



Short-term public transport solutions in Auckland, New Zealand



Muhammad Imran^{a,*}, Lee Matthews^b

^aSchool of People, Environment and Planning, Massey University, Private Bag 11222, Palmerston North 4442, New Zealand

^bSchool of People, Environment and Planning, Massey University, New Zealand

ARTICLE INFO

Article history:

Available online 12 August 2014

Keywords:

Public transport
Network planning
Auckland

ABSTRACT

This paper investigates policy approaches which will improve the existing public transport system in Auckland, New Zealand. The four principles of public transport network planning: line structure, frequency, transfers and fare systems, are applied to the Auckland Northern Express (the only Bus Rapid Transit (BRT) in New Zealand). The data concerning the Northern Express and its associated network was collected from policy and planning documents, timetables and websites. The data was further verified by conducting detailed fieldwork on the selected network. The results show that the Northern Express exhibits some network planning principles such as a simple straight-line route, high frequency and transferrable fares. However, the Northern Express is poorly coordinated with the surrounding bus network; this coordination could be improved to gain higher patronage levels. The analysis indicates that the poor performance of public transport in Auckland can be addressed in the short-term by improving public transport services at relatively little cost.

© 2014 World Conference on Transport Research Society. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Efficient public transport is integral to improving the economic, social and environmental sustainability of city transport systems (IPCC, 2014). There are ranges of factors that influence the development of an efficient public transport system, dispersed cities adding to the complexity of these factors. The poor performance of public transport in Auckland, New Zealand has been linked to the spatial and socio-economic characteristics of the city, and the policies adopted over time (Imran and Matthews, 2011). Certainly, these factors have influenced the successes and failures of city public transportation, but a public transport service has, of itself, the potential to make a system successful in the short-term, at relatively little cost (Mees et al., 2010; Stone et al., 2012). The aim of this paper is to investigate the policy approaches that are capable, in the relatively short-term, of improving the existing public transport services in Auckland.

This paper first reviews the long and short-term factors capable of making a public transport system successful. Next the research design and the reasons for selecting the Northern Express (the only BRT line) in Auckland as a case study for data collection and detailed investigation is discussed. The analysis of the Northern Express in the following section focuses on the core

elements of network planning including line structure, frequency, reliability, fare structure and transferring. The analysis is discussed, concluding that a network planning approach can, at relatively low cost, can improve public transport in Auckland in the short-term.

2. Public transport improvements – long and short-term factors

Public transport has the potential to mitigate the social, economic and environmental consequences of private vehicle travel in urban areas (IPCC, 2014). However, better quality and improved forms of public transport are a prerequisite for mitigation raising the question how can better quality public transport be achieved? The discussion in the literature concerning factors that can influence effective public transport provision can be divided into long and short-term factors.

2.1. Long-term factors

The physical, social and economic characteristics of a city, its people, political system, and institutional arrangements are factors that need to be considered in making public transport successful in the long term.

First, physical characteristics – compact cities, with high population densities and mixed land use such as Hong Kong and Singapore, are more likely to develop successful public transport

* Corresponding author. Tel.: +64 6 356 9099x83848.
E-mail address: m.imran@massey.ac.nz (M. Imran).

systems (Ewing, 1997; Cervero, 1998; Newman and Kenworthy, 1999; Naess, 2006). However, Cao et al. (2007) argue that urban composition cannot independently influence public transport success, the success being contingent on the quality of the transportation system provided. *Second*, the relationship between public transport use, income and status demographics is widely accepted (Dargay et al., 2007). Low income people are generally more likely to use public transport, although this is not the case in wealthy European and Asian cities (Newman and Kenworthy, 1999) where the quality of the public transport systems has a greater influence on car usage (Mees, 2000). However, people's perceptions and experiences, and convenience influence the use of public transport (Vugt et al., 2006; Tertoolen et al., 1998).

Third, political parties, their leadership and agendas have the potential to directly influence the success of public transport such as in Bogota, Melbourne and Vancouver (Alvarez, 2010; Stone, 2013). *Finally*, institutional arrangements – such as public monopoly, deregulation and privatisation, and public planning – are crucial supports for public transport policy and planning in a city. Public monopoly is superior when the aim is to protect customers, and employees, and provide equal access opportunities (Sohail et al., 2006; Savage, 2004). However, this arrangement suffers due to the large financial burdens (subsidies) imposed, and inefficiencies. Deregulation and privatisation increase competition, economic efficiency and productivity, but private companies neglect accessibility requirements, increase fares, decrease service levels and even give up unprofitable lines (Mees, 2005; Gwilliam, 2008; Rothengatter, 1991). Recently, a new structure of proactive public planning has emerged, where government regulates and directs the public transport system while contracting out service delivery to private companies (Barter, 2008). Selected private companies operate all or part of the public transport network in an integrated way such as in Curitiba and Santiago de Chile.

