Editorial

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I am privileged to introduce this first issue of *Transport* in 2017. This issue brings together a number of briefings and papers which consider the relationships between today's society and transport. Most people use transport on a daily basis as an enabler in their lives. This may be as part of a daily commute, through leisure, social or cultural activities or in business interests to create economic wealth. However, transport can also directly impact adversely on our lives with environmental and health concerns being the main issues. Readers of the *New Civil Engineer* will be familiar with the debate in cities worldwide which has centred on the impact of transport on public health and the consequential actions that are being considered to improve environmental conditions resulting from transport.

Cairns' (2017) briefing explores the benefits of travel by self-propulsion or active travel (Figure 1) as it is more commonly known, the subject of a double issue in our sister publication *Engineering Sustainability* (Cairns, 2016a, 2016b) in which the links between transport, the economy, public health and societal issues are investigated by the contributing authors. It is proposed that diversification of travel modes from those

Figure 1. Cycling is one of several methods of active travel being explored in a move towards more sustainable development and a more productive, healthier society

commonly used over the last 50 years is critical to achieve a more sustainable global future. Active travel is identified as an opportunity for civil engineers to implement imaginative solutions that are inclusive to wider society, leading to better health, well-being and independence. Seen from the widest perspective, this will be a truly sustainable outcome.

In the second briefing, Otto (2017) examines the upgrading of gravel roads to bituminous standards. The briefing offers guidance on issues such as assessing strength, deciding how much, if any, of the existing compacted wearing course should be incorporated into the new pavement and whether it should be processed. It also discusses common errors and assumptions made during assessment that lead to inappropriate measures being taken. This guidance should be used in conjunction with design documents, offering good advice to achieve the expected outcomes.

Carbon dioxide emissions are a major element of transport's contribution to climate change. Yang *et al.* (2017) pick this up in an analysis of the carbon dioxide emissions from home-based commuting in Xi'an, a typically rapidly growing city in China. The relationship with various environmental and social factors is examined and the authors conclude that car availability, household income and parking facilities increase carbon dioxide emissions, while access to more public transport routes and higher population density reduce them. High emitters at a personal level were found to contribute disproportionately to overall emissions, leading to a focus on reducing emissions of well-defined groups. While the paper is focused on a growing city in China, the methodology used could be applied to different types of city where growth is less of a factor.

Human interaction with the environment is constantly changing, some of which is due to changes in society. Lo (2017) examines the impact of the change from a 1-d to a 2-d weekend on life in Taiwan, with the consequential increase in leisure activities that take place in the newly available time. 'Low-carbon-dioxide tourism' is being promoted by the Taiwanese government in conjunction with environmental protection.

The author explores what influences individual choices in respect of green transport modes and identifies the difficulties they may encounter in trying to leave a small 'carbon footprint'.

Injuries and fatalities continue to occur as a result of road traffic collisions. Xu *et al.* (2017) investigated the level of injury severity at crashes in right-turns at signalised intersections in the USA. They concluded that a number of issues lead to a significantly higher likelihood of severe injury. Elimination of some or all of the factors determined in this paper would improve the operation of the road network.

Driver behaviour on multi-lane highways has often assumed similar behaviour in every trafficked lane. Khansari *et al.* (2017) examined the speed, headway and cautiousness between lanes. The findings from the data on sections of the Tehran–Qom freeway in Iran show that behaviours in lanes closer to the central median are: reduced driver cautiousness, increased speed and reduced headway between vehicles. All of these factors contribute to an increased flow in the range of 7 to 24% compared to other lanes. These results may enable better modelling of flows on multi-lane highways.

In our final paper of this edition, Sun *et al.* (2017) compared the air navigation routes of 15 countries using a complex network theory. The networks were found to be quite varied and their expected performance against certain failures was similarly varied. The USA's system is robust against node failure whilst South Africa's is quite vulnerable. Countries with similar geographies tended to perform in the same manner. This approach to air navigation route network analysis may enable potential bottlenecks to be predicted, which would need validation with empirical data.

Looking forward to 2017, some of the ideas in this edition will be developed into a themed issue on 'Transport emissions and climate change'. Other themed issues planned during this year are on the UK's HS2 project, 'Smart infrastructure and remote monitoring' and the second part of 'Transport and global poverty' (improving lives and wealth creation).

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