NATIONAL TRANSPORT DEVELOPMENT POLICY COMMITTEE

Interim Report

Government of India
Planning Commission
April 2012

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INTRODUCTION to the INTERIM REPORT[1]

The Government of India set up the National Transport Development Policy Committee (NTDPC) as a High Level Committee on February, 11, 2010 under the Chairmanship of Dr. Rakesh Mohan. The composition and Terms of Reference of the Committee are annexed (Annex 1).

[1] Incorporating comments on the Twelfth Plan draft chapters on transport and urban transport.

The NTDPC was appointed to provide guidance on long term transport policy for the country. The policy would help in devising overall strategy for the sector, including decision making for investments that need to be made for the provision of transport infrastructure and derived services that are commensurate with the country's growth aspirations. As India continues its current growth trajectory to attaining middle income status and beyond, the NTDPC is addressing critical questions on capacity augmentation and the types and magnitudes of transport investments required to support rapid economic growth. In addressing these issues, the NTDPC is paying particular attention to building the institutional and informational foundations that will help in meeting specific challenges as they emerge over time. As technologies, institutional capacity, prices and incomes will undergo a significant change over the next 20 years, the absence of such institutional foundations brings the risk of "lock ins" with currently available options dominating choices that may have to be made in later periods. This is particularly important as transport investments typically have long lives of 25 to 100 years.

1.1 Mode of Functioning of the Committee

Working Groups: To aid in its work, the Committee initially set up five Working Groups: on Roads, Railways, Civil Aviation, Ports & Shipping and Urban Transport. Later, it also set up specialised Working Groups on two major issues which needed focused attention: one on Bulk Transportation of Energy and another on Development of Transport Infrastructure in Inaccessible Areas, focussing particularly on the North East. Intermodal integration and improving logistics also forms an important part of the NTDPC's approach. So a special group was also formed to deliberate on the various issues relating to the logistics sector.

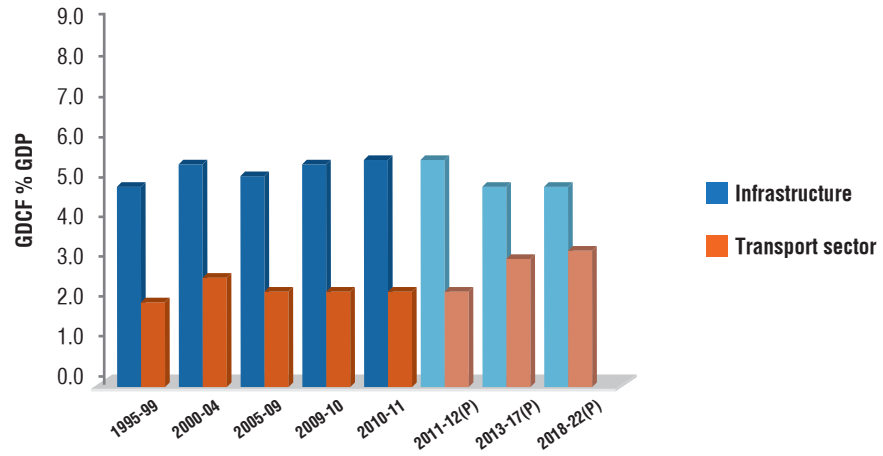
Studies: The committee has also commissioned a few research studies to aid in its work. First, the National Council of Applied Economic Research (NCAER) was commissioned to study the extent to which taxes and subsidies are distorting prices and functioning of the transport sector. A second study is under way on the regulatory framework governing the transport sector. Third, The Energy and Resources Institute (TERI) has been commissioned to do another study on life cycle costs of emissions of different transport modes.

Macro Framework: The NTDPC will also be providing guidance on the broad magnitude of transport investments that can be supported by the Indian economy. While sector specific investment needs are being estimated independently, their magnitudes may be several times higher than what the overall economy can support. A national accounts and macro consistent framework has been developed for this purpose. Investments in infrastructure (measured as gross domestic capital formation in the national accounts framework) have increased from 4.9 percent of GDP during 1995-99 to around 5.6 percent of GDP between 2007 and 2011. Of this, the share of the transport sector has increased from 2 percent of GDP during 1995-99 to an average of 2.6 percent of GDP between 2007 and 2011. In fact, the transport sector's share of overall infrastructure investment has increased from 41 percent to 47 percent during these two periods. Early projections from the NTDPC's macro model suggest that transport investments should gain importance during the 12th and 13th plan periods, increasing to 3.1 percent of GDP during 2013-17, and 3.6 percent of GDP during 2018-22. This is projected to be a part of an overall push to stimulate overall infrastructure investments to 6.8 percent of GDP during the 12th plan and 8.0 percent of GDP during the 13th plan. Within the transport sector, a step up in investment is projected across all sub sectors. These estimates/projections are based on the national accounts concept of gross domestic capital formation. Using the Planning Commission's definition of investment, these estimates will need to be enhanced by 1 to 1.5 percent of GDP.

International Experience: While the committee has drawn heavily on indigenous resources and expertise, it was realised that international expertise in selected areas of transport, could provide useful inputs for the task of the Committee. The NTDPC obtained technical assistance from the World Bank to provide information on best practice and international experiences in the following areas: (i) Railways, (ii) Highways, (iii) Urban Transport, and (iv) Ports & Shipping. An International Workshop was held in New Delhi in early February to discuss the papers.

The NTDPC is in the process of assimilating all the various inputs as detailed above in order to compile its final report. This Interim Report is being issued

Figure 1: Transport Investments as percent of GDP



Source: NTDPC macro model, data are national accounts consistent

as an input to the Twelfth Five Year Plan. An attempt has been made to focus on the major issues that have emerged in the deliberations of the Committee. As such this report eschews detail and focuses on the key strategic directions that need to be taken in the Twelfth Five Year Plan. It also incorporates specific comments on the Twelfth Plan draft chapter on Transport and the Urban Transport section of the draft chapter on "Managing Urbanisation". This Interim Report incorporates the overall approach being adopted by the National Transport Development Policy Committee, and goes beyond the specifics in the draft chapters reviewed.

OVERALL APROACH

2.1 Growth Projections

Different overall growth projections imply vastly different levels of traffic growth over a 20-year period. For example, even under assumptions of unit elasticity for both passenger and freight traffic with respect to GDP growth, a 7 percent annual growth rate over 20 years implies an expansion in traffic by a factor of four; whereas 10 percent annual growth would result in an eight-fold increase in traffic over the same period. With the expectation of such a large increase in traffic, specific attention needs to be paid to the appropriate pricing of all modes of transport so that users are aware of and pay all the inherent costs. Users would then be able to make choices over different transport modes on a more rational basis.

The Twelfth Plan Transport chapter should begin by providing an overall view of the expectation of growth in transport demand that is consistent with the economic growth projections being made for the Twelfth Five Year Plan. These traffic projections should then be divided into the different modal shares – rail, road, air, shipping and inland water transport – for both passenger and freight transport that are expected or desired. Further, it is desirable that these projections be placed in a longer 15 to 20 year perspective. This is important since the transport investments that may be needed in the 13th, 14th and 15th Five Year Plans are likely to be predicated on prior actions that need to be taken in the Twelfth Plan period.

Unit elasticity for transport demand is a conservative assumption. In fact, it is estimated that freight transport grew by a factor of 5 over the last 30 years or so. If, as is likely, industrial and trade growth rates are each higher than GDP growth, the growth elasticity of demand for transport will be greater than one, thereby implying a much larger expansion in the demand for transport services. Thus the strategy for all constituent modes of the transport sector, including ports and airports, ought to be designed with these projections in mind. The proposals put forward by the relevant administrative ministries for the Twelfth Plan can then be evaluated with reference to such traffic projections.

2.2 Transport Strategy

The current approach, as articulated in the Twelfth Plan draft chapter is essentially piecemeal. A more integrated approach is desirable once the relevant transport projections mentioned above are available. The desired 'end state' would be an overlay of transportation networks, allowing for the efficient transportation of passengers on the one hand and of each commodity type on the other, as well as natural interchange points where networks intersect and where large quantities are broken down into smaller volumes for last mile transportation into urban centers. A vastly superior logistics infrastructure is thus essential to achieve such a transportation system. We need a modal mix that will make feasible an efficient, sustainable, economical, safe, reliable, environmentally friendly and regionally balanced transportation system. A similar approach is needed for passenger transportation.

Choices will need to be made on the priorities to be placed on different investments. The optimal movement passengers, and of freight by matching cargo category with transportation mode, will be crucial in a scenario of expanding magnitudes across categories. This implies some judgment on the normative modal shares that are desired for rail, road, air, shipping, and inland waterway traffic. At present, this prioritization and decision-making is disjointed. For example decisions on investments in road expressways on the one hand, and potential railway Dedicated Freight Corridors (DFCs) and even possible high speed trains, are being made in isolation of each other. Investments in ports also need to be co-ordinated more closely with other investments in the overall transport network.

Regional Connectivity: In formulating a transport strategy for India, it is imperative that this is also undertaken within the larger context of connectivity within South Asia and between South Asia and South-East Asia. As political and diplomatic conditions improve in the region consideration will need to be given to promote connectivity of countries with each other through a dense web of transport links, encompassing road, rail, waterways, and air. A corollary to this is the need to develop modern, efficient and convenient, cross-border transport linkages, in particular, by rail and road. Most of our border areas have been left deliberately underdeveloped because of an outdated notion of security which looks upon borders as walls separating India from a hostile neighbourhood, rather than as connectors bringing peoples and economies together. Transport linkages across our border regions must be developed in tandem with "backward linkages" i.e. links with the Indian heartland. If the latter fall behind the former, there is a danger of further alienating our border regions and the people inhabiting them.

Efficient transport linkages can be a significant multiplier in promoting economic development, both within the country and within the larger region in which India is located. For India to emerge an economic powerhouse in South Asia and South East Asia, the development of a dense network of transport linkages throughout this larger neighbourhood is indispensable.

The NTDPC is giving specific consideration to such a strategic viewpoint in its work on transport issues in the North East. A wider view, however, needs to be taken with respect to linkages with all our neighbours, particularly in view of recent developments promoting intra regional trade.

Design of a Pan India Transport Network: Keeping all the above considerations in view, the Twelfth Plan should design the contours of a multimodal Pan India Transport Network that is desired to be in place by 2030. Investment in transport infrastructure in the Twelfth Plan period should be embedded within that. In view of the resource constraints being faced by the country now, and into the future, informed choices can then be made when high cost investments are contemplated.

2.3 Roads

India's road network has benefitted greatly from the articulation of the National Highways Development Project (NHDP). In the year 2000, a strategic decision was taken to implement a phased pr ogramme of four-lane highways connecting the four metro cities (the Golden Quadrilateral) and constructing key transport arteries on the East-West and North-South axes of the country. The plan has been augmented to connect key ports and other major economic nodes, along with special attention to roads in the North-East region. Further, a plan is now under consideration for building limited-access expressways on the heavily travelled trunk routes. This is somewhat similar to the interstate highway system of about 41,000 miles that was initiated in the United States in 1956 and which was largely completed in the following 20 years. It is important that the desired routing for NHDP 4-lane highways and expressways is frozen now and a clear phased programme is put in place for its implementation.

Similarly, a strategic decision was made to initiate the *Pradhan Mantri Gram Sadak Yojana* for rural roads, which has guided the rollout of rural roads since then. However, there has not been a similar approach for state highways. The Twelfth Plan should therefore initiate a similar strategic programme in every state for the development of state highways for the next 20 years.

