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RESILIENT PITTSBURGH

PITTSBURGH'S RESILIENCE STRATEGY

Together We Move Forward As One Pittsburgh

▪ 2017 ▪

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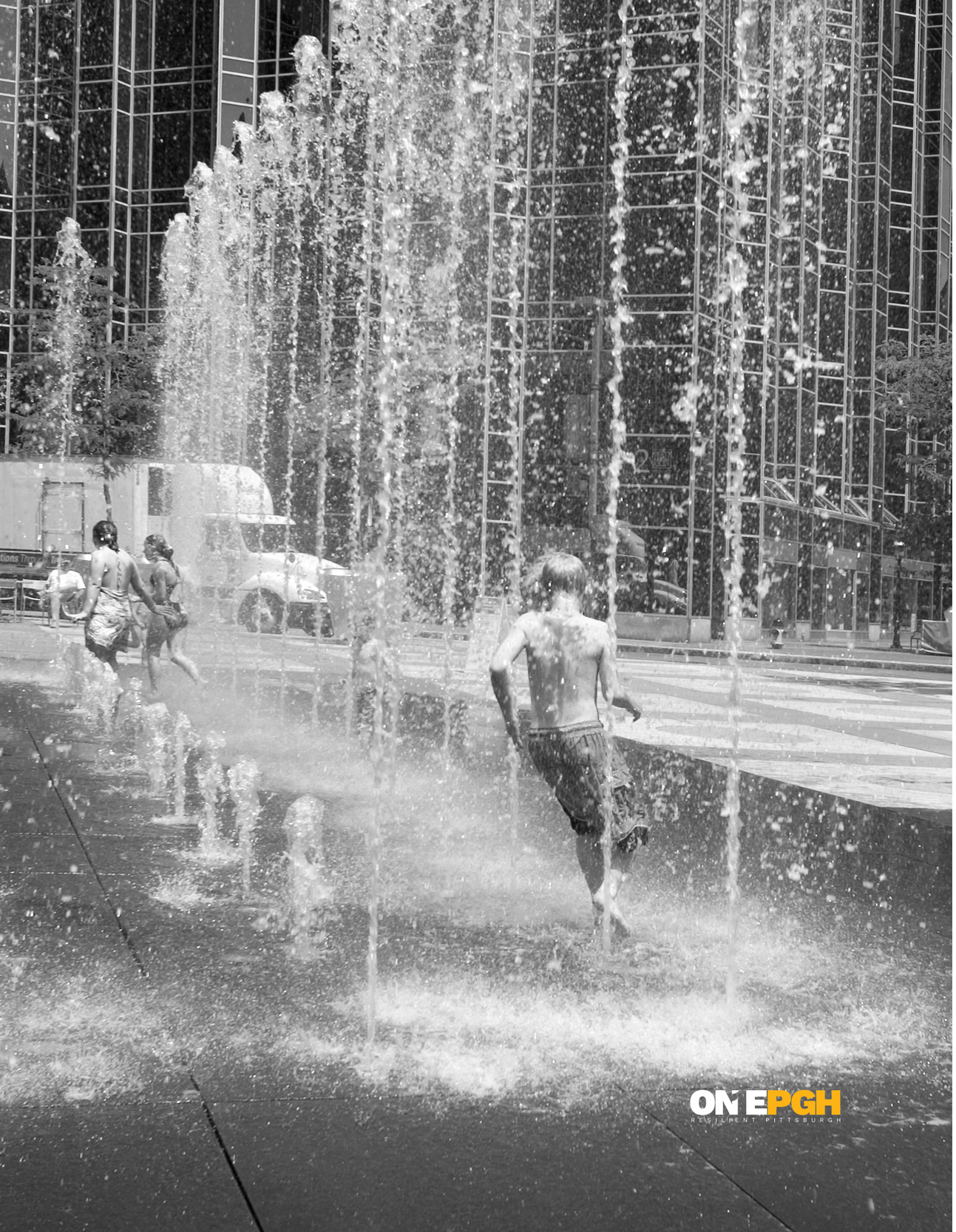


VISION FOR A RESILIENT PITTSBURGH

Pittsburgh will be a resilient city when the entire community shares the same opportunities for prosperity, and when all residents are well cared for and prepared to face potential risks and adversities. The Pittsburgh resilience strategy establishes a bold vision for the city, building on the successes in recent decades and a wealth of community assets, while directly confronting the complex challenges that the city continues to face.

Resilience is a holistic approach to urban systems management that demonstrates interrelationships between sectors. The resilience strategy is intended as a guide for city plans and initiatives to achieve maximum community impact by addressing the root causes of systemic challenges. The strategy will help Pittsburgh realize the central purpose of a thriving city in the 21st century: to create conditions in which every resident can flourish in the face of challenges and every community can effectively respond and recover in any circumstance.

By fostering a regional atmosphere of collaborative problem solving and resource coordination, the strategy will build on collective efforts and establish a guide for activities that need initiation, coordination, acceleration and amplification. Pittsburgh will thrive in the 21st century as a city of engaged, empowered and coordinated neighbors.

Citizens of Pittsburgh,

Resilience is a journey. Cities recognize this statement better than most. Cities exist at the center of the ebb and flow of human progress, and as such have the ability to encourage innovation and great societal benefit. Along our journeys, cities confront the inevitable challenges that disrupt our thoughtful, predetermined courses and have the ability to respond to opportunities that seemingly arise out of nowhere. It is important to recognize that both opportunities and disruptions offer the greatest occasion for administrators and elected officials to capitalize, create benefit and chart new and positive trajectories for their communities.

For Pittsburgh, the current chapter of our resilience journey begins with the acknowledgment of our recent past. A reverence to our scars, it is within our history that we find lessons from which we can learn, and set a course that allows us to improve and drive towards a stronger, albeit uncertain future.

The City of Pittsburgh and our residents are familiar with the resilience journey. Pittsburgh's history is filled with the peaks of success and the valleys of disappointment. The picture of Pittsburgh is a checkered range marked with impairments such as air and water pollution, labor and racial unrest and economic boom and bust; alongside numerous industrial innovations, advances in science and education and a rich cultural tradition. It is with this recognition of our past that we look forward towards our future. It is this understanding of history that is at the root of our partnership with 100 Resilient Cities, and why we have taken on the challenge of creating Pittsburgh's first resilience strategy.

Today, Pittsburgh finds itself in a pivotal moment in history. The challenges of globalization, our ever changing environment, and urbanization - once the causes of many of the City's shocks and stresses, are now initiating a shift for the City; from managing population and economic decline to encouraging us to manage growth and prosperity. Amid a time of positive momentum, we recognize that now is the perfect moment in time to chart the course for Pittsburgh's next generation. All Pittsburghers have not benefited from the current momentum, and with this in mind, let me state that a resilient community must be one that provides inclusive, sustainable and welcoming opportunities for all its residents.

Building resilience is a process. Its requires recognition of our challenges, and the ability to heal physical and mental wounds, to create adaptive policies, and to restructure investment decisions. To lead this process, our strategy is built with the belief that with the right tools, the ability to empower our people, and the acknowledgment that the City of Pittsburgh will continuously improve - we will all come together as neighbors to find solutions to our common problems.

We recognize that one of the shortcomings in our past was that we walked separately, along differing paths. Today, we have the opportunity to walk with intent and purpose as a community towards a brighter future. We, the City government, are at the helm of this plan - but we are not at the center. At the core of this strategy are the residents, the people of the City of Pittsburgh.

Today, together, we move forward as one Pittsburgh.

Sincerely,

William Peduto
Mayor, City of Pittsburgh

Dear Pittsburgh,

On behalf of the entire 100 Resilient Cities team, I want to congratulate the City of Pittsburgh on the release of ONE PGH: Pittsburgh's Resilience Strategy, a major milestone for the city and for our partnership. ONE PGH lays out an exemplary vision of urban resilience for the city's residents, neighborhoods, and the region. As the city's post-industrial resurgence continues, this Resilience Strategy provides a comprehensive path toward realizing a vision of an inclusive and innovative city where "if it's not for all, it's not for us."

The Steel City's success is proof that post-industrial demise is not a permanent condition. After capturing the world's imagination in the late 19th and first half of the 20th century – in 1911, the city was producing half of all American steel -- the city devolved into a cautionary tale, with steel mills and related industries shuttering, and the effects of heavy industry taking their toll on the environment. Along with its industrial base, the immense amount of resources that the Fricks, Carnegies, and Mellons invested to create world class educational and cultural institutions also faded. But after losing 40% of its population between 1970 and 2006, Pittsburgh is growing again, this time at the forefront of a rustbelt revival that is anchored in a broad variety of new industries spanning technology, finance, higher education, and advanced manufacturing. But, as this strategy acknowledges, not all in Pittsburgh have felt this rebirth equally.

The actions outlined within ONE PGH will strengthen Pittsburgh not just in the face of the sudden shocks that will confront cities throughout the 21st Century, but also the chronic stresses that challenge the city over the longer term, and that exacerbate the effects of those shocks when they do occur. That is the power of resilience solutions: single interventions designed to achieve multiple benefits.

The support of City leadership has been critical toward the formation of this Strategy. Mayor Bill Peduto has helped promote resilience as a cornerstone for collaborative action across the city and region, in both the public and private sectors, and has championed the message of an open, resurgent, and globally connected Pittsburgh throughout our network. We thank the Mayor and his team for their commitment. With Strategy Partner RAND Corporation, and their valuable expertise, the Resilient Pittsburgh team has led a robust, community-driven process that reached far and wide, reflecting the full spectrum of Pittsburgh's voices and concerns.

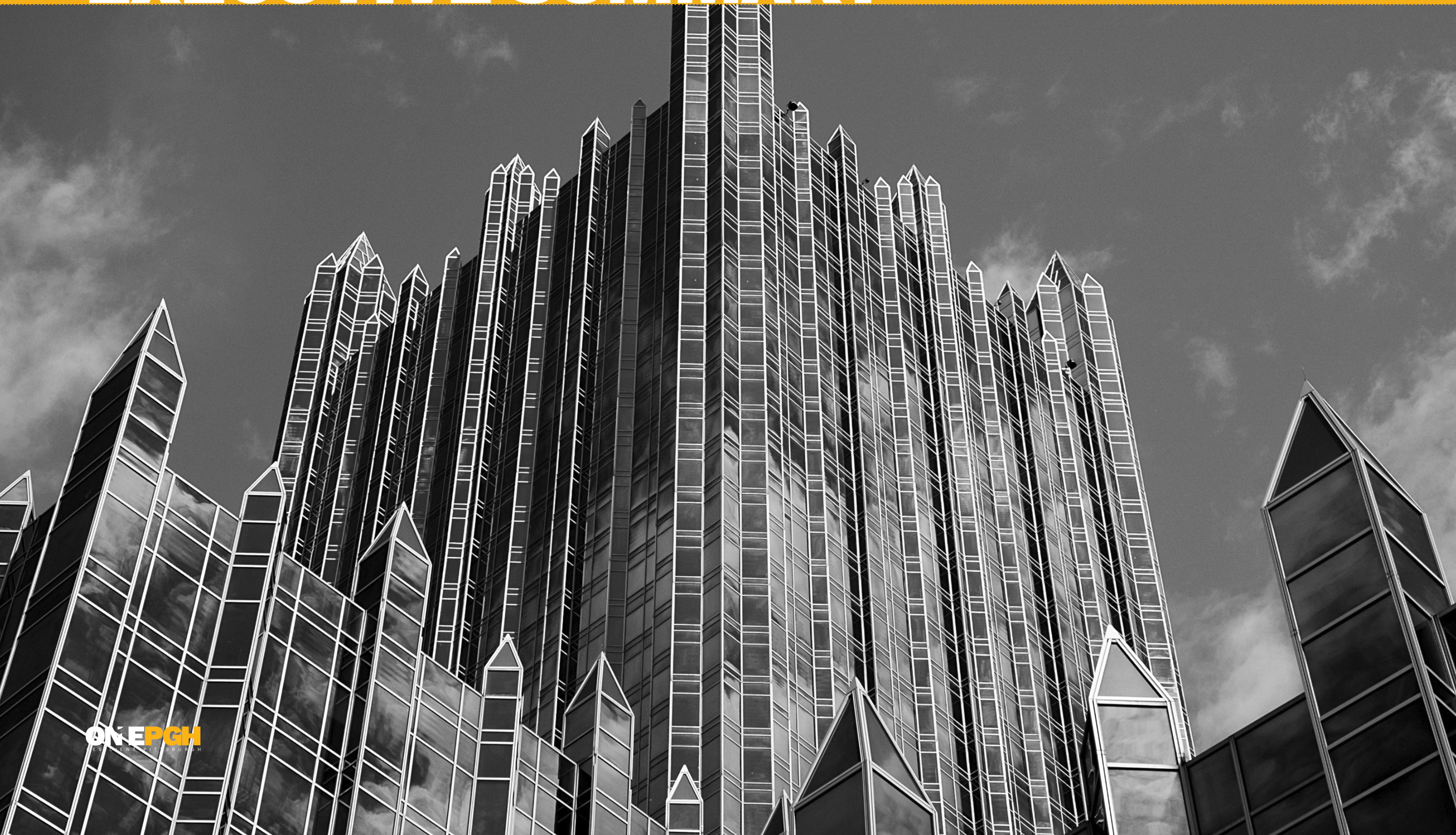
As our partnership moves into implementation, it does so with a major advantage – the city's groundbreaking planning initiative, p4 Pittsburgh. Launched in 2015, p4 provides a framework for unified action across the city to achieve a just and sustainable future. Its ethos of collaboration and communal reach will deepen the impact of the Strategy, and contribute to the shared goal of a "world class city that benefits all."

Pittsburgh has already shown its ability to recover and adapt to the new challenges of the 21st Century and we are excited for the continued course of resilience this Strategy charts.

Congratulations again on this enormous achievement, and we look forward to our continued partnership in the journey ahead.

Michael Berkowitz
President, 100 Resilient Cities

EXECUTIVE SUMMARY



CITY CONTEXT

The City of Pittsburgh celebrated its 200th anniversary in 2016 as a city on the rise. The grit and ingenuity of generations of Pittsburghers has helped the city rebound after fires, floods, and the collapse of the steel industry in the mid-20th century. After losing 40 percent of its population between 1970 and 2006, Pittsburgh is growing again. The number of millennials and recent college graduates in the city, for example, went up by more than eight percent over the past decade. Today, Pittsburgh faces lower natural disaster risk and is less exposed to another economic shock than many other cities due to its location, natural resources, and diversified economy. Investments in higher education, workforce retraining, startups and small businesses, and the redevelopment and remediation of a thousand acres of former industrial sites have drawn attention to Pittsburgh as one of America's most livable cities.

WHY A RESILIENCE STRATEGY FOR PITTSBURGH?

Despite its well-publicized recent successes, the "Steel City" must still overcome the stresses associated with its industrial legacy and crumbling infrastructure, while responding to ongoing pressures stemming from urbanization, globalization, and climate change. Persistent socioeconomic inequities, coupled with a history of fragmented governance, planning and service delivery, continue to undercut resident quality of life and strain city resources.

Public, private, and non-profit organizations have made significant investments in building a more livable Pittsburgh, cleaning up the city's industrial legacy, and creating new economic and residential opportunities. A number of strategic initiatives have been initiated in recent years to address resilience-related goals, including p4, the Roadmap for Inclusive Innovation, Welcoming Pittsburgh, Climate Action Plan, My Brother's Keeper, a Threat and Hazard Identification and Risk Assessment, and the Western Pennsylvania Regional Data Center (WPRDC). These collective efforts are helping to transform the city's narrative from a story of loss and decline to one of resilience and opportunity, but have not yet been aligned or coordinated to ensure successful implementation or improved and sustainable outcomes for residents' wellbeing. This strategy will strengthen collaborations and support the integration of the practice of urban resilience among the people and the institutions of the city.

> The Resilience Strategy will afford long-term benefits by ensuring:
> - **Improved coordination** among government and non-government organizations
> - **Better budgeting** and **capital coordination** city-wide
> - **Adoption of resilience practices** in government, institutions, organizations, neighborhoods, etc.
> - Increased **resident engagement and empowerment**

The present time represents an important crossroads for the city. Pittsburgh seeks to capitalize on its recovery with sustainable growth, but needs to avoid repeating the mistakes of the past. The way forward demands thoughtful planning, close coordination, and integration between and among government and nongovernmental partners to ensure that the city grows equitably and sustainably. The city also must recognize the needs and value of its long-term residents while welcoming and supporting newcomers.

Capitalizing on Pittsburgh's assets—its universities; wealth of parks, rivers, and streams; robust philanthropic sector; highly collaborative spirit; new economic drivers; visionary and capable non-profits; and resident enthusiasm and activity—Resilient Pittsburgh and its partners developed a comprehensive strategy to address these opportunities and challenges. Pittsburgh applied and was selected to become one of 100 Resilient Cities – Pioneered by The Rockefeller Foundation (100RC) in December 2014. 100RC helps cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of the 21st century. 100RC defines resilience as the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.

HOW THE STRATEGY WAS DEVELOPED

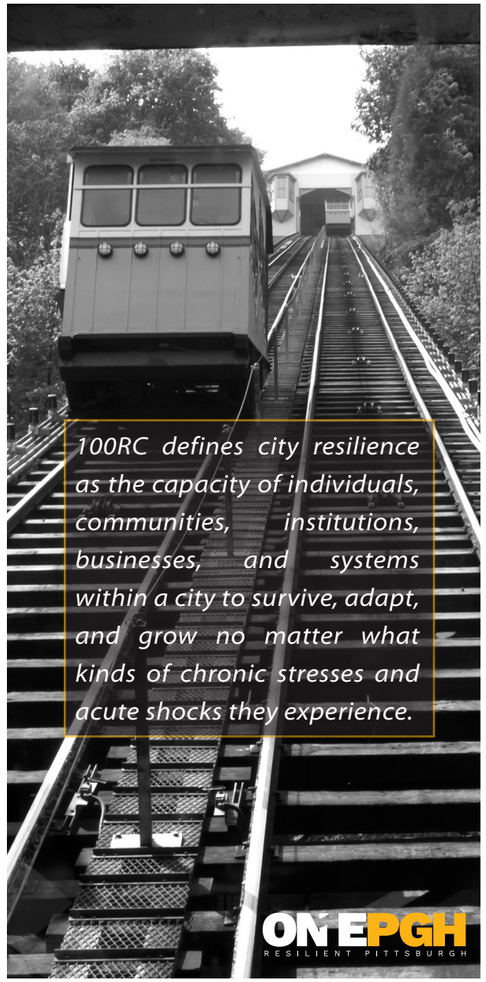
The 100RC City Resilience Strategy process includes three phases. Phase 1 involved stakeholder engagement and data collection activities to understand the current state of the city's resilience, resulting in a Preliminary Resilience Assessment. Phase 2 entailed in-depth research on themes identified in Phase 1, additional stakeholder engagement; brainstorming of the goals, objectives, and actions that comprise the resilience framework; and prioritization and synthesis work, culminating in this resilience strategy. Phase 3, implementation, will follow release of the strategy. This process was led by the Resilient Pittsburgh team, comprised of the city's Chief Resilience Officer (CRO) Grant Ervin and the City Resilience team in the Division of Sustainability and Resilience, the RAND Corporation as a strategy partner, and 100RC as the funder and collaborator. It has also involved the contributions of over 600 Pittsburghers since June 2015.

This document describes Pittsburgh's resilience strategy. The strategy is intended to acknowledge and address the city's recent challenges and trends proactively, applying lessons from the past and from other partnering cities to forge a stronger future for the city and region. Because the city of Pittsburgh is the beneficiary of funding from 100RC, the strategy will often refer to "Pittsburgh" or "the city" in a leadership capacity. However, ***the vision of a resilient Pittsburgh extends beyond the city borders, and recommendations in this strategy aim to help the entire Pittsburgh metropolitan region move toward a model of greater collaboration in order to support planning and convey benefits to the region more broadly.***

PITTSBURGH'S RESILIENCE CHALLENGES

The threats to Pittsburgh's resilience form a constellation of risks, including both ***chronic stresses***—long-term, slow burning issues that overwhelm the capacity of city resources and erode resident wellbeing—and potential ***acute shocks***—sudden, large-scale disasters that disrupt city services and threaten residents from extreme weather.

While the city's inland geography protects its residents from many of the natural hazards that are expected to occur more frequently in coastal regions, the city's endemic stresses disproportionately affect some of its most vulnerable residents and represent its core resilience challenges. Specifically, Pittsburgh faces significant challenges with social, racial, and economic inequities that have persisted for decades, which have led to unequal access to housing, transportation, employment, and services. Other key stresses affecting vulnerable Pittsburghers include aging infrastructure and poor air and water quality. Concerns about affordability have also emerged as the city redevelops, and an aging population and workforce continue to threaten the economic stability of the region. Simultaneously, fragmentation of effort among non-profits and local governments in the region hinders efforts to address these challenges. Moreover, acute shocks, some predicted to become more likely as a result of climate change, pose threats to the city. Potential future shocks include extreme weather, flooding, landslides, and extreme temperatures, among other concerns identified during strategy development.



PITTSBURGH'S RESILIENCE FRAMEWORK

The Pittsburgh resilience strategy consists of a holistic set of goals, objectives, and actions that tackle some of the region's major resilience challenges and help the city build the capacity to successfully confront future threats. The goals of Pittsburgh resilience framework purposefully align with the four "p"s of the p4 framework, already adopted by partners across the city to inspire innovative, sustainable, and inclusive action. The resilience framework then builds upon p4 to create a holistic, community-centered approach and to describe the specific ways in which different sectors will work collectively to make Pittsburgh a resilient city in terms of its People, Place, Planet, and Performance.

PEOPLE

Pittsburgh will empower all residents to contribute to thriving and supportive communities by ensuring that basic needs are met. We will be an inclusive city of innovation that celebrates our diversity, and all residents will have equal access to resources and opportunity.

PLACE

Pittsburgh will use land to benefit all residents; to increase social cohesion, connectivity, public and ecological health; and to protect against current and future risks. We will design, scale, and maintain our infrastructure for current and future needs, providing benefits and services to our neighborhoods during times of calm and crisis.

PLANET

Pittsburgh will achieve long-term environmental health through wise stewardship, improved use of our resources, and a reduced carbon footprint.

PERFORMANCE

Pittsburgh will work closely with neighbors and partners for improved planning and decision-making.

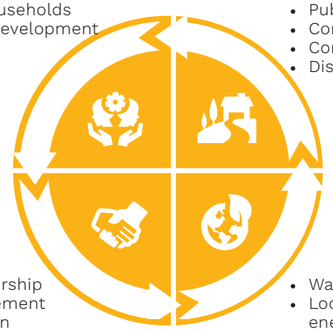
Each of these four goals is supported by a series of sector-specific objective. While each objective typically focuses on a specific topic area within each goal, the objectives are also designed to work across stresses and shocks to produce a "resilience dividend" – that is, multiple benefits for resilience from a single activity.

This strategy identifies both existing and new actions related to resilience, connects these actions to relevant resilience goals and objectives, and identifies next steps to ensure that these actions can be implemented successfully to yield improved outcomes for residents. Detail on Pittsburgh's resilience actions can be found in Appendix A.

Figure 1: p4 and Pittsburgh's resilience objectives

- Housing
- Health
- Food
- Safety
- Education
- Emergency preparedness
- Resilient households
- Workforce development
- Diversity

- Transportation
- Recapitalized infrastructure
- Mixed uses
- Vacant land
- Green space
- Public space
- Communications
- Commercial transport
- Disaster reliability



- Entrepreneurship
- Civic engagement
- Collaboration
- Measurement

- Water
- Local and renewable energy
- Resource efficiency
- Natural infrastructure
- Resilient design

STRATEGY IMPLEMENTATION

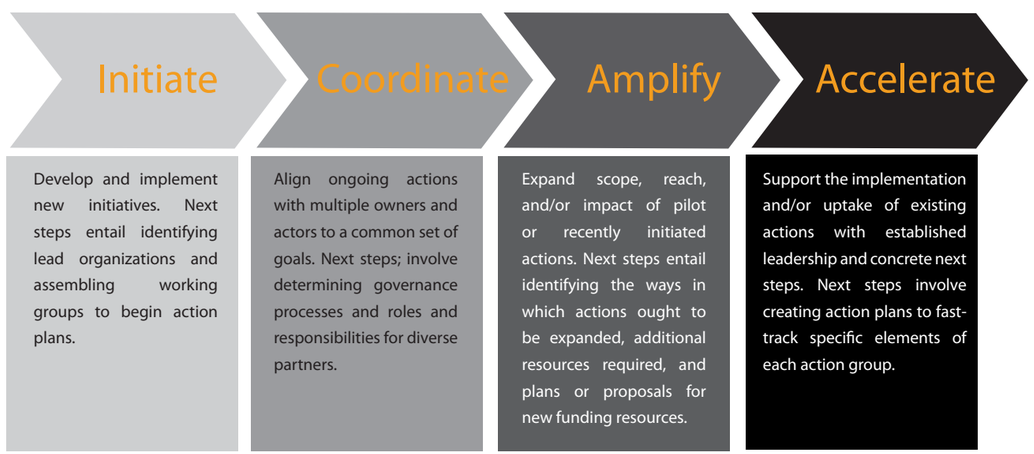
The Pittsburgh resilience strategy requires a comprehensive implementation plan to support uptake, integration, and long-term sustainability. The Division of Sustainability and Resilience, as a part of the Department of City Planning in collaboration with the Mayor's Office, will serve as the lead office for strategy implementation and will support a series of implementation steps through the next year to facilitate the effective rollout and adoption of the strategy across sectors and stakeholders. The immediate next steps for strategy implementation in year one include:

1. Convene action leadership groups
2. Establish a governance and institutionalization framework
3. Establish a measurement framework
4. Integrate resilience-building into civic engagement and public events.

The new and existing actions featured in this strategy are the activities to be implemented in order for Pittsburgh to achieve its resilience goals and objectives. Addressing the goals of Pittsburgh's resilience strategy requires not only the initiation of some new actions, but also better coordination, amplification, and acceleration of promising existing government and nongovernmental activities and initiatives to create a resilient and livable city of innovation for all. Figure 2 shows an example of how existing and new activities fall along a taxonomy of implementation.

Additional efforts are needed to support implementation over the long term. These include coordination among government and nongovernmental sectors, resource allocation and a cohesive investment framework, community awareness and ongoing education, and targeted partner building. Ongoing measurement and regular analysis and use of the data collected will also be central to implementation.

Figure 2. Taxonomy for implementing resilience actions with select examples



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INTRODUCTION

The City of Pittsburgh celebrated its 200th anniversary in 2016. The grit and ingenuity of generations of Pittsburghers has helped the city rebound after fires, floods, and the collapse of the steel industry in the mid-20th century. After losing 40 percent of its population between 1970 and 2006, Pittsburgh is growing again. Today, Pittsburgh faces lower natural disaster risk and is less exposed to another economic shock than many other cities due to its location, natural resources, and diversified economy. Investments in higher education, workforce retraining, startups and small businesses, and the redevelopment and remediation of a thousand acres of former industrial sites have drawn attention to Pittsburgh as one of America's most livable cities. The city is home to 378 Leadership in Energy & Environmental Design (LEED) certified projects and two "living buildings."[4] Pittsburgh was named the number one food city in America by Zagat in 2015, and 2,800 new hotel rooms have been added in the city since 2011.[5]

However, the "Steel City" must still overcome the stresses associated with its industrial legacy and crumbling infrastructure while responding to ongoing pressures stemming from the global mega-trends of urbanization, globalization, and climate change. Persistent socioeconomic inequities, coupled with a history of fragmented governance, planning and service delivery, continue to undercut resident quality of life and strain city resources.

To build upon the city's strengths and to improve its resilience, Pittsburgh applied and was selected to become one of 100 Resilient Cities– Pioneered by the Rockefeller Foundation (100RC) in December 2014. 100RC helps cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of the 21st century. 100RC defines resilience as the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.

Becoming part of 100RC has provided Pittsburgh with funding for a Chief Resilience Officer (CRO) to lead resilience efforts and a team to support him (Resilient Pittsburgh); resources for developing this resilience strategy; membership in a global partnership network of peer cities to share lessons learned; and access to a city solutions network, which provides member cities with access to a curated suite of resilience-building tools and services. The 100RC network also allows the city to share Pittsburgh's story and learn from the community of cities around the world. The Resilient Pittsburgh team sees this as an important opportunity to harness community energy and realize the potential of Pittsburgh's residents and institutions to create positive and lasting long-term change.

