Managed Retreat Toolkit

Managed retreat, or the voluntary movement and transition of people and ecosystems away from vulnerable coastal areas, is increasingly becoming part of the conversation as coastal states and communities face difficult questions on how best to protect people, development, infrastructure, and coastal ecosystems from sea-level rise, flooding, and land loss. Georgetown Climate Center's new Managed Retreat Toolkit combines legal and policy tools, best and emerging practices, and case studies to support peer learning and decisionmaking around managed retreat and climate adaptation.

Introduction

The impacts of climate change are becoming more apparent and severe, as sea levels rise and the frequency and intensity of extreme weather events increase. Climate change impacts are forcing state and local policymakers to address the risks facing many coastal communities. In addition to undertaking measures aimed at protection (building flood risk reduction structures e.g., levees, hard shoreline armoring devices) and accommodation (building structures to better withstand future flood risk e.g., elevating or flood-proofing structures), coastal governments and communities are increasingly evaluating managed retreat as a potential component of their comprehensive adaptation strategies.

The aim of managed retreat is to proactively move people, structures, and infrastructure out of harm's way before disasters or other threats occur to avoid damage, maximize benefits, and minimize costs for communities and ecosystems. For example, policymakers may reduce risks of flooding by conserving wetlands and protecting habitat migration corridors and minimize the social, psychological, and economic costs of relocation by making investments in safer, affordable housing within existing communities.

Source: Louisiana Strategic Adaptations for Future Environments (LA SAFE).

Under the best of circumstances, managed retreat is the coordinated process of voluntarily and equitably relocating people, structures, and infrastructure away from vulnerable coastal areas in response to episodic or chronic threats in order to facilitate the transition of individual people, communities, and ecosystems (both species and habitats) inland. In practice, however, managed retreat is an inherently complex and challenging subject and adaptation option for state and local governments. This is especially true given the political, economic, and policy imperative to design strategies that maximize benefits and minimize costs for people, communities, and the environment. Beyond the formidable planning, legal, and financial considerations involved, decisionmakers must also ensure that the people most affected are included in designing and implementing these processes and that the outcomes are equitable for the communities involved. If communities with vulnerable coastal areas fail to establish the enabling conditions for a gradual relocation strategy, increasing development pressures and reactive responses to sea-level rise and coastal storms will degrade communities and result in the gradual loss of important coastal ecosystems and protection as shorelines erode or are armored.

To navigate these challenges, and implement proactive resilience measures like managed retreat, state and local governments need tools that help them evaluate risks and develop legally viable approaches. Georgetown Climate Center's Managed Retreat Toolkit (toolkit) includes a range of legal and policy tools that state and local governments can consider using to facilitate managed retreat in vulnerable coastal areas experiencing sea-level rise, flooding, and land loss. These include tools related to planning, infrastructure relocation and disinvestment, acquisition, and regulation, as well as market-based tools. The aim of the toolkit is to assist state and local coastal policymakers in advancing discussions within their communities about laws and policies related to managed retreat. Equipped with an understanding of the issues at play and the lessons from other communities' experiences, decisionmakers will be better prepared to engage coastal communities in conversations regarding different adaptation strategies to respond to coastal threats and to support potential future on-the-ground actions.

Flooding in Charlotte, North Carolina after Hurricane Florence in 2018. Credit: ArcGIS Storymaps.

About This Toolkit

Overview

The first comprehensive online resource on managed retreat, the Managed Retreat Toolkit combines legal and policy tools, best and emerging practices, and case studies to support peer-learning and decisionmaking around managed retreat and climate adaptation. Collectively, this toolkit is designed to help policymakers:

- Identify and assess a range of legal and policy tools available to facilitate managed retreat in vulnerable coastal areas experiencing sea-level rise, flooding, and land loss;
- Implement best and emerging practices by highlighting the most innovative managed retreat practices that are being deployed at the state and local levels around the country; and
- Overcome legal and policy barriers to implementation by providing decisionmaking frameworks for navigating these barriers and evaluating tradeoffs facing people, communities, and the environment.

The primary audiences for the toolkit are state, territorial, and local policymakers in U.S. coastal jurisdictions. Despite this emphasis on the coastal sector, some of the management practices and case studies are drawn from riverine or non-coastal states and communities because of the

Credit: Integration and Application Network, University of Maryland Center for Environmental Science.

transferable lessons they can provide others. For example, hazard mitigation buyouts in the U.S. have historically and predominantly occurred in inland riverine areas, but coastal decisionmakers can learn from these buyout programs to avoid "reinventing the wheel." Of course, many of these tools can also be applied in inland communities at increasing risk of other types of flooding, such as from heavy precipitation events.

The case studies included in this toolkit were selected to reflect the interdisciplinary and complex nature of retreat decisions and underscore the need for comprehensive solutions and fair and equitable decisionmaking processes to address these challenging considerations. By highlighting how various legal and policy tools are being implemented across a range of jurisdictions — from urban, suburban, and rural to both riverine and coastal — these case studies are intended to provide transferable lessons and potential management practices for coastal state and local policymakers. The case studies also highlight the policy tradeoffs and procedural considerations necessitated by managed retreat decisions. Each jurisdiction is confronting different challenges and opportunities and has different, perhaps even competing, objectives for retreat. In addition, stakeholders are attempting to balance multiple considerations, including: fostering community engagement and equity; preparing "receiving communities" or areas where people may voluntarily choose to relocate; protecting coastal ecosystems and the environment; and assessing public and private funding options and availability.

While the toolkit presents an analysis of managed retreat laws, policies, and case studies from across several U.S. jurisdictions, it is not a 50-state survey. Applications of the legal and policy frameworks and recommended best and emerging practice tips vary state-by-state and on a case-by-case basis, and are provided for educational and informational purposes only to support climate adaptation processes and decisions on the ground. When considering or implementing any managed retreat strategy, government officials and staff should consult their own legal counsel with respect to any questions or concerns that are specific to their jurisdiction and should engage local community members to tailor the program in a way that works for all.

Organization and Content

The toolkit contains eight sections that present different legal and policy tools state and local coastal governments can evaluate to potentially implement broader managed retreat strategies. These eight sections fall into two categories:

- The toolkit contains ***five "tools" sections*** that identify the legal approaches that jurisdictions can consider adapting to meet local context and needs around managed retreat. These include planning, infrastructure relocation and disinvestment, acquisition, regulatory, and market-based tools. State and local decisionmakers can apply each tool individually or advance a potential suite of tools collectively as a part of comprehensive managed retreat strategies.
- The toolkit contains ***two "crosscutting" sections*** on legal and policy considerations, respectively. These sections do a deeper-dive look into legal and policy questions and issues that are raised across all or most tools.

For the five tools section, each tool includes a definition of the tool; how it can be used in a coastal managed retreat context; the legal and policy considerations or tradeoffs associated with that specific tool; and "practice tips" that provide best or emerging practice recommendations for implementing that tool.

State and local decisionmakers will need to evaluate the tradeoffs among different managed retreat tools and options. The policy considerations presented for each tool include:

- **Administrative:** How easily a tool can be implemented considering technical and political feasibility, its fiscal and administrative capacity, and its administrative complexity.

- **Economic:** How well a tool maximizes long-term economic benefits (both public and private) and minimizes economic costs, including the costs to implement (build and maintain) it; how well a tool minimizes the loss of taxable land; and how well the tool minimizes economic disruption.

- **Environmental:** How well a tool minimizes impacts on — and maximizes benefits to — natural resources, ecosystems, and physical environmental qualities and conditions.

- **Social/Equity:** How well a tool maximizes protection for people, public safety and welfare, and minimizes loss of life and property; minimizes social disruption and the disruption of public services; how it minimizes impacts to cultural and historical resources; how it maximizes protection of low-income, resource-disadvantaged, historically marginalized, and frontline communities; and how a tool equitably distributes economic costs and benefits between private individuals and the general public.

Taken together, these considerations will assist states and communities with weighing the potential costs and benefits of potential tools and policy options based on how they value or prioritize different tradeoffs.[1]

Given the interrelated nature of topics around managed retreat, users can navigate this online toolkit in multiple ways to suit their needs. Reading all or many of the sections and case studies provides a more comprehensive picture of the legal and policy landscape and potential tool options available to coastal states and communities. Alternatively, toolkit users can read any single standalone section to gain an introduction to a particular approach and the relevant legal or policy issues. In addition, where there are notable connections to other sections that may benefit toolkit users, the authors of the toolkit have made explicit cross-references.

The Process to Develop the Toolkit and Maintain it as a Living Resource

The development of this toolkit was informed by policymakers, practitioners, and community members who have led or participated in the work presented in this report.[2] Between 2018 and 2020, Georgetown Climate Center's (GCC) outreach efforts related to the development of the Managed Retreat Toolkit engaged more than 1,000 people at more than 20 events, and more than 500 participants who participated in workshops hosted or co-hosted by GCC. Managed retreat is a field that is growing and evolving rapidly, and GCC intends to update the Managed Retreat Toolkit regularly to incorporate user feedback and new information, insights, and case studies.

Photo credit: Georgetown Climate Center

How and When to Talk About Managed Retreat

Source: Louisiana Strategic Adaptations for Future Environments (LA SAFE).

The first questions decisionmakers often ask are: "How should we refer to 'managed retreat?' What do we call it? and When should we first talk about it?" There is no universally accepted name or definition for "managed retreat," let alone a consensus about when communities should first discuss it as a climate adaptation strategy.[3] The idea of retreat can spark challenges that may thwart community dialogues even before they begin, especially given the highly charged political and social dynamics that often surround any discussion of asking people or a whole community to consider moving to a new location due to impending threats. There is no "one-size-fits-all" approach to managed retreat. Moreover, managed retreat will not always be the best or most preferred option to adapt to coastal threats and hazards. However, policymakers and communities should have open and honest discussions about managed retreat at the outset of climate adaptation planning and decisionmaking processes to ensure that everyone affected can adequately consider all options. The answer to the question of when to begin is, ideally, policymakers and communities should bring managed retreat considerations to the table at the same time that more traditional protection and accommodation strategies are presented.

In addition, state and local policymakers should work together with community members to select a decisionmaking framework that is respectful of cultural and historical sensitivities and local context to promote effective and informative discussions. Some alternative names for "managed retreat" include variations of the terms "planned, strategic, and adaptive" and "relocation, resettlement, and realignment."

Some communities are thinking more creatively to focus less on the name of the activity and more about capturing an accurate description of the adaptation response itself. For example, Hampton, New Hampshire is structuring dialogues with its community members around protection ("keep water out"), accommodation ("live with water"), and managed retreat or relocation ("get out of the water's way"). One scholar, Liz Koslov, similarly suggests that "[w]hen a shoreline retreats due to erosion or sea level rise, one option is to manage that retreat instead of attempting to prevent it. In this context, managing retreat means removing hard coastal defenses to create space for the coastline to move, for water to come in, and for intertidal habitats such as wetlands and salt marshes to flourish."[4]

At a minimum, the term should not act as a barrier to these discussions or be counterproductive, offensive, or inappropriate. At best, the right term will resonate with local residents to support robust and thoughtful discussions around the future of their communities and the potential opportunities and challenges of managed retreat, even if it is not selected or applied as an adaptation strategy. Ultimately, the focus of these discussions should be on the risks communities are facing and the range of adaptation responses communities may consider in order to protect their families and the environment. By acting with intention and communicating openly and honestly, policymakers can reduce the likelihood that debates over terminology will derail these important conversations.

Authors and Acknowledgements

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Crosscutting Legal Considerations

State and local coastal governments considering and/or implementing managed retreat strategies will have to navigate a multi-jurisdictional legal framework. This section provides an introduction to that framework by highlighting the primary legal authorities and questions that governments may encounter. First, this section provides an overview of an overarching legal framework for managed retreat. Coastal zone management and land-use regulations will play a significant role in managed retreat. Second, this section highlights three primary legal considerations that are likely to arise in a managed retreat context: the regulation of private land uses and "takings" limitations; any duty to maintain public infrastructure and potential for negligence claims; and, the possibilities for cross-jurisdictional or regional governance structures. Within this legal framework, governments will need to balance financial limitations, safety, and environmental benefits with private property rights. Governments may also need to consider innovative cross-jurisdictional or regional managed retreat solutions in order to account for people, economies, and ecosystems that cross boundaries and straddle more than one level of government (i.e., federal, state, and local).

Planning for managed retreat must take account of applicable law. State and local policymakers should consult with their lawyers and involve them in planning processes to align community priorities and needs with legally feasible solutions. By involving community members in all stages of decisionmaking, policymakers can maximize environmental benefits and help ensure that policies are meeting community needs. Moreover, attorneys can help policymakers avoid or minimize legal challenges by identifying and addressing them early. Policymakers should not

Source: Integration and Application Network, University of Maryland Center for Environmental Science.

necessarily view all legal questions as insurmountable barriers to managed retreat. Oftentimes, there will be ways to navigate or overcome these legal risks. Proactive legal analysis can support policymaking in the public interest.

Many or most of the legal authorities and questions identified in this section are "crosscutting," that is, they apply to more than one of the planning, infrastructure-related, acquisition, regulatory, and market-based tools presented in this toolkit. Accordingly, these legal considerations are presented in this standalone section of the Managed Retreat Toolkit. The authors of this toolkit recommend that state and local policymakers read this section in conjunction with the other sections, particularly that concerning Regulatory Tools. It is important to note, however, that application of this legal framework and potential takings and governance considerations will vary state-by-state and on a case-by-case basis, and is provided herein for educational and informational purposes only. When considering or implementing any managed retreat strategies, government officials and staff should consult their own legal counsel with respect to any questions or concerns that are specific to their jurisdiction.

Overview of the Legal Framework

State and local governments will have to consider multiple questions of legal authority and compliance when implementing managed retreat laws and policies. Generally, state and local governments will proceed through a series of three different steps to determine whether they have the authority or power to implement a certain tool and if so, whether the government actions chosen to implement that tool are compliant with all relevant statutes, regulations, common law, and constitutional requirements.

Step One: Authority

State and local coastal governments interested in implementing tools for managed retreat should first inquire about their legal authority to implement different tools. This step applies to all types of tools — planning, infrastructure-related, acquisition, regulatory, and market-based.

The source of authority will vary based on the type of tool considered. The primary state and local powers that will come up in a managed retreat context include those for coastal, environmental, natural resources, and floodplain management and land use and zoning, as summarized herein. These powers are just a few among many that have been delegated to state, local, and in some cases regional entities, and do not constitute an exhaustive list of powers that may apply to implement legal tools for managed retreat. Depending on the structure of a state's coastal, environmental, or natural resources programs, the state and local levels of government could have separate or shared jurisdiction. State agencies are creatures of the state and can only delegate those authorities that have been specifically delegated to them by their state legislature.

Local governments tend to have primary authority to regulate land uses in their communities through zoning and floodplain ordinances. In particular, zoning ordinances provide the legal framework that governs the use and development of land in a municipality permitting different uses in different districts (e.g., residential, commercial, industrial).[5] Before implementing any zoning or land-use changes, however, local governments must ensure that they have the authority to utilize a tool under authority of state power, particularly in Dillon Rule states. In Dillon Rule states, state legislatures must delegate specific powers to local governments compared to home rule states, where local governments have broader authority.[6] Although, in general, local governments, particularly in home rule states, enjoy broad powers to take actions to protect the public health, welfare, and safety of residents under their existing police powers.

In the context of retreat decisions relating to public infrastructure, such as roads and bridges, states, local governments, and other public agencies owning or operating infrastructure should understand who has authority over the infrastructure assets in question, and what responsibilities that authority entails. For example, an agency's duty to maintain infrastructure may be relevant in the context of decisions to phase out maintenance and potential for negligence claims (discussed further in the toolkit sections on Crosscutting Legal Considerations>Negligence and Infrastructure). Authority to formally abandon infrastructure may help relieve an agency's duty to maintain and conform to state law,[7] but may not prevent a successful takings claim under certain circumstances (e.g., if it removes an abutting property owner's only means of access). Questions relating to an agency's duty to maintain and authority to disinvest in public infrastructure assets may be answered by looking to the jurisdiction's statutory and case law.

In some cases, state agencies or local governments may benefit from clearer statutory authority specifically enabling actions designed to address climate change impacts or facilitate managed retreat, warranting legislative actions to amend existing statutes or ordinances at the state or local levels. For example, many states already provide local governments the power to create zoning and overlay districts or Transfer of Development Rights programs for broad conservation purposes. Local governments, however, may require or benefit from explicit statutory authorizations to use either of those tools to achieve managed retreat goals, for example, to

protect and remove development from wetland migration corridors. Explicit or clear statutory authorizations can encourage governments to take actions to adapt to climate change by removing the legal uncertainty around their authority to do as such. Regardless, it is important to emphasize that local governments generally have broad powers to take actions to protect the public health, welfare, and safety of residents, and should not let a lack of clear explicit legal authority be an excuse for failing to take actions to address climate threats, like sea-level rise, using existing police powers.

Step Two: Statutory and Regulatory Compliance

Next, state and local governments must ensure that their actions are consistent with federal, state, and local laws. In particular, the coastal zone presents policymakers with complex, often overlapping jurisdictions. Most commonly, coastal retreat will necessitate a review of coastal zone and floodplain management and wetlands laws at the federal, state, and local levels. Notably, the system for regulating wetlands alone can involve many statutes. At the federal level, the U.S. Army Corps of Engineers is one of the primary agencies that regulate activities in intertidal areas that affect wetlands under two statutes, the Clean Water Act[8] and Rivers and Harbors Act.[9] In addition, most states, in coordination with federal agencies, manage their coastal zones under the federal Coastal Zone Management Act[10] and may have special protections for coastal uses and resources, such as wetlands, where certain actions conducted in or adjacent to these resources may be prohibited or require specific mitigations through permit conditions or other approvals (e.g., consistency certifications).[11] For retreat strategies that have an emphasis or focus on conserving coastal wetlands or other resources like dunes and facilitating their inland migration, these laws may play a prominent role in shaping government actions.

Given the interdisciplinary nature of comprehensive policies for managed retreat, these decisions could also implicate a range of other laws depending on the purpose of or need for a tool. For example, buyout strategies coupled with housing and infrastructure investments in receiving areas could require a municipality to evaluate hazard mitigation, infrastructure, affordable housing, and historic preservation laws. To ensure that all applicable laws are identified and addressed in decisionmaking processes, governments should seek to engage legal staff early and often and coordinate across relevant agencies.

Step Three: Constitutional Compliance

The two primary constitutional protections governments must evaluate and balance in a managed retreat context are takings and due process rights for private property owners.

First, the Fifth Amendment of the U.S. Constitution mandates that the federal government shall not "take" private property for a public use or purpose without just compensation.[12] This provision of the Fifth Amendment has also been applied to states through the Constitution's Fourteenth Amendment.[13] Under federal and state law, there are different types of takings that can result. Generally, courts apply a "per se" test to physical occupations[14] and regulations that deprive a private property owner of all or essentially all of his/her property's economic value;[15] however, in a managed retreat context, most regulations designed to protect people, property, and the coastal environment fall within a "regulatory takings" category and will be evaluated under a case-by-case-specific balancing test.[16] Regardless, state and local governments have navigated takings limits and regulated the use of private property to protect sensitive coastal ecosystems. Generally, governments can restrict or limit development in vulnerable coastal areas and floodplains, so long as a property maintains some economic value and a regulation serves a legitimate public interest, such as safety or to offset ecological impacts resulting from use of private property (federal takings rules and case law are examined further in the toolkit sections on Takings).

In addition to takings, governments must also ensure that managed retreat decisions do not violate a property owner's due process rights under the Fourteenth Amendment. The Fourteenth Amendment provides that no government "shall . . . deprive any person of life, liberty, or property, without due process of law."[17] The U.S. and state constitutions require the governments to maintain both procedural and substantive due process rights. Procedural due process requires that governments provide people and entities fair notice of applicable regulations and an opportunity to seek administrative or judicial appeals. Conversely, substantive due process requires that regulations be "rationally related to a legitimate public interest."[18] Although this is a low constitutional bar, which to some extent overlaps with requirements for regulatory takings, climate adaptation and managed retreat decisions must meet this level of constitutional scrutiny.

Takings

The Fifth Amendment of the U.S. Constitution mandates that the federal government shall not "take" private property for a public use or purpose without just compensation.[19] This provision of the Fifth Amendment has also been applied to states through the Constitution's Fourteenth Amendment.[20] The U.S. Supreme Court has come to apply the takings prohibition to a government's regulation of uses that are "the functional or economic equivalents" of a government using its eminent domain powers or otherwise executing an action that physically occupies all or a portion of a property.[21] This section presents the three most likely takings claims — for regulatory takings and per se takings, which is one type of regulatory takings, and exactions — and legal rules under federal constitutional law that may apply to state and local decisions to regulate development in coastal areas.

While states are required to meet constitutional minima set by the U.S. Supreme Court, state constitutions, legislatures, and courts may exceed those minimum requirements with stronger protections for private property owners. In addition, state legislatures can create additional causes of action through takings statutes. Notably, Florida and Oregon, and to a lesser extent Louisiana,

Mississippi, Texas, and Arizona, have all codified takings protections for private property owners that exceed federal baselines and have created a second cause of action.[22] For example, Florida possesses one of the nation's most aggressive private property protection statutes, the Bert J. Harris, Jr. Private Property Rights Protection Act.[23] The act provides property owners with a judicially enforceable right to compensation based on "burdensome" regulatory restrictions on the use of real property.[24] Through the act, the state explicitly establishes a second or enhanced ground — in addition to the constitutional case law discussed in this section — for private property owners to assert challenges against regulations that impact the use of their property. Specifically, through the Bert J. Harris Act, the Florida legislature established "a separate and distinct cause of action from the law of takings" wherein a property owner is entitled to "relief, or payment of compensation, when a new law, rule, regulation, or ordinance of the state or a political entity in the state, as applied, *unfairly affects [or inordinately burdens] real property*."[25] The effect that statute has had in terms of potentially discouraging state and local regulations of private real property in Florida is, at best, unclear;[26] however, acts like this one can, at a minimum, create a perception that private property protections are a significant barrier to climate adaptation and managed retreat regulations. As this example shows, state and local governments must therefore look at both federal and state constitutions, statutes, and case law when crafting managed retreat proposals. Given the variation among states, this section does not provide a state-by-state analysis of takings law, but rather a broad overview based on generally applicable constitutional principles developed by the U.S. Supreme Court.

This section also includes a few case law examples and practice tips for state and local governments to minimize potential legal liability. While takings claims are easy for private property owners to initiate, they are far more difficult to win. Governments can take steps to minimize their potential legal risks and should not be paralyzed from acting by the threat of litigation.

Regulatory Takings

Introduction to Regulatory Takings

This part of the section introduces the different tests courts apply for regulatory takings, including per se takings, which are a subset of regulatory takings. Under the per se test, a court will find a takings has occurred if a government regulation deprives a person of all the economic value of his/her property. If not, courts will then evaluate whether a regulatory takings has occurred under a three-factor balancing test. Private plaintiffs will often stack or layer both per se and fact-specific regulatory takings claims in a single lawsuit with the aim that if the per se threshold cannot be reached, a court may find against the government under the more flexible regulatory takings test. Rules and practice tips to minimize legal risk are described below. There are exceptions to takings

in the managed retreat context that can come into play — one is for public nuisances and the other is for the public trust.[27] Given current case law, only the former is discussed in detail herein, but it is important to note that both preclude takings liability.

Per Se Takings

One clear limit on a coastal government's regulatory authority is that a regulation cannot amount to a per se takings. The U.S. Supreme Court enunciated the rule for a per se takings in a well-known case called *Lucas v. S.C. Coastal Council*, 505 U.S. 1003 (1992). In *Lucas*, David Lucas owned two coastal lots in the Isle of Palms in South Carolina. After he bought the properties, South Carolina passed a setback law that prohibited the construction of residential properties on those lots. The U.S. Supreme Court relied on a lower court finding that South Carolina's law had deprived Lucas of "all economically beneficial uses" of his property to hold that the regulation effected a taking "per se" requiring the government to pay Lucas substantial compensation.[28]

The *Lucas* or per se takings rule essentially tells policymakers that coastal regulations cannot prohibit or restrict private property uses to the point of depriving an owner of all the economic value of his/her property. In practice, the per se bar can be a hard one for a plaintiff to meet in a court. Here, Professor J. Peter Byrne and other legal scholars have argued that "likelihood that a retreat regulation will be found" to rise to the level of a per se takings will likely depend on "the severity of the economic effect" of that regulation on a property owner.[29] Moreover, the Supreme Court has held that the *Lucas* rule will only be applied where a government regulation effectively removes a property's economic value in its entirety;[30] therefore, if a government can show that a property owner retains the right to conduct at least some economically beneficial uses on all or a portion of his/her property, it will be found to have some economic value and there is no *Lucas* per se takings.[31] In the latter instance, a court will instead apply the more flexible rule for a regulatory takings.

Regulatory Takings

When a land-use regulation has seriously decreased the value of a property but not deprived it of all "economically beneficial uses," claims of regulatory taking will be assessed under the fact-specific inquiry established by the Supreme Court in *Penn. Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978). In *Penn Central*, the Court employed a three-factor balancing test for courts to analyze a regulatory takings claim. Those three factors are:

1. The character of the government's action, perhaps including the weight of the public purpose advanced;
2. The extent to which the regulation has damaged the property's economic value; and
3. The effect of the regulation on the reasonable investment-backed expectations of the owner.

The *Penn Central* test is applied on a case-by-case basis. While the application of this test can create uncertainty for coastal governments, case law shows that "governments have generally succeeded in showing that thoughtful regulation does not excessively impinge on the constitutionally protected core of private property."[32]

Regulatory Takings in a Managed Retreat Context Generally

Governments should consider how to build comprehensive retreat strategies that minimize regulatory takings claims. In a managed retreat context, a purely regulatory approach is more likely to trigger takings claims, whereas an approach that uses a combination of land-use regulations, voluntary acquisitions/buyouts, and market-based tools, like Transfer of Development Rights or "TDR" programs, is much more likely to pass constitutional muster because these types of tools allow property owners to recoup some economic value for their land. Regulatory tools — like those featured in this toolkit for living shorelines requirements, hard armoring restrictions, setback and buffer requirements, conditional permits, and zoning and overlay zones — have faced legal barriers in some states, and policymakers considering these types of approaches, in particular, should seek guidance from their attorneys.

State and local governments have successfully navigated takings limits to protect people, property, and sensitive coastal areas and floodplains. For example, in Chatham, Massachusetts, the town passed a zoning bylaw that designated a "conservancy overlay district" that encompassed the town's entire 100-year floodplain to protect people and properties from future flooding risks.[33] The conservancy district prohibited uses, such as the filling of land and the construction of residential structures, but permitted limited uses like recreational and water-dependent activities.[34] One property owner in Chatham wanted to sell her property to a prospective buyer couple who made the deal contingent upon their ability to obtain a development permit to build a home; this deal occurred *after* the conservancy district was established. When Chatham denied the development permit, the property owner sued alleging claims that either a per se or regulatory takings had occurred as a result of the bylaw.

The town's floodplain regulations survived this legal challenge. In 2005, the Massachusetts Supreme Court found in favor of the town, holding that no takings had occurred.[35] Under the *Lucas* per se analysis, the property still had economically beneficial uses, just not for residential purposes.[36] Then, under the *Penn Central* balancing test, the court found that: the city had a legitimate public purpose in protecting people and property from flood risks; the property still had economic value; and the property owner had no reasonable investment-backed expectations in the property to build a residential structure since the bylaw prohibiting such residential structures *predated* the purchase offer.[37] To reach its conclusion, the court cited supporting factors, including how Chatham: (1) clearly articulated public safety goals in its zoning bylaws; (2) did not apply the regulation to a greater spatial area than was necessary to meet its stated purposes; and (3) gave residents adequate notice because the conservancy district existed prior to the town receiving the

development application.[38] At least in Massachusetts, the Chatham case established that local governments can restrict or limit development in vulnerable floodplains, so long as a property maintains some economic value and a regulation serves a legitimate public interest.

As the Chatham case illustrates, takings challenges are a legal risk that state and local governments must consider in the context of managed retreat; however, state and local governments also have tools to minimize their own potential legal risk. For example, in Chatham, the court pointed to the town's purposes and findings in its bylaws, which demonstrated a clear threat to people and property. Moreover, the conservancy district was fair and consistently applied to all property owners in the 100-year floodplain that share the same risk. Other governments can similarly seek to prepare strong justifications to support their regulatory actions, for example, by collecting and documenting best available scientific evidence and community knowledge and lived experiences. Governments should carefully develop such evidence and findings in the administrative record, which justifies the regulation of private property in relation to the *Penn Central* factors. Based on the evidence justifying a regulation, governments should apply regulations proportionally to address the risk or need confronting people under its jurisdiction. In a managed retreat context, that may mean applying a tool judiciously in a jurisdiction's most vulnerable coastal areas subject to imminent threats from sea-level rise, flooding, and erosion. In addition, the property owner in the Chatham case had advance notice of the conservancy district, since purchase of the property was contingent on securing a new development permit. Governments can provide notice to property owners through a variety of means such as plans (notably local comprehensive plans and policies), community engagement processes, and real estate disclosures,[39] which courts consider when analyzing a property owner's "economic or investment-backed expectations."

Regulatory Takings Relating to Infrastructure Disinvestment

Additional takings considerations could potentially arise in the context of disinvestment decisions relating to public roads, although there are few if any cases addressing this issue directly in the context of sea-level rise and coastal hazards, and state and local governments could further reduce legal risk with proactive planning, policies, or laws and ordinances. Tools and strategies for infrastructure disinvestment are discussed further in the Infrastructure section of this toolkit.

Disinvestment may increasingly become an attractive strategy for dealing with rising safety risks and maintenance costs to keep roads open in vulnerable coastal areas. "Disinvestment" in the infrastructure context generally refers to a process of consciously allowing an infrastructure asset to "fall below previously accepted standards of condition or performance," typically to be able to reduce long-term investment in the asset and prioritize resources elsewhere.[40] In this context of managed retreat, the term "disinvestment" is referring more specifically to strategies that either phase out maintenance of roads or affirmatively abandon or discontinue roads (e.g., via legislatively authorized procedures) where coastal conditions make upkeep challenging or prohibitive. Although disinvestment decisions will often relieve a government of its duty to maintain infrastructure (as discussed in the Negligence section), nearby landowners may still challenge that action as a "taking" of their property without just compensation. The closure of a

road can prevent or diminish a landowner's ability to access abutting public roads and/or the general public road network, and the takings claim in this context therefore would derive from a landowner's *loss of access*.[41]

In some states, courts have examined the question of when a government action that results in a road closure or otherwise affects a landowner's access amounts to a taking, although not in the specific context of disinvestment in the face of increased flooding and road damage.[42] In states where loss of access has been evaluated as a potential taking, it has typically been a fact-dependent exercise, based on the level of interference a road closure causes for property owners. If the loss of access to public roads is total (e.g., that road is the only access point to a person's property) or "unreasonable" or the access is "substantially impaired," a court is more likely to find that a taking has occurred.[43] For partial losses of access where alternative, though perhaps more circuitous, access routes exist,[44] the analysis may also involve looking at how the road or road system is used and whether alternative routes offer the same level or type of use (e.g., whether the road can accommodate the same load).[45] Additionally, a loss of access specific to one landowner is more likely to be found as a takings than a closure that affects the general public more broadly.[46]

Dorchester County is "the rural Ground Zero" of sea-level rise in the Chesapeake, where climate change is leaving a mark—not in 25 or 50 years, but now, says Tom Horton, Bay Journal.

Credit: Tom Horton, in the State of Maryland report, Sea-Level Rise: Projections for Maryland 2018.

It is also important to distinguish between whether the abandonment is a formal action by the government (e.g., going through statutory abandonment, closure, or discontinuance procedures) as opposed to inaction (e.g., underinvestment or failure to maintain, leading to an effective partial

or total loss of access). Typically takings claims require some kind of government *action* in order to succeed,[47] although inaction in this context could alternatively give rise to claims that the duty to maintain has been breached, as discussed further in the Negligence section.

Governments considering the need to disinvest in high-exposure coastal roads may reduce the risk of successful takings claims by integrating a disinvestment strategy into planning and policy. This might be done, for example, by establishing clear frameworks for phased out maintenance or closure as environmental conditions degrade or reach certain flooding thresholds. While there may still be some risk of successful takings claims, formal policies or ordinances laying out a disinvestment strategy can help put landowners on notice of potential access restrictions, thereby helping set reasonable investment-backed expectations under the *Penn Central* framework.[48] Additionally, the purpose of the policy would be relevant; a disinvestment policy that seeks to avoid public harm (e.g., by demonstrating safety considerations, such as protecting the public from repeated flood conditions) is more likely to survive a takings claim than a disinvestment action that is primarily for public benefit.[49] Agencies considering disinvestment strategies for public roads in high-risk areas should evaluate the potential for negligence claims and takings claims in different road maintenance and abandonment scenarios, and consider proactive policy options to reduce legal risk.

