

GESTIRE I RISCHI DAL TERRITORIO AL MONDO VIRTUALE

L'evoluzione del mestiere di assicuratore

RELATORE:

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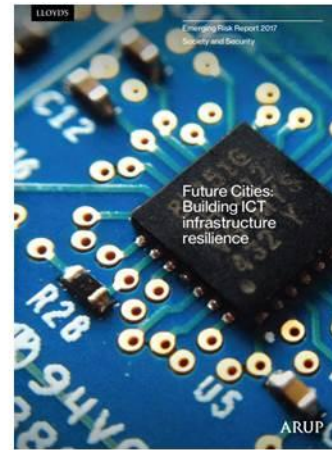
Future Cities: Building Infrastructure Resilience

A collaboration between Lloyd's and Arup

May 2017

Future cities: building infrastructure resilience

We hope you find these thought provoking and useful



[Lloyds.com/cityresilience](https://www.lloyds.com/cityresilience)

Future Cities: Building infrastructure resilience

- Energy
- ICT
- Transport
- Water

Innovation and emerging risks at Lloyd's

- **Innovation is vital**
 - Mega trends are real and need creative ideas
 - Insurance disruption is quickening
- **This can be done**
 - We are a creative market and technology can support us
 - We need new skills as well as old skills
- **Some key emerging risks that will have important insurance consequences**
 - Autonomous vehicles, Food security, Business blackout etc
 - Lots more! www.Lloyds.com/emergingrisks

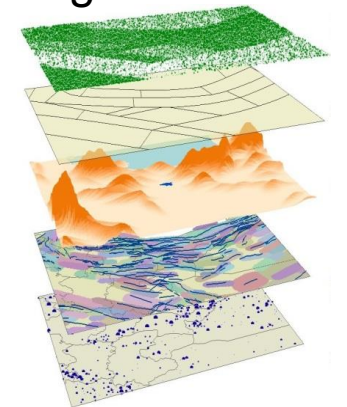
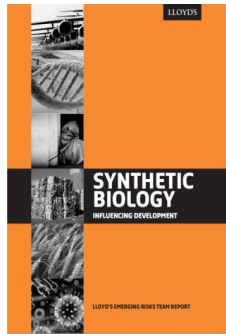
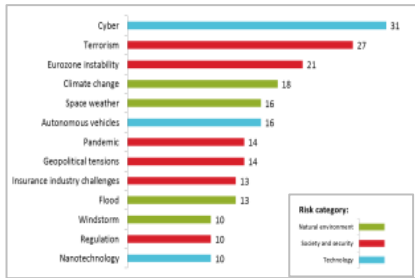
Our new definitions

