

Paris Resilience Strategy

FLUCTUAT NEC MERGITUR



Anne Hidalgo, Mayor of Paris

“Fluctuat nec Mergitur”, which translates to “Beaten by the waves but not sunk”, proudly announces our motto. Made official in 1853 by the Baron Haussmann, it had been used by Parisians since the 16th century. Its origins lie in the river’s history, dating back to antiquity! Urban resilience is therefore not a new trend: it is an integral part of urban discourse. The concept was, however, somewhat forgotten at the end of the 20th century, as our societies were convinced that technical solutions would be able to overcome the risks faced by our cities.

Today we are confronted with new and great challenges, which affect current and future generations. Climate change, air pollution, growing inequalities, terror threats, persistent water insecurity, the migrant crisis – all these challenges bring cities to the front line.

Far from inducing anxiety, urban resilience offers solutions to better prepare and adapt cities, their populations, businesses and infrastructures to these challenges. It also provides opportunities to create new activities and jobs while improving citizens’ quality of life.

Governance, which is our ability to organise ourselves collectively with all stakeholders and to create new partnerships, particularly beyond the municipality, is key to the resilience of Paris.

It is also the functioning of our city that is in question: its flexibility, its ability to learn from disasters to better anticipate them, to think of its projects in a systemic way that multiplies their benefits, but also to mobilise and include citizens, companies, researchers in those projects. This resilience strategy is therefore aimed at citizens, since it is primarily Parisians who will build the resilience of Paris. We will offer them opportunities to be further trained, mobilised, engaged and united, in emergency situations and in everyday life. It is also necessary that our infrastructure and the way we think about urban planning be more adapted to their needs and current challenges. It is therefore a matter of transforming Paris, in order to calmly confront the risks of the century and improve Parisians’ quality of life in both the short and long terms.



I would like to express my sincere thanks to all the institutional, business, academic and associated partners, as well as to the municipal teams, for their contribution to this very ambitious work, which has only just begun. I also warmly thank Michael Berkowitz and 100 Resilient Cities – Pioneered by the Rockefeller Foundation (100RC), who have enlightened, guided and supported us in this essential step for our city and Parisians.”

Célia Blauel, Deputy Mayor for the Environment

“In recent years, our city has been confronted with some significant challenges. Paris has experienced record flooding of the Seine, intense heat waves – including that of 2003 which led to a sanitary disaster – terror attacks, and a large influx of migrants. In response to the scale of these challenges, structural, systemic and cultural changes are required, and *the city and its citizens must be prepared to cope with and bounce back from such emergencies.*

In 2015, just a few weeks before COP21, the City of Paris launched an Adaptation Strategy that laid the foundation for a more resilient territory. The Strategy sets out a vision to adapt Paris to the effects of climate change and resource scarcity while making it more attractive and more pleasant to live in. The resilience strategy builds on this vision and further anticipates the changes in our society and places a greater emphasis on social cohesion. The concept of resilience carries within it the notion of cross-cutting, interdependencies and co-benefits. It allows us to frame the major challenges facing our territories as a coherent whole and to deliver projects that reinforce one another.

Humans are at the centre of this strategy. Citizens, commuters, partners are at the heart of our attention. It is the strength of social bonds, and everyone’s active participation in a common destiny that will enable us to become a resilient, livable and proud city in the face of various risks. Paris is very pleased to benefit from the support of the Rockefeller Foundation’s 100 Resilient Cities programme, which enables us to accelerate and considerably improve the municipality’s actions aimed at working together to build a more resilient city.”



DR/Maire de Paris

Michael Berkowitz, President, 100 Resilient Cities

“On behalf of the entire 100 Resilient Cities (100RC) family, I want to congratulate Mayor Anne Hidalgo, the city of Paris, and Chief Resilience Officer Sebastien Maire, on the release of Paris Resilience Strategy, a major milestone for the city and 100RC’s partnership with it.

The cultural, political, and economic center of France for close to a millennium, Paris still remains one of the most vibrant and important cities in Europe and the world. The city’s motto *Fluctuat Nec Mergitur* -- Tossed but Never Sunk - perfectly captures the city’s long history of resilience, as it has endured and survived invasions, sieges, plagues and violent political upheavals. More recently, Paris has secured its place at the vanguard of important political and cultural forces, hosting COP 21 where the historic Paris Climate Agreement was reached. Now, Paris stands poised to turn its challenges into resilience-building opportunities. This Strategy provides the city a framework for actions that ensure this is a future in which Paris continues to not only survive but thrive, and lead other cities to do so as well.

With the Paris Resilience Strategy, the city has set itself on a course to form meaningful urban resilience through plans that account for the city’s entire urban ecosystem. It addresses not only the city’s shocks, such as terror attacks, extreme heat, flooding, and infrastructure failure, but also its chronic stresses, such as poor air quality, economic inequality, and social exclusion - continuous pressures that erode the urban fabric and exacerbate the major shocks when they do occur. As it implements the Strategy and its integrated inter-systemic solutions, it can serve as a model to cities across Europe and around the world. The Strategy’s six themes - social, economic, territorial inequalities and social cohesion; climate change; air pollutions and environmental health; terrorism and security; the Seine River; and territorial governance -- present a holistic framework with interventions that maximize the city’s assets and provide multiple benefits.

As Paris implements its Strategy, it can serve as a model to other cities across Europe and around the world. The Strategy’s pillars aim to build an inclusive and supportive city to strengthen social cohesion, adapt infrastructure to meet the challenges of the 21st century, harness the city’s talent and dynamism and adapt its governance systems to better integrate with surrounding territories - recognizing that many of the city’s most deeply entrenched stresses require a metropolitan lens. The interventions designed to realize these goals include using schools as cooling oases during heatwaves; creating a resilient and carbon-neutral neighborhood in Saint-Vincent de Paul; transforming the Paris ring road; and supporting climate change adaptation measures connected to the Seine to improve water quality and prevent flooding. Within these lies Paris’ opportunity



to become a world-class exporter of best practices for tackling climate-related threats while achieving social integration for its most poor and vulnerable citizens. This Strategy can serve as both a blueprint and an engine for all of Paris’ efforts to ensure a future that is more inclusive, healthy, integrated, economically and socially equitable, and where the environment and climate change are forces to live with and not against.

Through the commitment and hard work of CRO Sebastien Maire and his team, and the unfailing support of Mayor Anne Hidalgo and Deputy Mayor Celia Blauel, this ambitious Strategy reflects the diversity of voices and communities engaged during its development. It also reveals the active role Paris has already played in our network, not least through its participation in the 100RC city exchange on migration late last year and the current collaboration and work on metropolitan governance issues with Santiago, Greater Manchester and other member cities.

Even after months of effort and tireless leadership, 100RC’s partnership with Paris is just beginning, and we are excited to see Paris continue on its path of innovative interventions to ensure a vibrant collective future. Because we know that only by implementing this groundbreaking Strategy can we help ensure a resilient future for Paris, and all those who reside there.”



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Sébastien Maire, Chief Resilience Officer

“This strategy is not a detailed and comprehensive “plan” that pretends to list all the actions to be carried out in the decades to come to guarantee the resilience of Paris. Such an approach would be contrary to the concept of resilience given that, within 30 years, scientific discoveries, technological advances, changes in society, natural events are likely to challenge some of the directions proposed today.

The strategy does not intend to “plan” for resilience, but rather to start engaging with the City of Paris and its partners on how to progressively change existing processes, ways of thinking and of designing policies and projects so as to build a more flexible, more responsive territory that responds proactively to new urban challenges.

Resilience is above all a process that aims to change the making of the city.

Consistent with the collaborative approach taken to develop this strategy, building a resilient city will require deep involvement of citizens, businesses, researchers and associations. This is particularly important as most of the solutions and answers to the challenges of the century are already being provided by the civil society as well as social and technological innovators.

We must also take better account of the issue of scale. Firstly, time scale: will the infrastructure built today serve our city for the next 50 or 100 years? Are challenges relating to social equity and climate change systematically and adequately taken into consideration in the planning of our infrastructure systems? Secondly, geographical scale because resilience-building is rarely confined to administrative boundaries. It is the scale of human relations at the level of the building’s stairwell or the neighbourhood that counts for social resilience; that of the agglomeration for mobility and employment issues; the geophysical scale of the watershed to address the risks associated with the river, and that of the planet for climate change and mass migrations.



Maire de Paris

The making of the resilient city, particularly in a very dense city like Paris, must evolve to entrench temporary urbanism, modularity, energy sobriety and reversibility to deliver better equipment and public spaces at lower cost. It calls for a true and systematic consideration, both in policy objectives, methods and regulations for cooling, energy, water, biodiversity and air quality. The making of the resilient city must finally take an “integrated” approach that looks at how policy and infrastructure systems can be developed as interacting with one another in a cross-cutting way. This is the strength of this approach: resilience is not costlier, but rather aims to meet more needs and produce more benefits, with the same budgets.

The road to resilience is therefore virtuous and offers remarkable opportunities for developers and engineers, for companies, and for the city’s citizens.”



Introduction



Urban resilience

Resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and thrive no matter what kinds of chronic emergencies and acute shocks they experience.

Resilient systems are characterised by seven qualities:

Inclusive

Based on broad consultation and engagement with stakeholders

Integrated

Facilitates linkages between systems, infrastructure and institutions in order to maximise benefits

Reflective

Learns from shocks and disruptions in order to become stronger

Resourceful

Considers different and more efficient ways of using existing resources, in response to changing circumstances

Robust

Designed to reduce risks of failure and damages in case of shocks or disruptions

Redundant

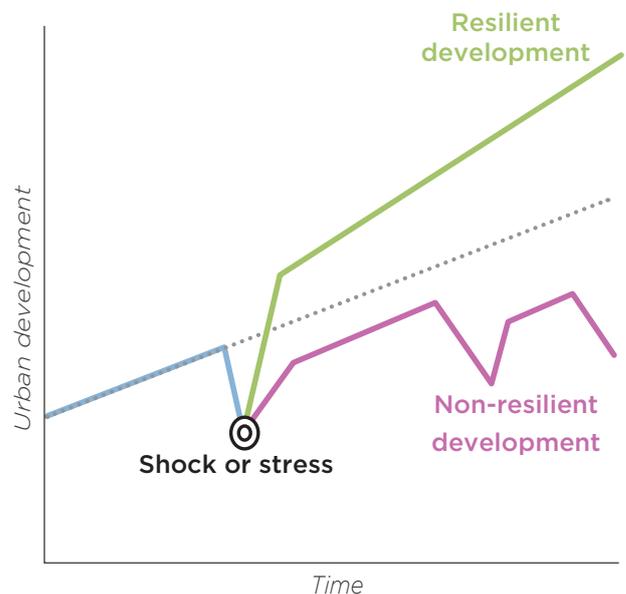
Includes spare capacity to adapt to extreme conditions or unforeseen external shocks

Flexible

Can adopt alternative service delivery strategies in response to changing circumstances

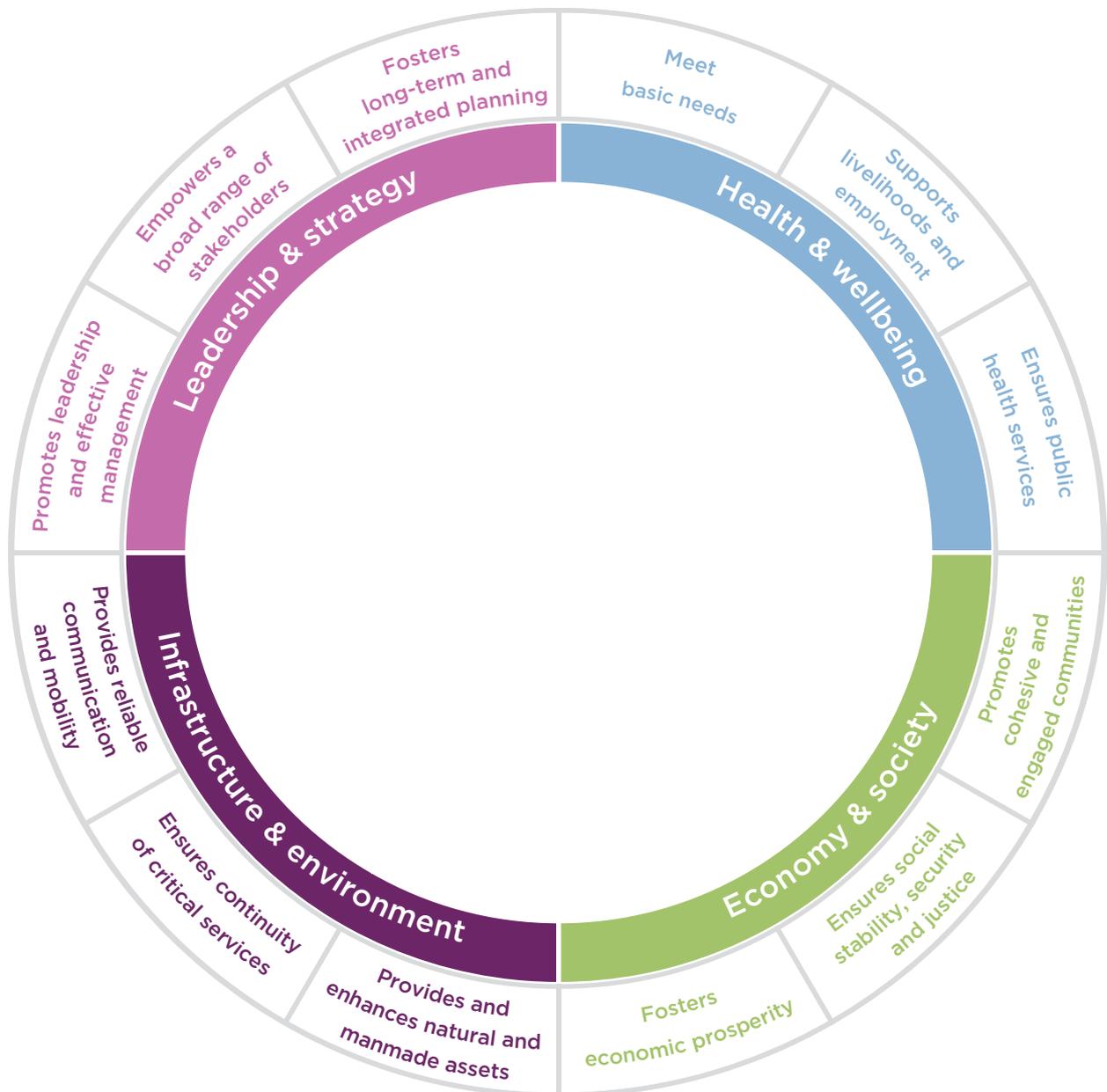
Cities in the 21st century face complex and inter-dependent crises. This includes a global economic system under great strain; social and territorial tensions; ongoing terror threats; rising geopolitical tensions, increasing migration flows, and a leap into the unknown due to climate change and dwindling environmental resources. In this context, a resilience-based approach is an obvious response to an increasingly unpredictable future. As cities are at the front line of all these disruptions, they must protect their populations against these risks.

Urban resilience aims to find effective and pragmatic solutions that prepare cities for expected shocks or stresses, as well as unforeseen challenges. This calls for a fundamental change in the way in which urban ecosystems work, making them more flexible and adaptable to change. The systemic and functional approach advocated by resilience principles reinvents urban development at a time when the share of the world's urban population will reach 70% by 2050.



Urban resilience encompasses all aspects of urban development, from natural and built assets to citizens' wellbeing and social and economic issues, underpinned by effective governance. The diagram

below shows the themes covered by the City Resilience Framework used to design this strategy.





100 Resilient Cities network

100 Resilient Cities - Pioneered by the Rockefeller Foundation (100RC) was launched in 2013 to help cities around the world become more resilient to the major shocks and chronic stresses. The long-term objective is a radical and large-scale overhaul of how cities approach risk and develop.

Cities in the 100RC network are supported throughout the strategy development and implementation process with:

- Funding for the role of a Chief Resilience Officer.
- Access to technical expertise and methodological guidance via a Strategy Partner.
- Access to the 100RC Platform - a group of leading service providers who offer in-kind services to member cities.
- Membership in a global network of cities seeking to build their resilience.

New York, United States
CERT, p.43
Community schools, p.47

San Francisco, United States
SF72 Programme, p.45

Berkeley, United States
Measure T1, p.99

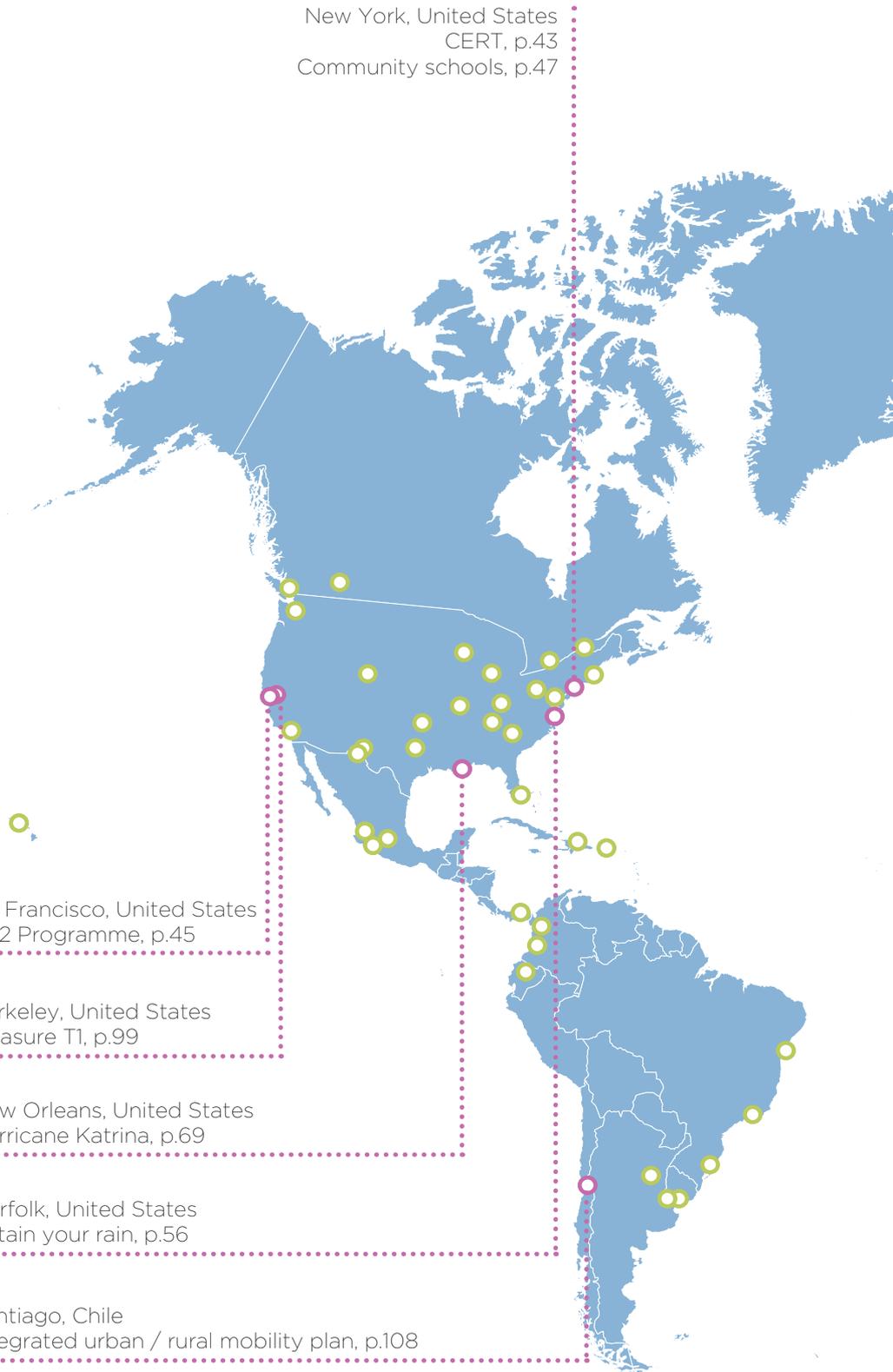
New Orleans, United States
Hurricane Katrina, p.69

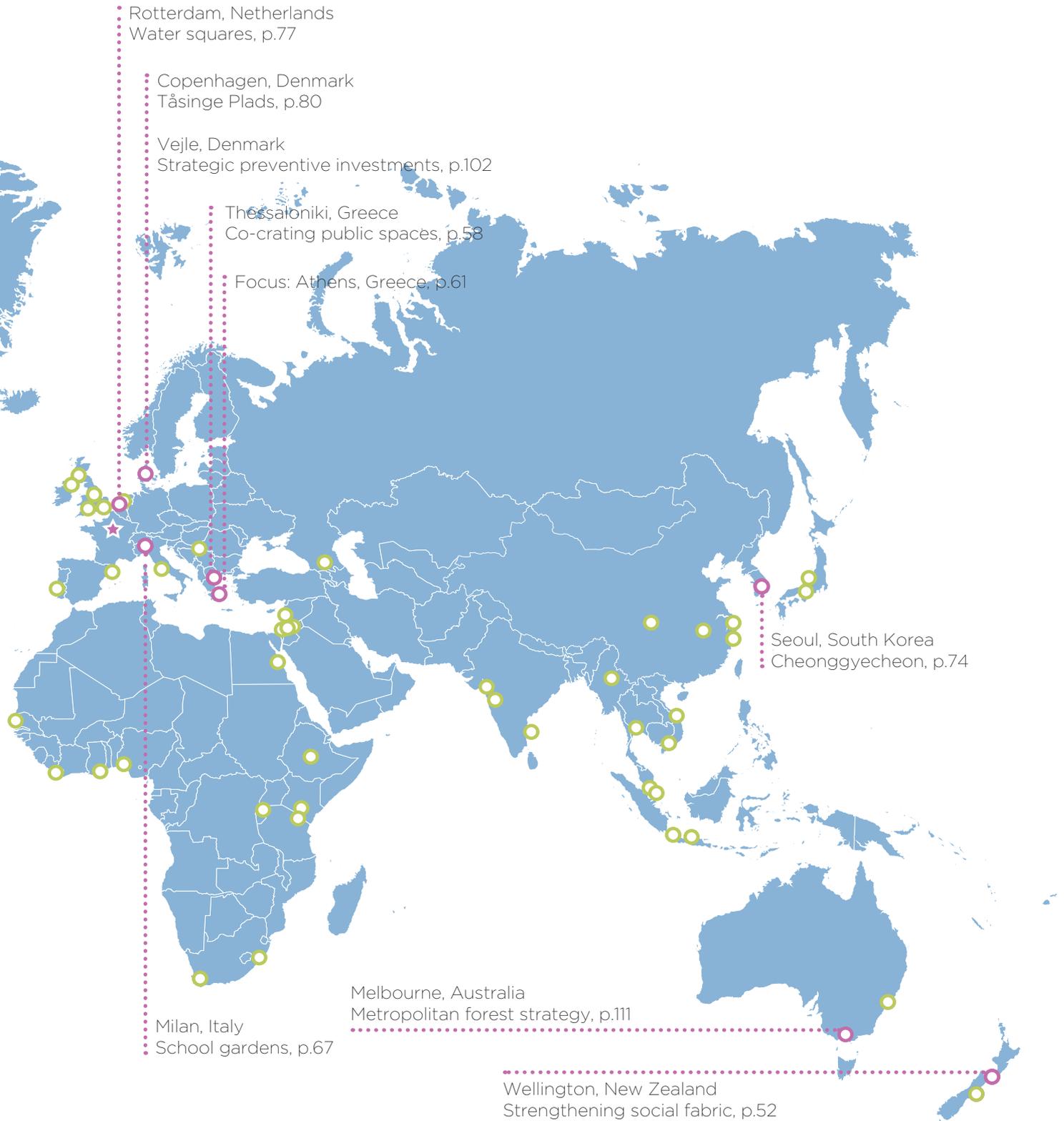
Norfolk, United States
Retain your rain, p.56

Santiago, Chile
Integrated urban / rural mobility plan, p.108

Legend

- 100RC Network cities
- Inspirations







The Resilience Strategy development process

November 2015:
Appointment of the Chief Resilience Officer (CRO)

Agenda Setting Workshop

April 2016: Workshop with more than a hundred representatives from municipal departments, as well as economic, community, academic and citizen stakeholders. The objective was to define urban resilience, identify and rank shocks and stresses, and begin to understand the capacity of the territory to face these challenges.

October 2016: Preliminary Resilience Assessment of the territory, following consultation of numerous stakeholders and review of multiple studies and data available.

6 major challenges are identified:

- **Social, economic and spatial inequalities and social cohesion;**
- **The terror threat and security context;**
- **Climate change;**
- **Air pollution and environmental health;**
- **The Seine and river-related risks;** and
- **Territorial governance.**



Mission Résilience/Mairie de Paris

Co-designing solutions

November 2016-May 2017: New mobilisation of a large number of stakeholders to develop responses to these challenges, and conducting new specific studies:

800 stakeholders

8 workshops

- Social innovation for better resilience;
- Schools and resilience;
- The centennial flood: “Build Back Better”;
- Global Resilience Academy on the Saint Vincent de Paul redevelopment project;
- Informed and united citizens to better face risks;
- Resilience in the food system;
- Resilience at the metropolitan scale; and
- Lessons learned: managing the response to the attacks on November 2015 and the flood of June 2016.

