Infrastructure Development In India: Emerging Challenges[•]

I. BACKGROUND

Infrastructure contributes significantly to economic development both by increasing productivity and by providing amenities that enhance the quality of life. The impact of infrastructure on economic growth is well documented internationally. In the Indian context too, elasticities of output with respect to various stocks of infrastructure indicate that the transport and communication sectors play a dominant role in explaining the variations in GDP and its sub-sectors. The index of industrial production is also found to track closely the movements in the composite index of infrastructure industries during the 1980s and the 1990s.

Historically, it can perhaps be said that infrastructure development in India came to be explicitly recognised as part of State responsibility during the regime of Emperor Sher Shah (1540-1545), when a multitude of infrastructure projects on irrigation and roads were completed, including the famous Grand Trunk Road linking the East and West extremities of the country. Another major turning point in the history of infrastructure development was the flagging off of the Indian Railways in 1853 during the British Raj. The implementation of the National Highway Development Project, coupled with the Prime Minister's Gram Sadak Yojana (The Prime Minister's Rural Roads Plan) will perhaps mark a similar milestone in this, the 21st century. The role of the State in putting in place an infrastructure network was also emphasized by the National Planning Committee (1938) and the Bombay Plan (1944) in pre-independent India. They provided the necessary building blocks for action on infrastructure under the subsequent Plans in post-independent India when it largely remained a responsibility of the State. The major policy shift on infrastructure occurred in the 1990s when, along with other wide ranging economic reforms, the sector was opened up to private and foreign participation in view of its large financing needs.

Macro Projections

The Government of India constituted an Expert Group in October 1994 to consider issues related to the commercialisation of infrastructure projects including institutional arrangements, legal frameworks and financial arrangements that would facilitate the free flow of resources to infrastructure. The Group submitted its report in June 1996.

The Group estimated infrastructure requirements up to 2005-06 based on annual GDP growth projections of 7.5 per cent during 1996-2001 and 8.5 per cent during 2001-2006. Clearly, the high growth of 7.3 per cent in 1994-95 and its continuation in 1995-96 were the building blocks for such projections. The rising trend in savings and investment also presented an optimistic outlook for the future. The ratio of Gross Domestic Savings (GDS) to Gross Domestic Product (GDP) had indicated a steady improvement since 1993-94, attaining its peak of 25.1 per cent in 1995-96. In tandem, the ratio of Gross Domestic Capital Formation (GDCF) to GDP also attained its peak at 26.8 per cent in 1995-96. Set against such a backdrop, the Expert Group felt that the accelerating GDP would require, in turn, enhanced and accelerating investment in

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infrastructure in order to sustain the momentum of high growth. In line with the East Asian experience, the Group felt that the sustained high growth would require a rise in the overall investment rate from the prevailing 25 per cent of GDP to about 29 per cent by 2000-01 and 31.5 per cent by 2005-06. The achievement of 7.5 to 8.5 per cent annual GDP growth at such investment levels would also require the Incremental Capital Output Ratio (ICOR) to decline to about 3.5, a level achieved by only the most efficient economies. The rate of industrial growth would also have to accelerate to 10.0-12.0 per cent per annum over the following 10 years.

In line with such macro projections, infrastructure investment was projected to increase from 5.5 per cent of GDP in 1995-96 to 7.0 per cent by 2000-01 and 8.0 per cent by 2005-06. This implied that the annual level of investment was to increase from Rs 600 billion in 1995-96 to about Rs 1100 billion by 2000-01 and Rs 1800 billion by 2005-06 (at constant 1995-96 prices). This also implied total infrastructure investment requirement of about Rs. 4000 – 4500 billion between 1996 and 2001, which would rise to Rs 7500 billion between 2001-02 and 2005-06. Assuming that 30-35 per cent of total external capital inflows would go into the financing of infrastructure, the Group expected 15 per cent of total capital requirements of infrastructure to be externally financed. The rest would have to be financed from domestic resources. The public sector, the engine of infrastructure investments in the past, would continue to have a major role in this sector, even as its share was expected to decline from over 80 per cent in 1995-96 to 55 per cent by the end of 2005-06. The share of private sector investment in infrastructure was projected to rise from about 1 per cent of GDP in 1995-96 to 2.5 per cent by 2000-01 and 3.5 per cent by 2005-06. This meant that in absolute terms, this investment would have to rise from about Rs.120 billion in 1995-96 to Rs 380 billion in 2000-01 and Rs.800 billion in 2005-06.

The subsequent reality has, however, turned out to be different. While the high growth momentum had continued in 1996-97, GDP growth slumped to 4.8 per cent in 1997-98. Although there was some recovery with 6 per cent *plus* growth during 1998-2000, it has since remained far below the mark of 7 per cent *plus* attained during the high growth phase of 1994-97. GDP growth declined to 4.4 per cent in 2002-03, the lowest since 1992-93. On the whole, the phase from 1997-98 to 2002-03 has been marked by a decelerated growth of 5.3 per cent, much lower than the average growth of 7.5 per cent attained during the high growth phase of 1994-95 to 1996-97 (**Table 1**).

At the sectoral level, the continuing slowdown was reflected in the steep decline in industrial growth from 9.6 per cent during the high growth phase (i.e., 1994-95 to 1996-97) to a mere 4.8 per cent in the subsequent phase (i.e., 1997-98 to 2002-03). The industrial slowdown has been led by a severe slackening in manufacturing growth from 12.2 per cent to a meagre 4.2 per cent over the same corresponding period. Simultaneously, agricultural growth has dipped from 4.6 per cent during the high growth phase to a modest 1.0 per cent during the subsequent period, contributed, among others, by the monsoons being lower than the long period average since 1999-00.

The most important negative development to have taken place is a marked deterioration in public sector savings, which have turned negative and fallen from 1.3 per cent in 1997-98 to (-)2.5 per cent in 2001-02, as against a positive 1.8 per cent of GDP during the high growth phase and 1.5 per cent in 1990-92.

The deteriorating fiscal health of both the Central and State Governments caused by high and increasing interest outgo coupled with a fall in the tax-GDP ratio has contributed to the sharp decline in public sector savings. As a matter of fact, the gross tax-GDP ratio for the Central Government declined from 9.3 per cent in the high growth phase to 8.7 per cent in the subsequent period. At the beginning of the 1990s, it was 10.1 per cent. On the other hand, interest payments-GDP ratio for the Central Government increased to 4.6 per cent from 4.3 per cent over the same reference period. The combined revenue deficit of central and state governments, which declined to 3.5 per cent of GDP in the high growth phase from 3.8 per cent during 1992-93 to 1993-94 increased substantially to 6.1 per cent in the subsequent period. Thus, more than 60 per cent of the borrowing to finance the fiscal deficit is going into current account expenditures with little or no expected returns. With the declining or stagnant tax/GDP ratio coupled with a deteriorating quality of government expenditure, there seems to be little prospect of improvement in overall revenues. Interest payments can be expected to increase continuously along with revenue and fiscal deficits. Such a fiscal situation leaves few resources for investment purposes. Consequently, contrary to projections made for a stable and constant level of public sector investment in infrastructure, actual public investment has been falling since 1995-96.

Apart from the deteriorating fiscal health of the Government (at both central and state levels), the fall in public sector savings also reflects the operations of public sector enterprises in the infrastructure sectors. The levy and collection of appropriate user charges for the delivery of infrastructure services is crucial for the financial health of public sector enterprises engaged in these services. Although there is increasing understanding of this issue, progress in this area has been minimal over the last decade. There has not been much headway in carrying forward the much-needed pricing reforms in the railways, State Road Transport Corporations (SRTCs), State Electricity Boards (SEBs) and urban water tariffs in terms of the levy of economic user charges. The fare freight ratio (earning per passenger km. v*is-à-vis* earning per tonne km.) continues to be one of the lowest in the world. It was at 0.31 in 2001-02 as against 0.30 in 1990-91 and 0.47 in 1950-51. A scrutiny of the financial performance of SRTCs shows that only 87 per cent of costs could be recovered through revenue receipts in 1999-00, leading to a total loss of around Rs.19.5 billion. The gap between the cost of supply of electricity and average tariff has worsened from a level of 23 paise in 1992-93 to about 110 paise in 2001-02 with the result that revenues have dropped from 82 per cent of costs in 1992-93 to 69 per cent in 2001-02. Similarly, although the average cost of urban water per cubic metre is estimated to be about Rs.15, average water charges are about a tenth of this cost. The political resistance encountered in recent years to the rise in local telephone tariffs to economic levels is also indicative of the widespread reluctance to pay user charges. The poor performance of public sector savings has to be seen in the light of these developments. This has clearly constrained the ability of the public sector to keep up public investments in infrastructure at the required levels.

Private corporate savings, which improved from 3.1 per cent of GDP during 1992-93 to 1993-94 to 4.3 per cent during the high growth phase slipped to 3.9 per cent in the subsequent period, particularly under the weight of lower corporate profits. This could have resulted from the corporate restructuring necessitated by the impact of increased competition arising from overall opening of the economy. As a result, the overall GDS/GDP ratio came down to 23.1 per

cent during 1997-98 to 2001-02 from 24.4 per cent during 1994-95 to 1996-97, despite an improvement in household savings/GDP ratio from 18.3 per cent to 20.2 per cent during the same period.

As a consequence, the projected increase in investment has not taken place at the macro level or with reference to infrastructure. GDCF had improved to 25.8 per cent of GDP in the high growth phase from 23.3 per cent during the first phase of reforms (i.e., 1992-93 to 1993-94). It has subsequently declined to 23.9 per cent during 1997-98 to 2001-02 on account of a decline in both private sector Gross Capital Formation(GCF) and public sector GCF to 15.8 per cent and 6.6 per cent, respectively, as per cent of GDP from 16.1 per cent and 7.8 per cent during 1994-95 to 1996-97. The private sector GCF has fallen under the weight of poor performance of the corporate sector, down to 6.1 per cent from 8.2 per cent over the reference period, notwithstanding an improved performance of the household sector in the subsequent period.

The acceleration in overall economic growth that had been envisaged in 1995-96 has clearly not taken place. Instead, there has been a significant deceleration. The trend in infrastructure investment has been correspondingly lower than that projected. The public sector has not been able to keep up the level of investment that was required and envisaged because of fiscal deterioration. Similarly, the optimism with regard to increasing private participation in infrastructure has also been belied. It is probably true that the enthusiasm related to private sector investment in infrastructure in the mid-1990s has proved to be unrealistic all across the world. There were perhaps unrealistic expectations by prospective private sector investors about the potential returns to equity, and that risks inherent to infrastructure were underestimated. The East Asian financial crisis of 1997 also contributed to a general meltdown in the hitherto burgeoning growth in foreign direct investment in developing countries, particularly in infrastructure. Although India was not affected significantly by the East Asian crisis, it is likely that the accompanying world economic slowdown affected domestic developments as well, particularly through the transmission of low product prices affecting corporate profits.

Apart from the macro developments that have led to the slowdown in infrastructure development, the lack of adequate reform in the pricing and regulatory environment has also inhibited both public and private sector investment in India. Thus, it is equally important to revisit the framework for private investment in infrastructure in addition to the macroeconomic corrections required.

