3.6
Urban Mobility

Urban mobility has become a key concern in cities of both developed and developing nations as it impacts the liveability of cities. Motorized urban transport, in particular, has become a hot topic among policymakers, planners and environmentalists who are seeking ways in which to minimize its negative effects, including greenhouse gas emissions, traffic congestion and air pollution.

Motorized urban transport accounts for a large share of energy consumption in cities, ranging from more than half of total energy consumption in cities such as Mexico City, Cape Town and Hong Kong to roughly a quarter of total energy consumption in cities such as London, Seoul and Bologna. Any policy aimed at mitigating the effects of climate change must, therefore, list motorized urban transport among its priorities.

In principle, reducing CO_2 emissions from the transport sector is much easier than cutting those from the building sector. The reason is simple: while new buildings can be constructed to consume low or zero energy, the energy consumption of existing buildings can only be improved to a limited extent, and buildings are made to last several decades or even centuries. Since the average lifespan of a motor vehicle is 15 years, however, any new approach that involves a change in vehicle technology or a shift to different mobility technologies and techniques can be implemented in a relatively short time. In other words, since a significant reduction of CO_2 emissions in the building sector implies the substitution of most of the existing building stock, this option is not feasible. With transport, the complete substitution of the motor vehicle stock is possible within a relatively short time. Transport, therefore, is a key element in our race toward keeping the earth's temperature at an acceptable level.

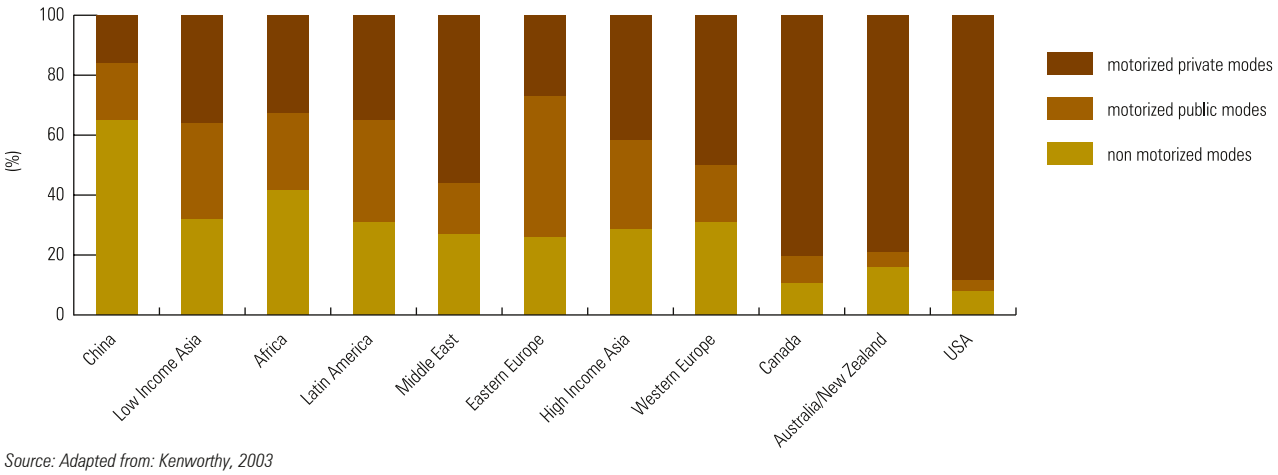
A study of automobile dependence in a sample of 84 cities around world found that although income levels determine degrees of motorization, wealth alone does not provide a consistent or satisfactory explanation of transport patterns in cities, since there is no significant statistical correlation between per capita private transport energy use and metropolitan GDP per capita.[1] While cities in the United States, Australia and New Zealand lead the world for the number of passenger cars per 1,000 persons, Eastern European cities rank first for number of passenger cars per dollar GDP. Even African cities have a rate of car ownership relative to wealth that is more than twice that of the United States. This could be explained by the large inequalities in income distribution in poorer cities, and the large proportions of low-income people. Western Europe and high-income Asian cities have placed more emphasis on public transport, rather than on individual car ownership, and therefore have lower ratios of car ownership to wealth.