2.4 Railways

Fall in Share of Railways: Indian Railways has seen a fall in the shares of both passengers and goods transported over the last 60 years. This phenomenon is similar to developments in almost all countries but the decline in India is somewhat steeper than in other large economies. In view of the expected uncertainties related to the availability of future crude oil supplies, the attendant implications for energy prices, and the adverse environmental impact of fossil fuels, it is essential that an attempt be made to reverse this trend or, at a minimum, to arrest it. This requires making a strategic decision in terms of the relative allocation of resources between rail and road, and accompanying pricing and taxation policies which can then be used to nudge transport demand towards the desired modal shares. Better understanding of the relative energy usages and life cycle energy costs of different transport modes will be very helpful in such decision-making.

Vision for Railways: It is of the utmost importance that a vision similar to that of NHDP is laid down for the Railways now so that we may expect a transformed railway network by 2030. If this is not done, the progressive achievements of the NHDP will only accelerate the loss in the railways' transport share leading to greater pollution and environmental degradation. The Twelfth Plan has to make a bold beginning in this direction together with the required organisational changes and important allocation decisions that would render such a strategy feasible.

Collateral Benefits for Industry: A large expansion of the Railway network will also bring collateral benefits for the economy through industrial growth resulting from the enhanced manufacturing demand for steel, wagons, engines, coaches, telecom, signalling etc. The Twelfth Plan should initiate policies that encourage modern manufacturing facilities and innovation in these critical areas.

2.5 Transportation of Key Commodities

Transportation of key commodities such as coal, iron ore, iron and steel and POL puts heavy demands on the transport system. At the same time the efficient movement of these commodities from production/originating points to demand/destination points is crucial for the operation of user sectors and growth of the economy. A scenario under which the Indian economy grows by 7 to 10 percent annually implies similar growth in both power generation and steel production. We have already seen the difficulties encountered by new power projects in sourcing coal. As some of the planned new steel plants receive clearances and begin production, similar problems may arise in the

transportation of iron ore. Over the next 20 years, the demand for the transport of these key commodities could well increase by a factor of four to six. With such an expected increase in the demands for these commodities domestic production will need to be supplemented significantly by imports, particularly of coal. Thus the addition of appropriate port capacity and associated links to the trunk transport routes will need to be coordinated. If we are not to run into significant transport bottlenecks in the carriage of these commodities in the future, the Twelfth Plan must detail the framework for investment in rail capacity and other transport modes for the transport of significantly greater quantities of these key commodities in future periods. The NTDPC will be making detailed recommendations in this regard.

2.6 Human Resource Development

In the course of its work the NTDPC has noted a severe lack of expertise in the country in almost every sphere of transportation. Thus, in order to meet the transportation requirements of a growing economy, and to make up for past transport deficits, there is a need for a quantum jump in capacity augmentation for all modes. This would not only require financial resources but also the availability of skilled manpower in a whole range of activities, related to the development and operation of transport infrastructure and services. This includes development, implementation, monitoring and management of projects on the one hand and research and development on the other. The NTDPC is of the view that human resource development would be the most critical factor in achieving the objective of creating a well developed and efficient transport system in the country. The NTDPC is therefore paying special attention to all aspects of human resource development related to the transport sector. It is, therefore, necessary for the Twelfth Plan to initiate steps as outlined in this interim report.

2.7 Safety

Safety in transport operations is emerging as an area of increasing concern with the rapid growth in both passenger and freight traffic in all modes. With acceleration in the rate of growth of the economy, there has been emphasis on improving accessibility and mobility, along with speed. This trend is expected to continue for the foreseeable future. The increase in traffic, crowding, payloads and higher speeds, all contribute to the increasing frequency of accidents and for the severity of consequences in terms of fatalities, injuries, overall human and economic costs to the economy. The Committee is, therefore, seriously concerned with the safety of transport operations and feels that this should be one of the thrust areas in the Twelfth Five Year Plan. The issues relating to safety have therefore been dealt with in a separate section of the

interim report as well as in the sections relating to individual modes of transport.

2.8 North East Region

Despite being richly endowed with natural resources, the North East Region (NER) has missed out on the economic growth acceleration witnessed in the other parts of India. The recent results of the National Sample Survey show that poverty has actually increased in the region unlike other parts of the country. The lack of adequate connectivity has virtually segregated and isolated the region not only from the rest of the country and the world, but also within itself. The state of poor infrastructure, particularly transportation infrastructure is the single biggest constraint to the region's prosperity. Thus, improving connectivity is an important precondition for social and economic mobility and market integration in the NER. The NTDPC has therefore paid special attention to this region as an integral part of the country's transport strategy. The Twelfth Plan should devise an integrated transport strategy, plans and programmes for the region encompassing all transport modes.

In order to forge closer and deeper economic integration with its Eastern and South Eastern neighbours, the Government of India has articulated its Look East Policy. Trade with these countries has been increasing and can be expected to grow rapidly in future. This would require opening of land/inland water routes particularly through Bangladesh and Myanmar. However, in the first instance, it is necessary to focus on the improvement of intra regional connectivity between the North East and rest of the country through the development of a multi-modal transport network which would usher in better connectivity with rest of the world.

2.9 Institutional Framework for Formulation of Transport Policy, Planning and Coordination

At present, the transport planning and policy co-ordination mechanism is very weak. We do not have any single agency either at the centre or at the state level for coordination of policy formulation for the transport sector as a whole. In the absence of such arrangements, the responsibility of investment coordination rests with the Planning Commission. In addition it is also expected to co-ordinate the policy formulation of the transport sector as a whole. In order to assist the Planning Commission, it is necessary to develop suitable institutional entities at both central and state levels which are endowed with adequate expertise to perform such coordination on a continuous basis. Such coordinating entities can then take into account logistic and

intermodal issues that are now essential for formulating and implementing coordinated transport planning and policy. The NTDPC will make concrete recommendations on this issue in its final report.

2.10 Summary

In summary, the chapter on investment in transport infrastructure in the Twelfth Plan must provide a strategic perspective on transport needs well into the future and embed Twelfth Plan programmes within such a framework. Thus the chapter should provide details of the proposed investment envisaged for this Plan period and of preparatory policies and programmes necessary for investment in later Plans.

The key issue facing the country relates to the desired strategy for capacity expansion of the railways over the next 20 years. All projections for the growth in demand for both freight and long distance passenger services suggest that overall economic growth could be stymied if appropriate strategic choices are not made now to facilitate significant capacity expansion of the railways, as has been done in China over the past decade or so. Such an expansion will not take place in a business as usual scenario.

RAILWAYS

3.1 Strategic View

The Ministry of Railways has brought out various documents that provide some vision for the development of India's railway infrastructure over the next 10-20 years. The **Report of the Expert Group on Railways of 2001**, the **Vision 2020 document of 2009**, the recent report of **Sam Pitroda Committee on Modernisation of Railways** and the **Kakodkar Report on Safety**, all provide guidance on strategies to aid planning for the future of Railways. The chapter on transport in the Twelfth Plan must reflect the views of these Committees in an organised manner to clarify the Government's overall strategy for the Railways for the next 20 years, once again embedding this within an essential all-encompassing strategic framework for India's transport infrastructure.

The document should lay out a vision for railways analogous to the NHDP, thereby providing an indication of the expected augmentation of the capacity of the trunk network over the next 20 years. Such a network could encompass the Golden Quadrilateral and possible North-South East-West corridors along with spurs to the major ports and mines, including the Dedicated Freight Corridors that have already been initiated. In addition, the capacity of feeder routes and key links to economic nodes like ports must be augmented. Growth projections will need to take account of the current overloading in both passenger and freight traffic leading to over utilisation of existing capacity. Further capacity expansion will thus have to be higher than the traffic growth projected.

3.2 Capacity Expansion

In the present draft of the Twelfth Plan transport chapter the growth rates projected for both freight and passenger growth are lower than overall traffic growth. Hence under this scenario the Railways will continue to lose share consistently over the 12th Plan period. Railways

have suffered from the absence of a comprehensive framework for capacity expansion over the last 60 years. Consequently, incremental changes have taken place through gauge conversion, doubling of lines, and some modernisation of signalling etc. Furthermore, there is continuous demand for new lines that are included in annual plans, but never really implemented. If consistent economic growth of 7-10 per cent per annum is to be achieved over the next 20 years, there is a pressing need for unprecedented capacity expansion of the Railways for both freight and passenger traffic in a manner that has not taken place since independence. Hence the transport chapter in the Twelfth Plan should lay out the Government's expectations for such capacity expansion in the next 20 years, and how much of this is to be accomplished in the next five. A clear view must be taken to abandon or not commence work on the many extraneous lines that have been initiated in the past, and on which almost no work has been done since they are not only expected to be uneconomic routes but also meet the traffic requirements to a very limited extent.

3.3 Capacity Building

Such an expansion in the capacity of the rail network would be a major departure from the observed trends over the past 60 years. China, incidentally, has indeed expanded capacity enormously along with modernising its rail network over the past 20 years. This was achieved with very significant augmentation of technical capacity in engineering, design, project execution and so on. For example, China is reported to have three railway design institutes, which compete for the design of each project. Each of these institutes employs three to five thousand engineers. If India is to embark on a similar plan for capacity expansion or modernisation of the railways, the groundwork for improving technical capacity in the railways sector will have to be done in the Twelfth Plan. This may also be induced by partnering with the private sector as has been done through the PPP approach in the NHDP. This could also include the possibility of opening capacity expansion works to international bidding so that technology transfer from abroad is made easier.

Research and Development: Thus, the Twelfth Five Year Plan should provide for major investment in programmes for capacity building in each of these areas noted above. Specific provision should be made for the establishment of a new National Railways Research Institute of substantial size that is designed to achieve quality that is at least as good as the IITs. Further, railway research centres should also be established in at least five additional technical institutes (IITs and RECs) and in at least two IIMs. These should be in the nature of full scale research centres where faculty can interact within a sizeable group. The designation of isolated Chairs is seldom found to be productive. Such steps

will necessitate a complete redefinition of the functions of the RDSO, and consequent actions to revitalize and strengthen it.

3.4 Safety & Modernization of Railways

The Kakodkar Committee has only recently submitted its report on Safety in Railways. Consistent with other reports on the same issue, better safety is inextricably connected with overall modernisation of the railways in every aspect. In order to upgrade technology and safety standards, investment would be required in upgradation of assets (track, bridges, signals and telecom etc), improvement of information and communication technology such as the Real Time Information Systems (RTIS), the Radio Frequency Identification (RFID) systems for wagons, coaches and locomotives to enhance wagon management and ensure real time monitoring and the like. Modernisation of rolling stock through the introduction of new generation locomotives, upgraded passenger coaches, heavy haul freight bogies, and modern high pay to tare ratio wagons etc would improve efficiency and quality of services along with better safety. As work progresses on the DFCs, and freight traffic is shifted to them, a major effort would be required to upgrade speeds to 200 kmph on segregated passenger corridors. This would imply deployment of advanced signalling technology (ATP/Cab Signalling/CTC), elimination of level crossings and fencing of tracks, and removal of permanent speed restrictions etc.

3.5 Organisational Change

Thus a coordinated strategic approach needs to be taken in the Twelfth Plan for capacity enhancement, capacity development, modernisation and safety improvements. The current departmental organisation of the Railways is not conducive to the running of railways as an economic and business enterprise, and towards executing the necessary changes to overhaul the service. Furthermore, speed in decision-making and delivering on plans will be of the essence if the goals of modernising the network and expanding its capacity are to be achieved over the next twenty years.

Recommendations in this regard have been made in different ways by the 2001 Expert Group and more recently by the Sam Pitroda Committee. For the railways to function in a more business like fashion, at a minimum the Railway Board should be re-organised along business lines, in contrast with the current division between the various disciplines, viz. electrical, mechanical, traffic etc. There is also a need for very large expansion in the capacities for manufacturing locomotives, coaches and freight wagons along with their modernisation. Thus, it may become imperative to hive off the existing manu-

facturing enterprises as public sector corporations so that they can expand and modernise quickly. Private sector manufacturing of rolling stock should also be encouraged.