II. PERFORMANCE OF INFRASTRUCTURE

As already mentioned, in terms of actual outcome, expectations of the Expert Group on infrastructure investment have not been fulfilled in the context of the subsequent macro-economic slowdown. The actual performance has been much lower than overall projected investment in infrastructure as per cent of GDP during 1995-96 through 2001-02 (**Table 2**). Sector-wise, the projection remained higher than the actual throughout for ‘electricity, gas and water supply’ and ‘railways’. In the case of ‘other transport’, ‘storage’ and ‘communications’, actual performance turned out close to the projection and even better than the latter for some years.

Expressed as a proportion of GDP the actual infrastructure investment undertaken in the public sector, overall and sector-wise, turned out to be lower all through than the Group's projections for 1995-96 to 1999-00, barring 'communications', in which case actual investment in the public sector has been higher than the projection (**Table 3**).

The actual performance of investment in infrastructure by the private sector also remained lower all through during 1995-96 to 1999-00 than what had been projected for 'railways' and 'communications' (**Table 4**). This is surprising since the data on private investment in communications that are available in the National Accounts do not seem to have captured the substantial private investment that has actually taken place in telecommunications. Mobile telephone services, radio pager services, internet and other value added services that were introduced in the late 1990s were almost entirely in the private sector. Private investment exceeded the projections for some years in the case of 'electricity, gas and water supply', 'other transport' and even at the aggregate level of infrastructure investment by the private sector.

This sectoral review suggests that the shortfall in actual infrastructure investment, expressed as a proportion of GDP in comparison with the projected proportions, has been greater for the public sector (about 33 per cent) than that in the private sector (about 10 per cent). However, the private sector shortfall has also been growing in recent years. These data suggest that there has indeed been an appropriate private sector response, but which could have been better if it had not been constrained by inadequate public policy action. For example, had the power sector reform taken place, particularly in the case of payment security, private sector investment would have been significant in this sector. The challenge for inducing greater infrastructure investment in the future, therefore, relates to both enhancement of public sector investment and also improvement in the policy framework for private investment. These issues need to be examined for each sector separately.

As part of the plan to double per capita income over the 10 year period (2002-2012), the Tenth Five Year Plan has set for itself an ambitious target of 8.0 per cent per annum growth in GDP over the period 2002 to 2007. With the loosening of the various constraints on growth, the Tenth Plan has also identified the lack of adequate infrastructure as one of the binding constraints on the growth process. It has advocated increased public investment in infrastructure so that the availability of infrastructural facilities is commensurate with the demands of the economy. Increased public sector savings have been assumed on the expectation of improved profitability of State Electricity Boards (SEBs), and other public sector enterprises, which would then facilitate increased public investment.

The Tenth Plan has observed that the on-going disinvestments and privatisation process has constrained the ability and willingness of the central PSUs to undertake investment activities. In view of the lack of sufficient alternative institutions through which public investment can be made especially in the infrastructure sectors, the institutional capacity of state governments may be utilised for infrastructure investment by the centre. The Tenth Plan has envisaged not only the use of financial resources but also food stocks for augmenting investment in rural infrastructure. The Tenth Plan has cautioned that unless the availability of equity and long-term debt to the private sector is enhanced substantially, the likelihood of adequate private investment in infrastructure appears to be remote.

In contrast to the actual investment performance in infrastructure, in the policy sphere there has been an active and continuous attempt at bringing about reforms in the infrastructure sector. The government is slowly moving away from its traditional role as a `provider' of services to one of `facilitator' by ensuring that infrastructure services are actually delivered in a desirable manner. While liberalizing the rules and procedures, it is attempting to create an environment conducive for private participation including foreign investment in the infrastructure sector.

The power sector was the first among the infrastructure sectors to be opened up for private participation and yet it is in this sector that the greatest difficulty has been encountered. Private investment in the power sector has been substantially short of expectations. The basic strategy was to invite private participation in the generation segment with independent power projects (IPPs) expected to sell the power to the SEBs. The reluctance of state governments to tackle the basic issues of power theft and inadequate tariffs that have led to the bankruptcy of SEBs has, however, prevented financial closure of independent power projects. The attempt has been to bypass these basic problems through stratagems like escrow arrangements and central government guarantees, which have not worked. Besides, the protracted acrimonious negotiations over the Dabhol power project in Maharashtra have highlighted the political risks that IPPs are fraught with, and are sufficient to put off any new investment in generation.

Notwithstanding the problems in the power sector, there have been success stories too, especially in roads, ports and telecom. The quality of highways will improve substantially in the coming years. The government has made rapid progress in the implementation of the National Highway Development Project (NHDP). There have been some efficiency gains in ports through the privatisation of ports' services and berths. The telecom sector has perhaps seen the most significant development. Greater clarity in regulatory and policy environments has accelerated activities and expanded coverage in the telecom sector. Several private operators are already in the market raising funds through bond financing. Tariffs in the telecom sector have come hurtling down thanks to deregulation, competition and technology. In no sector of the economy have prices come down so fast as in the telecom sector.

Clearly, the need of the hour is to renew the focus on the relatively lagging sectors, viz., power, railways and urban infrastructure. Here, the guiding principle has to be establishment of adequate user charges, direct or through cess, which has been the key to success for the better performing sectors. It is in this context, the following section presents a detailed sectoral review covering roads, telecom, ports, power, railways and urban infrastructure coupled with an agenda for future policy initiatives.

III. SECTORAL REVIEW

Roads

The National Highway Development Project (NHDP) consists of two major components: The "Golden Quadrilateral" and the "North South - East West" projects. "The Golden Quadrilateral" project will connect the four major metropolitan cities with 4-6 lane highways,

with a total length of about 5,850 km. The "North South - East West" project will connect the Northern most point of the country to the Southern most, and similarly from East to West, with a total length of about 7,300 km

The NHDP expected to cost Rs 540 billion, was started in 1998. The financing pattern of this project indicates that private sector participation in the form of investment amounts to only Rs 40 billion (7.4 per cent of the total). Over the course of the project, institutions like the World Bank, Asian Development Bank (ADB) and Japanese Bank for International Cooperation (JBIC) are expected to finance about Rs 200 billion; another Rs 200 billion of investment would be financed from the cess. An extra budgetary infusion of funds in the form of market borrowings is expected to be around Rs. 100 billion for NHDP Phase I, out of which National Highway Authority of India (NHAI) has already borrowed about Rs 85 billion up to November 2002. So far, NHAI has also tied up loans amounting to Rs 80 billion from World Bank, ADB and JBIC for NHDP Phase I.

This project is progressing well. Approximately 1,300 km of the "Golden Quadrilateral" have already been four laned. Similarly, on the North-South and East-West corridors, 560 km length has been four-laned. The announced completion date for the Golden Quadrilateral Project of December 2003, has now been postponed to December 2004, which actually was the original target date that had earlier been advanced. The North South - East West corridors are expected to be completed by 2007-2009.

Notwithstanding the efforts made over the years at state and central levels through different programmes, about 35-40 per cent of villages are yet to be connected by all weather roads. According to the information provided by the State Governments, there were still 262,000 unconnected villages till January 2004. Apart from 50 per cent of the cess on diesel earmarked for PMGSY, additional funds are to be made available for rural roads from the additional cess on diesel of 50 paise in the Union Budget 2003-04. Even these funds may not be adequate if all the villages (with more than 500 popultion) are to be connected within 5-7 years. There are multiple agencies involved in implementing road projects at district and state level under PMGSY, which need to be streamlined for improving efficiency. Although CRF is meant to be used for the development of the total hierarchy of roads from national highways to state highways and rural roads, the funds available do not seem to be sufficient for the development of state/rural roads.

The present condition and stage of development of state highways and major district roads varies widely from state to state. The status of major district roads is particularly worrisome. The main reason for this state of affairs is that the funds for the development of this secondary system are very inadequate. The National Highways are provided with reasonable funds for their development at the Central level while the rural roads receive the lion’s share at the State level. In the process, the secondary system of roads is neglected. In future, the fund flow from the CRF for the state roads can be enhanced. Several state governments like Maharashtra, Gujarat and Madhya Pradesh have initiated steps to involve the private sector in the development of state road sector. Andhra Pradesh, Maharashtra and Tamil Nadu have set up Road Development Corporations that have issued bonds for financing of road projects.

Investment in roads has been done substantially by the public sector in all countries. Private sector investment has been naturally confined to that in limited access toll highways. Even in this segment, private investment has been at the margin. However, there was a great degree of optimism with respect to private investment in highways in the early 1990s, with large private projects having been undertaken by countries such as Mexico, Indonesia and China. Unfortunately, the financial difficulties encountered in both Mexico and Indonesia have further discouraged private investment in roads.

The risks involved in road investment are characteristically high, and involve Governmental action at almost every step. Limited access toll highways typically involve large scale land acquisition programmes that are subject to unforeseen delays and, often, protracted litigation by those affected. This indeed seems to be the case in Bihar, U.P. and Orissa in the implementation of the NHDP. Rehabilitation and environmental concerns add further to the pre-project construction risk and unexpected delays. Post construction, traffic risk is typically high. Hence, *ex ante* risk perception on road investment is naturally high among private investors. Such investors, therefore, demand relatively high *ex-ante* return to equity. Given that the capacity of a new highway has to be designed to be adequate for some date in the future, say 10 years, overcapacity is built-in for the initial years. The return from economically and rationally priced tolls are, therefore, unlikely to produce profits in the initial years of the operation of a highway. Economic returns, therefore, come only over a long period of time; later profits compensating losses in initial years. These characteristics, therefore, deter private investments.

In view of these considerations, considerable discussion has taken place on how best to induce the private sector to invest in highways. There has also been the added concern over the level at which tolls can be levied in India, in view of the widespread reluctance to pay user charges. The Government has to engage in considerable risk mitigation to take care of all the relevant concerns of private investors. On the financing side, it is clear that any economic tolls that provide adequate return to private investment in highways would be too high in the Indian context. Hence, it is inescapable that leveraging private investment would involve the provision of some level of subsidy from the Government.

The initial discussion on this issue had suggested that the best way to provide such a subsidy would be to fix the level of toll considered feasible, and then to award a highway project on the basis of the lowest bid for subsidy from prospective investors. Clearly, in such a system, the level of subsidy bid would vary inversely with the level of traffic and public resources would be put to best use in leveraging the maximum level of private investment. Such a system would have the added advantage that heavily travelled segments would presumably be built first – thereby leading to economic efficiency in overall resource allocation. The subsidy could, of course, be given *ex ante* as a lump sum to finance construction, or as an annuity to finance the servicing of capital.

With the adequate availability of funds from the fuel cess and the enthusiasm of multilateral agencies to fund these projects, such a scheme for leveraging private investment in roads has not found favour, and an opportunity to leverage substantial private funds for road construction has been lost. Instead, a fully funded annuity scheme has been put into effect. Under this method, the developer is paid an annuity by the NHAI to cover the full costs over the

concession period, after certification by an independent consultant on the quality of services to the road users. In view of the much lower risks involved in this arrangement – the investor is not subject to any traffic risk - there has been a relatively healthy response from the private sector in these projects. The only risk involved is miscalculation on the magnitudes of the annuity. Until now, 8 annuity projects have been awarded, covering about 476 kilometres in the NHDP.