Despite the perception that the private car plays a dominant role in urban mobility everywhere, data shows that this is true only in the United States, Canada, Australia, New Zealand, and the Middle East. Elsewhere, non-motorized and mass transit modes prevail. In Western Europe, for instance, non-motorized transport accounts for 50 per cent of urban trips. The trend in developing countries and Eastern European cities, however, is toward increased use of private cars – a result of economic growth and policies that prioritize the construction of urban freeways and parking spaces. Decisions at the national level to support and promote car factories, as many Asian countries have recently made, also support the impression of an irresistible trend toward the uncontrolled diffusion of private motorization.

The 84-city study also found that urban form strongly influences energy consumption and CO_2 emissions. Urban density and CO_2 emissions have a direct, inverse correlation: in general, the lower the density of a city, the higher its emissions from the transport sector. This suggests that more compact cities are not only more energy-efficient but are also less carbon-intensive. The prevalence of freeways encourages car use, which also impacts carbon emissions. Freeways and parking spaces in city centres reduce traffic congestion, however, removing private vehicles from otherwise crowded city streets. In Tokyo, as well as in other large Japanese cities, passenger vehicle purchasers are required to prove that they have forward contracts for garaging within 5 kilometres of their residence before taking ownership.

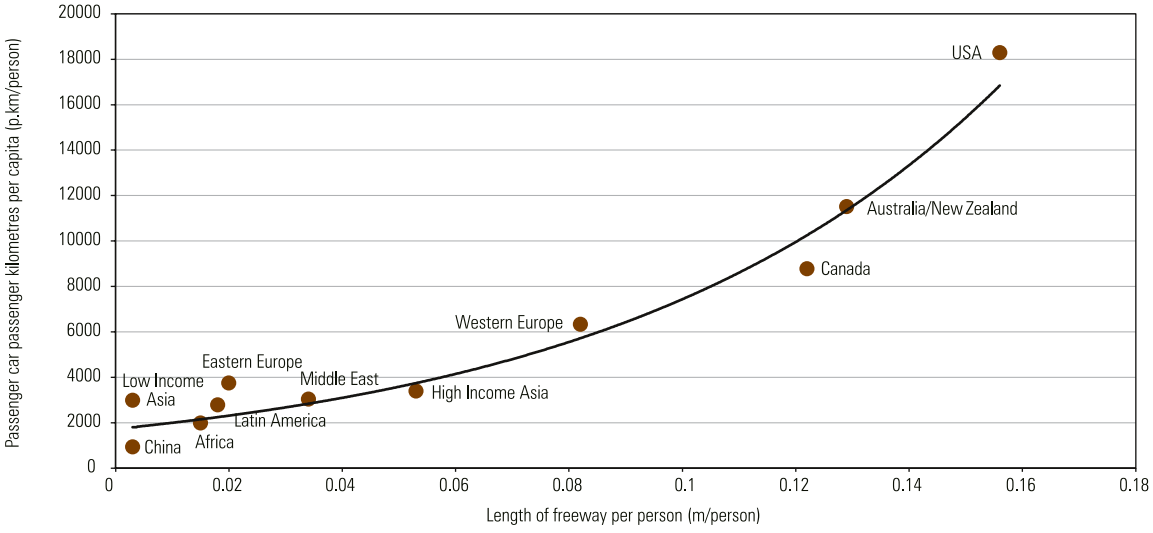
Private cars are the dominant form of transport in the United States, Australia, New Zealand and the Middle East.
©Elena Elisseeva/iStockphoto

