Greauxing Resilience at Home

City of Norfolk, Virginia: **PlaNorfolk 2030, Norfolk Vision 2100, and Resilience Zoning Updates**

GEORGETOWN CLIMATE CENTER

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Full List of Case Studies

ABOUT THIS REPORT

Louisiana is one of the hardest-hit areas in the United States as extreme weather events and regular flooding become more frequent and intense.[1] These challenges often fall "first and worst" on Black, Indigenous, and People of Color or "BIPOC" and low-income communities.[2] This is especially true in the U.S. Gulf Coast region and the state of Louisiana.

Over time, these challenges are being exacerbated by population increases and transitions as climate and non-climate drivers (e.g., people moving out of urban centers into more rural areas) influence where people choose — or are able — to live.

In southeast Louisiana, resilient, affordable housing initiatives are critical to ensuring equitable adaptation that takes into consideration the myriad overlapping challenges facing all Louisianans, but especially those living in communities that have long borne a disproportionate burden of risk.

Over a two-year period between fall 2020 and spring 2022, **Capital Region Planning Commission** and **Georgetown Climate Center** partnered with dozens of people from government, private, and nonprofit sectors and community stakeholders in Region Seven of the **Louisiana Watershed Initiative**.[3] The result of that partnership effort is **Greauxing Resilience at Home: A Regional Vision**[4] (Regional Vision), a resource to inform Region Seven's ongoing work to increase community resilience by promoting affordable housing and nature-based solutions.

Regional and local governments in Region Seven can use the Regional Vision to identify potential legal, planning, and policy tools and projects to increase the affordability and availability of housing and the use of nature-based solutions. In addition, the Regional Vision offers insights for policymakers across Louisiana, throughout the Gulf Coast region, and nationally.

This report is composed of 24 individual case studies developed by Georgetown Climate Center to support the Regional Vision. These case studies describe best and emerging practices, tools, and examples from Louisiana and other U.S. jurisdictions to make progress on these complex and challenging issues. These case studies are intended to provide transferable lessons and ideas for regional and local governments addressing housing and mitigating flood risk as integrated parts of comprehensive community resilience strategies. Collectively, these case studies present a suite, although not an exhaustive list of tools and approaches that can be used to facilitate any of these efforts.

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1 State of La., Louisiana Climate Action Plan: Climate Initiatives Task Force Recommendations to the Governor 15–16 (Feb. 2022), *available at* **https://gov.louisiana.gov/assets/docs/CCI-Task-force/CAP/ClimateActionPlanFinal.pdf**.

2 *See id.* at 15–17.

3 The Louisiana Watershed Initiative is an effort to create a paradigm shift in floodplain management towards a strategy that approaches flood risk reduction from a nature-based solutions and land-use-based approach. A part of this approach includes identifying eight separate regional watershed management areas to assist in achieving cross-jurisdictional activities.

Region Seven is one of these eight watershed regions. Region Seven encompasses the upper part of the toe of Louisiana's boot. It spans eastward from the Mississippi River near Baton Rouge across the Northshore (i.e., north of Lakes Pontchartrain and Maurepas) to Mississippi and along the Mississippi River to the Bonnet Carré Spillway. The region includes 13 parishes and 45 incorporated municipalities.

4 To reflect their connection to Louisiana's cultural heritage, the project team and members of Region Seven that participated in this process chose to use the word "Greaux," a French-inspired phonetic spelling of the word "Grow," to brand this product.

Where possible, all the case studies share a consistent organizational format to allow easier cross-comparison of tools, processes, and takeaways:

- The **Background** section introduces the regional and local context (e.g., location, demographics) for each case study, including the following facing each jurisdiction: extreme weather risks, housing and environmental challenges, and development pressures.
- The **Housing** section focuses on the legal, planning, and policy tools and projects that have been designed and implemented to support the growth and preservation of housing affordability and availability.
- The **Environment** section highlights how vulnerable habitats like floodplains and other open spaces are being restored, conserved, and protected as a part of comprehensive resilience strategies to provide important ecosystem and community benefits like reducing flood risk and creating community assets, such as parks and trails.
- The **Community Engagement** section summarizes how governments have provided different types of public engagement opportunities and how affected residents have contributed to these planning and decisionmaking processes.
- The **Funding** section identifies how the programs, plans, and projects discussed have been funded by federal, state, and local government and private and nongovernmental sources.
- The **Next Steps** section captures the anticipated future actions that featured case study jurisdictions may take in implementing these tools and strategies.
- The **Considerations and Lessons Learned** section concludes with the primary takeaways from each example that other regional and local policymakers and communities may consider when developing or implementing their own housing and resilience strategies using these legal, planning, and policy tools.