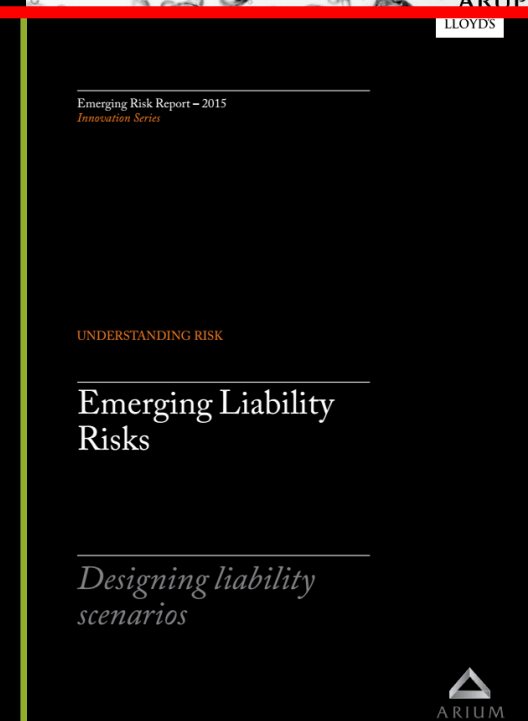
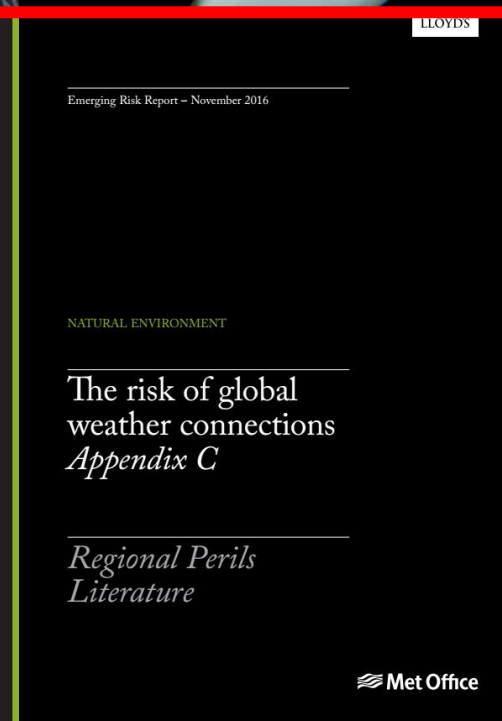
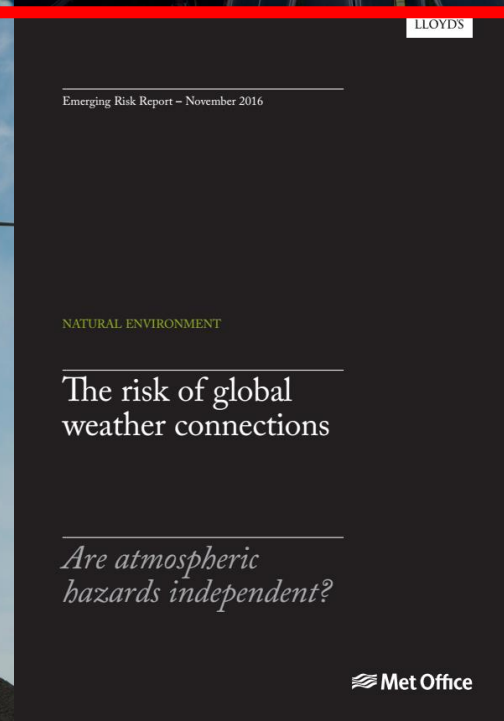
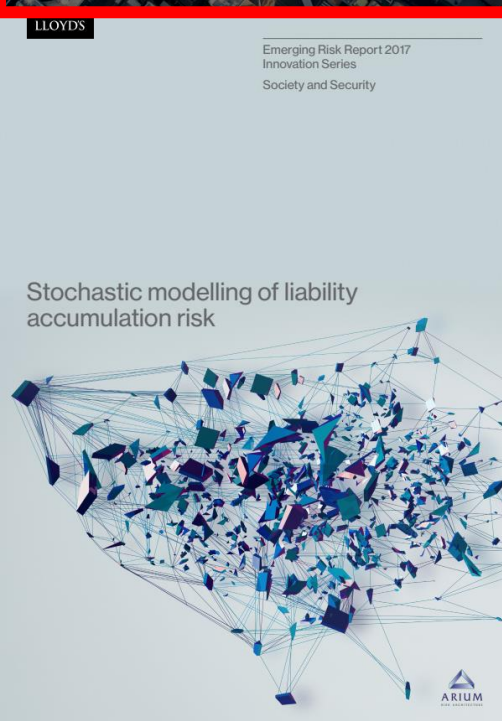
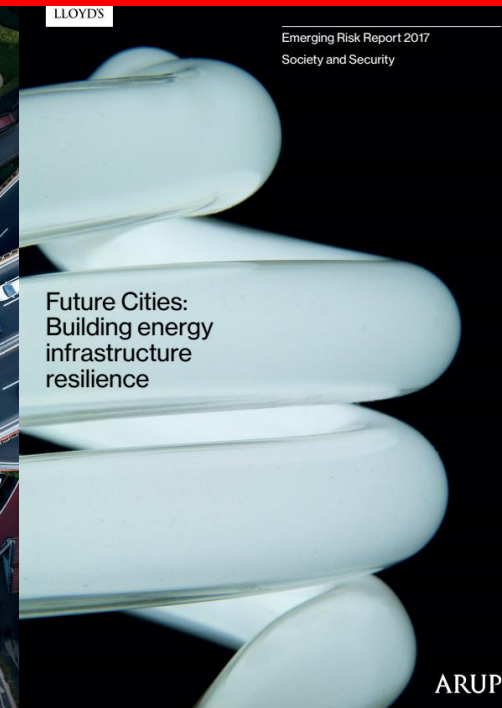
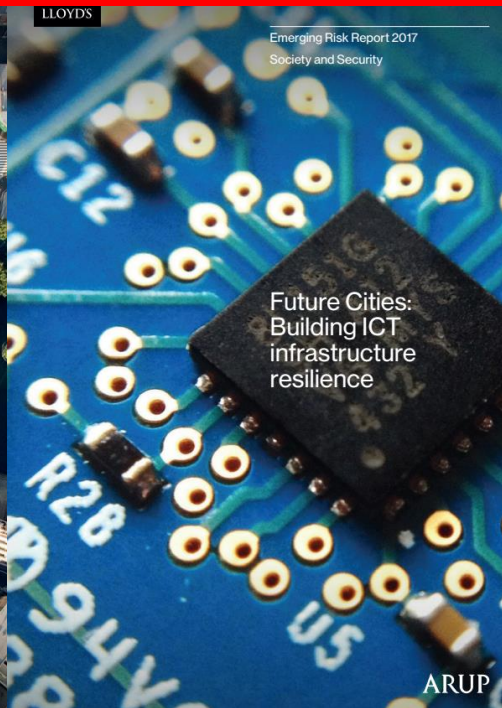
Defining the boundaries

