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INSIGHT'17 - Advanced Transportation Systems And Infrastructure Development in Developing India

Implementation of Automations for Optimisation of Public Operation and Services

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Abstract :- **In recent years, Indiais facing an explosive growth in vehicles ownership and utilization, which has led to traffic congestion and pollution. However Indians prefer to use private vehicles because of many reasons due to lack of cleanliness, lack of technology, smart solutions, their implementationsand bad services.This can be addressed by making smart assistance, using GPS, giving real time updates, updating regular stop and time table, making application which shows availability of public buses and various advanced technologies. In this regard, public transport operators are forced to lay emphasis on the monitoring and improvements of the services provided. This research paper focuses on traveler's satisfaction and preference towards public transport with service quality attributes. The aim is to evaluate the parameters in passenger preference and satisfaction on public transportation network with respect to facilities, comforts and quality of services. The application of this study suggest that the public transport operation especially, buses must improve the quality of their services for the prospective passengers.**

Keywords: **- Traffic congestion, public buses, advanced technologies,smart solutions**

I INTRODUCTION

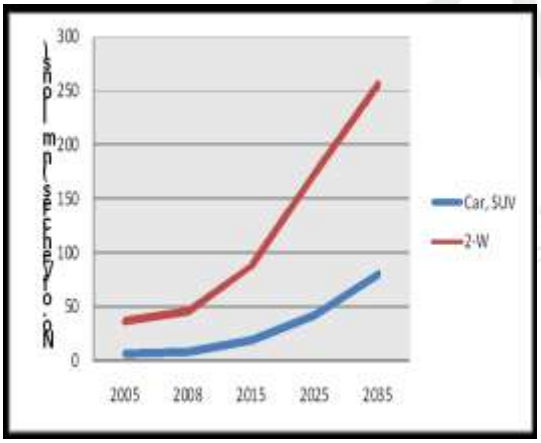

Figure 1: Forecast of Vehicle Populations in India

All the million plus cities in India facing a serious urban transport problems, due to the increases in population in urban areas as a result of both - the natural increase and migration from rural areas and smaller towns. The increase in the number of motorized vehicles and in the commercial and industrial activities has further added to transport demand in urban areas, shown in the above ***Figure 1***. In many cases, this demand has outstripped the existing road capacity. This is becoming more & more evident in the form of greater congestion and delays, which are widespread in Indian cities and indicate the seriousness of transport problems. A high level of pollution is another undesirable feature of these overloaded streets. The transport crisis also takes a human toll. Statistics indicate that traffic accidents are a primary cause of accidental deaths in Indian cities.

The main reasons behind these problems are (i) Prevailing imbalance in modal split, (ii) Inadequate transport infrastructure, and (iii) Sub-optimal use of existing transport infrastructure. The existing public transport systems in the Indian cities have not been able to keep pace with the rapid and substantial increases in demand over the past few decades. Particularly the bus services have much deteriorated, and their relative output is further getting reduced as passengers are continuously switching to personalized modes and intermediate public transport.

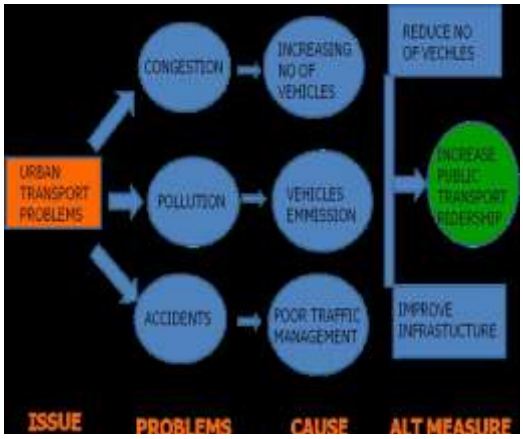

Figure 2

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The above figure 2 mention the major issue, problems cause and best alternative measure related to urban transport and shows that how public transport can reduce urban transport problem in Indian cities. These cities cannot afford to cater only to private cars and two-wheelers. There must be a general recognition that without public transport cities would be even less viable. There is a need to encourage public transport instead of personal vehicles. This requires both an increase in quantity as well as quality of public transport and effective use of demand as well as supply-side management measures.

Hence, it is incumbent on the government to institute appropriate policy initiatives to increase the share of public transport by improving the service quality and comfort. Such interventions should identify & consider factors influencing the demand for public transport and should also quantify the impact of environmental and policy variables. Presently the public transport systems are either undercrowded or overcrowded.