PURPOSE OF THE STRATEGY

Pittsburgh has already demonstrated marked resilience in recent decades after recovering from the steel industry's collapse. But this story remains unfinished: the city's livability and affordability are not broadly shared among residents, and ongoing stresses and acute shocks continue to strain city resources. In 2016, for example, the city suffered a series of new shocks. In August, flash flooding put Washington Boulevard, a main thoroughfare in the city's East End where flooding became fatal in 2011, underwater again. Routine maintenance caused a fire which closed the Liberty Bridge, a critical transportation link between the City of Pittsburgh and the South Hills suburbs, for multiple weeks in September. Consumer alerts from PWSA in the summer of 2016 exposed elevated lead levels in Pittsburgh's drinking water. These events put a spotlight on the continued challenges the city faces.

The resilience strategy serves as a blueprint to better prepare the city for these kinds of inevitable challenges. It is intended to help Pittsburghers work together to address the deeply rooted structural, social, economic, and environmental stresses that threaten the progress of the city and its residents. This strategy will strengthen collaborations and support the integration of the practice of urban resilience among the people and the institutions of the city. It will afford long-term benefits by ensuring:

- Improved coordination among government and non-government organizations
- Better budgeting and capital coordination city-wide
- Adoption of resilience practices in government, institutions, organizations, neighborhoods, etc.
- Increased resident engagement and empowerment

City resilience is the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.

The resilience strategy describes a high-level framework to understand resilience in Pittsburgh, relates existing and new programs and investments to this framework, and provides a pathway to evaluating the long-term resilience value of government and nongovernmental actions. It is also intended to serve as an "investment prospectus" for the city by showing where gaps exist and where new investment could yield the greatest benefits and co-benefits for all city residents. Building on the Mayor's vision, the Resilient Pittsburgh team asserts that Pittsburgh will be a resilient city when the entire community shares in the same opportunities for prosperity and all residents are equally well cared for and prepared to face potential risks.

PITTSBURGH'S CITY CONTEXT

Pittsburgh is a mid-sized American city with a current population of just over 300,000[6] and is the principal city of Allegheny County, Pennsylvania, which is home to over 1.2 million residents.[7] The broader ten-county metropolitan region includes 2.57 million residents, making it the 22nd largest metropolitan area in the United States.[7,8]

DEEP CONNECTION TO NEIGHBORHOOD & PLACE

Pittsburgh's 90 unique neighborhoods are places that people care about. Pittsburghers have a strong sense of identity within the neighborhoods where they live or grew up. This connection is not limited to a physical place, but includes a shared emotional connection with the people and experiences created in that neighborhood. Within neighborhoods, there is a sense of pride and willingness to collaborate that is shared from generation to generation.

Pittsburgh's geography is defined by hills, waterways, and bridges (Figure 3). The city is famously located at the confluence of the Allegheny and Monongahela Rivers (and their tributaries), which converge just outside of downtown to form the Ohio River. Over 2,000 miles of streams and 90 miles of rivers flow through Allegheny County (Figure 4).[15] Transportation routes generally follow the paths of rivers and streams, but the city is also home to some of the steepest streets and roads in the country, which connect different communities. These features contribute to a unique and beautiful cityscape but also divide the city into isolated geographic "pockets."

Western Pennsylvania includes a wealth of natural infrastructure, including forests, waterways, and other habitats sustained by Pittsburgh's relatively wet climate. The city and Allegheny County manage over 15,000 acres of parks or urban forest, providing a green landscape and recreational opportunities for residents and visitors. Active conservation by city and county park organizations has expanded and improved these amenities in recent years. The city and local nonprofits support urban agriculture and local food systems, including a number of community gardens and strategic uses of vacant land.

Figure 3: Topographic map of Pittsburgh

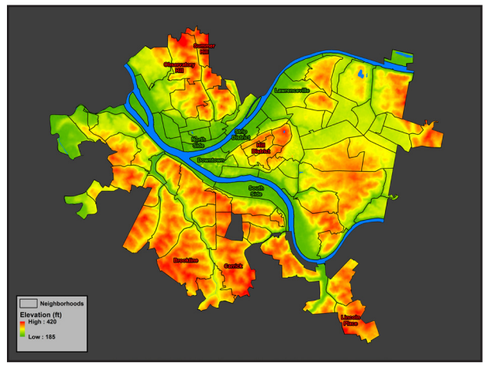


Figure notes: This topographic map of Pittsburgh shows areas of high elevation in red, notably the Hill District, Brookline, Carrick, Lincoln Place, Observatory Hill, and Summer Hill, and low elevation in green, notably most of Pittsburgh's Northside, Southside, Downtown, the Strip District, and Lawrenceville. Source: United States Geological Survey, 2000.[16]

Figure 4. Map of Allegheny County municipalities and hydrology

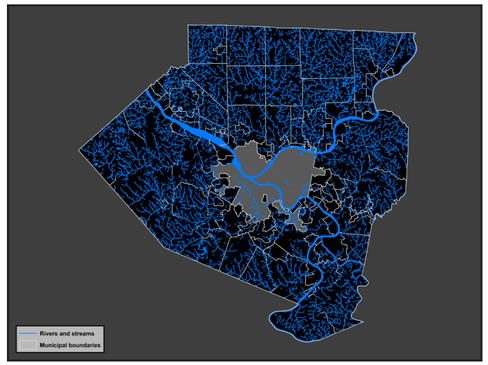
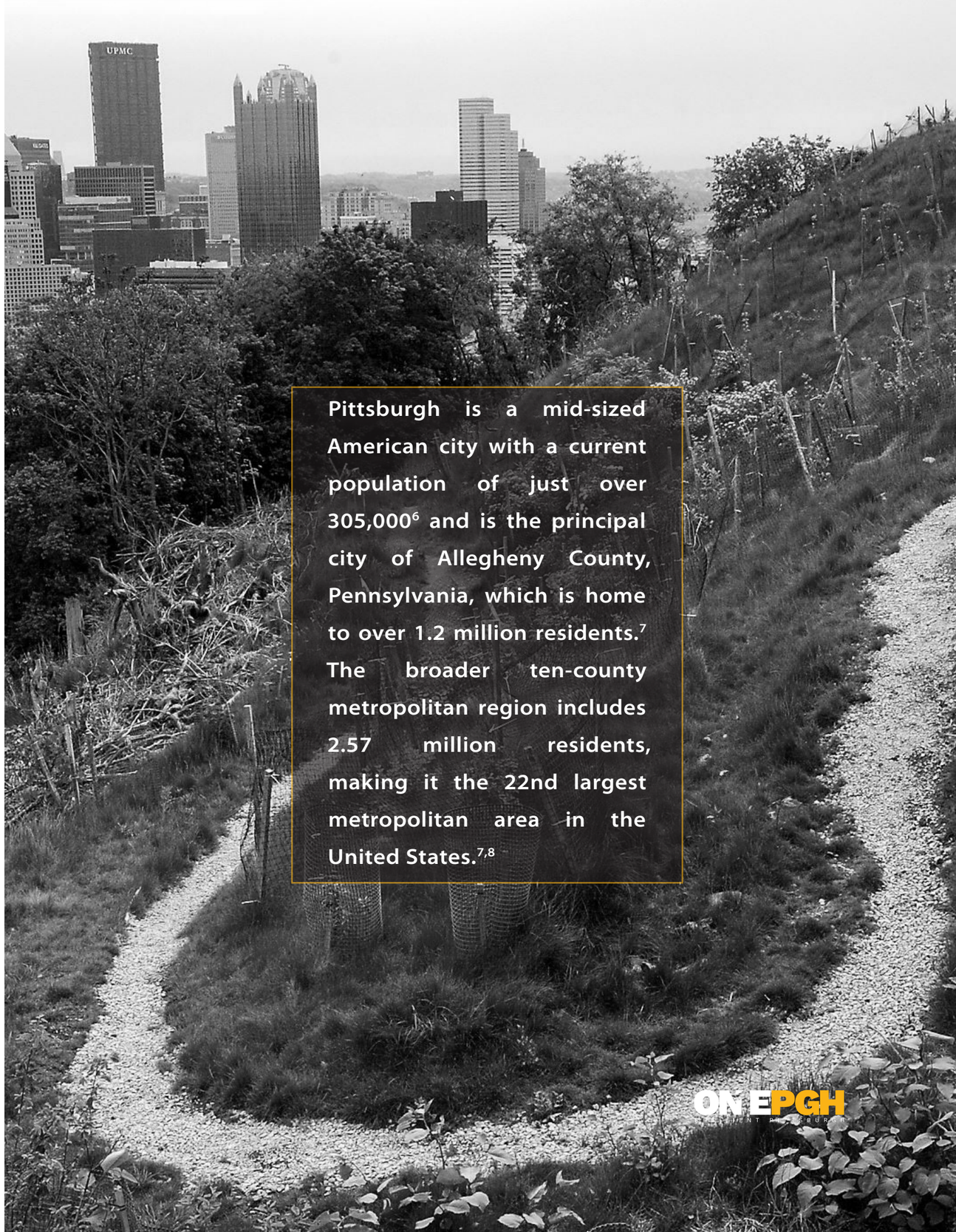


Figure notes: This map shows the network of rivers and streams that flows throughout Allegheny County. Note the lack of streams within the City of Pittsburgh, a result of piping most of the natural streamflow that once occurred within the city limits. Source: City of Pittsburgh, 2016.[17]



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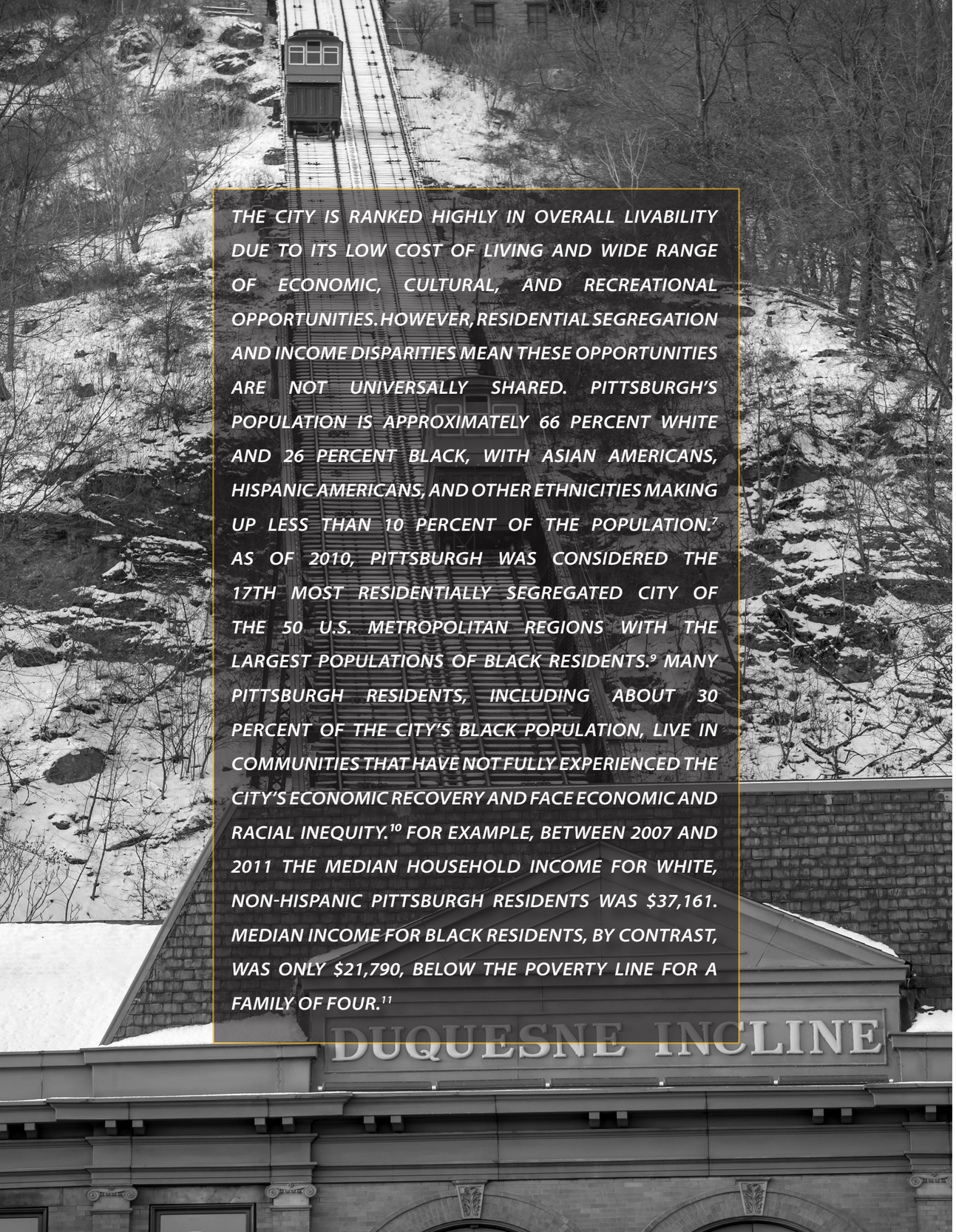


THE CITY IS RANKED HIGHLY IN OVERALL LIVABILITY DUE TO ITS LOW COST OF LIVING AND WIDE RANGE OF ECONOMIC, CULTURAL, AND RECREATIONAL OPPORTUNITIES. HOWEVER, RESIDENTIAL SEGREGATION AND INCOME DISPARITIES MEAN THESE OPPORTUNITIES ARE NOT UNIVERSALLY SHARED. PITTSBURGH'S POPULATION IS APPROXIMATELY 66 PERCENT WHITE AND 26 PERCENT BLACK, WITH ASIAN AMERICANS, HISPANIC AMERICANS, AND OTHER ETHNICITIES MAKING UP LESS THAN 10 PERCENT OF THE POPULATION.[7] AS OF 2010, PITTSBURGH WAS CONSIDERED THE 17TH MOST RESIDENTIALLY SEGREGATED CITY OF THE 50 U.S. METROPOLITAN REGIONS WITH THE LARGEST POPULATIONS OF BLACK RESIDENTS.[9] MANY PITTSBURGH RESIDENTS, INCLUDING ABOUT 30 PERCENT OF THE CITY'S BLACK POPULATION, LIVE IN COMMUNITIES THAT HAVE NOT FULLY EXPERIENCED THE CITY'S ECONOMIC RECOVERY AND FACE ECONOMIC AND RACIAL INEQUITY.[10] FOR EXAMPLE, BETWEEN 2007 AND 2011 THE MEDIAN HOUSEHOLD INCOME FOR WHITE, NON-HISPANIC PITTSBURGH RESIDENTS WAS $37,161. MEDIAN INCOME FOR BLACK RESIDENTS, BY CONTRAST, WAS ONLY $21,790, BELOW THE POVERTY LINE FOR A FAMILY OF FOUR.[11]

The city's and the region's populations have both skewed older in recent decades. The proportion of elderly residents (age 65 and older) in Allegheny County was 16.7 percent in 2010, compared with 13 percent for the nation as a whole.[12] This proportion is projected to grow to 21 percent by 2040, mirroring national demographic trends.[12] However, Pittsburgh is also experiencing a resurgence of young people moving to the city or remaining after graduating from one of its colleges and universities: In the past decade, there has been a 29-percent increase in young graduates choosing to remain in the city.[13]

Pittsburgh's narrative has been characterized by dramatic shifts in population size, industry viability, and economic development. Known as the "Gateway to the West" in its early days as a frontier village, Pittsburgh's location at the convergence of the Allegheny, Monongahela and Ohio Rivers provided ideal access for shipping materials and the region's abundant natural resources by river and rail. The city's population and industrial power rose in the late 19th and early 20th century during the Industrial Era.

Figure 6: Pittsburgh Population, 1950-2015

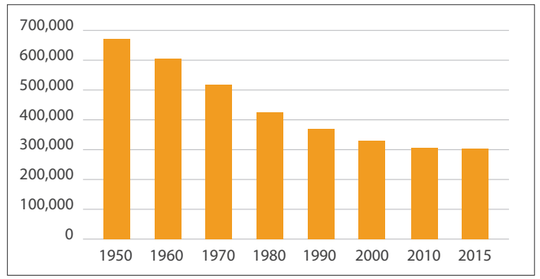


Figure notes: Historical population of Pittsburgh, 1950-2015, Source: U.S. Census Bureau

The steel and industrial boom produced investments in the city's physical infrastructure and educational and cultural institutions, led by industrialists and financiers such as Andrew Carnegie, Andrew Mellon, and Henry Clay Frick who built their fortunes in Pittsburgh. While heavy industry, coal mining, and steel production provided jobs, prominence, and money to the region, they also took a toll on city residents and the natural environment, leading to severe air and water pollution, acid mine drainage, and polluted soils. By the 1940s, Pittsburgh was critical in producing steel, ammunition and battleships for the war effort.

Pittsburgh's post WWII peak was followed by major economic changes, including the collapse of the domestic steel industry in the 1970s and 80s, the recession of 1982-83, and suburban flight, which all led to the out-migration of much of the population. By 2000, the city's population had halved along with its tax base, while the amount of infrastructure requiring maintenance remained the same.

As the population shrank, the City struggled to maintain quality of life for its residents. In the 1990s, the City and County formed the Regional Asset District, a 1% county-wide sales tax to fund cultural institutions, recreational facilities and libraries. City government-owned assets such as the National Aviary, Phipps Conservatory and the Pittsburgh Zoo and Aquarium then became nonprofit organizations that received RAD funding [18]. During this time, Pittsburgh Water and Sewer Authority was formed for bonding capacity. In 2003, the City laid off 446 full and part time employees, and in 2004 petitioned the Commonwealth to be designated as distressed according to the criteria of Act 47, and subject to Commonwealth oversight. Pittsburgh's credit rating was given junk bond status.[19]

The decentralization of assets and lack of capacity for service delivery at the city government led to the rise of philanthropy and the nonprofit sector to fill the voids and maintain quality of life for Pittsburghers. Today, as the City government rebounds, fragmentation between organizations and government challenges the efficiency of providing services to city residents, while years of deferred maintenance of the city's oversized infrastructure is emerging from a major stress into a cascade of shocks.

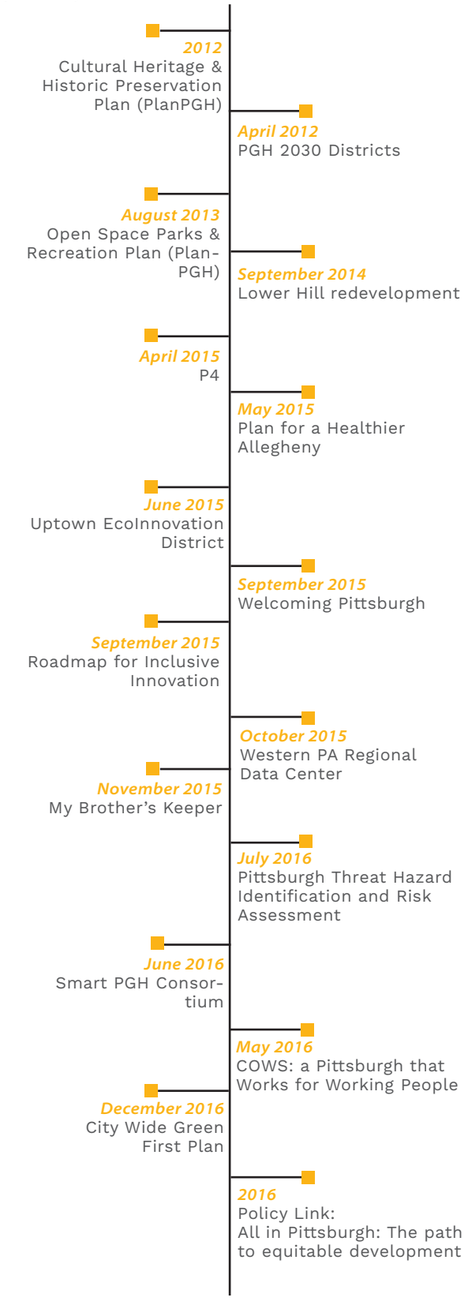
TODAY, THERE IS RENEWED INTEREST IN PITTSBURGH AS A PLACE TO LIVE AND WORK DUE TO THE LOW COST OF LIVING[20], AVAILABILITY OF CULTURAL AMENITIES, AND OPPORTUNITIES FOR ECONOMIC DEVELOPMENT AND DIVERSIFICATION. PITTSBURGH IS HOME TO 13 DEGREE-GRANTING INSTITUTIONS, THREE MODERN SPORTS ARENAS, AND TWO OF THE COUNTRY'S LARGEST BANKS. THE CITY'S ECONOMY HAS A NUMBER OF POSITIVE DRIVERS, AND ITS CURRENT KEY INDUSTRIES INCLUDE HIGHER EDUCATION, TECHNOLOGY AND ADVANCED MANUFACTURING, HEALTHCARE, FINANCIAL SERVICES, AND ENERGY PRODUCTION. A STRONG LOCAL FOOD SCENE, BURGEONING STARTUP CULTURE, AND GROWING "MAKER MOVEMENT" ARE STARTING TO ATTRACT ENTREPRENEURS TO THE AREA. AUTONOMOUS VEHICLES ARE BEING TESTED AND DEVELOPED, PUTTING THE CITY AT THE FOREFRONT OF TRANSPORTATION INNOVATION. WHILE PITTSBURGH IS STILL A CONSIDERED A "DISTRESSED MUNICIPALITY" IN TERMS OF CITY FINANCES, SINCE 2012 THE CITY HAS BEEN ABLE TO BORROW AGAIN TO INVEST IN CAPITAL IMPROVEMENTS. AVERAGE UNEMPLOYMENT HOVERS AROUND 8 PERCENT TODAY, DOWN FROM 18 PERCENT IN 1983.

At the same time, however, rising housing prices in Pittsburgh's traditionally mixed-income neighborhoods, concerns that the new tech-based economic growth may not provide broad-based opportunities, and a recognition that Pittsburgh's close neighbors (its inner-ring suburbs) have largely not rebounded from the collapse of the steel industry have raised questions about who is benefiting from Pittsburgh's transformation. Recent analyses ranked Pittsburgh in the bottom quarter of the top 100 regions nationwide in terms of progress on racial economic inclusion, as defined by racial gaps in wages, poverty, and employment.[21]

Upgrades and maintenance of the city's infrastructure and some of its institutions have also not been keeping pace with the rapidly changing environment.[22] Moreover, local venture capital investment will not fully meet the needs of growth-stage companies started in the city, and many of the city's most successful knowledge-based companies have sought support from outside of the city to grow their businesses.[23]

The present time represents an important crossroads for the city. Pittsburgh seeks to capitalize on its recovery with sustainable growth, but needs to avoid repeating the mistakes of the past. The way forward demands thoughtful planning, close coordination, and integration between and among government and nongovernmental partners to ensure that the city grows equitably and sustainably. The city also must recognize the needs and value of its long-term residents while welcoming and supporting newcomers. A number of strategic initiatives have been initiated in recent years to address resilience-related goals (Figure 7). These include, for example, changes to city operations, p4, the Roadmap for Inclusive Innovation, Welcoming Pittsburgh, a Climate Action Plan, My Brother's Keeper, the City's Comprehensive Plan, a Threat and Hazard Identification and Risk Assessment, and the Western Pennsylvania Regional Data Center (WPRDC). These collective efforts are helping to transform the city's narrative from a story of loss and decline to one of resilience and opportunity but have not yet been aligned or coordinated to ensure successful implementation or improved and sustainable outcomes for residents' wellbeing.

FIGURE 7: Resilience related efforts in Pittsburgh over the past five years



STAKEHOLDER ENGAGEMENT

The Resilient Pittsburgh team is comprised of the city's CRO Grant Ervin, the City Resilience team in the Division of Sustainability and Resilience, the RAND Corporation as the strategy partner, and 100RC. The team developed this strategy by researching the challenges facing Pittsburgh, gathering input from a wide range of stakeholders, convening residents for deliberative community forums using the Deliberative Democracy process (see pg. 79 for more information), and connecting with other members of the 100RC network. From June 2015 through January 2017, more than 600 Pittsburghers were engaged to support the strategy development.

PHASE I

June 2015
Initial workshop with focus groups concentrating on: Academic, Civic, Business, Philanthropy, Neighborhoods & Regional

November 2015
Deliberative Community Forums with 150 participants

October 2015
City/Stakeholders Workshop

January 2016
Steering Committee

The Preliminary Resilience Assessment (PRA)
Phase 1 strategy development process, including more detail on Pittsburgh's shocks, stresses, and assets.

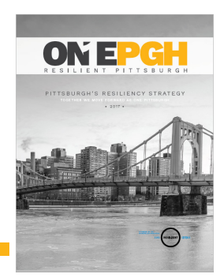
PHASE II

May 2016
Discovery Area Workshops:

July - October 2016
In-depth research activities

July-August 2016
Systems Performance Workshops

November 2016
Steering Committee Review



Resilience Strategy
Pittsburgh's vision for the future; A resilient Pittsburgh

PITTSBURGH'S RESILIENCE CHALLENGES:

STRESSES & SHOCKS

The threats to Pittsburgh's resilience form a constellation of risks, including chronic stresses related to water management, air quality, equal opportunity, and aging infrastructure and potential acute shocks from extreme weather due to climate change, another economic collapse, or infrastructure failure (Figure 8). More detail on Pittsburgh's resilience challenges can be found in the PRA, available for download from the city's website.

***Chronic stresses** are long-term, slow burning issues that overwhelm the capacity of city resources and erode resident wellbeing.*

***Acute shocks** are sudden, large-scale disasters that disrupt city services and threaten residents*

Figure 8. Pittsburgh's key stresses and shocks

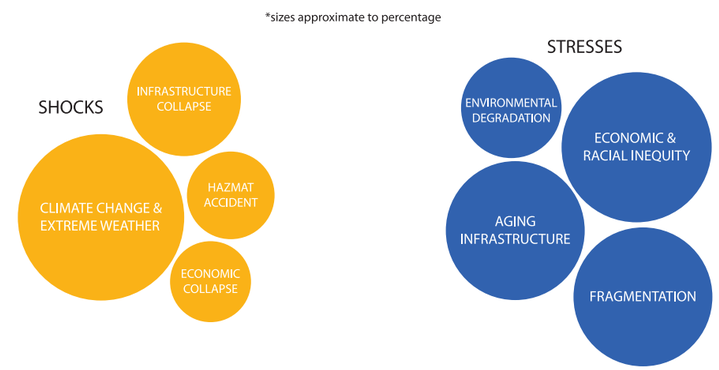


Figure notes: This diagram shows the priority shocks and stresses identified for Pittsburgh during strategy development. The size of the bubbles correspond to the relative importance placed on the shock or stress by stakeholders in a workshop exercise.

Figure 9. Relationship between stresses, shocks, and their impacts

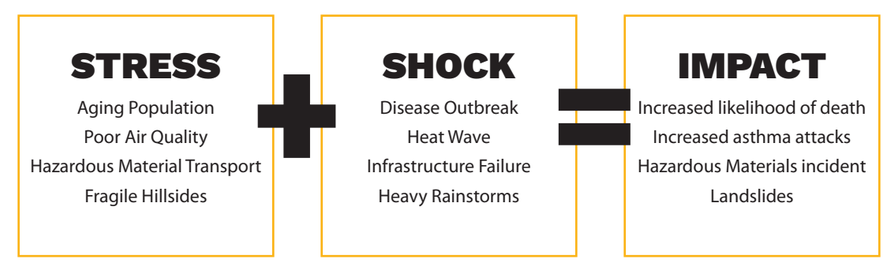


Figure notes: This figure illustrates the potential impact of ongoing chronic stresses coupled with a potential future shock, showing the interrelationships between shocks and stresses.

ENDEMIC STRESSES THAT IMPACT PITTSBURGHERS

Segregated and inequitable schools, neighborhoods, and labor markets

High rates of violence, poor health, poverty, blight, and an education system facing significant achievement gaps continue to affect many of Pittsburgh's communities, particularly populations of color and residents of low-income neighborhoods. As of 2010, Pittsburgh was considered the 17th most residentially segregated city of the 50 U.S. metropolitan regions with the largest populations of black residents,[9] a remnant of redlining policies from the mid-20th century, which limited the ability of Pittsburghers of color to get mortgages in certain neighborhoods (Figure 10). While Pittsburgh today is gaining recognition for its quality of life and livability, not all of the city's neighborhoods are sharing in the same prosperity. Some communities are negatively impacted by the city's development, as housing prices rise and employment growth among historically disadvantaged populations remains relatively stagnant. Historical and structural racial discrimination is evident in Pittsburgh's neighborhood segregation and economic inequities continue to play a role in influencing the quality of life of many of Pittsburgh's residents of color (Figure 10).