Public Nuisance Exception to Regulatory Takings

Before concluding the discussion on regulatory takings in a managed retreat context, it is worth mentioning that the U.S. Supreme Court has recognized that a regulation that abates a nuisance cannot be a taking, since the owner has no property right to engage in a nuisance.[50] A public nuisance is generally a private property use that interferes with the public welfare, health, or safety or the public's ability to use public property.[51]

One case from Nags Head, North Carolina provides some context to evaluate this exception. Under state law, North Carolina provides a right of public access to the beach.[52] Due to erosion, many homes in Nags Head are now located in the public trust area between mean high water and coastal dunes. In 2009, the Town of Nags Head declared a row of cottages along East Seagull Drive that had been severely damaged by a nor'easter storm as public nuisances that had to be demolished.[53] The town's public nuisance determination was based on the fact that, due to coastal erosion, this row of cottages — located halfway between mean high water and the dunes — was now located in the public trust domain and posed a safety threat and obstructed public access to the beach.[54] The majority of homeowners agreed that their homes could be demolished, but three groups of homeowners who owned nine of the cottages challenged the town's nuisance declaration and findings.[55]

Although the plaintiffs, in one of their claims against Nags Head, alleged that the town's action was in effect a taking that required "just compensation," Nags Head declared the properties to be a public nuisance, which did not require compensation to private property owners under state

law.[56] The decision ultimately was overturned on appeal, although on other grounds.[57] Specifically, the North Carolina Court of Appeals found that a state public trust statute preempted or precluded local governments from declaring public nuisances.[58]

As sea levels rise, lands erode, and the line demarcating public from private ownership of coastal lands (usually the mean high tide line) migrates inland, public nuisance declarations and lawsuits may become more common, particularly as an avenue to avoid takings issues. Regardless, it would behoove governments to be proactive and truly "manage" or plan retreat from vulnerable coastal areas by taking early actions to prepare for climate change impacts. Even if other state and local governments have a clearer authority to declare public nuisances than Nags Head initially did,[59] governments should seek to have these discussions with their communities before sea-level rise begins threatening properties to maximize benefits for communities and the environment.

Exactions and Development Permit Conditions

Introduction to Exactions

In addition to per se and regulatory takings, the U.S. Supreme Court recognizes special rules for exactions. Exactions are regulatory obligations imposed as conditions for the grant of a development permit that require a private property owner to convey to the public an interest in real property or the monetary equivalent.[60] The purpose of such conditions will be to mitigate the public harm caused by new private development. The property interest required to be conveyed can be a fee interest in land or a public easement authorizing public access. The Supreme Court also has held that exaction analysis is appropriate when a property owner is required to pay money to the government as a substitute for conveying a real property interest.[61]

Exactions raise takings concerns because they require a property owner to convey property to the government without the payment of just compensation. The U.S. Supreme Court has found that exactions do not effect a taking when two requirements are met. First, there must be an "essential nexus" between the character of the exaction and the public harm that the exaction is mitigating.[62] Second, there must be a "rough proportionality" between the value of the property rights conveyed and the harm to the public interest that the exaction mitigates.[63] The principal cases for those two requirements are *Nollan v. Cal. Coastal Comm'n*, 483 U.S. 825 (1978) and *Dolan v. City of Tigard*, 512 U.S. 374 (1994), respectively. Legal experts often refer to the two cases concurrently as the "*Nollan/Dolan*" test when describing the constitutional requirements for exactions.

Exactions and Development Permit Conditions in a Managed Retreat Context

In a managed retreat context, states and local governments can set conditions for new development and redevelopment through coastal zone management, environmental, and land-use and zoning permits. For example, governments could require a property owner to remove or relocate structures upon the happening of some event, such as a beach eroding to a minimum width (for more information, see the Regulatory Tools>Development Permit Conditions section of this toolkit). A condition that would likely amount to an exaction would be allowing an existing public easement along the beach to migrate inland with the beach. Here, it is important to distinguish between permit conditions that require the conveyance of an interest in property, which are analyzed as exactions, and other permit conditions on land use that do not involve the transfer of an interest in property, which are analyzed under the general *Penn Central* regulatory takings analysis. Under *Nollan/Dolan*, governments will be expected to meet a heightened takings threshold for exactions compared to regulatory takings under *Penn Central*. For exactions subject to the *Nollan/Dolan* test, a government can minimize its potential takings liability by having a clear nexus or link between an exaction and the government's purpose for imposing that condition.[64] Here, the purpose will likely be related to protecting people, property, and the coastal environment — including public access and public trust resources — from sea-level rise, flooding, and erosion. In addition, as long as a government's permit condition does not take more land than necessary to facilitate a public purpose for retreat, and that land interest "does not exceed in size or value the portion permitted to be developed," that exaction should pass the *Dolan* rough proportionality test.[65]

For comparison to the case in Encinitas, this is an image of cliff-top development and erosion in Isla Vista, California. Credit: Patrick Limber, U.S. Geological Survey.

One recent case illustrates many of these concepts and provides takeaways for state and local governments about how to draft legally viable permit conditions. In one California case, the California Court of Appeals upheld coastal restrictions to protect coastal development and ensure continued public beach access from bluff erosion. In *Lindstrom v. Cal. Coastal Comm'n*,[66] property owners sought a coastal development permit to construct a home on a bluff in Encinitas. The city approved the permit with conditions, including that the home be set back 40 feet from the edge of the bluff for safety reasons.[67] Dissatisfied with the outcome, the property owners appealed the local decision to the state's coastal management agency, the California Coastal Commission. Ultimately, the commission added conditions to the permit including a larger 60- to 62-foot setback, a waiver prohibiting any future hard armoring structures, and managed retreat conditions requiring the removal of structures in whole or part if the bluff erodes to a certain point.[68]

On appeal from the commission's decision, the California Court of Appeals upheld the constitutionality of almost every one of the conditions, including the ones for managed retreat. Notably, the court upheld the requirement that the Lindstroms follow the recommendations in a geotechnical report to remove unsafe portions of their home if the bluff recedes to a point within 10 feet of it.[69] While another condition requiring structure removal was held to be "overly broad" as currently drafted, the court allowed the commission to revise the condition in accordance with its order.[70] In other words, at least in California, the court found that removal conditions can be constitutional so long as they meet minimum requirements.

Based on the plaintiff's complaint, the court analyzed the permit conditions under state law claims as well as takings and procedural and substantive due process claims. The condition that bans a seawall was the only one evaluated as a regulatory taking, and the court found that it did not raise *Lucas* or *Nollan/Dolan* concerns.[71] Under the *Lucas* framework, the court found that the property would still retain economic value despite that condition, so it did not cause a complete deprivation of economic use or value.[72] Under *Nollan/Dolan*, the court found that the condition was not an exaction because it did not require the conveyance of a property interest or payment of money; thus, the condition did not have to meet the nexus/proportionality requirements. In contrast, the conditions requiring the removal of structures (in whole or part) if the bluff erodes to a certain point were only challenged on procedural and substantive due process grounds, which the court found lacked merit due to a lack of factual arguments made by the plaintiffs.[73] The main takeaways from this California case are that: (1) restrictions on property (as opposed to requirements to dedicate land or pay fees) are not exactions that are subject to *Nollan/Dolan* scrutiny; and (2) the court upheld the commission's ability to restrict someone's future ability to build a seawall, which will help ensure natural shoreline processes continue unabated. As to the former takeaway, this case illustrates the point that not every permit condition or development restriction has to meet *Nollan/Dolan* nexus/proportionality requirements. Accordingly, governments may be able to avoid meeting heightened scrutiny under *Nollan/Dolan* if permit conditions are drafted as land-use regulations rather than exactions. More broadly, as the use of exactions and permit conditions in

coastal and land-use permits evolve at the state and local levels, governments should keep apprised of new federal and state case law on the subject and the multiple and different claims plaintiffs may assert.

Negligence

Decisions relating to public roads and other infrastructure are likely to be an important component of an overall managed retreat strategy. As discussed in the Takings section, this may entail decisions to disinvest through reduced maintenance or abandonment of infrastructure. Many disinvestment strategies (in particular, formal closure, discontinuance, or abandonment of a road) will eliminate the duty to maintain the infrastructure and thereby preempt any potential negligence claims for inadequate maintenance in the face of increasing erosion, inundation, or other hazards affecting road condition. However, agencies with jurisdiction over transportation assets in high-risk areas may still want to understand the legal framework for negligence and how it has been interpreted in the context of maintenance of public infrastructure in their jurisdiction, as it could affect the nature or timing of decisions to disinvest and avoid potential negligence claims.

In any negligence claim, four elements must be met: (1) the existence of a legal duty (in this context, duty to maintain); (2) breach of duty (i.e., inadequate maintenance or failure to maintain); (3) causation (i.e., that the breach of duty caused some sort of harm); and (4) damages (i.e., actual harm or damage experienced). This overview is not intended to provide a comprehensive or state-by-state analysis of negligence elements, remedies, or defenses, but rather provides a brief introduction to the duty and breach elements of negligence in the context of maintaining public roads in coastal areas and typical defenses that might be available. For more information on tools to relocate or disinvest in infrastructure in a managed retreat context, see the Infrastructure section of this toolkit.

Duty to Maintain

In general, governmental entities (states, counties, towns, and municipalities) owe a duty of care to the public to keep roads and bridges under their jurisdiction[74] in reasonable repair; that is, they have a legal duty to maintain the infrastructure.[75] The level of maintenance required, and whether it encompasses an affirmative duty to improve the asset, varies according to state law; different standards may apply for different classifications of roads and may also differ somewhat for state-, county-, and municipally-owned roads. For example, the standard might be framed in safety-based terms (e.g., Florida and Georgia's requirements that municipal roads be kept in a "reasonably safe condition") or in more performance-based terms (e.g., Florida's requirement that county roads can provide "meaningful access," or Georgia's requirement that county roads can accommodate "ordinary loads").[76]

Breach of Duty to Maintain

The second element of *negligence* occurs when the public agency has failed to meet (i.e., breached) that duty of care, typically by failing to maintain the infrastructure according to the safety or performance-based standard as established by statutory and/or case law, which in turn may be informed by industry standards or best practice. In the context of flooding, this breach of duty could occur when, for example, repeated tidal inundation events cause structural damage to the roadway that renders the road unsafe for travel because the government responsible for the roadway did not ameliorate the known and recurring dangerous condition (repeated tidal inundation events).

In an era of climate change and sea-level rise, it is becoming more challenging for infrastructure agencies to budget for routine maintenance or improvements to mitigate or prevent water obstructions, damage, and other safety hazards. With more frequent erosion, inundation events, and storm-related damage, maintenance costs are increasing — which will make it more costly and difficult for agencies to meet their duty of care. In some areas, "routine" maintenance (e.g., repaving) may cease to be sufficient. Although the duty to maintain and repair would not typically require an agency to *upgrade* (e.g., adapt road design or alignment to make it more resilient to sea-level rise), upgrades may in fact be necessary in order to maintain road safety and performance.[77] In other words, when it comes time to repave a road segment — an activity that historically would fall within the category of routine maintenance and repair — an agency may find it necessary to elevate the road (which would normally fall within the category of upgrades) in order to prevent increasing flooding and ensure safe travel and levels of service. State courts have not addressed this issue of where the lines are drawn between routine maintenance and upgrades in the context of sea-level rise and increasing coastal hazards. However, there could be costly implications for potential liability for infrastructure and potential losses if state courts were to consider upgrades, such as road elevations, as falling within the duty to "maintain."[78] For this reason, agencies may wish to consider a proactive disinvestment strategy (e.g., abandoning or reclassifying roads to reduce maintenance standards) that removes or modifies the duty to maintain.[79]

Defenses

Given the considerations noted above, infrastructure agencies that are opting for an ongoing maintenance strategy (as opposed to disinvestment) in the face of increasing coastal hazards should understand whether they can defend against any potential negligence claims. In some jurisdictions, government agencies may do so by claiming sovereign immunity, a legal doctrine preventing the government from being sued without its consent — which applies under different circumstances to different government actors (federal, state, local). State tort claims acts often provide a framework for when government can be liable for harm resulting from conditions of

highways and roads.[80] Typically, government entities can claim immunity for any discretionary or planning activities (i.e., activities that require exercise of judgment), but not for activities categorized as ministerial, operational, or proprietary.[81] In general, then, this defense will depend on whether state courts have interpreted repair and maintenance to be discretionary or ministerial/operational.[82] The distinction may depend upon how specifically maintenance duties and activities are prescribed,[83] and the distinction may be different depending on the jurisdictional level, e.g., municipal vs. county vs. state.[84] "Upgrades" (e.g., design adaptations to render a road more resilient) are more likely to be considered discretionary and therefore subject to immunity — though as noted above, this may not always be a clear distinction in a climate change-driven sea-level rise context.

Aside from immunity defenses, a government may also succeed against a negligence claim if the government has acted reasonably under the circumstances (i.e., met its duty to maintain). In the case of hazards, such as flooding and inundation, the government should provide warnings about the hazard and take steps to prevent harm to users. If sovereign immunity would not apply, agencies should evaluate the circumstances in which courts have interpreted maintenance actions as reasonable in the face of coastal hazards like flooding and erosion.[85]

Governance

Given the cross-jurisdictional impacts of sea-level rise, flooding, and land loss, states and local governments may contemplate regional approaches for managed retreat. The need for regional governance structures could be compounded by shifting populations and ecosystems that move from one jurisdiction to another. Notably, if people choose to leave vulnerable coastal areas, those municipalities may suffer losses to their tax bases. This will hinder municipalities' ability to provide basic and essential services and make sustained investments in their communities (e.g., building and maintaining infrastructure, schools) more difficult. While larger urban municipalities may be able to absorb some or many of the costs associated with these tax transfers, these losses could exacerbate resource inequities in underserved smaller and frontline communities. Compartmentalized governmental structures could also contribute to the insufficient oversight of important shared coastal resources and public assets, which can lead to their deterioration or destruction. In addition, governments will have to meet the needs of "receiving" communities in different jurisdictions.

One potential solution to avoid or mitigate economic, environmental, and social impacts on individual municipalities would be to share the costs of sea-level rise, flooding, and erosion by distributing them across a greater number of people over a larger area.[86] Regional solutions could be more equitable in addition to better protecting migrating ecosystems and public beaches and coasts. To overcome these challenges, state and especially local governments can consider various approaches for regional governance including:

- Establishing regional government entities that supplement, but do not displace independent local authorities to administer prescribed government functions like collecting and distributing

tax revenues; building, maintaining, and funding cross-jurisdictional investments in infrastructure like roads and drinking and stormwater systems; or implementing tools for larger-scale retreat strategies like buyouts and Transfer of Development Rights programs (e.g., **San Francisco Bay Conservation and Development Commission**; Maryland Senate Bill 547; Charlotte-Mecklenburg Storm Water Services Floodplain Buyout Program, North Carolina; Harris County Flood Control District, Texas; King County Transfer of Development Rights Program, Washington State; New Hampshire Senate Bill 285);

- Altering municipal boundaries either by dissolving and merging independent municipalities together or annexing parts of other municipalities to create consolidated local government units and acquire higher ground land that can serve as receiving areas (e.g., Princeville, North Carolina; Punta Gorda, Florida);
- Engaging in regional planning for managed retreat to identify and prioritize coastal adaptation actions and leverage funding and other resources to implement those actions (e.g., Louisiana Strategic Adaptations for Future Environments or "LA SAFE"); or
- Entering into informal, non-binding agreements (e.g., memoranda of understanding or agreement) or regional collaborations to better guide and coordinate the actions of individual municipalities to achieve mutual benefits and shared outcomes (e.g., **Southeast Florida Regional Climate Compact**).

As climate change and coastal hazards increase in frequency and intensity, local governments and particularly smaller municipalities may have an increasing need to evaluate regional models for the purpose of administering or supporting either select or multiple government functions.

States may also consider developing inter-state regional approaches for retreat. In addition, states can provide different types of support for intra-state regional efforts at the local level, including through technical and funding assistance and amending existing or creating new laws to meet regional governance needs.

Planning Tools

Planning will be a critical component of managed retreat strategies. A diversity of plans can be used as a strategic and guiding mechanism to proactively evaluate and implement actions for managed retreat to maximize benefits and minimize costs for multiple stakeholders and the environment. Comprehensive managed retreat strategies will ideally consist of plans and a combination of infrastructure, acquisition, regulatory, and market-based tools.

All plans should be developed through highly participatory public processes that provide interested stakeholders with an opportunity to meaningfully engage and inform the plan's development. Furthermore, governments should coordinate across agencies and clearly link different plans that include elements of managed retreat.

Flooding at Studemont Street and Buffalo Bayou in Houston from 2016. Credit: Harris County Flood Control District.

Plans

Introduction to Planning

Source: Louisiana Strategic Adaptations for Future Environments (LA SAFE).

Plans are important collaborative tools at all levels of government. Planning initiatives simultaneously help state and local governments prepare their communities for the future while also having the practical effect of establishing frameworks for future collaboration between diverse government agencies and stakeholders. Plans come in a variety of types and sizes at all levels of government and have different spatial and temporal attributes. In addition, some plans may be legally mandated or have legal force or effect, while others may have no particular legal mandate or requirements and are initiated primarily because of the strategic policy benefits they can provide governments. Plans should be developed through highly participatory public processes that provide all interested stakeholders an opportunity to meaningfully engage and inform the plan's development. Plans often require updates and can evolve as living documents as changes occur, such as with community needs and environmental considerations.

Planning in a Managed Retreat Context

The Benefits of Planning

Source: Louisiana Strategic Adaptations for Future Environments (LA SAFE).

Planning will be a critical component of managed retreat strategies for many reasons. These include: (1) plans serving as useful organizational and implementation tools; (2) elevating and encouraging proactive discussions about managed retreat; (3) supporting the phasing of actions over time; and (4) promoting community participation and support.

First, plans and planning processes can serve as tools to help states and communities evaluate and balance legal and policy tradeoffs for managed retreat and organize and prioritize strategies that inform future implementation actions. There is no "one-size-fits-all" approach to managed retreat and governments and residents will have to consider what acquisition, infrastructure, regulatory, and market-based tools, if any, can be adapted to meet state and local needs. In addition, plans can assist governments in identifying more resilient and adaptive investments, particularly for urban development and infrastructure that will be directly impacted by long-term sea-level rise.

Second, plans can proactively engage stakeholders about managed retreat as a part of comprehensive adaptation processes. Due to the challenges associated with managed retreat, governments and communities have primarily thought about retreat in a post-disaster or reactive hazard mitigation context. As a result, protection and accommodation strategies have historically been prioritized. Importantly, plans can elevate discussions about managed retreat and put it on an equal playing field with protection and accommodation at the start of decisionmaking efforts. This is not to say that managed retreat will always be the best or preferred adaptation strategy, endorsed by community members, or even appropriate given the physical risks facing an area. Nonetheless, by elevating discussions about managed retreat, plans can help maximize benefits (e.g., social, economic, environmental) and minimize costs by bringing a comprehensive suite of adaptation strategies to state and local decisionmaking tables at the outset. Notably, proactive plans can also help policymakers and communities better "manage" retreat over a long period of time. "Unmanaged" retreat can exacerbate historical inequities and environmental degradation and should therefore be avoided, when and where possible, to provide policymakers and

community members with an opportunity to evaluate and consider a feasible range of adaptation alternatives (for more discussion, see the Crosscutting Policy Considerations>Community Engagement and Equity section of this toolkit).

Third, plans can be used to phase implementation actions over time so that governments can better formulate budgets and investments with the timelines associated with physical coastal impacts. Plans can also help governments identify legal and policy changes that must take place before certain actions can be implemented (e.g., state grant of authority to local governments, amend land-use and zoning regulations). In addition, phasing actions can minimize the potential adverse consequences or costs of managed retreat by distributing those costs over extended time periods. For example, if voluntary buyouts are scheduled to occur over a ten- rather than a one-year period, residents may be more willing to participate in buyout programs and support managed retreat strategies because community character and tax bases will not shift as suddenly.

Fourth, participatory planning can help educate stakeholders and build support for complex community solutions. Through the visionary component of plans, governments can give residents a voice to inform the future state of their communities in light of changing coastlines. Plans can potentially mitigate the sense of loss people may feel by giving them a platform to influence the future of their communities and providing them with a tangible vision for which they can aim. In short, plans can potentially aid governments in creating managed retreat processes that reflect community transformation instead of loss.

Developing Plans for Managed Retreat

The issues associated with coastal zone management should not be considered separate or apart from ongoing land-use and infrastructure planning. As such, these issues need to be explicitly incorporated into the regular cycle of legally mandated planning documents. There may, however, also be an opportunity to pursue supplemental planning initiatives for discrete purposes or areas. These efforts might be out-of-cycle or discretionary planning initiatives that explore solutions to challenges, such as specific inter-governmental coordination efforts, or unique conditions associated with inter-jurisdictional challenges, such as metropolitan-scale coordination or ecological asset-based planning centered on watersheds or regional wetlands.

Among the many types of planning efforts that can be applied in a managed retreat context, below are nine types of plans that states and local governments can consider developing:

- Hazard Mitigation Plans
- Coastal Management Plans

- Local Comprehensive Plans
- Climate Adaptation Plans
- Long-Term or Visioning Plans
- Post-Disaster Recovery and Redevelopment Plans
- Managed Retreat or Relocation-Specific Plans
- Wetlands Migration or Ecosystem-Specific Plans
- Long-Range Transportation Plans

These particular plans, described in detail below, reflect current examples of coastal jurisdictions that have developed or are in the process of implementing plans with a strong or explicit nexus to managed retreat. This list and these case study examples will be updated as other jurisdictions incorporate managed retreat in their plans.

Hazard Mitigation Plans (e.g., State of Hawaii and City and County of Honolulu): In hazard mitigation plans, state and local governments develop strategies to protect people and property from future disaster events. These plans must meet requirements set by the Federal Emergency Management Agency (FEMA).[87] Hazard mitigation plans start by identifying risks and vulnerabilities related to a given disaster or multiple types of disasters, like hurricanes, tsunamis, or flooding, and then potential strategies to reduce those risks and vulnerabilities.[88] In a managed retreat context, hazard mitigation plans can identify and increase awareness of coastal risks and vulnerabilities related to climate change. Hazard mitigation plans can also include strategies like buyouts that can be used to implement retreat.

Source: Wikimedia Commons.

While hazard mitigation plans can serve as an effective planning tool for managed retreat, they are also notable because a hazard mitigation plan approved by FEMA is a prerequisite for state and local governments to receive funding from FEMA's **Building Resilient Infrastructure and Communiteis (BRIC)**, **Hazard Mitigation Grant,** and **Flood Mitigation Assistance** programs.[89] Hazard mitigation plans provide the dual benefit of making state and local governments eligible for potential federal funding opportunities to implement retreat strategies. Only those strategies that are included in or consistent with hazard mitigation plans,

however, can be funded; therefore, it is important for state and local governments to evaluate potential managed retreat strategies in these plans if they want to preserve their options for future funding consideration.

Hazard mitigation plans can be cross-jurisdictional and cover multiple hazards in multi-hazard mitigation plans. The physical impacts of sea-level rise, flooding, and land loss may necessitate regional and multifaceted approaches to planning for retreat that hazard mitigation plans can offer because coasts and flooding extend across jurisdictional boundaries and can be influenced by various climate- and disaster-related factors. Although distinct, hazard mitigation plans can be similar to and aligned with climate adaptation plans and incorporated into other types of state and local plans.[90]

Coastal Management Plans (e.g., *Hawaii Feasibility Study on Managed Retreat*, Louisiana Coastal Master Plan, *Rhode Island Shoreline Change Special Area Management Plan* or "Beach SAMP"): Coastal management plans are a way for state and local governments to consider and articulate balancing human uses and development with ecosystem conservation and protection in vulnerable coastal areas. The federal Coastal Zone Management Act (CZMA) and state-developed coastal management programs approved by the U.S. Secretary of Commerce under the CZMA regulates the "coastal zone" as a unique legal jurisdiction.[91]

In a managed retreat context, this type of plan can specifically guide development and conservation actions within a jurisdiction. While governments can develop new coastal management plans to meet individual needs, jurisdictions may not have to "reinvent the wheel" and can think creatively about existing plan opportunities, templates, and models and adapt them for climate change and managed retreat purposes. For example, Special Area Management Plans or "SAMPs" can be developed using coastal zone enhancement funding[92] from the National Oceanic and Atmospheric Administration (NOAA) under the CZMA.[93] SAMPs are resource management plans developed to better manage specific geographic areas, although this may include a state's entire coastal zone (e.g., Rhode Island). Notably, the CZMA provides that SAMPs can be used to "provide for increased specificity in protecting significant natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by *land subsidence [and] sea level rise* . . . ."[94] Rhode Island capitalized on its extensive experience with the existing SAMP model[95] to create the nation's first coast-wide adaptation plan, the Beach SAMP, that mapped climate and flooding impacts along the state's coastline to inform more resilient development and redevelopment and potential retreat or relocation strategies. In contrast, some states or local governments may choose to pave the way with new examples of coastal management plans for

retreat. In 2019, the State of Hawaii released the first example of a non-SAMP coastal plan assessing the potential feasibility of managed retreat in Hawaii. States and local governments can evaluate opportunities for both adapting existing types of plans like SAMPs and creating new types when reinvention is needed.

Coastal management plans can complement or supplement state and local pre-disaster mitigation planning and recovery efforts, and local comprehensive plans and zoning regulations.

Local Comprehensive Plans **(e.g., *plaNorfolk 2030*, Punta Gorda, Florida):** Municipalities are generally required to have a long-term comprehensive plan that anticipates future land-use controls, such as zoning and special urban design districts.[96] A comprehensive plan provides the legal basis and support for land-use regulations.[97] Comprehensive plans are often referred to as general or master plans as well. Comprehensive plans are generally prepared for anywhere from a 10- or 25-year time horizon. Typically, legislation mandates updates (e.g., every five years) and that plans must be informed by many different studies, not the least of which are demographic projections, assumptions around the economy, housing, and infrastructure, as well as environmental studies. After this document has been completed (typically with robust stakeholder engagement), it is usually adopted by either a jurisdiction's city council, board of supervisors, or a dedicated planning commission. Once adopted, comprehensive plans become the legal foundation for zoning in a jurisdiction, which typically specifies site-specific standards for discrete land-use proposals.[98]

Source: Wikimedia Commons.

At least in theory, municipalities possess tools and legal structures to anticipate coastal change and plan for managed retreat — where appropriate and prioritized by communities — through existing comprehensive plans and land-use and zoning regulations and programs. It is important to note that to date, there are only a handful of municipalities in the United States that have meaningfully incorporated sea-level rise into their comprehensive plans. Comprehensive plans can play an important role in identifying and coordinating many actions related to retreat including: identifying areas most suitable for long-term land uses; designating open space zones for wetlands migration corridors; providing legal justification for

coastal setbacks or other regulatory tools for new development; and factoring future demographic data about population shifts due to climate change into demographic projections to support housing and infrastructure investments in higher ground receiving areas.

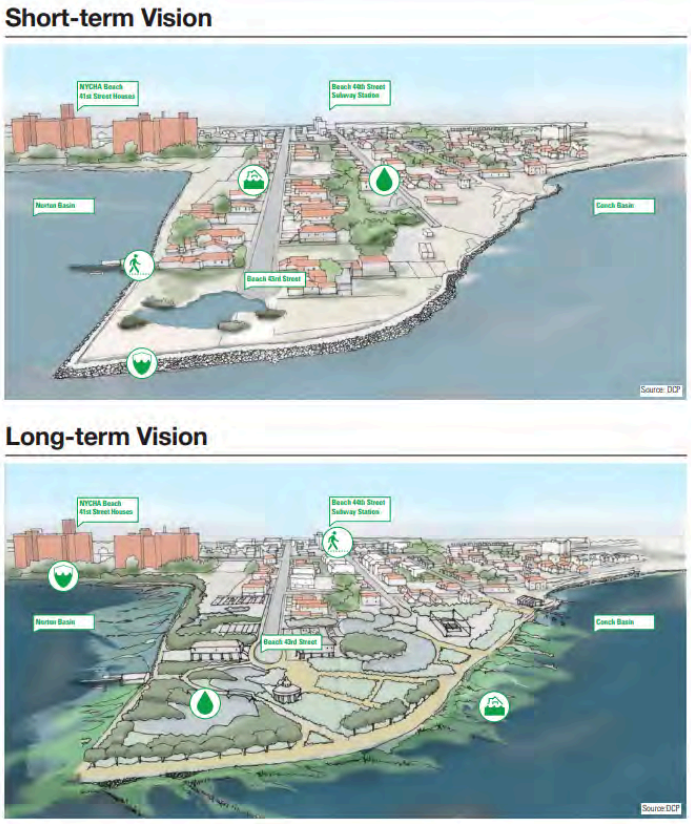
By meeting the legal requirements for comprehensive plans, local governments can develop a key tool to enhance the potential for incorporating sea-level rise, flooding, and land loss considerations into local land-use and zoning decisions. In addition, local governments can utilize comprehensive plans as a tool to integrate and potentially implement other types of plans for retreat that traditionally lack a concurrent legal nexus, particularly hazard mitigation plans and climate adaptation plans (e.g., Punta Gorda, Florida).

Climate Adaptation Plans **(e.g., Punta Gorda, Florida, Louisiana Strategic Adaptations for Future Environments or "LA SAFE" Adaptation Strategies, *Virginia Beach Sea Level Wise Strategy*):** Climate adaptation plans outline or direct how states and local governments will prepare to address forecasted climate change impacts. These plans vary in format, level of detail, and sectors covered, among other factors, and are often preceded by and aligned with or include a climate vulnerability assessment.

For coastal states and communities, climate adaptation plans will ideally provide an opportunity for governments and other stakeholders to consider the full range of climate adaptation strategies for protection, accommodation, and retreat. This decisionmaking process informs where and when, if at all, each strategy will be prioritized and potentially implemented through different legal and policy tools. While managed retreat may not play a role in or be appropriate for all climate adaptation plans, the key is that these plans can be used as a mechanism to elevate proactive discussions about managed retreat to put it on an even playing field with protection and accommodation strategies. Where managed retreat is identified as a preferred coastal adaptation strategy, these plans can better enable states and communities to mitigate potential costs (e.g., economic, environmental, social) at the outset of these processes and not solely view retreat as an option of last resort.

As sea-level rise, flooding, land loss, and disaster events are expected to increase in frequency and intensity, it will become increasingly important to prepare these comprehensive adaptation strategies early and not just in a post-disaster context. Early discussions are particularly advantageous where efforts to conserve coastal ecosystems require more lead time to protect migration corridors and prepare receiving areas for people choosing to relocate away from the coast. These efforts may also require significant investments in housing and supporting infrastructure and services.

Climate adaptation plans may overlap with other types of plans, particularly longer-term or visioning ones, and can be integrated with or implemented through hazard mitigation plans and disaster recovery funding or local comprehensive plans and land-use and zoning regulations.



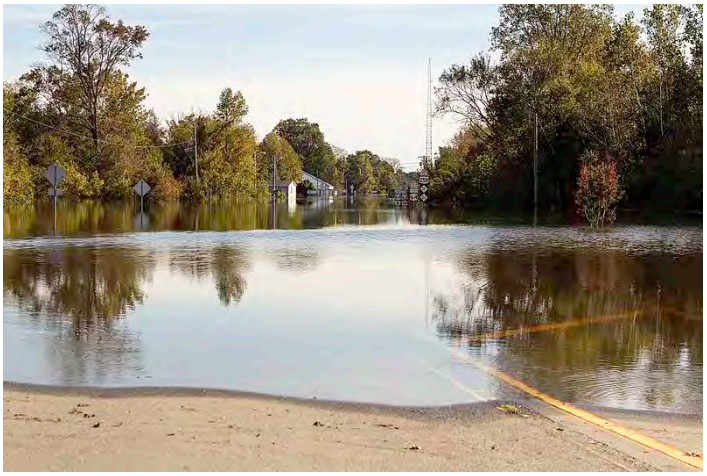
Short-term and long-term visions from the Resilient Edgemere Community Plan. Credit: New York City Department of Housing, Preservation, and Development.

Long-Term or Visioning Plans **(e.g., Norfolk Vision 2100, Virginia, *Resilient Edgemere Community Plan*, Queens, New York):** Long-term or visioning plans are distinct from local comprehensive plans because they are not legally required and can help communities plan over longer time periods (i.e., beyond a 10-25-year time horizon) by taking a forward-facing look at what their communities could look like in light of anticipated climate impacts. These types of plans can also provide municipalities with more flexibility to engage communities and design plans to suit their unique climate adaptation and managed retreat needs and priorities without having to meet specific legal requirements (e.g., complex plan formats, extraneous elements). For example, while Norfolk Vision 2100 encompasses the entire municipality of Norfolk, the *Resilient Edgemere Community Plan* was drafted through a community engagement process to address the specific needs of one neighborhood in Queens after Hurricane Sandy.

While these types of plans are likely to play a greater role at the local level with communities on the front lines of coastal change, states can also consider long-term or visioning plans that complement or support local initiatives (e.g., Louisiana Coastal Master Plan). Since physical impacts on the coast will manifest over present and future time periods, long-term and visioning plans can help states and communities better plan for and make smarter, more resilient investments in coastal development that will be in place for more than a few years.

Post-Disaster Recovery and Redevelopment Plans **(e.g., State of Florida, State of Georgia, Princeville, North Carolina):** Post-disaster recovery and redevelopment plans guide how a community will recover and rebuild after a major disaster. Post-disaster recovery and redevelopment plans can help state and local governments implement post-disaster response and recovery actions to mitigate future risk in coastal areas. These plans can be integrated with hazard mitigation and local comprehensive plans. Like hazard mitigation plans, post-disaster recovery and redevelopment plans can help align state and more often local actions with comprehensive managed retreat strategies in a coordinated rather than a haphazard fashion. While governments should strive to proactively plan to "manage" retreat, discussions about retreat have traditionally been and will necessarily continue in a post-disaster context. Coordinated responses and recovery actions can also help governments avoid conflicts with longer-term managed retreat policies.