II LITERATURE SURVEY

Herbert S. Levinson and Samuel Zimmerman proposed that the spiraling cost of rail transit, and market realities, a growing number of cities have installed or are planning BRT. This paper presents a synthesis of current experience, drawing upon ongoing research. The paper describes the nature of BRT; where BRT operates; key features such as running ways, stations, vehicles, ITS, and service patterns; performance in terms of ridership, travel times and land development; and the emerging implications for new systems. It is important to match transit markets to rights-of-way; achieve benefits in speed, reliability, and identity, minimize adverse impacts to street traffic, property access, and pedestrians; and obtain community support throughout an open planning process.

The paper by Dario Hidalgo and Pierre Graftieauxsummarizes technical, financial, and performance information regarding bus system improvements in 11 cities in Latin America and Asia. The cities selected in this review improved their transport conditions either through citywide bus reorganizations through improvements in selected corridors and areas of the city. Both citywide reorganizations and corridor improvements included the introduction of bus rapid transit (BRT) elements. The reviewed systems improved the transport conditions for the commuters served and had other benefits, particularly the reduction of pollution and accidents. The BRT corridors implemented show high performance and have generally been well received by the users, with relatively low capital investments and small or no operational subsidies. The systems have faced problems related to planning, implementation, and operations, mostly as a result of institutional and financial constraints. Most problems were solved in the initial months after implementation. The experiences in developing cities show the potential of BRT for a wide range of applications, from medium-demand to very-high-demand corridors. Lessons learned from these applications are useful for the development of similar projects.

III METHODOLOGY

This study provides information on the implementation of public transportation initiatives. The document contains a non-exhaustive list of measures to improve bus service. The approach developed in this guide is flexible and adaptable to local conditions and circumstances, allowing for adjustments and variations.

Section 1 introduces the purpose of the studyby explaining the rationale behind transportation projects aimed at improving bus services, and defining the main attributes of an improved bus system. Furthermore, the guide elaborates on the key motives for improving bus service as well as the potential payoffs that could result from such improvements.

Section 2 provides information on the steps to plan and implement improved bus services.

Section 3 lists a series of potential initiatives and measuresaimed at improving bus service. The first two themes, “network planning and services” and “branding & marketing”, are discussed in a qualitative manner. The last three themes – “right of way & transit priority”, “bus stop and bus station” and “vehicle” – are described in a standardized format, i.e. on index cards including a brief description of the measure, its potential benefits and issues, as well as average costs, examples and additional resources.

Section 4 contains direction on the monitoring and evaluation of improved bus services initiatives.

“The strategy to attract people to transit is always based on increasing convenience, affordability and the promise of performance. The strategy to retain riders is based on reliability and on the many other aspects of a customer’s experience that influence feelings of safety, trust and ease-of-use."

This guide has identified five “categories of action”, each of these containing more specific and

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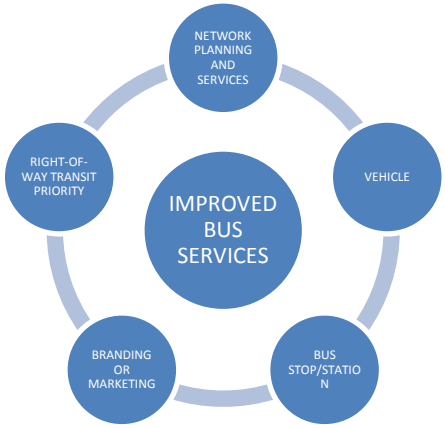
detailed measures or initiatives to achieve bus service improvements:



Network Planning and Services

These strategies aim to improve the transportation planning process. Planning for bus service is more effective when it relies on a comprehensive and strategic approach. The primary purpose is to form an integrated and efficient network of transit services, combining bus service with other modes of transportation (both public and private) and urban development policies.

Vehicle

Vehicles should be carefully selected because of their impacts on travel time, service reliability, and operating or maintenance costs.

Bus Stop and Bus Station

Bus stops and stations should be carefully designed because of their impacts on both the convenience and the attractiveness of using a bus service. Various key elements should be considered, such as the visibility of the bus stop/station, its accessibility and available commodities, the linkages to other transportation modes, enhanced traveler information as well as the location of the bus stops/stations (transit-supportive development). Choosing a bus stop location that maximizes surveillance may also contribute to reduce opportunities for crime.

Branding and Marketing

Branding and marketing strategies have become a critical component of transit improvement projects. These strategies are intended to build a distinct brand identity for a bus service by emphasizing its distinctive features and benefits, and presenting it as a "premium" transportation alternative. Branding, market research activities and social marketing are among the list of possibilities.

