



# Natural Hazard Retrofit Program Toolkit

A Guide for Designing a Disaster-Resilient  
Building Retrofit Program in Your Community



**FEMA**

## ACKNOWLEDGMENTS

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FIGURE 1. Retrofit programs can help the wider community.

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# INTRODUCTION

**Protecting our communities from natural hazards is increasingly important in the United States. When flooding, seismic events, wildfires, hurricanes, typhoons and other events strike, we must ensure that our buildings and homes can withstand these forces as much as possible. Retrofitting structures is one way to save lives and prevent widespread damage to property and the economy.**

FEMA Region 9 created this Natural Hazard Retrofit Program Toolkit to help state, local, tribal and territorial jurisdictions shape a retrofit program that meets their specific needs. As each community is unique and faces different hazards, a building retrofit program must be tailored accordingly. While this toolkit outlines each section step by step, you will likely refer to sections as you need them. Each community is different and there is no right way to approach building a retrofit program. The visual on page 3 will help you navigate this document and easily navigate to specific sections when needed.

The document has guidance and resources related to:

- Assessing vulnerabilities and hazards.
- Funding.
- Designing a program.
- Community outreach.
- Monitoring and evaluation.
- Retrofit program best practices.

## Retrofitting

*Making changes to existing structures to mitigate the impacts of natural hazards. A way to adapt to evolving hazards and a tool for disaster risk reduction.*

Many of the best practices, examples and advice featured here were drawn from interviews that FEMA Region 9 conducted with state and local governments across the United States. These states, counties, cities and towns implemented retrofit programs to address a variety of hazards. Case studies and summaries of their programs can be found in **Appendix A**.

This toolkit includes **three appendices**:

- **Appendix A** summarizes the case studies used throughout this document.
- **Appendix B** provides companion tools and resources to support the development of your program.
- **Appendix C** captures additional information on behavioral science, including worksheets to help support you in implementing your program.

## GUIDING PRINCIPLES AND CONSIDERATIONS

This toolkit also provides additional insights to help improve your retrofit program. For example, behavioral science can help you design and implement programs that overcome common barriers and capitalize on predictable human behaviors. Other recommendations throughout this toolkit will help you design and apply an equitable program that better serves the whole community. Use the following practices and principles to develop a program with community-informed results.



### **Behavioral Science – Unlocking the “Why” and “How” of Human Behavior**

The objective of this toolkit is to positively change communities’ behavior by helping them protect their homes and livelihoods. But if we want to change people’s behavior, we have to go beyond just giving them information. We have to gain a better understanding of the thoughts, feelings and actions of the people we are trying to help.

Behavioral science unlocks the knowledge of “why” and “how” people think and behave. This toolkit uses behavioral insights in a realistic, applicable and effective way to help center program design on community members.



### **Equity – Designing Programs That Work for the Whole Community**

Centering your program around equity will help community members reduce the risk to their homes, businesses, property and, most importantly, their families. Many factors determine one’s social vulnerability. We need to understand the variety of drivers and recognize how they overlap and intersect to affect an individual’s position, access and resources. These insights will help us create a more holistic program that provides greater and more equitable benefits to the larger community. When planning and designing retrofit programs, it is important to consider those most affected by them. Keeping the needs of marginalized populations at the forefront of your planning process will contribute to a greater impact, action and overall success.



### **Historic Preservation – Stewardship of Our History**

Natural and historic landscapes and resources are important to us all. These can include long-honored landmarks and natural resources that hold meaning for communities and give communities their identity, purpose, economy or touristic appeal. They hold communities’ history and unique environmental ecosystems. For these reasons, local communities, states, territories, tribal governments and the federal government work to preserve these natural and historic resources. They have established various codes, ordinances, laws and regulations, and legal mandates to protect them, including during hazard mitigation project work. As you explore a retrofit program, you will need to consider the importance of the historic and natural landscape and resources and how best to comply with all legal requirements.

