Bus Rapid Transit (BRTs): An Efficient and Competitive Mode of MassTransport

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Abstract

Transport is very important part of nation's economy. Public transport is the primary mode of transport for most of the population, and India's public transport systems are world's most heavily used systems. The main problems are common all around the world including India.They have to face problems associated with passenger mobility and connecting the city verge with central part. There are few innovative solutions are present to overcome these problems. Urban Planners and Administrator have found Bus Rapid Transit System (BRTS) as efficient, cost effective and simple as compare to other Light Rail Transit (LRT) and Metro Rail solution to provide mass public transport to city. This is a bus based mass transit system. It is known as a "surface subway", BRTS aims to join the capacity and simplicity of a bus system. BRTS is best suited to mid-size cities like Indore with deficient bus services and middle class basically forms the social structure. There is high demand irrespective of availability of Right Of Way;it can operate in a mixed traffic situation also. Basic concept of BRTS is to relieve road space by reducing private vehicles with low occupancy, to a comfortable, fast, mass transit mode. The objective was to study the BRT system based on qualitative parameters. This will help when designing future systems. The paper discusses about the vehicular growth and modal split in India and advantages of BRTS over other Transit systems. The Design and operational features of BRT are discussed in detail, problems presently faced by the system are discussed and solutions to these are suggested. Further improvements are suggested which can help to increase the ridership of the system.

Keywords: Public transport system; Passenger mobility; BRTS; LRT; Metro rail; Vehicular growth; Modal split

Introduction

Improvement of Transportation system is very important for development of urban areas. By providing access and mobility weenable functioning of urban areas efficiently. Passenger has an influence on the functioning of the city and with growth the mobility also needs to be increased. There is two ways to increase mobility, by encouraging private transport services like auto-rickshaw, private buses, and taxis or by public transport systems. Instead of private transport system we can choose public transport system to decrease traffic congestion, air pollution, and greenhouse gas emissions. By attracting development around transit stations it helps in reduction of sprawl. Hence community planning officials examined improved public transportation for addressing their urban mobility issues. There are many transit technologies like Metro Rail Transit, Light Rail Transit (LRT), Mono Rail etc. but these are uneconomical, non-flexible and have high capital and operating costs so we needed creative ways of improving service quality cost-effectively. BRTS has operational flexibility, and can be built quickly, incrementally, and economically.

Figure1: Vehicular growth and modal split in India.

Vehicular growth and modal split in India

[illegible] decades India has seen a high rate of increase of motorised

years. Urban traffic in India includes high levels of Non-Motorized

buses operate in bus-priority lanes, which also permit access to mixed traffic. Bypassing lanes at stations enable express routes to skip certain stations and reduce travel times for some passengers. Not all corridors have the same travel demand and so there is not a one-size-fits-all BRT. A city should aim to implement the highest-quality BRT that meets the travel demand and mobility needs on a particular corridor [4].

Globally, the range of systems varies from very high-capacity to relatively low-volume corridors as with BRT performance, project costs vary significantly across systems depending on the extent of the roadwork's required, corridor capacity (e.g., inclusion of bypass lanes at stations), obligatory simultaneous repair or upgrading of urban utilities (e.g., water, sanitation and electric services along the BRT corridor) and the quantity and type of equipment used, among other factors. Local conditions, such as cost of labor and capital, will also have an impact on total system costs. Where BRTs are used as a vehicle for broader urban transport reform, suchas formalizing an informal transport industry, there are added costs associated with that transformation. While capital costs per kilometer and operating costs can vary significantly among BRTs, data from existing systems help to define an indicative range of BRT costs. Total BRT capital costs include busway infrastructure, stations, buses and technology systems such as passenger information and fare collection systems.

Cost-benefit analysis methodology

Bus rapid transit projects have the potential to provide travel time, public health, environmental, land use, and other benefits to society. However, like all transport options, BRT systems can also impose social costs from construction, operation, and maintenance. In order for policymakers to make an informed decision regarding the development or expansion of a BRT project, the project should be evaluated in terms of total benefits compared to total costs. Ideally, an analysis of alternatives should be done comparing alternative solutions in a preconstruction phase. Cost-benefit analysis (CBA) is used to capture both public and private costs and benefits for society as a

- Savings in operation costs of public transport vehicles are the second largest benefits. This is the result of larger, newer buses that operate at higher speeds. This also helps the system to achieve lower emissions.
- The largest proportion of users of the BRT system is in the lower- and middle-income groups.
- The largest proportion of benefits accrue to those of modest income representing the second quintile of the income distribution.
- The largest losses accrue to those at the top of the income distribution.

Johannesburg's rea vaya:

- Together the bus operation and maintenance contract and the capital costs constitute 96 percent of the total project costs.
- The high cost of the bus operating contract reflects, in part, the cost of formalizing and empowering the minibus taxi industry.
- The largest portion (37 percent) of benefits comes from travel time reductions followed by improved road safety (28 percent).
- Phase 1A has been a progressive project; the upper income quintile bears the majority of the costs, while the project benefits accrue to lower quintiles, predominately the 4th highest income quintile.

Social, Environmental and Economic Impacts of BRT Systems

The city's poorest residents are underrepresented in BRT users and therefore are not significant beneficiaries of the project. They do share in 4% of the project benefits, while only contributing to 2% of the costs.

Istanbul's metrobus

- The largest proportion (64 percent) of benefits comes from travel time reductions, followed by vehicle operating cost reductions (23 percent) and traffic safety (9 percent).
- Metrobüs costs are driven primarily by operating and maintenance costs.
- The largest proportion of users of the BRT system are in the lower- and middle-income groups, though benefits exceeded costs in all income groups.

The five cases suggest several general conclusions about BRT costs and benefits:

- Travel time savings dominate the BRT benefits as a result of segregated bus lanes and other design features that minimize waiting and in vehicle times.
- Shifting from informal/unregulated service with smaller vehicles operating in mixed traffic, to newer, larger buses operating at higher speeds results in significant reductions in vehicle operating costs with BRT (Bogota, Mexico City and Istanbul).
- Capital costs and bus operating costs were the most significant portion of project costs in the cities.

For the most part, the largest proportion of users from the case study BRT systems is in the lower- and middle-income groups. The

	Higher operation speeds increases passengers' willingness to walk to stations