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Melbourne * Rome * Thessaloniki
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Medellín * Bangkok * Rio de
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Belgrade * Ramallah * Glasgow
Montreal * Mandalay * Accra
London * El Paso * Bangalore
Surat * Jacksonville * San Juan
Durban * Sydney * Pittsburgh
Amman * Semarang * Enugu
Porto Alegre * San Francisco
Deyang * Santiago, Metropolitan
Region * Ashkelon * Wellington
City * St. Louis * Toyama * Byblos
Arusha * Christchurch * Tulsa
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The City of Norfolk is a model of resilience. Through four centuries we have withstood disruptions, weathered storms, and survived wars and pandemics. Time and time again, we have come back stronger.

Today our city is home to the largest naval station in the world, the third largest port on the East Coast, and NATO's Allied Command. Norfolk is a historic tourist destination and the urban core of Hampton Roads—the commercial, cultural, and educational hub for a region of 1.7 million residents.

Our evolutionary success comes from the people who make Norfolk home. We are and have always been a city of makers and doers, people and organizations who work together to help Norfolk survive, adapt, and grow, no matter the environmental, economic, and social stresses and shocks we experience. Resilience is in our DNA!

We take great pride in the world's recognition of our resilient reputation with the designation of Norfolk as one of the first resilient cities in The 100 Resilient Cities (100RC) network, a program pioneered by The Rockefeller Foundation. We are humbled to be part of this international group, which includes Paris, Milan, Rio de Janeiro, Lisbon, Melbourne, Glasgow, Sydney, Barcelona, Rome, Montreal, San Francisco, and other world-class cities. It's more than an honor; it's an amazing opportunity to connect with global experts and innovators. Through this international initiative, cities are identifying, sharing, and institutionalizing innovative resilience practices that will ultimately inspire and support thousands of cities around the world.

As a member of 100RC, we have developed our own resilience strategy to address the three major challenges facing our city today: sea level rise and recurrent flooding; a shifting economy; and a need to build strong, healthy neighborhoods.

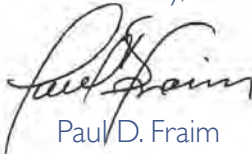
This document presents the initial direction of our city's resilience strategy. First and foremost, our strategy formally honors Norfolk's catalytic resilience leaders who have spearheaded much of the important work already underway. Throughout the document, we recognize many of our citizens as Resilient City Builders for their individual and organizational work connecting, sharing, and building Norfolk's resilience capacity.

Second, our strategy makes connections between people, places, ideas, and systems. For example, solutions to flooding can positively drive economic activity; innovative water management practices can be used to reconnect neighborhoods and drive economic vitality; and networks designed to ensure citizen safety during disruptive events can build neighborhood cohesion when the skies are blue. In short, our strategy views the city's challenges as opportunities to change in resilient ways.

Third, our strategy begins the process of formally identifying and articulating the values, processes, and common language that will enable and inspire more people and organizations to engage and participate in building a more resilient Norfolk.

The challenges ahead call for more people and organizations to join our resilience efforts. By working together as a community, leveraging expertise and resources available through 100RC, and creating a formal and intentional resilience plan, we will continue to thrive at sea level.

Please join us as we show the world why Norfolk has been and will always be America's most dynamic and authentic urban waterfront community.

Sincerely,

Paul D. Fraim
Mayor



The launch of Norfolk’s resilience strategy marks an important milestone: a year of research, stakeholder engagement, community outreach, and thoughtful planning. This hard work has now culminated in this impressive document, detailing the strategic goals, integrated solutions, creative partnerships, and action steps that will ensure Norfolk’s resilience strategy has a positive impact on the city for generations to come.

Through Norfolk’s resilience strategy, the city is embracing its challenges head-on: sea level rise and recurrent flooding; a shifting economy; and a need to build strong, healthy neighborhoods. It is identifying, orienting, and leveraging a variety of existing and new public and private partners to tackle these challenges. This not only includes incorporating the resilience work already in motion, but also enhancing the resilience benefits of these efforts. It also includes identifying and cultivating new collaborative efforts that build on the city’s history of innovation and reinvention. Ultimately, all of this work will make Norfolk more resilient to the physical, social, and economic challenges of the twenty-first century, while also making the city better in good times for all of its citizens and visitors.

The creation of Norfolk’s formal resilience strategy has helped raise awareness around the Hampton Roads region of the overall practice and value of city resilience planning. This, in turn, has reinforced Norfolk’s regional leadership role. Norfolk’s resilience planning has also put the city at the cutting edge of urban innovation nationwide—which is especially important as Norfolk plays such a major role in the nation’s economy and national security. Norfolk’s resilience work is having an impact far beyond America, too. Norfolk was one of the first members of 100 Resilient Cities (100RC), and has been helping us build a global practice ever since. In addition to cities, the practice of resilience planning is also being embraced worldwide by the private sector, national governments, and non-governmental organizations.

All of this is why the launch of Norfolk’s resilience strategy is so exciting for both Norfolk and 100RC. We are looking forward to continuing our close partnership with Norfolk as the city begins implementing its resilience strategy. While only time will tell how much of an impact our partnership will make locally and globally, the one thing we now know for certain is that we couldn’t have asked for a better start, more thoughtful local leaders, or a more engaged community to begin this important work.

Thank you Norfolk!

Sincerely,

Michael Berkowitz
President, 100 Resilient Cities

PIONEERED BY THE
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100 RESILIENT CITIES





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NEON Festival, Norfolk Arts District
We Can Create What We Can Imagine
by Esteban del Valle and Julia Rogers



Introduction

The City of Norfolk has been a resilient city for over 400 years. So we take great pride in recently being selected as one of the first members of 100 Resilient Cities (100RC), a program pioneered by The Rockefeller Foundation. We are humbled to be part of this international group that includes Paris, Milan, Rio de Janeiro, Lisbon, Melbourne, Glasgow, Sydney, Barcelona, Rome, Montreal, San Francisco, and other world-class cities.

100RC is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century by partnering directly with member cities to understand their resilience challenges and collaboratively build solutions.

100RC supports the adoption and incorporation of a view of resilience that includes not just the shocks—earthquakes, fires, floods, etc.—but also the stresses that weaken the fabric of a city on a day to day or cyclical basis. Examples of these stresses

include high unemployment; an overtaxed or inefficient public transportation system; endemic violence; or chronic food and water shortages. By addressing both the shocks and the stresses, a city becomes more able to respond to adverse events, and improves its ability to deliver basic functions to all populations in both good times and bad.

100RC's vision is not only to help individual member cities become more resilient, but also facilitate the building of a global practice of urban resilience among governments, NGOs, the private sector, and individual citizens. To advance that goal, 100RC provides several types of support: funding for a Chief Resilience Officer in each member city to lead resilience efforts; resources and technical assistance to develop a robust resilience strategy; membership in a global network of peer cities to share best practices and build the field; and access to a variety of resilience tools, services and expertise through a series of Platform Partners.

This document presents **Norfolk's Resilience Strategy**, which codifies our commitment to how we face and respond to our current and future challenges.

Our resilience strategy centers on the ability of individuals, systems, and our neighborhoods to survive, adapt, and, when conditions require it, transform in the face of shocks and stresses. At its core, our resilience strategy is a commitment by each citizen, organization, and municipal system, and by leadership from all sectors, to acknowledge our stresses and vulnerabilities and to work proactively to find solutions. Our collective goal is not only to reduce risks, but also to innovate and transform our city in a systemic and holistic way, embracing new ways of thinking and managing and thriving amid conditions that require continuous innovation.

It is our hope that this document serves as more than a record of Norfolk's resilience strategy, but rather as a call to action. To this end, throughout this document, we showcase the real power behind Norfolk's resilience: the doers and makers who call Norfolk home. We hold up these individuals — our **Resilient City Builders** — as our inspirational examples of what Norfolk is all about.

Over the next year, we will periodically identify and profile a growing number of Resilient City Builders, each time reminding us of our 400-year history of resilience and that Norfolk's future is what we make it. We encourage you to nominate anyone you believe is one of Norfolk's Resilient City Builders (the nomination form is on our website, www.NFKresilientcity.org). Most importantly, we encourage you to join us in creating the new Norfolk, an international model of resilience for the next 400 years.

RESILIENT CITY BUILDERS



Mason Andrews, a resident of Norfolk's Ghent neighborhood and an associate professor of architecture at Hampton University, is building the city's resilience to flooding. Mason is working collaboratively with Chesterfield Heights Civic League President **Cheryll Sumner**, Executive Director of Wetlands Watch **Skip Stiles**, and ODU Associate Professor of Civil and Environmental Engineering **Mujde Erten-Unal** to develop innovative water management practices to curtail flooding in the historic coastal neighborhood of Chesterfield Heights. Hampton University and ODU students designed ways for residents to work together to hold rain runoff in yards, planters, rain barrels, and streets, creating a system that, when implemented, will substantially reduce street flooding. This project was made possible by a close collaboration of engineers and architects across the region, and by generous funding from the Virginia Sea Grant.

Norfolk: Past, Present, and Future

Norfolk is a historic city on the water. For 400 years, the city has been a key part of America's history, commerce, and innovation. We are known for resilience — surviving wars, a plague, hurricanes, and social upheaval. Time and again, we have reinvented and rebuilt ourselves. This legacy has resulted in a citizenry accustomed to change and resilient to stresses and shocks. We recognize the challenges before us and are addressing them head-on with a conviction and passion that are unique to the people who make Norfolk home today.



City of Norfolk, 1892

Norfolk Yesterday

Norfolk was established in August 1682 after a British act in 1680 ordered the establishment of a fifty-acre port town in each Virginia county. The “Towne of Lower Norfolk County” was bounded on the east, west, and south by the Elizabeth River and on the north by what is now City Hall Avenue. In 1736, Norfolk was granted “borough” status. It grew steadily and had a population of 6,000 by 1775, the eve of the American Revolution.

Over the course of the eighteenth and nineteenth centuries, Norfolk's history was punctuated by challenging historical

events. However, these events alone did not shape Norfolk; rather, the way in which the city bounced back from these events created the Norfolk we know today.

On January 1, 1776, British forces bombarded Norfolk from ships anchored offshore. Patriot factions completed the destruction so the British could not house their army in the city. Only the walls of the Borough Church (today's St. Paul's Episcopal) remained standing. Citizens returned, however, and began to rebuild. By 1800, Norfolk's population numbered 7,000



Norfolk's original fifty acres imposed over the current city

— the eighth largest town in America.

The 1807 attack on the USS frigate *Chesapeake* by the HMS *Leopard* offshore was a contributing factor in President Thomas Jefferson's decision to ask Congress to declare war on Great Britain—the War of 1812. The ensuing British Navigation Acts and Jefferson's Embargo Act closed the port and all but crippled the local economy. But Norfolk rebounded; a gradual return to prosperity followed in subsequent decades, eventually leading to Norfolk's incorporation as a city in 1845.

In 1855, one-third of Norfolk's population died during a yellow fever epidemic. Just seven years later, early in the American Civil War, one of the most famous naval battles in history played out within view of the city between the first two ironclad battleships, the USS *Monitor* and CSS *Virginia* (formerly the USS *Merrimac*).

