



COMUNE DI GENOVA

# Lighthouse

Genoa's city strategy





If we can not control the volatile tides of changes,  
we can learn to build better boats.  
We can design – and redesign – organizations,  
institutions, and systems to better absorb disruption,  
operate under a wider variety of conditions, and  
shift more fluidly from one circumstance to the next.

*Andrew Zolli e Ann Marie Healy*



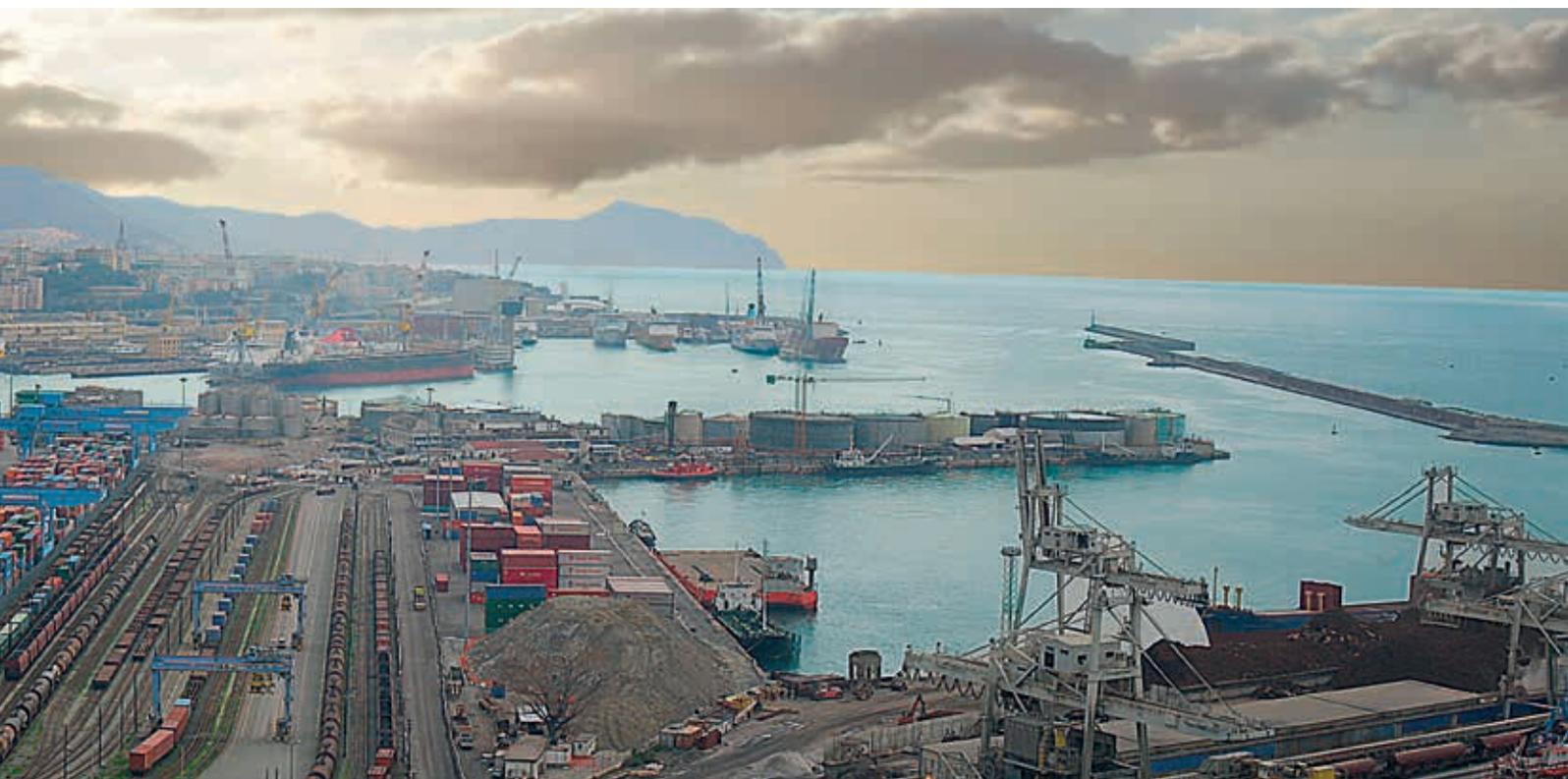
# Genova Lighthouse City



# Table of contents

## Lighthouse - Genoa's City Strategy to a better future

1. Background
2. Urban Transformation: Drivers of change
3. Goals: Innovation, Anticipation and Enhancement
4. Priorities: Recognize and Face Changes
5. Working Framework  
Assets and Themes GREY - Asset GREEN - Asset SOFT Asset
6. Method: Participation and Inclusion
7. Stakeholders: the Enabling Actors
8. Networks & Partnership: Better Together
9. Next Step: the Action Plan
10. Economic Transition
11. Urban Ecosystem Development Models
12. Definitions
13. References



# 1 Background

On November 20<sup>th</sup> 2018, during the 4<sup>th</sup> Genoa Smart Week, took place the first “Resilience Day”, which addressed the theme of the development of urban transformation strategies and offered an introductory overview of the current global framework at European, national and local level.

During the second part of the Day, more than 90 stakeholders were invited to share their contribute of skills and knowledge to the three thematic tables proposed:

- the **GREY** one, on infrastructure systems;
- the **GREEN** one, on the redevelopment of the urban environment and territory;
- the **SOFT** one, on Governance and socio-economic systems.

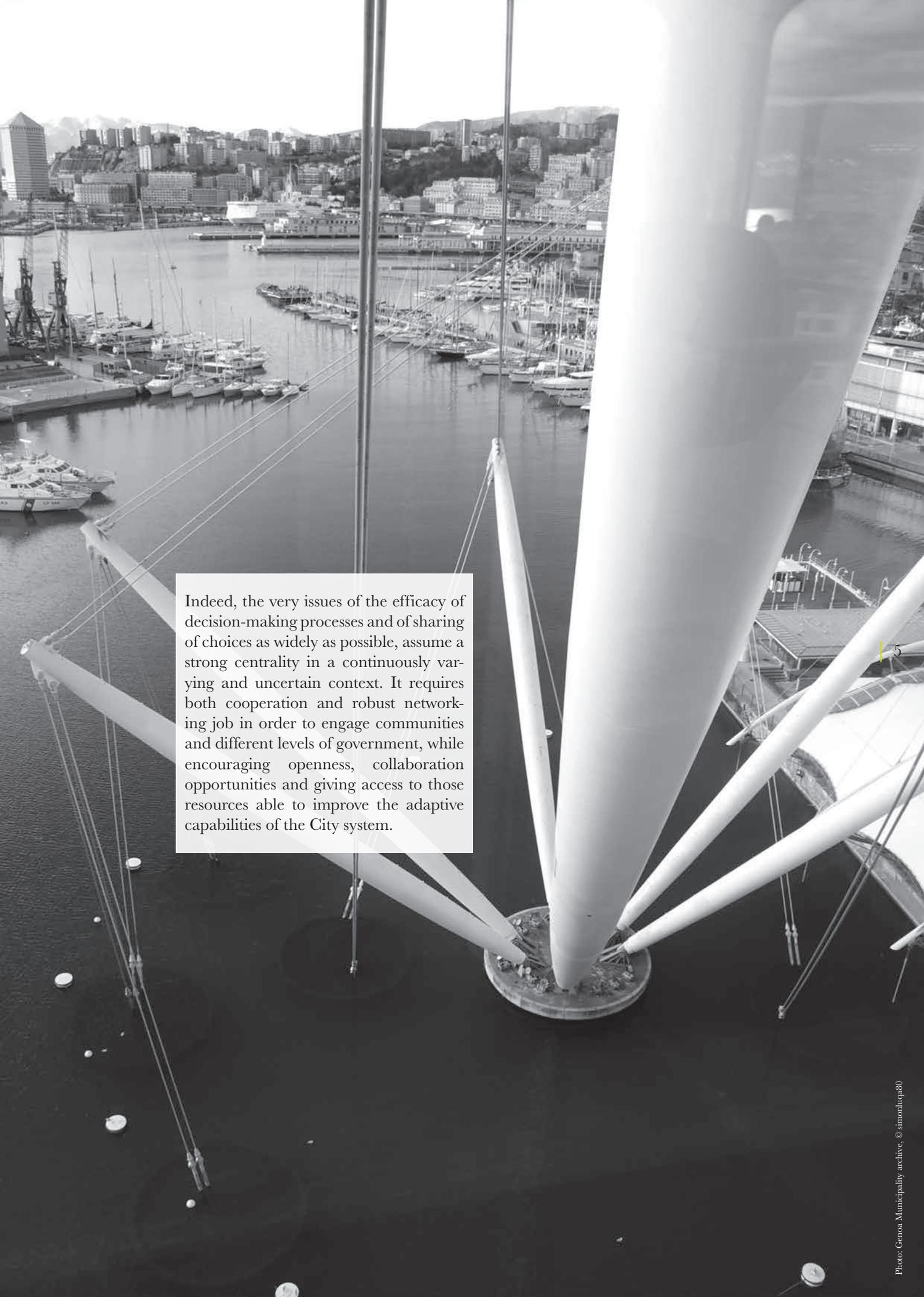
The work of the three tables produced a first concrete analysis of some of the key needs, expectation and aspects of urban resilience and brought out some of the typical specific properties (see box 5.1) helpful to qualify the resilience capability of a city system.