Figure 10. Historical "redlining" in Pittsburgh's neighborhoods

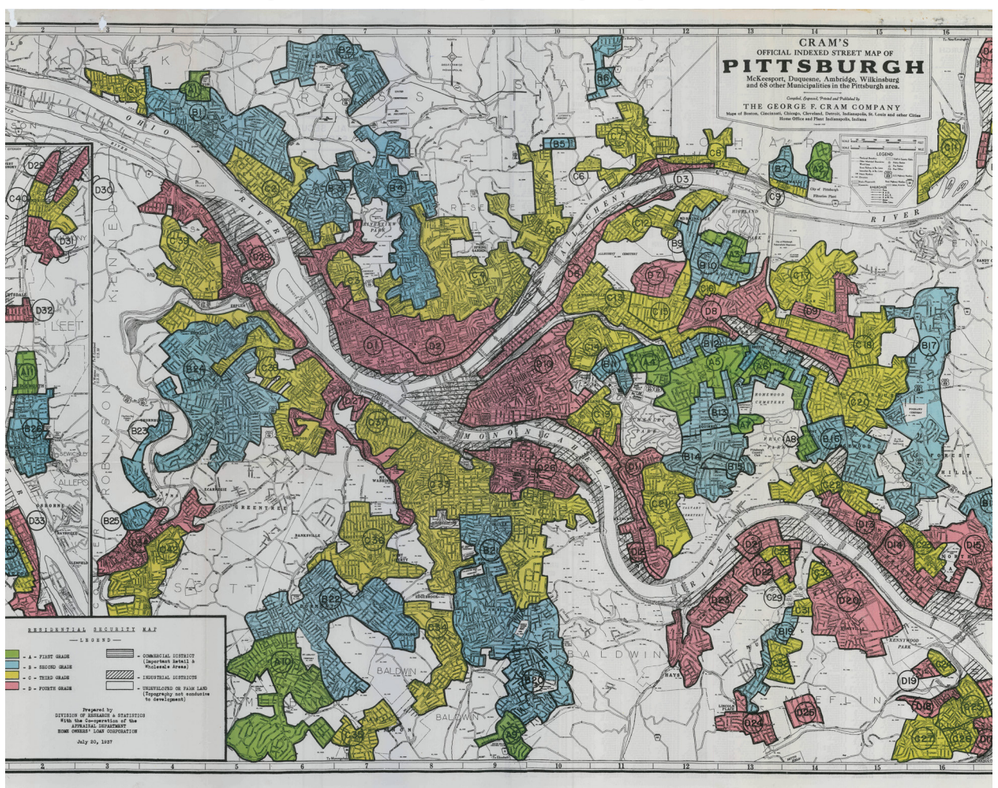


Figure notes: This historical map shows the areas where "redlining" occurred in Pittsburgh in the early 20th century. The demographic makeup of the city in 2017 is largely still reflective of policies that limited the areas in which populations of color were able to purchase homes. Source: Winling, Urban Oasis Digital HOLC Maps.[28]

Figure 11. Inequity in Pittsburgh: a snapshot

Employment and poverty:

- Unemployment rates show racial patterns, with black men having an unemployment rate of **12.2%** compared to **5.1%** for white men.[27]
- **55%** of black girls in Pittsburgh live in poverty.[29]

Education:

- In 2014, only **37%** of black PPS 3rd to 8th graders were reading-proficient compared to **45%** of black students of the same age statewide, **71%** of white PPS students, and **77%** of white students statewide.[30]
- Black girls are **3X** more likely to be suspended from school than white girls.[29]

Health:

- Black Pittsburghers face **higher rates** of exposure to air toxins, smoking rates, hospitalization due to asthma, and infant mortality rates than do white Pittsburghers.[31]
- Predominantly black neighborhoods **lacking access** to full-service grocery stores, farmers' markets, or other sources of healthy food options include Homewood, Lincoln-Lemington-Belmar, and Beechview.[32]

Affordable housing

- Between 2000 and 2014, housing prices in Allegheny County increased **59%**.[33]
- Between 2000 and 2014 housing prices in Lawrenceville increased **369%**.[33]

Safety and justice:

- Homicide data from 2010 to 2015[34] showed **94** homicides in five majority-black areas of the city compared to **0** homicides in the majority-white neighborhoods just across the street (Penn Avenue, running through Pittsburgh's East End).
- Black Pittsburghers were more than **3x** as likely as residents of other races to report being a victim of a crime.[34]
- In 2014, blacks constituted **56%** of all arrests in Pittsburgh, although they make up only **26.1%** of the population.[7,35]

Transportation:

- About **1/4** of Pittsburgh residents do not own a car.[38]
- The average Pittsburgher spends **42%** of his or her annual income on housing and transportation,[37] which is at the upper limit of what the U.S. Department of Transportation has deemed to be "affordable" for housing and transportation.[38]

Fragmentation across governments and non-profits

Fragmentation challenges local governance and the ability to address endemic stresses facing Pittsburghers. The City of Pittsburgh alone includes 90 neighborhoods, while Allegheny County has 130 municipalities, and the ten-county metropolitan region includes over 900 government units. Each municipality has independent responsibility for managing infrastructure and administering many local services, making it far more difficult for the city to plan and collaborate with the diverse and plentiful local political entities. Concurrently, the City of Pittsburgh is home to over 3,100 non-profit organizations, many with overlapping missions, and often competing for the same resources. Finally, ongoing planning efforts related to climate action, inclusive economic development, stormwater management and other priorities abound in the city, demanding intentional integration in order to capitalize on the opportunity for co-benefits.

Industrial legacy

Like many other Midwestern cities, Pittsburgh's population and built infrastructure are both aging. Economic hardship in the late 20th century led to deferred maintenance of roads, bridges, and water and sewer management systems. As jobs left the city, Pittsburgh's population started to shrink and baby boomers that remained began to age as the city struggled to retain young people for its workforce. Pittsburgh's industrial past also led to a series of air, water, and soil quality issues that plague the city to this day.

Aging population and workforce

The proportion of elderly residents (age 65 and older) in Allegheny County was 16.7 percent in 2010, compared with 13 percent for the nation as a whole. This proportion is projected to grow to 21 percent by 2040, mirroring national demographic trends.[12] An aging population poses challenges in terms of city and regional services, workforce maintenance and growth, and provision of healthcare and public health services.

The proportion of baby boomers nearing retirement is especially large in Pittsburgh, where 1.2 million workers will need to be hired or up-skilled over the next 10 years. Some of Pittsburgh's key industries will likely be hit by retirements, including energy, manufacturing, and utilities service delivery; these changes open opportunities for new jobs as traditional industries evolve or disappear. And while Pittsburgh has historically struggled to keep graduates of its universities in the area, over the last decade, there has been a 29-percent increase in young graduates choosing to remain in the city.[13]

Aging infrastructure

Much of Pittsburgh's infrastructure, including transportation networks, water and sewer management systems, and housing stock, was constructed during the population boom of the early-mid 20th century (Figure 17). Select neighborhoods in the city have benefited from redevelopment over the past few decades, but deferred repairs and upgrades in many communities have left a capital burden that currently strains city and county resources. For example, Allegheny County's sanitary sewer system, which services the city and 82 neighboring communities, is aging, poorly maintained, and inadequately sized to capture and treat stormwater during the region's frequent wet weather events. Pittsburgh Water and Sewer Authority's (PWSA) drinking water system is similarly strained, and loses at least one quarter of water treated at its single treatment plant to pipe leaks or bursts.[38] And concerns are mounting about aging and corroding pipes releasing lead into drinking water.

Moreover, modernization of Pittsburgh's energy and communications systems is required to help the city to achieve its goals of innovation and sustainability. The city relies on a large-scale, interconnected electricity distribution system. Temporary power outages are common in the city and are likely to increase as the energy grid is strained during extreme weather events. Aging infrastructure not only contributes to degradation in these networks but can also render the whole system vulnerable to widespread and cascading infrastructure failure.

Figure 12. Pittsburgh's aging infrastructure

Roads, bridges, locks, and dams:

- **5,147.4** square miles of roadway in the city[39]
- **1966** = average date of last construction or repair of bridge in the city[40]
- **16%** of the operational bridges in Pittsburgh are considered structurally deficient, and **22** of those **51** deemed "structurally deficient" are principal arterial connections.[40]
- Pittsburgh and the surrounding river system contain **23** locks and dams used to regulate water flow, transportation, and water supply to the city.[39]

Storm and wastewater management:

- **9 billion** gallons of combined stormwater and wastewater overflows yearly[41]
- ALCOSAN (the Allegheny County Sanitary Authority, which operates the only sewer treatment facility for Pittsburgh and 82 neighboring municipalities) is bound by an EPA consent decree to reduce combined sewer overflows by at least **85%**.[41]

Natural gas conveyance:

- A natural gas leak in the city's conveyance system occurs every **2 miles**.[42]

Housing and building stock:

- Most houses in Pittsburgh are over **60 years** old.[43]
- Renter-occupied properties approaching a median age of **65 years.**[43]

Electricity grid:

- During the polar vortex of 2014, a regional transmission operator lost **22%** of its capacity.[44]

Due to the age and condition of much of the City of Pittsburgh's infrastructure and with the potential strain placed on infrastructure due to extreme weather, the possibility of infrastructure failure is a growing concern. Because of the city's dynamic topography of hills, valleys, and waterways, for instance, any failure to a key road, tunnel, or bridge could immobilize residents, potentially isolating thousands of individuals until access is restored.

Environmental degradation: air, water, and soil

Pittsburgh's industrial past and aging infrastructure have led to air, water, and soil contamination. Pittsburgh still ranks among the top U.S. cities for worst air quality, and in wet weather, the combined sewer system overflows and spills raw sewage into the city's rivers. Much of the current air, water, and soil degradation stems from Pittsburgh's industrial legacy, when the sky was dark with smoke at noon.[45] In 2012, EPA categorized the region as an air quality non-attainment area, and Pittsburgh's air quality was 14th worst (24-hour PM2.5) in the country as of 2016.[46] This represents an improvement over recent years, though health and environmental impacts of poor air quality persist. New industries moving into the city and the surrounding area, including an ethane cracker plant and hydraulic fracturing operations, will have additional environmental impacts.

Inequity based on class

While racial inequity is especially pronounced in Pittsburgh, the city looks similar to many other Northeast or Midwestern cities in terms of inequities based on income. Lower-income Pittsburghers of any race or ethnicity tend to have less access to services, worse educational outcomes, and poorer health than their middle- and high-income counterparts. Prolonged disinvestment in Pittsburgh's inner-ring suburbs—particularly in the Monongahela Valley, where vacancy and crime are on the rise—could have spillover effects region-wide.[47]

Opioid crisis

Substance use disorders are becoming increasingly prevalent in Western Pennsylvania. Opioids are a class of drug often prescribed for pain, but recreational use of such drugs is often linked to substance use disorders, which are a contributing factor in its rising number of opioid overdose deaths. In 2014 and 2015, Pennsylvania—in particular,

Allegheny, Westmoreland, and Washington counties within Western Pennsylvania—experienced some of the highest overdose deaths per capita of any region of the country.[48] Many experts now characterize the opioid problem in Western Pennsylvania and across the United States as a public health emergency, partially predicated on the breakdown of social services, sense of isolation, and dislocation from the new economy observed broadly in communities across the region.

Gender-based inequity

Women in Pittsburgh struggle with pay inequity.[49] Pittsburgh also ranks 96th out of 100 metro areas in promoting women-owned businesses, and the city lags behind many other metro areas in growth of women-owned businesses. There has also recently been increased awareness of the ways in which racism and sexism impede the wellbeing, academic success, and positive development of Black girls and women in Pittsburgh, such as through higher poverty, school discipline, and exposure to violence.[28]

Invasive species

Pittsburgh's urban forest is one of its greatest assets: almost 40,000 trees were inventoried in the city—amounting 41 percent of the city having tree cover—which has been found to provide substantial ecosystem services to the city each year.[50-52] However, the region's tree canopy is susceptible to pests, invasive species, and other risk factors. An alarming 67 percent of the city's tree canopy is at risk of destruction by the Asian longhorned beetle. The emerald ash borer was first identified in Pittsburgh in 2007 and attacks all ash trees, which make up nine percent of the city's tree canopy. Other threats include fungus, disease, and invasive plant species. A decrease in tree canopy would not only reduce air and water quality and stormwater benefits, but destabilize hillsides as well.[51]

POTENTIAL SHOCKS IN AN UNCERTAIN FUTURE

While the stresses Pittsburgh experiences erode resident wellbeing on a day-to-day basis, the potential for future catastrophic events looms on the horizon. While Pittsburgh's geography protects it from a number of climate change impacts, the likelihood of severe weather and related shocks is expected to increase in the future.

Climate change and extreme weather

Pittsburgh confronts a variety of challenges from extreme weather, and most emerging evidence suggests that the risks will grow with climate change:

- **Precipitation and flooding:** Much of the city is adjacent to rivers and streams and their floodplains, and local weather patterns can produce a range of extreme precipitation events. Lack of capacity in the city's stormwater management system, combined with Pittsburgh's topography and changing weather patterns, have led to an increase in flash flooding in recent years. Such events have caused major disasters in the city's history, but climate change could make

extreme weather events in Pittsburgh either more frequent, more intense, or both.
- **Winter storms:** Large winter storms are relatively common in Pennsylvania and are expected to happen more frequently. Major winter storms occur an average of five times per year in Pennsylvania, and since 2003, Pittsburgh has experienced three major snowstorms which led to emergency declarations.[39] In the coming decades, the Northeastern United States is projected to experience a greater number of major winter storms, with an average precipitation increase of 5 to 20 percent.
- **Extreme temperatures:** Extreme hot and cold temperatures are expected to have a greater impact on the city in the future. Long and extended cold spells are common during winters in Pittsburgh. On the other hand, the climate is warming, and temperature fluctuations are increasing. Pittsburgh also experiences an "urban heat island effect," in which cities with more thermal mass tend to be 1 to 3 degrees warmer than surrounding rural areas.[53] Pittsburgh's aging population and housing infrastructure, including outdated heating and cooling systems, place residents at increased risk of negative health effects stemming from extreme temperatures.
- **Landslides and subsidence** incidents regularly affect parts of the city and may only get worse. The city and region have a long history of coal extraction and related erosion, putting many areas at risk for subsidence and sink holes in addition to the landslide risk to Pittsburgh's fragile hillsides. These risks are exacerbated by extreme weather events such as heavy rainfall. In fact, 900 structures within the city limits are considered to be in areas "very hazardous to landslides", and all of Allegheny County is classified as a "high incidence" area for landslides.[39,54] In recent years, landslides have occurred in the neighborhoods of Oakland, Greenfield, and Perry North. In 2014, wet weather caused a landslide on Mount Washington which covered 100 yards of rail lines, halting train traffic for 2 days.

Economic collapse

While Pittsburgh's economy is increasingly reliant on the healthcare, education, and technology sectors, these sectors are also experiencing rapid changes. Pittsburgh's "eds and meds" economy is in the spotlight as health care reform continues to be evaluated and increasing attention is paid to the cost of higher education. The volatility within these two drivers of Pittsburgh's economy creates concern about the risk of a significant economic collapse, not unlike that of the steel industry in the mid-20th century. Moreover, general economic trends of globalization, automation, and reliance on technology may pose additional challenges for Pittsburgh's key industries. However, these trends, if capitalized upon strategically, also have the potential to provide substantial economic opportunities given Pittsburgh's growing technology startup sector. Finally, the significant proportion of Pittsburgh residents employed by non-profits would also be negatively impacted by changes in government contracts, public or private grant making, or charitable giving precipitated by, or independent of, other economic shifts. Increased venture capital funding for new startups and support for owner-occupied small businesses in the city's neighborhoods would help to stave off negative impacts of major shifts in the city's key industries.

Hazardous materials incident

Hazardous materials, including oil and natural gas from the Marcellus and Utica shale formations, are transported directly through the City of Pittsburgh by road, rail, and barge multiple times per day, increasing the risk of an accident occurring within the city. Pittsburgh is a hub for a series of major transportation routes, including I-376, I-279, Route 28, Route 65, several rail lines, and the three rivers,[39] and an estimated 1.5 million people in Pennsylvania live in an area that could be affected by a train derailment resulting in a fire.[55]

PITTSBURGH'S RESILIENCE FRAMEWORK

The analysis of Pittsburgh's shocks and stresses, coupled with an extensive community engagement process (see Appendix B for methodology), informed the resilience goals and objectives that comprise Pittsburgh's resilience framework. This framework describes not only what a future resilient Pittsburgh will look like but also notes how specific sectors will play a role in addressing the chronic stresses facing the city and preparing for potential shocks.

Pittsburgh's resilience goals are aligned with the p4 values adopted by the City of Pittsburgh and partners to inspire innovative, inclusive, and sustainable urban development. The resilience framework adds specificity to p4, detailing specific objectives to be undertaken in order to meet Pittsburgh's resilience goals (Figure 14). The framework is holistic and community-centered, and acknowledges the integrated cross-sector activity that must also occur to achieve resilience. Resilience actions detail ongoing activities that provide resilience value because they address stresses and shocks as well as new actions that are needed to build a more resilient Pittsburgh.

PITTSBURGH'S RESILIENCE GOALS

PEOPLE

Pittsburgh will empower all residents to contribute to thriving and supportive communities by ensuring that basic needs are met. We will be an inclusive city of innovation that celebrates our diversity, and all residents will have equal access to resources and opportunity.

PLACE

Pittsburgh will use land to benefit all residents; to increase social cohesion, connectivity, public and ecological health; and to protect against current and future risks. We will design, scale, and maintain our infrastructure for current and future needs, providing benefits and services to our neighborhoods during times of calm and crisis.

PLANET

Pittsburgh will achieve long-term environmental health through wise stewardship, improved use of our resources, and a reduced carbon footprint.

PERFORMANCE

Pittsburgh will work closely with neighbors and partners for improved planning and decision-making.

Figure 14 shows the p4 framework with Pittsburgh's resilience objectives. Figure 15 shows the linkage between goals, objectives, and actions.

Figure 14. p4 and Pittsburgh's resilience objectives

Figure 15. Mapping of resilience goals to actions

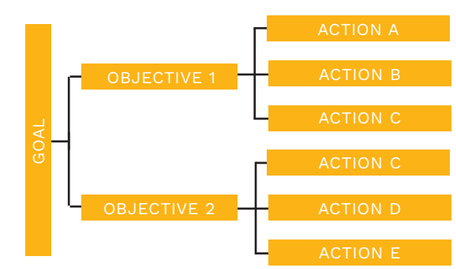


Figure notes: This figure depicts the ways that Pittsburgh's resilience goals, objectives, and actions nest to comprise the resilience framework foundational to the Pittsburgh resilience strategy.

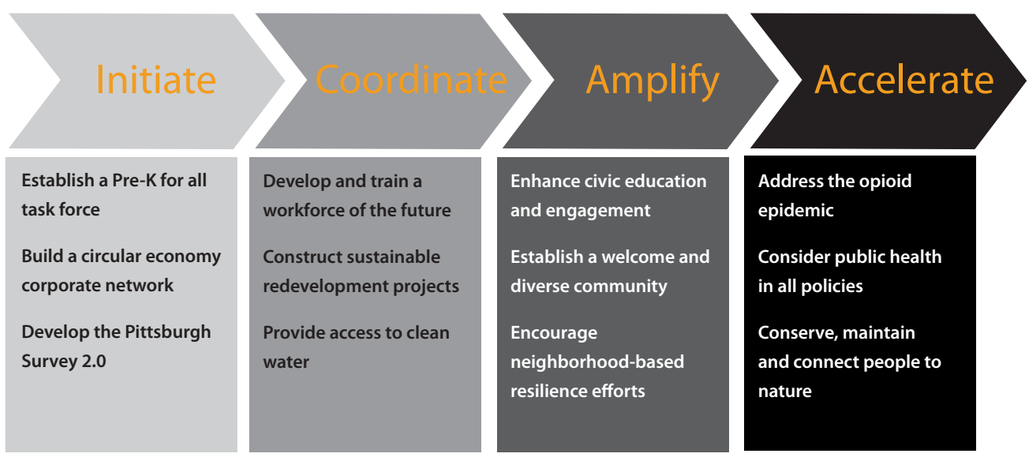
ALIGNING ACTIONS FOR MAXIMUM BENEFITS

As a step towards improved alignment and coordination, Resilient Pittsburgh has also sought to better understand the implementation status of city and regional actions that help realize resilience objectives. Addressing the goals of Pittsburgh's resilience strategy requires not only the **initiation** of some new actions but also better **coordination, amplification**, and **acceleration** of ongoing governmental and nongovernmental activities and initiatives.

- **Initiate:** Develop and implement new initiatives. Next steps entail identifying lead organizations and assembling working groups to begin action plans.
- **Coordinate:** Align ongoing actions with multiple owners and actors to a common set of goals. Next steps involve determining governance processes and roles and responsibilities for diverse partners.
- **Amplify:** Expand scope, reach, and/or impact of pilot or recently initiated actions. Next steps entail identifying the ways in which actions ought to be expanded, additional resources required, and plans or proposals for new funding resources.
- **Accelerate:** Support the implementation and/or uptake of existing actions with established leadership and concrete next steps. Next steps involve creating action plans to fast-track specific elements of each action group.

Figure 25 shows an example of how Resilient Pittsburgh might engage with actions at different stages of implementation, with example actions included. Appendix A of the strategy provides a full list of actions sorted in this way, along with further detail.

Figure 16. Taxonomy for implementing resilience actions with select examples



PEOPLE

PITTSBURGH WILL EMPOWER ALL RESIDENTS TO CONTRIBUTE TO A THRIVING AND SUPPORTIVE COMMUNITY BY ENSURING THAT BASIC NEEDS ARE MET.

PITTSBURGH WILL BE AN INCLUSIVE CITY OF INNOVATION THAT CELEBRATES DIVERSITY, IN WHICH ALL RESIDENTS WILL HAVE EQUAL ACCESS TO RESOURCES WITH THE ABILITY TO LEVERAGE OPPORTUNITY.

HOUSING 40
Objective: Affordable housing

HEALTH 42
Objective: Long, healthy lives

FOOD 43
Objective: Access & health

SAFETY 45
Objective: Public safety & inclusion

EDUCATION 46
Objective: High-quality learning

EMERGENCY PREPAREDNESS 47
Objective: Cohesive neighborhoods

RESILIENT HOUSEHOLDS 48
Objective: Safety & security

WORKFORCE DEVELOPMENT 49
Objective: Eliminate barriers

DIVERSITY 50
Objective: Attract & retain talent

Provide safe, affordable, and sustainable housing in new development or redevelopment

HOUSING PRICES ARE ON THE RISE IN MANY OF PITTSBURGH'S NEIGHBORHOODS, THREATENING THE ABILITY OF LONG-TERM RESIDENTS TO STAY IN THEIR HOMES, WHILE PITTSBURGHERS CONTINUE TO PAY SOME OF THE HIGHEST ENERGY PRICES IN THE COUNTRY. PRESERVING AFFORDABILITY AS THE CITY CONTINUES TO GROW WILL BE CRITICAL TO MAINTAINING THE TRADITIONAL CHARACTER AND SOCIAL CONNECTIVITY WITHIN PITTSBURGH'S NEIGHBORHOODS.

FEATURED ACTION: Promote equitable development
LEAD: Partner lead(s)
STAGE: Coordinate

Equitable development is a "positive development strategy that ensures everyone participates in and benefits from the region's economic transformation—especially low-income residents, communities of color, immigrants, and others at risk of being left behind." A recent PolicyLink report developed a set of recommendations for eliminating racial inequities and ensuring that all Pittsburghers have the opportunity to live in healthy and safe neighborhoods, to connect to economic opportunity and wealth generation, and to participate in decision-making. Neighborhood Allies, UrbanInnovation21, and other partnering organizations have begun working to implement these recommendations.

STRESSES & SHOCKS ADDRESSED

Inequity: Affordable housing
Aging infrastructure

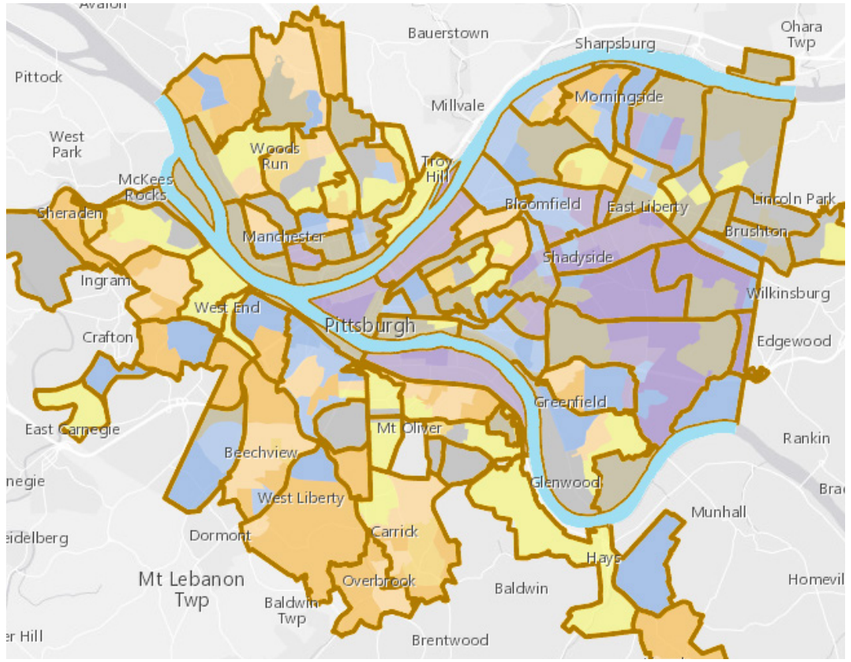
ACTIONS FOR IMPLEMENTATION

- Preserve and develop affordable housing
- Promote equitable development
- Create green and healthy homes
- Support veterans and homeless

FEATURED SUB-ACTION: Affordable Housing Task Force recommendations
LEAD: City of Pittsburgh
STATUS: Accelerate

The city's Affordable Housing Task Force, in partnership with community-based organizations and neighborhood coalitions, has developed a suite of recommendations, policies, programs, and initiatives that aim to address the growing issue of access to affordable housing in Pittsburgh. Additionally, financing programs and community outreach efforts are focused on improving the quality and sustainability of Pittsburgh's existing (and aging) housing stock in order to keep the total cost of housing affordable.

Figure 17: Market Value Analysis of Pittsburgh



Cluster	# BG	Median Sales Price 2011-2013	Variance Sales 2011-2013	Foreclosure 2011 - 2012 by Sales	% Commercial & Industrial, 2013	% Owner Occupied 2010	% Vacant Residential Land, 2013	% Public Housing 2013	% Violations 2011 - 2012	% All Permits 2011-2012
A	31	$333,578	0.50	4.70%	21.29%	58.12%	3.06%	0.61%	7.65%	4.28%
B	34	$191,998	0.49	11.39%	39.31%	23.90%	3.04%	3.09%	13.84%	3.53%
C	39	$119,922	0.55	17.95%	12.50%	60.70%	11.53%	2.50%	14.79%	1.37%
D	33	$84,342	0.64	14.08%	45.72%	35.88%	10.51%	9.93%	19.17%	2.08%
E	49	$69,816	0.52	28.20%	11.54%	72.89%	9.75%	2.33%	15.79%	0.60%
F	18	$45,819	0.79	28.47%	18.58%	47.88%	16.90%	59.53%	26.65%	1.59%
G	38	$40,787	0.79	30.92%	13.13%	59.93%	18.22%	5.15%	23.25%	1.08%
H	42	$19,282	0.89	32.64%	25.53%	51.66%	23.49%	21.81%	29.89%	1.50%
I	35	$8,790	0.92	32.46%	16.17%	48.75%	36.42%	11.84%	34.07%	0.45%
Not Classified	45	NULL	NULL	17.96%	34.38%	30.64%	33.28%	14.86%	16.23%	12.11%
Study Area	364	$97,938	0.67	22.21%	23.44%	49.81%	17.11%	10.80%	19.87%	3.02%

Figure notes: This map shows the Market Value Analysis (MVA) clusters within the city of Pittsburgh. MVA is a statistical tool that uses market data to classify geographic areas and produce a map of the varying market types within the city. Each color on the map represents one of nine distinct market types. Market types are designated according to clustering of similar characteristics, such as residential sales price or vacancy levels. Source: City of Pittsburgh, Department of City Planning, 2017.[57]

Improve the physical and mental health and wellbeing of all Pittsburghers

THOUGH PITTSBURGH IS KNOWN FOR ITS CENTERS OF HEALTHCARE EXCELLENCE, THE CITY ALSO EXPERIENCES DISPARITIES IN HEALTH RISKS AND OUTCOMES ALONG RACIAL AND ECONOMIC LINES, AND AS A RESULT OF ITS INDUSTRIAL LEGACY. WESTERN PENNSYLVANIA IS AN EPICENTER OF THE EMERGING NATIONAL OPIOID EPIDEMIC. A RESILIENT PITTSBURGH WILL ENABLE ALL PITTSBURGHERS TO LIVE THEIR BEST, HEALTHIEST LIVES.

