



# The costs of transportation in Santiago de Chile: analysis and policy implications

Christopher Zegras

*Instituto Internacional para la Conservación de Energía, General Flores 150, Providencia, Santiago, Chile*

## Abstract

In an attempt to better understand the current transportation situation in Santiago de Chile, this paper provides a framework within which personal expenditures, environmental consequences and social effects can be measured by a common metric, costs. The analysis includes all modes of transport, but has a specific focus on passenger transport modes. The paper presents the cost categories considered and methodologies and assumptions used in deriving the costs, a summary of the total magnitude of costs, a differentiation of internal and external costs, and a cost comparison according to various travel modes. The paper concludes with a brief analysis of the implications of the results for evaluating transport policy and pricing options. © 1998 Elsevier Science Ltd. All rights reserved.

*Keywords:* Economics; Full costs; Transportation

## 1. Introduction

Santiago, Chile's capital, is the nation's largest city, comprising nearly 35% of the national population. The city serves as the economic, administrative, cultural and academic hub of the country. Santiago is also a primary driver of the sustained economic growth that Chile has experienced since the second half of the 1980s, and as a result has undergone significant urbanization. Today, the city has approximately 5.5 million residents across an urbanized area of at least 500 km<sup>2</sup>.

Santiago's passenger transport system consists of pedestrians, bicycles, private automobiles, taxis, shared fixed-route taxis ('colectivos'), buses, an underground Metro and suburban rail. Freight movement is primarily by truck. In 1991, of the city's 8.4 million passenger trips per day, over 50% were public transport trips (48% bus, 4% Metro), 20% were walking trips and 16% were automobile trips (SECTRA, 1991). In 1994, there were approximately 460 000 autos and light trucks in the city, 10 000 motorcycles, 29 000 taxis, 11 000 buses and 8000 colectivos (see Table 1) (INE, 1995). There are approximately 315 concessioned bus lines and 150 colectivo routes, all privately owned and operated without subsidy. The Metro, an urban heavy rail system running underground, at surface level and on elevated tracks, is operated by a state-owned company, Metro, S.A. Metro has three lines covering approximately 37 km.

Santiago faces the transportation challenges of nearly all

large modern metropolis: congestion, air and noise pollution, and accidents, among others. In recent years, while private automobile use has increased rapidly and Metro use has increased somewhat, bus use has declined (see Fig. 1). Suburban rail plays a relatively minor role in urban passenger transport. The major cause of increased auto use in the city has been rapid income growth (average household income growth in the first half of this decade was nearly 5% per year) and the subsequent growth in private motor vehicle ownership (which has recently been growing at over 10% per year<sup>1</sup>). Additional influencing factors include continuous low-density urban outgrowth, increases in total trip distances and a sustained growth in the total number of motorized trips within the city.

To better understand the transportation situation in Santiago, this paper presents a framework within which personal expenditures, environmental consequences and social effects can be measured by a common metric: costs. The paper draws from the findings of a larger research effort, published in early 1997 (Zegras and Litman, 1997). The intention of the analysis is to establish a baseline by which future system performance can be measured. The analysis will also assist in evaluating various policy, infrastructure and technology options.

<sup>1</sup> Based on growth rates in vehicle registrations from 1989 to 1996 for automobiles, jeeps, vans and pickups, as reported annually by [INE (1989–1996)].