FIGURE. 3.6.1: **SHARE OF MOTORIZED AND NON-MOTORIZED PRIVATE AND PUBLIC TRANSPORT IN SELECTED REGIONS AND COUNTRIES**



Source: Adapted from: Kenworthy, 2003

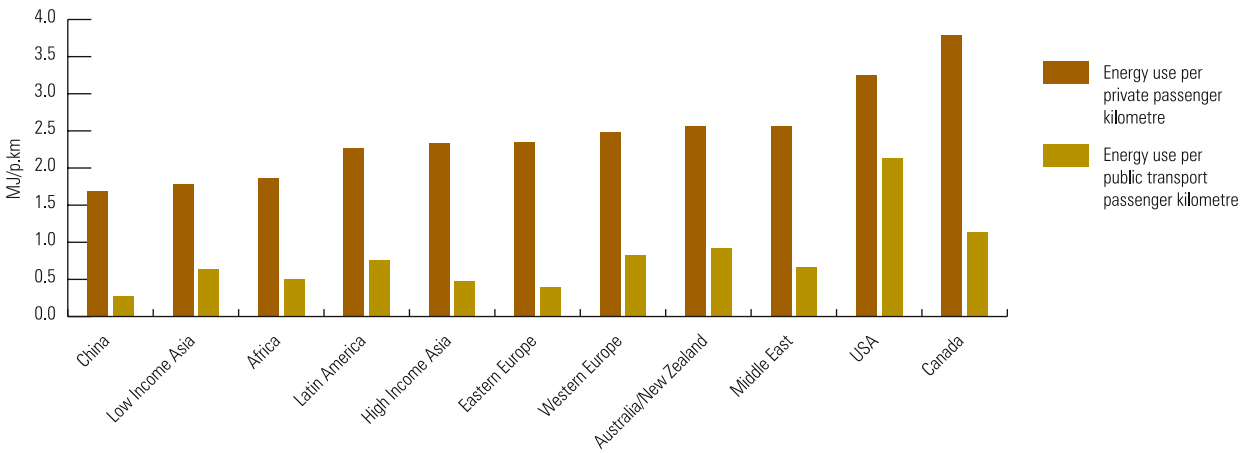
FIGURE 3.6.2: **RELATIONSHIP BETWEEN LENGTH OF FREEWAY PER PERSON AND PASSENGER CAR KILOMETRES**



Source: Adapted from: Kenworthy 2003

▲
Morning traffic in Beijing
©Tor Lindqvist/iStockphoto

FIGURE 3.6.3: **ENERGY USE BY TRAVEL MODE BY REGION**

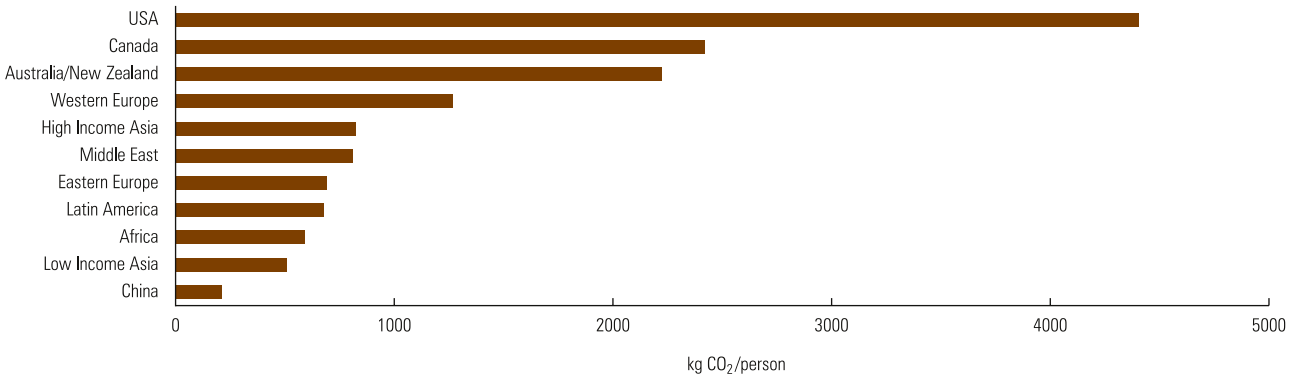


Source: Adapted from: Kenworthy, J. , 2003; http://cst.uwinnipeg.ca/documents/Transport_Greenhouse.pdf

An analysis of 28 cities[2] shows that while car use tends to be higher in cities of the developed world, a significant number of cities in the developing world, particularly in Asia, have very high car ownership. Bangkok and Dar es Salaam, for instance, have more cars per capita than Tokyo and Mumbai. On the other hand, in Singapore, the number of private vehicles per 1,000 inhabitants is lower than that of many cities in the developing world – a result of the city-state's effective mobility policy.