A few additional notes about the case studies:

- **The case studies selected prioritize relatable and scalable models from places similar to Louisiana:** Wherever possible, Georgetown Climate Center aimed to acknowledge and lift up the work of jurisdictions and nongovernmental actors in Region Seven and neighboring watershed regions to inspire peer-to-peer sharing and actions from as close to home as possible. These resources are drawn from 12 states, with an emphasis on regions and local areas in the Gulf and Mid-Atlantic: Colorado, Florida, Georgia, Illinois, Iowa, Louisiana, New York, North Carolina, Oregon, South Carolina, Texas, and Virginia. Examples and lessons drawn from these regions are easiest to apply to a Louisianan context because they feature similar geography or analogous impacts from flooding and other climate effects.
- **There are no perfect, "one-size-fits-all" solutions:** While the case studies and resource entries informing the Region Vision are instructive for Region Seven and beyond, none of them are "perfect" examples of how to solve these complex and challenging issues. Georgetown Climate Center found no single case study or resource that provides a point-for-point or model for what Region Seven is trying to accomplish. No other jurisdiction identified is currently trying to integrate housing, flooding, equity, resilience, and population changes together in a single plan, ordinance, or policy. However, some jurisdictions are moving in that direction, or are making progress on discrete elements of what will eventually become a more holistic strategy. Therefore, this report and the Regional Vision draw analogous connections and recommendations that can be combined to facilitate more comprehensive planning and land-use efforts.

The case studies in this report were informed by interviews with practitioners and community leaders in charge of designing and overseeing this work. No statements or opinions, however, should be attributed to any individual or organization included in the *Acknowledgements* section of this report.

It is also important to note that the examples described in each case study are ongoing and the content included in this report is current as of spring 2022. For future updates about these and other case studies and the Regional Vision, please visit **Greauxing Resilience at Home: A Regional Vision** and Georgetown Climate Center's **Adaptation Clearinghouse**.

City of Norfolk, Virginia

PlaNorfolk 2030, Norfolk Vision 2100, and Resilience Zoning Updates

EXECUTIVE SUMMARY

Norfolk, Virginia is a coastal city whose history, economy, and culture are deeply tied to its location on the water. Facing new challenges of increased flooding and sea-level rise due to climate change, Norfolk has responded by developing a host of planning and zoning initiatives that are informed by these new risks and designed to increase the city's resilience against them. Norfolk's efforts are an example of how various tools, including a comprehensive plan, a long-range plan, and an updated zoning ordinance, can be used together to build an integrated strategy for local resilience.

Norfolk also serves as an example of adaptive planning, in which new needs and priorities that arise over time are integrated as appendices to the city's comprehensive plan. For example, several appendices to Norfolk's comprehensive plan were developed to assist developers with housing design challenges that were not addressed in the original comprehensive plan.

Overall, Norfolk's efforts show how developing a long-range strategy centered on the communities' priorities can inform zoning rules that implement that vision. Other jurisdictions may look to Norfolk as an example of how local governments can orient and integrate planning and zoning initiatives toward increasing long-term resilience to the impacts of flooding.

BACKGROUND

Norfolk is a city on the southeastern coast of Virginia, with a population of over 242,000 in 2019, approximately the same as its population in 2010.[1] Founded as a port city at the mouth of the Chesapeake Bay, Norfolk's history in water-based industry is key to its identity as a city, with 144 miles of shoreline supporting economic, recreational, and aesthetic benefits for the city's residents and visitors.[2] However, increased frequency of flooding due to sea-level rise and land subsidence have posed problems in recent years, spurring new planning initiatives to respond to flooding and other climate threats.

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[1] *QuickFacts: Norfolk City, Virginia*, U.S. CENSUS BUREAU, https://www.census.gov/quickfacts/fact/table/norfolkcityvirginia/PST045219 (last visited Nov. 4, 2021).

[2] CITY OF NORFOLK, VA., NORFOLK VISION 2100 22 (Nov. 22, 2016), *available at* https://www.norfolk.gov/DocumentCenter/View/27768/Vision-2100---FINAL?bidId=.

The following sections detail elements of Norfolk's comprehensive plan, long-range resilience plan, and zoning ordinance that are notable as adaptive responses to the increased flooding risks facing the city.

OVERVIEW OF PLANORFOLK 2030, NORFOLK VISION 2100, AND ZONING CODE UPDATES

Norfolk has two main strategy documents guiding its resilience efforts: plaNorfolk 2030, the city's general comprehensive plan, and Norfolk Vision 2100, a longer-term visioning document for long-range resilience planning adopted as an addendum to the general comprehensive plan.[3] In 2018, elements of plaNorfolk 2030 and Norfolk Vision 2100 were incorporated into Norfolk's updated zoning ordinance.

In 2013, Norfolk adopted plaNorfolk 2030 as its general comprehensive plan.[4] Among other updates, plaNorfolk 2030 incorporates the city's increased awareness of risks caused by flooding and sea-level rise.[5] The plan advances a vision of Norfolk with green spaces that are "not simply protected, but enhanced" and "well-maintained housing options that are affordable and accessible to all residents."[6] To this end, the plan includes a chapter each for promoting environmental sustainability and ensuring housing choices for all, as well as several appendices that expand upon these initiatives in greater detail.[7]

Notably, plaNorfolk 2030 includes a goal to draft a new zoning ordinance, which had last been updated in 1992. At early stages in the rezoning process, Norfolk lacked an overarching vision that city planners wanted to implement. However, the city's subsequent participation in the 100 Resilient Cities program brought flood, economic, and neighborhood resilience to the forefront of the rezoning effort.[8]

Seeking to create the "most resilient ordinance in the U.S.," Norfolk paused the zoning update to develop Norfolk Vision 2100. Norfolk Vision 2100 emphasized deep community engagement, and came to inform the final zoning ordinance update to ensure that development arising from the new zoning ordinance reflects communities' goals and priorities.