A Flooded road in Princeville, North Carolina after Hurricane Matthew in 2016. Source: Wikimedia Commons.



In a managed retreat context, local governments can develop a post-disaster plan to identify opportunities to enhance resilience during disaster recovery efforts. Post-disaster plans prioritize the use of disaster recovery funding to discourage or prohibit redevelopment in repeatedly flooded areas through tools like rebuilding moratoria or stricter regulatory standards (e.g., setbacks and coastal buffers, minimum greenspace requirements). In addition to local comprehensive plans, local governments can utilize these plans to proactively make investments in higher ground, safer affordable housing options that can temporarily or permanently receive people after disasters.

Federal and state governments can provide support for local planning efforts through funding and technical assistance and possibly even require that local governments prepare these plans for statewide consistency in administering emergency management programs. Notably, the State of Florida requires that local governments prepare post-disaster redevelopment plans and provides best practices and guidance for developing them. In addition, Georgia's coastal program, emergency management agency, and FEMA Region IV are coordinating with four coastal counties to complete disaster recovery and redevelopment plans[99] with funding from the National Oceanic and Atmospheric Administration's Coastal Resiliency Grant Program.[100] Similar to Florida, Georgia also created a guidance document to assist the counties going through this process.[101]

Managed Retreat or Relocation-Specific Plans **(e.g., *2018 Green Cincinnati Plan*, Ohio, *Hawaii Feasibility Study on Managed Retreat*, Quinault Indian Nation *Taholah Village Relocation Master Plan* [Washington State]):** Managed retreat or relocation-specific plans are an emerging example of plans that guide how communities can proactively plan for different aspects of a managed retreat strategy. These plans are focused on a community's specific managed retreat goals and objectives and can facilitate easier project implementation because they provide a strategic look or analysis on this one subject, in lieu of solely including managed retreat as one element of a larger plan. For example, Quinault Indian Nation in Washington State created a comprehensive relocation master plan to direct and inform the phased relocation of its Taholah Village from a lower to higher elevation location. Communities or neighborhoods, like Quinault Indian Nation, that choose to relocate in whole or in part may consider this type of plan to be a useful tool.

Given the complex and interdisciplinary nature of managed retreat, managed retreat or relocation-specific plans can help communities identify, prioritize, organize, and coordinate a multifaceted approach to climate adaptation for a defined spatial area or a number of interested parties. Local governments can also tailor these plans to meet their individual needs around managed retreat. In the future, Cincinnati, Ohio anticipates receiving people moving away from the nation's coast. In its *2018 Green Cincinnati Plan*, Cincinnati aims to prepare to become a receiving area as one part of its resilience strategy. Here, managed retreat or relocation-specific plans can provide support to fill specific goals or objectives.

Given their place-based need and focus, these plans are more likely to be developed at the local level and can supplement other broader or longer-term or visioning plans. Nonetheless, states can provide support for plan development, like technical assistance and funding.

More than 250 residents participated in the 2018 Green Cincinnati Plan Kickoff held at the Cincinnati Zoo. Source: City of Cincinnati, Ohio.

Wetlands Migration or Ecosystem-Specific Plans **(e.g., *Blackwater 2100*, ReWild Mission Bay, San Diego, California):** Wetlands migration or ecosystem-specific plans can help direct state and local actions to facilitate coastal ecosystem changes in response to sea-level rise, flooding, and land loss. These plans can ensure that public and private efforts are compatible with comprehensive managed retreat strategies addressing structures, infrastructure, and other community needs.

People take part in interactive learning during Love Your Wetlands Day at Blackwater National Wildlife Refuge. Credit: Greg Hoxsie for ReWild Mission Bay.

As sea levels rise, wetlands are encountering physical barriers to inland migration in a phenomenon known as "coastal squeeze." Wetlands are being squeezed between sea-level rise on one side and human development on the other, preventing their natural ability to adapt by moving to higher ground. As wetlands migrate, they encroach on existing land uses, such as agriculture, forestry, and residential communities, raising additional questions about shifting economies, equity, and wetlands and private development regulations (e.g., Clean Water Act, coastal zone management and local land-use regulations).

Wetlands migration plans can help state and local governments identify and prioritize areas for coastal restoration that can serve as migration corridors and higher ground wetlands establishment areas before future development exacerbates coastal squeeze and precludes wetlands from transitioning inland. Wetlands migration plans can also be used as a tool to proactively seek community input to avoid or mitigate potential land-use conflicts. These plans can vary based on their spatial scale to cover a protected area (e.g., Blackwater National Wildlife Refuge) or a state's or municipality's entire coastline to elevate awareness of this challenge, particularly given the extensive and multiple benefits wetlands provide people, economies, and the environment. For example, a statewide wetland mitigation or adaptation plan could help guide state acquisition efforts, and a local one could support the development of zoning or overlay districts that enhance open space and natural resources conservation. For similar reasons, ecosystem-specific plans could be created for other types of coastal habitats, like forests, and species that are being impacted.

For more information on wetlands migration, see the Crosscutting Policy Considerations>Wetlands Migration section of this toolkit.

Long-Range Transportation Plans **(e.g., *Miami-Dade Transportation Planning Organization's 2045 Long-Range Transportation Plan*):** As a condition of receiving federal surface transportation funds, state transportation agencies and metropolitan planning organizations (MPOs) are required to engage in performance-based planning for the transportation system in their state or region.[102] States and MPOs must develop long-range plans (Long-Range Statewide Transportation Plan, or LRSTP, and Metropolitan Transportation Plan, or MTP, respectively) that detail performance measures and targets that will help to further national transportation goals set out in federal law.[103] Long-range plans typically have a 20- to 25-year planning horizon and provide a vision and overarching policy, and in some cases cite specific transportation projects planned. They provide the framework for developing the required short-term (four-year) plans, which detail specific priority projects and improvements that will be funded (Statewide Transportation Improvement Programs, or STIPs, in the case of states; and Transportation Improvement Programs, or TIPs, in the case of MPOs).

Some state departments of transportation and MPOs (e.g., Maryland Department of Transportation; Miami-Dade Transportation Planning Organization; North Florida Transportation Planning Organization) have begun integrating climate change and sea-level rise considerations in their long-range plans. These plans could provide an appropriate means to consider transportation infrastructure needs relating to a managed retreat strategy. For example, state DOTs and MPOs that opt to include performance targets in their long-range plans relating to climate change resilience and sea-level rise will then have to link their investment priorities (as laid out in STIPs and TIPs) to those targets. These plans can then further describe how planned transportation improvements and investments will help achieve targets relating to resilience. Furthermore, the Fixing America's Surface Transportation or "FAST" Act (the five-year surface transportation authorization passed in 2015) added new requirements for long-range plans to consider projects, strategies, and services that improve system "resiliency and reliability" and reduce or mitigate stormwater impacts.[104] State DOTs are also now required to conduct periodic evaluations on whether "reasonable alternatives" exist to roads, highways, and bridges that have repeatedly required repair or reconstruction as a result of emergency events.[105] In addition, state DOTs are required to consider these evaluations when developing projects and are encouraged to integrate findings in their planning documents as well, such as long-range plans.[106] These new planning requirements, while not citing climate change or sea-level rise specifically, may help encourage the consideration of strategies like managed retreat and asset relocation or disinvestment as long-term approaches to improving resilience and reliability of transportation infrastructure and networks.

For more information on infrastructure tools for managed retreat, see the Infrastructure section of this toolkit.

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The types and examples of plans described above can serve as a starting point for state and local governments looking to incorporate or elevate discussions about or goals and objectives for managed retreat into one or multiple types of planning efforts. Other project- or subject-based plans or guidance documents could be tiered from or created independently of any of these plans. For example, state and local governments that administer buyout programs could produce a plan or policy document that includes criteria to prioritize buyouts among properties volunteered to be acquired.

The important takeaways are that plans, whatever number and/or type, can be used as a strategic and guiding mechanism to proactively plan for managed retreat to maximize benefits and minimize costs for multiple stakeholders and the environment. Furthermore, different plans including elements of managed retreat should be coordinated and clearly linked.

Policy Tradeoffs of Plans

Plans can be used as a mechanism to help governments and communities decide among and prioritize different acquisition, infrastructure, regulatory, and market-based tools in their communities. Governments will have to choose between different types of plans to determine which options are better suited to meet state and local needs and specific objectives for managed retreat (e.g., an ecosystem plan to facilitate wetland migration in a more rural area, updates to comprehensive plans to prioritize investments in receiving areas in urban centers). Plans should be used in combination with and not to the exclusion of acquisition, infrastructure, regulatory, and market-based tools. Accordingly, it is more important for decisionmakers to determine what types of plans and planning processes can best meet state and local needs for retreat than weigh the policy tradeoffs of plans against other tools to select one type of tool over the other.

Moreover, since plans come in a variety of types and sizes, since they are created for different purposes, and take place at multiple jurisdictional levels, it is difficult to present every potential policy tradeoff of planning tools in a single table. For example, a local government with limited staff and funding resources might decide to prioritize investments in plans that can come with potential project funding opportunities, like a hazard mitigation plan, over a local long-term visioning plan. In contrast, some municipalities may have multiple types of plans with a managed retreat nexus. There are, however, some overarching policy considerations state and local governments can think about before initiating planning efforts:

- **Administrative:** Whether a short- or longer-term plan, plans require investments in government staff to start and sustain planning processes for activities that can often span multiple months or years and engage many diverse stakeholders. Smaller or rural communities may face more resource constraints and have less funding allocated to support specialized planning staff for these purposes. In addition, preparing a plan can be expensive and potentially cost-prohibitive for some governments. There are costs associated with the staff time needed to administer the process, retain specialty consultants to draft the plans, and expenses for data collection and engaging with the public. Federal and state grants to local governments are often limited by caps on how much money grantees can spend on planning or administrative functions and tasks. It is important that governments consider opportunities to fund planning processes in conjunction with project implementation.

- **Social/Equity:** Plans are more successful when communities are engaged throughout their conception, development, and implementation. Plans can serve as an effective vehicle for bringing communities together, elevating community voices and concerns, ensuring communities have influence on the process and are included in the decisionmaking, and minimizing inequities by enabling governments to “manage” or be more strategic, inclusive, and thoughtful about the social and economic consequences of climate adaptation and managed retreat. For more information on community engagement and equity in a managed retreat context, see the Crosscutting Policy Considerations>Community Engagement and Equity section of this toolkit.

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Practice Tips

When implementing planning tools in a managed retreat context, decisionmakers may consider the following practice tips:

- ***Invest in data at an appropriate scale:*** Physical impacts from sea-level rise, storm surge, different types of flooding (e.g., precipitation), and coastal erosion are the impetus or drivers for state and community decisions to retreat. Accordingly, governments will need the best available scientific data and information on an appropriate scale to effectively guide and inform planning, legal, policy, and project decisions on the ground. This data must be highly placed-based and is key to helping governments and communities identify what coastal areas may necessitate retreat and if so, when and how. While some governments may already have the necessary data, others will have to invest in or look for opportunities to obtain data before they can engage their agencies and communities in discussions about managed retreat. Federal agencies (e.g., National Oceanic and Atmospheric Administration, U.S. Geological Survey) and conservation nonprofits (e.g., The Nature Conservancy) may already have data on an appropriate scale that governments can use to inform the development of their plans and corresponding legal and policy decisions. Alternatively, state and local governments may have to consider grant or other funding opportunities to initiate partnerships to collect this data from scratch. Of particular note, flood data from the Federal Emergency Management Agency (FEMA) can serve as a starting point, but it has its limitations. Specifically, FEMA's data only includes historical and not future flood data, does not incorporate climate change considerations, and may not present data for a community's most at-risk areas outside of the 100-year (one-percent annual chance) floodplain, particularly for locations that are experiencing compounding flood risks.

  While scientific data is important, community residents — particularly those who have lived in an area for a long time or have historical or cultural ties — can provide additional types of data or information based on historical or lived experiences that, among other things, can help governments better understand cyclical or long-term changes on the coast to inform climate adaptation discussions (e.g., Louisiana Strategic Adaptations for Future Environments or "LA SAFE," Quinault Indian Nation Taholah Village Relocation). Governments, therefore, should aim to make data collection processes as comprehensive as possible and reach out to more than just scientific and coastal experts. In addition to scientific data, it will also be important for governments to gather and analyze other types of data like economic, housing, demographic, and habitat- and species-specific data to make more resilient investments to account for shifting human and natural resources populations (e.g., Louisiana Coastal Master Plan). Complementary datasets will be key to crafting well-rounded, interdisciplinary approaches for managed retreat.

- *Collaborate across agencies and levels of governments:* Given the interdisciplinary nature of managed retreat, it will be crucial for governments to collaborate across agencies and different levels of government (i.e., federal, state, and local) and integrate relevant plans that address various components of a managed retreat strategy. Although government collaboration and planning integration require investments in staff time and resources, they can contribute to more comprehensive strategies that increase the potential for maximizing and more equally distributing the various benefits of managed retreat while minimizing associated costs. For example, plans can enable governments to leverage limited staff time and funding to identify and implement managed retreat laws, policies, and projects that can achieve co-benefits for multiple stakeholders and the environment. Strategic and guiding mechanisms like plans — or intra- or inter-governmental committees or coordinating bodies built around a plan — can allow different agencies and levels of government to contribute their individual jurisdiction or expertise to a collective "bigger picture" vision for managed retreat.

- *Plan over both short- and longer-term time horizons:* One of the systemic risks associated with short-term planning is that the long-term impacts of climate change are not being adequately incorporated into decisionmaking. Since there is no "one-size-fits-all" approach for planning, governments should consider developing plans over different and multiple temporal horizons. Physical impacts from climate change will manifest differently over time in places and planning processes can help governments coordinate the legal and policy decisions related to those impacts. Planning over shorter-term (e.g., ten years or less) and longer-term time horizons (e.g., more than ten years) will prompt different types of questions and needs that should be addressed proactively in the appropriate types of plans to guide managed retreat decisions both today and tomorrow. Importantly, short-term or present decisions about investments with multiple-decadal life spans (e.g., infrastructure) will have long-term consequences if future development and redevelopment are not designed and sited with sea-level rise, flooding, and coastal erosion in mind.

  In addition, states and communities make decisions along different time horizons (e.g., two- or four-year election cycles, 20-30-year mortgage or infrastructure investments). As a result, plans can be used as a tool to foster cooperation among policymakers and residents in ways that align with important life decisions and milestones. A coordinated approach can help to frame discussions about climate adaptation and managed retreat in more understandable or analogous terms that can create political and community buy-in to advance and support planning and potential implementation efforts.

- *Create flexible planning models and tools, including phased approaches:* State and local governments should consider opportunities to design and implement flexible planning models that can absorb and respond to different factors like changing physical impacts on the coast, community needs and priorities, and other administrative factors (e.g., funding availability, state and local policy or political changes). For example, governments can evaluate how to apply adaptive management principles in their plans, particularly for novel or evolving projects that are anticipated to be implemented and have uncertain impacts or effects. Moreover, flexible and phased approaches to community-driven plans can be used to shape and manage community

expectations and mitigate the potential costs of managed retreat. Notably, elected officials, agency policymakers, and residents may be more willing to engage in longer-term planning efforts for managed retreat if potential policies and tools are phased in over time. Specifically, a plan to implement policies over a longer time horizon can mitigate potential losses to local tax bases, economies, and community character and networks.

- ***Align plans with the prerequisite and supporting actions needed to implement managed retreat strategies:*** Plans can serve as strategic guidance for implementation and help coastal communities respond to climate change impacts. Durable planning documentation can provide enhanced legal certainty to support resilient investments in communities. Plans can also assist governments in taking actions that will have to occur or take place before managed retreat strategies can be implemented. These actions can include removing barriers to implementation by proactively identifying potential funding sources or amending land-use and zoning ordinances. By incorporating these supporting actions into planning efforts, governments can also assess the feasibility of different managed retreat strategies and either prioritize or eliminate many at the early planning phase before investing time and resources into those strategies at the point of implementation.

- ***Remove procedural barriers to equitable participation in planning processes:*** As with all aspects of developing comprehensive managed retreat strategies, governments should provide communities with the tools, information, and opportunities they need to meaningfully engage and actively participate in planning processes. Governments can make upfront investments to support outreach and educational and information needs by providing meals, daycare, and compensating participants for their time with a stipend to defer travel costs. Allocating funding to support community engagement removes procedural barriers to equitable participation. These investments can ultimately increase the number of people who are able to participate and encourage valuable input through sharing important first-hand knowledge of coastal flooding impacts and community needs. Community insights can be factored into the design and selection of a plan's mission and vision statements, goals, objectives, and potential adaptation projects. For more information, see the Crosscutting Policy Considerations>Community Engagement and Equity section of this toolkit and Georgetown Climate Center's Equitable Adaptation Legal and Policy Toolkit.
- ***Build community capacity to participate in planning efforts:*** In addition to encouraging and facilitating participation from all interested residents, governments should also evaluate opportunities to build local capacity for residents to lead and meaningfully contribute to planning processes and their implementation. For example, as part of the Louisiana Strategic Adaptations for Future Environments or "LA SAFE" community engagement planning process, the state partnered with a nonprofit, the Foundation for Louisiana, to train local facilitators who played an active role in leading the development of local adaptation plans. Facilitators were offered stipends to compensate them for their time and contributions to the process. Governments can also design and implement plans in ways that can be used as a vehicle to build local capacity.

- ***Build public-private partnerships:*** State and local governments can build various types of partnerships to offset some of the administrative, economic, and social costs of planning processes for managed retreat. For example, public-private partnerships with universities or nonprofits could be used to collect localized data, engage communities in planning discussions and determine how plans can best support local needs to minimize social costs, and evaluate how projects identified in plans can be implemented on the ground. Nonprofit organizations like Urban Land Institute are working to bring private sector investors, developers, and economic development officials to the decisionmaking table as well.

Infrastructure

One challenge that governments face when deciding whether to implement a managed retreat strategy is how to develop that strategy in the context of public infrastructure assets, such as roads and bridges.[107] Rising sea levels in some areas are causing coastal roads and other public infrastructure to experience more frequent inundation during king tides or even daily high tides, more severe erosion and flooding from coastal storm events, and in some cases inundation or pooling from below that extends further inland as groundwater tables rise. These impacts create public safety hazards and prevent public infrastructure from functioning as intended, as flooded roads cause traffic delays, require detours, and in some cases, temporarily cut off sole access to communities. Roads that have been eroded, washed out, or weakened structurally (e.g., by heightened groundwater tables) can require more frequent and costly maintenance and repairs. Infrastructure agencies are increasingly confronting these challenges and can benefit from tools to help evaluate the tradeoffs of different policy, planning, design, and operational and maintenance strategies to minimize travel-related impacts from coastal hazards. **This section currently focuses primarily on decisionmaking considerations for *public roads*** in a managed retreat context, but does include several case studies and examples applicable to other types of infrastructure (e.g., drainage assets).

Road damage from Hurricane Sandy in Delaware. Source: Delaware Department of Natural Resources and Environmental Control.

Departments of transportation (DOTs) and other authorities overseeing roads and bridges have many factors to consider in making decisions about infrastructure capital investments, maintenance, and operations. Climate change and sea-level rise increasingly pose a challenge for cost-conscious agencies that must now factor in higher upfront adaptation costs or higher maintenance costs over the lifetime of assets. An expectation that assets will be subject to more frequent and severe flooding and erosion requires infrastructure agencies to consider whether to protect or modify the designs of their assets to withstand future conditions, to realign or relocate certain assets to less vulnerable areas, or to disinvest by phasing out maintenance or abandoning assets altogether.

Further complicating matters, managed retreat strategies may require collaboration between multiple levels of government. Authority over roads and bridges may often be shared by state, county (if the state has county government structure), and municipal governments, as well as regional agencies such as metropolitan planning organizations (MPOs) for urbanized areas. For example, a particular road or bridge asset may primarily serve a specific municipality but may be under state or county jurisdiction; and multiple state agencies and local governments might oversee different types of infrastructure that all occupy the same area, such as roads, bridges, dams, and levees or dikes. In the context of managed retreat, infrastructure owners and operators will likely need to collaborate with other agencies and decisionmakers at local and state levels to ensure that the approaches to infrastructure resilience or retreat are consistent with the larger strategy.

Utqiagvik, Alaska. Source: NOAA.

This section focuses on the policy options for state and local governments, particularly transportation agencies, to prepare public transportation infrastructure assets for coastal impacts of climate change by (1) modifying asset design or adding protective features, (2) relocating or realigning assets, or (3) disinvesting in assets in high-exposure areas. These strategies each come with important legal, fiscal, and practical considerations that must be weighed by the decisionmakers overseeing assets, such as asset use and criticality, design life and anticipated lifecycle costs, potential for legal challenges, and more. For each of the policy options, there is an overview of the option, discussion of policy tradeoffs, practice tips to aid in implementation, and case study examples on how some of these options have been implemented in practice.

Design Modifications and Asset Protection

Introduction to Design Modifications and Asset Protection

Governments and infrastructure agencies are increasingly turning attention to the need to ensure that public infrastructure is planned and designed to withstand future climate conditions and extreme events. As the availability and quality of climate data and projections improve, this is slowly becoming a less daunting task. In coastal areas, design and protective modifications include measures such as elevating roads and bridges, protecting assets with hard structures or nature-based features,[108] and modifying pavement materials or structural design to be more resistant to effects from inundation or to minimize environmental impacts if flooded or washed out (e.g., "sacrificial" roads).

Corpus Christi is exploring nature-based solutions to protect a vulnerable section of Laguna Shores Road. Source: Corpus Christi MPO.

Looking south at the project location on Laguna Shores Road under typical (non-storm) conditions.

Transportation agencies can utilize resources such as the Federal Highway Administration's engineering circular, *Highways in the Coastal Environment: Assessing Extreme Events*, to help with evaluating exposure and vulnerability of coastal highways to sea-level rise and extreme events, and identifying appropriate adaptation approaches.[109]

Adaptive design approaches are being implemented on a project-by-project basis in some states and cities. However, states and local governments, and to some extent, regional transportation planning agencies, can also institutionalize climate change-informed design through the following approaches:

- **State or local law:** Some states and local governments have developed legislative directives requiring agencies to consider future impacts from climate change and sea-level rise in planning or decisionmaking related to public investments. For example, New York's **Community Risk and Resiliency Act** requires the state to adopt sea-level rise projections by regulation and state agencies to consider sea-level rise and storm surge risk in certain permitting, funding, and other decisions.[110] **California's A.B. 2800** (2016) required state agencies to consider "current and future impacts of climate change when planning, designing, building, operating, maintaining and investing in state infrastructure" and called for the creation of a Climate-Safe Infrastructure

Working Group to examine methods for integrating climate change projections into infrastructure engineering.[111]

- **Planning processes:** State DOTs can integrate managed retreat considerations and phased adaptation approaches in planning efforts, such as statewide adaptation planning,[112] long-range transportation planning (and subsequent development of Statewide Transportation Improvement Programs), and asset management planning. Already, under current federal regulations, state departments of transportation must develop risk-based asset management plans that incorporate consideration of how climate change and extreme weather events will affect lifecycle costs.[113] State DOTs and metropolitan planning organizations (MPOs) are required to consider resilience needs in long-range transportation planning processes,[114] and some are also beginning to integrate resilience into performance measures and targets that inform transportation investment decisions.[115] Some state departments of transportation have developed guidance documents to assist their departments, regional agencies, or local governments with integrating climate change and resilience considerations into transportation planning.[116] At the local level, infrastructure-related adaptation needs and phased retreat considerations might be integrated into comprehensive planning and capital improvement planning.[117]
- **Permitting and environmental review processes:** Coastal vulnerability considerations can also be included as a required component of permitting or environmental review processes to ensure that for new assets or redesign, potential vulnerabilities are identified and evaluated and that the project identifies risk-reduction measures.[118]
- **Design standards or design guides:** Another tool that infrastructure agencies have utilized is climate-informed design standards and guidelines. These approaches typically provide appropriate climate change and sea-level rise projections to consider, and minimum design modifications for certain infrastructure categories (e.g., critical vs. non-critical; within or outside floodplains; etc.).[119]

Design Modifications and Asset Protection in a Managed Retreat Context

In the context of a comprehensive managed retreat strategy, asset design and protective features will likely primarily be used as an intermediate strategy to bridge the gap to more permanent solutions like disinvestment. Depending on the function or use of the asset and the timeframe for comprehensive retreat from coastal areas, a disinvestment strategy for public infrastructure may not be initially feasible. In these instances, infrastructure managers may want to consider design-related adaptation strategies to ensure the adequate functioning of assets, especially those

deemed critical. Design modifications can provide an effective intermediate-term strategy for ensuring public safety and infrastructure resilience to coastal hazards while broader long-term retreat strategies and tools are being planned and considered.

Policy Tradeoffs of Design Modifications and Asset Protection

Administrative	• Climate-informed design requires agencies to have access to localized climate change data and projections and knowledge on how to apply this information in engineering and design. Some states and local jurisdictions have developed their own projections for agencies to use; in other cases, infrastructure agencies can look to existing tools, such as those provided by the Federal Highway Administration, including the CMIP Climate Data Processing Tool and Vulnerability Assessment Scoring Tool.[120] • Infrastructure agencies should assess whether any climate-informed decisionmaking requirements exist and when they apply (e.g., planning, environmental review, in the context of capital investments vs. repairs and maintenance, etc.). For example, depending on the agency or level of government, different federal planning requirements that relate to resilience and risk management might apply, including in state and regional long-range planning and state asset management planning. However, states may have implemented additional requirements through legislation or other processes that may affect state agencies or local governments. • In some contexts, design modifications may involve additional administrative complications, such as land acquisition (e.g., with roadway elevation projects, which require widening of the roadbed[121]) and environmental permitting processes.
Economic	• Design modification and asset protection can be expensive, but reduced maintenance costs, avoided travel delays, and other benefits over the lifetime of the asset may make up for these upfront costs. • A robust cost-benefit analysis can help agencies evaluate potential adaptation options and prioritize investments. New resources have been developed to assist transportation agencies in this process, such as the National Academies' *Incorporating the Costs and Benefits of Adaptation Measures in Preparation for Extreme Weather Events and Climate Change Guidebook*.[122]

	• Design modifications and asset protective features should be informed by current and future environmental conditions.
Environmental	• Environmental impacts of these strategies depend on the context and strategy adopted. Design modifications in some instances may result in a net environmental benefit (e.g., when using more environmentally sensitive materials, or elevating a road to facilitate natural processes); hard protective features will often be a detriment to the environment, while nature-based protection can provide a net benefit.
Social/Equity	• Some roads and bridges may be considered "critical" and therefore important to protect and preserve functioning despite high exposure to coastal flooding. This may be the case, for example, for roads and bridges serving as evacuation routes or providing sole access to hospitals or other critical services. • Roads that provide sole access to communities or are otherwise heavily used and serve important functions in the larger transportation network may be prioritized for adaptive design or protective features.

Practice Tips

When considering the need for design modifications or protective features for public infrastructure, as compared to alternative strategies (relocation/realignment, disinvestment), decisionmakers may wish to consider the following practice tips to balance policy tradeoffs:

- ***Build considerations of asset criticality and use into policy, planning, and programmatic approaches:*** Considerations of asset criticality and use can help identify investments in adaptation and infrastructure protection to prioritize. With limited budgets, agencies will need methods and tools to evaluate alternative approaches and prioritize the most critical routes for ensuring safe travel in vulnerable coastal areas. This requires an understanding of how roads are used, the communities they serve, and their roles within the transportation network.
- ***Plan ahead to phase infrastructure design solutions with appropriate lifecycle stages and in the context of longer-term retreat strategies:*** Policymakers and infrastructure agencies can plan and prepare proactively to integrate design changes and adaptation solutions within normal asset management and investment cycles. This might include, for example, evaluating changes in paving needs as part of maintenance and repairs or identifying timeframes for assets approaching the end of their design life to determine whether redesigning with adaptive features may be appropriate. Estimating asset lifecycle costs ahead of time, including changing maintenance and operational costs, will help infrastructure agencies balance potential adaptation investments. As noted above, risk-based asset management planning is required for

state DOTs. Local governments and infrastructure agencies can develop similar approaches to ensure that decisionmaking is informed by an assessment of how future coastal conditions will affect the performance of assets.

- *Adopt an adaptive management approach:* Policymakers can adopt approaches that "[track] hazards, impacts, costs, and effectiveness of adaptations and post-disaster response"[123] to inform future adaptation, realignment, or disinvestment policies and approaches. An adaptive management approach in a retreat context should consider the environmental thresholds at which design and protective features, combined with maintenance and repair, may no longer be sufficient for providing safe travel and keeping a state of good repair and may require a transition to a realignment or disinvestment strategy. Proactive monitoring can help agencies identify when these threshold or trigger conditions are approaching and adjust operational, design, or other management strategies as appropriate. For example, the California Coastal Commission, in responding to a Coastal Development Permit (CDP) application from Caltrans to improve a six-mile section of Highway 101 along Humboldt Bay in Northern California, recommended that Caltrans be required to submit a CDP amendment and Phased Adaptation Plan within one year of the first time the corridor floods at least four times during a twelve-month period (the threshold condition).[124] This phased approach with a triggering condition is intended to ensure that there is time to develop adaptation alternatives for long-term viability (e.g., design modifications, relocation, removal) before sea-level rise conditions begin to challenge travel on a monthly or daily basis.
- *Understand legal interpretations of the duty to maintain/repair and implications for coastal assets requiring more frequent maintenance:* As discussed in the Crosscutting Legal Considerations>Negligence section, infrastructure owners and operators have a duty to maintain and repair the public infrastructure they oversee, and the specific responsibilities to meet the requirements of that duty varies according to state statutory and case law. Infrastructure agencies should be aware of any legal interpretations affecting their jurisdiction that might expand this duty to encompass an affirmative duty to upgrade or improve in the context of environmental conditions like sea-level rise and nuisance flooding that increasingly and more rapidly deteriorate coastal roads. Expanded duties could have implications for agency maintenance and capital budgets, and may affect considerations about when to formally disinvest as opposed to protecting or redesigning assets.

Asset Relocation and Realignment

Introduction to Asset Relocation and Realignment

Beyond protecting or redesigning assets in-place, agencies can consider relocating (or "realigning") as another alternative to formal disinvestment. Relocating or realigning roads, or high-risk segments of roads, to less vulnerable locations may offer a longer-term solution than design modifications or protective measures. This approach has been utilized in some coastal states to ensure longer-term safety of roads threatened by erosion, frequent inundation, or washout from storms and to reduce future maintenance needs of roads.

State DOTs in particular may be encouraged to consider options for realignment when dealing with coastal highways that are vulnerable to extreme events. Under Federal Highway Administration regulations, state DOTs are required to conduct periodic evaluations to determine if reasonable alternatives exist to roads, highways, or bridges that have repeatedly required repair and reconstruction activities due to emergency events such as natural disasters.[125]

Erosion affecting SR 1 in Sonoma County, CA, where Caltrans is pursuing realignment. Source: Caltrans.

The intent is to encourage more cost-effective transportation planning and investment. The results of these evaluations are to be incorporated when state DOTs develop projects and are encouraged to be considered in long-range planning.[126] While these requirements do not apply at the municipal level, nor do they require analysis of repeated damage from non-emergency events such as high tide flooding, they may help encourage infrastructure agencies to plan proactively and build analyses and justifications for relocating infrastructure in high-risk coastal areas.[127]

Asset Relocation and Realignment in a Managed Retreat Context

In the context of a coastal area considering the need for managed retreat in the future, a road relocation or realignment strategy is likely a temporary solution, albeit an often longer-term solution than design modifications or protective features. Where additional near-term managed retreat tools are being pursued, this strategy may not be necessary or appropriate as use of the road would be expected to dwindle as retreat tools are implemented, leading in the extreme to a scenario where a resilient road does not serve any community. Transportation agencies might consider developing a proactive phased approach to public infrastructure disinvestment as part of a managed retreat strategy, which may include road realignment as a strategy to bridge the gap (as

with design modifications and protective features) to permanent disinvestment. However, this strategy comes with significant administrative and financial burdens, and accordingly agencies will likely reserve this option for the most critical or heavily used routes.

Policy Tradeoffs of Asset Relocation and Realignment

Administrative

- Road relocation and realignment is likely to require new right-of-way or other land acquisition, which can be administratively and financially challenging.
- These projects therefore may have to undergo environmental review pursuant to the National Environmental Policy Act (NEPA)[128] and/or any state environmental review requirements (as applicable),[129] in addition to ensuring compliance with other environmental statutes. The level of administrative burden caused by environmental compliance will depend on the proposed location for the realigned road, including land ownership, land use(s), communities served or affected, and surroundings (e.g., environmentally sensitive land such as wetlands).

Economic

- Relocating a road or section of road involves substantial costs, including to complete feasibility and other studies, secure permits, acquire needed land or right-of-way, and construct the new road. Accordingly, agencies may wish to reserve this option for corridors that are heavily used, are evacuation routes, or provide an important or sole means of access to communities, critical services, or other parts of the transportation network.
- Environmental reviews and analyses and other permitting processes may require substantial upfront costs and time to complete.
- However, the benefits of road realignment may outweigh the administrative and construction costs where the strategy is expected to significantly minimize or eliminate the need for any repairs beyond routine maintenance of pavement, for example, over the lifetime of the road.