3.6 Accounting Reform

This organisational reform will not be feasible unless the Railways' accounts are restructured to conform to standard business accounting formats. This principle was accepted by the Ministry of Railways almost a decade ago but is yet to be implemented. Regardless of the form of the organisational change that may take place; the Twelfth Plan should advocate the early adoption of business accounting. This would make it much easier to identify the relevant costs and profitability of different activities and sectors. It will allow clear identification of those routes that are taken up for social reasons and those for which a Government subsidy is necessary. The Twelfth Plan must urgently advocate for this change and provide budgetary resources if necessary. Business software is now easily available for such detailed activity based accounting.

Budgetary Reforms: The Planning Commission provides budgetary support through annual plans on which the Indian Railways pays dividends. If the Railways undertake the kind of accounting reform proposed, it will become much easier to make informed decisions on the areas of investment where budgetary support is to be given. For example, budgetary support could be provided in three parts. First, support could be provided to the commercially justified remunerative projects which are part of the strategic plan referred to earlier. Second, where the government mandates new lines for social considerations, funds could be provided on a grant basis. Third, budgetary support could also be provided for the projects/schemes that result in immediate benefit by way of increased throughput for greater efficiency or cost reduction or on the grounds of safety considerations, that is, implementation of a 'modernization plan'.

Depreciation Reserve Fund: Among the consequences of the inappropriate departmental accounting practices followed in the railways is the ad hoc approach followed in respect of appropriation to the Depreciation Reserve Fund, which is supposed to ensure the replacement and renewal of assets on a regular basis. More often than not, the contribution is adjusted to indicate a better operating ratio. A scrutiny of the data for the last few years indicates that the appropriation is uneven and does not follow any relationship to the capital that the fund is required to serve. The adoption of standard business accounting policies will necessitate adequate appropriations to depreciation reserves on a predictable, systematic and transparent basis.

3.7 Railways Tariff Regulator

Pricing of transport services of all other modes is either free or subject to a tariff regulating body. In the railways, however, tariff decisions are taken primarily as part of the railways budget. Various expert groups have proposed the setting up of a railways tariff regulatory authority. The Twelfth Plan should initiate action on setting up the Authority.

ROADS

IV

4.1 National Highway Development Project (NHDP)

The NHDP network has been well conceived and significant progress has been made over the last 10 years, particularly with the completion of the Golden Quadrilateral. The draft Twelfth Plan chapter provides a summary of the progress made thus far, though the details supplied are disjoined and do not comprise a comprehensive review of the project. More importantly, the continued progress of the project is not described fully. This can best be done through a pictorial representation in maps of what has been achieved so far and what remains to be accomplished in the Twelfth Plan and beyond. This will presumably help industry and economic actors in general to plan their own investments in a rational manner.

It would also be useful to provide a clear account of the financing mechanisms used to fund the NHDP in the 10th and 11th Plans, including a division between resources arising from the petrol and diesel cesses, multilateral loans, equity in PPP projects, budgetary allocations and extra budgetary borrowings. This may necessitate provision of information on the mode of delivery for different projects. A similar break up for investments proposed in the Twelfth Five Year Plan, both for NHDP and non-NHDP, will be immensely useful
Four- and six-laning: Many two-lane national highways have been upgraded to four-lane highways under the NHDP, and some of these are now being converted to six-lane roads with almost all being tolled. Since these are not access controlled and there are usually no alternate roads, most of these highways have mixed traffic exhibiting a wide variety of different speeds posing inevitable highway safety hazards and resulting in ever-increasing injuries and fatalities. The Twelfth Plan should give serious consideration to evolving a mandatory policy for the provision of service roads that segregate the local, relatively slow, traffic. With the addition of service roads it may then not be necessary to expand a four-lane highway to a six-lane one. If traffic volumes are such that six laning is found to be essential, consideration must be given to making these stretches access controlled, which also implies the provision of alternate roads for local traffic, and the provision of safe, convenient and frequent crossover points for non motorised traffic.

Two Laning: The Twelfth Plan should have as an objective that all National Highways have at least two lanes by the end of the Plan period as this would help in both energy efficiency and safety. A similar strategy needs to be worked out for State Highways.

Tolling: There is an increasing tendency to impose tolling on all manner of highways. This is in addition to the fuel cess that is paid by all users of motorised transport. There should be greater clarity on the rationale for imposing tolls in addition to the fuel cess that is levied. In principle, toll should be levied only when there is an enhanced level of service. Thus a policy decision should be taken in the context of the Twelfth Plan that tolling will not be resorted to on highways that have fewer than 4 lanes.

4.2 Expressways

The draft Twelfth Plan chapter provides an estimate of the requirement of 15,000 km of expressways. However, there is inadequate information on the characteristics of the road links, traffic volumes and traffic patterns that would justify expressway-level investment. A comprehensive master plan for the construction of access-controlled expressways on new alignments is essential to make the case for necessary land acquisitions and other actions. Access-controlled highways effectively divide the countryside and it becomes difficult for the many people who use non-motorised transport in India to cross such highways. It will therefore be necessary to provide frequent crossing points leading to the elevation of such highways, and consequent higher costs that will have to be built in.

Investments in expressways are of an order of magnitude higher than those in four- or six-lane highways that are not access-controlled. Decisions will also need to be taken between the priorities in rail investment and expressways, and also between widening existing roads to six lanes and building expressways. The Twelfth Plan should provide some indication of the economic criteria on which these resource allocation decisions will be taken.

4.3 State Highways

The development of State Highways has not received adequate attention in the past. As of now, there is no state that has a credible long term development programme for the roads sector which takes into account the need for meeting the deficiencies in the existing network and also the need to meet future traffic requirements. The Twelfth Plan should mandate each state to formulate development plans for the state highways identifying major provincial corridors and appropriate linkages to national highways. The Plan should also initi-

ate provisions for all state highways to have two-lanes as a minimum, over a specified time period. Priority for this can be decided on the basis of traffic and providing service to industrial hubs, SEZs, ports, tourist and religious centres. Some states have already done so. This should spread to other states as well.

4.4 Rural Roads

In the last 10 years or so the Pradhan Mantri Gram Sadak Yojana (PMGSY) has been the organising framework for improving accessibility in rural India. The existing programme under PMGSY needs to be completed expeditiously and expanded to address the issue of universal accessibility. The Committee is of the view that all the habitation in the country may be covered and the programme of upgradation is completed in the next 10-15 years. This will require the commitment of greater resources. Consideration needs to be given to the utilisation of other funds, such as in MGNREGA, where the employment and road building objectives are both met. At the same time, provision of both funds and organisational arrangements need to be made at the state level for continuous maintenance of the assets built, otherwise much of the investment already made will be lost.

Fuel Cess: The existing fuel cess was last revised to Rs 2 per litre in 2005-06. The price of petrol and diesel has risen considerably since then. For enhancing the availability of funds for the rural roads programme as well as other programmes relating to road development, the fuel cess should be doubled for the Twelfth Plan, and consideration given to levy it on an ad valorem basis.

4.5 Design Standards

The Twelfth Plan draft chapter has reiterated the need for studying the capacity of existing roads and revising capacity norms, as earlier also mentioned in the Eleventh Plan. In view of the substantial road investment expected to be undertaken over the next 20 years it is desirable to be more explicit about the hierarchy of roads, corresponding design standards and how these relate to the traffic carried. The principles and criteria for classification of roads need a revisit. A clear categorisation of roads and accompanying design standards will make it easier to estimate costs associated with constructing and maintaining different roads and also the decision criteria on which a road is upgraded to the next standard level as traffic increases. A review of existing design standards and a programme for the setting of new design standards and the procedure for their enforcement should form part of the Twelfth Five Year Plan.

4.6 Capacity Building and Research & Development

As in other areas of transport infrastructure, significant technical capacity building is also required in the road sector. The Twelfth Plan draft chapter notes the existence of supply-side constraints, mentioning the limited capacity of road departments (PWDs) in certain states to absorb any additional traffic, inability to make consequent investments for upgradation, and the inadequate institutional capacities for developing new roads. The Twelfth Plan should consider the allocation of a fixed percentage of all road investment, say 1 percent to be devoted to capacity building at the central, state and local levels so that there is rapid increase in engineering and design capacities across the country. This would include dedicated programmes for upgrading all state PWDs, rural engineering organisations, central road organisations and other executing agencies. For example, in view of the huge investments that are expected to be made in the country's national highway network, state highways and rural roads, on a continuing basis in the foreseeable future, a large high level central professional institution should be created in the Twelfth Plan. Such an institution should be expected to employ at least 500 professionals for design, research and standard setting in the roads sector. Additional allocation should be made for setting up new technical institutions and for providing R&D funds to IITs and regional engineering colleges.

Building Skills: There is a massive skill gap in the middle and lower levels of the construction industry. Skill upgradation of workers, equipment operators and site engineers of the contractors is a critical requirement so as to improve the productivity of labour and quality of construction. Special programmes should also be initiated for upgrading technical capacities amongst contractors in the private sector as well. This will require a joint effort of the states and the contracting industry.

4.7 Road Safety

Faster road transport has brought an attendant increase in traffic injuries and fatalities. By most international comparisons, India stands out for having amongst the most dangerous roads. In light of this, the Government had appointed the Sundar Committee on Road Safety. International experts have corroborated the Committee's analysis and have validated its recommendations as corresponding to the best international practice. The 12th Plan should reflect the recommendations of the Sundar Committee and make relevant allocations for building the institutional capacity indicated therein. The Sundar Committee recommendations should be implemented on an urgent basis. Finally, investment needs to be made in developing evidence-based safety strategies.

4.8 Road Transport

With the implementation of the NHDP and general integration of the road network across the country a great deal of modernisation needs to be undertaken in the administration of road transport in the country. Another Expert Committee under Mr. S. Sundar has made a series of recommendations for modernisation of the system and urgent amendments to the Motor Vehicles Act. The Twelfth Plan draft chapter does not seem to reflect the recommendations of this report. These recommendations should be incorporated in the chapter, together with the specification of an integrated national programme, including necessary actions by state governments, for their implementation.

4.9 Data Centre

The existing system of planning and management of various categories of roads involves some level of judgment and empiricism due to the lack of a sound database on the existing condition of roads, the volume of traffic, vehicle fleet, level of service, accidents, etc. Inadequately organized data on both freight and passenger movement, makes rational planning very difficult. The basic road statistics collected by the Transport Research Wing of MoRTH from states does not focus on the data on traffic history on the road network and its performance. Moreover the data received by MoRTH from multiple agencies is generally incomplete or inconsistent. There is also a need to collect data on traffic flows and cost at regular intervals. Accordingly, the Twelfth Plan should make provision for setting up a dedicated Road Data Centre.

PORTS

V

5.1 Need for a Strategic View on Port Investment

As mentioned in the Twelfth Plan draft chapter, the medium-term strategy outlined in the EXIM policy of the Government envisages an increase in India's share of world trade from the current 0.8 percent to 1.5 percent. At present there is no comprehensive and coherent strategy for the location of ports in the country or indeed for the overall investment programme in these ports. Each of the world's major economies has a few mega ports which are then well connected with the inland transport system through road, rail, inland waterways and costal shipping. At present, India has no mega port comparable to the size of such ports in other countries.

Hitherto, investment in both major and non-major ports has been done in a somewhat haphazard piecemeal fashion. A key issue that the Twelfth Plan should address is the desirability (or otherwise) of investing in 4 to 6 mega ports over the next 20 years, with 2 to 3 on each coast. These mega ports can be established either by transforming some of the existing major (or non major) ports into mega ports, if feasible, by combining some major and minor ports, or by setting up totally new mega ports. This would call for close coordination with the maritime states. Contingent on such a decision, the location of these ports should be harmonised with plans for the NHDP and the dedicated freight corridor system being planned for the railways so that there is efficient connectivity. At present, a good proportion of India's maritime trade is transhipped in Colombo or Singapore because of the lack of such ports on the Indian coastline. Current investment trends may lead to significant waste and inefficiencies in the building of transport links that connect with the burgeoning non-major ports. If such mega ports are to be commissioned, decisions to do so must be taken speedily. This is so that initiating studies and other actions for port construction are in concert with plans for other transport infrastructures. This strategy should also take note of the transport requirements of key commodities such as coal, petroleum and iron ore.

