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Research issues regarding societal change and transport

Genevieve Giuliano

School of Urban Planning and Development, University of Southern California, Los Angeles, CA 90089-042, USA

Andrew Gillespie

Centre for Urban and Regional Development Studies, The University, Newcastle upon Tyne, NE1 7RU, UK

We discuss societal change issues in two parts: those related to household and population, and those related to the workplace. Among the former, we identify growth of the elderly population, foreign immigration, decline of the nuclear family, growing income disparities, and impacts of information technology on lifestyle as worthy of comparative research. We argue that workplace related changes, being driven by information and telecommunications technology and globalization, are particularly promising areas for research. These include various types of teleworking, increases in flexible forms of employment, and changing linkages between and among firms. Little is yet known about these changes, or about how they may affect location and travel patterns. These technology-induced changes will be mediated by political, social and cultural values, hence providing a rich area for international collaborative research. © **1997 Elsevier Science Ltd. All rights reserved**

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Introduction

The purpose of this paper is to identify research issues related to societal change and transport that merit international comparative research. Societal change is a broad term. In order to make our task manageable, we choose to highlight selected issues that, in our view, would benefit the most from a joint research effort. We also restrict ourselves to urban passenger travel. Our discussion is in two parts: the first part deals with household and population-related changes; the second part deals with workplace-related changes. Prior to our presentation of research issues, we describe our criteria for selecting the most promising research issues. We also provide a basic context for our discussion by reviewing the major trends in urban travel and land use.

The list of researchable topics associated with societal change is potentially very long. We therefore develop a set of selection criteria that guides our suggestions for joint research activities. The criteria are:

- The problem/phenomenon is common to the US and Europe, or expected to be in the near future.
- The expression, characteristics or outcomes of the problem are different in the US and Europe.
- There is a demonstrated lack of research on the problem.
- The potential impact on travel or urban form is significant.
- Significant benefits can be expected from joint, coordinated research efforts.

The decentralization context

The major trend in urban spatial patterns for several decades has been decentralization. In the US, large scale population suburbanization was followed by large scale employment decentralization and by the emergence of major agglomerations outside the traditional downtown (e.g. Muller, 1995). More recently, decentralization has been accompanied by dispersion, with most growth occurring outside major centers.

A similar process of population and employment decentralization is also evident within most metropolitan areas in Europe, although from a very different starting point and with a wider degree of variability of experience. In the most developed countries of north-

west and central Europe, decentralization is frequently taking place within the context of metropolitan decline. In the Mediterranean countries and in eastern Europe urbanization remains strong due to rural-to-urban migration (Masser *et al*, 1992).

Changes in economic structure, advancements in information and telecommunications technologies, and rising affluence suggest that these trends will continue. There is a need to understand both the underlying forces and consequences of decentralization. We therefore frame our proposed research topics within the context of this larger trend.

Travel trends and urban patterns in the US

Continuing trends that have been in evidence for several decades, the most recent national survey data (1990) show that throughout the US, people own more private vehicles, use them more frequently, drive more miles, and are more likely to drive alone than ever before. *Table 1* gives private auto registrations per population for the US. There were 460 000 autos registered in 1910, or 1 for every 200 people. The most rapid increase in ownership took place in the 1920s. The Depression and WW II slowed the trend, but auto ownership has continued to increase through 1990. If we include privately owned light trucks (minivans and compact trucks are in this category) in the 1990 figure, the national figures are 179.8 million private vehicles, 191.4 million persons of driving age, and 167 million licensed drivers.

Rising car ownership is also illustrated by the decrease in the number of households with no vehicles and increase in households with more than one vehicle. U.S. census data show that about 21% of all households had no vehicles in 1960; by 1990 the percentage had dropped to 11%. In contrast, the share of households with three or more vehicles increased from 2.5% in 1960 to 17% in 1990 (Rosetti and Eversole, 1993).

Observed increases in private vehicle travel over the past decade have been far in excess of population or employment growth. Between 1983 and 1990, private vehicle miles travelled (VMT) increased by 37%, while population increased by just 4%. Growth in VMT reflects increases in the number of trips, longer trips, more trips by private vehicle, and more driving alone (Vincent *et al*, 1994).[1] In contrast, public transit use has continued to lose market share, and now accounts for just 2% of all person trips and 5.5% of all journey-to-work trips (Hu and Young, 1992). To illustrate, basic travel characteristics of the 12 US metropolitan areas with over 2 million population are given in *Table 2*.

Table 1 US private automobile registration per population

Year	Auto registrations[a]	Population[b]	Autos/population
1910	0.460	92.0	1 per 200
1930	23.0	122.82	1 per 5.3
1950	40.4	150.7	1 per 3.7
1970	88.8	203.2	1 per 2.3
1990	142.4	248.7	1 per 1.7

[a]in millions, includes private and commercial automobiles.
[b]in millions.
Source: Altshuler *et al* (1979), p. 24; Federal Highway Administration (1990), pp. 16–17

Table 2 Travel characteristics for the 12 largest US metropolitan areas, 1990

Characteristic	
Percentage of households with more than one vehicle per driver	76%
Share of person trips by mode	
Private vehicle driver	61.1%
Private vehicle passenger	21.4%
Transit	3.7%
Walk	10.6%
Other	3.1%
Private vehicle trip length, by trip purpose, in miles	
To work	11.4
To shop	4.1
Social or recreational	9.6
Persons per vehicle	
Work trips	1.12
Nonwork trips	1.63

Source: Vincent *et al*, 1994

Major explanatory factors for the rise in automobile ownership and use include increased affluence, declining household size, and increased participation of women in the workforce. Increased affluence implies higher value of time, making travel time relatively more important in travel choice decisions. At the same time, the US continues to employ policies that make the cost of auto use very low by international standards (Pucher, 1988). Declining household size, accounted for by increased numbers of single person households, female-headed households, and lower birth rates means more travel for personal or household needs. Increased participation of women in the workforce has not been accompanied by any major changes in household responsibilities. All else equal, working women are subject to greater time pressure, and consequently attribute high value to the efficiency of driving alone (Rosenbloom, 1995a). Although women in 1990 still drove fewer annual VMT than men, the rate of increase in VMT since 1983 has been higher for women (Pisarski, 1992).

Decentralization of both population and employment has occurred for several decades in US metropolitan areas. *Table 3* gives population growth rates for metropolitan areas with 1 million or more population, by decade, for 1960 through 1990, using US census data. In each decade, population growth was more

[1]Lave (1996) claims that the VMT increase reported in the National Personal Transportation Survey documents is excessive. Using other data sources, Lave estimates a VMT annual growth rate of 1.4–1.6% over the same period, compared to the NPTS rate of 2.7%.