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[3] CITY OF NORFOLK, VA., PLANORFOLK 2030 (2013), *available at* https://www.norfolk.gov/DocumentCenter/View/2483/plaNorfolk2030?bidId=; CITY OF NORFOLK, VA., NORFOLK VISION 2100 (Nov. 22, 2016), *available at* https://www.norfolk.gov/DocumentCenter/View/27768/Vision-2100---FINAL?bidId=.

[4] CITY OF NORFOLK, VA., PLANORFOLK 2030 (2013), *available at* https://www.norfolk.gov/DocumentCenter/View/2483/plaNorfolk2030?bidId=.

[5] *Id.* at 1-2.

[6] *Id.* at 1-3.

[7] *plaNorfolk 2030,* CITY OF NORFOLK, VA., https://www.norfolk.gov/1376/plaNorfolk2030 (last visited Nov 3, 2021).

[8] *Id.* at 2–3.

In 2016, the city adopted Norfolk Vision 2100 (Vision 2100) as an amendment to plaNorfolk 2030.[9] Vision 2100 was developed to guide a long-term strategy around flooding and sea-level rise due to climate change. Vision 2100 designates different areas in the city according to a four-color system, with each color representing a combination of the area's flooding vulnerability and current and future assets.[10] For each of the four area types, Vision 2100 provides unique goals and actions pertaining to each area's unique challenges and opportunities.[11] Vision 2100 also offers a set of resilience policies that would apply across area types, including improving transit connections and incentivizing more resilient and affordable housing.[12] While Vision 2100 is not itself a comprehensive plan, it has been formally adopted as an appendix to plaNorfolk 2030 and provides a framework to inform development-related decisions made pursuant to the comprehensive plan.

To implement its resilience goals, Norfolk then revised and adopted a new zoning code in 2018. The new zoning ordinance was informed by Vision 2100 and embraces form-based zoning to: (1) ensure that development in flood hazard zones meets minimum resilience standards; and (2) encourage new development in areas with lower flooding risk.

The following sections highlight some of the resilience features of plaNorfolk 2030 and Norfolk Vision 2100 and their implementation through the city's zoning regulations. In particular, the sections focus on Norfolk's efforts to increase resilient housing access, increase green infrastructure, and conduct area-based planning informed by flood risk projections.

PlaNorfolk 2030

PlaNorfolk 2030 demonstrates the use of land use planning as a tool to mitigate environmental vulnerabilities, setting forth the city's environmental and development goals, strategies, and action items that will guide where and how development should occur. Action items in the plan related to resilience include:

- Evaluating the potential impact of sea-level rise when reviewing development proposals, budget preparations, and changes to development regulations;[13]
- Promoting growth in the least flood-prone areas and creating incentives to encourage elevating structures higher than the minimum Base Flood Elevation in flood hazard zones;[14]

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[9] CITY OF NORFOLK, VA., NORFOLK VISION 2100 (Nov. 22, 2016), *available at* https://www.norfolk.gov/DocumentCenter/View/27768/Vision-2100---FINAL?bidId=.
[10] *Id.* at 22.
[11] *Id.* at 27–43.
[12] *Id.* at 23–25.
[13] CITY OF NORFOLK, VA., PLANORFOLK 2030 2-20, 6-15 (2013), *available at* https://www.norfolk.gov/DocumentCenter/View/2483/plaNorfolk2030?bidId=.
[14] *Id.* at 6-15–6-16.

- Ensuring that all new development in designated flood-prone areas comply with the city's flood protection regulations;[15]
- Updating zoning regulations to strengthen stormwater management requirements and mitigate flooding;[16]
- Developing a stormwater master plan with information on water volumes and rates of discharge;[17] and
- Developing area-based planning approaches based on the area types identified in Norfolk Vision 2100.[18]

Norfolk Vision 2100

PlaNorfolk 2030 and Norfolk Vision 2100 were developed as complementary planning instruments. The writers of Vision 2100 stress that it is not a comprehensive plan like plaNorfolk 2030 — rather, Vision 2100 is narrower in scope and was created to provide an additional longer-range vision out to the year 2100 to complement the more specific guidance in the city's comprehensive plan.[19] However, Vision 2100 was formally adopted as an appendix to the comprehensive plan and will serve to inform decisions made to implement plaNorfolk 2030's future land use map, which identifies the "best" future land use for all properties in the city.[20]

Norfolk Vision 2100 arose out of Norfolk's induction into 100 Resilient Cities (100RC), a global network of cities partnering to develop strategies for incorporating climate resilience into local governance.[21] Norfolk adopted a whole-city approach for Vision 2100, planning not just for areas projected to face the highest risks from flooding and sea-level rise, but also for how these impacts would indirectly affect other parts of the city. For example, neighborhoods at higher elevations may rely on coastal areas for economic vitality.[22] In addition, underdeveloped neighborhoods may absorb future growth from lower-lying flood-prone areas if people are displaced by or choose to relocate locally due to sea-level rise.[23]

Vision 2100 designates different areas in the city according to a four-color system, with each color designation primarily based on two factors: flooding risk and present or future assets. Each color