5.2 Shortfall in the 11th Plan investment in Ports

The Twelfth Plan draft chapter has documented the significant shortfall in the envisaged capacity at major ports while capacity creation at non-major ports has been almost as was expected. The share of shipping traffic at non-major ports has therefore increased significantly. Further the chapter has also documented deterioration in the various productivity parameters in major ports during the Eleventh Five Year Plan period. Much of the investment in ports is now taking place through PPPs, progress in which has accelerated during the last few years after the clarifications made in the model concession agreements. The chapter does not provide the strategy to be adopted to reverse the shortfall in investments in the major ports and the measures that need to be taken to improve productivity.

5.3 Institutional Development

The Twelfth Plan draft chapter has reviewed some of the institutional issues related to the port sector. Considerable discussion has taken place over the past 15 years on the appropriate legislative framework for the port sector. Whereas there has been a generalised acceptance at the highest levels for moving to the concept of landlord ports and corporatisation of port trusts, there has been little progress towards implementation of these ideas. Internationally, the once-dominant service port model of port operation is now considered obsolete. The Twelfth Plan should therefore advocate appropriate legislative and policy changes to expedite the move to the landlord model and to transform the Port Trusts to statutory landlord port authorities through specific legislation. All the terminal operations of port trusts would need to be corporatized as public sector corporations. Then, both private- and corporatized public-sector terminal operators would compete under the aegis of the landlord port authority. The corporatized public sector terminal operators could potentially be disinvested, listed, and possibly privatised at a later stage. The landlord port authority would carry out all public sector services and operations such as the award of bids for containers and other terminals, dredging etc.

5.4 Port Legislation

The Indian Ports Act, 1908 and the Major Port Trusts Act, 1963 are both archaic and do not serve current and future needs of the port sector The existence of two fundamentally different port management and legal systems for major and non-major ports makes country wide port planning very difficult. The Port Trusts as they are constituted presently do not address the needs of the trade or the interests of the ports; nor do they function on commercial

lines subject to the disciplines of the financial and capital markets. A review of port legislation should be undertaken to have one unified law relating to conservancy and a new law to transform the Port Trusts to landlord port authorities with functional and financial autonomy. This would naturally involve detailed discussions with the maritime states.

5.5 Tariff Setting

The cargo handling facilities of the major ports and those set up by the private sector under BOT arrangements, fall under two tariff regimes: the 2005 guidelines which provide for a cost-plus approach, and the 2008 guidelines which provide for a normative approach. It is essential that those terminals whose services are now priced under the cost-plus approach should also be brought under a normative approach. Eventually, all the terminals and cargo handling facilities at ports should be encouraged to operate at higher levels of efficiency using the best available technologies. This can only be achieved through competition and not through a process of tariff setting. Based on the assessed levels of competition between non-major and major ports and between similar cargo handling terminals in a region, tariff determination should be left to market forces. Prevention of anti-competitive practices, regulation of cross subsidization, review of concession agreements etc should be left to the Competition Commission. Tariff regulation should be resorted to only where monopoly conditions prevail and competition is not adequate. Eventually as competition grows, the Tariff Authority for Major Ports (TAMP) should be restructured and equipped to regulate safety, conservancy, the environment and the performance of both major and non-major ports.

The combination of strategic decisions on investment in mega ports and movement to a landlord port system would do much to accelerate the investment in and modernisation of Indian ports.

5.6 Coastal Shipping

The Twelfth Plan draft chapter has referred to the relatively low share of coastal shipping in the country's transport network despite its low unit transportation cost and lower environmental impact. For coastal shipping to increase its share significantly, greater integration with landside infrastructure is imperative. This may be achieved through inter-modal facilities, which allow for the transfer and onward transport of cargo, especially containers, seamlessly. Such progress can only take place if there is the implementation of a more organised vision for the transport system as proposed earlier. At the same time, various institutional and regulatory changes are important, such as those related to cabotage laws and regulations.

Given India's coastline, and the congestion on the roads and in the Railways, there is significant potential for increasing the share of coastal shipping in cargo movement in India. Coastal shipping would also help considerably to reduce CO2 emissions from the transport sector. Urgent attention should be paid to promote coastal shipping through:

- According priority to coastal ships by setting up coastal terminals at the major ports and identifying and developing five or six no major ports on the east and west coasts as designated coastal ports.

- Providing adequate road and rail connectivity to these coastal terminals and designated non-major coastal ports.

- Lowering the manning scales and vehicle specifications for coastal ships, which are currently related to ocean going vessels.

- Allowing coastal ships to import bunker fuel as well as spare parts with the same concessions availed of by ocean going vessels.

- Providing fiscal incentives to consignors who shift cargo from road and rail to coastal shipping on the lines of the incentives provided by the EU under the Marco Polo scheme.

5.7 Inland Water Transport

India's inland waterways total about 14,500 kilometres in length and yet the volume of cargo moved through inland water transport remains very low: it is confined largely to the movement of iron ore in Goa and fertilizer raw material in the West Coast region. Development of inland water transport with adequate intermodal connectivity can help to reduce the congestion on roads and rail and reduce CO2 emissions. Given that the available draught in the waterways is low, the appropriate strategy would be to focus on the waterways in the North East Region (NER) by setting up terminals and cargo handling facilities at strategic locations thus providing strategic linkages in the region. With respect to the Indo-Bangladesh Protocol on Inland Water Transit and Trade, there is scope for further analysis of mutually advantageous options for inter-country waterways linkages. The goal should be to formalise agreements to promote a stable trading environment in the region. The tenure of the protocol should be long enough to encourage investments from Indian and Bangladesh entrepreneurs.

The following measures merit consideration:

- Set up terminals and cargo handling facilities at strategic locations in the north-east
- Provide connectivity to road and rail
- Provide support at concessional terms for setting up cargo handling facilities and for the acquisition of vessels
- Provide fiscal incentives to consignors using inland water transport

CIVIL AVIATION

VI

6.1 Expected Growth

The Twelfth Plan draft chapter has documented the tremendous increase that has taken place in both passenger and cargo air traffic during the Eleventh Plan period. It projects similar rates of growth for both domestic and international air traffic during the Twelfth Plan period and beyond. The air traffic growth observed in China over the past decade would suggest that such growth will continue for the foreseeable future, perhaps a doubling every 5 to 7 years so that it can be expected to be at least 8 times the current level by 2030. Thus the challenge for the Twelfth Plan is to take measures that can lay the groundwork for such an expected increase in traffic over this period.

6.2 Airports

The privatisation of Delhi, Mumbai, Bangalore, Hyderabad and Cochin airports has been successful and these cities now have airports that compare very well internationally. The Chennai and Kolkata airports are also being modernised and expanded by the Airports Authority of India (AAI). Airport capacity in these cities is therefore considered adequate till the end of the Twelfth Five-Year Plan period. The Twelfth Plan should initiate thinking on policy for either the further expansion of these airports or the establishment of a second airport in these larger cities, as is being discussed with regard to the Navi Mumbai airport for Mumbai, and NOIDA airport for Delhi.

The Twelfth Plan draft chapter suggests that there would be an additional requirement for 30 functional airports by 2017 and another 150 over the next 10 years. A clear policy needs to be enunciated in the Twelfth Plan on the decision making process for the development of these airports: what kind of expected traffic would justify the building of a new airport; how these airports are to be developed; how will they be financed, etc. The emphasis should be laid on developing low cost airports coupled with development of small aircraft based regional airlines. A Planning Commission Task Force has already been appointed to take a view on various modes of development of airports: through the AAI route or the PPP route, particularly in Tier II and

Tier III cities. The task force should take an integrated view on the connectivity of these cities with existing airports through other modes in order to economise on investment. It should also delineate the respective roles of state and city level governments in the decision making and financing process related to airports.

6.3 Financial Viability of Airlines

Although air traffic has expanded considerably and several private airlines have entered the market, the financial viability of most airlines is currently precarious. Given the expected high growth in demand for air traffic, disruptive exits of major airlines will pose problems for the development of the sector, and for the economy as a whole. It is therefore essential that provisions are made for the orderly restructuring and/or bankruptcy of airlines, including protocols for mergers and acquisitions. The existing procedures under company law for bankruptcy of companies are not conducive for quick orderly restructuring that is needed in a public service sector. The problems are analogous to the too big to fail issue in banking.

Whereas it would be advisable to permit the bankruptcy of private airlines should they become insolvent, there is a need to better understand the reasons for the present fragility of the aviation sector. The main reasons that are currently put forth include the high price of Aviation Turbine Fuel (ATF) and the predatory pricing practices of many airlines. It may therefore be necessary for the aviation regulator to ensure that airfares reflect the impact of both ATF prices and other airport charges, and that predatory pricing does not endanger the financial viability of the whole industry. Some degree of price regulation may therefore be necessary, but it must be ensured that the dynamic competitive pricing that is the norm around the world in the airline industry is allowed to continue and that competition between airlines is not discouraged.

6.4 Regulatory Framework

Although there has been considerable discussion on the proposal to create a civil aviation authority as the key regulator in civil aviation, the Twelfth Plan draft chapter does not make any mention of this proposal. With the expected expansion of civil aviation it is necessary for a civil aviation authority to take on the role of a unified and professional regulator (functioning in a capacity similar to that of the Civil Aviation Authority of the UK, and the Federal Aviation Administration of the USA). The proposed Civil Aviation Authority will combine both technical work pertaining to safety, and also competitive, economic and consumer protection related issues, as is the practice in many civil aviation authorities around the world. There is also a need to remove factors impeding competition in civil aviation. The Twelfth Plan should

propose the consolidation of all aviation regulatory functions in such an authority and make provisions for the development of highly skilled resources in-house. The authority must have the expertise to regulate over a wide range of issues such as monitoring air space, competition, criteria for entry and market expansion, environmental considerations, consumer protection, and pricing.

6.5 Maintenance, Repair and Overhaul (MRO)

The Twelfth Plan draft chapter notes the potential for India to become a regional MRO hub due to a growing aircraft fleet, location advantages and the availability of engineering talent. At present, domestic airlines are obliged to ferry their aircraft to foreign destinations for maintenance and safety checks. This reduces aircraft productivity and raises costs. MRO is a major business opportunity for the country with a significant potential for employment of technical personnel at all levels. The Twelfth Plan draft chapter has proposed a number of policy and fiscal measures to enable augmentation of MRO capacities in the country. This should be given greater emphasis on the grounds that MRO operations can expand to a very large extent over the next 20 years.

6.6 Expansion of Airlines: Implications

Many Indian airlines have placed large orders for the procurement of passenger aircraft from the two main manufacturers—Airbus and Boeing—for delivery over the next 10 years. India, along with China, will be among the largest markets for aircraft in the next couple of decades. The global aircraft industry is highly oligopolistic with only two manufacturers of large aircraft and a handful of firms that manufacture smaller aircraft. The relatively high traffic growth in the aviation sector provides an opportunity for the country to develop its aviation industry. Therefore, while sourcing aircraft from the major global manufacturers, there is an opportunity to build long-term partnerships for technology transfer, fostering design capability and building manufacturing capacity in the country. In consultation with the airline industry the Twelfth Plan should initiate a programme for better engagement with the manufacturers in this regard. The focus should be on the development of an aerospace industry. An appropriate policy for promotion and development of the industry and development of civilian aircraft will be a proper direction. Offset policy can also be considered to direct investment to needy areas of the sector.

