

• Human transport systems and sustainability

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Background

The UN estimates that the world's urban population will grow by 2.5 billion by 2050, and almost 90 % of this increase is expected to occur in Asia and Africa. In the face of this rapid urbanisation, we need to rethink our urban transport systems. Population growth is driving growing demand for public transport. Moreover, the rise of average salaries in low income countries led to a more than 60% increase in the rate of motor vehicle ownership between 2005 and 2015 in Latin America and Asia. Changing transport habits and needs as a result of urbanisation are already posing major sustainability challenges. In this article, we look at the direct and indirect impacts of transport on various Sustainable Development Goals, identifying potential avenues for further research.

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Further reading

TURNER P., CIAMBRA A., 2019 – *Mobility and the SDGs: A safe, affordable, accessible and sustainable transport system for all*, Gold Policy Series.

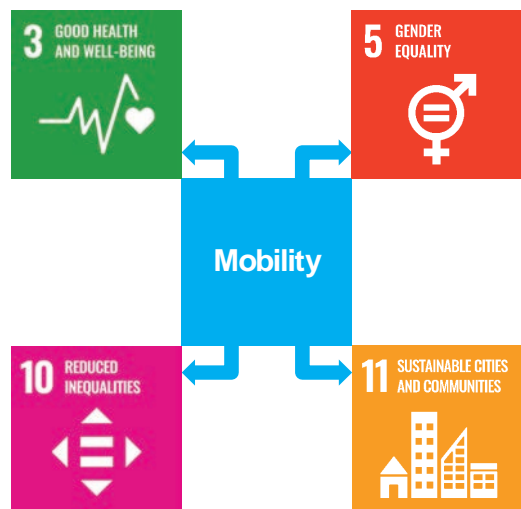
Transport and sustainable cities

Target 11.2 of the UN's Sustainable Development Goals calls for "access to safe, affordable, accessible and sustainable transport systems for all, improving road safety." And yet, the number of fatal road accidents continues to increase in many countries in Africa and South-East Asia, to such an extent that road accidents are now the leading cause of youth mortality in Africa. By modelling the connections between traffic flow data, urban transport infrastructure and accident number, it is possible to identify potential dangers and high-risk zones. Analysing and modelling transport flows is also key to understanding the factors which influence individual transport choices, and as such may provide clues as to how we can attenuate the negative environmental impact (Target 11.6) of day-to-day urban transport.

Transport and inequalities

In some cases, urbanisation in the Global South has gone hand-in-hand with an increase in inequality and social exclusion. Although urbanisation may open up new opportunities for the most vulnerable segments of the population, those opportunities may just as well prove to be inaccessible. Fair access to transport plays an essential role in reducing social inequality, as it also has a decisive influence on access to healthcare, education, amenities and employment. Evaluating disparities in accessibility with reference to gender and socioeconomic status, identifying those

groups with the lowest level of service, is therefore a crucial step in the drive to provide equal opportunities. Segregation, which can exacerbate inequalities, is often studied in a static manner by looking at the geographical distribution of different groups in the population, but we can also adopt a more dynamic approach by analysing individual transport habits. As has been noted in some Brazilian cities, the distribution of the population in terms of the urban areas they visit and the different forms of transport they use may have the effect of reproducing segregation patterns already observable in the residential and professional spheres, thus exacerbating existing socioeconomic inequalities.



Direct and indirect impacts of transport on several SDGs.

Transport and health

The Covid-19 pandemic illustrated the extent to which health and transport are interconnected. In the early days of the pandemic, transport restrictions were one of the few methods available to help limit the spread of the virus. Mobility plays a key role in the replication dynamics of many pathogens. Measuring key mobility indicators is thus of great importance to epidemiologists. Transport habits also play a decisive role in the development of certain chronic illnesses. Promoting active forms of transport for everyday journeys, including cycling and walking, can help to tackle obesity and heart disease. Access to green spaces and the option of living in a city which promotes environmentally friendly modes of transport can also have a positive impact on people's health.

New perspectives for the study of transportation

Digital data - such as those stored on our mobile phones - could provide an invaluable source of information to complement the data derived from surveys, allowing us to study transport habits with a very high degree of temporal and spatial resolution. Mobile phone ownership continues to grow in low-income nations, raising the prospect of studying different transport systems with the help of tracking data. Furthermore, the availability of open data collated by volunteer-led initiatives such as OpenStreetMap makes it possible to

map the urban transport infrastructure of cities in developed nations and a certain number of cities in middle-income nations such as Medellín, Colombia and Buenos Aires, Argentina. Open data about public transport can also help us to quantify disparities in accessibility. Effectively utilising these data flows often requires the use of sophisticated tools incorporating artificial intelligence. For example, unsupervised machine learning tools can be used to identify the reasons for individual journeys based solely on the GPS coordinates provided by mobile phones. The increasingly rapid development of AI methods for processing data on a vast scale, combined with growing rates of phone ownership among even the poorest segments of society in low-income countries, can help us to gain a better understanding of the multiple facets of urban transport systems in these countries. Nevertheless, as of yet very few studies have made use of these emerging data sources to probe transport disparities between lower and middle-income groups, or even gender and socioeconomic inequalities in urban mobility. Exactly how useful these digital data sources may be to researchers studying these inequalities remains to be seen. Moreover, since these data are collective passively from consenting users, they may be biased and unrepresentative of the population as a whole. It will thus be necessary to develop tools to correct the data. These caveats notwithstanding, using new data sources to study transport systems could open up new avenues for progress on the SDGs.

KEY POINTS

Technological advances can help us to better understand everyday mobility behaviours, in spite of the challenges involved in analysing vast, multidimensional datasets and getting round their blind spots. Properly evaluating disparities in mobility is an important step towards achieving inclusive mobility in line with SDG 10 (reducing inequality). Tackling urban transport disparities would also be a boost to SDG 5, ensuring that men and women have equal opportunities in matters of mobility. Furthermore, mapping disparities in mobility would be a major contribution toward SDG 11, making our cities safer, more inclusive, more resilient and more sustainable. The benefits of sustainable mobility are considerable, not least in terms of reducing emissions, improving public health and working to deliver social and economic justice.

SUSTAINABILITY SCIENCE

UNDERSTAND, CO-CONSTRUCT, TRANSFORM

Volume 3

Collective thinking coordinated
by Olivier Dangles, Marie-Lise Sabrié and Claire Fréour

IRD Éditions

**French National Research Institute for Sustainable Development
Marseille, 2024**

Editorial coordinator: Corinne Lavagne
Editorial preparation: Jasmine Portal-Cabanel
Cover, design and layout: Charlotte Devanz

Cover photo: Rock painting, Cueva de las Manos, Argentina.
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ISBN PDF: 978-2-7099-3041-3