In the 2003-04 Budget Speech, the Finance Minister announced a viability gap funding mechanism to attract Rs 600 billion in the infrastructure sector through public-private partnerships. Under the new scheme, for BOT projects in the road sector, the government will provide a subsidy in the form of an annuity flow to meet the shortfall between anticipated revenue and loan repayment obligations. The shortfall may arise out of various types of risk involved in the project. Armed with Government's guarantees to bridge any revenue shortfall, the executing companies will find it easier to tie up with financial institutions to raise resources. This is another opportunity to leverage private sector investment in highways through the kind of process described earlier. However, some important issues about the competent authority to determine the level of annual subsidy, and prudent and reasonable loan repayment obligations on the part of developer are yet to be cleared for actual implementation. This subsidy is likely to have an adverse fiscal impact. Further, there is an urgent need for a proper unbundling of risks and their assignment to the participants best able to manage them to minimize the cost of risk management. Control of National Highways (Land and Traffic) Bill 2002 has been passed to prevent unauthorized occupation of national highway land and control access points to national highways and control traffic on them. As the road sector is facing considerable funds constraint, especially in view of massive expansion, maintenance and upgradation requirements, private sector participation in road building activities has to be encouraged through well structured O&M contracts and by a combination of construction and maintenance contracts. The future plans of NHAI include an ambitious tolling programme, which is going to be a huge challenge in view of user resistance, traffic leakages and lower than expected traffic as witnessed in case of a few projects.

Telecommunications

The substantial progress made in telecommunications since the early 1990s is a success story. The number of telephone lines has grown by 25-30 per cent each year throughout the 1990s. The number of telephone lines were only about 5 million in 1991 which doubled to about 10 million by 1995. The India Infrastructure Report provided a range of demand projections between about 30 million and 45 million, with 35-36 million being the mean projection for 2002-03. The cellular mobile demand was projected to be between 3.5 million and 11 million by 2003. Interestingly, the licence fee parity demand for mobile phones was projected to be 8.9 million for 2003. The actual achievement has been within the range of projections, with basic service lines having reached 41 million and cellular mobile connections 12.6 million by the end of March 2003 (**Table 5**). Private sector investment required for achieving this kind of growth was estimated to be about Rs 500 billion (at 1995-96 prices) between 1997 and 2002. The estimates for actual private sector investment during this period range between Rs 380 billion (in current prices) and Rs 450 billion, with about a quarter coming from Foreign Direct Investment (FDI). Thus, viewed from any vantage point, the growth in telecommunications must be regarded as a success, despite the many difficulties that have been encountered in the way, relating to frequent

policy changes, regulatory problems and tariff restructuring. This experience shows that the Indian private sector is indeed willing to take risk and invest in infrastructure provided it can see a certain degree of payment security and profitability.

Reform in the telecommunications sector began in 1992-93 with the opening of value added services to the private sector. Subsequently, after intensive deliberation within the Government and outside, the National Telecom Policy (NTP 1994) announced the opening of basic telecom services to competition, and the initiation of cellular mobile services. Private initiative was to complement public sector efforts to raise additional resources through increased internal generation and the adoption of innovative means like leasing, deferred payments, build-operate transfer, and the like. The NTP 1994 also envisaged the provision of a public telephone becoming available for every 500 persons in urban areas and at least one in every village. (There are now about 1.37 million public telephones in the country and about 600,000 village public telephones). The method employed for inducing the private sector into both basic and cellular services was through the auction of licence fees, consistent with what has been followed by many other countries. The consequence was that the auction process elicited excessively high bids, even from bidders who had no previous history of substantive telecom experience, or even any other experience. Once the licences had been awarded, and operations had begun, inevitable complaints arose about the licence fees being too high and uneconomic. Since various developments had taken place in the telecom sector and new issues had arisen, a New Telecom Policy (NTP 1999) was announced. The issues that had arisen during this period related to:

- Perception of the original licence fee bids having been excessive
- Inadequate competition resulting from the existence of only two operators in each circle
- Continuing changes in technology
- The emergence of India as a significant player in the IT industry

Under the NTP 1999, a package for migration from fixed licence fee to revenue sharing was offered in July 1999 to the existing cellular and basic service providers. The MTNL• was allowed as a third operator to provide cellular services to promote competition. Government opened national long-distance services to private operators without any restriction on the number of operators and with moderate entry fees. International Long Distance Services were then opened in 2001, also with no limit on the number of operators and moderate entry fees. Both are subject to licence fees being paid as revenue sharing. Thus significant competition was introduced in the Indian telecom market starting in 2000-2001. The consequence has been dramatic: cellular mobile tariffs have fallen by about 75 per cent since 1999, and long distance tariffs, both domestic and international, fell by 60 per cent between 2000 and the end of 2002.

Corresponding organisational changes also took place during 2000-01. The two service providing departments of the telecom sector were corporatised, viz., Department of Telecom Services (DTS) and Department of Telecom Operations (DTO). A new public sector company 'Bharat Sanchar Nigam Limited' (BSNL) was given all service providing functions of these two

• MTNL - Mahanagar Telephone Nigam Limited - the government owned telephone company operating in New Delhi and Mumbai.

departments with effect from October 2000. A fourth cellular operator in all the circles was permitted.

With the introduction of effective competition in the cellular mobile services sector, the Telecom Regulatory Authority of India (TRAI) made cellular mobile tariffs free from regulation while reserving the right to intervene in the case of any malpractice such as the offer of predatory tariffs.

Apart from the success of telecom policy reflected in the growth of services and substantial reduction in tariffs, the objective of providing rural telephones is also making good progress. It is estimated that, out of about 610,000 villages in the country, about 510,000 have already been provided with at least one "Village Public Telephone" (VPT).

Although the outcome of reforms in the telecom sector is reflected in the greater role of the private sector, higher tele-density, decreasing supply of demand gap and the availability of services at substantially cheaper rates, the new challenges in the telecom sector are concerned with ongoing convergence that is taking place and the appropriate regulatory response to greater competition in the market. There has been excessive fragmentation in the provision of services on the basis of type of service, geographical coverage between service providers, and even technology (e.g. Cellular Mobile Services and Wireless Local Loop Limited Mobile Services). Hence, convergence of different services, broadcasting, multimedia and telecommunications through a single national service provider is being constrained. As a result of this fragmentation, none of the operators is able to build a technology base that would strengthen their bargaining power in the international market. It is true, however, that consolidation is indeed taking place through mergers and acquisitions: it is quite likely that the country will end up with four or five private operators along with the public sector incumbent. A key issue for policy is how to hasten this process through consolidation of different licences. We could then see the emergence of significant Indian telecom players who could then operate on an international scale.

The corporatisation of the Department of Telecommunications into BSNL and the privatization of VSNL• have been bold steps on the part of Government. It is now necessary to strengthen both BSNL and MTNL as corporate entities. With about 40 million lines between them they would probably rank among the top six to ten telecommunications entities in the world. Government equity in MTNL is now about 55 per cent, while BSNL remains 100 per cent government owned. Two opposite kinds of problems are arising out of their government owned incumbent status. First, with open entry in almost all service segments, the privileges given to the incumbents (e.g. non payment of licence fees) provide for unjust competition to the private sector operators. On the other hand, however, their public sector status constrains them from competing freely with the new operators. The recent intervention by the Government on restraining BSNL and MTNL from adjusting their tariffs is a case in point. A key issue, therefore, relates to the further restructuring of BSNL and MTNL so that they can compete effectively, while they also provide fairness and transparency in operations with respect to the private sector. Social obligations must be met through the mechanism of Universal Service Obligations (USO) as proposed in NTP 1999, and compensation through the USO Fund should get earmarked resources from the licence fee.

• Videsh Sanchar Nigam Limited - the hitherto government owned international log distance monopoly operator.

It has been argued that BSNL deserves preferential treatment from the Government since it has to bear the social obligations of providing unremunerative telephone social services in rural areas and other far flung areas. This view has got reinforced with the failure of private operators in complying with their licencing conditions related to rural services. BSNL has argued for not paying licence fees, and instead receiving additional subsidies from Government. Whereas the argument for receiving subsidies for social obligations is justified, this must be done in transparent fashion through the means of the Universal Service Obligations Fund(USO Fund) as proposed in NTP 1999. The USO Fund itself should be funded from earmarked resources from the licence fee, e.g. 5 per cent of total revenues from all operators, including BSNL. Fairness between the public and private sector operators would then be established and perceived as such. Furthermore, as and when BSNL is disinvested and privatised, such a system could continue to operate without difficulty.

Efficient, credible, and authoritative functioning of the regulator is essential for the functioning of the telecom market. The overall functioning of the TRAI must be adjudged an unusual success: it has been effective in introducing competition in the reduction of tariffs, and in the rapid expansion of services. However, its functioning has been subjected to a number of controversies and recent events suggest that it needs to be strengthened considerably. The key issues are:

(i) The Government must eschew temptation to interfere in the decision making process of the TRAI, as a consequence of corporate or political lobbying. This erodes the credibility of the regulator and gives rise to erosion of its authority, as seen in recent months.

(ii) TRAI must be strengthened professionally. This will be difficult unless it is made financially independent and the compensation structure delinked from the Government, but made totally transparent.

(iii) The appointment of the Authority should be more transparent and process linked so that it does not become a sinecure for retiring civil servants. The appointment of respected professionals would also add to its technical strength and respect in the market.

With the increasing difficulties encountered in tariff restructuring, it is absolutely essential that the regulator is strengthened and made more independent. The restructuring of basic service rentals and tariffs have been resisted politically. This is when there are only about 41 million fixed lines in the country: clearly the poor do not have telephones. The political sensitivity of telephone tariffs will only increase in the future as teledensity expands. Tariffs will have to be at economic levels if the telecom sector is to remain sound and not go the way of the power sector.

Ports

A common characteristic of the fast growing East and South East Asian countries has been the rapid growth of trade during their high growth period. A higher share of trade in the economy contributes to the attainment of higher efficiency. A country improves its resource allocation by exporting those goods where it exhibits competitive advantage and imports those where it does not. As its comparative advantage changes, so does the composition of its exports and imports. Thus, in order to achieve higher economic growth and higher efficiency levels, the trade-GDP ratio needs to increase substantially. Improvement in the efficiency of ports and expansion of their capacity is essential for promoting the growth of trade and export competitiveness.

In the wake of 20 per cent plus annual growth of exports during 1993 to 1996, the India Infrastructure Report had projected annual average growth in exports of about 15 per cent between 1995-96 and 2005-06, 20 per cent growth tapering down to 10 per cent over that 10 year period. Thus, exports were projected to increase from a level of about 10 per cent of GDP in 1995-96 to about 17 per cent in 2002-03 (about US$87 billion) and 18 per cent by 2005-06. Correspondingly, imports were expected to increase from a level of about 11-12 per cent in 1995-96 to about 18 per cent of GDP in 2002-03 and 19 per cent in 2005-06. Total trade as a proportion of GDP was expected to have reached 35 per cent by now. The projections for port traffic had been made based on these trade projections. Thus, total port traffic was expected to increase from a level of around 215 million tonnes in 1995-96 to 480 million tonnes by 2002-03 and 650 million tonnes by 2005-06. In fact, growth in trade has been much slower, reaching a level of about 22 per cent of GDP in 2002-03: exports at 10 per cent and imports at 12 per cent. Thus total port traffic in 2002-03 is recorded at only 313 million tones. It is partly because of this relatively slow growth in trade in goods that ports have not been a constraint in the late 1990s.

