance facilities for EMUs	184.00
Stabling lines for EMUs	114.00
Technical Assistance and Institutional Strengthening	50.00
Grand Total Phase II	4509.00

#### Funding Arrangement

GOM has proposed that Rs 605 crore each be contributed by GOM and MOR. Out of the Rs 900 crore proposed to be mobilized through property development on railway land in Mumbai, Rs 600 crore are expected to be utilized to fund MUTP II. The balance amount of Rs 2700 crore will be raised through loan either from World Bank or other sources.

#### HYDERABAD MULTIMODAL TRANSPORT SYSTEM PHASE I

This is a partnership project between IR and Government of Andhra Pradesh (GoAP) which aims at upgrading the existing rail network in the twin cities of Hyderabad and Secunderabad to develop an efficient and effective multimodal rail-based transport system. This is the first time a participation model has made an attempt to address all the issues related to suburban rail transportation namely, patronization, multimodal integration, subsidy of operating loss by the state government and so on. Phase-I involves optimization of existing rail infrastructure by infusing additional inputs which are prerequisites for running frequent suburban train services such as automatic signalling, electrification of track, and use of multiple units as rolling stock. Ten new service stations had been proposed for development in this proposal to improve the accessibility and reach of the project. Routes of Lingampally–Hyderabad, Secunderabad–Falaknuma were identified for this phase. The basic features of the project are as under:

1. Cost of new infrastructure and upgradation of existing infrastructure including rolling stock is shared between IR and GoAP and construction undertaken by IR.
2. An appropriate structure is being examined to facilitate multi-modal ticketing, levy of surcharge and so on to insulate IR from operational losses.
3. IR will operate the suburban trains and recover the operational losses from the state government.
4. Levy of surcharge and multi-modal fare fixation can be done with the approval of MOR.
5. Project cost of the 1st phase is Rs 69 crore for upgradation of fixed infrastructure and Rs 90 crore for the rolling stock.
6. EMU coaches are specially designed with enhanced features.
7. World-class new railway stations have been constructed.
8. Feeder buses run on schedules that are coordinated with the train timings on the new routes.
9. Directed economic activity is encouraged along the rail corridors to improve patronization.
10. Bus bays and parking areas are developed at stations to improve ridership.

The Phase I of the project commenced on 1 November 2001 and the first train started running from 9 August 2003. The project design is innovative in the sense that it has been conceptualized as a suburban rail service with the look and feel of a metro. Since finances were

a main constraint, and so was the dependence on shared infrastructure of the existing Railways, the project design was aimed at creating a fresh look by introducing a low cost but standardized infrastructure.

The gradual reform of suburban rail services suggests that the Railways are open to fresh ideas which meet the aspirations of new urban centres without creating a financial burden for the Indian Railways.

## 5.4

# PPP Models for Rail Infrastructure in India

*Ranjan Kumar Jain*

### INDUSTRY STRUCTURE

Railways in India started as a private enterprise and during its growth into one of the largest networks in the world, it saw experimentation with almost all kinds of financing and management models. The current legal framework under the Railways Act 1989 allows private railway systems in all forms. However, the government policy enunciated under Industrial Policy Resolution of 1991 as amended from time to time, reserves railway transportation for the public sector. It means that train operation can only be done by the public sector, while all other activities of design, construction, financing, and maintenance can be undertaken through private participation through award of concessions by Government of India. Presently, the Railways are managed through 17 Railway Administrations which are legal entities. In addition there are six port and other railways. These railway systems are members of the Indian Railway Conference Association. Indian Railway Conference Association deals with issues of inter-railway movement of wagons and locomotives in terms of levy of hire charges for use of rolling stock belonging to other railways, neutral train examination for ensuring that railways do not pass on deficient wagons to other railways. The Railway Board was constituted under the Railway Board Act 1905 and it is also a railway regulator, dealing with a large number of issues including tariff regulation. Railway Board and the Commissioner of Railway Safety, whose office is under administrative control of Ministry of Civil Aviation, jointly work as safety regulator.

As the Railways operate a network it is important to have seamless, integrated operations over a size which accrues economies of scale. There are only two kinds of rail systems that lie outside the integrated IR network. The first includes the close circuit systems that is, the Merry-Go-Round systems created and operated by the NTPC for super thermal power plants. The other kind includes stand-alone metro rail systems which are planned for and financed by the Ministry of Urban Development.

The private sector has been largely associated in design, financing, construction, and maintenance of fixed infrastructure in railways. Construction activity in rail sector is always undertaken by the private sector through contracts. However, now large Engineering Procurement and Construction contracts are being awarded to Construction Supervision Consultants. Design, build, finance, maintain, and operate concessions are being given to SPVs, which are JVs between IR and private sector strategic partners. Such concessions pass on all risks to developers including the demand risk. The concession period is typically thirty three years.

Design, build, finance concessions are also being given with annuity payment in which the demand risk remains with IR. Such concessions are typically for ten to twelve years. The developer is selected through competitive bidding process and the bidding parameter is the bi-yearly annuity payment. Projects may involve construction of new railway lines and gauge conversion from meter gauge to broad gauge and additional lines by way of doubling, third line, and fourth line.

Private freight terminals are also permitted through the fully private route. Rolling stock is acquired through the leasing route. In the container business, the Indian government has announced a policy for permitting private operators to operate private container trains, which involves acquisition of rolling stock and construction and operation of key-side and Inland Container Depots. Such permission is given through a concession. Fifteen companies have entered the field of container train operation, including CONCOR, which is owned by GOI with 63 per cent equity.

Private sector participation in the development of railway infrastructure is encouraged for many reasons which include:

1. Supplementing government financial resources for timely and speedy development of rail infrastructure capacity in the country.

2. Ensuring financial viability of the project by involving the user and strategic investors in financial participation, thereby ensuring freight traffic on rail mode of transport.
3. Pre-selling of capacity through long term ‘take or pay’ agreements.
4. Bringing private sector efficiency in management of projects and construction.
5. Providing business focus to railway projects.
6. Bringing about significant reduction in O&M costs.
7. Spreading and sharing business risks with partners.

**PPP MODELS FOR FIXED INFRASTRUCTURE OF RAILWAYS**

The main areas of the private sector involvement and investment in railway sector are indicated below.

**BUILD-OWN-TRANSFER (ANNUITY MODEL)**

This model of private investment allows private sector participation in designing, building, and financing of the project. On completion of construction the project is handed over to IR for O&M. The ownership of the assets continues to remain with the private developer. The MOR awards a concession for a period of twelve years. After termination of the concession the assets gets transferred to the concerned Zonal Railway. During the concession period the private developer gets annuity payment twice a year. Selection of the developer is done through competitive bidding. The construction risk gets transferred to the developer, while the demand risk reposes with IR. The

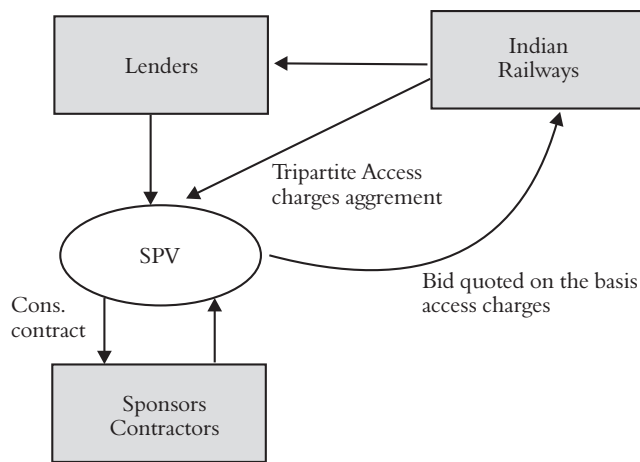


FIGURE 5.4.1: Schematic Representation of the Railways Annuity Model

developer has the incentive of completing the project early to start earning annuity payments.

**BUILD-OWN-OPERATE-TRANSFER MODEL**

Under this model of private sector participation, the private sector is involved in design, construction, financing, maintenance, and operation of railway projects. This model is normally applied to new line and gauge conversion projects. Operation in most cases is undertaken by IR under a contract as is the case with the maintenance of gauge conversion projects. These projects are a part of the network and the scale of economy demands integrated seamless operation.

**PRIVATE RAILWAYS**

Private sector involvement under this model covers design, construction, financing, maintenance, and operation. The operation can be undertaken by IR under contract or by the concessionaire, depending upon the situation.

**Rolling Stock Manufacturing JV**

Considering the demand for world class technology in railway passenger coaches, locomotives and wagons and also the need for enhancing manufacturing capacity in the country, IR has decided to set up new coach factories and loco manufacturing units as JVs. The main objective is to invite international technology, attract lower maintenance and operating costs, and to harness expertise and efficiencies of the private sector of international repute in running such a plant. IR has already decided to set up a coach factory at Rai Bareilly, and a loco manufacturing unit at Marowhra and Madhepura.

**Future of PPP in Development of Rail Infrastructure**

Railways are planning a quantum jump in plan expenditure during the 11th Plan period (2007–12). Plan size is expected to be around Rs 250,000 crore compared to about Rs 84,000 crore in 10th Plan period. Three-fold growth in investment can be supported only through large scale dependence on non-budgetary funds through borrowings and PPP. Railways are planning to mobilize about Rs 75,000 crore through these means. As a large number of schemes have already been launched in different areas of railway infrastructure, it is hoped that this period will see stabilization of various PPP models and evolution of new models.

