Editorial

Sakdirat Kaewunruen BEng (Hons), MEng, PhD, MBA, CPEng,
NER, RPEQ, FHEA, APEC Eng
Senior Lecturer in Railway and Civil Engineering, School of Engineering,
The University of Birmingham, Edgbaston, UK

The next generation of transport engineers and scientists will need to comprehend and manage the grand challenges in providing sustainable, smart and resilient transport systems critical for maintaining the competitiveness of cities and built environments (Kaewunruen *et al.*, 2016). Importantly, they will also need capabilities to balance between societal needs and environmental impacts in accordance with the United Nations' Sustainable Development Goals (SDGs), as illustrated in Figure 1. Every interdependent transport mode (i.e. road, rail, marine, aviation, pipeline) is a key essential enabler to most of the SDGs. If you cannot realise it, imagine what would happen when no transportation systems exist. The scale, scope and significance of transport systems for the SDGs pave the way to the impact of this issue of *Transport*.

It is thus my great honour to welcome you to this issue of the Institution of Civil Engineers' (ICE) *Transport* journal. This issue of *Transport* will highlight new findings and lessons learnt from transport infrastructure and system management in order to assure integrated and sustainable transport planning for future cities and communities. This is my first editorial as a member of the editorial advisory panel. I am very grateful to ICE and the editorial advisory panel members for giving

me the opportunity to welcome you to this issue. On behalf of the editorial advisory panel, I hope that the published materials are useful and provide new reference nodes for the transportation community, including researchers, engineers, planners, policymakers, students and the public.

This April 2019 edition offers five articles on a variety of transportation issues, ranging from bicycling, road and rail to the network system. A brief overview of all five papers can be found below.

The first paper, 'Building an institution for rural roads management in Timor-Leste' by Done and Lawther (2019), deals with transport policy. The authors comprehensively assessed both public and private road-management institutions in Timor-Leste, whose road network has not been maintained since 2006. Several guiding principles have been drawn to improve rural infrastructure in a developing country with low private and public sector capacity. These principles can be useful for designing or restructuring a road transport organisation.

The second paper addresses a key societal issue: 'Cyclists in shared bus lanes: could there be unrecognised impacts on bus journey times?' (Aldred *et al.*, 2019). In this paper, a case study of bus-cycle interactions in London has been carried out to address the implications of cyclists in shared bus lanes. The modelling outcomes clearly revealed that the cycles can cause dramatic delays to buses in the shared lanes. This study is interesting and will be beneficial to transport planners considering the trade-off between congestion and sustainability among cycles, buses and cars. This paper has an appendix of parameter inputs for the modelling, which can be useful for transport modellers.

The third paper tackles the complication of freight train operations in 'A simulation model for train movements in the rail network' by Moeinaddini *et al.* (2019). Optimal movement of freight is the main emphasis of this study. A simulation

Figure 1. UN Sustainable Development Goals (UN, 2019)

model of train movements associated with blocking and dispatching problems has been established. The Iranian freight network has been used as a case study to demonstrate the mathematical model. The analysis revealed that the application of a flexible sending strategy and a necessary classification strategy yields the best performance of the freight rail network. This study has taken into account the fuel consumption of freight trains as a key criterion in eco-friendly optimisation, which can be of interest for transport planners.

In the fourth paper, 'Flexible pavement design for hot climates – a case study', Kuna and Kelly (2019) highlight the extreme climate adaptation design of a road network from the bottom up. Best practices and lessons learnt in pavement design for hot climates from a highway project in Qatar (where the surface temperature can reach 70°C) have been comprehensively and interestingly presented in this paper. The design of pavements with a cement-stabilised base has been demonstrated by empirical design practice, test results and new research findings. The analysis highlights the importance of pavement temperature distribution throughout the year as the key design input. This paper will be useful to road pavement designers when considering climate resilience.

The last paper of this issue, 'A composite resilience index for road transport networks' (El Rashidy and Grant-Muller, 2019), proposes a new approach to cope with disruptive events. The paper discusses the three resilience characteristics of road transport networks, including redundancy, vulnerability and mobility. A new composite resilience index has been established based on travel behaviours. Delft city road transport network has been used as a case study. This paper demonstrates the benefit of the new index for transport policymakers to understand better the dynamic nature of transport resilience

and the weakness in the network so that future planning and resource re-allocation can be emphasised.

It is very clear that all of these papers in this issue contribute towards transport sustainability as well as the SDGs. I sincerely hope that you find these papers beneficial to your work anyhow. The mission of the journal is to attract high-quality papers that extend our reach internationally. Therefore, further dissemination by either word of mouth or other means will be deeply appreciated. In addition, any comments on the articles in this issue are most welcome.

REFERENCES

- Aldred R, Best L and Jones P (2019) Cyclists in shared bus lanes: could there be unrecognised impacts on bus journey times? *Proceedings of the Institution of Civil Engineers – Transport* **172**(3): 135–151, <https://doi.org/10.1680/jtran.16.00072>.
- Done S and Lawther TP (2019) Building an institution for rural roads management in Timor-Leste. *Proceedings of the Institution of Civil Engineers – Transport* **172**(3): 125–134, <https://doi.org/10.1680/jtran.15.00077>.
- El Rashidy RAH and Grant-Muller S (2019) A composite resilience index for road transport networks. *Proceedings of the Institution of Civil Engineers – Transport* **172**(3): 174–183, <https://doi.org/10.1680/jtran.16.00139>.
- Kaewunruen S, Sussman JM and Matsumoto A (2016) Grand challenges in transportation and transit systems. *Frontiers in Built Environment* **2**: article 4, <https://doi.org/10.3389/fbuil.2016.00004>.
- Kuna K and Kelly K (2019) Flexible pavement design for hot climates – a case study. *Proceedings of the Institution of Civil Engineers – Transport* **172**(3): 164–173, <https://doi.org/10.1680/jtran.16.00097>.
- Moeinaddini A, Shafahi Y and Hasany RM (2019) A simulation model for train movements in the rail network. *Proceedings of the Institution of Civil Engineers – Transport* **172**(3): 152–163, <https://doi.org/10.1680/jtran.16.00082>.
- UN (2019) *Sustainable Development Goals*. United Nations, New York, NY, USA. See <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> (accessed 15/04/2019).