Port functioning has actually improved quite significantly, and there has been no shortage of needed investment by both the private and public sectors. Cargo handled by major ports has steadily increased albeit modestly to 313 million tones (MT) in 2002-03 from 215 MT in 1995-96 (**Table 6**). The Ninth Five Year Plan had only targetted traffic at 289 MT in the terminal year, i.e. 2001-02 as against the anticipated capacity of 344 MT. Thus, port capacity is no longer a constraint. During the Ninth Five Year Plan (1997-2002), 17 private sector/captive port projects of 60 MT capacity with an investment of about Rs 35 billion have been approved and are at different stages of construction. The Tenth Five Year Plan (2002-07) visualizes 6 per cent annual growth in traffic, a traffic load of 415 MT in the terminal year and a total capacity of 470 MT at the major ports, contributed, among others, by improvement in productivity to the extent of 15 MT. There has been an improvement in the principal indicators of port efficiency at the major ports. The average pre-berthing waiting time has come down from 1.7 days in 1996-97 to 0.50 days in 2001-02. The average turnaround time has declined from 7.5 days in 1996-97 to 4.1 days in 2000-01 and further to 3.7 days in 2001-02. The output per ship berth day has increased from 4,497 tonnes in 1996-97 to 6,701 tonnes in 2000-01 and further to 6,972 tonnes in 2001-02. Labour productivity has also increased from 307 tonnes in 1997-98 to 413 tonnes in 2000-01 in terms of output per gang shift. Productivity indicators have, however, varied widely across the ports. This suggests that there could be institutional innovations as have occurred at better performing ports such as the Jawaharlal Nehru Port Trust (JNPT in New Mumbai), which may be adopted in other ports.

The Government has laid down guidelines for private sector participation in the areas of leasing out of assets, construction and operation of terminals, berths, warehousing, tank farms, container freight stations, and captive power plants; pilotage and captive facilities for port based industries. 100 per cent FDI in ports has been allowed in December 1998 through the automatic approval route under the Reserve Bank of India. Guidelines on joint venture in major ports have been issued in September 2000. Model bid documents including license agreement have been finalised to attract private sector investment and participation. The norms for private BOT projects in major ports have been relaxed in 2001-02, in the context of limited private participation in major ports. So far, 41 private sector projects involving a capacity addition of about 160 MT and investment of about Rs 108 billion are at various stages of evaluation and implementation, out of which seven projects with capacity addition of 28 MT and investment of Rs 18.5 billion have already been completed. Private sector participation in major ports has been mainly under licensing of operations of existing container berths or granting Build Own Operate Transfer (BOOT) concessions for increasing terminal capacity. Thus, there is no shortage of private sector willingness to invest in the port sector. Higher trade growth is quite likely to elicit greater private sector response.

International trade is witnessing an increasing trend in containerisation. Accordingly, container traffic at major ports has shown impressive growth of over 10 per cent during the last three years. At present, about 70 per cent of the containers, which flow through India are trans-shipped through ports of Colombo, Singapore, Dubai and Salalah, leading to increased delay and cost in trade and transactions. It is, therefore, necessary to develop a hub port each on the east and west coasts of the country. Already, an international container trans-shipment terminal at Vallarpadam, Cochin is proposed to be developed.

Even though the major ports continue to handle about 75 per cent of the port traffic in the country, state ports are increasingly exhibiting higher traffic growth than the major ports. During the Ninth Plan (1997-02) when the overall traffic growth was 8.5 per cent, it has grown at 27.9 per cent for state ports and at 4.9 per cent for major ports. Besides, there is a need for alternatives to the congested major ports, particularly in the context of development of coastal shipping. There is great potential for private investment for the development of minor/ intermediate ports. Gujarat is by far the most active state in attracting private participation. Andhra Pradesh, Tamil Nadu and Orissa have also invited private participation to develop minor ports by offering long-term leases. The state governments and the Union Ministry of Surface Transport have set up the Maritime States Development Council for formulating an integrated ports policy including minor ports.

As the Government changed policy to permit private investment in ports, it became necessary to set up a mechanism for setting tariffs on a transparent and fair basis. With all major ports being in the public sector and structured as port trusts, tariffs were earlier proposed by Port Trusts and approved by the Ministry of Surface Transport. Accordingly, the Tariff Authority for Major Ports (TAMP) was set up in 1997. The TAMP has generally worked on cost plus principles, but has done so on a transparent and consultative basis. It initiated a system of transparent consultation with all stakeholders before approving or setting any tariff.

Tariffs had earlier been set on an entirely *ad hoc* basis by each Port Trust with little rationale or uniformity in approach. TAMP has attempted to work on broad principles of cost plus, but moderated by a normative approach allowing port trusts a certain return to capital. It also aimed to get a broad comparability in approach across ports, which was then applied equally to the new private port operators.

With the achievement of some initial rationalisation, TAMP now needs to focus more pro-actively on promoting competitive tariffs: users of cargo services should not end up paying for port or labour inefficiencies. Tariff policy should now be used as leverage to prescribe standards of service, thus contributing to productivity and efficiency. Competition between ports should also be encouraged through flexibility in pricing. Tariff policy can also be used for rationing port capacity, with high tariffs in ports that are congested. However, this cannot be taken too far since the on land transportation facilities vary tremendously between ports.

With the movement towards corporatisation of ports, and increasing weight of minor ports in total cargo throughput, the restriction of TAMP's jurisdiction to major ports only will progressively reduce its effectiveness. In fact, since TAMP was formed through an amendment to the Major Port Trusts Act, its jurisdiction is restricted to major port trusts. Ironically, as major port trusts get corporatised they, will go out of TAMP's jurisdiction, thus defeating the original purpose of TAMP providing a level tariff playing field between port trust operations and newer private operators. Thus, further thought needs to be given to the functioning of TAMP. It should have jurisdiction over all ports over some stipulated size, but its pricing strategy needs to be much more flexible to promote competition and have lower prices.

So far, Indian port tariffs are generally higher than other ports, and their efficiency also compares poorly, despite the improvements cited, with the world's major ports including those in the region, such as Colombo, Shanghai and Singapore. If Indian trade is to expand substantially in the future, substantial new investment will be required along with modernisation of existing facilities. This will need significant organisational restructuring of existing port trusts, including that traditional, restrictive, labour practices. Fortunately, the tariff structure is such that port investment can be extremely lucrative, even as efficiency increases and port tariffs come down.

The existing port trusts being constrained by their structure are unable to compete with the private operators and minor ports. Although the port trusts are being encouraged to convert themselves into limited companies, corporatisation with continuing government ownership and control may not be of much help without the design of appropriate governance structures for the new corporatised entities. The existing port trust structure does give voice to other stake holders and local governments through membership of the Trusts. Thus, a good degree of consultation will be needed for the transition. It would perhaps be desirable for the port trusts or their successors to turn into a landlord port structure where each terminal may be hived off as a separate company and competitively bid, with or without the port authority being a joint venture partner to boost intra-port competition. These terminal companies could compete and invest across diverse ports so as to mitigate risks out of a single base. Besides, they should be exposed to competition in raising funds from the capital market and to competition for management control. In order to enhance inter-port competition, port connectivity needs to be improved with inter-modal co-ordination between Railways, Container Corporation of India(CONCOR),

Central Water Commission(CWC) and National Highway Authority of India(NHAI). For sustaining competition, both inter-port and intra-port, the key regulatory issues such as dispute resolution mechanism, entry of new players, issue of concession, and merger/de-merger in the ports sector need to be clearly enunciated. In ports where private investment has taken place through container terminals such as in Nhava Sheva and Chennai, conflicts of interest have arisen with the host Port Trusts performing the role of land lords as well as operating competitors. In order to aid this process, TAMP could perhaps be turned into an overall port regulator rather than being restricted to just tariff determination and approval.

Power

The power sector was the first among infrastructure sectors to be opened for private sector investment. As economic reforms were initiated in 1991 and significantly higher growth expected as a result, it was clear that public sector resources would not be adequate for the kind of investment required in the power sector. Internationally, and particularly in East and South East Asia, the world as a whole had discovered the idea of independent power projects (IPPs) for generation and sale of power to the existing grids. Consequently, large plans were drawn up for attracting investments in independent power projects from both domestic and international investors.

The installed capacity at the beginning of the Eighth Five Year Plan (1992) was about 69,075 MW. This increased by about 16,500 MW during the Eighth Plan as compared with the planned addition of about 30,000 MW. The India Infrastructure Report had projected a capacity addition of about 33,000 MW between 1996 and 2001, and 50,000 MW between 2001 and 2006, along with significant improvements in efficiency to improve further utilization of existing capacity. Correspondingly, the Ninth Five Year Plan projected an addition of 40,000 MW between 1997 and 2002 and the Tenth Plan projects another 41,000 MW between 2002 and 2007. The actual achievement was an addition of about 16,500 mw during 1992 to 1997 and about 19,000 MW during 1997 to 2002 (See **Table 7**). With this poor achievement, there would have been a severe shortage of power had it not been for the slowdown in both industrial and agricultural growth in the last five years, and the significant improvement in the plant load factor from 57 per cent in 1992-93 to almost 70 per cent in 2001-2002.

In view of the poor financial condition of State Electricity Boards caused both by inefficiency and low agricultural and domestic tariffs, the original idea was to provide payment security to private investors through government guarantees and escrow arrangements providing them priority in payments. It was expected that these would be temporary measures as the State Electricity Boards would improve their functioning and become able to pay Independent Power Producers(IPPs) adequately. These arrangements were done in the context of rather generous assumptions about return to equity embedded in the power purchase agreements (PPAs). Consequently, there was enthusiastic response from both international and domestic investors. The aftermath of this exuberance is too well known to be repeated here: suffice it to say that the programme was replete with errors on all sides. The consequence is that the expectation of private sector investment in generation has been scaled down considerably for the Tenth Five Year Plan **(Table 7)**.

The reluctance of State Governments to tackle the basic issues of power theft and inadequate tariffs has led to the bankruptcy of SEBs, which has then made it impossible for viable private investment to take place in the power sector.

It is now well recognized that the financial difficulties of the State Electricity Boards (SEBs) lie at the heart of the power sector problems. The financial position of all the SEBs has deteriorated rapidly during the 1990s. Barring the SEBs in Himachal Pradesh and Maharashtra, all other SEBs have recorded losses between 1992-93 and 2001-02 ranging from Rs 40 million to Rs 37 billion. During 2001-02 alone, the commercial loss (excluding subsidy) was of the order of Rs 240 billion according to Planning Commission estimates. Such huge losses have adversely affected the ability of SEBs to supply electricity reliably, leading to default in payments to the power generation/transmission PSUs.