[15] *Id.* at 2-20, 6-15–6-16.
[16] *Id.* at 2-20.
[17] *Id.* at 6-16.
[18] *Id.* at 3-11.
[19] CITY OF NORFOLK, VA., NORFOLK VISION 2100 46–48 (Nov. 22, 2016), *available at* https://www.norfolk.gov/DocumentCenter/View/27768/Vision-2100---FINAL?bidId=.
[20] *Id.* at 47.
[21] *Id.* at 2.
[22] *Id.* at 3.
[23] *Id.*

corresponds to a set of adaptation and resilience strategies that should be targeted for the unique risks and opportunities that define a given area type.[24]

- **Red areas** are those with high flood risk and high levels of assets. In Norfolk, red areas include waterfront areas that serve as major economic engines, with built assets including downtown Norfolk, ports and shipyards, universities, and medical centers.[25] Because these assets are highly valuable and cannot feasibly be relocated elsewhere in the city, Norfolk's resilience strategy for these areas emphasize investing in major flood control infrastructure and increasing density to take advantage of long-term flood protection.[26]
- **Yellow areas** are considered high-risk and low-asset areas. Many of these areas contain historic waterfront residential communities. As such, Norfolk's approach in yellow areas focuses on increasing flood mitigation measures and encouraging strategic investment decisions.[27]
- **Green areas** are considered to have low levels of flood risk and high levels of current or future assets. Green areas are contemplated as priority areas for development and redevelopment, including for high-density housing for residents that choose to relocate from more at-risk areas of the city.[28]
- **Purple areas** are low-risk, low-asset areas. Purple areas are expected to become the "neighborhoods of the future," where the city seeks to improve upon housing affordability, access to quality-of-life amenities, and general neighborhood attractiveness.[29]

This framework recognizes that the optimal resilience strategy will be different for different places in Norfolk, and provides a system for policymakers to prioritize the most effective strategies at the neighborhood level.

Vision 2100 also offers a set of resilience policies that apply across all of the four areas, including improving transit connections, incentivizing more resilient and affordable housing, and increasing green infrastructure for stormwater management.[30]

[24] *Id.* at 22.
[25] *Id.* at 28.
[26] *Id.* at 28–29.
[27] *Id.* at 33–36.
[28] *Id.* at 38.
[29] *Id.* at 41–43.
[30] *Id.* at 23–25.

HOUSING

Resilience Programs

Norfolk has several programs to encourage resilient homes at the building level. For example, the Southeastern Tidewater Opportunity Project (STOP) Weatherization Program provides assistance with insulating and air sealing for lower-income homeowners, which can increase the energy efficiency of heating and cooling systems.[31] Additionally, programs such as Equity Secure and Norfolk Home Rehabilitation help residents modernize their homes by helping fund repairs and the replacement of heating, plumbing, and other systems.[32] For new construction, Norfolk's Green Home Choice Program offers expedited permitting for construction that meets certain energy efficient design standards.[33]

Norfolk is also a participant in the Community Rating System (CRS) program, a voluntary incentive program under the federal National Flood Insurance Program (NFIP).[34] As a Class Seven CRS community, Norfolk residents receive a 15 percent discount on their flood insurance premiums in exchange for the city implementing floodplain management practices that go above minimum NFIP requirements.[35] PlaNorfolk 2030 also includes action items to ensure that new development in flood-prone areas is compliant with floodplain regulations and that residents in flood-prone areas are notified of the threats to their properties.[36]

Planning

Norfolk is a mature, developed city where only 3.1 percent of the city's land remains vacant.[37] As such, Norfolk's planning to increase affordable housing development acknowledges that new development will be limited to primarily redevelopment or infill.[38] The city nevertheless recognizes a need for more affordable housing and has developed some approaches to increasing local housing stock under this context. To this end, plaNorfolk 2030 contains some actions, including ensuring that the zoning ordinance permits a variety of residential densities and housing types and encouraging compatible infill housing on vacant and underutilized parcels to minimize

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[31] CITY OF NORFOLK, VA., PLANORFOLK 2030 7-6 (2013), *available at* https://www.norfolk.gov/DocumentCenter/View/2483/plaNorfolk2030?bidId=.
[32] *Id.* at 7-4–7-5.
[33] *Id.* at 6-18, 7-6.
[34] *Id.* at 7-7.
[35] *The Community Rating System (CRS),* VA. DEP'T OF CONSERVATION & RECREATION (June 23, 2021), https://www.dcr.virginia.gov/dam-safety-and-floodplains/fp-crs.
[36] CITY OF NORFOLK, VA., PLANORFOLK 2030 7-7 (2013), *available at* https://www.norfolk.gov/DocumentCenter/View/2483/plaNorfolk2030?bidId=.
[37] *Id.* at 2-2.
[38] *Id.*

land costs.[39] However, the city has added different housing-related appendices to plaNorfolk to adapt to changing affordable housing issues that mirror the need for increased actions to build neighborhood-level resilience.