Environmental

- Road relocation can provide environmental benefits by allowing the previous right-of-way to revert to natural conditions and provide a coastal buffer and opportunities for ecosystem migration.
- However, this strategy involves building a road where one previously did not exist, and accordingly may also have negative environmental impacts, especially if sensitive ecosystems are disrupted. These impacts should be evaluated through environmental review and mitigated to the maximum extent possible.

Social/Equity	• Agencies considering road relocation and realignment should engage with communities that might be affected by the new siting and by any closures anticipated during construction, to gather public input and to provide information regarding any construction-related or permanent travel delays or other community impacts from detours or new route siting. • As roads typically provide the primary or only means of accessing the coast, decisionmakers may need to evaluate trade-offs of relocating roads inland and the effects on public access to the coast, and identify potential strategies to mitigate the effects on access.

Practice Tips

When considering the need for relocating/realigning public infrastructure such as roads and bridges, as compared to alternative strategies (redesign in place, disinvestment), decisionmakers may wish to consider the following practice tips to balance policy tradeoffs:

- *Engage the public and communities likely to be affected by a road relocation or realignment strategy:* This includes users who may be affected by any closures anticipated during construction or by the new siting of the route. Governments should solicit input through public meetings and active community outreach early in the planning process to identify community concerns and aim to address or mitigate them during siting, design, and construction. For example, a realignment strategy may elicit concerns of loss of public access to the coast, travel delays, impacts to communities located near or around the original alignment and the proposed realignment, and more. In particular, residents and communities located in the areas proposed for a new road alignment should be engaged in the decisionmaking process at all stages in order to ensure that there will not be any adverse impacts to community cohesion or economies. Past practices relating to siting of the Interstate Highway System, for example, provide stark examples of how government decisions relating to infrastructure siting can destroy or isolate vibrant neighborhoods. Decisionmakers should learn from these mistakes of the past and view public and community engagement as a critical and ongoing component of the decisionmaking process in this context.

- *Develop robust analysis and projections of future conditions to inform a realignment strategy:* Given the significant administrative and construction costs of this strategy, decisionmakers will want to ensure the relocated road will last under future conditions for the full desired lifetime of the asset. Therefore it is important to have robust science and data regarding coastal impacts that the existing road is experiencing, like tidal flooding and erosion, and to understand how those impacts may continue, change, or accelerate in the future to determine siting options that will ensure long-term safety of the road.

- *Integrate relocation and realignment strategies for high-risk coastal assets into transportation planning efforts and consider appropriate timing within asset management and investment cycles:* As discussed above, state DOTs are required to develop risk-based asset management plans and to conduct periodic evaluations of alternatives to roads, highways, and bridges that have required repeated repairs due to emergency events. The information generated through periodic evaluations can inform both asset management and long-range planning and help transportation agencies evaluate timing of and potential funding to implement relocation and realignment strategies for repeatedly damaged roads.[130] For example, FHWA has clarified that both Federal-aid highway funding[131] and Emergency Relief (ER) funding[132] following disaster events can be used for resilience purposes, which may include design or protective measures and relocation strategies. In the case of ER funding, "betterments" that replace an asset with resilience improvements compared to the pre-disaster design or siting can be justified and federally reimbursed if the resilience improvement are required by newer standards in place at the time of disaster (e.g., state highway siting and design criteria) or if economically justified.[133] Agencies eligible to receive federal disaster recovery funding for transportation can therefore plan ahead by identifying opportunities to rebuild more resiliently in following the next storm event and by adjusting siting and design criteria, codes, and standards in advance of the next storm event.

- *Adopt an adaptive management approach:* Policymakers can adopt approaches that "[track] hazards, impacts, costs, and effectiveness of adaptations and post-disaster response"[134] to inform future adaptation, realignment, or disinvestment policies and approaches. An adaptive management approach should consider the thresholds at which a protect-in-place strategy might give way to a realignment strategy, or at which a realignment strategy might give way to disinvestment as a more viable permanent solution. Thresholds might include environmental conditions such as the number of times inundated in a year, or policy triggers such as the implementation of other managed retreat tools that results in shifting public needs and priorities. Adaptive management should involve monitoring conditions proactively in order to leave time for planning and engagement around disinvestment strategies as threshold or "trigger" conditions are approaching.

Infrastructure Disinvestment

Introduction to Infrastructure Disinvestment

Agencies overseeing transportation infrastructure often must make difficult decisions regarding maintenance needs and priorities given budgetary constraints and other challenges. Disinvestment in general refers to a process of consciously allowing an infrastructure asset to "fall below previously accepted standards of condition or performance," typically to be able to reduce long-term investment in the asset and prioritize resources elsewhere.[135] This is in contrast to underinvestment in infrastructure, which refers to a gap between funding needs to prevent asset deterioration and actual funding levels but is less of a conscious decision than disinvestment

(though it may in some instances have the same practical effect, i.e., infrastructure that does not meet its standard of performance). The need for disinvestment may arise in contexts such as shifting use of the infrastructure, aging infrastructure, budgetary constraints, and climate change-related risks.[136]

Source: Town of Milton, Massachusetts.

In this section, the term "disinvestment" is used more specifically to refer to strategies that either phase out maintenance of roads or affirmatively abandon or discontinue roads where coastal conditions make upkeep challenging or prohibitive. Disinvestment strategies may include, for example:

- Official abandonment or road closure via legislative or administrative proceedings as specified in state statute or otherwise authorized;[137]
- Downgrading roads to reduce the level of service and maintenance requirements; and
- Phasing out maintenance as environmental conditions degrade to certain threshold levels, as laid out and provided for, e.g., in a plan, statute, or ordinance.

Infrastructure Disinvestment in a Managed Retreat Context

Road washout on Olympic Peninsula in Washington. Source: National Park Service.

Ultimately, state DOTs and local governments may have to adopt a disinvestment strategy for road infrastructure that is repeatedly flooded and damaged or otherwise at high risk of regular damage due to sea-level rise and coastal conditions. Where coastal roads are frequently flooded, eroding,

or experiencing storm-related damages, underinvestment may already be a concern leading to poor infrastructure performance, traffic delays, and safety concerns. A more deliberate approach through disinvestment may provide the most practical strategy to reduce the risk of public harm caused by traveling a road in unsafe condition – particularly where the alternatives (more frequent maintenance/repairs, road redesign or protection, or realignment) would place a far greater strain on the agency or municipal budget.[138]

These strategies each come with different considerations, benefits, and drawbacks. For example, disinvestment can help address public safety concerns and ease the burden of mounting maintenance costs as coastal roads are more frequently inundated and damaged by tidal flooding and storm events. However, these strategies may come with legal risk. For example, a disinvestment strategy may be challenged as a "taking" of private property (typically, right of access to the road network) without just compensation. Agencies should understand the legal issues arising in the context of disinvestment (overviewed below and discussed further in the Crosscutting Legal Considerations section).

Policy Tradeoffs of Infrastructure Disinvestment

Administrative	• Robust data on asset condition and performance, environmental conditions (e.g., as provided by Road Weather Information Systems and other monitoring infrastructure), and anticipated climate change/sea-level rise impacts are important to inform disinvestment decisions. • Some disinvestment strategies may require complicated state-mandated administrative procedures, such as those relating to downgrading of roads or pursuing formal abandonment/closure/discontinuance of a road. Others may be incorporated into transportation planning and programming or adopted as passive disinvestment policies of reduced maintenance. • Agencies considering infrastructure disinvestment may need to evaluate various legal risks of disinvestment decisions, as discussed below and in further detail in the Crosscutting Legal Considerations section.
Economic	• Where a disinvestment strategy is being considered, it is likely due at least in part to budget strain and maintenance costs that have far surpassed the anticipated lifecycle costs of the asset. A cost-benefit analysis in a disinvestment scenario will need to consider factors such as: cost savings from not having to repeatedly maintain and repair the asset (or to modify design, add protective features, or realign the road), user delay and detour costs and related economic impacts,[139] any costs to physically remove or decommission infrastructure, and potential costs of legal liability (e.g., a successful takings claim).

- Robust economic analysis can help inform decisionmaking related to disinvestment, especially permanent closure or abandonment. Importantly, this analysis can also help make the case for disinvestment to the public, legislatures or city councils, and other stakeholders.

- Disinvestment decisions, as with design and relocation or realignment decisions, should be informed by current and future environmental conditions and a risk management approach.

Environmental

- The environmental impacts of disinvestment may vary depending on the particular strategy and geographic context. In the context of road closure, for example, there may be environmental benefits if the road is removed and natural features of the landscape restored. However, in a disinvestment scenario of reduced maintenance, there could be exacerbated environmental impacts from erosion and washout of road materials, for example.

- Understanding the use, importance, and role of the asset in the transportation network as a whole can help agencies make decisions regarding appropriate disinvestment strategies.

Social/Equity

- Residents, businesses, and other users of the transportation network should be engaged and informed in decisionmaking and discussions related to disinvestment in order to help avoid or minimize potential impacts to the community.

Practice Tips

When considering the need to disinvest in public infrastructure through reduced or phased out maintenance or road closure/abandonment, decisionmakers may wish to consider the following practice tips to balance policy tradeoffs:

- ***Integrate disinvestment strategies or policies into transportation planning and programming:*** Long-range planning at state and regional levels involves specifying and documenting performance measures and targets that will help achieve national goals, including *safety*, *infrastructure condition* (state of good repair), and *environmental sustainability*, among other goals.[140] State DOTs and MPOs, therefore, might consider integrating resilience and the need for disinvestment into these documents as a means of meeting performance goals.[141] These plans provide the basis for transportation improvement programs (the list of projects to be funded over a five-year timeframe), which then can provide the platform for ongoing decisions

about specific infrastructure investment and disinvestment needs.[142] Local governments can similarly integrate disinvestment into local planning processes such as comprehensive planning and capital improvement/investment planning. Infrastructure decisionmakers and planners can assess the effects of underinvestment in coastal roads where maintenance or upgrade needs have surpassed agency capacity and budget and use this information to inform a more strategic disinvestment policy.

- *Evaluate an asset's use, criticality, and/or role in the system as a whole when considering disinvestment:* For a road that is heavily used or considered "critical" (e.g., serving an important network function, providing sole access to critical goods and services, etc.), or that provides sole access to homes, disinvestment may not be a viable option until other managed retreat strategies have been implemented, significantly reducing the road's use and importance. Agencies will need to consider the context of the surrounding areas and use factors such as annual average daily traffic and the type(s) of vehicles using the road (e.g., freight vs. passenger) when evaluating the feasibility of a disinvestment strategy for a high-risk coastal road.

- *Consider phasing disinvestment as appropriate in the context of asset use and criticality, infrastructure condition, and the implementation of other managed retreat tools:* The timing of a disinvestment strategy should be informed by the asset's criticality and use as mentioned above. For less utilized and non-critical roads, more immediate disinvestment may be a viable option to address safety and budgetary concerns of increasing maintenance needs. For heavily used or critical roads, a longer-term strategy towards disinvestment may be appropriate, such as by integrating a phased disinvestment policy into planning documents or local ordinances. The infrastructure condition in real-time may also factor into the timing or type of disinvestment decision. For example, reducing maintenance may offer a viable near-term strategy with the expectation that the road may not be rebuilt after significant damage (e.g., from a storm event) or when certain threshold environmental conditions are reached, which might be laid out in ordinance, for example.

- *Engage community members, businesses, emergency responders, and other stakeholders early in planning processes before initiating a disinvestment strategy for a particular road or asset:* A disinvestment strategy may be more politically feasible if all interested stakeholders are informed of: the asset's vulnerabilities and related safety concerns; economic impacts of maintaining the same asset condition or performance versus disinvesting; and anticipated travel delay or access-related impacts for community members and emergency responders. Outreach and engagement can also help inform governments on how the infrastructure in question is used, its importance to the transportation network, and whether and how any anticipated travel impacts such as detours or loss of access can be mitigated.

- *When considering disinvestment strategies, evaluate government authority and procedures available:* If considering formally disinvesting in coastal roads, agencies should be familiar with authorities and requirements established in state law. For example, the state may set uniform minimum design and maintenance standards that could inhibit efforts to disinvest in the form of

phasing out maintenance.[143] In the context of formal road closure or abandonment, agencies should understand the abandonment proceedings available to them and the factors that go into any analysis of whether abandonment would be reasonable. State law typically establishes a standard for when abandonment or discontinuance is permissible[144] and state courts may have further elaborated on these standards by identifying factors that must be weighed in determining whether tests like "substantial public purpose," "public interest," and "reasonable means of access" have been met. The specific standards and factors may differ depending on municipal, county, or state level as well.

- *Evaluate the potential for negligence claims arising from reduced maintenance of coastal roads:* If the disinvestment strategy sought involves phasing out maintenance without formally closing or abandoning the road, agencies should be familiar with how the duty to maintain roads has been interpreted in their jurisdiction and assess whether reduced maintenance might result in negligence claims and if sovereign immunity applies (typically depending on the distinction of discretionary versus operational functions of government, as discussed in Crosscutting Legal Considerations>Negligence).[145] These claims may be warded off by adopting a more proactive disinvestment strategy that lowers the maintenance standards for the road, such as by reclassifying the road to reduce the level of service and providing notice to travelers regarding road conditions.[146] However, such approaches might open the agency to takings claims if it effectively prevents access (as discussed further below and in Crosscutting Legal Considerations).

- *Evaluate the potential for takings claims resulting from a disinvestment strategy, especially road abandonment or closure:* Agencies considering disinvestment strategies, particularly abandonment or other means of permanent road closure, should understand the legal standards for when a "taking" of private land has occurred. This is typically dependent on the specific facts and circumstances and will involve examining context such as: the level of interference the road closure causes for property owners (i.e., how their direct access and access to the public road network as a whole is affected), whether the interference or inconvenience of access is specific to one landowner or more general, whether reasonable alternative access options are available, and how the road or road system is used and whether the same level or type of access (considering, e.g., load restrictions) is provided in alternate routes. To reduce the likelihood of successful takings claims, agencies could implement proactive policies that establish guidelines or formulas in planning, policy, and law or ordinance, as discussed above. Demonstrating awareness of the challenges and importance of the decisions, providing ample opportunity for public input, and providing robust due process for property owners may help courts recognize the inevitability of retreat in some instances. Potential legal issues relating to infrastructure disinvestment and takings are discussed further in the Crosscutting Legal Considerations section.

Acquisition Tools

Given the amount of privately owned land throughout most of the United States,[147] particularly on the coast, state and local governments that adopt managed retreat strategies should evaluate opportunities to use land acquisition powers to transfer more land to public ownership. Publicly owned, compared to privately owned land, can be held for the benefit of communities and the environment. Land acquisitions can occur through either the purchase of properties in fee simple or development rights (to part of or an entire property) through easements. Acquisition tools can require the expenditure of public and private funds (buyouts and open space acquisitions) and/or the in-kind exchange of land (land swaps).

Acquisition tools should be conceived of and communicated as one part of a comprehensive managed retreat strategy to facilitate the transition of people and coastal ecosystems away from vulnerable areas. By linking acquisitions with other tools (e.g., planning, regulatory, market-based), decisionmakers can minimize the social disruption of acquisitions and maximize economic, environmental, and social benefits by restoring acquired lands. This toolkit presents examples of how state and local governments and nongovernmental partners are implementing different buyout and acquisition tools to achieve these outcomes. Governments and residents should evaluate and address the tradeoffs that come with land acquisitions at the outset of climate adaptation and retreat decisionmaking efforts. For purposes of this section and the toolkit, all acquisition tools are presented as voluntary acquisitions in contrast to eminent domain. While eminent domain is a legally feasible option state and local decisionmakers may consider for purposes of effectuating managed retreat, it is not likely a politically viable adaptation strategy, particularly for residential areas.

This section will introduce five types of acquisition tools that state and local coastal governments could include — one, a few, or all — as part of a comprehensive managed retreat strategy.

Large-scale flooding, known as the "Halloween Flood of 2013," in Austin's Onion Creek neighborhood. Credit: Watershed Protection Department, City of Austin.

Voluntary Buyouts

Introduction to Voluntary Buyouts[148]

When thinking about managed retreat, "voluntary" property buyouts — where people choose to accept a buyout offer — are often the first adaptation tool that comes to mind (compared to eminent domain or "involuntary" buyouts and acquisitions). While buyouts are a valuable tool to acquire properties in vulnerable coastal areas and remove *existing* structures, they should be coupled with other tools discussed in this toolkit to prohibit, regulate, and discourage *future* development or redevelopment as part of a comprehensive retreat strategy.

Most[149] state and local governments use the terms "buyout" and "acquisition" interchangeably to describe the set of actions whereby a government generally: purchases a property from a willing seller, demolishes existing structures on the property, and prohibits future development (i.e., through deed restrictions or a conservation easement) and allows the property to naturally revert to open space (or be restored to specific environmental conditions depending on varying degrees of human intervention) in perpetuity; post-buyout, property ownership can vary among different entities including the government (federal, state, or local) or nonprofit conservation or land trust organizations. Properties purchased through buyouts are generally acquired for hazard mitigation and passive recreational purposes and will already be developed (compared to open space acquisitions of undeveloped property with a high conservation value). For purposes of clarity in this

toolkit, “buyouts” will be used distinctly to only describe the former compared to “open space acquisitions.” Buyout programs can be administered at the state (e.g., New Jersey Blue Acres Program) or local levels (e.g., Charlotte-Mecklenburg County, North Carolina, City of Austin and Harris County, Texas, New York City, New York).

Credit: Sandy Urgo, The Land Conservancy of New Jersey.

In regards to scale, buyouts can proceed on a parcel-by-parcel basis or more comprehensively either within a defined area (e.g., a neighborhood), or, where an entire community is relocated (e.g., Isle de Jean Charles, Louisiana). While the latter community-level relocations are an emerging concept in response to climate change and sea-level rise,[150] and likely to be rare in the foreseeable future, it may become increasingly common for governments to move beyond individual, standalone buyouts and evaluate the need for larger-scale buyouts in a jurisdiction’s most vulnerable coastal areas. Specifically, as the threats of sea-level rise, flooding, and erosion become more widespread over time, an increasing number of people, from residential homeowners to landlords and tenants, to commercial business owners, will have to weigh the costs of “staying in place” against the benefits of relocating to higher ground. Where enough consensus from residents can be generated, state and local governments can seek to work through community-based and -driven processes to facilitate larger areas for buyouts, whether the buyouts occur all-at-once or through a phased approach (e.g., to align with funding availability or when set regulatory requirements are triggered, such as like minimum beach width, are triggered). Larger bought-out areas can maximize the benefits that buyouts can offer, including flood reduction through the greater conversion of open space and minimized or eliminated government costs for providing services (e.g., emergency, infrastructure development and repair) to remaining hold-out residents.

Buyouts in a Managed Retreat Context

Historically, buyouts in the U.S. have predominantly occurred post-disaster in riverine floodplain communities, particularly in the Midwest.[151] Moreover, buyouts have not traditionally been implemented as a part of proactive efforts to prepare for climate impacts, but are more often reactive responses to extreme storms or flooding events.[152] Riverine examples of state and local buyout programs, like those featured in this toolkit, can provide a longer-term lens and lessons learned to avoid “reinventing the wheel” for coastal decisionmakers increasingly encountering similar questions in response to climate change.[153]

Regardless, the large cost of coastal development and its force as an economic driver can pose political and funding hurdles that are likely to be magnified in a coastal context. The high value of coastal properties and potential reductions in local tax bases can act as barriers for governments considering buying out homes even if they will result in post-disaster benefits and reduce risk. This latter barrier is especially challenging for local governments in states like Alaska, Florida, and New Hampshire where property taxes are a primary form of government revenues. Regardless, as sea levels rise and coastal impacts become more pronounced, real estate and insurance markets may begin to factor in increasing risks of flooding that affect property values in high-risk areas ahead of government action. Some communities have successfully mitigated the negative financial consequences of buyouts by: encouraging and facilitating relocation within the same jurisdiction (e.g., Lumberton, North Carolina, Minot, North Dakota); using buyouts to generate overall cost savings by phasing-out infrastructure and services (e.g., Charlotte-Mecklenburg County, North Carolina, Oakwood Beach, Staten Island, New York, Woodbridge, New Jersey); generating additional tax revenues by incorporating trails and other recreational amenities on bought-out properties for nearby homes (e..g, Charlotte-Mecklenburg County, North Carolina, Harris County, Texas, Woodbridge, New Jersey); and generating new sources of revenue from bought-out properties (e.g., leasebacks in Charlotte-Mecklenburg County, North Carolina and Wyoming County, West Virginia). State and local coastal governments could learn from these and other examples to support potential buyout strategies that can act in advance of disasters, increasing climate impacts, and negative-trending market forces and result in long-term economic, community, and environmental benefits.

Policy Tradeoffs of Voluntary Buyouts

Administrative

- From educating and engaging communities about buyouts to the active restoration and maintenance of bought-out land, buyout programs necessitate a long-term commitment of resources and diversified support staff that can contribute important expertise (e.g., grants management, real estate, economics/benefit-cost analysis, floodplain and natural resources management, community development) and play a variety of different roles to help governments and communities navigate complex and often long buyouts processes. Staff may also require regular training and/or new staff could be hired to address emerging needs.
- Governments without an existing buyout program will have to develop one, which can require new investments in staff, the identification of new funding resources, and that agencies navigate potential political and community concerns around buyouts (e.g., potential loss of property tax revenue, a perception that managed retreat could negatively impact community cohesion or character).

- Federal funding opportunities may only be available in a disaster context that can disincentivize or inhibit pre-disaster buyouts. While there are examples of buyout programs with state and local funding sources, more sources are needed to implement buyouts at a pace and on a scale unique to sea-level rise and other gradual or chronic coastal threats.
- High-valued real estate in wealthier coastal communities can be costly for state and local governments to acquire through their own funding sources and limit the ability for them to conduct large-scale buyouts, including on groups of contiguous properties or clusters. Even if federal funding is available, it can be difficult for state and local governments to provide a required match to buy out higher-valued properties and for these properties to meet eligibility requirements through, for example, the Federal Emergency Management Agency's benefit-cost ratio.

Economic

- If bought-out residents do not relocate within the same jurisdiction, local governments can face losses in property tax revenue that can reduce a municipality's overall funding availability.
- For comprehensive buyouts, decisionmakers have to budget and allocate funding for property restoration and long-term management, and/or relocation assistance, which will exceed the price tag for the traditional expenses of only purchasing a property and demolishing structures.
- Governments should also evaluate funding for investments in affordable housing, infrastructure, and community services in "receiving areas" that can minimize the economic and social costs of relocation.
- Through property restoration and protection, communities can earn flood insurance discounts for their residents under the National Flood Insurance Program's Community Rating System.

Environmental

- The restoration, protection, and management of bought-out properties can maximize the attainment of environmental benefits, like reducing flood or storm impacts, reducing flood insurance premiums for neighboring residents, and providing habitat for species like migratory birds.
- Through meaningful and sustained community engagement into the design and use of bought-out properties, they can be transformed into important community assets, like parks or passive recreational trails, that can bring people together (barring any legal restrictions on future uses on the land e.g., through federal grant requirements).
- Open space can remove existing development and hard, structural barriers to facilitate the inland migration of coastal wetlands and forests that are unable to keep pace with sea-level rise, saltwater intrusion and salinization, and a loss of sediment to “adapt-in-place” on the coast.

Social/Equity

- Underserved or lower-income neighborhoods with lower property values can be disproportionately identified for buyouts, even if they are voluntary, which can create social inequities. This is a complex issue with many contributors including the high cost of buyouts and the concentration of lower-income neighborhoods in higher risk areas.
- The buyout price (e.g., fair market value) offered to participants can create barriers for people relocating in coastal areas with historically strong real estate markets, particularly for frontline populations or the elderly who cannot afford or do not want to take out a large mortgage to purchase a new home in their existing communities (for more discussion, see the Crosscutting Policy Considerations>Community Engagement and Equity section of this toolkit).
- Meaningful and sustained community engagement can help residents: learn about potential buyout options, understand issues related to buyouts, build support for buyouts, and inform the design and management of post-buyout community assets.

Practice Tips

When implementing buyouts in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- ***Develop sustainable sources of state and local funding:*** There is a lack of consistent or predictable sources of non-disaster-related funding to plan for and implement buyouts. Moreover, the amount of funding generally available is not comparable to the current needs of

state and local governments, residents, businesses, and other important stakeholders in coastal communities. To minimize the administrative, economic, and social/equity costs of buyouts, the most successful examples of retreat will leverage state and/or local funding sources; however, many state and local governments struggle to identify viable ways to fund adaptation efforts on their own or without significant federal support. In order to implement buyouts in a non-disaster recovery context, state and local governments need to develop new, non-disaster-related sources of funding. Local programs in Austin, Texas (impervious surface cover fee), Charlotte-Mecklenburg County, North Carolina (stormwater fees), New York City, New York (water and sewer bills), and Harris County, Texas (property taxes) offer successful examples of governments implementing a phased-approach to buyouts supported by local funding. Dedicated local funding sources can also enable willing property owners who are otherwise ineligible for federal disaster-recovery dollars to be bought out. Charlotte-Mecklenburg Stormwater Services acquires homes that do not otherwise meet federal requirements through an "orphan" buyout program. States could consider enacting a comparable funding mechanism, loan program, or revolving fund to either support local buyouts or conduct buyouts at the state level. For example, New Jersey amended its constitution to annually appropriate a portion of its Corporate Business Tax for buyouts conducted through the New Jersey Blue Acres program. In addition, in 2019/2020, California and South Carolina proposed bills to create a state revolving loan fund that local governments could draw on for buyouts.[154] Independent sources of state and local funding can also be used to provide the state match, as needed, for buyouts under federal grants.

- *Restore and manage bought-out land:* In institutionalizing managed retreat through buyouts, governments need to think beyond the purchase of a property and the demolition of existing structures to the long-term use, management, and maintenance and quality of the land left behind. To attain objectives of long-term risk reduction and coastal resilience, buyouts have to be about more than an exercise in "walking away." In addition to environmental benefits to reduce flooding and conserve ecosystems, communities can be further enhanced by and should be engaged in the development of nature-based assets, such as parks and trails.

  Where possible, governments should pursue larger-scale buyouts and avoid checkerboarding to maximize these benefits. Governments should take a long-term or phased view of buyouts, especially for larger-scale areas comprising multiple contiguous or groups of properties. Often, residents are ready to move at different times due to various reasons like life events and for financial reasons. Returning over time to review if there is new interest in a buyout from remaining property owners can help reduce or eliminate checkerboarding. Other Acquisition Tools, such as leasebacks and life estates, can also help governments pursue larger-scale buyouts by working with property owners to balance their current needs with long-term risk reduction and managed retreat objectives.

- *Provide relocation assistance:* To minimize the social/equity costs of buyouts, governments can offer bought-out residents money in addition to the (pre-storm) fair market value they receive for their old homes to enable them to purchase quality new homes in less risky coastal areas or outside of 100- or 500-year floodplains. To facilitate buyouts, most governments offer participants the (pre-storm) fair market value of their homes; however, that amount can often

create a barrier if it is not sufficient to acquire a new home outside flood hazard areas within the same jurisdiction, particularly in coastal areas with historically strong real estate markets. That barrier can be exacerbated for frontline populations, like the elderly and economically disadvantaged, and even younger generations who cannot afford or do not want to take out a large mortgage to purchase a new home over a decades-long time horizon. To mitigate or remove this barrier, state and local governments can look at examples from other jurisdictions, like Austin, Texas and the State of New York, who offer/have offered different types of financial incentives above the (pre-storm) fair market value of their homes to encourage participation in buyout programs and facilitate better transitions to higher value, lower risk properties within their jurisdiction. Moreover, proper financial incentives can also help people to relocate within their same state or municipality to maintain community cohesion and prevent the loss of different tax revenues.

When evaluating the amount of and types of potential relocation incentives for homeowners, governments do not have to "reinvent the wheel" and can draw from existing resources. The **Uniform Relocation Assistance and Real Property Acquisition Act of 1970** (URA) is a federal law enacted to provide standard and predictable real property acquisition and relocation expenses for homeowners and tenants of land acquired through eminent domain. URA ensures consistent treatment for people displaced through federal programs or with federal funding. In accordance with URA, **states** have developed relocation assistance laws and guidance for properties acquired through eminent domain for transportation (e.g., rights-of-way, road improvements) and other public works projects. States or local governments can replicate or build on this already-established work and adapt it for institutionalizing voluntary buyouts in a coastal context. For example, in Austin, Texas, the city's Watershed Protection Department has exceeded federal and state requirements and adopted URA's relocation assistance model for voluntary, in addition to involuntary, buyouts for flood risk reduction projects. Austin utilizes an existing system to provide relocation assistance (in the form of payments above a buyout offer to enable people to purchase a "comparable home" in Austin) and does not need to dedicate limited city resources to develop new relocation assistance policies from scratch.

- ***Coordinate buyouts with investments in receiving communities:*** To minimize the economic and social/equity costs of buyouts, it is important that governments remember getting people out of harm's way is only a part of, and not the entire, objective of managed retreat. Retreat also necessitates facilitating meaningful transitions for people to safer, higher ground locations or "receiving areas or communities" where they can, at a minimum, have their basic needs met for affordable, comparable housing and necessary infrastructure and community services (e.g., Minot, North Dakota, Lumberton, North Carolina). Governments can, for example, minimize losses in property tax revenues if people relocate locally by moving into homes within their current jurisdiction (For more discussion about receiving communities, see other sections in this toolkit).

- ***Build public-private partnerships:*** Governments can build different types of public-private partnerships to maximize environmental and social/equity benefits and minimize administrative, environmental, and social/equity costs. Depending on the purpose of a given partnership,

nongovernmental partners can include a host of entities like environmental nonprofits, universities, local industries, community development or community-based organizations, religious charities, and land trusts. Public-private partnerships have led to successful post-buyout restoration projects and supported on-going stewardship. For example, environmental nonprofits, universities, and conservation land trusts can lend governments scientific expertise, volunteers, and funding support or supplement limited government staff and funding resources to restore and monitor bought-out land. Moreover, these organizations could potentially be given title to and management responsibilities over bought-out land (barring any legal restrictions on title transfers, for example, through the Federal Emergency Management Agency's Hazard Mitigation Grant Program regulatory requirements). In addition, public-private partnerships with community-based organizations can facilitate better engagement with residents to educate them about the tradeoffs of participating in a buyout and empower them with accurate information to make informed decisions. These types of relationships can also help governments overcome community engagement barriers due to fears of government mistrust or eminent domain, particularly in historically marginalized or underserved communities. Partners like religious charities can also provide bought-out residents with relocation assistance or "gap" funding above the price they received for their homes to ease transitions to a new area (e.g., moving costs).

To sustain buyout programs and justify the expenditure of public funds, governments will likely need to demonstrate the benefits of buyouts, including their returns on investment (e.g., Charlotte-Mecklenburg Storm Water Services, North Carolina) or potential to offset lost property tax revenues, through comprehensive benefit-cost analyses and other tools (e.g., Harris County, Texas Flood Control District's use of GIS technology to show avoided flood damages in bought-out areas). Governments could consider developing public-private partnerships with universities or nonprofits that specialize in data collection and analysis to evaluate the benefits and costs of buyouts and potential increases in properties that surround bought-out areas that may offset property tax losses, at least to some extent.

Open Space Acquisitions

Introduction to Open Space Acquisitions

State and local open space programs — and similar programs for agriculture and forestry — are designed to protect open space and working lands, respectively. Through these programs, governments voluntarily acquire title to all or part of a tract of privately owned land for specified conservation purposes. Governments can acquire either fee simple title or interests in or use rights to land through easements or covenant agreements. Landowners who decide to participate in one of these programs receive money for the purchase of their land or a conservation easement. In addition, federal, state, or local law may also provide private landowners with tax incentives or credits, particularly for conservation easements.

In contrast to hazard mitigation buyout programs, open space acquisition programs and policies are typically executed for the primary purpose of voluntarily acquiring privately owned land for open space or recreation (e.g., parks, trails) or working land uses (e.g., agriculture, forest) that are compatible with conservation. In addition, the lands purchased tend to be — although are not always — undeveloped or moderately-altered habitats, whereas hazard mitigation properties are more often developed or contain structures. Although the two types of programs are not mutually exclusive in terms of resulting environmental and community benefits, they can be administered separately — even within a single agency — and may have different sources of funding (e.g., New Jersey Green and Blue Acres programs, New York City Land Acquisition and Flood Buyout programs).

Open Space Acquisitions in a Managed Retreat Context

As part of a comprehensive managed retreat strategy, open space acquisition programs can support coastal conservation in multiple ways. States and communities can use these programs to protect priority migration corridors that will enable coastal ecosystems — consisting of both habitats (i.e., wetlands and forests) and species — to migrate inland and help to mitigate the overall loss of coastal habitats as a result of sea-level-rise inundation, saltwater intrusion, and salinization. Governments can also use these programs to acquire land in higher ground areas that can serve as future habitat to enable the inland transition or “establishment” of these migrating ecosystems.

To support open space acquisition programs, state and local coastal governments can leverage voluntary buyouts for hazard mitigation purposes to conserve land to enhance coastal resilience and accommodate migrating ecosystems. Governments can also evaluate opportunities to build climate change and projected habitat data into these programs so that land purchases are informed by future impacts.

Acquisition programs and the funding sources that support acquisitions often specify the types and uses of properties that can be acquired and the purposes for which land can be acquired. As a result, governments will need to ensure that the lands they are identifying for acquisition for retreat purposes meet the requirements of the particular program and funding sources.