This first touchstone is the result of a work which started years ago, with the participation of the City of Genoa in the partnership consortia of some European projects<sup>1</sup> that marked an ideal path of approach – in many respects more and more various and articulated – to the theme of urban resilience.

Most of these still ongoing projects debate and deepen the issues of infrastructure vulnerability, anthropogenic risk of the major accidents, early warning systems of dangers, institutions-citizens communication of risk-alert, contingency planning, urban redevelopment through natural solutions, post-event recovery and re-start, public areas safety, as well as the themes of energy efficiency and waste management, also related to urban system resilience.

More recently, during 2017, the European Commission welcomed the candidacy of Genoa Municipality as coordinator of the Partnership on Adaptation to Climate Changes promoted by the Urban Agenda for the European Union (see chs. 6 and 7). Thanks to this further acknowledgement Genoa extended the range of the Public Administration relationships with the different levels of Governance where decision-making takes place.

1) The main European projects which saw and still see the participation of Genoa Municipality on the general theme of resilience and whose topics have, in turn, been reflected in the working tables proposed during the day of November 20<sup>th</sup> 2018 are: HARMONISE (FP7); LOSE (Interreg IT-FR); ANYWHERE (H2020); FLOOD-Serv (H2020); UNaLab (H2020); FORCE (H2020); LOSE+ (Interreg IT-FR).



Indeed, the very issues of the efficacy of decision-making processes and of sharing of choices as widely as possible, assume a strong centrality in a continuously varying and uncertain context. It requires both cooperation and robust networking job in order to engage communities and different levels of government, while encouraging openness, collaboration opportunities and giving access to those resources able to improve the adaptive capabilities of the City system.

# 2 Urban Transformation: Driver of change

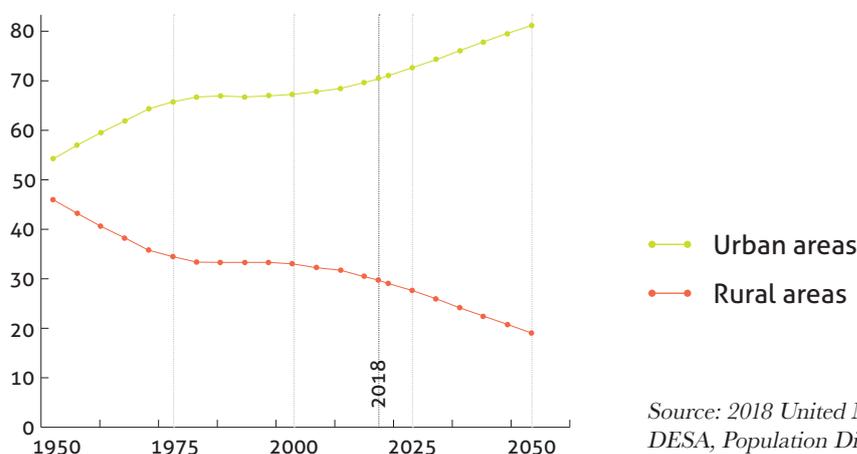
In 2050, Europe's urban areas will host 82% of the population. This expected demographic change will require deep transformations of the urban ecosystem –as well as of its socio-economic fabric – and of the public services offered to citizens

The recent review of the *World Urbanization Prospects 2018*<sup>2</sup> by the United Nations Department of Economics and Social Affairs predicts that by 2050 68% of the world's population will live in urbanized areas of the planet. In 1930 it was only 30%.

This urban drift will request profound social and territorial transformations that will need to be managed with a long-term perspective and through solutions able to meet a renewed demand for housing, transportation, energy and important essential services such as education of the young population and health care of the elderly.

6 | Already today, in Europe, 74% of the population lives in urban environments and in 2050, both in Europe and Italy, urban areas will host no less than 82% of their total inhabitants.

## Population percentage in urban and rural areas in Italy



Source: 2018 United Nations, DESA, Population Division

2) <https://population.un.org/wup/>



Photo: Genoa Municipality archive, © Massimo

Also Genoa and its metropolitan area will go through a similar process of urbanization, which will be accompanied by a progressive increase in population longevity and by the abandonment of rural and suburban areas.

To understand and explain these new needs – already reported in the growth of the urban environments – new tools will be necessary, together with the ability to manage an increasing complexity that will require the transformation of the current urban settlements of the city into more resilient and sustainable, with modern infrastructures and services, and capable to meet a growing demand for equity, opportunities, well-being and quality of life.

It is clear that the concept of Resilience must be considered in a broader sense and cannot simply consist in recovering and returning to the starting point after an acute shock or a disruptive phenomenon.

It is not always useful, in fact, to recreate the original condition when this has already shown its limits, just as it is not always enough to rely on the data and knowledge of the past, because the uncertainty inherent with a variety of possible futures needs different techniques and new processes of experimentation and innovation.

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**Building the adaptation and the transformation of an urban area or a city will require new information and the ability to fully explore the urban system even beyond its “boundary”**

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This involves the creation of specific structures on the territory – capable of catalysing resources – in addition to the strengthening of relations with qualified stakeholders and the capitalization of already robust collaborations with local, national and international networks.

# 3 Goals: Innovation, Anticipation and Enhancement

Artificial Intelligence, Automation, Robotics, 5G, Big Data, Augmented Reality, IoT, Cloud, etc. will improve our ability for anticipation, innovation and new experimentation

8 |

If a system is agile and flexible enough it can either reorganize itself in a reasonably short time and cope, in the most effective way, with a range of different events or, on the same time, it can adapt to new changes.

In an ever-changing landscape of risks and opportunities, these properties ensure a long-term resilience, thus, in order to be able to act flexibly, the city-system shall own and demonstrate both forecasting and innovation capabilities in relation to the changing trends (see ch. 4).

Indeed, a key factor for a city's security and for its resilience to natural events – linked or not to the effects of climate/man-made changes caused by climate or man (such as a terrorist attack) – lies in the considerable opportunities offered by the digital transition processes.

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**The development of ICT technologies for the management of shocks and stresses will allow to experience innovative analytical methods, communication and a decentralized cooperative coordination.**

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The availability of new digital resources will improve the collection and processing of increasingly numerous, fine-scale and useful data for a plurality of subjects (companies, local administrations, law enforcement, rescuers, hospitals, citizens, etc.) that will need to find new ways to interact through a collaborative process able to provide scenarios and solutions addressing the real problems of the different concerned parties.

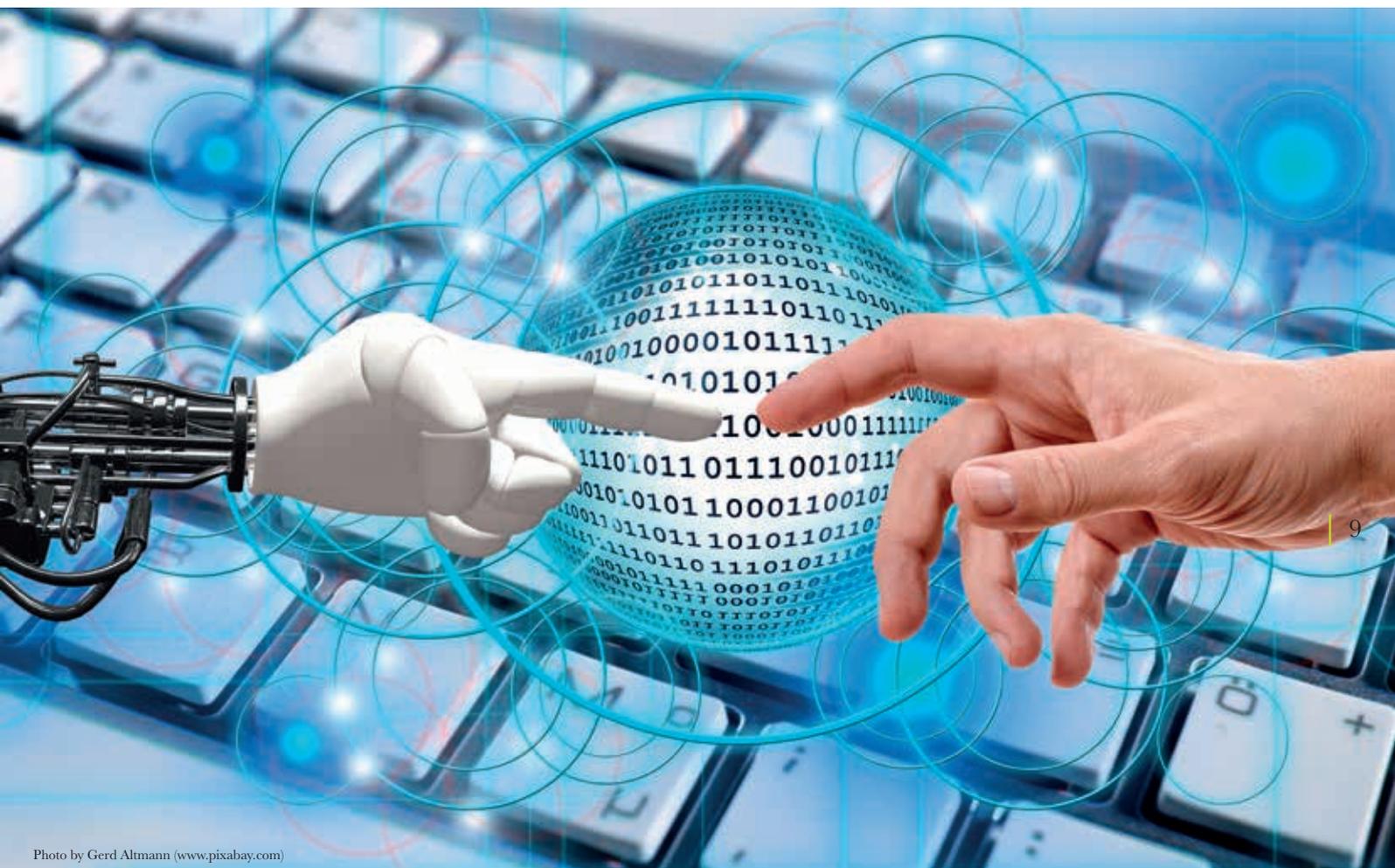


Photo by Gerd Altmann (www.pixabay.com)

