

**AGENDA NOTE FOR THE 20TH MEETING OF THE
NATIONAL TRANSPORT DEVELOPMENT POLICY COMMITTEE (NTDPC)**

KEY RECOMMENDATIONS

The agenda of the 20th meeting of NTDPC is to discuss the key recommendations of the following chapters:

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1. ROADS

Policy and Planning

- ***Traffic Surveys and Data Centre***

Road development should not be seen in isolation but as part of an integrated modal system of transport. For decision support system, regional traffic and transport surveys be carried out every five years. Setting up of a dedicated road data centre managed through a high level institution would help in reducing the current ad-hoc decision making in the road development planning process.

- ***Capacity Augmentation***

Identify and carve out road development and maintenance programmes to meet the expected traffic demand and improve transport productivity and also to ensure that such programmes reduce in their wake the negative externalities of energy inefficiency, environment pollution and accident hazards.

- ***Rural Connectivity***

The Core Road Network master plans should be reviewed every five years to account for both agricultural and industrial growth in each district. The current programme of PMGSY needs to be expanded to achieve universal connectivity to all habitations on a time bound basis.

- ***Social Aspects***

Road design standards should account for finding ways and means of reducing the burden of land acquisition where it affects the communities.

- ***Road Classification***

Roads to be divided into three classes – primary, secondary and tertiary. State highways to be part of primary. Criteria and classification to rest with classification commission comprising planners, geographers, administrators and technocrats. Introduce systematic numbering of different classes of roads as per international practice. For each class of road and traffic groupings, the standards should be uniform both in design and translation on ground.

- ***Expressways***

A minimum threshold of 40,000 PCUs per day is recommended to consider provision of an expressway in consultation with the states. Some of the existing four-lane roads under the NHDP may be considered for converting them into access control facilities by providing service lanes all through for local and non-motorised traffic as an immediate step. User charge principle would be amply justified in provision of such facilities. Strategy of constructing 2000 to 3000 km initially through the government budget and borrowings, and thereafter handing over such stretches to the private sector for its O&M and leveraging the revenue earned to expand the network could be another promising option.

- ***Special Needs of NE Region***

It is necessary to formulate and implement a comprehensive master plan for the NE region covering all modes of transport including roads.

- ***Auto-Industry***

Bus design is in need of overhaul to improve boarding and riding comfort. Upgradation of technology in the auto industry, especially the commercial vehicle sector to meet the objectives of better comfort, productivity, energy efficiency, safety and emission standards in line with international practices and standards would be beneficial.

Road Development

- ***Strategies for Primary Roads (National Highways and State Highways)***

- (i) Expansion of the existing network of national highways and state highways. Stress should be laid on consolidation of this network in terms of capacity augmentation through multi-laning of existing highways and provision of access controlled expressway facilities.
 - (ii) For capacity augmentation of national highways, continue with NHDP, accelerate two laning, slow down six laning, plan and provide expressways based on economic justification. As an interim, service lanes on 4-lane/6-lane corridors
 - (iii) Develop SHs and MDRs on lines of NHDP
 - (iv) Financing of these roads should rely on user charge principle in the form of tolls as direct beneficiaries and continuing with the existing Central Road Fund through additional levies on petrol and diesel. The existing policy of PPP to continue. Enhance corpus of CRF through ad valorem tax on fuel. The existing policy of levy of toll on two lane roads needs to be done away with.
 - (v) The alignment for bypasses should be planned jointly by the road agency and the urban development agency. Further, these bypasses should be planned and provided as access controlled expressway type facilities with entry/exit at predetermined locations. For large size cities (population above one million), bypasses could also be provided in the form of peripheral expressways. The intersection points of bypasses with main highways may also serve as freight logistics parks on case to case basis.
 - (vi) Special needs of connectivity to ports, airports, mining areas and development of power plants should be factored in development of the road programmes. Special programmes of reconstruction of dilapidated bridges across NHs, SHs, MDRs and construction of missing bridges across mighty rivers should be implemented.
- ***Strategies for Secondary Roads (Major District Roads)***
 - (i) For these roads, the strategy should be on consolidation of the road network. Stress should be to accelerate the programme of widening of these roads to regular two lanes including bridges and provision of rail over/under bridges on heavy trafficked stretches. Priorities may be governed by the traffic – current and projected. Some limited stretches may require four-laning also in later years depending upon the traffic growth witnessed.
 - (ii) Attention would be required for strengthening of pavement of existing single lane and provision of hard shoulders to enable safe movement of vehicles and preventing such stretches from getting damaged beyond repair and rehabilitation. Programmes of improvement in riding quality with partial strengthening need to be planned and implemented.
 - (iii) Some isolated bridges on the MDR network which show signs of distress would also require reconstruction as standalone works.

(iv) Currently, the Central Government is providing some funds for these roads out of the CRF but it needs a quantum increase in order to make up for the continued neglect by the states.

- ***Strategies for Rural Roads (Other District Roads and Village Roads)***

- (i) Continue with PMGSY. Consolidate past achievements. Target universal connectivity and upgradation of roads connecting rural business hubs.

- (ii) Basically, these roads can stay as single lane roads in view of low volume of traffic likely to prevail. However, some roads under this category could witness traffic volumes that may justify widening to intermediate or two lane. Provision should be made accordingly.

- (iii) For financing of these roads, the current CRF accruals and RIDF window of NABARD may need to be augmented. The strategy of some states to raise funds through market committee fees on agricultural produce is commended for being emulated by other states as well. Some funds for earth work for example can be leveraged from MGNREGA schemes.

Maintenance and Asset Management

- It is advisable for the states to institute road network asset management systems so that there is scientific condition assessment and priorities for maintenance interventions are fixed on rational basis.
- Both the central and state governments should declare as a policy that the roads would receive dependable and adequate allocation of funds on a continuous basis. A system of working out the replacement value of the road assets at the end of each financial year should be established by every road agency for roads under its jurisdiction. The information relating to road asset value should be put on website in public domain.
- The government may also consider not to treat maintenance of roads as a non-plan activity so that it does not suffer ad-hoc cuts as is the current experience.
- Enforcement of performance standards by the government through a well laid down mechanism is essential and engineers responsible for execution of maintenance works made accountable.
- Structured questionnaire and analysis of response can bring out road user satisfaction index on various stretches of the primary road network.
- Technology for maintenance also needs a quantum jump particularly in respect of primary and secondary roads. Mobile maintenance units need to become a normal practice.
- The state transport authorities also need to support the road agencies in enforcing axle load limits of vehicles particularly trucks as overloading is seen to damage the roads prematurely.

- Annual allocations required for maintenance should be worked out by each road agency for the roads under its jurisdiction based on asset management principles and traffic and road condition observed on the system.

Capacity Building for Enhancing Delivery Efficiency

- ***Indian Roads Congress***

- (i) There is need to review design standards on a regular basis so that these are in line with international practices. The current system of formulating design codes and manuals needs an overhaul.
- (ii) The IRC needs to expand its mandate to cover a systematic assessment of road transport operations and their impact on the road network with a view to reviewing the existing standards and guidelines so that the roads serve the intended purpose.
- (iii) The IRC can draw lessons from international to further enhance its capacity.

- ***Road Design Institute***

- (i) There is compelling need for a dedicated road design institute for the road sector that should function under the umbrella of MORTH.