The root of the problem lies in the gap between user charges and cost of supply. Despite a graduated hike in user charges, the gap between cost of supply and average tariff per unit of electricity produced has actually worsened from a level of 23 paise in 1992-93 to about 110 paise in 2001-02 (**Table 8**). Revenues dropped from 82 per cent of costs in 1992-93 to 69 per cent in 2001-02. While there has been some rationalisation of tariff for the subsidised sectors, viz., agriculture and domestic sectors, the process is obviously far from complete.

What is interesting about Table 8 is that the increases in average tariffs have actually exceeded average inflation as measured by the Wholesale Price Index (See **Table 9**). Thus, tariffs have indeed increased substantially. But, the pace of increase in costs has been even faster.

The gap between cost of supply and average tariff has been accentuated further owing to losses in transmission and distribution (T&D), which correspond to electricity produced but not paid for. T&D losses of SEBs rose from 24.8 per cent in 1997-98 to 26.5 per cent in 1998-99 and further to 30.9 per cent in 1999-00. T&D losses are caused by a variety of factors such as electricity sold at low voltage, sparsely distributed loads across large rural areas, inadequate investments in distribution, improper billing and outright theft.

The poor financial health of SEBs and the resultant spill-over on the generating utilities are reflected in the subdued growth in power generation, which was at 3.1 per cent in 2001-02 down from 3.9 per cent in the preceding period (**Table 10**). The growth in capacity addition, after a turnaround in 1997-98 has slowed down, and entered negative territory in 2000-01 and 2001-02. On the other hand, plant load factor (PLF), which is a measure of operational efficiency of thermal power plants has indicated a steady improvement from 57 per cent in 1992-93 to about 70 per cent in 2001-02. This is witnessed in all the regions excepting the North Eastern region. The demand-supply attained a peak of 11.5 per cent of demand in 1996-97, declined to 5.9 per cent in 1998-99, but increased again to 7.7 per cent in 2002-02.

Power Reforms

Power sector reforms were initiated in 1991, encouraging competition in each sub element of the sector, viz., generation, transmission and distribution. The Central Electricity Regulatory Commission (CERC) was set up at the national level in 1997 and State Electricity

Regulatory Commissions (SERCs) have now been set up in 22 states, 13 of which have issued tariff orders so far. Private participation in power transmission has been allowed with the enactment of the Electricity Laws (Amendment) Act in 1998. The Indian Electricity Grid Code has been established in January 2000 by the CERC to ensure grid discipline for individual players in the T&D sector. The Availability Based Tariff order of January 2000 by the CERC is expected to encourage reliability and efficiency in generation.

The Electricity Bill, originally drafted in 2001 has recently been passed by the Parliament in 2003. It would replace the existing three laws on electricity, viz., the Indian Electricity Act, 1910; the Electricity (Supply) Act, 1948 and the Electricity Regulatory Commission Act, 1998. It recognises trading of power as a distinct activity and provides a legal framework for enabling reforms and restructuring of the power sector. Already, SEBs in nine states have been unbundled/corporatised. The distribution operations in Orissa and Delhi have been privatised. The newly set up distribution companies are expected to emulate the success of private sector distribution in Mumbai, Kolkata and Ahmedabad, and ensure effective enforcement of user charges.

An Accelerated Power Development Programme (APDP) initiated in 2000-01 and subsequently modified as Accelerated Power Development and Reforms Programme (APDRP) with an outlay of Rs. 3,500 crore has been designed to assist reforms in the distribution sector. It aims at 100 per cent metering, energy audit, replacement of distribution transformers, and IT solutions relating to power flow at critical points to ensure accountability at all levels. The APDRP also provides for financial incentive to the states to reduce the gap between unit cost of supply and revenue realisation. The Ministry of Power has already signed memorundum of understanding (MoU) with 25 states to undertake reforms in a time bound manner.

On the issue of outstanding SEB dues to Central PSUs and dues from Central PSUs to State Power Utilities, the Ahluwalia Expert Group constituted by the Ministry of Power in 2001, designed a securitisation scheme for one-time settlement of the approximately Rs 420 billion payable by SEBs to Central Government Public Sector Units(PSUs) as on September 30, 2001 after writing off Rs 96 billion. Towards this end, a tripartite agreement has been signed recently in March 2003 between the Ministry of Power, State Governments and the Reserve Bank of India. In accordance with the agreement, defaults in current payment would attract a graded reduction in supply of power from Central power stations.

The one time settlement of SEB dues needs to be strengthened with the right pricing of power. Once the SEBs' capacity to pay is enhanced in a durable manner, investment in power generation or transmission with active private participation is expected to take off. The passage of the Electricity Act, 2003 has now created an enabling environment towards a competitive power sector. However, a great deal of work remains to be done particularly at the state level. The reform template recently put forward by the Ministry of Power's Expert Committee on State Specific Reforms could be helpful in making further progress.

The last ten years have been intensive in discussions related to power sector reforms. The policy framework is now in place to actually implement them. The key issue is the curbing of

theft and the restructuring tariffs. The increase in tariffs that has taken place already is indicative of the willingness of consumers to pay, provided they get reliable power supply. The accent now has to be on a countrywide campaign across all States, regardless of parties in power to eliminate power theft. Such theft is clearly not being done by the poor, since consumption of electricity requires the ownership of items that consume electricity. If there is not a transper ant demonstration of the curbing of power theft, it will be difficult to increase power tariffs much further. The industrial tariffs are already too high in comparison to both international standards and local costs.

Railways

Indian Railways (IR) have been the prime movers to the nation and have the distinction of being the second largest railway system in the world under single management. IR has historically played an important integrating role in the socio-economic development of the country. Its role in economic development assumes importance due to its innate advantage as a mode of surface transport being more energy efficient and environment friendly than other transport modes.

However, IR has run into severe financial difficulties in the 1990s, which has hampered its growth and cast severe doubt on its ability to provide competitive transport services in the future. If the growth of the Indian economy accelerates, the supply of all transportation services would have to accelerate correspondingly. With an open economy and an increasingly competitive world environment, transportation will also have to be increasingly competitive in terms of both cost and quality of services. India being a large continental economy, with a large proportion of its activities located inland, the role of Indian Railways in providing such competitive services will be a critical part of the solution to India's infrastructure needs.

As in the case of power, a tradition has been built up to see railways as part of essential public service, the usage of which should not be denied even to those unable to pay. Correspondingly, freight users have been seen as those classes of users who could easily pay, and more. Consequently, freight services subsidise passenger services as a whole, and upper class passengers subsidise others. This was a viable system in the context of a closed economy, since higher goods freight charges could merely be passed on to the ever suffering consumer. Moreover, since the freight user was predominantly the public sector operating in an administered price system (oil, steel, coal, foodgrains), this caused no marketing problems for the railways. This is no longer sustainable in the open economy.

With the implementation of the Fifth Pay Commission award, the financial difficulties of the Railways got accentuated in the late 1990s. For the first time in 17 years, in 2000-01, IR was not able to pay its dividend to the Government, and this continued in 2001-02. A commercial enterprise in such a situation would have been declared in default, and would have had to go for restructuring.

Competition has been increasing across all sectors of the economy and the transportation business is no different. After trucking was deregulated in the 1980s, road transportation has

grown rapidly and has impacted Railways' market share significantly. Features like greater customer orientation, flexibility and lower cost of short leads are increasing the share of roadways even in bulk commodities that have been the traditional stronghold of the Railways. Over the last decade, the proportion of the total production of bulk commodities that was transported by rail has gone down in almost all commodities. The annual growth rate of freight carried by IR (in net tonne kilometres) averaged 5.33 per cent between 1984 and 1991, but dropped to 1.86 per cent in the next seven years 1992-99. Road dominance is likely to increase further with the completion of the Golden Quadrilateral in the National Highway Development Project; and the increasing use of pipelines for transportation of POL products.

The loss of market share in the profitable freight business, lack of flexibility in pricing, high cost of internally sourced products and services, together with investments in unremunerative projects, have meant that the rate of growth in revenues has been outstripped by the rate of increase in costs. Investment in unremunerative projects escalated during the 1990s. First, the adoption of the uniguage project involving large investments during this period has been particularly harmful to the finances of IR. Second, the temptation to begin a myriad of new lines for political reasons has been much greater in the politically fractured 1990s, and continues to this day. Revenue growth has also suffered from the saturation of freight traffic on trunk routes, particularly the golden quadrilateral. This is partly due to the large differential in spread between passenger and freight trains, which constrains severely the freight carrying capacity of trunk routes. Timely investment in new technology, track upgradation and signaling could have eased this constraint.

The proportion of expenditure on repairs and maintenance has been declining over the years, and adequate investment has not been made in track renewals and other safety related areas. Consequently, the arrears of track renewals have grown from about 3,500 km to about 13,000 km over the last 10-11 years. To arrest the steep decline in its share, and to improve the quality of its services, the IR needs to increase investments in infrastructure substantively. However, if the existing trends in cost increases, uneconomical tariff setting, and investments in unremunerative projects were to continue, it would be impossible for IR to find the funds for such investments and to service them.

In recognition of these problems, IR appointed an Expert Group on Indian Railways in 1999, which submitted its Report on July 2001. The Expert Group concluded that:

> "If IR is to survive as an ongoing transportation organisation, it has to modernize and expand its capacity to serve the emerging needs of a growing economy. This will require substantial investment on a regular basis for the foreseeable future. With the prospect of getting substantial free or subsidised resources from the government being unlikely, new investment will have to be financed on a commercial basis. This is the challenge facing Indian Railways".

The ability of the Indian Railways to accelerate the growth rate of their revenues from freight and passenger traffic is central to the success of any effort to restructure the organisation and to finance the necessary investments.

With these objectives in mind, the Expert Group recommended a multi-track strategy :

(i) **Tariff Rebalancing**: In order to correct the imbalance between freight and passenger traffic, both tariffs have to be rebalanced. Any further increase in freight tariffs would lead to loss of freight share. Within passenger tariffs, the ratio of lower classes fares to highest AC I class fares would have to be corrected from the existing high ratio of about 1:14 to about 1:9, as was also recommended in 1993 by the Railway Freight and Fares Committee. This could be done over a period of about 5 years.

(ii) **A Major Investment Programme**: Expansion of revenue will involve a significant increase in traffic - both freight and passenger - to about 7 - 7.5 per cent per year. Achievement of such growth will involve all round modernization, introduction of high speed modern passenger services, commodity specific freight strategies, and introduction of new technology, particularly in signaling and communications.

(iii) **Organisational Restructuring and Corporatisation**: Such tariff rebalancing, traffic growth, and a strategic investment programme cannot be done in a "Business-as-Usual" basis. Thus IR has to be reorganized to a corporate framework from its current departmental form of organisation. This would be essential to achieve the kind of commercial and customer orientation needed to achieve the goals outlined. Such large restructuring would be a very complex task and would have to be done carefully over a 5-7 year period. A beginning would be made with the recasting of accounts in a corporate framework in order to enable accountability and commercialisation of IR.

(iv) **Separation of Functions**: In line with developments in other infrastructure sectors, it would be desirable to separate policy setting, regulatory and operational functions. The Government should obviously be responsible for policy making; an Indian Railways Regulatory Authority could be in charge of regulation, including tariffs; and the corporatised Indian Railways Corporation would be responsible for all commercial operations.

