INSTITUTIONAL ARRANGEMENTS FOR THE PROVISION OF URBAN PUBLIC TRANSPORT

BY

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CERTIFICATE

This is to certify that the thesis titled "**Institutional Arrangements for the Provision of Urban Public Transport**" being submitted by Om Prakash Agarwal to the Indian Institute of Technology (IIT), Delhi for the award of the degree of Doctor of Philosophy is a record of the bonafide research work carried out by him under our supervision and guidance. The thesis work, in our opinion, has reached the requisite standard fulfilling the requirements for the degree of Doctor of Philosophy. The results contained in this thesis have not been submitted in part or in full, to any other university or institute for the award of any degree or diploma.

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ABSTRACT

Urban transport plays a critical role in the economic development of modern societies and the quality of life of their citizens. Unfortunately, cities around the world, more so in the developing world, are facing serious problems of congestion, air pollution, safety and energy security on account of the rapid motorization. It is also the fastest growing contributor to GHG emissions, a globally increasing concern. This trend is projected to continue, if remedial measures are not taken.

Persuading people to shift to public transport is an effective answer to these problems, as, on per unit of travel demand; public transport uses less road space, consumes less fuel and emits less pollutant. However, this requires that public transport be safe, convenient, affordable and clean. This is turn requires good institutional arrangements for organizing, regulating and managing such systems on a comprehensive basis.

It is in the above context that this research seeks to identify the best options for regulating and managing the public transport systems in a city. More specifically, it seeks to:

1. Identify the different institutional arrangements adopted for the regulation, management and delivery of urban public transport services

2. Study which institutional arrangement results in better performance of the public transport system

3. Suggest possible changes in the current institutional arrangements for three Indian cities of different size classifications

Answers to the research questions were sought by comparing the systems of urban public transport governance (regulation, management and delivery system) with the performance of the public transport systems in a sample of 20 cities around the world. It was expected that such a comparison would enable an identification of certain attributes of the governance system that contributed to good performance.

In analyzing the governance of urban public transport, a three tier framework of the different functions that need to be performed was adopted. The three tier structure comprised strategic functions, tactical functions and operational functions. The main question researched was who performed each of these functions how the different agencies performing these functions were inter-related.

Indicators to evaluate the performance of the public transport system were considered from three perspectives – the user, the operator and the larger society. The indicators studied were the Boardings to Population Ratio (BPR), Coverage, Affordability, Cost Recovery, and Air quality.

The study of the governance systems showed that the models for providing urban public transport services could be classified into three models, with one of them having two variants, as given below:

- Model 1 involves a single monolithic entity that plans and operates all public transport services

- Model 2 involves a separation of planning and coordination from operations with a separate entity undertaking planning and coordination and operations being with completely different entities. Within this model, there are two variants:
    - Loose coordination variant where there are multiple operators, most of whom undertake their own service planning, but are answerable to the planning and coordination entity for overall performance and integration with other modes
    - Tight coordination variant, where the planning and coordination entity undertakes demand assessment and service planning, following which it procures services under binding contracts. Thus, operator's compete "For" the market and are answerable to the planning entity under contractual agreements.
- Model 3 involves multiple operators undertaking their own planning and operating services based on permits or authorization from a public entity. There is no entity for coordinated planning or coordination of the services and there is competition amongst the operators "In" the market.

The findings show that a regulatory and management system that has a single service planning and oversight agency, with multiple and separate operating agencies, who compete "For" the market, performs best. Monolithic service planning and operating systems as well as systems where individual operators plan their own services were the lowest ranked.

It also finds that coordinated planning, separated from operations, is a more important determinant of public transport performance than public or private operation of such services.

Unfortunately, most Indian cities fall into one or other of the two lowest performing management categories. No Indian city has a single and separate planning entity. Either they have a monolithic operating company that plans its own services, or they have separate operators each of whom plans and operates in isolation of others. This needs to change and a over-arching planning entity needs to be set up, with operations being carried out by separate agencies, under tight contractual arrangements.

Accordingly, recommendations have been made for the governance structure for urban public transport in Delhi, Pune and Guwahati to be modified to have unified planning entities, with operations being separated from the planning process.

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