Policy Tradeoffs of Open Space Acquisitions

Administrative

- From educating and engaging communities about land conservation to the active restoration and maintenance of acquired land, open space acquisition programs necessitate a long-term commitment of resources and diversified support staff that can contribute important expertise (e.g., grants management, real estate,

economics/benefit-cost analysis, floodplain, natural resources, and park management). Staff may also require regular training and/or new staff could be hired to address emerging needs.

- Governments without an existing open space acquisition program will have to develop one, which could require additional investment in staff and funding resources. Agencies will also need to navigate the potential political and community concerns around acquisitions (e.g., potential losses of property tax revenue by converting land from private to public ownership, inland wetland migration or encroachment, spending limited public funds on open space conservation at the expense of other community needs).

Economic

- Open space acquisition programs require significant capital for the short-term purchase and long-term maintenance, restoration, and monitoring of land, in addition to costs for staff and other resources necessary to accomplish these tasks.
- To pay for the above costs, governments ideally need sustainable sources of funding to operate and manage these programs and acquire land.
- Governments can offset some of the costs of these programs by allowing revenue-generating land uses compatible with conservation, like by incorporating passive recreational amenities and educational facilities. Funding restrictions on the money used to purchase a property may affect the types of land uses that may be allowed.
- Open space and agricultural preservation programs often also allow for continued economic use of lands for recreation or farmland.

Environmental

- Open space acquisition programs can remove or preclude the construction of hard, structural barriers to facilitate the inland migration of coastal wetlands and forests that are unable to keep pace with sea-level rise inundation, saltwater intrusion, and salinization, and a loss of sediment to “adapt-in-place” on the coast. Inland migration can mitigate the overall loss of important coastal habitats.
- Open space acquisition programs play important roles in protecting and restoring sensitive coastal ecosystems that deliver important ecological services like reducing flood or storm impacts, reducing flood insurance premiums for neighboring residents, and providing habitat for species like migratory birds.

Social/Equity

- By preemptively pursuing open space acquisition programs, governments and nongovernmental partners can acquire lands in vulnerable areas with high potential for development and ensure that new development is not constructed in harm’s way.

- By incorporating recreational amenities, open space acquisition programs can be used to preserve and increase public access to coastal ecosystems.
- Coastal ecosystems provide a host of benefits for communities that include preserving a sense of cultural identity and history.
- Lands acquired through open space programs can facilitate the encroachment of wetlands near or on surrounding private properties. Some private property owners, particularly in rural areas, may have concerns that encroaching wetlands could impact existing and future land uses and development.

Practice Tips

When implementing open space acquisitions in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- *Leverage and align priorities across different types of acquisition programs:* Both state and local governments usually administer hazard mitigation buyout and open space acquisition programs separately, despite their overlapping staff expertise and benefits for communities and the environment, among other factors. By leveraging and aligning priorities and funding sources across different types of acquisition programs, governments can reduce the costs and administrative complexity of acquiring, restoring, and maintaining land to enhance beneficial outcomes. To implement both types of acquisitions as part of a comprehensive managed retreat strategy, governments can start by identifying the following for each type of program: (1) all of the potential agency participants that should be consulted; (2) how both types of property purchases can be prioritized to advance mutual program objectives; and (3) potential sources and structures for funding. Alternatively, governments could consider combining land acquisition programs (or creating a hybrid version where they do not already exist) to more efficiently manage limited staff and funding. Both types of programs require similar answers to administrative and funding questions, that include how to secure sustainable sources of funding, what agency resources are needed to buy and restore, manage, and monitor land in the long term, and at what point should governments conduct benefit-cost and policy tradeoff analyses before acquiring title to privately owned land.

- *Incorporate climate change data into open space acquisition programs:* Governments should consider ways to incorporate data about forecasted climate impacts into their land acquisition programs and decisions. This data can enable governments to make more informed decisions about how to prioritize and allocate limited funds. For example, governments may choose to prioritize acquiring land that will not be inundated by sea-level rise over a specific time horizon or can serve as important habitat or species migration corridors (e.g., Florida Forever Program, Maryland GreenPrint and Program Open Space). Where sufficient data is unavailable,

governments can consider partnering with nongovernmental organizations, like universities, to supplement their expertise and resources.

- *Coordinate land acquisitions with other legal and policy tools:* Governments should combine buyouts and open space acquisitions with other planning, regulatory, market-based, and other policy tools to facilitate coastal habitat migration including potential state or local regulatory restrictions on hard shoreline armoring and relocating infrastructure inland to remove barriers to migration pathways.

- *Build public-private partnerships:* Governments can build different types of public-private partnerships to maximize environmental and social/equity benefits and minimize administrative, environmental, and social/equity costs. Given the amount of and geographic scale of privately owned land that will be impacted by rising seas, public-private partnerships will enhance a community's ability to protect and conserve important coastal ecosystems. Depending on the purpose of a given partnership, nongovernmental partners can include a host of entities like environmental nonprofits, universities, community development or community-based organizations, and land trusts. For example, environmental nonprofits, universities, and conservation land trusts can lend governments scientific expertise, volunteers, and funding support or supplement limited government staff and funding resources to restore and monitor acquired land. Different land-owning entities, including governments, can seek to leverage their funds to acquire more land in priority areas like migration corridors or higher ground areas where coastal habitats can become established. In addition, nonprofits and community-based organizations can conduct outreach to educate people about the benefits of coastal ecosystems and create local stewards. These organizations can also help governments gather information about community preference for different land purchases.

Conservation Land Trusts

Introduction to Conservation Land Trusts

Conservation land trusts ("land trusts") are nonprofit organizations that are incorporated for the purpose of acquiring and holding land for the public benefit. Conservation land trusts often focus on preserving and restoring undeveloped lands for their natural resource values, such as protecting natural habitats and watersheds, or for preserving working lands for farming or forestry. They preserve important lands with high ecological or conservation values by acquiring land or interests in land, through conservation easements.[155]

Conservation Land Trusts in a Managed Retreat Context

Conservation land trusts can be constructive partners in helping governments facilitate retreat from vulnerable flood-prone areas and efforts to restore and maintain natural floodplains. In some areas, land trusts are already helping governments facilitate retreat by acquiring flood-prone properties, restoring natural floodplains, and creating new "receiving" developments to help families relocate to homes out of harm's way.

State and local governments can work with land trusts to support managed retreat efforts by:

- Collaborating to identify priority areas for acquisition where environmentally beneficial restoration could improve habitats and preserve migration corridors for wetlands and other coastal ecosystems that are vulnerable to sea-level rise;
- Ensuring that land trusts are eligible to receive acquired properties from hazard mitigation buyouts; and
- Ensuring that land trusts have the financial resources to restore and maintain properties over the long term.

Policy Considerations for Conservation Land Trusts

Administrative

- Land trusts often need start-up support to launch and build sufficient capital to acquire properties.
- Land trusts often have to patch together funding and financing from multiple sources to support the acquisition, restoration, and long-term management of properties
- It is unclear whether land acquired with certain types of disaster aid can be transferred to a land trust for long-term management or whether disaster recovery funds can be used to support environmentally beneficial restoration of acquired properties.
- Land trusts have to navigate state and federal laws to qualify for tax benefits for land held for "conservation purposes."
- Land trusts may need start-up legal support to draw up legal agreements, including conservation easements.

Economic

- Land trusts can help to reduce the cost of buyouts on communities by providing for long-term maintenance of properties.
- Land trusts can help to generate economic value by delivering recreational uses of acquired properties.

	• Land trusts benefit from state and federal tax incentives for holding land in trust for public benefit. • Land trusts could also help to develop “receiving communities” that can create safe, affordable housing for residents relocating away from vulnerable flood-prone areas.
Environmental	• Land trusts help to maximize the environmental benefits delivered by acquired lands because they restore and enhance natural ecosystems.
Social/Equity	• Land trusts are often trusted community partners because they are active in communities and steward important community assets, like recreational open space.

Practice Tips

When using or working with conservation land trusts in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- ***Develop acquisition programs in ways that can leverage partnerships with land trusts while complying with different funding programs:*** Most acquisition and buyout programs will leverage different federal funding programs (e.g., Hazard Mitigation grants from the Federal Emergency Management Agency (FEMA) and the U.S. Department of Housing and Urban Development’s Community Development Block Grant–Disaster Recovery grant program). Both state and local governments administering disaster recovery and other funding programs must ensure that different funding sources can be leveraged to support different aspects of a project (buyout, relocation incentives, development of receiving communities, restoration of buyout sites, etc.) and that funds and the conditions of the funding sources can be passed along to land trust partners to implement different aspects of the project. For example, sites bought out with FEMA funding must be preserved in perpetuity as undeveloped open space. Land trusts acquiring properties with FEMA funding must have the capacity and financial resources to enforce deed restrictions on the acquired properties and to restore and maintain the sites as environmentally beneficial open space in perpetuity. Additionally, bonds, environmental grants, and other programs should be considered and aligned as potential sources of funding to restore and maintain bought-out sites, to maximize the environmental and flood risk reduction benefits delivered by buyout projects. Finally, state and local governments may also need to incorporate buyouts and resettlement projects into plans that govern the use of disaster aid (e.g., hazard mitigation plans) and community development (e.g., local comprehensive plans) so that these

types of partnerships can be activated quickly in the aftermath of a disaster when significant federal aid becomes available to help communities recover and rebuild.

- *Seek state legislation to enable public-private partnerships with land trusts:* Many states have adopted enabling legislation to specifically authorize the formation of nonprofit land trusts and even government-led land trusts. These types of enabling statutes are useful because they clarify the structure and operation of land trusts, allow for the dedication of conservation easements to preserve land in perpetuity for natural and open space uses, and allow preferential tax assessments to encourage the conservation of open space lands. Policymakers should evaluate state laws to determine the types of roles that land trusts can play in managed retreat initiatives and the adequacy of incentives, like tax incentives, to enable land trusts to play these roles. Additionally, states should review legislation establishing various state funding programs to ensure that land trusts are eligible grant recipients under programs that could support buyouts, restoration, redevelopment, community engagement, planning, and other activities that will be required to implement comprehensive managed retreat projects. For example, in South Carolina, the state legislature is considering a bill that would create a Resilience Revolving Fund to facilitate floodplain buyouts and restoration of natural floodplains and the program specifically includes land trusts as eligible recipients of funding under this program.

- *Provide start-up funding and technical assistance:* Governments can provide funding and technical assistance to help start-up and build the capacity of land trusts to support state and local resilience efforts, including managed retreat initiatives. Most conservation land trusts were formed to conserve pristine natural landscapes and may not have the technical know-how to navigate disaster recovery programs and facilitate floodplain buyouts. To enable land trusts to play these types of roles, state and local governments can provide start-up funding and training to help land trusts develop the capacities needed to engage with disaster recovery programs, develop legal agreements needed to comply with program requirements, develop the skills and capacities to engaged disaster-affected residents, among other skills and expertise needed to support managed retreat initiatives. This type of start-up support has proven instrumental in the affordable housing context, where cities — like the City of Irvine in California — have supported the establishment of community land trusts to build and maintain permanently affordable housing.

Land Swaps

Introduction to Land Swaps

A land swap is the exchange or “swap” of title to land in perpetuity between two or more property owners. This acquisition tool typically centers on an in-kind exchange of property between parties instead of the purchase of land, although money can supplement in-kind exchanges. Land swaps can take a diversity of forms, involve different numbers and types of property owners, and can be

highly complex, but they also provide an effective means of effectuating retreat on a large scale. Land swaps can occur between a government and private landowners, like residents or businesses, or involve other parties or intermediaries, like nonprofits or land trusts.

Lands Swaps in a Managed Retreat Context

Governments that own public land, including vacant lots, may consider land swaps to implement retreat for different purposes. In a managed retreat context, land swaps can be used for different purposes including to facilitate:

- Inland wetland mitigation and ecosystem conservation by acquiring priority migration corridors and large, contiguous areas of upland property that are less susceptible to sea-level rise and can be protected in perpetuity (e.g., Los Cerritos Wetlands Restoration and Land Swap (Long Beach, California)); or
- Affordable housing transitions away from vulnerable coastal areas experiencing sea-level rise, flooding, and land loss by acquiring higher ground capable of supporting safer, thriving communities (e.g., Resilient Edgemere Community Plan, New Orleans Project Home Again Land Swaps).

Depending on the purpose, state and local coastal governments and other nongovernmental partners can design land swaps for retreat in ways that meet community needs.

While larger size properties are often used to implement land swaps, parcel size alone should not be a determinative factor for decisionmakers evaluating this potential acquisition tool. For example, in Long Beach, California, a public-private land swap is planned that would exchange 154 acres of land currently in private ownership for five acres of publicly owned land. In addition, housing in higher ground receiving areas could be consolidated on denser, upzoned parcels.

Policy Tradeoffs of Land Swaps

Administrative

- Governments may have insufficient land to facilitate swaps. They can also involve complex real estate transactions. Governments should consider the size of potential parcels, in addition to the different types of values or benefits land can provide to attract a variety of potential swap participants.
- Land swaps can also be politically controversial as residents may be concerned about the transfer and conversion of public to private land.

Economic	• Land swaps can help governments avoid spending money to buy out property owners in flood-prone areas. • Land swaps can also help ensure that affected residents are able to relocate to higher ground within their existing communities, thereby preserving local tax bases. • Land swaps potentially save governments money overall by avoiding future service, maintenance, infrastructure, and disaster recovery and response costs.
Environmental	• Land swaps can remove existing development and hard, structural barriers to facilitate the inland migration of coastal wetlands and forests that are unable to keep pace with sea-level rise, saltwater intrusion and salinization, and a loss of sediment to "adapt-in-place" on the coast.
Social/Equity	• Compared to buyouts, land swaps can increase participation in acquisitions by reducing uncertainty because property owners are aware of the location of their new property upfront. • Larger-scale land swaps implemented to voluntarily relocate residents to higher ground may help communities stay together and preserve social cohesion, compared to having people move individually through standalone buyouts.

Practice Tips

When implementing land swaps in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- ***Structure land swaps in accordance with a community's specific objectives for managed retreat:*** The objectives and outcomes of a land swap should guide all elements of a deal, from potential land to be swapped to community members engaged.

- ***Be strategic in selecting local lands to be swapped:*** Land swaps can be more cost-effective and easier to garner political support if communities and ecosystem benefits are maintained locally or regionally.

- ***Be creative:*** Land swaps are complex and may require creative approaches to be implemented (e.g., multiple private property owners and multiple parcels, in addition to monetary support, may be needed to implement a land swap).

- *Plan to account for homeowner and housing needs:* For land swaps that involve homeowners, ensure that new comparable housing is or can easily be constructed and available within a reasonable amount of time that does not cause undue hardships and moving delays for participants.

Leasebacks

Introduction to Leasebacks

A leaseback is a legal tool that governments can use to lease acquired properties to their original owners to generate revenue or a third party to reduce maintenance costs. A government compensates a property owner for purchase of the land and then leases the property back to the former owner, now the lessee, who pays rent (either monetary or in-kind) to the government as lessor. In exchange for rent, the lessees can use their property according to the terms and conditions on the lease, but no longer own it. Leasebacks can also be one option for governments to assign land management to a third party private or nongovernmental entity without permanently transferring ownership.

Leasebacks can be structured in different ways, including the following common forms:

- *Triple net leasebacks:* A triple net leaseback is a specific type of lease where the lessor is not responsible for any of the costs or services associated with the property, including the costs of maintenance or improvements, except those required to ensure a decent, safe, and sanitary condition.[156] For this type of leaseback, the lessor purchases a property (generally at fair market value) to compensate the homeowner and the lease period begins at closing. The lessor's limited legal obligations are reflected in a reduced rent price for the lessee. The amount of monthly rent charged can be based on the market rate in an area minus the average costs of maintenance incurred by the lessee. While lessees are often the original property owner, properties can be leased to others as well (e.g., a temporary renter).

- *Orphan parcel leasebacks*: Orphan parcel leases occur when a property owner is willing to maintain a bought-out property in exchange for a lease allowing exclusive use of the property. Lessees provide in-kind services in exchange for the use of a property and are not charged any monetary rent.

A government's ability to use leasebacks may depend on the sources of funds it uses to acquire a property. For example, the Federal Emergency Management Agency must approve leases and transfers of title for buyouts funded by its Hazard Mitigation Assistance Grant Programs, where full title can only be transferred to another public entity or conservation nonprofit (i.e., not private entities).[157] Governments should consult funding requirements that may affect their ability to enter into a certain type of leaseback or how a lease may be structured or drafted.

Leasebacks in a Managed Retreat Context

Leasebacks provide governments with a more flexible means to acquire vulnerable properties for hazard mitigation or eventual open space purposes by meeting private landowners' present needs. Similar to life estates, leasebacks can encourage property owners to participate in buyouts by offering them a limited amount of time in their homes to facilitate easier transitions to new ones. For example, Charlotte-Mecklenburg Storm Water Services in North Carolina has used leasebacks with elderly homeowners or people who need additional time to purchase new homes. Leasebacks can increase participation in buyouts but should be integrated into an overall acquisition program to avoid checkerboarding. They should be used on a case-by-case basis and may not always be a prerequisite to facilitate participation in buyouts. Alternatively, leasebacks may not be a viable option if imminent physical risk or damage precludes buyout participants from living in their homes any longer than necessary.

Furthermore, some landowners may not be incentivized to participate in leasebacks. People's homes are often a huge component of their personal net worth and may play a large role in their long-term estate planning, inheritance, and retirement. While leasebacks might be appropriate for some property owners in certain circumstances, they may not be feasible for others who are counting on long-term ownership of their property and increasing property values as a part of their overall financial wellbeing.

To effectively help people relocate out of harm's way and protect environmental resources, decisionmakers will need to carefully consider the terms and conditions of leasebacks based on future sea-level rise, flooding, and land loss projections to ensure that people are not allowed to stay on a parcel beyond its safe use or time span. For example, leases could expire after a standard, reasonable period of time (e.g., a few months to one year) or include "triggering" conditions that require a lease to end when forecasted physical impacts manifest (e.g., a property is damaged beyond a certain threshold or after a specific number of flood events occur, the mean high tide line migrates to a given point on a lot).

Governments can also evaluate the use of orphan parcel leasebacks after buyouts occur to help reduce or offset some of the administrative and economic costs associated with maintaining properties as open space in perpetuity. This type of leaseback can also provide benefits for individual lessees (e.g., rights to use surrounding properties) and promote local community and environmental stewardship. Similar to triple net leasebacks, governments should also carefully craft the terms and conditions of orphan parcel leasebacks to ensure that potential property uses do not violate funding requirements or interfere with the long-term objectives for flood risk reduction and open space conservation.

Policy Tradeoffs of Leasebacks

Administrative	• Leasebacks can be more flexible and attractive than a buyout alone for both governments and private property owners. • Leasebacks can create administrative burdens for governments that have to assume the role of landlord or lessor. In addition to drafting a lease, agency staff need to monitor and enforce the terms and conditions of a leaseback agreement, especially where the use of federal funding is conditioned on compliance with strict land-use restrictions.
Economic	• Leasebacks can result in some cost savings for governments to offset the costs of buyouts. Local governments, for example, could generate revenue by renting bought-out properties (either back to the original property owner or to another person e.g., as a vacation rental) and orphan parcel leases can help reduce maintenance costs.
Environmental	• Increased participation in buyouts through leasebacks can enable governments to acquire more land to convert larger parcels to open space uses. This can maximize benefits and avoid alternating ownership across multiple parcels or checkerboarding. • Leasebacks to adjoining property owners can ensure stewardship and maintenance of land in its natural floodplain conditions.
Social/Equity	• Leasebacks can help minimize some of the negative social consequences of buyouts by allowing homeowners to stay on their properties for longer, but not unlimited, time periods. Leasebacks can also increase the political acceptance of buyouts. • Leasebacks can provide additional time for people to plan for their transition to new homes. • Leasebacks may not be appropriate for all homeowners based on economic, cultural, historical, or sentimental reasons.

Practice Tips

When implementing leasebacks in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- *Consider using multiple types of leasebacks:* Governments should evaluate different types of leasebacks, like triple net and orphan parcel leasebacks, before and after buyouts to achieve different but complementary purposes.

- *Evaluate potential funding sources:* Like voluntary buyouts, governments will need to compensate property owners upfront for leasebacks. Accordingly, governments will need to identify potential funding sources and requirements imposed by those sources. In particular, governments should assess whether federal hazard mitigation funding regulations place any restrictions on the use of leasebacks, or if alternative state and local sources are needed.

- *Develop a leaseback policy:* Governments should consider developing general policies for leasebacks. For example, a policy could include decisionmaking criteria for how and when a buyout agency should offer leasebacks to participants. Criteria could also include standard lease terms and conditions that are compatible with objectives for hazard mitigation, conservation, and legal and regulatory requirements. Leaseback policies can also accommodate individual participant needs and circumstances and enable agencies that are administering buyouts programs to implement leasebacks more consistently and fairly.

- *Draft the terms and conditions of leasebacks to balance both a property owner's needs and environmental benefits:* As part of any general policies or operating guidelines, governments should consider how to draft leasebacks in ways that balance a property owner's short-term or present needs with long-term objectives to reduce risk and achieve environmental benefits. By working directly with residents, governments can identify opportunities to couple leasebacks with buyouts to simultaneously improve the well-being of affected residents and their broader communities.

- *Prepare for becoming a landlord*: Government agencies that do not already own or manage publicly owned buildings or properties should familiarize themselves with the administrative and legal responsibilities in their state for becoming landlords or lessors. In particular, federally funded land acquisitions require landlords to comply with a number of regulations and procedures for drafting leases.

Life Estates and Future Interests

Introduction to Life Estates and Future Interests

The property law of every state allows ownership to be divided in time between a present possessory estate and various future interests. This law can be highly technical, but it offers approaches to managed retreat that have significant benefits for both current landowners and

governments. For example, a government can purchase a remainder interest in a parcel leaving the property owner with a life estate, which will give the landowner a possessory ownership interest that will terminate at his/her death, automatically vesting full ownership at that time in the government.[158] Present possessory interests can also be structured to terminate on the occurrence of events related to climate change, such as a rise of the mean high tide line to a certain level.

Life Estates and Future Interests in a Managed Retreat Context

In a managed retreat context, governments and other nongovernmental partners, like land trusts or nonprofits, can purchase and hold title to future interests in land. Once the future interest held by the government or nongovernmental partner becomes possessory, they will enjoy full ownership and can manage the land for conservation or related purposes.

The acquisition of future interests should be coupled with other tools like hazard mitigation buyouts, open space acquisitions (e.g., Florida Forever Land Acquisition Program), or development permits (e.g., Norfolk, Virginia). Governments with new or active Transfer of Development Rights (TDR) programs can also attain future property interests through their "banks," in addition to current development rights to all or part of a property. With a TDR bank, developers purchase TDR credits from a government or third-party entity instead of directly from landowners. A TDR bank can make programs more predictable and manageable for both landowners and developers (for more information, see the Market-Based Tools>Transfer of Development Rights section of this toolkit).

Like with leasebacks, state and local governments can consider leaving private owners with present possessory estates like life estates to encourage participation in hazard mitigation and open space acquisition programs. Acquiring only future interests can help facilitate property acquisitions in the short term where sea-level rise and other climate impacts are projected to occur over a long-term time horizon. Moreover, acquiring only future interests can help bring along property owners who want to stay in their homes or continue using their properties for other uses like working lands for agriculture or forestry. Acquiring only a future interest will eventually give the government full fee simple ownership of the parcel, but allow a private owner substantial discretion in the use of the parcel during the possessory estate.[159] In addition, depending on the level of participation in an acquisition program, leaving private owners with present possessory interests could allow governments to better plan for and allocate funds to phase acquisitions that will not all happen at once, compared to after a post-disaster event.[160]

Future interests should be acquired on a case-by-case basis where they can be justified by the physical environment, local support, funding availability, and level or ease of government administration, among other factors. Governments may avoid acquiring future interests for properties facing severe, imminent threats from sea-level rise, flooding, and erosion. Acquiring future interests may be less attractive for landowners with long-standing or significant economic, cultural, historical, or sentimental ties to their homes or where there is an expectation or desire that homes will be passed from one generation to another. Moreover, land without a "clean" title or mortgage (e.g., liens) could complicate or prevent governments from acquiring a future interest.

Policy Tradeoffs of Life Estates and Future Interests

Administrative	• Future interests may offer a more flexible and attractive approach for both governments and private property owners than a buyout alone. • Governments must monitor when future interests vest in possession. Once title transfers, governments will become responsible for managing the land including demolishing any structures and restoring floodplains and coasts to their natural conditions. • The structuring and monitoring of future interests require substantial legal expertise and time.
Economic	• State and local funding sources are likely to be needed to acquire future interests. In particular, there are likely restrictions on using federal hazard mitigation funding to purchase future interests compared to more traditional buyouts. • Future interests can offset or defer some of a community's costs associated with buyouts. For example, residents that remain in their communities for longer periods of time defer the loss of property tax ratables while contributing economically to their communities. Governments can also phase acquisition costs over a longer-term, planned time period.
Environmental	• Increased participation in buyouts through the use of future interests can enable governments to convert large-scale areas to open space, which can maximize benefits and avoid checkerboarding.
Social/Equity	• Future interests can increase participation in buyouts and help minimize some of the negative social consequences of buyouts by allowing homeowners to stay on their properties for longer, but not unlimited, time periods. They can also increase the political acceptance of buyouts.

- Future interests can provide people additional time to remain in and contribute to their communities and to plan for their transition to new homes.

Practice Tips

When implementing life estates and future interests in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- ***Prepare for becoming a landowner:*** Government agencies that do not already own or manage publicly owned buildings or properties should familiarize themselves with the administrative and legal responsibilities in their state for becoming future landowners. This tool may require different administrative needs when compared to buyouts, open space acquisitions, and leasebacks. For example, governments will have to create some type of monitoring or enforcement mechanism to know when its future interest in the land vests.

- ***Evaluate potential funding sources:*** It is likely that governments will have to compensate property owners for the sale or transfer of their future interests in land, unless, for example, a property owner wants to donate his/her future interests for conservation purposes. Accordingly, governments will need to identify potential funding sources to purchase these future interests. For example, governments should assess whether federal hazard mitigation funding regulations place any restrictions on the use of future interests, or if alternative state and local sources are needed.

- ***Develop a life estate and future interests policy:*** Governments should consider developing policies for the use of life estates and future interests. For example, a policy could include criteria for when an agency should offer a limited possessory interest as an option to coastal homeowners or standard terms and conditions when drafting a future interest. These policies can enable governments to implement life estates and future interests more consistently and fairly for all participants and maximize community and environmental benefits.

- ***Draft conditions with current and future land use in mind***: Governments should ensure that any future interests take account of the best available science to protect property owners and life estates from future hazards. For example, projected sea-level rise should not outpace the actuarial life expectancy of a life estate holder. Deed conditions terminating a present possessory interest should employ widely accepted indicia of increased environmental risk, such as repetitive flooding or a specific rise in the mean high tide line. Deeds for present possessory interests will need to employ additional conditions to ensure that current land uses allowed on a property are compatible with and will not preclude or undermine efforts to conserve future species habitat.

Regulatory Tools

Given the amount of privately owned land throughout most of the United States,[161] particularly on the coast, state and local governments pursuing managed retreat strategies will need to evaluate potential opportunities to regulate private land uses. Most regulatory tools for managed retreat will be implemented through coastal, environmental, and natural resources regulations and land-use and zoning powers that govern development and redevelopment in both vulnerable coastal areas and relocation or "receiving" areas.

Source: Integration and Application Network, University of Maryland Center for Environmental Science.

This toolkit section presents examples of how state and local governments are implementing various types of regulatory tools. Each tool presents governments and residents with different tradeoffs that should be evaluated and addressed at the outset of decisionmaking efforts. Among the four buckets of non-infrastructure-related tools presented in this toolkit — planning, acquisition, regulatory, and market-based — regulatory tools likely necessitate the greatest consideration of potential legal challenges, particularly from private property owners alleging takings claims. Accordingly, the authors of this toolkit recommend that this section on regulatory tools be read in conjunction with the one on Crosscutting Legal Considerations. Collectively, these two sections can provide state and local policymakers with a framework for evaluating legal barriers and identifying opportunities to minimize legal risk.

Policymakers may be able to minimize legal risks by developing regulatory tools through meaningful community engagement processes and identifying economic, environmental, and social benefits that can be delivered through regulatory approaches. As highlighted and emphasized throughout this toolkit, the most successful managed retreat strategies will be comprehensive — by building on the different types of legal and policy tools available — and developed with the support of communities. These principles hold for state and local governments evaluating regulatory tools as a part of a comprehensive and community-based and -driven approach.

To date, this toolkit does not feature an exhaustive list of all theoretically possible regulatory tools and case studies for a few reasons. First, many state and local governments are actively working with their communities to consider and implement potential regulatory strategies for managed retreat; however, a lot of these discussions are currently at the planning or proposal stages and

Source: Integration and Application Network, University of Maryland Center for Environmental Science.

have yet to be finalized. In addition, there are several other potential regulatory tools, like rebuilding restrictions or moratoria and subdivision regulations, that have primarily been proposed in academic literature but not implemented yet by any jurisdictions to facilitate managed retreat. As coastal states and communities continue to innovate and implement regulatory tools for managed retreat, this section will be updated with more types of tools and case study examples as they become available.

This section will introduce four types of regulatory tools that state and local coastal governments could include — one, a few, or all — as part of a comprehensive managed retreat strategy.

Living Shorelines

Introduction to Living Shorelines

Traditionally, property owners have turned to hard armoring or man-made engineered techniques like bulkheads, sea walls, revetments, dikes, tide gates, storm surge barriers, and groins to protect coastal development from flooding and erosion.[162] Increasingly, however, coastal states and communities are considering or encouraging the use of living shorelines or other "soft armoring" techniques (e.g., dune creation, wetland restoration) to avoid the negative impacts of hard armoring structures that can divert flooding and exacerbate erosion on surrounding properties and beaches.[163] While there are many definitions for what constitutes a living shoreline, a recent report by the National Wildlife Federation and Coastal States Organization provides as follows:

The term “living shorelines” is used to describe a broad range of techniques and approaches for providing shoreline stabilization through the use of ecological, or “soft” approaches, as opposed to hard infrastructure. Although often solely associated with engineered approaches for shoreline stabilization, the concept of living shorelines spans the full range of natural defenses, from fully functioning natural systems to hybrid green-gray features. Such approaches, whether natural or engineered, typically serve to accommodate natural coastal processes as a means to reduce shoreline erosion, provide storm protection, and enhance habitat value.[164]

The intended purpose of living shorelines is to conserve or enhance an existing shoreline so that the land-water interface does not move further landward.

Credit: Kirsten Howard, New Hampshire Department of Environmental Services

As many state and local governments move to promote the use of living shorelines on private property, they are simultaneously evaluating ways to prohibit or restrict the use of hard armoring structures.[165] Living shorelines are commonly proposed as a more environmentally acceptable option to protect development and maintain coastal ecosystems. Policymakers are requiring property owners to evaluate soft armoring techniques like living shorelines before they can get a permit for hard armoring, and must use soft approaches, where feasible.[166] Governments can concurrently restrict the use of hard armoring techniques by prohibiting the construction of new armoring structures, limiting hard armoring to areas where living shorelines are infeasible, and, in some case, requiring the removal of a hard armoring structure after it has been damaged or if it is having negative impacts on coastal ecosystems like adjacent beaches or wetlands.

Living Shorelines in a Managed Retreat Context

In a managed retreat context, living shorelines can stabilize shorelines and preserve the many benefits (see table below) of coastal ecosystems for communities and the environment. Living shorelines can *forestall or slow down the retreat of shorelines* in some places, which can allow

property owners to stay in place longer in response to sea-level rise and erosion. Living shorelines can also *facilitate the inland retreat of coastal ecosystems* that are unable to adapt-in-place. Specifically, living shorelines can limit or preclude the construction of hard armoring barriers that prevent the inland migration of wetlands, forests, and natural resources to higher ground establishment areas.

State and local coastal, environmental, and natural resources laws and policies, and local land-use, zoning, and floodplain regulations provide the greatest opportunities to encourage or require the use of living shorelines and implement hard armoring restrictions. Governments considering living shorelines should evaluate how to develop effective laws and policies in light of the impacts of sea-level rise, flooding, and erosion in their particular jurisdiction.

Policy Tradeoffs of Living Shorelines

Administrative	• Governments without an existing living shorelines program will likely have to invest in developing new regulations, policies, and guidance for their states or communities. This may also necessitate funding for new staff or technical expertise and training (e.g., science, community education, and outreach). • Successful living shorelines programs require investments in education for landowners on the benefits of these types of approaches and for contractors who design and build them. • Depending on different environmental factors, living shorelines may not be feasible in certain areas (e.g., to maintain as much as or greater shoreline protection against flooding and erosion as a hard armoring structure).
Economic	• Living shorelines may be less expensive than hard armoring structures; however, they necessitate upfront investments and routine maintenance and monitoring, particularly after a severe flood or storm event. • Living shorelines can help protect and maintain natural shorelines to reduce flooding and preserve the economic benefits of ecosystem services.
Environmental	• Living shorelines can prevent or limit the use of environmentally harmful hard shoreline armoring structures. • Living shorelines can limit or preclude the construction of hard structures that act as barriers to inland migration of coastal wetlands and forests that are unable to keep pace with sea-level rise inundation, saltwater intrusion, and salinization, by“adapting-in-place” on the coast. Inland migration can mitigate the overall loss of important coastal habitats.