The Expert Group argued that the financial situation of IR is currently such that anything short of a bold programme would not rescue IR from its current financial straits.

The response of IR and the Government to the Report of the Expert Group has been less than lukewarm. Some tariff rebalancing has indeed been done. It is possible that such rebalancing might continue; particularly due to market pressures. It is becoming difficult to increase upper class fares because of emerging competition from airlines. Second, modernization of the Golden Quadrilateral is being taken up in right earnest with assistance from both the Asian Development Bank and the World Bank. However, it is not yet clear how the whole project will be financed and how these finances will ultimately be serviced. On the organisational side, there has been no response at all. The prognosis for Indian Railways being able to perform its functions efficiently in the future is not positive.

Urban Infrastructure

The attainment of high growth requires well functioning and efficient cities. India now has 27 million plus cities, and 400 plus cities with population greater than 100,000. As growth proceeds apace, we can expect urbanisation to accelerate along with the structural changes expected in the economy, with activities shifting away from agriculture and towards industry and services. Efficient production of industrial goods and that of services requires agglomeration.

In the other areas of infrastructure, either significant policy changes have already been made (telecom, roads, ports) to improve performance, or the policy changes necessary are known but are proving difficult to implement (power and railways). In the case of urban infrastructure, there is little understanding of what needs to be done and how. Part of the problem is intrinsic. The implementation of urban infrastructure programmes lies with city level agencies or some state agencies, but these are typically bereft of resources and technical competence. A great deal of policy level discussion takes place at the national level, but the Central Government has few policy instruments to use to steer urban infrastructure in any particular direction. The Central Government has initiated a number of centrally sponsored schemes but resources allocated to these schemes are essentially token in nature.

As in the case of other infrastructure, urban infrastructure investment suffers from the lack of resources resulting from inadequate municipal finances and low user charges. With the state of Central and State finances being what it is, precious little can be done by way of downward devolution. For the provision of public goods, there is little alternative to the generation of local resources through local taxes, in particular property taxes, which should be buoyant in the face of rapid urbanisation and an incipient housing boom. Because of inefficient and antiquated property tax systems, many cities have relied on octroi taxes, a tax that has always been at the top of the list of rank bad taxes. Similarly, user charges for water supply, sewage, solid waste disposal, etc. are kept low in the name of the poor, thereby starving these services of the investment that is surely required. Correction of this situation needs a few city leaders (political or bureaucratic) who can change the situation through resource generation and associated improvement in the delivery of services that is transparent to the people. The demonstration effect should then spread out to other cities. The legislative provision for the exercise of such leadership now exists.

The 74th Constitutional Amendment Act, 1992 has given constitutional status to municipal governments and has defined municipal responsibilities and entrusted the responsibility of defining financial relations between state and local governments. In many states the devolution of administrative powers relating to planning, financing and managing municipal services has not yet become effective. In order to augment resources in the urban infrastructure, 100 per cent foreign direct investments (FDI) has been permitted in the development of integrated township since 2001. For urban infrastructure, in view of declining availability of state finances and the Reserve Bank of India's endeavor to bring discipline to lend against state guarantees, the Urban Local Bodies (ULBs) are compelled to explore alternative sources of financing like municipal bonds. ULBs in Ahmedbad, Bangalore, Vijayawada and Ludhiana etc. have already raised money through municipal bonds. However, there is a need to incentivise the markets so that investment in these instruments of longer tenor can be made attractive for retail and institutional investors. The municipal bond is one of the most potent ways of raising resources for ULBs. Norms for getting them rated have to be put in place. Investments have not

taken place because of very rigid existing problems related to land acquisition and stamp duty. In forward looking states like Andhra Pradesh, there has been some success in terms of customer oriented and transparent delivery mechanisms. Andhra Pradesh has taken the lead role in introducing e-Governance and has achieved considerable progress in this area. **e-Seva** is one among the major e-Governance projects rendering multiple services to the public through integrated citizen service centers. Initially it was covered in 16 integrated citizen service centers in the twin cities of Hyderabad and Secunderabad, called TWINS or Twin Cities Network Services pilot project. Now the e-Seva project covers the entire Andhra Pradesh providing 19 citizen services across the same counter. These services include information, all payments to government departments/agencies, submission of forms, tax returns, certificates/licenses, reservation of travels tickets etc. E-governance systems like TWINS and E-Seva in Andhra Pradesh are needed to be adopted by other states too.

In the area of water supply, municipalities, state governments and water boards have initially shown considerable interest in attracting the private sector for funding, constructing, operating and maintaining facilities such as bulk water treatment plants. However, several projects were subsequently abandoned in Hyderabad, Cochin and Pune due to various potential obstacles. Water supply and solid waste collection & disposal system need a shift from 'Government Only' approach to provide better services in the cities. Urban areas presently face severe concerns emerging from the gap between demand and supply of urban services due to adequate finance and ineffective governance that has impinged on the productivity of urban areas. The participation of the private sector to meet rising financial requirements for water projects is constrained, as this sector is fraught with risks. Since user charges do not cover services costs the colossal subsidy component has compelled various ULBs to borrow massively. There is no regulatory authority for the water sector that could make private projects more bankable.

The World Bank and UNDP have recently conducted careful studies on the cost of urban water in India and the tariffs charged. It has been found that all water consumers receive large subsidies at present. Whereas the average cost of water works out to be about Rs.15 per cubic metre, the average tariff is about Rs.1.50 per cubic metre. Even industrial and commercial tariffs are found to be significantly below cost. Since better off customers, industrial, commercial and domestic, typically consume larger volumes of water, they end up receiving larger effective subsidies than the poor who consume much less water. Yet, the prevailing view is that water cannot be priced at rational economic levels because of the law affordability of the poor.

In the urban infrastructure sector, urban local bodies (ULBs) which provide services are autonomous in theory but are still guided by an extensive set of government regulations. The poor financial position of ULBs is the main constraint on the growth of urban infrastructure. There is also considerable political interference in operations, managerial decision making and tariff setting. Tariff fixation should be based on average incremental cost including operation and maintenance charges, depreciation charges, debt dues etc. The current institutional arrangements do not create the proper structures and incentives for improvement of operational efficiency and quality of service. Problems relating to inadequate information about current financial and physical condition of the existing service provider and assets, tariffs well below cost recovery

levels etc are the issues for the international water operators trying to identify opportunities in medium size towns in India.

For the provision of urban infrastructure, ULBs particularly small ones are without the wherewithal to access the capital market to raise resources at competitive rates. These lack institutional capacity to manage the complexities and tasks involved in operating infrastructure services. For them urban housing and development corporations and insurance companies have been the main source of funds which provide funds at a higher rate. The problem gets accentuated when ULBs are unable to levy adequate user charges to service the debt and the projects are too small to be financed through debt/equity etc. Such identified small projects can be financed jointly as has been the practice of multi-project financing adopted in East European countries by the European Bank for Reconstruction and Development. The possibility of pooled financing of such identified projects through floating of bonds should be explored. It can save transaction costs as well as borrowing cost. Apart from these, sound accounting and financial management practices are required to enable the municipalities to access domestic debt markets and pay for the facilities constructed and operated by the private sector. Recently 14 ULBs in Tamil Nadu pooled certain water and sanitation projects to float bonds. Currently more than 50 ULBs are experimenting with various forms of arrangements to introduce private sector participation in Solid Waste Management (SWM) and its transportation.

IV. CONCLUSIONS

Infrastructure investment used to be a staid, regular, uninteresting activity that the public sector was involved in and which was taken for granted by most of the population. The kind of active discussion, experimentation and innovation that has taken place over the past decade is unprecedented in the area of infrastructure in India, and in the rest of the world. It is now time for consolidation and actual implementation. It is inescapable that if India is to achieve the kind of economic growth rates that have now become a matter of common aspiration, infrastructure must become even more of a priority than it has been.

That the public sector financing constraint is an objective reality has been documented in this paper. The lesson is two fold. First, all constraints to private sector investment must be loosened so that it can at least partially compensate for the lower than desirable level of public investment. Second, there is no escape from raising the public sector levels of infrastructure investment since some infrastructure services are really public goods, whereas others exhibit partial public good characteristics. However, it will not be feasible to restore public sector infrastructure investment levels to appropriate levels without fiscal improvements, particularly through revenue increases in both tax and non-tax areas.

Rural Infrastructure

There has been a significant slowdown in agricultural growth over the past five years. Even prior to this period, trend growth had been in the region of around 3 per cent annual growth, although it had accelerated to 4.5-5.0 per cent during the early to mid 1990s (Table 1). If India is to approach annual growth of 7-8 per cent over the next 5-10 years, it will be difficult to do so if agriculture grows at rates of 2-3 per cent annually. In the past, growth in agriculture has

been equated with that in production of foodgrains. It is now clear that, with rising incomes all round, the average Indian diet in both rural and urban areas is becoming increasingly diversified. Consequently, expenditure on foodgrains is falling as a proportion of total household food expenditure. Growth in domestic demand for foodgrains is, therefore, unlikely to sustain growth in production greater than what has been achieved in the past. Higher agricultural growth will now have to come from a much more diversified agriculture as has been the experience in other fast growing Asian countries.

Agricultural diversification and accelerated agricultural growth will be difficult to achieve without much greater investment in rural infrastructure such as roads, storage facilities, telecommunications, power, and the like. Diversified agriculture will need much more complex commercial linkages between the farm and market. Thus, rural infrastructure investment will yield high economic returns, but it is difficult to develop any methodology to yield adequate financial returns. States such as Punjab, Haryana, Kerala, Tamil Nadu and Goa that invested in rural roads relatively early have demonstrated how essential it is to do so.

A key challenge for India in the coming years will be the investment in and financing of rural infrastructure. Given the difficult fiscal situation already alluded to, innovation will have to be the order of the day. New approaches to public private partnerships, participation of local governments, funds sourced from dedicated levies such as the fuel cess will all have to be explored. It will also have to be understood politically that continuation of tariff policies such as the low rural electricity tariffs will not contribute to the rapid development of rural infrastructure.

Regulation

Increases in private sector investments can take place on both exclusive and partnership basis. In sectors such as telecom where service users can pay user charges at economic levels there is no constraint, in principle, to exclusive private sector investment. The main area of policy concern in such sectors is the removal of regulatory risk. The rapid technological change that characterised telecommunications over the past decade gave rise to unavoidable regulatory changes, which often trailed technology. New kinds of services became possible, and falling equipment prices often gave new entrants an advantage over incumbents, giving rise to disputes over tariff issues. Although technical change in telecommunications is continuing to take place, it is probable that the big tide of innovation of the 1990s has now receded. Similar has been the case in the power sector, where information technology has made possible consumer choice and competition possible where none was thought feasible earlier. Here also, regulators have had to cope with new forms of organizational frameworks that require new kinds of regulatory intervention. These kinds of problems are intrinsic to sectors where rapid technical change is taking place.

