Are We Reaching A Plateau or 'Peak' Travel?

Trends in Passenger Transportation in Six Industrialized Countries

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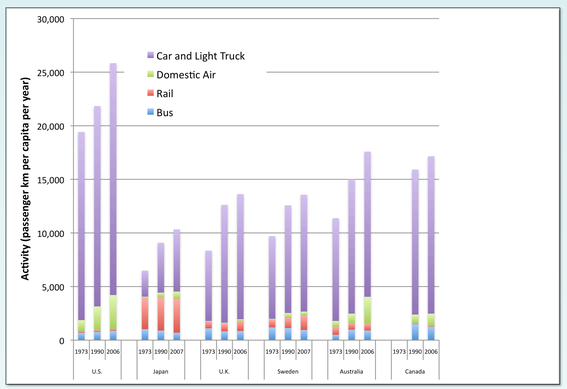
Introduction

The transport sector's trends of more people; owning more, larger and more powerful cars; and driving more have sometimes seemed inexorable. In the U.S., projected annual increases in vehicle miles traveled will leave carbon emissions roughly constant over the next 25 years, despite increases in fuel economy.

Basic travel demand theory would suggest that there exists some saturation point for vehicle ownership and travel. With talk of "peak oil", why not "peak travel?"

This paper provides some qualitative evidence to support these ideas of saturation. It is based on a cross-national analysis of trends in six industrialized countries, compiled from a wide variety of national-level data sources. To understand the driving forces behind the trends, we decompose energy use into activity (passenger km); modal structure; and modal energy intensity.

Modal Structure



Rather than a major shift away from public transport, increased energy use has been caused by growth in total activity based on the car and domestic air. The mode share of bus and rail has remained relatively constant or declined only slightly in five of the six countries. The exception is Japan, where the share of public transport declined precipitously until the year 2000. However, compared to the other five countries, Japan still has the largest mode share for bus and rail.

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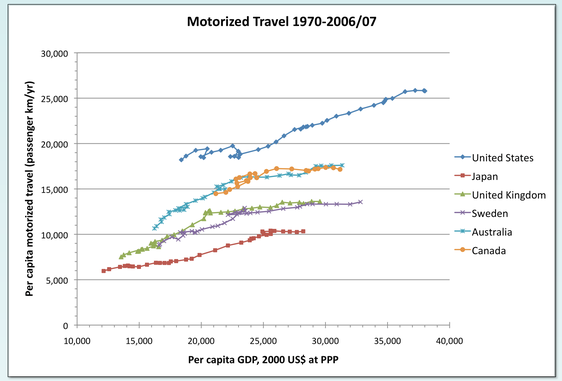
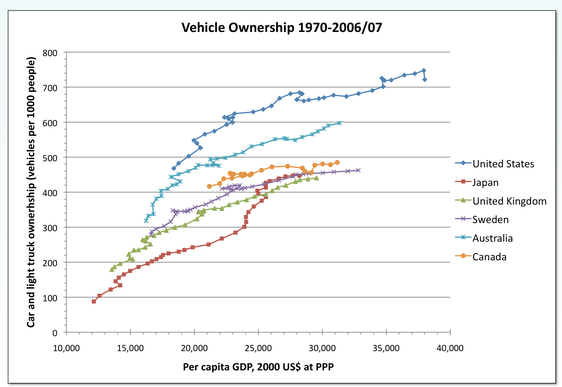
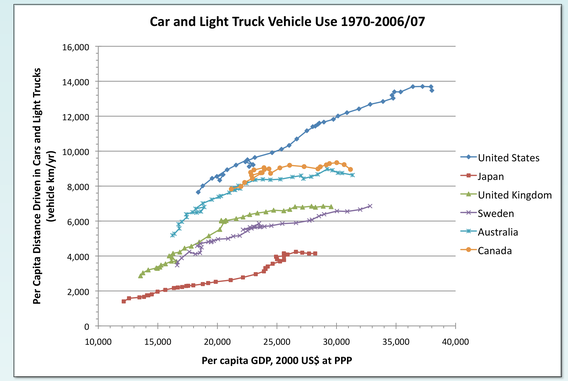


Activity

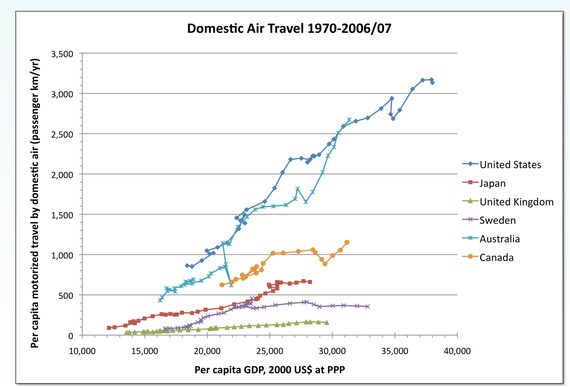
The last three decades have shown rapid increases in total travel activity. There are, however, signs of a leveling out or saturation at a GDP of between $25,000 and $30,000 in most countries, and in the U.S. at a slightly higher income of about $37,000. To some extent, this saturation is related to higher fuel prices, but this leveling out predated the rapid rises in oil price from 2007.



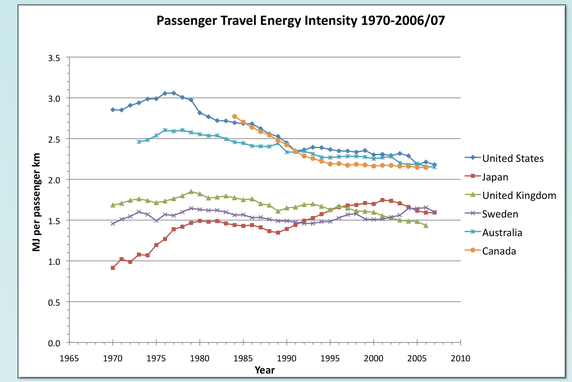


Importantly, the flattening of total per capita travel over so many countries has never been experienced. If it is a truly permanent change, then future projections of CO_2 emissions and fuel demand should be scaled back.

Signs of saturation are also evident for vehicle ownership. Domestic air travel has continued to grow, but only in large countries with little inter-city passenger rail infrastructure.



Energy Intensity



Passenger travel has become less energy intensive in most countries since 1970, with the exceptions of Japan and Sweden. Canada and the U.S. in particular have shown steep drops.

Individual modes, particularly cars, have become even less energy intensive per vehicle kilometer (*not shown*). The energy intensity of cars and light trucks has declined in all six countries since 1980. The most marked decline was in the U.S. from the late 1970s, following the advent of Corporate Average Fuel Economy standards.

However, improvements in vehicle efficiency been offset by lower load factors and a shift to more energy intensive modes, particularly in Europe and Japan.

Conclusions

Projections of transport energy use and CO_2 emissions for industrialized countries typically assume continued growth. Historically, increases in activity (passenger travel) have been the driving force behind increased energy use, offset somewhat by declining energy intensity. We show that total activity growth has halted relative to GDP in recent years in the six countries examined. If these trends continue, it is possible that accelerated decline in the energy intensity of car travel; stagnation in total travel per capita; some shifts back to rail and bus modes; and at least somewhat less carbon per unit of energy could leave absolute emissions in 2020 or 2030 lower than today.

Acknowledgements

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