6.7 Air Traffic Control

Air space and traffic management will become increasingly challenging as air traffic increases according to current projections. There would also be an expansion of general aviation and helicopter activity as mentioned in the Twelfth Plan draft chapter. Measures have already been initiated to formulate an Air and Navigation Services (ANS) master plan to enhance capacity and safety levels in the face of higher air traffic movement in the future. The draft chapter has done well to provide for adequate investment in ANS infrastructure during the Twelfth Five-Year Plan. Air space and air traffic management are very specialized activities. Accordingly, in line with the best practices in the world, a separate organization needs to be created for air space and air traffic management. In addition to adequate investment proposed in ANS infrastructure during Twelfth Five Year Plan, an Air Navigation Services Corporation should be set up to manage capacity, safety, congestion and efficiency issues of air transport.

6.8 Human Resource Development

The Twelfth Plan draft chapter has noted the manpower requirement of the airline industry at all levels. It has also proposed expansion of training facilities in each area. These proposals are not specific enough. Greater emphasis needs to be placed on the development of human resources in the industry and the Twelfth Plan should make provision for specific investments in existing technical institutions across the country. There is a proposal to set up a National Aviation University devoted to academic education, research, development and next generation aviation. Instead of setting up a free standing university consideration should be given to establishing it within an existing technical institution, like one of the IITs or another engineering college. Existing expertise and technical capacities in different areas like mechanical, aerospace, electrical and electronics engineering etc. can be used for this specialised purpose. Two or three such institutions should be identified to set up specialised civil aviation-related training facilities.

TRANSPORTATION OF KEY COMMODITIES:

VII

7.1 Introduction

A KEY LONG TERM TRANSPORT issue facing the country is the investment needed to ensure adequate transportation of bulk commodities over the next 20 years. A scenario under which the Indian economy grows by 7 to 10 percent implies similar or higher growth in both power generation and steel production. In 20 years, the demand for the transport of coal, iron ore, steel and petroleum products could well increase by a factor of four to eight. Present capacities in almost all modes are just about adequate for current requirements, although some bottlenecks have already begun to appear. Thus a key issue that needs to be addressed in the Twelfth Five Year Plan is the transportation of these commodities. What needs to be done in the next five years to make sure that the groundwork is laid for the future? The Twelfth Plan draft chapter does not pay any attention to this issue. The NTDPC has commissioned a special Working Group to address this issue and a detailed report will form part of its work.

7.2 Increasing Imports

Domestic production of coal is unlikely to be able to keep pace with requirements, resulting in increasing amounts of imports over the next couple of decades. The bulk of petroleum demand is already met through imports. Consequently, not only will there be dramatic increases in the amounts of key commodities that will have to be transported, but the patterns of movements are also expected to change.

If we are not to run into significant transport bottlenecks in the carriage of these commodities in the future, the Twelfth Plan must detail the framework for investment in rail capacity and other transport modes for coping with these challenges. The Twelfth Plan should initiate the process for an integrated planning framework linking investments in rail and road capacity, and in associated port and logistics capacity. This capacity can be deployed to transport both domestically produced and imported coal and petroleum. The future location of power plants will be determined by the expected mix of

domestic and imported coal, and hence the requirements of transportation. The NTDPC is attempting to simulate the likely scenarios that may emerge, and their implications for power and transport planning.

7.3 Coal

The level and location of domestic coal production is the most important driver of transportation requirements for coal. It not only determines the volume of domestic coal that needs to be moved, but also affects the level of imports and hence the pattern of movement of imported coal. Further, because imported coal is much more expensive than domestic coal, increasing levels of imported coal will raise electricity prices. Domestic coal production will need to increase much more rapidly than currently projected to keep imports at an acceptable level.

Many of the major transport links are already operating beyond their capacity and see very significant amounts of congestion. This is particularly true for the Delhi-Kolkata, Kolkata-Mumbai and Kolkata-Chennai routes which are the main transportation routes for coal. The current plans for the Dedicated Freight Corridors (DFCs) do not include the Kolkata - Mumbai and Kolkata - Chennai routes.

It is important that trunk routes are upgraded soon so that there are no delays and no additional costs in transporting coal to power plants. In addition, where rail links have not been established from mines, those rail projects will have to be expedited. Port connectivity must be established at sufficiently high level of traffic to carry the much greater volume of imported coal that will need to be transported in the coming two decades. Further thought needs to be given to the potential of coastal shipping for this purpose.

7.4 Capacity Building

Many factors significantly affect the level and pattern of coal movement. These factors, such as international coal prices, domestic coal production levels, and the cost-effectiveness of renewable energy cannot be predicted with much certainty. Therefore, it is important that planning for bulk transport of energy commodities is adaptive. A strategic planning group should be established to monitor developments in coal and other fuel markets, renewable energy technologies, and domestic fuel supply. In response to changing conditions it should periodically direct changes in the plans for transport of fuels, so that adequate fuel supplies are available to power plants without delay and at low cost. The strategic planning group should include all major stakeholders and representatives from power, railways, and natural gas sectors. The Twelfth

Five Year Plan should initiate the establishment of such a group and make arrangements for effective coordination among the major stakeholders in government, public sector entities and the private sector.

URBAN TRANSPORT

VIII

8.1 Introduction

In the draft Twelfth Plan Urban Transport is included in a more comprehensive chapter on Managing Urbanisation in the Twelfth Plan. The chapter as a whole does a commendable job in looking at the prospects of urbanisation in the long term over about 20 years and then embedding the Twelfth Plan policies and programmes within such a long term vision.

The urban transport section also provides estimates for the proposed capital investment in urban transport for the Twelfth plan as part of total requirement of capital expenditure over the next 20 years. This has been made possible in light of the urban infrastructure investment projections that were available from the high powered Expert Committee on Urban Infrastructure Investment. Similar projections and estimates in this area are also available in a McKinsey study on India's urbanisation. The comments below are based on the urban transport section of the Twelfth Plan Urbanisation chapter.

8.2 Pattern of Urban Transport in India

Urban transport in India consists of a multitude of modes including non-motorised transport (walking and bicycling), intermediate public transport (auto rickshaws, taxis, tempos, etc.), buses including those plying on BRT systems, company buses, private motorised modes (cars and two wheelers), suburban rail-based services and metros. The distribution of travel among these modes varies significantly across cities.

At present, there is inadequate understanding of or data on the patterns of use between these various transport modes. International experience suggests that multiple policy options need to be used simultaneously to increase mobility and reduce effectively the different externalities arising from urban road transportation. This is because most policy options are not mutually exclusive. In its present form the Twelfth Plan draft chapter provides little guidance on urban transport policy except for a number of recommendations made for the implementation of metro- and rail-based transport.

8.3 The Need for a Comprehensive Approach

Thus urban transport strategy for the Twelfth Plan period and beyond should be based on a comprehensive approach. Such an approach should consist of:

- Considerations of accessibility of transport for all users in terms of cost, convenience and quality.
- Minimisation of urban transport costs and expenditures for both the state and users, while improving the quality of access of urban transport services.
- Empowering urban local governments to make decisions on urban transport in their respective cities.
- Minimisation of full life-cycle costs in the choice between different urban transport systems and modes.
- Emphasis on improved safety and environmental emisions standards and designs in the operation of urban transport modes and systems.
- Enhancement of technical capacity at all levels: central, state, and local.
- Full consideration of all public transport modes, including buses, taxi systems, shared vehicles, para transit modes, BRT, and rail based systems and metros. All modes need to be made more efficient. The use of public transport should take account of all the various intermediate transport modes.
- Use of a fiscal regime at central, state and local levels to influence mode choice in accordance with the desired shares.

8.4 Emphasis on Public Transport

The chapter observes that public transport accounts for only 22 percent of urban transport in India (source not mentioned; hence needs to be verified). The key objective stated is to raise the share of public transport to 60 percent of all motorised trips from this current level of 22 percent by the end of the Twelfth Plan. This is a welcome objective, but it must be based on more sound data. It seems that the estimates for public transport (P/T) use and walking and bicycling (W/B) are significantly underestimated.[1] Because of prevailing low income levels, the use of W/B and P/T in India is much higher than in higher income countries. Thus the approach to fostering public transport must be better informed, and policies need to be designed to make public transport more efficient, accessible and convenient, so that the drift to private motorised modes is arrested.

[1] The recently released Census data shows car ownership as ~ 15-20 percent of households in high income cities, but generally less than 10 percent; two wheeler ownership at around 20-30 percent. Since the car or two wheeler is generally used by one or two members of the household, others have to use other modes on a regular basis. Thus it is unlikely that more than 20-30 percent of trips are by private motorised modes. Most surveys show that 30 to 40 percent of trips are by W/B. Thus 30 to 50 percent of all trips could be by P/T, P/T being defined as buses, tempos, mini buses, company buses and all forms of intermediate transport modes. Thus, of motorised trips P/T could account for 50-70 percent of those trips.

8.5 Institutional Strengthening

The Twelfth Plan draft chapter proposes a number of institutional reforms to accomplish the objective of promoting better public transport. It is suggested that policy making capacity at the Central Government level can be strengthened through:

- Comprehensive legislation to deliver a carefully articulated mandate over urban transport,
- Constitutional amendments to put urban transport on the concurrent list,
- Establishment of a new Department of Urban Transport in the Ministry of Urban Development at both the Centre and in States,
- Formation of a National Urban Rail Transit Corporation,
- Creation of unified metropolitan transport authorities.

There is no doubt that the institutional framework for policy and plan formulation, as also for the design of and implementation of projects, needs to be strengthened. At present multiple agencies are performing these tasks with no clear cut division of responsibilities amongst them. As these proposals stand, however, there is excessive emphasis on shifting urban transport responsibility to the central government. Instead there should be much greater emphasis on the empowerment of city governments and city level planning and implementation agencies for planning, coordination and implementation of transport services and projects. The State Governments should be responsible for

laying down policies, administering laws, rules and regulations, organizing enforcement of laws and standards and allotment of funds to cities on a pre-determined basis. It should assist the cities with guidelines and manuals to plan and provide good urban transport.

The existing Unified Metropolitan Transport Authorities (UMTAs) function more like bureaucratic committee type coordinating mechanisms. Large cities do need the establishment of UMTAs but they need to be structured as relatively autonomous unified planning and implementation authorities with their own powers, budgets, and expertise.
The Central Government should develop national policies to guide state and city level governments and agencies on best practices.

8.6 Emphasis on Mass Rapid Transit (MRT)

Whereas the investment proposed in mass rapid transit in the Twelfth Plan draft chapter amounts to about 18 percent of total estimated investments in the urban transport sector, there is perhaps excessive emphasis on the provision of metros and other rail based transit in large cities in the chapter. As observed in the chapter metro and rail based transit options constitute the most capital intensive segment of the urban transport options. In fact, in most countries the introduction of metro systems took place at much higher levels of per capita incomes than is the case at present in India. Even the richest cities in the world are cautious in committing to MRT in case they are not able to achieve the expected ridership, and find it difficult to get adequate funds for operation and maintenance at the required quality levels. Further, some studies find that under- or over- ground systems running on electric power are not necessarily beneficial in terms of lifetime costs of energy and emissions. Thus, decisions to make large investments in metro systems should be taken with great caution and extremely selectively.

A good beginning has been made in the chapter to provide some criteria for the selection of cities where investments may be contemplated in metro systems. Estimates of minimum populations needed to sustain a metro system are perhaps too low at 2 million. A city should have a population of at least at 5 million people, if not 10 million, to warrant a metro system given the current state of India's development, income and urbanisation level. There are few cities even in developed countries that are able to afford metro systems at such population levels of 2 million. This is particularly important in view of the severe resource constraints being faced by the country at the present time and in the foreseeable future. In general, all urban transport costs, including that of metros should be met by the cities themselves, through a combination of user charges and fiscal imposts. This could itself form a good guiding prin-

ciple for the selection of cities where metro systems are to be initiated. Where subsidies are needed they should be cross-subsidised within the city. (The central budgetary requirements for these projects are placed at Rs. 75,000 crore for the Twelfth Plan, which is much in excess of Rs 55,000 crore that is provided for mass transit in another table in the same chapter.)

