Bigger Faster Wetter

Functional Cities 2014 – the conference



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Bigger, Faster, Wetter. Functional Cities 2014, the conference

Bigger, Faster, Wetter. Functional Cities 2014 – the conference is one of the minibooks from Resilient Regions Association. These books are issued sporadically. Keep an eye out for the next one!

Functional Cities – the conference

On October 9, 2014, sixty participants met in Malmö to discuss and share knowledge and experience of their work with building more attractive, effective and functional cities. With speakers from Sweden, Denmark, Britain and Spain, it was a conference with local, regional and global perspectives on how to implement urban resilience.

This minibook summarizes the presentations given at the conference.

An attractive city



Magnus Qvant, Secretary General of Resilient Regions Association

Due to urbanization, aging infrastructure and climate change it is becoming even more important for regions and cities to function, and function well. It is a competence factor for a city to be attractive: to appeal to companies, people and the workforce. To succeed, a city also has to be competent. Cities want to be, and people want to be in, an area that is well functioning and attractive.

Resilient Regions Association gathered speakers and guests from cities, universities, private companies and governments from all around Europe at the Functional Cities conference. "We know that it is crucial for these groups to work together to make a difference for the future", says the Secretary General Magnus Qvant. "Our cities are aging and for them to stay attractive in relation to the increasing population, we have to take care of and upgrade them. The challenges we are facing might all occur on the same day ... This is why it is so important for us to build smart, functional and resilient cities."

A video greeting from Rockefeller Foundation, New York

As an introduction, the audience was greeted on video by the Vice President of the Rockefeller Foundation initiative *100 Resilient Cities Challenge*, Bryna Lipper. This is a network helping cities around the world to become more resilient to the physical, social and economic challenges that are a growing part of this century.



"Our ambition is to create a tipping point for resilience"

The Rockefeller Foundation is investing 100 million USD dollars to support the adaption and incorporation of a view of resilience that includes not just the shocks – earthquakes, fires, floods, etc. – but also the stresses that weaken the fabric of a city on a day to day basis.

"100 Resilient Cities is an effort that was born within the Rockefeller Foundation", says Ms. Lipper, "to help cities around the world build resilience in their communities. We are providing support for a Chief Resilience Officer for each of these 100 cities, a senior official who will work within the municipal government to support and convene a variety of different resources to build resilience in their city. We are also providing a platform of tools and services, expertise that the cities can draw on to help support and implement their initiatives.

Just like the Resilient Regions Association does.

By working with 100 cities globally, our ambition is to create a tipping point for resilience. Our goal is to understand what resilience is, build strategies around these cities and bring a marketplace of resources to them."

Protect core values and prepare for change



Nils Svartz, Deputy Director General at the Swedish Civil Contingencies Agency (MSB)

"I have seen rain, cloudbursts, drought, heat waves and fires up close during the last couple of years. Disasters that affect individuals, families, cities and companies", says Nils Svartz, Deputy Director General at the Swedish Civil Contingencies Agency (MSB). "This also causes high insurance costs in the Western world and an on-going stress on infrastructure worldwide."

Climate change will continue to challenge our capabilities in the future. It is difficult to predict when and how these issues will affect us. However, we can prepare for some of the factors that we are aware of.

Pack your things, we are moving

As of today, 50% of the worlds' population live in cities. This number is estimated to increase to 70% by 2050. There are many upsides to this: it is much easier to provide water, sanitation, health and education services to people that live closer together. On the other hand, urbanization increases the strain on the environment and natural resources.

Sorry, I do not speak tech

When discussing cyber security, the discourse often turns into a highly technical and complicated one. To make the conversations more understandable, there are four main keywords one should remember to be able to take on the discussion:

- Confidentiality
- Accuracy
- Availability
- Traceability



Age is nothing but a number

An aging population is a welcomed by-product of increased medical and economic progress. There are social and economic challenges for society, individuals and families that come with this. However, with the right policies in place we can all benefit from this. Older people have wisdom, energy and experience. Only bad polices turn long life into an economic problem.