- ***Road Agencies***

- (i) The road agencies may consider self evaluation or undertake capacity analysis for effective delivery of road programme through domain management expert agencies to identify enhancement measures required to improve their capacity and performance.
- (ii) Staff at various levels should receive regular training in various aspects of the road projects. Each road agency should have its training plan and calendar for both short-term and long-term.
- (iii) There is a huge backlog of training at the cutting edge level of supervisors, junior engineers and assistant engineers for which special programmes need to be evolved and provided.
- (iv) The government also needs to support Indian Academy of Highway Engineers (IAHE), other training institutes at state level and academic institutions to improve their infrastructure for training of road agencies.
- (v) Study tours should also be undertaken both within the country and abroad for raising awareness among road agencies staff about good national/international practices in implementation of road projects.

- ***Consultants***

- (i) The government should also tighten the current performance evaluation system to bring in more accountability of the consultants.

- (ii) For complex projects, the current practice of third party review of consultants' design may continue but such a role should ideally be performed by the Road Design Institute referred to earlier.
- ***Contractors and Concessionaires***
 - (i) Promotion of the concept of equipment bank. Private entrepreneurs could venture into this arena.
- ***Financing for Capacity Building***
 - (i) A provision of one percent of the total road investments should be earmarked for capacity building of the stakeholders involved and technology innovations in the road sector.

Research, Development and Technology Initiatives

- (i) R&D vision and strategy needs to be developed for the next twenty years.
- (ii) Centres of Excellence should be created on different aspects of roads and road transport including safety in IITs, NITs, other engineering institutes and IIMs to accelerate the research activities.

Private Financing Initiatives

- (i) Undertake case studies of a few PPP projects on random sample basis to draw lessons for future projects.
- (ii) The government should stop the policy of undertaking projects through BOT (Annuity) Model. Where this mode of delivery is proposed, these should be a cap say 15 per cent of the annual budget to defray contingent liability year by year. Further, such projects should be subjected to rigorous value-for-money analysis and compared with public sector delivery option.
- (iii) Support of state governments would be needed for effective control on ribbon development along the high density corridors.

Road Transport

- (i) Amend Motor Vehicle Act (Sundar Committee)
- (ii) Achieve seamless movement of commercial vehicles across states. Creation of logistics parks, transport nagars
- (iii) Use of Intelligent Transport Systems
- (iv) Modernisation of the Inspection and Certification regime practiced by the State Transport Departments
- (v) Establish collection centres for end-of-life vehicles to retrieve scrappage material
- (vi) Public-private partnership in case of passenger transport services in rural areas needs to be explored.
- (vii) Stricter regime for control on overloading

Road Safety

- (i) Safety engineering measures should become an integral part of road design and construction.
- (ii) The wide-ranging recommendations of the Sundar Committee on road safety and traffic management should be implemented by the government on a priority basis to contain the accident situation which is going from bad to worse.

Governance

There is need for enhanced governance to improve quality of contract agreements and contract administration to achieve higher performance levels in delivery of road programmes and projects rather than a separate regulatory.

2. POTENTIAL OF INFORMATIONAL TECHNOLOGY TO ENHANCE TRANSPORT EFFICIENCY

Information and communication technologies (ICT) that can be used to improve the transportation system fall into three classes: (1) automation technologies (sensors and controllers) which can help in location of vehicles and control of gates at access points, etc.; (2) communication technologies (such as 3G) which can help in receiving and transmitting information to, and from vehicles; and (3) information technology (including software systems) which can be built on top of the underlying automation and communication systems to manage traffic, coordinate transportation systems, plan trips, move victims during accidents to nearby medical facilities, etc.

Based on these components and technologies, systems and services can be created to improve the operations of transportation systems and increase satisfaction of the users of transportation systems. Such systems and services fall into the following four broad categories:

1. Inter and intra-vehicle systems, which as the name suggests, are systems within the vehicles which help in improving safety and navigation.
2. Traffic management systems.
3. Transport co-ordination systems which help in multi-modal transport of passengers and freight.
4. Traveler or User Information Systems which provide users with real-time information about public transport or freight transport.

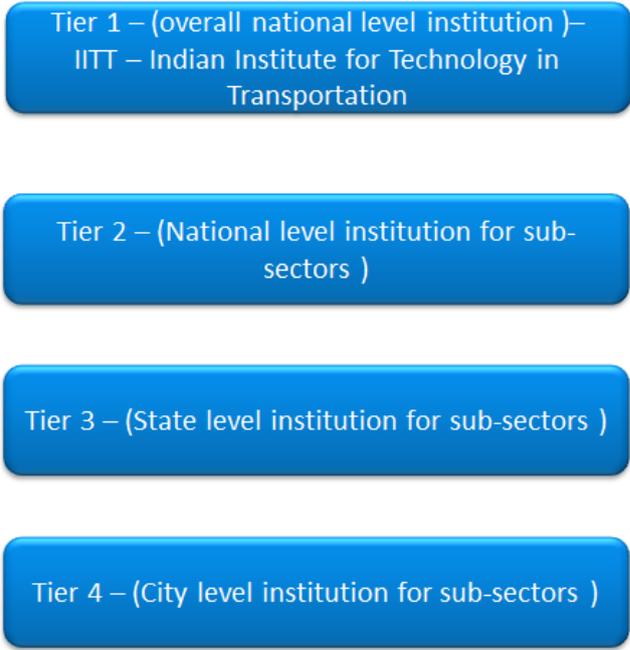
There are many measures and initiatives under these four categories that could be used to improve the transportation system. However they cannot all be implemented simultaneously. Therefore, we have divided the various ICT solutions or initiatives into three phases of implementation: solutions that need to be implemented in the short term (0-5 years); the medium term (5-10 years); and the long term (10-15 years). The solutions were included in the different phases by scoring them on four parameters:

1. cost of implementation;
2. time requirement for implementation of the solution;
3. potential benefit expected out of the solution; and
4. criticality of the initiative or solution to the development of the overall architecture for a sector or for the whole transportation system.

The solutions proposed for the short term have a heavy focus on building an efficient database for various functional areas across all sub-sectors. The other sets of solutions that are proposed for the short term are those focused on scheduling and planning, which will help in addressing some of the key capacity and efficiency issues across the sector. Solutions proposed for the medium term are the ones which will bring significant changes in operations and infrastructure and also leverage the greater availability of data and the access mechanisms developed as a result of the measures taken in the short term. The long term solutions focus on improving customer experience and introducing advanced technology infrastructure. Sector-wise road maps for implementing IT based on this prioritization framework are attached.