9 studies

- Paris resilience: state of play on public spaces and recommendations for multiple benefits (ENPC / AgroParis Tech);
- The multiple benefits of coworking spaces to reduce journeys in urban areas (New York University);
- The benefits of reducing road traffic (AECOM);
- Adapting the city to migration flows (IRC);
- Developing a resilience strategy for the metropolitan area (Sciences Po / MGP);
- Identifying, prioritising and mapping the potential of floodplain expansion and wetlands for the watershed (Amec FW / EPTB);
- Benchmarking “Build Back Better” good practice (UPEM/Tulane University, New Orleans)
- Internal study on cross-cutting engagement to improve air quality; and
- Innovative technical solutions and regulatory mechanisms against urban heat islands and air pollution (UPEM/EIVP).

Implementation

Implementation and follow up on actions.

4 October 2017:

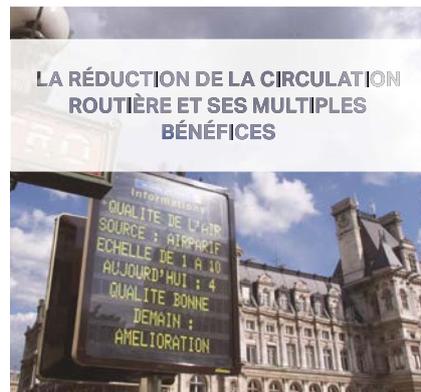
Presentation of the resilience strategy

25 September 2017:

Vote on the resilience strategy

June-September 2017:

Strategy write-up



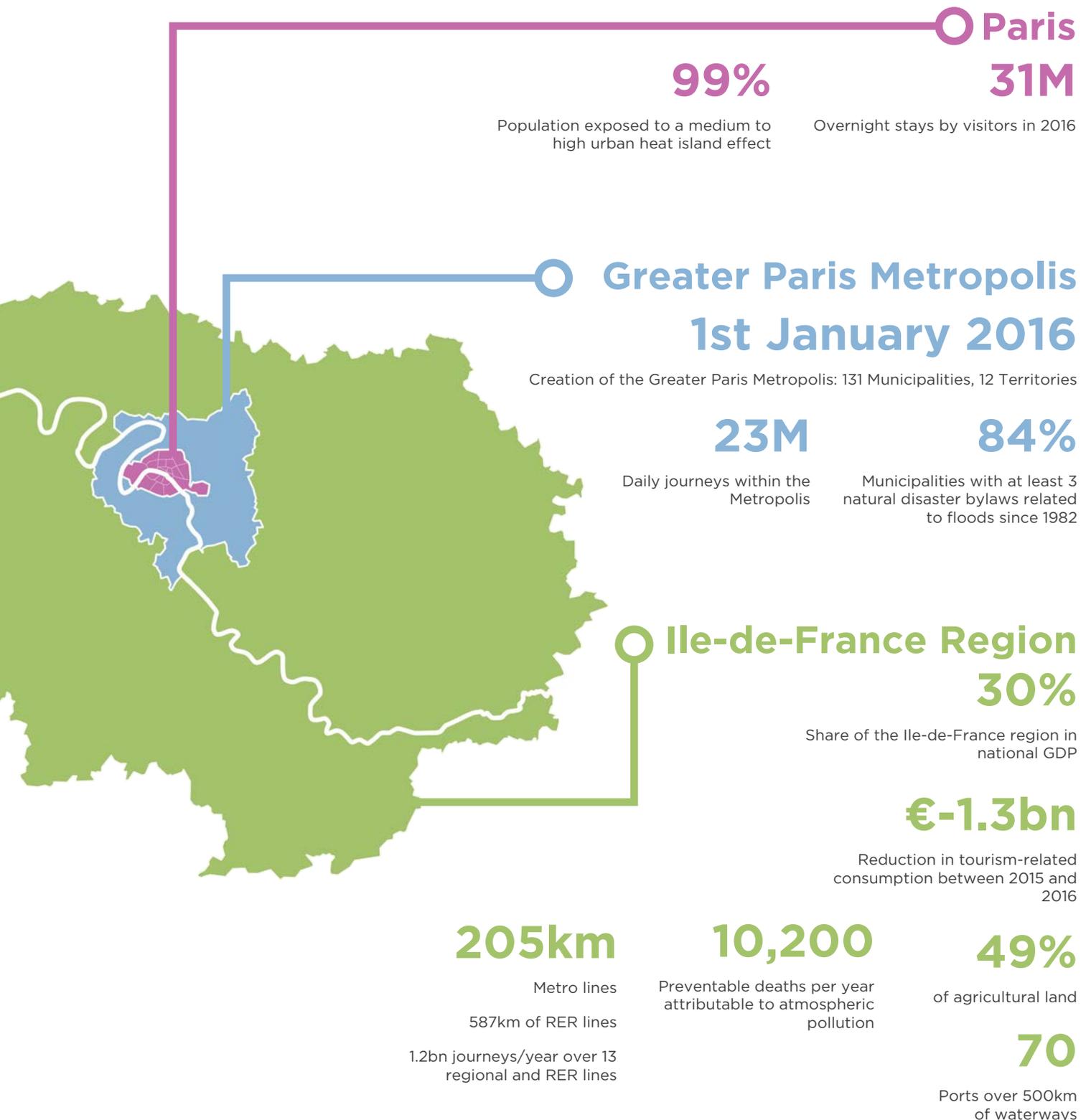
Top left: AECOM for 100RC. top right: Sciences Po for 100RC
Bottom: Emmanuel Nguyen Ngoc/ Mairie de Paris



Paris: key figures

	Paris	Greater Paris Metropolis	Ile-de-France Region
Population	2.2M	7M	12M
Annual average percentage change in population between 2008-2013	+0.2%	+0.4%	+0.5%
Inhabitants/km ² (2014)	21,000	8,600	1,000
Over 65 yo (2014)	350,000	982,000	1.67M
Unemployment	7.4% (1st term 2017)	13.5% (2014)	8.3% (1st term 2017)
Youth (15-24yo) unemployment (2016)	12%	-	17.9%
Number of jobs (2014)	1.8M	4.1M	5.7M
Number of homes in flood zone (100-year flood)	107,700	336,850	435,000







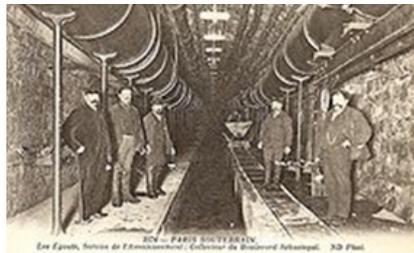
Resilience through the ages



The city's coat of arms refers to the water which brought wealth as well as recurring risks.

Succession of severe floods

The Academy for Sciences commissions hydrologist **Philippe Buache** to monitor and measure water levels.



Succession of deadly epidemics

Charities and community groups helped cope with the huge costs health impacts.

Birth of Paris



-8000

Century

0 BC

1st 3rd 10th

1740



18th



In ancient Lutèce, the Pillar of the Nautes shows the city's urban maturity and honors social and religious cohesion, conducive to urban and trade development.

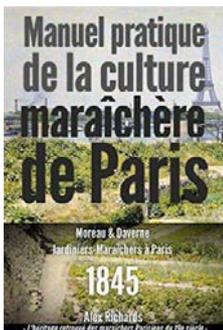
These measures result in a [map of flooded areas](#)



Food resilience

In 1845:

- 12% of inner Paris is farmed
- 10,000 agricultural workers



13th November 2015 attacks.

Parisians reclaim their motto "**Fluctuat Nec Mergitur**" as a symbol of their resilience.

Multiple widespread fires

In 1878, after several large fires, the insurance company Urbaine-Incendies sets up a rate to stimulate the **modernisation of gas and lighting systems**. Electricity is installed in major theatres through financial incentives.

5% of the Paris area, which represents **600 hectares**, is still **used for food gardening** in the years 1930-1940

1878

2015

19th

1853-1870

20th 1914-1918

1939-1945

21st

1910



© Photographies Cyrille Weimer, octobre 2016

Haussmanian urbanism, based on flexibility and reversibility, it enhances the resilience of infrastructure, 600km of sewers, 175km of roads, but does not take social impacts into account.



20,000 buildings and 200,000 people are affected by the **centennial flood**. In the absence of technical solutions, Parisians can only rely on mutual assistance and solidarity. But the "flood of dedication" happens to the detriment of the suburbs which remain under water.

Public spaces in occupied Paris are requisitioned by Parisians to grow food.





1. Social, economic and spatial inequalities, and social cohesion



2. The terror threat and security context



3. Climate Change



4. Air pollution, a challenge for environmental health



5. The Seine and river-related risks



6. Territorial governance

Resilience challenges



The strategy development process identified six priority challenges, which impact the territory and the resilience of Paris. This list of priority challenges is not exhaustive. Paris will face other risks, particularly related to new technologies but also nuclear risks, pandemics or epidemics, financial and oil crises, large scale strikes or road blockades. Ultimately, resilience means preparing for the unpredictable, preparing for any type of shock or stress. The priority challenges identified form the basis of the solutions presented in this strategy.



1. Social, economic and spatial inequalities, and social cohesion

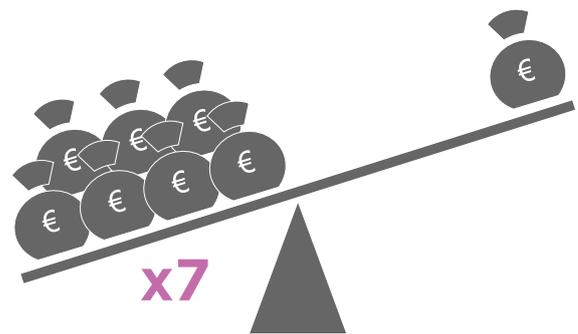
Like many large cities, Paris is a city of contrasts. Socioeconomic and spatial inequalities are prevalent and rapidly evolving across the urban area, threatening social cohesion. There are many dimensions to the socio-economic inequalities that plague Paris: precariousness refers to living an existence lacking in predictability, job security, material or psychological welfare. This condition is no longer limited to the isolated and homeless; families, the working poor, and migrants – who face additional barriers to integration – are increasingly vulnerable.

In Paris, precariousness has manifested as a spatial challenge. There has been a decline in housing accessibility and affordability due to gentrification and real estate speculation. In 2016 alone, 2,200 families were unable to secure accommodation in Paris. Housing quality has also declined as vulnerable populations are pushed into unsafe shelter or conditions that lack basic energy infrastructure. The geography of vulnerability has significant secondary impacts on social welfare. Those facing social exclusion are often the same people with heightened vulnerability to health risks.

Precariousness is also characterised and compounded by demographic disparities, with women, children, the elderly, the disabled and the displaced suffering disproportionate risks of social exclusion. Women do not have the same opportunities as men: their mobility, job opportunities and daily lives reflect disparate contexts and constraints, creating and reinforcing deep-rooted gender inequalities. Children make up an increasingly large portion of the affected and, as the child poverty rate approaches 22%, the wellbeing of this next generation remains a priority for a more resilient future.

An aging population must be accommodated – if demographic trends observed between 1997 and 2007 continue, by the year 2030 24% of the city's population will be over 60 years old and 10% will be over 75 years. Disability is also a challenge – in 2008, 15% of the population of Ile-de-France was affected by some form of disability, whether identified, felt or recognised, and 7% were officially classified as disabled.

10% of the wealthiest **10% of the poorest**

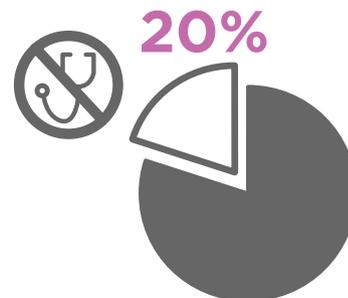


Annual average income in 2012 in Paris

+84% in 15 years



Homeless people in the Paris area



Non-use of healthcare services in some of Paris boroughs

Displaced communities form a fifth and growing group that suffers increasing exclusion. Since October 2015, on average nearly 100 migrants arrive in Paris each day, fleeing geopolitical and climate induced disasters and the conflicts they generate. In response, Paris must assert its role as a welcoming European and global city, while ensuring the resilience of its most vulnerable citizens.

Pockets of poverty are concentrated in suburban neighbourhoods, especially in the north and northeast of Paris. The “Périphérique” (ring road) remains a strong physical and symbolic boundary between the capital and the rest of the metropolitan area, delineating spatial inequalities with regard to access to public transport, government services, culture, employment and other opportunities. Intercultural tensions and heightened security concerns add to these enduring inequalities to further jeopardise social cohesion.

In its geographic and demographic manifestations, social exclusion can trigger vicious cycles – exclusion weakens territorial resilience and disintegrates the fabric of human networks, leading to democratic fatigue and placing growing pressure on scarce public resources which in turn fuels further exclusion. In response to these 21st century challenges, the city has identified social inclusion and the fight against inequality, alongside the objective of climate resilience, as priorities for a resilient Paris.





2. The terror threat and security context

Terror attacks have a profound psychological impact and are perceived by Parisians as a major risk. Countering terrorism requires a wide range of actions and collaborative governance based on rational responses and meaningful involvement from citizens.

The events presented below profoundly affected Paris and its inhabitants. Each new attack in nearby European cities, such as Nice, Brussels, Berlin, London or Barcelona, triggers painful memories and serves as a reminder of the ongoing terror risk. The tremendous resilience of Parisians was illustrated by the messages of peace and solidarity that followed local and global attacks.

In addition to the severe human and emotional toll, terrorism has also affected the economy of Paris, a city of tourism. The retail and hospitality sectors suffered in the aftermath of terror events: international hotel arrivals in Ile-de-France were 22% lower in December 2015, compared to December 2014. Like the people of Paris, the economy and tourism sector have demonstrated resilience in the months that followed, benefiting also from the support of local and national authorities committed to maintaining Paris' role as a vibrant tourism destination.

In the aftermath of the 2015 and 2017 attacks, new measures were introduced and implemented to enhance security in public places and spaces. These steps were necessary, and were expected by the population. Rationalising and improving terror alert systems, emergencies management, medical response and psychological assistance in the case of a terror attack remain ongoing priorities for the government, victim associations and many others. They build on lessons learned from French and international cities facing similar terror threats.

Nevertheless, there is no infallible solution that can fully eradicate the terror threat. Protecting urban populations relies above all on instituting the right reactions and behaviour when emergencies arise. Resilience thus allows us to think beyond security headlines to the need for a more peaceful society that is marked by less inequality and provides more opportunities for all. The main risk to security in Paris is actually the potential loss of social cohesion, which can result in intercultural and interfaith tensions. This is why the Paris resilience strategy focuses on strengthening social ties and on hyperlocal solidarity, and prioritises children and early civic education. Wellbeing, mental health and individual resilience must together be the drivers of collective resilience.

7 January 2015

9 January 2015

13 November 2015

20 April 2017

12 people are killed inside the offices of satirical newspaper Charlie Hebdo.

4 people are killed during a hostage situation in a Hyper Cacher store located near Porte de Vincennes. The day before, the assailant killed a policewoman in the town of Montrouge.

A succession of seven attacks starts in Paris and in Seine Saint-Denis leading to the death of 129 people and the wounding of 300 others (99 of which were severe). Seven attackers are killed during the worst terror attack France has known since the Second World War. The "Islamic State" group claims credit for the slaughter and devastation.

A man kills a policeman shooting at a patrol van. The "Islamic State" group again claims responsibility for the attack.

Joachim Rocin/Charlie Hebdo





3. Climate Change

“It is the children of today, those playing in schoolyards, who could endure summers at 50°C”

Jean Jouzel, Climatologue

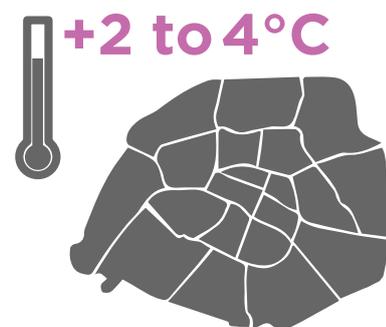
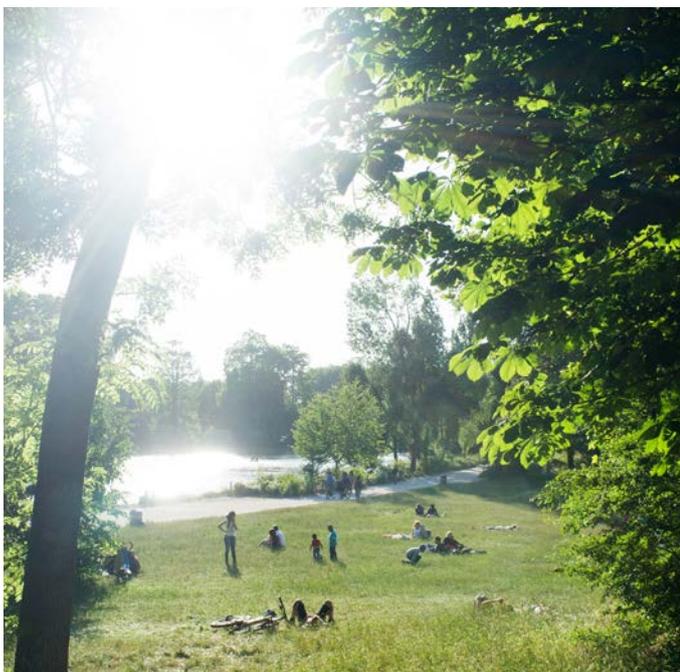
Average temperatures in Paris are set to rise by 2°C to 4°C in the coming decades, requiring preparedness for risks such as heatwaves, droughts, violent storms, flooding, and water scarcity.

For the first time in 2017, the city’s “heatwave plan” was triggered in June during the school term as temperatures climbed in June 2017 – an event that is likely to increase in frequency, duration and intensity due to climate change. A few weeks later exceptional rainfall led to extensive damage and the temporary closure of several underground stations: the city experienced nearly 50mm of rainfall in just one hour, a level unprecedented since the installation of rainfall monitoring stations by Météo France. This type of intense and localised rainfall is becoming more common across the globe, necessitating adaptive infrastructure.

Climate change thus already has tangible impacts for Paris and the city needs to mitigate and adapt

to these in the short, medium and long-term. For example, our urban infrastructure, networks and services are highly vulnerable to extreme weather events, while our natural environment is under stress from high temperatures and the urban heat island effect, which can also worsen air quality issues in Paris. In this context, the most vulnerable individuals are disproportionately affected: children, the elderly, the sick, and those on the streets. While the 2003 heatwave caused an estimated 15,000 deaths in France – including nearly 1,100 in Paris – the June 2017 heatwave caused 580 additional deaths nationally. This suggests public policies have been effective to some extent, but they may not be the most efficient approach given the increasing frequency and intensity of recurring climatic events and the disproportionate impact on vulnerable populations. This is why action against social exclusion and action against climate change are intrinsically linked, and why solidarity remains a priority for the resilience of the territory.

Jean-Baptiste Gurliat/Mairie de Paris



Average temperature in the next decade in Paris



4. Air pollution, a challenge for environmental health

Air pollution now joins alcohol and tobacco as the primary health risk for Parisians: 70% of the city's citizens are exposed to polluted air, despite some improvement over the last decade (AirParif, 2015).

Air pollution has multiple, complex and severe consequences for the health and wellbeing of Parisians. The immediate impacts of pollution may include irritation of the eyes and respiratory tract, asthma attacks, and exacerbation of cardiovascular and respiratory disorders that may lead to hospitalisation or death in the most severe cases. Long-term effects due to repeated or continuous exposure may lead to the worsening of diseases such as cancer (World Health Organization, 2013), cardiovascular and respiratory diseases, and neurological or developmental disorders.

The economic costs of air pollution are significantly underestimated because the health impacts are not yet fully understood. However, even beyond the significant human health risks, air pollution generates many physical costs such as: increased building maintenance; economic losses linked to absenteeism and productivity loss; and environmental damage that are difficult to reverse, still poorly researched and rarely quantified.

In Paris, air pollution is mainly caused by road traffic, as well as residential and commercial heating. Road traffic generates almost two-thirds of nitrogen oxides (NOx) emissions and more than half of fine particulate (PM10 and PM2.5) emissions. The residential and services sectors are the primary sources of greenhouse gas (GHG) emissions and sulfur dioxide (SO₂) emissions. These sectors also contribute air pollutant emissions such as NOx and fine particulate matter.

The Paris urban area is crossed by the largest motorway hub in Europe: the "Périphérique" (ring road). Here, no fewer than nine motorways and expressways converge at a point that is less than 4 km from the heart of Paris. With more than one

Each year, air pollution...

exposes **70%** of parisians to poor air quality



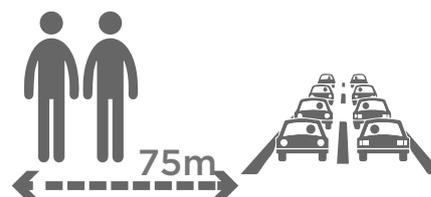
costs up to **€1.7bn** in Paris



causes **6,500** premature deaths in the Greater Paris Metropolis



30%



Parisians proximity to main arterial roads

million users every day and making up 40% of road traffic in Paris, the “Périphérique” is the most polluting infrastructure in Ile-de-France and contributes to 37% of the region’s NOx and 35% of fine particulate (PM10) emissions.

While media attention tends to focus on pollution peaks, health impacts are mostly caused by chronic exposure. Inhabitants of the metropolitan area are exposed to poor air quality each day, and some – including children, the elderly and those with respiratory and/or cardiovascular diseases – are the

most vulnerable. Improving air quality is therefore a major challenge for health and resilience. A more resilient city requires improved air quality by taking back urban spaces occupied by road traffic.



Henri Garat/Mairie de Paris



5. The Seine and river-related risks

In Paris, the effects of climate change on the Seine basin are already tangible: Paris experienced a severe and unprecedented flood in June 2016 and equally extreme and premature low water levels in the same period the following year. For this reason, the Seine was identified early on as one of the priority resilience challenges for the capital.

In particular, Paris must prepare for the risk of a major flood equivalent to or worse than that of 1910. The Organization for Economic Co-operation and Development has estimated that the direct cost of a centennial flood in Paris could reach 30 billion euros in public and private capital losses, while the direct costs to the economy could exceed 60 billion euros with 430,000 jobs directly at risk. As a result of the intensive urbanisation of the Seine riverbed (60% of floodplains have been built upon) and the scaling of urban networks and services without sufficient accounting for river-related risks, the territory's ability to operate and deliver public services will be severely impacted. The 2016 flood made this risk tangible for all, highlighting a range of technical and organisational vulnerabilities for the territory.

The risk of low water levels in the Seine and the worsening scarcity of water resources is another major and emerging climate-related challenge. The phenomenon of severe droughts raises the issue of stable water supply for Paris and the surrounding region, both for potable water, and also for agriculture, industry and river operations. In 2016, 55% of water supply in the capital was derived from groundwater sources and 45% from surface water

Potential impacts of centennial flood

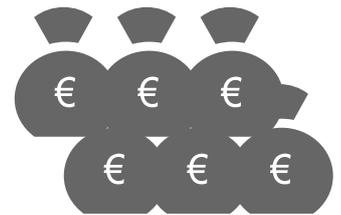
€30bn

Direct loss in public and private capital



€60bn

Direct loss in economic activity

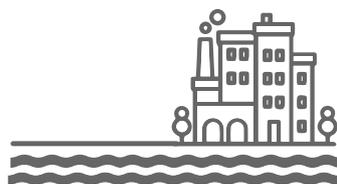


430,000

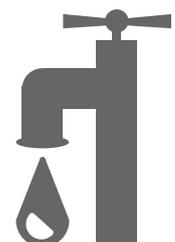
Jobs directly threatened



60%
of the Seine river flood zones are built up



30%
Decrease of the Seine river flow and its affluents by 2080



(specifically, the Seine and Marne rivers). There are concerns that the flow of the Seine and its tributaries could be reduced by 30% by 2080.

Improving water quality is also a priority. This refers both to supply, as well as water needed for biodiversity, recreation (e.g. swimming) and cooling of our city during heatwaves. Coping with

these multiple risks requires an understanding of the interdependencies at the level of the Seine watershed, and not just at the level of the City of Paris. Close cooperation between the relevant regional organisations and territories is imperative to prevent and manage river-related risks.



Hemri Garatz/Mairie de Paris



6. Territorial governance

In order to respond to each of the challenges mentioned above, it is necessary to operate beyond the administrative boundaries of the City of Paris, transcending municipal organisational structures and territorial division. Resilience requires mobilisation of all stakeholders, resources and ideas, as well as organisational adaptation and cooperation between territories that are increasingly interdependent. Governance is therefore a priority challenge within this resilience strategy.

Effective governance requires a strong relationship between the city and its stakeholders as well as a profound capacity for government to innovate, experiment and involve private operators upstream in the design of its projects. Such cooperative governance will ensure maximal resources are dedicated to the resilience of the territory.

