

# METRO RAIL POLICY-2017

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## METRO RAIL POLICY-2017

### A. Background and Context

- i. Indian cities are growing rapidly. There is a need to direct growth in a planned manner with adequate attention to the transport system at early stages in their development. Cities are witnessing fast growth in the number of personal motor vehicles, with severe congestion and pollution being the most visible manifestation of the growth in the number of motor vehicles. Efforts at remedying the situation will need to focus on improving the public transport system. In several cities this would require implementation of Mass Transit systems such as metro rail, bus rapid transit, light rail, etc.
- ii. Urban Rail, popularly referred to as Metro Rail, has seen substantial growth in India in the recent years. More cities are experiencing the need for metro rail to meet their day-to-day mobility requirements. Most of the metro rail projects have been financed by the central government in partnership with the state governments, while some have been funded by the state governments either on their own or with private partnership. Metro rail projects provide high capacity public transit and are capital intensive. However, considering the rapid urbanization and the imminent need for enhancing mobility in cities through metro rail, it is imperative to explore alternative and innovative sources of funds to supplement the budgetary resources. At the same time, it is also important to ensure that the proposals are prepared and appraised in a comprehensive manner to enhance urban mobility as well as the speed and quality of implementation of metro projects. It is in this context that the need for a policy on metro rail has been felt necessary to ensure that such systems are decided upon and implemented in the most sustainable manner from the social, economic and environmental perspectives.
- iii. The following are the prevalent broad models of financing metro rail in India:
  - a. The existing 50:50 Joint Venture model that is predominantly the major model available for the financing and organization structure was started with Delhi Metro Rail Corporation and later followed in other metros like Mumbai Line-3, Chennai, Bangalore, Nagpur, Lucknow, Kochi and Ahmedabad.
  - b. The second model is that of full funding by the central government. Examples of this model are the first metro in the city of Calcutta (now Kolkata) by Indian Railways, followed by East-West corridor in Kolkata being implemented on a 74:26 equity sharing between Ministry of Railways and Ministry of Housing and Urban Affairs respectively.
  - c. The third model is that of complete funding by state government; examples are Metro rail in Jaipur and Monorail in Mumbai.

- d. The other model is the Public Private Partnership (PPP). Mumbai Metro Line-1 and Hyderabad metro rail have been taken up with Viability Gap Funding (VGF) from Government of India. The Rapid Metro in Gurugram is an initiative of Government of Haryana where full funding is by the private concessionaire.

## **B. Benefits of Mass Rapid Transit Systems**

- i. Mass Rapid Transit Systems in urban areas not only facilitate easy and quick movement of people but also have a positive impact on the economic growth and quality of life. This result in increased income and various benefits to the society like reduced external cost due to reduction in traffic congestion, road and parking cost, transport cost and per-capita traffic accidents. Mass Rapid Transit Systems tend to reduce per capita vehicle ownership and usage and encourage more compact & walkable development pattern which provide developmental benefits to the society. Reduction in cost and time of travel lowers the cost of production of goods and services which significantly improves city's competitiveness. One of the significant contributions is substantial reduction in per capita pollution emission bringing down various chronic diseases; hence, results in huge public health benefits.

## **C. Options of Mass Rapid Transit Systems(MRTS)**

- i. The mass transit systems in cities/ urban agglomeration can be broadly classified into the following 5 categories:
  - a. **Busways and Bus Rapid Transit System (BRTS):** Busways are physically demarcated bus lanes along the main carriageway with a segregated corridor for movement of buses only. At the intersections, the buses may be given priority over other modes through a signalling system. BRTS, is an enhanced form of a busway which incorporates features such as facilities for pedestrians, Non-Motorised Vehicles (NMV) and many other associated infrastructures including operations and control mechanism.
  - b. **Light Rail Transit (LRT):** LRT is generally at-grade rail based mass transit system, which is generally segregated from the main carriageway.
  - c. **Tramways:** These are at-grade rail based system that are not segregated and often move in mixed traffic conditions.
  - d. **Metro Rail:** Metro rail is a fully segregated rail based mass transit system, which could be at grade, elevated or underground. Due to its physical segregation and system technology, metro rail can have a very high capacity of 40,000 – 80,000 passengers per hour per direction (PPHPD). Metro systems also include monorails, which, however, has lower capacities and higher maintenance cost.
  - e. **Regional Rail:** Regional rail caters to passenger services within a larger urban agglomerate or metropolitan area connecting the

outskirts to the center of the city. The services have greater number of halts at smaller distances compared to long distance railways but fewer halts and higher speeds compared to metro rail. Regional rail are common in large metropolitan cities and help in decongesting the city center by providing safe, and speedy access to the city center for commuters residing in less congested suburbs.