Capacity Building for ICT in Transportation

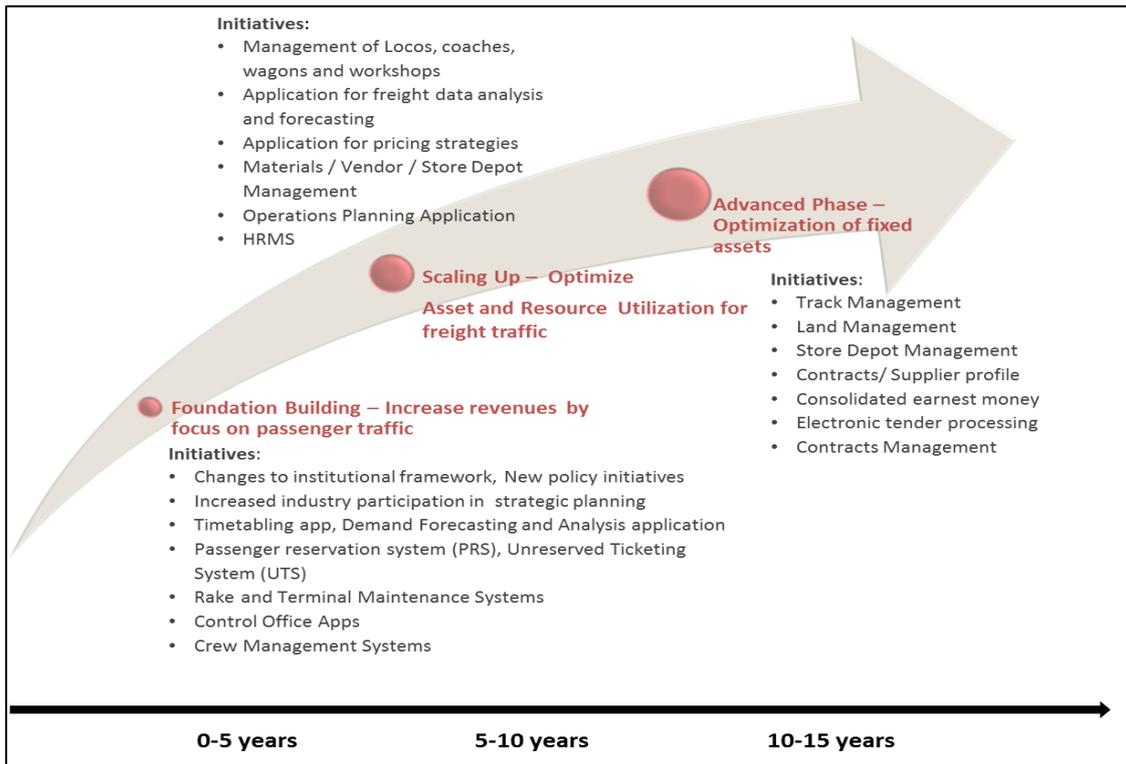
The development and implementation of the various ICT initiatives for transportation will require a strong institutional foundation. We propose an institutional structure along three dimensions: (1) geographic area of focus (national, state or city); (2) sector (railways, roads, etc.); and (3) functional area of focus (policy advice, standard setting, training, project management, etc.). The following figure illustrates our recommended institutional framework.



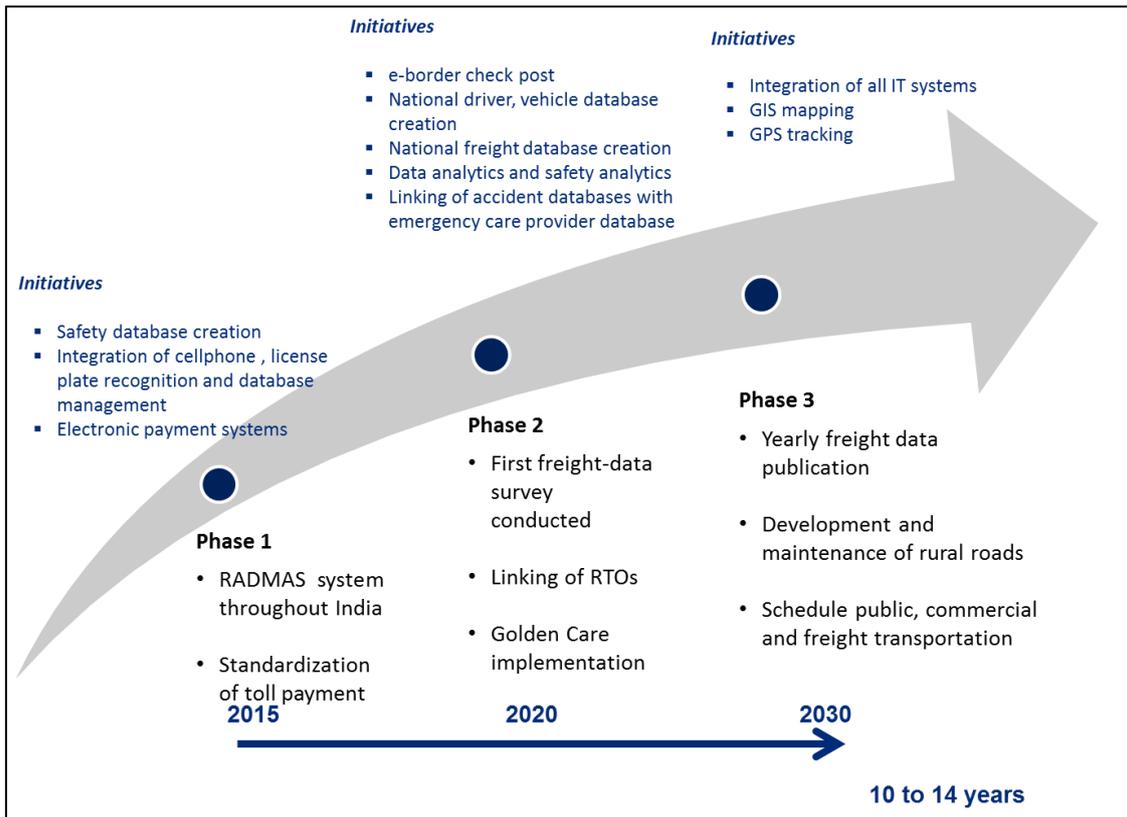
Sub-sectors	Centre	State	City *
Railways	✓	↔	
Ports	✓		
Aviation	✓		
Roads	✓	✓	✓
Urban Roads	✓		✓

* - Cities having population greater than 5-6 million will have their own roads and urban roads institution for facilitating ICT in transportation

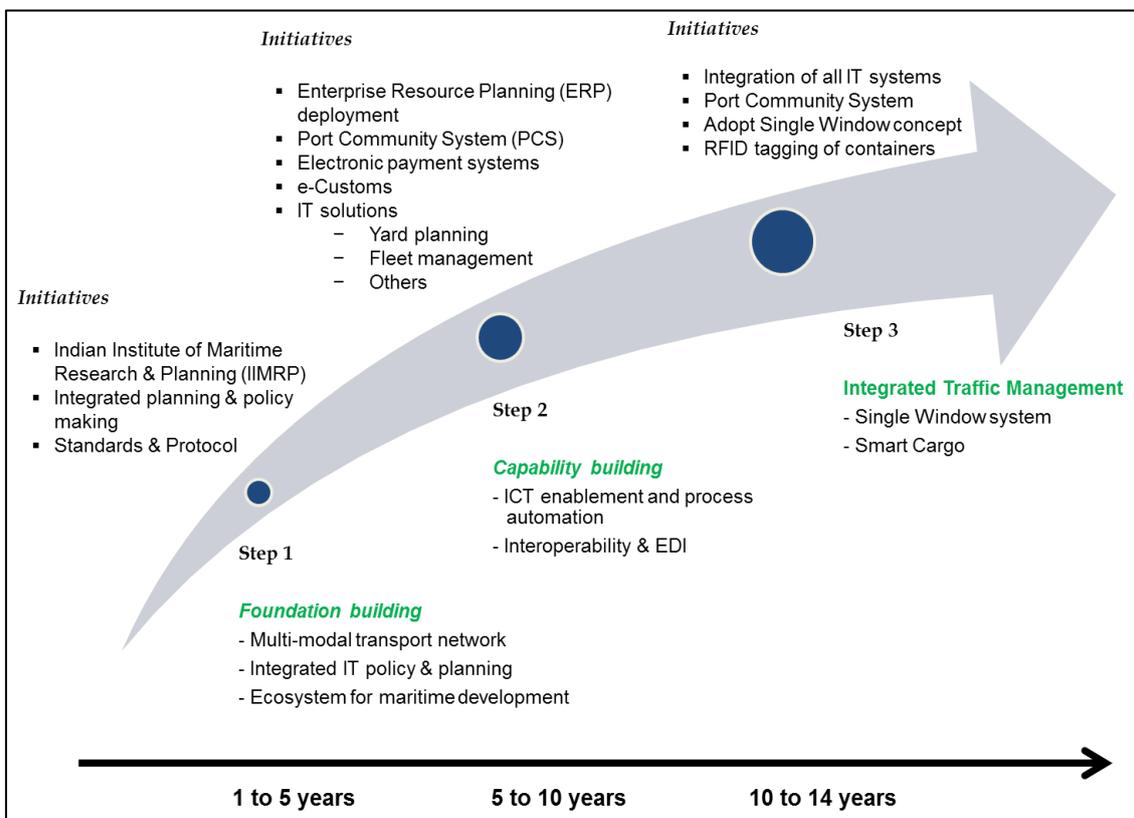
↔ - Railways will have a centre level institution which will interface with all states