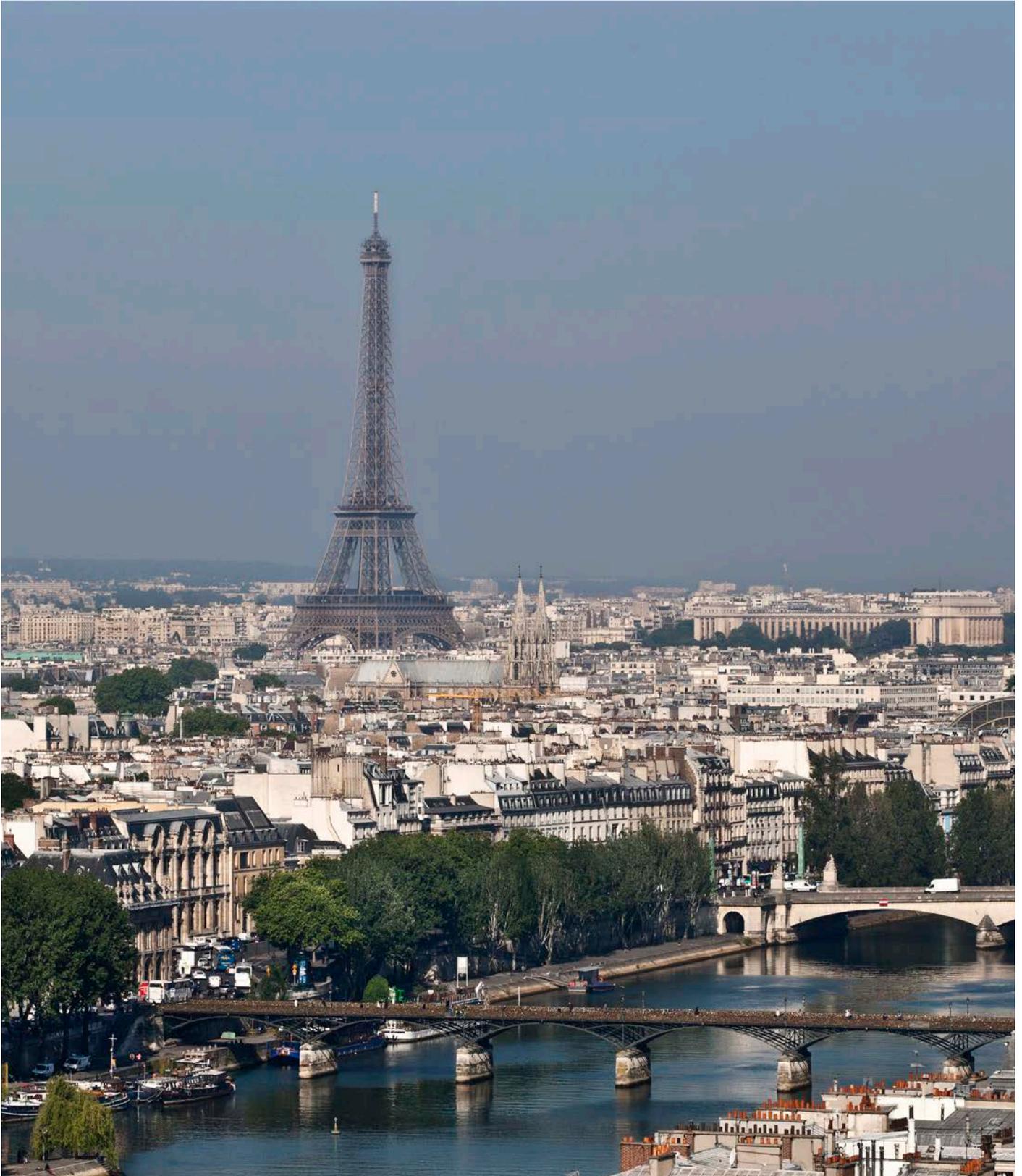
The city's administrative structures must also adapt to local changes if we are to guarantee the quality and continuity of public services despite disruptions. The City of Paris, affected by exogenous and endogenous risks, must constantly improve its responses to disasters and everyday emergencies

and commit each of its employees to continually learn, train and innovate.

A capital city of 2.2 million inhabitants, Paris sits at the heart of a region of 10.5 million people. It relies on rural communities well beyond the urban area for food, transport, and labour. This broader, interdependent, network highlights the need for cooperation across local authorities for a resilient approach. The Greater Paris Metropolis (GMP), which is home to 7 million people, was created in 2016 and today is responsible for: economic, social and cultural development; urban planning at the metropolitan level; housing policy, and environmental protection and policy. In this context, the development of a common vision and resilience solutions across different territorial tiers (e.g. boroughs, city, metropolitan area, regions, state,) remains absolutely essential for the wellbeing of the collective region.



Célia Pernot/Mairie de Paris



Célia Pernot/Mairie de Paris



Vision

“Paris relies on its residents, adapts its infrastructure, mobilises its collective intelligence, and the territories that surround it, to turn the challenges of the century into opportunities”



Driven by its motto “*Fluctuat Nec Mergitur*”, and as demonstrated throughout history during events such as the great flood of 1910, Paris has shown time after time its ability to emerge stronger when confronted with major events. The terror attacks in 2015 reaffirmed once more the tremendous resilience of the city and its inhabitants.

Our vision is to continue to reinforce and promote these characteristics by considering the city's development and the 21st century challenges it faces through the lens of resilience. Such challenges include the consequences of climate change (such as flooding and heatwaves), the health impacts of pollution and environmental degradation, resource scarcity, and broadening inequalities, which pose risks to the social and democratic order, as well as to security and stability of the city both in the long and short terms.

In our resilience vision, these risks are looked at in a holistic and inclusive way. A holistic approach contends that is more efficient to build integrated solutions that respond to climate, social and environmental emergencies together, rather than separately. Public policy, from building infrastructure or equipment to setting up new services, must integrate from the outset the imperatives of mitigation and adaptation to global warming and reduction of inequalities.

Paris is already a world leader in the fields of climate adaptation and the fight against exclusion. By focusing on resilience, the city is creating a new urban development model that is more flexible, more ingenious, more efficient and adaptable to the hazardous changes of the world.



Action plan

Pillar 1

An inclusive and cohesive city, which builds on the strength of its residents to become more resilient

The approach must be inclusive because resilience only works if everyone participates: public institutions, private stakeholders, associations, inhabitants, researchers, and other city users. The more inclusive a society, the more it is united and supportive, and the more it can face all eventualities, daily as well as in emergencies. Resilience is therefore firmly people-centred, driven by all citizens and communities, and with a focus on the interests of children.

A. Prepare young and old to cope with acute shocks and daily stresses

B. Create conditions that encourage goodwill among neighbours and inclusive neighbourhoods

C. Enable residents to co-create the city of tomorrow

Pillar 2

A city built and developed to meet the challenges of the 21st century

Resilience also calls for a different approach to urban spaces and infrastructure in order to respond to challenges in an integrated, tactical and flexible way:

Integrated, so as to address all risks at the same time through cooperation across silos, in order to achieve long-term benefits

Tactical, because small scale actions can serve broad and ambitious goals by exploring new areas

Flexible, because public spaces, buildings and heritage sites are all places to innovate, absorb shocks and react to the unpredictable in a dense city, thanks to reversible, modular, temporary solutions.

A. Anticipate risks and adapt infrastructure

B. Design infrastructure that creates multiple benefits

C. Promote resilient urbanism in a dense city

Pillar 3

A city in transition that mobilises collective intelligence, adapts its operations, and cooperates with its surrounding territories

Finally, it involves mobilising the collective intelligence of citizens, associations and businesses to effect change through innovation and collaborative work, organisational change and cooperation with neighbouring territories. This is necessary for the resilience effort to reflect what is at stake.

A. Mobilise collective intelligence and resources

B. Ensure the continuity of public services and the resilience of the administration

C. Cooperate with other territories to initiate transitions

1. Mobilise a citizen reserve network to support crisis management and daily resilience building efforts
2. Deploy wide-ranging, interactive first aid and risk management training.
3. Ensure psychological support for all City residents after a shock to strengthen social cohesion and preserve health
4. Strengthen support for parents and families and help the education community deal with trauma and daily stress
5. Increase daily solidarity measures by facilitating links between those who want to get involved and those who need help
6. Encourage neighbours, youth and adults to temporarily occupy public spaces
7. Support the creation of new community-focused local jobs
8. Support initiatives, implementation and co-funding of resilience solutions by individuals and local stakeholders
9. Standardise temporary and small-scale interventions to liven, re-invent and transform urban spaces with citizens
10. Transform schoolyards into cooling island “oases”
11. Anticipate risks, their potential impacts on infrastructure, their cost, and develop multi-partner mitigation solutions
12. Anticipate future energy consumption and site energy generation locally to achieve carbon neutrality by 2050
13. Improve knowledge of the underground to reduce risks related to building collapse and flooding, and enhance infrastructure
14. Initiate the transformation of the ring road (“Périphérique”) and the motorway network
15. Transform public spaces to increase social wellbeing and inclusion through integrated planning, innovation, and a better incorporation of nature
16. Transform street lighting to provide multiple urban services
17. Adapt public facilities to address priority challenges and ensure that they are flexible, modular and capable of accommodating multiple uses
18. Develop integrated green spaces to respond to climate and social challenges
19. Explore the city from its roots to its canopy and assess the potential for rooftop and basement development
20. Mainstream temporary urbanism
21. Develop the first resilient and climate-sensitive neighbourhood at Saint-Vincent-de-Paul
22. Design an exemplary resilient neighbourhood at Bercy-Charenton
23. Incorporate resilience solutions in urban planning through regulatory documents and specifications
24. Create an open-source, multi-target resource, research and training centre for resilience
25. Establish an observatory to understand how different risks impact public health and study socio-environmental vulnerabilities of the territory
26. Mobilise innovation and digital stakeholders to help develop a dynamic and participatory mapping of urban resilience challenges
27. Develop new finance mechanisms for resilience solutions in Paris: from sustainability bonds to resilience bonds
28. Shift municipal investments, concession treaties, public service delegations and public procurement towards resilience by using new indicators
29. Ensure continuity of municipal activity in the event of an emergency
30. Build resilience into municipal information systems and enhance security in the event of cyber attacks
31. Define and sign a territorial cooperation pact with peri-urban and rural municipalities, based on common interests and shared actions
32. Support the watershed’s climate change adaptation programme to preserve water resources and limit the scale of floods in partnership with rural municipalities
33. Adopt a sustainable food strategy for the territory
34. Carry out a multi-stakeholder study to examine the potential for creating coworking centres and facilitate job swapping at the metropolitan scale
35. Develop circular economy, local manufacturing and non-monetary trading



A strategy based on cross-cutting projects

The City of Paris is acting on multiple fronts to address its priority challenges. Many cross-cutting strategies and public policies have been developed to: mitigate and adapt to climate change; improve environmental quality and mobility; increase biodiversity; improve opportunities for citizens through engagement; strengthen social cohesion and solidarity between territories and generations; promote responsible production and consumption systems; and support the circular economy.

The resilience strategy builds on these actions, especially on the **climate adaptation strategy** voted in December 2015 which launched Paris' approach to urban resilience.

This resilience strategy aims to enhance the existing measures and policies, maximise their co-benefits and pool the resources that contribute to this **common agenda**.

The **fight against social exclusion** is the Great Cause of the 2014-2020 mayoral term. A pact was signed between representatives from 450 charities, businesses, the State, the City and vulnerable individuals. Three priorities were identified to support individuals; improve early warning of social exclusion; intervene more effectively with vulnerable individuals; and long term reinsertion in society.



Mairie de Paris

The **Smart and Sustainable Paris Strategy** aims to respond to three challenges: energy transition, sustainable mobility, and changing lifestyles. It sets three objectives to make Paris: an open city that focuses on people, a connected city with innovative digital tools, an ingenious city that transforms itself to tackle the challenges it faces.



Mairie de Paris



A pioneer with its 2007 **Climate Plan** and its **2015 Climate Change Adaptation Strategy**, today Paris aims to be an international leader on these topics. After hosting 1,000 world mayors at the Climat Summit for Local Leaders during COP21, Anne Hidalgo is now President of the C40 network, which brings together the world's major metropolitan areas in their efforts to mitigate and adapt to climate change.



Mairie de Paris

Hosting the **2024 Olympic and Paralympic Games in Paris** will accelerate urban development and mobilise stakeholders around an action plan to address global warming; to build new housing; to support employment, economic competitiveness, innovation and the circular economy; to strengthen support for the most vulnerable individuals; to take back public spaces; and to improve public services. The legacy of the Olympic and Paralympic Games from improving the Seine water quality to creating new urban links between Paris and Seine-Saint-Denis, will further reinforce the resilience of the territory.



Jean-Baptiste Gurliat/Mairie de Paris

A strategy based on cross-cutting projects





Pillar 1

An inclusive and cohesive city, which builds on the strength of its residents to become more resilient



Objectives

- A. Prepare young and old to cope with acute shocks and daily stresses..... p. 41
- B. Create conditions that encourage goodwill among neighbours and inclusive neighbourhoods..... p. 49
- C. Enable residents to co-create the city of tomorrow..... p. 55



An inclusive and cohesive city, which builds on the strength of its residents to become more resilient

Getting Prepared

Collective resilience rests first and foremost on each individual being prepared to face acute shocks and chronic stresses. This involves the mobilisation of voluntary citizen networks, the deployment of a wide-ranging and accessible training programmes, psychological assistance for citizens in case of emergency and support for parents. To this end, Paris will have the tools to inform, train and involve youth and adults in the construction of a more resilient city.

Engaging Neighbours

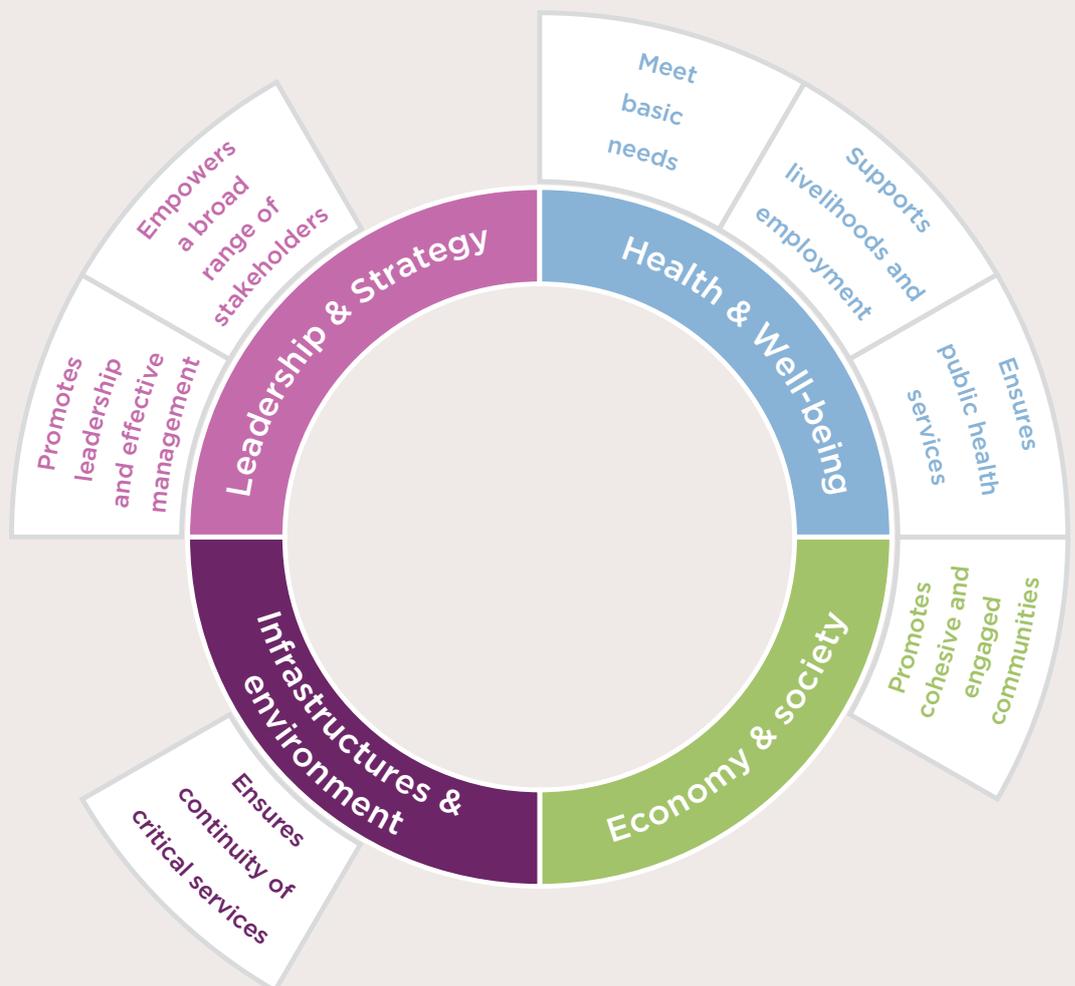
A city that is united and supportive is a more resilient city, where goodwill and conviviality further enhance individual and collective resilience. This requires maintaining and strengthening social cohesion by creating opportunities, places and projects, which support social links and connectivity. The goal is to protect one another because we “have become united by the risks that we impose on one another” (Bruno Latour).

Getting Involved

A resilient city is also a city that enables and promotes citizens’ initiatives. For institutions to acquire a culture of prevention, society must first adopt a culture of action. In this sense, it is essential to inform and invite citizens to co-construct and participate in the implementation of public policies. Tactical urbanism tools and new technologies can help catalyse citizen interventions.

Objective A. Prepare young and old to cope with acute shocks and daily stresses

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 1



Mobilise a citizen reserve network to support crisis management and daily resilience building efforts

Unlike many cities, traditional emergency management in Paris leaves little room for citizen involvement. Yet, during the attacks of November 2015, hundreds of people offered their services, and the exemplary behaviour of shopkeepers and neighbours adjacent to the sites of the attacks, before the arrival of the emergency services, demonstrates how valuable citizen assistance can be in the event of a disaster... as well as in daily life.

The City of Paris will create a network of citizens whose role is to coordinate with emergency actors on the ground in the event of a major crisis. They will also work to maintain an ongoing relationship to strengthen solidarity among citizens so they can understand, get involved in and take action to build resilience.

Trained in first aid and crisis management by Paris firefighters and civil security associations, this network will play a major role in prevention, crisis management and recovery, to amplify and support the efforts of public authorities. It will also be used in non-crisis situations to support associations and to take part in awareness-raising events, etc. The network will build on the City's existing citizen participation platforms such as the Paris citizen card and mobilise civic services and voluntary ambassadors at the neighbourhood level beginning in 2018. This network will be designed in partnership with organisations with rapid response resources or volunteering employees (RATP, AP-HP, etc.), in conjunction with the Paris solidary reserve and approved civil security associations. It will rely on local networks for neighbourhood and citizen participation and it may be mobilised at the metropolitan scale and beyond.

Implementation

First step(s)

Short-term – Design the programme and tools, Mobilise the carte-citoyenne, Citizen Workshop, Progressively Deploy the Network

Owner(s)

Office for Local Democracy / Relations with District Councils (DDCT)

Main partner(s)

Paris Fire Brigade (BSPP), Civil Security Associations, Neighbourhood networks

The Paris citizen card

The Paris citizen card was launched in 2016 after the Charlie Hebdo terror attack. The card allows residents to access a range of educational, civic and cultural services. It opens the door to the City Council and allows citizens to meet with elected officials. The existing 150,000 cardholders will now have access to training and be able to participate in building a more resilient city.



Mairie de Paris

Inspiration: New York, United States

Community Emergency Response Teams (CERT) are groups of dedicated volunteers who help to prepare their neighbours and communities for different types of disasters. It falls under the Community Outreach unit within New York City Emergency Management, and coordinates various stakeholders (firefighters, civil protection associations, etc.). Accommodation centres are planned to welcome nearly 120,000 citizens with reduced mobility and to transport them in the event of an emergency. New York also mobilises the volunteers to assist in organising civic events.



CERT/New York City



Jean-Baptiste Gurliat/Mairie de Paris



Action 2



Deploy wide-ranging, interactive first aid and risk management training

Risk culture is poorly developed in France compared to other countries, and often takes an “administrative” approach. Such an approach may generate anxiety in citizens even though information about potential risks and emergency behaviours is crucial for strengthening resilience.

The City of Paris plans to expand the “Paris Saves” initiative by: increasing the number of defibrillators in public spaces; expanding first aid and risk management training to include major climatic events, and furthering education on health and environmental risks. The objective is that by 2030, 90% of Parisians will be trained in first aid and risk management to enable them to save lives. Paris also plans to develop a training programme for adults

and children, which is focused on actions they can take in the event of a major disaster (self-protection kit). This will include citizen participation in exercises organised by risk prevention and crisis management services. The City will also support the development of simulation exercises such as “serious game”, run interactive and playful challenges to encourage behaviour change, and organise events for youth and adults. Finally, as part of the Participatory Budget for schools, extra-curricular programmes will be developed in partnership with the Ministry of Education, so that schools can become a prime space for the city in transition.



Sophie Robichon/Mairie de Paris

Paris qui sauve: Paris Saves

After the November 2015 attacks, thousands of Parisians asked to be trained in first aid so that they would know how to respond in the event of a crisis. It is estimated that if 20% of French citizens received basic emergency response skills, 10,000 lives could be saved each year. In response, the City of Paris has developed a programme known as “Paris qui Sauve” or “Paris Saves”. The City is working with its partners to create further initiatives for citizens, install defibrillators in public places and offer first aid training.



Mairie de Paris

Implementation

First step(s)

Short-term – Provide training targeting City Council members, apartment building concierges, municipal employees who are in contact with the public and / or present in public spaces; first aid training open to Paris Citizen cardholders; expand the “Paris qui sauve” programme (awareness on culture of risk); afternoon snack breaks focusing on issues of resilience, design of the participatory budgeting of schools and colleges “in transition”, development of an extracurricular module programme; communication campaigns on recreational challenges (car ban, waste sorting, vegetarian etc.).

Medium-term - Offer training exercises to citizens.

Owner(s)

Office for Local Democracy / Relations with District Councils (DDCT), Department of Health, Family and Social Services (DASES), Department of Security and Emergency Management (DPSP)

Main partner(s)

Paris Fire Brigade (BSPP), Civil Security Associations, Ministry of National Education, Public Territorial Institute of the Seine Basin (EPTB Seine Grands Lacs), Department of Risk Prevention (DGPR)

Inspiration: San Francisco, United States

The SF72 programme teaches citizens how to adopt risk prevention behaviours. The programme offers citizens to sign up for information guides to prepare survival kits and supports individuals who want to develop their own emergency “plans” to protect themselves and their loved ones.



SF72



Action 3



Ensure psychological support for all City residents after a shock to strengthen social cohesion and preserve health

Psychological resilience is a priority in cities where threats, terror ones in particular, are a significant risk to social cohesion, wellbeing and mental health. Existing support measures have been strengthened by both State and local authorities, but they only relate to victims, their relatives or individuals directly involved. These measures do not extend to the wider population, which is also deeply affected by these events and may be susceptible to post-traumatic stress.

This strategy proposes the deployment of a City-wide programme to provide long-term psychological support in the event of a major shock at the local level in partnership with the Medico-Psychological Emergency Unit and the Parisian Mobile Intervention Unit. This programme will specifically target City municipal employees who are in regular and frequent contact with the public. Training greatly reduces the risk of developing post-traumatic stress, helps build long-term resilience to shocks and allows those affected to help others. A specific module will be developed in the short-term to reassure the education community, in particular

with regards to terror threats. Through educational tools and videos, the module will help parents and school staff talk to children about terrorism.

Implementation

First step(s)

Short-term - Develop and implement the psychological support programme open to all and of the specific module for volunteering schools; plan for a specific communication campaign.

Owner(s)

Department of Health, Family and Social Services (DASES)

Main partner(s)

Local Associations



Richard Holding, 2015

Action 4



Strengthen support for parents and families and help the education community deal with trauma and daily stress

This action proposes to create more safe spaces and opportunities for dialogue between parents; between parents and children; and between parents, children and teachers; so that they have safe spaces to discuss challenges. This also involves supporting parents in reconciling their professional, domestic and personal lives (by developing new services dedicated to young children, taking action to change the work environment, etc.). Finally, the City will increase the number of anticipated and targeted parenting support measures, which will consist of listening and offering resources to parents, supporting them to become better parents. Specific attention will be paid during periods of domestic stress (behavioural disorders, risky behaviours, psychological disorders, substance abuse, absenteeism, academic failure, petty crime, parental separation, mourning of a child or parent, etc.).

Paris in action: The strategy “Making Paris the City of Children and Families”

aims to support every Parisian parent, from the birth of their child to the time when they gain independence, on a daily basis as well as in the case of severe difficulties (mourning, parental separation, trauma, etc.). In this context, the City has set up services, places of exchange between parents or between parents and children, as well as solidarity networks and sponsorship.

Implementation

First step(s)

Short-term – Experiment “primary prevention” and deploy child-care space; research actions to experiment innovative solutions devised by families and professionals on the ground; mobilise resources and psychological reinforcements in ten priority schools from the programme “all mobilised”.

