

# 27 The Infrastructure Sector in India, 2009–10

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With the effect of the global financial crisis of 2008–9 on the Indian economy wearing off and a new government taking charge in India, the focus during 2009–10 was to rejuvenate the pace of infrastructure development. Considering the limited progress in capacity expansion in the infrastructure sectors in 2008–9, the GoI constituted a high-powered committee in July 2009 to fast-track implementation of projects and monitoring their performance. It was empowered to take all decisions, including approval of all infrastructure related proposals costing over Rs 150 crore.

Besides this attempt to improve the pace of award and execution of infrastructure projects, the year saw regulatory reforms in almost all sectors. Concerns in the regulatory framework for private sector participation (PSP) in national highways were ironed out, there was a proposal for setting up of a Major Port Regulatory Authority (MPRA) with more teeth, the Airports Economic Regulatory Authority of India (AERA) began functioning, and the creation of a coal regulator was announced. These reforms are expected to improve the investment climate for PSP and thus, attract greater private capital.

But the resurgence in the investment climate was tempered by two court cases, under different legal jurisdictions, which would impact setting up of Special Purpose Vehicles (SPVs) for projects planned through the Public Private Partnership (PPP) route (see Box 27.1). The judgments of the High Courts of Karnataka and Maharashtra on public scrutiny of activities of SPVs imply that such SPVs would be amenable to the writ jurisdiction of the High Court or the Supreme Court and can also be exposed to the Right to Information (RTI) Act, since they perform a public function and receive concessions or other

financial aid from the central or state governments. Therefore, SPVs would be open to public scrutiny and would be also required to disclose procedural and commercial information, including contracts. This view was substantiated by the Central Information Commission (CIC), the appellate authority under the RTI Act. The CIC, in a judgment, observed that all contracts related to a PPP project must be disclosed in their entirety to ensure transparency. These judgments imply that any SPV, regardless of whether a government has a stake in it, would need to function under ‘public scrutiny’ and ‘transparency’.

A review of the developments in the individual infrastructure sectors is presented below.

## TELECOM

The telecom sector was characterized by intense competitive activity due to the entry of new players and expansion by smaller players, particularly in the wireless segment. This increase in competition was evident from the aggressive tariff plans introduced by the wireless operators to attract customers. Not surprisingly, teledensity grew from 37 per cent as at the end of FY 2008–9 to 53 per cent at the end of FY 2009–10. As has been the case over the past few years, the main contribution to growth in teledensity came from wireless subscribers who registered an increase of almost 50 per cent during the same period. The bulk of this increase in wireless subscribers came from semi-urban and rural areas, which also increased by 50 per cent growth over this period.

However, there is a large variation in teledensity across states. Many less developed states, which include Chhattisgarh, Jharkhand, and Uttaranchal, and parts of the North-East have teledensity well below 20 per cent.

## Box 27.1

## Public Scrutiny of SPVs Formed to Execute Infrastructure Projects through the SPV Route

The Flemingo Duty-free Shops Pvt. Ltd. (FDSL) filed a writ petition against the Bangalore International Airport Ltd. (BIAL) in the High Court of Karnataka on the grounds that BIAL's shortlisting of bidders for establishment of retail and duty-free shops in the international terminals at new BIAL, following the notification of Expression of Interest (EoI) which did not detail the evaluation criteria, was arbitrary and discriminatory in nature. This violated Article 14 of the Constitution of India. The High Court of Karnataka took the view that BIAL discharges the statutory functions/duties under Section 12-A of the Airports Authorities of India Act, 1994 and is therefore a 'State'. Further, under Article 226 of the Constitution of India, any agency including an SPV performing public duty is an instrumentality of the State and under Article 12 of the Constitution of India, is the 'State' itself. This means that the SPV would be open to scrutiny in a manner that any government department would be and, by extension, could be asked to follow the processes as in any agency which is an arm of the State.

The High Court of Maharashtra, on a similar writ petition filed against the Mumbai International Airport Ltd. (MIAL) issued a judgment in favour of the petitioner. It held that though MIAL is a registered private company, it performs a public function and is a 'State' as defined by the Constitution. Therefore, MIAL comes under the purview of the Right to Information (RTI) Act.

*Source:* Author's own.

The problem is more pronounced in case of rural teledensity, which still remains low at 21 per cent. This is a matter of concern, in view of the fact that only 40 per cent of funds collected as universal service levy from telecom operators since 2002–3 have been utilized till date (see Table 27.1) for increasing the penetration of telecom services in rural and remote areas.

**TABLE 27.1** Status of Funds Collected and Allocated by the Universal Service Obligation Fund

<i>(in Rs Crore)</i>			
	<i>Opening balance</i>	<i>Funds collected as USL</i>	<i>Funds allocated</i>
2002–3	0	1653.61	300
2003–4	1353.61	2143.22	200
2004–5	3296.83	3457.73	1314.59
2005–6	5439.97	3533.29	1766.85
2006–7	7206.41	4211.13	1500
2007–8	9917.54	5405.46	1290
2008–9	14033.00	5759.52	1600
2009–10	18192.52		2400
<b>Total</b>		<b>26163.96</b>	<b>10371.44</b>

*Source:* Department of Telecommunications, Government of India.

The year saw declines in average revenue per user (ARPU), revenue growth and profitability of the industry due to competitive tariffs, increasing number of rural subscribers, and growth in the share of pre-paid subscribers (see Table 27.2). Value-added services (VAS) are therefore increasingly being considered by service-providers to boost ARPUs and also differentiate their services. Currently, the

contribution of VAS to the total mobile revenues of the telecom operators is just 9–10 per cent, but is expected to grow manifold with the GoI finally undertaking the auction of 3G spectrum.