After the 2007–2009 economic recession, the issue of affordable housing in Norfolk gained renewed attention. To address this challenge, the city began with a partnership with Olde Huntersville, a historically underserved neighborhood in Norfolk facing a lack of investment and new development. The Olde Huntersville community and the city worked together to create the Traditional Neighborhoods Plan Book: Chapter One — Olde Huntersville (Plan Book), which contains free design plans for property owners and builders who want to develop or redevelop their parcels or vacant lots in Olde Huntersville.[40] As stated in the Plan Book:

The Olde Huntersville Civic League has already begun the work of identifying challenges to the neighborhood and has set a plan in motion with their Olde Huntersville Neighborhood Strategic Plan. In support of the neighborhood, the City embarked on this Plan Book effort to address some of the issues related to the housing stock. Specifically, some new houses compromise the character of the community with blank walls, poor proportions, and concrete front yards. In addition, there is an abundance of vacant lots, most only 25 feet in width. The overall goal is to bring new homeowners to Olde Huntersville by constructing new, affordable homes that are compatible with the neighborhood character.[41]

As such, the Plan Book "is intended to make it easy for potential homeowners to build their dream home in the beautiful, historic Olde Huntersville neighborhood."[42] The houses in the Plan Book are customizable, market-rate designs that are compatible with the existing architectural character of the neighborhood, including three, four, and five-bedroom options for accessible bedrooms that can be used to aid people aging-in-place.[43]

The Plan Book is an appendix to plaNorfolk 2030.[44] It marks the city's first effort to "give residents tools to make building affordable and well-designed houses on narrow lots possible without going through the rigorous and time-consuming Non-Standard Lot Review process or the Special Exception process."[45]

Over the last several years, the Plan Book has resulted in the construction of 29 new houses in Olde Huntersville, all of which incorporated resilient design principles. This plan and technical

[39] *Id.* at 7-9–7-10.
[40] CITY OF NORFOLK, VA., TRADITIONAL NEIGHBORHOODS PLAN BOOK: CHAPTER ONE — OLDE HUNTERSVILLE, *available at* https://www.norfolk.gov/DocumentCenter/View/29595/Traditional-Neighborhood-Plan-Book?bidId=.
[41] *Id*. at 5.
[42] *Id*. at 7.
[43] *Id.*
[44] *plaNorfolk 2030,* CITY OF NORFOLK, VA., https://www.norfolk.gov/1376/plaNorfolk2030 (last visited Nov 3, 2021).
[45] CITY OF NORFOLK, VA., TRADITIONAL NEIGHBORHOODS PLAN BOOK: CHAPTER ONE — OLDE HUNTERSVILLE 7, *available at* https://www.norfolk.gov/DocumentCenter/View/29595/Traditional-Neighborhood-Plan-Book?bidId=.

assistance from the city empowered people to develop their properties while ensuring development would be compatible with existing neighborhood character.

The initial success of the Plan Book spurred Norfolk to invest in similar resources that can support the development and reuse of vacant and industrial parcels in other neighborhoods across the city. Additional housing appendices to plaNorfolk 2030 are designed to encourage the development of housing that is resilient, higher-density, and more diverse: the Design Principles for Multifamily Development, the Missing Middle Pattern Book, and the Narrow Lot House Plan Catalog.[46] The appendices serve to help developers navigate some of the upfront design and permitting challenges associated with building on Norfolk's limited stock of vacant lots. By making it easier to build multi-unit housing in Norfolk, these appendices can ultimately help increase the range and quantity of affordable housing options in the city.

Developed in 2020, the Design Principles for Multifamily Development (Design Principles), contains a set of aspirational principles to evaluate and promote high-quality multifamily housing development in various forms and available at various costs.[47] The Design Principles contain a recognition that suburban sprawl, automobile dependency, and the isolation of low-income families to "housing projects" were trends in recent history that eroded the stable and walkable "Traditional American neighborhood."[48] As such, the goal of establishing the Design Principles is to reverse these trends by ensuring that affordable high-density housing is more equitable by integrating it into the broader community through increasing residents' access to open space and amenities and enhancing neighborhood character.[49]

Adopted by the City Council in 2021, Norfolk's Missing Middle Pattern Book (Pattern Book), further builds out this vision of multifamily housing by providing a guide for missing middle housing development.[50] "Missing middle" refers to a set of multifamily housing types that can offer a greater quantity of units to meet housing needs while remaining compatible in scale and form with existing single-family homes.[51] The Pattern Book sets forth missing middle housing as a pathway to greater housing options and affordability, allowing people to stay in their neighborhoods as their lifestyle needs change.[52] It can also be more cost-effective to build missing

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[46] *plaNorfolk 2030,* CITY OF NORFOLK, VA., https://www.norfolk.gov/1376/plaNorfolk2030 (last visited Nov 3, 2021).
[47] CITY OF NORFOLK, VA., BUILDING HOMES AND NEIGHBORHOODS: DESIGN PRINCIPLES FOR MULTIFAMILY DEVELOPMENT (Aug. 5, 2020), *available at* https://www.norfolk.gov/DocumentCenter/View/64728/Design-Principles-for-Multifamily-Development.
[48] *Id.* at 3–4.
[49] *Id.* at 5–11.
[50] WORK PROGRAM ARCHITECTS ET AL., MISSING MIDDLE PATTERN BOOK (May 21, 2021), *available at* https://www.norfolk.gov/DocumentCenter/View/66555/MissingMiddlePatternBook.
[51] *Missing Middle Housing*, OPTICOS DESIGN, INC., https://missingmiddlehousing.com (last visited Nov. 3, 2021).
[52] WORK PROGRAM ARCHITECTS ET AL., MISSING MIDDLE PATTERN BOOK 5 (May 21, 2021), *available at* https://www.norfolk.gov/DocumentCenter/View/66555/MissingMiddlePatternBook; WORK PROGRAM ARCHITECTS ET AL., MISSING MIDDLE PATTERN BOOK 5 (May 21, 2021), *available at* https://www.norfolk.gov/DocumentCenter/View/66555/MissingMiddlePatternBook.

