



Resilience in future cities

White paper

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Continuity in critical infrastructure

Our society must function even during civil disturbances, crises and even war. It needs to meet new rapidly changing challenges characterized by, for example; privatisation, technological development, globalisation, just-in time deliveries, electrification and digitalisation. Today, there are increased dependencies between sectors, businesses and functions that go way beyond any complexity that society has ever met before. There are also major trends that we must be able to adjust to. This creates vulnerabilities that needs to be managed in order to be resilient. This means that we need to be prepared for, have a capacity to manage and recover quickly from various kinds of disruptions. To manage, cities must take a holistic perspective on resilience, from the early planning phase of an infrastructural change to daily life lived in the city. The preparedness for disruptions must be a constant and living perspective.

With this said, we need to focus on critical functions. The protection of critical infrastructure is about ensuring that activities and functions of importance to the population's life and health, society's functionality and our basic values, have an ability to prevent, manage and recover from serious disruption.

There are numerous challenges. For example, in several countries, critical infrastructural are split between an increasing number of public as well as private actors. The problem is that when many different actors with diverse roles and mandates are involved in the delivery of, for example health care, the system becomes more vulnerable, and communication and coordination become especially important in order to achieve a holistic view. Another problem is that little research has been conducted on how this affects the resilience of critical infrastructures, especially in relation to recovery after infrastructure failure.

The tools we use to reduce vulnerabilities and increase our resilience are various methods of analysis. At ÅF, we believe that using quantitative as well as qualitative methods and constructing teams with a mix of competences and experience is the best way to meet these challenges. We have unique experience from public as well as private actors and cooperate closely with authorities and the research community.

Reduce vulnerability in our cities and increase ability

Our fast-changing society and the threats to it requires us modify the way we work. We need to ask ourselves new and diverse questions such as: What kind of vulnerabilities do we build into our society? Can we reduce these weaknesses already in the early stages of the planning process? If not, can we increase our ability by being aware of our weakest links and securing these with different backup solutions? How do we manage an extended disruption? Can the changes we make in our infrastructure handle not only one strain but several? Do we have a plan?



The challenges for present and future cities are numerous, but so are the opportunities for improvement. We must be conscious and increase our knowledge about threats. Not only threats from climate change and a fast-changing society, with many complex dependencies, but also threats that are more complex and indistinct, compared to the past. Threats with a less clear boundary between peace and war. There are countries and actors who seek to influence other countries' interests, their freedom to act and their abilities. These actors can use political, economic, psychological and military means to achieve their intentions. This includes pressure, sanctions, spread of disinformation, sabotage and other demonstrations of power.

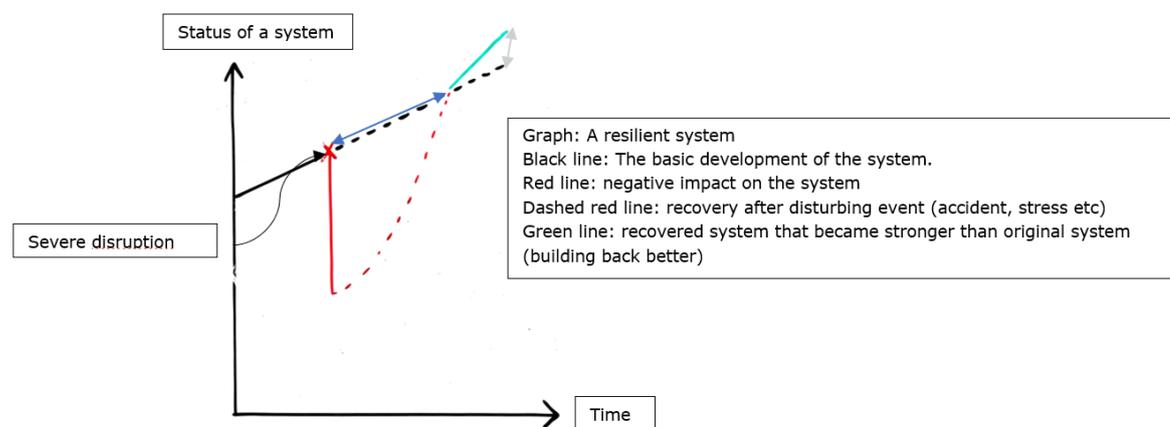
Civil defence and how ÅF can contribute to the ability to build back better

The foundation of civil defence is building sustainable and resilient cities, that can resist, manage and quickly recover after a severe strain. A society that can deliver goods and services to its population despite serious stress is a society that contributes to civil defence.

Our purpose at ÅF is to:

- Prevent any disturbing event. Though, it is not realistic or always justified to avoid disruption at any cost.
- Minimize systems failure during disruptions (see red line in figure below). This means various kinds of preventative work, developing action plans, identifying and securing critical infrastructure.
- Generate an ability for swift recovery (red dotted line). Above all, to make "lessons learned" recovery possible. This means that the system learns and becomes more resilient than before the disruptive event (green line).

An important tool for decreasing the gap between the new system and the original (the red line) is through the work with risk- and vulnerability analysis. These methods are used for reducing the effect of disruptions and crises by systematically increasing capacity and reducing vulnerability.



Graph: With inspiration from Professor David Lallemand and Senior lecturer Per Becker.



ÅF has the tools and experience to build resilience.

For more than a decade, we have been obliged by law to regularly perform risk and vulnerability analyses on various societal levels in Sweden. ÅF's consultants are highly experienced in this field, having participated in the development, implementation, and project management of these analyses on a national, regional and local level. ÅF is specialised on a method that combines both risk management and continuity management, which focuses on the protection, ability and continuity of critical infrastructure in a society.

ÅF as a sustainable and resilient partner

We have the capacity to assemble teams with knowledge and experience of preparedness planning, city planning, sustainability, fire protection, risk and crisis management, able to apply a combination of qualitative and quantitative analysis methods. As we aim to build knowledge within the client's organisation, we regard interaction and cooperation with clients as key.

Conclusion

To achieve resilient communities, now and in the future, they must create inherent ability. There is a need to develop current planning processes and change the mindset in the early stages of development for new buildings and infrastructure.

Knowledge of crisis management and preparedness must be added to different levels of planning and construction, along with perspectives on mega trends and various threats. This requires more disciplines than before to interact with each other, to protect, manage and finally build back better after societal disruptions or crises. This is an important foundation for civil defence capacity and all actors, both public and private, need to work together.

The work that we do and specialise in connects to several of the sustainable development goals of the UN. Especially no. 11, *Sustainable cities and communities*; no 16, *Peace, justice and strong institutions*; no 9, *Industry, innovation and infrastructure*; and no. 3, *Good health and well-being*, as well as the *Sendai framework for disaster risk reduction 2015-2030*.

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