"Disasters affect individuals, families, cities and companies"

Uncomfortable questions

"At MSB we have to ask questions like 'what kind of threats are we facing?' covering the whole scale from emergency, crisis and war", says Nils Svartz. "We work with capabilities in many ways, with a focus on knowledge management. By connecting stakeholders we enable them to share experiences and knowledge so that they too are ready to respond when needed.

By protecting core values, planning long-term, describing threats, and using the power of joint forces from the private, public and civil society we can build as resilient a city as possible."



Photo by: Nils Rosenvold

Vejle, a city full of water



Ole Due, Director of Ecolarium & Resilience Coordinator, Vejle Kommune

The Danish municipality of Vejle is facing a future full of challenges. Research shows that the city will be under water by 2100. This is a city where resilience cannot wait, and Vejle works with many innovative projects to find solutions to the increasing water levels. Since 2013 Vejle is also a part of the Rockefeller Foundations 100 Resilient Cities project.

"Vejle's biggest threat and asset is the sea", says Vejle municipality's Resilience Coordinator, Ole Due. "It provides the city with beautiful scenery and surroundings, but it can also contaminate the drinking water and disable the infrastructure as the water levels are rising."

Since 2013, Vejle has been working on a new type of storm water infiltration beds that purifies and filtrates contaminated road water.

Another important facet of Vejle's work with resilience is to focus on all the positive aspects and opportunities that water provides. "Vejle could become a mini-Venice, with resilient and climate adapted infrastructure", says Ole Due.



The Internet of Things



Paul Davidsson, Director, Internet of Things and People Research Centre, Malmö Högskola

"In the near future everything that benefits from being connected, will be connected. The technology is affordable and can be used worldwide", says Paul Davidsson, Professor and Director of the Internet of Things and People Research Centre at Malmö University.

Sensor technology and connectivity can help manage our daily life; thermostats, locks and appliances can be adjusted with our mobile phones. This applies to businesses, cities and consumers.

In functional cities, this means great opportunities in transportation, power and energy. There are already some interesting initiatives by major companies such as Apple, Google and IBM to implement this sensor technology in cities. For example, waste management can be made easier by using "connected containers", bins with sensors telling *"Everything that benefits from being connected, will be connected"*



the system when they are full. Local transportation can easily send real time information to devices and information boards through the use of sensor technology.

Villains and blackouts

"Connecting the city to new smart technology also comes with challenges. How can we handle power outages and data blackouts? How can we make Internet services more robust? There is also the threat of malicious actors in the system, like hackers and other cyber-crime. Today we have powerful technology, but we are lacking an equally powerful legislation", Paul Davidsson points out. Increased connectivity and social capital can make cities more resilient



Mikael Grape, Senior Consultant Risk & Resilience, 4C Strategies

In 2013 there were riots and social unrest in Husby in Stockholm, Sweden. 32 police officers were injured and policing costs rose by 500%. Even though this is an uncommon phenomenon in Sweden, similar events have occurred in London and Paris.

The riots in Husby subsided only when locally organized peaceful

"One of the most important aspects to prevent social unrest is presence"

organizations stepped in. This is one example of how social unrest cannot be countered solely by increased police presence; you need to utilize the social capital of local residents.

The city's eyes and ears

"The best way to foresee and prevent social unrest is by working closely with locally anchored community hosts, social workers and volunteers", says Mikael Grape, Senior Consultant at the risk, business continuity, crisis management and training management company 4C Strategies. "These groups are providing one of the most important aspects to prevent social unrest: presence."

In the past it has been complicated to organize the patrol routes of these groups. Their reports of deviations and damage, such as broken windows, have been a time-consuming and manual task. Capitalizing on the already existing technology in smartphones and similar devices can improve the effectiveness and cooperation of these groups.

This is a cost-effective way of letting the people be the city's eyes and ears, and increases the effectiveness and the reach of the preventive efforts. This is exactly what 4C Strategies have done in Järva,

Stockholm. Through their native app Exonaout, they have equipped a large number of night volunteers with a solution to plan their routes, gather, store and share information. All in real-time.