There are other kinds of regulatory risks that can indeed be removed. These relate to regulatory predictability and transparency. The principles of regulation must be well thought out, articulated transparently and reasoned. They must be technically sound so that they can be understood and accepted by market participants. If this is done, abrupt and *ad hoc* changes will be automatically avoided and private investment will flow. The various regulatory authorities in India are still in their infancy and can still be characterized to be on a steep learning curve. They

have been handicapped by the lack of technical expertise at both the staff and authority levels. Thus, many of their operations can be characterized as "learning by doing". Staffing at the Authority level has typically been done by the re-employment of retired civil servants; and that at the staff level through temporary secondments from government departments. The authorities have exhibited a marked reluctance to hire from the market, both at the authority and staff levels. Regulatory authorities in other countries typically have a better mix of staff that include technical experts hired from the market along with a sprinkling of civil servants. With the imposition of public sector compensation structures, it is difficult to attract appropriate expertise at any level. Thus, a key requirement is that regulatory authorities must be made financially and administratively autonomous. The remuneration of technical staff as well as of their members must be market related but made transparent for accountability. The ultimate responsibility for their actions does rest with government and Parliament, hence accountability has to built into their governance structure.

A good degree of regulatory risk arises from government or political interference in the work of the regulator, though it would be naïve to argue that the regulator must be completely immune to political and government pressures. The regulator is ultimately responsible to government and Parliament. This problem can be reduced by the articulation of conditions and the manner in which government can give directions to the regulator in a transparent manner. As has been provided in Sri Lanka, for example, where government direction results in revenue loss to the operators, it must have a responsibility to provide equivalent budgetary funds for that loss.

Tariffs are both the most contentious of issues that regulators handle, and also the raison d'etre for their formation. It is with the objective of removing the tariff setting processes from political pressures that regulators are often set up. Hence, it is doubly important for Government to devise procedures and conventions that allow regulators to function independently in tariff setting. Thus, it is important for the government to approach the achievement of a bipartisan consensus on tariff issues. This would involve wide public education and discussion on principles of pricing utilities. It is only if there is better understanding of these issues, and of the necessity of economic pricing, can there be any hope of regulators being allowed to do rational economic pricing.

A higher level of independence, financial autonomy, and technical expertise in regulatory authorities will do much to remove avoidable regulatory risk. Distancing of government from tariff decisions will also reduce inevitable special interest lobbying that often results in dysfunctional outcomes. Transparency in the appointments process would also contribute to greater independence and credibility of regulators.

Financing

The second issue related to private sector investment in infrastructure is the availability of financing of adequate magnitude and structure. Each infrastructure sector has its own different characteristics and financing mechanisms need to correspond to these characteristics. For example, once a power station or toll road is built, and tariffs are set in a transparent and predictable manner, the cash flows are fairly regular and predictable. They can then be securitized easily. However, the pre-operation risk is extremely high: hence risk mitigation, and

credit enhancement is necessary to attract resources at reasonable cost. Market instruments need to be designed to meet these requirements, along with specific government interventions, where necessary, in order to mitigate pre-operative risk.

The 1990s witnessed a great degree of innovation in structured finance all across the world. The huge expansion of cross border flows of capital aided this explosion of innovation. It was also the period during which the former socialist economies made their transit towards the market system: all of them had large backlogs of infrastructure investment that had to be financed. Similarly, China, Indonesia and other fast growing East-Asian countries exhibited great demand for infrastructure finance. The exuberance of international capital flows, particularly towards developing countries has dampened during this decade and hence needs some revival. As already noted, the initial expectations of return to equity were perhaps excessive, and particularly unsuited to infrastructure investment. Thus, a new look is needed at the international arrangements for cross border flows of finances for infrastructure investment. The international financial institutions can look more carefully from the point of view of both the investors and recipients. In some cases, large investments have been made for the privatisation of existing utilities, particularly in Latin America. In other cases, green field investments have also been made in areas such as telecom, power and roads. Serious problems have arisen for investors where large changes have taken place in currency adjustments that were characteristic of the 1990s. Equity investors have consequently suffered through loss of return whereas, in the case of debt, recipient countries have encountered debt servicing problems. These issues need to be given due attention in the discussions related to the new financial architecture. Mechanisms need to be evolved to provide some protection to both potential investors and recipients so that large financial flows for infrastructure investments can be rekindled. Mechanisms could be devised for credit enhancement of borrowers. Similarly, it should be possible to find ways and means for providing a floor of return to investment below which some form of investment insurance kicks in. The floor should clearly be below the level of market return to minimise moral hazard.

Various developments have taken place in the recent past that should make it easier for resources to be intermediated towards infrastructure projects. The government securities market has developed well and hence debt market benchmarks are now available. It is now quite a liquid market and government securities can also be traded in the stock exchanges. Thus, the technological infrastructure for the debt market is in place in the stock exchanges. Interest rate derivatives are about to be introduced to aid in risk management. An act has been passed recently enabling securitization of receivables on a widespread basis. The same Act has also strengthened creditor rights.

The Infrastructure Development Finance Company (IDFC) was founded in 1997 as a joint venture between the Government of India, the Reserve Bank of India, domestic financial institutions, and foreign investors like the Asian Development Bank (ADB), the International Finance Corporation (IFC), among others. Thus, institutional financing is also available for infrastructure. In fact, credit disbursed from the banking system for infrastructure has increased from 1.0 per cent of overall non food credit in March 1998 to 3.0 per cent in end-March 2003. IDFC itself has disbursed Rs.28.5 billion until March 2002. Thus, there is no shortage of credit availability for viable infrastructure projects.

The equity market has been generally dormant since the mid-1990s. Hence, raising private equity has not been easy, particularly with the decline of the Unit Trust of India(UTI). Accordingly, a new initiative, the India Development Fund has also been initiated to help private sector promoters to raise equity. It is expected that this fund will amount to Rs.10 billion shortly. Furthermore, private sector insurance companies have begun operations and the entry of independent pension funds has now been announced. Thus, a greater variety and volume of institutional investors will now become available for both direct and indirect investment in infrastructure.

Thus institutional investors such as banks, insurance companies, pension funds and the like can increasingly create specialised vehicles such as this to channel equity funds into infrastructure projects, where risk capital is otherwise scarce. International infrastructure funds were the rage in the 1990s. They need to be emulated domestically in India now, but perhaps with a greater degree of realism in terms of expected returns. If such infrastructure equity funds succeed, they can also operate as credit enhancement vehicles bringing other equity investors to the market in their wake.

A major development that has taken place in recent years is the significant reduction in inflation on a sustained basis, both internationally and in India. It was during the days of 7-10 per cent annual inflation that equity investors expected 20-25 per cent returns on risk capital, particularly international investors. With inflationary expectations having come down to 3-5 per cent levels, there should be a corresponding reduction in both costs of debt and equity. This should also make formerly unviable projects viable, and hence amenable to commercial investment. The consequent reduction in user charges necessary for viability would also come down, leading to greater acceptability.

There also needs to be greater learning from the many different financing techniques employed in developed countries, which effectively amount to private financing of public infrastructure or of private-public partnerships. Two patent examples come to mind. In the United States, municipal bonds, having been made tax free by the Federal Government enable local governments to tap the large U.S. capital market to finance local urban and other infrastructure. Because of the tax free status recognising the public good element in urban infrastructure, they could raise finances at lower cost, thus keeping user charges at affordable levels or municipal taxes at acceptable rates. The institution of municipal bonds provides internalised incentives for local authorities to be fiscally prudent: defaults on municipal bond servicing causes great hardship. The Pfandbrief system in Germany is another effective example of private financing of public infrastructure. In their case, it is large mortgage banks that pool local authority debt into "pfandbriefs", which is effective credit enhancement of entities that may not otherwise be creditworthy. Pfandbriefs have succeeded in keeping up their credit quality for more than a hundred years, through hyper inflation and two world wars. There is a complex system of government guarantees that underlies this system. In India too, and in other developing countries, thought needs to be given to how such innovative systems can be derived to generate greater private financing of infrastructure.

In sum, there continue to be great opportunities for devising viable financing systems for the funding of infrastructure in both the public and private sectors. Much greater information is

available on different techniques; now technology makes possible financing systems not earlier available; and cross border flows can again be rekindled. The fall in inflation and interest rates should also make hitherto unviable projects financially viable.

Management in the Public Sector

Even if all constraints are removed for private sector investments, there will continue to be a very significant presence of the public sector in infrastructure, both in existing entities as well as in new investments. Most roads, except for toll roads, will necessarily remain in the public sector; as will sewerage systems; public lighting, and other similar components of urban infrastructure. Water supply systems, particularly distribution systems are natural monopolies, and will always have large public good elements embedded in them. Water generation, purification, treatment, etc. can indeed be privatised but the rest of the system will either remain in public sector hands or be heavily regulated. Similarly, in the railways, it is difficult to privatise the common carrier, i.e. the track, whereas operation of trains, maintenance, etc. can potentially be privatised, though the international experience of the private sector operating the railways is, at best, mixed. In other areas, such as ports and airports, whereas activities such as operation of terminals, traffic handling, and airline operation and shipping, are typically in the private sector, port or airport ownership as landlords is typically in the public sector. Thus, public investment in infrastructure will remain essential indefinitely, as will be a good part of its operation.

This must be understood and appreciated better. A much greater focus, than is the case at present, must be placed on public sector management. The public sector that continues to exist in infrastructure must be commercially oriented and must have the best of management skills, since infrastructure systems are typically large systems. There is a great need for instilling excellence in public management systems. Capabilities need to be built up to bring in modern management systems. The best managers in the system must be attracted to such activities. As happens in many systems, the public sector and governmental management systems in India have become ossified with excessive rigidities and careerism built in. Entry into these systems is essentially at the basic entry level, with little or no mobility of personnel at higher levels. There is little infusion of new blood at higher levels, except at the Board level and excessive in-breeding and inward looking attitudes have become the norm. What is needed is a system of induction of outside expertise at all levels in an organised framework. Labour mobility is hampered by the rigidities in the social security system where pensions and other similar benefits are not portable.

Great change has taken place around the world, and in India, in management systems. Public sector management, be it in public sector enterprises, central, state or municipal governments, needs to be modernised to take on the new challenges. Public sector systems are typically large systems and, therefore, intrinsically more challenging. Young people of high calibre need to be attracted to these activities in much the same way as the best and most dynamic corporations attract the best talent to their portals.

In the current system in India, which now has a mix of public and private companies in the same sector, great inequalities in compensation have crept in between people performing similar functions. This issue needs to be tackled head on and an acceptable methodology found to address it.

A major issue in public sector management is the tenure of chief executives. In the Indian Railways, for example, the chief executive, the Chairman of the Railway Board seldom has a tenure greater than one year. With such a tenure, he can scarcely be expected to have even a medium term vision, let alone a long term one of bringing any change into the system. Even if he does, he certainly would have no chance of implementing it. Experience in India has been that in cases where there has been stability of leadership enterprises have performed relatively well. The system of promotion by seniority is not conducive to commercial operation.

There is great need, therefore, for new thinking on public sector management. Whereas privatization must be pursued with vigour, it is equally important to instill pride and excellence in public sector management.