middle housing types compared to large-scale developments or the same number of single-family homes.[53] The Pattern Book offers step-by-step instructions for developers to build missing middle housing options, numerous examples of design-ready building types and floorplans that developers can consider, and a section on Resilient Construction and Sustainable Design to help developers meet Norfolk's Resilience Point System zoning requirement (detailed in the following section).[54]

The city's Narrow Lot House Plan Catalog (Catalog) offers further support to developers seeking to build infill housing on narrow lots. Infill development can often pose challenges for developers related to code compliance, affordability, context sensibility, and consumer demand for certain housing types.[55] The Catalog was developed to provide developers with ready-made design plans that meet these challenges, offering an inventory of narrow lot house plans organized by lot width that developers can adopt.

ENVIRONMENT

Land Use and Zoning

As stated previously, Norfolk adopted a new zoning ordinance in 2018 aligned with Vision 2100 to enhance citywide flood resilience and direct new and more intense development to higher ground.[56] The revision includes several key zoning requirements that ensure greater resilience including the following:

- **Resilience Quotient Points System**: The ordinance adds a new Resilience Quotient System, where developers accrue points for adopting different resilience measures related to stormwater management, risk reduction, energy efficiency, water quality and conservation, urban greenery, and healthy lifestyles.[57] Unless exempt (e.g., historic structures, buildings becoming LEED certified [Leadership in Environmental and Energy Design] at the gold level or above),[58] project proponents either either have to elevate and capture the first 1.25 inches of stormwater or provide improvements equal to the required number of points based on the development type (e.g., residential, non-residential, mixed use) and development size. The ordinance includes a table of options to earn points for each type of development.[59] Project proponents can either choose from a pre-identified list

[53] *Id*.
[54] *Id.* at 11 for developer instructions; at 28–73 for examples; and at 69–72 for resilient design guidelines.
[55] *Norfolk Narrow Lot House Plan Catalog*, CITY OF NORFOLK, VA., https://www.norfolk.gov/1093/Norfolk-Narrow-Lot-House-Plan-Catalog#one (last visited Nov. 3, 2021).
[56] NORFOLK, VA., ZONING ORDINANCE (2018), *available at* https://www.norfolk.gov/DocumentCenter/View/35581/Adopted-Zoning-Ordinance?bidId=.
[57] *Id.* at art. 5.12 (2018).
[58] *Id.* at art. 5.12.1(A) (2018) (exempted development).
[59] *Id.* at t. 5.12.6, t. 5.12.7 (2018).

of resilience activities to achieve points or work with the city to design new actions that both meet developer- and project-specific needs and meet city requirements.

- **Overlay zones:**
    - **Coastal Resilience Overlay (CRO):** The CRO is an overlay applied to areas facing higher flood risk, where new development is encouraged to actively increase resilience to sea-level risk and stormwater flooding. Development in the CRO zone includes additional requirements above the base zoning layer designation, such as the use of permeable surfaces on new parking spaces and stormwater infiltration features.[60]
    - **Upland Resilience Overlay (URO):** URO zones are outside of flood hazard zones where Norfolk seeks to encourage new development of walkable, bikeable, and transit-rich neighborhoods. Among different options to earn points under the Resilience Quotient System, developers building in the URO zones may accrue a significant number of points in exchange for extinguishing development rights for properties in CRO zones.[61]
- **Freeboard:** The ordinance requires that construction in the 100-year floodplain be elevated at least three feet above the 100-year base flood elevation, and construction in the 500-year floodplain be elevated or floodproofed to 1.5 feet above the 500-year base flood elevation.[62]

Planning: PlaNorfolk 2030 Green Infrastructure Plan

PlaNorfolk 2030 identifies several environmental resilience strategies that involve protecting and promoting the use of natural elements to provide myriad of benefits:

- Continuing to implement wetland design changes, such as the use of living shorelines that allow for the landward migration of wetlands for promoting community and environmental resilience to future sea-level rise;[63]

[60] *Id.* at art. 3.9.18 (2018)

[61] *Id.* at art. 3.9.19 (2018). For more information about how the URO and RQS is structured in the zoning ordinance, see Georgetown Climate Ctr., *Building a Better Norfolk: A Zoning Ordinance of the 21st Century — Norfolk, Virginia*, ADAPTATION CLEARINGHOUSE (Jan. 23, 2018), https://www.adaptationclearinghouse.org/resources/building-a-better-norfolk-a-zoning-ordinance-of-the-21st-century-norfolk-virginia.html?preview=true.

[62] Areas in the 100-year floodplain are designated as Floodplain Districts (Article 3.9.2). The freeboard requirement for 100-year floodplains is codified at Article 3.9.7(J)(1), and the freeboard requirement for 500-year floodplains (designated "X Zones"), is codified at Article 3.9.7(M)(1). NORFOLK, VA., ZONING ORDINANCE art. 3.9.2, 3.9.7 (2018).

[63] CITY OF NORFOLK, VA., PLANORFOLK 2030 6-16 (2013), *available at* https://www.norfolk.gov/DocumentCenter/View/2483/plaNorfolk2030?bidId=.