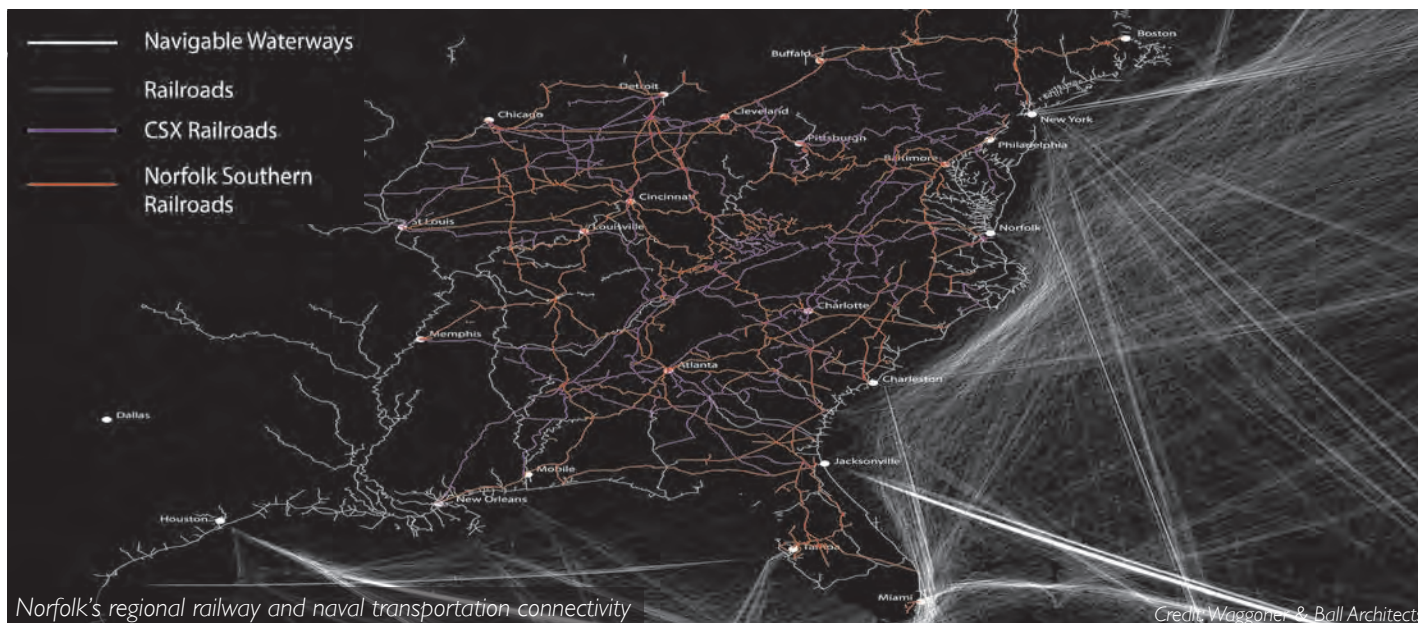
Two months later in May 1862, Norfolk was surrendered to Union forces and was under federal occupation for the remainder of the Civil War.

Despite these grave challenges, Norfolk was able to bounce back. By the turn of the century, Norfolk's borders were expanding and the city was experiencing significant economic growth. In 1917, the grounds of the 1907 Jamestown Exposition became home to the U.S. Naval Operating Base, setting the stage for the city's current economic engine, Naval Station Norfolk. Two world wars more than doubled the city's population. This population growth, combined with infill development to support the industrial waterfront and a series of annexations that ended in 1959, defined Norfolk's current borders: 61.86 square miles with 144 miles of waterfront that surround and shape the city's identity.

RESILIENCE

Urban 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.

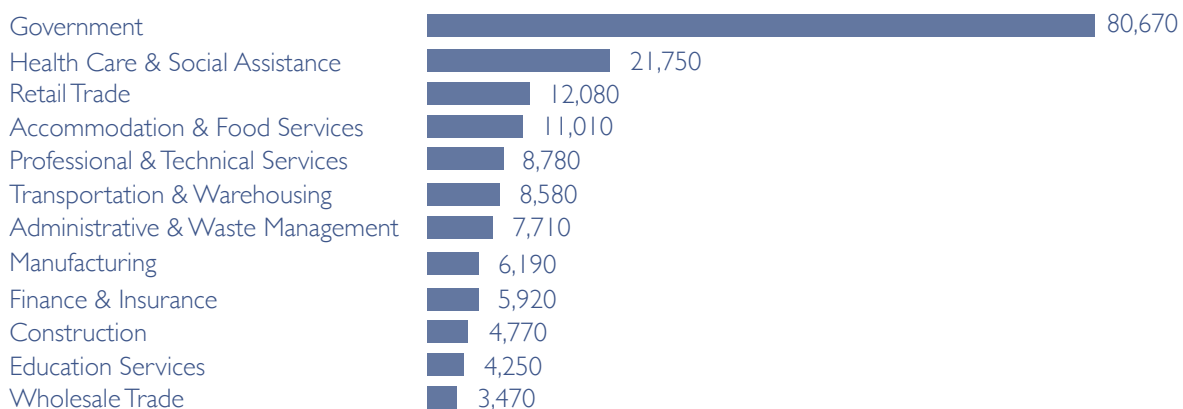


Norfolk Today

Today, Norfolk is an international city and the hub of the Hampton Roads region. Norfolk is the home to Naval Station Norfolk, the largest naval complex in the world, which supports the readiness of the Navy's U.S. Atlantic fleet and drives the economy of Norfolk and the region. Norfolk is also home to the Port of Virginia's Norfolk International Terminals, one of the city's and the region's most significant economic assets, which makes Norfolk an integral node in national and global trade.

These two stalwart industries provide the foundation for the region's economy. Department of Defense spending supports 40 percent of total regional employment. Over 8,000 service members transition out of the military annually in the Hampton Roads region, providing the city with a highly skilled labor force. In addition, the Port of Virginia handles over 81 million tons of cargo, generates \$60 billion of economic activity annually, and provides employment in port-related industries for 343,000 Virginians.

Norfolk Jobs by Industry Sector, 2014



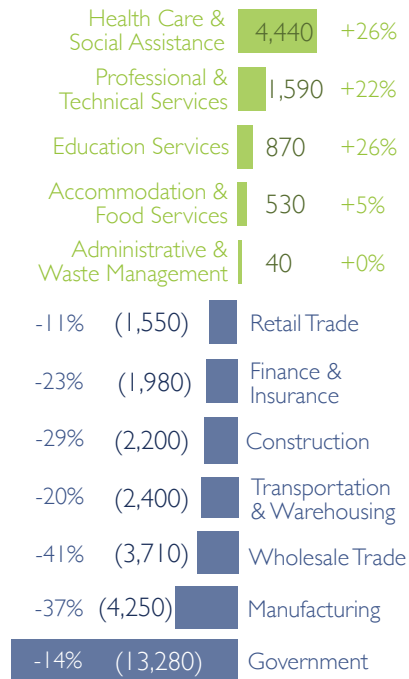
Source: EMSI (Note: Industries with fewer than 3,000 jobs and other services not depicted; rounded)

Overreliance on these sectors, though, poses risks to today's economy. Military jobs in Norfolk decreased approximately 25 percent between 2001 and 2014, sending ripple effects through the city's economy and driving the city toward an overall job loss of 11 percent during that time period. While the Port of Virginia is projected to grow, the city has not maximized its position near the port to cultivate an export economy in the city.

Slow growth in other sectors has made it difficult for the city to rebound from significant military job loss and the recent recession. According to the Brookings Institution, economic recovery in the Virginia Beach-Norfolk-Newport News metropolitan statistical area ranked 281 of 300 metropolitan areas nationwide. Further, sectors in the city that are seeing job growth tend to have lower wages than sectors that are declining.

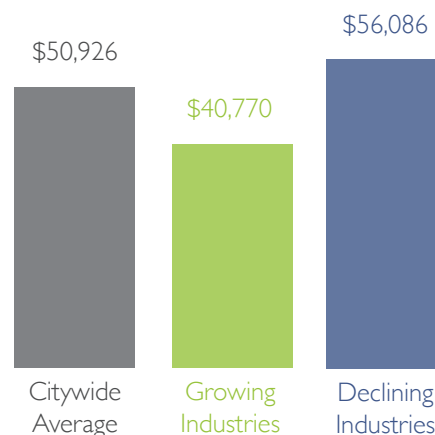
In addition, the city faces unique fiscal, capital, and land availability challenges. Over 5,000 of the city's 73,000+ parcels are non-taxable due to the large presence of government and nonprofit institutions, which limits the city's ability to raise needed revenue. Further, over 90 percent of the city is built, making it difficult to expand existing or locate new large businesses. Finally, while the city's entrepreneurship sector is growing, venture capital investment, a key component of an entrepreneurial system, remains low. In 2014, the region was ranked 88th out of 89 regions in the total value of venture capital invested.

Norfolk Job Loss/Growth by Industry Sector, 2001- 2014



Source: EMSI (Note: industries with fewer than 3,000 jobs in 2014 and other services not depicted; rounded)

Average City Wages for Growing & Declining Industries, 2014



Industries in which Norfolk is gaining jobs have lower wages than industries in which Norfolk is losing jobs. Source: EMSI

At the same time, the city presents several key characteristics that position it well for economic growth and diversification, including:

- **Strength in other sectors:** While the port and military are large anchor institutions and will continue to provide a foundation for the city's economy, Norfolk is a leader in health care, education, finance, and information technology within the region.
- **Role as the region's urban job center:** With 191,212 jobs, Norfolk is the region's job center. And with 3,533 jobs per square mile, Norfolk also has the highest job density in the region. The city provides urban assets by serving as the region's downtown commercial core and by supplying its only rail transit system, the Tide, to support residents and employees.
- **Concentration of high-wage jobs:** Norfolk's status as a hub for industries, like professional services and finance, is reflected in an average wage of \$50,926—higher than the Hampton Roads region and slightly higher than the Commonwealth and the nation.
- **Presence of educational institutions:** Norfolk has a foundation of higher education institutions that can support a workforce development pipeline. Old Dominion University, Norfolk State University, Eastern Virginia Medical School, Virginia Wesleyan College, and Tidewater Community College provide a diverse set of programs that can equip Norfolk residents with the skills they need to engage in growing and emerging industries. The institutions are also conducting research that has the potential to spur new economic growth, particularly if the pipeline between academia and industry is strengthened.
- **Emergence of an entrepreneurial economy:** Norfolk is a city that works. While indicators like venture capital investment remain low, the city's reputation for entrepreneurial activity is growing. Local residents and entrepreneurs see momentum in the entrepreneurial economy, and Entrepreneur magazine recently named Norfolk one of the top five U.S. markets for startups. This spirit of hard work is evident throughout the city, as residents, businesses, and military personnel and their families revitalize old spaces, create new businesses, and infuse energy into emerging industries.



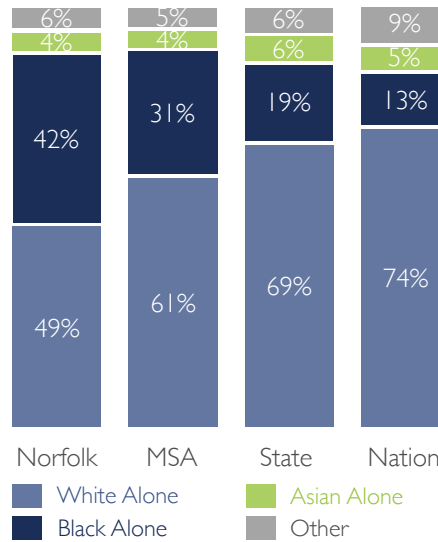
Norfolk is not only a city that works, but also a city of neighborhoods. Norfolk is made up of more than 120 distinct communities with vibrant character and high degrees of citizen engagement. Our citizens live on the beach and along the hundreds of inlets and waterways — and more and more, they also live downtown on the waterfront and in the Arts District. The diversity of neighborhoods in this urban core distinguishes Norfolk from many other cities along the East Coast.

