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Automobile use within selected island states

Marcus P. Enoch [a,1], James P. Warren [b,*]

[a] Transport Studies Group, Department of Civil and Building Engineering, Loughborough University, Leicestershire LE11 3TU, UK
[b] Design and Innovation Group, The Open University, Cintra House, 12 Hills Road, Cambridge CB2 1PF, UK

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ABSTRACT

Transport use in island states shares many of the same characteristics as other developing countries, but with added complications of geographic isolation and lack of capital for many islanders. This paper examines the influence of the automobile in 45 Small Island Developing States (SIDS), as defined by the United Nations, using multiple regression techniques. Under these cross-sectional processes, car-based mobility is tested against factors including gross domestic product, population, vehicle ownership, road length, and urbanisation, data for which is obtained from a range of primary and secondary sources for a subset of 38 island states.

The analysis shows a strong relationship between increased mobility and increased GDP, while other factors which appear to be important included population density and vehicles per unit road length. The model results are then compared and contrasted with average apparent global mobility figures from a much larger set of countries, and this shows that mobility is significantly lower (almost half) that of comparably wealthy non-SIDS.

1. Introduction

Car use – and the economic, social and environmental impact that this activity generates – is rapidly increasing in countries across the world. While much of this expansion is occurring in richer nations, growth in many poorer nations is also taking place and in many cases is becoming increasingly problematic.

1.1. Key characteristics of island states

Islands are attractive to researchers because they are detached, self-contained entities with obvious boundaries. From a geographers' perspective, this has long been recognised as a distinct advantage, with islands effectively 'functioning as small-scale spatial laboratories where theories can be tested and processes observed in the setting of a semi-closed system' (King, 1993 and McCall, 1994). However, from the viewpoint of the policy maker on an island state, this is a distinct disadvantage as these 'island systems' already face many of the problems faced by more developed countries, but with less time, experience and resources to come up with a solution before the situation becomes critical due to the faster growth of population and the economy (Gakenheimer, 1999), coupled with a lack of space.

* Corresponding author. Tel.: +44 1223 364721; fax: +44 1223 355207.
E-mail addresses: m.p.enoch@lboro.ac.uk (M.P. Enoch), j.p.warren@open.ac.uk (J.P. Warren).
[1] Tel.: +44 1509 223408; fax: +44 1509 223981.

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Islands have a combination of economic, social/cultural, geographic, climatic and environmental characteristics that distinguish them from larger and landlocked developing countries (Lockhart et al., 1993; Kakazu, 1994; Weisser, 2004; Briguglio, 1995). The interaction of these island-specific attributes generates a set of development problems that are often very different from those faced by larger countries'. In particular, intrinsic economic constraints have considerable influence on the economic structure and performance of an island. The most obvious limitation that islands have to endure relates to their geographic parameters of smallness and remoteness, as well as the acute outward-looking economic orientation. The combined influences can cause significant economic vulnerability and an inability to pursue economic development without substantial economic support. Finally, the smallness of island states leads to limited capacities both in terms of production and consumption. They are rarely in a position to develop economies of scale and cannot create substantial internal markets, as well as unable to raise large amounts of capital/finance on the home market. In many of these islands there is strong reliance on both aid and external remittances. These characteristics are summarised in Table 1.

Although worldwide there are nearly 2000 'significant' islands of which only some are inhabited (UN, 1998), obtaining data for the vast majority of these would be problematic and so the focus of this paper has been to look exclusively at the 45 so-called Small Island Developing States (SIDS) as defined by the United Nations (2003b). It should be noted that this list includes not only 'islands', but also 'low-lying coastal countries that share similar sustainable development challenges, including small population, lack of resources, remoteness, susceptibility to natural disasters, excessive dependence on international trade and vulnerability to global developments. In addition, they suffer from the similar issues such as lack of economies of scale, high transportation and communication costs, and costly public administration and infrastructure. A further point is that some more developed island nations such as Singapore, Cyprus and the Netherlands Antilles are included in the initial dataset. Some of the SIDS indeed are islands which are connected to the mainland (e.g. Singapore and Bahrain) and thus experience the bridge-effect (Baldacchino, 2005). This undoubtedly affects overall mobility. Those nations which are connected to the mainland directly (e.g. Belize, Guinea-Bissau, Guyana, Suriname) will also be influenced by their neighbouring countries in terms of mobility. It should also be noted that in some cases the islands are not *that* small (e.g. Cuba) and that by some monetary frameworks others are probably not strictly 'developing' but rather developed. Nevertheless the SIDS grouping provides useful construct.

In this work we attempt to find commonalities based on transport trends and practices. Island specific issues are too diverse to adequately summarise here, thus here only land transport issues are addressed. For full details of some of the issues examined for certain states see the Appendix.

1.2. Factors affecting vehicle use

Briefly, there have been a number of studies looking at factors affecting car use across a range of countries. For instance, in a longitudinal review of cars and usage from 1958 to 1980 in 19 (developed) countries, Tanner (1983) finds that 'among the clearest and strongest influences are those of income levels on the number of cars, and of petrol prices on the sizes of cars and hence how much petrol they use'.

More directly relevant, as it focuses on less developed countries, Button et al. (1993) reviews vehicle ownership and use and finds again there is a strong relationship between car ownership and the rate of economic growth. Fuel price and income were found to be important influences in the short term. The study models vehicle ownership and use in low income countries, but specifically leaves out small island states as 'special circumstances may influence underlying causal relationships'. The paper concludes that at the national level the main independent variable influencing ownership is income, while additional variables include the price of fuel, the level of urbanisation and the degree of industrialisation. Car use depends primarily on the level of vehicle ownership, followed by income, the price of fuel, the degree of urbanisation and the extent of the road network. Also relating to developing countries, Simon (1996) suggests that in addition to per capita income, car ownership levels also depend on factors including country size, infrastructure availability, quality, affordability, availability of public transport services, cultural, social and religious values, state policies, and income distribution within the country being considered. Lastly, Vasconcellos (2001) notes that car use is dependent on income, gender, age, occupation and educational level, and that it is highly influenced by economic and spatial constraints. Thus, Western Europeans have higher per capita incomes than US citizens and yet they travel less by car, while the wealthy Asian countries have a 20% lower income than the US but travel seven times less by car.

Table 1
Intrinsic vulnerabilities in SIDS adapted from sources: Pelling and Uitto (2001), Lockhart et al. (1993), Conway (1998), Armstrong and Read (2006) and Slade (1999)

Factor	Vulnerability examples
Smallness	Limited natural resource base, high competition between land use, intensity of land use, immediacy of interdependence in human–environment systems, spatial concentration of productive assets
Remoteness and insularity	High external transport costs, time delays and high costs in accessing external goods, delays and reduced quality in information flows, geopolitically weakened
Demographic factors	Limited human resource base, small population, rapid population changes, single urban centre, population concentrated on coastal zone, dis-economies of scale leading to high per capita costs for infrastructure and services
Economic factors	Small economies, dependence on external finance, small internal market, dependence on natural resources, high specialisation of production