**TABLE 1: CREATING A RETROFIT PROGRAM: AT A GLANCE**

Section	Key Question	Behavioral Science and Equity Insights	Resources
 <p><b>Assess Risks and Vulnerabilities</b></p>	<ul style="list-style-type: none"> <li>▪ Evaluate hazards – How have hazards affected your community?</li> <li>▪ Identify vulnerabilities – Which populations and community assets would be most impacted?</li> </ul>	<p>Consider community demographics and socioeconomic factors, in addition to infrastructure, when identifying vulnerability.</p>	<p>Local Hazard Mitigation Plan, FEMA hazard identification and risk assessment resources</p>
 <p><b>Consider the Context</b></p>	<ul style="list-style-type: none"> <li>▪ Examine hazard retrofit options – Which options work best for your building stock?</li> <li>▪ Review community priorities – Who are your participants, and what is important to them?</li> <li>▪ Analyze market profile – Which businesses are available to support the program?</li> <li>▪ Consider the implementation team – Who can you partner with and how can they help?</li> </ul>	<p>Identify potential barriers community members may face as they seek to participate in the program and constraints that have inhibited retrofitting in the past.</p>	<p>Statistic and demographic data sources table, FEMA retrofit and construction guides</p>
 <p><b>Determine Funding</b></p>	<ul style="list-style-type: none"> <li>▪ Examine project costs – What level of funding do you need?</li> <li>▪ Discover funding options – What funding sources are available?</li> <li>▪ Evaluate options – Do the requirements, timelines and commitments match your team/program capacity?</li> </ul>	<p>Build relationships with funding source contacts and communicate often.</p>	<p>Build better funder relationships worksheet, Funding evaluation checklist</p>
 <p><b>Design the Program</b></p>	<ul style="list-style-type: none"> <li>▪ Establish program goals and timelines – What do you want to accomplish and when?</li> <li>▪ Establish retrofit standards – What standard is required to achieve the desired level of safety?</li> <li>▪ Design an ordinance – Will it be mandatory or voluntary, and how will you apply it?</li> <li>▪ Design an outreach/recruitment program – How will you motivate people to participate?</li> <li>▪ Design the application process – How will people apply, and how will you select participants?</li> <li>▪ Design a contractor/inspector program component – Who is eligible to participate and what training will be required?</li> <li>▪ Design an evaluation process – How will you measure success and refine program processes?</li> </ul>	<p>In order to garner and maintain engagement from your whole community, use positive incentives as motivators, while also ensuring the program structure does not marginalize or exclude community members or groups.</p>	<p>S.M.A.R.T. Goals, Program examples, E.A.S.T. framework</p>
 <p><b>Prepare</b></p>	<ul style="list-style-type: none"> <li>▪ Pass the ordinance – How will you gather support from key stakeholders?</li> <li>▪ Solicit participation from owners and the private sector – What communication tools and/or events can you use to reach potential participants?</li> <li>▪ Train staff and partners – What do they need to know to successfully run the program?</li> </ul>	<p>Tailor your outreach messaging to the values and characteristics of the individuals to whom you are communicating.</p>	<p>Messaging framework</p>
 <p><b>Implement</b></p>	<ul style="list-style-type: none"> <li>▪ Begin the program – How will you kick it off and distribute information?</li> <li>▪ Monitor, evaluate, respond and adapt – What is working? What can you simplify or update?</li> </ul>	<p>Maintain clear and consistent communication with participants, staff and partners.</p>	<p>Sample outreach plan, Program evaluation guide</p>



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# DEFINITIONS

## Building

- A structure with two or more outside rigid walls, and a fully secured roof, that is affixed to a permanent site.
- A manufactured home (also known as a mobile home) built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation.
- A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws.

“Building” does not mean a gas or liquid storage tank or a recreational vehicle, a park trailer, or other similar vehicle, except as described above.

## Environmental and Historic Preservation (EHP)

This process ensures that federal grant monies are used in a manner consistent with federal laws pertaining to the environment and historic preservation. This process also considers the effects to, and protection and enhancement of, natural and cultural resources.

## Hazard Mitigation

- Actions that reduce or eliminate the long-term risk to people and property from the effects of hazards.
- A mitigation activity is a measure, project, plan or action proposed to reduce risk of future damage, hardship, loss or suffering from disasters.

## National Flood Insurance Program (NFIP)

The program of flood insurance coverage and floodplain management administered under the National Flood Insurance Act and applicable federal regulations enforced in Title 44 of the Code of Federal Regulations, Subchapter B.

- **Special Flood Hazard Area (SFHA).** An area having special flood, mudflow or flood-related erosion hazards and shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map as Zone A, AO, A1-A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1-A30, V1-V30, VE or V.
- The term “**substantially damaged**” is used when a home or business is damaged by a flood to the point that repairs will cost 50% or more of the building's pre-damage market value.
- **Repetitive loss** is defined as when a home or business has been damaged by a flood two times in the past 10 years, where the cost of repairing the flood damage, on average, equaled or exceeded 25% of its market value at the time of each flood.