The solution: the smartphone revolution

- 1. Divide an area into manageable blocks
- Identify and map hotspots and routs: preschools, schools, services etc.
- 3. Identify critical stakeholders, residents, social workers, volunteers, local police etc.

An important aspect of this model is connecting these actors to reach a synergy effect. They can take photos and videos of damages, take notes, make observations, track their geographical position and upload all of this in real-time using technology that is already in their pockets.

The data collected also helps in analyzing and finding new risk indicators. By monitoring these indicators, we can coordinate actions to prevent riots and other acts of social unrest before it is too late. For example, a damaged window can be an indicator of bigger underlying issues.

Using this bottom-up perspective benefits everyone in the area, creating a safer and more robust city for its citizens, companies, services and schools.

Resilience makes day-to-day life better



Michael Stevns, Partner Manager Siemens, Competence of Cities, London

"We're actually not very well adapted even to our current climate. And in the future, even average weather will pose challenges to our cities, where an increasing amount of people, industrial assets and private property are at risk", says Michael Stevns, Partner Manager at Siemens in London. He emphasizes the fact that action today could help us manage risks, reduce costs, create jobs, attract and retain investments, and provide a better environment — and better quality of life.

He also notes that the changes are going to take generations to implement, but says that it is of vital importance that we get it right

now. Infrastructure, cities and developments have to be designed to manage the climate that we will experience over a lifetime. "And that's a long time."

Not only a question of disasters

The UN has estimated that 2012 was the third consecutive year where more than 100 billion USD in damage could be directly related to factors like floods, storms, earthquakes and droughts.

"It's not only about the major disasters", says Michael Stevns. "It's also about everyday incidents, like heavy snowfall stopping transportation in cities for more than a week, causing chaos, closing schools and disrupting the ordinary life of many families."

Five factors for resilience

Siemens works with five characteristics that are important to a resilient system. Michael Stevns says that in an ideal world the systems would have all five of them (see diagram to the right)

Very often, investments in resilience are compared to taking out an insurance policy; something that would help to mitigate the effect and costs of a disaster. *"Resilience investments actually provide day-to-day benefits for citizens and create more sustainable and more efficient cities."*

Infrastructure requirements to make cities more resilient



"Infrastructure, cities and developments have to be designed to manage the climate that we will experience over a lifetime."

"That of course is true, but what we would argue is that resilience investments actually provide day-to-day benefits for citizens and create more sustainable and more efficient cities."

To prove this, Siemens has analyzed the New York City power distribution net and what happened during Hurricane Sandy in 2012. One of the best, and perhaps the most obvious, example is a co-op area in the Bronx that invested in its own power plant. When Hurricane Sandy hit New York, lights still stayed on in this Bronx area that has more than 60,000 residents.

Interestingly enough, they did not make this investment for resilience, but for cost saving. Their expected payback time is five years.

Doing nothing is not an option

Michael Stevns continued his presentation by showing the costs and the benefits for the New York power grid in three different scenarios. As you can see from the diagram, doing nothing is hardly an option:



Cost = Benefits from Action Plan

Do NothingAnticipated damage

to the power arid over

20 years: USD 1-3 bn

14

\$4

\$2

\$0

(\$2

(\$4)

Protection only

 Investment pays back through reduced damage
But city still has net losses

Full Grid Resilience

20 Years

- Protection PLUS system resilience, reliability and efficiency
- Net benefits

14

Doing nothing for resilience costs slightly less – in the beginning.

(Source: Siemens)



Implementing climate adaption in Copenhagen – green visions and hard structures



Peter Jeppe Tolstrup, Project Manager Climate Adaptation

In 2010, a climate adaption study was initiated in Copenhagen, Denmark, concerning the possible effects of climate change. Focusing mainly on rainfall, sea levels and heat waves.

In the summer of 2011 the plan was ready. One week later a cloudburst flooded the entire city: 150 mm of rain fell within three hours, 90,000 damages were reported, eventually costing around 1 billion euros in insurance compensation. But things could have gotten even worse, with water posing major threats to health care, police communication and important infrastructure.