- Promoting soil management best practices that enhance stormwater infiltration;[64] and
- Increasing the quantity, density, and diversity of trees to achieve a goal of 40-percent tree canopy cover through a combination city-provided trees and land-use regulation, including revising landscape regulations to require shade trees in parking lots.[65]

In 2018, the city adopted a Green Infrastructure Plan (GIP) as an appendix to plaNorfolk 2030.[66] The purpose of the GIP is to increase the city's use of natural assets to improve environmental health, improve community health, and better protect built infrastructure, including roads and buildings.[67] Norfolk defines green infrastructure as part of the city's overall infrastructure, which includes "marshes, creeks, parks, and trees that provide habitat, filter the air and water, moderate air temperatures, and provide recreation and scenic beauty."[68] These elements can help filter and reduce stormwater runoff, provide shade and recreation, and add aesthetic and economic value to neighborhoods and commercial zones.[69]

The GIP includes comprehensive maps of the city's natural assets, which can be used to support decisionmaking to increase the prevalence of and community access to green infrastructure features.[70] In addition to maps, the GIP outlines specific green infrastructure objectives, initial implementation steps for the city, and timelines for implementation.[71]

In the GIP, the city further lays out its two-tiered approach for promoting and encouraging green space with a focus "first on conservation, then on restoration."[72] Specifically, Norfolk's green infrastructure approach first looks to maximizing "natural green infrastructure," including wetlands, trees, parks, meadows, trails, and creeks, before considering "constructed green infrastructure" to mitigate the impacts of impervious surfaces due to development.[73] The GIP prioritizes the conservation of existing natural green infrastructure because it is less expensive and can be more effective than imposing engineered solutions that attempt to replicate natural processes.[74]

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[64] *Id.* at 6-14.
[65] *Id.* at 6-13.
[66] CITY OF NORFOLK, VA., A GREEN INFRASTRUCTURE PLAN FOR NORFOLK (July 2018), *available at* https://www.norfolk.gov/DocumentCenter/View/38067/Norfolk-Green-Infrastructure-Plan--Action-Plan-Appendix-for-Endangered-Species?bidId=.
[67] *Id.* at 1.
[68] *Id.*
[69] *Id.* at 11.
[70] *Id.* at 12–21.
[71] *Id.* at 50–58.
[72] *Id.* at 10.
[73] *Id.*
[74] *Id.*

Planning: Complete Streets Policy

In 2016, Norfolk also adopted the Complete Streets Policy as an appendix to plaNorfolk 2030.[75] The city defines complete streets as "streets that are designed — or redesigned — and operated to allow safe access to all people, regardless of age, ability, income, ethnicity, or chosen mode of travel, including pedestrians, bicyclists, motorists and transit riders."[76] Complete streets offer several advantages to traditional street designs including:

- Increasing the safety and enjoyability of walking and biking;
- Reducing vehicle pollution;
- Improving neighborhood aesthetics; and
- Offering opportunities to incorporate environmental strategies, such as green infrastructure and stormwater management features.

Norfolk's Complete Streets Policy establishes that the city will strive to develop and maintain an integrated network of safe and accessible streets, all of which will incorporate features including sidewalks, grassy areas to assist with stormwater management, and designated travel lanes and facilities to better support bikes and transit.[77] The policy applies to all new construction and reconstruction of streets and street segments, including utility upgrades and resurfacing projects, but provides for flexibility for varying circumstances.[78] The implementation of complete streets will be informed by the best and latest design guidelines, including those developed by the National Association of City Transportation Officials and International Transportation Engineers.[79]

Norfolk's Complete Streets Policy offers an example for other policymakers to integrate numerous environmental and social benefits into existing street networks. Complete street features such as universal sidewalks and tree canopies can promote public health by increasing commuter options and enjoyability, economic vitality by increasing commercial and home values, and environmental benefits by mitigating runoff from paved surfaces and reducing vehicle pollution. Because complete streets can be built using a variety of different features, policymakers also have flexibility to customize complete street implementation to the priorities and needs of different communities.

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[75] CITY OF NORFOLK, VA., COMPLETE STREETS POLICY (2018), https://www.norfolk.gov/DocumentCenter/View/24580/Complete-Streets-Policy-adopted?bidId=.
[76] *Id.* at 1.
[77] *Id.*
[78] *Id.* at 2.
[79] *Id.*

COMMUNITY ENGAGEMENT

Vision 2100

During the process to develop Vision 2100, city planners engaged in extensive consultation with residents and other stakeholders in a three-phase process: awareness, asset mapping, and vision development.[80] These included staff from the departments of City Planning, Communications and Technology, and Neighborhood Development, the Resilience Office, and the City Manager's Office; members of the Norfolk City Council and Norfolk City Planning Commission; and more than 500 participants from the general public.