Road Map for ICT in Railways



Road Map for ICT in Roads



Road Map for ICT in Ports

Recommendations for Aviation Sector

Because the various airports are at different levels in terms of their current use of ICT, it is not possible to give a road map for general application to all airports, as has been done for the other sectors. The use of ICT to improve aviation is recommended for the following activities along with the proposed technologies as follows:

- **Optimization of airport operations.** Deploy technology solutions such as: (1) Mobile services; (2) Flight Information Display Systems; (3) Airport Kiosks; (4) Near Field Communication; (5) RFID for baggage tracking to increase operational efficiency and to reduce costs at airports.
- **Effective management of airspace and aircraft navigation.** Proposed technology solutions are: (1) VHF coverage and networking; (2) High-frequency radio transmission for air-ground communications; (3) Satellite phones; (4) Instrument Landing System.
- **Safety and security enhancement:** Proposed technology solutions are: (1) Biometric enrolment and authentication; (2) Access Control Systems (Remote Controlled Doors, Smart access control); (3) Ground vehicle monitoring and tracking; (4) Video surveillance and image analysis etc.
- **Efficient air-cargo operations.** Proposed technology solutions are: (1) Air Cargo Community System; (2) Electronic Data Interchange; (3) Warehouse Management System.
- **Capacity Building.** It is recommended that an organization, which we tentatively call Institute of Aviation Research and Planning (IARP), be set up for conducting research, innovation and training in aviation technologies.

3. ENERGY AND ENVIRONMENT

The chapter on Energy and Environment takes a holistic look at India's road transport sector's growing energy consumption and emissions, and it highlights the negative effects of these and possible ways to mitigate them. The key recommendations of the chapter are as follows:-

Vehicle Emission & Fuel Quality Standards

- **Tighter Fuel Quality Standards-** 50 ppm sulphur fuels should be mandated nationwide by the middle of this decade, and 10 ppm sulphur fuels should be mandated nationwide by 2020. Reforms in diesel pricing currently being implemented should be used to pay for refinery investments needed to produce these cleaner fuels.
- **Tighter New Vehicle Emissions Standards-** In line with fuel quality standards, Bharat IV should be implemented nationwide by the middle of this decade, and there should be a target to reach Bharat VI by 2020.
- **Evaporative Emissions Standards-** The middle of this decade, India should mandate Stage I controls, which capture vapours emitted when retail outlets are supplied and return them to fuel tankers, and Stage II controls, which capture vapours during vehicle refuelling and return them to the storage tanks at retail outlets. India should also mandate all new vehicles to have on-board refuelling vapour recovery (ORVR) systems at the same time. These systems return vapours to a vehicle's fuel tank rather than to retail outlets. Stage II controls can be lifted about ten years after the implementation of ORVR systems because the majority of India's vehicle fleet will then have ORVR systems in place.
- **World-harmonised Test Cycles -** Replacing current test cycles with world-harmonized test cycles will make it less likely that certain vehicles "beat" emissions testing by passing the test cycle while emitting much more under real-world conditions. India should make world-harmonised test cycles optional when Bharat IV regulations go into force nationwide and mandatory when Bharat V regulations come into force.
- **Review Auto Fuel Policy Every Five Years -** In 2003, the Mashelkar Auto Fuel Policy committee had recommended a review of the auto fuel policy every five years. Mandatory formulation of a new Auto Fuel Policy Committee every five years after the previous one completes its work. Provisions should be made for this in the MoPNG's five-year plans.

Compliance & Enforcement

- **Single Agency for Vehicle Emissions and Fuel Quality Regulations-** In 2003, the Mashelkar Auto Fuel Policy Committee had recommended the formation of a National Automobile Pollution and Fuel Authority (NAPFA) responsible for setting and enforcing vehicle emissions and fuel quality standards in India. Currently there are a number of ministries and agencies responsible for compliance and enforcement in India, which allows blame to be passed onto others if there are problems. Parliament should establish a permanent NAPFA and ensure that it is fully funded.

- **National In-use Vehicle Testing Program-** India needs to establish a robust Inspection and Certification (I&C) regime to ensure safety, road worthiness and emission performance of in-use vehicles. National-level vehicle testing needs to move beyond type approval (TA) and conformity of production (COP) to include in-use testing. All motor vehicle categories should be covered under the I&C regime. There should also be a recall policy to recall models which on testing do not adhere to the emission standards. Modern I&C centres with minimum manual interference need to be established on a PPP basis in a phased manner. In the beginning, transport (commercial) vehicles could be targeted, followed by non-transport (private) vehicles. Cities with higher vehicular pollution should be targeted first. The frequency of testing should be based on the principle that commercial vehicles and older vehicles are tested more frequently, preferably annually. Central government should lay down the policy and regulatory framework for tests, equipments, manpower requirements based on advise of an independent agency like a National Accreditation Board (NAB) that could also monitor implementation of I&C by state governments.
- **Clear Recall Policies and Punitive Measures** - Until NAPFA is set up, the MoRTH should establish clear punitive measures and recall processes for noncompliant vehicles and the MoPNG should establish clear punitive measures for noncompliant fuels.
- **Test Fuel Quality at Retail Outlets-** There is little, if any, evidence that government or independent fuel quality testing is done anywhere along the fuel distribution system in India. Given the history of fuel adulteration, it is especially important to test fuel at retail outlets, where consumers ultimately purchase fuels. Until NAPFA is set up, the MoPNG should develop a national plan to test fuel at retail outlets, along the lines of what is done by the US EPA or Japan's METI and NPA.