- ii. Choice of Metro Rail as a Mode of Mass Transit: The choice of a particular MRTS will depend on a variety of factors like demand, capacity, cost and ease of implementation. A BRT or LRT systems at grade may require linear pathway to be carved out of existing land if additional space cannot be made available on the sideways and will reduce the space for other traffic depending on the width of existing roads. LRTs and Tramways without horizontal separation will have reduced speed and hence reduced capacity. The capacity of MRTS is generally denoted by passengers per hour per direction (PPHPD). A BRTS typically has a capacity of 10,000-15,000 PPHPD on a single lane but can be enhanced with additional lanes. Comparatively metro rail systems are able to carry much higher passenger volumes of 60,000 PPHPD and can go up to 80,000. Such rail based systems also generally provide rapid service, a higher quality ride and service regularity due to grade separation.
- iii. It is pertinent to observe that the above mentioned capacities of different systems can be at best, a guidance parameter and choice of mode will depend on the overall feasibility of the transport system.

#### **D. Planning and Implementation of Metro Rail Projects**

##### **i. Metro Rail: A mode of Urban Transport**

Due to the very nature of urban transport and its inseparable and intricate connect with the issues of urban development, it is essential that those who have overall perspective and feel of the city formulate the plans for urban transport for that city. Therefore, the proposals for central assistance for an identified metro rail project will have to be mooted by the State Government; also as the “Urban development” is a State subject in the Constitution.

##### **ii. System Approach**

- a. There should be a comprehensive approach to planning for urban land use and transport infrastructure. A system approach should be applied in the planning of multi-modal transport systems in a city. For, this, a city can be represented by land use zones superimposed with a matching transport networks. By treating the urban area as a system, and recognizing the interactions between land use, traffic and transport, it is possible to predict future requirements and accordingly evaluate alternative modes for the most optimum mobility plan for the city.

Therefore, a Comprehensive Mobility Plan (CMP), is a mandatory prerequisite for planning metro rail in any city. Cities having a population of two million and more may start planning for mass transit systems including metro rail based on the CMP.

- b. Integration between various modes like roadway, railways, non-motorized transport, and other modes of transport enhances the mobility of the citizens and encourages public transport. Existing railway suburban services or circular rail systems, if any, should be integrated with the metro rail and other transport modes. It is imperative that the various service providers collaborate through signing of a Memorandum of Understanding (MoU), to provide seamless integration between the various modes.
- c. For integrated approach in planning and management of urban transport, State Governments should constitute Unified Metropolitan Transport Authority (UMTA) as a statutory body. This Authority would prepare Comprehensive Mobility Plan for the city, organize investments in urban transport infrastructure, establish effective coordination among various urban transport agencies, manage the Urban Transport Fund (UTF) etc.
- d. As metro rail systems operate in the urban arena, it would be worthwhile considering a stake of the local body like municipal corporations or city development authorities in the agency implementing and/or operating the metro rail system in a city.
- e. For metro projects in metropolitan region, which transcend state boundaries, there is a need for the governments to synergize their efforts in providing a comprehensive transport system which can be formalized through a Memorandum of Understanding between the States.

### iii. **Alternatives Analysis**

- a. Metro rail, though being capital intensive, provides the much needed high capacity rapid transit in the cities. Though they have a life of 100 years and beyond, due to the nature of construction, the flexibility in design changes after the construction is very limited. Hence, they should be planned and executed with a longer future perspective. Being a high capacity transport system, they are most suited for growing cities having prospective increase in population over several years. Therefore, the metro rail systems are best suited for cities with teeming population and favorable future growth prospects. Further, they should be decided upon with due care and after a systematic and unbiased analysis of different alternatives. In this context, the spatial pattern of a city is important. Cities with a well spread out spatial pattern, even if they have a high population, may not have sufficient number of corridors with adequate density to

justify investments in a metro. Yet cities with a linear spatial pattern may justify a metro even at lower population levels as they have fewer corridors and each would have a high traffic density. A comparative analysis of alternate modes should be an essential requirement for the transit mode selection. The mode which matches the demand projections over the project life cycle and has the least cost should be chosen.