Today Norfolk’s population is over 245,000 in a region of 1.7 million people. Norfolk is the second largest city in the Commonwealth and serves as the region’s urban center with the highest population density in the region (4,548 people per square mile). Norfolk’s population diversity sets the city apart from the region, the Commonwealth, and the nation. This diversity is recognized and celebrated by its citizens. When asked in local surveys what distinguishes Norfolk from other U.S. cities, respondents often identify Norfolk’s diversity as one of the city’s greatest advantages.

While diversity is one of our city’s most distinguishing attributes, it is also one of our greatest challenges. Poverty levels are highly concentrated in some communities, and the difference is even more significant by race and age.

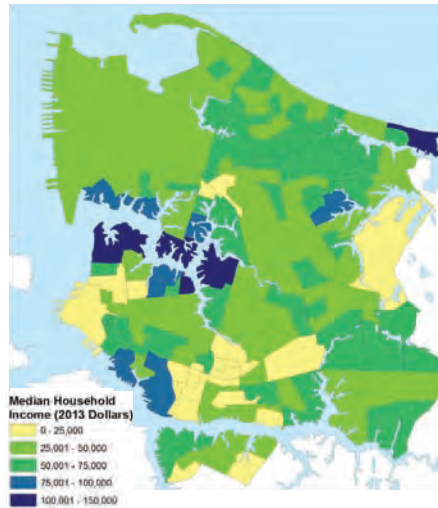
Relative to other cities in Hampton Roads, Norfolk has the highest level of income inequality. More than half of our residents have low to moderate incomes, with 19.2 percent living in poverty, and the city’s median household income of \$44,747 is lower than that of the region, state, and country. Nearly one-third of Norfolk’s residents are highly rent-burdened, spending over 50 percent of their income on housing. The current social and economic stresses facing many residents pose critical challenges for the city.

Share of Population by Race, 2013



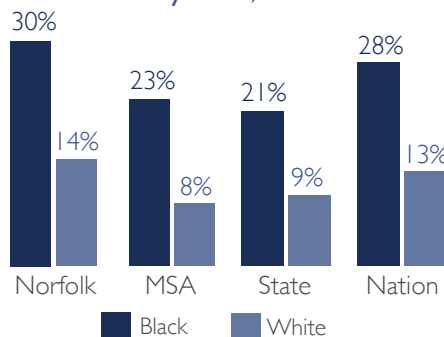
Source: US Census Bureau

Median Household Income by Census Block Group, 2013



Source: ESRI

Share of Population Living in Poverty by Race, 2013



Source: US Census Bureau

It is imperative that every member of our diverse city have an acceptable standard of living and easy access to all the community's services and related advantages.

Norfolk's greatest advantage is its access to water. Water has always been one of our most critical assets, as it drives our economy and enhances our quality of life. Few urban environments offer access to 144 miles of shoreline; water is our identity, and it differentiates us.

Norfolk floods. The city has flooded throughout its history, but the severity and frequency of this flooding have increased significantly over the last decade. Several new trends are exacerbating these risks and forcing us to evolve the way we live with water, including:

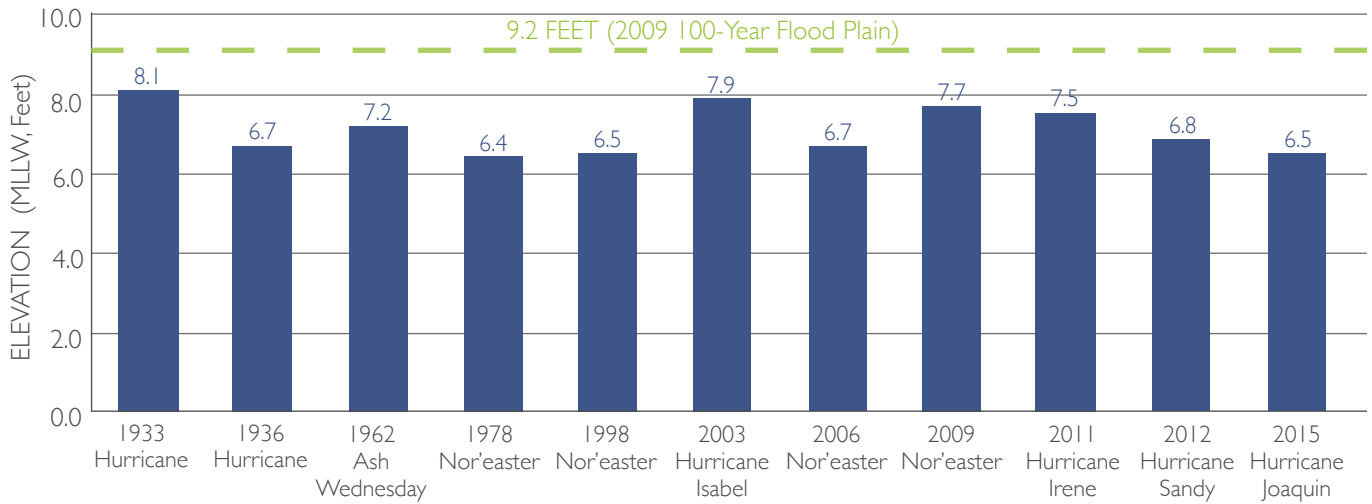
- **Sea level rise and subsidence:** Rising seas and localized land subsidence have led to Norfolk having the highest rate of relative sea level rise on the East Coast. While global sea levels have risen 5–8 inches over the last century, in Norfolk, the sea level has risen over 14 inches since 1930.
- **More frequent storms:** Six out of the eleven highest water levels that affected Norfolk since 1933 occurred in the last twelve years. Flooding risks will continue to increase. Nuisance tidal flooding in the city has increased by 325 percent since 1960 and the local sea level is projected to rise between 1.5 and 7.5 feet by the year 2100. With 25 percent of Norfolk's parcels already located in the 100-year floodplain, it's clear the city will need to plan differently for the future.
- **Increasing flood risk:** While all residents of Norfolk are increasingly threatened by more frequent and more intense storms, as well as routine nuisance flooding, some of Norfolk's most socially and economically at-risk neighborhoods are disproportionately vulnerable to flooding and storms.

RESILIENT CITY BUILDERS



Karen Scherberger, CEO of Norfolk's Festevents, and **Mary Miller**, President and CEO of the Downtown Norfolk Council, joined forces to help the community capture the essence of Norfolk. Through their work establishing Norfolk's Collaboratory, Karen and Mary asked citizens to weigh in on what's important and unique about our city. Through this innovative crowdsourcing effort, residents identified specific attributes — our waterfront, our diverse population, our historic importance, our military, and our unique urban vibe — as characteristics that make Norfolk a great place to live. Now members of the Collaboratory are working together to highlight these important characteristics, telling the world what makes Norfolk great.

Water Level Elevations of Significant Storms since 1933 at Sewells Point Tide Gauge



Source: NOAA; Sewells Point Tide Gauge, Norfolk

Norfolk's Future

As our coastal risks continue to shift, we face challenges in how to respond and plan for today and the future. With over 90 percent of our land built out with homes and businesses, there is little room to physically shift ourselves in traditional ways. Nor do we wish to retreat from the water; instead, we will find new ways to live with it.

While changing natural, economic, and social environments are challenging, they are not impossible to address. In fact, these stresses present an opportunity for us to leverage our strengths and assets to build a stronger, more resilient Norfolk for the next 400 years.

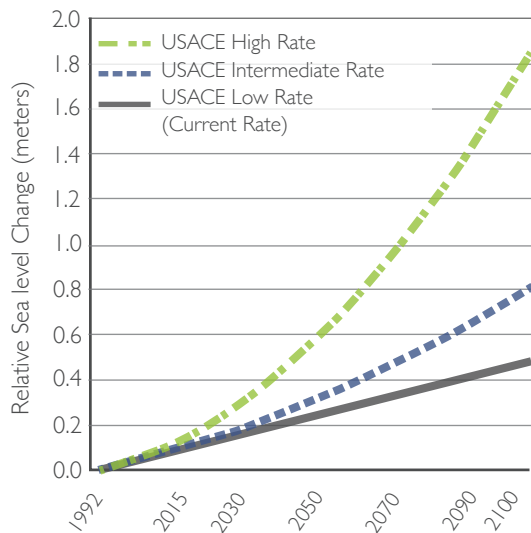
Norfolk's livelihood and economy will remain on the water. Because of this, Norfolk must adapt to the changing environment in new ways. Living and working differently on the water allow us to think about new ways to harness the water — developing innovative industries and technologies, designing

new physical and open spaces, and engaging differently with each other to mitigate risks and strengthen communities.

The changing role of the military and other economic shifts require us to identify new opportunities to grow our economic pie. With our strengths and emerging industries, we have an opportunity to pursue strategies that create living-wage jobs for all residents by building, retaining, and attracting a diverse set of vibrant businesses and by equipping Norfolk's residents with the skills they will need for jobs in growing industries. Industries such as the maritime and medical clusters and entrepreneurial businesses can be catalysts for this inclusive growth.

Norfolk's long-term resilience will be based, in part, on decreasing high levels and concentrations of poverty. Neighborhoods that have been physically, economically, or socially

Projected Sea Level Rise at Sewells Point, VA, 1992 - 2100



Source: US Army Corps of Engineers

disconnected must be better connected to quality jobs, schools, transportation, healthy food, parks and recreation, and other factors that improve quality of life and build strong, resilient communities. Expanding access to employment and services, creating neighborhoods of choice, and tackling poverty head-on require dedicated attention, more innovative and holistic solutions, and additional resources.

Building the city of the future requires leveraging our opportunities and seeking adaptive, innovative strategies to embrace and overcome our challenges. Residents, community groups, the private sector, and city leaders must engage with each other to develop solutions that allow businesses to flourish and residents to safely live, work, and play in this globally important city. This strategy also stands as an invitation to all residents to engage in dialogue and action to ensure that all of Norfolk's residents, neighborhoods, and businesses can continue to thrive at sea level.

RESILIENT CITY BUILDERS



Marty Kaszubowski has been working to build a support system for entrepreneurs for over a decade. His latest venture is Old Dominion University's Norfolk Innovation Center, opening on Boush Street in downtown Norfolk. The center connects new businesses to mentors, capital, learning, legal advice, marketing, and financial information. The goal is to help new businesses grow the region's economy. Marty believes connecting people to people, people to resources, and people to new ideas is the secret sauce for entrepreneurs.





NORFOLK'S RESILIENCE STRATEGY: Guiding Tenets

The development of Norfolk's Resilience Strategy is based on eight core guiding tenets or values. We believe our resilience strategy must be:

- **Celebrating and building on existing work:** We recognize, honor, and build on the important leaders and work already underway. The creation of our resilience strategy recognizes and seeks to elevate prior and current resilience building initiatives, projects, and actions by the city, nonprofit organizations, and communities.
- **Aspirational:** We take an approach that inspires other people and organizations across our community to engage and participate in the successful and continuous transformation of Norfolk into the most dynamic and authentic urban waterfront community in America.
- **Proactive, not reactive:** We acknowledge and embrace change, risks, and challenges by being proactive. We commit to transforming by viewing challenges as opportunities to reinvent ourselves.
- **Fair and equitable:** We define the future by developing visions built on our current assets, equitably distributed throughout the city. Our work is neighborhood-focused to ensure that all citizens live in resilient communities.
- **Community-driven and connected:** We create a strategy with, not for the community. We connect and align people, places, and systems to create benefits across multiple systems. By intentionally connecting these systems through a community-driven process, we believe we can have transformative impact and be an innovative leader in resilience.
- **Actionable and practical:** We create change at the city, neighborhood, and resident scales. Some resilience initiatives deliver rapid change while others may take a generation or more to realize. Collectively we generate strategies and solutions that can have significant impact on the city in the near and long term.
- **Informed:** We are informed by a growing body of data-driven and research-based plans and reports undertaken by the city and its partners. We will increase access to information for everyone to engage in informed decision-making for the future.
- **Long-lasting:** We focus on the continuous transformation of Norfolk. While Norfolk has constantly evolved over the past

NORFOLK'S RESILIENCE STRATEGY: Guiding Tenets

400 years, the challenges ahead call for more residents and organizations to join the resilience cause in a more deliberate manner.

