

Integrated Transport System for Kerman City in Iran - Key Success Factors

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Abstract: Transportation is an essential part for all our lives. Providing the same by the authority and availing the service by the people depends upon the capacity to provide and demand by the city in turn the people, however, making them accessible for comfort and effective matters. The integrated transport system always stand out as a success factor nowadays in planning. Transport integration is understood as the integration of different transport modes which operate on different transport networks. Generally, integration is required when some system is composed of several parts and elements due to their limitation of threshold services. The aim of integration is to increase the work efficiency of these elements by their complementary. Integration can be understood as the *physical*, *operating* and *managerial* aspects of integrated transport system. With the current technology, providing intermodal journey information has become easier with real-time information. In the emerging and developing countries, the rate of motorization is increased rapidly hence the implementation of a sustainable transportation system in growing cities is becoming a big challenge. Numerous societal trends have led to traffic performance growth, besides the growth of population and urbanization, increasing income and new production methods, as well as distance intensive trade relations, are key drivers for transport demand. In this paper, some important elements of planning and design principles for the public transport network which can form some important decisive factors for the success of public transportation in the form of modalities of integrated transport system for Kerman city in Iran has been discussed. The emphasis is on high-quality public transport that can replace car use to create a more sustainable and environment-friendly city region on a long-term basis hence creating solutions for public transport systems as a competitive alternative to the motor car for urban travel.

Keywords: Integration, sustainable transport, public transport, urbanization, growth.

INTRODUCTION

Movement of goods and people is one of the most fundamental challenges of urban development in the current world. Public transportation is a critical element in urban planning, and its significance in the sustainable form of mobility is a growing aspect in the present context of environmental challenges which burden the cities. There is a substantial growth in the number of private vehicles in the recent years, over the public transport service that has drawn the attention of policymakers and led to introducing new strategies and policy instruments to enhance public transportation services. In small cities, the predominant role of public transport is to provide social services, particularly for those who cannot or not able to use private cars. In large cities, its role is even more important because it aims to serve as many travelers as possible to prevent excessive traffic congestion and its negative side effects [1].

Public transport service requires special attention in policymaking as well as at the planning, and implementation stages since a lot of factors affect the

success of the planning strategies to be taken for better public transport service enhancement. To accommodate the public transport it requires designated access movements, the pathways, with terminal or stops facilities, integration and exchange hubs for another mode of transportation facilities are the utmost important elements forming the infrastructure of cities, because “transportation is indeed both a maker and breaker of cities” [2].

The absence of sufficient fleet, inadequate financial resources to fund infrastructure and operational subsidies, and also a lack of integrated transport planning are some of the major problems that some countries are facing in the planning process of public transport development [3].

Objectives

Hence the planning strategy for integrated transport system needs to follow the comprehensive study in the systematic sequence in the form of objectives such as:

- understand the integrated transport system development for seamless transport services in balancing the need and demand;
- evaluate the efficacy of transport integration for its effectiveness and efficiency with the city growth and rate of urbanization; and
- assess the success of integrated transport system to support the sustainable development and growth prosperity.

According to Givoni & Banister, [4] from policy to practice, integration is naturally required where a system is a buildup of several parts, and the bases need to complete each other so that it can work more efficiently. May & Roberts [5] studied integration as a principle in urban transport policy and suggested a range of types of integration, and highlight the problems in developing an effective integrated strategy, given the number of variables involved. Argued that integration should be designed to serve agreed objectives of transport policy, rather than being an objective in its right. They considered the principles for designing an effective integrated strategies as a combination of infrastructure, management and pricing measures to achieve better performance against transport policy objectives. Dr. Stephen Potter and Martin J Skinner [6] presented the planning process of an integrated urban transport system for a medium-sized metropolitan area. The overall objective of the integration is to enhance the traveling standards within the metropolitan area resulting in the change of the residents' traveling habits and behavior and modification of the modal split. Katarzyna Nosala, Katarzyna Solecka [7] examined the impact of travel demand management and basic concepts of urban public transport integration. The process of striving for integration of urban transport requires detailed analysis of tools to assess the activities. Chris Booth, Tim Richardson [8] studied the recent policy shift towards integrated transport has been accompanied by significant institutional changes, which have created a new framework for transport planning, with important implications for public involvement. John Preston [9] highlighted the reasons for the relative failure of integrated transport policies with particular reference to experience in the UK. The factors highlighted were the difficulties faced in defining the integration concept, difficulties in 'operationalizing' the concept, lack of practical evidence on the success of integrated policies and lastly barriers to behavioral change that integration requires.

