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Example of Resilience???

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WHAT IS RESILIENCE?

Infrastructure resilience is the **ability to withstand, adapt to changing conditions, and recover positively from shocks and stresses**.

Re·sil·ience

[\ ri-ˈzil-yən(t)s] adjective

Able to withstand or recover quickly from difficult conditions.

Resilience is made up of five pillars: self-awareness, mindfulness, self-care, positive relationships & purpose.

resilience noun

🔖 Save Word

re·sil·ience | \ ri-ˈzil-yən(t)s 🔊 \

Definition of *resilience*

1 : the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress

2 : an ability to recover from or adjust easily to misfortune or change

resilience

(noun) re-sil-ience

"...the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress — such as family and relationship problems, serious health problems or workplace and financial stressors."

"It means 'bouncing back' from difficult experiences."

Source: American Psychological Association

re·sil·ience

/riˈzilyəns/

noun

1. the ability of a substance or object to spring back into shape; elasticity.
   "nylon is excellent in wearability and resilience."

2. the capacity to recover quickly from difficulties; toughness.
   "the often remarkable resilience of so many British institutions"

resilient 🔊

adjective | re·sil·ient | \ri-ˈzil-yənt\

**Simple Definition of RESILIENT**   Popularity: Top 1% of lookups

: able to become strong, healthy, or successful again after something bad happens

: able to return to an original shape after being pulled, stretched, pressed, bent, etc.

Source: Merriam-Webster's Learner's Dictionary

WHAT IS A RESILIENT INFRASTRUCTURE?

Resilient infrastructure should be able to continue to provide essential services, due to its **ability to withstand, adapt and recover** from whatever shocks and stresses it may face at the present moment and in the future.

This applies to **physical infrastructure assets, and to the wider system that these assets are part of including the natural environment**.

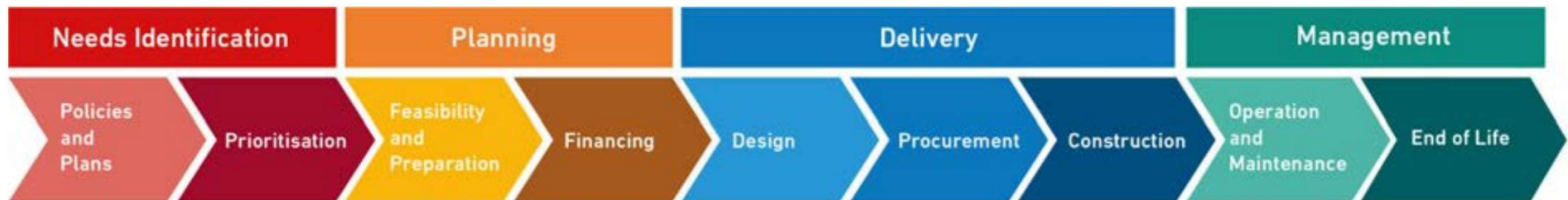INFRACRIT
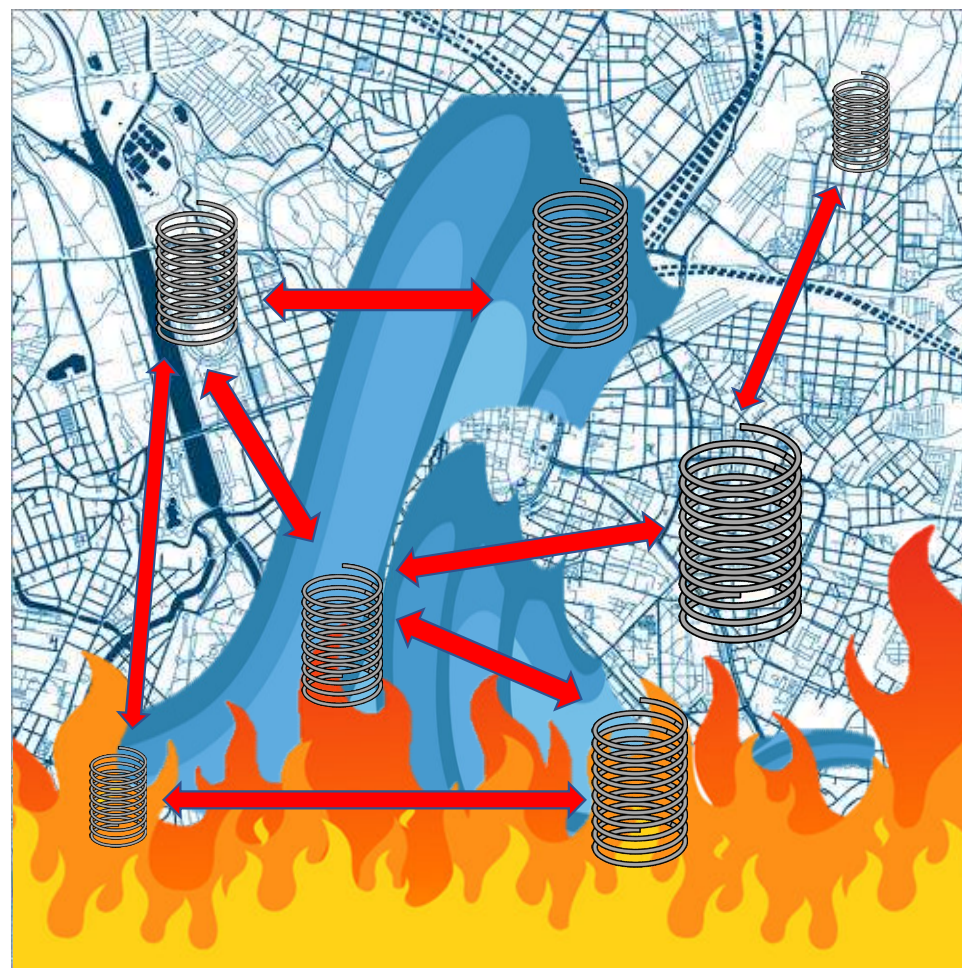
WHY DO WE NEED OUR INFRASTRUCTURE TO BE RESILIENT?