- b. The alternative analysis report will have to be necessarily incorporated in the project report while seeking central assistance. To make the analysis comparable among various alternatives, a horizon of 30 years or more may be taken for forecasting the cost and revenue variables.

iv. **Project Report**

- a. The project report will be the key document for assessing the feasibility of a metro project and the issue of central assistance. The report should examine the techno – economic feasibility and include provision of infrastructure for integration of various modes of transport, last mile connectivity, seamless transfer between various modes through common payment instrument and universally accessible infrastructure. Pricing of urban transport is a public policy issue and should be aimed at encouraging public transport. Therefore, it should be determined in a manner that it may incentivize modal shift from private vehicles. Pricing of metro rail should not be seen as a mere tool for enhancing financial viability as this will defeat the very purpose of having a high capacity mass transit system which brings in greater economic, social and environmental benefits to the city. Financial support of state government/ city authorities to ensure good financial health of the agency implementing/ operating the metro rail project will be essential and will need to be provided within a well-defined framework.
- b. As per global practice, urban transport projects, including urban rail, are treated as public projects which deliver public good. Therefore, appraisal of metro rail projects should entail economic and social cost benefit analysis. Metro rail projects provide larger economic and social benefits to the society in terms of reduction in cost and time of travel, substantial reduction in per capita pollution emissions resulting in reduction in chronic diseases, reduction in road accidents, bringing down noise pollution etc. Enhancing mobility catalyzes the economic development and improves the livability of a city. Hence, while appraising such project proposals the economic and social viability may be assessed. The economic internal rate of return for any metro rail project proposal should be 14% and above for consideration of its approval.
- c. For all metro rail projects taken up with central assistance it will be mandatory for the State Governments to give commitment to set up and

operationalise UMTA in the city within a year. Further, cities, where metro projects are under implementation, may consider setting up of UMTA within a year.

- d. The State Governments shall commit to provide required support to metro rail companies/agencies to ensure financial sustainability during operations.
- e. Proposals for additional metro lines in a city, or new metro in a State already having a metro rail in one of its cities, would be appraised keeping in view the state governments efforts in ensuring financial viability of the existing lines.

**v. Requirement of Allied Investments**

- a. Metro Rail systems need to be seen not merely as a transportation project, but as urban transformation projects that help a city move from sprawled development to greater compactness leading to sustainable cities. Lower travel distances, vastly reducing energy consumption and significantly lowering emissions should be the objective of such investments, along with faster mode of travel. Towards this end, allied investments in expanding utility capacity to densify areas around metro stations should be a requirement and this should be adequately covered in the project proposal report/ Detailed Project Report (DPR).
- b. As metro rail systems are high capacity systems with large congregations of people during the peak hours, it is essential that the security and safety of the system is planned accordingly. As security is a function of the State, it needs to be provided by the State.

**vi. Enhancing the Viability of Metro Rail Projects**

- a. Because of the well acknowledged role of metro rail in reducing urban transport-related problems, such as congestion, air and noise pollution, accidents and at the same time providing faster and safer mode of mass transport, more and more cities world over are providing rail based urban transport systems for their commuters. Public mass transport systems serve the economic and social requirements of a growing city and therefore need to be appraised using a socio-economic framework. Nevertheless, all efforts should be made to reduce costs and enhance revenues through various innovative means.