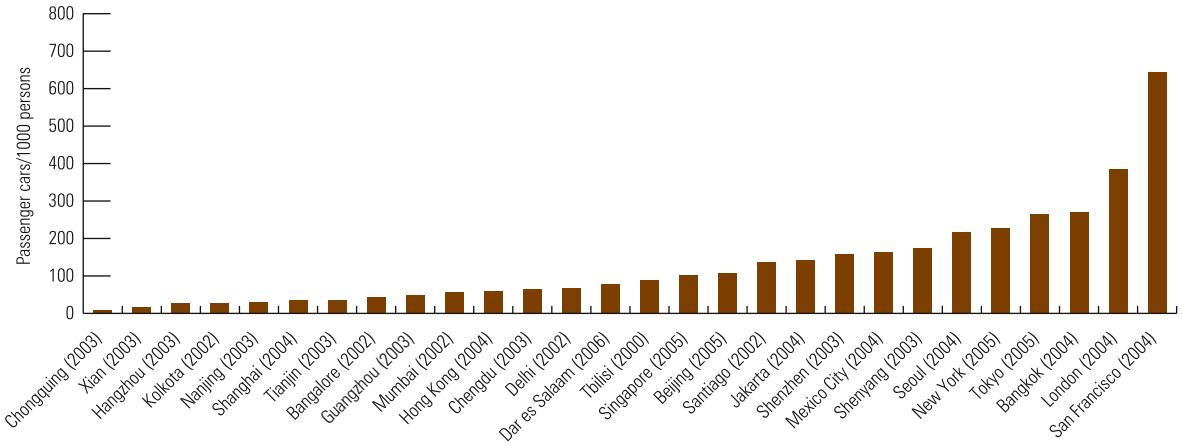
▲ Taxis in New York City
©Imre Cikajlo/iStockphoto

FIGURE 3.6.4: **TOTAL TRANSPORT (PRIVATE AND PUBLIC) CO_2 EMISSIONS IN SELECTED REGIONS AND COUNTRIES**



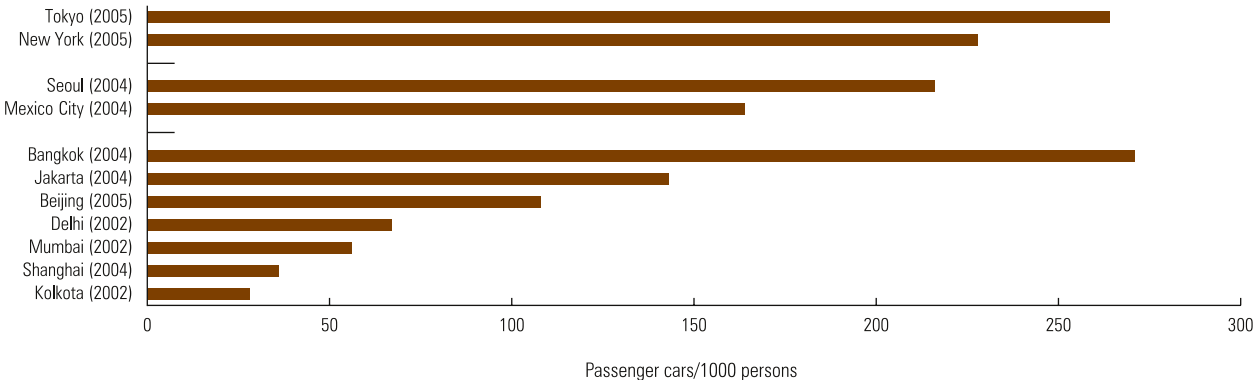
Source: Adapted from: Kenworthy, J. , 2003; http://cst.uwinnipeg.ca/documents/Transport_Greenhouse.pdf