The processes and tools of digital transition (A.I., Automation, 5G, Big Data, Augmented Reality, IoT, Cloud Technology, etc.) will significantly improve the ability to anticipate the trends of those phenomena associated with large-scale climate and demographic changes. Today predictive analyses already play a role in many different fields and could have a positive impact on the city's resilience ability, on critical infrastructure maintenance, on pollution prevention, on risk management,

on urban mobility and foster processes of inclusion and social innovation, etc.

This kind of knowledge, multiplied by digital transition, will provide new models to better develop decision-making and operational processes.

# 4 Priorities: Recognise and Face Changes

Demographic and climate changes together with digital transition are the major trends that will have the greatest impact on the liveability of urban areas. Each of these changes brings with it new development and transformation opportunities for the City

Cities are the playground for change. The urban clusters made of people and infrastructures are the hyper-local place, where the global trends of change show their development opportunities, chance for growth and challenges to improve the safety of both citizens and city-system itself.

These great changes offer the chance to transform the urban fabric and its functional areas but, in order to reach a sustainable future, it will be necessary to understand and give right voice to the aspirations and needs of those who – with their work – live and vivify the very sites of transformation.

10 |

The international economic and scientific community recognizes some “mega-trends” that, in the light of the verifiable data of their respective macroeconomic, geoclimatic, socio-political and technological radiative forces, shape up and foreshadow new “possible alternative world”, quite predictable, where the urbanised areas will play the role of a privileged catalyst for development processes.

These actions will require a new – maybe experimental – governance model, based on a public-private partnership and on an active research for the contribution of social networks participation, able to give a concrete support in terms of pragmatic policies and models of collaboration between Public Administration and Civil Society, both called to promote and support the transformation process.

If on one hand the concept of resilience can be interpreted as a fruitful adaptation to these changes, on the other one, from the perspective of development and opportunities to seize – even in a context of low economic growth – it is clear what a great value is provided by a knowledge able to identify the right priorities for action.

Indeed, the real challenge for the Public Administration will be to reach a renewed capacity in terms of new services offered, which shall be consistent with the results of an increasingly careful examination of both actual and expected changes.



# 5 Working Framework: Assets and Themes

Genoa Lighthouse Strategy is a programmatic initiative, with a shared and inclusive vision, intended to recognise priorities and tools in order to prevent risks, mitigate impacts and strengthen the city's urban, economic and social fabric.

12 |

The most important trends of change that, even in the long term, will affect the urbanized areas of the planet are discussed in some policy papers and in the International Agendas that the United Nations periodically update with the aim to provide solutions concerning the themes of sustainable development (New Urban Agenda - SDG 2030), climate change (Paris Agreement) and natural and anthropogenic risks (Sendai Framework).

The themes pertaining global changes, which, under many points of view, characterize the issues of the increasing urbanisation of population and of the resilience capability of complex systems, have been summed up – also at European level – to a system in the Urban Agenda for Europe signed by the EU Member States with the Amsterdam Pact (May 2016).



The direct experience of the City of Genoa as coordinator of the Partnership on Adaptation to Climate Changes – one of the 14 partnerships of the European Urban Agenda – helped to identify the first basic elements, even methodological, to tackle the path of defining a Local Resilience Strategy. The Genoa Resilient project, named Lighthouse, represents an initiative with a strongly shared and inclusive vision – aiming to identify those priorities and tools to prevent risks, mitigate impacts and strengthen the urban economic and social fabric of the City, – and moves from a process based on the local, but also national and international, networking on these issues, which the City of Genoa has been carrying out for some years.

As described in the box, the Local Strategy has been divided into three major Assets qualified by key elements and by their own particular themes, which, in turn, already indicate what could be the viable solutions in view of effects that can occur, in the face of major changes, in the medium to long term.

The choice of colour and terms, used in representing assets and themes of the Strategy with a language familiar to the different stakeholders – public and private – and to the decision-makers, have been shared at the local level and, on several occasions, also at a national and international level to ensure a broad spectrum of analysis and, at the same time, the best adherence to the needs expressed by the local context.

Needs, solutions, methods and actions will be accurately investigated and developed in the scheduled Action Plan, which will represent an ideal road map to support and anticipate changes and help bring the City's necessary transformation process to real.



## BOX 5.1 / ASSETS DISCUSSED AT THE WORKING TABLES

Redundancy, diversity and modularity are elements that qualify the degree of inherent resilience of a system both to its own internal changes and to those affecting it from the outside. During the workshops held during the Genoa Smart Week 2018, the elements emerged from the working tables were:

**GREY:** besides the issue of inner infrastructures security, the discussion focused on systems redundancy. While acknowledging the indisputable resilience value of this issue, specific aspects were taken into consideration such as its potential burden in terms of costs – both construction and maintenance – of resources which affect the soil utilisation and that, if underutilised, can significantly reduce the degree of optimization and efficiency of the system itself.

**GREEN:** the value of diversity/biodiversity – representing in nature a key strategy of resilience – has also been considered in terms of “property” of an anthropogenic system in which diversity must demonstrate its ability to contribute to the achievement of a clear, converging goal, able to respond to real, specific problems, in order to avoid being experienced with estrangement, if not even with rejection.

**SOFT:** the system modularity – which caught great attention during the discussion about Governance issues and socio-economic development – can give a concrete contribution, even in terms of organizational resilience, only providing that its elements interact in a functional, integrative and complementary way: in fact, poorly interactive modules risk to cancel the very principle of the system, just as too interactive modules could make the system lose its own spontaneous adaptive capabilities.

# Innovative Infrastructures

## GREY ASSET

### Key elements

GREY asset deals with the innovative development of infrastructures and, specifically, those related to the networks providing services of different nature, and those related to communications and spreading information. All of them enable the capability to provide the necessary essential services, ensuring continuity management and good quality assurance of the city-system based service.

### Change drivers

Digital and energy transition processes, and the demographic change are the drivers, whose variability affects the infrastructure systems. The latter, already now, shows population groups of different ages who, for various reasons (work, study, leisure, health, etc.), demand increasingly reliable, customized and performing supports and infrastructures.

### Partners

Besides creating a network able to involve the big players of this sector and their technologies, it will be essential to listen to the infrastructures end-users and know how to grasp their needs.

### Role of the administration

The task of the Administration – which for most infrastructures plays a role largely unrelated to the market logic governing its development and capillarity of distribution – finds its own value chain in a deep analysis of the territory and citizens needs anticipating, where possible, the medium-to-long-term trends in line with the general development guidelines of the City.

### Primary themes

1

**MAPPING** the distribution and coverage of the different infrastructures both on the municipal territory and in the wider functional areas connected to it;

2

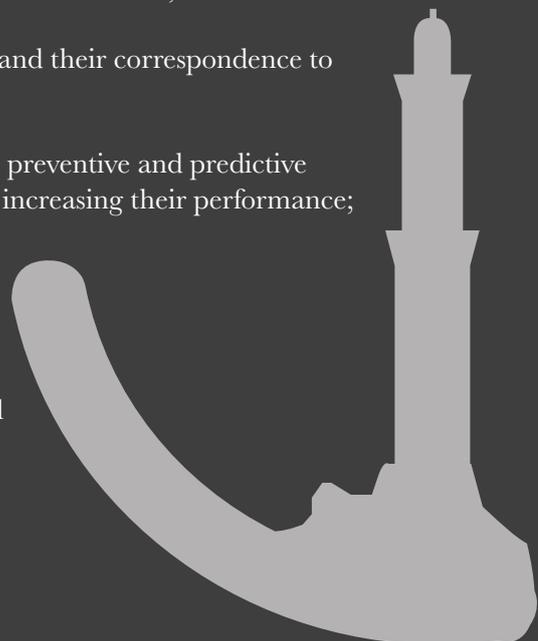
**CONDITIONS** and state of health of infrastructures and their correspondence to the future demand coming from the territory;

3

**MONITORING** of infrastructures in order to grant a preventive and predictive maintenance able to avoid networks breakdown while increasing their performance;

4

**INNOVATIVE DESIGN** – both physical and conceptual – of infrastructures, in order to improve security, redundancy, resilience and flexibility features of the networks in a shared governance framework able of promoting and speed up the overall territorial innovation processes.



# Urban Regeneration

## GREEN ASSET

### Key elements

GREEN asset is qualified by climate changes – including natural risks – and urban regeneration/redevelopment according to natural solutions, able to improve the quality of life of citizens and to make the urban landscape more pleasant.