**TABLE 27.2** ARPUs of Mobile Service-providers

*(in Rs)*

	<i>As of 31 March 2009</i>	<i>As of 31 December 2009</i>
Average Revenue Per User (ARPU) GSM	205	144
Average Revenue Per User (ARPU) CDMA	99	82

*Source:* Telecom Regulatory Authority of India.

Though much delayed, the GoI has at the end of FY 2009–10 initiated the process of auctioning 3G spectrum and Broadband Wireless Access (BWA). The GoI has set the date 9 April 2010 for the auction of 3G spectrum, with the auction of BWA stated to start two days after the close of the 3G auction. The GoI has fixed the base reserve price for the all-India 3G spectrum at Rs 3,500 crore for one slot and Rs 1,750 crore for an all-India roll out of broadband services. Successful bidders are required to pay the entire bid amount within a period of 10 days, although they can commercially use the 3G spectrum only from 1 September 2010.

One of the disappointments in the sector has been the slow progress in implementation of Mobile Number Portability (MNP). The deadlines to implement MNP in the metros and category 'A' circles by the middle of 2009, and in the rest of the country by the end of 2009, have not been met and are now proposed as 30 June 2010.

The Telecommunications Regulatory Authority of India (TRAI) has notified the key charges for the implementation of MNP. A subscriber would be able to port her/his number once in every 90 days (within the same circle). The subscriber may be required to pay a porting charge to the recipient operator, that is, the operator to whom the subscriber is porting his/her number, which would be subject to a maximum of Rs 19 per porting. The maximum time for completing the porting process would be four days (12 days for the circles of Jammu and Kashmir, Assam, and the North-East).

The ceiling set by TRAI for porting charges will make it considerably cheap for subscribers to port their numbers and is likely to be a major factor driving the increasing usage of the MNP facility as and when it commences, given the current dissatisfaction among consumers with quality of service (QoS), and the array of choices of operators and attractive plans.

## TRANSPORT

### Roads

The year 2008 had seen virtually no progress in the development of national highways due to several reasons, which include issues in standard bidding documents (SBD) and Model Concession Agreement (MCA), global economic slowdown, impediments in land acquisition, forest and environment clearances, shifting of utilities, etc. There was a distinct slowdown in the award of new projects in 2008–9 with only eight projects being awarded during the year and the implementation of ongoing projects was sluggish. The challenge in 2009 therefore was two-fold: regain the lost momentum of project award and achieve a

quantum jump in the pace of highway construction. But naturally, the sector received the spotlight in 2009. The MoRTH targeted at accomplishing construction of national highways at the pace of 20 km per day, targeting the completion of 35,000 km of national highways during 2009–14. Achieving this ambitious target required resolution of several impediments and roadblocks mentioned above.

Accordingly, the GoI constituted a committee under the Chairmanship of B.K. Chaturvedi, Member, Planning Commission (the B.K. Chaturvedi Committee or BKCC) to resolve procedural impediments and develop a financing plan for the National Highways Development Project (NHDP). The implementation of Part 1 of this Committee's recommendations removed several impediments to the award of highway projects. Amendments have been made in the SBD and MCA (see Box 27.2). The viability gap funding has been increased from 10 per cent to 20 per cent for low-traffic stretches in Phase V of the NHDP and from 5 per cent to 10 per cent for the six-laning programme. The entire VGF will be released in one go as against the previous norm of releasing 50 per cent of the amount during construction and 50 per cent during maintenance. The positive impact of these changes have resulted in the speedy progress of the highways sector and is evident from the award of 34 projects since these recommendations were effected in November 2009 (see Table 27.3).

The project delivery strategy of the NHAI has also been changed. The sequential project award strategy of first testing the award on a build-operate-transfer (BOT) toll basis, then on BOT annuity basis and finally, on an engineering, procurement, and construction (EPC) basis in

#### Box 27.2

##### Key Changes to The Standard Bid Documents and Model Concession Agreement for National Highways as Per Recommendations of The B.K. Chaturvedi Committee

- *Returns:* The concession agreement can be extended by five years if the concessionaire undertakes capacity augmentation in response to the actual traffic exceeding the designed road capacity. However, the concessionaire's IRR would be capped at 15 per cent. Earlier, the concession was terminated if the traffic exceeded capacity for more than three years.
- *Conflict of interest:* The limit for common shareholding between various bidders has been raised from 5 per cent to 25 per cent, and the NHAI is empowered to make project-specific exemptions where the conflict still exists.
- *Entry:* The bidders' technical capacity-related entry threshold with respect to the size of the past project experience has been reduced.
- *Funds:* The lenders are permitted to create a charge on the escrow account maintained by the concessionaire in relation to toll collections on the road project thereby making lending to roads projects 'secure'.
- *Exit:* Promoters holding majority shareholding can fully divest two years after project completion, a significant change from the present situation wherein the promoter's share could fall to 26 per cent three years after project completion and would remain constant for the rest of the concession period.

*Source:* B.K. Chaturvedi Committee Report (2009).

Table 27.3 Award of National Highway Projects During 2009–10

	<i>No. of projects awarded</i>	<i>Length (km)</i>	<i>Project Cost (Rs Crore)</i>
2008–9	8	643	8,591
April—October 2009	10	944	9,606
November 2009—March 2010 (post-implementation of B.K. Chaturvedi Committee recommendations)	34	2,532	25,616

*Source:* IDFC Policy Group Research.

case the project is found unviable on BOT annuity basis and has been changed. Projects will now be implemented on all the three modes of delivery, that is BOT toll, BOT Annuity, and EPC concurrently rather than sequentially. This will speed up the award of projects by identifying the mode of development upfront as against the sequential award process, which involved testing projects for the BOT toll mode even if they were not suitable for this mode because of traffic being below a certain threshold. Further, the NHAI is now empowered to take decisions on single bids after examining their reasonableness.