## Natural Hazard

A source of harm posed by the earth's natural processes, including earthquakes, hurricanes, tsunamis, tornadoes, floods, volcanic eruptions, storms, landslide, rising sea levels, wildfires, subsidence, etc.

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## Non-Federal Match

A non-federal match or “cost share” is the proportion of the costs of a federally assisted project or program not borne by the federal government. For FEMA, both the federal share and the non-federal share must be eligible costs used in direct support of activities that FEMA has approved in the grant award. Contributions of cash, third-party in-kind services, materials, or any combination thereof, may be accepted as part of the non-federal match.

## Retrofitting

Making changes to existing structures to mitigate the impacts of natural hazards. A way to adapt to evolving hazards and a tool for disaster risk reduction.

## Risk

The potential for damage or loss created by the interaction of natural hazards with community assets.

## Vulnerability

Characteristics of community assets that make them susceptible to damage from a given hazard.



FIGURE 2: Programs can be tailored to address the community’s risks, vulnerabilities and natural hazards.

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## ACRONYM LIST

**BCA:** Benefit-Cost Analysis

**CDBG:** Community Development Block Grant (HUD)

**EBB:** Earthquake Brace + Bolt (California)

**EHP:** Environmental and Historic Preservation

**FEMA:** Federal Emergency Management Agency

**HLMP:** Hurricane Loss Mitigation Program (Florida)

**HMP:** Hazard Mitigation Plan

**HOME:** HOME Investment Partnerships Program (HUD)

**HUD:** United States Department of Housing and Urban Development

**ICC:** Increased Cost of Compliance (NFIP)

**IBHS:** Insurance Institute for Business and Home Safety

**NFIP:** National Flood Insurance Program

**NHPA:** National Historic Preservation Act

**SAH:** Strengthen Alabama Homes

**SHIP:** State Housing Initiatives Partnership Program (Florida)

**SHMO:** State Hazard Mitigation Officer

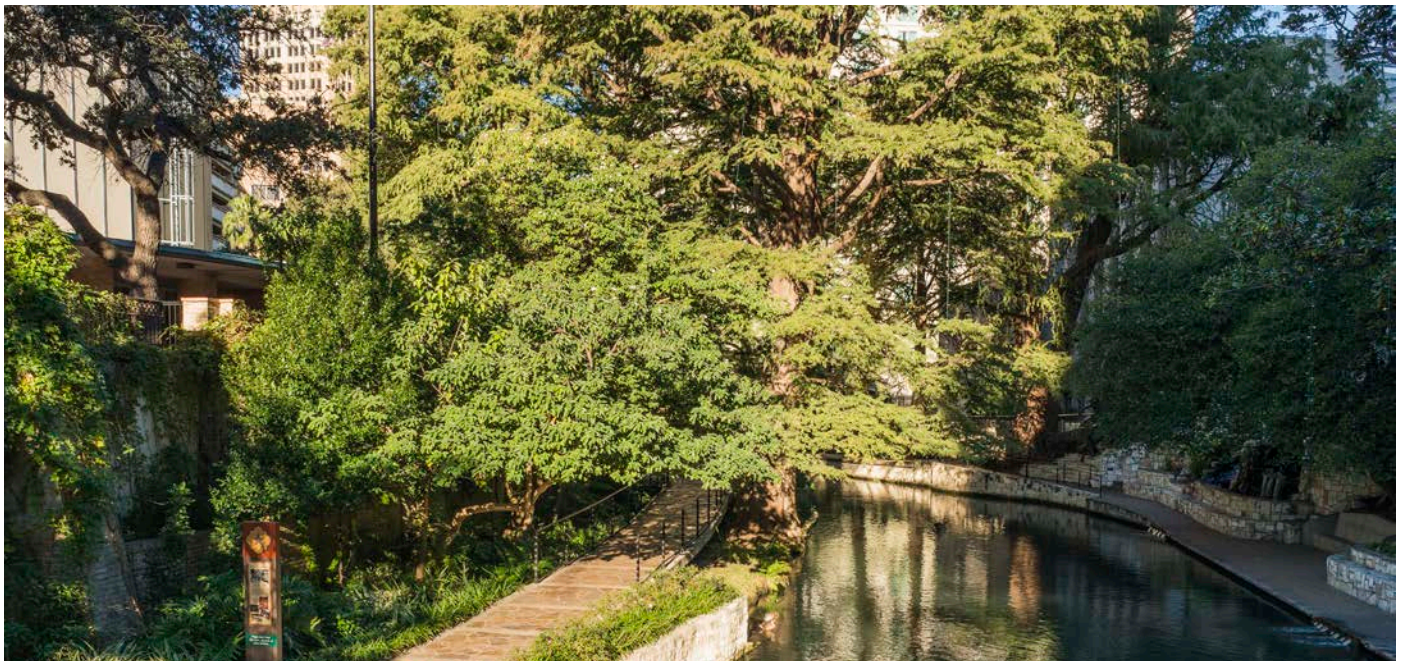


FIGURE 3: The impacts of a variety of hazards can be mitigated by retrofitting.

# SECTION 1: ASSESS RISKS AND VULNERABILITIES



## Assess Risks and Vulnerabilities

- Evaluate hazards – How have hazards affected your community?
- Identify vulnerabilities – Which populations and community assets would be most impacted?

Consider community demographics and socioeconomic factors, in addition to infrastructure, when identifying vulnerability.

Local Hazard Mitigation Plan, FEMA hazard identification and risk assessment resources

**We all want to defend our communities from natural hazards, and retrofitting buildings unable to withstand the impacts of natural events is a key part of reducing risk in most communities. Creating a building retrofit program can increase the number of retrofits undertaken in a community, building local resilience.**

Before you begin designing and implementing a program, you need to know what you're defending your community from and how your community will benefit.