## 5.5 PPP Models for Freight Business

*Ranjan Kumar Jain*

Railways are planning to not only maintain the high growth achieved in the current period but to further accelerate it. For this purpose, certain initiatives have been launched to partner with logistics providers in various ways so as to develop and integrate with a seamless logistics chain and to provide total logistics solutions to users. Some of these initiatives are listed below.

### PRIVATE FREIGHT TERMINAL

Under this policy the entire financing, construction, and operation of the freight terminal is undertaken by the private developer. A private terminal has been developed at Garhi Harsaru near Gurgaon by Gateway Distri Park within this scheme. MOR is formulating a policy of development of multimodal logistics parks or commodity-specific freight terminals on railway land on Build- Own-Operate (BOO) basis. Multimodal logistics parks will be like transport villages with all the facilities related to complete logistics operation. To begin with, locations are being identified along the dedicated freight corridors. Railways are building Dedicated Freight Corridor (DFC) between Delhi and Mumbai. Ministry of Industry has announced Delhi Mumbai Industrial Corridor along the Dedicated Freight Corridor. Investment to the tune of US\$ 90 billion is expected to be made in setting up of industrial units in the industrial corridor, largely by Japanese investors. Many multimodal logistics parks could be built along with the alignment of DFC in partnership with state governments and the private sector. Extensive integrated hubs in international logistics chain providing a large number of sidings with sheds, huge inland container depots, warehouses for storage, office buildings for logistics operators, highway connectivity, and smaller assembly units, working on imported raw materials for export purposes would be significant developments to watch out for in the coming years. Major logistics private players would act as lead promoters, with respective state governments providing land and road connectivity, and an SPV with DFC partnership for providing rail siding and rail connectivity.

### PRIVATE WAREHOUSE AND RAILWAY FREIGHT TERMINAL

Under this policy, railways offer land at lease charge and in addition, a share in revenue for the construction of

private warehouses at existing railway freight terminals. This helps in providing storage and distribution facilities at the rail head and avoids double handling in first transporting to a proximate warehouse using road transport. It reduces the overall cost of logistics and makes the chain more efficient. Warehouses have been constructed at Bangalore, Bhopal, Shakurbasti, Ghaziabad, Hyderabad, Nasik, Badnera, Lucknow by Central Warehousing Corporation Limited and so on. A total of twenty-two locations have been chosen so far.

### AGRI RETAIL LOGISTICS CHAIN

The country is witnessing a retail revolution. Big corporates have entered the retail chain market and are planning to open retail stores not only in the urban areas but also in rural areas. These retail chains will require a very strong supply chain network. It will also require the development of logistics facilities and networks. The railways have decided to be an integral part of these logistics chains by exploiting surplus railway land for the development of logistics facilities. The corporate entity managing the retail chain is expected to guarantee traffic movement to the railways.

### COMMODITY SPECIFIC FREIGHT TERMINALS

Railways have taken the initiative to develop commodity specific freight terminals, particularly for cement and steel traffic. These terminals will cater to the various logistics need of these commodities at the destination point. This endeavour will involve the development of warehousing facilities and partnership with the Clearing and Forwarding Agents with the aim of reducing the over-all cost of logistics and making railways a preferred mode of transport.

### PRIVATE CONTAINER TRAINS

The MOR has announced a policy of permitting private container train operators to move international container traffic. These operators will invest in container flats and construction and operation of private key side and inland container depots. Even for running of one train per day, it is expected that an investment of Rs 75 crore will need to be made by each operator. Fifteen companies have obtained licenses for entering the container operations fray so far.

Long term commitments on transit time and access charges on the part of railways would be necessary for achieving success in this area. The scope of this concession can be further increased to permit construction of private freight terminals, multimodal logistic parks, warehouses, and Container Freight Stations on BOO basis. Railways are planning to double the traffic under the 'other' category

(piecemeal containerized cargo and other bulk commodities) from 100 mt in 2007 to 200 mt in 2012. Such high growth will be possible if serious business effort is invested into the task by private train container operators in aggregating the piecemeal traffic which is presently moving by road through containerization and bringing it to railways for transportation.

## 5.6

# 4P Model of Freight Business for Indian Railways

G. Raghuram and Rachna Gangwar<sup>11</sup>

Indian Railways' overall share of freight declined from 89 per cent in 1950–1 to 40 per cent in 2000–1 making way for gains mainly for the road sector. In the recent years, pipelines have captured some share through POL (petroleum, oil, and lubricants) movement. Coastal shipping has emerged as a potential threat for IR. Due to lower prices, some bulk traffic like coal, iron ore, POL, and even cement is now moved by coastal shipping. Inland waterway transport is a potential competitive mode, though it needs a lot more investment to be effective. During the last fifty years IR hardly paid any attention to competitive perspectives, given that IR was a near-monopoly service provider for raw materials while there was significant competition for finished goods.

Table 5.6.1 presents the growth trend in the national production and IR's loading for five bulk commodities that accounted for nearly 70 per cent of the originating traffic for the period 1991–2 to 2003–4. The implication is that if IR's loading growth is higher than the production growth, then the originating traffic market share has increased, as in the case of coal and foodgrains. Conversely, IR's originating market share has decreased for iron & steel, cement, and POL. Thus, IR has increased its market share in low rated commodities, while its share in the high rated commodities has declined. This would also have affected IR's earnings adversely, for the same effort.

### FREIGHT TRAFFIC

Freight traffic accounts for nearly two-third of IR's revenues. It broadly consists of two groups, 'bulk'

TABLE 5.6.1  
Production and IR's Loading Growth

Bulk Commodity	Production Growth (per cent) (1991–2 to 2003–4)	IR's Loading Growth (per cent) (1991–2 to 2003–4)
<i>Low Rated Commodities</i>		
Coal	3.61	4.25
Food grains	1.22	4.24
<i>High Rated Commodities</i>		
Iron & steel	8.28	1.09
Cement	7.86	4.37
POL	8.02	2.88

Source: CRISIL (2005).

comprising seven commodities and, 'other goods,' consisting by and large of forty-two commodities.

Commodity-wise earnings (in percentage) of IR over three decades (1974–5 to 2004–5) are provided in Figure 5.6.1. IR's share in 'other commodities,' which was nearly 35 per cent in 1974–5, dropped to just 11 per cent by 2005–6. Other commodities include 'non bulk', high value items.

In the early 1980s, IR changed their policy of 'yard to yard' movement of rakes (a train load of wagons) to 'end to end' movement of rakes. Earlier, a customer could offer traffic as a wagon load. Such loaded wagons would be brought to the nearest yard, and after sufficient accumulation of wagons for a full rake for a yard in the direction of the destination, the rake would move to the

<sup>11</sup> This draws from the paper 'Marketing Strategies for Freight Traffic on Indian Railways—A Systems Perspective,' of the authors. This paper is being published in the Conference Proceedings of the Second National Conference on Management Science and Practice (SNCMSP), organized by Operational Research Society of India (ORSI) during March 9–11, 2007.

nominated yard. The wagon in the rake would then be sorted to build rakes for further yards towards the final destinations. This process would continue, with wagons sometimes having to undergo sorting upto half a dozen yards, incurring significant yard waiting times. This had resulted in operating inefficiency and delays.

In the ‘end to end’ movement, a customer was required to offer a full rake of traffic, in which case the rake moved right from the origin to destination without any intermediate sorting. While this policy provided significant operational gains for bulk commodities, which could offer rake load traffic, it resulted in loss of share in other (high rated) commodities due to the customer’s inability to offer rake load traffic. Road transport offered a competitive choice to these customers, even at a higher price, due to the flexibility, frequency, and door-to-door delivery. IR was unable to offer feasible options to these customers if the volumes were insufficient for rake load movement, especially keeping in view inventory costs. However, these commodities have future potential due to the growth in containerization.

### BUSINESS INITIATIVES BY IR SINCE 2002

During 1999–2000 and 2000–1, IR’s financial situation was very delicate. Surplus and fund balance had reached a record low and the operating ratio (ratio of total working expenses to total earnings) had reached a record high of 98.3 in 2000–1. Poor infrastructure imposed many safety concerns. In 2001, The Expert Group on IR submitted their report stating that the IR was heading towards

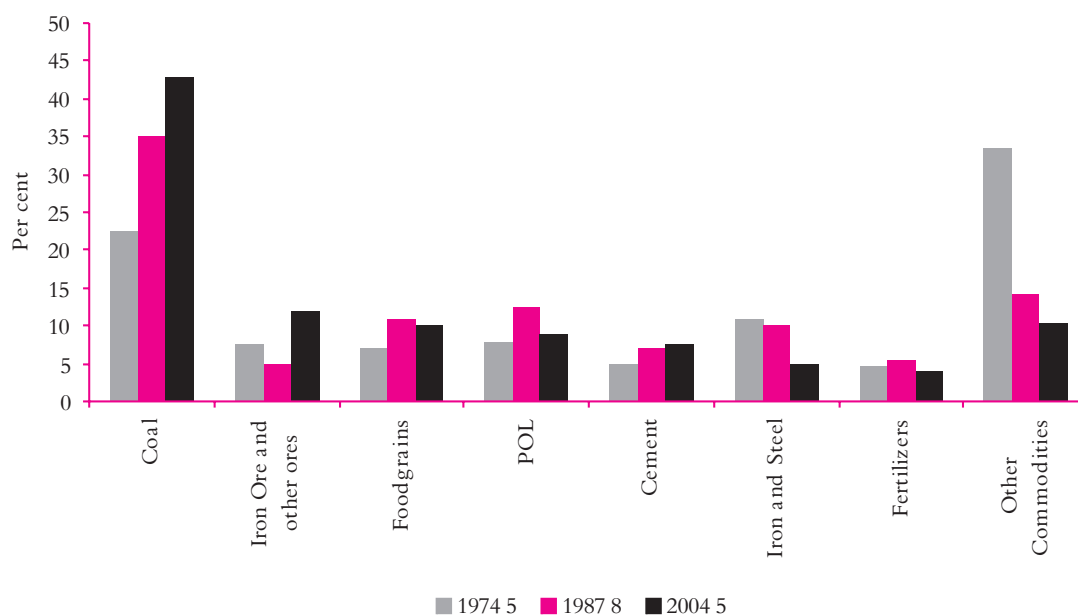
bankruptcy (NCAER, 2001). This jolted the IR into considering various initiatives.