source: https://doi.org/10.3390/infrastructures4010011
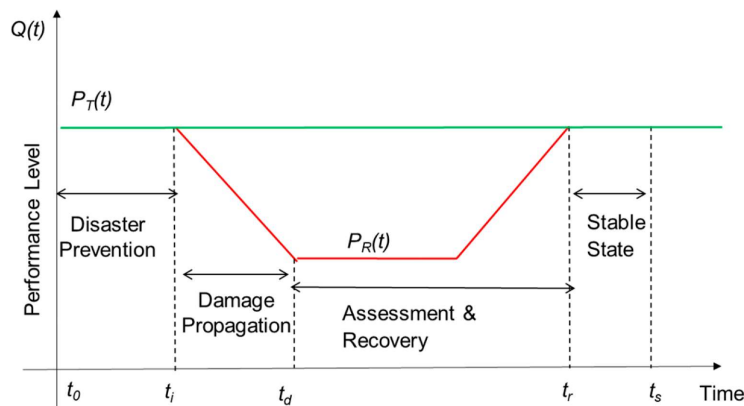
Existing infrastructure systems are increasingly **complex and interdependent**.

These systems are under pressure due to **growing demand**, and have become fragile due to fragmented governance and a lack of investment in regular maintenance.

source: Kannan et al (2021) Governance of Infrastructure Resilience. White Paper

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WHAT IS A RESILIENT CITY?

The resilient city is a concept by which a city adopts adequate measures to be able to **minimize direct and indirect consequences of a disaster**. It is also capable of a prompt and **quick restoration of basic services, social, institutional and economic activities** in the city after a disaster.

