# System of Systems EngineeringCollaborators Information Exchange (SoSECIE)

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**Resilience in Systems of Systems: Electrified Transport Systems**

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#### Abstract

The transport system is a large system of systems which currently faces challenges because of the climate-change-induced need to decrease the use of fossil fuels. The aim of mitigating climate change is realized in many parts of the transport system, concurrently and at high pace, which brings with it many challenges for the resilience of the system. By resilience, we mean the ability of a system to adapt due to disruptions and surprises. There are numerous links between the different systems that form the transport system and the actors responsible for available choices in the system of systems need to be identified. The aim of this paper is to identify requirements for developing a method for increasing resilience in the transport system. In this study a description of the electrified goods transport system as a system of systems is developed through a combination of researchers from different areas and discussions with experts mainly in the field of transport and governance. The resulting system of systems is presented in the paper together with a list of measures that will aid the development of a resilient electrified goods transport system. The measures are divided into technology, organisation and behaviour.

#### Biographies

Pontus Svenson is a senior scientist at RISE Research Institutes of Sweden. He received a PhD in Theoretical Physics in 2001 and has a 15-year background at the Swedish Defence Research Institute (FOI), where he worked on decision support, situation awareness and data fusion, mainly for military intelligence and critical infrastructure protection. His current research is focused on systems of systems engineering, and in particular on resilience and situation awareness aspects within the transportation and critical infrastructure domains. He is the author of around 100 scientific publications, has a h-index of 19 and is a member of INCOSE.

Kerstin Eriksson is a senior scientist at RISE Research Institutes of Sweden. She received here PhD in Fire Safety Engineering from Lund University in 2010. Since then, she has worked as a postdoc at Lund University and since 2014 at RISE, focusing on resilience and climate change.

Sara Janhäll is a senior scientist at RISE Research Institutes of Sweden. Her PhD in Environmental Physics was received at Gothenburg University 2005 with a focus on the urban aerosol and traffic related particles. She has since then worked as a researcher in transport and environmental related areas focusing on air quality, particles and decision support. Transport infrastructure development and effect on sustainability development is the current research focus. She is the author of around 90 scientific publications, with around 1800 citations and has a h-index of 16.