Reduction of energy consumption and CO2 emissions

- **Mandate fuel efficiency label for all new vehicles** - A BEE label to clearly display a vehicle's fuel efficiency has been developed, but not made mandatory. India should mandate this label for all new model year 2014 and later vehicles so consumers can make informed decisions when they purchase vehicles.
- **Notify LDV fuel consumption standards-** India has already developed LDV fuel consumption standards for the remainder of this decade, but their implementation has inexplicably been delayed. These standards should be notified immediately, and assessment for standards beyond 2020 should be started. The country should target LDV fleet average GHG emissions to be 95 gCO₂e/km by 2025, which is Europe target for 2020.
- **Develop HDVs and two- and three-wheelers fuel consumption standards-** There is also much that can be done to improve the fuel efficiency of HDVs and two- and three-wheelers. This is especially important in India, where motorcycles dominate new vehicle sales and are expected to continue to do so in the future. India should aim to have HDV standards in place by 2015 and two- and three-wheeler standards by 2016. In both these

cases, the target should be to reduce fuel consumption by 20 per cent under current levels by 2020.

- **Promote NMT and public transport, especially in urban areas-** Adequate and quality public transport systems should be assured in all cities with populations above 500,000 and safe NMT options should be available everywhere. Other measures, such as integrated land use planning, enhanced traffic management systems, and integrated transport modes, also help reduce the energy intensity of urban transport systems. The chapter on urban transport discusses these issues in more detail and makes recommendations regarding them.
- **Life cycle analysis approach to be adopted in transport decision making-** It is recommended that the capacity to conduct LCA should be built in key central agencies like Planning Commission, state governments and in all metro cities. State governments can conduct LCA for cities other than metro cities. These agencies should carry out LCA analysis to facilitate decisions related to inter-modal choices and intra-modal improvements from the perspective of reducing environmental costs of transport projects.

4. TRANSPORTATION IN THE NORTH EAST REGION

It is for the first time that while formulating National Transport Policy, separate attention has been paid to the transport needs of the North Eastern Region. The Committee decided to look at the situation under three categories:

- Intra-Regional transport connectivity
- Inter-Regional transport connectivity
- Trans Border Movement

Key Recommendations

A. Roads

1. There are a number of organisations involved in building of roads in the NE Region. To bring harmony in their activities, a committee under the chairmanship of Secretary DONER should be constituted with senior level representatives from each construction unit like CPWD, PWD(State), NHAI, BRO to monitor their performance.
2. Quality of construction has to be raised by adopting modern technological advances so that frequent need for maintenance is contained.
3. Higher axle load trucks need to be permitted all through the NER obviating the need for transshipment at the border between West Bengal and Assam – a wasteful exercise.
4. There is a need for improving the quality of DPRs. It is suggested that a new institutional structure be brought in place to provide technical support and guidance to the state PWD organisations. The structure of this institution could be on the same lines as that of the JASPERS (Joint Assistance to Support Projects in European Regions) which harmonizes road construction in the European Union.
5. There is a need for construction of a large number of foot suspension bridges to connect hamlets on either banks of the mountain rivers.
6. GIS mapping of roads is imperative to update and collate information on all types of roads in the entire region. The job may be entrusted to IIT Guwahati as a project funded by MoRTH.
7. There is a need to have training institutions to develop skills in the local population for quality and maintenance of road constructed in the region.
8. Road maintenance is a huge challenge for the NER. It is recommended that a policy decision be taken to cover maintenance expenditure under the Plan.

B. Rail

1. There are adequate projects of gauge conversion and new lines on hand. It should be ensured that by 2020 all the State Capitals get their place on the Indian Railway's map.
2. The sectional capacity on the Malda-New Bongaingaon route, which is the entrance to the NE Region, should be enhanced by introducing Automatic Block Section on the entire stretch.
3. Following projects must be taken up urgently:

a. Intra-regional connectivity

- Dhubri should be connected to Badarpur/ Silchar via Shillong. This line should provide connectivity to important centres of tourist attraction in the State of Meghalaya. It would also be an important alternate link between the two proposed Intra-modal hubs in the region.
- A North-South link from Tirap to Aizawl connecting Imphal and Kohima is imperative for improving regional connectivity.

b. International Connectivity

- Sittwe Port (Myanmar) to be connected by BG rail link to Aizawl
- Imphal to be connected by BG rail link to Moreh and onwards to Tamu – Mandalay (Myanmar)
- A proper connection to Chittagong port in Bangladesh is desirable. This can be done by either converting Agartala- Akhaura to BG and providing BG track upto Chittagong or by connecting Belonia in India to Chittagong port by BG alignment.

C. Civil Aviation

Civil aviation holds the key to not only linking the region to the rest of India but also catalyzing trade and commerce with the neighbouring countries.

1. In keeping with the geographical contours of the region and the thin spread of population, a ‘Hub and spoke’ model with hubs at Guwahati, Imphal and Agartala should be developed for the region.
2. Induction of smaller aircrafts with better technology can be a viable business model. Onetime capital cost may be met by the Government while operations may be leased out to private operators without any dependence on subsidy for day-to-day operations.
3. DONER should catalyse development of meteorological forecasting network in the region to make civil aviation predictable and safe.
4. Development of skill among the local population not only for operations of aircrafts but also for maintenance needs to be undertaken. This would facilitate night halt of aircrafts at various locations and provide connections in early morning so that local population may be able to travel to Kolkata/Delhi/Mumbai and return the same day.
5. Some of the currently inactive airports should be made operative within a time frame for civilian use to provide better connectivity not only for men but also for cargo. These would help establish connectivity required for horticulture / floriculture / aquaculture common in the region.

D. Inland Waterways

1. Indo-Bangladesh Protocol on Inland Water Transit & Trade needs to be extended for at least 10 years at a time to attract investment.
2. Inland water transport (IWT) should be utilised for movement of over dimensional consignments to avoid congestion on roads especially in the Chicken’s Neck area of the corridor between North Bengal area and Assam.

3. Barak River should be utilised for IWT in the NER and also connecting it to Bangladesh by taking up this project as a National Project on similar lines as has been done for river Brahmaputra.
4. Optimal use of the waterways in the North East requires investment in vessels and their regular operations. Apart from the policy regime of an extended period of the Indo-Bangladesh Protocol, an agency either in the public sector or with introduction of private players needs to be identified.

E. Development of Multi-modal hubs

Multi-modal hubs at two stations can facilitate smooth transportation in times of calamity as well as insurgency. These hubs have to be developed at following stations:

- Dhubri
- Badarpur

At both stations, it is possible to have connectivity from rail, road, inland water transport as well as civil aviation. These multi-modal hubs can be later on given to private players for operation or may be run by a corporation developed for the specific purpose.

F. Connectivity with Neighbouring Countries

1. Connecting Meghalaya and Tripura with Bangladesh – at several identified locations will develop international linkages with Bangladesh and also facilitate alternate routes between these two states, with rest of the country, access to the Asian Highway network and connectivity with major cities in Bangladesh.
2. Mobilizing fund for conversion of line from Agartala to Chittagong to have seamless freight operations on this route
3. A railway link upto Mandalay will open great opportunities for trade and travel between India, Myanmar and South East Asia.
4. A draft transit protocol between India and Myanmar should be worked out soon. Need to strengthen connectivity through Sittwe and make Imphal a railway hub.
5. By connecting Jashingang Dzong (in Bhutan) with Arunachal Pradesh and Assam three alternate routes will be developed.

5. CIVIL AVIATION

Key recommendations from the draft chapter for the NTDP's final report

1. *Aviation as part of a multi-modal transport network.*
 - a. Every decision on air transport infrastructure should, ultimately, be able to be traced back to a sense of place and purpose within the wider transport network that is inclusive of all modes.
 - b. Network-centric thinking should prevail in planning air transport infrastructure. Efforts should be directed at building complementary regional, national and international air networks.
 - c. Good land transport networks should be available to quickly distribute passenger and cargo traffic to and from the region served by an airport. Depending on economics, demographics and geography, this may include mass rapid transit options.
 - d. The great advantages of air travel in terms of the savings in time that it offers will be muted if the air network does not cohere well with land-based transport. This is especially true for time-sensitive cargo.