Some of the major steps taken in improving the IR’s share in freight traffic were (MOCI, 2003):

1. Rationalization of freight rates structure to leverage price elasticity of demand.
2. Incentives to premier customers generating freight earnings of more than Rs 25 crore per annum for traffic originating from the sidings.
3. Policy to attract short lead traffic through higher freight concessions.
4. Computerization of freight movement through Freight Operations Information System (FOIS).
5. Providing warehousing facilities through Central Warehousing Corporation and private freight terminals. An MoU has been signed for providing integrated freight terminals at twenty-two locations in the country.
6. Focus on improving port connectivity and inter-modal transport.
7. Privatization of container movement on IR.

IR’s market share is improving as a result of initiatives taken. Table 5.6.2 demonstrates significant improvement IR’s loading growth in the recent past. In fact, IR’s loading growth has surpassed the production growth in high rated commodities for 2004–5 to 2005–6.

The dynamic freight rates rationalization process undertaken in the past few years is reflected in the number of freight rates circulars issued year-on-year (Table 5.6.3).



Source: MOR, Various Years.

FIGURE 5.6.1: Commodity-wise Freight Earnings

TABLE 5.6.2  
Production and IR's Loading Growth

	Production Growth (1991–2 to 2003–4)	IR's Loading Growth (1991–2 to 2003–4)	Production Growth (2003–4 to 2005–6)	IR's Loading Growth* (2003–4 to 2005–6)	Production Growth (2004–5 to 2005–6)	IR's Loading Growth* (2004–5 to 2005–6)
<i>Low Rated Commodities</i>						
Coal	3.61	4.25	5.6	8.1		8.4
Food grains	1.22	4.24		–3.3		–10.9
<i>High Rated Commodities</i>						
Iron & steel	8.28	1.09	6.0	8.1	7.4	12.2
Cement	7.86	4.37	11.7	11.4	9.3	13.7
POL	8.02	2.88	4.7	2.9		5.6

\* MOR, Internal Correspondence.

Source: CRISIL (2005); CMA (2006); MOS (2006); MOPNG (2006).

TABLE 5.6.3  
Freight Rate Circulars Issued by IRs (2003–4)

Year	No of Freight Rates Circulars Issued
2007 (till 20th July)	76
2006	114
2005	76
2004	55
2003	35

Source: IR (2007).

#### 4P MODEL FOR FREIGHT BUSINESS

In a very fundamental way, IR focuses more on originating traffic and implicitly looks at customer service only at the origin. There is no focus on the destination end of the movement. While data on originating traffic is available by origin, similar data on terminating traffic is not readily available.

A recent analysis of IR's freight loading at the originating end revealed that IR's top six divisions accounted for 45 per cent of the total originating traffic in 2005–6 (Table 5.6.4).<sup>12</sup>

The data presented in Table 5.6.4 reveals the scope for 'focus' in improving services for originating traffic, with 45 per cent share being accounted for by six divisions. Similar data and consequent focus is not available for terminating traffic (Murty, 2006). One study that analyses terminating traffic (as part of a larger analysis) is available, though it is now quite dated (Saxena, 1985).

IR has a tremendous potential in the freight segment, but an appropriate framework for market segmentation is missing. Originating traffic is only one perspective. A 4P model—involving four Ps of marketing, namely product (service attributes), price, promotion, and place (logistics)—which takes into account both origin and destination (OD) like in any other transport business, could be

TABLE 5.6.4  
Originating Loading for Top Six Divisions of IR

Division	Originating Loading (2005–6) (mt)	Growth over (2004–5) (per cent)	Share (per cent)	Major Commodities
Bilaspur	71.2	5.4	10.7	Coal
Dhanbad	59.8	6.7	9.0	Coal
Chakradharpur	57.6	21.0	8.6	Iron ore, Steel
Secunderabad	40.4	10.8	6.0	Coal, Cement
Asansol	37.9	13.9	5.7	Coal, Steel
Waltair	36.8	8.8	5.5	Iron ore, Steel
Originating loading of six divisions	304.0	12.1	45.0	
Originating loading of IR	666.5	10.7	100	

Source: Murty (2006).

<sup>12</sup> The total number of divisions in IR is 67.

used. Rather than examining origins and destinations geographically, the authors categorize origins and destinations on attributes that have implications for providing appropriate services.

The rail traffic can be viewed as almost entirely originating in one of the following three types of origins, namely, industry or collection centre (mandis in the case of foodgrains, inland container depots (ICD) in the case of containerized traffic, goods sheds in the case of wagons of different parties), mines, and ports. A similar and exhaustive categorization of destinations would be industries, ports, and distribution centres. The total freight traffic handled by IR is allocated to these origins and destinations as given in Table 5.6.5.

TABLE 5.6.5  
Originating and Terminating Traffic

	(in mt)	
	2004–5	2005–6
<i>Originating Traffic: Origin</i>	602.1	666.5
Industry/Collection Centre	186.1	198.9
Mine	357.2	398.8
Port	58.8	68.9
<i>Terminating Traffic: Destination</i>	602.1	666.5
Industry	337.3	382.1
Port	70.7	72.1
Distribution Centre	194.1	210.3

Source: Authors' Analysis.

An attempt was made by the authors to assign this traffic in a two-way classification, using the OD perspective (Table 5.6.6).

The above analysis has implications for leveraging the 4Ps of marketing; product (service attributes), price, promotion, and place (logistics). Product (service) attributes would include development and ownership of sidings, which could be 'private' (owned and managed by the customer) or 'public' (owned by IR, but generally managed by customers), having the sidings at both the origins and destinations, automation of loading/unloading, special purpose wagons, 24 hours loading/unloading, engine on load (EOL) and so on. Pricing strategies for major bulk commodities and container traffic would be derived on the basis of competitiveness with respect to other modes and market potential. Promotion would include freight schemes (like the schemes IR has announced recently) to improve the service attribute, and information sharing (including through FOIS). Place (logistics) attributes relate to inter-modal integration and warehousing.

## ANALYSIS OF KEY OD SEGMENTS

### Mine to Industry

This is the most significant flow, accounting for 343 mt, which is about 51.5 per cent of IR's traffic. Coal is the dominant commodity accounting for 246 mt. Table 5.6.7 gives the production figures of selected minerals in 2005–6, tonnage carried by IR and the share by IR. IR carried about 73 per cent of coal produced in 2005–6. More than 80 per cent of the coal that the IR transports goes to industries. Other important modes carrying coal are merry-go-round (MGR) systems, road, conveyor belt, and the rail-cum-sea route. Iron ore and other ores is the second most important commodity for this OD segment, followed by limestone, dolomite, and gypsum.

For this traffic, both mines and the major industries (power plants, steel plants and so on) usually have direct rail access through sidings. IR faces less competition due to door-to-door service provision.

In the service attributes, IR has a potential for productivity improvements. Mechanized loading/unloading, 24 hours loading/unloading, ensuring siding at both origin and destination, electrification of sidings, EOL are the services specific to these customers. Some of the initiatives have been taken in the recent past, but the scope is substantial. Electronic Payment Gateway facility, special purpose wagons, and sidings for full rake load capability are other potential areas. As regards pricing, since IR has an inherent competitive advantage, they can charge high rates. However, new sources of competition like imported coal coming from ports and resulting in port to industry traffic need to be recognized. Promotions are needed to reduce pressure in the peak season and stir up demand during off-peak season. Discounts for higher volumes (where scale economy operates) and in the empty flow direction (recently announced freight incentive schemes focus on these) are other possibilities. Explicit focus on logistics attributes beyond the service attributes may not be necessary, since this is essentially a door-to-door service.

### Industry/Collection Centre to Distribution Centre

This is second largest flow accounting for 180.5 mt, which is about 27.1 per cent of IR's traffic. Cement and foodgrains alone account for about 103 mt. Other significant commodities are fertilizers, iron & steel, and POL. This is the segment where IR faces stiff competition by road and pipeline (in case of POL). IR's market share in iron & steel, cement, and POL and has been declining over the past fifty years.