8.7 National Urban Rail Transit Corporation (NURTC)

The Twelfth Plan draft chapter proposes the establishment of an NURTC to:

- Provide advisory services to the Centre for rail-based urban transport
- Draw specifications and standards for rail-based transport systems
- Develop alternative financial models for funding rail-based projects
- Develop capacity to roll out rail-based urban transport projects on a PPP basis
- Promote research and innovation in rail-based urban transport system

Further it is proposed to set up a research centre for rail-based urban mass transport systems.

As may be seen from these objectives, this entity should ideally be structured as an institute rather than a corporation since its functions are mainly advisory and research. Second, it is much more advisable if such an institute is set up for all aspects of urban transport, within which there could a centre for issues related to rail-based urban transport. Given the size of the urban transport problem and the increasing size of urban populations in different cities, the traffic carried by metro and other rail based systems will be a small proportion of total urban transport activity. It is therefore of the utmost importance that expertise is developed at both the centre and at state level to look at transport issues in a comprehensive fashion. Otherwise there is great danger of skewing urban transport attention to the development of the most capital intensive option for urban transport. The proposal should be to set up such an institute at the central level, and others at the state or city levels. One apex institute with no competition ensures academic and intellectual complacency and possible decay. Research centres should be set up in at least 20 academic institutions across the country for each area of activity.

8.8 Buses and Bus Rapid Transit

Despite the fact that buses carry the large majority of public transport users in Indian cities, there is scant mention of buses and BRT systems in the Twelfth Plan draft chapter, either in terms of policies or in terms of resources required. Apart from the provision of metro and rail based urban transport in just a few cities over the next 20 years, the bulk of urban public transport would be based on reserved lanes for buses (segregated, as in BRT corridors, or non segregated) and other bus operations. The investment costs related to bus transport are a small fraction of those for rail based systems. Furthermore, BRT corridors in different parts of the world in both developed and developing countries have demonstrated the possibility of carrying traffic in volumes that approach metro based systems. The Twelfth Plan should therefore give much greater importance to this mode. It should propose a much closer examination of urban transport options in the interest of making more cost effective and efficient choices for urban transport in our cities. Much more attention should be given to development of technology-based optimisation of city wide bus operations with concepts of bus platooning, hybrid buses, origin-destination routes, etc. operated by professional public transit companies with top notch internal expertise. There is not even one such operator in India today.

8.9 Demand Management

With rising incomes there has been an explosion of private ownership of motorised two wheelers and cars over the last 20 years. It must be recognised that this trend of high growth in ownership of private motorised transport modes will continue in the foreseeable future. It is therefore of the utmost importance that the Twelfth Plan emphasises the adoption of demand management policies in cities which would include higher taxes on all private motorised transport modes (not just on luxury cars), much higher parking charges, especially in central cities and other business centres, charging for all parking in all public spaces etc. The objective of increasing the share of public transport in the Twelfth Plan period cannot be achieved without very significant demand management practices of the kind indicated.

8.10 Non Motorised Transport

As already noted, a very large proportion of all trips are made by walking or by bicycle in all our cities including the larger ones. Most of this is done out of necessity despite the inadequacy of facilities that allow safe walking and bicycling. Thus, unlike in cities in developed countries, there is little need to encourage non-motorised transport in our cities. However, in order to ensure that walking and cycling do not decline from their current mode shares it is essential to provide roads and other facilities that are designed to not impede the use of these modes.

The Twelfth Plan draft chapter is proposing the allocation of significant funds for urban roads. Hence this is an opportune time to initiate a programme for designing and enforcing policies and standards that make it mandatory to provide pedestrian footpaths and cycle tracks in all areas of all cities. This will need earmarked funding along with the enforcement of design standards, possibly through the Jawaharlal Nehru National Urban Renewal Mission (JNNURM). Targets have to be set and laws enacted, as many countries are already doing for the provision of these facilities. For example, no renovation of arterial roads or new road projects should be approved without ensuring that universal design guidelines (including facilities for the disabled) have been followed for accompanying pedestrian paths and bicycle lanes. For existing urban roads, targets can be laid down for the renovation, according to these guidelines, of, say, 5-7 percent all urban roads every year.

Some urban arterial roads carry heavy traffic. To ease the congestion on these roads and improve mobility, bypasses are being planned for NHs under the NHDP to cater to long haul traffic. It would be advisable that the planning for such bypasses is the product of coordination between the implementing agencies of the central Ministry of Roads and Ministry of Urban Development, state governments and the local city authorities. This would ensure long term functioning of the bypass and healthy development of the urban areas.

8.11 Capacity Building for Decision Making

As urbanisation proceeds and the challenges posed by the changing needs and patterns of urban transport emerge, much more emphasis will need to be laid on the development of technical and decision making capacities at all levels. The draft chapter has done well to emphasise investment in capacity building for urban transport but the thrust of the proposal is on the building of central-level capacities and is skewed towards metro and rail based transit.

In view of the complexity of choices made by users in different cities and differing income levels, capacity building needs to be much more widespread at the state and city levels. The role of the Centre should mainly be of an advisory and technical nature and as a possible source of funds which can be accessed by states and cities under certain prescribed criteria. In this context, the draft Twelfth Plan chapter errs on the side of excessive centralisation in both decision making and funding. Given that we already have more than 50 cities with populations in excess of one million, which will number at least 70 by 2020, the provision of urban transport and its financing and management will become increasingly complex. Thus it will be difficult to take such decisions at the central level and much of the decision making will have to be done at the city or local authority level. The Twelfth Plan should aim to provide resources for the development of such technical capacities and institutions at the city level, possibly under the JNNURM.

8.12 Capacity Building for Implementation

If all the above proposals are to be carried out it will be of the utmost importance to upgrade all our delivery agencies concerned with urban transport, including the PWD on the one hand and traffic managers like the police on the other. Engineers need to be educated on modern concepts in road design in urban areas for traffic calming, narrower roads, less wide but more arteries and details of new technologies.

Police officials need to develop professional cadres for traffic control, etc. Responsibility for planning of facilities should be taken away from these organisations. PWD should only be responsible for construction and maintenance, and not for deciding the kinds of roads built. Police should be responsible for law enforcement according to the rules laid down and trained in modern enforcement techniques. They should not be planning traffic movement, traffic signal operations etc. Planning and design responsibilities should be with the professional transportation planning organisation of the city.

8.13 Capacity Building in Educational Institutions

The agenda for capacity building at the central, state and city levels cannot be fulfilled unless there is widespread introduction of courses and programmes on urban management, transport planning, transport engineering, information technology for urban transport, etc. in a host of technical and management institutions. Similarly there is need for much greater fund allocation for research and development activities in technical institutions like the IITs and regional engineering colleges. Massive expansion has taken place in the infor-

mation technology industry in India over the last two decades and it has been possible to produce the large numbers of technical graduates demanded by the industry. Thus the Twelfth Plan should make specific provision for the development of Masters type programmes, and other courses on urban transport in at least 25 institutions in the country.

PROMOTION OF INTEGRATED TRANSPORT AND LOGISTICS SYSTEMS

IX

9.1 Integrated Transport System

The transport of freight is currently not only constrained by the well highlighted lack of infrastructure but perhaps even more so by the misuse of different transport modes for inappropriate types of commodity. Various studies have established that the existing modal mix is far from optimal. The optimal movement of freight by matching a cargo category with transportation mode will be crucial in a scenario of expanding volumes across categories. There is a need to set up an institutional mechanism to study trends in traffic flows and costs and to suggest policies to govern the provision of transport capacity and costs of various modes of transport. The Committee intends to make recommendations on this issue in its final report.

9.2 Containerisation

For promoting an integrated transport system, containerisation of cargo plays an important role. Containerisation in India has made rapid progress but is still far behind levels observed in developed and more advanced developing countries. It is estimated that in future, container traffic will rise with rapid economic growth and increasing trade intensity. The roll out of NHDP and rail DFCs will also accelerate this process. The Twelfth Plan should put in place policies and programmes to promote a smoother transition to containerisation.

In the past Container Freight Stations (CFS) and Inland Container Depots (ICDs), which are referred to as dry ports, have been developed for the provision of logistics services for EXIM cargo and warehouses have been developed for domestic cargo. Keeping in view the huge growth of container traffic envisaged for India, it is important to increase the number of dry ports (CFS and ICDs). Also, many of the existing ICDs/ CFS are relatively small and hence there is a need to set up larger dry ports in order to improve efficiencies and reap the benefits of economies of scale. These should feature more advanced technologies and handling equipment to attend to the increasing traffic.

9.3 Warehousing Capacity

The efficiency of logistics operations is also conditioned on the provision of adequate warehousing capacity, and of logistic parks which are essential links in the logistics chain. The demand for efficient warehousing management services has been boosted by the growth in domestic manufacturing and retail segments. However, there is under investment in warehousing with current spending on organized warehousing in India forming only 9 per cent of total logistics spending compared with about 25 per cent in the US. Existing small godowns will need to be replaced by larger, modern warehouses incorporating global standards. By significantly reorganizing the warehousing space in India, with large hubs being developed in key locations, coupled with smaller spoke warehouses nearer to production and consumption center, costs to customers can be reduced through economies of scale and multiple modes of transportation can be optimally used.

9.4 Logistics Parks

There is also a need to create multimodal logistics parks to reduce the cost of interfacing and costs of intermodal transfer and overall production. Logistics parks are network hubs, critical for efficient multi-modal transport as they allow transshipment between modes and consolidation of freight. Designed through appropriate model concession agreements, these logistics parks should be equipped with the necessary infrastructure to ensure seamless movement of freight across modes. Such a program would include identifying and finalizing the number of logistics parks and their locations; earmarking land for logistics parks at about 15 to 20 key interchange points around major key urban and industrial centres, ideally on the proposed rail Dedicated Freight Corridor (DFC) routes; and providing infrastructure such as power, utilities, road/DFC linkages and rail sidings.

9.5 Air Cargo Complexes

The advent of inter-modalism has also brought to the fore the necessity of developing air cargo complexes or air cargo villages to cater to the growth in air freight traffic. These air cargo villages entail establishing an integrated cargo infrastructure comprising airline terminals, forwarders bonded terminals, and specialty centres for special cargoes (such as perishables, valuable cargo, pharmaceuticals, restricted articles, etc.), along with rationalized, streamlined, and simplified procedures, documentation, and charges.

HUMAN RESOURCE DEVELOPMENT FOR THE TRANSPORTATION SECTOR

X

10.1 Introduction

There is an urgent need to devise institutions and mechanisms for creating knowledge and generating the human capital necessary to deliver on the safe, efficient, and extensive transport systems identified above. The required transformations to our transport infrastructure will be the result of better science, engineering, finance, and project management. It is imperative that India invests now in educating and developing a new cadre of transport professionals who are well-versed in these critical fields. There is a similar need to invest in research and development related to all aspects of transport. The nature of the transport problem is such that such research must be of an interdisciplinary variety.

At present knowledge gaps exist in all areas of transport activity, ranging from understanding of actual travel patterns, efficiency and performance of different technologies and modes in use, life cycle costs of different modes, management systems needed for large transport networks that are undergoing rapid transformation, the requirements for multimodal transport planning, and the like. Expertise in such areas needs a great deal of interdisciplinary work and collaboration between knowledge producers and practitioners at all levels.

In the past, transport policies have focussed mainly on increasing capacity and speeds. Over the next few decades, these 'quantitative' improvements to transport networks will be made in the context of more 'qualitative' considerations such as safety, emissions targets, energy efficiency, climate change impact, and social equity. These multi-dimensional goals for India's transport network cannot be achieved without improving the skills and knowledge of both transport decision-makers and the workforce.