2. *Capacity enhancement.*
 - a. Airport capacity sufficient to process 1150 million passengers per annum (mmpa) is required by 2031-32. This will require the creation of additional capacity of around 1100 mmpa at a total cost of Rs 3,80,000 crore.
 - b. Expansions in airport capacity should be made with cognizance of systemic endogeneity: decisions made on airports today will influence the airline route maps of the future; equally, the expected airline route maps should, by rights, determine the distribution of today's investment.
 - c. Airport-specific investment plans should be dynamic in their response to changing traffic patterns and demand, and yet proactive, by building airport capacity in advance of the period when capacity constraints start to bite.
 - d. There is an urgent need to build airport capacity to process cargo. At the larger airports, capacity can be added through dedicated cargo terminals with land-side facilities let out to freight forwarders and logistics providers. Consideration should also be given to building airports that are entirely dedicated to freight. These may be public airports sited at locations that have other excellent transport facilities or are proximate to metropolitan cities and other final destinations for cargo. These may also be private airports that are operated by providers of logistics services. Off-airport cargo processing facilities similar to inland ports and container depots are required to reduce congestion and delays at airports. Air cargo terminals attached to airports may be considered only as transit points if on-site processing facilities are infeasible or costly.
 - e. Sufficient capacity to process passengers is determined by gate and apron capacity to accommodate aircraft; terminal capacity to accommodate passengers; ground traffic management and ancillary aviation processes that ensure quick aircraft turnarounds. Also helpful are improved air traffic and air space management practices, and new radar technology that allows narrower separations in the air and more closely spaced aircraft movement, as well as movements in adverse weather. Efforts at improving capacity must thus be

directed at all of these; pinch-points on any one front reduce capacities across the system.

- f. Capacity is also determined by size and of aircraft deployed by carriers and by frequency of service. It is recommended that air carriers be free to determine these operational details subject to other regulations.
- g. Helicopters can be enormously useful in tourism, mining, corporate travel, and in providing air ambulance services and homeland security. The development of heliports is important to support the growth of general aviation in India, especially in areas that cannot have runways for financial or terrain-related challenges. A PPP policy for the development of heliports needs to be formulated, and one that especially applies to remote area service. There is also a need to develop standardized route operating procedures for helicopters.

3. *Institutional arrangements and policy.*

- a. Reforms in the civil aviation sector should emphasise the streamlining of decisions taken by various authorities that regulate the sector aided by clarifications as to their agenda, remit and powers.
- b. Greater co-operation between the authorities, civic agencies, and the administrators of other transport modes should also be mandated.
- c. The taxation regime that applies to the entire industry from aircraft purchase to aviation turbine fuel to insurance and lease rentals should be revised in view of the distortionary nature of the present system of taxes and their unbundling from the economic tax base.
- d. The present policy on slot management, and especially the ban on the trading of landing slots, is not conducive to a well-functioning and competitive sector. Reviewing and gradually revising India's current slot allocation system will help to reduce a key market barrier to competition and in turn create a framework of more predictable and efficient slot allocation outcomes, as it has in other markets globally.

4. *Managing market competitiveness.*

- a. Regulatory agencies must walk a fine line between continuing to encourage industrial competitiveness to maximise consumer surpluses and ensuring that the competitiveness is not achieved at the price of unsustainable or irresponsible actions on the part of the airlines.
- b. It is important to ensure that the barriers to entry are not insurmountable for firms that clearly qualify on account of their financial standing or industry experience and expertise.
- c. It is equally important to manage the exit of airlines from the market with grace and efficiency so as to not impose negative externalities of these exits on the remaining airlines.

5. *Funding.*

- a. With respect to Air India, the government must set out a decisive policy of ownership, and a clear agenda for the airline. This agenda must not distort the market for privately owned competitors.

- b. The government must decide clear and stable rules governing the foreign ownership and operation of domestic airlines. This foreign ownership may also be expected to bring additional benefits of access to cheaper debt finance, technology transfers, management know-how and access to international markets.
- c. Careful regulations for assessing the stability of private equity and debt funding of domestic airlines should be developed, with a view towards promoting the overall financial health of the sector.
- d. The unique features of the aviation industry with the largest costs and substantial revenues determined in offshore markets mean that there is support for the relaxation of restrictions on External Commercial Borrowings by airlines.
- e. Each airport funded by the AAI should be endowed with a set of operations goals and a development plan, have measurable targets by which performance can be gauged, and be encouraged to adopt transparent reporting processes.
- f. For joint-venture airports, the task before regulators and administrators is to devise proposals that attract participants with both suitably deep pockets and expertise such that stable long-term ventures can be successfully negotiated.
- g. Airport development under PPP has proceeded well insofar as projects have been delivered and are operated largely to the desired standard. New public-private models will be required to fund the redevelopment of airports in non-metropolitan cities with lower traffic.
- h. At all airports, substantial scope exists to raise revenues from non-aeronautical activities, including from restaurants and food service, car parking, and rentals for concessions, retail, banking and other services.

6. *Pricing.*

- a. There is substantial scope for airports to ensure that their pricing regimes for landing charges, passenger services, cargo, parking and hangar space, and other items like security and noise-related charges, are fairly determined and transparently applied.
- b. The regulation of tariffs at airports operated under the PPP-model must be strengthened with more careful accounting of benefits and costs to various stakeholders, restructuring of tariff schedules, and with a view towards maintaining the dynamism of Indian civil aviation.
- c. Aviation Turbine Fuel pricing should be reformed. The tax structure on the fuel should, at a minimum, be rationalised and simplified, and also more closely justified by observed market failures or tied directly to the expected future development of the aviation industry. Further, with ATF being pricier than in India than regional airports offshore, there is also a case for reducing taxes to this baseline. Competition in the ATF market should be encouraged and any efforts at cross-subsidising (as with other fuels) should be avoided.
- d. The pricing of air services should largely be subject to market considerations, and remain under the purview of airline operators on a day-to-day basis. However, substantial regulatory vigilance is required to maintain market integrity and for consumer protection. This is motivated on the grounds of ensuring pricing that is fair and reasonable, non-predatory and non-discriminatory, and transparent. To that end, clearer rules are required

7. *Managing the environmental impact.*

- a. Globally, the airline sector has set itself the goal of reaching carbon-neutral growth by 2020 and that of reducing aviation's overall carbon-dioxide emissions by half between 2005 and 2050. Relative to the expected size of the industry in 20 years time, India is well-placed to adopt an environmentally-friendly growth path, which is preferable to post-hoc remedies to entrenched systems. With aviation equipment being internationally fungible, India is likely to automatically benefit from technological advances that improve fuel efficiency, and reduce emissions. The major domestic regulatory impetus will lie on policies that encourage more efficient flight paths, glide landings, fleet modernisations and renewals, and higher capacity utilisations.
- b. As cities and airports both expand, increasing shares of India's urban populations will lie under a flight path, and will expect reasonable efforts on the part of authorities to shield them from the worst excesses of aviation-related noise.