### Change drivers

Besides the aforementioned climate changes, the most influencing drivers in the urban landscape are the demographic change and the significant increase of the average age of the population, more and more concentrated in urban environments.

### Partners

Research institutions are the logical partners of the GREEN asset. Knowing the benefits that an urban environment can obtain from a proper management of its eco-systemic services and from the development of new technologies, can help to make urban areas safer, healthier and more comfortable.

### Role of the administration

The Administration's task is to act as a player in local regulations and, at the same time, as a change promoter towards the other governance levels, proposing improvements to the regulatory framework in order to make it more consistent with the needs of a territory that has to deal more and more quickly with the impacts of change.

### Primary themes

- 1** ADAPTATION to climate change, as an assessment of the impacts that can threaten the urban fabric, the services provided to it, the economic development and the health of citizens, in view of actions to reduce potential damage and take advantage of the opportunities of the territory transformation;
- 2** PREVENTION through the development of effective early warning systems against current hazards and through urban redevelopment interventions with respect of the natural characteristics of the territory and its ecosystems;
- 3** SUSTAINABLE DEVELOPMENT intended as a vision able to deal with a plurality of social, economic and natural aspects and aiming to improve both the quality of the urban environment and the well-being of citizens;
- 4** LOCAL URBAN AGENDA as a useful tool to repeat – at city local level – the framework to face the strictly relevant issues of the urbanized system, according to the priorities identified at an European and international level;
- 5** SECAP initiative (Sustainable Energy & Climate Action Plan), intended as an Operational Plan, to enact the commitments taken on the issues of energy transition and adaptation to climate changes.

# Communities/Enterprises

## SOFT ASSET

### Key elements

The SOFT Asset is the widest of the three, bringing together the two general areas of Governance and socio-economic systems; economic impacts, city community and companies make up its qualifying elements.

### Change drivers

Also due to the variety and range of the themes related to this Asset, the SOFT Asset is affected by all the trends of change considered above (climate and demographic changes, digital transition) with the addition of a more specific issue represented by the global shift, compared to traditional areas, of the new economic development centres.

### Partners

The choice of partners who could be involved in the issues of Soft Asset is extremely wide: Institutions at different levels; Universities and Research Institutes; Professional and representative associations; companies and enterprises; etc.

### Primary themes

- 1 VULNERABILITIES analysis through the introduction of indicators to guide/reorient the actions and measure their effectiveness;
- 2 COSTS/BENEFITS analysis, including inaction costs, to channel the resources and improve the decision-making processes;
- 3 TOOLS useful to share at different levels the knowledge about the trends of change and the responses of the different territorial components (social, economic, environmental), with an approach that figures “data” as common shared value;
- 4 RESILIENT COMMUNITY intended as a plural system capable to match the citizens needs, generating wealth in a sustainable way, guaranteeing rights and participation and increasing the quality of life of all its components;
- 5 WELFARE and related measures able to grant as much coverage as possible for a broad population keeping the focus on the dynamics of current and predictable demographic change;
- 6 INTEGRATE PLANNING to promote greater synergy and coherence between the different levels of territory government;
- 7 SOCIO-ECONOMIC and SOCIO-CULTURAL FABRIC actions in order to reach a mutual integration and enhancement and promoting the production of social capital and resources;
- 8 ORGANIZATIONAL RESILIENCE of institutional processes to innovate and improve the services portfolio – always maintaining the necessary solidity – in a constantly changing and evolving environment.



# 6 Method: Participation and Inclusion

## Ownership and Leadership are qualifying elements to add robustness and sustainability to the definition of the Strategy and of the Action Plan

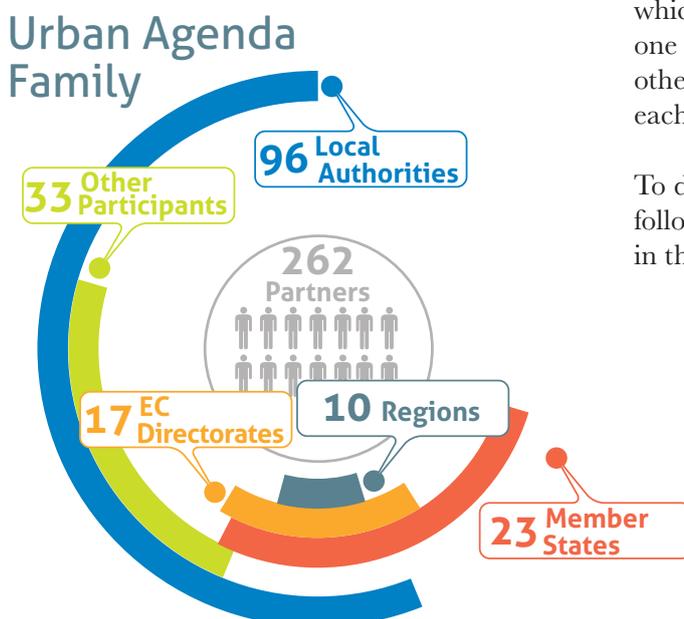
As already mentioned, the most qualifying elements for the writing of this strategy document have been the experiences of the municipal Administration in the testing activities, carried out through the participation to innovative European projects of research and the co-ordination work of the partnership on Climate Adaptation of the European Urban Agenda (Amsterdam Pact 2016).

18 | In particular, the multidisciplinary approach, the multi-level governance, together with participation and inclusion and the voluntary basis of membership to the programme, were the main qualifying elements shared by the European Commission with the different partners that took part in this important initiative.

The European Urban Agenda family consists of 262 partners including 23 Member States, 96 Local Authorities, 10 Regions, at least 17 EC thematic General Directorates and no less than 33 different institutions, networks, organisations and European programmes, besides different public and private stakeholders. Since 2017, over the course of two years' work, the 14 partnerships promoted 114 actions aiming to improve the European regulation in relation to the different issues of the Agenda as well as the access possibilities to the EU funds and their distribution, besides enhancing knowledge, sharing and ability to act.

The work done in a close contact with the Member States, the major European and global networks and with the General Directorates of the European Commission has made it possible to learn more deeply the dynamics of a "progressive" process in which any variations affecting even only one of the different levels can affect any other else, which is why it is not helpful for each of these levels to act independently.

To define the Strategy and the Action Plan follow several executive phases summarized in the diagram on the right.



## PROCESS INNOVATION

The development of this process brings with it some elements of innovation, including:

- a dedicated internal structure dedicated to the broad theme of sustainable resilient development;
- a renewed dialogue with the Administration's internal structures;
- a continuous investment in the local, national and international thematic networking to strengthen the positioning and the investment of the city on the field;
- sharing the working framework with the main national and international structures and networks before the start of the operational activities;
- the development of a strategy document that combines different languages (i.e. scientific, political, practitioners);
- the stakeholders involvement in the preliminary, executive and implementation phases of the Action Plan;
- the introduction of an organisational resilience concept as a paradigm of administrative action;



# 7 Stakeholders: the Enabling Actors

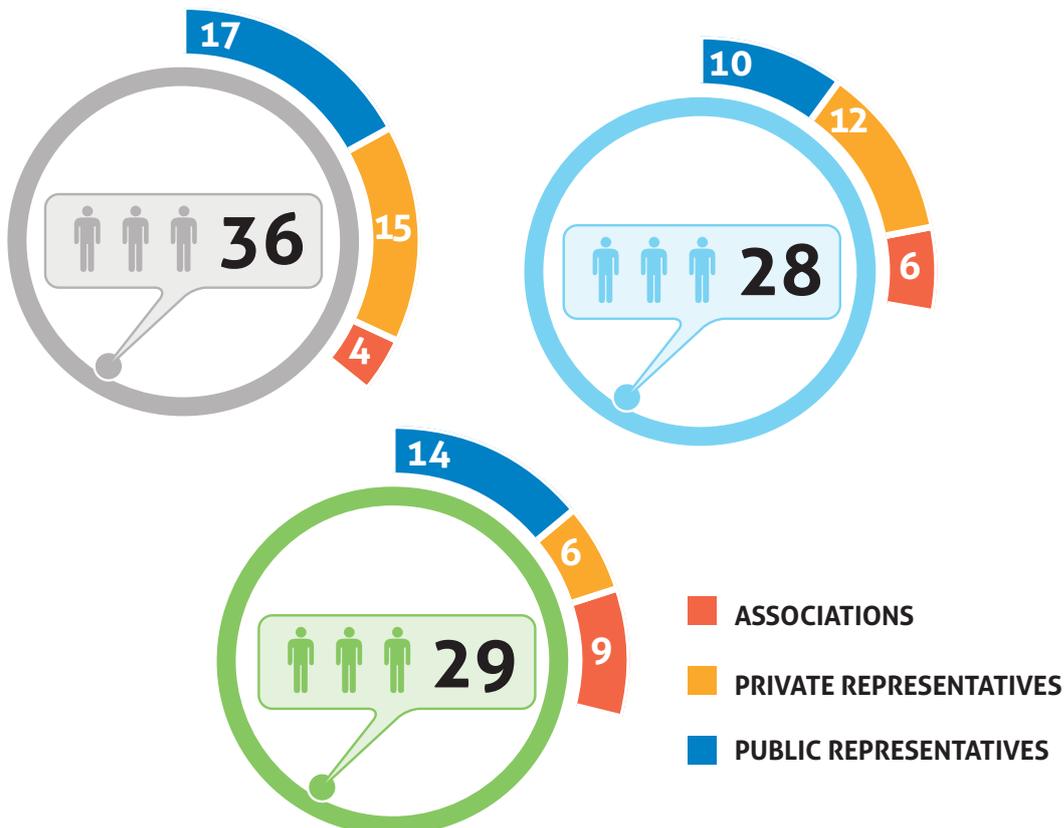
Both for the definition of the Strategy and the City's Action Plan, the actors involved for each asset (GREY, GREEN, SOFT) are:

- the political subjects
- the Institution's managers
- associations, consortia and trade orders delegates, representing the different sectors
- metropolitan and regional public institutions
- representatives from the business and industry world
- representatives from the research

At least two meetings and some in-depth sessions for each asset were required to complete the first analysis of needs and to give robustness and sustainability to the Strategy and to the resulting Action Plan.