IR's loadings for iron & steel have declined in the past. This is presumably because the primary and main steel

TABLE 5.6.6  
Origin-Destination-wise Freight Traffic (in mt)

2005–6 (Total 666.5 mt)

O/D	Industry (382.1)	Port (74.1)	Distribution Centre (210.3)
Industry/ Collection Centre (198.9)		– Containers (13.5)	– Cement (61.2)
		– POL (4.9)	– Foodgrains (41.4)
			– Fertilizers (26.8)
			– Iron & steel (20.1)
			– POL (20.0)
			– Salt (4.7)
			– Other commodities (3.5)
		– Sugar (2.8)	
		Total (18.4)	Total (180.5)
Mine (398.8)	– Coal (245.6)	– Iron ore/other ores (40.4)	
	– Iron ore/other ores (72.7)	– Coal (15.3)	
	– Limestone/dolomite (12.0)		
	– Stones, excl. marble (10.1)		
	– Gypsum (2.8)		
	Total (343.1)	Total (55.7)	
Port (68.9)	– Coal (33.3)		– Containers (13.5)
	– Other commodities (5.4)		– POL (8.5)
	– Iron ore/other ores (0.4)		– Fertilizers (5.9)
			– Iron & steel (1.7)
		– Foodgrains (0.3)	
	Total (39.0)		Total (29.8)

Source: Authors' Analysis.

2004–5 (Total 602.1 mt)

O/D	Industry (337.3)	Port (70.7)	Distribution Centre (194.1)
Industry/ Collection Centre (186.0)		– Containers (12.3)	– Cement (53.8)
		– POL (4.1)	– Foodgrains (46.2)
			– Fertilizers (24.9)
			– POL (19.9)
			– Iron & steel (17.4)
			– Salt (4.2)
			– Sugar (2.1)
		– Other commodities (1.1)	
		Total (16.4)	Total (169.6)
Mine (357.2)	– Coal (224.9)	– Iron ore/other ores (38.1)	
	– Iron ore/other ores (57.9)	– Coal (16.2)	
	– Limestone/dolomite (10.0)		
	– Stones, excl. marble (8.0)		
	– Gypsum (2.2)		
	Total (303.0)	Total (54.3)	
Port (58.8)	– Coal (29.3)		– Containers (11.5)
	– Other commodities (4.7)		– POL (7.8)
	– Iron ore/other ores (0.3)		– Fertilizers (3.9)
	Total (34.3)		– Foodgrains (0.3)
		– Iron & steel (1.0)	
		Total (24.5)	

Source: Annexe.

TABLE 5.6.7  
Minerals Traffic Share

Commodity	Production mt	Carried by IR		Mines-Industries Share	
		mt	per cent	mt	per cent
<i>2005–6</i>					
Coal	403	294	73.0	246	83.5
Iron ore and other ores	140	113	81.0	73	64.1
Limestone & dolomite	170	12	7.0	12	100.0
Gypsum	4	3	75.0	3	100.0
<i>2004–5</i>					
Coal	382	270	70.8	225	83.2
Iron ore and other ores	143	96	67.5	58	60.2
Limestone & dolomite	161	10	6.2	10	100.0
Gypsum	4	2	62.0	2	100.0

Source: MOM (2007); MOM (2006).

producers have always remained the principal customers of the IR while the secondary producers refrained from using the rail network.

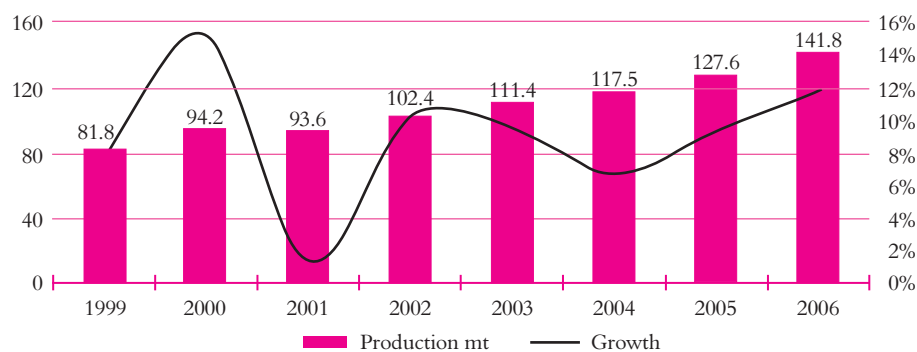
Cement production in the country recorded a compounded annual growth rate (CAGR) of 8.2 per cent between 1994–2003. The production and growth from 1999 to 2006 is given in Figure 5.6.2. Although production had been witnessing an impressive growth, IR was losing market. Currently, IR's share in cement is about 40 per cent.

The demand for petroleum products is projected to jump from 115 mt to 370 mt in the first quarter of the century. It has been estimated that at this level of demand it will be necessary to move 45 per cent or 170 mt of the product through pipelines against 30 per cent at present. After allowing 10 per cent for movement by coastal shipping (about 35 mt) and another 15 per cent by road (about 55 mt), there would be around 30 per cent share (about 110 mt) for IR as against 33 mt carried in 2005–6.

Since the competition is very high, IR should be at par with the other modes in terms of services. Terminals, availability of wagons, automation, timely delivery, and reliability are some of the service attributes. Special wagons for commodities such as cement (which is currently transported in bags) would add to the service. IR needs to offer competitive prices to retain customers on this OD segment. The Railways may provide volume-based discount to reduce unit cost to customers. Promotions to attract more traffic would be needed. Recently announced schemes (volume growth incentive schemes, consignment volume based schemes) are a step in the right direction. Logistics attributes including multi-modal services would be a critical factor in success.

### Mine to Port

This is the third largest flow, accounting for 55.7 mt, which is about 8.4 per cent of IR's traffic. Iron ore and other ores, and coal are the major commodities transported by rail.



Source: ICRA (2006).

FIGURE 5.6.2: India's Cement Production and Growth (in mt)

Iron ore and other ores move for exports. Coal moves to other parts in the country through coastal shipping. For this traffic, both mines and ports usually have direct rail access through sidings. IR faces less competition as it is a door-to-door service provider.

This recognition of being the favoured transporter made the IR upwardly revise the freight rates for iron ore for exports a few times in the past two years. However, significant quantities of iron ore for export still move by road since rail capacity to some of the ports (Paradip and Mormugao) is a bottleneck.

India's exports are growing at an average of 20 per cent per annum. However, India's export development strategy encourages 'value added' export. This means instead of increasing export of iron ore, export of finished goods, that is, steel or even steel-based finished products, will be encouraged. (Such export items would have a reduced proclivity to use IR. This needs to be countered with effective marketing support). Thus, mine to port export traffic may not grow fast. On the other hand, coastal shipping is expected to increase and this would be an opportunity for mine to port traffic by rail.

Service attributes could be door to door sidings, special purpose wagons, automation, and EOL. IR also needs to view coastal shipping in an inter-modal perspective and provide for it. Improved hinterland connectivity to ports is an important requirement. In pricing, IR has a competitive advantage of being a bulk carrier. Promotion may be needed to keep the customers by offering discounts.

### Port to Industry

This traffic flow accounts for 39.0 mt, which is 5.9 per cent of IR's traffic. Major commodities are coal, other commodities, and iron ore and other ores. Taking into consideration India's import growth, this traffic is likely to grow significantly in the future. Coal import is on the rise as the thermal power plants are gradually increasing use of imported coal as fuel. This is due to its high calorific value, and low ash and sulphur content as compared to domestic coal. In 2005–6, it was 33.3 mt, the largest commodity moving from ports to industry. Other commodities are all high value items, some moving in containers. The market share by rail of port to industry traffic does not exceed 30 per cent (PC, 2006).

The opportunities in this segment are significant. Containerized traffic is expected to grow. Import of raw material is also likely to grow in line with our export strategy.

For long lead traffic, the following emerge as key strategies:

- Sidings to enable more door-to-door movement, EOL for quick turn-round at the terminals, flexible

wagon design to enable use of the same wagon as open or covered so that empty wagon movement can be minimized and leveraged for goods movement.

- Dynamic pricing policy taking note of road competition, peak demand, and empty flow directions would be appropriate. Some of these would be in the nature of promotions.

Due to industrialization strategies, increasingly manufacturing locations are expected to be at or near ports. In such a case, the traffic between the port and the manufacturing location may move by other means of transport, like pipelines, conveyors belts, or even roads, more suited for short haul movement.

For short lead traffic, even though not apparent, opportunities for rail transportation could be available. There is significant industrial development within, say, 100 km of the ports, wherein both the raw material and finished goods move from and to the port. Appropriate merry-go-round services could bring the traffic to IR.

### Port to Distribution Centre

The traffic accounts for 29.8 mt, which is about 4.5 per cent of IR's traffic. Major commodities are containers, POL, and fertilizers. Traffic on this OD segment has a big potential to grow, taking into consideration the growth of imports (finished goods) and containerization.

Currently, 30 per cent of the traffic goes to hinterland by rail and the remaining moves entirely by road, mostly to nearby Container Freight Stations (CFS), and some to interior ICDs (PC, 2006).

Marketing requirements would be similar as in the port to industry OD segment. In the context of container traffic, competition in the rail container service sector would be critical to improve all marketing attributes. Double stack container trains would be an additional service attribute.

