

Chapter 56

Analysis of Passengers' Perception of Public Transport Quality and Performance

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ABSTRACT

This research investigates the passengers' level of satisfaction from the use of diverse public transport systems. The aim is to uncover factors that drive their modal choices and to assess the quality implications of the variability of the users' perceived satisfaction through the use of two statistical methods (ordered logit and linear mixed models) and comprehensive diagrammatic techniques. Five transit systems in the two major cities in Greece, Athens and Thessaloniki, have been examined. The analysis demonstrated that the most important satisfaction attributes are service frequency, followed by waiting conditions and network coverage, punctuality and in-vehicle transport conditions. A gender-based market segmentation analysis provided further insight into the differences among groups of the population. According to this analysis, female respondents tend to place their attention on punctuality, waiting conditions and driver behavior, while male respondents on in-vehicle transport conditions and the existence and quality of transfer information.

INTRODUCTION

Background

In an era of encouraging as much as possible the shift of passenger traffic to public transport and to more environmentally friendly transport modes in general, transport operators have a major role to play. Until recently and in order to satisfy cus-

tomers' demand, these operators used to place their attention to more operational characteristics of their services, such as scheduling and network coverage. Now and especially in the situations where services and infrastructures have reached their capacity limits, the public transport operators are obliged to take other softer measures and employ tools and methods, through which they can better understand mobility behaviour.

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In this context, understanding passengers' mobility needs and priorities has received growing attention in recent years. The aim is to explore the factors influencing the change of travel behaviour and modal choice in an attempt to influence the planning process and to adjust the transit services accordingly.

One of the tools used by the public transport operators refers to the quality control of services and performance programs. Through these programs, the operators can monitor, evaluate and improve the services provided to the customers in an attempt to address the increasing rate of car ownership and the deterioration of traffic conditions, and ultimately to contribute to a sustainable urban mobility.

Many approaches and techniques have been developed to assess quality of service mainly in North America and Europe. The *TRB Transit Capacity and Quality of Service Manual* (TRB, 2004), the *TRB Handbook for Measuring Customer Satisfaction and Service Quality* (TRB, 1999), and the *EC-CEN Transportation – Logistics and services – Public passenger transport – Service quality definition, targeting and measurement* (CEN, 2002) are some of the manuals produced for measuring public transit quality. The overall process to improve this quality entails the identification of customers' priorities and needs, the measurement of customers' satisfaction using appropriate indices, the use of this feedback to evaluate the relevant service parameters and finally the definition and implementation of measures to improve the services provided to the customers.

Additional efforts have been made by various research bodies in the area of public transit quality management. Some of the most important ones are *The demand for Public Transport: a practical guide* (TRL, 2004), which aims to provide practical guidance on demand estimation for those involved in planning and operating public transport services, and the various European Union (EU) Research and Development (R&D) efforts, such as PORTAL (2003), EQUIP (2000) and QUAT-

TRO (1998), which addressed benchmarking and quality management elements in public transport. All these initiatives and efforts tackled different quality aspects of public transport. For example, the project QUATTRO developed the "quality loop of public transport" based on which the various quality levels can be better coordinated and the provided service optimized.

Moreover, the research and academic communities worldwide have been working on the understanding of the various factors that determine mode choices and examined mobility behaviour from different standpoints. Srinivasan et al. (2007), for instance, investigated the mode choice changes by developing multinomial logit models of current and past mode choice decisions in order to strengthen the knowledge on transportation changes occurring in developing countries. According to their findings male workers with relative work experience are less likely to use public transportation than other modes. Another interesting finding is that individuals who reside in peri-urban and suburban areas were found to be more likely to use public transportation and non-motorized modes than urban residents.

Eboli and Mazzulla (2011) proposed a methodology for measuring transit service quality based on the use of both passenger perceptions and transit agency performance measures involving the main aspects characterizing a transit service. The authors defined a new indicator of service quality, which takes into account both subjective and objective measures, involving attributes related to "availability of schedule/maps at stop" and "availability of shelter and benches at stop", as well as "service frequency" and "punctuality" to a lesser extent.

From a methodological perspective, Cirillo et al. (2011) investigated the heterogeneity of transit users in perceiving service quality by estimating a mixed logit model with non-parametric distribution of coefficients. Among their key findings is that reliability is highly evaluated by the bus riders and that one third of the sample has a relative high willingness to pay for services that are on time.

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