The work carried out during these months allowed us to develop a better awareness of the extent of underway and future changes and their possible effects both on current planning, evaluation and monitoring models, and on process organization.

## The involved actors

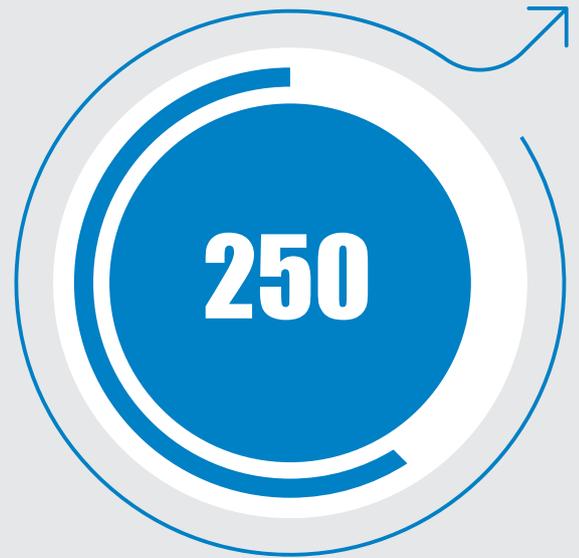


All the working groups agreed on the need to find solutions supporting the adaptation processes to be implemented in the short and medium term and also on the opportunity for a paradigm shift, i.e.: “restoring – a necessary but transitory condition – is not enough, what we need is a better redesign, more coherent in terms of prevention.”

Finally, it has been put in evidence both the need to be flexible in the use of resources and the ability to establish the feasibility and sustainability – not only economic – of actions supporting the city-system, not more with isolated initiatives, but mainstreaming them in an whole package of development.

In drawing up a dynamic and structured Action Plan, the Administration will play a precise role in facilitating and sharing the processes by fostering, where possible, new forms of collaboration. These could envisage the ownership and leadership of the actions by the interested stakeholders, through innovative partnership operating in accordance with the essential rules of transparency and fairness of the public administration.

participants



stakeholders



preliminary proposals



focuses

## BOX 7.1 / CO-PLANNING: THE STAKEHOLDERS ROLE

The meetings with the stakeholders highlighted some emerging needs, summarized in 6 focuses, for which some first solutions have been proposed, which will be subject of further study and that could become part of the Action Plan.

As a general rule, the proposed actions draw the attention to some common elements describing particular needs, here summarized below:

- a widespread demand for greater attention to a territorial context time-inconsistently changing compared with the normal routine of the Institution administrative action;
- a change of the services provided, to satisfy the demand for further innovation and adherence to the concrete needs of a territory experienced by many different communities;
- a greater socio-economic dynamism capable of acting as an attractor hub for those investors and external actors able to meet City's changes and transformations;
- particular attention to the vulnerabilities of the population, intended also as a development opportunity for different economic sectors;
- greater investments in the training processes with the aim to spot new professional skills and those emerging competences required by the territories.

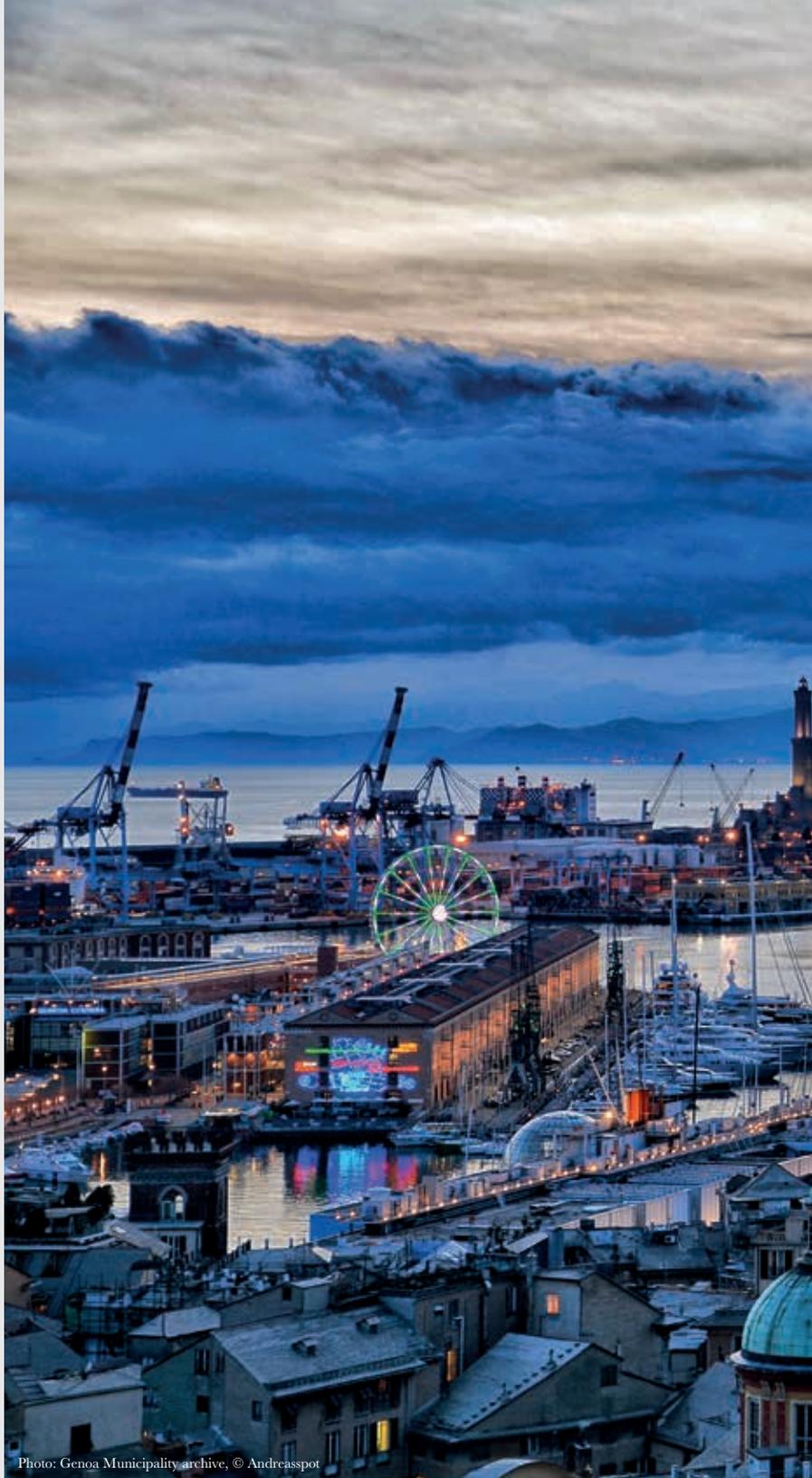
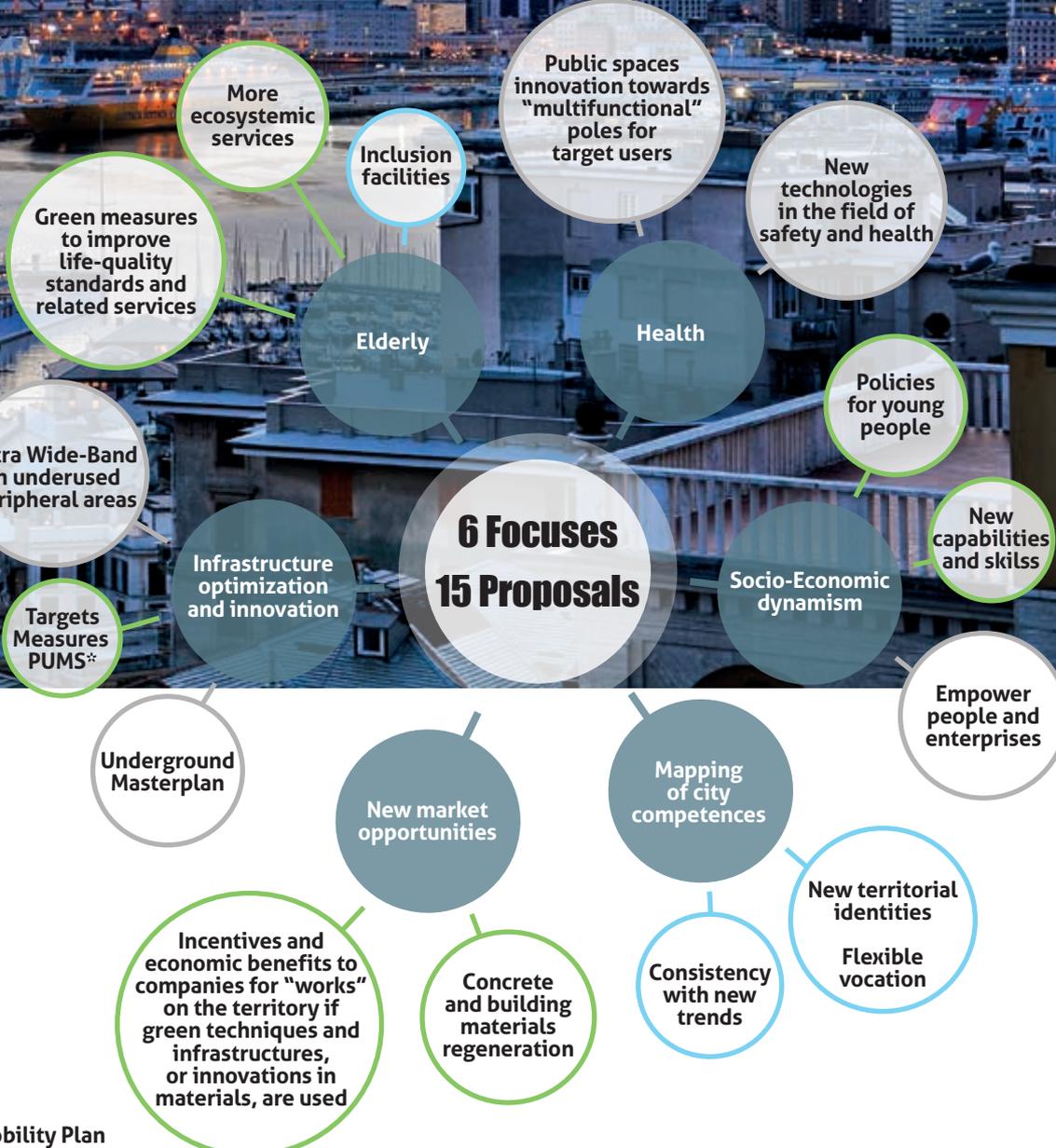