In the pages that follow, you will learn about our initial resilience strategy development process, vision, and implementation approach, all of which are guided by these fundamental tenets of belief.

The resilience strategy process was also guided by the **100RC City Resilience Framework (CRF)**. The CRF, developed by Arup with support from The Rockefeller Foundation, is based on extensive

research in and about city systems and is built on four essential dimensions of urban resilience: Health and Wellbeing, Economy and Society, Infrastructure and Environment, and Leadership and Strategy. Taken together, the CRF provides a new method for evaluating a city's strengths and weaknesses and a lens to understand the complexity of cities and the drivers that contribute to their resilience. The resilience team used this framework to assess Norfolk's challenges and opportunities and guide the strategies and actions included in this plan.



Each of the four CRF dimensions contains three "drivers," which reflect the actions cities can take to improve their resilience. The CRF also considers which key qualities resilient systems require to withstand, respond to, and adapt more readily to shocks and stresses. Extensive research has shown that resilient cities demonstrate seven qualities. Reflectiveness and resourcefulness reflect the ability to learn from the past and act in times of crisis. Robustness, redundancy, and flexibility are qualities that help to conceive systems and assets that can withstand shocks and stresses as well as build the willingness to use alternative strategies to facilitate rapid recovery. Inclusivity and integration reflect the processes of good governance and effective leadership that ensure investments and actions are appropriate, address the needs of the most vulnerable, and collectively create a resilient city—for everyone.

NORFOLK'S RESILIENCE STRATEGY: Planning Process



100 Resilient Cities Kickoff Workshop, February 2014

We began our journey by asking a simple question: What most challenges our city's ability to thrive today and to bounce back from a disaster tomorrow? Through a six-month conversation with hundreds of community members — representing residents, nonprofits, educational institutions, the military, the business sector, the faith based community, and local government — a clear picture emerged. While increasing frequency and intensity of coastal storms and resultant flooding was top-of-mind for almost every resident, issues impacting the city's economic future, including those arising from concentrations of poverty, quickly dominated the discussion.

To provide leadership and insight during this process, a steering committee and working groups — composed of resident, business, nonprofit, and city staff stakeholders — met to review previous work, digest new information,

and discuss ways to build resilience. All team members brought individual expertise to bear on the process, but the cross-committee dialogue was most critical in forming connections across the city's strengths and identifying creative resilience opportunities. For example, the steering committee and working groups recognized that solutions to flooding can positively drive economic activity; that innovative water management practices can be used to reconnect neighborhoods and drive economic vitality; and that networks designed to ensure citizen safety during disruptive events can build neighborhood cohesion when the skies are blue. In short, they viewed the city's challenges as opportunities to change in resilient ways.

This collaborative diagnostic work was informed by the array of initiatives and research already underway across the city and by independent analysis and

activities designed specifically for this process. The exciting new efforts included:

- Conducting a baseline economic analysis that assessed current trends and identified challenges and opportunities for the city's future economic growth, including interviews with more than thirty organizations and an entrepreneurial and small business survey completed by over 130 local businesspeople.
- Convening other cities in the 100RC network with land use experts from around the country to explore the next generation of resilient land use planning and to provide close consultation on Norfolk's specific land use challenges and opportunities.
- Partnering with Sandia National Laboratories, a 100RC platform partner, to assess the potential economic impact of a storm on Norfolk's key assets and the resultant economic impact on the nation.
- Collaborating with local leaders to better understand social and economic issues across Norfolk's diverse neighborhoods and experiment with new technologies to find ways to help connect people in need.
- Conducting comparative analysis and receiving technical support from other chief resilience officers and subject-matter experts around how global cities have used water infrastructure to help connect and protect communities.
- Developing a state-of-the-art Resilience Data Dashboard with the support of Palantir, another 100RC platform partner, to integrate key city data to improve the city's ability to understand risks, be more responsive to citizens, and make better decisions about the future.

This integrated approach led the city to identify three key resilience goals, each with supporting strategies and actions, which will help to bolster the city's physical, economic, and social resilience moving forward.

RESILIENT CITY BUILDERS



John Stewart, leader of the grassroots Lafayette Wetlands Partnership, has been working with communities to build resilience one green space at a time. Since 2007, John and his team of exceptional volunteers have worked with residents to restore wetlands throughout the Lafayette River system. To date, the partnership has restored over 15,000 square feet of wetlands, creating a “string of pearls” along the river that provides wildlife habitat, helps clean the water, and creates inviting places for people to visit along the Lafayette River.

NORFOLK'S RESILIENCE STRATEGY: Framework



NORFOLK'S RESILIENCE STRATEGY: Framework

Norfolk's resilience approach is driven by three key goals, each bolstered by supporting strategies and actions. Some actions represent new initiatives; others are already underway. All are a commitment to a new way of doing business — infused with our key tenets, they're collective and coordinated actions to build resilience.

The strategies and actions featured in this document are exhaustive of neither the efforts that have taken place, nor those initiatives the city will pursue. This strategy seeks to set a marker at this point in time to acknowledge the extensive work that has been done and establish a framework and philosophy for how Norfolk will collectively pursue our resilience-building efforts going forward. The strategic resilience framework is organized as follows:

GOAL 1 Design the coastal community of the future.

STRATEGIES

1. Collectively create a vision for the city's future.
2. Access, identify, and implement innovative infrastructure for water management.
3. Create a place where people want to live, work, and play.
4. Redesign tools and regulations to achieve our vision for the future.

GOAL 2 Create economic opportunity by advancing efforts to grow existing and new sectors.

STRATEGIES

1. Create a multi-pronged economic development strategy.
2. Nurture the city's entrepreneurial ecosystem.
3. Strengthen the workforce development pipeline.
4. Reinvest in and revitalize neighborhoods.
5. Explore innovative financing methods.

GOAL 3 Advance initiatives to connect communities, deconcentrate poverty, and strengthen neighborhoods.

STRATEGIES

1. Improve citizen access to information and services.
2. Support community-building efforts through technology.
3. Connect the community through conversation.



GOAL I: Design the Coastal Community of the Future

Norfolk's position as a coastal city is closely connected to its history, culture, and economy. In the face of rising sea levels, we are committed to continuing the globally important work of ensuring trade moves seamlessly through our port, to supporting the readiness of the nation's naval forces, and to safeguarding our city's historic, cultural, and natural assets. To achieve this goal we acknowledge that the city must physically change. We embrace the idea that this physical transformation can drive economic vitality and social cohesion.

Recognizing our risk, we have worked over the past decades to evaluate and design infrastructure to protect Norfolk's edge. We have built seawalls, sophisticated dune systems, and other types of gray and green infrastructure to keep us safe and dry. But with sea-level rise and increased storm intensity,

we need to expand our thinking and our solutions and develop creative new infrastructure systems at both the edge and within the city. We need to think differently about how we build, how we connect, and how we live with and embrace the water.

As we design and build a new kind of coastal community to withstand changing threats, we are committed to reducing residents' exposure to risk, to building an economy driven by innovative solutions, to leveraging infrastructure investments to create new open spaces for citizens, and to bringing communities together and attracting new residents to our city. Our efforts to design the coastal community of the future can demonstrate how coastal cities around the world can learn to live, adapt, and thrive along the water.

STRATEGY 1: Collectively create a vision for the city's future.

To create the coastal community of the future, we will define our future through a collaborative visioning process. Building on PlaNorfolk 2030, the city's comprehensive planning effort, we are developing our vision for a resilient future through design-based dialogues.

ACTIONS **Launch Vision 2100, a citizen-led long-term planning initiative.**

The City of Norfolk's Planning and Neighborhood Development departments are collaborating to create Vision 2100, a citizen-led discussion to identify what's important and what principles the city should use to guide future land use decisions. Vision 2100 is informed by the resilience thinking in this strategy; it will bring that thinking into communities, collectively map community assets, and facilitate discussions about where and how the city should make long-term investments for future growth.

Timeline: November 2015 through March 2016.

Partner with global experts to develop next-generation water management strategies.

The Royal Netherlands Embassy, Hampton Roads Planning District Commission, and the cities of Norfolk, Newport News, and Hampton jointly hosted the Virginia Dutch Dialogues in June 2015 to generate innovative ideas for living with water. For Norfolk, these innovations included using water management as a way to protect and revitalize neighborhoods.

Timeline: Drawing from ideas explored during the 2015 Virginia Dutch Dialogues, the City of Norfolk played a leadership role in developing a recent proposal submitted by the Commonwealth of Virginia to the Department of Housing and Urban Development for funds to build resilience to community threats, including flooding, economic downturns, and concentrated poverty. Grant awards are scheduled for January 2016.



Resilience partners include:

- American Institute of Architects
- ARCADIS
- City of Hampton
- City of Newport News
- City of Norfolk
- Commonwealth of Virginia
- Elizabeth River Project
- Emerging Leaders Program
- Hampton Roads ULI
- Hampton University
- HR&A Advisors
- Old Dominion University
- Royal Netherlands Embassy
- Slover Library Foundation
- Waggoner & Ball Architects
- Wetlands Watch
- Work Program Architects

STRATEGY 2: Assess, identify, and implement innovative infrastructure for water management.

Designing the coastal community of the future requires water management approaches and infrastructure that respond to both current and future risk. Norfolk will pioneer both hard and soft infrastructure solutions and the creative funding models needed to implement these solutions.

ACTIONS

Innovate to combine hard and natural systems to better control flooding.

RE.invest, a Rockefeller Foundation partnership with re:focus partners, Bechtel, Wall Street Without Walls, and Akin Gump Strauss Hauer Feld LLP, provided new ideas for designing and financing hard and natural systems to control flooding. The group focused on integrated flood management solutions in the Arts District and explored solutions, such as cost-effective green infrastructure options and seawall upgrades, to address the frequent flooding challenges that limit economic development opportunities. The team also identified relevant legal and financial mechanisms to support public and private investments in the innovative solutions. Led by the city's departments of Public Works and Finance, this partnership is working to move these ideas to new practices.

Timeline: The report was completed in 2014. The City of Norfolk is developing plans to implement the most promising innovations.

Establish a global practice on water innovation.

In October 2015, the 100RC cities of Norfolk, New Orleans, Bangkok, Berkeley, Surat, Mexico City, Vejle, Rome, and Rotterdam convened in Rotterdam with global experts to provide peer critiques and explore how to achieve multi-benefits from flood mitigation efforts. Norfolk presented its innovative model of using water management to revitalize a low-income neighborhood, and the City of Rotterdam was used as a living lab to explore Dutch innovations, such as water plazas and underground storage facilities. Leveraging the power of the 100RC network and global partners, Norfolk will lead the creation of the next generation of innovative practices for managing and living with water.

Timeline: Further network collaboration kicks off in November 2015 and will continue into 2016. We will synthesize these initial insights into recommendations for our local businesses, chamber of commerce, venture companies, and universities, and propose methods of capitalizing on emerging water management technologies by the end of 2016.