	• Living shorelines and wetlands play important roles in protecting and restoring sensitive coastal ecosystems that deliver important ecological services like reducing flood or storm impacts, reducing flood insurance premiums for neighboring residents, and providing habitat for species like migratory birds.
Social/Equity	• Living shorelines can help to protect culturally important resources (e.g., fisheries). • As a newer approach, living shorelines are more technically difficult to design and build. Lower-income communities and residents may need technical and financial assistance to facilitate the adoption of these approaches. • By disrupting natural sediment transport processes, hard armoring structures can lead to disproportionate impacts on neighboring properties (e.g., scouring, increased flooding).

Legal Considerations for Living Shorelines

The primary legal considerations concerning living shorelines will relate to constitutional takings and wetlands, environmental, and natural resources statutes and regulations at the federal, state, and local levels.

Jurisdictions can create living shorelines regulations and hard armoring restrictions to withstand potential regulatory takings challenges. The Fifth Amendment of the U.S. Constitution and analogous provisions of state constitutions prohibit governments from "taking" private property without just compensation.[167] While there are different types of takings, living shoreline hard armoring regulations designed to protect people, property, and the coastal environment will be evaluated under a case-by-case-specific balancing test.[168] Generally, governments can restrict or limit development in vulnerable coastal areas and floodplains, so long as a property maintains some economic value and a regulation serves a legitimate public interest, such as safety or offsetting ecological impacts from the use of private property.

Living shorelines provide an alternative to regulatory prohibitions on hard armoring structures. Living shorelines allow people to preserve their property and can thus preclude potential takings claims. However, private property owners could still challenge living shoreline regulations that restrict the use of hard armoring as a regulatory takings. To minimize potential legal risk, governments should: clearly justify the need for living shorelines based on best available science; articulate the purpose for these requirements in planning and other documents that put affected private property owners on sufficient notice; and allow exceptions for hard armoring structures, for example, based on prior use or where living shorelines will be less successful due to highly

erosive coastlines or other environmental factors. For more information on takings and recommendations to minimize legal risk, see the Crosscutting Legal Considerations>Takings section of this toolkit.

In addition to takings, living shorelines located in the coastal zone will intersect with a cross-jurisdictional framework that involves multiple federal, state, and local laws and agency players. The design and construction of living shorelines may require federal permits from the Army Corps of Engineers under the federal Clean Water Act[169] and federal Rivers and Harbors Act[170] for activities that discharge dredged or fill material into wetlands and/or create potential obstructions in navigable waterways. Living shorelines often require fill, and sometimes site grading, that triggers the need for approvals by the Army Corps, in addition to those at the state and local levels. At the state level, one or more agencies can be responsible for the permitting of living shorelines.[171] Additional state approvals may be needed for the use of state-owned submerged lands. States also possess the authority to review and approve Army Corps permits, both through Clean Water Act Section 401 water quality certification and Coastal Zone Management Act federal consistency authorities.[172] States can work together with the federal government to identify and implement strategies that reduce the permitting barriers associated with living shorelines.[173] At the local level, floodplain, environmental protection, and natural resources regulations may come into play for living shorelines that extend landward of intertidal areas, depending on their size and design and impacts on surrounding areas. In conclusion, governments and landowners should evaluate the range of federal, state, and local laws and agencies that may have regulatory authority or management and oversight over living shorelines.[174]

Practice Tips

When implementing living shorelines regulations and hard armoring restrictions in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- *Develop flexible, place-based laws and policies for living shorelines:* Among other factors, policymakers should consider natural environmental conditions and historical land-use patterns that will affect the physical and legal success and viability of living shorelines and their political and community acceptance and uptake. State and local governments can consider opportunities or exemptions for certain types of properties. For example, highly erosive areas or areas subject to a lot of wave action, or locations with a lot of critical infrastructure which has historically been protected by hard armoring structures may be less ideal candidates for living shorelines (e.g., East Hampton, New York).

- *Evaluate how living shorelines regulations can be combined with other legal and policy tools for managed retreat:* State and local governments can consider coupling laws and policies that promote or require living shorelines and prohibit or restrict hard armoring structures with other

planning, acquisition, and regulatory tools to implement more comprehensive retreat strategies. In particular, coastal, wetland migration or ecosystem-specific, and local comprehensive plans are of particular relevance for justifying and coordinating decisions around coastal uses, development, and environmental conservation. Moreover, other acquisition and regulatory tools, like zoning and overlay zones, could be layered to implement living shoreline and hard armoring requirements over an appropriate spatial scale, for example in less dense areas prioritized for open space acquisition or wetland migration.

- *Invest in data at an appropriate scale:* Physical impacts from sea-level rise, storm surge, different types of flooding (e.g., precipitation), and coastal erosion are the impetus or drivers for state and community decisions to retreat. Governments will need the best available scientific data and information on an appropriate scale to effectively develop and implement living shorelines and hard armoring restrictions. While some governments may already have the necessary data, others will have to invest in or look for opportunities to obtain data before they can consider promoting the use of living shorelines. Federal agencies (e.g., National Oceanic and Atmospheric Administration, U.S. Geological Survey) and conservation nonprofits (e.g., The Nature Conservancy) may already have data on an appropriate scale that governments can use to inform the development of setbacks and buffers. Alternatively, state and local governments may have to consider grant or other funding opportunities to initiate partnerships to collect this data from scratch.

  While scientific data is important, community residents — particularly those who have lived in an area for a long time or have historical or cultural ties — can provide additional types of data or information based on historical or lived experiences that, among other things, can help governments better understand cyclical or long-term changes on the coast to inform climate adaptation discussions. Governments, therefore, should aim to make data collection processes as comprehensive as possible and reach out to more than just scientific and coastal experts. Complementary datasets will be key to crafting well-rounded, interdisciplinary approaches for managed retreat.

- *Support the use and development of living shorelines through education and outreach programs:* State and local governments can increase the awareness and potential uptake of living shorelines by investing in education and outreach programs for private property owners and contractors. In addition to educating private property owners about the benefits and use of living shorelines, technical expertise from contractors and other experts will be required to effectively design, site, monitor, and maintain living shorelines. Governments can also look for opportunities — including developing public-private partnerships, providing living shorelines grants to community residents, or drafting permitting guidance — to ease the administrative, economic, and social burdens on private property owners and contractors to enhance the environmental benefits of living shorelines. For example, the North Carolina Department of Environmental Quality maintains a website on “Resources for Homeowners and Professionals” to learn more about living shorelines. The state has even worked with partners to hold a series of “lunch and learns” or “dinner and a movie” for marine contractors to educate them about the benefits of living shorelines versus bulkheads.

- *Build public-private partnerships:* State and local governments can build various types of partnerships to offset some of the administrative, economic, and social costs and enhance the environmental benefits of promoting the use of living shorelines. For example, public-private partnerships with universities or nonprofits could be used to collect localized data and provide technical assistance to property owners and marine contractors interested in or required to construct, monitor, and maintain living shorelines and support education and outreach efforts to create awareness of these programs and their associated benefits. In addition, these partners could leverage funding and expertise to engage in broader ecosystem restoration efforts or purchase adjacent properties for public purposes (i.e., open space acquisition or conservation easement) to facilitate larger-scale coastal conservation and inland migration.

Setbacks and Buffers

Introduction to Setbacks and Buffers

In the coastal context, a setback is generally the required distance a structure must be located behind a baseline, like a tidal line (e.g., mean high or low water) or various types of natural features (e.g., a coastal dune, wetland, or floodplain).[175] Setbacks are typically designed to keep development away from portions of a property that are subject to coastal threats like flooding or erosion.[176]

Setbacks are often specific to or tailored for individual properties whereby governments apply any combination of three common factors, as specified in the relevant law or regulations: (1) the size or square footage of a proposed development or structure; (2) the location of a baseline relative to the proposed development or structure; and (3) the level and severity of the physical risk facing that structure over a given time period (e.g., the lifespan of a structure). Nonetheless, governments can also implement standard setback distances for every property to which the requirement applies.

Similar to setbacks, buffers or buffer zones require landowners to leave parts of their property undeveloped to preserve them and their important natural functions.[177] Governments commonly use buffers to prohibit property owners from building structures on or immediately adjacent to wetlands and coastal dunes.[178]

Setback and buffer requirements vary and are usually implemented via state and local coastal, environmental, and natural resources laws and regulations and local land-use and floodplain ordinances.

Setbacks and Buffers in a Managed Retreat Context

With setbacks and buffers, state and local governments can require property owners seeking a development (or redevelopment) permit to site structures and infrastructure away from vulnerable coastal areas, while simultaneously conserving important habitats and natural resources. Most setbacks and buffers will cover areas and be designed in ways that serve a dual or reciprocal benefit to protect people and the structures behind it, in addition to protecting the natural features they are conserving; however, the purpose and ecosystem benefits of some setbacks and buffers may be different based on location or type of physical risk. For example, setbacks and buffers could be used to site development away from highly erosive shorelines or intertidal areas that will be lost in the future and/or higher ground or adjacent tidal areas that can facilitate inland wetland migration.

To support managed retreat efforts, setbacks and buffer distances can factor in future sea-level rise and erosion rates, but to do so requires significant investment in data collection and science to determine the rates that will be used to best achieve regulatory objectives. Governments may also have to evaluate and amend setback and buffer requirements, including what serves as the baseline, as physical conditions change over time (e.g., the rate of sea-level rise or erosion accelerates). For example, governments could consider setting fixed or permanent baselines for setbacks and buffers — for which no future development could occur seaward of that baseline — or move a baseline landward, as desired in response to local needs or concerns. From an administrative perspective, periodic updates to baselines can require lengthy and staff intensive regulatory processes. In comparison, dynamic baselines that, by law, are allowed to migrate landward (or seaward) with shifting coastlines and would not require a statutory or regulatory change can create more flexibility for agencies and potentially serve as a more effective climate adaptation strategy.

Setbacks and buffers allow governments to facilitate managed retreat in a way that can enable people to stay on their properties longer. These tools are likely to be more feasible and a regulatory option in rural areas or communities with more land and larger lot sizes where setbacks and buffers can be implemented without preventing all development on a given parcel.

Policy Tradeoffs of Setbacks and Buffers

Administrative

- Governments will likely have to make upfront staff and funding investments to determine, potentially revise, monitor, and enforce setback and buffer requirements.
- As regulatory tools, setbacks and buffers may be more politically controversial than non-regulatory tools because they decrease the amount of buildable space on a lot and could potentially foreclose redevelopment in the future as sea-level rise and coastal storms eat away at land.
- These tools are more feasible as a managed retreat strategy in rural areas or communities with larger lot sizes where setbacks and buffers can be

	implemented while still allowing for development to occur on a property.
Economic	• By extending the life of structures and enabling people to stay on their properties longer, setbacks and buffers will have fewer impacts on local economies and property tax revenues compared to buyouts or acquisitions because residents can remain in their homes and communities; however, these tools can still limit the amount of property that can be developed and possibly limit that property's economic valuation. • Setbacks and buffer preservation are less expensive than traditional hard armoring structures like sea walls.
Environmental	• Setbacks and buffers can remove or preclude the construction of hard, structural barriers to the inland migration of coastal wetlands and forests that are otherwise unable to "adapt-in-place" on the coast by keeping pace with sea-level rise inundation, saltwater intrusion, salinization, or a loss of sediment. Inland migration can also mitigate the overall loss of important coastal habitats. • These tools play important roles in protecting sensitive coastal ecosystems that deliver important ecological services like reducing flood or storm impacts, reducing flood insurance premiums for neighboring residents, and providing habitat for species like migratory birds.
Social/Equity	• Setbacks and buffers can prolong the life of structures and likely enable people to stay on their properties longer and preserve community character and cohesion. • Coastal ecosystems provide a host of benefits for communities that include preserving a sense of cultural identity and history. These tools can also prolong the lives of beaches and maintain public access to these areas, which serve as important recreational amenities. • Setbacks can provide public access to private shorelines. • Setbacks and buffers can facilitate the encroachment of wetlands near or onto private properties, including the one that is covered by the setback or buffer requirement. Some private property owners, particularly in rural areas, may have concerns that encroaching wetlands could impact existing and future land uses and development beyond the breadth of the current setback or buffer.

Legal Considerations for Setbacks and Buffers

The primary legal considerations concerning setbacks and buffers will relate to constitutional takings and environmental and natural resources statutes and regulations at the state and local levels.

Jurisdictions can design setbacks and buffers to withstand potential regulatory takings challenges. The Fifth Amendment of the U.S. Constitution and analogous provisions of state constitutions prohibit governments from "taking" private property without just compensation.[179] While there are different types of takings, courts apply a "per se" test to physical occupations[180] and regulations that deprive a private property owner of all or essentially all of his/her property's economic value;[181] however, in a managed retreat context, most setback and buffer regulations designed to protect people, property, and the coastal environment will be evaluated under a case-by-case-specific balancing test.[182] Generally, governments can use setbacks and buffers to restrict or limit development in vulnerable coastal areas and floodplains, so long as a property maintains some economic value and a regulation serves a legitimate public interest, such as safety or to offset ecological impacts resulting from use of private property.

Governments can avoid or mitigate potential takings risks by ensuring that setback and buffer requirements are informed by science and plans. At a minimum, governments should: clearly justify the need for setbacks and buffers based on best available science; articulate the purpose for these requirements in planning and other documents that put affected private property owners on sufficient notice; and design and implement them on a spatial scale that is proportionate to the coastal hazard being mitigated. For more information on takings and recommendations to minimize legal risk, see the Crosscutting Legal Considerations>Takings section of this toolkit.

In addition to takings, governments should also evaluate how setbacks and buffers may intersect with other environmental and natural resources laws and regulations, particularly under the federal Clean Water Act[183] and complementary state and local laws that protect wetlands and open space areas. By comprehensively viewing these types of laws in a managed retreat context, policymakers can avoid potential conflicts between laws and agencies by assessing where there are synergies to promote coastal conservation in a changing climate.

Practice Tips

When implementing setbacks and buffers in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different legal and policy tradeoffs:

- ***Invest in data at an appropriate scale:*** Physical impacts from sea-level rise, storm surge, different types of flooding (e.g., precipitation), and coastal erosion are the impetus or drivers for state and community decisions to retreat. Accordingly, governments will need the best available scientific data and information on an appropriate scale to effectively develop and implement setback and buffer requirements. The types of data that policymakers typically have to invest in to establish

setback and buffer requirements include sea-level rise and erosion rates, shoreline conditions, and the location and movement of coastal habitats like wetlands and forests. Collecting and compiling this data into resources that enable regulatory decisionmaking can be complex and expensive; however, governments can turn to federal agencies, universities, and other nonprofit partners to minimize these administrative and economic costs.

While scientific data is important, community residents — particularly those who have lived in an area for a long time or have historical or cultural ties — can provide additional types of data or information based on historical or lived experiences that, among other things, can help governments better understand cyclical or long-term changes on the coast to inform climate adaptation discussions. Governments, therefore, should aim to make data collection processes as comprehensive as possible and reach out to more than just scientific and coastal experts. Complementary datasets will be key to crafting well-rounded, interdisciplinary approaches for managed retreat.

- ***Engage communities:*** Governments should engage communities in the development and design of setback and buffer requirements. By engaging residents throughout the entire planning and regulatory implementation process, governments may be able to avoid or mitigate potential legal challenges by proactively seeking and addressing public concerns and conflicts. Plans documenting the consideration and justification for setbacks and buffers can serve as legal and policy guidance that puts residents "on notice" of regulatory decisions that may impact private property rights. In light of potential takings litigation, courts often evaluate whether local governments provided adequate notice to private property owners as one factor to assess whether a takings has occurred. Specifically, courts generally view public notice as one factor, among others, favorable to governments in finding that a takings has not occurred. This can also produce an administrative record that can show the reasons and justifications underlying a municipality's retreat decisions (e.g., to protect lives and property). A strong and factually supported administrative record can also aid governments in potential legal challenges. For more information on takings, see the Crosscutting Legal Considerations>Takings section of this toolkit.

- ***Evaluate how setbacks and buffers can be combined with other legal and policy tools for managed retreat:*** State and local governments can consider coupling setbacks and buffers with other planning and regulatory tools to implement more comprehensive retreat strategies that support one another. In particular, coastal, hazard mitigation, transportation, wetland migration or ecosystem-specific, and local comprehensive plans are of special relevance for justifying and coordinating decisions around setbacks and buffers. Moreover, other regulatory tools, like zoning and overlay zones, could be layered to implement setback and buffer requirements over an appropriate spatial scale, for example in less dense areas prioritized for wetland migration or in a community's most vulnerable, highly erosive coastal areas. Setbacks can also be combined with development permit conditions to remove or relocate structures. For example, a permit could provide that a future state or local approval to rebuild a structure may be denied if the shoreline becomes inundated and erodes as a result of sea-level rise and increasing erosion, such that the planned development can no longer comply with setback requirements. In this

way, a setback and development permit condition could allow development now, while also putting property owners on notice as land is lost to sea-level rise and erosion. This advance notice provision may also mitigate potential takings liability.

- *Align setback and buffer requirements with related programs and plans:* Local governments should strive to align setback and buffer requirements with other state and local plans and initiatives — especially state and local coastal and hazard mitigation programs, state and regional transportation plans, and local land-use and zoning plans and ordinances. This alignment will better ensure cross-governmental and agency coordination to enhance effective managed retreat and project objectives and avoid conflicting policies or decisions. For example, transportation departments with long-range planning timeframes can be informed of setback requirements that could impact the siting of future roads. Impacted roads could instead be sited behind setbacks and/or possibly elevated to facilitate changing shorelines and migrating coastal habitats. In addition, alignments can support mutual agency and environmental and social/equity benefits and reduce administrative and economic costs. For example, by implementing higher regulatory standards to protect coastal wetlands and flood buffers, municipalities participating in the **Federal Emergency Management Agency's Community Rating System** could potentially earn points to receive flood insurance discounts for their residents.

Development Permit Conditions

Introduction to Development Permit Conditions

States and local governments can set conditions for new development and redevelopment (e.g., above a certain threshold) through coastal, environmental, natural resources, and land-use and zoning permits. Permit conditions are often recorded with a property's deed to bind future owners. Permits can include many types of terms and conditions, such as requiring private property owners to pay impact fees, dedicate portions of their land for specific purposes (e.g., conservation), or restrict the use of their land;[184] however, this subsection on regulatory tools is focused on one type of condition that requires property owners to remove or relocate structures, as described in the next section.

Development Permit Conditions in a Managed Retreat Context

In a managed retreat context, state and local governments can require the owners of private properties covered by a permit condition to remove or relocate vulnerable or damaged structures upon the happening or occurrence of a "triggering" event (e.g., minimum beach width, a permanent movement of the tidal line demarcating public versus private lands like mean high or

low water). This type of condition allows landowners to develop property but with the expectation that development will eventually have to cede to future coastal climate impacts. These tools can require moving physical structures out of harm's way and can facilitate the inland migration of changing coastlines and ecosystems, like wetlands, in response to sea-level rise, flooding, and erosion.

While the specifics of these types of conditions will vary, the general public purpose would be to remove or relocate development to protect the coast, people, and property from the threats of sea-level rise, flooding, and erosion. The condition to remove or relocate the structure would be tied to a physical or environmental impact trigger. By being written into coastal management regulations and local land-use and zoning ordinances, in addition to the permits themselves, these conditions would have the effect of putting property owners on advanced notice to plan for these requirements. For example, in Big Lagoon in Humboldt County, California, the California Coastal Commission — the state's coastal management agency — conditioned a development permit by approving the permit with adaptive measures instead of denying a permit application for a new home being built on a high eroding bluff.[185] The commission determined that, based on sea-level rise and erosion rates, the house had about 50 years before it would need to be removed to avoid falling onto the beach below.[186] Accordingly, the commission is allowing the property owners to live in their home until bluff erosion reaches a point at which it is no longer safe to live there; it then has to be removed or relocated.[187]

It is important for governments to consider who is responsible for the costs associated with enforcing removal and relocation conditions. These conditions would likely place the removal or relocation costs on private property owners — barring any other legal arrangements to the contrary provided for in the permit. For larger structures or privately owned infrastructure (e.g., septic systems) in vulnerable coastal zones, state and local governments could go further and explicitly require a permittee to obtain a bond or other types of financial assurances to proactively ensure that these actions will be funded once a future condition occurs. These types of measures can preclude those costs from being passed on to the public-at-large, which could help to address concerns about public subsidies for people that may choose to live in areas prone to flooding and disaster events, like severe storms.

However, governments should evaluate and seek ways to minimize the potential disproportionate effects permits could have on frontline communities and residents who would likely be unable to afford the costs associated with removing or relocating structures. Moreover, some of the people living in vulnerable coastal areas may not be there by choice, but may instead lack the financial resources to be able to voluntarily move away. Without potential mitigating measures, this type of permit condition could exacerbate or compound economic and social inequities on the coast.

Policy Tradeoffs of Development Permit Conditions

Administrative	• The design, implementation, and enforcement of permit conditions will require data and staff investments, particularly when removal or relocation conditions manifest. • This type of condition may be more feasible as a retreat strategy in rural areas or communities with larger lot sizes where structures can be removed or relocated while still allowing for development to occur on a property. • Regulatory tools like these may be more politically controversial than other non-regulatory or voluntary tools because they require enforcement at a time when a property owner likely has experienced impacts from a disaster or similar event and the regulator is limiting their ability to rebuild.
Economic	• Permit conditions could shift the cost burden to remove or relocate vulnerable or damaged structures from the public-at-large to affected private property owners. This shift could be positive or negative depending on the economic status of those property owners (see Social/Equity considerations below). Governments and the public could also experience cost savings for emergency management and recovery duties, among other expenses. • Properties covered by a permit condition could potentially decrease in market value, which could affect the property tax revenues collected by state and particularly local governments.
Environmental	• This type of permit condition can lead to the removal or preclude the construction of hard, structural barriers to the inland migration of coastal wetlands and forests that are otherwise unable to “adapt-in-place” on the coast by keeping pace with sea-level rise inundation, saltwater intrusion, salinization, or a loss of sediment. Inland migration can also mitigate the overall loss of important coastal habitats. • Permit conditions can play important roles in protecting sensitive coastal ecosystems that deliver important ecological services like reducing flood or storm impacts, reducing flood insurance premiums for neighboring residents, and providing habitat for species like migratory birds. • Permit conditions not applied on a large-enough scale can create a checkerboarding pattern that would decrease their environmental benefits.
Social/Equity	• The use of development permit conditions can help to balance private property and public interests by allowing people to stay on their properties longer while accommodating a changing shoreline and threats from sea-level rise, flooding, and land loss. Among other benefits, this can preserve community character and cohesion.

- This permitting tool can also prolong the lives of beaches and maintain public access to these areas, which serve as important recreational amenities.
- Permit conditions can more equitably shift the cost to remove or relocate vulnerable or damaged structures from the public-at-large to affected property owners who may choose to live on the coast. Alternatively, these tools could exacerbate or compound economic and social inequities for frontline coastal communities who cannot afford potential removal or relocation costs.
- These conditions can facilitate the encroachment of wetlands near or onto private properties, including ones that are covered by the permit requirements. Some private property owners, particularly in rural areas, may have concerns that encroaching wetlands could significantly impact existing and future land uses and development.

Legal Considerations for Development Permit Conditions

Jurisdictions can draft development permit conditions to withstand potential regulatory takings challenges. The Fifth Amendment of the U.S. Constitution and analogous provisions of state constitutions prohibit governments from "taking" private property without just compensation.[188] While there are different types of takings, courts apply a "per se" test to physical occupations[189] and regulations that deprive a private property owner of all or essentially all of his/her property's economic value;[190] however, in a managed retreat context, most regulations designed to protect people, property, and the coastal environment will be evaluated under a case-by-case-specific balancing test.[191] Removal and relocation permit triggers are analyzed under the general *Penn Central* regulatory takings framework because they are conditions on land use and do not involve the transfer of an interest in property.[192] State and local governments considering removal and relocation conditions can succeed in takings claims if the property covered by a permit maintains some economic value and the regulatory purpose of the condition serves a legitimate public interest. To satisfy these legal requirements, governments should, at a minimum, clearly justify the need for triggering conditions based on best available science; articulate the purpose for these conditions in planning and other documents so as to put affected private property owners on sufficient notice; and apply the permits on a spatial scale that is proportionate to the coastal hazard being mitigated. For more information on takings and recommendations to minimize legal risk, see the Crosscutting Legal Considerations>Takings section of this toolkit.

Practice Tips

When implementing permits conditions in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different legal and policy tradeoffs:

- *Develop place-based laws and policies for permit conditions:* Among other factors, policymakers should consider environmental conditions and historical land-use patterns that will affect the physical and legal success and viability of these requirements and their political and community acceptance and compliance. Notably, governments should seek ways to balance permitting flexibility to meet the needs of individual property owners and changing environmental conditions with the aim to implement a coherent, consistent permitting program to maximize economic, environmental, and social benefits. However, governments can only ensure flexibility to the extent that they are compliant with federal and state constitutional equal protection requirements that require them to equally apply laws to similarly situated parties.[193] Moreover, governments can undermine the effectiveness of these programs if they grant too many exemptions or variances or do not sufficiently adhere to a consistent set of permit terms and conditions to the greatest extent practicable.

- *Invest in data at an appropriate scale:* Physical impacts from sea-level rise, storm surge, different types of flooding (e.g., precipitation), and coastal erosion are the impetus or drivers for state and community decisions to retreat. Accordingly, governments will need the best available scientific data and information on an appropriate scale to effectively develop and implement different types of permit requirements. This data must be highly place-based. While some governments may already have the necessary data, others will have to invest in or look for opportunities to obtain data before they can consider these tools. Federal agencies (e.g., National Oceanic and Atmospheric Administration, U.S. Geological Survey) and conservation nonprofits (e.g., The Nature Conservancy) may already have data on an appropriate scale that governments can use to inform the development of permit conditions and setbacks and buffers. Alternatively, state and local governments may have to consider grant or other funding opportunities to initiate partnerships to collect this data from scratch.

  While scientific data is important, community residents — particularly those who have lived in an area for a long time or have historical or cultural ties — can provide additional types of data or information based on historical or lived experiences that, among other things, can help governments better understand cyclical or long-term changes on the coast to inform climate adaptation discussions. Governments, therefore, should aim to make data collection processes as comprehensive as possible and reach out to more than just scientific and coastal experts. Complementary datasets will be key to crafting well-rounded, interdisciplinary approaches for managed retreat.

- *Evaluate how permit conditions can be combined with other legal and policy tools for managed retreat:* State and local governments can consider coupling permit conditions with other planning and regulatory tools to implement more comprehensive retreat strategies that support one another. Plans and data are necessary preconditions to implement permit triggers. In particular, coastal management, hazard mitigation, wetland migration or ecosystem-specific, and local comprehensive plans are of particular relevance for justifying and coordinating

decisions around permits. Moreover, other regulatory tools, like zoning and overlay zones, could be layered to implement permit requirements over an appropriate spatial scale, for example in areas prioritized for wetland migration or in a community's most vulnerable, highly erosive coastal areas. Removal/relocation triggers could also be coupled with setbacks to facilitate the natural movement of shorelines.

- ***Work with state legislatures:*** Given the emerging interest in using permit conditions in a managed retreat context, state agencies and local governments may choose to work with their state legislatures to update or amend statutes affecting coastal uses and development to ensure that they have the explicit or clear authority to impose these types of restrictions in vulnerable coastal areas and specify what types of corresponding actions may be required.[194] At the local level, differences may apply in home rule versus Dillon Rule states.[195] In some home rule states, existing authorizations may be broad enough to cover this type of permitting condition; however, clear statutory authorizations can encourage governments to consider this type of regulatory tool by eliminating uncertainty about a local government's legal authority. Generally, local governments in Dillon Rule states can impose "reasonable" permit conditions through their zoning powers. To the extent that removal/relocation triggers are considered reasonable in fact, local governments would be acting within their existing authority; if not, additional or explicit authorization may be needed.

Zoning and Overlay Zones

Introduction to Zoning and Overlay Zones

Credit: Jay Diener, Seabrook-Hamptons Estuary Alliance.

Local governments have the primary authority to regulate land uses in their communities through zoning and floodplain ordinances. In particular, zoning ordinances provide the legal framework that governs the use and development of land in a municipality according to different districts based on the uses that are permitted (e.g., residential, commercial, industrial).[196] Overlay zones or districts can impose additional regulations on an existing zone based on special characteristics in that zone, such as for natural, historical, or cultural resources protection.[197] One advantage of overlay zones is that they enable local governments to address area-specific needs or requirements without disrupting underlying zoning classifications. To establish an overlay zone, local governments must: (1) establish the purpose for creating the district; (2) map the district; and

(3) establish regulations to achieve the purposes for creating the district.[198] Before implementing any zoning or land-use changes, however, local governments must ensure that they have the authority to utilize a tool under state law.

Zoning and Overlay Zones in a Managed Retreat Context

Local governments can use zoning and overlay zones to support a variety of purposes and goals related to managed retreat including to:

- Phase out development in vulnerable coastal areas experiencing sea-level rise, recurrent flooding, and land loss by limiting or prohibiting new development or redevelopment — particularly in a post-disaster context — above a specified legal threshold (e.g., "substantial damage")[199] or requiring development setbacks or the removal or relocation of structures upon the occurrence of future physical impacts or "triggering" events (e.g., minimum beach width, permanent wetland encroachment; for more information, see the Managed Retreat Toolkit section on Regulatory Tools>Development Permit Conditions) (e.g., Florida Adaptation Action Areas, Norfolk, Virginia, "sending" areas for Transfer of Development Rights programs);
- Prohibit hard shoreline armoring structures and promote the use of living shorelines (with natural or nature-based features) to facilitate the construction of natural shoreline protection measures that can enable coastal ecosystems to maintain their connectivity to the surrounding ocean and coastal environment and also remove structural barriers to inland ecosystem migration as sea levels rise and coasts are eroding (e.g., East Hampton, New York);
- Protect inland habitat and species migration corridors and higher ground establishment areas that can support and sustain migrating habitats and species through natural resource conservation zones or overlays (e.g., Yankeetown, Florida); and
- Allow increased density and more resilient design standards in higher ground or inland "receiving" areas (e.g., Norfolk, Virginia, "receiving" areas for Transfer of Development Rights programs).

Zoning and overlay zones can be combined with other planning, acquisition, and regulatory tools to facilitate larger-scale or layered retreat strategies. Notably, local governments should seek to coordinate zoning decisions with coastal zone regulations (at state and/or local level; it varies by state) that can overlap with and serve similar purposes to balance human coastal uses and conservation. Moreover, local governments should look at managed retreat strategies comprehensively to ensure that one type of tool or legal or policy decision will not undermine or conflict with another. For example, after conducting a neighborhood-wide buyout of 200 homes, Woodbridge Township, New Jersey rezoned the 120-acre buyout area from Residential to Open Space Conservation/Resiliency in order to, among other requirements, prohibit new development and only allow for passive recreational amenities like trails and open space uses to preserve the floodplain. Regulations can also be combined with incentives through acquisition or market-based tools (e.g., tax benefits, conservation easements) to remove or relocate structures in vulnerable coastal areas or floodplains.

Although zoning is inherently a local government power, the state may also serve as a regulator in the coastal zone in some jurisdictions. In addition to their regulatory authority, states can be engaged in local land-use and zoning discussions and provide funding, technical, or other types of support to facilitate these managed retreat decisions. For example, states can consider working with local governments to fund and pilot the development of retreat-related overlay zones and create template language that could be adapted and replicated in other jurisdictions (e.g., Florida Adaptation Action Areas). In addition, states can play a key role in coordinating regional or cross-local government policies or actions that would require independent actions in more than one county or municipality. Local governments may also choose to work with state legislatures to amend or supplement zoning authorities — particularly in Dillon Rule states — where necessary.

Policy Tradeoffs of Zoning and Overlay Zones

Zoning decisions and overlay zones can vary in terms of purpose and scope, among other factors; therefore, it is difficult to assess the policy tradeoffs of these tools generally. There are, however, some overarching policy considerations for local governments.

Administrative	• Zoning processes necessitate staff and funding resources, particularly to support community engagement processes around complex and politically sensitive discussions around retreat. Depending on the ordinance, zoning changes can also require administrative support to enforce restrictions. Smaller or rural communities may face more resource constraints and have less funding available to support specialized zoning staff for these purposes. • Zoning restrictions may be more politically controversial than other non-regulatory tools because they will limit or regulate private property uses.
Economic	• Zoning decisions for retreat may have an impact — positive, negative, or neutral — on local tax bases. Where existing and future development is reduced or phased out in the face of sea-level rise, flooding, and land loss, governments will lose property tax rateables; however, where new development is intensified, local governments could experience gains in property tax revenues (or offset losses if zoning changes or overlay zones include both types of “sending” and “receiving” areas).
Environmental	• Whether directly or indirectly (e.g., by increasing density in higher ground areas away from the coast), zoning and overlay zones can promote the conservation and protection of important coastal habitats that provide various environmental and community benefits.

Social/Equity	• Zoning decisions are more successful when communities are engaged throughout both their development and implementation. By engaging communities, local governments can be more strategic, inclusive, and thoughtful about climate adaptation and managed retreat and minimize potential inequities — both in areas where existing and future development may be reduced or phased out in the face of sea-level rise, flooding, and land loss and areas where new development may be intensified and could cause existing residents and businesses to be displaced (e.g., climate gentrification). • To promote equitable outcomes, zoning should, at a minimum, prioritize the provision of recreation areas and public access in coastal areas and the development of affordable housing in receiving areas. • Zoning changes coupled with economic incentives may help to offset potential regulatory costs, particularly on frontline communities.