- *Innovation: Is the practical and realisable development and application of novel thinking, methods, practices and tools, to both existing and emerging challenges faced by the insurance industry, our corporation and our key stakeholders*
- *Emerging risk: A risk which is yet to be fully understood that may have significant consequences for the insurance industry**

Note: This definition builds on the standard ISO definition of a risk: “the effect of uncertainty on objectives”.

Emerging risks management

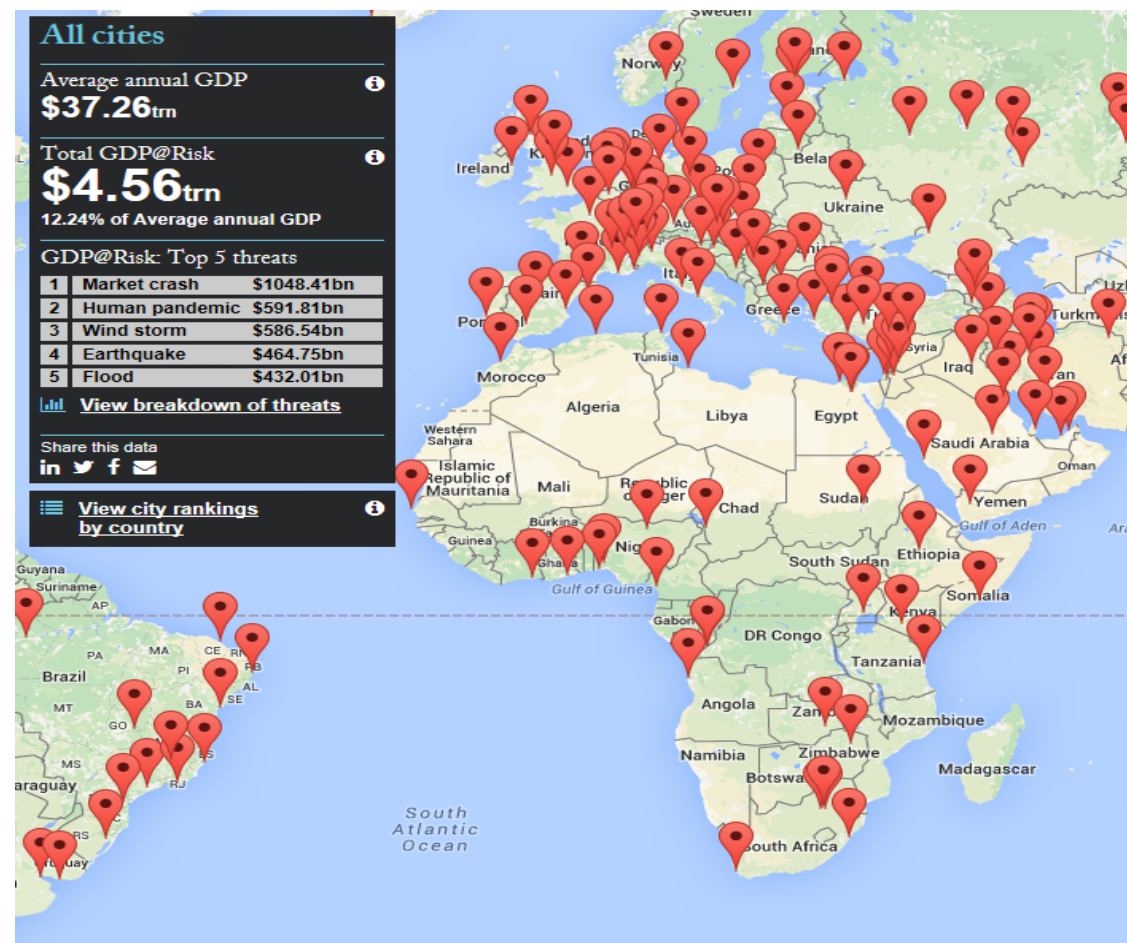




Why Cities?