Explore design ideas for the future.

In partnership with the University of Pennsylvania School of Design and The Rockefeller Foundation, Norfolk participated in a new initiative called the Structures of Coastal Resilience. The partnership produced new data and design concepts for the future, including building “fingers of high ground” in the Lafayette River watershed to create areas that can be developed even with expectant sea level rise. The new data and thinking are being integrated into Vision 2100 and other initiatives led by the city’s Planning Department.

Timeline: Initial findings were published in 2015. In December 2015, the U.S. Army Corps of Engineers and the City of Norfolk will host a charrette to further workshop design concepts and identify next steps.

Partner with the U.S. Army Corps of Engineers on a comprehensive flood risk study.

Working together, the City of Norfolk and the U.S. Army Corps of Engineers will conduct a comprehensive study of flooding in Norfolk. The study will evaluate options to reduce the city’s flooding risk.

Timeline: This will start in early 2016 and be completed in fall 2019. The city will integrate this study’s outcomes with other ongoing actions to advance strategies for better leveraging flood mitigation investments.

Resilience partners include:

- | | |
|----------------------------------|------------------------------|
| 100 Resilient Cities network | Rockefeller Foundation |
| Akin Gump Strauss Hauer Feld LLP | UPenn School of Design |
| Bechtel | U.S. Army Corps of Engineers |
| City of Norfolk | Wall Street Without Walls |
| refocus Partners | |

RESILIENT CITY BUILDERS



Tom McNeilan, a civil and geotechnical engineer, loves Norfolk! Tom, a resident of Freemason, was instrumental in connecting the city with Dale Morris from the Royal Netherlands Embassy and David Waggoner, a New Orleans-based architect, and in bringing the Virginia Dutch Dialogues’ “Life at Sea Level” workshop to Norfolk. Through Tom’s efforts, more than thirty experts from around the world came to Norfolk in June to help our citizens imagine what Norfolk will look like as we embrace the water. The resulting ideas are shaping solutions to flooding in the city and building resilience by helping us learn to live with water.

STRATEGY 3: Create a place where people want to live, work, and play.

Norfolk's coastal access is a strong foundation for attracting and retaining residents. In addition to protecting the coastline and downtown core through infrastructure investment, Norfolk must strengthen its identity as a vibrant, attractive place for residents and businesses alike.

ACTIONS

Brand the city.

The Downtown Norfolk Council (DNC), Festevents, and the City of Norfolk formed the Norfolk Collaboratory in 2013 to crowdsource Norfolk's brand messaging. Through the Collaboratory, over 1,600 residents identified the city's diversity, history, and waterfront environment as its key assets. City agencies and partners are now using the Collaboratory's brand message architecture to more seamlessly advance Norfolk's brand. The Collaboratory recently received an award of excellence from 3CMA for its work in engaging and empowering the community to help formulate Norfolk's messaging.

Timeline: Ongoing implementation. The DNC, Festevents, and other organizations that promote the city are using the Collaboratory's brand message architecture to market the city with a unified voice.

Focus on retaining talent.

The Greater Norfolk Corporation, the DNC, and the City of Norfolk have launched LiveNorfolk, a summer program that gives young people interning at corporations and other institutions in Norfolk the chance to experience the quality of life that the city has to offer. LiveNorfolk provides city tours, Nauticus sailing, networking receptions, and professional



Virginia Dutch Dialogues: Waggoner & Ball Architects Vision of Newton's Creek Watershed

In June 2015, the Royal Netherlands Embassy sponsored the second-ever Dutch Dialogues in the United States. Building on previous planning efforts, the dialogues brought together Dutch urban designers, engineers, landscape architects, planners, academics, and government officials to work with American counterparts to explore creative solutions and holistic concepts to reduce flooding. During the workshop, experts looked at improving infrastructure, nature-based solutions, and smart redevelopment. The outcome of the dialogues is an innovative water management solution that includes holding, absorbing, and filtering excess water in yards, streets, and new retention areas. The strategy developed for Norfolk combines rain gardens, cisterns, living shorelines, marshes, streams, and berms to create a system that works together to manage sea level rise and precipitation flooding in the city.

GOAL 1: Design the Coastal Community of the Future

development opportunities, among other events, to highlight the benefits of living and working in the city. Next year the program will be extended to more companies and organizations.

Timeline: Ongoing. LiveNorfolk began in summer 2014 and will continue in future summers.

Enliven commercial corridors with new local businesses.

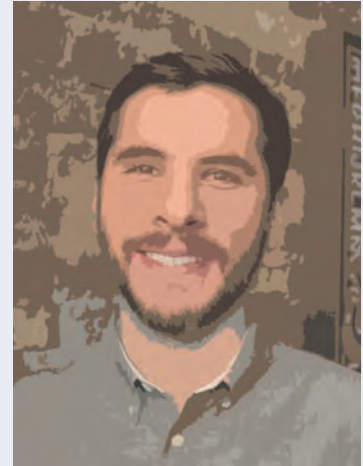
Vibrant Spaces, sponsored by the DNC, provides discounted retail space to startup businesses. The goal is to accelerate the creation of neighborhood-defining businesses while activating street-level experience in the city's commercial corridors. Vibrant Spaces provides grants to energize street-level businesses' storefronts, improve signage, add outdoor seating, activate sidewalks and rooftops, and house a new business collaboration. New businesses that are selected through a competitive application process receive \$20,000 and a 50 percent break on rent for two years.

Timeline: Ongoing. Vibrant Spaces launched in summer 2015.

Resilience partners include:

City of Norfolk
Downtown Norfolk Council
Festevents
Greater Norfolk Corporation
Grow
Nauticus
Norfolk Convention and Visitors Center
Virginia Arts Festival
Virginia Opera
Virginia Stage Company
Virginia Symphony

RESILIENT CITY BUILDERS



Drew Ungvarsky believes in Norfolk's economic potential. Owner of Grow, a digital agency located on Granby Street, Drew is committed to making Norfolk a great place for young talent to live. Drew is spearheading the Vibrant Spaces program for the Downtown Norfolk Council (DNC). Vibrant Spaces help define a city's unique sense of place. Inside and out, they are well-designed and alive with activity, embracing new ideas to create one-of-a-kind experiences, products, and services. Put simply, they're the places you can't wait to tell your friends about. Drew and the DNC are helping to create more Vibrant Spaces by connecting start-up retail businesses with street-level spaces at a deep discount. These new spaces will attract talent to and retain talent in the city by making it a more interesting place to be.

STRATEGY 4: Redesign tools and regulations to achieve our vision for the future.

Transforming together means that the city must create the government processes and regulatory environment to support resilient actions. These processes must be designed in a way that fosters community collaboration and engagement.

ACTIONS

Develop the most resilient zoning code in America.

With assistance from Clarion Associates, Renaissance Planning Group, Herd Planning & Design, Greehan, Taves, Pandak & Stoner, and the Miles Agency, the City of Norfolk is undertaking a comprehensive rewrite of the zoning code. The new code aspires to be a user-friendly document that incorporates modern best practices, supports and encourages resilient development, promotes environmentally friendly development, and recognizes the different characters of districts throughout the city. The city's Planning Department has been central in the development of this resilience strategy and has set the ambitious goal of using this zoning code rewrite to create the new gold standard for integrating resilience principles into land use planning. The rewrite will serve as a model for coastal zoning nationwide.

Timeline: The zoning code rewrite process began in November 2014, and completion is targeted for 2017.

Partner with academia and diverse cities on the future of land use.

With leadership from Norfolk and support from I00RC, the cities of Boulder, New York, New Orleans, and Norfolk participated in a workshop with national land use experts to

discuss how to infuse land use policies with resilient practices. As these cities embark on substantial updates of their land use and citywide plans, the workshop enabled the cities to develop land use principles and practices to enhance resilience. Norfolk is incorporating the lessons and technical assistance from the workshop into its zoning code rewrite process and the Vision 2100 plan. I00RC anticipates publication of a workshop summary report, *Leveraging Land Use Regulation to Achieve City Resilience Goals*.

Timeline: Ongoing. Outcomes from the land use workshop are being incorporated into the city's ongoing zoning code rewrite. I00RC anticipates releasing the workshop report in fall 2015.

Use Better Block demonstrations to test design ideas.

Working with citizens, the city held three Better Block demonstration projects to test design ideas in the city's downtown, Park Place, and Wards Corner neighborhoods. Citizens tested ideas for creating new businesses, expanding public spaces, and calming traffic to improve the pedestrian experience. The experiments are now driving permanent improvements in these neighborhoods.

Timeline: This launched in 2013.

GOAL 1: Design the Coastal Community of the Future

Improvements have been and are continuing to be implemented. To build on these successful efforts, the city will partner with I00RC partner Street Plans Collaborative to identify and plan a new demonstration project focused on placemaking, economic development, or active transportation that can be advanced in the near-term by residents.

Update the Long-Term Recovery Plan.

The City of Norfolk's Department of Emergency Preparedness and Response, in collaboration with the city's Planning Department and Resilience Office, is drafting a Long-Term Recovery Plan that will provide guidance on how the city will respond to and bounce forward from a major disaster.

Timeline: Ongoing. The city is beginning by reviewing models from other cities. The Planning and Neighborhood Development departments' Asset Mapping and Vision 2100 processes in early 2016 will create the general principles for developing the plan.

Develop a new rapid housing recovery model.

Supported by a grant from the U.S. Department of Housing and Urban Development, Old Dominion University is working with the cities of Norfolk and Portsmouth to create a rapid housing recovery model. The goal is to provide cities with a tool to identify factors that enhance housing production capacity, speed the approach back to normalcy, and strengthen the housing sector's resilience in the wake of a disaster.

Timeline: Model development is underway and will be available in fall 2016.



Better Block

In 2013, more than 130 citizen volunteers teamed with the city in a Better Block demonstration project. Using planning and infrastructure tools to guide development, the team tested ideas for a Downtown Arts and Design District. Not long after the weekend event, properties that had long stood vacant began to sell and lease and shops, galleries, and restaurants began to open. People started coming to live, work, and play in the district. This once largely neglected area is now thriving with business, philanthropic investment, and exciting programming, and it has benefited from significant redevelopment in formerly vacant properties.

Resilience partners include:

- I00 Resilient Cities network
- City of Boulder
- City of New Orleans
- City of New York
- City of Norfolk
- Clarion Associates
- Greehan, Taves, Pandak & Stoner
- Herd Planning & Design
- Miles Agency
- Old Dominion University
- Renaissance Planning Group



GOAL 2: Create Economic Opportunity by Advancing Efforts to Grow Existing Industries and New Sectors

Norfolk's economy is dependent on two strong assets: Naval Station Norfolk and the Port of Virginia. A trend of declining spending and job investment and an uncertain future geopolitical context make it unlikely that traditional naval activities alone will drive economic growth in the city. While the Port of Virginia is projected to grow, the city has not maximized its position near the port to cultivate an export economy in the city.

To diversify the economy, while also creating opportunity for living-wage employment for all of our citizens, the city will focus economic development on expanding existing businesses, helping new businesses start, improving the workforce to attract and retain businesses, and revitalizing our neighborhoods to provide great places for people to live, work, and play.

STRATEGY I: Create a multi-pronged economic development strategy.

To define and lead a disciplined approach to creating economic opportunity, Norfolk has examined its current economic drivers and identified the potential for existing and new sectors to drive economic growth. Moving forward, the city will incorporate this knowledge into a plan to guide the city's efforts and investment to increase economic growth, provide greater access to higher-paying jobs, and build the city's resilience to existing economic stresses.