Owner(s)

Department of Early Childhood and Family Services (DFPE), Department of School Affairs (DASCO)

Main partner(s)

Ministry of National Education

Inspiration: New York, United States

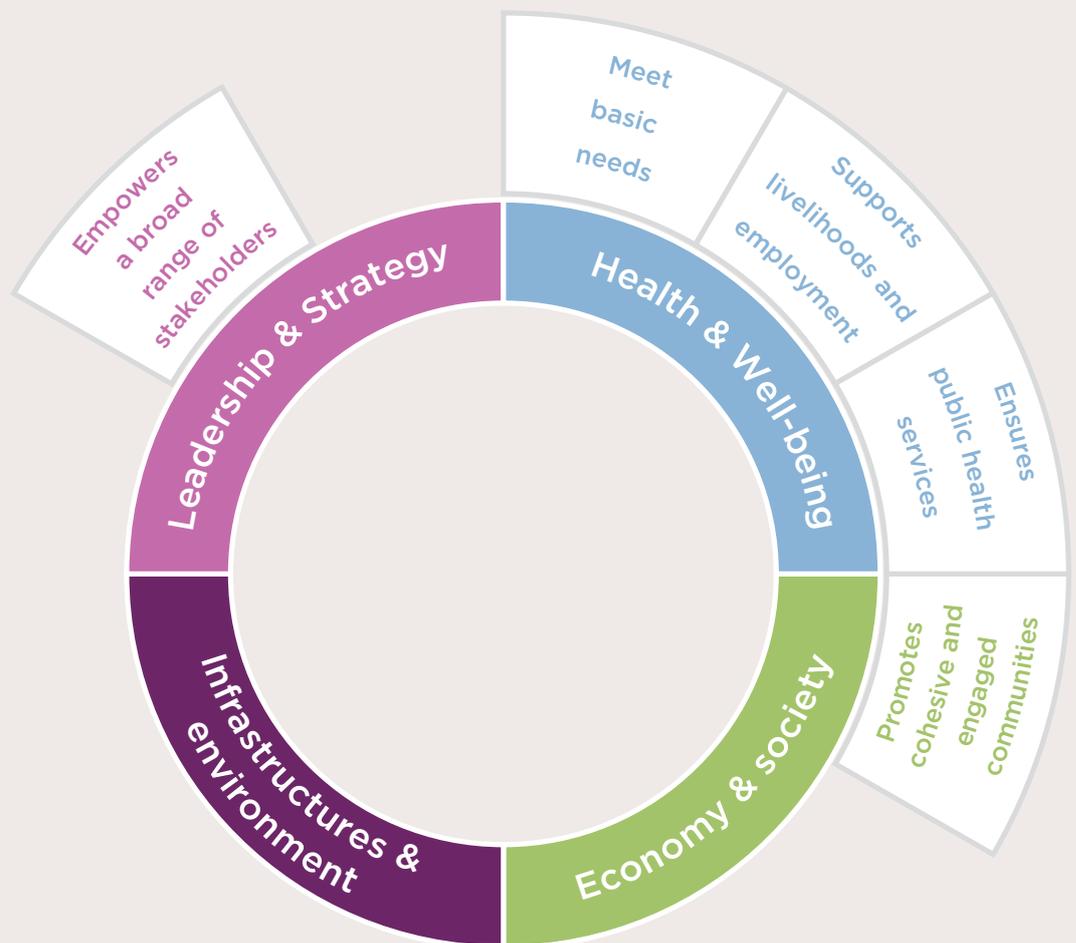
New York City's Community Schools recognise that the city must support all aspects of a child's life and family, both inside and outside of the classroom. The schools are responsive to the local needs of their communities and may include psychological support services or adjust their opening hours. These Community Schools aim to ensure equal opportunities for all children, support parents by giving them resources to actively participate in their child's education and strengthen the psychological resilience of the entire education community.





Objective B. Create conditions that encourage goodwill among neighbours and inclusive neighbourhoods

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 5



Increase daily solidarity measures by facilitating links between those who want to get involved and those who need help

By relying on community networks, businesses and leaders of social innovation, the City wants to create new local networks to connect supply (i.e. volunteers) with demand (for food, basic needs products, mutual aid services) on a simplified and daily basis.

The action will provide a platform connected to social and community practices, with an interactive mapping of geo-localised initiatives and tools (such as solidarity guide, services map, access to legal support, health services, etc.). This will be facilitated by local municipal services and the voluntary sector, as part of implementing Participatory Budget-funded projects. Several entities will lead, including citizens whose project proposals were approved, working groups on food aid and web developers. This will foster improved and real-time links between technology tools, events and association input (focusing on street furniture, public pantries, lockers, refrigerators, associations' premises, modular and

mobile spaces) with businesses active in their local economy.

Implementation

First step(s)

Short-term - Organise working groups with citizens and associations; web design and launch of the platform.

Owner(s)

Department of Health, Family and Social Services (DASES), Department for the Ageing and Social Welfare (CASVP)

Main partner(s)

Charities



Emilie Chaix/Mairie de Paris





Action 6



Encourage neighbours, youth and adults to temporarily occupy public spaces

Streets, parks and squares are meeting places where several citizen initiatives are already developing (neighbourhood block parties, etc.). Nevertheless, in daily life and in a very dense city, there are few spaces available to encourage these neighbourhood interactions. However, many public facilities could meet this demand for space outside of their opening hours, and these newly created public spaces could accommodate more community meetings and events, further promoting social connection and cohesion.

The strategy proposes that each arrondissement (district) develops existing mechanisms (such as mobile libraries, citizen kiosks); specific actions (such as organising a car free day, the Paris Breathes scheme); and facilitates local citizen initiatives by developing and improving platforms for booking public spaces. This will require cleaning, security and other responsibilities to be adapted according to the type of events. Training will be proposed to community groups. In addition, schools are regarded as the most widespread public asset across the City. Therefore, volunteering schools will serve as pilots by opening during off-peak hours, entrusting their management (access, security, cleaning, etc.) to parents or neighbourhood groups, or to members of

the citizen reserve network (see Action 1). Depending on its success, this initiative may be extended to other schools and facilities (sport fields, libraries, etc.).

Implementation

First step(s)

Short-Term - Establish a committee for programming public space events and define events typology; record and map public spaces and create a sharing platform; develop games in public spaces through the deployment of mobile libraries and pilot citizen participation in the use and management of these structures.

Owner(s)

Department of Road Works and Sustainable Mobility (DVD), Office for Local Democracy / Relations with District Councils (DDCT), Department of Communication (DICOM).

Main partner(s)

Police Department

Inspiration: Wellington, New Zealand

The #wellynextdoor programme aims to strengthen the social fabric within neighbourhoods by encouraging neighbours to meet. Coordinated by local associations, it plans to map and ultimately increase community spaces in the city. The programme also organises neighbourhood parties and teaches citizens about risks.



Action 7



Support the creation of new community-focused local jobs

The City of Paris intends to build on community interactions to foster social inclusion and to create new activities. The aim is to set up a neighbourhood manager position, as a relay for benevolent actions and a lead for social and climate resilience objectives at the local level.

The City will support two programmes, which will be evaluated to develop best practice models:

1. The creation of an eco-administrator position, shared between a tertiary building, a social landlord, an apartment co-ownership building and its facilities, whose role will be to communicate with technical service providers, to support stakeholders in achieving energy consumption targets, and to aggregate environmental and energy objectives.
2. The Paris Housing (“Paris Habitat”) study on the evolution of the concierge profession. A pilot project with the Paris Fire Brigade is proposed to involve concierges in risk prevention and the dissemination of risk education (first aid training, defibrillator use, the assistance to vulnerable individuals in case of a major event, etc.). The concierges will also coordinate local gatherings and community-led actions.

Implementation

First step(s)

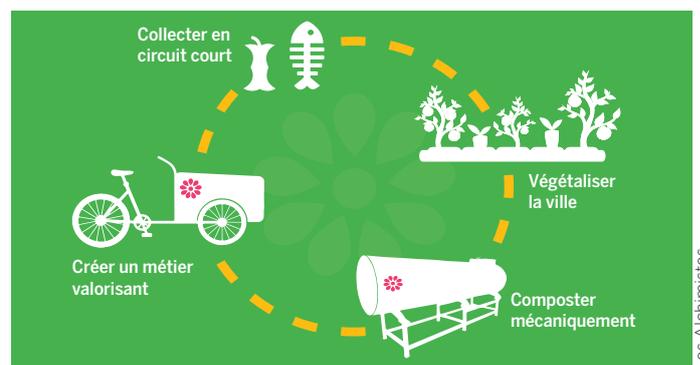
Short-term - Accompany the creation of eco-administrator positions; organise first workshop with the Paris Habitat concierges.

Owner(s)

Department of Environmental Protection and Public Gardens (DEVE), Department of Housing (DLH)

Main partner(s)

Paris Climate Agency (APC), ICADE, Paris Habitat



Les Alchimistes

Services éco-mobilité

Services numériques

Service de production locale

Services (Espaces) communs

Services liés à l'économie circulaire

Certifications, labellisations

Services biodiversité

Services d'intervention d'urgence

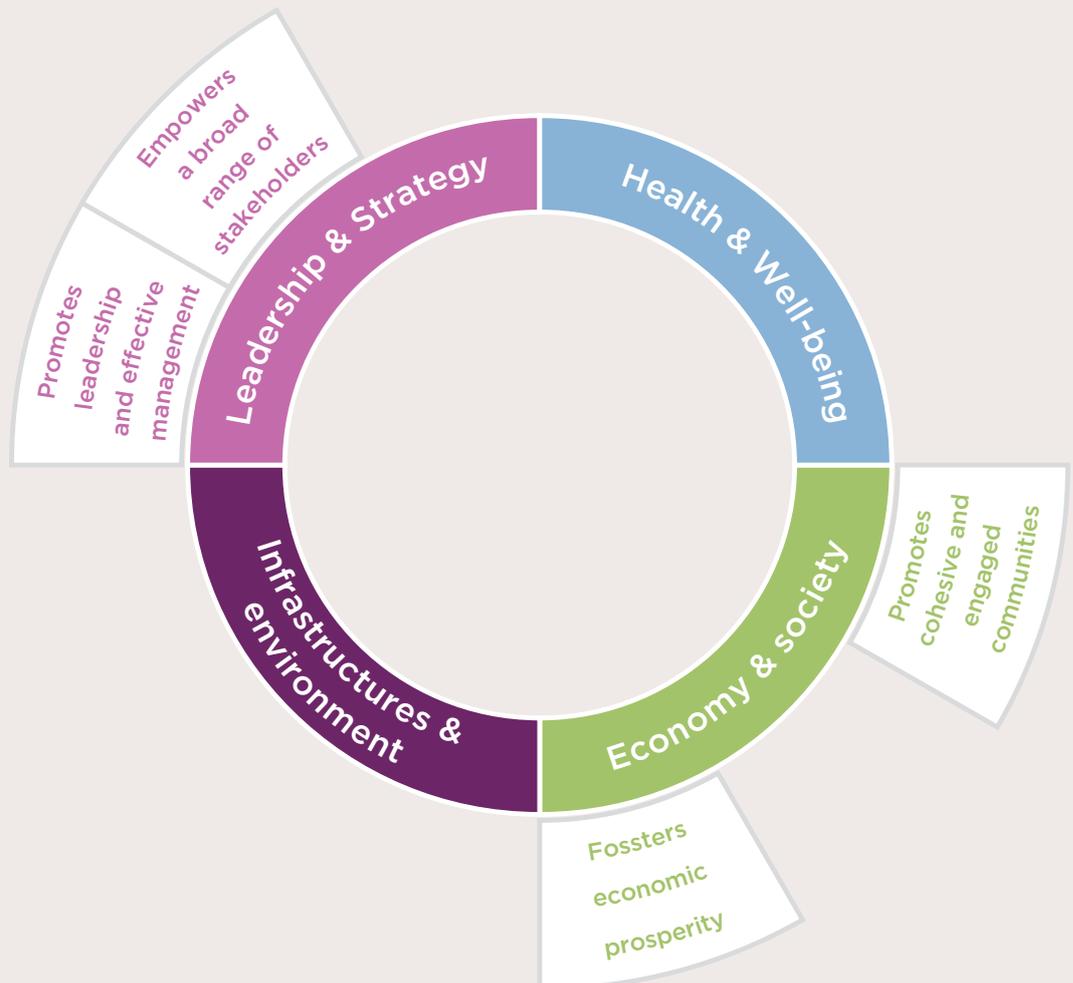
L'ECO GESTIONNAIRE

Coordonnateur de proximité de services mutualisés, collaboratifs, pour l'immobilier



Objective C. Enable citizens to co-create the city of tomorrow

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 8



Support initiatives, implementation and co-funding of resilience solutions by individuals and local stakeholders

The greening permit, established by the City of Paris, has generated a lot of enthusiasm among Parisians. It allows volunteers to independently manage green public spaces. This initiative, which aims to involve citizens directly in the implementation of solutions, is a driving force for participation, civic duty and resilience at the local scale.

The City of Paris will set up tools to facilitate, support and co-finance the participation of citizens and private actors in the implementation of resilience solutions, related to climate and social issues. Steered by the City of Paris and its partners, private individuals and companies owning or managing various spaces (walls, roofs, balconies, inner courtyards, buildings' ground floors, parking places etc.) will benefit from tools (urban heat island mapping, rainfall zoning, etc.) and be supported (technical assistance, funding finance) to install these solutions (increase of green spaces, rainwater harvesting, pantries, compost bins, rain barrels, etc.).

The new "Végétalisons Paris" platform, the greening permit, the Participatory Budget, the bartering or non-monetary exchange platforms (time vouchers, eco-rewards, etc.), crowdfunding and crowd lending will be mobilised to develop a flexible and collaborative system relying on existing tools.

The City will also explore incentives to encourage citizens' contributions to urban resilience.

Implementation

First step(s)

Short-term - Integrate private individuals' involvement in the future Rain Plan; set up a strategy to encourage crowdfunding; design guides to install solutions

Short-term - Design guides / manuals and integrate new features / solutions.

Medium term - The City provides tools / equipment such as rain barrels, bins, etc.

Owner(s)

Office for Local Democracy / Relations with District Councils (DDCT), Department of Environmental Protection and Public Gardens (DEVE)

Main partner(s)

Paris Climate Agency (APC), Housing Associations (social landlords)

Inspiration: Norfolk, United States

"Retain your rain" is a project implemented in Norfolk, Virginia through which the city supports citizens willing to contribute to the Rain Plan by providing rain barrels, greening kits... and organising neighbourhood workshops.



Norfolk Resilient City/ TOORC





Action 9



Standardise temporary and small-scale interventions to liven, re-invent and transform urban spaces with citizens

Tactical urban planning refers to a city and / or a citizen-led approach to neighbourhood building using short-term, low-cost, and scalable interventions to catalyse long-term change. It involves the activation of urban spaces in the short-term, while planning urban transformation projects over the long-term. This is in the context of a dense city where open spaces are lacking and where the management of public spaces is a challenge for quality of life and social cohesion.

The City of Paris will evaluate the impact and the model of the participative workshops led with and by citizens of the city's squares including: Vanves gate square, the Little Railway Belt, and seven of the city's square/roundabout sites. Following these initial pilots, the City will design an urban development programme through small-scale interventions, based on the wishes expressed by the citizens and on a catalogue of solutions for the City's operational departments and local arrondissement (district) administrations. This will include "tactical" tools (events, temporary occupation, temporary street furniture), identifying potential barriers, constraints

as well as opportunities. The City plans to mobilise these resources to transform the gates of Paris and, in time, major infrastructure such as the ring road ("Périphérique"). Citizens from neighbouring towns will be invited to participate where appropriate.

Implementation

First step(s)

Short-term - Develop a catalogue of "tactical" urban planning solutions; hold participatory workshops for the Petite Ceinture and Seven Squares, and assess.

Medium-term - Liven up and promote the Bruneseau site through urban experimentation; event on the ringroad ("Péripherique")

Owner(s)

Department of Road Works and Sustainable Mobility (DVD)

Main partner(s)

Street Plans Collaborative

Inspiration: Thessaloniki, Greece

The city of Thessaloniki is developing a programme for the co-creation of public spaces. The objective is to strengthen social cohesion and the capacity of citizens to organise themselves at the neighbourhood level, including partners (retailers, associations, etc.). Thessaloniki is mobilising a catalogue of tools and legal and financial mechanisms to redesign the city's public spaces.

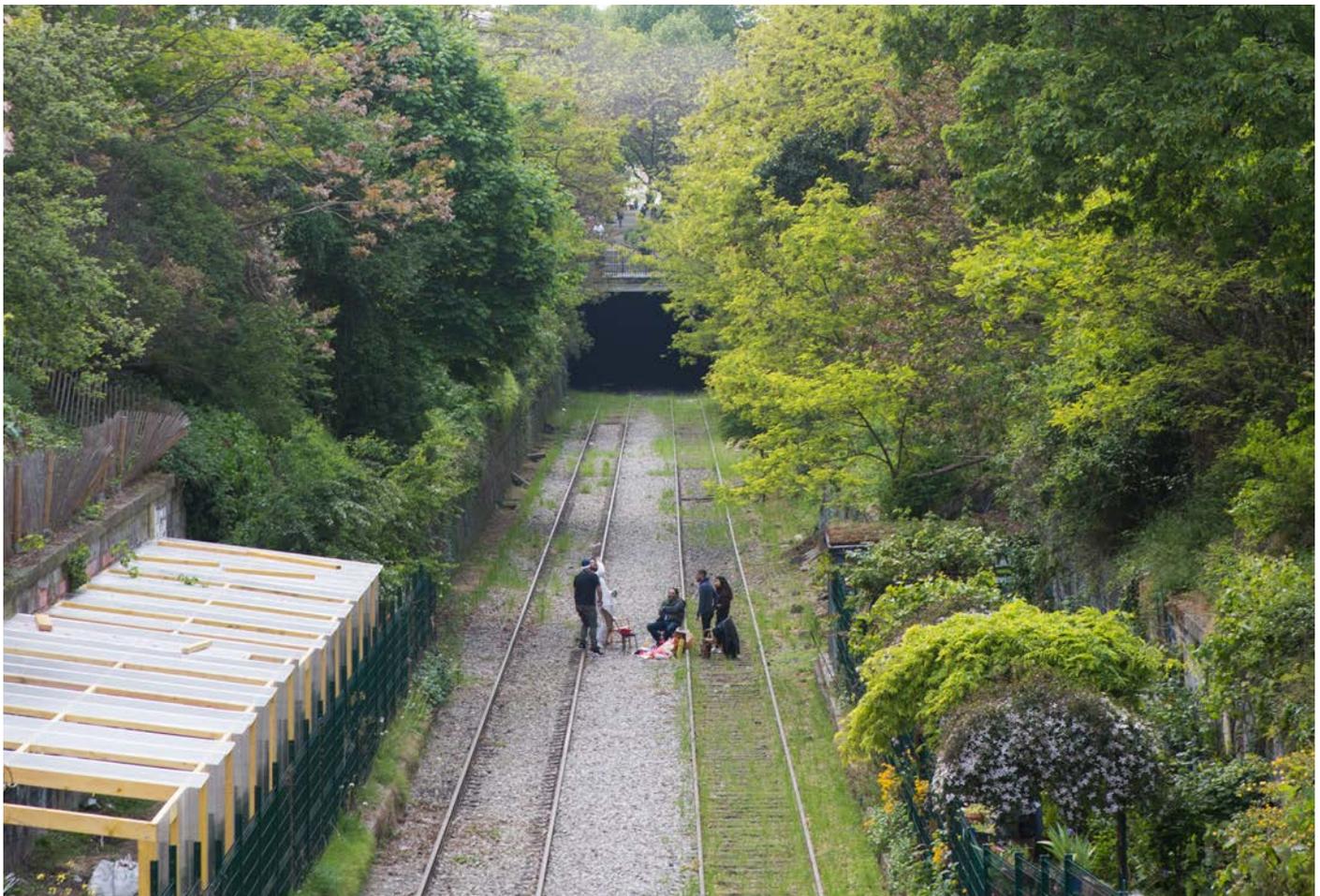


Paris in action: “Reinventing our squares”

The project to redesign seven Parisian squares (Bastille, Fêtes, Gambetta, Italie, Madeleine, Nation and Panthéon) seeks to create peaceful, welcoming and user-friendly spaces for all. Designers, constructors, thinkers, landscapers are brought together in multidisciplinary groups and work with citizens to define and build spaces, to “shape the city” together.



Mairie de Paris



Jean-Baptiste Gurliat/Mairie de Paris

Focus

Adapting the urban project to the challenge of migration

The **Resilience Strategy** takes into account the migratory phenomenon in a cross-cutting way: conviviality at the local level, the simplification of goodwill everyday gestures, support for local professions (pillar I), temporary urban planning – especially for emergency shelter (pillar II), the promotion of barter and non-monetary exchange tools (pillar III), etc.



PARIS

International Rescue Committee in Paris

In spring 2017, the International Rescue Committee, a 100RC Platform Partner, conducted a study on Paris' current responses to migration issues, with a wide range of stakeholders. Two main medium- and long-term challenges were identified: promoting social inclusion at the neighbourhood level through the involvement of local stakeholders (businesses, entrepreneurs, neighbours), and public services at the micro-local level to propose integration measures (welcoming migrants, employment, housing, citizenship). Building people's autonomy by ensuring safety, health and wellbeing, education, workforce integration, to allow everyone to choose their life paths in the city.



100 resilient and welcoming cities

The migration phenomenon is a long-term challenge. Climate change, according to the United Nations, could cause the displacement of 250 million people by 2050. Cities will have to be prepared to accommodate more migrants and face additional pressure on resources, and increased need for housing, infrastructure and services. The social and professional integration and the adaptation of urban projects to the migration challenges are therefore resilience issues. The City of Paris has worked with seven other member cities from the 100RC network in Athens to define common principles and develop solutions.



The mobilisation of the City of Paris for the arrival of refugees

Since 2015, Paris has been experiencing mass influx of people fleeing geo-political conflicts and climatic events. The City set two reception centres to respond to this emergency. The first one, located at Porte de la Chapelle, sheltered more than 15,000 people. A plan to mobilise the Paris community was adopted in 2015 and established several principles: equal rights and treatment of all people on the streets, Paris' mobilisation is that of the Parisians, and emergency response is interlinked with planning for the future.





Pillar 2

**A city built and developed
to meet the challenges of
the 21st century**



Objectives

A. Anticipate risks and adapt infrastructure..... p. 65

B. Design infrastructure that creates multiple benefits..... p. 73

C. Promote resilient urbanism in a dense city..... p. 83



A city built and developed to meet the challenges of the 21st century

The City of Paris is leading numerous programmes aimed at adapting the city to its resilience challenges. Key areas of municipal action include: responding to climate and social challenges, promoting nature-based solutions and biodiversity, and integrating new water uses. The Resilience Strategy addresses these challenges in a systematic and integrated manner.

Adapt. If citizens are the cornerstone of urban resilience, it is also essential to adapt infrastructure and urban networks to the risks that threaten them. Paris faces significant climate change and environmental risks (future increase in the number, frequency and intensity of heatwaves, major floods, intense rainfall events, frequent pollution peaks, etc.) and must therefore adapt. Protecting the most vulnerable groups from these threats and adapting the City's infrastructure to their specific needs are equally important objectives.

Multiply benefits. The City manages public spaces and facilities, urban networks and services, and ensures that they meet the City's needs. In the long run, a resilient approach calls for thinking in an integrated manner and assessing, at each stage, the multiple benefits which could be delivered by infrastructure beyond its primary function. Multifunctional, modular, flexible, redundant—these are some of the key principles which must be embedded in infrastructure planning to accelerate this transition and guarantee inclusivity.

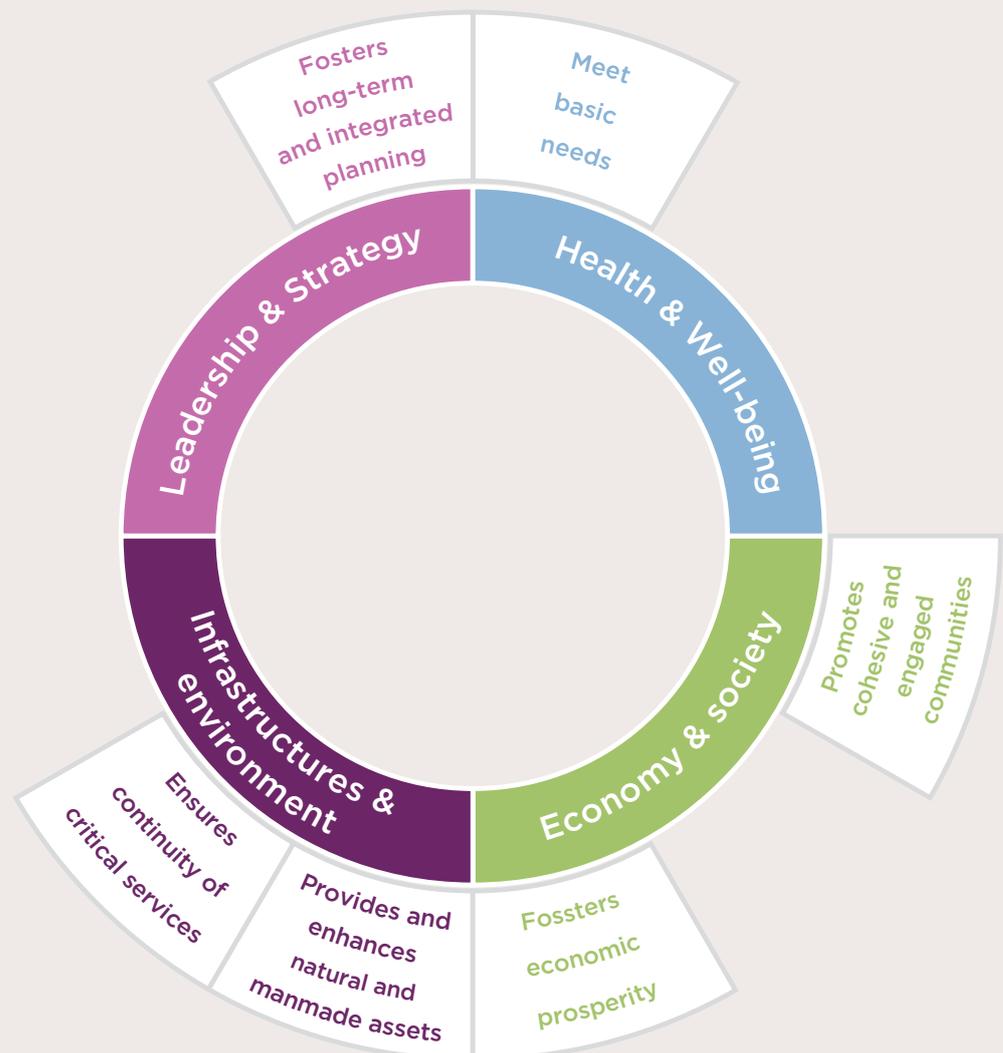
Explore. Paris is a dense city. In this context, urban planning offers immense opportunities for innovation and action aimed at exploring the City's resources, including its underground, roofs and vacant spaces for renewing the design and construction processes. Therefore, it is fitting, in the early years of this century, to adapt choices and practices to implement a temporary urbanism, to build adapted neighbourhoods and to make resilience an accelerator for urban innovation.