Lloyd's City Risk Index

- Cities accounted for half the World's GDP in 2015 and are expected to account for around 66% by 2025
- Lloyd's City Risk Index
 - 301 of the world's major cities
 - With a projected GDP of \$372.56trn 2015-2025
 - Assessed against 18 manmade and natural threats



Dubai 1990



Sheikh Zayed Road

Dubai 2004



Sheikh Zayed Road

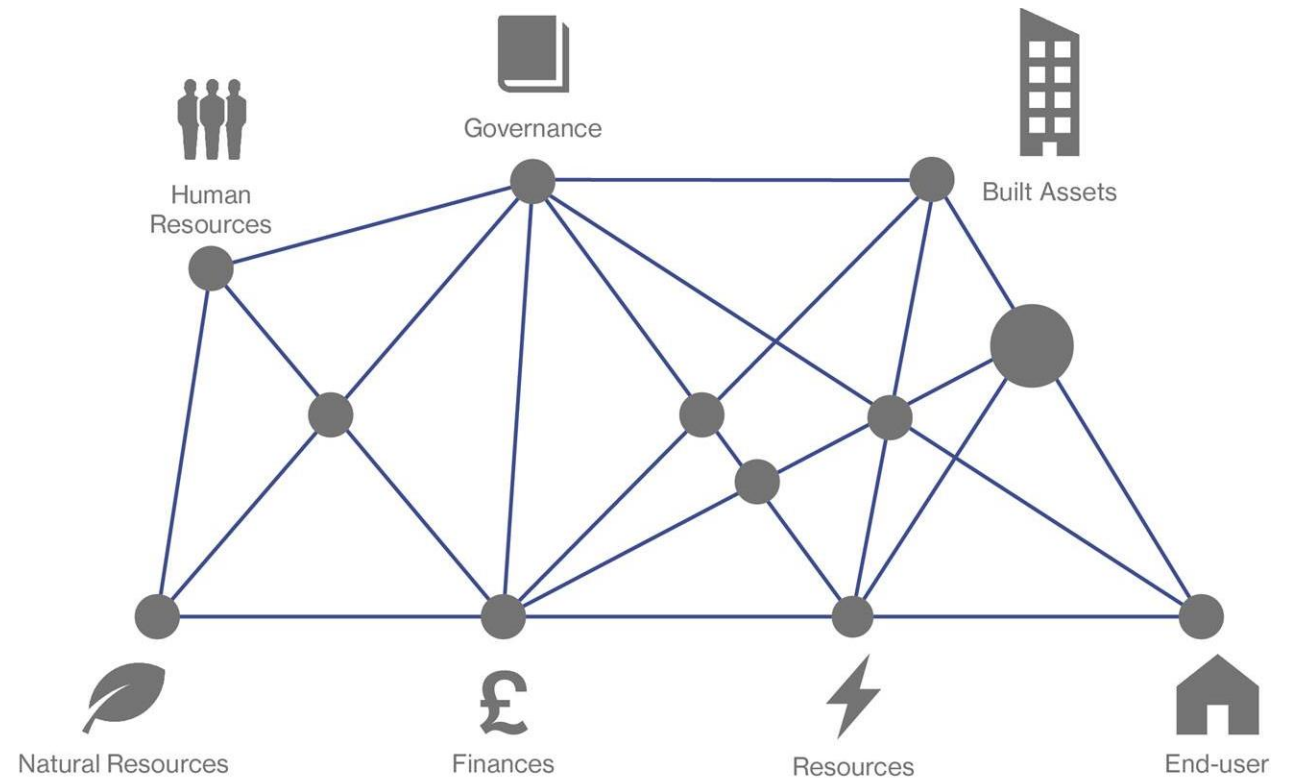
Dubai 2015



The problem: Underwriting human progress in cities

Protecting growth, and enhancing development

- Cities are complex, & rising costs of disasters is growing
 - Cities must mitigate these risks to protect development, but this is complex
 - City infrastructure supports complex interconnections
- Traditional approaches do not reflect this complexity
 - This left an innovation gap to explore
- Lloyd's and Arup collaborated to explore this space



Why explore resilience?