ACTIONS

Understand and articulate Norfolk's unique economic importance.

The Port of Virginia and Naval Station Norfolk create tremendous economic and security benefits, and both of these global assets rely directly on the City of Norfolk. To better understand those interdependencies, and make a case for more investment and protection, experts at the Sandia National Labs are calculating the cost to the world of disruptive flooding in Norfolk. The analysis will help reinforce the economic importance of Norfolk to the region and nation and bolster efforts to strengthen partnerships between the city and the port.

Timeline: A report is anticipated for fall 2015.

Craft an economic development plan for a resilient future.

Norfolk's Department of Development is creating a new Comprehensive Economic Development Strategy that builds on the comprehensive economic baseline study conducted for this strategy, and incorporates resilience thinking to set goals and identify opportunities for the city's economic future. The strategy will incorporate business recruitment, expansion, retention, and creation using identified growth areas, with an emphasis on capturing markets outside of the region. Norfolk's work will feed into a regional strategy led by the Hampton Roads Planning District Commission.

Timeline: Upcoming. The planning effort will begin in January 2016.

Cultivate new capital for job creation.

Norfolk's Department of Development is working with the U.S. Citizens and Immigration Service to establish an EB-5 Regional Center, which will allow foreign direct investment in regional projects that create jobs. EB-5 funding will create a new source of capital for job-creating developments in the city.

Timeline: Ongoing. The new regional center is anticipated to launch in 2016.

Better leverage the export market for local economic growth.

Through a community-driven process, the Hampton Roads Community Foundation identified increasing the region's share of the export market as an important economic development strategy. The foundation is funding the new Regional Export Assistance Program (REAP) to connect local businesses with training, business analytics, and incentives to help companies expand into new markets outside of the region.

Timeline: This launched in fall 2015.

Resilience partners include:

City of Norfolk

Hampton Roads Planning District Commission

ReInvent Hampton Roads

STRATEGY 2: Nurture the city's entrepreneurial ecosystem.

Norfolk has emerged over the past few years as a burgeoning center for entrepreneurs. These small and growing enterprises infuse energy and excitement into the city. Throughout the strategy process, the city engaged these entrepreneurs and identified that, to accelerate growth, it is critical that Norfolk address the key challenges of access to capital and access to talent.

ACTIONS

Launch a new Resilience Lab/ Accelerator.

The Commonwealth of Virginia and a consortium of partners, including Old Dominion University and the City of Norfolk, are launching a Resilience Lab/ Accelerator to serve as a connector between problems, solutions, and market for the region's resilience challenges. The goal is to create new businesses through the process of building citywide resilience. The partners recognize that solving the issues of living on the coast, with the impacts of sea level rise, will require tremendous investment in infrastructure, data analysis, and adaptation. The Lab/ Accelerator will work to capture a portion of the new resilience market by connecting problems with solutions and products.

Timeline: Fall 2016.

Create and sustain a vibrant business community.

In collaboration with the private, university, and nonprofit sectors, the City of Norfolk has launched or supported a series of programs and projects to encourage the creation of new businesses and to help existing businesses grow, including:

- Export Tech to assist local companies in accessing the export market.
- Community cafés to provide

Norfolk's Global Initiatives Fund

Starting in 2015, the City of Norfolk is funding and administering a Global Initiatives Fund to support local exporters by providing patient, flexible capital to fund their export-related activities. This innovative demonstration program recognizes Norfolk's unique port asset and serves small and medium-sized enterprises seeking to expand into global markets. Norfolk's Global Initiatives Fund is the first global commerce initiative of its kind launched by a local government institution in the United States.

neighborhood-based financial, mentoring, legal, and marketing support to small businesses, and HATCH, Start Norfolk, and Old Dominion University's Norfolk Innovation Center to provide incubator space, business training, mentoring, and access to finance for promising business startups.

- 757 Angels, a new network of investors that provides early-stage investment capital for emerging companies. Since the launch in February 2015, 757 Angels' 86 investor members have invested more than \$1 million in local companies.

Timeline: Some initiatives launched in summer 2015.

Resilience partners include:

757 Angels
Bank of Hampton Roads
City of Norfolk
Fulton Bank
HATCH
Hampton Roads Chamber of Commerce
Hampton Roads Community Foundation
Old Dominion University
Opportunity Inc.
Retail Alliance
SunTrust Bank
Score of Hampton Roads
Virginia Department of Housing and Community Development
U.S. Small Business Administration

RESILIENT CITY BUILDERS



James Rogers and Norfolk's Department of Neighborhood Development are supporting community-led efforts to strengthen the city. Through the soon-to-be-launched Rent Ready program, James and his team will connect landlords and renters to information that improves outcomes for both. Landlords who complete the Rent Ready Academy, sign up for the Emergency Notification Database, and pass a quality assessment inspection are eligible to receive a Rent Ready score. They will also be highlighted on a Rent Ready properties website that assists prospective renters with selecting quality rentals, and will receive services and resources to equip them to attract more renters. Through the Rent Ready Academy Renters Track, renters learn about their rights and responsibilities and how to be a great resident of one of Norfolk's neighborhoods.

STRATEGY 3: Strengthen the workforce development pipeline.

A highly qualified workforce is key to the city's future economic growth. Understanding the skills needed to fuel the future economy and ensuring that residents have access to training opportunities that build those skills are essential to building the city's resilience. Building a strong workforce starts with youth. We must create pathways for growth and ensure ongoing access to education and opportunity through adulthood. Working with partners, the City of Norfolk is committed to creating high-quality opportunities for our residents to build the knowledge and skills that enable them to support our growth while earning wages that support their families.

ACTIONS

Create a career pipeline for low-income residents.

Norfolk's Department of Development is developing partnerships with national corporations to offer job training opportunities that result in living-wage employment for low-income residents. The department is investigating how these projects might be financed using social impact bonds and program-related investments. The goal is to grow the number of living-wage jobs and improve the employment pipeline for residents by providing targeted and comprehensive training financed with partners, lowering the cost to the city.

Timeline: Fall 2015.

Open the region's first career pathways school.

The City of Norfolk, Norfolk Public Schools, the Greater Norfolk Corporation, and others are working together to open the region's first career technical school and workforce development center. The goal is to give students and transitioning workers opportunities to gain technical competency in high-employment, in-demand fields, including shipbuilding and



Tidewater Community College's Job Skills Training Program in downtown Norfolk. Credit: Hampton Roads



Virginia's maritime industry supports more than 63,000 jobs. Credit: maritime-executive.com

repair, medical services, and information technology. Located in Norfolk, the center will be open to students and transitioning workers from throughout the region, and will have a direct impact on strengthening the workforce development pipeline.

Timeline: The opening is anticipated for 2018.

Provide early interventions as part of a robust early childhood education system.

A strong workforce pipeline starts with ensuring that all children arrive at school ready to learn; that takes a strong early care and education system. Sentara Healthcare and The Planning Council joined forces to create a critical part of that system, a Universal Newborn Screening and Referral Program. The program provides services to families identified as at-risk across multiple factors that can lead to child abuse or neglect. The goal is to connect families with services to ultimately reduce the number of children who are abused or neglected. Started at Sentara's Norfolk General Hospital, the program will soon expand to Norfolk's Sentara Leigh Hospital.

Timeline: Ongoing. Expansion will take place in 2016.



Universal Screening and Referral Pilot

Early identification is key to delivering effective parenting services to reduce child abuse and neglect. In July 2014, Sentara Norfolk General Hospital, The Planning Council, and the city collectively launched Care Connection, a screening program to identify families with multiple risk factors. Nurses use a behavioral health risk checklist to screen newborns' families. Those identified with risk factors are referred to an intake specialist at The Planning Council. The specialist helps those families find needed services to mitigate the identified risk factors. This effort and efforts to improve the quality of early education offerings are part of the city's comprehensive effort to strengthen the first segments of the workforce development pipeline.

Resilience partners include:

- City of Norfolk
- Greater Norfolk Corporation
- Norfolk Public Schools
- Opportunity Inc.
- Old Dominion University
- Sentara Healthcare
- The Planning Council

STRATEGY 4: Reinvest and revitalize neighborhoods.

Norfolk's future economic strength is tied to the vitality of our neighborhoods. Concentrated poverty, lack of educational and workforce opportunities, and social isolation restrict economic vitality in many of our neighborhoods. To ensure our future resilience, we will focus on actions that deconcentrate poverty by mixing incomes and uses, create affordable housing opportunities, and build neighborhood-level capacity to drive economic development.

ACTIONS **Increase homeownership and deconcentrate poverty.**

The City of Norfolk is working with for-profit and nonprofit developers to build single-family houses on vacant properties throughout the city, with a goal of increasing homeownership and deconcentrating poverty. The city's program, called "Lots of Opportunity," targets households in a range from 60 percent to 120 percent of median income. The program is aimed at first-time homebuyers and allows the city to develop housing for a variety of incomes.

Timeline: This launched in fall 2015.

Implement targeted, place-based revitalization efforts.

The City of Norfolk, in partnership with the Norfolk Housing and Redevelopment Authority, is exploring place-based models to revitalize areas of highly concentrated poverty. Norfolk is exploring options that bring together innovations in education, housing, and economic development to remake areas in the city and provide opportunities for our citizens to thrive. The city also is focusing on neighborhoods that experience chronic flooding, using the need to remake the landscape as an opportunity to strengthen neighborhood and economic resilience. City leadership has visited model sites in other cities, including Purpose Built Communities sites, and is identifying critical model components for implementation.

Timeline: The fact-finding phase launched in October 2015.

Grow the capacity of local CDCs to build resilient neighborhoods.

The City of Norfolk is issuing a request for proposals for a high-quality provider to train and support community development corporations (CDCs). The goal is to grow the capacity of local CDCs so they can play a more dynamic role in neighborhood revitalization efforts, which links them to the

Bank on Norfolk

In January 2016, the city will launch Bank On Norfolk, a program that works with banks and credit unions to reduce barriers to banking and increase access to the financial mainstream. This voluntary, public-private partnership between local government, financial institutions, and community-based organizations provides low-income un- and under-banked people with free or low-cost starter "second chance" bank accounts and financial education. The program's unique ten-month class component teaches unbanked citizens the financial benefits of using mainstream banking services. Currently, 11.4 percent of Norfolk residents are unbanked, and 27.5 percent are under-banked. Bank On Norfolk helps reduce these percentages by connecting residents to financial institutions, providing comprehensive education on banking and budgeting, and building financial security by incentivizing savings.

larger resilience goals of the city. Areas of development will include mixed financing and equity financing of affordable housing units, business creation and expansion using HUD entitlement funds, and community leadership support.

Timeline: A request for proposals was released in October 2015.

Launch a new Affordable Housing Trust Fund.

As Norfolk's Plan to Reduce Poverty demonstrated, housing costs are a threat to neighborhood stability. The City of Norfolk is working with a consortium of private sector and nonprofit partners to launch a new Affordable Housing Trust Fund. In the city's FY 2016 budget, Norfolk's city council authorized funds to establish the trust fund. City staff are organizing an education series on housing trust funds for potential partners. The goal is to establish the operating principles and long-term, sustainable funding sources for the fund.

Timeline: A draft of operating principles for the fund will be completed by January 2016.

Help stabilize families to build stronger neighborhoods.