The revised financing plan for NHDP as drawn up by the BKCC indicates an investment requirement of Rs 812,661 crore of which 26 per cent is to be mobilized from the private sector.

Steps have been taken by the MoRTH and NHAI to streamline the land acquisition process and improve the pace of projects under implementation. Special Land Acquisition Units (SLAUs) have been set up to speed up land acquisition at the state level for national highways development. Out of the 192 SLAUs planned, 66 have already been appointed. As a result of these efforts, more than double the land (8,191 ha) has been acquired this year compared to the annual average (4,000 ha) of the last three years.

Though the GoI has shown a renewed impetus for pushing forward the road development programme, there are some existing and emerging issues that still need quick resolution. NHAI's capacity to prepare a pipeline of credible and bankable projects still remains clouded. NHAI requires significant capacity building and organizational reforms to be able to effectively shoulder the responsibility of building 20 km of national highways every day. Though the proposal for restructuring of NHAI was approved by the Union Cabinet in July 2007, actions to this end continue to be delayed on account of the process of amendment of the NHAI Act 1988. The NHAI (Amendment) Bill 2008 lapsed with the dissolution of the Fourteenth Lok Sabha—a consequence of the general elections in 2009.

Another issue is that of financing. Two major problems currently constrain highway sector finance. First, bank

loans to highway projects were unsecured, and as a consequence subject to higher provisioning and capital adequacy norms. Second, highway projects need substantial long-term financing as they are typically capital-intensive, long-gestation projects. Currently, commercial banks find it difficult to lend long-term due to apprehensions about asset-liability mismatch.

To address the first problem, following BKCC recommendations, the RBI allowed annuities and toll collection rights as tangible security for the purpose of secured bank loans. To address the second, the government recently approved norms for takeout financing for the India Infrastructure Finance Company Ltd. (IIFCL). Lending institutions will be able to sell part of the loan to IIFCL three to four years after the project starts commercial operations. Moreover, in order to bring in investors with a long-term horizon such as pension funds and insurance companies, their investment guidelines need to be relaxed while being cognizant of their capacity to manage risk.

Finally, with the road length and width set to increase by an enormous magnitude, an issue that has so far been overlooked and needs to be given importance is that of quality of service. Suitable Performance Indicators with penalty mechanisms need to be defined to measure the quality of service being provided to road users.

### Ports

During the year, the GoI mooted a new legislation, the Major Port Regulatory Authority Act, 2009, for the setting up of a Major Port Regulatory Authority (MPRA). If this legislation is passed by Parliament, MPRA will replace the existing regulator, the Tariff Authority for Major Ports (TAMP), which has no power to enforce its own tariff rulings or penalize violation of the terms and conditions governing tariffs.

MPRA will have the regulatory powers, inter alia, to specify and monitor performance standards for service to be provided by the port authorities and private operators; and levy penalty on terminal operators. This will also remove another key drawback associated with TAMP, which unlike other sectoral regulators in the country

such as TRAI and the CERC, is not vested with the powers to set and enforce performance standards and other measures for protection of user interests. Therefore, the creation of the MPRA will also go a long way in making ports more efficient. MPRA will also act as an appellate authority, settling disputes between port authorities, private operators, and users and looking into their problems arising from running or using port services.

The situation in the port sector has otherwise been somewhat stagnant. Although there have been few instances of capacity expansion, it may be argued that capacity is not a major issue for Indian ports. The traffic handled is more than the capacity in only four major ports, that is, Visakhapatnam, Chennai, Mormugao, and Mumbai (see Table 27.4). However, given that the majority of ports are operating at over 90 per cent capacity utilization and traffic at major ports is expected to reach 708.09 million tonnes in FY 2011–12, the issue of capacity addition cannot be completely ignored. In fact, the issue needs greater attention than before in view of the fact that the capacity addition of 70 MT since 2007–8 includes capacity anchorage to the tune of 11.40 MT. This refers to the capacity of cargo handled at anchorage and not physical addition in capacity, such as addition of berths. Further, capacity addition would improve service standards for end-users who now have to cope with near 100 per cent berth occupancy in these ports. In fact, service levels reflected through performance metrics such as average turnaround time, average pre-berthing time, average output per ship-berth-day, and dwell time of cargo/containers remain unsatisfactory by international comparison. The average turnaround time for the major ports increased from 3.85 days in 2008–9 to 4.54 days in 2009–10 (up to December 2009). Further, there are significant inter-port variations in performance (see Table 27.5). As against this, the average turnaround time at the Hong Kong port is estimated at 10 hours. This in turn undermines the competitiveness of the Indian ports.

Besides factors specific to ports such as non-availability of handling equipments and labour at ports, one of the major reasons for the high dwell time at ports is the inadequate inland connectivity for ports. In case of major ports, the capacity and quality of the existing rail and road connectivity requires improvement. The Comptroller and Auditor General of India, in its performance audit of functioning of major Ports Trusts, has observed that ports at Chennai, Cochin, Goa, Haldia, Kolkata, Tuticorin, and Vishakapatnam continue to have single-line connectivity, resulting in slower movement and inefficient cargo dispersal. At Cochin, the rail connectivity from the port area to the main rail line network is in a poor state while

**TABLE 27.4** Capacity vis-à-vis the Traffic Handled in Major Ports in India

*(In million tonnes)*

<i>Port</i>	<i>Capacity as on 31 March 2009</i>	<i>Traffic During 2008–9</i>
Kolkata	15.76	12.43
Haldia	46.70	41.79
Paradip	71.00	46.41
Vishakapatnam	62.23	63.91
Ennore	16.00	11.50
Chennai	55.75	57.49
Tuticorin	22.81	22.01
Cochin	28.37	15.23
New Mangalore	44.20	36.69
Mormugao	33.05	41.68
Mumbai	43.70	51.88
Jawaharlal Nehru	57.96	57.29
Kandla	77.24	72.22
Total	574.77	530.53

*Source:* Press India Bureau.

in Kandla, only three of the 11 tracks have double lines. Further, outside the port areas, passenger and freight systems share the same railway networks.