The Twelfth Plan must initiate urgent action in this area so that by the end of the Thirteenth Plan India has credible institutions and expertise that can deal with the emerging problems of transportation in an organised scientific manner.

10.2 Specialisation and Collaboration

The successful achievement of multi-dimensional goals is contingent on institutions and mechanisms that foster interdisciplinary collaboration between scientists, engineers, planners, promoters, designers, and maintenance staff. The effectiveness of this collaboration will in turn depend on specialised skills and expertise that each class of transport professional must develop and maintain. For example, professionals with responsibility for planning transport networks must be fully aware of traffic flows/ and costs patterns and requirements, of the cost effectiveness and efficiencies of different modes, and of the suitability of different technologies to the Indian socio-economic environment. However, these planning considerations will obviously rest on the more specialised knowledge available to academics and engineers amongst others. Successful collaborative effort will also ensure that staff at all levels and across all fields of endeavour will remain mindful of the over-arching themes of India's future transport network. As noted above, this is a network that is equitable, cost-effective, safe, and easy to navigate, and energy efficient as it serves its role as the backbone of the economy.

Decision-makers, transportation officials, and staff face increasingly complex issues when addressing transportation needs. Examples of the different kinds of expertise that are related to fulfil various functions include:

- Air quality assessment and health impacts: natural and physical sciences, medical sciences, mathematical modeling, instrumentation
- Freight and human movement: All engineering sciences, mathematical modelling
- Safety: engineering and medical sciences, epidemiology, statistical modelling, psychology and sociology
- Operations: Management, operations research, survey techniques, sociology and psychology

Hence the need for interdisciplinary work in transportation.

Expertise needs to be developed specifically in all these areas with special reference to different modes of transport. At present none of the agencies involved – educational institutions, research laboratories, operators, government agencies, NGOs – have adequate interdisciplinary expertise or the required number of personnel to service these needs. International data on

research output related to disciplines such as road safety, railways, emissions civil engineering, air transport, marine transport and transport planning show that India is far behind its peers such as China and Brazil. In most of these fields Indian research papers in refereed journals amount to less than 10 to 30 percent of those produced in China in the last 5 years.

Thus the gaps are large and corrective measures need to be taken on an urgent basis.

10.3 Skill Development

The upskilling of India's transport workforce will require a multi-faceted and a multi-layered approach. At the highest level, India's poor research output on transport economics and engineering must be addressed. This has a direct impact on our ability to design technologies and tools for monitoring air and environmental quality, more efficient freight and passenger movement, and ensuring safety amongst others. Equally, value for money is likely to be compromised with the use of sub-par technologies for asset management, cost estimation and financial planning.

However, an increase in research output alone is unlikely to yield the kind of systemic changes required for ensuring the more evidence- and knowledge-based policy environment necessary to engineer sustainable transport. Academic research must be tempered by the practical constraints of India's unique issues and concerns. The development of indigenous capability will also enable the country to choose and absorb foreign technology, processes and practices more efficiently.

Quality resources will need to be created for integrating hard and soft sciences research. The effort should be geared towards new forms of knowledge generation where technology improvements are the product of continuous negotiation between disciplines on one hand and between science and society on the other.

10.4 Institutional Set-up

Functioning transport systems in any location involve a complex set of interactions between individuals, firms, service providers, technologies, the built environment, and the existing institutional context. As with other complex structures, we tend to deal with transportation systems with little knowledge about these interactions and their myriad feedback loops. Better understanding of these feedback loops would help in better technology choices, development of appropriate physical and management structures and easier periodic

course corrections.

The above process can only be ensured if all stakeholders generate knowledge. This will ensure cross-checks of information and encourage competition among knowledge providers. It is not possible to provide organizational, investment and timeline details at present. However, an attempt is made to provide the direction in which we may proceed.

10.5 Stand Alone National Institutions

Indian Institute for Transport Research (IITR): The Twelfth Plan should make provision for establishing a national level institute responsible for research on all aspects of transport and logistics. It will be expected to play a leading role in national transport policy and technology development. The IITR should also be able to sponsor research in other organizations. At maturity, the IITR should have about 300-500 professionals at the post-graduate level.

Indian Institute for Transportation Statistics (IITS): The Twelfth Plan should also make provision for the establishment of a national level institute that will be responsible for maintaining data generated by all organizations associated with transportation. It should also be equipped for conducting its own national travel and transportation surveys on a periodic basis. It would be responsible for synchronizing this with other demographic and socio-economic data for the country available in the country. At maturity, the IITS could have a staff of about 100 post-graduate professionals.

It is necessary that both IITR and IITS work closely as the input of IITS would be vital for the work of IITR.

10.6 National Institutions Attached to Ministries

Multidisciplinary Research Organisations: The Twelfth Plan should make provision for establishing a multidisciplinary research organisation for applied research on current and future technology developments for each ministry associated with transport (air, water, road and railways). These organizations would be much larger and more ambitious than those present today and would serve as the channel for communication between the ministry and academic institutions of interest. At maturity, these research institutes should have annual budgets of about 1 percent of the turnover of the sector with appropriate professional staffing and modern laboratory facilities.

10.7 State and City Level Institutions

State Level: The Twelfth Plan, in consultation with the states, should initiate a programme to provide for each state transport ministry, the resources necessary to establish a transport research department. The responsibility of the department would be to generate state-level detailed plans, to collect and disseminate the data needed to bring such plans to fruition, to evaluate projects and policies, liaise with the Central Government, and fund research projects at state level institutions and universities.

City Level: The need for making provision of resources for the development of technical capacities and the institutions at the city level has been stressed in the section relating to urban transport. The Twelfth Plan should also make provision in the JNNURM to induce all megacities (population >5 million) to establish transportation planning research departments that could have responsibilities similar to state level units. Further, operating companies at the city level—such as DTC, BEST and others—should have analytical units at the institutional level to study service delivery and performance, and recommend improvements.

10.8 Academic Research Centres

The Twelfth Plan should initiate central and state government programmes to establish around 50 interdisciplinary Centres of Excellence for transport research in existing academic institutions by 2020. These Centres must be of an interdisciplinary nature and should be given establishment funds, endowment funds and Chairs. It should also be possible for one institution to have more than one Centre covering different aspects of transportation.

10.9 Summary

Transport planning and policy implementation has already become a very complex and contentious activity. This is partly because many infrastructure projects are capital intensive and invite the narrow interest of lobbyists and technology providers, and partly because solutions to many issues are not very clear. In an age of instant information transfer, decisions can be based on prevailing fashions that may not necessarily suit our current or future socio-economic environments. The fact that future energy availability and environmental impact is highly uncertain makes the task even more difficult.

In this scenario it is very important the country has a large number of professionals who are aware of all international developments in policy and technology and also have an in-depth knowledge of local conditions and require-

ments. The existence of these professionals will ensure competitive balance and growth and also throw up a few outstanding individuals of international standing in each area of activity.

SAFETY POLICY

XI

11.1 Introduction

Transport safety in India has been somewhat neglected in the past and the time is now opportune for the Twelfth Plan to initiate action to set up a credible institutional framework to address transport safety issues at central, state and city levels. This was would constitute an important departure for the planning process since this issue has so far not been addressed in the country in an organised manner. The NTDPC attaches great importance to the improvement of safety in all modes of transport.

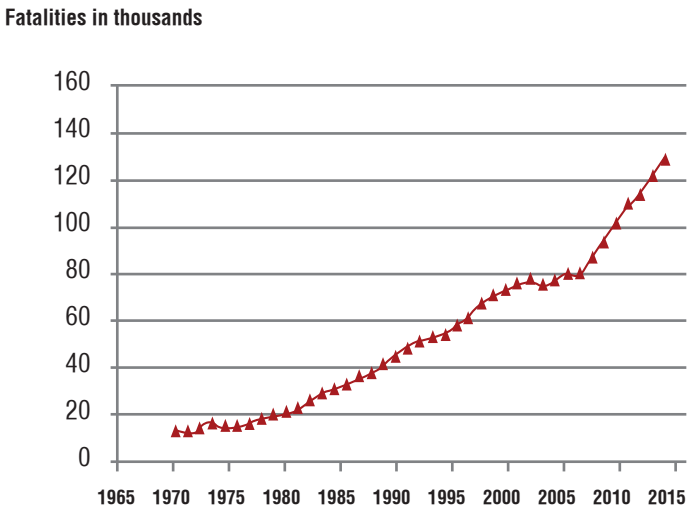
The seriousness of the situation is illustrated in Table 11.1 and Figure 11.1. Unless policies and evidence based countermeasures are put in place urgently the situation is likely to worsen. So far there has not been any coordinated policy response to traffic safety in the country. As Table 1 shows, the number of fatalities associated with various modes of transport in India in 2009 and 2010 and Figure 1 the road accident fatalities over the years.

Table 11.1 Transport Related Fatalities in India 2009-2010

Transport Mode	Fatalities in 2009	Fatalities in 2010
Air-Crash	23	12
Boat Capsize	984	760
Road Accidents	126,896	133,938
Rail-Road Accidents	1,516	3,347
Other Railway Accidents	24,277	24,451

Source: National Crime Record Bureau

Figure 1 Road traffic fatalities in India 1970-2010 (Source: National Crime Record Bureau).



Except for air-crash statistics, it is possible that the data on fatalities in other modes of transport are underestimates. For example, the statistics maintained by Indian Railways include only those cases which are considered 'consequential', which means that in those cases where the victim is considered to be at fault (e.g. by falling off an overcrowded carriage) it is not considered a railway accident. This is why 24,451 fatalities in 2010 are recorded separately as 'other railway accidents'. Altogether more than 162,000 persons died in transportation related accidents in 2010, or about 445 a day. International experience suggests that for each transportation death one can expect about 3-5 permanent disabilities and 15-20 hospitalisations. This would mean that at least 1,500 persons are disabled and 7,000 hospitalised every day in the country. It is estimated that the cost of road traffic crashes alone may be about 2 percent of the GDP. Road traffic crashes increased at a rate of about 8 percent per year in the past decade and show no sign of slowing down.

11.2 Systems Approach to Safety

There is little expertise, data, or information available in India to address the transport safety problem in a scientific manner. The international professional consensus is that it is not very productive to focus on human error alone. Since each accident is the result of a combination of human, vehicular and environmental factors, a sophisticated systems approach is a must in addressing transport safety issues. This approach is, for example, reflected in the 1997 Swedish Road Safety Bill: "*...the entire transport system must be designed to accommodate the individual who has the worst protection and the lowest tolerance of violence. No event must be allowed to generate a level of violence that is so high that it represents an unacceptable loss of health for that vulnerable indi-*

vidual" and, "*The responsibility for every death or loss of health in the road transport system rests with the person responsible for the design of that system*." This approach has not been internalised yet by any official organisation or institution dealing with safety in India. The predominant approach is still based on the outmoded principles of finding fault with an individual and then acting accordingly.

Business as usual will not work anymore. Transportation safety management has seen a shift from action based on experience, intuition, judgement, and tradition, to action based on scientific research and empirical evidence. Similarly, there is another shift from a consideration of road safety that is tacit and qualitative to views that are explicit and quantitative. Therefore, expanding the existing system without changing it might not be the best use of scarce resources. It is important to set up structures and processes that outlast individuals and ensure regular review and renewal of strategies. This will require:

- An institutional structure that creates a demand for scientific work in safety issues.
- Legislation and regulation (formulation and enforcement of laws and regulatory requirements)
- Monitoring and measurement (national databases of relevant information to monitor and assess various aspects of safety policies, technologies and knowledge needs.
- Assuring and improving the quality of safety services provided through professionals, individual institutions and with the use of specific technologies and devices.