The Planning Council operates a program using housing specialists to reach out to landlords, identify housing available to low-income families, and build relationships to further expand rental opportunities for safe, affordable, and accessible housing. Housing specialists negotiate with landlords to help with the rental process, promote the use of the affordable housing website to landlords and property managers, provide ongoing tenant and landlord education, and work with tenants to help ensure housing stability. The goal of the program is to provide resilient housing opportunities and long-term housing stability for vulnerable residents.

Timeline: This has been operational since 2012.

RESILIENT CITY BUILDERS



In Park Place, a group of residents led by current School Board Chair **Rodney Jordan** partnered with the city to pursue a resident-driven, healthy neighborhood approach to neighborhood revitalization and competitiveness. The effort led to the creation of the Greater Park Place Visioning and Engagement Process (VEP), which was the impetus for the city's Neighbors Building Neighborhoods initiative. The VEP is a resident-led revitalization effort in which neighbors help neighbors create and implement a vision for growing their neighborhood by focusing on its strengths. By connecting neighbors around a vision of growing healthy internal and external partnerships, the residents of Park Place are creating a neighborhood where families will want to live, work, and play in Norfolk.

Resilience partners include:

City of Norfolk	Norfolk Housing and Redevelopment Authority
Mayor's Commission on Poverty Reduction,	The Planning Council.

STRATEGY 5: Explore innovative financing methods.

Resourcing resilience solutions is one of the primary challenges cities face; Norfolk is no different. What makes Norfolk unique, however, is its commitment to developing new financing methods and refocusing existing resources to implement the city's 45 resilience strategies. Norfolk and its partners are exploring innovative ways to capture the financial benefits of risk-reducing resilience investments to support additional investment in resilience efforts.

ACTIONS **Pioneer the creation of new risk reduction bond.**

Supported by The Rockefeller Foundation, the RE.bound Program, which brings together a team of private sector leaders, is taking steps to design a new catastrophe bond-like product that can promote project-based risk reduction solutions. These new types of instruments would realize the potential insurance benefits from infrastructure improvements and monetize the physical and financial risk reductions associated with investments in resilient systems, such as seawalls and green stormwater infrastructure. RE.bound intends to fix this problem by modeling the financial benefits of specific resilient infrastructure projects upfront and integrating insurance coverage with investment in long-term risk reduction. Norfolk's departments of Budget and Strategic Planning and Finance are exploring how the RE.bound approach might help fund needed flood mitigation projects in the city.

Timeline: A complete review of the catastrophe bond process and its potential impact on the city's overall fiscal position is underway.

Investigate using social impact bonds to finance programs to advance social and economic resilience.

The City of Norfolk is working with Social Finance, a 100RC platform partner, to investigate the use of social impact bonds

Catastrophe Bonds

The private sector, philanthropy, and the City of Norfolk are driving innovation in capital markets. The city is applying lessons from The RE.bound Program to explore the use of a catastrophe bond-like product that reduces the city's exposure to loss due from a disaster. This type of bond can provide cost-effective insurance and help mobilize resources to mitigate against insured risk. A city is able to access capital for mitigation without increasing debt.

RE.invest

The RE.invest initiative is a collaboration among eight partner cities and leading engineering, law, and finance firms to create new public-private partnerships for resilient infrastructure. In Norfolk, the RE.invest initiative focused on integrated flood management solutions in the Arts District. Solutions included cost-effective green infrastructure options and seawall upgrades to address frequent flooding that currently limits economic development. The team also identified relevant legal and financial mechanisms to support public and private investments in the innovative solutions.

to finance social service programs. Social impact bonds provide private investors with an opportunity to fund programs designed to create value or lessen the cost of city services. For example, a bond might fund a training program that helps residents obtain living-wage employment. Bond investors receive payments when program goals are met.

Timeline: The initial workshop on social impact bonds with city staff and potential nonprofit and philanthropy partners will be held in 2016.

Create new investment funds for local business.

Norfolk's Department of Development has created four new investment funds to support local businesses and local neighborhood revitalization projects. The Citywide Partnership Fund, the Global Initiatives Fund, the Norfolk Innovation Fund, and the Grow Norfolk fund provide \$3 million annually to start and grow existing businesses in Norfolk. These funds will spur business creation, business expansion, and revitalization of the city's commercial corridors. As these funds grow, we will seek opportunities to give priority financing to businesses that advance the resilience themes of this strategy.

Timeline: This launched in July 2015.

Resilience partners include:

- 100 Resilient Cities
- City of Norfolk
- The Rockefeller Foundation
- Social Finance

RESILIENT CITY BUILDERS



Antipas Harris is the President of GIELD, a nonprofit organization dedicated to developing quality leaders within the church and society. Dr. Harris is supporting the effort to connect local churches to Bank On Norfolk. Bank On helps unbanked or under-banked residents connect to free or low-cost starter bank accounts and financial education. The local faith community will support the Bank On effort by providing matching dollars to incentivize residents to create emergency funds. By helping low-income residents save for emergencies, Dr. Harris and the Norfolk Senior Pastors' Roundtable are building the city's economic resilience.



GOAL 3: Advance Initiatives to Connect Communities, Deconcentrate Poverty, and Strengthen Neighborhoods

Together we are stronger. Whether conditions are good or challenging, we work better, are safer, and are more productive when we are connected, communicating, and supporting each other. As changing conditions lead to new ways of living and working, we are committed to building better by building together. We aspire to be a city where all residents are connected to the resources they need to be successful and are compelled to seize every opportunity to build our city into a great place to live, work, and play for all.

Connected neighbors build strong

neighborhoods that are safer, deliver a higher quality of life for residents, and protect people better in times of emergency. Norfolk's Neighbors Building Neighborhoods (NBN) initiative was built on the premise that more cohesive communities are safer, more prosperous communities, and on the fundamental belief that individuals are the catalysts for change in their communities. This plan seeks to complement and support the successful work accomplished and underway by NBN to strengthen communities and build resilience at the individual, neighborhood, and city level.

STRATEGY I: Improve citizen access to information.

Timely access to accurate information is critical to an individual's ability to make informed decisions—in good times and bad. By creating systems that can integrate and disseminate data into actionable information, Norfolk is developing the building blocks for information-based decision-making.

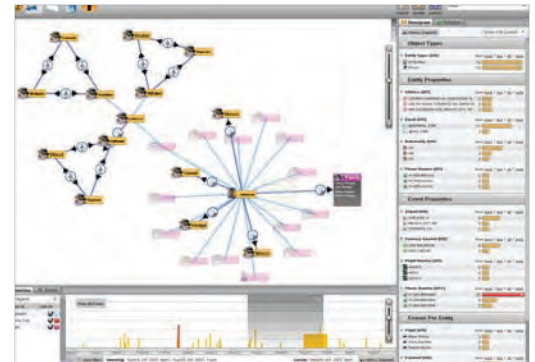
ACTIONS **Launch a state-of-the-art Resilience Dashboard.**

In close partnership with I00RC's platform partner Palantir, a global data integration company, the City of Norfolk is pioneering a new resilience module to integrate key data, improve the city's ability to respond to citizens today, and better plan for the future. The city's Information Technology Department and Palantir have improved the city's data integration, which gives users the ability to analyze information in a single platform. Dozens of staff in multiple departments, including Neighborhood Development, Planning, and Public Works, are using the dashboard to connect building, code violation, permitting, storm damage, and calls-for-service data to improve service delivery at the neighborhood level. Norfolk will capture lessons learned to help Palantir find ways to bring this new dashboard to other cities around the world.

Timeline: This launched in 2015.

Raise awareness of risks and resources to keep persons and property safe during storms.

The City of Norfolk has convened a working group of city staff and insurance, banking, planning, and community representatives to create a communications



Palantir Data Analysis System

To help solve hard problems, Norfolk is working with Palantir, a data analytics company, to change the way the city uses information. By bringing together data on flooding, buildings, code violations, permits, and calls for service, staff can provide interested residents with a better understanding of what's working well and what's not working well in our neighborhoods. The city's neighborhood specialists work with civic leagues to identify problems to be solved by analyzing what's happening and why. Staff use neighborhood-specific, real-time information that connects events, places, and people to assist residents to take actions that make their communities stronger.

campaign to alert citizens to the risks of flooding. The campaign will raise awareness of risks and resources to aid residents in informed decision-making during storms. The city will use city-owned media as well as local media to spread the word.

Timeline: The campaign will launch in winter 2016.

Involve citizens in budget development.

The city's departments of Communications and Budget and Strategic Planning convene residents each year for conversations on the city's budget. Over time, the focus of these gatherings has evolved from a summary of annual city spending to a discussion of the vision of Norfolk's future and priorities. These conversations provide an opportunity for residents and city staff to work collectively in establishing priorities, and to implement plans that build on that collective vision. To date, more than 600 residents have participated in these conversations.

Timeline: Community conversations will be held during the fall and winter of 2015 and 2016.

Reduce barriers to banking and financial mainstream.

The City of Norfolk is working with financial institutions and community groups to establish the Bank On Norfolk program. Bank On Norfolk takes a strategic approach to helping families build financial strength through connections to banking services, education, and mentoring. Bank On works with unbanked and under-banked residents to increase the financial stability of low- to moderate-income families by connecting them to traditional financial services and providing them with alternatives to expensive financial transactions.

Timeline: This will launch in winter 2016.

Resilience partners include:

- City of Norfolk
- Faith community
- Local banks
- Local media outlets
- Old Dominion University
- Palantir

RESILIENT CITY BUILDERS



Jim Redick, Director of Emergency Preparedness and Response for the City of Norfolk, understands the power of collaboration. Through Team Norfolk, Jim brings together government, the private sector, nonprofits, the faith community, higher education, and the military. With these community partners, Jim is building a collective effort to address all threats, including sea level rise. Jim believes connecting networks, forming relationships, and leveraging ideas and resources are key to building resilience. Beyond coordinating work in Norfolk, Jim serves as the chair of the Hampton Roads Sea Level Rise Preparedness and Resilience Intergovernmental Pilot Project, a White House initiative to coordinate "the whole of government" in planning for sea level rise. Jim is also co-chair of the Subcommittee on Recurrent Flooding, part of Virginia's Secure Commonwealth Panel.

STRATEGY 2: Support community-building efforts through technology.

Research confirms that connected, cohesive communities bounce back better from disruptive events. Advances in technology can help people more easily connect networks of people together. Norfolk will continue to build community by piloting new networking technologies that connect vulnerable populations with community and services.

ACTIONS

Develop new technology to help residents support those in need.

The City of Norfolk, local civic leagues, and local technology firm Concursive are working together to launch the Helping Hands program. Helping Hands is a smartphone app that connects small networks of residents as they support vulnerable neighbors during emergencies. The app provides information about emergency conditions and identifies resources to hyper-local networks available to assist at-risk neighbors when life-supporting services are disrupted by an event. This helps build community connection and ensure citizen safety while reducing burdens on emergency responders during emergencies.

Timeline: This will launch in winter 2016.

Connect the faith community with emergency responders.

The city's faith-based community is working with the Norfolk Department of Emergency Preparedness and Response on Operation Brother's Keeper. This initiative empowers neighborhood faith-based communities to support emergency preparedness efforts across the city. Faith-based institutions volunteer to act as communication and supply distribution centers and shelters, thereby ensuring the distribution of supplies and services at the neighborhood level during disasters. Information connecting residents

to these services is broadcast through websites and smartphone applications.

Timeline: Launched in 2015.

Use technology to support local giving.

Several local Boy Scout troops, Concursive, and community members have launched We Feed Norfolk. We Feed Norfolk uses mobile technology to communicate opportunities for residents to volunteer and give back to other residents. The pilot successfully engaged residents in donating over 3,500 pounds of food to the local food bank. The goal is to increase citizen participation in programs that support their communities, and the technology could be used in many different ways.