Further, many of the large minor ports that have started operations are connected/being connected through rail and road, have poor quality of inland connectivity, which is a major stumbling block in the seamless movement of cargo. Besides poor rail connectivity, inadequate numbers of wagons also hinder realizing the growth potential in cargo traffic and customers.

Managements in several ports have, however, woken up to the need for better services through port development as well as better technologies. Some of the Port Trusts are tying up with foreign port companies on these very aspects. The Mundra Port has signed an MoU with Antwerp Port Authority to absorb some of the international port management practices. The Mumbai Port Trust has entered into a sister port agreement with the Port of Marseille-Fos of France to foster experience sharing in the areas of engineering, management, security, and sustainable development while the Chennai Port Trust signed an agreement with the Port of Halifax, Canada, to cooperate on port development.

### Airports

Despite the civil aviation sector being opened up to the private sector in 1997 under the GoI's Airport Infra-

TABLE 27.5 Inter-port Performance Variations at Indian Ports

Name of Port	Average pre-berthing time under port a/c (in hours)			Average turnaround time (in days)		
	2007–8	2008–9	2009–10*	2007–8	2008–9	2009–10*
Kolkata	0.24	1.27	4.36	4.87	4.60	5.34
Haldia Dock	33.44	24.45	37.35	4.26	4.21	5.20
Mumbai	5.07	7.37	7.69	4.44	4.95	4.42
Jawaharlal Nehru	10.20	9.50	6.48	1.85	1.97	1.94
Chennai	1.00	0.90	0.98	4.60	4.20	4.12
Cochin	1.21	1.31	3.08	1.99	2.08	2.14
Vishakapatnam	5.10	4.35	23.89	3.91	3.93	5.17
Kandla	32.64	28.08	26.88	5.13	5.20	5.16
Mormugao	18.35	11.48	22.16	4.03	3.61	5.62
Paradip	1.48	1.30	1.50	5.54	4.78	9.84
New Mangalore	1.92	0.90	0.72	3.21	3.00	3.22
Tuticorin	4.32	3.36	11.52	3.80	3.66	4.14
Ennore	0.75	0.74	0.52	2.08	2.35	2.24
All Major Ports	11.40	9.55	13.44	3.93	3.87	4.54

Note: \* Up to December 2009.

Sources: Ministry of Finance (2010) and Department of Shipping (2010).

structure Policy, clarity and certainty to investors on the commercial potential of specific airport operations continued to elude the sector. In recent times, the absence of a clear set of guidelines for airport operators is responsible for their revenue models remaining a subject matter of national debate and controversy. Therefore, AERA becoming functional in August 2009 is a welcome development for the sector, even if it fructified six years after first recommended<sup>1</sup> and more than three years after the GoI proposed to establish an aviation regulator. AERA is empowered to set aeronautical charges, determine development fees, and monitor service and quality standards for the 12 airports in the country with traffic of more than 1.5 million passengers per annum.

The first issue taken up by AERA, almost within a month of its establishment, was the review of the development fee (DF) levied at the airport at New Delhi. The GoI had in February 2009 allowed the Delhi International Airport Ltd. (DIAL), the private sector consortium with GMR in the lead operating this airport, to levy Rs 200 per departing domestic passenger and Rs 1,300 per departing international passenger as DF for a period of 36 months w.e.f 1 March 2010. DIAL had sought

intervention of the GoI to fund the gap of Rs 1964 crore affecting the bankability of the airport project that arose due to the poor response and consequently, shortfall in deposits received from commercial property development of the airport due to the economic crisis of 2008–9. AERA has conducted stakeholder consultations on the subject and has sought information on the project cost of the Delhi airport as well as the bidding process in respect of commercial property development to determine the DF.

AERA has also initiated steps towards establishing the degree and nature of economic regulation of aeronautical services under five categories, that is (i) Airport Operators providing various attendant aeronautical services; (ii) Air Navigation Service-provider facilitating navigation, surveillance, and supportive communication thereto for air traffic management; (iii) Cargo Facility Operators; (iv) Ground Handling Operators; and (v) Fuel Access Providers. Some of the key issues being deliberated by AERA are appropriate forms of regulation, that is, price cap regulation, rate of return regulation or light-handed regulation; approach to traffic forecasting; service parameters to be measured for major airports; and accounting for under-

<sup>1</sup> The establishment of an independent aviation economic regulatory authority was first recommended by the Naresh Chandra Committee in its report to the GoI on the road map for the civil aviation sector in India.

performance vis-à-vis specified benchmarks on quality of service through tariffs. Box 27.3 provides a summary of positions that AERA is considering on select issues related to airport operators.

The GoI has also established an Appellate Tribunal to adjudicate disputes between two or more service-providers and between a service-provider and a group of consumers. Service-providers refer to any entity that provides aeronautical services and is eligible to levy and charge user development fees from the embarking passengers at any airport and includes the airport operator.

Another positive development in this sector is improvement in QoS at the airports in the country. The Hyderabad International Airport has been ranked amongst the world's top five in the annual Airport Service Quality (ASQ) passenger survey conducted by the Airports Council International. It also ranks first in the category of airports handling traffic of 5–15 million passengers. This airport is managed by a public-private joint venture consisting of the GMR Group, Malaysia Airports Holdings Berhad, the state government of Andhra Pradesh, and the Airports Authority of India (AAI). At the same time, the airport at New Delhi won the award for the best improvement in the Asia-Pacific region. Such enhanced customer service

and improved facilities at the airports is not restricted only to the airports managed by the private sector. With upgradation and modernization works being completed at the various non-metro airports, these airports too offer a better experience to passengers.