The Climate Change Adaptation Strategy, adopted at the end of 2015, is Paris' first resilience strategy. It comprises four pillars: protecting Parisians from extreme climate events; guaranteeing access to water, food and energy; living with climate change: sustainable urbanism; and supporting new ways of life and strengthening solidarity. The Resilience Strategy presented here aims to accelerate the Plan's implementation.



Objective A. Anticipate risks and adapt infrastructure

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 10



Transform schoolyards into cooling island “oases”

Since adopting its Climate Change Adaptation Strategy, Paris has launched several initiatives aimed at adapting urban spaces to high temperatures. It is creating more islands and cooling paths, new green and natural open spaces for protecting biodiversity as well as developing a cooling network.

Paris schoolyards, which represent a total of more than 600,000m² (800,000m² if the middle schools (“collèges”) are included) are covered with impermeable asphalt and closed to the general public even outside school hours. However, with very few Parisians living more than 200m away from a schoolyard and given that they are easily identifiable by all, schoolyards could be transformed into a true « oasis » for cooling and wellbeing.

In June 2017, the City activated its Emergency Heatwave Plan. It was the first time such a drastic event had occurred so early in the year and during the school term. A critical short-term action would be to respond to such emergency by installing various equipment (such as curtains, mist sprays, shading) to cool schoolyards and to finalise a school-specific Heatwave Plan, similar to the one in place for the elderly, alongside the opening of public cooling rooms. These would be operational at the start of the 2018 school year and propose alternative solutions in the event of heatwaves (adapting personal activities, moving to cool places, etc.). In the medium- to long-term, a cooling programme for all schools will be implemented. It will aim to gradually

replace asphalt walkways with trees and vegetation (lawns, orchards, vegetable gardens), and / or test new materials (stabilised materials, recycled wood, kinetic tiles, evapotranspiration and permeable coating, etc.) and new methods to cool schoolyards and / or dormitories (district energy, earth tubes, solar absorption cooling, etc.). The schoolyards will become places for learning (educational gardens), for improved wellbeing, etc. These processes will be defined and piloted before being replicated across the City.

Implementation

First steps(s)

Short-term - Select pilot site(s) for removing asphalt / cooling; assess the potential opportunity and implement the projects co-construction tools with the education community; deliver the first cooled schoolyard for the new 2018 school year.

Medium-term - Assess results and roll out the programme to other schools.

Owner(s)

Department of School Affairs (DASCO)

Main partner(s)

Ministry of Education

Inspiration: Milan, Italy

Schoolyards, which have been designed as gardens since the 20th century, act as cooling islands for the city and are currently being managed by the municipality's Department of Environmental Protection and Public Gardens.

In 2011, the municipality created the programme, "Educational Gardens", an environmental education project for the entire education community, managed collectively, involving children, but also students and seniors.



Marc Verhille/Mairie de Paris



Sophie Robichon/Mairie de Paris



Action 11



Anticipate risks, their potential impacts on infrastructure, their cost, and develop multi-partner mitigation solutions

In the wake of a major shock, cities are increasingly pressured to rapidly return to normal and restore infrastructure. This push to build back quickly has resulted in many cities recreating the same pre-disaster vulnerabilities. Resilience thinking does not solely aim to reinstate what was destroyed but it looks at how disasters can turn into an opportunity to reconstruct more robust infrastructure capable of withstanding similar shocks in the future.

It is proposed to carry out an audit of a representative part of the City’s assets (critical networks, cultural properties, etc.) and assess vulnerabilities to various climatic hazards, including: surveying lightning rods installed on buildings; identifying weaknesses of underground networks to flooding and high rainfall; renewing temperature sensitive components of the City’s telecommunications networks and electricity grid. In addition, insurance data will be used to identify building components (tiles, balconies, pipes, conduits, glass, limestone, stained glass, etc.) and elements (shops, pavements, roofs) that are most vulnerable to specific hazards (storms, air pollution, global warming, major flood of the Seine, etc.). The City will explore new solutions to monitor the health of buildings and infrastructure using tools such as drones or sensors. Knowing these vulnerabilities will make it possible to better anticipate reconstruction activities, adapt regulations (see Action 23) and mobilise adequate funding (see Actions 27 and 28). A “Build Back Better” approach will be adopted, particularly for anticipating the reconstruction of major infrastructure which could be impacted by a major flood of the Seine (identification of the most critical infrastructure with cascading effects, conducting early studies for their reconstruction).

Implementation

First step(s)

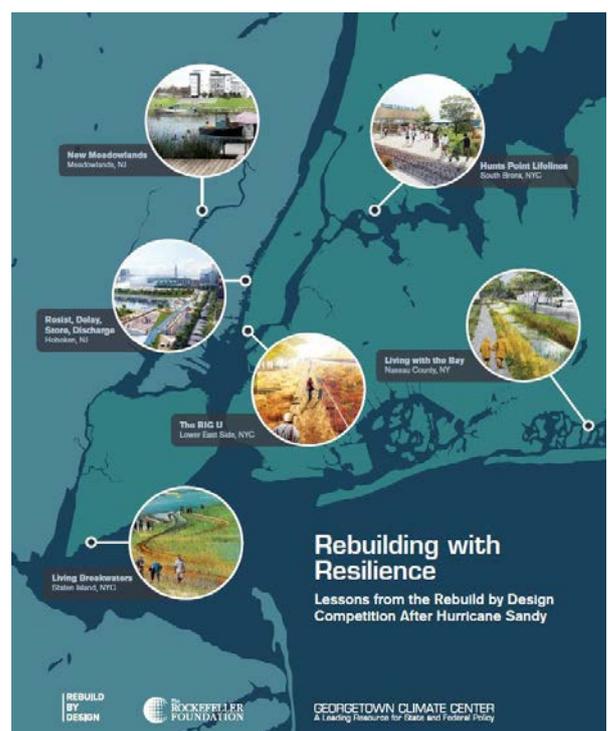
Short-term – Multi-stakeholder working groups (MRN); identify the most critical infrastructure and carrying out studies for their reconstruction

Owner(s)

Department of Security and Emergency Management (DPSP)

Main Partner(s)

Natural Risks Bureau (MRN), Construction Quality Agency (AQC), French Association for Natural Disaster Prevention (AFPCN)



Inspiration New Orleans, United States

Hurricane Katrina spurred great awareness globally on the need to strengthen the resilience of both people and infrastructure. It revealed that community preparedness, emergency assistance to the most vulnerable groups, as well as planning and zoning choices in relation to the risks identified are fundamental. This is particularly important as such events are likely to re-occur, as evidenced by Hurricane Harvey which struck Louisiana in August 2017, 12 years after Katrina.



AECOM

In March 2017, the Chief Resilience Officer gathered 80 partners to discuss how to best rebuild after a major flood.



Action 12



Anticipate future energy consumption and site energy generation locally to achieve carbon neutrality by 2050

The existing energy infrastructure was designed to be supplied by large centralised generators - 95% of the energy consumed in Paris is not produced in the city. Moreover, a large share of electrical energy is lost in transportation. Today, energy generation in the City is increasingly turning to renewable and recoverable energy sources, distributed on a smaller scale, similar to the first smart-grid project developed in the neighbourhood of Clichy-Batignolles. This project explores a new form of local governance for energy and a principle of energy co-responsibility for all stakeholders. Similar initiatives are being replicated across Paris, such as the introduction of biomass in the City's district heat network and energy recovery from sewers and data centres, which all contribute to the objectives of the Paris Climate Air and Energy Plan. Although the priority objective of the Climate Plan is to halve energy consumption, it must be noted that new energy intensive uses such as electric mobility risk increasing the overall energy consumption significantly.

In this context, it is necessary to anticipate the evolution of consumption patterns and behaviours to define energy mix scenarios for the decades to come, to explore solutions (re-balancing energy loads, self-sufficiency, cooperatives, etc.), to site renewable energy generation locally to the multiple local resources (solar, biomass, district heating / cooling, hydraulic, recovered energy, etc.) as much as possible, to improve the resilience of energy infrastructure and to promote synergies between networks. The City will incentivise and support citizen projects to reappropriate and relocate energy generation.

Implementation

First step(s)

Short-term - Workshop with energy operators and distributors; implementation the new Climate Air Energy Plan

Medium-term - Implement the City's first local district energy system at Saint-Vincent-de-Paul

Owner(s)

Office of Energy and Climate

Main partner(s)

Energy operators and distributors



Sophie Robichon/Mairie de Paris

Action 13



Improve knowledge of the underground to reduce risks related to building collapse and flooding, and enhance infrastructure

Changes in groundwater levels are poorly understood and difficult to anticipate, limiting the City's ability to predict the occurrence and potential impacts of a major flood.

It is necessary to map and further explore Paris' underground to gain a better understanding of its make up and vulnerabilities (collapse risk, sinkholes, rising groundwater, sewers). Digital tools (3D mapping, etc.) will be critical for this analysis.

The City of Paris launched a project at the end of 2017 to map the entire Paris sewer system (2,500 km), with the objectives of securing and improving knowledge. It will also be necessary to strengthen the underground piezometer (devices used to monitor groundwater level) network; to organise data sharing between stakeholders (City of Paris, ENEDIS, RATP, etc.); to create a map that simulates the rise of the Seine and its impacts on groundwater levels; and to anticipate ground movements, which will be accelerated by periods of drought and other climatic changes. Outcomes from these activities will inform the creation of an insurance fund and a resilience bond (see Action 27).

Implementation

First step(s)

Short-term - Recruit a Ph.D. student to start in Autumn 2017 to conduct the study; 3D mapping of underground, including sewers; develop and acquire new measurement tools

Owner(s)

Department of Road Works and Sustainable Mobility - General Institute of Quarries (DVD-IGC)

Main partner(s)

Public Territorial Institute of the Seine Basin (EPTB) Rental Management Company (SGL), Centre for Risks, Environment, Mobility and Urban Planning Studies (CEREMA), Paris City School of Engineering (EIVP)



Emilie Chaix/Mairie de Paris



Objective B. Design infrastructure that maximise multiple benefits

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 14



Initiate the transformation of the ring road (“Périphérique”) and the motorway network

The City proposes to undertake the transformation of the ring road (“Périphérique”) and the motorways leading to it. Establishing the appropriate territorial governance for this transition is thus a priority. The Metropolitan Forum of Greater Paris (FMGP), a forum dedicated to mobility and the evolution of the motorway network is pursuing this objective. By bringing together the various local governments of the Paris region, the FMGP will distribute mobility projects and priorities between all public, private and non-profit stakeholders within Paris, the Paris region and the Greater Paris Metropolis up to 2030 (development of active mobility, walking and cycling, traffic plan, intermodality and integration of Greater Paris Express stations, shared vehicles, autonomous transport, etc.).

A white paper will be prepared, serving as a guideline for a potential multidisciplinary international competition (architects, landscapers, mobility experts, demographers) on the future of the entire ring road (“Périphérique”) and its connections up to the A86 as well as their integration in the metropolitan area. This project of long term transformation will be based on the contribution of citizens (see Action 9) from all municipalities concerned through a participatory process.

Implementation

First step(s)

Short-term - Working groups of the Metropolitan Forum and white paper on mobility; urban planning studies.

Medium-term - International competition; citizens event on the ring road (“Périphérique”) and launch of the consultation process; first stage of transformation ahead of the Olympic and Paralympic Games

Owner(s)

General Secretariat (SG)

Main partner(s)

Metropolitan Forum of Greater Paris (FMGP), Greater Paris Metropolis (MGP)

Inspiration: Seoul, South Korea

Cheonggyecheon is an urban walkway of nearly 6km in the centre of the city. This is the name of a river that was covered in the 1960s by an elevated expressway. In 2005, the city of Seoul initiated the demolition of the road infrastructure to unveil the stream that years of neglect had almost dried up. Cheonggyecheon is today a public space for relaxation and leisure enjoyed by citizens and tourists.



Brian Kusler, 2011



Marc Verhille/Mairie de Paris



Action 15



Transform public spaces to increase social wellbeing and inclusion through integrated planning, innovation, and a better incorporation of nature

Whilst infrastructure planning and design for multiple purposes, also known as integrated planning, is poorly developed in France, it can help achieve significant cost, time and space efficiencies.

The City will develop a resilient road guide covering the following themes:

- Paving materials adapted to the various risks (quiet pavement, cooling pavements to reduce urban heat island, reversible cycle paths, kinetic slabs, draining structures, rainwater underground storage, grassed pavers, anti-ramming planters, etc.); surface typologies (ground cover, grass strips, delivery areas);
- Connecting the underground (recovery of heat and cold);
- Flexible street furniture;
- Accessibility for all and the potential for cultural activities (small parks, amphitheatres), sport (sports routes), soft mobility (100% cycling city by 2050, 75% of roads dedicated to active mobility);
- And integrating reused materials for construction (cobblestones) and citizen participation (neighbourhood watch reporting, Participatory Budget).

This integrated framework of municipal policies will be conceived as a guide to adapt existing regulations (see Action 23). It will also allow the integration of

innovative technological solutions (e.g. sensors, nudges and innovative signage) in the design and development of public spaces. This approach will not constitute an additional cost for road improvement operations as it aims to anticipate how to maximise profits and solve multiple issues at once. At the end of this process, one or more “resilient streets” located within the priority districts of the City’s Rain Plan will be developed to limit or avoid wastewater discharge into the Seine. The long-term objective is to scale the investment to the entire road network and enable the City’s public spaces to become a foundation for resilience building.

Implementation

First step(s)

Short-term - Test evapotranspirant and quiet paving materials; define the scope of the resilient road guide and integrate criteria in public procurement; implement the Rain Plan and the new Biodiversity Plan

Medium-term - Build “multi-benefits” streets (i.e. streets that have limited vehicle access and are green, inviting, biodiverse, energy positive, etc.)

Owner(s)

Department of Road Works and Sustainable Mobility (DVD)

Inspiration: Rotterdam

Faced with the risk of flooding, the municipality of Rotterdam decided to create water retention basins that are truly public spaces integrated into their surrounding neighbourhoods. A result of community-led development, the water basins were designed to store runoff water in case of heavy rains. The rest of the time, they are used as recreational spaces, where citizens can sit, play and host cultural events in strategic places around the city. The design also incorporates playful elements, with a color scheme indicating the function of the square: the flood zones are painted in different shades of blue depending on the severity of the flood, and all the water channels are clearly identifiable.



Palleesh=Azarifane



Jean-Pierre Vigier/ Mairie de Paris



Action 16



Transform street lighting to provide multiple urban services

Paris, also known as the City of Light, has more than 200,000 street lights. Although the existing lighting infrastructure was designed for a single purpose, it could be used to deliver a range of new services and benefits, in an efficient and cost-effective way. The current energy performance contract for streetlight aims to reduce energy consumption by 30% by 2020, and the City will continue its efforts beyond this date, as part of the future Paris Climate, Air and, Energy, Plan. Prior to the renewal of the current contract in 2021, the City will initiate a process to identify the potential for using streetlights to deploy multiple benefits and services. An integrated approach will be followed so that a diverse range of benefits are considered - lighting, climate change mitigation, but also solutions for tackling other priority challenges. Various urban services can be imagined and tested. These include: adaptive grid risk management, shading, misting / cooling systems, access to electricity, wifi, environmental sensors, cameras for traffic counting, electric vehicle charging, geolocation of parking spaces, dissemination of daily information or communication in the event of a crisis, and services for the homeless, etc.

Implementation

First step(s)

Short-term - Establish working groups on the evolution of street furniture; test smart street lamp posts; call for proposals from Urban Lab Paris & Co

Medium-term - Achieve 60% energy savings on public lighting while maximising services provided by street lamp posts in the context of a new energy-efficient market

Owner(s)

Department of Road Works and Sustainable Mobility (DVD)

Main partner(s)

Energy distributors



Anne Thomes/ Mairie de Paris

Action 17



Adapt public facilities to address priority challenges and ensure that they are flexible, modular and capable of accommodating multiple uses

In a dense city facing challenges imposed by climate and social changes, it is necessary to better allocate occupied spaces and to make constructive choices which take into account these changing requirements.

The aim is to integrate multi-use criteria and redundancy in the specifications for the design or renovation of all public facilities. This requires taking into account, early on in the process, the needs and constraints of users, standards and specificities for each activity, and management methods. In addition to being redundant, public facilities must be designed in line with the City's climate change and circular economy objectives.

The principle of urban resilience will be applied in the design of the first two buildings: the "multipurpose facility" in the future Saint-Vincent-de-Paul ecological neighbourhood, which will house a school, a day care (crèche), spaces for activities in the schoolyard and a gymnasium in the basement. The ZAC Bédier Porte d'Ivry development, beyond its primary functions, will include uses open to the neighbourhood.

The assessment of these design and management principles will enable the development of a methodology to integrate these criteria in the planning and design of future facilities or their renovations.

Implementation

First step(s)

Short-term - Design of the education and sports hub at Saint-Vincent-de-Paul

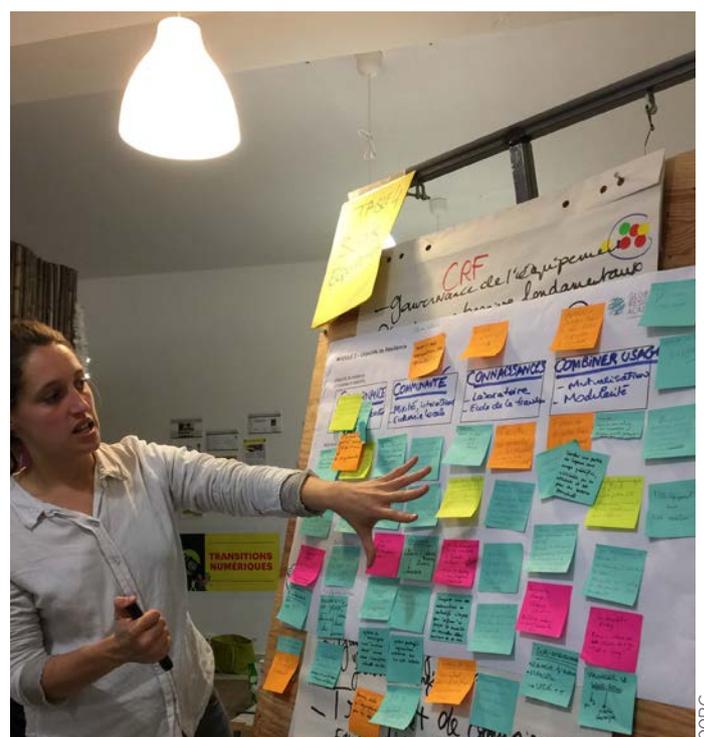
Medium-term - Integrate this approach in the development of specifications

Owner(s)

Department of Heritage and Architecture (DPA)

Main partner(s)

Paris City School of Engineering (EIVP), Developers





Action 18



Develop integrated green spaces to respond to climate and social challenges

It is proposed to design two resilient parks. In addition to being energy-sufficient, the parks will integrate territorial challenges (rainwater zoning, urban heat island, biodiversity, inclusion). Different solutions can be tested, including: ecological restoration of polluted soils; involvement of local citizens (especially socially excluded individuals) in the design and implementation of the project; production of kinetic energy from playground activity; “automatic and intelligent re-use” of all rainwater captured across the park; taking into account the capacity of plants for long-term climate change adaptation; preventing the generation of allergens and the spread of mosquitoes; and creating spaces for breathing and relaxation (“napping trees”, hammocks), for social interaction, for culture and artistic expression (amphitheatres, kiosks, pianos, etc.).

Implementation

First step(s)

Short-term – Select two pilot sites (potential sites include: Chapelle Charbon, boulevard de l’hôpital) and hold first participatory and integrated workshops.

Owner(s)

Department of Environmental Protection and Public Gardens (DEVE)

Inspiration: Copenhagen, Denmark

Tåsinge Plads is the first “resilient” green space in Copenhagen. Autonomous in water and energy thanks to an intelligent mechanism of rainwater and a kinetic floor, it also contributes to strengthening social bond in the neighbourhood, as a children’s playground.



Tina Saaby, 2015

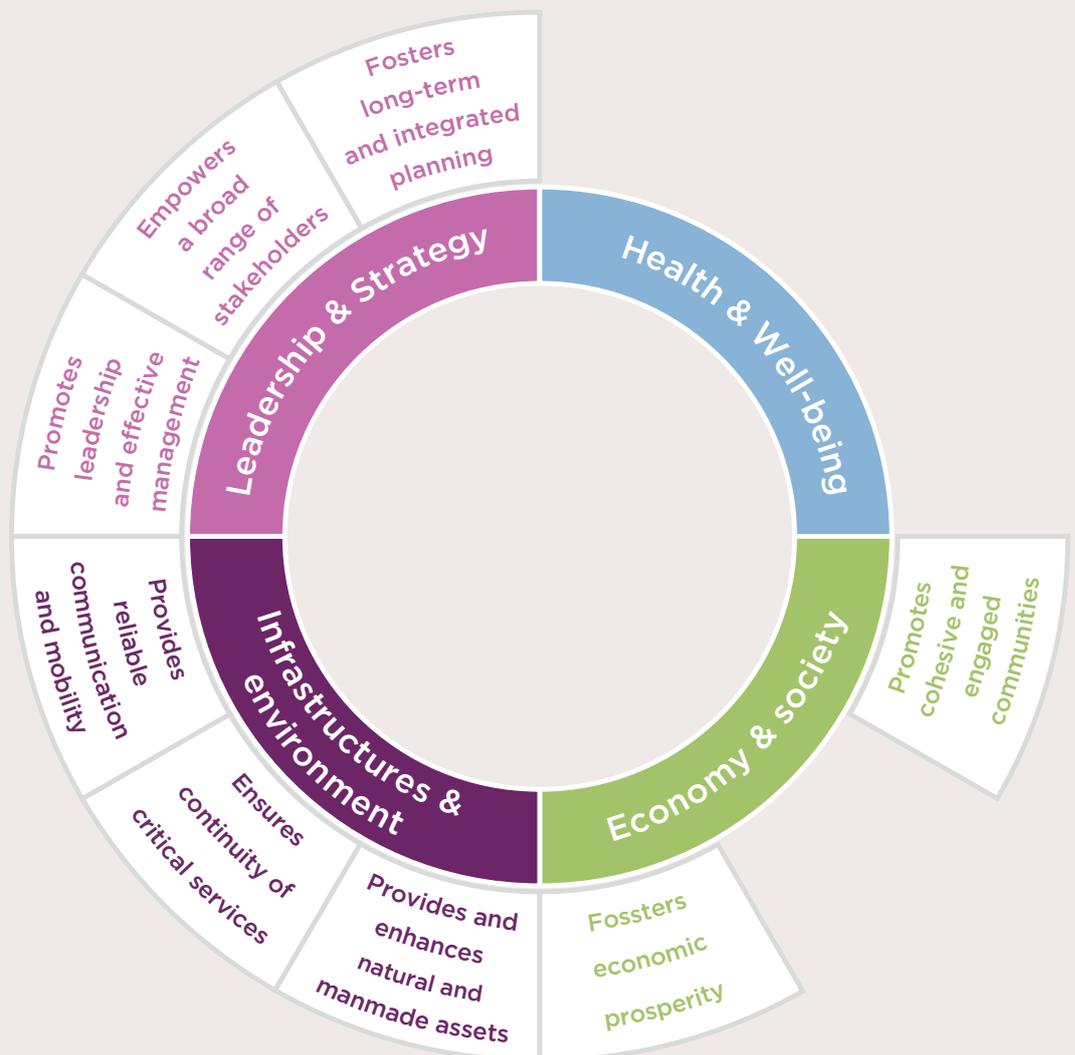


Elodie Loprin/Mairie de Paris



Objective C. Promote resilient urbanism in a dense city

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 19



Explore the city from its roots to its canopy and assess the potential for rooftop and basement development

Paris is the densest city in Europe and lacks available land and space for development. While urban development is increasingly taking the shape of vertical growth, the potential for using underground spaces and resources has not been adequately explored yet and rooftop development has been very limited.

