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Editorial: UK-Japan Symposium on Highspeed Rails

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Editorial on the Research Topic

UK-Japan Symposium on Highspeed Rails

The UK-Japan Symposium on Highspeed rails' had been hosted at the University of Birmingham to address one of the most important issues in the UK regarding high speed rail systems and how these systems create significant impacts to the public and enable positive contribution toward the environmental, social, and economic sustainability of the communities they serve. They are built to enhance social and economic connections, and people quickly take up the opportunities offered by the increased mobility. Around the world, high speed rails have been demonstrated to be the essential catalyst for regional growth and have improved the quality of everyday life (Kaewunruen et al., 2016). However, in the UK, highspeed rail systems have not fully been developed. The British Government has recently set up an ambitious plan to build a new highspeed rail line from London to Birmingham, toward the Northern Power House. This special topic presents a set of work presented in the symposium, which enhance a great opportunity for the UK industry to learn from the extensive expertise of the pioneers in highspeed rails.

Integration of transportation and transit systems to harmonize with real-life urban infrastructure systems needs extensive genuine discussion and collaboration among stakeholders, including scientists, engineers, policy makers, politicians, and society. The goal of this symposium is to develop an interface among the engineering, scientific, and general communities to underpin applied research contributions from the vital steps of highspeed railway sciences to the beginning steps of engineering and the adoption of engineered systems to serve the needs of individuals, societies, regions, industries, and countries. The topic of this symposium is very timely and original, especially when the UK currently and heavily invests in the highspeed rails (> £50 billions). The knowledge of life cycle and sustainability is extremely crucial for design, construction, maintenance, and operations of the highspeed rails acting as the system of system.

The key objectives of this symposium were to:

- Provide formal and informal platforms to establish long-lasting relationship between Japanese experts and the UK academics and industries.
- Enable knowledge transfer and share experience on highspeed rail systems, especially on the theme of life cycle management and sustainability.
- Highlight Birmingham as a world-class hub for high speed rail technology (Birmingham is home of National College for High Speed Rail, High Speed Two Ltd., British Alliance Rail Suppliers, and European-largest Birmingham Centre for Railway Research and Education).

This Research Topic thus highlights collaborative research for improving cost, maintenance, safety, sustainability and carbon footprint in transportation and transit systems in urban environments. The collaborative researches are aligned with United Nation's Sustainable

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Development Goals. With proven research insights and open data sciences, the presentation reveals that 6D BIM can be used to enhance sustainability in railway industry.

Along this line, Rungskunroch et al. presented a novel methodology to improve the end-of-life of highspeed rolling stock, considering CFRP composite material replacements. The investigation and insight has formed a part of ISO working group (#4) for a new ISO standard for recycling of rolling stock. This new standard has now been officially endorsed by ISO for applications in the industry.

Almujibah and Preston shared an investigation into total social costs of constructing and operating a highspeed rail line based on a case of Riyadh-Dammam Corridor, Saudi Arabia. A highlight is the total external environmental cost resulting from the sum of average costs of noise and air pollution, climate change, and accident using the corridor data in Saudi Arabia.

Kaewunruen et al. shared extensive total track inspection of railway track systems. The extensive review specifies the systems thinking approach in track inspection activity planning. The insight underpins a risk-based inspection and maintenance of railway track systems, taking into account safety, reliability, risk, and uncertainties in railway asset operations and maintenance.

Kaewunruen and Xu highlighted the application and development of the three-dimensional model of the King's Cross station building toward a 6D building information model. This is the world's first to enable a 6D model that is embedded with actual time and cost schedules, as well as carbon footprint calculation, and engineering assumptions for renovation. The result of this research can provide construction engineers and stakeholders with engineering guidance of BIM utilization for railway station projects that can enhance every stage of life cycle such as planning, designing, and operating an economic and environmental efficient construction project.

These papers provide an insight on design, construction, operation, maintenance, risk mitigation, assurance, and development toward sustainable highspeed rail systems. The topic editors are grateful to the review editors and associated editors.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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Conflict of Interest: MI is employed by Nippon Koei Co., Ltd.

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