### Railways

The Indian Railways (IR) released its ambitious 'Vision 2020' in December 2009 which recognizes the need for IR to reinvent itself to pursue growth in market share as well as revenue. The route network of IR has expanded very slowly in the past, with only 10,000 km of rail network added between 1947 and 2009. Fund shortage and poor project execution due to organizational and managerial issues have been the main reasons for this. The operating ratio of IR, which was 76 per cent in 2007–8, is projected at 92.3 per cent, implying that IR has only Rs 7.5 out of every Rs 100 for developmental works. The market share in India of rail transport for freight traffic has reduced drastically from 89 per cent in 1950–51 to 30 per cent in 2007–08 and IR faces heightened competition from roads with major investments in highways. Inter-country comparisons indicate that IR lags behind several other countries on key parameters (see Table 27.6).

#### Box 27.3

##### AERA's Proposed Regulatory Philosophy and Approach for Economic Regulation of Airport Operators

- *Form of regulation:* Price Cap Regulation or Incentive Based Regulation
- *Form of price control and tariff structure:* A yield per passenger to be determined initially under the tariff determination process and subsequently detailed tariff proposals from airports operators (pertaining to approved yield per passenger) to be reviewed and approved.
- *Fair rate of return:* To be estimated by using a weighted average cost of capital approach to estimate the nominal post-tax cost of capital.
- Cost of equity determined by using the Capital Asset Pricing Model.
- Cost of debt estimated by examining the actual cost of debt faced by airport operators, subject to reasonableness of such costs based on review of the sources, procedure, and method through which the debt was raised.
- Airport's actual gearing to be used for the time being.
- *Capital investment:* Airport development plans and investments proposed for inclusion in the Regulatory Asset Base to be taken up after user consultations.
- *Traffic forecasting:* Airports to provide traffic forecasts after consultation with users at each price review. AERA may review forecast assumptions, methodologies, and processes, and determine the final forecast to be used for tariff determination. AERA may introduce a forecast correction mechanism if the actual traffic falls outside the prescribed bands.
- *Operating expenditure:* Assessment of operating costs will cover (i) baseline operating costs taking cognizance of variance over the preceding year, including treatment of one-time costs; (ii) operating cost projection taking into account efficiency improvement for controllable costs; and (iii) cost-pass through allowance for uncontrollable mandated costs.
- *Quality of Service:* A mechanism that specifies reduced tariff for under-performance vis-à-vis specified benchmarks on quality of service so as to adequately protect the interest of the users. Under such a mechanism, the calculated level of rebate for a year will be passed on to users of airport services in the form of reduced airport (aeronautical) tariff in the subsequent years.

*Source:* Airports Economic Regulatory Authority of India (2010).

**TABLE 27.6** International Comparison of Rail Networks

	<i>Million traffic units per employee</i>	<i>Route kms per million population</i>	<i>Route kms per square km area</i>
USA	15.3	747.4	23.6
China	1.6	45.5	6.4
Germany	0.7	410.9	94.9
France	2.1	466.5	54.2
Russia	2.6	598.1	4.9
India	0.9	55.2	19.3
Japan	2.2	157.5	53

*Source:* Indian Railways Vision 2020.

Thus, Vision 2020 aims to undertake a complete overhaul of rail infrastructure and transform train travel (see Box 27.4), and target a revenue of Rs 2,70,000 crore<sup>2</sup> from about Rs 90,000 crore at present. The vision also proposes several measures to reduce the carbon footprint of IR (see Box 27.5). More importantly, the vision proposes organizational restructuring of IR, which would involve separation of infrastructure from operations and reorganization of IR on business lines that is passenger, freight, and parcel and other auxiliary services so that each service could be managed and measured on a profit-centre basis.

The key to achieving the vision and its specific goals is a massive investment programme—Rs 14 lakh crore in over ten years. Out of this, just over 60 per cent of these funds

are meant to be generated internally, including the use of PPP initiatives. PPP is proposed for the development of world-class stations, setting up of rolling stock manufacturing units, logistics hubs, high-speed corridors, expansion and management of the extensive network of Optical Fibre Cables and infrastructure projects like new lines and Dedicated Freight Corridors (DFC). The remaining funds are proposed to come from the GoI through an Accelerated Rail Development Fund (ARDF). An amount of Rs 1 lakh crore would be set aside from the ARDF to clear the pending backlog of socially desirable, new line and gauge conversion projects as a one-time grant for the GoI. While the investment proposed under the vision may seem enormous in view of the past trends for IR, it comes across as paltry when compared with China, which is currently undertaking one of the most ambitious rail expansions. China has earmarked \$ 300 billion (Rs 14 lakh crore approximately) for investment over the next three years.

As mentioned above, the vision envisages developing and implementing new business models in the railways through PPP. However, the intent of promoting PPP within the railways needs to be backed by credible action by the GoI. The Annual Plan for FY 2010–11 envisages a small contribution from PPP (not exceeding 2.5 per cent of the total outlay) in meeting the planned expenditure. Further, there is no comprehensive PPP policy for IR. Policies for private sector participation are issued as and when need arises and most of these are skewed heavily

#### Box 27.4

##### Targets Set by Indian Railways Under Vision 2020

- Expand route network at the rate of 2,500 km per annum to add 25,000 km of new lines by 2020.
- Almost the entire network (barring the hill and heritage railways) to be in broad gauge.
- More than 30,000 km of network to be double/multiple lines.
- More than 6,000 km of network to be quadrupled lines with segregation of passenger and freight services into separate double-line corridors.
- Production of passenger coaches to go up from the present level of 2,500 per annum to at least 5,000 per annum within the next three years and to 10,000 per annum by 2020.
- Target to achieve zero accidents and zero failures in equipments.
- Availability on demand for rail service.
- Raise speeds of passenger trains from 130 kmph to 160–200 kmph on segregated routes and speed of freight trains from 60–70 kmph to 100 kmph.
- Complete four high-speed corridors covering 2,000 kms to provide bullet train services at 250–350 kmph and plan development of eight others.
- Develop 50 world class Stations which compare with the best, internationally.