100RC NETWORK SHARING HIGHLIGHT:
Pittsburgh and Glasgow Welding Health Equity and Resilience Together (PGWT)
LEAD: Partner lead(s)
STAGE: Coordinate

This project, led by the Consumer Health Coalition in partnership with Resilient Pittsburgh, the Allegheny County Health Department (ACHD), Resilient Glasgow and the Glasgow Centre for Population Health, will accelerate the development of an actionable, merged resilience and health equity strategy based on lessons learned from Glasgow's approach and experience. It seeks to weld "health equity thinking" with "resilience thinking" together in a way that will profoundly influence Pittsburgh's culture of health. The work in Pittsburgh and in other cities across the network shows there is a great opportunity to foster these connections both domestically and internationally.

STRESSES & SHOCKS ADDRESSED

Inequity: health
Aging population
Opioid epidemic

ACTIONS FOR IMPLEMENTATION

- Implement a Public Health 3.0 model
- Address the opioid epidemic
- Improve outdoor and indoor air quality
- Provide food security and healthy food access
- Support aging Pittsburghers and those with disabilities
- Integrate social services into Pittsburgh Public Schools (PPS Community Schools)
- Create green and healthy homes
- Support veterans and homeless Pittsburghers

PLATFORM PARTNER ACTION: Crisis Information Management Technology Assessment and Pilot
LEAD: Crisis Information Management Technology Assessment and Pilot
POSSIBLE PLATFORM PARTNER: Intermedix

Resilient Pittsburgh is working with Intermedix, and the University of Pittsburgh's Graduate School of Public Health to assess resources and identify gaps in emergency management and public health preparedness requirements and functions. A simulated exercise will assume a compounding inversion, extended heat wave and air pollution event, and look at the policy levers, emergency management response, and financing options to ensure maximum population health.

Improve access to healthy, affordable food choices

FULL-SERVICE GROCERY STORES, FARMERS' MARKETS AND STANDS, COMMUNITY AND SCHOOL GARDENS, AND SELECT CONVENIENCE STORES SUPPLY PITTSBURGHERS WITH HEALTHY FOODS THAT CONTRIBUTE TO IMPROVED OVERALL HEALTH. HOWEVER, THESE RESOURCES ARE NOT DISTRIBUTED EQUITABLY THROUGHOUT THE CITY AND MAY CONTRIBUTE TO DISPARITIES IN OBESITY AND CHRONIC DISEASE AS WELL AS FOOD INSECURITY. IN FACT, AROUND 14 PERCENT OF PITTSBURGH RESIDENTS STRUGGLE WITH FOOD SECURITY.[58] A RESILIENT PITTSBURGH WILL ENHANCE THE WELLBEING OF ALL OF THE CITY'S COMMUNITIES AND ENSURE THAT FOODS TO ENABLE HEALTHY LIVING ARE ACCESSIBLE TO ALL.

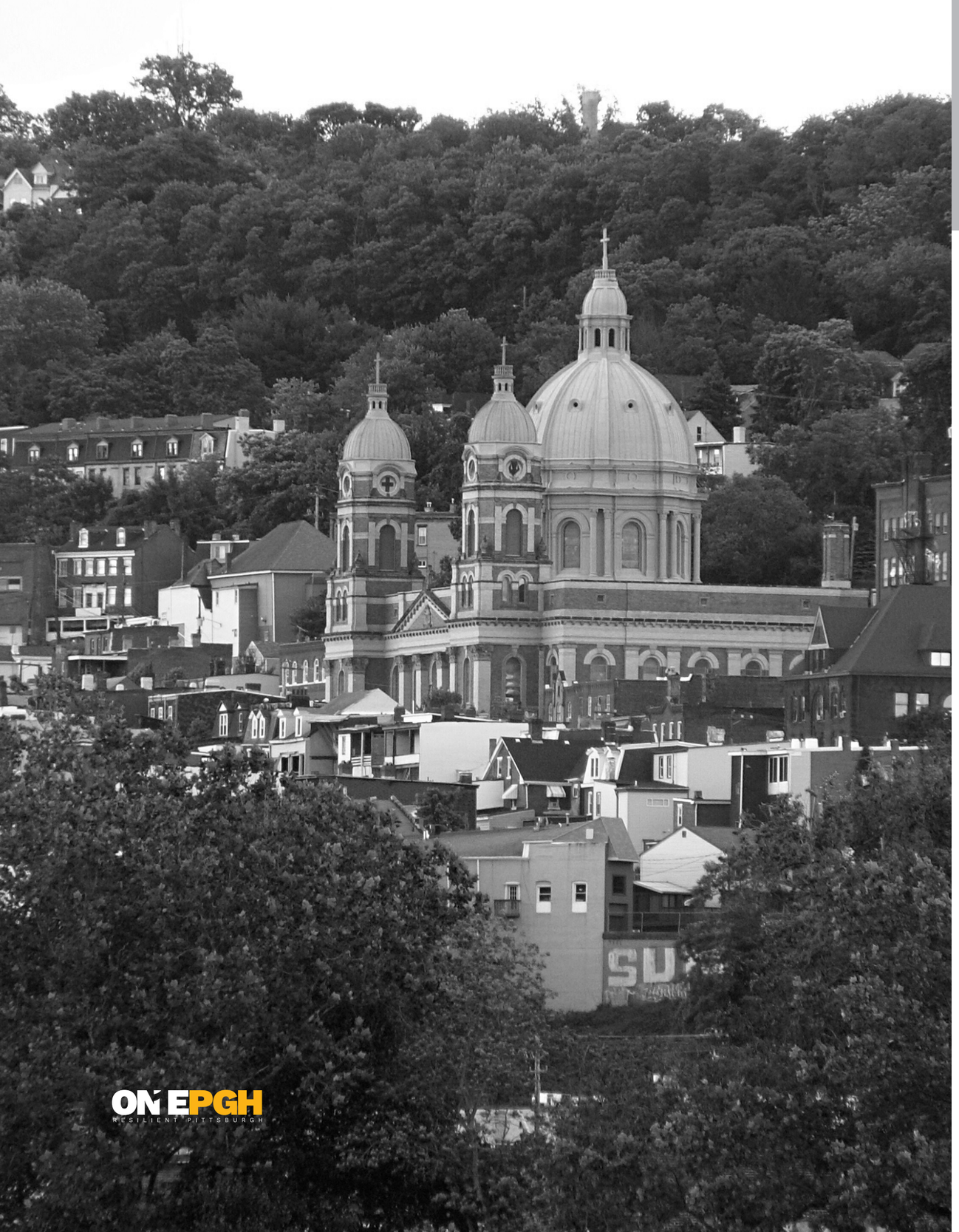
STRESSES & SHOCKS ADDRESSED

Inequity: Food access and health

ACTIONS FOR IMPLEMENTATION

- Provide food security and healthy food access
- Support local and urban agriculture
- Integrate social services into Pittsburgh Public Schools (PPS Community Schools)

412 Food Rescue works with food retailers, wholesalers, restaurants, caterers, universities and other food providers to rescue un-sellable but perfectly good food. Volunteers collect fresh, healthy food that would otherwise be discarded and directly distribute to community organizations that serve those in need. 412 Food Rescue utilizes app technology to aggregate and match food donors and beneficiaries and mobilizes a community of volunteers to efficiently transport food between locations.



Invest in and support safe, inclusive, and cohesive neighborhoods for all Pittsburghers

PITTSBURGH HAS BEEN DEFINED BY ITS NEIGHBORHOODS OVER ITS HISTORY AND IS RECENTLY GAINING RECOGNITION FOR ITS QUALITY OF LIFE AND LIVABILITY (MOST LIVABLE CITY, BEST PLACE TO RETIRE, ETC.). HOWEVER, NOT ALL OF THE CITY'S NEIGHBORHOODS ARE SHARING IN THE SAME PROSPERITY: THE CITY IS HIGHLY SEGREGATED, CRIME AND VIOLENCE PLAGUE MANY NEIGHBORHOODS, AND NEW DEVELOPMENT THREATENS TO DEEPEN CULTURAL DIVIDES. AS PITTSBURGH WORKS TO BECOME MORE RESILIENT, ITS 90 UNIQUE NEIGHBORHOODS WILL RETAIN THEIR CULTURE WHILE BUILDING SOCIAL CONNECTIVITY AMONG ALL COMMUNITIES ACROSS THE CITY.

FEATURED ACTION: Community policing initiatives
LEAD: City of Pittsburgh, Department of Public Safety, Bureau of Police
STAGE: Amplify

As a participant in the U.S. Department of Justice's National Initiative for Building Community Trust and Justice, Pittsburgh's community policing initiatives are in the spotlight. Ongoing efforts in community outreach, technology-assisted citizen engagement, and open police data can be amplified to achieve a greater impact on public safety and improved community-police relations.

STRESSES & SHOCKS ADDRESSED

Inequity: Public safety

ACTIONS FOR IMPLEMENTATION

- Improve community-police relations
- Confront and overcoming structural barriers and racism
- Support job and life skills for Pittsburgh's youth of color

FEATURED SUB-ACTION: Pittsburgh Peace and Justice Initiative
LEAD: Pittsburgh Black Elected Officials Coalition
STAGE: Amplify

The Pittsburgh Peace and Justice Initiative (P&JI) convened residents from across the city to create a community-informed policy agenda. Under the direction of the Pittsburgh Black Elected Officials Coalition, the P&JI was founded to "increase public safety, improve quality of life, and ensure the delivery of fair and impartial public safety services" among constituents in the City of Pittsburgh.
The initiative endeavors to create or facilitate:

1. An ongoing and systematic black community engagement process;
2. A resident-informed Peace and Justice Policy Agenda
3. The implementation of the Peace and Justice Policy Agenda utilizing all interested stakeholders and available resources; and
4. A stronger partnership between city, county and state governments and Pittsburgh's black communities to improve public safety and overall quality of life in those communities.

Provide access for all to high-quality and engaging education to support wellbeing, informed citizens, and the workforce of the future

AS PITTSBURGH'S WORKFORCE AGES, THE CITY'S SCHOOLS HAVE THE OPPORTUNITY TO CREATE AN "ESCALATOR OF OPPORTUNITY," HELPING STUDENTS BUILD THE SKILLS NECESSARY TO FILL VACANT POSITIONS AND PARTICIPATE IN PITTSBURGH'S EVOLVING ECONOMY. PITTSBURGH'S PRIMARY EDUCATION SYSTEM IS PLAGUED BY ACHIEVEMENT GAPS BY RACE/ETHNICITY, AND THERE IS UNEQUAL ACCESS TO QUALITY EARLY EDUCATION IN THE CITY.[29] A QUALITY PUBLIC EDUCATION SYSTEM CITYWIDE CREATES EQUITY OF OPPORTUNITY FOR PITTSBURGHERS, AND LOCAL INSTITUTIONS OF HIGHER EDUCATION, ALONG WITH THE CITY'S CULTURAL ASSETS, CONTRIBUTE TO LEARNING ACROSS THE LIFESPAN.

FEATURED ACTION: Provide pre-K for all of Pittsburgh's children
LEAD: City of Pittsburgh and partners
STAGE: Initiate

Pittsburgh's children currently have unequal access to pre-K education, resulting in disparities in educational outcomes later in life. The City of Pittsburgh plans to pursue the funding, organizational structure, and capacity necessary to ensure pre-K is available to all of Pittsburgh's children.

STRESSES & SHOCKS ADDRESSED

Inequity: Education and employment
Aging population and workforce
Economic collapse

ACTIONS FOR IMPLEMENTATION

- Provide 21st century education for youth
- Provide pre-K for all of Pittsburgh's children
- Integrate data systems to serve PPS students more effectively (Student Connections)
- Integrate social services into Pittsburgh Public Schools (PPS Community Schools)

FEATURED SUB-ACTION: Articulate connections between students and resources to serve PPS students more effectively
LEAD: The Pittsburgh Promise, Pittsburgh Public Schools, Department of Human Services, United Way, OnHand Schools
STAGE: Initiate

Consolidating student information and streamlining access to resources that are currently dispersed across agencies will result in a more robust information system. Articulating transparent protocols for connecting students to available resources will better serve student needs. This effort will increase the collective impact of current programs, services, and education initiatives by improving communication and coordination between and among professionals and the families they support. The goal is to connect more students to the resources they want and need when they want and need them so they can succeed in school and after graduation.

Provide access to emergency food, water, and shelter for all residents during times of catastrophe

AT THEIR MOST FUNDAMENTAL LEVEL, RESILIENT CITIES ENSURE RESIDENTS' BASIC NEEDS ARE MET IN THE FACE OF DISASTER. ANTICIPATING INCREASED RISK OF FLOODING, SEVERE WINTER STORMS, AND HIGHER TEMPERATURES DUE TO CLIMATE CHANGE, A RESILIENT PITTSBURGH WILL ESTABLISH RESOURCES AND PROCEDURES TO ENSURE EMERGENCY ACCESS TO FOOD, SHELTER, AND WATER FOR RESIDENTS.

STRESSES & SHOCKS ADDRESSED

Fragmentation
All acute shocks

ACTIONS FOR IMPLEMENTATION

- Improve disaster preparedness and response (THIRA and Hazard Mitigation Plan Update)
- Provide food security and healthy food access

Ensure that Pittsburgh households are prepared to respond to emergency situations

EMERGENCY RESPONSE OFTEN OCCURS AT THE HOUSEHOLD LEVEL. IMMEDIATE HELP FOLLOWING A DISASTER MAY NOT BE AVAILABLE, SO IT IS IMPORTANT FOR INDIVIDUALS AND FAMILIES TO BE KNOWLEDGEABLE AND READY TO RESPOND IN CASE OF AN EMERGENCY. IN LIGHT OF PITTSBURGH'S AGING POPULATION, PREPARING FAMILIES AND NEIGHBORS TO CONSIDER THE WELLBEING OF SENIORS WILL BE INCREASINGLY IMPORTANT. THE DEPARTMENTS OF EMERGENCY MANAGEMENT AND PUBLIC SAFETY SHOULD CONTINUE TO WORK TOGETHER TO PROVIDE THE NECESSARY TRAINING, TOOLS, AND SUPPORT NEEDED.

STRESSES & SHOCKS ADDRESSED

Aging population and workforce
All acute shocks

ACTIONS FOR IMPLEMENTATION

- Encourage neighborhood-based grassroots efforts
- Improve disaster preparedness and response (THIRA and Hazard Mitigation Plan Update)
- Enhance civic education and engagement
- Create green and healthy homes
- Enhance city government-to-citizen communication

FEATURED SUB-ACTION: Love Your Block Grants
LEAD: City of Pittsburgh, Resilient Pittsburgh
PARTNERS: Cities of Service, Peoples Natural Gas, ioby
STATUS: Coordinate

Block grants are an initiative that invites organizations to submit project proposals that can transform their blocks with up to $1,500 and the support of city departments. With these grant funds, winning groups can purchase supplies, engage their neighbors, and roll up their sleeves to build resilience block by block. Projects may include, but are not limited to, creating green spaces, implementing stormwater capture, enhancing parks, streetscaping, removing graffiti and litter, sprucing up pathways, and building emergency preparedness.

Eliminate barriers to opportunity for education and employment for all Pittsburghers

HIGH RATES OF POVERTY, UN- AND UNDEREMPLOYMENT, AND AN INEQUITABLE EDUCATION SYSTEM CONTINUE TO IMPACT MANY OF PITTSBURGH'S COMMUNITIES, PARTICULARLY THOSE OF COLOR. AS PITTSBURGH'S CURRENT WORKFORCE AGES AND THE ECONOMY CONTINUES TO TRANSFORM, THE CITY IS PRESENTED WITH AN OPPORTUNITY TO DEVELOP THE SKILLS OF TRADITIONALLY DISADVANTAGED RESIDENTS TO SECURE LIVING WAGE JOBS.

100RC PLATFORM PARTNER HIGHLIGHT:
Pittsburgh companies Manchester-Bidwell and Fourth Economy join 100RC's Platform Partner network

Pittsburgh has contributed some of its own talent to the 100RC network of global experts. In 2016, Manchester-Bidwell and Fourth Economy joined the Platform Partner network, offering their services in workforce development programming and economic development consulting, respectively.

STRESSES & SHOCKS ADDRESSED

Inequity: Education, employment, income
Aging population and workforce
Economic collapse

ACTIONS FOR IMPLEMENTATION

- Develop and retraining Pittsburgh's workforce
- Support job and life skills for Pittsburgh's youth of color
- Stimulate small business development
- Establish a welcoming and diverse community (Welcoming Pittsburgh)
- Provide 21st century education for youth

100RC NETWORK SHARING HIGHLIGHT:
Workforce development sharing with DaNang

DaNang, Vietnam's resilience strategy outlines several large-scale workforce development actions, including actions to help the city better understand the linkages between demand from employers and skills among the city's workforce as well as training options for those residents. Sharing via both the Sister City and 100RC networks will allow Pittsburgh and DaNang to collaborate on their shared workforce challenges.

Develop, attract, and retain the best and most diverse talent for Pittsburgh's workforce

AS PITTSBURGH'S POPULATION AND WORKFORCE AGE AND THE CITY CONTINUES TO STRUGGLE WITH RELATIVELY LOW POPULATION GROWTH RATES, MAYOR BILL PEDUTO HOPES TO ATTRACT AT LEAST 20,000 RESIDENTS IN THE NEXT 10 YEARS. A VIBRANT AND RESILIENT CITY WILL CREATE WORKING AND LIVING ENVIRONMENTS THAT NURTURE CURRENT RESIDENTS AND ATTRACT NEW PEOPLE TO THE CITY, OFFERING ECONOMIC OPPORTUNITY AND CELEBRATING CULTURAL DIVERSITY AS WELL AS THE TRADITIONAL PITTSBURGH ETHOS.

STRESSES & SHOCKS ADDRESSED

Inequity: Education, employment, income
Aging population and workforce
Economic collapse

ACTIONS FOR IMPLEMENTATION

- Establish a welcoming and diverse community (Welcoming Pittsburgh)
- Support job and life skills for Pittsburgh's youth of color
- Confront and overcome structural barriers and racism
- Promote equitable development

FEATURED ACTION: Welcoming Pittsburgh
LEAD: City of Pittsburgh, Office of the Mayor
STATUS: Amplify

Mayor Peduto's Welcoming Pittsburgh Plan aims to improve the lives of immigrants and long-time residents alike by creating informed, diverse, and welcoming experiences throughout the city. Derived from community and Advisory Council input, the plan includes a broad set of recommendations in three categories: Welcome, Neighbor! (creating community connections), Bridge to the City (linking to government services, policy, and housing), and Prospering Together (promoting economic opportunity).

PLACE

PITTSBURGH WILL USE LAND SYSTEMATICALLY TO BENEFIT ALL RESIDENTS; TO INCREASE SOCIAL COHESION, CONNECTIVITY, PUBLIC AND ECOLOGICAL HEALTH; AND TO PROTECT AGAINST CURRENT AND FUTURE RISKS.

PITTSBURGH WILL DESIGN, SCALE, AND MAINTAIN INFRASTRUCTURE FOR CURRENT AND FUTURE NEEDS EQUITABLY AND SUSTAINABLY, PROVIDING BENEFITS AND SERVICES TO THE REGION DURING TIMES OF CALM AND CRISIS.

TRANSPORTATION 54

Objective: Multi-modal transportation options

RECAPITALIZED INFRASTRUCTURE 55

Objective: Improve physical infrastructure

MIXED USES 56

Objective: Serve multiple needs

VACANT LAND 58

Objective: Re-purpose underutilized land

GREEN SPACE 60

Objective: Connect communities to nature

PUBLIC SPACE 61

Objective: Create & maintain refuge space

COMMUNICATIONS 62

Objective: Accessible, modern communication

COMMERCIAL TRANSPORT 63

Objective: Minimize risk

DISASTER RELIABILITY 64

Objective: Ensure reliable performance

Connect all communities to economic opportunity and green spaces with safe, reliable, and convenient multi-modal transportation

PITTSBURGH'S TRANSPORTATION NETWORK IS CONSTRAINED BY THE RIVERS AND HILLS THAT CHARACTERIZE THE CITY'S LANDSCAPE. MOVING FORWARD, INCREASING ACCESS TO MOBILITY IN THE FACE OF THESE FACTORS IS CRUCIAL TO CREATING A THRIVING URBAN ENVIRONMENT IN TIMES OF CALM AND HELPING COMMUNITIES ACCESS CRITICAL SERVICES AFTER A DISASTER.

STRESSES & SHOCKS ADDRESSED

Inequity: Mobility
Aging infrastructure
Aging population
Environmental degradation
Climate change impacts

ACTIONS FOR IMPLEMENTATION

- Enable multi-modal transportation
- Develop a smart transportation system
- Support aging Pittsburghers and those with disabilities

FEATURED ACTION: Enable multi-modal transportation
LEAD: City of Pittsburgh, Department of Mobility and Infrastructure and partners
STATUS: Coordinate

Advocacy groups, non-profit organizations, city and county departments, and county- and region-level coalitions and planning organizations are currently working to expand multi-modal transportation opportunities in and around Pittsburgh. From policy changes that mandate complete streets to physical infrastructure construction to Port Authority service changes to various recommendations in reports and plans at different stages of implementation, the city is not lacking in activity or enthusiasm in this arena. Coordinating activities will help ensure that expanded options continue to be realized for Pittsburghers in all parts of the city.

Figure 18. Key public transit corridors in Pittsburgh

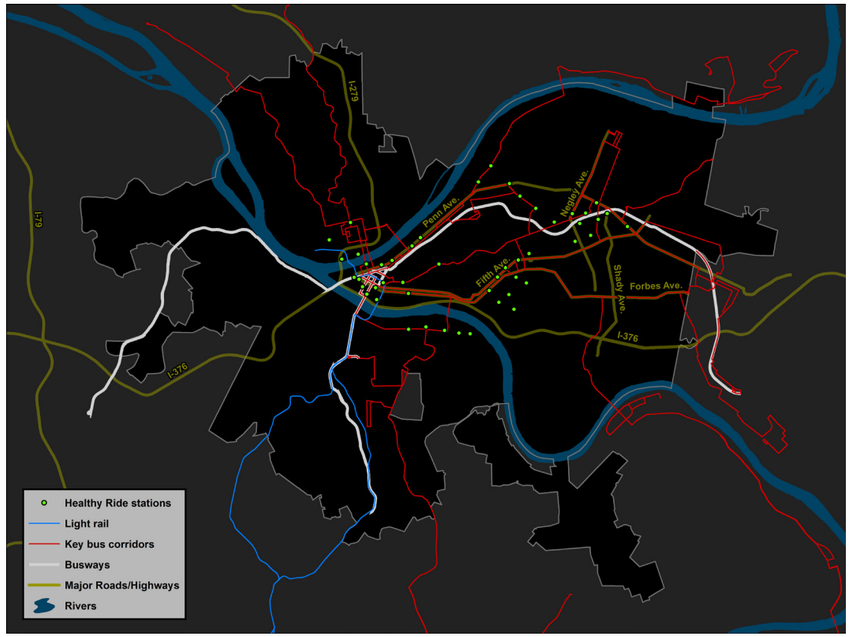


Figure notes: This map shows the key transportation corridors in the city, including Healthy Ride bike share stations, light rail, key bus corridors (defined by stretches of roadway covered by multiple bus routes), bus-ways, and major roads and highways connecting neighborhoods throughout the city. Source: City of Pittsburgh, 2016.[17]

Maintain and improve existing physical infrastructure for the long term

PITTSBURGH HAS ENOUGH PHYSICAL INFRASTRUCTURE (ROADWAYS, BRIDGES, WATER AND WASTE MANAGEMENT SYSTEMS, ETC.) TO SUPPORT A POPULATION TWICE ITS CURRENT SIZE. STRATEGIC COORDINATION AND PLANNING CAN HELP TRANSFORM AGING INFRASTRUCTURE INTO AN ASSET RATHER THAN A RISK.

STRESSES & SHOCKS ADDRESSED

Fragmentation
Aging infrastructure

ACTIONS FOR IMPLEMENTATION

- Put city facilities to their best and highest uses (Strategic Investment & Maintenance Plan)
- Develop a smart transportation system

Support a mix of uses in neighborhoods and communities that serve multiple needs

PITTSBURGH IS MADE UP OF 90 DISTINCT AND OFTEN DISCONNECTED NEIGHBORHOODS AT VARIOUS STAGES OF NEGLECT, VACANCY, REDEVELOPMENT, AND STABILITY. RESIDENTS OF MANY NEIGHBORHOODS AND OF VARIOUS SOCIOECONOMIC POSITIONS FEEL STRONGLY CONNECTED TO ONE ANOTHER AND HAVE A SENSE OF NEIGHBORHOOD PRIDE. ALL NEIGHBORHOODS IN THE CITY SHOULD BENEFIT FROM ACCESS TO HOUSING, COMMERCIAL AMENITIES, JOB CENTERS, AND GREEN SPACE.

FEATURED SUB-ACTION: Complete Streets
LEAD: City of Pittsburgh
STATUS: Coordinate

In April 2015, Mayor Peduto signed an executive order calling for a city-wide policy on Complete Streets and an adoption of design guidelines. After an internal policy workshop and public meeting, the City drafted a policy to help redesign streets to better meet the needs of all users. This policy will work in tandem with other ongoing comprehensive planning efforts of the Department of City Planning, including the Mobility Plan.

STRESSES & SHOCKS ADDRESSED

Inequity
Aging infrastructure
Environmental degradation
Climate change impacts

ACTIONS FOR IMPLEMENTATION

- Design and construct smart and sustainable redevelopment projects
- Promote equitable development

FEATURED SUB-ACTION: Eco Innovation District
LEAD: City of Pittsburgh
STATUS: Coordinate

Focused on the Uptown and West Oakland communities, the Ecoinnovation District Plan will create a new model for urban growth that is inclusive, innovative, and environmentally sound. The project is the product of ongoing collaboration among Uptown Partners of Pittsburgh, Oakland Planning and Development Corporation, City of Pittsburgh, Sustainable Pittsburgh, Urban Redevelopment Authority of Pittsburgh, Port Authority of Allegheny County, and Allegheny County Economic Development, neighborhood residents and groups, universities, and other partners.

ECO INNOVATION DISTRICT UPTOWN OAKLAND

100RC NETWORK SHARING HIGHLIGHT:
Community-led land use planning sharing with Melbourne

Melbourne, Australia's resilience strategy features an action around "community-led neighborhood renewal and development pilot projects," which brings developers and local residents together to test tools and frameworks for collaborating and sharing in decision-making, work in conjunction with academics to measure results, and contribute to a body of public guidance on participatory planning. This type of approach would promote Pittsburgh's resilience objectives related to land use planning, civic engagement, collaboration, and measurement.

Repurpose underutilized land and building stock in vulnerable places for community benefit

BLIGHT AND VACANCY MAR MANY OF PITTSBURGH'S NEIGHBORHOODS. VACANT AND UNDERUTILIZED LAND HAS THE POTENTIAL TO BECOME A COMMUNITY ASSET, PROVIDING SPACE FOR RECREATION, URBAN AGRICULTURE, STORMWATER CAPTURE, PUBLIC ART, AND MORE. VACANT BUILDINGS, INCLUDING HOMES, CHURCHES, AND COMMERCIAL BUILDINGS THAT CURRENTLY SIGNAL NEIGHBORHOOD DISINVESTMENT ARE ALSO ASSETS FOR HELPING TO ACHIEVE OTHER RESILIENCE GOALS, INCLUDING AFFORDABLE HOUSING, SOCIAL COHESION, AND EMERGENCY SHELTERING.