Legal Considerations for Zoning and Overlay Zones

By amending zoning ordinances, the most common legal challenge governments may face is takings claims. Jurisdictions can design zoning changes in ways that can withstand potential regulatory takings challenges and minimize potential legal risk. The Fifth Amendment of the U.S. Constitution and analogous provisions of state constitutions prohibit governments from "taking" private property without just compensation.[200] While there are different types of takings, courts apply a "per se" test to physical occupations[201] and regulations that deprive a private property owner of all or essentially all of his/her property's economic value;[202] however, in a managed retreat context, most zoning regulations designed to protect people, property, and the coastal environment will be evaluated under a case-by-case-specific balancing test.[203] Generally, courts will uphold zoning changes that restrict or limit development in vulnerable coastal areas and floodplains if an affected property maintains some economic value and a regulation serves a legitimate public interest, such as safety or to offset ecological impacts resulting from the use of private property.

Governments can avoid or mitigate potential takings risk by ensuring that zoning changes and overlay zones are informed by relevant data and plans, particularly local comprehensive plans. At a minimum, governments should: clearly justify the need for zoning amendments based on best available data; articulate the purpose for new development and redevelopment requirements in planning and other documents that put affected private property owners on sufficient notice; and design and implement zoning decisions on appropriate spatial scales that are not greater than the spatial area necessary to achieve their stated purpose (e.g., establishing lower density development requirements only in a municipality's coastal areas most vulnerable to sea-level rise

and erosion to protect people and property from these physical threats). For more information on takings and recommendations to minimize legal risk, see the Crosscutting Legal Considerations>Takings section of this toolkit.

Practice Tips

When implementing zoning changes and overlay zones in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different legal and policy tradeoffs:

- ***Create integrated long-term comprehensive plans, which provide a durable legal framework to implement zoning:*** Clear and well-designed comprehensive plans provide a more durable legal framework for zoning and a greater level of certainty for public and private investments around long-term managed retreat strategies. If well designed, this certainty is a key economic development strategy. Zoning that is constantly changed and amended can have a chilling effect on new investments.

- ***Evaluate how zoning can be used to meet local needs for managed retreat:*** Communities will have varying needs associated with managed retreat and local governments should consider how zoning changes or overlay zones can help them achieve different purposes, goals, and objectives. Local governments can avoid "reinventing the wheel" by using these longstanding tools but apply them in ways that will support areas affected by rising seas and other climate impacts.

- ***Invest in data at an appropriate scale:*** Local governments will need the best available data and information on an appropriate scale to effectively guide and inform planning and zoning decisions. While specific data needs will vary based on a proposed zoning change or purpose, governments can consider the following data relevant to informing planning and zoning changes: sea-level rise and erosion rates, shoreline conditions, demographics, economics, and the location of existing and migrating coastal habitats like wetlands and forests.

  While some governments may already have the necessary data, others will have to invest in or look for opportunities to obtain data before they can engage their agencies and communities in discussions about managed retreat. Notably, much of this data (e.g., demographic projections, environmental studies) may already be collected by local governments to support local comprehensive planning processes and could also be leveraged for zoning purposes. In addition, federal agencies (e.g., National Oceanic and Atmospheric Administration, U.S. Geological Survey) and conservation nonprofits (e.g., The Nature Conservancy) may have data on an appropriate scale that governments can use to inform the development of their plans and corresponding legal and policy decisions. Alternatively, local governments may have to consider grant or other funding opportunities to initiate partnerships to collect this data from scratch.

Community residents — particularly those who have lived in an area for a long time or have historical or cultural ties — can provide additional types of data or information based on historical or lived experiences that, among other things, can help governments better understand cyclical or long-term changes on the coast to inform zoning discussions. Governments, therefore, should aim to make data collection processes as comprehensive as possible and reach out to more than just traditional experts.

- *Engage communities:* Local governments should seek to engage community members throughout the entirety of comprehensive planning and zoning processes for managed retreat, especially those who live, work, or have other interests (e.g., recreational) in an area that is the subject of potential zoning changes. Comprehensive plans and zoning can affect the daily lives and livelihoods of residents, so it is important for local governments to include those most directly affected in these discussions. In addition to minimizing potential legal risk (see bullet below), community engagement processes can help local governments craft stronger decisions that better support community or neighborhood priorities, needs, livelihoods, and overall well being. For example, in areas rezoned for natural resource conservation purposes, governments can work with residents to identify wetland migration corridors that do not conflict with other private property uses. Similarly, residents could aid governments in identifying potential higher ground receiving areas that need revitalization or new investments and would not cause the displacement of current residents (e.g., climate gentrification).

- *Align zoning with different types of local plans and initiatives:* Local governments should strive to align zoning decisions with different types of local plans and initiatives, in addition to long-term comprehensive plans. Aligning zoning decisions with other plans and initiatives can offset various administrative and economic tradeoffs. This can occur when governments aim to coordinate land-use and zoning actions across different types of plans and agencies that have related authorities or actions. Additionally, this alignment can help maximize environmental and social/equity benefits and minimize the associated costs by avoiding conflicting decisions from different agencies. For example, if a local government creates an overlay district in its local comprehensive plan to discourage or limit new residential development and promote the conservation of open space in a vulnerable coastal area, transportation-related plans (e.g., Long Range Transportation Plans) should not prioritize siting new roads in that location.

- *Minimize potential legal risk by implementing zoning changes that are informed by communities and plans:* By engaging residents throughout the entire process of planning and proposing changes to zoning regulations, governments may be able to avoid or mitigate potential legal challenges by proactively seeking and addressing public concerns and conflicts. In addition, comprehensive plans especially can serve as legal and policy guidance that put residents “on notice” of regulatory decisions that may impact private property rights. In light of potential takings litigation, courts often evaluate whether local governments provided adequate notice to private property owners as one factor in assessing whether a takings has occurred. Generally, courts view public notice as one factor, among others, favorable to governments in finding that a takings has not occurred. Finally, local governments should seek to document the findings of their zoning decisions (e.g., scientific, economic, safety) in comprehensive plans and other

documents to produce an administrative record that can show the reasons and justification underlying a municipality's managed retreat decision (e.g., to protect lives and property). For more information on takings, see the Crosscutting Legal Considerations>Takings section of this toolkit.

Market-Based Tools

Among a suite of planning, infrastructure, acquisition, and regulatory tools, state and local governments can also consider “market-based tools” or financial incentives — like Transfer Development Rights (TDR) programs or tax credits — to encourage people to move away from, protect, or relocate structures in areas on the coast that are identified for open space preservation or conservation. In addition, governments can also use market-based tools to increase density in higher ground or inland urban or suburban areas. States, municipalities, and communities from across the country have expressed an interest in using market-based tools to facilitate managed retreat; however, there are currently few examples of how these tools have been directly applied to implement managed retreat as a coastal adaptation strategy. There are likely several reasons why these examples are rare, including two worthy of particular note. First, while market-based tools are often favored as cost-effective policy instruments, market-based tools for managed retreat will have to overcome the unique challenge of creating incentives that will encourage people to phase out or relocate or remove development in vulnerable, but highly desirable coastal areas and/or move away from the coast. Second, given the voluntary nature of market-based tools, governments will also have to evaluate how to raise public support for and awareness of these types of programs and how to design incentives in ways that maximize participation as sea-level rise increases. In short, governments will have to comprehensively value the community and environmental benefits of managed retreat and be able to communicate those benefits in a way that will encourage public participation in the absence of an enforcement mechanism. As coastal states and communities continue to innovate in this space, this section will be updated as more tools and case study examples become available.

This section will introduce different types of market-based tools that state and local coastal governments could include as part of a comprehensive managed retreat strategy.

Transfer of Development Rights

Introduction to TDR Programs

Transfer of Development Rights (TDR) programs create market incentives to shift development away from areas where it is discouraged (called “sending areas”) to areas where development is preferred (called “receiving areas”).[204] Sending areas typically include undeveloped areas with natural resource or agricultural value, and receiving areas are typically urban and suburban areas with existing services and infrastructure where additional growth and development can be accommodated. Local governments, like counties and towns, generally designate sending and receiving areas using zoning ordinances and maps. Under a TDR program, landowners in a sending

area can choose to sever and sell some or all of their unused development rights from their property as “TDR credits.” In selling TDR credits, landowners agree to forgo development and preserve their property through a conservation easement. TDR credits can be bought and sold as a tradable commodity separate from the land itself. Separated TDR credits are typically sold to developers in receiving sites, who can then use the TDR credits to increase the density of proposed development above base zoning standards in the receiving area.

Property owners in sending areas are encouraged to participate in TDR programs because they can often receive two types of financial incentives: a payment (at the prevailing market price) for their extinguished development rights; and tax cuts or exemptions by dedicating parts or all of their land to conservation uses. Property owners in sending areas may also be motivated to participate due to the knowledge that they are contributing to conservation efforts in their communities. Developers in receiving areas can benefit from the purchase of TDR credits to maximize project outcomes and returns on investment. For example, by acquiring a requisite number of TDR credits, developers can increase the number of dwelling units or parking spaces in a housing development to provide more homes for people and increase their own profits. As envisioned, developers will ideally recoup the initial costs allocated to purchase TDR credits by enhancing the density or other features of their projects.

All TDR programs can require short-term start-up investments and long-term administration costs. Although most TDR programs share these common components, each program is different and tailored to meet local context. In addition, four programmatic differences are noted here for their application to thinking about managed retreat (see below). First, TDR programs can be managed by governments — typically at the county or municipal level — or third-party entities, like nonprofits or consultants. Second, TDR programs can operate on different scales, for example, within a single municipality or county jurisdiction, or across multiple jurisdictions. Third, TDR programs can be mandatory or voluntary; however, for purposes of this toolkit section on market-based — compared to regulatory — tools, only the latter will be discussed. Fourth, programs can be structured as “TDR banks” or through sales directly between property owners and developers seeking credits on a project-by-project basis. With a TDR bank, developers purchase TDR credits from a government or third-party entity instead of directly from landowners. A TDR bank can make programs more predictable and manageable for both landowners and developers. Government staff, however, are needed to administer both types of program structures.

TDR Programs in a Managed Retreat Context and Legal Considerations

In a managed retreat context, TDR programs could be used in two primary ways. First, governments could use TDR programs to transition or create disincentives for new development in vulnerable coastal sending areas by transferring TDR credits to increase density in more inland or higher ground receiving areas. The sale of TDR credits could also encourage property owners with

already developed lots to remove or relocate structures that could act as barriers to the inland migration of coastal habitats being inundated by rising seas and unable to adapt in their current location. At present, however, there are few examples of TDR programs in the U.S. that were or are being created for the explicit purpose of managed retreat.

While there are some TDR programs that exist to protect coastal ecosystems, sea-level rise will present novel legal and policy questions that decisionmakers, particularly at the local level, will have to factor into the design of these programs to implement managed retreat. Importantly, local governments will have to evaluate whether they have the legal authority to create TDR programs for managed retreat. Most TDR enabling statutes were likely written before policymakers and communities started thinking about using them in a managed retreat context. Depending on how each statute is written, governments will have to determine whether current statutory language is broad enough to cover these types of programs; if not, statutory amendments may be needed. In addition to specific statutory authorizations in land-use and zoning enabling statutes, local governments, particularly in home rule compared to Dillon Rule states, may be able to rely on their plenary police powers to establish a TDR program. In Dillon Rule states, state legislatures must delegate specific powers to local governments compared to home rule states, where local governments may have broader powers.

Similarly, the coastal impacts of climate change will often extend across jurisdictional boundaries at the local level and may necessitate regional or cross-jurisdictional adaptation strategies, especially for managed retreat. Many existing examples of TDR programs only operate within a singular jurisdiction. Accordingly, state and local governments may have to evaluate how they can create programs that can operate at a regional or cross-jurisdictional level. State and local decisionmakers should first determine whether local governments have the authority to transfer TDR credits across jurisdictions; if not, potential statutory amendments may be needed.

The intermunicipal transfer of TDR credits may also implicate other legal and policy considerations regarding potential revenue shifts across sending and receiving areas. Specifically, sending areas may experience a loss in property tax rateables (i.e., for properties protected by conservation easements), and receiving areas with increasing populations may need to fund investments in supporting infrastructure and community services. For receiving areas in particular, the price of TDR credits may not be sufficient to support these additional costs. State and local governments should consider ways to mitigate these potential impacts on both sending and receiving areas in order to encourage and facilitate their participation in TDR programs. Local governments — with either or both sending and receiving areas — will also have to assess whether TDR programs are compatible with their existing local plans (e.g., comprehensive plans, longer-term visioning or strategic plans) and land-use and zoning ordinances, or whether they can and should be amended to accommodate new zoning designations (e.g., for open space) and density requirements (e.g., upzoning receiving areas).

In addition to questions about legal authority and the intermunicipal transfer of TDR credits and revenue sharing, local decisionmakers should consider how they can structure effective financial incentives in this unique context. Most existing TDR programs have financial incentives that direct development away from more sparsely populated, presumably more affordable rural areas to

denser, more expensive urban areas. This difference in property valuation and densities can create a demand for increased density that drives the sale of TDR credits. In contrast, coastal sending areas, while vulnerable to climate change, are likely highly desirable areas supported by strong real estate markets. It could be more challenging for governments to create the right types of and price for market incentives to encourage people to phase out development in more expensive areas with a greater demand for development and increase development in an area with a lesser demand for increased density. Moreover, many coastal properties, particularly in urban areas, are likely to have smaller lot sizes with less acreage to sever development rights from sending areas, unless TDR allocation ratios are adjusted to establish a meaningful incentive even for small lots with less development potential. For example, governments can choose to incentivize conservation by awarding more TDR credits than the number of development units a parcel would allow. In the absence of effective TDR ratios though, there could be potentially less of a supply for TDR credits in these sending areas.

Policy Tradeoffs of TDR Programs

	• Local agencies will have to dedicate funding and staff resources over both the short term — for the design and set up of TDR programs — and the long term — for program management and administration, especially for government-run programs. Local agencies may also have to acquire staff with new expertise in economics, among other fields, or outside consultants. • Local governments can consider different models and types of TDR programs — including whether the program will be government-run or administered by a nongovernmental partner — and can adapt a program's design based on local needs and economic market conditions, among other factors.
Administrative	• TDR programs for sea-level rise will necessitate localized data for physical impacts on the coast and inland areas that can accommodate increased density to identify and designate sending and receiving areas, respectively. If this data is not readily available, local governments will have to invest in or work with federal, state, university, and nongovernmental partners to produce and acquire this data at an appropriate scale. • Local governments will have to amend land-use and zoning maps and regulations to designate sending and receiving areas and provide for a program's rules of operation. Local governments may also prepare guidance and education and outreach documents to facilitate program awareness and uptake in both types of areas.
Economic	• TDR programs can generate and sustain an independent source of revenue to prevent future and remove existing development in vulnerable coastal areas.

- Property owners in sending areas are encouraged to participate in TDR programs because they can often receive two types of financial incentives: a payment (at the prevailing market price) for their extinguished development rights; and tax cuts or exemptions by dedicating parts or all of their land to conservation uses.
- By keeping some coastal areas free of development, state and local governments and property owners can save on costs associated with emergency response and recovery after damaging events like severe storms.
- New TDR programs for managed retreat will require startup costs. Long-term program management may also necessitate ongoing public costs until a program becomes self-sustainable by generating sufficient funds.
- It may be challenging to create the right financial incentives to drive supply and demand for TDR credits, particularly in changing markets.
- For regional or cross-jurisdictional TDR programs, local governments with sending areas may experience property tax losses.
- Receiving areas with significant increases in density and housing will likely need additional funding for investments in new supporting infrastructure and services. The sale of TDR credits, however, does not usually account for these costs.

Environmental

- TDR programs can protect open spaces from future development and remove existing development in vulnerable coastal areas that are being impacted by sea-level rise, flooding, and land loss. These open spaces can provide multiple benefits including reducing flood risk, sequestering carbon, and preserving habitat for important natural resources, like migratory birds.
- Open space can prevent future development and remove existing development to facilitate the inland migration of coastal wetlands and forests that are unable to keep pace with sea-level rise, saltwater intrusion and salinization, and a loss of sediment to “adapt-in-place” on the coast.

Social/Equity

- Voluntary TDR programs can garner greater public acceptance and encounter less political barriers than mandatory TDR programs to implement managed retreat.
- Local governments should engage communities before designating sending and receiving areas. In particular, current residents in receiving areas may be concerned about how their communities may change in response to increasing density and population (possible effects on neighborhood character and community cohesion, the capacity of infrastructure, and schools).

Practice Tips

When implementing TDR programs in a managed retreat context, decisionmakers may consider the following practice tips to address and balance different policy tradeoffs:

- ***Innovate and be flexible at the local level:*** Local governments interested in coastal TDR programs for managed retreat should consider opportunities to pilot the design of programs and engage communities to inform their development and implementation. For example, Miami-Dade County conducted a TDR program study and the City of Norfolk, Virginia is piloting a new type of TDR program through its land-use permitting regulations. While local governments can look to existing TDR programs, like in King County, Washington, for transferable takeaways and lessons learned, TDR programs in this context may require some innovation, in addition to the flexibility to adapt to changing local needs, physical impacts, and market conditions. In particular, regional or cross-jurisdictional programs may require creative brainstorming to minimize administrative and economic costs.

- ***Work with state legislatures:*** Given the unique and somewhat novel context of coastal TDR programs for managed retreat, local governments should work with their state legislatures to consider updating or amending TDR program enabling statutes to give them the explicit power to create TDR programs to adapt to sea-level rise and other coastal and climate impacts. For many local governments, particularly in home rule states, police powers for actions that protect the public health, welfare, and safety of residents may be broad enough to cover this type of program; however, clear statutory authorizations can encourage governments to consider this type of market-based tool by eliminating uncertainty about a local government's legal authority. New York State's TDR program statute can serve as one example for other states. Local governments interested in designing regional or cross-jurisdictional TDR programs for managed retreat can also work with their state legislatures to evaluate potential legal options to transfer TDR credits across jurisdictions. Statutory solutions can possibly minimize the administrative and economic costs of TDR programs — particularly for property tax losses in sending jurisdictions and funding to support infrastructure investments in receiving communities — and maximize the economic and environmental benefits by enabling these programs to be implemented on a governmental scale that corresponds with an appropriate scale of physical risk.

- ***Plan for and make investments in receiving areas:*** Municipalities serving as receiving areas with increasing density and housing will necessitate long-term planning and investments in infrastructure and community services. Proactive planning efforts and dedicated funding to support these investments, like in Washington State, can help to minimize the administrative, economic, and social costs of TDR programs. For example, local governments can engage residents in planning and visioning exercises to allocate new growth in a way that is consistent with maintaining community character and enhancing community priorities. Since the money generated by the sale of TDR credits typically does not account for these costs, state and local

governments should evaluate potential opportunities for additional revenue to advance these purposes, particularly on a regional level.

- *Build public-private partnerships:* Local governments can build various types of partnerships to offset some of the administrative, economic, and social costs of TDR programs for managed retreat. For example, regional partnerships with other municipalities or county or state governments to set up a TDR bank can lower costs by distributing them across more entities and creating larger-scale, more sustainable markets for TDR credits. In addition, public-private partnerships with universities or nonprofits could be used to collect localized data to identify and designate sending and receiving areas and engage communities in these discussions.

Crosscutting Policy Considerations

Although the specific form of managed retreat strategies will vary based on local need and context, coastal governments and communities will nonetheless face many of the same issues, such as funding, impacts on coastal ecosystems, community engagement and equity, and the challenges for "receiving" communities (those that take in others moving away from coasts and other flood-prone areas). Building on the policy tradeoffs analyzed for each tool, this section presents four "crosscutting" policy considerations that will affect the development of most, if not all, managed retreat strategies that follow a comprehensive approach.

This section provides a deeper dive into the following four topics.

Economic: Funding

Overview

Adequate and available funding will be a prerequisite for state and local governments to implement managed retreat strategies. Nationally, there is a perception that retreat can only occur — or primarily occurs — in the aftermath of a disaster or extreme weather event. Part of this narrative is driven by the availability of federal funding in disaster recovery contexts, which are delivered through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP) and the U.S. Department of Housing and Urban Development's (HUD) Community Development Block Grant–Disaster Recovery (CDBG–DR) program. As governments implement a diverse suite of tools in a pre-disaster and more comprehensive fashion, increased types and amounts of funding across all levels of government will be needed. Most managed retreat strategies will require funding — particularly those involving acquisitions, environmental conservation and restoration, and affordable housing and infrastructure investments in receiving communities. Generally, there is insufficient funding for climate adaptation, let alone managed retreat. This lack of funding will be exacerbated by the global coronavirus pandemic because of the crisis's impacts on federal, state, and local budgets and the economy.

The section presents a thorough, but non-exhaustive list of funding options and examples that have been used nationally to fund the implementation of different tools for managed retreat and different components of comprehensive strategies. This section includes federal, state, and local funding sources that could be applied in a managed retreat context. This section also includes examples of funding from case study programs and projects featured in this toolkit. Although the focus of this toolkit is on developing proactive or "managed" retreat responses, both pre- and post-disaster sources are included below given the amount of money that flows in a disaster context that can supplement pre-disaster sources.

Overall, most of the currently available funding sources can be used to support planning initiatives; acquire property for hazard mitigation or open space purposes; and implement projects to restore, conserve, and facilitate the inland migration and higher ground establishment of coastal ecosystems, namely wetlands. This summary, however, reveals gaps in the funding system for managed retreat. In particular, new types of funding will be required for data collection and monitoring, community engagement efforts, and affordable housing, infrastructure investments, and critical services in receiving areas. In addition, federal, state, and local policymakers should assess whether there are opportunities to use existing funding in new ways under current legal and policy authorities, or if more significant reform is needed.

Practice Tips

Priority and overarching practice tips for funding managed retreat include:

- *Leverage and combine funding and in-kind support from multiple sources to support different components of a comprehensive managed retreat strategy over time:* Funding for managed retreat should be viewed holistically. Multiple sources of funding will likely be needed to support different aspects of comprehensive managed retreat strategies, from planning and community engagement efforts to acquisitions, relocation assistance, and ecosystem restoration and conservation. Moreover, given the likely longer-term and phased nature of many adaptation strategies, governments should also evaluate different public and private funding sources over varying time periods. To develop successful, layered funding strategies, governments must be knowledgeable about each potential type of funding, particularly for federal sources — including its purpose, eligible uses, any restrictions or limitations (e.g., timing, future land uses), and reporting, monitoring, and other administrative requirements. For grants in particular, this knowledge can also help governments identify where one type of funding may be used as a match for another. Governments can also evaluate opportunities to provide in-kind support like land or staff time to implement managed retreat strategies (e.g., Los Cerritos Wetlands Restoration and Land Swap, Long Beach, California). Federal and state agencies and regional entities can play important roles in helping resource-disadvantaged or -constrained communities overcome informational and educational barriers to learning about, applying for, and administering a diversity of funding options.

- *Create sustainable state and local funding sources and other revenue streams for climate adaptation and managed retreat:* Given the competitiveness and limitations of federal funding, particularly in a disaster recovery context, state and local governments will have to evaluate and develop alternative state and local sources where they do not already exist. Local context and community needs will help governments assess what new types of funding (e.g., grants, loans, bonds, taxes) will be more politically feasible and maximize the attainment of priority goals and objectives. Where annual appropriations or consistent revenue streams are available — such as from property, stormwater, or business taxes that support buyout programs like those in Harris County, Texas, the Charlotte-Mecklenburg County region in North Carolina and New York City, and the State of New Jersey, respectively — governments can create predictable sources of funding that will support and sustain community adaptation efforts. Furthermore, to adequately support the consideration and implementation of managed retreat strategies, multiple types of activities should be eligible for funding, in addition to capital projects. For example, local governments and communities, especially in historically resource-disadvantaged areas, are often in need of additional funding to aid them in planning, collecting data, long-term monitoring and evaluation projects (e.g., shoreline change, ecosystem restoration), designing and facilitating community engagement processes, and meeting other administrative needs, such as hiring and training new and existing staff.
- *Evaluate new opportunities to finance managed retreat strategies:* Financing managed retreat is an evolving area of study. Nonetheless, governments can work through public-private partnerships, such as with universities and environmental consultants and nonprofits, to evaluate opportunities to finance, among other things, property acquisitions and the conservation and restoration of publicly owned lands. Tools like wetland mitigation banks and Transfer of Development Rights (TDR) programs can create a potential market to finance some components of managed retreat. For example, the Harris County Flood Control District is permanently preserving 910 acres of bought-out land as a “Greens WetBank” for government and private developers that need wetland mitigation credits to offset losses elsewhere. Here, developers will foot the bill for wetland restoration. Similarly, 76 acres of degraded wetlands that are a part of a 154-acre land swap in Long Beach, California will be restored via a mitigation bank. In addition, more than 144,290 acres of rural and resource lands were conserved and protected through the market for development credits created by the King County TDR Program in Washington. As a result, more than 2,400 potential dwelling units have been relocated from rural to urban areas. Despite these examples, more innovation will be needed. In particular, it will be important for governments and other partners to engage in pilot projects, where possible, to ground truth and adapt market theories to meet local context and needs.

Environmental: Wetlands Migration

Introduction[205]

As sea levels rise, wetlands are

Credit: Greg Hoxsie for ReWild Mission Bay.

encountering physical barriers to inland migration — a phenomenon known as "coastal squeeze." Wetlands are being squeezed between sea-level rise on one side and human development on the other, preventing their natural ability to adapt by moving inland to higher ground. To respond to these threats, there are two primary management responses state and local governments may consider: (1) maintaining existing or restoring coastal wetlands; and (2) facilitating their migration inland.[206] Each management response raises similar and yet distinct questions that decisionmakers will have to address to enhance wetlands and support their long-term viability. For example, maintaining existing or restoring coastal wetlands and adequate sediment supplies will require that decisionmakers evaluate water management requirements regarding allowable discharges and deposits to government-regulated water bodies (that can restrict sediment flows) and the use of clean fill in wetlands, including from dredging. Allowing the migration inland of wetlands raises different issues, since migrating wetlands may encroach on existing land uses, such as agriculture, forestry, and residential communities. As a result, decisionmakers will need to address additional questions about shifting economies, environmental justice and equity, and wetlands and private development regulations. Ideally, governments will develop comprehensive managed retreat strategies to implement both types of management responses. However, there is deficient information about legal and policy tools that state and local governments can use to adapt to sea-level rise and limit the impacts of coastal squeeze on migrating wetlands. This section attempts to fill that informational gap.

This section first provides a short background on the law and federal, state, and local actors that could impact state and local decisions, including considerations for wetlands on public versus private property. This section then identifies six components of a comprehensive wetland migration strategy as recommended practice tips for state and local coastal governments: (1) data; (2) planning; (3) voluntary land acquisitions; (4) legal tools; (5) community engagement; and (6) funding. This section concludes with case study examples to illustrate each of these six components. While other coastal ecosystems, like forests, and myriad species are also capable of and will need to shift their habitats to adapt to different climate threats, this section focuses on wetlands. This section will be broadened in the future as more on-the-ground actions occur.

It is important to note that, as multiple coastal ecosystems change and encroach on human development, land managers and communities will have to weigh decisions about whether to prioritize the conservation of some habitats or species over others. For example, in Dorchester County, Maryland, the inland migration of salt marshes is killing forests, resulting in a phenomenon

known as “ghost forests.”[207] While sea-level rise may continue unabated, governments and people can take short- and long-term actions that affect the survivability of each habitat. For example, governments could help marshes migrate inland by removing roads or conversely, protect forests by erecting a flood barrier to keep marshes at bay. As people and ecosystems retreat away from the coast, land-use decisions should reflect human priorities for the environment.

A loblolly pine "ghost" forest in Blackwater National Wildlife Refuge in Dorchester County, Maryland (June 2018). Sea-level rise and land subsidence result in brackish water intruding on forested land and killing trees.

Credit: Will Parson, Chesapeake Bay Program, U.S. Fish and Wildlife Service.

Summary of Primary Actors and Laws Affecting Wetland Migration

Wetlands are regulated under a complex, and often overlapping jurisdictional framework at the federal, state, and local levels. At the federal level, the U.S. Army Corps of Engineers (Corps) is one of the primary agencies that regulate activities in intertidal areas that affect wetlands under two statutes, the Clean Water Act, 33 U.S.C. §§ 1251 *et seq*. and Rivers and Harbors Act of 1899, 33 U.S.C. §§ 403 *et seq*.).[208] States also regulate their coastal zones under the federal Coastal Zone Management Act, 16 U.S.C. §§ 1451 *et seq*. and may have special protections for wetlands, where certain actions conducted in or adjacent to wetlands may be prohibited or require specific mitigations through permits. Local governments have the primary authority to regulate land uses in their communities through zoning and floodplain ordinances. In particular, zoning ordinances

provide the legal framework that governs the use and development of land in a municipality according to different districts based on the uses that are permitted (e.g., residential, commercial, industrial).[209] Overlay districts can impose additional regulations on an existing zone based on special characteristics in that zone, such as for natural resource conservation.[210] Before implementing any zoning or land-use changes, however, local governments must ensure that they have the authority to utilize a tool under state law, particularly in Dillon Rule states. In Dillon Rule states, state legislatures must delegate specific powers to local governments whereas, in home rule states, local governments generally have broader authorities.[211]

Governments will have more control to actively manage wetlands and facilitate migration on publicly owned lands. In contrast, where wetlands are being affected by private development, governments will need to consider protections for private property rights. Most land in the U.S. is privately owned.[212] As wetlands migrate inland, governments will have to consider how development regulations intersect with private property rights.

The greatest concern for most decisionmakers will likely be potential conflicts with the U.S. Constitution's Fifth Amendment prohibition against the "taking" of private property for public use without "just compensation."[213] This protection for private property rights is also included in state constitutions. There are different types of takings that can result. Generally, courts apply a "per se" test to physical occupations[214] and regulations that deprive a private property owner of all or essentially all of his/her property's economic value[215] but most regulations designed to protect wetlands will be evaluated under a case-by-case-specific balancing test.[216] Regardless, state and local governments have successfully navigated takings limits and protected sensitive ecosystems analogous to migrating wetlands. While state and local governments must consider constitutional and statutory protections for private property rights, policymakers can likely minimize their legal risk for implementing environmental regulations by being cognizant of existing federal and state takings law (for more information on takings law in a managed retreat context, see the Crosscutting Legal Considerations>Takings section of this toolkit).

Practice Tips

As climate change impacts alter both built and natural landscapes, state and local governments should have proactive discussions about the conservation and protection of migrating wetlands. Any actions should be supported by public-private partnerships and communities to balance the tradeoffs and impacts of wetlands on human values and land uses. Policymakers can consider the following practice tips to facilitate wetland migration as a part of comprehensive managed retreat strategies:

- ***Invest in data:*** To effectively evaluate and make legal and policy decisions that facilitate wetland migration and conservation, governments must start with data. Successful strategies must be

built on and informed by the best available, high-quality data at a local or place-based scale. The potential for wetland migration is highly variable based on different place-based physical factors, such as topography and relative sea-level rise, in addition to information about current and future zoning and land uses and the location of current and proposed structures and infrastructure on or near the coast that can act as barriers to inland wetland migration.[217] Data and information can come from a variety of sources like the federal and state governments, educational institutions, and nonprofit organizations. For example, some jurisdictions can utilize the U.S. Fish and Wildlife Service's Sea-Level Rise Affecting Marshes Model (SLAMM), an online modeling tool that allows users to visualize and assess the impacts of sea-level rise on coastal areas under different scenarios out to the year 2100, including predicted impacts to coastal wetlands and shorelines. Nonprofits like the National Audubon Society and The Nature Conservancy have collaborated with various partners to create different mapping layers and sea-level rise vulnerability assessments for coastal habitats, species, and protected lands in different regions on both the East and West coasts of the U.S. Collectively, these types of tools and studies can be used to supplement other local data on zoning, land use, and development to support robust decisionmaking efforts. Still, governments have to account for staff time and training requirements to utilize data and to develop new partnerships for any of these examples.

- *Plan for wetland migration:* Effective, proactive planning built on data, implemented through land acquisitions and legal tools, and supported by public-private partnerships and community engagement can better ensure that government actions are coordinated, efficient, and maximize benefits for humans and the environment in light of climate change impacts. Governments should consider wetland migration both across different temporal scales and types of plans. First, wetland migration will impact communities differently in the short- (five years or less) and long-term (greater than five years). Governments should incorporate management objectives and priorities for wetlands into both short- and long-term plans to preserve future wetland corridors or establishment areas now before the rate of sea-level rise escalates and potentially hinders migration. Second, a variety of plans at the state and local levels can impact wetland conservation. These include plans for: coastal management; open spaces and parks; natural resources or protected areas; hazard mitigation; floodplain management; zoning and land use (i.e., local comprehensive plans); transportation (e.g., long-range planning); and climate adaptation (e.g., Punta Gorda, Florida).

