

# PRINCIPLES OF URBAN RESILIENCE AND MATRIX OF MEASURES

**FIELDS OF ACTION** Urban Structure Mobility Open Spaces Safety

## PRINCIPLE OF URBAN RESILIENCE

### REDUNDANT

Same functions are provided multiple times, so that spare capacities are kept free to be able to react to unforeseeable risks and access them if necessary.

## GUIDELINES ON QUARTER-LEVEL

- RE 1 - Identify, check and preserve spatial back-ups
- RE 2 - Double-structures for emergency-/ evacuation-roads
- RE 3 - Redundant retention areas
- RE 4 - Implementation of multiple power supply circuits

## MEASURES ON BLOCK-LEVEL

## MEASURES ON PLOT- AND BUILDING -LEVEL

### EFFICIENT

Spatial functions are planned in a space-saving manner or embedded in existing structures, resulting in efficient spatial structures

- EF 1 - Development of compact, green and mixed-use quarters
- EF 2 - Development of short-distance-quarters
- EF 3 - Climate-sensitive densification within the quarter

- EF 1.1 - Clear distinction between inside and outside
- EF 1.2 - Densification within existing urban structure
- EF 1.3 - Dense structures for resource- and space-saving development

- EF 3.1 - Degree of sealing is kept low in new developments
- EF 3.2 - The orientation of new buildings is designed for climatically relevant functions
- EF 3.3 - Optimized openings of blocks to climate-relevant open spaces
- EF 3.4 - Building structures are climate-friendly designed

- EF 3.4.1 - energy standards for new constructions
- EF 3.4.2 - Shading of buildings
- EF 3.4.3 - Use of building materials and paving with a high albedo level
- EF 4.1.1 - Continuously shaded networks of primary footpaths and cycle paths
- EF 4.1.2 - Green and shaded bus stops and waiting areas
- EF 4.1.3 - Climate-friendly design of stationary traffic

- EF 4 - Integration of climate-friendly mobility

- EF 4.1 - Combination of slow mobility and heat relief
- EF 4.2 - Space-saving mobility infrastructure with low sealing

- EF 5 - Climate-friendly design of public spaces

- EF 5.1 - shaded public spaces
- EF 5.2 - Water-sensitive design
- EF 5.3 - unsealed surfaces
- EF 5.4 - Integration of blue-green-gray infrastructure
- EF 5.5 - Cooling and tangible water elements

- EF 6 - Development of climate-friendly open space systems

- EF 6.1 - Protection of air induction passages
- EF 6.2 - Establishing and optimizing connectivity and accessibility to higher-level green spaces
- EF 6.3 - Grünräume schützen und weiterentwickeln
- EF 6.4 - Greenery of courtyards

- EF 7 - Sponge city principle: retaining and using rainwater as a resource

- EF 7.1 - Maintain and create retention areas
- EF 7.2 - Using rainwater cisterns
- EF 7.3 - Storing rainwater and using it for evaporation and infiltration

- EF 7.1.1 - Create evaporation beds and basins
- EF 7.1.2 - Green roofs / solar roofs with retention systems
- EF 7.1.3 - Facade greening
- EF 7.1.4 - Swale infiltration and infiltration trench systems

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## FIELDS OF ACTION

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## PRINCIPLE OF URBAN RESILIENCE

### ROBUST

Robust systems take precautions, are self-sufficient in an emergency and overcome crises independently.