## **vii. Enhancing Revenues**

- a. Feeder System to Metro Rail: Every proposal for Metro Rail should necessarily include proposals for feeder systems that help to enlarge the catchment area of each metro station atleast to 5 kms. Last mile connectivity through pedestrian pathways, Non-Motorized Transport (NMT) infrastructure, and induction of facilities for para transit modes will be essential requirements for availing any central assistance for the proposed metro rail projects. State governments will be required to commit provisioning of feeder systems for the metro rail proposed for availing central financing assistance.
- b. Transit Oriented Development (TOD) and Value Capture Finance (VCF): The project proposal should mandatorily contain a chapter on the “Transit Oriented Development (TOD)” with proposed intermodal integration, universal accessibility, adequate walkways and pathways for Non-Motorized Transport (NMT), stations for public bike sharing, commensurate parking lots for cycles and personal vehicles, as well as adequate arrangement for receiving and dispatch of feeder buses at all metro stations. The commitment by the State Government to adhere the guidelines issued by the central government w.r.t. TOD and adoption of VCF framework should be an integral part of the project proposal. The commitment should inter alia include commitment of transfer of the financial benefits accruing in the influence zone of the metro alignment on account of the TOD policies and VCF framework directly to the Special Purpose Vehicle (SPV)/agency implementing the metro rail project. The project report should specify the proposed quantum of such benefits being transferred to the project. This requirement would form a mandatory part of all metro rail project proposals.
- c. Commercial/property development at stations and on other urban land has been used as a key instrument for maximizing revenues in metro rail/ railway systems in cities around the world. Notable examples are Hong Kong and Tokyo. Metro rail implementing agencies should endeavor to maximize revenue through commercial development at stations and on land allocated for this purpose.
- d. The DPR should also mandatorily contain a chapter on enhancing non-fare box revenue through conventional as well as innovative means. The State Government shall ex-ante commit the enabling policy and regulatory framework and provision of requisite permissions, clearances & licenses etc. for all avenues of exploiting non-fare box revenue such as advertisements, leasing of space, fire clearances etc. under the state statute and rules through a single window facility to the SPV/agency implementing the metro rail project.

## **viii. Reducing Costs: Standardization, Indigenization and Inducing Competition**

- a. All efforts should be made to reduce the cost of construction and operation. Substantial efforts have been made since the advent of metro rail systems in India in standardizing the various components of Metro Rail Systems like track-gauge, civil



structure and components of rolling stock. These should be further consolidated progressively from time to time by the government to take care of the emerging technologies with the increase in the number of projects and increase in the quantum of rolling stock required so as to reduce costs on account of economies of scale by the manufacturers. Government will progressively take requisite steps to further standardize the sub-systems and components of the Metro Rail Systems without hampering the flexibility required for the varying urban texture and differing new emerging needs of rapidly urbanizing agglomerations in the country. The standards so evolved will have to be mandatorily adhered to for the metro projects taken up with central assistance.

- b. Government and metro rail implementing agencies shall take adequate steps for progressively indigenizing the metro rail systems through incentivizing and encouraging indigenous development and manufacture of the components that are being presently imported. Such steps will include compulsory indigenization and progressive increase in local content in the conditions of procurement, encouraging bulk tendering for similar components duly aggregating the requirements of various agencies within a state, among other initiatives.

**ix. Legal Cover**

All the metro rail projects will have to be governed by the Central Metro Acts.

**x. Fare Fixation**

The fixation of the fare will be as per the extant provisions of the Act governing the metro rail projects.

**xi. Issuance of Bonds by Metro Rail Companies**

The financial health of metro rail projects hinges, among other things, on the cost of capital used for funding the project. It is, therefore, imperative that the avenues of mobilizing capital at reasonable cost should be facilitated for metro rail project. State Governments should enable metro rail implementing agencies to raise cheaper long term debt by allowing them to issue corporate debt bonds or earmarking revenue from VCF modes like betterment levies etc. The provision of such security to support corporate debt bonds issued by metro rail companies will enable such bonds to obtain appropriate credit rating thereby making them attractive debt investment options for investors.

**xii. Appraisal**

The project reports, which entail financial assistance from the Government of India, will be appraised by an independent agency/ agencies identified by the Government. These agencies like the national Institute of Urban Transport, other 'centers of excellence' etc. will be identified on the basis of the domain

knowledge and expertise in the field of urban transport and metro rail available with them. Government will come up with a rigorous appraisal framework for appraisal of metro rail proposals. The identified independent agency/ agencies will appraise the projects on the basis of an appraisal framework.

**xiii. Monitoring of Performance**

Performance of metro rail projects during construction and implementation shall be monitored regularly against established Key Performance Indicators to ensure high standards of service delivery. The metro rail implementing agencies shall put in place an appropriate monitoring mechanism for this and the same should be indicated in the project report.