*Source:* Indian Railways Vision 2020.

<sup>2</sup> Projected by IR by assuming an elasticity of transport to GDP of 1.25.

## Box 27.5

## Promoting Low Carbon Growth: The Indian Railways' Vision

Under the Vision 2020, IR has set targets to make railway operations environmentally friendly. It has claimed that infrastructure creation and operation would not make any draft on the environmental resources. It has in fact committed to over-compensate the environmental damage caused by transport activities by adopting green technologies. It proposes to review every facet of railway operations and infrastructure from this angle. The vision states that IR has already taken several measures to reduce its carbon footprint. Some of these measures are as follows:

- New suburban trains introduced in Mumbai with regenerative braking features saving up to 35–40 per cent of the energy.
- Replacement of incandescent lamps with energy-saving Compact Fluorescent Lamps (CFLs) in railway quarters through free distribution of 26 million CFLs (four per family) to railway employees, thereby reducing about 0.14 million tonnes of CO<sub>2</sub> emissions per annum. This project is entirely financed with the carbon credits earned under the CDM framework.
- Induction of light-weight stainless steel coaches with enhanced passenger carrying capacity and new designs of freight stock with higher payload to tare ratio.
- Increased production of high-horse power, fuel-efficient diesel locomotives with plans to switch over completely to the manufacture of these locomotives at Diesel Locomotive Works.

Going forward, the vision proposes to:

- Save up to 15 per cent of energy through improved energy efficiency in traction, which accounts for 87 per cent of energy consumed by IR as well as non-traction use.
- Induce new-generation locomotives and rolling stock, that use less energy and less material.
- Conduct energy audits to improve energy efficiency in stations and offices.
- Adopt LED lighting and the Energy Conservation Building Code (ECBC).
- Source at least 10 per cent of energy used from renewable sources such as solar power and biomass.
- Procure only three-star or higher-rated products for achieving energy efficiency.
- Undertake a massive plantation drive along the railway tracks and in railway colonies and use grass-turfing as protective anti-erosion measure on the slopes of the banks along the track.

*Source:* Indian Railways Vision 2020.

in favour of IR or its PSUs. The lack of capacity building with regard to PPP within IR and the absence of an institutional framework for PPP add to these problems. Unless the GoI addresses these issues and takes up organizational restructuring of IR, thereby providing a better level playing field to private players, private sector investment in railways would remain minimal.

Besides the implementation of PPPs, concerns regarding realizing the vision arise because the railway budget 2010–11 does not give a road map for achieving the targets set in the vision. On the other hand, it gives disproportionate importance to setting up of hospitals, schools, cultural centres, and drinking water plants to provide cheap bottled water in trains and stations. That the railways should invest in such non-core activities, even if in a PPP, is irrational; particularly at a time when it expects the GoI to provide Rs 5 lakh crore in the form of budgetary commitment to the ARDF. It makes greater sense to completely outsource these activities to the private sector.

The budget also turns a blind eye towards the imperative of rationalizing the prices of services rendered by IR. A White Paper presented by IR to the Parliament in

December 2009 notes that while passenger services consume nearly 60 per cent of IR's network capacity, their share in the traffic earnings amounts to only 33 per cent. Further, in the past few years, fares for an overwhelming majority of passengers rose very minimally or declined. Higher passenger earnings (see Table 27.7) in these past years have resulted due to increase in passenger capacity in the form of new and longer trains, running of special trains to capture seasonal requirements, enhanced reservation fees, and realization from Tatkal charges. Unless, passenger fares are rationalized, running a financially healthy railway system in the long run would become difficult.

**TABLE 27.7** Economics of Passenger Services of Indian Railways

	<i>Earnings per train passenger km (Rs)</i>	<i>Cost of hauling a passenger train km (Rs)</i>	<i>Net earnings on working a passenger train km (Rs)</i>
2005–06	322.02	454.50	–132.48
2006–07	368.07	509.06	–140.99
2007–08	412.22	550.97	–138.75

*Source:* White Paper on Indian Railways; GoI, Ministry of Railways (Railway Board); December, 2009.

## URBAN INFRASTRUCTURE

Urban infrastructure did not see any significant developments. This was the fifth year of the JNNURM, aimed at spearheading governance and fiscal reforms at the local government level and boosting investment in urban infrastructure. But progress has been slow. Only 16 JNNURM cities out of 65 achieved more than 85 per cent effective coverage of properties through property tax and only six were able to collect 100 per cent of the O&M costs incurred in providing services such as water supply through user charges. Half of the cities included under this mission were yet to adopt accrual-based double accounting system. Since the disbursement of funds from the centre for projects proposed by urban local bodies (ULBs) is conditional on states and ULBs achieving certain reform targets, the poor status of reforms has meant that only 55 per cent of the allocated central outlay for JNNURM for 2009–10 was utilized.

One of the primary objectives of JNNURM is to attract PSP wherever possible. However, the private sector has been cautious in participating in urban infrastructure development. Though recent developments are encouraging, with 68 projects taking the PPP route having been approved under JNNURM till December 2009, the quantum of private investment remains minimal. There are several reasons for this. Demand-side issues such as developing and structuring bankable projects continue to remain a challenge. Further, the operational and financial profile of ULBs is poor, and regulatory and legal frameworks to facilitate PPP are missing.