Climate change – and political change

"This was a political game changer", says Peter Jeppe Tolstrup, Project Manager Climate Adaption in the city of Copenhagen. "We got a lot of political attention, and also a lot of political 'ownership' for the continued process. The newly appointed technical and environmental mayor of Copenhagen was also obviously thankful to see that the city actually had a plan for how to deal with these kinds of problems in the future."

After the cloudburst, further calculations were made to determine what level of protection would be profitable. One of the means of investigating exactly what happened during the rain was using social media to collect pictures and films to check what happened: "did the water actually run in this street or not?" The researchers soon found out that investing to protect the city from a 100-year storm would be directly profitable, but a higher degree of protection would be too costly.

"Now, we are a front runner in climate adaption"

A front-runner in climate adaptation

In 2012 a new plan was adapted. Here, risk calculations were made on a city level, and then broken down further for each area. One example from the plan is using the banks of a city lake as a basin. Another is preparing city lanes to function as canals if rain or seawater floods the city again.

"The rains in 2011 showed that we were not at all prepared for the effects of climate change", says Tolstrup. "Now, we are a front runner in climate adaption. The plan is ready, and we know what to do in each part of the city. There are more than 300 specific projects, and it will take ten years or more to complete them."

He is proud of the quick process, and compares it to the big metro project that is in the midst of completion today. It took ten years for the city to decide upon that project. The climate adaption plan is three times larger in financial terms, but was decided upon in only one year.

"The whole plan will be financed through the water fees. This also made the decision more easy for the politicians."

Preparation is the best way to minimize business interruption costs



Staffan Ljung, Business Interruption Specialist, If P&C Insurance

Business interruption is the term for consequential damages following property damage. In a typical insurance case, business interruption accounts for 40% of the compensation. However, the bigger the claim, the bigger the business interruption part of the compensation, which in dire cases can reach up to 70%. This kind of big, long-term damage is typical for climate related catastrophes like the ones caused by Hurricane Sandy in the US in October 2012.

"Unfortunately very few of our policyholders are prepared for major damages"

The lesson to be learned for all of us is that business interruption can pose a real threat to a company. Also bear in mind that the insurance compensation for business interruption only lasts up to 12 months. Consequently, there are some measures that companies can take to minimize the effects of business interruption lowering their insurance premium in the process.

Staffan Ljung is Business Interruption Specialist and Underwriter at If P&C Insurance. He stresses the importance of preparation. Most important is to make a business continuity plan:

"It's a documented collection of procedures and information that is developed, compiled and maintained to be ready to be used in case of an incident. It enables your organization to continue to deliver its critical activities at an acceptable pre-defined level."

With a business continuity plan, companies can more easily see the need to safeguard access to spare parts and machines, as well as to suppliers. The plan functions as a guard for preparing temporary solutions, such as securing possible spare capacity, whether it is within a group or through outsourcing.

This illustration shows the statistical outcome for companies without a business continuity plan. As you can see, it is rather bleak. What are the odds for a company that did its homework, then?

"Unfortunately I have no corresponding image for that", says Staffan Ljung. "I have been an interruption-claims adjuster for a long time, and unfortunately very few of our policyholders are prepared for major damages. As a matter of fact, I can only remember one specific case where a client actually referred to a disaster plan. On the other hand, that case went very well and the company began mitigating the damages right from the start."

Importance of a Business Continuity Plan



(Source: If P&C Insurance)

Barcelona – preparing for the unexpected



Ares Gabas, Resilience Director, Barcelona

An electrical blackout in Barcelona in 2007 left more than 300,000 users without power for three days.

"If nothing was done to improve the redundancy rate, it would happen again", says Area Gabas, Resilience Director of the city of Barcelona, one of the first in the world carrying this title. "Furthermore, a failure in one system could have had a cascade effect affecting also other important systems. So: something had to be done."

From constant threat of chaos to a resilient city

A society's ability to overcome and recover from stress is crucial, especially for urban functions. The interdependence between critical systems increases the demand for cooperation, and the Functional Cities conference audience pricked up their ears inquisitively when Ares Gabas presented how Barcelona in only a few years had gone from a constant threat of chaos to today's well-oiled and robust, resilient city.