FEATURED SUB-ACTION: Hays Woods
LEAD: Partner lead(s)
STATUS: Accelerate

In 2016, the City of Pittsburgh acquired 660 acres and the mineral rights to land known as Hays Woods, which will eventually become the city's largest park. Past private ownership had planned the site for strip mining, a casino and a racetrack, all of which fell through and led to the City's purchase for $5 million. The unmanaged property boasts beautiful views of the Monongahela riverfront and wildlife including a celebrated family of bald eagles.

STRESSES & SHOCKS ADDRESSED

Inequity
Aging infrastructure
Environmental degradation
Climate change: Flooding, extreme heat

ACTIONS FOR IMPLEMENTATION

- Recycle Pittsburgh's land for its best and highest use
- Preserve and develop affordable housing
- Support local and urban agriculture

FEATURED SUB-ACTION: Open Space Plan
LEAD: City of Pittsburgh
STATUS: Accelerate

OpenSpacePGH is our city's first comprehensive guide to the optimal use of its vacant, green, and recreation spaces. As one of twelve components of PlanPGH, this plan provides clear instructions and guidelines for land use and infrastructure decisions related to the ownership, management, maintenance, connectivity, and programming of Pittsburgh's open space system.

Figure 19. Blight in Pittsburgh by neighborhood

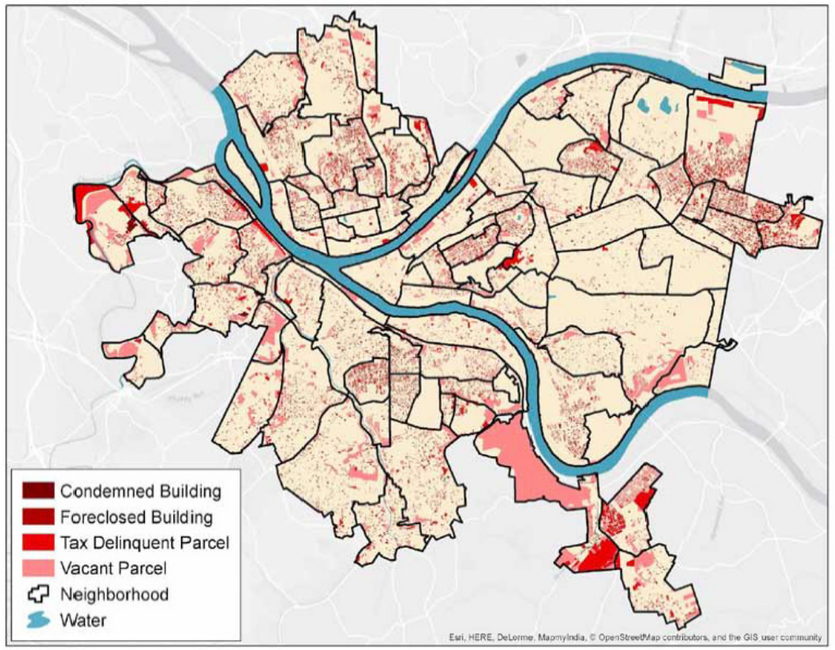


Figure Notes: This map depicts the number of condemned and foreclosed buildings and tax-delinquent and vacant parcels in Pittsburgh. The areas with the greatest number of vacant, condemned, or foreclosed parcels include the Hill District, Garfield, Homewood, Lincoln-Lemington Belmar; Larimer in the East End of Pittsburgh; and areas on Pittsburgh's Northside, including Perry South and Fineview. Hays, in the southeastern corner of the city limits, is largely open space and will be converted into a city park. Source: City of Pittsburgh, 2017.[59]

PLACE

Ensure that each community in Pittsburgh is connected to nature

PITTSBURGH IS ENDOWED WITH A WEALTH OF GREEN AND "BLUE" SPACE—NATURAL INFRASTRUCTURE—IN THE FORMS OF ITS LARGE AND DIVERSE PARKS, RIVERS, AND STREAMS. WHETHER THEY ARE AWARE OF IT OR NOT, PITTSBURGHERS ALREADY BENEFIT FROM THESE RESOURCES, WHICH CAN HELP TO IMPROVE AIR AND WATER QUALITY, REDUCE STORMWATER FLOWS, AND LOWER EXPOSURE TO URBAN HEAT ISLAND EFFECTS. PITTSBURGH HAS THE OPPORTUNITY TO ENHANCE RESIDENTS' APPRECIATION AND UTILIZATION OF NATURAL RESOURCES AND TO IMPROVE HUMAN HEALTH AND ENVIRONMENTAL CONSERVATION.

FEATURED SUB-ACTION: Greenways 2.0
LEAD: City of Pittsburgh, Department of City Planning
STATUS: Accelerate

The city's Greenways 2.0 initiative is designed to expand and enhance the city's greenways. This will involve developing a network of hiking and mountain biking trails, expanding the existing multi-use trail network, enhancing outdoor recreational opportunities, and managing invasive species. The city intends to accomplish these goals by fostering hands-on involvement from residents and building partnerships with organizations across the city.

STRESSES & SHOCKS ADDRESSED

Environmental degradation
Climate change: Flooding, extreme heat

ACTIONS FOR IMPLEMENTATION

- Conserve, investing in, and connect to nature (Biophilic city)
- Recycle Pittsburgh's land for its best and highest use
- Support local and urban agriculture

Figure 20. Walking access to green space in Pittsburgh

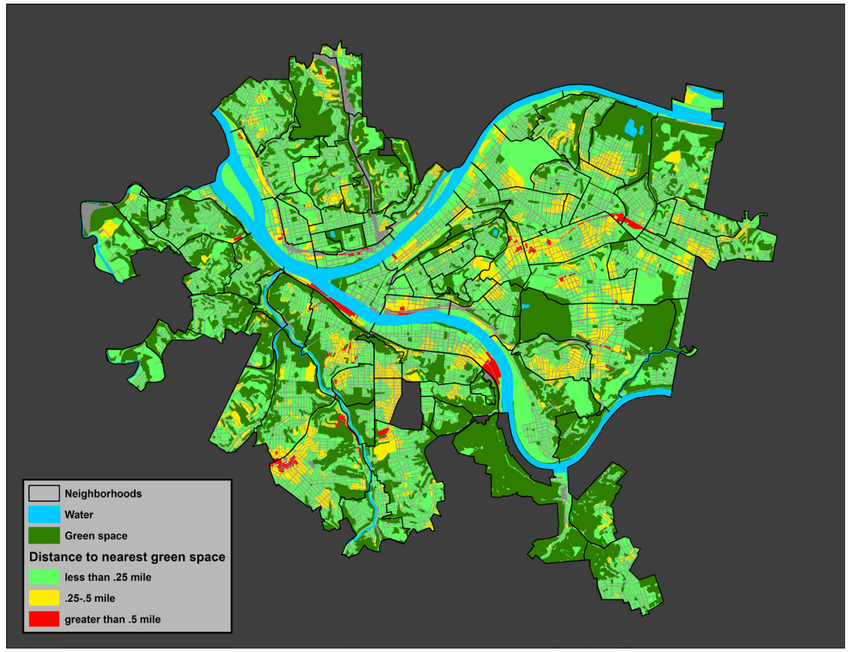


Figure notes: This map shows the walking distance to the nearest accessible green space from each parcel in the City of Pittsburgh. Access to the rivers or other water bodies is also counted but only if a walking path to the river front is present. Steep slopes are excluded, as is green space with no usable walking point of entry. Neighborhoods of note with areas of limited walking access to green space include Brookline and portions of Mt. Washington, Carrick, Knoxville, and Allentown (South Side); Greenfield, Shadyside, North Oakland, and portions of Squirrel Hill and Homewood (East End); and Uptown/Bluff. Source: City of Pittsburgh, 2016.[59-61]

PLACE

Maintain or create attractive and accessible public space throughout the city for all to use and to serve as refuge in times of crisis

PITTSBURGH'S PUBLIC SPACES, INCLUDING GREEN SPACE, PUBLIC SQUARES, AND PUBLIC BUILDINGS, ENRICH THE LIVES OF CITY RESIDENTS YEAR-ROUND. THESE SPACES MAY PROVIDE CO-BENEFITS IF MAINTAINED AND UTILIZED STRATEGICALLY AS GATHERING PLACES, SHELTER, FOOD DISTRIBUTION CENTERS, AND MORE DURING TIMES OF CRISIS.

STRESSES & SHOCKS ADDRESSED

Inequity
All acute shocks

ACTIONS FOR IMPLEMENTATION

- Design and construct smart and sustainable redevelopment projects
- Recycle Pittsburgh's land for its best and highest use

Establish a reliable, modern communications infrastructure that is accessible to all

A MODERN COMMUNICATIONS SYSTEM NOT ONLY IMPROVES RESIDENTS' ACCESS TO INFORMATION AND SERVICES BUT ALSO SUPPORTS THE OPERATION OF OTHER INFRASTRUCTURE SYSTEMS, INCLUDING TRANSPORTATION, ENERGY, AND WATER. PITTSBURGH'S LOCAL TECH INDUSTRY POSITIONS THE CITY TO ESTABLISH GOLD STANDARD TELECOMMUNICATION, DATA SHARING, AND CYBER SECURITY PROCESSES.

STRESSES & SHOCKS ADDRESSED

Inequity
Fragmentation
Aging infrastructure
All acute shocks

ACTIONS FOR IMPLEMENTATION

- Enhance city government-to-citizen communication
- Become a city of inclusive innovation (Pittsburgh Roadmap for Inclusive Innovation)

Improve reliability and minimize the risk from commercial and industrial transport throughout the region

MASSIVE SHIPMENTS, INCLUDING POTENTIALLY HAZARDOUS MATERIALS LIKE OIL AND NATURAL GAS, TRAVEL THROUGH PITTSBURGH EVERY DAY BY ROAD, RAIL, AND BARGE. FOR THIS TRANSPORT TO BE A BOON TO THE CITY'S ECONOMY RATHER THAN A RISK TO ITS INFRASTRUCTURE, ENVIRONMENT, AND RESIDENTS REQUIRES INFORMATION TO BE COLLECTED AND REPORTED ON COMMERCIAL TRANSPORT AND ACTION TO BE TAKEN TO MINIMIZE RISK.

100RC NETWORK SHARING HIGHLIGHT:
Smart commercial transport sharing with Mexico City

Mexico City, Mexico's resilience strategy features an action related to mobility data sharing through public-private partnerships within the city. As Pittsburgh builds out its smart transportation plan and system to include shared data systems for tracking and monitoring transit in the region, there is an opportunity to share lessons learned between the two cities.

STRESSES & SHOCKS ADDRESSED

Aging infrastructure
Hazardous materials incident

ACTIONS FOR IMPLEMENTATION

- Develop a smart transportation system

FEATURED ACTION: Develop a smart transportation system
LEAD: City of Pittsburgh, Department of Mobility and Infrastructure
STATUS: Accelerate

Pittsburgh's smart transportation efforts involve developing an open platform and corresponding governance structure to improve the safety, equity, and efficiency of the city's transportation network and its interaction with the energy and communications networks. By building on existing technology deployments and increasing fixed and mobile sensors over a number of major "Smart Spine" corridors that connect with primary commercial centers and amenities, Pittsburgh will collect, analyze, visualize, and act on information to improve mobility for residents.

Ensure reliable performance of critical infrastructure during disaster

THE CITY'S DYNAMIC TOPOGRAPHY OF HILLS, VALLEYS, AND WATERWAYS DEMANDS THAT KEY ROADS, TUNNELS, AND BRIDGES PERFORM RELIABLY IN THE FACE OF AN ACUTE SHOCK TO AVOID IMMOBILIZING OR ISOLATING THOUSANDS OF RESIDENTS. HAZARD MITIGATION PLANNING THAT PRIORITIZES REGIONAL AND INTERDEPARTMENTAL COORDINATION AND SPECIFIC ACTION STEPS WILL FACILITATE THE CITY'S RESPONSE.

STRESSES & SHOCKS ADDRESSED

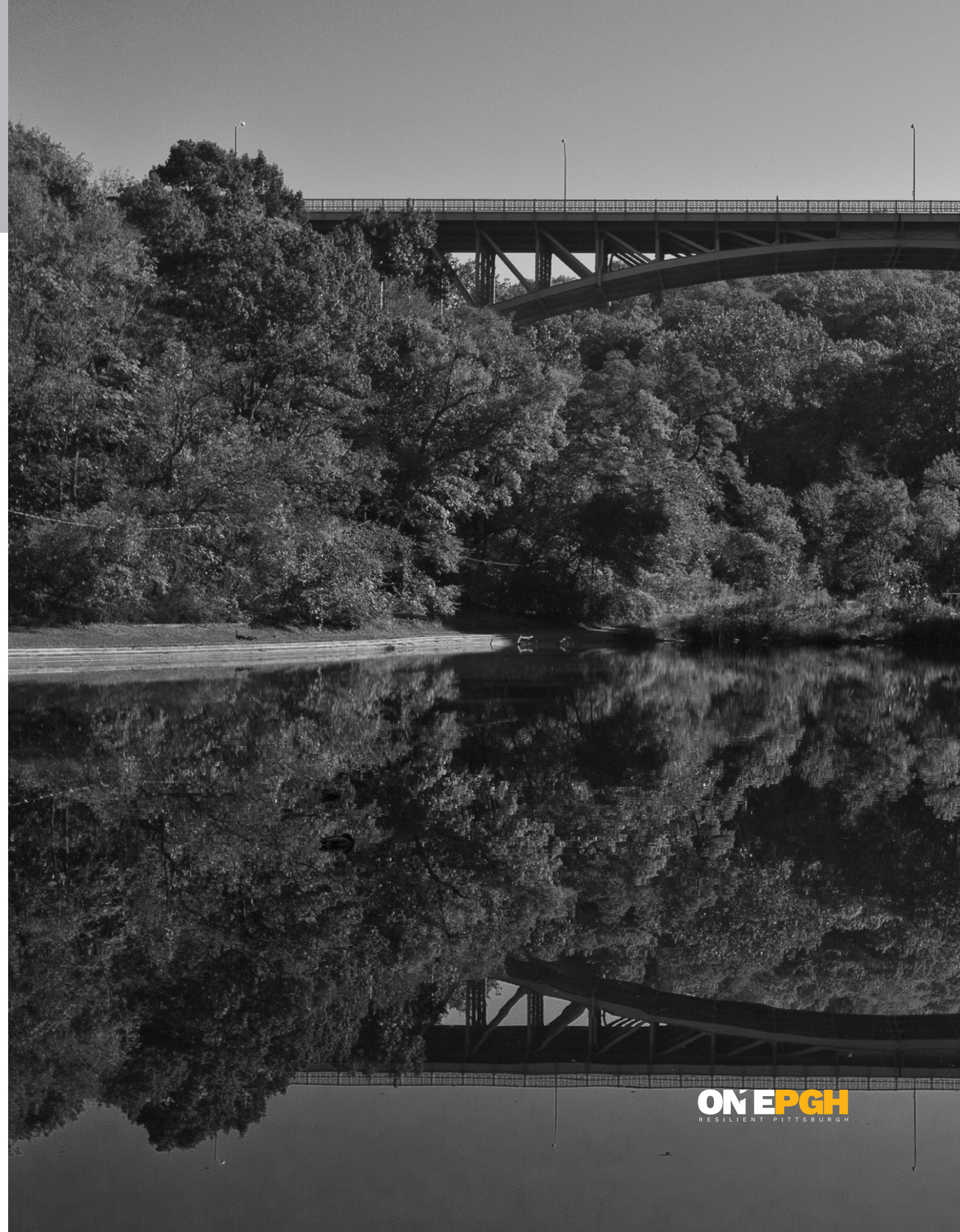
Aging infrastructure
All acute shocks

ACTIONS FOR IMPLEMENTATION

- Improve disaster preparedness and response (THIRA and Hazard Mitigation Plan Update)
- Upgrade and improve the resilience of the power grid (District Energy Pittsburgh)
- Develop a smart transportation system

PLATFORM PARTNER ACTION: Cyber resilience best practice and strategy development
LEAD: City of Pittsburgh, Department of Innovation and Performance
PLATFORM PARTNER: Microsoft

As more of Pittsburgh's systems become internet-based, the city needs to ensure its cybersecurity. Microsoft is working with the Department of Innovation and Performance to understand what optimal security requires and increase capacity across city departments for understanding where vulnerabilities lie and how the city should approach the management of cybersecurity as a complex, integrated system. This will allow the city to understand and plan for vulnerabilities to the information technology system as well as expand its capacity for planned and future technologies with which the city will engage.



PLANET

PITTSBURGH WILL ACHIEVE LONG-TERM ENVIRONMENTAL SUSTAINABILITY THROUGH WISE STEWARDSHIP, IMPROVED RESOURCE MANAGEMENT, AND A REDUCED CARBON FOOTPRINT.

WATER.....68

Objective: Improve water quality

ENERGY.....70

Objective : Develop resilient energy portfolio

RESOURCE EFFICIENCY.....72

Objective: Efficient use of resources

NATURAL INFRASTRUCTURE.....73

Objective: Maintain and improve assets

RESILIENT DESIGN.....74

Objective: Minimize public health impacts

Minimize stormwater, wastewater, and sewer issues to reduce flooding and improve the quality and accessibility of our water resources

PITTSBURGH IS FAMOUSLY LOCATED AT THE CONFLUENCE OF THE ALLEGHENY AND MONONGAHELA RIVERS (AND THEIR TRIBUTARIES), WHICH CONVERGE IN THE HEART OF THE CITY TO FORM THE OHIO RIVER. PITTSBURGH IS AWASH IN WATER RESOURCES: OVER 2,000 MILES OF STREAMS AND 90 MILES OF RIVERS FLOW THROUGH ALLEGHENY COUNTY. HOWEVER, COMBINED STORMWATER AND WASTEWATER SYSTEMS THAT DRAIN TO THE RIVERS AND INCREASING PRECIPITATION PREDICTED WITH CLIMATE CHANGE POSE CHALLENGES FOR THE WATERWAYS' CONTINUED ENVIRONMENTAL HEALTH AND ACCESSIBILITY.

100RC NETWORK SHARING HIGHLIGHT:
Convene resilience leaders in Pittsburgh around the global water crisis

In 2017, Pittsburgh will host a Global Water Crisis Conference at Duquesne University and partners from around the world. The Conference will leverage the 100RC Network of CROs and Platform partners around water stress – both a shortage and a surplus. Pittsburgh's innovative leadership around green infrastructure in response to the U.S. EPA's consent decree on combined sewer overflow will similarly highlight new approaches in the urban water management space for the global network.

STRESSES & SHOCKS ADDRESSED

Fragmentation
Aging infrastructure
Environmental degradation
Climate change: Flooding

ACTIONS FOR IMPLEMENTATION

- Provide access to clean water for drinking and recreation (3 Rivers, 365)
- Recycle Pittsburgh's land for its best and highest use

PLATFORM PARTNER ACTION: Develop a value proposition for green infrastructure
LEAD: City of Pittsburgh, PWSA
PLATFORM PARTNER: Impact Infrastructure

The City-Wide Green First Plan outlines how Pittsburgh intends to use innovative, cost-effective, and green infrastructure approaches to manage stormwater. The stormwater management practices outlined in the plan will help the city and the region comply with U.S. Environmental Protection Agency (EPA) combined sewer overflow mandates, improve the quality of local waterways, and address flooding issues. This green-first plan will create short-term and long-term jobs, improve air quality, and revitalize neighborhoods with green space and other amenities.
In an effort to better understand the multiple co-benefits that these projects can bring to the city, PWSA used Impact Infrastructure's AUTOCASE tool to perform triple bottom line (TBL) analysis to add environmental and social equity factors in addition to financial considerations to the green infrastructure projects proposed in the Plan.

PLATFORM PARTNER ACTION: Negley Run Watershed Resilience Accelerator
LEAD: : City of Pittsburgh,
PLATFORM PARTNER: ARCADIS

The city region is under consent decree from the U.S. EPA to address the combined sewer overflows into the three rivers, and PWSA is taking a green-first approach to a solution. As part of this ongoing effort and because financing green first initiatives can present unique challenges, the City of Pittsburgh engaged Arcadis to host a one-day workshop to explore and advance the implementation of green infrastructure in the Negley Run watershed, which makes up the A-42 sewershed, comprising over 3,000 acres of dense urban neighborhood development, commercial and light industry, and institutional campus sites.

The goal of the workshop was to understand the current state of practice for interagency collaboration and recent developments in finance and implementation protocols that are relevant for Negley Run. With experts from a select group of community representatives, including PWSA and ALCOSAN as well as national and global experts in resilience and stormwater management, the session focused on global and local best practices, project value assessments, innovative financial structures, current governance and regulations, and possible implementation strategies for green infrastructure.

The city will use the outputs from the workshop to inform the development of an Implementation Protocol that can be applied to green infrastructure projects for Negley Run and serve as a blueprint for other similar projects in other areas of the city.

Develop a resilient energy portfolio through diversified sources and local generation

PITTSBURGH RELIES ON A LARGE-SCALE, INTERCONNECTED ELECTRICITY DISTRIBUTION SYSTEM THAT IS FUELED BY A VARIETY OF SOURCES, INCLUDING COAL, NATURAL GAS, AND NUCLEAR ENERGY, WITH A SMALL PROPORTION FUELED BY RENEWABLES. NEW DEVELOPMENTS IN THE DISTRICT ENERGY SPACE AIM TO CREATE A MORE DISTRIBUTED ENERGY GRID LESS PRONE TO CAPACITY LOSS, WHILE LOCAL GENERATION HAS THE POTENTIAL TO BENEFIT THE GRID AND THE CLIMATE.

100RC NETWORK SHARING HIGHLIGHT: Building a resilient grid with partners across the network

CROs in cities across the 100RC network, from Boston, Massachusetts to Berkeley, California to Boulder, Colorado and beyond, have been sharing knowledge and collaborating around microgrids. Pittsburgh has been a trailblazer in this area, working to build strong relationships across the utilities, major users, and university partners conducting research on distributed energy and microgrids. Additionally, Pittsburgh will be featured as part of Siemens/100RC event series as a thought leader in technology and innovation in microgrids/distributed energy and resilience. Within the 100RC network, Pittsburgh will be a key part of advancing and elevating the work on microgrids and distributed energy among CROs, and the city itself will be a living lab to see the progress in technology and innovation as this work develops.

STRESSES & SHOCKS ADDRESSED

Aging infrastructure
Environmental degradation
Climate change impacts

ACTIONS FOR IMPLEMENTATION

- Increase local renewable energy production
- Create a circular economy in Pittsburgh
- Upgrade and improve the resilience of the power grid (District Energy Pittsburgh)
- Establish future climate goals and strategies (Climate Action Plan and 2030 Goals)

FEATURED SUB-ACTION: MOU with National Energy Technology Lab (NETL)
LEAD: City of Pittsburgh, Department of Mobility and Infrastructure
STATUS: Accelerate

In 2015 Mayor Peduto signed a Memorandum of Understanding (MOU) with the National Energy Technology Laboratory on behalf of the U.S. Department of Energy on joint efforts to design 21st Century energy infrastructure for Pittsburgh. The MOU will serve to position Pittsburgh as a demonstrated national and global leader in new technology development, and demonstration and application of strategic models. The outcomes of this MOU will help modernize delivery of utility services through new business models and markets, grow technology research and development opportunities and product manufacturing, reduce environmental impacts, enhance resilience and security through integrated district-based microgrid solutions, address affordability for consumers, and encourage workforce development.

Figure 21. District Energy Pittsburgh sites

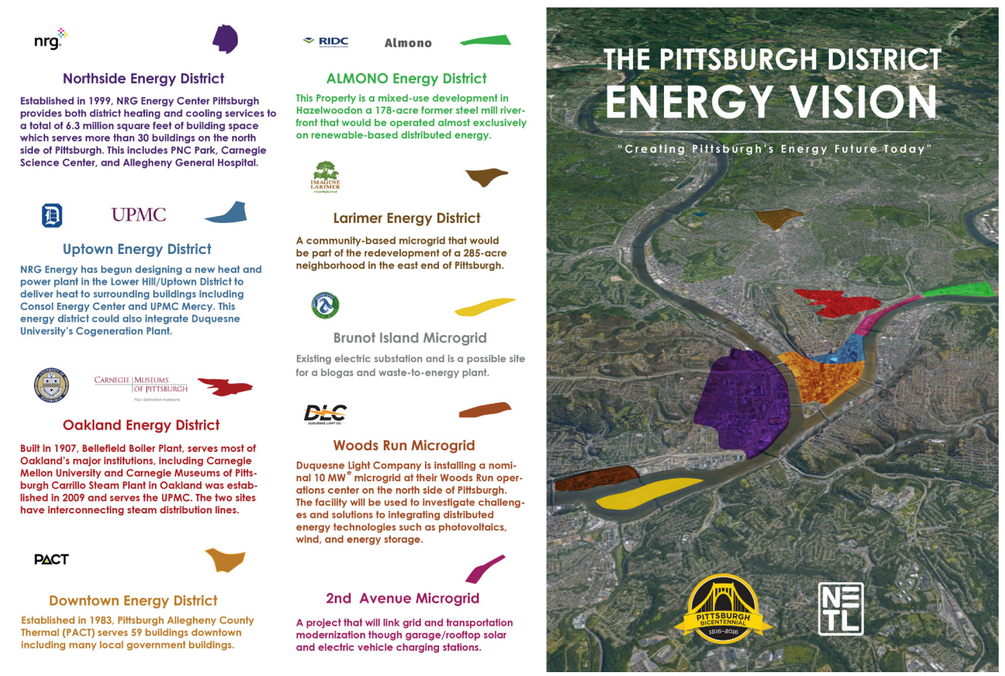


Figure notes: This map depicts the District Energy Pittsburgh sites distributed in key locations throughout the city. Some sites are currently established and operational while others are in the planning phases. Source: National Energy Technology Lab, 2016

Make efficient use of water, energy, and waste management resources citywide

AS A PART OF THE CLIMATE ACTION PLANNING PROCESS, PARTNERS IN PITTSBURGH HAVE ESTABLISHED A SET OF GOALS RELATED TO REDUCING WATER, ENERGY USE, AND EMISSIONS AND MAKING WASTE MANAGEMENT MORE EFFICIENT. A RESILIENT PITTSBURGH WILL EXTEND THE REACH OF THESE GOALS TO PROMOTE EFFICIENT RESOURCE USE CITY-WIDE.

FEATURED ACTION: Establish future climate goals and strategies
LEAD: City of Pittsburgh and partners
STATUS: Accelerate

The Pittsburgh 2030 District is a collaborative community of high-performance buildings in Downtown Pittsburgh working towards 50 percent reductions in energy use, water use, and transportation emissions by 2030, with new construction reaching carbon neutrality by that time. This supports the city's Climate Initiative and Climate Action Plan, which seeks collaboration across sectors to analyze and implement strategies, policies, and projects to reduce greenhouse gas emissions within city limits and mitigate Pittsburgh's contribution to global climate change.

STRESSES & SHOCKS ADDRESSED

Environmental degradation
Climate change impacts

ACTIONS FOR IMPLEMENTATION

- Establish future climate goals and strategies (Climate Action Plan and 2030 Goals)
- Improve corporate sustainability and green buildings
- Create a circular economy in Pittsburgh
- Create green and healthy homes

PLATFORM PARTNER ACTION: Thriving Earth Exchange Initiative
LEAD: City of Pittsburgh
PLATFORM PARTNER: American Geophysical Union (AGU) Thriving Earth Exchange

The City is in the process of completing the third iteration of its Greenhouse Gas Inventory. Through the Thriving Earth Exchange, AGU provided technical support to help the city validate the inventory and participate in the Climate Action Planning process. AGU's support will help Pittsburgh develop a standardized methodology to benchmark greenhouse gases year on year, which will enable the city to better track their progress in meeting the carbon mitigation goals set forth in the Climate Action Plan.

Maintain and improve natural infrastructure assets

PITTSBURGH IS ENDOWED WITH A WEALTH OF NATURAL RESOURCES, FROM ITS FORESTS TO ITS RIVERS TO ITS OVER 15,000 ACRES OF PARKS IN THE CITY AND SURROUNDING ALLEGHENY COUNTY. NON-PROFITS AND CITY AND COUNTY PARKS ORGANIZATIONS HAVE EXPANDED AND IMPROVED THE CITY'S NATURAL INFRASTRUCTURE IN RECENT YEARS. INVASIVE SPECIES AND INCREASED DEVELOPMENT THREATEN THE HEALTH AND SURVIVAL OF PITTSBURGH'S NATURAL ASSETS, SO STRATEGIC CONSERVATION EFFORTS ARE WARRANTED.