A positive development in the sector, however, has been the preparation of service level benchmarks for urban transport for the JNNURM mission cities by the Ministry of Urban Development (MoUD). These benchmarks focus on the extent of availability and coverage of public transport; quality and financial sustainability of public transport; pedestrian/non-motorized transport (NMT) safety and infrastructure facilities; Intelligent Transport System (ITS) facilities in a city; land-use transport integration; and parking systems and pollution levels in a city.

## POWER

The highlight of the year in the power sector was the renewed policy and regulatory thrust on renewable energy (RE). The GoI announced the National Solar Mission, which aims to scale-up solar capacity to 20GW by 2022 (see Table 27.8) and has issued several guidelines towards its implementation. The mission aims to indigenously develop and demonstrate a range of solar technologies across different scales and create a leadership position in manufacturing of solar power-related components. Since solar power technology is not yet cost-effective and at present is unlikely to find willing buyers, the mission creates a demand for solar power by stating that the National Tariff Policy, 2006 would be modified to mandate that state electricity regulators fix a share for solar power under the existing Renewable Purchase Obligation (RPO) for distribution utilities (DISCOMs). This RPO may start with 0.25 per cent of the total power purchase in the first phase of the mission and could go up to 3 per cent by 2022.

One of the main features of this mission is a 'bundling scheme' where the 1000 MW of solar capacity addition planned till 2013 will be 'bundled' with equivalent power from the cheaper unallocated quota of NTPC coal-based stations (that is power not committed to any state and available for allocation through GoI's discretion) and selling the bundled power to DISCOMs at rates fixed by the CERC. NTPC Vidyut Vyapar Nigam (NVVN) has been appointed as the nodal agency for purchasing this power from solar power developers (SPDs) and selling it to the DISCOMs. The mission also provides generation-based incentives (GBI) to roof-top and small solar power plants connected to distribution networks below 33 kV. The GBI shall be equal to the difference between the tariff determined by the CERC and the base rate, which will be Rs 5.50 per kWh in the first fiscal year of commissioning to be escalated by 3 per cent every year.

However, this ambitious mission has many deficiencies. For instance, the allocation of low-cost NTPC power to promote solar, does not reduce the high cost of solar power, as argued by the mission. It only creates a

TABLE 27.8 Targets for Solar Power Capacity Addition Under The National Solar Mission

<i>Phases</i>	<i>Target for grid solar power including roof-top</i>	<i>Target for off-grid solar applications</i>
Phase I (2010–13)	1,000–2,000 MW	200 MW
Phase II (2013–17)	4,000 MW (10,000 MW based on enhanced international finance and technology transfer)	1,000 MW
Phase III (2017–22)	20,000 MW	2,000 MW

Source: Jawaharlal Nehru National Solar Mission.

bankable single buyer for solar projects at tariffs determined by CERC. Further, since the payment to be made to SPDs by NVVN hinges entirely on the payment made by DISCOMs, unless SPDs have assurance of payment security in terms of NVVN bearing payment risks, investors may not be comfortable of lending money to these projects. Several other issues can be pointed out in the guidelines proposed by the GoI for giving effect to this mission. But the key challenge to the achievement of the targets laid down in the mission is the absence of a strategy to promote the development of solar power beyond 2013.

Besides solar power, the GoI has taken steps towards harnessing the so far untapped wind energy potential (estimated at 37636 MW) and increasing the generation of wind energy. In December 2009, it announced GBI for grid-connected wind projects (commissioned after the announcement of this scheme but on or before 31 March 2012) at Rs 0.50 per unit of wind energy fed into the grid for a period not less than four years and a maximum period of 10 years. Developers can avail either GBI or accelerated depreciation (AD) of up to 80 per cent of project cost in the first year under the Income Tax Act. The GBI will be applicable to a maximum capacity of 4000 MW during the remaining period of the Eleventh Plan.

The above initiatives of the GoI were backed by several concessions to solar and wind power projects in the budget for FY 2010–11 along with other incentives to encourage the uptake of clean technologies (see Box 27.6). The National Clean Energy Fund (NCEF), created by a clean energy cess at Rs 50 per tonne on domestic and imported coal for funding research and innovative projects in clean energy technologies, has the potential to make a significant impact on the development of

clean technology. Taking the FY 2008–9 level of coal production and import (551.95 MT), the cess will generate a minimum of Rs 2,760 crore every year. Since the coal consumption is expected to rise at the rate of 7 to 8 per cent annually, at the least, the annual amount in this fund is likely to grow. However, appropriate utilization of this fund through well-defined areas of investment, eligibility criteria for seeking support, targets, and deliverables would be necessary to achieve its objectives.

The above policy-related initiatives have been well-supported by the regulatory framework. The CERC has notified tariff regulations for electricity generated from RE sources (see Box 27.7). Based on these regulations, it has issued generic tariff for various RE sources for 2009–10 and 2010–11. It has also laid down a framework for trading in Renewable Energy Certificates (RECs). This mechanism introducing ‘paper purchase’ of RE would help DISCOMs to meet their RPO without ‘physical purchase’ of RE, would help overcome the problem of mismatched demand and supply of RE in some states.

On the capacity addition front, the shortage of generation capacity did not ease. The capacity addition target for 2009–10 is 14507 MW. Against this, only 7510 MW has been commissioned up to February 2010. The peak and energy deficit of power was 12.6 per cent and 9.9 per cent, respectively till January 2010. The CEA has assessed that against planned capacity addition of 78,700 MW for the Eleventh Plan, a capacity of 18235 MW has been commissioned till 21 October 2009 and a capacity aggregating to 44139 MW is likely to be commissioned with a high level of certainty during the remaining Plan period. Thus a total capacity of 62,374 MW is likely with high level of certainty. In addition a capacity of 12590 MW may materialize on a best-effort basis during this Plan period.