### Industry/Collection Centre to Port

The traffic in this segment accounts for 18.4 mt, which is about 2.8 per cent of IR's traffic. Major commodities are containers and POL. While this is a growing segment, the market share by rail is less than 30 per cent (PC, 2006). Requirement of marketing attributes would be similar to the port to distribution centre OD segment.

### COMMON CONCERNS

The analysis for marketing strategies of the different OD segments can be fine-tuned by a further segmentation of

short lead and long lead traffic. While this was explored in the port to industry segment, the paper does not carry it forward to all the other segments. For example, price discounts to ensure return of empties on long leads to desired destinations would be a useful strategy. Recently, IR has been aggressive through rate discounts in attracting export foodgrain traffic from roads to leverage the empty rake movement towards ports.

The potential door-to-door traffic (consisting of the mine to industry, mine to port, and port to industry segments) accounts for 65.7 per cent of the total traffic. In many ways, this is a result of IR's own policies of requiring full rake load movement from origin to destination and pricing. While the segment-wise analysis provides a framework to question this, it is also important to ensure that door-to-door segments are catered to with an aggressive perspective on efficiency.

A few common strategies to all the segments would be:

1. Improvement to terminals through automation of loading/unloading, full rake handling, intermodal coordination for stream lined evacuation and 24 hour loading/unloading.
2. Improvements to rail capacity by (a) de-bottlenecking at loading/unloading stations, faster movement in and out of sidings, bypasses, etc., (b) converting key Meter Gauge (MG) segments to Broad Gauge (BG), and (c) doubling of saturated BG segments.
3. Freight forwarding and stock yard development at the originating/terminating end to enable consolidated movement of goods.
4. Improved wagon design for flexibility of use between open and covered requirements, for stacking of packaged goods at multiple levels to ensure better service and utilization.
5. Non-electrification and removal of overhead infringing on a nominated route to the North Indian hinterland to enable better utilization of track capacity by running trains with double stacking of containers.

## POTENTIAL CLIENTS OF IR

IR handled 1333 mt of traffic either at origins or destinations in 2005–6. Out of this, industries handled 580.9 mt, mines 398.8 mt, distribution centres 210.3 mt, and ports 143.0 mt together at origins and destinations. The shares would be: industries 43.6 per cent, mines 29.7 per cent, distribution centres 15.8 per cent, and ports 10.7 per cent. In the above perspective, industries are the biggest client followed by the mines, distribution centres, and ports.

These figures and the OD analysis together have the following implications on client-based strategies.

### INDUSTRY

Industry originating traffic is 198.9 mt and industry terminating traffic is 382.1 mt, accounting for a total of 580.9 mt, which is about 43.6 per cent of IR's traffic. Terminating traffic is about 92.1 per cent higher than the originating traffic. Coal (which accounts for 44.1 per cent of the total industry handled traffic) is the reason for relatively much higher traffic at the terminating end.

IR needs to respond to the industry specific needs by interacting with them regularly. IR should be in line with other modes to retain/improve its originating traffic, which is mainly to the distribution centres. There is a potential for IR, provided high capacity wagons, special purpose wagons, bigger train loads, closed circuit rakes, and round the clock operations are given significant focus based on customer-specific requirements.

### MINES

Mines traffic is 398.8 mt, almost 29.9 per cent of total IR's traffic. 86.0 per cent traffic from mines moves to the industries. The remaining 14.0 per cent goes to the ports. By improving infrastructures at loading points (goods sheds, terminals, sidings, automation), IR could be the most competitive mode for these clients.

### DISTRIBUTION CENTRES

IR carried 210.3 mt traffic to distribution centres, which is about 15.8 per cent of the total OD traffic. 85.8 per cent of this traffic is from industries, and the remaining 14.2 per cent is from ports. Traffic moved further from distribution centres to the retail outlets, is moved by other modes, mainly road. IR can target this traffic, and could be the single transporter to its customers. There could also be possibilities of providing multi-modal transportation services in collaboration with other transport modes.

### PORT

Port originating traffic is 68.9 mt and port terminating traffic is 74.1 mt, accounting for a total of 143.0 mt, which is about 10.7 per cent of IR's traffic. The port as a significant client needs to be recognized in this framework, since otherwise IR tends to look at clients at the originating side.

IR has opportunities to increase its traffic volumes and market share in port traffic. Apart from increasing line capacity on the rail route to the hinterland (which the IR were already considering through appropriate infrastructural investments), it would also be important to develop appropriate customer oriented systems and other infrastructure. The strategies that IR needs to adopt for this would emerge as a result of understanding the supply chain requirements of the major commodities being handled at these ports.

India's international trade is going up. Port traffic is also going up, both due to international trade and coastal movement. IR's market share of domestic movement is going down. IR has a market share of about 30 per cent of the port traffic for hinterland movement (PC, 2006). Port traffic is largely bulk and containers and IR has expertise in this. There is potential for IR to focus on port-based traffic and develop a sustainable niche. The mode choice for traffic from and to the hinterland is based on lead to/from port, freight rates, volume per shipment, availability of wagons, and services at the customer interface.

## CONCLUDING REMARKS

IR has yet to evolve a culture of generating its strategies rooted in an understanding of the customer. For this, segmenting the market on key dimensions would be essential. IR should focus on the OD perspective proposed in the 4P model of this paper. They can also focus on inter-divisional OD flows. This needs comprehensive information on terminating traffic. This orientation will allow each division to derive their own strategies based on market segmentation. IR needs to change their perspective of looking at the traffic. They must view traffic along with their clients as partners. There is a need for client based strategies. Integration and increase of IT related technologies are required. FOIS is a good initiative, and can be used to collect comprehensive data on OD segments, lead, customers at the divisional level. Pricing, provision of infrastructure and services, long term contracting and so on could be driven effectively by appropriate segmentation. It would also be essential to have consultative process with key customers.

## ANNEXE

## Methodology Used to Derive the OD Matrix

## ORIGINATING TRAFFIC

The origins are categorized as Industry/Collection Centre, Mine, and Port.

First, the IR traffic from the ports is estimated by assessing the port-wise commodity-wise import and then applying the IR market share.

For major ports, the share of IR for each port and commodity is taken as the modal splits estimated by the Planning Commission, except for other ores, fertilizers, and iron & steel, which were not estimated. For these commodities, the authors made assumptions based on the nature and quantum of cargo, and rail-port connectivity. More than 80 per cent of the 'other ores' import is through Tuticorin. IR is estimated to be carrying only 30 per cent of this traffic. Fertilizers import is largely at Visakhapatnam, Kandla, Chennai, and New Mangalore. Existing rail connectivity from these ports enables IR to have higher share in the traffic, which is estimated to be around 70 per cent. Iron & steel is largely imported through Mumbai and Kandla and only 30 per cent of this is estimated to be carried by rail.

A similar methodology was followed for non-major ports. Coal, POL, foodgrains, fertilizers, and some dry bulk are the major commodities that are imported through the non-major ports in Gujarat and Maharashtra. Rail share is estimated to be the same as from the major ports, except for thermal coal, which is entirely carried by IR.

Table A5.6.1 shows the calculations for the IR traffic originating at ports for 2005–6.

After the above calculation of IR traffic from ports, the non-port IR originating traffic is determined by subtracting the port traffic from the total commodity-wise traffic of IR. The non-port IR originating traffic has been allocated to industry and mines by recognizing the specific origin for each commodity such as coal from mines, iron ore and other ores from mines, cement from industry, POL from industry, foodgrains from industry (collection centre), fertilizers from industry, iron and steel from industry, limestone & dolomite from mines, stones from mines, gypsum from mines, salt from industry (collection centre), sugar from industry.

## TERMINATING TRAFFIC

The destinations are categorized as:

- Industry
- Port
- Distribution Centre

First, the IR traffic to the ports is estimated by assessing the port-wise commodity-wise export and then applying the IR market share.

For major ports, the share of IR for each port and commodity is taken as the modal splits estimated by the Planning Commission, except for thermal coal, which was not estimated. For this commodity, the authors assumed 100 per cent rail share, since this entire amount is brought from mines to the ports for the coastal movement.

TABLE A5.6.1  
IR Traffic Originating at Ports for 2005–6

Commodity Group	Commodity	Major Ports		Non-Major Ports		Total by IR (mt)	Total by IR (mt)
		Import <sup>1</sup> (mt)	IR Share <sup>2</sup> (per cent)	Import <sup>1</sup> (mt)	IR Share (per cent)		
Coal	Thermal coal	22.36	20	2.11	100	6.58	33.32
	Coking	21.10	100	1.05	100	22.15	
	Other coal	9.18	50	0.00	0	4.59	
Iron ore and other ores	Iron ores	0.19	0	0.00	0	0.00	0.35
	Other ores	1.16	30	0.00	0	0.35	
Cement	Cement	0.85	0	0.00	0	0.00	0.00
POL	POL	16.79	25	11.58	25	7.09	8.54
	LPG	2.89	50	0.00	0	1.44	
Foodgrains	Foodgrains	0.05	70	0.32	70	0.25	0.25
Fertilizers	Fertilizers	6.62	70	1.79	70	5.89	5.89
Iron & steel	Iron & steel	5.51	30	0.00	0	1.65	1.65
Other	Other dry bulk	5.77	30	10.33	25	4.31	5.36
	Other liquid bulk	5.24	20	0.00	0	1.05	
Containers	Containers	30.02	45	0.00	0	13.51	13.51
Total	Total	127.73		27.18		68.88	68.88

Source: <sup>1</sup>IPA (2007); <sup>2</sup>PC (2006).