Today there are systems of cooperation, risk analysis and risk mitigation in place. There are also sustained efforts to eliminate weaknesses and bottlenecks in infrastructure and flows. Barcelona's Resilience Department takes a holistic approach to preventing problems before they occur.

"An example of the importance of cooperation can be found in the service of the city's pipes for gas and water, which are buried in the streets of our sometimes extremely compact city. A problem in one system can easily cause problems in the other. Today, if you need to repair a gas pipe it is easy to access all necessary information about what's hidden underneath the asphalt. This was not possible in the past. Back then, we simply had to start digging and see what we would find"

Integrating 1,000 different platforms

Achieving this was neither a straight nor a simple path in a city where the services had 1,000 different platforms, with different data and

partial views. All this had to be integrated into one, communal system. This has been done successfully, and today what has been a necessity for a long time has become reality. The new platform provides all the necessary information to all actors managing the city systems – including relevant information from a large number of privately owned networks and businesses.

Ares Gabas says that some of the private companies were not very enthusiastic at first, but now they are both committed and have realized the benefits of cooperation.

"They have changed their attitude, seen the benefits of cooperative work and the information from other services. Now they are asking to be involved", she says. She also stresses the fact that the Barcelona City Resilience Department and its endeavors is the result of necessity:

"Things happened that we absolutely did not want to see repeated. When we initiated this organization after the power outage in 2007, we didn't even talk about resilience – today it has become a sexy concept!"

"Back then, we simply had to start digging and see what we would find" Resilient Regions Association – a neutral arena for cooperation



Lennart Svensson, Chairman Resilient Regions Association

When Resilient Regions Association saw the need for local engagement, it decided to create a concept called Resilient Communities, built on the needs of the actors in a region. "The first community has been built in Skåne in Southern Sweden. It is a pilot, to test and develop the concept. It is a part of the greater Resilient Regions Association concept but is driven by the actors themselves; they own it and they decide what to do" says Lennart Svensson, Chairman of Resilient Regions Association.

Different perspectives

There are different needs and different perspectives creating this community. One of them is establishing and enabling a regional framework for cooperation, connecting people from different organizations. Together they can do what no one can do by themselves.

Resilient Communities are built on the idea of open innovation; they take a long-term perspective, and are also driven by concrete needs that have to be taken care of.

Moving forward, we encourage you to engage in, or start establishing, local Resilient Communities. These regional communities, in combination with new technologies and innovations, are key aspects of building the resilient regions of the future.

Resilient Regions Association has the know-how and is very willing to assist you.

Creating value by investing in resilience

Resilient Regions Association

Urbanization, climate change and the need for an updated infrastructure pose enormous challenges to our cities, as well as to those responsible for operating them. However, as the Functional Cities conference revealed, investing in resilience is creating value by improving the functionality of the city's day-to-day life. This has a greater value than "traditional investments" aiming at preventing and preparing for disasters. In addition, there is the added bonus of improved competitiveness in the constant competition for labor, investment and attractiveness.

Two main messages can be crystallized from the first Functional Cities conference:

We need new ways of working with the city's functionality. There are already positive experiences from appointing leaders with titles such as Chief Resilient Officer and Resilience Directors and giving them a broad mission and mandate to work across management structures and directly with the companies operating the city. The concept of Resilient Communities is the tool for creating neutral arenas for innovation, development and dedication.

We need new solutions and undaunted innovation, particularly by exploiting the opportunities offered by new technology and the networked society. For the innovators to succeed, we also need these innovations to be implemented, beginning with tests and living labs.

Now, we are looking forward to the 2015 conference. Through the activity of participants and speakers, it will once again be an event where we obtain new insights and spark the innovations that make a difference for cities and regions.

Stay connected.

See you at Functional Cities 2015.

For smart and sustainable societies

Resilient Regions is a neutral arena where the business sector, academia, municipalities and government agencies meet to solve regional challenges. Together we build a more resilient society with robust functions and flows – a society with the ability to quickly overcome and recover from societal pressures.

resilientregions.org