In this section, we will present tools and assessments that can help you build a retrofit program tailored to your community's unique needs.

The four basic steps of a risk assessment — a process to identify potential hazards and vulnerabilities and analyze what could happen if a hazard event occurs — are: 1) describe hazards; 2) identify community assets; 3) analyze risks; and 4) summarize vulnerability. This process is useful for informing priorities, developing or comparing courses of action, and informing decision-making.



FIGURE 4: Assessing hazards becomes increasingly important as risks change.

## 1.1 HAZARD EVALUATION

To learn more about your community’s risk, a great place to start is with your Hazard Mitigation Plan (HMP). The HMP discusses and summarizes your community’s risks and vulnerabilities related to major hazards. It may include most, if not all, of the information you need for your assessment. Your HMP can help you answer the following questions:

- What hazards have occurred in the past?
- What parts of your geography does each hazard affect? Are the effects more intense in particular locations?
- How is the extent, or intensity, of each hazard measured?
- How probable is it that each hazard will occur in particular geographies?

Once you have identified the geography, intensity and probability of local hazards, you can choose which type of hazardous event you would like to address through building retrofits. For example, will your retrofit program address the most extreme events, which occur rarely but would cause widespread damage? Or will your program address milder hazard events, which occur on a regular basis and cause minor to moderate damage? The hazard event or events you choose to address—which engineers sometimes label the “design event”—will help you identify the specific buildings in your jurisdiction that are most in need of retrofitting (further discussed in **Section 1.3**). If multiple hazards affect buildings in the area, it is also important to ensure that retrofit activities to address one hazard do not increase the risk from other hazards.

If your community does not have an HMP, you can review your State Hazard Mitigation Plan or the safety policies in your community’s Comprehensive, General Plan, or Threat and Hazard Identification and Risk Assessment. Another option is to see if your area is covered under a multijurisdictional HMP (often led by the county). Conducting a local risk assessment provides essential information about your community and much of this information may be needed when you apply for funding.

Many resources, including FEMA’s [Local Mitigation Planning Handbook](#), [Tribal Mitigation Planning Handbook](#) and [Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards](#), can guide you through conducting a risk assessment and considering various mitigation actions. Additional hazard and risk information can be found in [FEMA’s hazard identification and risk assessment resources](#), the United States Geological Survey’s [Data and Tools](#), and the [National Water & Climate Center](#), hosted by the National Resources Conservation Service. These resources can help you find the available hazard data and assessments. For more information, refer to **Appendix B.1**.