FEATURED SUB-ACTION: Biophilic City
LEAD: City of Pittsburgh; Phipps Conservatory
STATUS: Accelerate

Phipps Conservatory coordinates monthly Biophilia group meetups and, in partnership with the Biophilic Cities movement, worked with the City of Pittsburgh to become designated as a Biophilic city in 2016. Biophilic cities are built around nature, giving residents a recognition and affinity for local flora and fauna, providing education, and investing in infrastructure that protects nature and brings residents closer to it.

STRESSES & SHOCKS ADDRESSED

Inequity
Aging infrastructure
Environmental degradation
Climate change: Flooding, extreme heat
Invasive species

ACTIONS FOR IMPLEMENTATION

- Conserve, invest in, and connect to nature (Biophilic city)
- Recycle Pittsburgh's land for its best and highest use
- Provide access to clean water for drinking and recreation (3 Rivers, 365)

100RC NETWORK SHARING HIGHLIGHT:
Ecosystem planning sharing with Boulder

Boulder's strategy includes actions related to bring together disparate efforts to develop an integrated urban ecosystem management plan. With this plan, Boulder will support its complex local ecosystem and prepare for the systemic stresses and changes anticipated with climate change impacts. As Pittsburgh explores ways to build upon, protect, and better integrate efforts around its natural infrastructure, lessons learned from Boulder related to systems-level actions will be useful.

Design infrastructure to minimize environmental and public health impacts

PITTSBURGH'S POOR AIR, SOIL, AND WATER QUALITY BEAR THE MARKS OF THE CITY'S INDUSTRIAL LEGACY. A RESILIENT PITTSBURGH WILL NOT ONLY WORK TO RE-MEDIATE THE DAMAGES OF THE PAST BUT ALSO DESIGN INFRASTRUCTURE AND PRODUCE ENERGY IN WAYS THAT MINIMIZE FUTURE ENVIRONMENTAL IMPACTS.

PLATFORM PARTNER ACTION: Roadmap to Zero Waste
LEAD: City of Pittsburgh, Division of Sustainability and Resilience
PLATFORM PARTNER: R20

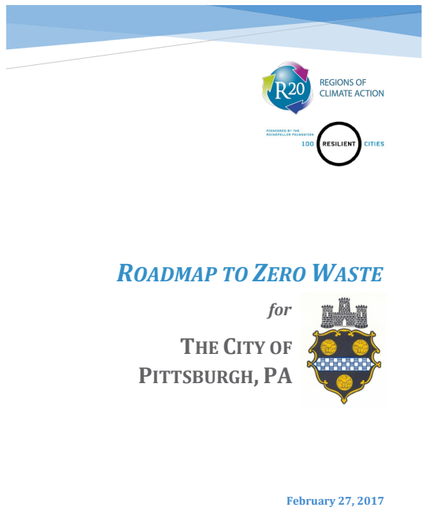
In December 2015, Mayor Peduto released the city's 2030 goals, which includes a goal to divert 100 percent of the city's waste from landfill. R20 worked with the city to conduct a waste survey, site visits, and interviews with key stakeholders to assess the state of the city's current waste management practices and has developed a roadmap of activities the city can take to achieve its zero waste goals. The roadmap includes opportunities that can be leveraged by understanding barriers to zero waste, taking advantage of technologies and best practices that can be brought to the city, as well as policy and legislation recommendations that will create an enabling environment to achieve 100 percent diversion from landfill by 2030.

STRESSES & SHOCKS ADDRESSED

Aging infrastructure
Environmental degradation
Climate change impacts

ACTIONS FOR IMPLEMENTATION

- Create a circular economy in Pittsburgh
- Enable multi-modal transportation
- Upgrade and improve the resilience of the power grid (District Energy Pittsburgh)
- Improve outdoor and indoor air quality
- Create green and healthy homes
- Develop a smart transportation system



PERFORMANCE

PITTSBURGH WILL WORK COLLABORATIVELY WITH GOVERNMENT AND NON-GOVERNMENTAL PARTNERS IN THE REGION FOR PLANNING AND DECISION-MAKING.

ENTREPRENEURSHIP.....78

Objective: Promote innovation

CIVIC ENGAGEMENT.....79

Objective : Educate & empower residents

COLLABORATION.....80

Objective: Support collaboration

MEASUREMENT.....81

Objective: Integrate data

Promote innovation and incubation of new technologies and businesses

AN EMERGING TECHNOLOGY AND ROBOTICS SECTOR IN THE CITY BUILDS ON RESEARCH CONDUCTED AT CARNEGIE MELLON UNIVERSITY, THE UNIVERSITY OF PITTSBURGH, AND OTHER LOCAL RESEARCH INSTITUTIONS. MOREOVER, THE CITY IS INCREASINGLY RECOGNIZED FOR THE CULTURAL AMENITIES AFFORDED BY THE ARTS, ENTERTAINMENT, AND FOOD SERVICE SECTORS. TO ENHANCE ITS ECONOMIC PROFILE AND BUILD ON ITS TRADITION OF INNOVATION, PITTSBURGH SHOULD CONTINUE TO SUPPORT PIONEERING TECHNOLOGY (AND NON-TECHNOLOGICAL INNOVATION) AND NEW BUSINESS DEVELOPMENT.

FEATURED ACTION: Roadmap for Inclusive Innovation
LEAD: City of Pittsburgh, Department of Innovation and Performance
STATUS: Accelerate

The Roadmap for Inclusive Innovation lays out a number of initiatives the City of Pittsburgh should undertake in the coming months and years to remain a hub of innovation for social groups, companies, and people. Specific action steps have been established to address the digital divide, empower city-to-citizen engagement, provide open data, improve internal city operations and capacity, advance the clean tech sector, and promote the local business environment.

STRESSES & SHOCKS ADDRESSED

Inequity: Education, employment, income
Aging population and workforce
Economic collapse

ACTIONS FOR IMPLEMENTATION

- Stimulate small business development
- Become a city of inclusive innovation (Pittsburgh Roadmap for Inclusive Innovation)
- Develop and retrain Pittsburgh's workforce

Educate, engage, and empower residents to take part in civic decision-making

PITTSBURGHERS TAKE GREAT PRIDE IN THEIR CITY AS A "BIG SMALL TOWN," WHERE RESIDENTS FEEL CONNECTED TO THEIR NEIGHBORHOODS AND HAVE A SAY IN CIVIC DECISION-MAKING. AS PITTSBURGH GROWS, THE CITY SHOULD SEEK TO MAXIMIZE COMMUNITY PARTICIPATION IN PLANNING PROCESSES AND PROVIDE A SEAT AT THE TABLE FOR ALL RESIDENTS.

FEATURED ORGANIZATION:
Program for Deliberative Democracy

The Program for Deliberative Democracy strives to improve local and regional decision-making through informed citizen deliberations. It has utilized Deliberative Citizen Forums and other forms of community conversations to cover such topics as capital budgeting, climate change, good governance, resilience, and the selection of a new Pittsburgh Police Chief. Forums are open to the public and typically include facilitated small group discussions, the opportunity to ask questions of an expert panel, and a survey.

STRESSES & SHOCKS ADDRESSED

Inequity
Fragmentation

ACTIONS FOR IMPLEMENTATION

- Enhance civic education and engagement
- Provide opportunities for community service and volunteering
- Encourage neighborhood-based grassroots efforts
- Enhance city government-to-citizen communication
- Improve community-police relations
- Confront and overcome structural barriers and racism
- Become a city of inclusive innovation (Pittsburgh Roadmap for Inclusive Innovation)
- Conserve, investing in, and connect to nature (Biophilic city)

100RC NETWORK SHARING HIGHLIGHT:
Civic engagement sharing with Semarang

Semarang, Indonesia's resilience strategy highlights enhancing public engagement and trust in government. A strategic pillar of their strategy, "Transparent Public Information and Governance," focuses on improving an existing participatory planning process already in place in Semarang to better engage citizens to solicit more meaningful input in development and budgeting decisions. Lessons learned from Semarang's resilience actions will be useful as Pittsburgh experiments with new ways of engaging residents in decision-making.

Align and dedicate funding and resources to support collaboration around shared goals

WHILE PITTSBURGHERS PRIDE THEMSELVES ON COLLEGIALITY AND WORKING WELL WITH ONE ANOTHER, FRAGMENTATION AMONG AND WITHIN GOVERNMENT DEPARTMENTS AND WITH NON-PROFITS RESULTS IN DUPLICATION OF EFFORTS AND LOST POTENTIAL FOR IMPACT. THERE ARE A NUMBER OF SHARED REGIONAL ISSUES THAT INVITE COLLABORATION, FROM WATER AND AIR QUALITY ISSUES TO TRANSPORTATION TO TACKLING THE OPIOID EPIDEMIC. SUCCESSFUL COLLABORATION NOT ONLY REQUIRES DEDICATION TO A SHARED MISSION BUT ALSO CAPACITY AND RESOURCES TO CONVENE PARTNERS.

FEATURED SUB-ACTION: DOT Smart Cities Challenge
LEAD: City of Pittsburgh and partners
STATUS: Accelerate

The SmartPGH Consortium believes in using their collective resources to ensure that SmartPGH results in a system of transportation networks that are more efficient, effective, and equitable for all. They intend to become the global model for urban transportation planning, replicating their effective approach within this region and others across the United States. They will provide leadership, input, oversight, and accountability for the SmartPGH Vision as established in the city's application to the Department of Transportation's Smart City Competition.

STRESSES & SHOCKS ADDRESSED

Fragmentation
Economic collapse

ACTIONS FOR IMPLEMENTATION

- Institutionalize the resilience lens in city processes
- Measure Pittsburgh's resilience and wellbeing (Pittsburgh Survey, 2.0)
- Share and integrate data
- Enhance city-to-city collaboration around shared issues
- Enhance Pittsburgh's fiscal capacity in partnership with non-profits (Payment in Lieu of Taxes (PILOT))
- Explore the creation of the Resilience Institute of Pittsburgh
- Integrate data systems to serve PPS students more effectively (Student Connections)
- Integrate social services into Pittsburgh Public Schools (PPS Community Schools)
- Improve disaster preparedness and response (THIRA and Hazard Mitigation Plan Update)

FEATURED EVENT: CONNECT Utilities Summit
LEAD: Congress of Neighboring Communities (CONNECT)

CONNECT brings together the City of Pittsburgh and surrounding municipalities to identify common public policy challenges and advocate for collective change on behalf of Allegheny County's urban core. The annual Utilities Summit includes the sharing of upcoming paving and construction plans with the goal of identifying opportunities for collaboration and an effort to procure a common data platform that the Utilities and municipalities can use to coordinate plans.

Integrate data and build analytic capabilities across organizations and government entities to

GOVERNMENT TRANSPARENCY AND OPEN DATA ARE A MAJOR FOCAL POINT IN PITTSBURGH, WHERE THE CITY OF PITTSBURGH ANALYTICS TEAM MANAGES THE CITY'S OPEN DATA, BUILDS NEW PERFORMANCE MANAGEMENT TOOLS, AND AIMS TO MAKE DATA MORE ACCESSIBLE AND USABLE FOR GOVERNMENT AND NGO PARTNERS. HOWEVER, PITTSBURGH CURRENTLY DOES NOT HAVE A SHARED FRAMEWORK FOR MEASUREMENT AND DECISION-MAKING ON WHICH TO LAYER THESE DATA, NOR A CURRENT OR COMPREHENSIVE PICTURE OF RESIDENT WELLBEING. BUILDING UPON THE WORK OF THE WESTERN PENNSYLVANIA REGIONAL DATA CENTER, EXPANDING THE NUMBER OF ORGANIZATIONS CONTRIBUTING DATA TO THE DATA CENTER, AND COLLECTING NEW DATA TO FILL GAPS IN UNDERSTANDING WILL ENABLE MORE EFFECTIVE COLLABORATION.

FEATURED ACTION: Pittsburgh Survey 2.0
LEAD: City of Pittsburgh, Resilient Pittsburgh, RAND Corporation, and partners
STATUS: Initiate

Pittsburgh Survey 2.0 will serve as the measurement framework for this strategy and plan and will provide a comprehensive picture of what life is like for Pittsburgh residents today. It will incorporate data integration from the vast array of ongoing activities in the city as well new data collection from Pittsburgh residents. The Survey will help the city to benchmark and track progress toward the objectives laid out in this strategy, serve as a tool to support decision-making by aligning key priorities and initiatives in the city, and help to integrate and track those priority initiatives within a framework of action.

STRESSES & SHOCKS ADDRESSED

Fragmentation

ACTIONS FOR IMPLEMENTATION

- Share and integrate data
- Measure Pittsburgh's resilience and wellbeing (Pittsburgh Survey, 2.0)
- Integrate data systems to serve PPS students more effectively (Student Connections)
- Explore the creation of the Resilience Institute of Pittsburgh
- Develop a smart transportation system

FEATURED ACTION: Shared/integrated data efforts
LEAD: City of Pittsburgh, Department of Innovation and Performance; Western Pennsylvania Regional Data Center (WPRDC); and partners
Shared/integrated data efforts
STATUS: Accelerate

Data sharing initiatives are ongoing in the city, where the Western Pennsylvania Regional Data Center, the city's open data portal, acts as a single data hub to support community initiatives by making public information easier to find and use. Data is increasingly being shared to support action in a range of sectors, including health, transportation, and public safety, both within the City of Pittsburgh and by public sector agencies, academic institutions, and non-profit organizations. Data sharing provides a foundation on which to address shared issues and reduce the stovepiping that often inhibits collaboration, while empowering residents with information about their community.

IMPLEMENTATION

ONE PGH
RESILIENT PITTSBURGH

IMPLEMENTING THE STRATEGY

The strategy offers a single, unifying way to strengthen the resilience and wellbeing of all Pittsburgh residents. For the promise of the strategy to be realized, the city plans to support a series of implementation steps through the next year to ensure coordinated and effective rollout and adoption by a range of sectors and stakeholders.

In the near term, the city will integrate resilience strategy into core government activities, as evidenced by the institutionalization of the Resilient Pittsburgh team to the Division of Sustainability and Resilience within the Department of City Planning, the creation of action leadership teams on themes from the strategy (e.g., economic development and workforce, cohesive monitoring and evaluation), and clear resource allocations to support priority strategy objectives. These near-term steps will ensure that the strategy produces clear outcomes but also catalyzes continued dialogue and immediate action. Further, in order to facilitate implementation, the city will need to effectively organize current city activities to realize their respective benefits for resilience. Finally, in the long term, organizational alignment and smart resource allocation will be important for strategy maintenance and sustainability.

NEAR-TERM IMPLEMENTATION STEPS

The release of the resilience strategy will take on a multifaceted approach, both to ensure the work is representative of diverse stakeholders and to realize maximum impact. The Resilient Pittsburgh website will outline highlights from the strategy document, serve as the platform for measuring progress over time, and will host a repository of ongoing events and initiatives related to the strategy. A video will provide additional context for the vision of Resilient Pittsburgh and inspire Pittsburghers to create positive change in their neighborhoods and households. Finally, an investment prospectus will draw from the actions featured in the strategy to address resilience challenges, and motivate funding for resource coordination and reduction of fragmentation among philanthropic initiatives.

The Division of Sustainability and Resilience will serve as the lead office for strategy implementation. The Division will also focus on four pathways to implement the strategy in year one:

1. Convene action leadership groups
2. Establish a governance and institutionalization framework
3. Establish a measurement framework
4. Integrate resilience-building into civic engagement and public events.

1. Convene action leadership groups

Resilient Pittsburgh recognizes that the city government cannot execute this strategy alone. It was developed collaboratively as a citywide collaborative effort, and also addresses a range of regional resilience challenges. Tackling fragmentation within the city's systems and between the city and external organizations is central in the first year of strategy implementation.

A series of events and round-tables will bring together diverse organizations working on systemic issues – for example, water quality, education, energy, and public health – to establish leadership and coordination in solving some of the city's most pressing challenges. Improved coordination will result in resource efficiency, better communication and long lasting partnerships, as well as agility across sectors for a deeper analysis of what is truly driving challenges to city resilience. Establishing leadership within topical areas is also intended to motivate both city departments and external organizations to lead implementation of the resilience strategy over the long-term.

2. Establish a governance and institutionalization framework

Institutionalization of the resilience focus within city government will ensure that the strategy remains relevant regardless of changes in personnel or shifts in political leadership. The location of the Division of Sustainability and Resilience within the Department of City Planning will support long-term integration of resilience by establishing formal resilience commissions and committees in the coming year.

As a first step, Resilient Pittsburgh will work with members of the resilience strategy steering committee to convene a governance framework group, which will provide recommendations to the Mayor for establishing commissions and implementation structures.

3. ***Establish a measurement framework: Pittsburgh Survey 2.0***

To document progress and monitor the effectiveness of resilience-building initiatives and actions, the Resilient Pittsburgh team will begin to establish a measurement framework in the first year. Currently, existing information about city needs is diffused and fragmented across the city both in government and nongovernmental activities. One important ongoing measurement effort is the p4 Performance Measures Project, which aims to "provide a comprehensive evaluation tool for the consistent assessment of real estate development projects in the city of Pittsburgh to advance sustainable and equitable development practices."[63] The Measures are currently in use by the URA as a new method for evaluating the benefit and impact of a site development project receiving public investment. Building upon the p4 Performance Measures and other data collection and measurement efforts underway, Pittsburgh is poised to develop a holistic and coordinated way to capture progress towards city resilience and wellbeing using a more integrated survey method.

A "Pittsburgh Survey, 2.0", which is inspired by a ground-breaking survey of city residents administered over a century ago, will address some of the challenges identified in this implementation section.[64] It will serve as a comprehensive information system to align and support Pittsburgh's initiatives (at the public level, while also available to private entities, non-profits, and foundations) from now through 2030.

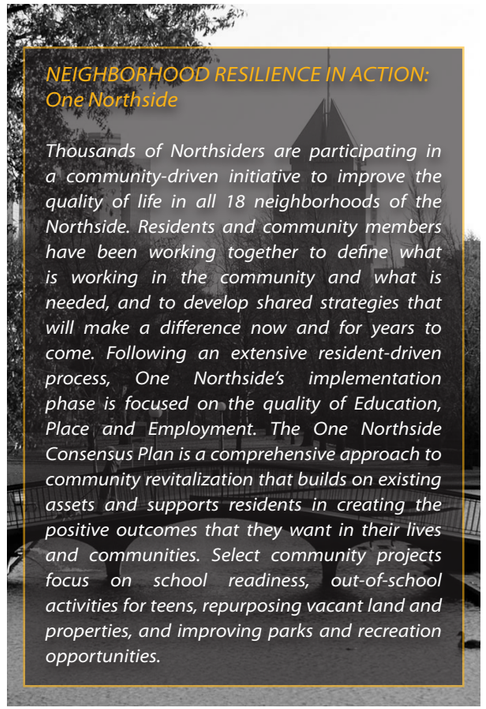
The Survey will become the central monitoring and evaluation mechanism for the implementation of this resilience strategy. It will centrally track existing secondary and administrative data that supports resilience and identify places where new or primary data collection is needed. The Survey will include core resilience and related wellbeing objectives, organize relevant actions like those in the strategy, and offer a foundation of data to link the effectiveness and efficiency of current investments, initiatives, policies, and programs to support resilience and wellbeing in Pittsburgh.

4. Integrate resilience into civic engagement and public events

To bring resilience into prominence in the larger city narrative, the Resilient Pittsburgh team will integrate resilience-building into civic engagement initiatives and existing events. In year one, Love Your Resilient Block grants will fund community-driven projects that address the city's resilience challenges at the neighborhood level.

Resilience Fairs and a series of citywide events will leverage partner organizations' ongoing resilience-building initiatives. By utilizing partnerships, Resilient Pittsburgh will connect with regional audiences and engage residences, businesses, and institutions in learning about and celebrating resilience in all facets of life in Pittsburgh.

Overall, near-term implementation will focus heavily on institutionalization and reducing fragmentation in both government and nongovernmental areas, fostering a regional atmosphere of collaborative problem solving and resource coordination. Year one of implementation is about bringing people, neighborhoods, and organizations together as we prepare to address the future uncertain challenges that all Pittsburghers will face from climate change, globalization, and urbanization.



NEIGHBORHOOD RESILIENCE IN ACTION: One Northside

Thousands of Northsiders are participating in a community-driven initiative to improve the quality of life in all 18 neighborhoods of the Northside. Residents and community members have been working together to define what is working in the community and what is needed, and to develop shared strategies that will make a difference now and for years to come. Following an extensive resident-driven process, One Northside's implementation phase is focused on the quality of Education, Place and Employment. The One Northside Consensus Plan is a comprehensive approach to community revitalization that builds on existing assets and supports residents in creating the positive outcomes that they want in their lives and communities. Select community projects focus on school readiness, out-of-school activities for teens, repurposing vacant land and properties, and improving parks and recreation opportunities.

LONG-TERM IMPLEMENTATION FACTORS

The Pittsburgh resilience strategy requires a comprehensive implementation plan to support uptake, integration, and long-term sustainability. There are several ways in which the strategy could be propelled to advance its vision and objectives but also areas that could impede implementation, particularly after the initial activities are complete. We briefly describe each of the factors that will support implementation over the next several years and then discuss measures to monitor long-term progress towards strategy goals and objectives. These measures will be included in the Pittsburgh Survey, described earlier.

Coordination among government and nongovernmental sectors

Coordination among government and nongovernmental sectors is central, particularly because the strategy relies on integrated actions by many sectors and stakeholders working together. As such, each action group will require lead and supporting actors who will contribute to its achievement. Further, coordination will be required to determine how the range of government agencies, nonprofits, businesses, and other organizations will integrate the strategy and its objectives into their core missions and organizational plans.

In the context of coordination, it is also important to consider the governance structures that will appropriately "scaffold" the strategy, that is, help build robust and usable plans for decision-making, prioritization of actions, and resource allocation. This also includes careful planning around leadership, including how the city provides leadership to the strategy and how community leaders can serve as ambassadors for the strategy's goals and objectives over time.

Resource allocation and a cohesive investment framework

Clearly, dedicated resources (both fiscal and non-fiscal) are important when a new endeavor like the resilience strategy is introduced. However, implementation is not simply about raising funds or increasing funding levels. Rather, it is important to understand how resources already allocated in existing budgets (government and non-government) support the strategy's objectives. For example, Pittsburgh's capital budget can be reviewed in light of resilience priorities (see example in the callout box).

CASE STUDY FOR CITY OF PITTSBURGH CAPITAL INVESTMENT DECISIONS: ASSESSING UTILITY BILLS IN THE CONTEXT OF RESILIENCE

The City of Pittsburgh owns and maintains 139 municipal buildings and additional assets for which it must pay monthly operating expenses. Utility bills represent one significant recurring expense: in 2016, the city expects to pay around $4.2 million, $1.1 million, and $370,000, respectively, for electricity, natural gas, and water. To maintain its assets, the city makes capital investments, which may lead to reductions in monthly utility bills. To assess the relative impact of these capital investments on Pittsburgh's resilience, the city could conduct several analyses to determine optimal actions/decisions. Resilience outcome metrics can be mapped to the allocation of funding for capital investments across the city's many building and structural assets. Budgeting approaches could focus on strengthening city resilience through general efficiency and identifying resilience co-benefits from investment choices or budget re-allocation. The utility budget is used to illustrate each approach.

Cost-benefit analysis and action to build basic resilience and energy efficiency: Using readily available data, City assets could be ranked in terms of attributes such as the absolute size of the utility bills and the building age, size, structure type, or other physical characteristics. Based on this type of information, capital funding could be allocated to building projects that, for example, would lead to the greatest net reduction in monthly utility bills (such as the biggest economic "bang for the buck") or the maximum economic benefit per unit cost of capital improvement investment. Table 1 provides examples of goals, associated metrics, and assets that would first be considered with this focus.

Table 1. Example energy efficiency goals, metrics, and assets for investment

Example Goal	Potential Metric(s)	Candidate Assets for Capital Investments[2]
Largest energy bill reduction with fewest number of projects	• Highest total energy bills for single assets	City County Building; General Services Eazor Warehouse; Police Headquarters[3]
Largest energy bill reduction with lowest total expenditure	• Largest per-square-foot energy bills • Age of building and structural considerations	Public Works Traffic Division Storage Building, Morningside Fieldhouse, McKinley Park Storage Shed[4]

Resilience-focused analysis and action with attention to resilience co-benefits: By collecting and utilizing additional quantitative and qualitative data on socioeconomics and community resources and assets (for example, household surveys), or incorporating information on externalities (for example, greenhouse gas footprint or intensity), a more sophisticated approach to investment can be made using the "resilience lens." The portfolio of investments selected by considering a broader set of metrics and assessing the corresponding quantitative and qualitative data would likely not be the same as those selected with economic cost-benefit analysis alone. In this case, metrics would need to be expanded to a more holistic and complete list that captures all facets of city resilience, and co-benefits would be explicitly considered.

For example, if the city wanted to prioritize the improvement and functionality of emergency response services, it might choose to focus on these assets first. In this case, the "Medic 10" facility—with the highest total energy bill and dramatically higher per-square-foot energy intensity among emergency medical services facilities, which the city owns and maintains[5]—might be the clear choice. Although this facility is not the most obvious target across the full set of city assets from a total energy cost perspective, it has high per-square-foot energy intensity and provides the potential co-benefit of enhancing emergency response services that operate out of this facility.

Footnotes

1 Additional information regarding the amount, type, and timing of previous capital investments likely to impact utility usage—which may have occurred over multiple years—would also be required for better understanding and ranking expected cost-benefit.
2 Detailed energy audits might be required to obtain a final ranking of priority investments. However, existing data would enable identification of priority assets for energy audits.
3 Total energy costs for these buildings were $417,011, $161,892, and $147,626, respectively, in 2014.
4 Energy intensities for these assets were 18.8, 7.16, and 5.02 dollars per square foot, respectively.
5 Energy intensity was $4.47/ft2 in 2014, compared to an average of $1.02/ft2 across the other comparable facilities.

Sources

City of Pittsburgh, 2015 Operating Budget; City of Pittsburgh, 2016 Operating Budget; City of Pittsburgh, 2017 Operating Budget;[1] Western Pennsylvania Regional Data Center, "Municipal Building Energy Use, 2009-2014;"[2] Western Pennsylvania Regional Data Center, "Pittsburgh City Facilities"[3]

There are many instances within this strategy that suggest new ways to align resources with programs and policies already in place. The action taxonomy offered below (Figure 25)—initiate, coordinate, amplify, and accelerate—is a useful way to categorize resource decisions. Some actions will require concentrated resources to amplify or accelerate progress. Other actions will benefit from coordination of resources from across government and nongovernmental sectors.

In general, this resilience strategy can be thought of as an investment framework or prospectus for private and public sector entities in Pittsburgh. The main goals of the strategy (for example, People) along with the detailed objectives inform areas in which sector-specific investments may be needed and co-benefits from investments could be realized. Many of the maps indicating where assets are low and vulnerabilities are high also suggest places for targeted investment.

Community awareness and ongoing education

Another factor that will facilitate effective implementation is continued dialogue about why resilience matters, how a resilience lens for existing and new programs and investments moves beyond traditional silos, and what benefits or co-benefits strategy implementation could achieve. Without the consistent engagement of Pittsburgh stakeholders, it will be difficult to advance interest and active participation in the strategy and realization of its vision. This includes ongoing efforts and the post-strategy launch to keep community members connected to the strategy. This education campaign may require new engagement strategies, use of diverse media approaches, and ongoing analysis of how the strategy is being received, adopted, and integrated by different constituencies.

Targeted partner building

While coordination, resource allocation, and education are critical for implementation, these are not sufficient in themselves to support implementation of a strategy that is holistic and integrated into whole-of-city planning and policy development. Targeted actions and investments that facilitate new and, in some cases, unusual collaborations, are essential for breaking down silos that may impede integrated efforts to achieve some of the strategy objectives.

Successful implementation will also depend on lessons learned, information sharing, and peer city support through city-to-city networks. Existing networks like 100RC, the National League of Cities, Urban Sustainability Directors Network, Sister Cities, the Mayors' Compact on Climate Change, and the Pennsylvania League of Cities and Municipalities are important exemplars that Pittsburgh is already actively engaged with.