Photo: Genoa Municipality archive, © Andreasspot

- Focuses
- Proposals relating to the Grey asset
- Proposals relating to the Green asset
- Proposals relating to the Soft asset



**6 Focuses  
15 Proposals**



\* Sustainable Urban Mobility Plan

# 8 Networking: Partnership and Condivision

Cooperation and networking foster dialogue, information-sharing, opportunities and access to resources that can improve the adaptive capacity of the City ecosystem

Genoa has a long tradition of strong relationships with other cities and institutions at national and international level on different areas. Also with regard to the issue of resilience and related sustainability matters, the City chose an approach of partnerships-sharing and participation in some of the most important international networks addressing the theme in urban areas.

Both the working method and framework were informally shared with the following key players:

- at a local level: the most directly involved structures, directions and councillors;
- at a national level: the Department of Civil Protection (DPC), the representatives of the Territorial Cohesion Agency (ANCI) and the Ministry of the Environment (MATTM);
- at European and international level: ICLEI and 100ResilientCities (100RC), EUROCITIES and the European Committee of Municipalities and Regions (CEMR);
- at the level of the European institutions: the General Directorate on Climate (DG CLIMA), that of Regional Affairs (DG REGIO) and the Joint Research Center (JRC) of the European Commission.

This path led to the identification of more immediate outputs, short- and medium-term outcomes, and medium-long term effects, in short:

- Outputs: approval of framework and working methodology;
- Outcomes: interest in collaborating and offering opportunities for spreading the initiative at national (DPC, MATTM, ANCI) and international (JRC, EUROCITIES, ICLEI) level;
- Impacts: creating new partnerships and projects (JRC, 100RC, ICLEI).

## BOX 8.1 / RECENT INITIATIVES AND COMMITMENTS FOR GENOA LIGHTHOUSE CITY

National, international institutions and networks working on the different aspects concerning the issue of urban resilience recognise the added value of a holistic and cooperative approach. Genoa takes part to some recent initiatives which share innovative models pertaining the themes of adaptation and transformation of urban areas.

### NETWORK OF RESILIENT CITIES

The different approach to the issue of resilience, as a driver for change to seize the opportunities of territorial challenges, has gained the interest of the National Department of Civil Protection (DPC) which, under the programme “Network of resilient cities” chose the Genoese initiative as a case history representative of local initiatives taken over by international activities.

### GENOA CORNER RISK DATA HUB

The interest shown by the European Commission Joint Research Centre for the Lighthouse Strategy developed at a local level allowed to start a collaboration that will make the City of Genoa the first local-size reality participating in the new “Risk Data Hub” platform developed by the Disaster Risk Management Knowledge Center. The processing system of the territorial data integrated with that one on the climate change scenario will produce exposure maps and analysis of vulnerability to risks both at local district level and at single municipal census unit level (also related to social and economic aspect).

### SECAP (PAESC)

The city – already a member of the Covenant of Mayors with the 2020 targets of the Sustainable Energy Action Plan (SEAP) – renewed, in December 2018, its commitment signing the agreements for the year 2030, with the expectation of a 40% reduction in emissions of greenhouse gasses and the commitment to chose a path for resilience to climate changes by writing an Adaptation and Mitigation Plan to be completed within the next two years.

# 9

## Next Step: the Action Plan

Legislation to support territorial resilience, development of public-private partnership processes and funding tools to foster better growth opportunities will be common elements to feed the Action Plan

The Action Plan is the implementing tool of the policies contained in the Strategy document. While the latter has a medium and long-term vision of the city, the Plan has a different breath with an evolution and updating process on an annual basis.

The major subjects taken into consideration in the Action Plan are:

- expected and predictable change scenarios;
- potential impacts and local risks in relation to the different change drivers operating on the three Resilience Strategy assets (GREY, GREEN, SOFT);
- the proposal of some markers – even composite – of general value, able to allow the monitoring of expected outputs, outcomes and impacts;
- financial instruments ensuring the interventions sustainability;
- a list of the adaptation and transformation actions.

Each action, for its part, will be mainly defined in terms of:

- the needs that determined it;
- contributing leaders and partners;
- specific output, outcome, and impact markers;
- timing of implementation;
- necessary resources;
- role of local Administration.

### The Action Plan “core”

Scenario analysis of demographic, climatic and digital change trends on macro-sectors of services, economy, health and environment

Effects and impacts **GREY GREEN SOFT**

**GREY GREEN SOFT** and cross-cutting actions

Short, medium and long-term perspectives

Cohesion to international agendas

Supporting legislative and regulatory framework

Identification of public-private partnership Models

Resources and Funding identification



Individual actions may present features of different natures: in some cases a more precise aspect of response to a specific need may be prominent, while, in other instances, more cross-cutting aspects may prevail and the action could concern, at the same time, the legislation for territory resilience, the development of public-private partnership processes or the funding tools to foster better growth opportunities.

The actions will ultimately have to help define the executive management programmes of the Municipality and be consistent with the results of the preliminary analysis carried out from the GREY, GREEN, SOFT points of view, with the contents of the International Agendas and with the main European Community funding programmes.

The further and no less important contribution to identifying actions will be the preliminary analysis of the territory needs as expressed by the stakeholders (see box 7.1).

## BOX 9.1 / FROM ACTIONS...

To build the path for a resilient, sustainable and future oriented city it is necessary to know the possible scenarios of change and analyse one's own capacities for innovation and transformation, putting to system what is being achieved and what will be realized, in order to anticipate the predictable effects of such changes and to strengthen the resilience of the structural and social fabric of the City.

The analysis – according to the GRAY, GREEN, SOFT assets – of the strategic and operational actions contained in the Unique Programming Document (DUP) of the municipality and of the projects supported by European and national funding programs, shows that many of the ongoing activities are already qualified as actions of local resilience and match the principles of the International Agendas (Urban Agenda for the EU, Sendai Framework, Sustainable Development Goals SDG2030) and the global trends of change taken into consideration (Digital Transition TD, Climate Changes CC, Demographic Change CD). The tables on these pages illustrate the actions that match best the themes of urban resilience and the assets of the strategy.

### DUP

Sector/Field	Actions	Assets
Management and enhancement of urban green areas and woodland	Planting of 15,000 trees	
	Construction of a pedestrian/cycle pathway from Stazione Marittima to Nervi	 
Securing the territory from the hydro-geological risk	Hydraulic adjustment of the smaller rivers of Val Bisagno	
	Hydraulic adjustment of Chiaravagna brook	
	Spillways of Bisagno and Fereggiano brooks	
New technologies for the prevention of hydro-geological weather risk	A digital model for rain and water-level data	
	A digital platform for managing the hydro-geological weather alert	

### PON METRO

Project	Actions	Assets
Digital Agenda	A digital model for rain and water-level data	 
	A unique information system for emergency management	 
Energy efficiency	Interventions on the lighting network and on buildings owned by the Municipality	 
Mobility	Cycling development in the Genoa area	 
Services for Social Inclusion	Enhancement of social gathering spaces in degraded areas	 
	Strengthening the autonomy of young people in fragile conditions	

## European Projects

Projects	Actions	Assets
ANYWHERE	Multi-risk digital platform for extreme weather events management	
FLOOD-SERV	Platform between citizens and institutions for information exchange on risks	
UNALAB	Hydraulic adjustment and re-naturalization of the Lagaccio stream	
	A redevelopment with nature-based solutions of the former barracks Gavoglio	
FORCE	Circular economy for plastic, wood, WEEE and food waste	
	Management of natural wood waste to reduce hydro-geological risk	
LOSE+	Monitoring and control of dangerous goods	
ELVITEN	Development of light electric mobility	
	Enhancement of structures supporting light electric mobility	
CYBERSEC	Governance models for information technology security	
CLIMACTIONS	Nature based solutions for the San Benigno area	
	Effects on health and spreading of diseases related to climate change	

## European Urban Agenda for climate change Adaptation

Actions	Assets
Tools for economic analysis of the adaptation actions - EIB	
Climatic services, Copernicus satellite network - JRC	
Training Academy for local politicians- CEMR	

### BOX 9.1 / ... TO THE ACTION PLAN

The Assets (GREY, GREEN, SOFT) of the Strategy are the baseline for the expected Action Plan. They will allow the development of new initiatives that will integrate and complete the ongoing interventions and projects, born from the awareness of the challenges that the city has had to face in the recent past.