Decisionmakers can leverage the benefits of wetlands that cut across different sectors and agencies to align planning efforts and coordinate actions that can affect these coastal habitats. For example, federally mandated statewide and metropolitan long-range transportation plans must consider projects and strategies that will "protect and enhance the environment . . . and promote consistency between transportation improvements and State and local planned growth and economic development patterns" and that "improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation."[218] Nature-based solutions, such as wetland preservation, can help transportation agencies meet these planning requirements and provide a means of protection for coastal roads with high adaptive capacity and numerous environmental co-benefits.[219] Governments can also develop wetland-specific management or strategic plans

(e.g., *Blackwater 2100*) that can provide the necessary specificity to evaluate potential management responses on an appropriate place-based scale; these plans can feed into broader state and local plans to account for wetlands adaptation on both site-specific and landscape-scale planes.

- ***Acquire land to protect and conserve wetland migration corridors and higher ground establishment areas:*** Land acquisitions can occur through either the purchase of properties in fee simple or development rights (to part of or an entire property) through easements.[220] Governments can consider different approaches for how to prioritize wetland migration in land acquisitions and maximize the expenditure of limited public funding. Florida and Maryland present examples of state-level legislation and data and tools that account for wetland migration in land acquisition programs, respectively. Governments can also acquire land voluntarily through the in-kind exchange or "swap" of publicly owned land for privately owned land in strategic conservation areas (e.g., Los Cerritos Wetlands, Long Beach, California). Generally, unobstructed land without any structures on it and restricted to human uses compatible with conservation will provide the simplest means and greatest potential for wetland migration. Land in both priority wetland migration corridors and upland establishment areas should be the aim of comprehensive land acquisition strategies for managed retreat. Regardless, land acquisitions present governments with tradeoffs that require substantial investments in funding both in the short-term to purchase land and use rights and the long-term to manage, monitor, and potentially enforce conservation restrictions. Moreover, as land is converted to public ownership, local governments may face revenue decreases due to a loss of private property taxes. Additionally, to voluntarily acquire property, governments must often overcome common barriers to working with landowners, including government distrust and educating residents about the benefits of wetland conservation.
- ***Develop complementary legal tools:*** Supplementing acquisitions with regulatory or market-based tools for managed retreat can aid in implementing comprehensive strategies to maximize ecosystem benefits. A non-exhaustive list of legal tools that state and local governments could consider include zoning; setbacks; living shorelines/hard armoring restrictions; and Transfer of Development Rights/Purchase of Development Rights programs. As stated above, state coastal zone management regulations and local government zoning, floodplain, and land-use ordinances will likely be the primary instruments for implementing these tools. Maine's Sand Dune Rules and a natural resource overlay district from Yankeetown, Florida present two respective examples. Again, governments should implement any actions in partnership with the federal, state, and local actors and per applicable laws and private property considerations to minimize potential legal risk.
- ***Engage communities and diverse stakeholders:*** Comprehensive wetland conservation strategies should include community engagement throughout their development and implementation. Wetlands — and the environment and natural resources more broadly—are a part of and not a distinct, isolated element of people's communities. Wetlands provide several quantitative and qualitative benefits for humans (in addition to other species) including reducing flood damage, improving water quality, supporting fishing, recreation, and tourism economies, and serving as tangible refuse and escape. Residents in local communities should be included in decisions regarding wetland conservation from the outset. Educating residents about the value of wetlands can create local stewards, in addition to enhancing the benefits that can be attained

for both people and the coastal environment. Moreover, communities can help state and local governments set management objectives in response to data to determine priority actions, like where to establish wetland migration corridors. As previously stated, not all wetlands can and will be saved, so community input should be sought on these potentially life-impacting decisions.

Of particular note, some property owners in rural areas are concerned that wetland migration or "encroachment" could impact existing and future land uses and development. For example, owners of working lands, like farmers and forest managers, could have their revenue-generating acreage decrease when productive lands are naturally converted into wetlands.[221] In addition, private property owners facing wetland migration could unknowingly (due to a lack of education and awareness about this phenomenon) become subject to federal and state regulations that protect wetlands and limit development (e.g., Corps Clean Water Act Section 404 permits, state coastal zone management regulations). This can raise questions about how to balance environmental protection and community needs (especially for frontline, underrepresented communities). As sea levels continue to rise, communities and policymakers will have to evaluate how to protect and preserve wetlands and address private property and community concerns. In order to minimize potential conflicts and maximize benefits, governments should engage community members throughout all stages of these decisionmaking processes from planning development to post-implementation monitoring and evaluation. This should include those who own properties, frequently use, or operate businesses in or adjacent to wetlands or areas identified as potential wetland migration corridors.

- *Evaluate diverse funding opportunities:* Voluntary land acquisitions will necessitate funding, in addition to restoration and conservation activities associated with land management. Governments should seek different types of federal, state, and local funding that can be used for these purposes, and leverage public-private partnerships with conservation nonprofits and land trusts. Governments can also evaluate the potential for generating revenue for holding land in a conservation status, such as a wetland or carbon offset bank (e.g., Los Cerritos Wetlands, Long Beach, California, Greens Bayou Mitigation Bank, Harris County, Texas). This could be supplemented by in-kind exchanges of land (i.e., through a land swap) and other types of in-kind support, like volunteer time for citizen science or restoration activities or the donation of space to hold community meetings. For more information on available funding and financing options, see the Crosscutting Policy Considerations>Funding section of this toolkit.

Social/Equity: Community Engagement and Equity

Introduction

While managed retreat tools and strategies will vary based on local context, one crosscutting element is critical: these decisions must be community-based, -driven, and -supported. It will be important for state and local governments everywhere to design and implement equitable community engagement and adaptation approaches. This will be particularly relevant for the development of laws and policies affecting frontline communities in both coastal and "receiving"

areas. Frontline communities include people who are both more exposed to climate risks (because of the places where they live and the projected changes expected to occur in those places) and have fewer resources or safety nets to respond to and recover from those risks (e.g., individuals who may lack financial resources).[222] Frontline communities living and working on the coast are being disproportionately impacted by sea-level rise, flooding, erosion, and other coastal hazards like extreme storms.[223] While some people a part of frontline communities may choose to live on the coast or in floodplains for economic, historical, cultural, or personal reasons (e.g., fishermen, watermen, shrimpers, and those working in the shipping and port industries), others have been forced to live or resettle there due to systemically racist and discriminatory government policies and decisions.[224] Those living on the coast — even if initially forced or displaced — have built lives there and have ties to these places that will make it difficult to move away from their homes and property, despite present and future climate threats.

Source: New York City Department of Housing, Preservation, and Development.

Additionally, people living and working in higher ground "receiving" areas will also be affected by managed retreat. In many places, "climate gentrification" is an emerging trend whereby traditionally low-income and communities of color are now being displaced from inland or higher elevation neighborhoods that are generally less vulnerable to climate impacts including sea-level rise and flooding. Black and other people of color who were historically shut out from more desirable areas within different regions because of economic limitations and discriminatory redlining policies now face displacement due to climate change.[225] Redlining, a practice — where banks restricted mortgage lending to black people in specified, and typically undesirable areas — reinforced racial segregation in residential housing and education and contributed to social and economic disparities in access to jobs and essential services that remain today.[226] In some instances, these policies ultimately forced communities of color to find housing in undesirable areas, for example, at the extreme reaches of the coast in Louisiana and further inland in South Florida.[227] While the official policies were discontinued in the 1960s, the effects of redlining, which

Source: New York City Department of Housing, Preservation, and Development.

include a lack of neighborhood investment that reinforced social and economic disparities, remain for many black communities and other low-income communities of color.[228] Climate gentrification now threatens to disproportionately displace the same communities of color that were subject to segregation and redlining policies. Specifically, many of the individuals and communities of color that contributed to the neighborhoods, businesses, and cultural hallmarks and traditions that emerged despite the burden of housing discrimination now face housing vulnerability and potential evictions as real estate values and rents increase in areas that are being valued for their resiliency. For cities like Miami, as sea levels rise, developers and homeowners are looking to higher ground in the Liberty City, Little Haiti, and West Coconut Grove neighborhoods to shift development away from the coast.[229] Prevented from living on the coast, people in these Miami communities are being displaced from their homes and businesses in areas that are considered receiving or less climate vulnerable locations where new development is intensifying.[230]

Managed retreat should be viewed comprehensively and implemented in ways that can help alleviate or mitigate some of the physical climate and coastal hazard impacts and present inequities facing communities. Moreover, if retreat is “managed” in a proactive, pre-disaster context, it can also help minimize the economic, environmental, and social costs of sudden displacements and more haphazard post-disaster or “unmanaged” responses.[231] Managed retreat may even create new opportunities for policymakers to better support people who choose to move from riskier coastal areas to safer receiving communities. This section provides some case studies and practice tips compiled from current and emerging examples where community engagement and equitable considerations were or are successfully being integrated into decisionmaking processes around managed retreat.

Community Engagement and Equity in a Managed Retreat Context

State and local governments can start engaging communities by equitably fostering discussions about managed retreat at the outset of climate adaptation and resilience discussions. While managed retreat will not always be the best or a preferred adaptation strategy in every location, governments should encourage proactive discussions about it to avoid precluding the consideration and potential implementation of viable and less costly or disruptive adaptation alternatives. As climate change intensifies and sea levels continue to rise, short-term and short-sighted decisionmaking could exacerbate the physical, fiscal, and economic risks already facing many communities and governments. Before convening these discussions, however, governments must work with communities to build trust where it may not already exist. Additionally, governments should work with community members and community-based organizations — especially in economically- and resource-disadvantaged communities — to identify and provide them with tools and information (e.g., data, mapping, and metrics) that are prompting decisionmakers to take action and include the community as a partner in the process. The work to

build local capacity and educate residents should be viewed as a sustained goal — and not a one-off project — so that people can actively participate in and contribute to legal and policymaking processes over the long term. Specifically, state and local governments need to engage people in both vulnerable coastal areas and receiving communities throughout the entirety of these processes from the early planning stages to legal, policy, and project implementation. Further, governments have to design and structure these processes in authentic and meaningful ways beyond merely "checking a box." Notably, policymakers must recognize and be open to actively listen to the history, needs, and values of community members themselves and evaluate these processes to ensure that all sides feel heard and empowered. This will require that governments — and public-private partnerships — dedicate the funding and staffing resources necessary to support and sustain them.

Source: Georgetown Climate Center.

While there are resources available on community engagement and equitable adaptation,[232] there is a general recognition among state and local policymakers and community-based and grassroots organizations that more tools, resources, and innovation are needed to support more effective dialogues on this specific subject. This is underscored by the unique and encompassing challenges associated with managed retreat that include legitimate and deeply felt concerns about leaving one's home, the loss of a sense of place, severing cultural and historical ties, and fears and mistrust of the government and its encroachment on private property rights, among others. Some organizations, like the Climigration Network run by the nonprofit Consensus Building Institute,[233] are actively working in this space to help support community-led processes around managed retreat by providing funding for small projects on the ground;[234] however, much more support and engagement are needed given the scale of the challenge. Regardless, it is necessary to highlight that all examples, takeaways, and lessons learned will have to be adapted to the local context, including the relevant legal and policy considerations.

From Community Engagement to the Equitable Implementation of Managed Retreat Strategies

While the focus of this section is on incorporating equity into community engagement, it is crucial to note the connection between these processes and the implementation of managed retreat strategies on the ground. For those who choose to move away from the coast, state and local governments must build on community engagement efforts to craft managed retreat laws and policies that do not exacerbate historical and systemic discrimination and inequalities. While this will be important for the consideration and implementation of all legal and policy tools, it will be

especially magnified in the context of buyouts and other acquisition tools, like land swaps, where people decide to physically relocate away from their homes.[235] Notably, studies have shown that many buyout programs have disproportionate impacts on low-income communities and communities of color and that people participating in buyouts will not always be made whole.[236] Here, policymakers need to be mindful of supporting equitable transitions that help people move somewhere safer (e.g., outside of vulnerable floodplains) where they can, at a minimum, attain comparable housing, infrastructure, and services. State and local governments can play important roles in facilitating transitions for residents that can help minimize some of the economic, social, and psychological impacts of buyouts. For example, the New Jersey Blue Acres Buyout Program and City of Austin, Texas provide buyout participants with individual case workers to guide them through the process and navigate questions about how to find new, comparable homes or rental units. One municipality participating in the New Jersey Blue Acres Program, Woodbridge Township, worked with Catholic Charities to help people find rental housing in buyouts post-Hurricane Sandy.

Source: New York City Department of Housing, Preservation, and Development.

In addition to helping to facilitate more equitable transitions, governments must address the implications of managed retreat on anticipated receiving communities. By prioritizing the need to assess and mitigate the impacts of managed retreat on a receiving community, governments can ease transitions for people moving into these areas, and also alleviate the potential resource burdens on those already living there. By factoring the needs of the receiving communities into decisionmaking, governments will be able to proactively invest in affordable housing, infrastructure, and critical services. These investments should support and sustain relocated residents, while simultaneously reflecting — and not displacing — the needs, priorities, and historic and cultural character of current residents and neighborhoods. This is a tall order, especially in resource-strapped and already densely populated communities.

Given the crosscutting purpose of this section, in-depth recommendations for how state and local policymakers can equitably design and implement each tool are provided in individual tool sections of this toolkit.

Practice Tips

Meaningful community engagement can be safeguarded through carefully designed processes. State and local governments can consider applying the following practice tips to actualize and center community engagement processes in equity:

- ***Consider managed retreat at the start of climate adaptation discussions:*** Managed retreat considerations should be brought to the table at the outset of climate adaptation planning processes. While the term "managed retreat" may be a sensitive or jarring term subject to local, cultural, or historical scrutiny, policymakers should not put off the discussion of managed retreat until after disasters occur. The terminology (i.e., what to call managed retreat) challenge should not serve as a deterrent or an outright barrier to working with communities to save lives, properties, and the environment. Before convening these discussions, however, governments must work with communities to build trust where it does not already exist. To ensure more productive dialogues and build or grow trust, state and local governments should partner with local nonprofits or community-based or grassroots organizations with established ties and relationships in their communities. For instance, in Hampton, New Hampshire, the local conservation nonprofit Seabrook-Hamptons Estuary Alliance is leading an ongoing discussion at the local level about climate adaptation and managed retreat. As a part of this process, the Seabrook-Hamptons Estuary Alliance has been successful in bringing state and local agency staff, elected officials, and local stakeholders and residents to the decisionmaking table.
- *Develop informed and transparent processes:* To build trust and authentic partnerships with communities, policymakers or organizers should, if possible, have first-hand knowledge of the local context in the places in which they are working. Managed retreat requires expert inputs in addition to a true understanding of local communities. It is also important to keep affected residents and stakeholders apprised of policy and project updates. Governments should aim to keep community members informed at appropriate junctures, even when policy or project updates may not be favorable. As with the Quinault Indian Nation, governments can use various mediums and types of materials to update people, like through newsletters and regular reports to legislative bodies (e.g., city council).
- ***Allocate sufficient funds and resources to support community engagement processes:*** Effective and sustained community engagement requires funding and staff support. State or local governments should develop these processes with sufficient resources in mind. To implement LA SAFE's comprehensive community engagement and planning model, the State of Louisiana received $40 million from the U.S. Department of Housing and Urban Development through the National Disaster Resilience Competition, in addition to other state and nongovernmental funds. In the absence of comparable funding opportunities, this level of funding and the scale of this model will be difficult to replicate in many jurisdictions; however, governments should seek opportunities to leverage public-private partnerships and other federal and external sources of funding and in-kind support (e.g., volunteer time, meeting facilities, food) to fulfill priority community engagement needs.
- ***Design phased process to facilitate more equitable transitions:*** Due to the complexities of managed retreat, it is unlikely that comprehensive strategies will be solely implemented through short-term, standalone efforts. Instead, governments must contemplate phasing managed retreat actions over a long-term time horizon. Managed retreat is more than just physically helping people move out of harm's way. State and local governments must also consider the

social and cultural implications of managed retreat and design multi-stage planning processes. Among other benefits, phased processes can help communities gradually transition away from vulnerable coastal areas and allow residents to have more time to process the grief associated with leaving their homes. Additionally, phased processes can provide governments with more time to engage and learn from residents about the climate impacts they are experiencing and provide more time to prepare for and make investments in receiving areas.

- *Design transformative or visioning processes for managed retreat:* Visioning processes can create a platform to help communities plan for retreat and receiving communities to sketch their future development blueprint according to the changing landscape. Plans, among other tools aimed at promoting long-term, "bigger picture" thinking, can potentially support the design of receiving communities. While this will not entirely mitigate the significant emotional trauma or sense of loss people may experience from leaving their homes, it may help create a sense of hope where they can contribute to shaping their futures. One example of this type of process comes from Edgemere, a neighborhood in Queens, New York, that suffered damage after Hurricane Sandy. The City of New York used questionnaires and held workshops, open houses, and small group meetings to build a community-led vision of how Edgemere could become more resilient through the potential implementation of different projects over both the short and long term. Thoughtful processes can also help people preserve and carry forward elements from their previous communities to their new ones while maintaining some sense of continuity. In 2017, the Town of Princeville, North Carolina engaged experts and communities in a long-term, comprehensive planning process to annex a 53-acre parcel of land located outside of the town's 100-year floodplain to develop a safer, higher ground area where residents, structures, and infrastructure can be relocated. Princeville provides an example for other municipalities for how to balance the preservation of original townships while addressing vulnerabilities to flooding and increasing the resiliency of core community assets and services.
- *Set a clear timeframe and achievable meeting goals:* Community engagement processes around managed retreat will involve working among several and diverse stakeholders over longer time periods (i.e., multiple months or years). Accordingly, it will be crucial for governments to design and execute efficient processes that set clear timeframes, goals, objectives, and expectations to bring community members along and maximize their participation and contributions. Notably, governments and communities may disagree on these points, so there may be a need for upfront dialogue, iteration, and flexibility on both sides. LA SAFE provides one model that governments can consider when handling larger-scale managed retreat efforts. LA SAFE organizers set a realistic nine-month time frame to hold community meetings and divided that time into five rounds of meetings. Moreover, each meeting was structured around a clear and achievable goal to focus participants.
- *Build local capacity:* To conduct a truly community-driven process, community members themselves must have the capacity to guide and participate in these conversations. The government should also lean on existing community knowledge and leadership and provide the option of training local community leaders to facilitate and lead the discussions on community adaptation issues if needed. Governments can create training programs and offer stipends for community facilitators who are willing to dedicate time to enhance and build upon the existing skills needed to coordinate these discussions. For instance, to support LA SAFE, the nonprofit Foundation for Louisiana trained local facilitators through its LEAD the Coast program.

- *Design various types of interactive activities to facilitate increased and more meaningful engagement:* To encourage community participation, state and local governments should design various types of activities, such as small group meetings, brainstorming workshops, virtual meeting options, surveys, and questionnaires, that can help get people out of their comfort zone and build deeper relationships. Governments should not confine themselves to rigid public hearing formats; instead, they should apply different approaches across the various stages of decisionmaking processes to achieve different objectives. For example, as the State of Hawaii assessed the potential feasibility of managed retreat in the state, the lead agency held various meetings and symposiums inviting community members to join. Through this process, community members became more familiar with the concept of managed retreat and gave valuable input that informed the government's work. In Punta Gorda, Florida, the city developed its Climate Adaptation Plan with direct public participation from residents through games, individual interviews, and pre- and post-workshops surveys. Creative conservation projects can also foster enhanced community engagement opportunities. To cultivate stewards at Blackwater National Wildlife Refuge in Maryland, federal and state land managers and environmental nonprofits have invited residents to replant marsh grasses vulnerable to sea-level rise and take tours of restoration sites.
- *Provide support services and resources to facilitate increased participation:* Governments should provide necessary support services and resources so that residents can participate in meetings and feel valued for their time spent. Examples of support services and resources include: providing childcare, translating meeting materials in different languages, and making these materials available via multiple in-person and online platforms. For example, in some cases, residents cannot leave their children at home to join community meetings; therefore, offering childcare can be essential to enable diverse perspectives and inclusive attendance and participation. LA SAFE organizers provided childcare so that more residents could join meetings. Governments should also provide translated materials for non-English speaking residents, as the LA SAFE organizers did for Vietnamese and Cambodian residents. Other types of support services can include providing meals and stipends for meeting participants. Furthermore, to allow residents to learn about managed retreat tools and options, governments should also consider opportunities to create and distribute online resources to reach wider audiences. In Harris County, Texas, the regional Flood Control District bought-out more than 3,000 properties located in vulnerable floodplains and, in the process, established a user-friendly website providing detailed information about the voluntary buyout process. The website also includes testimonials from previous program participants, infographics, and easy-to-follow videos.
- *Build public-private partnerships:* Community-based and grassroots organizations have valuable hands-on experiences working and building trust with their communities. Governments should evaluate opportunities for partnering with these entities to promote the consideration of managed retreat policies. Two types of partnerships can be instructive here. First, partnerships can be structured to let community-based or grassroots organizations take the lead. For instance, in Hampton, New Hampshire, the Seabrook-Hamptons Estuary Alliance initiated climate adaptation workshops and dialogues through the development of a state-local partnership. Second, state and local governments can invite nongovernmental entities to participate in these processes. In Woodbridge Township, New Jersey, the township partnered with The Land Conservancy of New Jersey to educate residents flooded during Hurricane Sandy

about the benefits and tradeoffs of participating in the New Jersey Blue Acres Buyout Program. As a result, nearly 200 residents accepted a buyout offer.

- ***Evaluate and adapt community engagement processes:*** Governments and communities should work together to design community engagement processes with active evaluation steps and feedback loops to manage and adapt to them, as needed. This will be particularly important to assess and ensure that community members feel heard, community expectations are met, and procedural and substantive goals and objectives are achieved. Moreover, given the ongoing peer-learning among communities considering managed retreat nationally, evaluation processes and results can better inform and improve future efforts.

Social/Equity: Receiving Communities

Overview

Source: King County Parks.

Working with communities to facilitate voluntary transitions is only one side of the managed retreat coin. “Receiving communities” — or “receiving areas” — is the broad term used to refer to locations where people may be relocating in response to coastal hazards and climate impacts. Receiving areas can be located within the same municipality as a “sending” area or in a different municipal, county, state, or national jurisdiction. While the geographic characteristics and land-use patterns of individual receiving communities will vary, they will ideally be located at a higher elevation and/or further inland away from coastal sending areas experiencing sea-level rise, flooding, and/or erosion. This will better ensure that people are safer and better off, at least from a reduced risk standpoint. Receiving communities can apply in both a pre- and post-disaster context where people seek refuge in response to either episodic (e.g., hurricanes) or chronic (e.g., high tide flooding) threats. People may choose to stay there temporarily or indefinitely. Given the focus on proactive managed retreat strategies, this toolkit section primarily discusses and proposes legal and policy recommendations for receiving communities where people permanently choose to relocate in a non-disaster-related context.

To adequately prepare receiving areas, state and especially local governments should aim to plan for and make proactive investments in affordable housing, infrastructure, and critical services (e.g., schools). These actions are necessary to support anticipated population increases unless particular regions or municipalities already possess sufficient but underutilized capacity. The growth of receiving communities will present governments with important fiscal and social questions. Fiscally,

governments will have to evaluate how to fund the implementation of potential policies and projects and assess the impacts of population changes and these investments on state and local budgets and tax bases. Socially, governments must work with both current and new residents to guide and inform the future development of these areas.

Where governments implement hazard mitigation buyouts (e.g., Minot, North Dakota), land swaps (e.g., Resilient Edgemere and New Orleans, Louisiana), or Transfer of Development Rights (TDR) programs (e.g., King County, Washington), policymakers will be directly confronted by some or all of these considerations; however, some areas will indirectly receive people from outside their jurisdiction and not as a direct result of their managed retreat policies. For example, some places that will serve as receiving communities will choose to adapt through non-retreat strategies or will not experience significant sea-level rise or coastal erosion. These locations would include urban cities with seawalls that protect shorelines; and non-coastal cities like Buffalo, New York or Cincinnati, Ohio that are anticipating future population growth as people leave the coast. Regardless of the cause or impetus, governments should be aware of the potential ways they could become receiving communities. Governments can use demographic and other types of data to track or monitor these shifts.

In elevating and prioritizing considerations about receiving communities, it is important for governments to simultaneously recognize that not everyone will choose or be able to move away from vulnerable coastal areas (e.g., people who desire to stay in place and/or lack the financial resources to leave). Different adaptation strategies are needed for low risk receiving areas with growing populations and high and moderate risk areas that may be losing population; therefore, measures are also needed to help residents and businesses that will continue to occupy higher risk areas. Policies and programs can be designed to help communities transition and mitigate impacts from population losses and reduced tax bases — for example, by making investments to sustain communities by enhancing the resilience of homes and infrastructure (e.g., through floodproofing or elevation).

Practice Tips

State and local governments that anticipate becoming receiving communities may consider the following practice tips:

- *Invest in data:* Before governments can evaluate whether to plan for and make investments in receiving communities, they will need the best available data to identify these areas. In most cases, this will be a threshold or dispositive question before governments take any actions to avoid wasting limited resources. Through one approach advanced by the Louisiana Strategic Adaptations for Future Environments, or “LA SAFE” program, governments can overlay demographic and economic data with physical risk data (i.e., rate of sea-level rise and erosion, flooding) to identify low-risk areas receiving people migrating away from the coast. Specifically, demographic and economic data can indicate places experiencing population gains (compared

to losses) over specific time periods to inform where receiving regions and municipalities may be located. While receiving areas are not geographically homogenous and will likely face varying degrees of physical risk, they will ideally possess a lower risk profile — as compared to coastal sending areas — that supports or justifies an increased number of people. With LA SAFE, the state used this model to help guide community discussions with six coastal parishes experiencing significant rates of sea-level rise and land loss. Based on demographic, economic, and physical risk data, the state identified three levels of flood risk — high, moderate, and low — that correspond with different development principles to adapt to that flood risk. Notably, the state characterized low-risk areas as having relatively favorable future flood risk projections for 0–3 feet in a 100-year or one-percent-chance flood event over a 50-year planning horizon. In general, the state recommended that, based on this low risk, these areas could present new development opportunities, and could receive populations and businesses supporting economic activities that are relocating away from moderate and high-risk areas.

It is important to recognize that data will largely serve a predictive function with varying degrees of accuracy. One of the greatest challenges demographers and other experts will encounter is how to account for personal preferences and choices when building predictive models to show future population patterns.[237] Additionally, models may not account for legal and policy decisions around climate adaptation that may otherwise enable people to stay in their homes longer.[238] Data collected on a regional or local scale over a statistically reasonable time period will likely have more predictive accuracy compared to population shifts examined on a cross-state or national scale presumably because, among other factors: (1) there are likely fewer variables to control for on a smaller spatial scale; and (2) people may be more inclined to stay closer to home when relocating to remain near family, friends, and jobs.[239] One exception, however, could be in states and municipalities where governments can, at least to some degree, anticipate that they will receive an influx of people in a post-disaster context because their residents have well-established cultural, historical, familial, or other connections with those affected by a disaster event. For example, Holyoke, Massachusetts has a large Puerto Rican population. After Hurricane Maria devastated Puerto Rico, the city prepared to receive a large number of family members and friends who were either temporarily or permanently displaced by the storm due to their familial or kinship ties and relationships with Holyoke's residents. In the end, policymakers will have to determine what level of statistical risk they are comfortable with before planning for or making investments in receiving communities.

As a starting point, governments can engage in partnerships with universities and nonprofits to collect and analyze this data and develop predictive models to inform planning and policy decisions and use publicly available sources of data, like the U.S. Census Bureau. Other experts have used forwarding mailing addresses to show where those who can afford to move are moving and information on which cities received displaced people after disaster events.[240] Residents in both sending and receiving areas can also provide important information, namely to help policymakers better understand relocation trends (e.g., why are people leaving the coast, what factors influence where they are moving) and how population increases and decreases are affecting communities. Governments implementing hazard mitigation buyouts can also seek to collect information from willing participants to learn where

people are moving. This data — which should be collected voluntarily and protect personally identifiable information — can be shared between buyout sending and receiving areas to increase community-level awareness of these population shifts.

- *Plan for receiving areas:* Where receiving communities can be reasonably identified, different types of plans can help state and local governments prioritize considerations about receiving communities. Notably, local comprehensive plans and post-disaster recovery plans could play key roles here given their purpose in guiding future land-use and zoning at the local level (for more information about plans, see the Planning Tools section of this toolkit). Plans can also guide policymaking decisions that inform legal and investment decisions in areas that are likely to receive people leaving the coast; and phase and distribute anticipated costs over a longer time period to minimize present economic impacts. For example, plans can help local policymakers proactively identify parts of a municipality that may have to be upzoned or where to allocate funding for road, stormwater, or other infrastructure upgrades to accommodate an increased number of residents. Additionally, plans can serve as a medium to engage existing residents in receiving locations to reflect community priorities and needs in the design and implementation of potential projects. States can also support and coordinate land-use and other types of planning across local jurisdictional boundaries.
- *Seek new funding sources — or use existing funding sources in new ways:* Overall, current examples of federal, state, and local funding programs do not contemplate or prioritize funding for receiving communities. As the concept of managed retreat and receiving communities becomes increasingly mainstream, policy reform and innovation will be required to sufficiently support investments in receiving communities. For example, eligible state and local governments look to the **Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program** and **Department of Housing and Urban Development's (HUD) Community Development Block Grant–Disaster Recovery program** to fund disaster recovery in their jurisdictions; however, state and local governments generally prioritize funding for areas that are covered by a presidential disaster declaration.[241] Additionally, for funding sources like **FEMA's Public Assistance (PA) grants**, agency policy can prohibit grantees from directing funds to receiving communities that fall outside of disaster-designated areas.[242] While it is important that governments prioritize funding to meet the needs of those hit hardest, the current system does not provide governments in receiving areas with adequate funding to support any new costs associated with a temporary or permanent influx of residents. In the month after Hurricane Katrina made landfall, several nearby urban centers, including Houston, served as receiving areas that took in large numbers of residents displaced from Louisiana. Houston was the largest receiving point outside of the State of Louisiana with approximately 240,000 people.[243] This sudden population increase tested the capacity of Houston's schools, hospitals, social welfare organizations, and communications and local infrastructure systems.[244] As these examples illustrate, governments at all levels should seek opportunities to either create new sources of funding or use existing funding sources in new ways so that policymakers can support all areas necessitating financial assistance whether they are covered by a disaster declaration or not.[245]

Washington State presents one example of a unique funding program for receiving communities. King County operates a regional Transfer of Development Rights (TDR) Program to achieve long-term planning goals and incentivize development in strategic growth areas. Municipalities and unincorporated areas across the county can voluntarily choose to participate in a TDR Program. The State of Washington created the regional Landscape Conservation and Local Infrastructure Program (LCLIP) to support TDR Programs like King County's by financing infrastructure development and other improvements in receiving communities to ensure these areas can keep pace with population growth.[246] By adopting a TDR Program and agreeing to accept a specified amount of regional (as opposed to only municipal) development rights, municipalities within three counties in the state are eligible to receive a bonus portion of their county's property tax revenues to finance investments in receiving areas, such as transportation, water, and sewer system repairs and upgrades, construction of public transit, community amenities like parks and trails, and electric, gas, or other utility infrastructure.[247] LCLIP only reallocates a portion of the incremental property taxes that result from new development and does not impose any new tax burden on residents or businesses. LCLIP is a novel, but rare funding example which has not yet gained a lot of traction: As of 2019, Seattle is the only city that has created a "Local Infrastructure Project Area" tax financing district.[248] In short, more state and local experimentation is needed.

- *Anticipate the need for potential new laws or legal amendments:* Governments with oversight of receiving communities may need to adopt new laws or draft amendments to existing laws to align local land-use and zoning provisions with managed retreat policies or projects (e.g., upzoning). Governments should anticipate these types of potential changes and seek to make them in advance of when policies or projects will be implemented to avoid social and economic costs associated with delays (e.g., affordable housing shortages due to zoning density restrictions).
- *Actively and meaningfully engage community members:* Residents in receiving areas should guide and inform the development and implementation of plans and projects that will affect their lives and livelihoods. Governments need to ensure that any investments in or decisions affecting receiving areas are compatible with a community's character, needs, and priorities, and, most important, do not displace current residents from their homes or businesses. For example, black communities and other low-income communities of color are being forced out of their neighborhoods in Miami due to "climate gentrification." As sea levels rise, developers and homeowners are looking to higher ground areas in the Liberty City, Little Haiti, and West Coconut Grove neighborhoods to shift development away from the coast.[249] As a result, these communities are being displaced from their homes and businesses. In response, the Mayor of Miami passed a resolution in 2018 directing city staff to research the effects of climate gentrification on these and other low-income communities to explore ways to stabilize property taxes to reduce displacement. Threats of displacement like the ones in Miami may increasingly require local government responses to better understand these issues and protect current residents. In protecting current residents from displacement, however, receiving communities should not exclude people moving away from the coast. Instead, receiving communities should, at a minimum, provide them with a comparable home and necessary infrastructure and services in a safer location. To the greatest extent practicable, local policymakers should aim to balance

the needs of both current and future residents; although achieving a balance may be especially challenging where the interests of the two groups significantly diverge from one another.

- *Build bridges between sending and receiving areas:* Although it is an emerging and evolving concept, governments can seek opportunities to create or support partnerships that build individual- and community-level bridges and connections between coastal sending and higher ground receiving areas. These bridges can potentially encourage people to get out of harm's way sooner and help to minimize the social and psychological impacts of relocation. If people feel welcome and more at home in their new locations, they will have a better chance of thriving. For example, religious institutions and organizations, and other groups located in receiving areas can be encouraged to establish and grow relationships with people living in vulnerable coastal areas who may consider moving in the future.[250]