The definition we used

“City resilience describes the capacity of cities to function, so that the people living and working in cities – particularly the poor and vulnerable – survive and thrive no matter what stresses or shocks they encounter.”

- Rockefeller Foundation, 2015

The solution: Methodology

Lloyd's and Arup collaborate

- Lloyd's worked with Arup to develop a new set of principles for key components of city infrastructure to improve resilience
 - principles guide planning, design, construction and operation
- Stages:
 - Literature review
 - Case-study research
 - Consultation with key infrastructure sector specialists
 - Insurance sector consultation

Case studies

Learning from the past to plan for the future

1. Uses case studies to assess past infrastructure failures
2. and suggest actions that could be taken to avoid them in the future

Hurricane Katrina

New Orleans, 2005



Mumbai Terrorist Attacks

2008



Bangkok Floods

2011



Katrina

Event overview

Hurricane Katrina's final landfall hit the southeast coast of Louisiana and southern Mississippi on 29 August, 2005 as a Category 3 hurricane with sustained winds of 140 mph.

The city of New Orleans was devastated by Katrina. Storm surge and battering wave action smashed the levees of the city, causing extensive flooding.

Around 80% of New Orleans and surrounding parishes were inundated, and remained flooded for weeks after the storm had passed.

(Associated Press, 2015)

- The energy distribution system experienced near instant collapse
- Repair and recovery crews responded quickly due to good logistical planning but...
- Vehicles, human resources and material supplies were severely stretched
- Entergy's financial reserves were also overwhelmed

Katrina

Insurance lessons

- Katrina highlighted the need to record information on structures and vulnerabilities in greater details
 - Now better recognition of wide array of buildings that companies are insuring (floating casinos)
 - View of the vulnerability of assets has increased as a result of greater granularity of information
 - We need better data = broker role as insurer/insured connector