#### Box 27.6

##### Promoting Low Carbon Growth: The Incentives for Clean Power Generation

- Establishment of a National Clean Energy Fund for funding research and innovative projects in clean energy technologies. Corpus of the fund to be built through a cess of Rs 50 per tonne on domestic and imported coal.
- Concessional customs duty of 5 per cent to machinery, instruments, equipment and appliances etc. required for the initial setting up of photovoltaic and solar thermal power generating units.
- Exemption from excise duty for solar photovoltaic and solar thermal generating units.
- Exemption from basic customs duty and special additional duty for ground source heat pumps used to tap geo-thermal energy.
- Existing exemption from excise duty on specified inputs required for the manufacture of rotor blades for wind energy generators to be extended to cover more inputs.
- Excise duty on LED lights reduced from 8 per cent to 4 per cent at par with Compact Fluorescent Lamps.
- Concessional excise duty of 4 per cent for ‘soleckshaw’ (solar-electric rickshaw), a product developed by CSIR to replace manually operated rickshaws. Exemption from excise duty for key parts and components of this rickshaw.
- Exemption from basic customs duty for import of compostable polymer.

Source: Union Budget FY 2010–11.

## Box 27.7

## Terms and Conditions for Tariff Determination for Electricity Generation from Renewable Energy Sources

The CERC has notified tariff regulations for electricity generated from RE sources. The salient features of these regulations are as under:

- Control Period of three years, except for solar projects for which capital cost shall be reviewed every year in view of technological advancement.
- Tariff Period is 13 years for RE technologies; excluding small hydro below 5 MW (35 years), Solar Photovoltaic (PV) and Solar Thermal (25 years) as these technologies need handholding support for a longer time.
- Thirteen Years Tariff Period covers the debt repayment obligation; beyond the tariff period, RE project is to compete.
- RE plants, except for biomass power plants with installed capacity of 10 MW and above, and non-fossil fuel based co-generation plants to be treated as 'must run' power plants and not to be subjected to 'merit order despatch' principles.
- Provision for single part tariff consisting of the fixed cost components of return on equity, interest on loan capital, depreciation, interest on working capital, and operation and maintenance expenses.
- Provision for generic levelized tariff based on suo motu petition for RE sources such as wind energy, small hydro power, biomass power, non-fossil fuel co-generation, and solar PV and solar thermal.
- Provision for project-specific tariff for municipal solid waste projects, solar PV and solar thermal power projects (if the developer so opts), hybrid solar thermal power plants, and biomass projects other than those based on rankine cycle technology application with water-cooled condenser.

*Source: Economic Survey of India (2009–10) and Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations (2009).*

The GoI modified the mega power policy which extends various fiscal benefits to large power projects (for thermal projects above 1000 MW, except in Jammu and Kashmir and the North-Eastern states where it is above 700 MW). Some provisions of this policy were becoming difficult to fulfill in view of the changes in the sector in recent years. For example, many private sector projects could not meet the earlier mandatory condition of sale of power to more than one state for getting mega power status, since DISCOMs are mandated to procure long-term power from private projects only through tariff-based competitive procurement (effective from 2005). This condition has now been removed. Other important changes to the policy include the lowering of the threshold capacity for hydro power plants located in Sikkim and the North-Eastern states from 500 MW to 350 MW. This will facilitate hydro based capacity addition in these states where hydro-power projects of 57085 MW have been allotted for implementation but are yet to be taken up for construction.

On the fuel supply side, supply constraints for domestic coal availability remains constrained and the situation is unlikely to improve going forward. Consequently, public and private sector entities have embarked upon sourcing imported coal as a means to bridge the deficit. Against this backdrop, the GoI's approval for the formation of a SPV, namely International Coal Ventures Ltd. (ICVL) for securing metallurgical coal and thermal coal assets overseas by PSUs, including Coal India Ltd. is a positive move and would help ease the shortage of coal for power projects as

well. Aspects like the functioning of ICVL and strength of personnel are still being finalized.

To speed up production from captive coal blocks and attract serious developers, the GoI has proposed to introduce a competitive bidding process for allocating such blocks in future. Despite the large number of captive coal blocks allotted to the private sector over the past 10 years, only a few coal blocks have commenced production. It is estimated that the captive coal blocks allocated for power projects have coal reserves of 27 billion tonnes, about 25 per cent of the total proven coal reserves. Competitive bidding is also expected to minimize the cost of production and supply of coal. It is, thus, necessary that the bidding criteria should be linked to the least cost of power generated from the block and not the highest bid value offered for the block. However, till sufficient data on the quantity and quality of coal are available for the blocks, the maximum proposed production or production sharing formula may be adopted for auctioning as a second-best approach.

The GoI has also announced the creation of a regulator for the coal sector. With an increasing number of private players participating in the coal mining business, the need for an independent regulator has long been felt necessary for creating a level playing field in the sector. It will also facilitate resolution of issues like economic pricing of coal. However, the functional effectiveness of the regulatory authority will critically depend on what kind of jurisdiction it is given.

In the case of natural gas, the shortage continued despite an increase of 40 per cent in domestic gas production during the year, due primarily to the commencement of gas production from the D6 block at the Krishna–Godavari (KG) basin, promoted by Reliance Industries Ltd. (RIL). However, availability of gas suffers from the lack of clarity on the long-term policy for gas allocation. Under the current policy, fuel supply agreements are for a maximum of five years.

## CONCLUSION

The investment climate in the various infrastructure sectors in India have undoubtedly improved. The challenges

in implementing projects in each sector are immense, but are gradually being tackled. While sectors such as national highways and power continue to get the desired attention, it is time that urban infrastructure gets undivided attention. The high degree of urbanization accomplished in a short time has exposed the constraints of cities and towns in coping with related service provision. Unless the governance and provision of urban services is improved drastically, cities will not be able to sustain economic growth. Therefore, going forward, infrastructure development has to focus on the urban sector to eliminate infrastructure as a bottleneck to economic growth.

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