MEASURING PROGRESS

As described above, ongoing measurement and regular analysis and use of the data collected will be central to successful implementation. The resilience objectives and actions provide a way to measure strategy progress. There are three approaches for strategy evaluation. First, each of the objectives can be linked to metrics that assess both process and outcomes. This will help Pittsburgh determine whether the city is becoming more resilient in key areas. **(Table 2).**

Second, the strategy will also need to track how particular actions are implemented against community readiness and the appropriateness or each action for adoption or uptake. The city will also want to track how well that process is taking shape. For example, how well are new actions initiated; is there better coordination among existing actions; are current actions being amplified to meet new populations; and are particular actions being accelerated to speed up adoption? **(Table 3)**

Finally, while tables like the one above are useful for tracking progress from specific goal to objective to resilience outcomes, they do not include critical monitoring of whether the strategy as a whole continues to meet its larger vision of making Pittsburgh more resilient to a range of shocks and stresses. As such, it will be important use a more overarching evaluation to determine how the systems and sectors that support resilience are also progressing institutionally. For example, key questions may include:

- Do all sectors across Pittsburgh and regionally integrate resilience as a core principle of mission, vision, and operating efforts? How is that attention to resilience represented?
- Is there more effective and efficient coordination among agencies and organizations to pursue resilience goals and objectives?

- Is there better communication and partnership among agencies and organizations?

Overall, this chapter provides a clear set of near-term steps to support successful strategy implementation and outlines critical organizational and community factors that are required to build Pittsburgh's resilience. Integration and alignment of metrics and evaluation activities across city departments and organizations will be central to achieving the primary goal and objectives of this resilience strategy.

Table 2. Example of linking strategy goals, objectives, and evaluation measures

GOAL	OBJECTIVE	MEASURES	
		Process	**Outcome-based**
People	Housing: Provide safe, affordable, and sustainable housing in new development or redevelopment	Provision of services that support rehabilitation of housing stock and prevent blight	Uptake of affordable housing across Pittsburgh neighborhoods Linkage of housing security with employment, income, and/or related outcomes
Place	Green space: Ensure that each community in Pittsburgh is connected to nature	Allocation of resources to support maintenance of green space	Use of green space by Pittsburgh residents, regardless of income or other background characteristics Benefits of green space use on resident health

Table 3. Examples of process measures within this action taxonomy

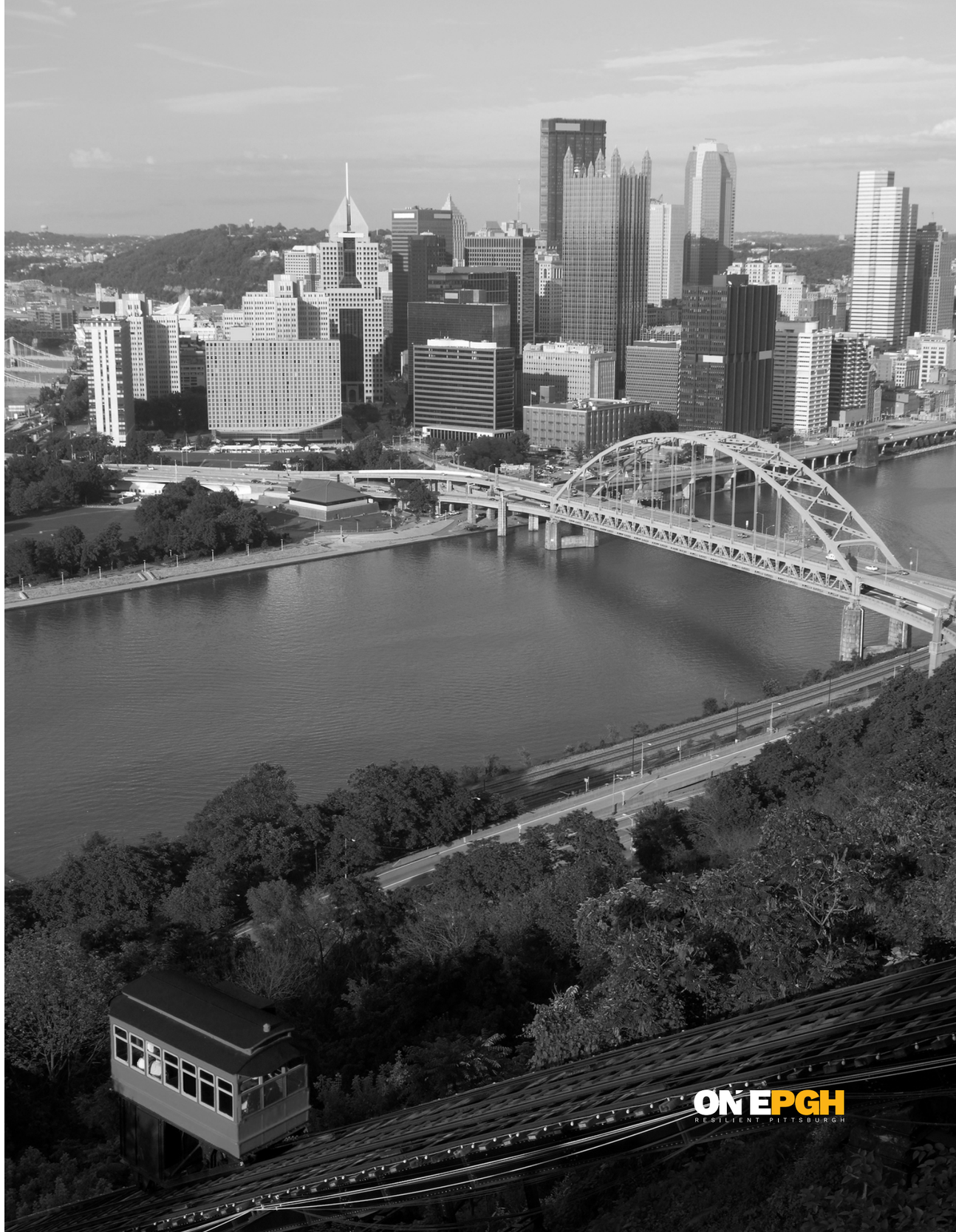
ACTION TAXONOMY	EXAMPLE PROCESS MEASURES
Initiation of new action	• Clear articulation of the motivation and purpose of the action, including linkage with strategy goal and objective • Leadership for the new action with plan for roll-out
Coordination among existing actions	• Linkage among organizations required to implement action • Communication quality and ease among organizations responsible for action
Amplification of current actions	• Uptake of action in new neighborhood(s), among new population(s) • Resource allocation matches broadening or diffusion of action
Acceleration of actions	• Relative speed of action implementation, use, and/or uptake • Change in behaviors or other outcomes related to exposure to the action

CONCLUSION

The Pittsburgh resilience strategy establishes a bold vision for the city, building on the successes in recent decades and a wealth of community assets while directly confronting the complex challenges that the city continues to face. The resilience strategy is greater than a single initiative or plan. It is a guide for city decisions and expectations, and is built to be sustainable over time. The strategy will help Pittsburgh realize the central purpose of a thriving city in the 21st century: to create conditions in which every resident can flourish in the face of challenges and a community that can effectively respond and recover in any circumstance.

The strategy comes at a critical period in Pittsburgh's history, in which choices made today about globalization, urbanization, climate change, equity, and economic progress will set a trajectory for generations to come. It acknowledges the complex interconnections among city challenges, with social, economic, and environmental effects resulting from every major decision. As such, siloed and single-sector actions are not sufficient, and city government cannot solve problems alone. Instead, a vast array of unique contributions from government and nongovernmental organizations needs to be harnessed to build on Pittsburgh's strengths, minimize its vulnerabilities, and help the city more effectively and cooperatively towards resilience goals.

The strategy makes organization and governance central to its successful implementation, evidenced by resilience actions like the Pittsburgh Survey 2.0 and other initiatives to align actions and measurement. It recognizes that the sustainability of the strategy over the long term will be rooted in a foundation of near-term achievements. As this strategy is implemented and cross-sector coordination improves, Pittsburgh will have more tools and capabilities to support its residents in addressing a range of shocks and stresses and in ensuring that basic needs are met. These efforts will not stop at the city borders, but are intended to provide benefits for residents across the metropolitan region. In a resilient Pittsburgh, basic needs will be met for all, and residents can pursue opportunity for themselves and their families. Successful implementation of the strategy means that Pittsburgh as a community can fully realize its aims to be inclusive, celebrate diversity, and promote innovation and sustainable development.



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Heinz Endowments
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Intermedix
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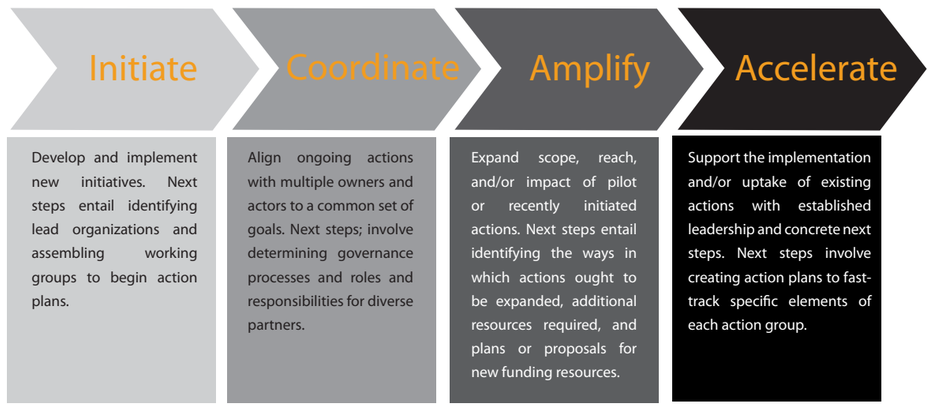
APPENDIX A: ACTIONS LIST

The Resilience Strategy is intended to push forward existing actions and supplement gaps with new initiatives. To identify, understand, and organize collective city-wide resilience building, actions have been grouped. The taxonomy in this appendix highlights the status of each "action group" (a group of actions with similar intended benefit) which are also identified in brief in the strategy. This will help Resilient Pittsburgh determine the best way to engage and support these activities during strategy implementation. Each category requires a particular type of effort and, in some cases, a specific approach to collaboration and measurement.



INITIATE

Integrate social services into Pittsburgh Public Schools (PPS Community Schools)

A Pittsburgh Community Schools model would designate district buildings to serve as hubs for social-service programs for students and the neighborhood. Community schools provide students with equitable access to programs and services like medical care, psychological services, access to a food bank, English as a second language training or work education programs all in a familiar building: a public school. Westinghouse High School in Pittsburgh's Homewood neighborhood has been operating as a community school for several years and offers a model and lessons learned for scaling to the city level.

Goals	People
Objectives	Health, Food, Education, Collaboration
Sub-actions	Pittsburgh Public Schools Community Schools, Westinghouse Full Service Community School
Possible action lead(s) & Partners	Partner lead

Provide Pre-K for all of Pittsburgh's children

Pittsburgh's children currently have unequal access to pre-K education, resulting in disparities in educational outcomes later in life. The City of Pittsburgh plans to pursue the funding, organizational structure, and capacity necessary to ensure pre-K is available to all of Pittsburgh's children.

Goals	People
Objectives	Education
Sub-actions	Mayor's Blue Ribbon Panel on Early Childhood Education
Possible action lead(s) & Partners	City of Pittsburgh and partners

Create a circular economy in Pittsburgh

The city's circular economy or waste-to-energy strategy, an innovative approach to managing Pittsburgh's waste management challenges while simultaneously reducing its carbon footprint, is in early stages. Local working groups established action plans and are working to implement short-term steps. Once fully implemented, the circular economy will result in upgrades to the city's waste management infrastructure, provide a source of renewable energy to help the city reach its 2030 climate goals, and provide new employment opportunities for Pittsburghers.

Goals	Place, Planet
Objectives	Local And Renewable Energy, Resource Efficiency, Resilient Design
Sub-actions	Circular economy
Possible action lead(s) & Partners	City of Pittsburgh, Resilient Pittsburgh

Enhance city-to-city collaboration around shared issues

The City of Pittsburgh is involved in global sharing networks with cities around the world. These collaborations—from our Sister Cities to the 100RCNetwork to the German Marshall Fund's Transatlantic Cooperation Network—are intended to support city-to-city information sharing and collaborative problem solving around common issues. Rather than each city starting from scratch to solve its own problems, these networks establish lines of communication and opportunities to scale and replicate successful solutions world-wide.

Goals	Performance
Objectives	Collaboration
Sub-actions	Sister City planning, 100 Resilient Cities network sharing
Possible action lead(s) & Partners	City of Pittsburgh, Mayor's Office; City of Pittsburgh, Resilient Pittsburgh; partners; 100 Resilient Cities network, especially with Sister City and fellow 100 RC DaNang, Vietnam

Enhance Pittsburgh's fiscal capacity in partnership with non-profits (Payment in Lieu of Taxes (PILOT))

Pittsburgh's non-profits are an important economic engine for the city, employing many Pittsburghers, serving the city's residents, contributing to its national profile, and providing some of the city's largest land-owning institutions, particularly its health and educational institutions. However, these institutions are tax-exempt and do not significantly contribute to the city's fiscal capacity. As Pittsburgh continues to pull itself out of financial distress, the city will explore options for payment in lieu of taxes from non-profits in the city.

Goals	Performance
Objectives	Collaboration
Sub-actions	Payment in Lieu of Taxes (PILOT)
Possible action lead(s) & Partners	City of Pittsburgh, Mayor's Office

Institutionalize the resilience lens in city processes

Embedding resilience in the capital budgeting process is a next logical step after the signing of the Resilience Pledge, the commitment of Mayor Peduto to dedicate at least 10% of the city's capital budget to resilience-related activities. This process would build upon best practices in utilizing the resilience lens as a decision-making tool for making capital budget decisions in order to achieve the most "resilience bang for our buck." Additionally, a Resilience Compact, similar to the Southeast Florida Regional Climate Change Compact and others, would formalize a partnership among local leaders and highlight strategies needed to collaboratively address resilience in Pittsburgh.

Goals	Performance
Objectives	Collaboration
Sub-actions	Resilience in capital budgeting, 10% Resilience Pledge, Resilience Compact
Possible action lead(s) & Partners	City of Pittsburgh, Resilient Pittsburgh; City of Pittsburgh, Office of Management and Budget; Boulder and New Orleans 100RC network sharing

Explore the creation of the Resilience Institute of Pittsburgh

Pittsburgh has wealth of research institutions, including its universities, consultancies, and independent research institutions, that are already engaged in work to benefit the city and improve the ways in which it operates. While city data is increasingly available via shared data systems, demands for analytical capabilities are growing to ensure that data can be used to inform decision-making. The city's data and analysis assets highlight an opportunity to institutionalize a core of researchers dedicated to resilience-related topics. The city will explore ways in which it can capitalize upon its homegrown research capacity to help it solve future challenges, such as exploring ways to repurpose Pittsburgh's waste for energy.

Goals	Performance
Objectives	Collaboration, Measurement
Sub-actions	Resilience Institute of Pittsburgh
Possible action lead(s) & Partners	City of Pittsburgh, Department of Innovation and Performance and partners

Articulate connections between students and resources to serve PPS students more effectively

Consolidating student information and streamlining access to resources that are currently dispersed across agencies will result in a more robust information system. Articulating transparent protocols for connecting students to available resources will better serve student needs. This effort will increase the collective impact of current programs, services, and education initiatives by improving communication and coordination between and among professionals and the families they support. The goal is to connect more students to the resources they want and need when they want and need them so they can succeed in school and after graduation.

Goals	Performance, People
Objectives	Education, Collaboration, Measurement
Sub-actions	Student Connections
Possible action lead(s) & Partners	Partner lead

Measure Pittsburgh's resilience and wellbeing (Pittsburgh Survey 2.0)

Pittsburgh Survey 2.0 will not only serve as the measurement framework for this strategy and plan but will also paint a comprehensive picture of what life is like for today's Pittsburgh residents. It will integrate data from the vast array of ongoing activities in the city as well new data collected from Pittsburgh residents. The Survey will help the city to benchmark and track progress toward the objectives laid out in this strategy, serve as a tool to support decision-making by aligning key priorities and initiatives in the city, and help to integrate and track those priority initiatives within a framework of action.

Goals	Performance
Objectives	Collaboration, Measurement
Sub-actions	Pittsburgh Survey 2.0
Possible action lead(s) & Partners	City of Pittsburgh, RAND Corporation, and partners

COORDINATE

Improve outdoor and indoor air quality

County and city agencies, researchers, and community organizations are all involved in studying Pittsburgh's air quality and its impact on residents. Better coordination of measurement, advocacy, community engagement, and regulatory efforts around air quality in the region would help Pittsburgh to more efficiently and effectively address one of its key public health challenges.

Goals	People, Planet
Objectives	Health, Resilient Design
Sub-actions	Speck IAQ Monitor Deployment, Pittsburgh Pollution Data Collection (Breathmobiles), Environmental Justice Community Alert Matrix (EJCAM)
Possible action lead(s) & Partners	Partner lead

Promote equitable development

Equitable development is a "positive development strategy that ensures everyone participates in and benefits from the region's economic transformation—especially low-income residents, communities of color, immigrants, and others at risk of being left behind." This action groupt is currently a set of recommendations for eliminating racial inequities and ensuring that all Pittsburghers have the opportunity to live in healthy and safe neighborhoods, to connect to economic opportunity and wealth generation, and to participate in decision-making.

Goals	People
Objectives	Housing, Diversity, Mixed Uses
Sub-actions	100 Percent Pittsburgh, All-In Pittsburgh, Recommendations for an Equity, Justice and Inclusion Agenda for Pittsburgh
Possible action lead(s) & Partners	Partner lead

Provide food security and healthy food access

Pittsburgh is home to a large number of non-profits working on food security, participates in state and federal programs to increase access to healthy foods, and is expanding its footprint in terms of urban agriculture. But a good number of Pittsburghers still go hungry, and many others lack access to a range of healthy food options. Coordinating ongoing initiatives, programs, and actors would help Pittsburgh feed more residents for its efforts.

Goals	People
Objectives	Food, Health, Emergency Preparedness
Sub-actions	Fresh Access Food Bucks Bonus, Fresh Corners, Grub Up, Farm to Food Bank, Community Table, 412 Food Rescue, Helping Hands, Senior Box Program
Possible action lead(s) & Partners	City of Pittsburgh and partners; New Orleans 100RC network sharing

Create green and healthy homes

Efforts to "green" Pittsburgh's housing stock abound, as do approaches to make the city's homes healthier and safer places to live. These include a range of players, such as county- and city-administered federal funding for lead issues, private companies offering incentives and programs to improve energy efficiency, public service providers and city departments conducting home safety inspections, and non-profits offering programming to help residents to reduce their utility bills. Coordination of these efforts, through programs like the Green and Healthy Homes Initiative, will extend their impact.

Goals	People, Planet
Objectives	Housing, Health, Resilient Households, Resource Efficiency, Resilient Design
Sub-actions	Green and Healthy Homes, Grassroots Green Homes, Allegheny Lead Safe Homes, Free lead testing program, Environment and Energy Community Outreach (EECO) Center, Residential efficiency certification systems (e.g., HERS Index; Energy Star), Private energy efficiency programs
Possible action lead(s) & Partners	City of Pittsburgh, Resilient Pittsburgh and partners

Support local and urban agriculture

Pittsburgh's climate and wealth of green and open space within the city prime it for advancements in local urban agriculture. Coordinating ongoing efforts, from community gardens to initiatives at Pittsburgh Public Schools to policy-level approaches to developing local food systems will increase the robustness and redundancy of the city's food supply.

Goals	People, Place
Objectives	Food, Vacant Land, Green Space
Sub-actions	Urban Agriculture Zoning Code, Homegrown, Edible Schoolyard, Local Food Supply Chain Initiative in Southwestern Pennsylvania
Possible action lead(s) & Partners	City of Pittsburgh, Department of City Planning and partners

Develop and retrain Pittsburgh's workforce

Over time, Pittsburgh's economy will need to rely on a new cadre of middle-skilled workers. There are many city-sponsored activities currently underway to assist with workforce development and career and technical training for adults, including technical training programs sponsored by industries anticipating workforce transitions. Better coordination of the city's ongoing activities would help establish a pipeline of qualified Pittsburghers ready to fill vacancies left by retirees and positioned to take on the jobs of the future in healthcare, technology, energy, utilities, transportation, 21st century manufacturing, and other areas.

Goals	People
Objectives	Workforce Development, Entrepreneurship
Sub-actions	Landforce, Electrical Distribution Technology certificate program, Manchester-Bidwell programming, Appalachia Partnership Initiative,Community Kitchen Culinary Training Program
Possible action lead(s) & Partners	City of Pittsburgh, Pittsburgh Job Corps Center and partners; DaNang 100RC network sharing

Stimulate small business development

A growing suite of services has been offered by the City of Pittsburgh to promote small business development. These include efforts to connect local startups with the City of Pittsburgh to improve city operations and to give entrepreneurs access to representatives from all relevant departments within city services. Initiatives also help entrepreneurs locate and secure capital resources and provide mentorship opportunities for starting and growing new businesses. Initiatives to grow capital to support knowledge-based start-ups and to expand small businesses started in the city are ongoing. Key next steps will involve developing mechanisms to coordinate capital and to provide a pathway by which new capital can be introduced.

Goals	People
Objectives	Workforce Development, Entrepreneurship
Sub-actions	City of Pittsburgh: LaunchPGH.com, PGH Lab, Small Business Resource Fairs; partners
Possible action lead(s) & Partners	City of Pittsburgh, Department of Innovation & Performance

Repurpose Pittsburgh's land for its best and highest use

A number of ongoing and new initiatives in the city have dedicated resources and aim to repurpose Pittsburgh's more than 30,000 vacant lots for community benefit. Better coordination and streamlined city processes will allow accelerated conversion of blighted properties and vacant lots into resources for community benefit, such as community gardens, urban forest expansion, rain gardens, or other public space.

Goals	Place, Planet
Objectives	Vacant Land, Green Space, Public Space, Water, Natural Infrastructure
Sub-actions	Love Your [Resilient] Block, Resilience Generation, URA/City Vacant Lot maintenance process redesign, Adopt-a-Lot, Blight Bootcamp, Lots to Love, ReClaim and Neighborhood Ambassadors, Green Tool Box, Vacant Lot Toolkit
Possible action lead(s) & Partners	City of Pittsburgh, Department of City Planning; URA; partners

Design and construct smart and sustainable redevelopment projects

Redevelopment projects in Pittsburgh provide new housing along with office, retail, and recreational opportunities, taking advantage of vacant or underutilized land in key geographies. Key aspects of these efforts include the use of green strategies for building, transportation, water, and energy infrastructure using innovative, home-grown technological solutions; collaboration between diverse government and non-government partners; and community engagement efforts.

Goals	Place
Objectives	Mixed Uses, Public Space
Sub-actions	Almono, Uptown EcoInnovation District, Lower Hill Redevelopment, Choice Neighborhood Implementation Grant (Larimer), Produce Terminal Development, City of Pittsburgh
Possible action lead(s) & Partners	City of Pittsburgh, Department of City Planning; URA; Melbourne 100RC network sharing

Enable multi-modal transportation

Advocacy groups, non-profit organizations, city and county departments, and county and regional-level coalitions and planning organizations are currently working to expand multi-modal transportation opportunities in and around Pittsburgh. Related efforts include "complete streets" policy changes, physical infrastructure construction, Port Authority service changes, and various recommendations in reports and plans at different stages of implementation. Better coordination of this wide range of capital investments, operational improvements, and policy changes will help ensure that these efforts meet city resilience goals and that expanded options continue to be realized for Pittsburghers across the city.

Goals	Place, Planet
Objectives	Transportation, Resilient Design
Sub-actions	Complete streets executive order/policy, Downtown-Uptown-Oakland Bus Rapid Transit (BRT), Green Bike Lanes, Better Bikeways Vision, Bike PGH bike inventory, Healthy Ride, Make My Trip Count, 2015 Commuter Survey
Possible action lead(s) & Partners	City of Pittsburgh, Department of Mobility and Infrastructure and partners

Provide access to clean water for drinking and recreation (3 Rivers, 365)

"3 Rivers, 365" refers to a set of efforts that aim to ensure that Pittsburgh's water is fishable, swimmable, and drinkable. Pittsburgh's three rivers are some of its most important assets, and these initiatives address the stormwater management, water quality, and water accessibility issues that currently challenge the city and surrounding region. This set of actions also includes existing and new efforts by PWSA to identify and resolve issues with elevated lead levels in Pittsburgh's drinking water.

Goals	Planet
Objectives	Water, Natural Infrastructure
Sub-actions	City-Wide Green First Plan, ALCOSAN Wet Weather Plan, Pilot green infrastructure projects (bioswales, daylighting, Parks waterway management, etc.), Integrated Stormwater/ Watershed Management Planning, PWSA Green Infrastructure maintenance, Riverfront Interim Planning Overlay District (IPOD), Route 51 Green Boulevard, Stormwater Management Overlay District, Stormwater Management Trust Fund, Project 15206, Living Waters of Larimer, Negley Run Watershed Resilience Accelerator, PWSA participation in National Green Infrastructure Certification Program, PWSA Reorganization
Possible action lead(s) & Partners	Pittsburgh Water and Sewer Authority; Impact Infrastructure, Inc.; ARCADIS

AMPLIFY

Enhance civic education and engagement

Recent technological developments and the institutionalization of processes like the Deliberative Democracy model into the city's decision-making have provided new and innovative options for civic engagement. Additional effort is needed to expand and increase Pittsburgh's civic awareness and to ensure that new processes continue to have an impact on civic decisions. New actions are warranted to ensure that traditionally underrepresented groups are able to have a say in what happens in their communities.

Goals	People, Performance
Objectives	Resilient Households, Civic Engagement
Sub-actions	Civic Leadership Academy, Deliberative Democracy Forums
Possible action lead(s) & Partners	City of Pittsburgh; Semarang 100RC network sharing

Improve community-police relations

As a participant in the U.S. Department of Justice's National Initiative for Building Community Trust and Justice, Pittsburgh's community policing initiatives are in the spotlight. However, the federal program's future may be in question, and the recent departure of Chief Cameron McClay, who prioritized improved community-police relations during his tenure, leaves local implementation in question as well. Nevertheless, a priority for resilience strategy implementation is to ensure that ongoing efforts in community outreach, technology-assisted citizen engagement, and open police data can be sustained and amplified regardless of potential changes in federal support or funding to achieve a greater impact on public safety and improved community-police relations.

Goals	People, Performance
Objectives	Safety, Civic Engagement
Sub-actions	National Initiative for Building Community Trust and Justice, Safer Together, Citizen's Police Academy (CPA)
Possible action lead(s) & Partners	City of Pittsburgh, Department of Public Safety, Bureau of Police

Support aging Pittsburghers and those with disabilities

The City of Pittsburgh, Allegheny County, and a number of local non-profits and foundations offer services for Pittsburghers with disabilities. As the population in the region continues to age and demands for services increase, a number of ongoing and new efforts aim to meet the needs of these populations, including offering healthy living opportunities, enabling mobility, promoting workforce development, enhancing home and community-based care, meeting basic needs, providing access to supportive housing, and other objectives.

Goals	People, Place
Objectives	Health, Transportation
Sub-actions	Health Active Living, Snow Angels, Community HealthChoices (CHC), transit accessibility efforts (e.g., ACCESS), 21 and able
Possible action lead(s) & Partners	Citiparks and partners

Support veterans and homeless Pittsburghers

Beginning with the Mayors Challenge to End Veteran Homelessness, efforts to support the homeless population, particularly veterans, in the city are beginning to take shape. Technology is connecting people in need with services in innovative ways. These and other small-scale projects can be amplified to reach more of their target population.

Goals	People
Objectives	Housing, Health
Sub-actions	Mayors Challenge to End Veteran Homelessness, Homefront Pittsburgh, BigBurgh
Possible action lead(s) & Partners	City of Pittsburgh, Mayor's Office; Housing Authority of the City of Pittsburgh

Confront and overcoming structural barriers and racism

Workshops and trainings organized by national and local organizations aim to shed light on the historic inequities, systemic bias, and racism that have impacted Pittsburgh's communities of color over the course of the city's history. Amplifying these initiatives and building awareness of racism and discrimination among all Pittsburghers will be critical to creating an equitable city for all.

Goals	People, Performance
Objectives	Safety, Diversity, Civic Engagement
Sub-actions	Pittsburgh Peace and Justice Initiative, Dignity and Respect Campaign, Beyond Diversity, Trauma intervention workshops, Youth Undoing Institutional Racism (YUIR) Weekend
Possible action lead(s) & Partners	Partner lead

Establish a welcoming and diverse community (Welcoming Pittsburgh)

Mayor Peduto's Welcoming Pittsburgh Plan aims to improve the lives of immigrants and long-time residents alike by creating informed, diverse, and welcoming experiences throughout the city. Derived from community and Advisory Council input, the plan includes a broad set of recommendations in three categories: Welcome, Neighbor! (creating community connections), Bridge to the City (linking residents to government services, policy, and housing), and Prospering Together (promoting economic opportunity).