**xiv. Private participation and Public Private Partnership (PPP)**

Private participation either for complete provisioning of metro rail or for some unbundled components will form an essential requirement for all metro rail project proposals seeking central financial assistance.

- a. More cities are now leveraging on the private partnership for development and implementation of metro rail projects by way of unbundling the various activities and components to capitalize on the private resources, expertise and entrepreneurship.
- b. Government will encourage Public Private Partnership (PPP) for implementation of the metro rail projects in the country. State Government desirous of availing central financial assistance for metro rail system in a city should mandatorily explore the possibility of having a PPP arrangement.
- c. Forms of Public Private Partnership-All forms of PPP will be encouraged by the Government. As an indicative menu, the following broad models of PPP are some of the options for a way forward for PPP in Metro Rail:
  - i. Construction of new Metro Rail systems through DBFOTs (Design-Build-Finance-Operate- Transfer);
  - ii. Award of Concessions for operational services which could include supply of rolling stock;
  - iii. Award of Concessions for maintenance and upgrading of infrastructure.
- d. Private Participation in Operation and Maintenance (O&M)- With the increase of metro rail systems in the country coupled with the steady development of the expertise for managing the services in the private sector, metro rail agencies may explore the possibility of provisioning of rolling stock, signaling systems etc. and also maintenance and operation by a private entity. This would also bring in the managerial efficiencies, and entrepreneurial spirit of the private sector in the delivery of service.

Also, it is important to define the exact nature of private participation in the early stage of planning.

Some indicative models of O&M are:

**Cost + Fee Contract:** The authority/ owner pays the operator a monthly/ annual payment for operations and maintenance of the system. The remuneration given could comprise of a fixed fee and a variable component, which would depend on the quality of service provided. The operating and revenue risk are borne by the authority.

**Gross Cost Contract:** The operator is paid an agreed fixed sum for the duration of the contract. All risks related to operation and maintenance is borne by the operator and the revenue risk is assumed by the authority.

**Net Cost Contract:** The operator collects the complete revenue generated from the services provided. In case, the revenue generated is lower than O&M cost, the Authority may agree to compensate the difference in cost to the operator while finalizing the agreement. However, the operating and revenue risk are borne by the operator for the tenure of the contract.

- e. Private Participation in non-core activities: Some metro companies have been successful in involving private participation in the Automatic Fare Collection System leading to higher efficiencies and sharing of the cost by the private partner. Other such non-core activities should be explored for unbundling on PPP mode.

## **E. Options of Central Assistance for Metro Rail Projects**

The various options for central financial assistance for metro projects are as below:

- i. **Public Private Partnership (PPP):** Central financing for this model will be governed by the Viability Gap Funding (VGF) Scheme of Government of India or by any other guidelines issued or revised by Government of India from time to time.
- ii. **Grant by the Central Government :** Central Government will consider providing a grant of 10% of project cost, excluding private investment, cost of land, rehabilitation & resettlement and tax, to the state government for the construction of a metro rail project. The release of the grant may be indexed with the progress of the project. However, public private partnership in some form for implementation, operation & maintenance, fare collection or any other unbundled activities of the proposed metro rail project, wherever feasible, will be required.

iii. **Equity Sharing Model:**

- a. In this model, projects will be taken up under equal ownership of Central and State Government concerned through **equal sharing of equity**. The formation of a jointly owned Special Purpose Vehicle (SPV) will be an essential feature of this model. As is the prevalent structure, the SPV will be managed by a Board of Directors. The Managing Director of the SPV will be a nominee of the State Government so appointed with the prior approval of the Central Government. The ex-officio chairman of the SPV will be nominee of Government of India.
  - b. In this model, public private partnership (PPP) in some form for implementation, operation & maintenance, fare collection or any other unbundled activities of the proposed metro rail project, wherever feasible, will be required.
  - c. Government of India will provide financial support to metro rail projects in the form of equity and subordinate debt (for part of taxes), subject to an overall ceiling of 20% of the cost of the project excluding private investment, cost of land, rehabilitation and resettlement, after evaluating various parameters and as per extant practice and policies.
- iv. Government of India on its own may take up, after due consultation with the concerned state government(s), in the existing equity sharing model or any other funding pattern and institutional arrangement, those projects which are necessary for a city or metropolitan region development.

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