TABLE A5.6.2  
The Consequent Allocation of the IR's Traffic (Commoditywise and Originwise) for 2005–6

Commodity	Total mt	Port		Industry		Mine	
		mt	per cent	mt	per cent	mt	per cent
1 Coal	294.25	33.32	11.32	0.00	0.00	260.93	88.68
2 Iron ore and other ores	113.45	0.35	0.31	0.00	0.00	113.10	99.69
3 Cement	61.20	0.00	0.00	61.20	100.00	0.00	0.00
4 POL (mineral oils)	33.45	8.54	25.52	24.91	74.48	0.00	0.00
5 Foodgrains	41.64	0.25	0.61	41.39	99.39	0.00	0.00
6 Fertilisers	32.65	5.89	18.04	26.76	81.96	0.00	0.00
7 Iron & steel	21.76	1.65	7.60	20.11	92.40	0.00	0.00
8 Limestone & dolomite	11.95	0.00	0.00	0.00	0.00	11.95	100.00
9 Stones (excl. marble)	10.06	0.00	0.00	0.00	0.00	10.06	100.00
10 Gypsum	2.74	0.00	0.00	0.00	0.00	2.74	100.00
11 Salt	4.69	0.00	0.00	4.69	100.00	0.00	0.00
12 Sugar	2.81	0.00	0.00	2.81	100.00	0.00	0.00
13 Containers	13.51	13.51	100.00	0.00	0.00	0.00	0.00
14 Other commodities	22.35	5.36	23.99	16.99	76.01	0.00	0.00
<b>Total</b>	<b>666.51</b>	<b>68.88</b>	<b>10.33</b>	<b>198.85</b>	<b>29.84</b>	<b>398.78</b>	<b>59.83</b>

Source: MOR (2007).

There is hardly any rail movement for exports at non-major ports. This is hence assumed to be zero. Table A5.6.3 calculates the IR traffic terminating at ports for 2005–6.

After the above calculation of IR traffic to ports, the non-port IR terminating traffic is determined by subtracting the port traffic from the total commodity-wise traffic of IR. The non-port IR terminating traffic has been allocated to industry and distribution centre by recognizing the specific destination for each commodity, namely, coal to industry, iron ore and other ores to industry, cement to distribution centre, POL to distribution centre, foodgrains to distribution centre, fertilizers to distribution centre, iron & steel to distribution centre, limestone & dolomite to industry, stones to industry, gypsum to industry, salt to distribution centre, sugar to distribution centre. The consequent allocation of the IR's

traffic (commodity-wise and destination-wise) for 2005–6 is given in Table A5.6.4.

### ASSIGNING TRAFFIC TO OD SEGMENTS

The commodities originating at ports are first examined to identify the destinations. Coal, other commodities, iron ore, and other ores terminate at industries, while containers, POL, fertilizers, foodgrains, and iron & steel terminate at distribution centres.

The commodities terminating at ports are similarly examined to identify the origins. Containers and POL are from industry/collection centre, while iron ore and other ores, and coal are from mines.

TABLE A5.6.3  
IR Traffic Terminating at Ports in 2005–6

Commodity Group	Commodity	Export <sup>1</sup> (Major Ports) (mt)	IR Share <sup>2</sup> per cent	Total by IR (mt)	Total by IR (mt)
Coal	Thermal coal	15.30	100	15.30	15.30
	Coking	0.00	0	0.00	
	Other coal	0.00	0	0.00	
Iron ore and other ores	Iron ores	78.99	50	39.49	40.43
	Other ores	1.87	50	0.94	
Cement	Cement	0.00	0	0.00	0.00
POL	POL	19.71	25	4.93	4.93
	LPG	0.00	0	0.00	
Foodgrains	Foodgrains	0.00	0	0.00	0.00
Fertilizers	Fertilizers	0.00	0	0.00	0.00
Iron & steel	Iron & steel	0.00	0	0.00	0.00
Other	Other dry bulk	0.00	0	0.00	0.00
	Other liquid bulk	0.00	0	0.00	
Containers	Containers	29.92	45	13.46	13.46
<b>Total</b>	<b>Total</b>	<b>145.78</b>		<b>74.12</b>	<b>74.12</b>

Source: <sup>1</sup>IPA (2007); <sup>2</sup>PC (2006).

After assigning the above, all the remaining

(ii) mine originating traffic can be assigned to industries.

- (i) industry originating traffic can be assigned to the distribution centres, and

The OD matrix has been prepared based on the above calculations and presented in Table 5.6.6.

TABLE A5.6.4  
IR's Traffic (Commoditywise and Destinationwise) for 2005–6

Commodity	Total mt	Port		Industry		Distribution Centre	
		mt	per cent	mt	per cent	mt	per cent
1 Coal	294.25	15.30	5.20	278.95	94.80	0.00	0.00
2 Iron ore and other ores	113.45	40.43	35.64	73.02	64.36	0.00	0.00
3 Cement	61.20	0.00	0.00	0.00	0.00	61.20	100.00
4 POL (mineral oils)	33.45	4.93	14.74	0.00	0.00	28.52	85.26
5 Foodgrains	41.64	0.00	0.00	0.00	0.00	41.64	100.00
6 Fertilisers	32.65	0.00	0.00	0.00	0.00	32.65	100.00
7 Iron & steel	21.76	0.00	0.00	0.00	0.00	21.76	100.00
8 Limestone & dolomite	11.95	0.00	0.00	11.95	100.00	0.00	0.00
9 Stones (excl marble)	10.06	0.00	0.00	10.06	100.00	0.00	0.00
10 Gypsum	2.74	0.00	0.00	2.74	100.00	0.00	0.00
11 Salt	4.69	0.00	0.00	0.00	0.00	4.69	100.00
12 Sugar	2.81	0.00	0.00	0.00	0.00	2.81	100.00
13 Containers	13.51	13.46	99.63	0.00	0.00	0.05	0.37
14 Other commodities	22.35	0.00	0.00	5.40	24.16	16.95	75.84
<b>Total</b>	<b>666.51</b>	<b>74.12</b>	<b>11.12</b>	<b>382.12</b>	<b>57.33</b>	<b>210.27</b>	<b>31.55</b>

Source: MOR (2007).

## 5.7

## PPP Model of Indian Airports—Lessons from Delhi and Mumbai Airport Concessions<sup>13</sup>

*Rekha Jain, G. Raghuram, and Rachna Gangwar*

In June 2003, the Airports Authority of India (AAI) board approved a modernization proposal through the privatization route for Delhi and Mumbai airports. The bidding process began in May 2004 with an original completion date of September 2004. However, due to a variety of reasons, the bids were finally sought and received by September 2005. The evaluation process of the bids was questioned at various levels. Various government committees considered different aspects of modernization of airports and the final decision was made in January 2006 by the government after compromising on some of its own set parameters for the Mumbai airport (Jain et al., 2007).

In 2003–4, Delhi airport handled 10.4 million passengers, of which 58 per cent were domestic. The total cargo traffic was 296 thousand tonnes, of which 31 per cent was domestic. The main source of revenue at Delhi airport was aeronautical services (42 per cent). Non-aeronautical services included cargo (26 per cent), and commercial and others (32 per cent) (AAI, 2005a). Figure 5.7.1 gives the revenue streams for the airport operator.

In 2003–4, Mumbai airport handled 13.3 million passengers, of which 60 per cent were domestic. The total cargo traffic was 326 thousand tonnes, of which 28 per cent was domestic. The main source of revenue at Mumbai airport was aeronautical services (50 per cent). Non-aeronautical services included cargo (17 per cent), and commercial and other (33 per cent) (AAI, 2005b).

During the early period of the 10th Plan (2002–7), passenger traffic at airports grew at an average rate of 7 per cent per annum. The government was expecting an average growth rate of 16 per cent per annum by 2010, given the ‘Open Skies’ policies and the response by the private sector in establishing new airlines, including low cost carriers.

In 2002–7, nearly 97 per cent of the country’s foreign tourists arrived by air, mostly through the Delhi and Mumbai gateways. Tourism was the nation’s second largest foreign exchange earner. While cargo carried by air weighed less than 1 per cent of the total cargo exported/imported, it accounted for nearly 20 per cent of the total value.