These factors could have been a set of considerable aspects to draw out a methodology for planning integrated transport system and their comprehensibility will remain as success factors.

This discussion content of this paper relies on the documents and the statistical data officially published by the authorities regarding public transport, urban transportation and the city overview and environment of Kerman, in Iran. Hence it employed secondary source data to address all research objectives of the paper.

Growth of Population & Road Network in Kerman City – An Overview

The population of the city in 1996 was 385,000 and in 2006 was 515,414 and the present population is 722,484. Kerman city is located in Kerman province which is in the southeastern part of Iran. It engages about 45401 square kilometer which is equal to 24.39 percent of total area of Kerman province. Its urban spread in the form of compact development has a distance of 7 to 8 km from the central business district. Kerman area until the end of Qajar dynasty was about 200 hectares after that in 1969 it expanded to 400 hectares so it is said that the city size has become double. According to the municipality of the Kerman city, the present area of the city is 13000 hectares. Kerman city's urbanization has increased with the urban population. The urban population is scattered in large geographical areas and various places in Kerman city. The various requirements like education, employment, hospitals, entertainment, marketing, recreation, administration and many more necessities of the urban population are well accommodated in the city, with an updated road network. The transportation ensures the mobility of people, goods, and services which are the essential mechanisms of city function and development. Any dysfunction or rupture in the road system will put the cities into serious difficulties affecting deeply the transportation of the city system, its livability, and its growth. Roads serving particular land uses must be adequate regarding the design and safety criteria correspond to those of the land uses. Otherwise, conflict is going to occur which leads to transportation problems.

The demand for transportation in urban centers is linked to the residential location choices that people make about places of work, shopping, entertainment, schools and other important activities. The primary causes for the rapid growth of travel demand in Kerman city, Iran, are due to urbanization, population growth, and rising incomes. Increased urban population and number of vehicles have led to increased traffic congestion in Kerman cities, but the existing road network is unable to cope with the ever-burgeoning traffic volume day by day. Urban roads in the city of Kerman have reached the level of saturation regarding the volume-capacity ratio in many cases, which is evident of severe congestion. Other areas of cities are the worst affected in this respect, with road space being extremely scarce compared to the rest of the city. This

brings into sharp focus on the role of public transport in urban areas.

Kerman City Transport Plan

Looking at the investment needed to satisfy the growing demand and to plan for a sustainable future the transport master plan was drawn by using outside consultants by the government of Iran. The approach of the government is noteworthy as they tried to create a transport solution that will deliver a strategic vision for the city for 2025 and beyond. The focus is on high capacity mass transport. The pillar of the plan is a strong commitment to rail transport complemented with Bus Rapid Transport (BRT), improved regular bus services, as well as cycling and walking improvements. Concerned authorities have tried to develop a comprehensive strategic plan which illustrates a sustainable development of the city. The primary mode of transport choice being public transport with a semi public system as a complementary and private transit mode as the least priority. This is in place with a special emphasis on private sector partnership and investment.

Integration of Public Transport – A Need

Transportation affects city development both directly and indirectly. On the other hand, development of cities influences transit networks and systems. Among them, public transportation owing to its high functional capacity influence the city on a vast scale; thus, it requires extra attention: “public transportation should be considered in basic decisions about form and identity of a city and its city region or metropolitan area as the most effective mode and most trips as the only possible substitution for automobile” [10]. The mass public transport alone will not provide effective service. The integration of various modes may achieve success through effective planning strategies.