FIGURE 3.6.5: **CAR OWNERSHIP IN SELECTED CITIES**



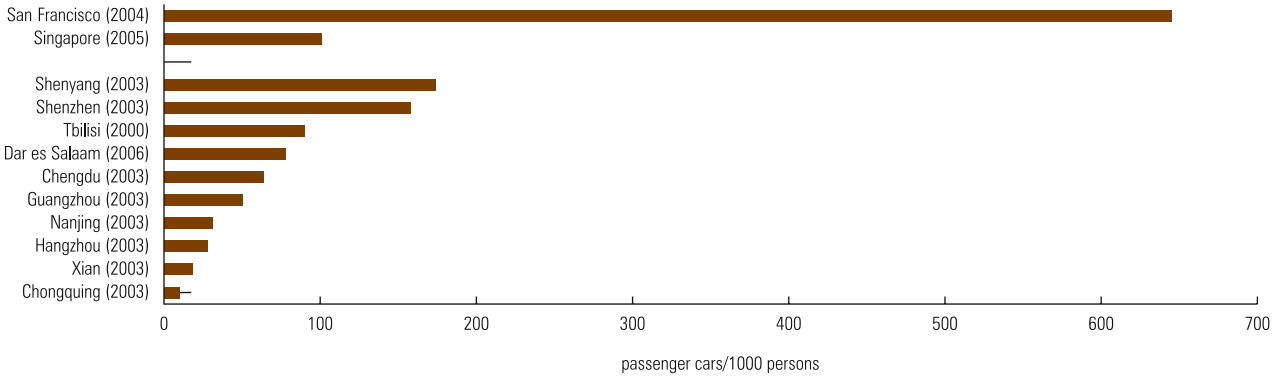
Source: UN-HABITAT Global Urban Observatory 2008
Note: Data derived from various sources, 2000-2004

FIGURE 3.6.6: **PRIVATE CAR OWNERSHIP IN SELECTED LARGE AND MEGACITIES**



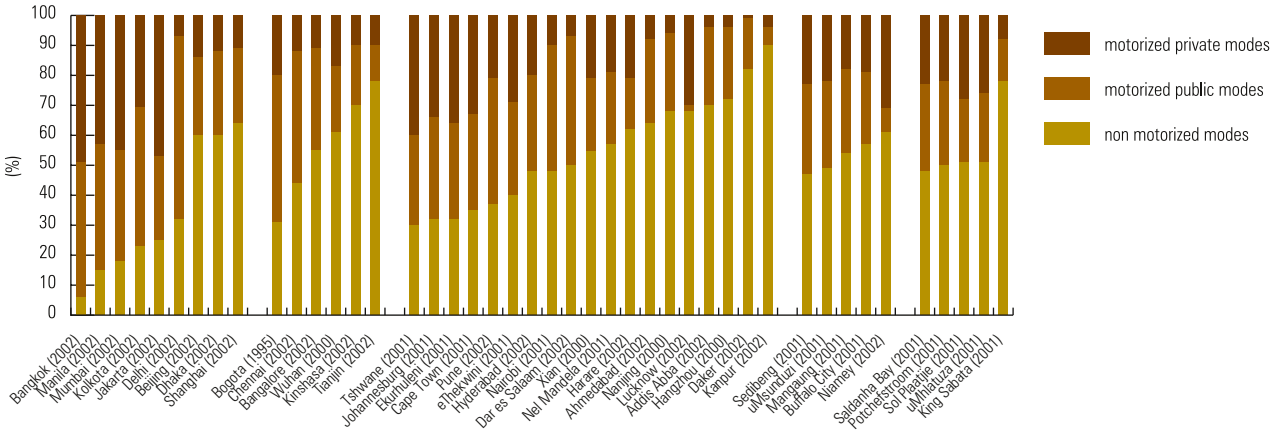
Source: UN-HABITAT Global Urban Observatory 2008
Note: Data derived from various sources, 2000-2004

