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## Editorial

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**Biographical notes:** Ronald E. Fisher has over 20 years of experience in critical infrastructure protection and resilience (CIP) including serving on President Clinton's Presidential Commission on Critical Infrastructure Protection and as a Senior Consultant to the National Petroleum Council. He has been the Program Manager for CIP activities for Department of Energy, Department of Defense, and Department of Homeland Security. He has over 150 publications including contributions to multiple books on homeland security. His degree is in organisational development, and his dissertation focused on homeland security and is titled, 'Taking a normative approach to organisational culture change on critical infrastructure protection'.

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The word resilience means different things to different people, organisations, and nations. In its simplified form, resilience is being prepared for stress to critical infrastructures. This stress may or may not lead to an infrastructure outage and resilience includes the capacity to recover quickly from disruption. This special issue 'International perspectives on full spectrum resilience' examines resilience across multiple critical infrastructures (e.g., roads, rail, and buildings) and at differing geographic scale (e.g., city, and region). The papers selected reflect the complexity and diversity of full spectrum resilience. The authors provide a global diversity (the USA, Canada, Columbia, Italy, Germany, and Spain) as resilience is a global challenge that requires strong research collaboration.

This special issue is based on papers selected by the infrastructure security partnership (TISP) knowledge, skills, and education committee. All papers in this special issue were reviewed by multiple distinguished experts in a blind review process and have been revised to reflect these reviews. The commonality of global challenges to resilience includes issues such as:

- dealing with aging infrastructure
- understanding the impacts of infrastructure dependencies and interdependencies (one way and bi-directional dependencies)
- changing financial landscape – decrease in infrastructure investments
- increasing utilisation of existing infrastructure.

Lessons learned from natural disasters [e.g., Hurricane Sandy (USA), Munich Germany blackout, flash floods in Italy] provide needed insights into increasing resilience. Although, these lessons learned are valuable, lives were lost and communities were significantly impacted. Proactive measures are being taken across the globe that

potentially can reduce the impacts from natural disasters and other threats to critical infrastructures.

The paper by Pierluigi Olmati, Patrick Trasborg, Clay Naito, and Franco Bontempi, titled 'Blast resistant design of precast reinforced concrete walls for strategic infrastructures under uncertainty', proposes an approach in evaluating buildings' vulnerabilities to vehicle borne improvised explosive devices. Their approach focuses on fragility curves in analysing peak pressure and impulse from blast loads.

The paper by Miguel Jaller, PhD, Carlos A. González-Calderón, PhD, Wilfredo F. Yushimito, PhD, and Iván D. Sánchez-Díaz, PhD, titled 'An investigation of the effects of critical infrastructure on urban mobility in the city of Medellín', examines transportation bottle necks in the City of Medellín, Columbia. Their analysis of commuter congestion is applicable to other major cities.

The paper by Manuel Valdés i López, Margarita Fernández-Armesto, Ares Gabàs Masip, and Josep Raventós i Fornós, titled 'Barcelona: building resilience strategies', proposes a joint stakeholder approach to urban management adopted in Barcelona, Spain. Their integrated approach is a solid framework for other cities and regions to consider adopting.

The paper by Steve A. Thompson titled 'Consequence modelling of the population risk exposure resulting from airborne toxic material released from rail cars within Toronto, Ontario', discusses the risks of hazardous rail transport in Toronto, Canada. This paper provides insights into risk management of this critical topic.

The paper by Christoph Riegel, titled 'Spatial criticality – identifying CIP hot-spots for German regional planning', discusses spatial and functional aspects of resilience planning in Germany. The lack of available land for new critical infrastructure expansion drives the higher utilisation of existing right-of-ways. This paper offers an analysis approach when considering critical infrastructure expansion.

This special issue identifies gaps in resilience research. There is still much more resilience research to undertake. Our global economy, security, and safety hinge on critical infrastructure protection and resilience. As a research community, we need to increase collaboration to leverage knowledge and investments. Hopefully, this special edition is the start of many articles and publications on resilience.

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