Public passenger transport integration is the integration of different transport modes which are operating on the different transport networks on which various providers of public passenger transport provide services. Integration brings together the different subjects approaches aims, intentions, and barriers together. Integrated transport can be defined as the organizational process through which the planning and other system elements are associated with the aim to increase economic and social benefits considering the impact on the environment.

Various possible modes of transport which can pool up through the integrating process are:

- Private transportation (walking, biking, and personal car);
- Semi-public transportation (includes vehicles such as vans, mini-buses, city cars, high-occupancy vehicles (HOV), car pooling and taxis); and

- Public transportation (Public transit has the capacity of displacing more passengers than private and semi-public transportation).

Some of the critical success factors for integration which is to be considered for an effective planning are:

- Institutions – to ensure the right transport choices are made for the public;
- Infrastructure – to ensure public can enjoy the most convenient travel experience possible;
- Network – to ensure the public can make a joined up journey from origin to destination;
- Information – to ensure the public can make informed decisions before and during their journey; and
- Fares – to ensure reasonable compensation is charged for traveling in public transport.

Key success factors of public transportation planning require awareness of how the transportation system should be developed finding the right balance between demand and supply of oriented planning with coordination and combination of different travel needs.

The main groups which should be involved in the integrated transport systems are identified:

- public passenger transport providers - they have to be willing to provide the interconnection of their systems regarding transport, economic, organizational and tariff;
- general public - they are the decision-makers, they create the demand, and they decide about the success of transport system; and
- authorities (public service) – they create the legislative framework how the integrated transport system should operate.

How to Achieve Transport Integration

Along with all the aspects which are discussed in the preceding paragraphs, three prerequisites are required to achieve a successful integrated transport networks systems:

- Integrated planning,
- Integrated infrastructure, and
- Integrated operations.

Integrated Planning – it is a major challenge to get all the agencies which are directly responsible for planning and effective transport networks (e.g., at state, local and private). To coordinate their efforts and to ensure transport policy formulation, services development, managerial and legal authorities, finance, environment, trade, and commerce, etc. for their coordination for developing networks and an integrated system.

Integration of Infrastructure – It requires various transport modes to seamlessly connect to enable the most convenient and highest quality travel experience. The operation of services at interchanges is of particular importance, as waiting time is perceived to be 2.5 times greater than the actual time.

Integrated Operations - integration of infrastructure, public transport services need to be coordinated to ensure seamless connections between services (bus to bus, bus to train, bus to the ferry, etc.) from origin to destination. In high patronage areas, ‘turn up and go’ frequencies of 5 to 10-minute intervals are preferred. The different modes need to complement each other, rather than operate independently or in competition with one another. Traveler information, particularly real-time service information, integrated with computerized automation is the key factor to success as well.

CONCLUSION

Integrated public transport systems make travel easier and more affordable. To have a truly integrated transport system, a regular review of the existing and proposed transport infrastructure and services is an essential factor. If the general public has to decide for the public transport in the form of integrated transport system and not for individual automobile transport, then it has to be attractive regarding offering services and advantageous fares. The key to success of public transport is good network planning and development and having the right network plan and the right network design principle. To create an integrated network for all modes and services with superior infrastructure for public transport structure that is fixed and stable to form the backbone of any urban land-use planning and development. The government of Iran has to recognize that future development is very important and this requires effective strategic planning while understanding the fundamentals of sustainable land use and transport policy. To understand the meaning and impact of transport integration one have to observe transport-related concerns and challenges from the traveler's point of view to create integrated transport systems.

Over the past fifteen years, the traffic congestion has become more than a nuisance and turned into a major challenge in all the metropolitan regions of Iran. The metropolitan region is growing at a rate of about one per cent so any new transportation system is needed to cater for the growing demand and it has to be adapted to the development and expansion of the city.

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