The Plan will define an index of local resilience – based on composite indicators – which will make it possible to select a range of further actions related to the expected change scenarios, identify the most suitable tools to ensure their financial sustainability and monitor their effectiveness in the short, medium and long period. This interpretation of the ongoing territory transformations should further qualify the already recognized ability to adopt robust and sustainable policies able to bring innovation with a view to competitiveness and attractiveness.

# 10 Economic Transition

The urban ecosystem can become attractive and competitive – in a short- medium- and long-term growth perspective – through flexible economic models and measures to transform the city

Resilience: from challenges to opportunities, it is more than a slogan, it indicates a change of mind-set, crossing multiple fields and involving, more and more, the world of the economy, taking on a qualifying role for the development of the supply and value chain. In the economic field there is a growing attention toward the need for “sound” decisions in the feeding systems of the various sectors, where awareness of current and future territorial challenges develops, and where cities and urban areas are preparing to adapt in order to respond to the market requests.

In the *Global Risk Report 2019*, the World Economic Forum points out the major risks and global trends needing particular attention and requiring specific counter-action policies and stronger choices; the identified macro areas are those of Economy, Environment, Geopolitics, Social and Technology and, for each, the causes that lead to higher costs for the economic system are mentioned.

The world is facing a growing number of complex and interconnected challenges ranging from the slowdown of the global growth to the enduring economic disparity and from climate change to geopolitical tensions up to the accelerated pace of the Fourth industrial revolution, underlining the need for collaboration and a multi-stakeholder approach to face the global problems<sup>3</sup>.

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**Many institutions and bank funds highlight the necessity to address the urban areas problems in a preventive and programmatic way in order to intercept well before new needs and thus build resilient economic systems.**

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Photo: "Porto antico of Genoa, Italy - Aerial view" by Andrea Puggioni - license CC BY 2.0

The European Investment Bank itself, partner of the Municipality of Genoa in the group working on the theme of climate adaptation in the Urban Agenda, has carried out interesting studies stressing the necessity to improve the cities' capacity to face new risk scenarios by renewed dialogue with the main global funding<sup>4</sup> sources.

The business world, at all levels, recognises that a resilient business model keeps on growing in a consistent way with the needs and expectations of the stakeholders and, besides increasing its ability to successfully adapt to changes, it is also able to anticipate the risks and recognize the opportunities, which results in robust products and processes that enhance its reputation.

Both globally and locally, this type of analysis acts as a booster for new professional skills, determining an increase in the market demand always focused on innovative solutions in those fields which ensure business and territory resilience.

From such a perspective, the expectation towards start-ups and traditional enterprises is that of taking up in time the challenge of change to ensure a prosperous future for businesses, provided that the local Institutions are prepared to accept these changes and contributions into their social and economic fabric.

Therefore, in order to become attractive and competitive, the urban system has to adopt a flexible economic model, characterized by the dialogue with private stakeholders, companies and trade associations to share current and future issues, introducing measures and tools able to transform the city's economic model in a short, medium and long-term growth perspective.

In response to these requests, Genoa has strengthened its commitment to support the different economies – Silver, Green-Blue, Circular, Hi Tech – whereby to develop a number of actions which, qualified in a process of organizational resilience, will be able to trigger a flywheel of interest from new international investors.

4) *Final Report to the European Investment Bank on Economics of Climate Change Adaptation 2019 – EIB-BEI*

## BOX 10.1 / GENOA'S "ECONOMIES"

The issue of resilience, sustainability and “futures” are more or less evident both in the approach to investment in forthcoming areas of economic transition and in the resulting employment opportunities. Demographic, climatic and technological/digital changes set the priorities that the economic business models need to pay attention to in order to grasp all the potential of a dynamic market lying outside the traditional vision and targeting an improved urban environment able to fit the international agendas.

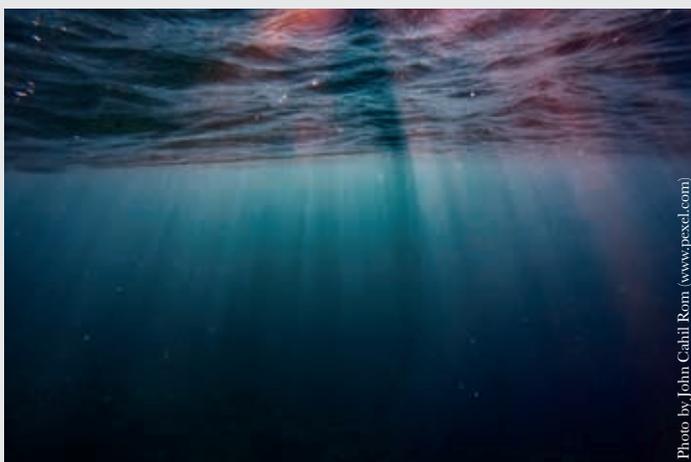
**Silver economy:** a 2018 study estimates the consumption of the European Silvers at about 3,700 billion Euros, and more than

4,200 billions, spin-off included. The Silver economy does not cover just a few sectors but, on the contrary, involves many industries and networks of small and medium-sized enterprises, creating job opportunities in different fields such as pharmaceutical companies, health services, residences for the elderly, cultural and recreational services, travel and tourism, home automation, digital technology, food market, banking and insurance, real estate for seniors and fashion design.



**Benchmark event: Silver Economy Forum, taking place annually.**  
**2019 edition:**  
• 50 speakers  
• 2000 participants involved in the prospects arising from the expected changing scenarios

The **Blue Economy** encourages the use of new technologies that, thanks to scientific research, can reduce the production costs in every field without neglecting the necessary respect for the environment. At the heart of the Blue Economy there is the “blue thinking”, a philosophy of thought that looks at eco-sustainability and renewable resources as an “ocean” of possibilities at zero-impact for the social and economic growth. Enhancing the concerned territories, raising the quality standard of products and food safety are the high goals of this philosophy. Genoa has 47,300 employees in the blue economy.



**Benchmark event: Blue Economy Summit, taking place annually.**  
**2019 edition:**  
• 70 speakers  
• 1500 participants  
• 700 students interested in the perspectives of development of the involved sectors

**Circular Economy**, i.e. a zero waste economy, where any product is consumed and disposed of without a trace. Mostly important in the circular economy are the renewable energies and the modularity and versatility of objects, which could and should be used in different contexts aiming to last as long as possible possible (life-cycle assessment).



Photo: www.freepick.com

The systemic way of thinking proper to circular economy does not settle for the design of products intended for a single purpose. This kind of economy not only protects the environment and allows production and management costs savings, but also produces high profits. Many initiatives envisages Genoa engaged against food waste or in favour of using secondary raw materials – coming out of the waste cycle and which raise upon a new life – and improving of the water resources through innovative plants, such as the network of connected aqueducts that ensures water supply for long periods during drought even in decentralized areas, which represents an example of valuable practice.

**Hi Tech** represents one of the most promising sectors for the development of the world economy in the coming decades. Genoa counts about 23,000 employees in this field, with a significant presence in the electronics, robotics and biotech sectors and a network of companies representing real centres of excellence. The rapidity with which the phenomenon of future technologies spreads leads to fostering paths of high specialization and new professionalism, to design and develop a new paradigm of services. Among the Genoese economies, it is perhaps the one that is more commonly utilized both in the traditional and innovative fields pertaining to the issue of resilience, both in terms of innovative capacity and flexibility of application.



Photo: www.pexels.com

**Benchmark event: Genova Smart Week, taking place annually. (November).**  
**2018 edition:**

- 200 speakers
- 2000 professionals discussed and brought territorial and global innovations to common factor.

# 11 Urban Ecosystem Development Models

Resilient, Sustainable Human cities are the evolution of the smart city as a consistent response to the internal and external requests of becoming a model for a future urban development

How many vocations can a city have? And how many identities?

The main movements targeting to a medium and long-term vision, such as those related to the Smart and to the Resilient City, try to design better cities under many points of view and with different needs.