## GUIDELINES ON QUARTER-LEVEL

- RO 1 - Self-sufficiency through circular quarters
- RO 2 - Strengthening the building stock to create stable urban structures
- RO 3 - Urban identity as a strength
- RO 4 - Clear hierarchies of streetscapes and squares
- RO 5 - Preserving landscape-heritage
- RO 5 - Developing open spaces into a robust framework of a city/quarter
- RO 6 - Development of urban-/vertical agriculture
- RO 7 - Developing and maintaining a safe grid of reachable shelter and bunker
- RO 8 - Implement heavy rain precautions

## MEASURES ON BLOCK-LEVEL

- RO 2.1 - Defining spaces due to ownership and responsibility
- RO 2.2 - Development of robust typologies
- RO 3.1 - Urban and architectural heritage is protected and preserved as a cultural asset
- RO 3.2 - Urban heritage buildings are subject to special protection
- RO 3.3 - Cautious design of historically significant zones in a city
- RO 7.1 - Securing and developing water-dominated cultural landscapes
- RO 7.2 - Qualify water bodies and banks as retention areas
- RO 7.3 - Route drains via emergency waterways
- RO 7.4 - Protect objects
- RO 7.5 - Avoid substructures / basements
- RO 7.6 - Integration of warming- and water-self-sufficiency

## MEASURES ON PLOT- AND BUILDING -LEVEL

- RO 7.2.1 - Develop near-natural shoreline areas
- RO 7.2.1 - Renaturation of water bodies
- RO 7.4.1 - Permanent / mobile protective devices
- RO 7.4.2 - Backsplashes
- RO 7.4.3 - Preventive planning

# PRINCIPLES OF URBAN RESILIENCE AND MATRIX OF MEASURES

**FIELDS OF ACTION** Urban Structure Mobility Open Spaces Safety

## PRINCIPLE OF URBAN RESILIENCE

**FLEXIBLE**  
Flexible systems can change, evolve and adapt to changing circumstances

## GUIDELINES ON QUARTER-LEVEL

- FL 1 - Development of polycentric structures
- FL 2 - Planning flexible building structures and transforming existing ones
- FL 3 - Flexible design of public spaces
- FL 4 - Diverse scales of public spaces
- FL 5 - Establish modular / decentralized infrastructures (water, electricity, gas or telecommunications networks) to prevent cascading incidents.
- FL 6 - Development of a healthcare-grid
- FL 7 - Qualifying suitable building structures to shelters

## MEASURES ON BLOCK-LEVEL

- FL 1.1 - Polycentric structures have to be equipped with daily needs on a local scale
- FL 1.2 - Polycentric structures are/ can be embedded in a hierarchical network of different scales
- FL 1.3 - Decentralized supply
- FL 1.4 - Equip and develop quarter centers as anchors of a neighborhood with everyday amenities
- FL 2.1 - Activating vacancies through pop-ups, temporary uses and conversions
- FL 2.2 - Transformation of socialistic structures into hybrid blocks
- FL 2.3 - Transforming conflict-loaded urban and architectural heritage into new typologies
- FL 3.1 - Mobile urban furniture for a more flexible design of public squares, streets and green spaces
- FL 3.2 - Transforming parking spaces into parklets
- FL 7.1 - make existing infrastructures accessible as safe spaces: metro, existing bunker, basements of public buildings
- FL 7.2 - Transformation of publicly accessible buildings into shelter in case of emergency
- FL 7.3 - During an unexpected attack, a city quickly converts schools and community centers into emergency shelters and medical facilities to accommodate displaced residents.

## MEASURES ON PLOT- AND BUILDING -LEVEL

**DIVERSE**  
Urban systems are less vulnerable to disruptions when different alternatives and choices are provided. Diversity enables a faster response to crises and the ability to adapt to new conditions..

- DI 1 - Establish multifunctional and diverse (sub-) centres
- DI 2 - Mixed-used mobility-Hubs in different scales
- DI 3 - Provide a diverse and integrated mobility mix
- DI 4 - Develop diverse designed public spaces including green areas next to housing
- DI 5 - Development of UA-specific Safe-Hubs / Security-Hubs
- DI 6 - Decentralization of critical infrastructures ensures a supply network despite isolated outages

- DI 1.1 - Mix of typologies
- DI 1.2 - Active first-floor-zones
- DI 1.2 - Integrate new usage concepts in the quarter: Third places (combinations of business, culture, education and participation)