8. *Human resources*

- a. Institutions that regulate civil aviation will need to be strengthened with the addition of substantial numbers of staff skilled in network economics and regulation, certification, safety, setting and implementing standards, finance, and law. Existing private institutions do not offer sufficient depth and variety in their course content, and the infrastructure facilities available to them are insufficient.
- b. Thus, the desired growth in Indian aviation will require the country's technical colleges and flying schools to churn out engineers, pilots, air traffic controllers and other key staff in substantially greater numbers than at present.
- c. On the management and regulatory front, there is a requirement for an improved, larger cadre of airline administrators and managers, regulatory economists and planning professionals.
- d. An institute for training civilian helicopter flights should be set up.
- e. There is an absence of formally recognised educational programs at the degree and diploma level in the field of civil aviation. Budgetary support should be provided, and industry support encouraged, for the expansion of aviation programmes at universities, especially at the graduate level. In conjunction with industry and academia, the state should also boost the value of these programmes by defining qualitative and quantitative standards for the academic programmes. More generally, the systems of accreditation of the various training institutes should be reviewed with a view towards ensuring minimal standards in educational outcomes.
- f. The training of a new corps of air-traffic control officers requires immediate priority. Partnership options with international ATC training institutes and with the Indian Air Force should be explored to enhance ATC-capacity.

9. *Air connectivity in remote areas*

- a. Air travel can be the quickest, cheapest, and most environmentally friendly class of transport links that can be extended to remote regions with challenging geography or topography.
- b. The current arrangement for ensuring essential air services is not satisfactory. Air connectivity in remote areas is largely concentrated on routes connecting

state capitals. Meanwhile, the Route Disbursal Guidelines intended to ensure minimum connectivity to remote and inaccessible regions cast a burden on the commercial health of airlines in India. Essentially being a cross-subsidisation tool, several distortions arise from its implementation, and further reliance on these guidelines will be unhelpful at a time of industry-wide financial stress.

- c. The establishment of a non-lapsable exclusive fund to provide explicit and direct subsidies to airlines as a form of viability-gap funding is a preferable alternative to ensuring service to remote and inaccessible, and so financially non-profitable, areas of the country.

10. *Statistics and Data*

- a. Data furnished by airline operators to the DGCA should be processed subject to cross-verification. The DGCA should work closely with MIS personnel at the carriers to define systems for data collection, verification and dissemination.
- b. A country-specific forecasting model should be developed for the Indian aviation market to aid infrastructure planning, route management and expansion, and regulation. Effort should be devoted to studying the decomposition of airfreight and passenger traffic in greater detail, and a database built of origins, destinations, and the nature and value of shipments. This will provide valuable information on the candidate sites for dedicated passenger and cargo facilities.
- c. Aviation is grossly under-estimated in the national accounts; the present compilation of National Account Statistics should be modified to reflect the wider array of activities that relate to the aviation sector. A system of satellite accounting for the civil aviation sector should be introduced especially in cases where direct data collection is not possible.

6. FISCAL ISSUES IN TRANSPORT

Transport Tax system in India:

1. The current transport pricing system is an accumulation of multiple taxes and user charges implemented at different points of time at varying levels of governance.
2. Fuel tax is an integral part of transport pricing.
3. The prevailing tax regime is quite complex, particularly for road transport sector. The taxation structure is different across modes and states. The tax differentiation is determined by a number of parameters that vary across states, uses and types.
4. Road transport sector has suffered on account of entry barriers through taxes imposed on inter-state movement.
5. Whereas revenue objective of pricing policy has been achieved partially, ad-hoc and complex nature of some of the taxes, especially at the state level, has resulted in less than efficient delivery of transport services which, in turn, affect the efficiency of other sectors.
6. Inefficiencies in transport sectors get transmitted to other sectors of the economy as some of the sectors are relatively heavy users of transport services and have strong linkages with rest of the economy.

Key Recommendations:

1. **Empowered Committee** - It is recommended that the Ministry of Finance may convene an Empowered Committee of State Finance Ministers to undertake this exercise on simplification and rationalisation of tax structure.
2. **Single Window Clearance for all taxes** - There is a need to integrate tax administration related to inter-state movement of freight and passengers through information and communication technology (ICT) at national, state and regional level. This will greatly reduce transaction and logistic cost due to borderless and paperless movement. Competent authority may look into the possibility of implementing "green channel" (Gujarat has already implemented) if proper paper works has already been done in advance for specific consignments. A "single window" clearance system for all types of taxes and charges at state border will greatly reduce transaction cost.
3. Cities located across the state borders should share a common taxation mechanism so that unnecessary wastage of time and harassment at state borders are avoided.
4. **User Charges** - Transport infrastructure requires heavy capital investment and charges should be levied on users. User charges should be effectively collected from railway infrastructure as well. We recommend that Indian railway should develop a system of accounting of depreciation and internalisation of all costs into its pricing system through user charges. Once the depreciation costs are accounted for, cross subsidisation or direct subsidisation may still exist in its current form. It is important

to emphasise that public transport pricing is widely used as an instrument of poverty alleviation. Fares are regulated in developing countries in order to provide affordable mode of transport to the poor. Therefore, we do not recommend completely doing away with cross subsidisation. However, developing a system of accounting for infrastructure cost and user charges is important.

5. **Study to quantify Efficiency loss** - We also recommend that the authority should undertake a study to identify and quantify the efficiency loss in transport sectors due to several obstacles for free movement of freight across states. Special focus should be given to the complexity of tax system and lack of harmonisation of regulations across states.
6. **Internalising Marginal Social Cost** - The issue of incorporating externalities including congestion and pollution (social costs) in marginal cost pricing does not seem to have been addressed adequately while formulating the tax rates. There is also a need for internalisation of negative externalities in transport pricing, especially in urban transport. However, it is very difficult. We recommend formation of an expert group to assess the closest monetary figure for the marginal social cost of this possibility. Once we find a reasonable figure, a composite and uniform tax can replace current ad-hoc environmental cesses at state level.

7. Urban TRANSPORT

I Urban Transport Policy

Urban transport policy should follow the “avoid, shift, and improve” approach, while also developing a robust city lead decision making framework for mega-projects

- a. **Avoid:** Reduction in the need for travel by planning city structures and urban densities, imaginative use of Information and Communication Technologies, so that there is a reduction in requirements of travel
- b. **Shift:** change modal choice to promote lower fuel consumption per passenger-km and/or freight-km and manage traffic so as to reduce fuel consumption and air pollutants; and
- c. **Improve:** increase the energy efficiency of vehicles and use of efficient and cleaner fuels to decrease impacts of distances travelled and reduce the greenhouse gas footprint of fuel consumed.
- d. **Mega-project planning and implementation frameworks:** an Office of Transport strategy (OTS) should be set up in all five million plus cities which is a technical group in support of the nodal agency/the Urban Metropolitan Transport Agency (UrMTA). The OTS should be responsible for analyzing alternative project possibilities and technologies and then undertaking a broad based consultation exercise in a participatory manner involving affected stakeholders, to inform decision makers on the options.
- e. **Full life cycle accounting:** is a comprehensive way of accounting for the costs of an urban transit systems as it provides a sophisticated and accurate basis on which choices between different technologies should be made by decision makers.

II Economic Measures for transport demand management aimed at Sustainable Urban Transport

Various economic measures with the view to control the growth in transport demand especially related to personal motorised vehicles which offer individual commuters a tangible economic benefit or dis-benefit related to the use of one or other travel modes such as congestion charges and other costs related to travel such as parking fee and transit tariff, should be pursued in larger cities.