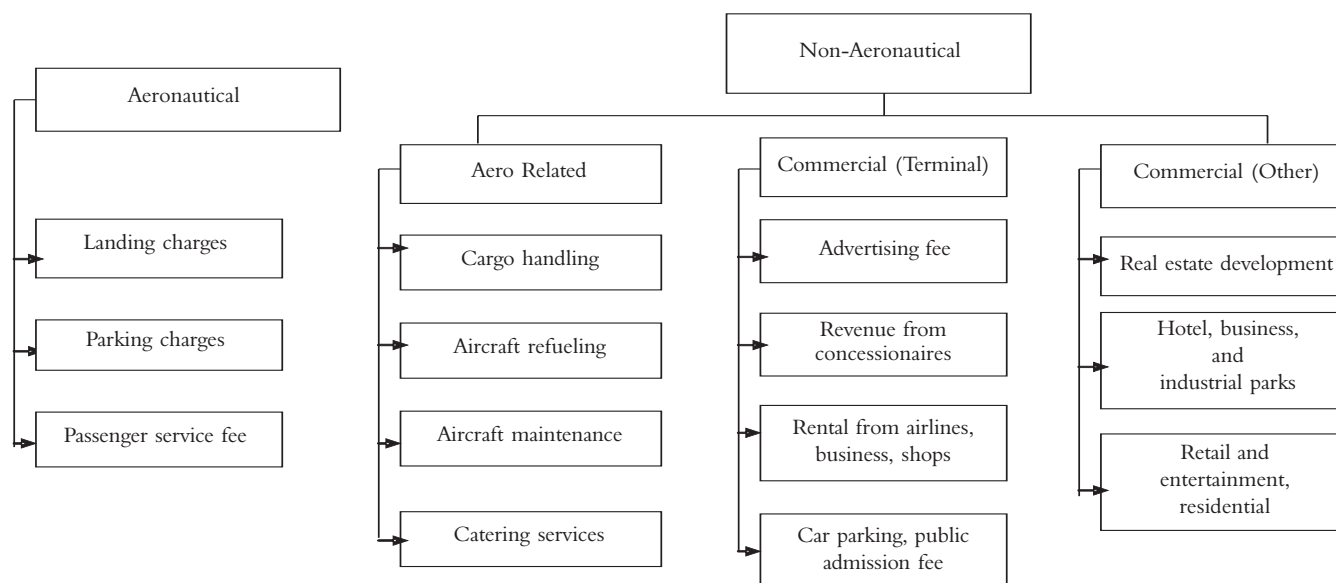
A survey by the International Air Transport Association revealed that for the year 1999, Delhi and Mumbai airports ranked amongst the three least favoured airports in the Asia Pacific region in each of the 19 service elements considered. The overall ratings for Delhi and Mumbai were 2.6 and 2.3 respectively on a 5 point scale, while the average for airports in the Asia Pacific region was 3.5 and for world airports was 3.8. Copenhagen, Singapore’s Changi, and Helsinki ranked among the top for overall passenger satisfaction out of the 57 airports covered in the survey, with a rating of about 4.3 to 4.4 (RSS, 2002).

### AIRPORT CONCESSION MODEL

The driving force of the airport concession model was to capture private sector efficiency in developing a world class airport in a short period of time. The concession was designed to ensure that the new JV company (JVC) met its commitments to make timely provision of high quality airport infrastructure (on both the airside and landside) to meet the growing demand. Apart from the physical infrastructure, the concessionaire was also expected to set up airport management systems of global standards. Serious, committed, successful bidders were selected with suitable operational expertise, managerial and financial capabilities, quality consciousness and integrity.

In addition, the model was structured in a way that ensured timely completion and certainty of closure, with minimal residual risks. Smooth transition of operations under the concession agreements was envisaged through appropriate regulation—achieving economic regulation of aeronautical assets that was fair, commercially and economically appropriate, transparent, predictable, consistent, and stable while protecting the interests of users. Fair and equitable treatment of AAI employees, including preservation of accrued entitlements was assured. The concession allowed for diversity of ownership between Delhi and Mumbai airports, to encourage innovation and allow competitive benchmarking. These objectives formed part of the bid evaluation criteria. Hence, GoI reserved the right to alter these objectives as appropriate.

<sup>13</sup> This paper is derived from a series of case studies written on the subject by the authors.



Source: GMR, 2006.

FIGURE 5.7.1: Airport Operator Revenue Streams

#### KEY CLAUSES ON THE CONCESSION

AAI and other GoI public sector entities would together own 26 per cent equity in each JVC and the remaining 74 per cent equity would be contributed by the successful bidder. Certain key functions such as Air Traffic Services, security, customs, immigration, quarantine, and meteorological services would not be performed by the JVCs. Existing employees of AAI at the airports should be deputed to the JVC for a period of three years.

Each JVC would have a long-term concession to operate the Delhi and Mumbai airports respectively. The period of the concession and the terms for its possible extension including the right of first refusal for competing airports in the vicinity of the airports would be determined subsequently.

EOIs would be invited for either or both the airports. Short-listing of prospective bidders would be carried out on the basis of information provided in the EOI documents. Pre-qualified bidders (PQB) would then be given the opportunity to submit final binding bids in accordance with the Request for Proposal (RFP).

Successful bidders would enter into separate JVs with AAI for the two airports through a shareholder's agreement for operation and management of each of the JVCs.

#### CONDITIONALITIES FOR THE CONSORTIUM AND OWNERSHIP

Key conditionalities, as given in the Invitation to Register an Expression of Interest are stated below (AAI, 2004):

#### Net Worth

It was mandatory for each prospective bidder to have a net worth in excess of Rs 5000 million as per the most recent audited accounts. In the event that the prospective bidder was a consortium, the combined net worth of only the Prime Members would be considered.

#### Lead Member of the Consortium

In the event that the prospective bidder was a consortium, each consortium would have to nominate a lead member as the authorized representative of the consortium. Entities would be prohibited from participating in more than one consortium submitting an EOI for the same airport.

#### Entities in a Disqualified Consortium

Entities of a consortium that had been disqualified (except entity(ies) who had been disqualified for probity, security or related reasons) at the EOI stage could participate with a PQB subject to prior written approval of AAI. Notwithstanding any such written approval, such changes should not affect the quality and operational capability of the PQB.

#### Airport Operator

Each prospective bidder was expected to be an airport operator or have at least one airport operator in its consortium.

Airport operators would be required, at the least, to enter into a service performance contract acceptable to AAI.

Additional weight would be given to prospective bidders with airport operators proposing to hold equity of no less than 10 per cent in the JVC.

### *Cross-Ownership*

AAI had decided to impose cross-ownership restrictions between Delhi and Mumbai airports, which would preclude:

1. Any common ownership by successful bidders with common prime members throughout the term of the concession period.
2. Any common ownership or common involvement by an airport operator via participation through a service performance contract.

Interested parties could lodge an EOI for both Delhi and Mumbai airports. If pre-qualified for both airports, bidders could bid for both airports, but on the basis that only one bid would be successful.

### *Airline Participation*

Equity ownership in the JVCs by scheduled airlines, cargo airlines, and their group entities was restricted to 5 per cent. However, group entities of scheduled airlines and cargo airlines that were existing airport operators as on the date of issue of this document were exempted from this restriction.

### *Foreign Ownership*

The JVC would be subject to a 74 per cent foreign ownership limit as per the prevailing Foreign Direct Investment guidelines on sectoral limits (and as amended from time to time).

### *Lock-in*

The successful bidder or the entities in its consortium (where applicable) would be subject to a suitable lock-in period which would be determined subsequently in the process.

### **REQUEST FOR PROPOSAL**

The Empowered Group of Ministers (EGoM) approved key principles of the RFP document (AAI, 2005c) along with the draft transaction documents. The RFP document for Delhi and Mumbai airports and the draft transaction documents were issued to nine PQBs on 1 April 2005.

The finals bids were to be submitted by 24 June 2005. The pre-bid process envisaged management presentations, site visits, due diligence, question and answer processes,

technical inspection of airports, management interviews, proposed changes in the draft transaction documents, review meetings of PQBs with the government transaction team, and culmination with the lodgement of offers. Dates and deadlines were provided for each of the above.

The evaluation process was to be conducted in four phases. Phase 1 required the consideration of certain mandatory requirements, not meeting which would result in removal from further consideration. These included the FDI cap, equity ownership, and bid bond.

Phase 2 involved the consideration of financial commitment. There was a requirement that the external funding of aeronautical developments at the airport could not be secured against the land and aeronautical assets. Committed equity for the first seven years and committed bank lending for debt for the first seven years was a mandatory requirement.

All remaining offers would be then assessed in Phase 3 for a minimum benchmark of 80 per cent on two technical pre-qualification criteria. These were (a) management capability, commitment, and value-addition and (b) development capability, commitment, and value-addition. For each of the above criteria, there were various sub-criteria. Marks were assigned to the sub-criteria so that the total for a criterion added to 100. The assessment was to be on an absolute (and not on a relative) basis between the offers. There was no pre-determined number of offers that would be considered for Phase 4.

Phase 4 involved the assessment of the financial consideration. The principle was that the bidder who offered the highest percentage of gross revenue (both aeronautical and non-aeronautical) to be shared with the government would be the successful bidder. A minimum bid of 5 per cent was set.

As it was possible that a bidder could bid for more than one airport, it was also envisaged that the highest bidder may be the highest for both the airports. In such a case, the highest bidder would be declared as the successful bidder for that airport where the margin between the highest offer and the second best offer was the most. Accordingly, the successful bidder for the other airport would be the bidder with the second best offer for that airport provided that bidder was willing to match the highest bidder for that airport.

As per the RFP, the winning bidders were mandated to undertake capital expenditure of Rs 28 billion at Delhi and Rs 26 billion at Mumbai in the first five years. The expenditure on development of Delhi was likely to be Rs 79 billion for the period 2005–24 and for Mumbai, it was likely to be Rs 59 billion for the period 2005–19. The capital expenditure would depend on the extent of

upgradation of existing terminal buildings, new terminal buildings, rail link connectivity between terminals, connectivity to city public transportation, upgradation of Air Traffic Control equipment, development/upgradation of retail outlets, advertising, parking and so on. Capital expenditure even to upgrade basic maintenance was expected at Rs 250 million per annum.

