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Editorial

Kate Cairns BEng (Hons), MSc, DIC, MIoD, CEng, FICE
Independent Sustainability Advisor, Cairns Consultancy

This special issue of *Engineering Sustainability* is the second part of our themed issue on facilitating active travel.

This topic is timely with the invitation for papers on active travel achieving a record number of submissions and exceeding the capacity for one issue.

Increasing international focus on climate change coupled with the significant carbon emissions from the transport sector and the addition of ever-growing urban populations means a paradigm shift in the uptake of active travel is not only material but essential in moving towards more sustainable development.

Part one of the issue explored factors that might affect the uptake of active travel in its widest definition and by all sections of society, including bicycle training for children, adoption of small-wheel modes such as scooting and skating, space provision for tricycles and bike trailers, and methods for estimating bicycle parking demand.

Part two returns focus to the traditional assumed definitions of active travel – walking and cycling. It includes an overview paper on those two modes; a review of design standards and the effect of cycling infrastructure; a study on the public acceptance of bike sharing; and application of a multimodal traffic equilibrium model with emission effects (MTEEE) solved by a particle swarm optimisation (PSO) algorithm.

The first paper (Tight, 2016) gives a comprehensive and articulate overview of the role of walking and cycling and how these modes might be further developed both in quantity and quality of experience to meet our urban transport needs. The paper recognises that while the two modes are different in many ways, they complement each other, as together they provide a means to cover the kinds of distance required for most trips in urban areas. Although both modes are under-utilised, they remain marginalised in favour of motorised modes in terms of provision, priority and planning. The paper goes on to explore different measures to promote these modes.

One such measure, cycling infrastructure, is the topic of the second paper by Deegan (2016), which demonstrates the successes and failures of the London Cycle Network plus (LCN+) project, and includes examination of the effectiveness of shared-use footways as a design practice. The paper discusses the standard of highway engineering schemes that have been delivered to date, particularly in relation to their overall impact on ride quality. Design approaches were cross-referenced against cycling growth and pedal cycle collisions. Overall, the LCN+ project is shown to have had a positive influence on promoting cycling growth in central London but little identifiable impact on collisions. By highlighting areas where changes could have been made to improve the delivery of the project, lessons can be learned for future projects of this type.

The third paper (Nikitas *et al*., 2016) examines the acceptance of another measure to promote cycling, that of bike-sharing schemes. The paper reports on a quantitative study that was set to frame attitudes reflecting public acceptance towards the expanding bike-sharing scheme in Gothenburg, Sweden in order to identify the 'formula for success'. The paradox appears when even respondents who reported a small (or no) likelihood of using a hire bike were positive towards the scheme. The authors suggest that this means these respondents recognise that bike sharing is not a system favouring a particular road-user segment over others that might not be interested or able to use it; they generally believe that the scheme is a pro-environment, inexpensive and healthy transport mode, which compliments the city's other public transport services and has significant pro-social potential in promoting a more human-friendly identity for Gothenburg.

This is a reassuring result and suggests that such shared transport schemes, if adopted in other countries, could breakdown divisive attitudes and animosity that often occur between people adopting different modes, and which in turn can act as a deterrent to those considering cycling.

The final paper (Meng *et al*., 2016) presents a MTEEE that considers energy use per person and pollutant emissions. MTEEE is based on a general traffic equilibrium model, which jointly reduces congestion and emissions in a multimodal transportation network incorporating car, bus and electric bike. Aiming for control of the total amount of carbon dioxide and limiting the link concentration of carbon monoxide, the model is expressed as a mathematical programming problem by combining the concept of environmental capacity with traffic capacity as constraints. The proposed MTEEE is solved by a PSO algorithm. The two experiments are conducted to demonstrate the effectiveness of the proposed model and the convergence properties of the PSO algorithm. The developed model can be directly used by transportation decision makers to evaluate the effects of various polices that focus on limiting emissions on the overall multimodal transportation performance.

I am pleased how this second part of the issue, which focuses on walking and cycling, complements part one (see http://www.icevirtuallibrary.com/toc/jensu/169/2), where we are reminded to stretch traditional perceptions to the widest possible definition of active travel to look to future possibilities and encompass modes that facilitate all groups of society, such as the less-abled, those older or younger, or those with restrictions or deterrents due to, for example, dress or culture.

The economic, environmental and health benefits of active travel are undisputed but we should note the immeasurable wider social benefits the increased well-being experienced by those who have individual control over their own propulsion – and the heightened senses of empowerment, exhilaration and freedom, so clearly demonstrated in the joy of a child realising for the first time that they are in full control of their bike. When civil engineers take on the opportunity and the responsibility to facilitate active travel for all members of society, we are surely engineering sustainability in its truest form.

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