2.2. Short-term factors

The short-term factors include fixing existing public transport services within the pre-existing organisational, financial and legal framework (Nielson, 2005). These fixes may include frequency, reliability, transferring and fares improvements brought about by adopting simple and grid-based line structures adopted within a network context (Mees, 2000; Nielson, 2005). The 'network effect' enables public transport services to be added in ways that increase demand proportionally faster than the resources are added.

2.2.1. Line or route structures

The network planning approach to public transport demands the adoption of simple, straight and stable line principles, moving from origin to destination using the most direct path possible given the surrounding land uses, topography and road network (Mees, 2000; Nielson, 2005). The primary reason for this is that simple and straight-line patterns offer the most direct and quickest travel paths for passengers, and develop a system which can be easily understood by passengers. Mees et al. (2010) argue that public transport lines should be a 'defined and unchanging physical route with a fixed stopping pattern, a specific timetable, and a unique name and number' (p. 20). The simple and straight-line structure has been adopted in cities including Zurich and Toronto, to minimise travel time and make the public transport network more efficient (Mees, 2000, 2010; Stone et al., 2012; Nielson, 2005; Thompson, 1977).

By adopting simple and straight line principles, public transport can operate in north-south and east-west directions, creating a cross-city grid pattern, where passengers can 'go anywhere, anytime' using the most direct path possible (Thompson, 1977). As a result, a very comprehensive public transport service network

is created as all areas of the city can be accessed from any other part. Normally, the only requirement is for passengers to transfer at least once to reach their final destination. This pattern is also suitable for today's dispersed travel patterns where activities are becoming more decentralised. For example, the CBDs in United States' cities contain less than 10 per cent of city jobs (Thompson and Matoff, 2003); a citywide public transport network is therefore needed.

In simple and straight principles, the central city is not the start and end destinations for public transport. Instead, public transport routes serving commercial and educational land uses can improve accessibility, be maintained at high frequencies, and generate patronage (Ceder, 2007). This is a classic example of public transport route design where land use generates high levels of patronage, but there is a possibility of losing passengers if the services are too indirect (ibid). Ottawa offers an interesting trade-off model where buses serve land uses in suburbs before entering a busway. In this way, Ottawa combines meandering routes serving important land uses, with high frequency direct routes on busways or main lines, offering the high frequencies which generate transport-led development (Nielson, 2005). Based on these principles, this research explores the public transport line structures present in Auckland.

2.2.2. Transferring

Shifting between modes or services to reach an end destination is a key concept in the grid-based public transport service planning approach to generate the 'network effect'. Coordinated transfers offer an increased range of travel destinations, improve operational flexibility and efficiency, and ultimately increase public transport demand in the network (Lo et al., 2003; Mees, 2010; Stone et al., 2012; Nielson, 2005). In Hong Kong, travellers often need to transfer three or four times to reach their end destination (Lo et al., 2003). Similarly, 70 per cent of all Munich and London underground trips, 40 per cent of all Paris public transport trips and 30 per cent of New York subway trips require at least one transfer to reach an end destination (Guo and Wilson, 2011). Due to well-designed transfers, patronage levels remain high in these cities because 'transfers open travel paths to and from non-CBD destinations that are reachable in radial systems only by lengthy and circuitous travel' (Thompson and Matoff, 2003, p.298). However, if timely and quality transfers are not provided, transfer becomes a negative element as 'riders may perceive it to be more acceptable to take modified routes that eliminate transfers, even if initial waits and riding consume more time' (Horowitz and Zlosek, 1981, p. 282). Express buses are an example of avoiding transfers in many cities. The provision of quality transfer points and a connected network clearly needs to be a priority in public transport service design. This research seeks to investigate whether public transport in Auckland facilitates transfers between different lines and modes.

2.2.3. Frequency and reliability

How frequency and coverage is incorporated into the design of public transport services is complex, and depends on policy goals. For example, if the goal is to provide maximum accessibility to a city's population, then public transport services are designed to improve coverage. Over the last two decades, Auckland has aimed to provide public transport service stops within a 400 m reach of each resident. This aim is consistent with many other Australasian cities which provide public transport access to 90% of their populations (Murray, 2001). Similarly, if the policy goal is improving patronage and economic efficiency, then frequency and reliability are important. Frequency of public transport refers to how often a bus or train travels along a particular route, while reliability refers to efficiency and speed with which that bus or

Download English Version:

<https://daneshyari.com/en/article/250676>

Download Persian Version:

<https://daneshyari.com/article/250676>

[Daneshyari.com](https://daneshyari.com)