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source: Rockfeller Foundation. 100 Resilient Cities

STAKEHOLDERS AND INTEREST AREAS

source: https://doi.org/10.12955/cbup.v5.917

Government		Education	
Local government		Education institutions (universities, etc.)	
Regional and local administration active in all other interest areas		Research institutions	
International agencies and institutions		Other institutions which provide education (professional courses and trainings) related to the issue of civil preparedness	
Health		**Infrastructure (transport)**	
Providers of healthcare (hospitals, clinics, health centres, etc.)		Transport, mobility, logistic companies (private, public)	
Pharmaceutic companies		Information and Communication services providers	
		Energy suppliers, agencies, utilities (electricity, gas, oil, heat)	
		Water and waste management and agencies	
Society and Culture		**Disasters**	
Citizens		Integrated Rescue Services representatives	
Relevant social groups (representatives of society - civic associations: workers, students, ethnic group, religion representatives, etc.)		NGO's and other organised civil society representatives (Red Cross, voluntary firefighters, other organised voluntary groups, etc.)	
Political parties		Private companies which are active in disasters solutions	
Social services centres		Risk assessment companies (consultants, etc.)	
		Spatial planning subjects (building companies, developers, chambers of architects and engineers)	
Environment		**Economy**	
Companies with the potential of environmental pollution		Private sector (banks, business, industry, etc.)	
		Trade unions	
		Employment agencies	

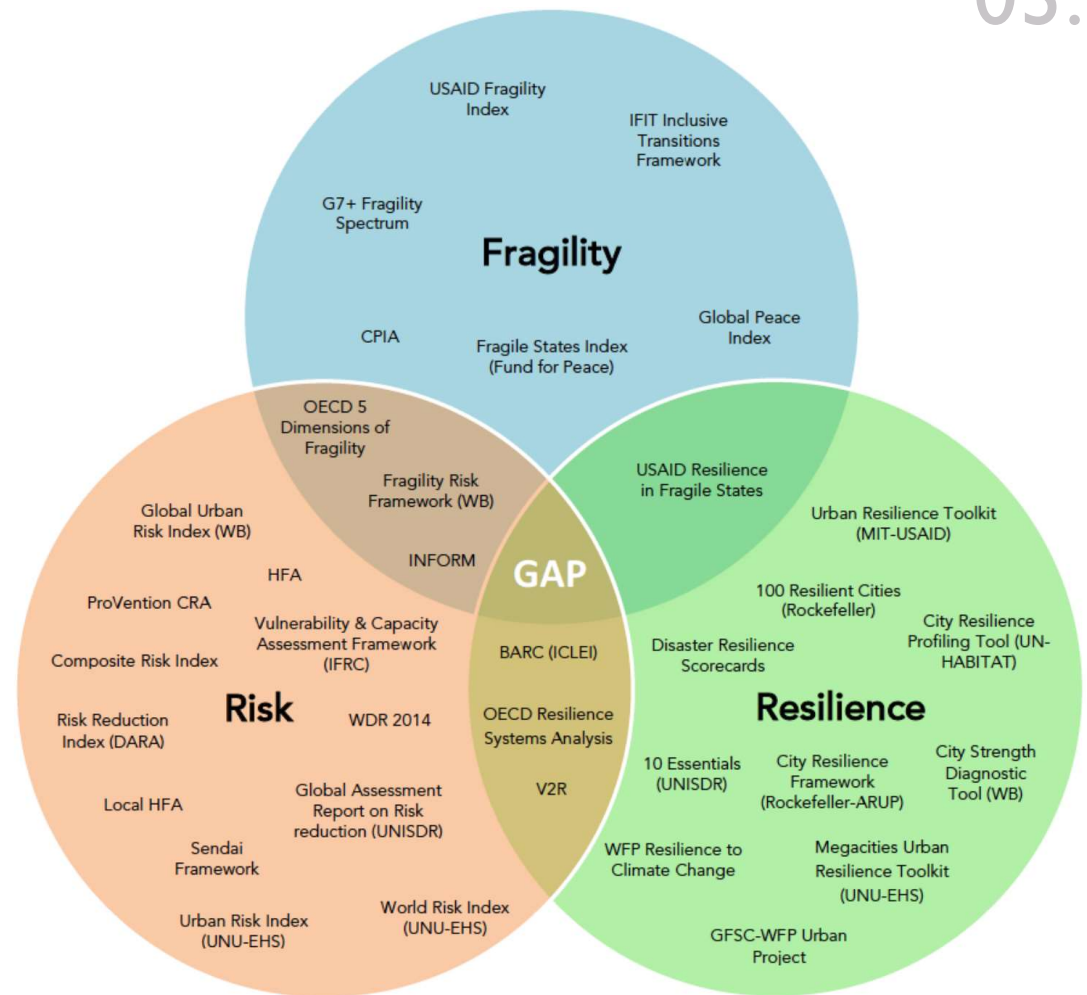# STAKEHOLDERS AND INTEREST AREAS

source: Kannan et al (2021) Governance of Infrastructure Resilience. White Paper

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CITY RESILIENCE FRAMEWORK

Fragility may be seen as the ability and willingness of a component to carry out its basic or core functions