III: Comprehensive Mobility Planning for sustainable urban transport

Conventional urban transport planning approach has focused mainly on flow of motor vehicle traffic. Since the National Urban Transport Policy, 2006, some attention is now also being placed on “moving people not cars”. The focus should shift to accessibility (the ability to reach desired goods, services and activities) and mobility of people, as against mobility for motor vehicle. Thus planning should aim at improving accessibility, mobility and finally traffic flow in that order. Recommendations on measures include:

- a. Implementing mixed land use and high density developments and avoiding urban sprawl in city planning

- b. Integrated land use and transport planning
- c. Focusing on dense public transport provision across cities
- d. Multimodal Integrated and City wide public transport network
- e. Regional and suburban Transport
- f. Improved planning for Urban Freight traffic
- g. Parking
- h. Traffic management measures
- i. Safety
- j. Security
- k. Universal Accessibility
- l. Vehicle and fuel technology
- m. New Technology applications
- n. Education, Promotion, Outreach aimed at better awareness and behavior change of users

IV Institutions and Governance

The present institutional arrangements to manage urban transport are very fragmented and the responsibility is diffused. The Constitution of India, does not specifically list the urban transport sector, making it to a large extent and a constitutional and institutional orphan. Specific recommendations therefore include:

- a. A department of urban transport in the Ministry of urban development is strengthened, with a strong technical unit and data cell
- b. When a unified Ministry of Transport is established, the urban transport department in the Ministry of urban development should develop a protocol for decision making which ensures that the new Ministry of Transport is involved in all key urban transport decisions
- c. A dedicated department of urban transport is created in each state/union territory under the urban development/municipal administration departments
- d. A Safety Board in each state to regulate and monitor transport safety issues
- e. Setting up MPC/DPC as envisaged in the 74th constitutional amendment for inter-sectorial coordination at the local level
- f. A dedicated urban transport authority (UrMTA) in million plus cities is set up which includes traffic management and engineering cells. These units should be set up by the local governments in cooperation/consultation with each other, with the motivation of developing and administering regional/multi-municipal projects, etc. A similar urban transport authority is created at the state level to manage affairs in other cities of the state.
- g. Existing city agencies engaged in implementation and operation of UT related projects while continuing in their present roles, should find new mechanisms for joint decision making at the city level.
- h. The need for a comprehensive urban transport law, which needs to be adopted at the state level, with the possibility of model guidance from the Centre, which sets out the roles and responsibilities of the multiple city and state level entities with regard to public transport, land use and public transport integration, multi-modal integration, facilities for walk and NMT, etc
- i. For improving the implementation processes recommendations suggest measures for Capacity building, recruitment and retention of professional staff, Knowledge Management and Database creation and management, Research and development and technology upgrade.

V Investment Requirements and financing

a. Goals to be achieved by the year 2030 for which funding should be prioritised in the order of inputs as are presented below:

- Walk and cycle lanes to be provided in all one hundred thousand plus population cities and state capitals
- Creation of an effective institutional and implementation framework as well as capacity building arrangements to manage projected investments
- Development of organized dense city bus service as per urban bus specifications i.e. Vehicle tracking Systems (VTS) and Passenger Information Systems (PIS) in all one hundred thousand plus population cities and state capitals
- Safety, safety audit and security to be upgraded
- Smaller cities starting from twenty thousand population should also have organized urban public transport, with the use of para-transit modes
- Technology to be used for Multimodal integration, Enforcement and traffic management
- As a thumb rule BRTS of approximately 20 km/1 Mn population in cities with population > 1 Mn may be needed and so the investment requirements could be based on this assumption
- Road network in all one hundred thousand plus population cities to be completed with missing links and with good surface and drainage.
- Damage to roads by utility agencies need to be regulated
- Cities with population >3 Mn to start planning metro rail projects, with 5 Mn to start construction. Estimated requirement 10 km per Mn.
- In existing mega cities, Metro rail to be expanded at approximately 10 km per/yr
- Suburban rail services to be provided in urban agglomerations with population > 4 Mn.

b. Investment requirement

The Working group on Urban Transport (WGUT) constituted under the NTDPCC has made investment requirement projections for the urban transport sector till the year 2030. The estimates have been developed for three scenarios as listed below:

- **Scenario 1:** the Business as usual (BAU) scenario; which assumes that the policies strategies and trends continue as witnessed currently and as described in the section on Urban transport in India today. The WGUT estimated that if current trends continue an investment of Rs. 22.78 lac crores, will be required over the next twenty years.
- **Scenario 2;** Intermediate scenario; is a scenario which is in between the desired sustainable scenario and the business as usual scenario Rs 17 lac crores
- **Scenario 3;** Desired scenario; is the scenario which will be closest to the sustainable urban transport scenario, the estimated investment requirement in this scenario will be Rs 15 lac crores
- The investment requirements as mentioned above vary across scenarios. Across scenarios however average annual outlays are in the range of Rs. **75,000 Crores to 100,000 Crores each year.**

c. Financing the Investment required

The key sources of financing urban transport are as below:

- (i) User charges: The main source of direct funds for urban transport projects are the user charges.
- (ii) Support from national government: is linked with the National budget, hence often unpredictable and inadequate, given the large number of national priorities. In the specific case of urban transport there is also a strong case for the CRF (central road fund) funding being made available for urban transport projects. Given that the Central Road Fund has already been used to fund the construction of national highways, it is recommended that going forward the primary application of this fund could be for urban transport as the CRF primary revenue source is a surcharge on petrol and about 80% of petrol is used in urban areas.
- (iii) Tax concessions and dedicated levies, Tax concessions in India potentially can reduce the funding requirements by nearly 20% at the project cost level.
- (iv) Land Monetization, the value created in the proximity zones can be recovered through land monetization; i.e. a 'Betterment Levy' or 'Land Value Tax' or enhanced property tax or grant of development rights.
- (v) Recovery from non-user beneficiaries: Dedicated levies can be levied on non-user beneficiaries mainly users of private modes.
- (vi) Commercial Debt and raising initial project cost through PPPs: is another

Other than these sources The NTDPC recommends that new innovative financing mechanisms are put in place. Learning from the global examples, a dedicated (non lapsable and non fungible) Urban Transport fund should be set up at National level as envisaged in NUTP-2006. The NUTF apart from meeting capital needs may also be required to cater support to certain systems during the operations stage. The NUTP should be funded in a robust manner as per the suggestions below:

- **A Green Surcharge of Rs. 2 on petrol sold across the country:** the rationale behind the fact that petrol is consumed exclusively by personalized vehicles. The green surcharge from petrol in the base year is Rs. 3108 Crore and over the period of first four years.
- **A Green Cess on existing Personalised Vehicles:** at the rate of 3 percent of the annual insured value both for car and two wheelers. It is estimated that during first year will be Rs. 18,163 Crore and the amount over first four years will total to Rs. 83, 753 Crore.
- **Urban Transport Tax on Purchase of New Cars and Two Wheelers:** at 7.5% of the total cost of the petrol vehicles and 20% in case personalised diesel cars. This will be Rs 20,929 Crore in the first year and Rs. 95,739 Crore over first four years.

The total annual yield from the three sources will be Rs 42, 199 Crore in the first year, and Rs 1, 93, 542 Crore in four years.