This action proposes to explore the underground and alternative uses for rooftops, and to evaluate the potential urban services they could provide.

From 2017, efforts will be made to map and explore Paris' underground using digital tools (data science competition, 3D mapping, etc.) to identify possible uses. These could include: hybrid sites, pools, resources, storage, energy generation (e.g. recovery of sewer heat), cooling systems connected to wells, hydrogeological studies for geothermal energy, etc.

In a context of growing land scarcity, rooftops could provide additional space for transforming the City. Therefore, it is proposed to identify and analyse the possible uses of rooftops: open and shared spaces for neighbours to organise leisure events, cooling, urban agriculture, greening, solar energy, rainwater storage, etc.

In 2017 a workshop will be organised with network and service operators, licensees, logistics service providers, landlords, restaurants, cultural stakeholders and private individuals to explore the culture of risk between various stakeholders and identify the potential for underground development. This will help define the criteria for the upcoming 2018 competition "Reinventing Paris II", and will shape future regulations (see Action 23).

Implementation

First step(s)

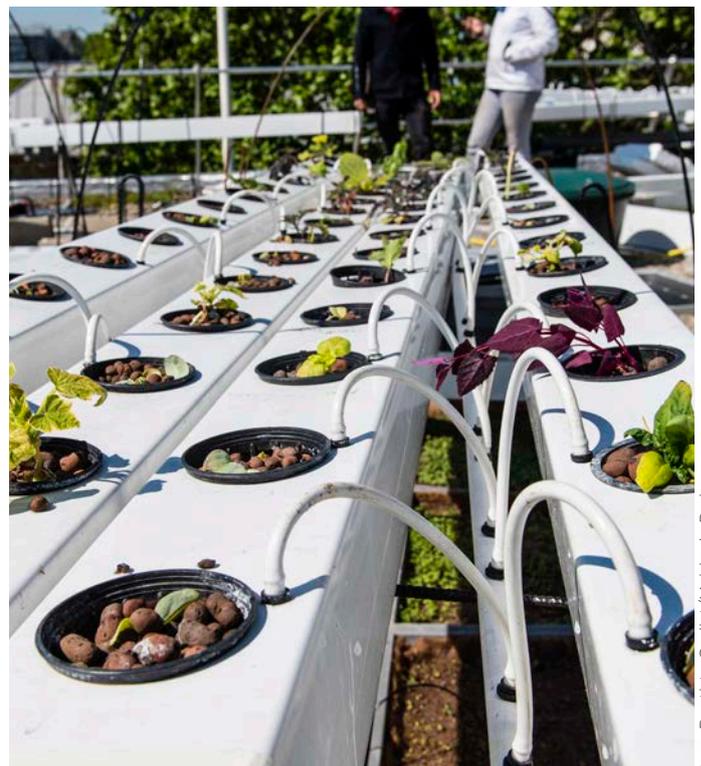
Short-term - Identify and mobilise stakeholders; establish "underground" and "rooftop" working groups; Reinventing Paris II competition.

Owner(s)

Department of City Planning (DU)

Main partner(s)

Office of Urban Design (APUR)



Jean-Baptiste Gurliat/Mairie de Paris

Action 20

Mainstream temporary urbanism

Temporary urbanism has many advantages. It can raise the profile of an area and maintain a degree of vibrancy while waiting for redevelopment to begin, which can sometimes take years. It also provides additional space for a host of activities such as providing temporary shelter for refugees, vulnerable and homeless people; working spaces for technology companies and resources centres; or venues for cultural events with a high local impact, urban agriculture, etc.

The strategy proposes to systematically use vacant and idle spaces to renew the use of the urban space and respond to different needs. More specifically, this action will look at ways of connecting land owners and developers with project owners, potential occupiers, or temporary users so as to promote solutions that support urban resilience. The objective should be that all urban projects follow this principle which will be set out in a charter of temporary / transitional occupation.

The redevelopment of Saint-Vincent-de-Paul and

other initiatives currently underway, particularly at the SNCF sites, attest to the value of temporary occupation. The objective is to measure the short-term impact of these initiatives on the territory, to evaluate the economic models of the stakeholders involved, and to assess possible changes in the legal framework of occupation.

Implementation

First step(s)

Short-term - Develop a charter of temporary / transitional occupation; create a platform to connect project owners with developers / managers / owners of urban spaces in development.

Owner(s)

Department of City Planning (DU)

Main partner(s)

Plateau urbain (temporary urbanism cooperative), real estate developers





Action 21



Develop the first resilient and climate-sensitive neighbourhood at Saint-Vincent-de-Paul

The former Saint-Vincent-de-Paul hospital sits on a 3.4-hectare site, in the north of the 14th arrondissement (district). It is part of a new “eco-district” development designed to be simple, unadorned, sustainable, and innovative. The partnership known as “Les Grands Voisins” comprises three organisations and was established to clear the hospital site and explore opportunities for occupying and using the site during its vacancy period. They are responsible for maintaining the premises, guiding temporary users and opening the site to the public. Today, nearly 2,000 people live and work there. The site includes shelter for vulnerable people as well as working spaces for cultural associations and social enterprises. It makes “Les Grands Voisins” a laboratory for temporary urbanism (see Action 20) and for urban resilience.

Therefore, it is proposed that the future neighbourhood remains a place of innovation and urban resilience. It will be adapted to climate change (water and energy usage, circular economy, etc.), while promoting innovative social practices, such as participatory housing, modularity, redundancy, local management of resources and energy, urban agriculture, local manufacturing. Five components will be incorporated in the current redevelopment project: the creation of a water cycle at the neighbourhood level; a reservation system for open spaces to encourage temporary occupation, managed by users and voluntary citizens; the installation of modular and open-source urban furniture; an integrated road network; and the design of an educational hub to serve as a neighbourhood centre, and as a pilot project to explore and invent the public facilities of tomorrow (pooled, hybrid and redundant facilities delivering urban services and social cohesion, etc).

Implementation

First step(s)

Short-term - Integrate resilience criteria in the project design brief

Owner(s)

Department of City Planning (DU)

Main partner(s)

Paris Batignolles Development Corporation (PBA)



Action 22



Design an exemplary resilient neighbourhood at Bercy-Charenton

This strategic area in the structuring of the metropolitan area is located at the entrance of Paris (12th arrondissement or district), on the banks of the Seine and at the intersection of major railway and road infrastructures. The 70-hectare site, partially located in a flood zone, is one of the last major brownfield redevelopment areas in the City and offers a significant opportunity for transforming this district into an exemplary resilient neighbourhood.

The aim is to integrate resilience criteria from the design stage of the project and throughout its development process. Analytical tools and partners will be mobilised to ensure that risks and resilience solutions are taken into account in all the components of the project: landscape, construction, public services and networks, implementation of the Rain Plan, energy supply (including geothermal energy), solidarity within the wider area, specific link to the Seine, resilience to floods, etc.

Starting in 2017, the resilience and adaptation indicators developed within the framework of the European project “RESIN” will be integrated. Starting in 2018, an international call for ideas will

be launched to define the resilience requirements to incorporate in the architectural designs. The specific issue of high-rise buildings and their capacity to integrate resilience criteria will be of particular interest, including: technical, natural and social solutions to floods, climate-related challenges, and air pollution.

Implementation

First step(s)

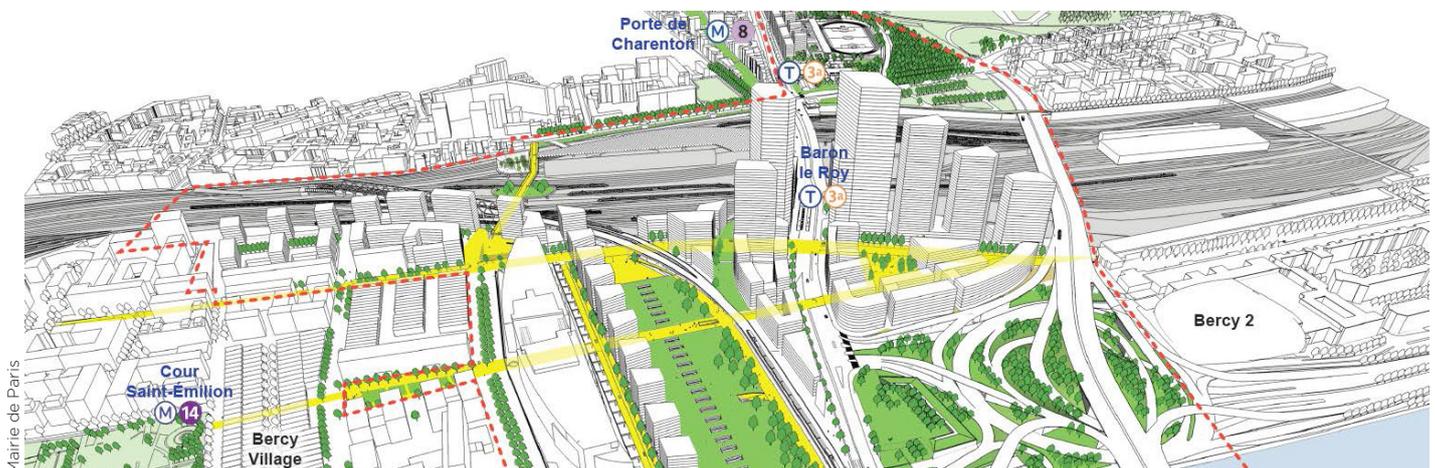
Short-term – Integrate resilience criteria in the concession agreement; support the developer and international call for ideas to integrate resilience in the specifications

Owner(s)

Department of City Planning (DU)

Main partner(s)

Developer





Action 23



Incorporate resilience solutions in urban planning through regulatory documents and specifications

Some municipal, national or international regulations must evolve for Paris to become more resilient. For example, the “inorganic character” of urban planning in Paris, as enshrined in urban and heritage regulations, will have to evolve to make the City more responsive to the effects of climate change.

A first step would be to identify the current regulatory obstacles to mainstream resilience in urban development and construction, and to introduce new binding measures or incentives, particularly in strategic urban planning requirements at the city and metropolitan scales. They will have to allow / encourage / constrain a flexible, adaptable or even reversible programming, from the design stage, thereby enabling buildings to evolve according to different uses during their lifetime (housing, household and demographic changes, technical equipment, commercial premises, use of roofs, etc.).

The opportunity for revising the PPRI, designed to limit the risks associated with a major flood, must be considered so as to integrate new construction processes. The resilient road guide (see Action 15) will inform practitioners on the role of materials for managing social, climatic and health risks. A summary of the sustainable development objectives of urban projects and an environmental guide of the PLU providing case studies and recommendations will be produced. Housing solutions will be explored including redundancy, modularity, services and design that facilitate wellbeing and limit the isolation of individuals, taking into account the evolution of migratory flows, an aging population and the desire to stay longer at home. The City of Paris will lobby real estate operators and develop incentives.

Implementation

First step(s)

Short-term - Inventory of municipal and national regulations; prepare a reference memorandum for the urban planning department; develop proposals for the Greater Paris Metropolis (MGP) to inform its plans and masterplans.

Owner(s)

General Secretariat (SG)

Main partner(s)

Greater Paris Metropolis (MGP), the State



Dan Lal/Mairie de Paris



Jean-Baptiste Gurliat/Mairie de Paris

Focus

Using road infrastructure as an asset for advancing resilience

The Resilience Strategy takes into account the transformation of road infrastructure in a cross-cutting way: the occupation of public spaces by neighbours, tactical urban planning and the implementation of solutions by citizens (pillar I). It foresees the transformation of the ring road (“Périphérique”) and the reappropriation of the road network to develop multiple uses (pillar II). Finally, it integrates the systemic dimension of this issue through territorial cooperation, particularly on the development of coworking and employment exchanges at the regional scale (pillar III).



PARIS

The City of Paris is committed to reducing the impact of road traffic and improving mobility solutions

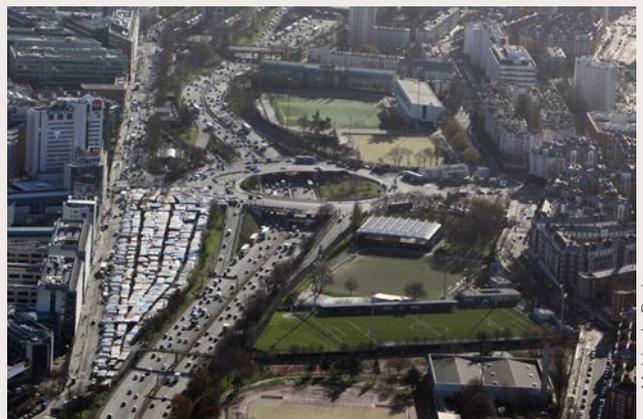
To address air pollution, the City is currently implementing a plan to encourage Parisians to adopt sustainable solutions. Key measures include: financial incentives for purchasing electric vehicles, subsidies for purchasing electric bicycles and cycle shelter grants, development of public transport, etc. In parallel, the City is taking steps towards reallocating public space in favour of active mobility through the following measures and initiatives: vehicle restricted area, Limited Traffic Zone, “Paris Respire” (“Paris Breathes”) neighbourhood, Paris pedestrian strategy, Cycle plan, etc.



Jean-François Gornet, 2012

AECOM studies the multiple benefits of reducing road traffic

In the spring of 2017, AECOM, a Strategy Partner of 100RC, conducted a study on the multiple benefits from reduced road traffic in Paris. These include: reduction in accident rates; reduction in health costs (€350-400 million per year); reduction in ecosystem and building costs; opportunities for urban renewal; freeing-up valuable urban space for other uses; reduction in obesity through the promotion of active transport modes; improving quality of life; lower levels of traffic congestion which in turn unlocks productivity gains, improves deliveries and enhances territorial attractiveness. According to the simple assumptions made in this study, the external costs of road traffic are estimated at between €2.9 and €4.5 billion per year in Paris and between €14 and €17.8 billion in the Île-de-France region.



Air quality is a resilience issue

Air pollution has been identified as one of the priority challenges for Paris and the Paris metropolitan area. In June 2016, the city's Chief Resilience Officer organised a World Summit of Cities and Metropolises in Paris which resulted in the creation of a Global Urban Air Pollution Observatory (GUAPO). The objective is to share knowledge on air pollution and its health impact, as well as monitor progress achieved in reducing urban pollution in metropolitan areas.

cities
for Air

qualité de l'air,
les villes et métropoles
en action



Pillar 3

A city in transition that mobilises collective intelligence, adapts its operations, and cooperates with its surrounding territories



Objectives

A. Mobilise collective intelligence and resources..... p. 95

B. Ensure the continuity of public services and the resilience of the administration..... p. 101

C. Cooperate with other territories to initiate transitions..... p. 107





A city in transition that mobilises collective intelligence, adapts its operations, and cooperates with its surrounding territories

The resilient approach is an effective solution to turn transitions (such as ecological, energetic, economic or digital transitions) into opportunities for developing and improving living standards. Several approaches are proposed to organise these transitions and adapt public policies as well as territorial governance to tomorrow's challenges.

Mobilise. Mobilising and training of a wide range of stakeholders, producing additional spatial data of the territory, its vulnerabilities and the risks that threaten it, are some of the drivers that will enable a better allocation of resources and ensure the implementation of shared and sustainable solutions.

Organise. The city administration must constantly adapt its operations to ensure the continuity of its activities in all circumstances, and to make sure that, each and every day, its investments, staff and policies contribute to the resilience of the territory.

Collaborate. The responses to most of the issues identified operate at a scale wider than that of the city's administration boundaries. As a result, improved territorial governance is needed. The creation of the Greater Paris Metropolis and the establishment of new links with rural municipalities are some of the key levers to transform the interdependencies between territories into opportunities. These places that form a system, irrespective of administrative borders, and the urban metabolism, its flows, inputs, waste, shared assets, and economic links, must all be re-invented.

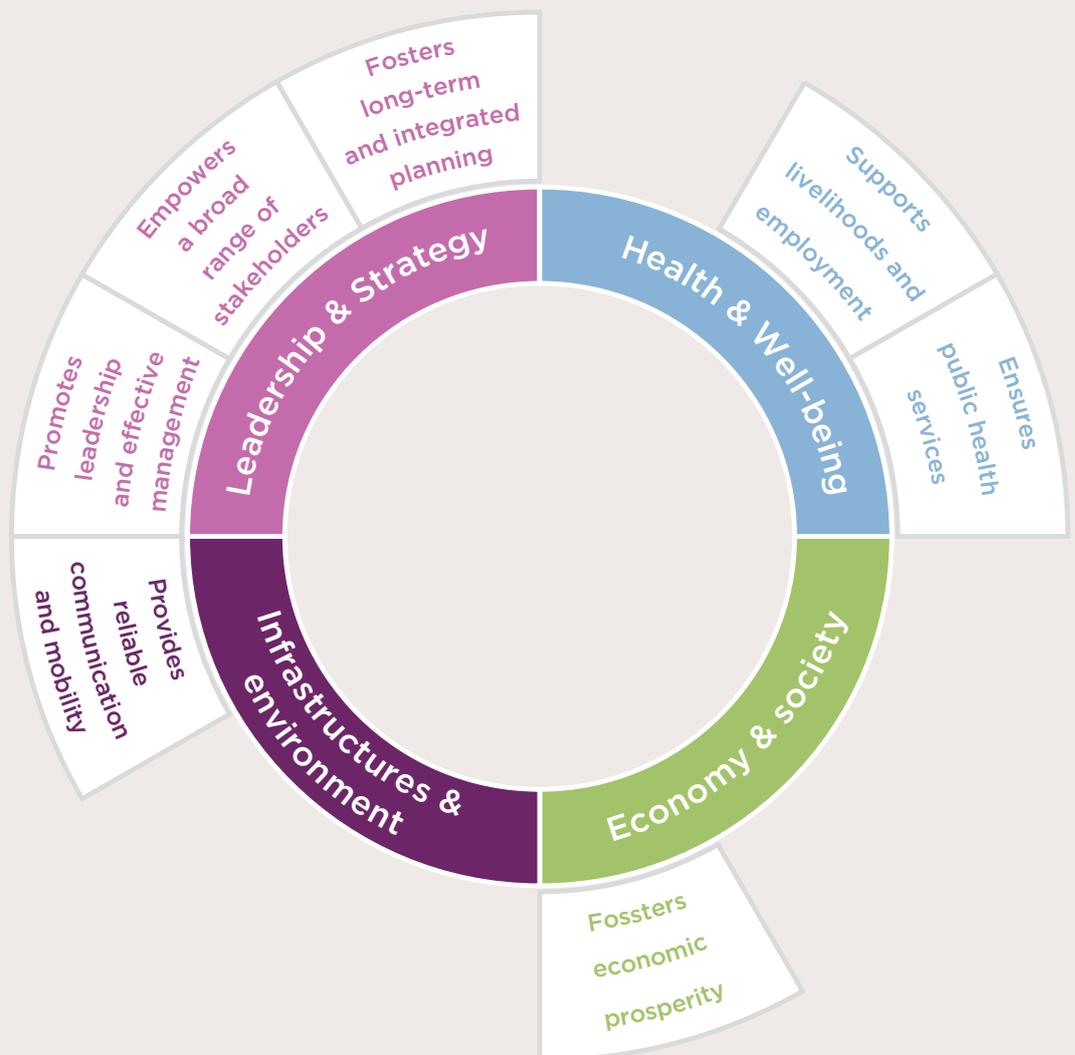
The metropolitan approach as a resilience driver: From the start of the strategy development, a key point emerged: none of the identified stresses and shocks could only be addressed at the city scale. Responses must be formulated at the metropolitan level. Resilience is also a central theme of the first Innovation Agreement between the Greater Paris Metropolis and the State, and at the core of the metropolis' strategic competencies (i.e. planning, shelter and housing, management of aquatic environments and flood prevention). 100RC commissioned students from Sciences Po to explore this topic with cities and territories of the metropolis and other cities around the world. This resulted in recommendations for improving dialogue and co-operation, pilot projects to demonstrate proof of concept, ensuring its visibility in public spaces and its mainstreaming.



Paris 16, 2016

Objective A. Mobilise collective intelligence and resources

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 24



Create an open-source, multi-target resource, research and training centre for resilience

This research, training and resource centre will build on contributions from the Scientific Interest Group working on the resilience of the territory, and / or on the “resilient city” application submitted by the Ecole des Ponts in partnership with the City of Paris and some 20 other organisations, in response to the “I-Sites” call for projects on future cities.

The objectives of the centre include developing research programmes around this strategy and urban resilience, supporting the design of dedicated training courses, developing MOOC (online training open to all) on resilience-related issues. It will support the creation of specialised Master courses and training courses for staff members of local authorities as well as private sector and not-for-profit organisations. These courses will be delivered as part of the Paris arrondissements’ (district) Initiative and Consultation Committees and prepared in collaboration with the local municipalities. Programmes will be designed in partnership with various stakeholders (corporations, local businesses, hotel industry, pharmacists, etc.) and tailored to their specific challenges).

Among the overarching principles, the creation of “commons” will be proposed to promote the creativity and the up-skilling of all. This centre will rely on existing bodies at all levels within the City of Paris, including: The Smart City partners committee, the Parisian Climate Agency, and leaders of the sustainable Paris agenda. It will also train senior City staff on risks and resilience (see Action 29).

Implementation

First step(s)

Short-term – Set up a scientific interest group; Submit “I-Site” application to the Investments for the Future Programme (PIA); establish an online resource platform

Medium-term – Establish the research, training and resource centre

Owner(s)

Chief Resilience Officer (CRO)

Main partner(s)

Sustainable City Institute (IVD)



Sophie Robichon/Mairie de Paris

Action 25



Establish an observatory to understand how different risks impact public health and study socio-environmental vulnerabilities of the territory

While vegetation and water in cities are effective urban heat island mitigators, the health risks that may arise if they are not adequately anticipated (allergies, mosquitos and the pandemics they may carry, etc.) must be considered.

In addition, as social and territorial vulnerabilities can increase health vulnerabilities, there is a need to better understand these interdependencies. It is proposed to bring together experts from within the City of Paris and from the territory to assess and formulate recommendations on how to address the challenges of the 21st century for better health and wellbeing in the city using a resilience, disaster preparedness and climate adaptation lens.

This expert hub will study the interactions between different themes including benefits, risks and adaptation of green solutions in the city (adapting plant species, water and biodiversity to climate changes, allergenic plants, hydrometeorology); the health impacts of climate change and air pollution (asthma, cardiovascular and respiratory diseases, allergies, etc.); risks of major health shocks (nuclear accident, epidemic), solutions for combating vector-borne diseases through urban planning (saturnism); the study of individual strategies to adapt to climate change (behaviours, choices, perceptions); health inequalities; and socio-environmental vulnerabilities.

Implementation

First step(s)

Short-term - Establish the observatory

Owner(s)

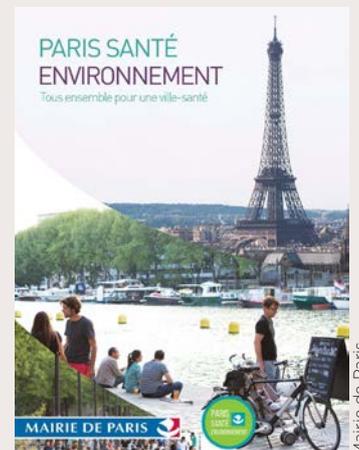
Department of Health, Family and Social Services (DASES)

Main partner(s)

French Society for Health and Environment (SFSE)

Paris in action: Paris Environmental Health Plan

This Plan aims to gain a better understanding of environmental health challenges, and to embed health improvement objectives for Parisians in the City's operations and in its urban projects: urban planning, health impacts research, respiratory diseases monitoring, environmental health culture, diagnostics, citizen initiatives, and public facilities management.





Action 26



Mobilise innovation and digital stakeholders to help develop a dynamic and participatory mapping of urban resilience challenges

The development of disruptive technologies, such as robotics, artificial intelligence, the massive and exponential development of personal data, etc., call for the increased adaptation of public authorities to this rapid change and complex issues. For Paris, the main challenge is to seize this opportunity, to mobilise innovation leaders to build shared assets, while ensuring that these technologies meet the needs of citizens and safeguard public service quality and resources.

We will prepare a dynamic and participatory risk mapping, drawing on contributions from volunteers and the support of “ethical hackers” associations. This mapping will be carried out with data provided by citizens themselves and will allow the information produced to be integrated in risk prevention systems and emergency management. The idea is to encourage citizens to acquire sensors and to develop data collection and analysis tools. This mapping will also contribute to the improvement of emergency communication through new technologies. We propose to train members of community solidarity networks in open source mapping along with organising an event on collaborative mapping as an urban development and resilience tool.

In January 2018, a Resilience Innovation Fellowship will bring together innovation leaders to develop responses to the challenges identified in this strategy (underground mapping, increasing risk awareness through gamification, matching supply and demand for volunteers). Finally, this mapping will be designed and will be open data, ensuring reliability, free access and providing guarantees for the ethical use of the data produced.