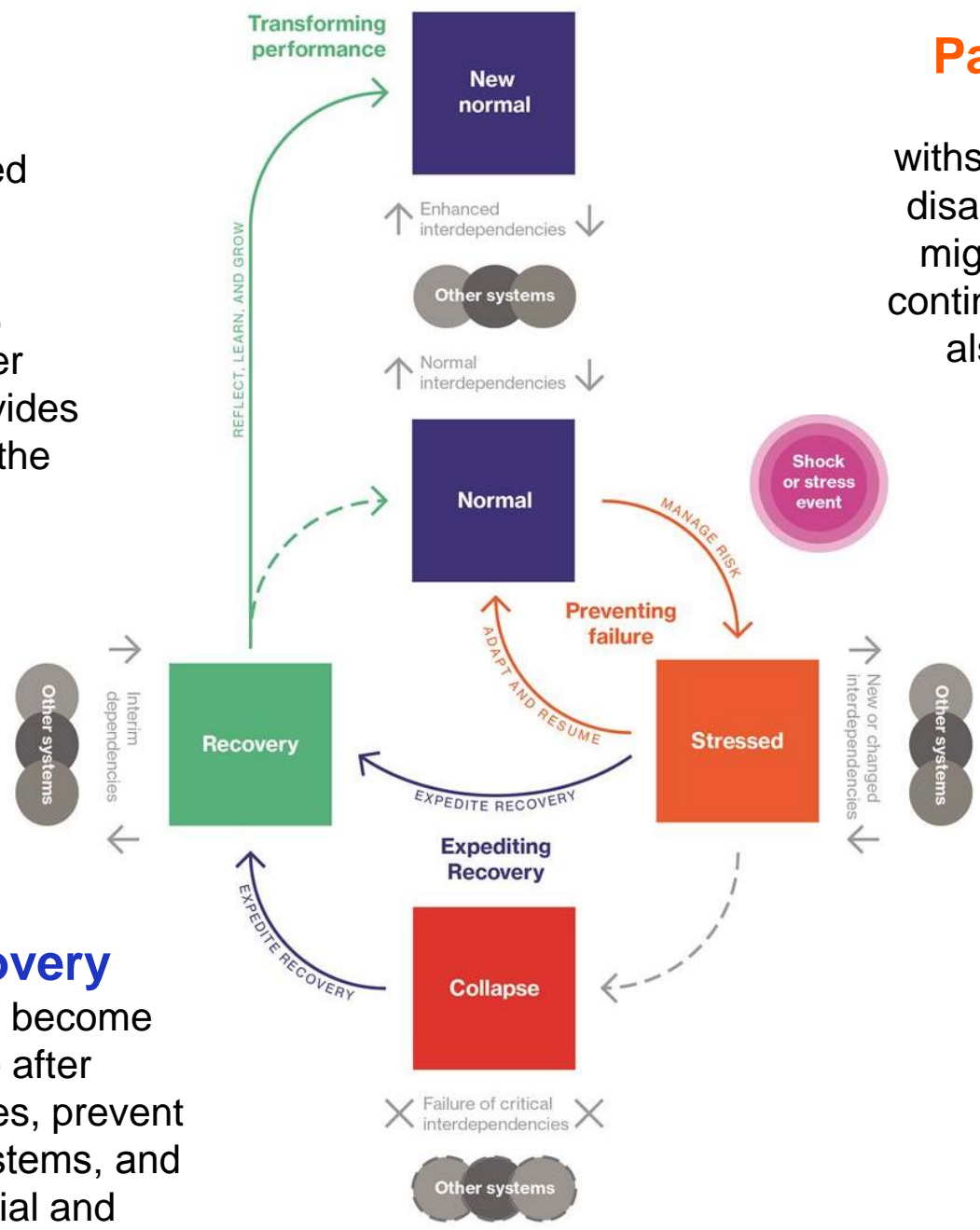


Pathway 3: Transforming performance

Working towards a new and improved state, rather than simply reverting to 'business as usual'. This requires reflection on successes and failures, learning, and growing. Recovery after infrastructure failure or collapse provides a crucial opportunity - although not the only avenue for such change.

Pathway 2: Expediting recovery

Supporting infrastructure systems to become functional again as soon as possible after stress or collapse. This can save lives, prevent 'cascading failure' of other urban systems, and minimise potentially-devastating social and economic outcomes.



Pathway 1: Preventing failure

Ensuring infrastructure systems can withstand the direct and indirect impact of disasters. Though individual components might fail temporarily, the overall system continues to fulfil its normal functions, and also support any additional emergency demands that arise.

Nine areas for collective action to build city resilience

1. Improving **data** collection
2. Using this new data to **quantify the risk** and help inform stakeholder decision-making
3. **Establishing metrics** to enable the development of indices and models to assess resilience
4. Finding ways to **incentivise investment** by making resilience assessments available
5. **Incentivising policyholders** to take risk mitigation measures through risk-based pricing
6. Developing collaborative **models and tools** that provide a transparent, comprehensive and accessible approach to analysing and pricing risk
7. Encouraging the **creation of indices** that can be used by insurers to incorporate levels of resilience into the underwriting process
8. Creating **shared understanding** of how the components and stakeholders of cities interact and what the key areas and concerns are for each stakeholder
9. Considering **resilience services** which draw on facilities management, disaster recovery, build and operate contracts and insurance

Next steps

Transform towards the “new normal”

Enhancing resilience at a city and global scale will require action at many levels to move from reacting after disasters strike, to
create a world where failure to
plan in advance is unacceptable.

Collaborate, take action, scale up

Resilience is risk management

- Insurers often presented with a final risk
 - Not involved at the design, planning and procurement stages
- Many initiatives exploring options → recognised need for collaboration
 - Challenge in making action happen at scale
- What is in the precompetitive space?
 - Limiting the duration effect: Fort McMurray, 2016
 - Bottle neck at site access stage at loss sites – day 26
 - Technology of today meets aspirations of resilience – drones

Fort McMurray: Alberta, Canada

- Estimated losses:
Economic \$9.5bn/
\$3.58bn in insured
- Started 1 May 2016
- 2,400 homes lost, 2,000 residents displaced
- Not under control until 5 July

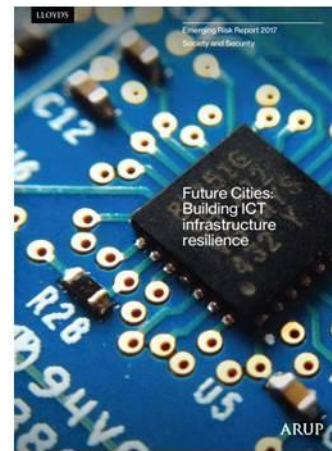


Conclusions

- Clear pathways and principles to guide action
- Building resilience requires collaboration
 - Resilience is an incentive ← **lets demonstrate that**
 - Silos need to be bridged ← **communication is king**
 - Model the outcomes, demonstrate resilience benefits ← **common language essential**
- Lloyd's and Arup hope this study gets you thinking about how you can take action
 - There are roles for **everyone**
- Underwriting human progress has never been more important for cities

Available to download

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