Timeline: Ongoing. This launched in 2015.

Resilience partners include:

- City of Norfolk
- Civic leagues
- Concursive
- Faith-based community
- FoodBank of Southeastern Virginia
- Local Boy Scouts of America troops

STRATEGY 3: Connect the community through conversation.

The City of Norfolk is committed to continually improving methods for citizens to connect with each other and their government to define the city's future. Norfolk believes that citizens who are engaged in building the vision for the future will be active in working to implement that vision.

ACTIONS

Collaborate with residents to map neighborhood assets.

The city's Department of Neighborhood Development is helping residents map their neighborhood's physical, social, and economic assets. This asset-mapping process will help the city identify those characteristics and places that make neighborhoods strong in good times, and provide crucial support in times of emergency. The city's Neighbors Building Neighborhoods initiative will leverage this analysis to work with local communities to build neighborhoods of choice—places where people choose to live because of the high quality of life.

Timeline: Community mapping sessions will be held in winter 2016.

Create new dialogues between the police and the community leaders.

The city's police department and community leaders are working together to build a stronger police-community relationship. Community and police leaders engage in frank discussions about critical issues, including bias-free policing, use of force, and police recruiting. The goal is to create open lines of communication to ensure that the community

and the police department are working together effectively to keep communities safe.

Timeline: This program was launched in 2015.

Outreach through community events.

Police Chief Michael Goldsmith and Neighborhood Development Director James Rogers have instituted "Hamburgers and Hotdogs with the Chief of Police" events. Chief Goldsmith and Rogers regularly meet with residents in neighborhood homes and parks and at neighborhood-sponsored events to discuss important issues about the department's interactions with citizens. The goal is for the chief to hear firsthand the concerns of residents and for residents to have a direct communication with the leadership of the force.

Timeline: This launched in 2014.

Engage diverse voices through the Norfolk Senior Pastors' Roundtable.

The local faith-based community and city leaders have convened a pastoral roundtable. The roundtable meets frequently to discuss important community issues. These meetings act

GOAL 3: Advance Initiatives to Connect Communities, Deconcentrate Poverty, and Strengthen Neighborhoods

as an opportunity to listen, share, and vet ideas on topics of interest to the city and the faith-based community. The goal is to create consensus around and to collaboratively implement actions that drive positive change. Through roundtable discussions, local churches have agreed to raise funds to match savings of participants in the city's Bank On Norfolk program.

Timeline: This initiative is already underway.

Resilience partners include:

City of Norfolk
Civic leagues
Faith-based community

The Norfolk Senior Pastors' Roundtable

The roundtable was established in January 2015 and serves as a trusted environment that values and fosters frank discussions with faith-based partners about issues they find important for the thousands of residents they serve in the City of Norfolk. The roundtable provides the city manager with an opportunity to discuss important issues to better our city. The roundtable's stated commitment is to work toward the well-being of the city, especially as it relates to social and economic justice and ethnic harmony. The meetings are held monthly and rotate among the city's houses of worship. The pastors involved in the roundtable represent approximately 15,000 congregants.

RESILIENT CITY BUILDERS



Dave Richards has lived in a number of Norfolk neighborhoods over the past 25 years and co-owns Concursive, a technology company located in downtown Norfolk. Dave believes Norfolk should be the most connected city in the world, especially as it relates to "doing things that matter!" To jump-start that effort, he launched We Feed Norfolk, enlisting local Boy Scout troops 24 and 1 to collect food donations from area residents. The program distributes reusable bags to the front doors of Norfolk residents and asks them to sign up and download the We Feed Norfolk app on a smartphone. Dave and other volunteers send out a message alerting users that the Boy Scouts will be out collecting the bags full of food. Residents who want to participate leave the bag of food on their porch and press the app for a pickup. In just the three initial pilot runs, the program collected over 3,500 pounds of food for the region's food bank.

What's Next



Norfolk's Resilience Strategy represents the first step toward creating and cultivating an ongoing resilience practice across the city. In addition to moving these strategies and actions forward, Norfolk's Resilience Strategy will accomplish the following tasks over the next nine to twelve months:

- **Identify and showcase a growing number of Norfolk's Resilient City Builders, both organizational partners and individuals.** Optimally, by July 2016, we will have recognized one hundred people and organizations as Norfolk Resilient City Builders.
- **Establish a global practice on water innovation.** Norfolk is a hub of activity for advancing next-generation thinking on living with the water. From the Dutch Dialogues to the Resilience Lab/Accelerator to the 100RC exchange and community of practitioners, Norfolk will be a leading global thinker—and doer.
- **Partner with other 100RC network cities to create innovations in resilience.** For example, the cities of New Orleans and Norfolk will partner on developing innovative financing to fund infrastructure improvements and accelerate economic vitality.

- **Hold the second Norfolk Resilient City Builder Summit event in July 2016.** This event will bring together Norfolk's Resilient City Builders to review and discuss our resilience planning efforts to date, including this strategy.
- **Measure the city's resilience performance and institutionalize new practices** by creating a resilience program performance dashboard and developing an ongoing communications system that will institutionalize resilience planning and implementation for centuries to come.
- **Continue to transform the way Norfolk does business.** The future of Norfolk depends on putting in place resilience strategies that propel the city forward today and that efficiently activate in times of need to ensure the city stays safe and strong. By working together as a community and partnering with the expertise and resources available throughout I00RC, Norfolk is leading a movement to build resilient cities across the globe. Collectively, we are transforming the way our city works — collaboratively, proactively, thoughtfully, and inspired by an understanding that the challenges before us provide an opportunity to build an even better, more vibrant Norfolk for the next 400 years.



Norfolk 100RC Initiative Leadership

Resilience Steering Committee Members

Paul D. Fraim
Mayor, City of Norfolk

Shawn Avery
Opportunity, Inc.

Edna Baehre-Kolovani
Tidewater Community College

Ray Toll
Old Dominion University

William Crow
Virginia Ship Repair

Richard Homan, M.D.
Eastern Virginia Medical School

Marcus D. Jones
Norfolk City Manager

Randy Keaton
Hampton Roads Planning District Commission

Andria McClellan
Norfolk Planning Commission

Thaler McCormack
ForKids

Suzanne Puryear
The Planning Council

John Reinhart
Virginia Port Authority

Skip Stiles
Wetlands Watch

Theresa Whibley, M.D.
Norfolk City Council

Coastal Resilience Working Group Members

Richard Broad
City of Norfolk, Dept. of Public Works

Christy Everett
Chesapeake Bay Foundation

George Homewood
City of Norfolk, Dept. of Planning

Marjorie Mayfield Jackson
Elizabeth River Project

Kristen Lentz
City of Norfolk, Dept. of Utilities

Molly Mitchell
Virginia Institute of Marine Science

Eddie Redfearn
S.L. Nusbaum Insurance

Jim Redick
City of Norfolk, Dept. of Emergency Preparedness and Response

W. Craig Riley
Monarch Bank

John Stewart
Lafayette Wetlands Partnership

John White
City of Norfolk, Dept. of Public Works

Ron Williams
City of Norfolk, City Manager's Office

Andrew Yancey
City of Norfolk, Dept. of Development

Neighborhood Resilience Working Group Members

Lori Crouch
City of Norfolk, City Manager's Office

Tina Gill
The Up Center

Michael Goldsmith
City of Norfolk, Police Dept.

Stephen Hawks
City of Norfolk, Dept. of Human Services

George Homewood
City of Norfolk, Dept. of Planning

Demitria Lindsey, M.D.
Norfolk Department of Public Health

Shurl Montgomery
Norfolk Redevelopment and Housing Authority (Retired)

James Rogers
City of Norfolk, Dept. of Neighborhood Development

Randy Ross
Norfolk Federation of Civic Leagues

Denise Thompson
City of Norfolk, Dept. of Public Works

Mike Wasserberg
City of Norfolk, Office to End Homelessness

Jeff Wise
City of Norfolk, Dept. of Fire and Rescue

Economic Resilience Working Group Members

Barry Bishop
Greater Norfolk Corporation

William Crow
Virginia Ship Repair Association

Dan Cohen
City of Norfolk, Dept. of Economic Development

Robert Garris
Norfolk Economic Development Authority

Patricia Harrison, Ph.D.
City of Norfolk, Office of Budget and Strategic Planning

Richard Homan, M.D.
Eastern Virginia Medical School

Marty Kaszubowski
ODU Norfolk Innovation Center

Mary Miller
Downtown Norfolk Council

Zach Miller
HATCH

Sarah Parker
City of Norfolk, Dept. of Economic Development

Susan Perry, Ph.D.
City of Norfolk, Mayor's Commission on Poverty Reduction

John Porter
Entrepreneur

Don Ingerson
Titan Virginia

Bryan Stephens
Hampton Roads Chamber of Commerce

Robert Sharak
Opportunity Inc.

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Working Group Contributors

Leo Adriaanse
Mason Andrews
John Atkinson
Ramona Austin
Mac Ball
Bob Batchler
Joshua Behr
Sam Belfield
Juvarya Beltkamp
Wynter Benda
Joe Bouchard
John Broderick
Peter Chapman
Chesterfield Heights Civic League
Stephen Conrad
Michelle Covi
Robert Crum
Caroline Deitrich
Rafael Diaz
Ramiro Diaz
Piet Dircke
East Ocean View Civic League
Mudje Ertan-Unal
Jeremy Forest
Adam Frank
Vlad Gavrilovic
Adrian Gheorghie
Ray Gindroz
Jamie Goldin
Richard Goll
Jennifer Graeff
Michelle Hamor
David Harnage
James Herbst
JanDirk Hoekstra
Oneiceia Howard
Hannah Hoyt
Shereen Hughes
Robert Jeffers
Michelle Johnson
Peter Johnston

Steve Jones
Sabrina Joy-Hogg
Alex Kaplan
Whitney Katchmark
John Kownack
Bruce Lawlor
Jonathan Lester
Miranda Luna
John Macomber
Jeremy Maloney
Sarene Marshall
John Martin
Kaye Matheny
Brenden McEneaney
Ben McFarlane
John Mclwain
Tom McNeilan
Jonathan Miller
Dale Morris
Paul Moyer
Rhonda Murray
Leonard Newcomb
Paul Olsen
Howard Passell
Thaddeus Pawlowski
Fraser Picard
Mel Price
Carlton "Ray" Ransom
David Richards
Craig Richardson
Joe Rieger
Capt. Jorge Rios
Paul Robinson
Burrell Saunders
Charles Schilke
Jeremy Sharp
Paula Shea
Beth Silverman
Steven Slabbers
Scott Smith
Kyle Spencer
South Brambleton Civic League

Dave Stebbins
Mary-Carson Stiff
Roelof Stuurman
Cheryll Sumner
Hannah Teicher
Sas Terpstra
Steve Van Leeuwen
Drew Ungvarsky
Shalini Vajjhala
Jaap van den Bout
Jan van der Grift
Jaap van der Salm
Jarda van Spengen
Peter van Veelen
Kyle Vangel
Juvarya Veltkamp
David Waggonner
Alex Wall
Edgar Westerhof
Morgan Whayland
John White
Thom White
Lindsay Woodson
Wie Yusuf
Kevin Zerbe

Norfolk Office of Resilience:
Christine Morris, Chief Resilience Officer
Katerina Oskarsson, Management Analyst III
Jessica Dennis, City Manager Fellow



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Norfolk's Resilience Strategy Guiding Tenets

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Image: Universal Screening and Referral Pilot. Hampton Roads Chamber

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What's Next

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100 RESILIENT CITIES