Public Private Partnerships

Given that most infrastructure sectors exhibit some public good characteristics, investment can be maximized through public private partnerships. If the achievable return to an infrastructure activity through the levy of user charges is, say, 70 per cent of market returns, a public subsidy of 30 per cent would elicit market based private investment, and the enterprise can then run on commercial basis. One example of such an activity has already been given in the case of toll roads. Another example could be that of urban water supply where some water has to be given free for the less well off through public standposts; another could be for unremunerative railway lines that are deemed necessary for other objectives. Such partnerships are, however, not easy to do in a democratic parliamentary framework : inevitable questions arise on award of concessions and contracts. Hence, a great deal of work needs to be done to devise methodologies for the development of public private partnerships: this also requires excellence in public sector management.

None of this is possible unless infrastructure is productive: it must either improve productivity so that the gains result in higher tax revenues, or directly through the collection of user charges.

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* MTNL - Mahanagar Telephone Nigam Limited - the government owned telephone company operating in New Delhi and Mumbai

* Videsh Sanchar Nigam Limited - the hitherto government owned international log distance monopoly operator.

Table 1:Macro Economic Indicators - Annual Growth
(Per cent)

Item	1992-93 to 1993-94	1994-95 to 1996-97	1997-98 to 2002-03*
Gross Domestic Product			
GDP	5.5	7.5	5.3
GVA of Agriculture & Allied Activities	5.0	4.6	1.0

GVA of Industry	4.6	9.6	4.8
GVA of Manufacturing	6.3	12.2	4.2
GVA of Services	6.5	8.3	8.0
Gross Domestic Capital Formation			
GDCF/GDP	23.3	25.8	23.9
GCF/GDP	14.1	16.1	15.8
Private Sector			
Household Sector GCF/GDP	8.1	7.9	9.7
Private Corporate Sector GCF/GDP	6.0	8.2	6.1
Public Sector GCF/GDP	8.4	7.8	6.6
Gross Domestic Savings			
GDS/GDP	22.2	24.4	23.1
Private Sector			
GDS/GDP	21.0	22.6	24.1
Household Sector GDS/GDP	18.0	18.3	20.2
Private Corporate Sector GDS/GDP	3.1	4.3	3.9
Public Sector GDS/GDP	1.1	1.8	-1.1
Public Finances			
Central Tax/ GDP	9.4	9.3	8.7
Interest Payments/GDP	4.2	4.3	4.6
Combined Revenue Deficit/GDP	3.8	3.5	6.1
Combined Govt Exp/GDP	27.1	25.9	26.9
Interest payments/GDP	4.9	5.1	5.6

* Figures relating to investment and saving are averages over 1997-98 to 2001-02.
Note: GDCF, GCF, GDS, tax and interest payments are calculated as per cent of GDP at current market prices; tax and interest payments pertain to the Central Government.
Source: Central Statistical Organisation and Reserve Bank of India.
GDP - Gross Domestic Product
GVA - Gross Value Added
GDCF - Gross Domestic Capital Formation
GCF – Gross Capital Formation
GDS – Gross Domestic Savings

Table 2: Projected Investment in Infrastructure & Actual Performance
(Per Cent of GDP)

Year	Elec., Gas & Water Supply		Railways		Other transport		Storage		Com-munications		In-frastructure	
	P	A	P	A	P	A	P	A	P	A	P	A
1995-96	2.9	2.0	0.7	0.5	1.2	1.8	0.0	0.0	0.7	0.7	5.5	5.0
1996-97	3.0	2.2	0.7	0.4	1.4	1.7	0.0	0.0	0.7	0.6	5.8	4.9
1997-98	3.1	2.1	0.7	0.4	1.6	1.1	0.0	0.0	0.7	0.6	6.1	4.2
1998-99	3.1	2.2	0.7	0.3	1.8	1.2	0.0	0.0	0.7	0.6	6.4	4.3
1999-00	3.2	1.9	0.7	0.3	2.0	1.3	0.0	0.0	0.8	0.7	6.7	4.2
2000-01	3.3	1.8	0.8	0.3	2.1	1.4	0.0	0.1	0.8	1.0	7.0	4.6
2001-02	3.4	1.7	0.8	0.3	2.3	0.9	0.0	0.1	0.8	0.8	7.2	3.8

P: Projection by the Expert Group; A: Actual Performance.
Source: India Infrastructure Report, Ministry of Finance and Central Statistical Organisation.

Table 3: Projected Investment in Infrastructure & Actual Performance: Public Sector
(Per Cent of GDP)

Year	Elec., Gas Water Supply		Railways		Other transport		Storage		Com-munications		In-frastructure	
	P	A	P	A	P	A	P	A	P	A	P	A
1995-96	2.8	1.8	0.7	0.5	0.3	0.3	0.0	0.0	0.6	0.7	4.4	3.3
1996-97	2.8	1.7	0.6	0.4	0.3	0.2	0.0	0.0	0.6	0.6	4.4	3.0
1997-98	2.8	1.7	0.6	0.4	0.4	0.2	0.0	0.0	0.5	0.6	4.4	2.9
1998-99	2.8	1.7	0.6	0.3	0.5	0.2	0.0	0.0	0.5	0.6	4.4	2.9
1999-00	2.8	1.6	0.6	0.3	0.5	0.2	0.0	0.0	0.5	0.7	4.5	2.8

P: Projection by the Expert Group; A: Actual Performance.
Source: India Infrastructure Report, Ministry of Finance and Central Statistical Organisation.

Table 4: Projected Investment in Infrastructure & Actual Performance: Private Sector (Per Cent of GDP)

Year	Elec., Gas Water Supply		Railways		Other transport		Storage		Com-munications		In-frastructure	
	P	A	P	A	P	A	P	A	P	A	P	A
1995-96	0.1	0.2	0.0	0.0	0.9	1.5	0.0	0.0	0.1	0.0	1.1	1.7
1996-97	0.2	0.4	0.0	0.0	1.0	1.4	0.0	0.0	0.1	0.0	1.4	1.9
1997-98	0.3	0.3	0.1	0.0	1.2	0.9	0.0	0.0	0.2	0.0	1.7	1.3
1998-99	0.3	0.5	0.1	0.0	1.4	0.9	0.0	0.0	0.2	0.0	2.0	1.4
1999-00	0.4	0.3	0.1	0.0	1.5	1.1	0.0	0.0	0.2	0.0	2.2	1.4

P: Projection by the Expert Group; A: Actual Performance.
Source: India Infrastructure Report, Ministry of Finance and Central Statistical Organisation.

Table 5: Telecommunications: Subscriber Base

(In millions)

	Basic	Cellular Mobile	VPT	PCO
1988	3.8			
1989	4.2			
1990	4.6			
1991	5.1			
1992	5.8			
1993	6.8			
1994	8.0			
1995	9.8			
1996	12.0			
1997	14.5	0.34		
1998	17.8	0.88		
1999	21.6	1.20	0.341	0.52
2000	26.5	1.88	0.375	0.65
2001	32.4	3.60	0.409	0.86
2002	39.0	6.40	0.468	1.07
2003	41.0	12.60	0.507	1.37
	(Mar 2003)	(Mar 2003)	(Dec 2002)	(Dec 2002)

VPT - Village Public Telephones
PCO – Public Call Offices (Public Telephones)
Source: Telecom Regulatory Authority of India (TRAI)

Table 6: Port Traffic

Year	Traffic Throughout (Million Tonnes)	Growth (Per cent)
1992-93	167	9.0
1993-94	179	7.6
1994-95	197	10.0
1995-96	215	9.2
1996-97	227	5.5
1997-98	254	12.0
1998-99	252	-1.1
1999-00	272	8.0
2000-01	281	3.4
2001-02	288	2.4
2002-03	313	8.9

Source: Infrastructure Review, Ministry of Statistics and Programme Implementation.

Table 7: Capacity Addition in the Power Sector--Plan Target vs Achievement
Eighth Five Year Plan (1992-1997) (MW)

	Target				Achievement			
	Central	State	Private	Total	Central	State	Private	Total
Hydro	3,260	5,860	162	9,282	1,465	795	168	2,428
Thermal	8,498	9,010	2,646	20,156	6,252	6,040	1,262	13,555
Nuclear	1,100	-	-	1,100	440	-	-	440
Total	12,858	14,870	2,810	30,538	8,157	6,835	1,430	16,423

Ninth Five Year Plan (1997-2002) (MW)

	Target				Achievement			
	Central	State	Private	Total	Central	State	Private	Total
Hydro	3,455	5,815	550	9,820	540	3,912	86	4,538
Thermal	7,574	4,933	17,038	29,545	3,084	5,538	4,975	13,597
Nuclear	880	-	-	880	880	-	-	880
Total	11,909	10,748	17,588	40,245	4,504	9,450	5,061	19,015

Projected Capacity Addition during the Tenth Five Year (2002-2007) (MW)

	Central Sector	State Sector	Private Sector	Total
Hydro	8,742	4,481	1,170	14,393
Thermal	12,790	6,676	5,951	25,417
Nuclear	1,300	-	-	1,300
Total	22,832	11,157	7,121	41,110

Table 8: Recovery of Cost of Power Supply

Year	Average Cost Per Unit (Paise)	Average Tariff Per Unit (Paise)	Recovery of Cost (Per cent)
1992-93	128	105	82
1993-94	149	117	78
1994-95	163	128	78
1995-96	180	139	77
1996-97	216	165	77

1997-98	240	180	75
1998-99	263	187	71
1999-00	305	207	68
2000-01	327	226	69
2001-02	350	240	69

Source: Economic Survey 2002-03

Table 9: Cost of Power Supply, Power Tariff and Wholesale Price Index (Base: 1993-94=100)

Year	Index of Average Cost per Unit	Growth of Average Cost per Unit (Per cent)	Index of Average Tariff per Unit (Per cent)	Growth Rate of Tariff	Average WPI	Average WPI Inflation Rate (Per cent)
1992-93	86	-	92			
1993-94	100	16.3	100	10.7	100	8.4
1994-95	110	9.6	110	9.7	113	12.5
1995-96	121	9.9	119	8.6	122	8.1
1996-97	145	20.0	142	18.9	127	4.6
1997-98	161	11.2	155	9.1	133	4.4
1998-99	177	9.8	160	3.6	141	5.9
1999-00	205	16.0	177	10.8	145	3.3
2000-01	220	7.3	194	9.3	156	7.2
2001-02	235	6.9	206	6.0	161	3.6

Source: Table 8 and Office of the Economic Adviser, Ministry of Commerce and Industry

Table 10: Physical Performance of the Power Sector

Year	Generation (Billion Kwh)	Thermal PLF (Per cent)	Capacity Addition (MW)	Demand-Supply Gap (MW)@
1992-93	301	57.1	3537	25442 (8.3)
1993-94	323	61.0	4538	23758 (7.3)
1994-95	351	60.0	4598	24979 (7.1)
1995-96	380	63.0	2123	35676 (9.2)
1996-97	394	64.4	1624	47590 (11.5)
1997-98	420	64.7	3226	34175 (8.1)
1998-99	448	64.6	4242	26349 (5.9)
1999-00	480	67.3	4507	29836 (6.2)
2000-01	499	67.7	3775	39816 (7.8)
2001-02	515	69.9	3115	39276 (7.5)

@: Figures in bracket are demand-supply gap as a per cent of demand.
Source: *Economic Survey* and *Annual Report*, Ministry of Power, Various Issues.