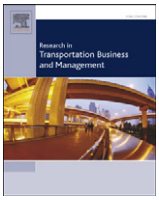
Research in Transportation Business & Management 3 (2012) 71–81

Contents lists available at SciVerse ScienceDirect

Research in Transportation Business & Management



Personal vehicle sharing services in North America

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ARTICLE INFO

Article history:
Received 1 November 2011
Received in revised form 26 March 2012
Accepted 27 April 2012
Available online 31 May 2012

Keywords:
Personal vehicle sharing
Carsharing
Peer-to-peer (P2P) carsharing
Collaborative consumption

ABSTRACT

Over the past three decades, carsharing has grown from a collection of local grassroots organizations into a worldwide industry. Traditional carsharing, though expanding, has a limited network of vehicles and locations. The next generation of shared-use vehicle services could overcome such expansion barriers as capital costs and land use by incorporating new concepts like personal vehicle sharing.

Personal vehicle sharing provides short-term access to privately-owned vehicles. As of May 2012, there were 33 personal vehicle sharing operators worldwide, with 10 active or in pilot phase, three planned, and four defunct in North America. Due to operator non-disclosure, personal vehicle sharing member numbers are currently unknown. The authors investigated personal vehicle sharing in North America by conducting 34 expert interviews. This research explores the development of personal vehicle sharing including business models, market opportunities, and service barriers to assess its early viability as a sustainable transportation mode and to provide a foundation for future research on the topic. Personal vehicle sharing has the potential to impact the transportation sector by increasing the availability and interconnectivity among modes and providing greater alternatives to vehicle ownership in more geographic locations.

1. Introduction

Although the personal automobile remains the primary transportation mode in North America, recent research supports the view that private vehicle use is in decline in numerous countries (Millard-Ball & Schipper, 2011; Newman & Kenworthy, 2011). Indeed, the U.S. Department of Energy recorded a drop in ownership of four million vehicles in 2009—the first significant decline since it began recordkeeping in 1960 (Mittelstaedt, 2010). This decline coincides with a growing prevalence of alternative modes such as traditional carsharing and the development of new modes such as personal vehicle sharing (short-term access to privately-owned vehicles).

Traditional carsharing provides members access to a vehicle for short-term daily use. Automobiles owned or leased by a carsharing operator are distributed throughout a network; members access the vehicles with a reservation and are charged per time and often per mile. They benefit by obtaining personal automobility without the need to own a private vehicle; this can result in considerable monetary savings and environmental benefits.

Traditional carsharing is intended for short trips and as a supplement public transit. Initial market entry in North America focused on the neighborhood carsharing model, characterized by a fleet of shared-use vehicles parked in designated areas throughout a neighborhood or municipality. In recent years, business models have advanced and diversified. Variations on the neighborhood model developed in North America include: business; college/university; government/institutional fleet; and public transit (carsharing provided at public transit stations or multi-modal nodes). Despite differences in target markets, these models share a similar organizational structure, capital ownership, and revenue stream.

The next generation of shared-use vehicle services, which provide access to a fleet of shared-use vehicles, incorporates new concepts, technologies, and operational methods. These models represent innovative solutions and notable advances. They include one-way carsharing and personal vehicle sharing. One-way carsharing, also known as "free-floating" carsharing, frees users from the restriction of having to return a vehicle to the same location from which it was accessed. Instead, users leave vehicles parked at any spot within the organization's operating area, allowing for the possibility of one-way trips. The one-way model resembles more traditional forms of carsharing—except for the logistics of vehicle redistribution and the need for expanded vehicle parking.

Personal vehicle sharing, which is the focus of this paper, represents a more distinct model due to differences in organizational structure, capital stock, and liability. Personal vehicle sharing involves short-term access to privately-owned vehicles, enabling a lower operating cost and a wider vehicle distribution. While two versions of personal vehicle sharing first occurred in North America beginning in 2001, the personal

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doi:10.1016/j.rtbm.2012.04.005

vehicle sharing model did not begin significant expansion until 2010 when companies began to emerge across the globe. Since then, personal vehicle sharing models have evolved rapidly. As of May 2012, there were 33 personal vehicle sharing operators worldwide, with 10 active or in pilot phase, three planned, and four defunct in North America.

Personal vehicle sharing remains an extremely new concept within the shared-use vehicle spectrum, the potential of which is unknown. This research explores the development of personal vehicle sharing including business models, market opportunities, and service barriers to assess its early viability as a sustainable transportation mode, and to provide a foundation for future research on the topic.

This paper is organized into six sections. First, it presents a background section, which provides an overview of the emergence of personal vehicle sharing. Next, it provides the study methodology. This is followed by the results of 34 expert interviews on personal vehicle sharing—exploring business models, barriers, and opportunities for this market. Next, a continuum framework for understanding shared-use models is presented, followed by a brief discussion of the implications of personal vehicle sharing for managerial practice. Finally, it concludes with a summary of key findings and recommendations for future research.

2. Background

This section focuses on the emergence of personal vehicle sharing as an extension of traditional carsharing, in part resulting from recent shifts in consumption patterns referred to as "collaborative consumption." Collaborative consumption is an economic model that emphasizes "access" or "sharing" instead of ownership. The discussion of traditional carsharing includes its evolution over time in North America and a review of its social and environmental impacts—key drivers to service growth.