### BID SUBMISSION

Transaction documents were issued to eight PQBs, with the extended bid date of 14 September 2005. In the interim, the DLF–MANSB consortium had dissolved itself. MANSB was invited to join the GMR-Fraport consortium. Out of eight PQBs, Bharti-Changi, and L&T-Piramal-Hochtief pulled out citing stiff performance conditions in the transaction documents. Five consortia submitted their bids for Delhi and six for Mumbai on 14 September 2005.

Bidders for Delhi Airport	Bidders for Mumbai Airport
1. Reliance-ASA	1. Reliance-ASA
2. GMR-Fraport	2. GMR-Fraport
3. DS Construction-Munich	3. DS Construction-Munich
4. Sterlite-Macquarie-ADP	4. Sterlite-Macquarie-ADP
5. Essel-TAV	5. Essel-TAV
	6. GVK-ACSA

### POST-BID EVENTS

An Evaluation Committee (EC) was formed in mid-September to evaluate the bids. It submitted the report in November 2006, announcing two short-listed consortia as Reliance-ASA and GMR-Fraport based on the qualifying marks of 80 per cent. The evaluation was questioned at various levels, leading to further reviews and delays. Several committees were formed to reach a conclusion, the last being the Group of Eminent Technical Experts (GETE), which was constituted at the end of December 2006. The scope of GETE, amongst other process suggestions, was to have an overall validation of the evaluation process, including calibration of the qualifying cut-off and sensitivity analysis. The sensitivity analysis would cover the impact of *inter-se* weightages of sub-criteria as well as scoring.

The GETE evaluation had an effect on the management capability scores of the bidders. GETE submitted their report on 17 January 2007, announcing GMR-Fraport as being the only technically qualified bidder (Table 5.7.1).

TABLE 5.7.1  
Technical Evaluation Score Summary

S. no.	Name of the Bidder	(Per cent)		
		Management Capability		Development Capability
		EC	GETE	EC
<i>Delhi Airport</i>				
1	Reliance-ASA	80.9	74.8	81.0
2	GMR-Fraport	84.7	81.7	80.1
3	DS Construction-Munich	73.1	73.3	70.5
4	Sterlite-Macquarie-ADP	57.0	53.5	61.9
5	Essel-TAV	37.6	40.4	41.4
<i>Mumbai Airport</i>				
1	Reliance-ASA	81.0	74.8	80.2
2	GMR-Fraport	84.7	81.7	92.7
3	DS Construction-Munich	73.1	73.3	54.7
4	Sterlite-Macquarie-ADP	57.0	53.5	65.1
5	Essel-TAV	35.5	38.3	29.4
6	GVK-ACSA	76.0	73.0	59.3

Source: SC (2006).

### Government Decision and Subsequent Events

On 24 January 2006, the EGoM met and made various decisions. These were announced by Ministry of Civil Aviation and the AAI on 31 January 2006:

- GMR-Fraport is the only technically qualified bidder for both the airports.
- Financial bids of the top four technical bidders will be opened.
- GMR-Fraport is given the choice of selecting the airport subject to matching the highest financial bid since it is the only technically qualified bidder.
- The other airport (not chosen by GMR-Fraport) will be awarded to the highest financial bidder amongst three bidders. This is essential because the government cannot afford to wait for another bidding process which is time consuming. The government has declared technical cut-off marks of 50 per cent for this airport.

The financial bids were opened on January 31, 2006 (Table 5.7.2).

On January 31, the following decisions were made:

- GMR-Fraport chose Delhi airport and matched the highest bid of Reliance ASA.
- GMR-Fraport was selected for Delhi airport.
- Mumbai airport was awarded to GVK-ACSA.

EGoM approved the selection of GMR-Fraport for Delhi and GVK-ACSA for Mumbai and forwarded it to the Cabinet for approval.

TABLE 5.7.2  
Evaluation of Delhi and Mumbai Airport Bids

(Per cent)

Delhi Airport		Mumbai Airport	
Bidders	Bid	Bidders	Bid
Reliance-ASA	45.99	Reliance-ASA	21.33
GMR-Fraport	43.64	GMR-Fraport	33.03
DS Construction-Munich	40.15	DS Construction-Munich	28.12
Sterlite-Macquarie-ADP	37.04	Sterlite-Macquarie-ADP	Bid not Opened
Essel-TAV	Bid not Opened	Essel-TAV	Bid not Opened
		GVK-ACSA	38.70

Source: SC (2006).

One of the losing bidders called this an arbitrary decision making process and challenged the decision in court. After two stages of legal battle, the bidder finally lost the case in November 2006 and the original awardees retained their position. In March 2006, GoI handed over Delhi and Mumbai airports to manage to private parties, Delhi International Airport (P) Ltd. and Mumbai International Airport (P) Ltd, respectively.

## LESSONS LEARNT

### SIGNIFICANT THOUGHT SHOULD BE GIVEN TO THE RFP INCLUDING THE BID STRUCTURE, CONSTITUTION OF COMMITTEES AND CONTINGENCY PLANNING (ESPECIALLY IF NONE OR ONLY ONE BIDDER QUALIFIED)

While the bid structure was reasonably detailed, it still did not include factors like the development of an integrated terminal (between arrival and departure, different airlines, domestic and international, and with other modes). The weightages of sub-factors had not been specified, leading to debates on whether they should be weighted equally or based on 'perceived' importance. Minimum thresholds were not clearly specified in all cases as mandatory. The scoring scale between the threshold and the maximum was left open.

The constitution of one of the committees was criticized on the grounds of conflict of interest. The creation of additional committees was also criticized, since a prior, thought-out process was not specified. While the RFP had envisaged ties in the outcome of the bid, it had not recognized the situation of none or one qualifying. Unfortunately, this is what happened, leading to EGoM having to use its power of 'absolute discretion'.

### NORMS DURING THE BIDDING PROCESS NEED TO BE SPECIFIED AND COMPLIED WITH

Adherence to deadlines, responsibility of the bidders in identifying and bringing to notice deficiencies in the bid document during pre bid meetings, discretion on the part

of bidders in independently communicating with sensitive stakeholders (decision makers, media and so on), and deciding modifications in the evaluation by the EC, if required, prior to opening of the bids would be examples of such norms.

The experience with the concessioning of the Delhi and Mumbai airports raises a number of issues which may deserve sensitive consideration for the future.

The first among these is whether the GETE report ought to have been accepted given that it resulted in the revision of the Reliance score to sub-threshold levels. Indeed, this led two re-valuations which may not have been justified. Should the GETE report have been accepted, especially since it revises the Reliance score to below cut off? Were the two re-evaluations justified?

It is important to ask if GMR should have been given a choice rather than being awarded the airport that brought best value to the GoI on opening the financial bids. GMR's choice of Delhi airport effectively got Reliance out of the bid. Taking this thought further, asking GMR to match the highest financial bid while making a choice on the airport was perhaps not the best of ideas given that the top four bids might have been significantly higher than GMR's?

The Mumbai airport ended up in the hands of a bidder that, by the EoGM's own admission, was not technically qualified to earn the benchmark score of 80 per cent. Perhaps a re-tendering was in order, which had implications of its own, of course. Even under the circumstances where re-tendering was attempted, rather than treating the top four bidders equally, once GMR chose Delhi, it might have been wiser to rank the bidders by their technical qualification scores and the one with the highest score among these been given a change to match the highest financial bid.

If a key criterion for the EGoM had been to come up with a framework by which no winning bid for a specific airport could be known *a priori*, to avoid possible accusations of bias, then the options available to EoGM for designing such a framework should have been worked out.

In concluding this section it is pertinent to raise certain questions thrown up by the Mumbai-Delhi experience

that would merit attention before such a concessioning of an airport is attempted again in the country.

- Is there a danger of over-determination in the contractual parameters? (One of the interested parties with rich experience walked out of the bidding process because they did not receive a satisfactory answer on how some of the parameters would be monitored and penalized for non-compliance). This would also depend on the maturity of the sector.
- Is the pool of bidders being restricted by requirements such as Foreign Direct Investment caps, a foreign player having to be a constituent of the bid consortia, and limits on airline participation? These issues, however, need to be examined in the broader context of the national policy on foreign exchange flows, ability to bring in new technology and processes, and scope for economies between airlines and airports versus conflict of interest, respectively. In the latter case, the maritime sector in India has permitted bids for container terminals both by shipping lines and by

the then monopoly container rail operator. What are appropriate requirements for pre-qualifying bidders?

- Is economic regulation required, especially for tariff setting of aeronautical charges?
- What are the implications for the next round of airport privatization bids? What are the implications for the privatization process in other infrastructure sectors?
- In this context, are revenue shares of 38–46 per cent sustainable? Are these reflective of early entrant strategies? (The minimum revenue share had been set at 5 per cent).

In conclusion, with this, India has managed to award long-term concessions to private consortia something many other countries in the world aspire to do but have not yet attempted. This is all the more significant, given that the two airports being concessioned out are Delhi and Mumbai, the political and commercial capitals of the country respectively.

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