Right-of-Way and Transit Priority

A bus service can significantly benefit from the introduction of right-of-way and other measures that reallocate road space by giving priority to transit vehicles and increase the competitiveness of buses. By allowing buses to bypass traffic congestion, the service gains in speed and reliability. There exists a variety of transit priority measures and right-of-ways along which the bus can operate, such as dedicated right-of-ways, bus lanes and transit priority systems.

Smart Application for Public Convenience

Present bus transportation system is not well organized, so people avoid the use of public bus transport. Therefore there is a need of a smoother bus transport system. This application will keep the users updated.

This application will have following specifications:-

1. Bus timings
2. Bus routes
3. Alternative Bus which can be use
4. Booking facility available
5. Synced with GPS
6. Rapid Transit facility

Rapid Transit System

BRT (BRTS, busway, transitway) is a bus-based public transport system designed to improve capacity and reliability relative to a conventional bus system. Typically, a BRT system includes roadway that is dedicated to buses, and gives priority to buses at intersections where buses may interact with other traffic; alongside design features to reduce delays caused by passengers boarding or leaving buses, or purchasing fares. BRT aims to combine the capacity and speed of a metro with the flexibility, lower cost and simplicity of a bus system.

BRT systems normally include most of the following features:

Dedicated lane

Bus-only lanes make for faster travel and ensure that buses are not delayed by mixed traffic congestion. Separate rights of way may be elevated, in a cutting, or in a tunnel, possibly using former rail routes. Transit malls or 'bus streets' may also be created in city centers.

Busway alignment

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Centre of roadway or bus-only corridor keeps buses away from the busy curb-side, where cars and trucks are parking, standing and turning.

Off-board fare collection

Fare prepayment at the station, instead of on board the bus, eliminates the delay caused by passengers paying on board.

Intersection treatment

Prohibiting turns for traffic across the bus lane significantly reduces delays to the buses. Bus priority will often be provided at signalized intersections to reduce delays by extending the green phase or reducing the red phase in the required direction compared to the normal sequence. Prohibiting turns may be the most important measure for moving buses through intersections.

Platform-level boarding

Station platforms should be level with the bus floor for quick and easy boarding, making it fully accessible for wheelchairs, disabled passengers and baby strollers, with minimal delays.

High-level platforms for high-floored buses makes it difficult to have stops outside dedicated platforms, or to have conventional buses stop at high-level platforms, so these BRT stops are distinct from street-level bus stops. Similar to rail vehicles, there is a risk of a dangerous gap between bus and platform, and is even greater due to the nature of bus operations. Kassel curbs or other methods may be used to ease quick and safe alignment of the BRT vehicle with a platform.A popular compromise is low-floor buses with a low step at the door, which can allow easy boarding at low-platform stops compatible with other buses. This intermediate design may be used with some low- or medium-capacity BRT systems.

High capacity vehicles

High-capacity vehicles such bi-articulated buses may be used, typically with multiple doors for fast entry and exit. Double-decker buses or guided buses may also be used. Advanced Power train control may be used for a smoother ride.

Quality stations

BRT systems typically feature significant investment in enclosed stations which may incorporate attractive sliding glass doors, staffed ticket booths, information booths, and other more standard features listed above. They will often include level boarding, using either low-floor buses or higher boarding platforms level, and multiple doors to speed passenger boarding and enhance accessibility to disabled passengers. Fare validation upon entry to the station in a similar manner to that used on entry to a subway system is also common, particularly at busy stations.

Prominent brand or identity

A unique and distinctive identity can contribute to BRT's attractiveness as an alternative to driving cars, marking stops and stations as well as the buses.

Large cities usually have big bus networks. A map showing all bus lines might be incomprehensible, and cause people to wait for low-frequency buses that may not even be running at the time they are needed. By identifying the main bus lines having high-frequency service, with a special brand and separate maps, it is easier to understand the entire network.

IV CONCLUSION

There is a growing number of bus rapid transit systems throughout the world. A review of these experiences indicates that BRT can reduce saving times, attract new riders, and induce transit-oriented development. It can be more cost effective and provide greater operating flexibility than rail transit. BRT can also be a cost extension of rail transit lines. And it generally can provide sufficient capacities to meet peak-hour travel demands in most U.S. corridors.

There is, however, a need for improvements in vehicle design and system identity. There remain missing elements in many BRT systems, often a result of cost-cutting measures made during the development process. Other considerations include maintaining high average trip speeds. High speeds can be best achieved when a large portion of the service operates on separate rights-of-way. In addition, major BRT investments should be reinforced by transit supportive land development and parking policies.

More cities can be expected to implement BRT systems in the future. There will be a growing number of fully integrated systems, and even more applications of selected elements. These efforts will lead to substantial improvements in transit access and mobility.

This paper also suggests the use of smart application which will help in the smooth functioning of the BRT.

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