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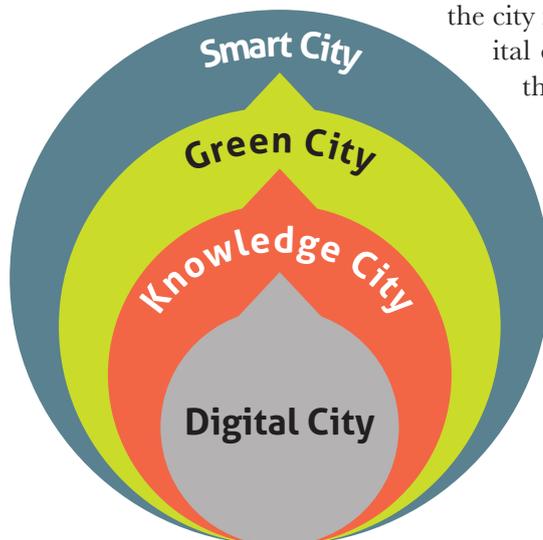
**A smart city is a city 4.0 able to effectively manage the resources and constantly attentive to life quality and needs of citizens and people who experience its “places” in a different way and with dissimilar expectations.**

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Smart city is synonymous with wi-fi connections at various locations, development of “smart” infrastructures, roads ran by self-driving cars, intersections regulated by smart traffic-lights, high technological levels where objects exchange information (IoT), and it is also the place where food is produced in an innovative way and where is possible experiencing a sustainable mobility made up of bike-sharing, car-sharing and hybrid or electric cars.

For all these reasons, a smart city is studded with sensors producing a large amount of data in order to support the most advanced services in real time and allow administrations to be effective in territory management.

The leading process to become a smart city can be described in a chart where the city itself turns from a digital one, through a wired, then to a “knowledge”, until becoming a smart one.



The smart city scheme proposed by Genoa includes a partnership system, implemented with the establishment of the Genoa Smart City Association, which, since 2010, under the Municipality coordination, is responsible for building a project to make Genoa a smart city, by identifying actions, projects and initiatives boosting and encouraging:

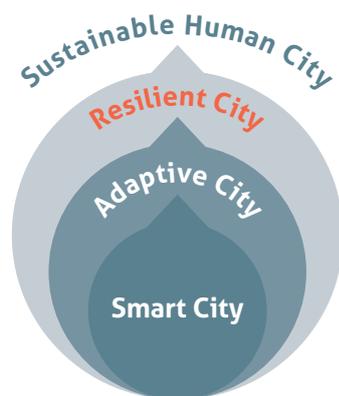
- a better quality of life;
- environmental safeguarding, retraining and sustainability in accordance with European and international policy guidelines;
- economic development and employment growth;
- research support and strong collaboration between research, innovation and enterprise;
- the achievement of the objectives described by the Covenant of Mayors;
- participation in European funding programmes;

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**The resilient city represents the smart city further evolution, arising from the need to respond in a consistent way to the stresses caused by critical events such as sudden shocks and chronic stress conditions, and aims to become a model for a sustainable urban development.**

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This shift opens up new opportunities to affect, in a pro-active and integrated way, on social, environmental and economic policies (energy demand, services suitable for an extremely diversified population), with levels of attention and demand marked by the effects of the major ongoing changes.



Resilience, therefore, not only implies response and adaptation strategies, but also transformative paths able to improve the city and its territory both during “negative” and “positive” phases, aiming at a prevention governance through a process that requires development of knowledge, flexibility, differentiation, integration, inclusivity and adaptation.

Pursuing urban resilience leads to a number of projects and policies that face multiple challenges at the same time, improving services and saving resources according to the logic of the “resilience dividend”, i.e. the whole of social, economic and physical benefits of the urban context, achieved through a forward-looking and aware planning of the short, medium and long-term risks.

The concepts of smart city and resilient city – although strongly interconnected – do not coincide, and must not be confused.

While it is true that smart tools help a city become resilient, they don’t automatically make it so. In fact, if the smart city focuses on efficiency and, therefore, on the elimination of “repetitions” representing a cost to the community, the resilient city is characterized by redundancy and diversity characteristics and promotes the creation of options (roads, means of transport, resources supply, etc.) and aims to prevent stress and shock situations for all its communities to ensure high standards of quality, attractiveness and competitiveness.

Both the Smart City – with its specializations – and the Resilient city – with its character of urgency, innovation and proactive evolution – look carefully, and give their contribution as prominent elements, to the “Human City”, a city on a human scale in which the human being will be at the heart of a more livable ecosystem, specifically designed to make his life better, so as to avoid further depletion of resources and allow the urban environment renewal for higher life quality standards.

# 12 Definitions

The terms used in this document are defined as follows:

## **Adaptation**

An adapting process of a system to current or expected changes and their effects, in order to reduce or prevent harm and to take advantage of favourable opportunities.

## **Cost-benefit analysis**

Decision-making tool that compares economic costs and benefits of a proposed policy or project.

## **Climate change**

Changes in the state of climate persisting for an extended period, typically decades or more.

Note: climate change may be due to natural causes, to persistent anthropogenic changes modifying the atmosphere composition or soil use.

## **Capacity**

Combination of all the strong points, attributes, and resources proper of a system and necessary to manage and reduce the negative effects of a change and strengthen resilience.

## **Disruptive phenomena**

Conditions (such as chronic stress or acute shock) impacting on urban systems, on ecosystem services and/or on the business continuity of socio-economic systems.

## **Governance**

How responses and management of social, economic and technological changes are carried out through the role of the different levels of government – global, international, regional, local – and with private contribution, i.e. non-governmental players and civil society.

## **Resilience**

Transformation ability that helps avoid the negative effects of a change.

Note: this ability concerns systems of any nature and size and their connections with others on a different scale which, even if in uncertain conditions with respect to events that may affect their stability, are able to secure themselves in case one or more of their components or those of the systems to which they are connected should fail.

## **Ecosystem-based Services**

Multiple benefits provided by ecosystems to mankind.

Note: the qualifying conditions of an ecosystem service imply its natural origins, its capability to improve human well-being and its direct availability to people.

## **System - Complex system**

Set of variable elements strongly interconnected also in their temporal evolution.



### **Sustainability**

Development condition that ensures the satisfaction of current needs without compromising the natural capital of resources of the future generations.

### **Transformation**

Process of deep modification of the fundamental attributes of a system.

Note: the transformation can involve technological or biological elements, value systems, regulatory, legislative and financial institutions, etc.

# 13

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## Acknowledgements

This document was created thanks to the collaboration of colleagues in the Public Administration, to the contributions of stakeholders, active part in the working groups such as research institutions, trade associations, private representation of the business world, small and medium-sized enterprises and industry.

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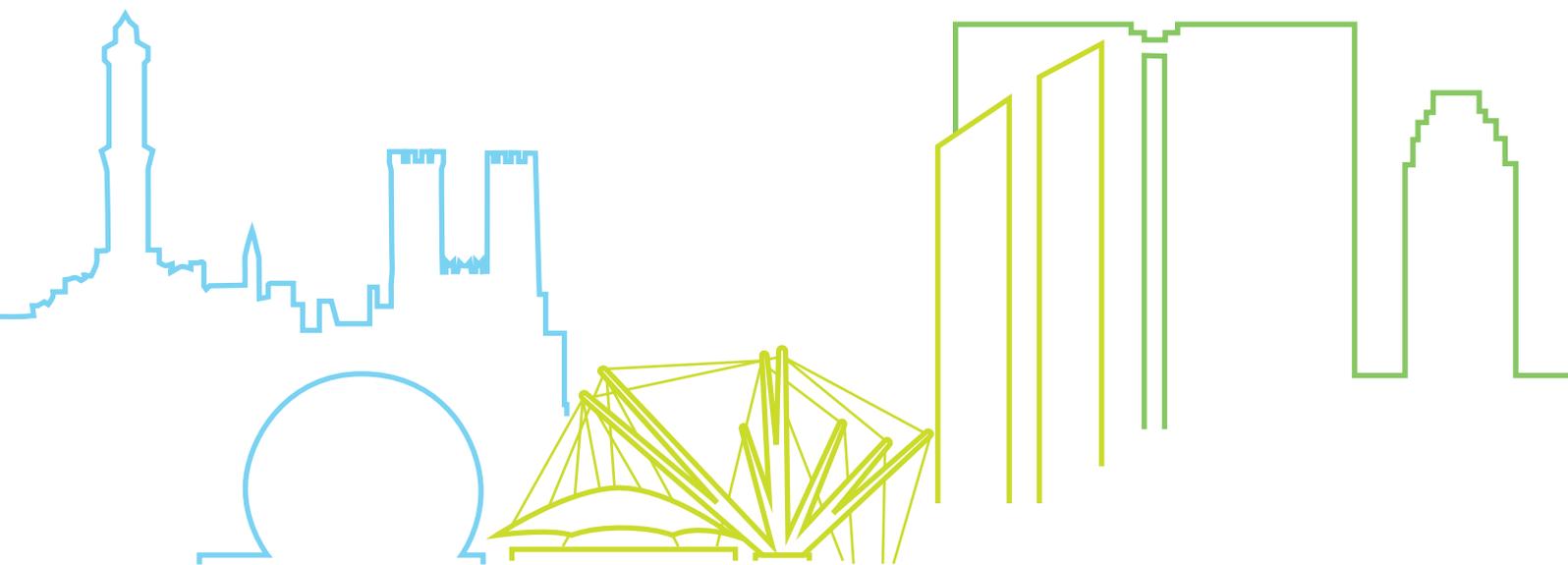
Genoa Municipality

Economic Development and Innovative Projects Directorate

Resilience and European Projects Office – Urban Resilience Strategies

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