Implementation

First step(s)

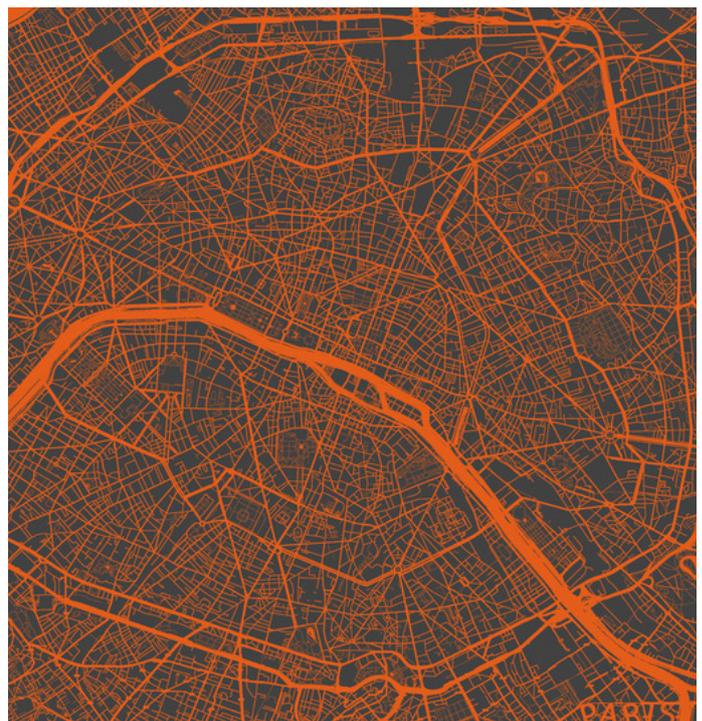
Short-term - “Resilience innovation fellowship” - programme for mobilising innovation stakeholders around the Resilience Strategy’s 35 actions; create a dynamic and participatory platform

Owner(s)

Chief Data Officer

Main partner(s)

OpenStreetMap France, Resilient Paris Innovation Fellowship (Five by Five) and Hackers Against Natural Disasters (HAND)



Map Map Maps, 2014

Action 27



Develop new finance mechanisms for resilience solutions in Paris: from sustainability bonds to resilience bonds

We aim to develop an innovative strategy to finance resilience actions, which will include local carbon offsetting funds, crowdfunding, social financing, micro-grants, tax incentives, etc.

As a first step, a Sustainability Bond will be issued in 2017. Sustainability bonds provide an opportunity to diversify not only the type but also the quality of investors. Such bonds will also need to meet sustainable development objectives. In November 2015, the City of Paris issued a Climate Bond of ²€300 million to fund climate-compatible projects aligned with the objectives of the Climate-Air-Energy Plan. The benefits of this type of bond reside as much in the financing of projects with specific objectives, as in their management approach (improvement of procedures, third party assessments of projects progress and social / environmental responsibility governance). The Sustainability Bond will follow a similar approach. Its objective will be even more forward-looking and will include a resilience component specifically targeting extreme climate events. We aim to mobilise expertise and financing from resilience specialists (finance and banking stakeholders, insurers and / or reinsurers, third party

auditors, etc.) to ensure that the projects financed have clear resilience benefits. Outcomes from the audit carried out by the Resilience Team will be presented to investors at a conference to explore areas of opportunity.

In the medium-term, we will propose the creation of a Resilience Bond focused on flood prevention / reconstruction.

Implementation

First step(s)

Short-term - Issue a Sustainability Bond

Medium-term - Organise a conference with investors on catalytic resilience projects and issue a Resilience Bond

Owner(s)

Department of Finance and Public Procurement (DFA)

Berkeley Funds Resilience and Announces Infrastructure Project List

A \$100M infrastructure bond, known as Measure T1, was initiated as part of the city's resilience building efforts. Berkeley published a list of more than 30 infrastructure projects eligible for funding. For inclusion on the list, every project had to meet certain safety, financial, social, and environmental criteria laid out in the Resilience Strategy. Furthermore, it had to demonstrate how it provided multiple benefits to the community. The projects included: bioswales, bicycle infrastructure, shelter centres, and repairs to the pier.

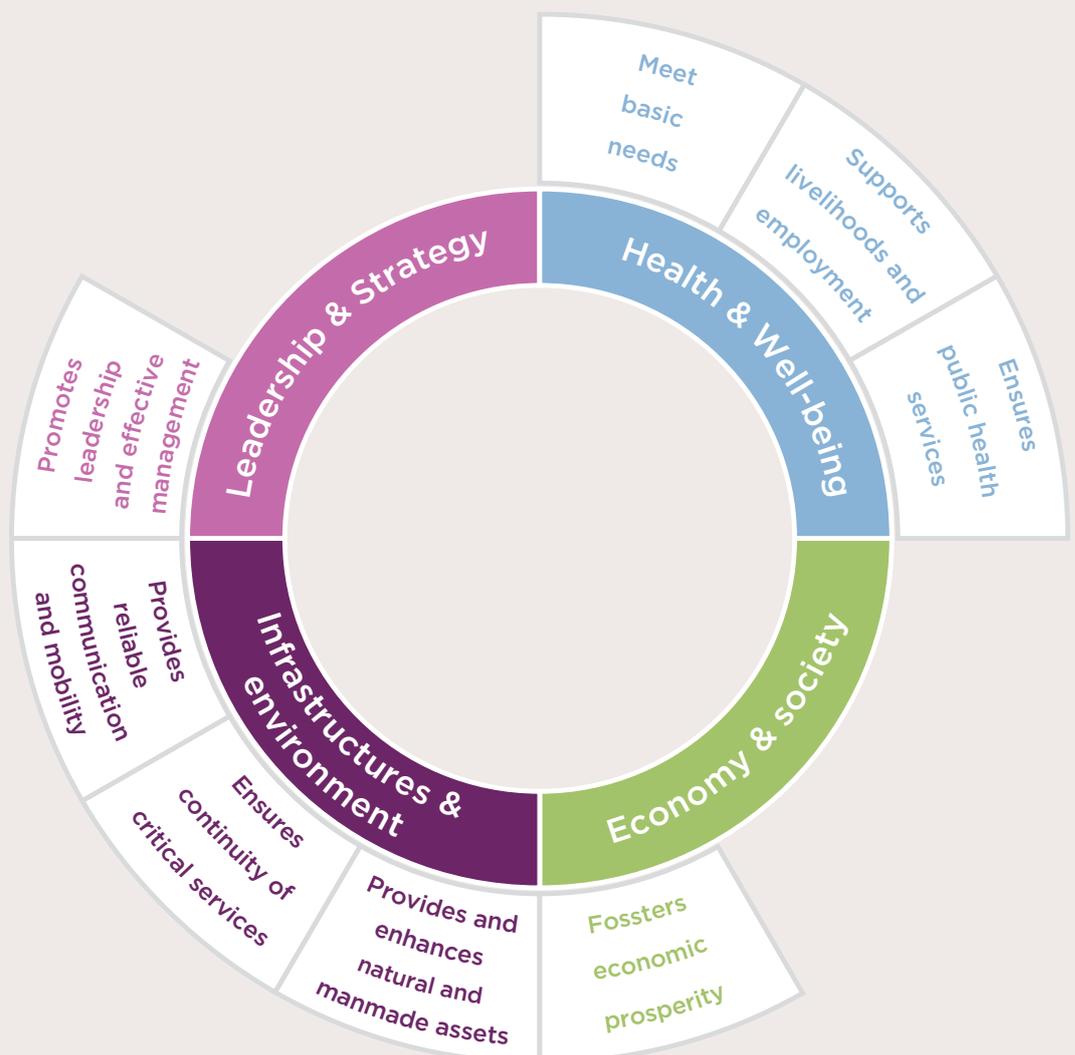


Mike Procarolo, 2014



Objective B. Ensure the continuity of public services and the resilience of the administration

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 28



Shift municipal investments, concession treaties, public service delegations and public procurement towards resilience by using new indicators

Infrastructure investments, concessions and public service delegation agreements, as well as the City’s procurement policy, constitute key levers for resilience. While the City of Paris is endowed with a 10 billion euros capital budget for the entire mandate, every euro that is spent can and must contribute towards climate resilience and the strengthening of social cohesion.

This action aims to create and mobilise resilience indicators (biodiversity, social inclusion, adaptation to climate change - and the cost of non-adaptation, etc.) to prioritise investment and procurement choices, and to elaborate compulsory specification of concession and public service delegation agreements.

We will also explore developing a tool for monitoring the evolution of municipal spending to enable measurement of the City’s commitment to dedicate 10% of its capital expenditure to resilience building. Cost and benefit analysis will be incorporated throughout the decision-making process. The resilience indicators will help adapt the City’s public procurement plan and assess the need for anticipating the renewal of certain concession agreements and delegations of public services to

integrate the latest technological developments and knowledge. To this end, the City’s budget staff will be trained to evaluate projects against these cross-cutting indicators, and investment programmes will be defined using this framework.

Implementation

First step(s)

Short-term – Select a consultant or commission a 100RC partner, benchmark and develop a tool for tracking resilience-related expenditure; develop new indicators; identify opportunities to renew concessions or service provider contracts.

Owner(s)

Department of Finance and Public Procurement (DFA)

Main partner(s)

100RC, C40

Vejle - Strategic Preventative Investments: Applying resilience learning from other sectors to public healthcare and wellbeing

Vejle has identified several neighbourhoods, which will serve as laboratories for testing preventative health solutions along with indicators developed for assessing investment projects. The initiative places great emphasis on parental and family relations, and more broadly on the connection between resilient neighbourhoods and public health. With this intervention, the city aims to improve the quality of life, break cycles of “negative social heritage” and ensure that good investments are made at the right time.



Vejle Museerne

Action 29



Ensure continuity of municipal activity in the event of an emergency

The development and / or revision of the Business Continuity Plans must be pursued, and the City's entire management staff mobilised and working towards achieving this goal. An on-call reserve, made up of about 100 retired employees from the City of Paris, is already involved in programmes introduced during previous heatwaves.

We propose to finalize 100% of the Business Continuity Plans by the end of 2018. To this end, support will be provided to all City Departments with a special emphasis placed on vulnerable people who are typically more exposed to risks. We will also train municipal supervisors on risk and resilience and ensure that such training is integrated in new staff onboarding. The aim is also to extend the on-call reserve that is currently solely made up of retired staff, to include voluntary workers. The end goal is to train 100% of municipal employees on risk and crisis management. The training will be adapted to the identified risks and tailored to each profession. Municipal employees working in the public space will receive training adapted to their profession and their

role. These training programmes will be renewed to refresh memories, methods and tools. Finally, we will support the departments in setting up crisis management and resilience mechanisms, similar to ongoing experiences within the Department of Health, Family and Social Services as well as the Social Action Centre of the City of Paris. Within these two public agencies, pilot committees focusing on resilience have been set up to guarantee the regular monitoring of these issues and integration of these challenges at every level.

Implementation

First step(s)

Short-term – Select a consultant to accompany the departments in the elaboration of their Business Continuity Plans

Owner(s)

Department of Security and Emergency Management (DPSP)

Paris in action: internal innovation within the City of Paris

The resilience of the administration also depends on the ability to innovate and adapt. The “Transfo” programme, carried out with the 27th region, provides training for municipal employees on new and user-centric approaches to public policy design. A “City Start-Up” entrepreneurship scheme is also underway.

In the long-term, the objective is to establish an innovation laboratory within the City, focusing on the design of citizen-centric public policies. This laboratory will also help to build and spread a culture of public service innovation within the city administration.



La Transfo Paris © La 27e Région



Action 30



Build resilience into municipal information systems and enhance security in the event of cyber attacks

In view of cyber attack risks, digital infrastructure vulnerability, exposure to flood hazards and intense heatwaves, a comprehensive action plan is proposed to strengthen the resilience of municipal information systems.

This plan will include actions to provide backup sites (in protected areas) integrating network consolidation and convergence, continuity requirements for applications and resources needed in the event of an emergency, investment in internal risk management infrastructures, and the contractualisation of resilience and security requirements of outsourcing markets.

For each new infrastructure, an assessment of energy and heat consumption will be carried out and recommendations will be formulated on: heat recovery systems, transformation of heating into cooling, use of carbon neutral energy sources for these developments, carbon offsetting, or even an energy recovery scheme, shared with other partners and dedicated to powering local energy loops, in line with the new Climate Plan.

Implementation

First step(s)

Short-term - Conduct an audit with qualified service providers and ethical hackers, and implement a new cyber defense strategy

Medium-term - Establish an independent emergency communication system and improve infrastructure resilience

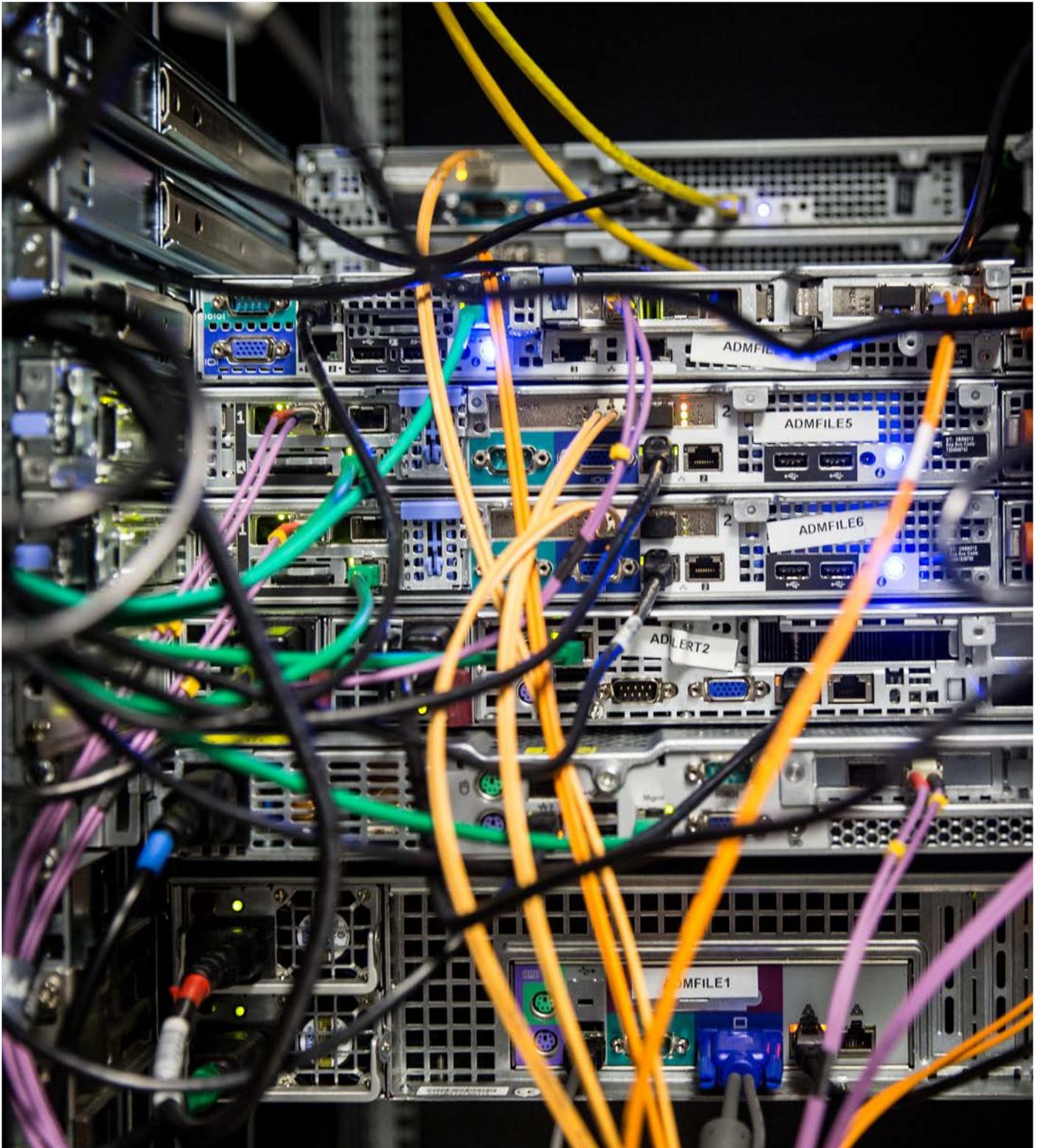
Owner(s)

Department of Information Technology and Telecommunications (DSTI)

Main partner(s)

National Agency for the Security of Information Systems and Technologies (ANSSI)

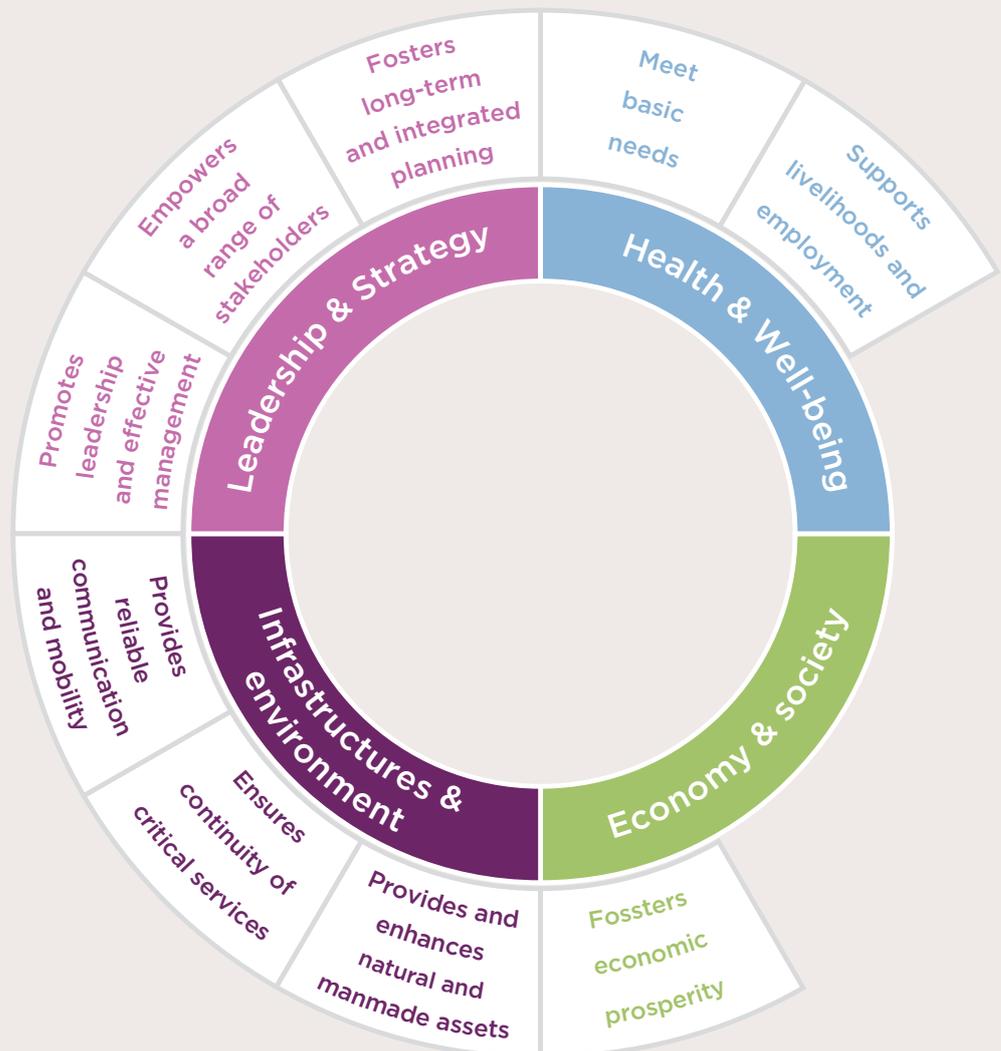






Objective C. Cooperate with other territories to initiate transitions

Through the actions listed subsequently, this objective will improve the resilience of the city in the following areas:





Action 31



Define and sign a territorial cooperation pact with peri-urban and rural municipalities, based on common interests and shared actions

Whether it is for food supply, employment, flood risk prevention at the watershed level or even the limitation of commuting journeys through remote / home working, Paris depends on its surrounding rural areas, and vice versa.

The action therefore proposes to materialise common interests and to initiate actions through an agreement between the City of Paris, the Greater Paris Metropolis and the Association of Rural Mayors of France, to promote territorial cooperation for resilience. The objective is to develop new interactions between urban and rural areas, and to formalise the common interests between Paris, the Greater Paris Metropolis and rural territories.

The partners will lead pilot projects in various areas including: reduction of commutes to / from Paris by creating coworking centres in the periphery of the capital and beyond (7% of municipal employees live outside the Ile-de-France region), conservation of water resources in cooperation with towns in the catchment area, such as the programme that the Eau de Paris (Paris Water Authority) is leading in this field, sharing technical expertise from Paris to rural areas and towns in transition, sustainable food and supply, circular economy and recycling of materials, investment in the production of renewable energy

sources and carbon sink projects beyond city limits or outside Paris, school twinnings between Paris and rural towns, etc. Energy solidarity, jobs and resource relocation and the vitality of the territories are just some of the key advantages of such a cooperation pact. The pact will be developed initially through workshops with possible action plans then presented to key partners.

Implementation

First step(s)

Short-term - Sign a declaration of intent between the Mayor of Paris, the President of the Greater Paris Metropolis and the Association of Rural Mayors of France; develop a shared diagnosis and common line of action through thematic workshops

Owner(s)

Chief Resilience Officer, City of Paris

Main partner(s)

Association of Rural Mayors of France (AMRF), Greater Paris Metropolis (MGP)

Urban-rural mobility in Santiago de Chile

Recognising the interdependencies between urban and rural areas, Santiago has developed a Mobility Plan which includes intermodal and integrated mobility at the urban and rural scales as part of its urban planning process.



Pieter Edeliman, 2016





Action 32



Support the watershed’s climate change adaptation programme to preserve water resources and limit the scale of floods in partnership with rural municipalities

The challenges of limiting the risk of flooding, preventing low flows and improving the quality of the Seine’s water call for a common and integrated approach and response. Such action must contribute towards the following goals: ensuring the permeability of soils and renaturation where possible of the riverbed of the Seine and its tributaries, drastic limitation of polluting discharges in the rivers through the creation of new positive partnerships with towns, farmers and industries of the watershed. To address these challenges, the Seine Normandie Basin Committee has approved an adaptation plan for climate change, of which the City of Paris and Paris Water Authority are partners.

Within the framework of the 100RC programme, a study has already been carried out by a Platform Partner on the potential for the expansion of the flood zone and the redevelopment of biodiversity and wetlands, which can play an important role for both flood and low-water prevention and decontamination. An assessment of the socio-economic and environmental impacts resulting from low-water level and severe droughts on the Seine’s upstream watershed will also be carried out by EPTB Seine Great Lacs (Public Territorial Institute of the Seine Basin). Several doctoral theses on flood risks will also be reviewed by the City of Paris or by its partners.

The City of Paris will pursue partnerships with neighbouring territories. In accordance with its plan for the protection of water resources, Eau de Paris

(Paris Water Authority) will continue to purchase agricultural land and to support farmers located in the areas supplying safe drinking water to develop sustainable agricultural practices. Other initiatives include: developing freight transportation on the River Seine and canals, encouraging large scale catering companies to buy from local farmers in the Paris basin.

Implementation

First step(s)

Short-term - Identify six reference territories representing the different typologies of the watershed; mobilise the mapping developed within the framework of the Resilience Strategy to set up pilot projects with farmers, manufacturers or communes of the voluntary watershed.