2.1. Collaborative consumption

According to Rachel Botsman, author of *What's Mine is Yours: The Rise of Collaborative Consumption*, the phenomenon of a "sharing economy" has become more prevalent in recent years due to a number of factors: online connectivity, which makes shared access networks ubiquitously accessible; technology; the "living local" movement, which facilitates community focused lifestyle; cost consciousness due to the economic downturn that began in 2008; and environmental consciousness. The sharing of information, photos, and music is widespread and mainstream; thus, it is not surprising that the digital sharing template has been applied to physical goods (N Gorenflo, 2011, pers. comm., 28 July).

Online social networking, such as LinkedIn, Facebook, and Twitter, has allowed people to connect, influence, converse, and share information about new products, companies, and ideas more easily and rapidly than ever before. While people have always exchanged such information, the Internet makes it easier, more wide reaching, and faster. It has also enabled an offline experience, where people can connect with their communities face to face through peer-to-peer or person-to-person (P2P) sharing networks (L Anderson, 2011, pers. comm., 8 August). Social media, both offline and via the web, is an important facet of marketing for most consumer-facing businesses today and perhaps even more so for P2P sharing businesses, including personal vehicle sharing, which must overcome a lack of familiarity with the concept and fear of sharing among users.

The public understanding of "access to shared goods" advanced by the traditional carsharing industry has likely increased consumer acceptance of sharing high-value assets, such as vehicles. Carsharing marketing, education, and experimentation have impacted the way many consumers view their car and perhaps are diminishing the importance of the private vehicle as a status symbol (S Savoure, 2011, pers. comm., 9 June; and M Williams, 2011, pers. comm., 21 June). The next section provides a discussion of traditional carsharing's evolution in North America.

2.2. Personal vehicle sharing: evolution and growth

Traditional carsharing was first introduced in North America by way of two experiments: Purdue University's Mobility Enterprise (1983–86) and Short-Term Auto Rental (STAR) in San Francisco (1983–85). Carsharing later reemerged in 1994 in Quebec City, Canada, with the founding of the cooperative Auto-Com, which operates today as the for-profit Communauto in Montreal and the Province of Quebec. In 1998, CarSharing Portland in Portland, Oregon was the first successful launch of modern carsharing in the United States (U.S.) (Shaheen, Cohen, & Chung, 2009). In 2000, Zipcar was started in Cambridge, Massachusetts, and Flexcar was established in Seattle, Washington. These organizations expanded rapidly with the help of outside capital and eventually merged to dominate several large cities in the Northeast and Pacific Northwest by the end of the decade.

As of July 2011, 26 U.S. carsharing programs claimed 560,572 members and 10,019 vehicles. In Canada, 78,840 members shared 2605 vehicles among 20 carsharing organizations. At present, carsharing organizations operate in 20 metropolitan regions in the U.S. and Canada. Despite sustained membership growth, traditional carsharing remains geographically limited. Sullivan and Magid (2005) estimated that the profitability of a carsharing business is contingent upon gaining approximately 25 active members living within 0.40 km/0.25 miles of each point of departure (POD) to ensure sufficient use. This estimation is supported by the findings of Cervero et al. (2007), which indicated that 80% of all City CarShare members lived within 0.80 km/0.50 miles of the nearest POD, and more than 50% lived within 0.40 km/0.25 miles of the nearest POD.

As early as 2001, eGO CarShare (formerly Boulder Carshare) of Boulder, Colorado implemented the first personal vehicle sharing model by incorporating private vehicles into their commercial fleet through the transfer of personal vehicle titles to the carsharing organization. In this model, the carsharing operator becomes the temporary owner and maintainer of the transferred vehicles. In the same year, RentMyCar was launched using a marketplace approach (similar to eBay®), whereby vehicle owners pay a small fee to list their automobile on the website. Beginning in 2007, a variety of companies offering personal vehicle sharing were established internationally including: Wombat Car Club (England), Zilok (France), and Drive My Car Rentals (Australia). Since then, the personal vehicle sharing market has continued to expand domestically and internationally.

The next section provides a summary of the social and environmental impacts of traditional carsharing, which may be common to personal vehicle sharing, and have been associated with user adoption and public- and private-sector support.

2.3. Social and environmental impacts

An increasing body of empirical evidence indicates that traditional carsharing can provide numerous transportation, land use, environmental, and social benefits (Dallaire, Lafond, Lanoix, & Viviani, 2007; Econsult Corporation, 2010; Shaheen et al., 2009). Public benefits are generated through reduced vehicle ownership, vehicle miles/kilometers traveled (VMT/VKT), and greenhouse gas (GHG) emissions, as well as through the provision of short-term auto access. Table 1 provides an overview of the changes in auto ownership impacts and VMT/VKT due to carsharing from a range of studies conducted in North America over the last decade.

One of carsharing's notable impacts is vehicle ownership reduction. A 2008 survey of more than 6281 carsharing members in North America found car ownership among the survey population dropped by approximately 50% due to carsharing participation (Martin & Shaheen, 2011a). Data from the same survey indicate that carsharing removed between 9