Risk is usually defined as the combination of the probability of occurrence of an event and its impacts and consequences.
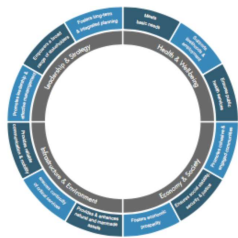
Resilience is often considered as the ability and capacity of individuals, organizations, and infrastructures (such as cities) to cope, adapt, and recover from shocks and stresses.
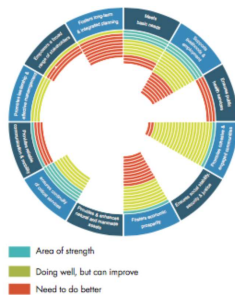
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Fragility
- USAID Fragility Index
- IFIT Inclusive Transitions Framework
- G7+ Fragility Spectrum
- Global Peace Index
- CPIA
- Fragile States Index (Fund for Peace)

OECD 5 Dimensions of Fragility
Fragility Risk Framework (WB)
INFORM

USAID Resilience in Fragile States

GAP

Risk
- Global Urban Risk Index (WB)
- HFA
- ProVention CRA
- Vulnerability & Capacity Assessment Framework (IFRC)
- Composite Risk Index
- Risk Reduction Index (DARA)
- WDR 2014
- Local HFA
- Global Assessment Report on Risk reduction (UNISDR)
- Sendai Framework
- Urban Risk Index (UNU-EHS)
- World Risk Index (UNU-EHS)

BARC (ICLEI)
OECD Resilience Systems Analysis
V2R

Resilience
- Urban Resilience Toolkit (MIT-USAID)
- 100 Resilient Cities (Rockefeller)
- City Resilience Profiling Tool (UN-HABITAT)
- Disaster Resilience Scorecards
- 10 Essentials (UNISDR)
- City Resilience Framework (Rockefeller-ARUP)
- City Strength Diagnostic Tool (WB)
- WFP Resilience to Climate Change
- Megacities Urban Resilience Toolkit (UNU-EHS)
- GFSC-WFP Urban Project

source: Bosetti et al. (2016) Fragility, Risk, and Resilience: A Review of Existing Frameworks
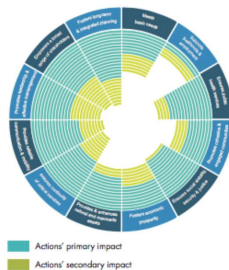
CITY RESILIENCE FRAMEWORK

Cities can calculate an indicator of their resilience with respect to 12 main goals and subsequently develop a strategy to improve weak points.

Resilience status perception

Area of strength
Doing well, but can improve
Need to do better

Actions contributing to resilience

Actions' primary impact
Actions' secondary impact

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source: https://smartcityhub.com/collaborative-city/smart-cities-resilient-cities-make-difference

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CONCLUSIONS

By **assessing, analyzing and predicting the risks** that threaten a city stability and performance, one is able to improve its overall behavior and the well-being of its citizens, when facing events both expected and as yet unimagined.

Developing a resilient urban future requires undertaking challenges and creating solutions in a **place-based, integrated, inclusive, risk-aware, and forward-looking manner**.

Nevertheles, determination of **resilience of existing critical infrastructures** needs to based on analysis of different components and failure scenarios including structural components and service infrastructures (see more at IABSE TG5.8)

Resilience is relevant to a wide variety of applications and thus must be considered **transversally and holistically**, even if one needs to tackle it **component by component**.

THANK YOU

Hélder S. Sousa (sousa.hms@gmail.com)

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