Goals	People
Objectives	Workforce Development, Diversity
Sub-actions	Welcoming Pittsburgh, Bridge ID Program, Vibrant Pittsburgh programming, Hola Pittsburgh
Possible action lead(s) & Partners	City of Pittsburgh, Mayor's Office; 100RC network sharing (sanctuary cities)

Provide 21st century education for youth

In and out of school, Pittsburgh's children are receiving training and building skills and enthusiasm to pursue 21st century jobs in engineering, computer science, advanced manufacturing, and more – sectors that characterize Pittsburgh's key growth industries. Science, Technology, Engineering, Arts, and Math (STEAM) initiatives are currently being piloted in primary and secondary schools around the region, and select afterschool programs and city-run community centers are exploring ways to integrate these principles into their programming. Expanding the scope of these largely pilot and small-scale efforts would contribute to a school-to-work pipeline accessible to all of Pittsburgh's children.

Goals	People
Objectives	Education, Workforce Development
Sub-actions	Rec2Tech, Pittsburgh Learn & Earn Summer Youth Employment Program, PPS STEAM initiatives, career and technical education in PPS, Remake Learning, Allegheny Intermediate Unit (AIU) STEAM Grants, Global Passport Project, pre-apprenticeship programs (e.g., Energy Innovation Center), Start on Success, Workforce Innovation and Opportunity Act (WIOA) youth programming
Possible action lead(s) & Partners	City of Pittsburgh and partners; Manchester-Bidwell Corporation (local Platform Partner)

Support job and life skills for Pittsburgh's youth of color

A body of data has raised concerns about barriers to healthy development, education, and economic opportunity for Pittsburgh's youth of color. The city participates in the My Brother's Keeper program, which lays out a roadmap for addressing the opportunity gap for boys and young men of color. A recent report has also offered recommendations for how to positively change the trajectory for Black girls and women. Regardless of how the national My Brother's Keeper program proceeds in future years, it will be up to local partners to sustain and amplify the impact of the program in Pittsburgh.

Goals	People
Objectives	Safety, Workforce Development, Diversity
Sub-actions	Inequities Affecting Black Girls in Pittsburgh and Allegheny County, My Brother's Keeper
Possible action lead(s) & Partners	City of Pittsburgh, Mayor's Office and partners

Enhance city government-to-citizen communication

The City of Pittsburgh manages a growing collection of dedicated web pages, mobile applications, social media-based initiatives, and telephone and television-based communication channels that facilitate communication between the government and citizens. These services utilize technology, make data and information available to users, allow residents to express their opinions on civic issues, and enable the city to rapidly communicate with residents in case of emergency.

Goals	People, Place, Performance
Objectives	Resilient Households, Communications, Civic Engagement
Sub-actions	311, My Burgh app, BuildingEye, Burgh's Eye View, Resilient Pittsburgh website, City of Pittsburgh website redesign, City-Nextdoor Partnership, Snow Plow Tracker
Possible action lead(s) & Partners	City of Pittsburgh, Department of Innovation & Performance and partners

Improve corporate sustainability and green buildings

With its wealth of ongoing activity, Pittsburgh is a leader in green buildings and corporate sustainability. As of 2016, the Pittsburgh region was home to 378 LEED certified projects, 438 buildings committed to Pittsburgh 2030 District goals, 5 AIA COTE Top 10 Award Winners, 2 Living Buildings, a Net Zero Energy certified building, a Sustainable Sites certified building, and a WELL certified building. Momentum is building to expand participation in corporate sustainability and green building programming.

Goals	Planet
Objectives	Resource Efficiency
Sub-actions	Pittsburgh 2030 Districts, Building energy disclosure ordinance, Phipps Center for Sustainable Landscapes Living Building Challenge, Green Garage Initiative, Sustainable Pittsburgh certifications/challenges, Green Building Council PEER accreditation, Green Mountain Energy Sun Club® grants
Possible action lead(s) & Partners	Partner lead

Encourage neighborhood-based resilience efforts

Because Pittsburgh is a city of neighborhoods, the city's resilience efforts often take place at a neighborhood level, led by a set of engaged and innovative neighborhood coalitions. These groups promote resident engagement and aim to solve some of the most pressing issues to Pittsburghers, from repurposing vacant land to organizing around affordable housing.

Goals	People, Performance
Objectives	Resilient Households, Civic Engagement
Sub-actions	One Northside, Larimer Consensus group, Making a Greater Hazelwood, HELP
Possible action lead(s) & Partners	City of Pittsburgh, Bureau of Neighborhood Empowerment; Department of City Planning

Provide opportunities for community service and volunteering

Pittsburgh's long-standing traditions of social connectivity and civic engagement as well as its wealth of non-profit institutions enables a wide variety of opportunities for Pittsburghers to get engaged in making the city a better place. This strategy presents an opportunity to expand the scope of activities, many coordinated through the city's ServePGH program, that aim to address resilience-related issues through impact volunteerism, including protecting the urban forest, cleaning up blighted neighborhoods, or assisting Pittsburgh's elderly or disabled populations.

Goals	Performance
Objectives	Civic Engagement
Sub-actions	ServePGH, Beautify the 'Burgh, Resilience Fairs, Urban EcoSteward, Tree Tenders, TreeVitalize, Open Your Heart
Possible action lead(s) & Partners	City of Pittsburgh, Mayor's Office and partners

ACCELERATE

Address the opioid epidemic

There is growing recognition of the need for a coordinated policy response to the opioid epidemic in areas like Western Pennsylvania. Current recommendations for the region from the Allegheny County Health Department include mapping how the recommendations of the National Heroin Task Force Report are being implemented on a regional level and setting framework for moving forward. The plan underscores the importance of integrating public health and public safety to reduce overdoses, catalogs regional efforts to highlight existing best practices that can be deployed in other settings, exposes gaps, identifies next steps, and creates a continuum of care model to maximize interventions.

Goals	People
Objectives	Health
Sub-actions	Western Pennsylvania Opioid Response Report and Recommendations
Possible action lead(s) & Partners	Partner lead; Intermedix

Implement a Public Health 3.0 model

Public Health 3.0 is a federal concept that encourages public health agencies to think differently about their work by fostering public-private partnerships, using data more effectively, and collaborating across government units to foster community wellbeing and preparedness. The effort kicked off in Allegheny County this year and provides a framework for accelerating implementation of the county's Plan for a Healthy Allegheny (PHA). New initiatives aim to address the priority areas identified in the PHA through the lens of Public Health 3.0, with new partnerships and with a commitment to working toward building a culture of health in the region.

Goals	People
Objectives	Health
Sub-actions	Plan for a Healthier Allegheny (and Community Health Assessment), Live Well Allegheny/Pittsburgh, Pittsburgh and Glasgow Welding Health Equity and Resilience Together (PGWT), Healthy Together, Let's Move!, Pittsburgh Parks Rx, Playful Pittsburgh Collaboration
Possible action lead(s) & Partners	City of Pittsburgh, Resilient Pittsburgh and partners; Glasgow 100RC network sharing

Preserve and develop affordable housing

The city's Affordable Housing Task Force, in partnership with community-based organizations and neighborhood coalitions, has developed a suite of recommendations, policies, programs, and initiatives to address access to affordable housing in Pittsburgh. Additionally, financing programs and community outreach efforts are focused on improving the quality and sustainability of Pittsburgh's existing (and aging) housing stock in order to keep the total cost of housing affordable.

Goals	People, Place
Objectives	Housing, Vacant Land
Sub-actions	Affordable Housing Task Force Recommendations, Affordable Housing Trust Fund, Inclusionary Zoning, Bridges Beyond Blight, Community Acquisition and Rehabilitation Loan (CARL) Program, Pittsburgh Home Rehabilitation Program + (PHRP PLUS)
Possible action lead(s) & Partners	City of Pittsburgh, Affordable Housing Task Force

Become a city of inclusive innovation (Pittsburgh Roadmap for Inclusive Innovation)

The Roadmap for Inclusive Innovation lays out a number of initiatives the City of Pittsburgh should undertake in the coming months and years to remain a hub of innovation for social groups, companies, and people. Specific action steps have been established to address the digital divide, empower city-to-citizen engagement, provide open data, improve internal city operations and capacity, advance the clean technology sector, and promote the local business environment.

Goals	Place, Performance
Objectives	Communications, Entrepreneurship, Civic Engagement
Sub-actions	Pittsburgh Roadmap for Inclusive Innovation
Possible action lead(s) & Partners	City of Pittsburgh, Department of Innovation & Performance

Develop a smart transportation system

Pittsburgh is emerging as a leading center of innovation in autonomous vehicles, smart infrastructure, and other transportation technologies. Pittsburgh's Smart Transportation Plan involves developing an open platform and corresponding governance structure to improve the safety, equity, and efficiency of our transportation network and its interaction with the energy and communications networks. By building on existing technology deployments and increasing fixed and mobile sensors over a number of major "Smart Spine" corridors that connect with primary commercial centers and amenities, Pittsburgh will collect, analyze, visualize, and act on information to improve mobility for residents.

Goals	Place, Planet, Performance
Objectives	Transportation, Recapitalized Infrastructure, Commercial Transport, Disaster Reliability, Resilient Design, Measurement
Sub-actions	SmartPGH Consortium, Smart Spines, LED Streetlight Retrofit Program, Adaptive Traffic Signals, cyber resilience best practice and strategy development
Possible action lead(s) & Partners	City of Pittsburgh, Department of Mobility and Infrastructure; Mexico City 100RC network sharing; R20, Microsoft

Improve disaster preparedness and response (THIRA and Hazard Mitigation Plan)

Pittsburgh's Threat and Hazard Identification and Risk Assessment (THIRA) process helps to identify potential manmade or natural threats and hazards to the City of Pittsburgh. Key steps include describing the context, assessing capacity to respond, and developing recommendations, including resource requirements. Planning activities building upon THIRA, including Hazard Mitigation Plan updates, will serve as a blueprint for reducing property damage from natural or manmade disaster and will focus on saving lives from the effects of any future disaster. Moreover, Pittsburgh's emergency management and public safety sectors provide a model for intra- and inter-government collaboration from which other agencies can learn.

Goals	People, Place, Performance
Objectives	Emergency Preparedness, Resilient Households, Disaster Reliability, Collaboration
Sub-actions	THIRA and Hazard Mitigation Plan Update, Knowledge Center, Citiparks facilities (warming/cooling; wi-fi), National Incident Management system for critical transportation linkages
Possible action lead(s) & Partners	City of Pittsburgh, Department of Emergency Management and partners

Put city facilities to their best and highest uses (Strategic Investment & Maintenance Plan)

The City's Strategic Investment and Maintenance Plan for city assets includes an assessment of the current state of city facilities and the establishment of maintenance schedules and long term investment plans so each facility will be put to its "best and highest use." It also extends beyond city facilities to begin to develop plans for city streets and sidewalks; for the city's vehicle fleet; for city owned walls, steps and fences; for urban forests and hillsides; and for public spaces and monuments, among other assets.

Goals	Place
Objectives	Recapitalized Infrastructure
Sub-actions	Strategic Investment & Maintenance Plan
Possible action lead(s) & Partners	City of Pittsburgh, Office of Management and Budget

Conserve, invest in, and connecting to nature (Biophilic city)

Pittsburgh's designation as a Biophilic city sets a course for a city that values its green space, urban forests, biodiversity, and community education and engagement. Biophilic cities are built around nature, giving residents a recognition and affinity for local flora and fauna, providing education, investing in infrastructure that protects nature and brings residents closer to it.

Goals	Place, Planet, Performance
Objectives	Green Space, Natural Infrastructure, Civic Engagement
Sub-actions	Biophilic Cities, Pittsburgh Urban Forest Master Plan, Greenways 2.0, Open Space Trust Fund, Pittsburgh Regional Parks Master Plan, Hays land acquisition, Allegheny Places Greenway Network, Allegheny County Green Web, Frick Environmental Learning Center
Possible action lead(s) & Partners	City of Pittsburgh, Division of Sustainability and Resilience and partners; Boulder 100RC network sharing

Establish future climate goals and strategies (Climate Action Plan and 2030 Goals)

Pittsburgh's Climate Action Plan outlines Pittsburgh's 2030 climate goals for municipal operations, including 50% reductions in energy and water use, 100% renewable energy use, 100% waste diversion, divestment in fossil fuels. The Plan and related initiatives establish strategies for local government, businesses, higher education institutions and communities to help achieve the 2030 goals.

Goals	Planet
Objectives	Local And Renewable Energy, Resource Efficiency
Sub-actions	Climate Action Plan (PCAP 3.0) and Pittsburgh Climate Initiative, 100% waste diversion roadmap, City of Pittsburgh Fleet Purchasing Policy, Thriving Earth Exchange
Possible action lead(s) & Partners	City of Pittsburgh, Division of Sustainability and Resilience, AGU - American Geophysical Union; R20

Increase local renewable energy production

The City of Pittsburgh is committed to increasing production and utilization of local renewable energy sources including hydro, solar, and waste-to-energy. These efforts contribute to achieving the city's 2030 climate goals and help make the city's energy infrastructure more robust and sustainable.

Goals	Planet
Objectives	Local And Renewable Energy
Sub-actions	Western Pennsylvania Energy Consortium, Alternative Energy Portfolio Standard (18% by 2021), Solarize Allegheny, Braddock locks and dam hydroelectric power plant, Emsworth locks and dam hydroelectric power plant
Possible action lead(s) & Partners	City of Pittsburgh

Upgrade and improve the resilience of the power grid (District Energy Pittsburgh)

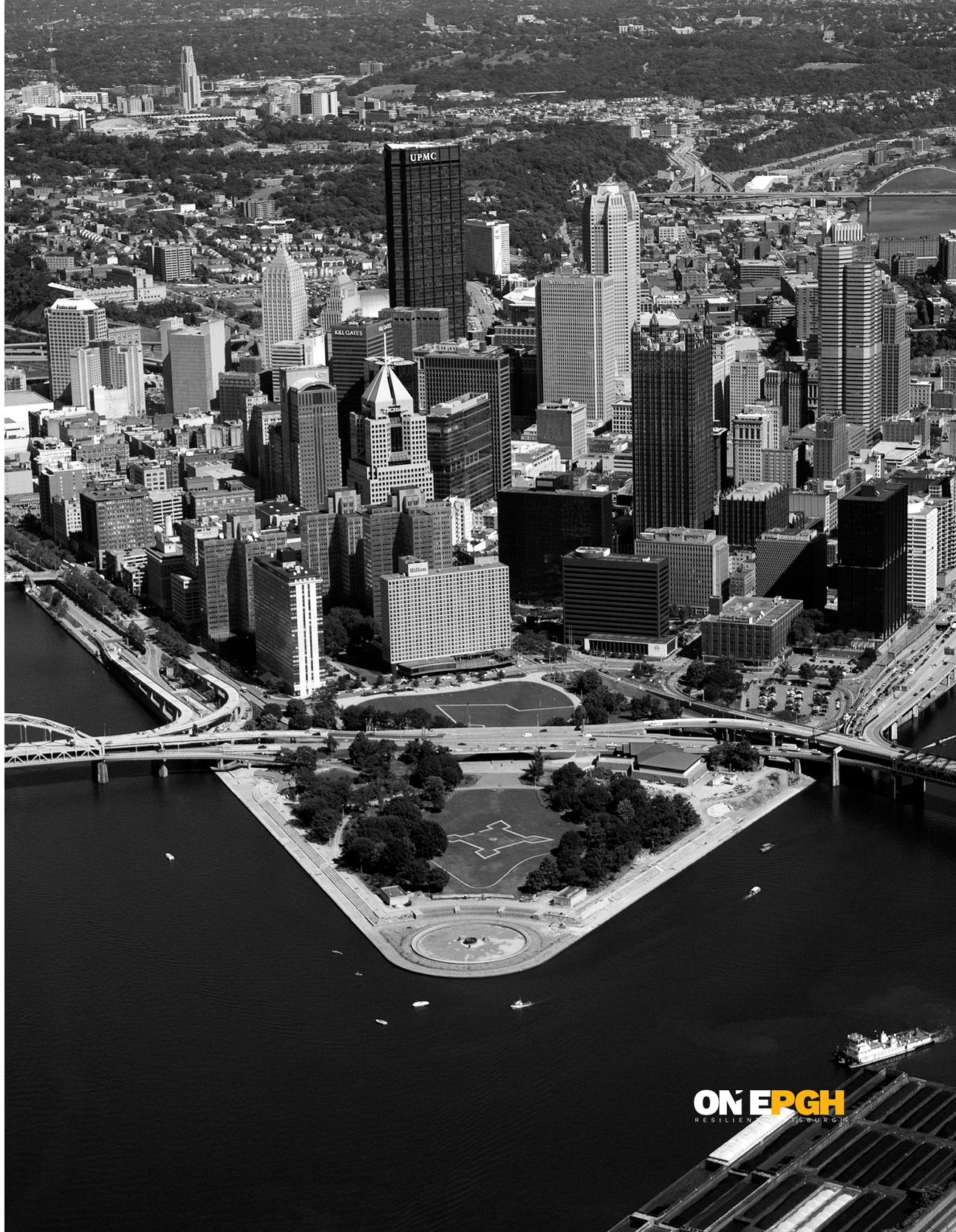
District Energy Pittsburgh is the focus of a memorandum of understanding with the U.S. Department of Energy to use district energy systems to upgrade Pittsburgh's aging electrical grid with 21st century clean technologies and solutions. It will optimize existing systems and infrastructure, support infill development to connect to existing systems, and develop new systems in order to create a distributed energy system that has the capacity to support innovative renewable energy solutions.

Goals	Place, Planet
Objectives	Disaster Reliability, Local And Renewable Energy, Resilient Design
Sub-actions	District Energy Pittsburgh, MOU with National Energy Technology Lab
Possible action lead(s) & Partners	City of Pittsburgh and partners

Share and integrate data

Data sharing initiatives ongoing in the city with the Western Pennsylvania Regional Data Center, the city's open data portal, acting as a single data hub support key community initiatives by making public information easier to find and use. Data is increasingly being shared by public sector agencies, academic institutions, and non-profit organizations in order to support action in a range of sectors, including health, transportation, and public safety. Data sharing supports resilience by providing a foundation to address shared issues and reduce the stovepiping that often inhibits collaboration, while also empowering residents with information about their community.

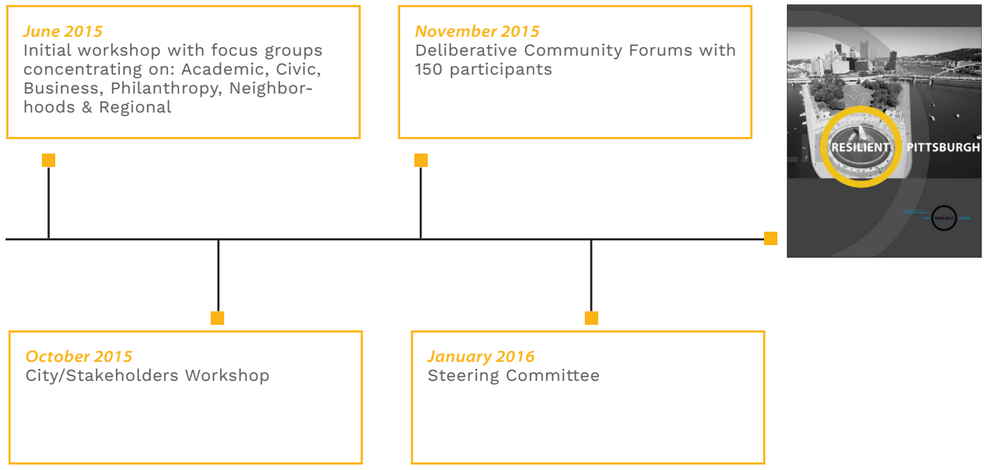
Goals	Performance
Objectives	Collaboration, Measurement
Sub-actions	Western Pennsylvania Regional Data Center (WPRDC), Burgh's Eye View, Police Data Initiative, Cartegraph, Allegheny County Data Sharing Alliance for Health, Pittsburgh Dataworks, Pittsburgh Local Data Collaborative
Possible action lead(s) & Partners	City of Pittsburgh, Department of Innovation and Performance and partners



APPENDIX B: METHODOLOGY

The Resilient Pittsburgh team is comprised of the city's CRO Grant Ervin, the City Resilience team in the Division of Sustainability and Resilience, RAND Corporation as the strategy partner, and 100RC. The team developed this strategy by researching the challenges facing Pittsburgh, gathering input from a wide range of stakeholders, convening residents for Deliberative Community Forums using the Deliberative Democracy process, and connecting with other members of the 100RC network. From June 2015 through January 2017, more than 500 Pittsburghers were engaged to support the strategy development (Figure 10).

Figure 10. Activities comprising Phase 1 of the strategy development process



Determining and prioritizing stresses and shocks

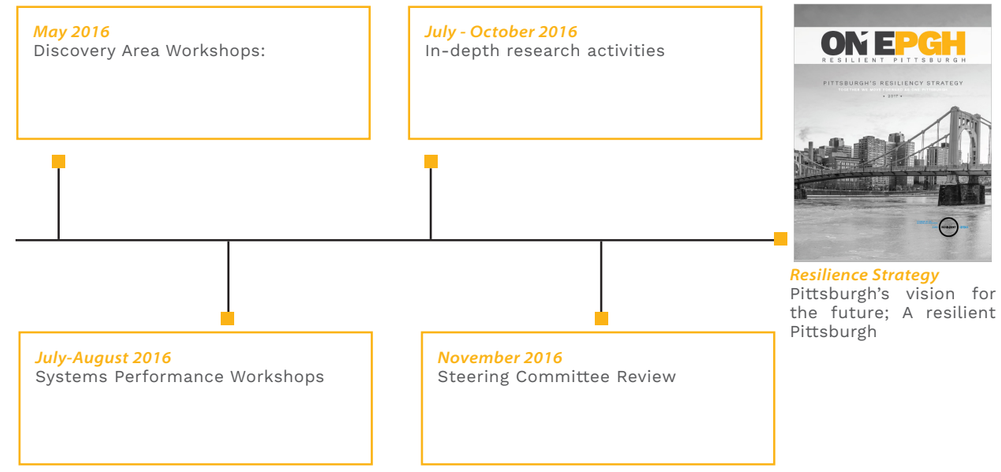
The city developed a preliminary list of stresses (chronic, long-term, slow-burning issues) and shocks (sudden, large-scale disasters) for Pittsburgh's application to become a member of the 100RC network. This was augmented with additional items drawn from secondary sources, and resulting items were prioritized using a rating activity during the Pittsburgh resilience strategy kick-off workshop in June 2015. The list was reviewed and vetted by subsequent focus groups and working sessions during Phase 1 to produce the Preliminary Resilience Assessment.

Developing Pittsburgh's resilience framework: goals, objectives, and actions

Phase 1 concluded with the identification of discovery and overarching themes which informed the more in-depth research, additional engagement, brainstorming of new solutions, prioritization, and synthesis work that took place in Phase 2 (Figure 11). Cross-sector working groups were assembled around the discovery areas, which correspond to the goals of this strategy and elements of the p4 framework: basic needs and opportunity (People) and infrastructure and land use (Place). A working group was also assembled to discuss the overarching issue of Systems Performance (Performance), primarily focused on fragmentation and coordination of agencies working on shared issues. All working groups considered Pittsburgh's resilience through the lens of sustainability (Planet). In addition, the issue of equity was at the core of the discussion for all working

groups and was ultimately reflected in the final list of resilience goals and objectives.

Figure 11. Engagement and strategy development process in Phase 2



Cross-sector working groups met two to three times over the course of Phase 2. These groups, comprised of 8 to 12 members, included representatives from city and county government; local non-profit organizations; universities, research, and consultancy groups; architects and design firms; philanthropy; banking; technology; and other sectors. Meetings were designed to explore the issues identified for the respective discovery area; identify further areas for analysis; and brainstorm and prioritize goals, objectives, measurable outcomes, and existing and new actions.

The goals and objectives described in this strategy come directly from the working groups. Working groups reviewed information about their respective discovery areas and were tasked with developing a single, high-level goal for their area using prompts like "How will we know the resilience strategy was successful related to [discovery area]?" and "How will our city be different in the year 2050, one generation from now?" They brainstormed goal statements and collaboratively refined the wording over the course of the two workshops. Participants were also asked to brainstorm measurable objectives that were specific to the discovery area and that would support achievement of the established goal. A prioritization activity followed, and a list of five to seven sector-specific objectives related to the goal were agreed upon for each discovery area. Discovery area goals and objectives were aligned with the p4 framework to create the final resilience goals and objectives framework for Pittsburgh.

Additionally, stakeholders contributing to the strategy development, coupled with desktop research, identified a working list of 308 unique actions undertaken or planned by a variety of partners who could contribute to the resilience strategy's goals. Some actions focused on specific sites (for example, the Green Garage Initiative in some of Pittsburgh's downtown parking garages), while others recommended changes city- or region-wide (for example, Roadmap for Inclusive Innovation). The level of activity and number of ongoing actions suggest that new actions are being initiated regularly, so this list should be considered a working snapshot that will be updated on a regular basis by the Resilient Pittsburgh team through the forthcoming website.

The Resilient Pittsburgh team mapped ongoing actions to resilience objectives developed by the working groups and determined where new actions were needed to address unmet needs. Consequently, this strategy includes new actions as well

as ongoing actions that need improved coordination, could be broadened in scope or funding level, or would yield greater benefit with an accelerated timeline.

Using the resulting list, the resilience team grouped actions according to general topic area or sector of influence to create "action groups," which were prioritized for the strategy. Some groups were defined by a single, larger-scale action (for example, Welcoming Pittsburgh), while others were defined by several smaller-scale actions related to a common topic. Each action group includes a number of programs, initiatives, and policies (referred to as "sub-actions"). Prioritized action groups met the following criteria:

- They yield a resilience dividend, operating across shocks and/or stresses to achieve co-benefits.
- They address one or more of Pittsburgh's resilience objectives.
- There is clear leadership by an organization, or ideally, a consortium or collaboration of organizations working on the action.
- They are a priority for the Mayor's Office and/or community stakeholders.
- They are catalytic and represent innovation beyond "business as usual" for a city.
- There is fiscal support for the action.

These action groups are intended to yield progress towards multiple resilience goals and objectives simultaneously, helping to yield a resilience dividend for the city. As a result, each action group can support multiple objectives.

East Liberty Deliberative Democracy Forum, November 19, 2015

Resilient Pittsburgh Steering Committee meeting, January 15, 2016

Resilient Pittsburgh Resilience Fair, September 14, 2016

Resilient Pittsburgh Resilience Fair, September 14, 2016

APPENDIX C: ACRONYM LIST

100RC	100 Resilient Cities
AGU	American Geophysical Union
AIU	Allegheny Intermediate Unit
ALCOSAN	Allegheny County Sanitary Authority
BRT	Bus Rapid Transit
CARL	Community Acquisition and Rehabilitation Loan
CERT	Community Emergency Response Teams
CHC	Community HealthChoices
CONNECT	Congress of Neighboring Communities
CPA	Citizen's Police Academy
CRO	Chief Resilience Officer
EECO	Environment and Energy Community Outreach
EJCAM	Environmental Justice Community Alert Matrix
ELDI	East Liberty Development, Inc.
HELP	Homewood, East Hills, East Liberty, Lincoln-Lemington-Belmar, and Larimer Protection Initiative
IPOD	Interim Planning Overlay District
LEED	Leadership in Energy & Environmental Design
MVA	Market Value Analysis
NGO	nongovernmental organization
PCAP	Pittsburgh Climate Action Plan
PGWT	Pittsburgh and Glasgow Welding Health Equity and Resilience Together
PHA	Plan for a Healthy Allegheny
PHRP	Pittsburgh Home Rehabilitation Program
PILOT	Payment in Lieu of Taxes
PBEOC	Pittsburgh Black Elected Officials Coalition
P&JI	Pittsburgh Peace and Justice Initiative
PPS	Pittsburgh Public Schools
PRA	Preliminary Resilience Assessment
PWSA	Pittsburgh Water and Sewer Authority
STEAM	Science, Technology, Engineering, Arts, and Math
THIRA	Threat and Hazard Identification and Risk Assessment
URA	Urban Redevelopment Authority
WIOA	Workforce Innovation and Opportunity Act
WPRDC	Western Pennsylvania Regional Data Center
YUIR	Youth Undoing Institutional Racism

ONEPGH: PITTSBURGH'S RESILIENCE STRATEGY

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