As part of the first phase, awareness, city staffers began sharing news of Norfolk's long-range initiative by creating an outreach campaign that included attendance at local festivals and events, appearances on local media, attending educational institutions to solicit feedback, and a social media campaign with its own hashtag.[81] These efforts all went toward alerting the public of the existence of the development of the plan. The first phase of awareness also involved regular meetings between city departments to ensure that all city staffers were speaking from the same script regarding Vision 2100.[82]

The second phase, asset mapping, involved city departments working together with community members to assess and map the city's most valued assets. The purpose of this phase was to ensure that planning enabled the enhancement and preservation of what community members valued the most. To reach as broad of an audience as possible, the city used multiple strategies that included inviting community leaders to weekend breakfast meetings, media campaigns, and workshops.[83]

In the third phase, vision development, city staffers held in-person and online community meetings where participants were asked to collaborate in teams to identify priorities for asset preservation and development. By asking participant teams to reach a consensus on priority assets, this phase built upon the second phase by adding the concept of limited resources.[84]

PlaNorfolk Green Infrastructure Plan

Over the two-year period to create the Green Infrastructure Plan, Norfolk held ten public community meetings, consulted across various city departments, and met with local environmental

[80] CITY OF NORFOLK, VA., NORFOLK VISION 2100 10–18 (Nov. 22, 2016), *available at* https://www.norfolk.gov/DocumentCenter/View/27768/Vision-2100---FINAL?bidId=.
[81] *Id*. at 10.
[82] *Id*.
[83] *Id*. at 11–12.
[84] *Id*. at 13–14.

and academic organizations.[85] These conversations revealed stakeholder desires and suggestions for additional access to green space and water recreation, historic and cultural sites for Black history, water infiltration to reduce high tide flooding, greater shade for streets and bus stops, and naturalizing landscapes to mitigate runoff.[86] The city also gathered input from workshops on related initiatives, including data from engagement for the Complete Streets Policy and Vision 2100.[87]

NEXT STEPS

Given the recent and significant update of the city's zoning ordinance in 2018, the city is committed to an ongoing evaluation process to assess the performance and usability of provisions, like the Resilience Quotient System. For example, as of 2021, the city is partnering with a Virginia-based conservation nonprofit, Wetlands Watch, and other stakeholders to assess the potential for updates to its Resilience Quotient System and new ideas to extinguish development rights in the CRO and encourage more dense development in the URO.[88]

CONSIDERATIONS AND LESSONS LEARNED

As a city with coastal activity at the core of its economy, history, and culture, Norfolk is notable for its pioneering initiatives to plan for sea-level rise and flooding risks. For other local policymakers, Norfolk offers examples of connecting planning with zoning updates and adopting resilience measures at all scales — from a long-term strategy to the site-by-site scale and all levels in between.

High-level plans that map areas based on risks, assets, and future land uses can serve as a basis for policymakers to develop tailored resilience strategies and priorities for each area type. Long-range planning can be supplemented with more detailed priority plans over time to increase resilient affordable housing, green infrastructure, and complete streets. This is what Norfolk did by starting with Vision 2100 and adding appendices to its comprehensive plan, plaNorfolk overtime. These types of addendums can simultaneously refine the stated goals of the comprehensive plan as cities gather new information and local priorities evolve and shift. In addition, more specific subject matter addendums can help implement and foster the achievement of community goals by providing technical assistance for developers.

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[85] CITY OF NORFOLK, VA., A GREEN INFRASTRUCTURE PLAN FOR NORFOLK 8 (July 2018), *available at* https://www.norfolk.gov/DocumentCenter/View/38067/Norfolk-Green-Infrastructure-Plan--Action-Plan-Appendix-for-Endangered-Species?bidId=.

[86] *Id.*

[87] *Id.* at 9.

[88] *See, e.g.*, *Managed Retreat Planning*, WETLANDS WATCH, https://wetlandswatch.org/managed-retreat (last visited Nov. 6, 2021).

In tandem with tailored plans, zoning ordinances can be revised to implement different priorities for different areas.

Norfolk's planning and zoning updates also reflect one approach to work with developers to promote more resilient community housing options and environmental features through the use of non-regulatory tools. Developer-oriented technical resources, such as Norfolk's Design Principles for Multifamily Development and Narrow Lot House Plan Catalog, can help encourage resilient and affordable housing development by removing some of the administrative and cost barriers associated with these projects. Moreover, Norfolk's housing tools leverage a local asset, vacant lands, to promote holistic community resilience through the construction of new neighborhood-appropriate housing options for various types of lots and sizes. In addition, resilient zoning features such as the Resilient Quotient System can provide developers with flexibility in meeting building standards while making progress on resilient development goals.

Another key takeaway from Norfolk's resilience planning is the depth and breadth of stakeholder engagement. Because Norfolk residents were aware of and personally affected by the increasing frequency and intensity of flooding, the city framed this effort to plan for flood resilience as a local issue rather than a climate or national-level issue. This enabled a more effective and productive collaboration with community members throughout the planning process. This highlights the importance of contextualizing community and planning dialogues in the needs and challenges people are facing. Other jurisdictions seeking to replicate Norfolk's community engagement efforts may consider emphasizing the ways in which resilience can help redress the problems that community members have encountered tangibly in their lived experiences.

Engagement with the developer community was also critical to achieving broad political support. Developer buy-in for the resilient planning and zoning ordinance required numerous conversations with developers to understand and respond to their interests and concerns. The flexibility provided in the Resilient Quotient System, supported by the housing appendices' numerous design options, reflects the efforts to gain support from this key stakeholder group.

Overall, Norfolk serves as an example of channeling recognized resilience needs into tangible on-the-ground changes. Policymakers seeking to replicate resilience against flooding and sea-level rise in their own communities may look to Norfolk's process of beginning with strategic long-term planning and priority-setting, followed by supplemental topic-specific initiatives, and ultimately integration into the zoning ordinance to bring goals into reality.