Owner(s)

Seine-Normandy Water Agency (AESN)

Main partner(s)

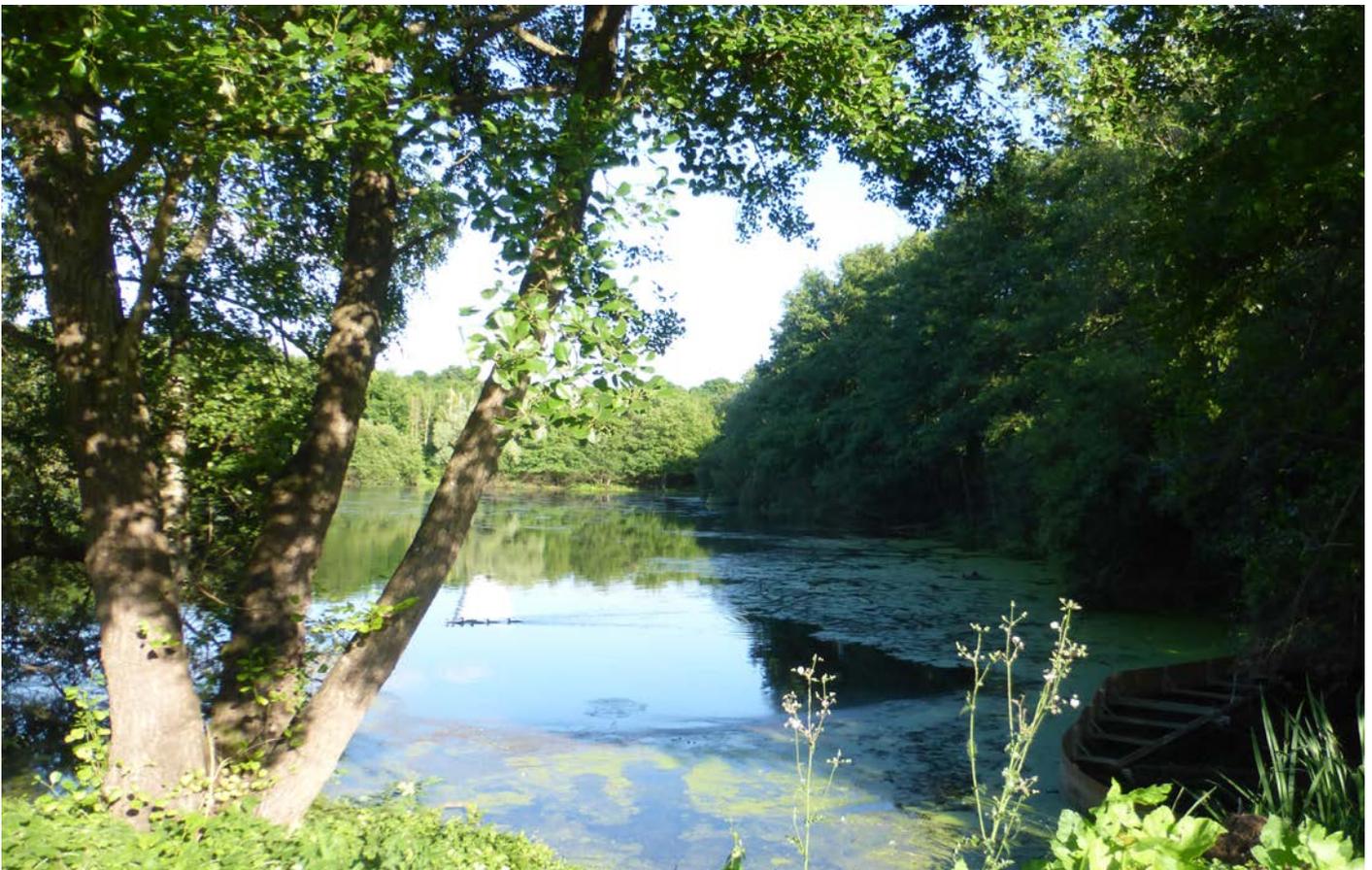
Public Territorial Institute of the Seine Basin (EPTB Seine Grands Lacs)

Melbourne's "metropolitan forest" strategy

Across Melbourne, urban greening and revegetation projects are being undertaken by local councils, water authorities, community groups, and regional agencies and organisations. By undertaking a coordinated metropolitan strategy, Melbourne will enable stakeholders, and others wanting to deliver urban greening projects in the future, to understand how their efforts can best contribute to improving ecosystem health and services such as urban cooling and flood mitigation.



Kevin Hunt, 2011



Delphine Cingal, 2017



Action 33



Adopt a sustainable food strategy for the territory

8 million meals are eaten in Paris everyday. Strengthening the independence, autonomy and resilience of the food system is a priority for the years to come. This could be achieved by diversifying and bringing supply chains ‘closer to home’, especially through new partnerships with rural territories.

To guarantee supply, it is also necessary to improve information sharing between crisis management services for communities and operators, distributors and the State on stocks, sectors, and impacts related to transport. It is estimated that food supply and consumption in France accounts for 36% of greenhouse gas emissions, mainly due to the territories’ dependence on long supply routes. Thus, Paris has committed to developing a sustainable food strategy for the territory, which will help achieve the goal of a sustainable, inclusive and resilient food system that is safe and diversified for all.

This strategy, currently under development, involves food stakeholders at every level: distributors, processors, retailers, farmers, etc. It presents a specific partnership plan for guaranteeing food supply in the event of a major flood. This scheme could be replicated for other types of emergencies. It will integrate the ambition to consolidate urban and local agriculture and to explore new ways of producing in urban areas. This strategy will be a key element in the overall work with rural municipalities (see Action 31), which is another tangible opportunity to create links between urban and rural areas.

Implementation

First step(s)

Short-term – Conduct consultation and set up the line of action with partners; mobilise of cooperation tools (see Action 31)

Owner(s)

Department of Environmental Protection and Public Gardens (DEVE)

Main partner(s)

Farmers, distributors, the State

Paris in action: the “Parisculteurs” (Parisian farmers)

The City of Paris and its 71 partners, signatories of the “100 hectares objective” Charter are mobilising to increase the green coverage of 100 hectares of buildings by 2020 in the capital, a third of which is devoted to urban agriculture. In this context, numerous innovative techniques for food production in urban areas are proposed (aeroponics, aquaponics, hydroponics, mushroom cultivation, “lasagna” gardening, permaculture, etc.), particularly through the “Parisculteurs” call for projects, which makes new land available to urban farmers.



Action 34



Carry out a multi-stakeholder study to examine the potential for creating coworking centres and facilitate job swapping at the metropolitan scale

Technological tools offer new solutions, making it possible to move less and reduce commuting-related emissions. A study carried out as part of the Paris administration Commuter Plan showed that 10,000 of the 50,000 employees in the regional government could potentially work remotely part of the week.

The objective is to reduce the number of commuting trips by 30% at the scale of the conurbation by 2030 through remote working and coworking. This in turn will promote territorial solidarity by reducing the strain on workers in Ile-de-France who are forced into long commutes and by participating in the revitalisation of local economies throughout the region. A study will be launched in 2018 in conjunction with large companies and administrations to identify and describe coworking space needs, and the impacts of promoting remote work on road traffic, quality of life and health and the economy.

Implementation

First step(s)

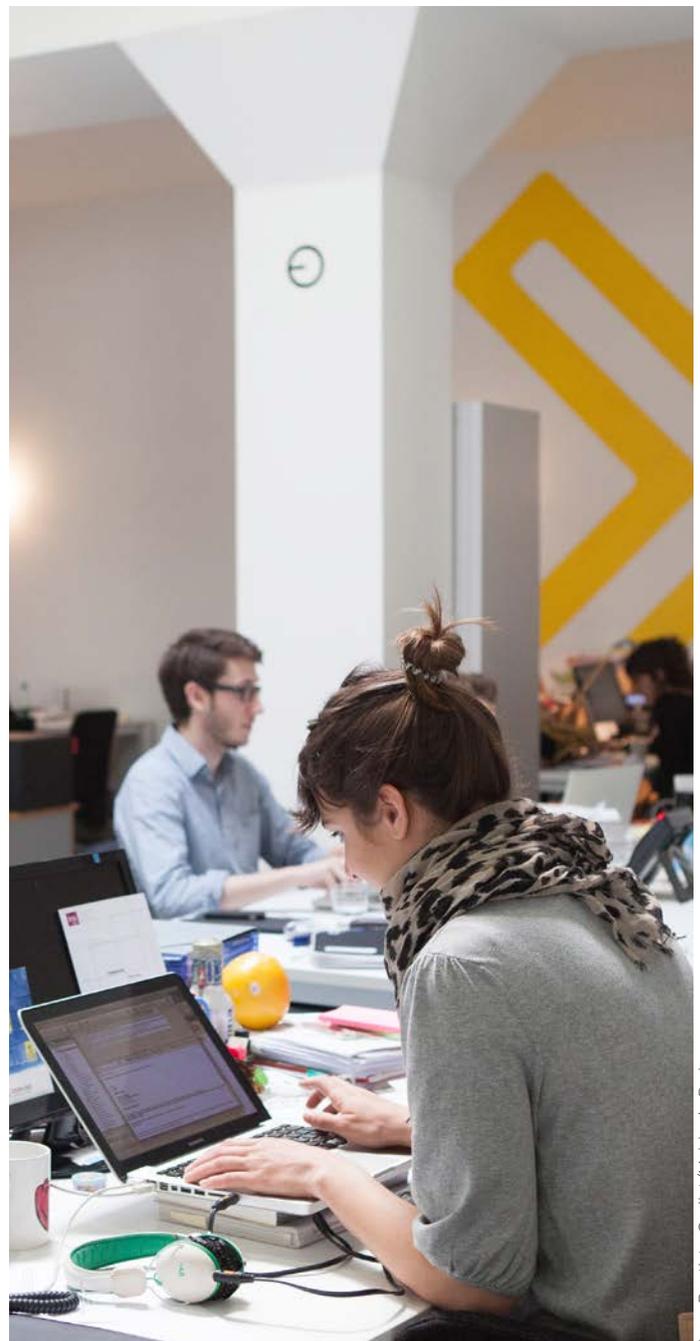
Short-term - Launch of the study and assessment of the process required to support the emergence of coworking spaces at a metropolitan scale

Owner(s)

Department of Economic Development and Employment (DAE)

Main partner(s)

Greater Paris Metropolis, Association of Rural Mayors of France (AMRF)



Jean-Baptiste Gurliat/Mairie de Paris



Action 35



Develop circular economy, local manufacturing and non-monetary trading

In Paris, many activities are being developed to improve the management of local resources and to define a new urban metabolism. These activities challenge the boundaries and scales of the existing territories. Resource centres, recycling activities, non-monetary trade, “repair cafes”, micro-methanisation, waste sorting, urban agriculture, local manufacturing (fablabs) are all drivers for social inclusion. They help lead to projects for social integration, agricultural training, maintenance of community spaces, and creating biodiversity-related jobs.

The aim is to implement the roadmap on circular economy and to develop local manufacturing, which brings more autonomy, sobriety, integration through local job creation (entrepreneurs, designers, artists, handymen, hackers) and ultimately builds resilience. Identifying places for innovation, at the neighbourhood level, will enable the mobilisation of innovation stakeholders and other key stakeholders within “living labs” - local experimentation of smart

solutions: Deux Rives (Two River Banks), Innovation Territories, etc. Finally, the City of Paris will work with key leaders of the Social and Solidarity Economy (SSE) to promote lending, bartering and non-monetary exchanges.

Many initiatives are being developed to lend and exchange goods and services, referred to as “collaborative consumption” by sociologists and economists. The practice of bartering invites us to rethink how we consume and connect with others: less unnecessary purchases, waste, pollution, more mutual help, solidarity, alternative ways... Beyond these dimensions, barter is a lever for social inclusion, facilitating access to means of exchange with other citizens. It may also constitute, if its practice is well developed, a protection against the effects of a monetary, economic or financial crisis.



Implementation

First step(s)

Short-term - Implement the circular economy roadmap; steer the creation of living labs for the circular economy; support for platforms, resource centres, recycling centres; create re-employment hub; hold international event “Fabricating resilience”

Medium-term - Aim for a zero-carbon emission city

Owner(s)

Department of Economic Development and Employment (DAE), Department of Environmental Protection and Public Gardens (DEVE)

Main partner(s)

Fab City Grand Paris, Greater Paris Metropolis

Paris in action: The first circular economy roadmap,

voted in July 2017, identifies 15 actions responding to five structural challenges: planning and construction, reemployment opportunities, reuse and repair sites in Paris, support to territorial stakeholders and networking, public procurement and, finally, the promotion of new patterns of sustainable consumption. This roadmap will be regularly updated.



Emilie Chaix/Mairie de Paris

Focus

The Seine, agent of resilience

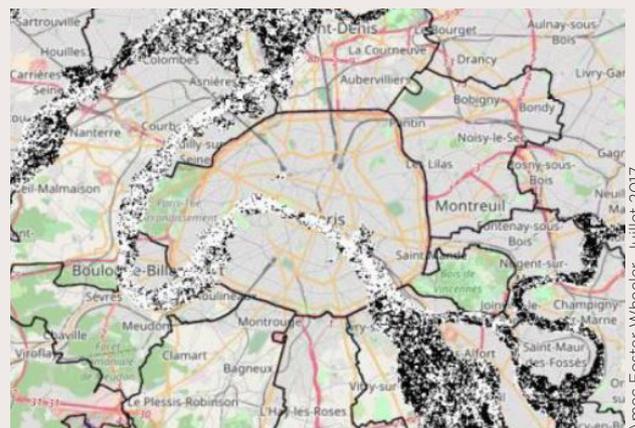
The Resilience Strategy addresses the challenges associated with the River Seine in a cross-cutting and comprehensive way: it proposes to raise awareness about flood risks, to mobilise them within the framework of community solidarity networks, in particular in the event of a flood (pillar I); to anticipate and adapt the impacts of shocks and stresses related to the river on infrastructure (pillar II); to improve the integration of flood risk within the City administration; to guide partners involved in the climate change adaptation of the watershed, to renew and strengthen cooperation with municipalities and farmers upstream (pillar III), etc.



PARIS

Amec Foster Wheeler maps and characterises areas of flood expansion and wetlands in the Seine watershed

A partner of the 100RC city solutions platform, this English engineering and consultancy firm, conducted a study commissioned by the City of Paris, on behalf of the EPTB Seine Grands Lacs (Public Territorial Institute of the Seine Basin). The study evaluates the potential to recreate the original riverbed of the Seine, with the threefold objective of mitigating the effects of drought and low flows, limiting floods, and improving the water quality.



The City is developing with the river

The pedestrianisation of the road running along the right bank of the River Seine, the call for projects on “Reinventing the Seine”, the plan to make the Seine swimmable for the 2024 Olympic Games, the future Rain and Biodiversity Plan, are all interventions that aim to restore the City’s relationship with its river and its environment, and to adapt it to climate change. At the same time, the City of Paris is continuing its efforts to manage risks from flooding. Beyond the new infrastructure and the permanent monitoring of water levels, the City is engaging with stakeholders and participating in the programme of actions and prevention of floods (PAPI) of the Seine and Marne Francilienne. In 2016, the European SEQUANA exercise brought together all stakeholders to experience a flood simulation, for the first time.



The Seine resilience challenge

The Seine is an infinite resource for Paris and its metropolitan area, but also represents three priority challenges: drought and risks related to low water, poor water quality, and flood management. For the latter, it is necessary to anticipate the impacts of a major flooding of the Seine and to identify the systems, infrastructure and services to be rebuilt if such an event were to occur. The City of Paris has defined technical, social and governance challenges to prepare for this reconstruction by bringing together network operators, state services, urban planners and architects.



Henri Garat/Mairie de Paris



Conclusion

Embedding resilience in behaviours and norms is a challenge for the future. The City of Paris will pursue the efforts initiated as part of the partnership with the 100 Resilient Cities network, to enhance resilience at its scale.

A single agenda now guides cross-cutting policies for a sustainable, connected, inclusive, supportive and resilient city that meets the challenges of the 21st century. Paris is committed to dedicating 10% of its annual budget towards resilience-building activities and investments. The first step has been accomplished. This new approach will enable the administration to innovate and adapt professional practices to the needs of the territory. Implementing this strategy will entail regular meetings with partners, citizens and economic leaders.

Paris will continue its international exchanges with 100 Resilient Cities and will lead networks of cities that share similar resilience challenges: cities hosting refugees and migrants, confronting terror threats, and fighting the local impacts of climate change and air pollution. Through this continued knowledge exchange, Paris hopes to work with other like-minded cities on co-designing resilient urban solutions.

The resilient approach will also capture the **2024 Olympic and Paralympic Games** in Paris as an opportunity for the development of education through sports, weaving a material and symbolic community to renew processes and to build on solidarity between Paris and its suburbs, thereby creating a resilient metropolitan area.

The holistic and integrated approach to resilience is a new way of policy-making. Far from being a rigid planning document prescribing actions for the coming decades, this strategy proposes a path and identifies first steps that must be re-examined to constantly learn, innovate, recover and prepare for the risks that now determine human relations and links between societies and their environment.

“The Haussmann Revolution” of the Second Empire propelled Paris into a completely new era through the lasting changes it made in various areas: urbanism, transport, mobility, infrastructure, networks, equipment, parks, street furniture, etc. It especially sought to address major stresses, such as congestion and squalor, and was, in part, considered an effective, sustainable, “integrated and holistic” vision. However it did not adequately consider the **social challenges stemming from such a transformation.**

To face the new stresses and risks facing the city today, Paris and its metropolitan area require a revolution of the same magnitude, **a shift in the way of thinking about the future and managing the territory, to provide its citizens with a better quality of life, protection against hazards, and positive prospects for the future.** This is what the resilient approach proposes.



Jean-Baptiste Gurliat/Maire de Paris

Appendices



Our partners

Some of the organisations involved in the strategy development process

Public bodies / Institutions



Networks



Businesses



Associations



Research stakeholders



Technical Experts





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Glossary

Nudge

The physical, social, and psychological aspects of the environment that influence and in which our choices take place – in ways that promote a more preferred behaviour rather than obstruct it. Nudging offers policy makers an effective way to influence citizens' behaviour without further restricting freedom of choice, imposing mandatory obligations, or introducing new taxations, or tax reliefs. It is particularly interesting to use these methods when designing public facilities and public spaces.

Tactical Urbanism

A term used to describe a collection of low-cost, temporary changes to the built environment, usually in cities, intended to improve local neighbourhoods and city gathering places. Tactical Urbanism is also commonly referred to as guerrilla urbanism, pop-up urbanism, city repair.

Temporary Urbanism

The notion that urban spaces do not need to remain void when undergoing a transition on their usage. Through temporary urbanism, actions such as pop up parks, housing art exhibitions, cafe may keep the place under transition as an asset for the urban space instead of a burden.

Modularity

Design approach that subdivides a system into smaller parts called modules or skids, that can be independently created and then used in different systems. A modular system can be characterised by functional partitioning into discrete scalable, reusable modules; rigorous use of well-defined modular interfaces, etc. It is a tool for flexibility and ingenuity, two criteria of a resilient system.

Reversibility

The ability to revisit what we have done - for instance, to make urbanised spaces more natural, and to integrate this capacity into the architectural and urban production themselves.

Commons

Movement to explore alternative approaches to the governance of cities as means of altering the way citizens and administrations perceive, and manage shared urban territories and spaces. It works by creating new or alternative /collaborative arrangements between city administrators, citizens, and private property owners.

Living Labs

A user-centred, open-innovation ecosystem, often operating in a territorial context (e.g. city, neighbourhood), integrating concurrent research and innovation processes within a public-private-people partnership.

Build Back Better

Aligned with the notion of recovery as the restoration and improvement of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.



Acronyms

City of Paris

AEU (DEVE): Agence d'Écologie Urbaine - Urban Ecology Agency

AM (DVD): Agence de la Mobilité - Mobility Agency

BSPP: Brigade de Sapeurs-Pompiers de Paris - Paris Fire Brigade

CASVP: Centre d'Action Sociale de la Ville de Paris - Department of Social Welfare

DAC: Direction des Affaires Culturelles - Department of Cultural Affairs ("Mission Cinema" - Paris Film Office)

DAE: Direction de l'Attractivité et de l'Emploi - Department of Economic Development and Employment

DAJ: Direction des Affaires Juridiques - Department of Legal Affairs

DASCO: Direction des Affaires Scolaires - Department of School Affairs

DASES: Direction de l'Action Sociale, de l'Enfance et de la Santé - Department of Health, Family and Social Services

D CPA: Direction des Constructions Publiques et de l'Architecture - Department of Architecture and Public Works

DDCT: Direction de la Démocratie, des Citoyens et des Territoires - Office for Local Democracy / Relations with District Councils

DEVE: Direction des Espaces Verts et de l'Environnement - Department of Environmental Protection and Public Spaces

DFA: Direction des Finances et des Achats - Department of Finance and Public Procurement

DFPE: Direction des Familles et de la Petite Enfance - Department of Early Childhood and Family Services

DGPR: Direction Générale de la Prévention des Risques - Department of Risks Prevention

DICOM: Direction de l'Information et de la Communication - Department of Communication

DILT: Direction de l'Immobilier, de la Logistique et des Transports - Department of Buildings, Logistics and Transport

DJS: Direction de la Jeunesse et des Sports - Department of Sports and Youth

DLH: Direction du Logement et de l'Habitat - Department of Housing

DPA: Direction du Patrimoine et de l'Architecture - Department of Heritage and Architecture

DPE: Direction de la Propreté et de l'Eau - Department of Waste and Water Management

DPSP: Direction de la Prévention, de la Sécurité et de

la Protection - Department of Security and Emergency Management

DRH: Direction des Ressources Humaines - Department of Human Resources

DSTI: Direction des Systèmes et Technologies de l'Information - Department of Information Technology and Telecommunications

DU: Direction de l'Urbanisme - Department of City Planning

DVD: Direction de la Voirie et des Déplacements - Department of Road Works and Mobility

IG: Inspection Generale - Auditing Department

MIVID: Mission Ville Intelligente et Durable - Office for a Smart and Sustainable City

SG: Secrétariat Général - General Secretariat oversees and coordinates City Departments to implement the policies of the Mayor and of its Deputy Mayors, in collaboration with the 20 town halls of the Paris arrondissements (districts).

SGVP: Secrétariat Général de la Ville de Paris - Paris City General Secretariat

Other Acronyms

100RC: 100 Resilient Cities

AESN: Agence de l'Eau Seine-Normandie - Seine-Normandy Water Agency

AFPCN: Association Française de Prévention des Catastrophes Naturelles - French Association for Natural Disaster Prevention

AMO: Assistance à Maitrise d'Ouvrage - Project Management

AMRF: Association des Maires Ruraux de France - Association of Rural Mayors of France

ANSSI: Agence Nationale de la Sécurité des Systèmes d'Information - National Agency for the Security of Information Systems and Technologies

APC: Agence Parisienne du Climat - Paris Climate Agency

AP-HP: Assistance Publique - Hôpitaux de Paris - Public Health - Paris Hospitals

APUR: Atelier Parisien d'Urbanisme - Office of Urban Design

AQC: Agence de Qualité Construction - Construction Quality Agency

ARS: Agence Régionale de Santé - Regional Health Agency

CEREMA: Centre d'Études et d'Expertise sur les Risques, l'Environnement, la Mobilité et l'Aménagement - Centre for Risks, Environment, Mobility and Urban Planning Studies

CERT: Community Emergency Response Team

CPCU: Compagnie Parisienne de Chauffage Urbain - Parisian District Heating Company

CRO: Chief Resilience Officer

DRIEE: Direction Régionale et Interdépartementale de l'Environnement et de l'Énergie - Regional and Cross-Departmental Environment and Energy Agency

EIS: Evaluation d'Impacts sur la Santé - Health Impacts Assessment

EIVP: Ecole des Ingénieurs de la Ville de Paris - Paris City School of Engineering

ENPC: Ecole Nationale des Ponts et Chaussées - National Civil Engineering School

EPTB: Etablissement Territorial de Bassin - Public Territorial Institute of the Seine Basin

ERN: European River Network

GDP: Gross Domestic Product

GEMAPI: Gestion des Milieux Aquatiques et Prévention des Inondations - Management of Aquatic Environments and Flood Prevention

GUAPO: Global Urban Air Pollution Observatory

HAND: Hackers Against Natural Disasters

IAU: Institut d'Aménagement et d'Urbanisme de la région - Regional Urban Planning and Development Institute

IDF: Région Ile-de-France - Ile-de-France Region

IGC: Inspection Générale des Carrières - General Institute of Quarries

IRC: International Rescue Committee

IVD: Institut pour la Ville Durable - Sustainable City Institute

JOP: Jeux Olympiques & Paralympiques - Olympic & Paralympic Games

MGP: Métropole du Grand Paris - Greater Paris Metropolis

MOOC: Massive Open Online Course

MRN: Mission Risques Naturels - Natural Risks Bureau

NGO: Non Governmental Organisation

OECD: Organisation for Economic Co-operation and Development

PAPI: Programme d'Actions de Prévention des Inondations - Flood Prevention Actions Programme

PAGES: Plan d'Amélioration de la Qualité des Eaux de la Seine - Seine Waters Quality Improvement Plan

PBA: Paris Batignolles Aménagement - Paris Batignolles Development Corporation

PCA: Plan de Continuité d'Activité - Business Continuity Plan

PCAEM: Plan Climat-Air-Énergie Métropolitain - Metropolitan Climate-Air-Energy Plan

PCAET: Plan Climat Air Énergie Territorial - Regional Climate-Air-Energy Plan

PIA: Programme d'Investissement d'Avenir - Future Investment Programme

PMHH: Plan Métropolitain de l'Habitat et de l'Hébergement - Metropolitan Habitat and Shelter Plan

PP: Préfecture de Police - Police Department

PPCI: Plan de Prévention Contre les Inondations - Flood Prevention Plan

PPRI: Plan de Prévention des Risques Inondations - Flood Risks Prevention Plan

RATP: Régie Autonome des Transports Parisiens - Paris Transport Agency

SAGE: Schéma d'Aménagement et de Gestion des Eaux - Development and Water Management Plan

SCOT: Schéma de Cohérence Territoriale - Territorial Coherence Plan

SEMAEST: Société d'Economie Mixte d'Aménagement de l'Est parisien - East Paris Development Agency

SEMAPA: Société d'Étude, de Maîtrise d'Ouvrage et d'Aménagement Parisienne - Paris Study, Project Management and Development Agency

SFSE: Société Française de Santé et Environnement - French Society for Health and Environment

SGL: Société de Gestion Locative - Letting Management Company

SIAAP: Syndicat Interdépartemental pour l'Assainissement de l'Agglomération Parisienne - Cross-Departmental Union for Paris Wastewater Treatment

SNCF: Société Nationale des Chemins de Fer - National Railways Agency

SPSE: Service Parisien de Santé Environnementale - Paris Environmental Health Services

THD: Très Haut Dèbit - Broadband

UPEM: Université Paris Est Marne la Vallée - Paris East Marne la Vallée University

WHO: World Health Organisation

ZAC: Zone d'Aménagement Concertée - Concerted Development Area

ZCR: Zone à Circulation Restreinte - Restricted Vehicle Zone

ZDS: Zone de Défense et de Sécurité - Defense and Security Zone



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resilience@paris.fr

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