11.3 The Way Forward

Since public safety is a quintessential public good it is the responsibility of the public sector to create the long-term stable demand for safety fostering work. Demand for better knowledge and technologies in the transport sector can only be provided by public bodies such as central and state governments, and local bodies like municipalities and transit authorities. Accordingly, institutes for road, railway, water and air transport safety need to be set up to (a) ensure that safety professionals in the country are abreast of international knowledge and findings, (b) collect data on the size and severity of safety-related problems, (c) provide information that helps prioritize problems and measure progress in solving them (d) make assessments of best solutions to idiosyncratic transport safety problems and, (e) ensure that evidence of the effective-

ness of safety countermeasures is made an integral part of decision-making at all stages, rather than just a reaction to observed safety failures or political demands. If professional jobs become available with progressive, secure career paths in safety research and operations, talented individuals would gravitate to the field. This in turn would encourage educational and training institutions to provide the programmes necessary for such employment.

It is important that action on establishing credible institutions related to safety is not delayed any further, as international evidence suggests that no country has been able to deal with the problem of safety without very strong professional institutional mechanisms. The Twelfth Plan should therefore initiate a programme to announce safety policies with measurable indicators for evaluation in each sector for a five year and ten year period before the end of 2013.

11.4 The National Level

National Boards: Action should be initiated to establish National Boards for Road, Railway, Water/Marine and Air Safety. These Boards must be (a) independent of the respective operational agencies to avoid conflict of interest, (b) the CEO of the Boards should be of a rank of Secretary to the Government of India and report directly to the Minister of the concerned ministry, (c) The Boards should be staffed by professionals who have the opportunity to rise to the highest ranks equivalent to CSIR/IIT etc professionals, (d) the Boards should have an adequate funding based on the turnover of that sector, and (e) the terms of reference can incorporate the recommendations in the reports submitted by the Sundar Committee on roads and the Kakodkar Committee on Railways.

The National Board on Water Transport safety could be headquartered at one of the major port cities with a branch in the Northeast.

Safety Departments need to be set up within operating agencies (at different levels) for ensuring day to day compliance with safety standards, studying effectiveness of existing policies and standards, conducting safety audits, collecting relevant data, etc. These agencies could be NHAI, the Civil Aviation Ministry, Airports Authority, Railway Board, etc. These departments must employ 50-60 percent professionals with expertise in the relevant area of safety, and 40-50 percent of staff could be on deputation from the field.

Data Collection: Action needs to be taken to reform data collection and analytical procedures for traffic accidents in consonance with international practices at different levels. This includes the creation of a national database of

transport-related accidents, detailed survey systems for fatal cases, sampling systems for medical data etc.

Safety Research Institutions: The Twelfth Plan should make provision for the funding and establishment of multidisciplinary safety research centres at academic institutions. The number could vary from about 10-15 for road safety, 5-10 for railways and 4-6 for water and air.

11.5 State and City Level

The Twelfth Plan should initiate consultations with state governments to set up similar institutions at the state level. Such a programme would require technical and initial funding assistance from the Centre. The following actions should be considered:

- Each Sate must establish a Road Safety Board on the lines suggested by the Sundar Committee.

- Those states dealing with significant amount of water transport must set up State Water Transport Safety Boards.

- Safety Departments can also be set up at the state level within operating agencies for ensuring day to day compliance with safety standards, studying effectiveness of existing policies and standards, conducting safety audits, collecting relevant data, etc. These agencies could be state PWDs, Railway Regional headquarters, port trusts, large urban transit agencies, and municipalities of large cities. These departments must employ 50-60 percent professionals with expertise in the relevant area of safety, and 40-50 percent of the staff could be on deputation form the field. There must be clear identification of responsibilities between central and state safety departments, and between these and the safety boards.

TRANSPORTATION IN THE NORTH EAST

XII

12.1 Introduction

The NTDPC constituted a special Working Group to address issues related to the improvement and development of transport infrastructure in the North East. The Committee decided to give special attention to this region since transport infrastructure is vital to strengthen integration within the region, to its integration with the rest of the country, and also for India's increased integration with the East in the future. At present, India's international transport linkages with the East are highly underdeveloped, as are its linkages with Bangladesh. With the change in political climate in Myanmar and intensification of discussions with Bangladesh, the Committee felt that this is an opportune time to take a strategic long term view on intensifying international transport linkages from the north east region. For such international linkages to be productive there has to be even better transport integration of the region internally, and with the rest of India. The NTDPC's final report will have detailed recommendations emerging from such an approach.

12.2 Multi-modal Transport Planning

The North East region has a number of characteristics that make it imperative for more organised inter-sectoral planning to be done for transportation in the region: it is remote from the rest of India; several areas feature difficult hilly terrain; it also has many rivers, which can permit significant inland water transport options, but also contribute to difficulties in engineering transport infrastructure; it has a long border with neighbouring countries which increases the importance of transport infrastructure from a strategic and security viewpoint; and it consists of 8 states, each of which have their own requirements and priorities. Thus the Twelfth Five Year Plan must initiate action to undertake region-wide transport planning for the four transport sectors – roads, civil aviation, rail, and inland waterways – in an integrated framework. Therefore, a body to undertake regional transport planning, with adequate technical expertise, needs to be conceptualised.

12.3 Development of Railways in NER

The Railway infrastructure in the North East Region needs to be strengthened and expanded so that the aspirations of the people in the area can be met in a significant manner. A decision has already been taken to connect all the state capitals in the North East with the rest of the country. The state capitals of Assam and Tripura are already connected. New lines for connecting state capitals of Arunachal Pradesh, Manipur, Nagaland, Mizoram and Meghalaya have been sanctioned and work is in progress. In the 12th Five Year Plan, the work on these railway lines may be expedited so that all state capitals in the North East Region are on the rail map by 2020.

12.4 Development of Roads in the North East Region

The need to develop the road network in the North East Region has been well recognized. A number of programmes have been launched for the development of National Highways, State Highways and other roads in the North East Region. As a result of these programmes investments have been increasing. As a matter of fact, the implementing agencies are unable to spend the allocated amount and complete the projects in time.

Hence there is a great need for capacity augmentation and institutional strengthening in the areas related to evolving of projects, preparation of project reports, implementation, monitoring and management of projects in the North East region as a whole.

12.5 Air Connectivity in the NER

Air connectivity in the North Eastern States is hampered by difficult terrain, relatively low levels of economic development and poor connectivity. Considering the importance of the development of civil aviation to the development of the NER, a new policy centred around small aircraft is required to implement a hub-and-spoke model. With more frequent flights in and out of this geographically difficult region, there may be considerable reduction in the physical exclusion of the Northeast Region. The development of existing airports and operationalization of non-operational airports would not only make air links feasible between the state capitals but also with neighbouring countries. Multi-utility based air services which enable the movement of high value cargo can also be instrumental in improving the economic vitality of the region. However, in order to achieve the objective of uninterrupted and reliable air services and to prevent accidents, there is a need to develop state of art weather and navigation information systems and human resources together with the actual physical airport infrastructure. Guwahati Airport

should also be developed as a potential major gateway to South East Asia, both for passenger and freight traffic

12.6 Inland Water Transport in the NER

Historically, undivided Bengal and the North East Region were an integrated market prior to independence where riverine transport was used extensively for both passenger and freight transport. IWT has a natural fit with the bulk commodities that the North East Region imports and exports from the rest of India. Tea, oil, cement and coal are exported, while food grains, fertilizers and petroleum products are imported. All these items are non-perishable and transported in high volumes, making them suitable for transportation by IWT. In principle such transport is cheaper and more energy efficient than other modes, though slower.

Any serious development of IWT requires active and positive participation by Bangladesh. Thus IWT arrangements must be devised in such a manner that stakeholders in both India and Bangladesh benefit significantly. The Twelfth Plan should make a new departure in this area so that international considerations are taken aboard the planning process through an appropriate consultation framework. The Indo-Bangladesh Protocol on Inland Water Transit and Trade already exists. Efforts should be made to extend the validity of this protocol for at least 20 years. This would provide stability to the trading environment and hence enable appropriate investment planning in both the public and private sectors. It would also clear the way for the development of public private partnerships in the development, management and operation of inland water transport in the region.

If such a policy and planning framework is put in place investments can then be stimulated in areas such as:

- Ships, ferry services and transport enterprises;
- Modern material handling facilities on the Brahmaputra river at key nodes;
- Barges that can promote containerised traffic on the Brahmaputra and Barak rivers;
- Creation of multi-modal hub facilities at appropriate points such as Badarpur in Assam;
- Facilitation of cargo trans-shipment between seagoing ships and inland vessels for onward distribution;

- Small scale inland water transport for both passengers and cargo.

For such investments to become feasible they would have to pass the test of economic and financial viability. This will be facilitated by the clear announcement of public investment programmes in the Twelfth Plan related to the strengthening of the Inland Waterways Authority of India (IWAI) for undertaking the creation of waterways infrastructure, and a stable policy framework that results from international arrangements referred to above.

Composition and Terms of Reference of National Transport Development Policy Committee

Annex I

Composition:

Chairman:
Dr. Rakesh Mohan (in an Honorary capacity with the status of Minister of State).

Members:
1) Chairman, Railway Board
2) Secretary, Ministry of Urban Development
3) Secretary, Ministry of Road Transport & Highways
4) Secretary, Ministry of Civil Aviation
5) Secretary, Ministry of Shipping
6) Secretary, Department of Financial Services
7) Secretary, Ministry of Coal
8) Secretary, Ministry of Power
9) Secretary, Ministry of Petroleum & Natural Gas
10) Adviser to Deputy Chairman, Planning Commission
11) Chairman, RITES
12) Shri K.L. Thapar, Chairman, Asian Institute of Transport Development
13) Shri M. Ravindra, former Chairman, Railway Board
14) Shri S. Sundar, former Secretary, Transport & Shipping
15) Shri D.P. Gupta, former DG Roads
16) Prof. Dinesh Mohan, IIT Delhi
17) Shri Bharat Sheth, MD, Great Eastern Shipping
18) Dr. Rajiv B. Lall, MD, IDFC
19) Shri Mohandas Pai, Infosys
20) Shri Cyrus Guzder, Chairman, AFL Group

Member Secretary:
Shri B.N. Puri, Sr. Consultant (Transport), Planning Commission

Terms of Reference:

(i) To assess the transport requirements of the economy for the next two decades in the context of economic, demographic and tecnological trends at local, national and global levels.

(ii) To recommend a comprehensive and sustainable policy for meeting the transport requirements keeping in view the comparative resource cost advantages of various modes of transport i.e. road, rail, air, shipping and inland water transport with a special focus on the modes that have developed less than economically desirable and the need to:
   (a) encourage a rational mix of various modes of transport in order to minimize the overall resource cost to the economy,
   (b) ensure balance between the ability of transport to serve economic development and to conserve energy, protect the environment, promote safety, and sustain future quality of life,
   (c) ensure universal rural connectivity,
   (d) address the special problems of remote and difficult areas on the one hand and of urban and metropolitan areas on the other, and
   (e) adopt and evolve suitable technologies for cost effective creation, economical maintenance and efficient utilization of transport assets.

(iii) To assess the investment requirements of the transport sector and to identify the roles of state and private sector in meeting these investment needs and to suggest measures for greater commercial orientation of transport services. In this context the Committee should pay particular attention to reviewing the experience with the PPP approach or suggest ways of modifying it further.

(iv) To examine the laws, rules and regulations pertaining to various modes of transport and traffic and to suggest measures for strengthening their enforcement in the interest of the community and streamlining the procedures and processes in line with the needs of a fast growing modern economy.

(v) To identify areas where data base needs to be improved in order to formulate and implement policy measures recommended by the Committee.

(vi) To suggest measures to improve the capacity to evolve and implement projects.

(vii) To suggest measures for implementing various components of the recommended policy within a specified time frame.

(viii) To recommend any other measure which the Committee consider relevant to the items (i) and (vii) above.