FIGURE 3.6.7: **PRIVATE CAR OWNERSHIP IN SELECTED CITIES**



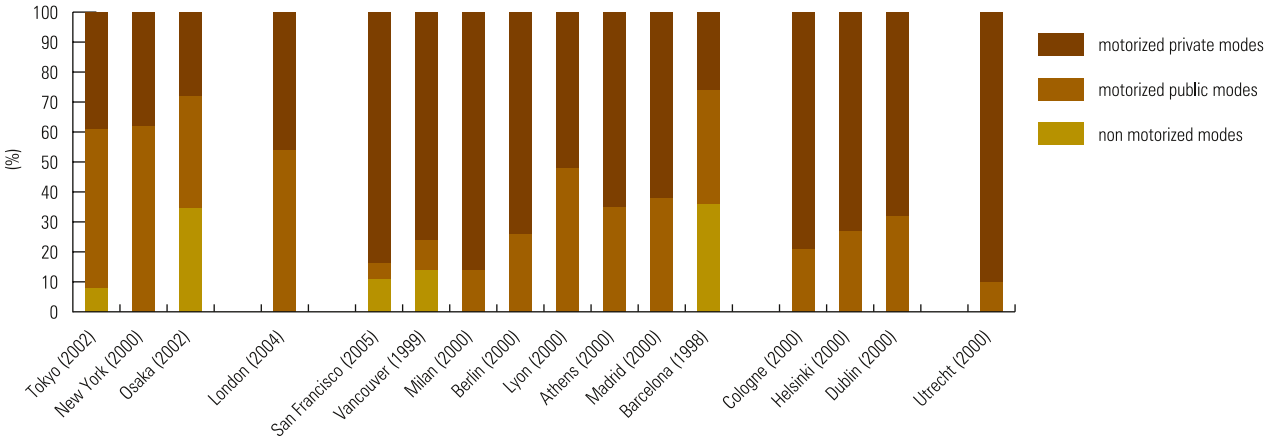
Source: UN-HABITAT Global Urban Observatory 2008
Note: Data derived from various sources, 2000-2004

FIGURE 3.6.8: **TRANSPORT MODE SPLIT IN SELECTED CITIES**



Source: UN-HABITAT Global Urban Observatory 2008
Note: Data derived from various sources, 1995-2002

FIGURE 3.6.9: **TRANSPORT MODE SPLIT IN CITIES IN THE DEVELOPED WORLD**



Source: UN-HABITAT Global Urban Observatory 2008
Note: Data derived from various sources, 1998-2005

London buses: A congestion charge introduced in 2003 has significantly reduced traffic in the city centre.
©Michele Lugaresi/iStockphoto

In many cities with environmentally conscious policies, mayors are struggling to find a way to clear streets of private passenger vehicles. In London, under Mayor Ken Livingstone, a congestion charge introduced in 2003 has significantly reduced traffic in the city centre. The charge is imposed on cars entering central London between 7 a.m. and 6:30 p.m. As a result, many commuters have switched to public transport, and traffic delays have been reduced by one-third. Under Mayor Jaime Lerner in the 1970s and 1980s, the Brazilian city of Curitiba developed a specially designed bus system using dedicated bus lanes along radial routes from the city centre. The development of the system gave priority to mass transit by developing "trunk lines" running along major roads, with up to three lanes accessible only to buses. And from 1998 to 2000, Bogota, Enrique Peñalosa the Mayor of Bogota led a campaign to promote bicycle use and walking in the city by developing 300 kilometres of bicycle paths and pedestrian-only streets. The Colombian capital has also been experimenting with banning the use of cars at certain times of the day, and the experiment is proving to be popular.

NOTES

[1] Kenworthy, J., Transport Energy Use and Greenhouse Gases in Urban Passenger Transport System: a Study of 84 Global Cities, Third Conference of the Regional Government Network for Sustainable Development, Notre Dame University, Fremantle, Western Australia, September 2003 http://cst.uwinnipeg.ca/documents/Transport_Greenhouse.pdf.

[2] Analysis by Federico Butera was commissioned by UN-HABITAT for this report.