### BEST PRACTICE: CONDUCT A THOROUGH ASSESSMENT

*Conduct a thorough hazard and vulnerability assessment for your community. This puts you in the best position to design a program that meets your community’s resilience needs.*

## 1.2 VULNERABILITY IDENTIFICATION

If you have an HMP, you will also want to review the vulnerability assessment. The vulnerability assessment identifies the infrastructure and community assets that are particularly vulnerable to certain hazards. Looking at vulnerable assets in your community will start to give you a general idea of potential buildings or homes to address with your program. It will also help you to identify commonalities in building features that might contribute to vulnerability and that could be addressed with a building retrofit program. Sometimes communities realize their vulnerability through the lack of necessary access to resources, such as insurance. The costs of both insurance and construction projects are barriers to mitigation that interact and can cause a cycle of inaccessibility. Communities can take measures to break this cycle and support greater protection for all community members.

If you do not have an HMP, the following table can help you begin identifying vulnerabilities in your community.

### EXAMPLE:

*Alabama and South Carolina both started retrofit programs because residents in their coastal communities did not have sufficient access to wind and other hazard insurance. Retrofitting the homes in those communities keeps them safer and intact during storms, and insurance companies are more willing to sell policies to homeowners with retrofitted homes.*

**TABLE 2: QUESTIONS TO HELP IDENTIFY VULNERABILITIES**

QUESTION	DATA COLLECTED	DATA SOURCES
Who lives and works in the affected area?	Age, race/ethnicity, income level, family status, renter or owner, transportation status, language spoken at home, people without housing, seasonal populations.	<u>American Community Survey/ Census data</u> , labor statistics, business information, industrial data, chamber of commerce.
What are the buildings used for? What is the economic output (if this criteria is important in your program)?	Residential, commercial, industrial, mixed use, agricultural, maritime, critical facilities, hours of use, human capacity, storage capacity, economic output, number of occupants.	Zoning codes, Comprehensive/ General Plan's land use policies, assessor parcel data, Sanborn maps, real estate data.
What kind of buildings are in this area?	Building location, footprint, type, age, number of stories, materials, size, value.	Assessor parcel data, aerial imagery, land surveys, Hazus analysis, Microsoft U.S. Building footprints, community's building department structure inventory.



FIGURE 5: Particularly vulnerable to seismic events, unreinforced masonry buildings are often prioritized in retrofit programs.

It is important to not overlook who lives and works in the affected areas. Often, the populations that are already considered under-represented or marginalized (such as the elderly, people experiencing homelessness and non-English speaking communities) have higher risk in an emergency. Working with these communities early to mitigate their risks will lead to better preparation and hazard awareness.

### EXAMPLE:

*As part of their vulnerability and risk assessment, Hayward, California, conducted a racial equity analysis. They found clear racial disparities in natural hazard risk. Approximately half of the city's housing is used as rental units; 75% of the local Black population and 65% of the local Latinx population are renters. As renters are often disproportionately affected by disasters, their equity analysis provided critical data for the city council to consider since hazards would affect communities of color in their city more heavily than others.*



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## 1.3 INVENTORY ANALYSIS

Now that you have chosen the hazard you want to address and identified types of structures you are interested in, it is time to develop a detailed inventory which will identify the specific structures that need retrofitting.

What is an inventory? An inventory is a list or collation of one or more types of community assets, which usually includes specific information or features of each asset. Inventories help us understand gaps, deficiencies, needs and changes, and can even help us measure successes. Inventory data can be collected for assets in the built and natural environments, as well as for services and functions.

Examples of types of assets:

- **Physical:** buildings, streets, pipelines, water (natural and stored), transportation lines/routes (public and commercial), emergency evacuation centers, power station/lines, sanitation, vegetation, etc.
- **Institutional:** health and medical, education, government, religious, public safety, business, etc.
- **Social/organizational:** population characteristics, community networks, homeowner/renter groups, fire safe councils, etc.

For a building retrofit program, your inventory will probably be focused on physical and/or institutional assets. Information or features that can be collected for buildings include housing type, age, number of stories, etc.

Inventories are valuable program planning tools; knowing what assets your community has and where they are located is valuable information for many sectors and a variety of planning and strategizing activities. They can show the necessity of projects and help get those projects funded. An inventory will not only be useful for you, it will also be helpful in getting your project funded and getting buy-in. In fact, inventories can streamline the path to funding! They can be used for budgets, program or physical maintenance, internal and external collaboration, or as a tool for actionable decision-making.

To conduct a useful inventory that addresses true vulnerability, you must be sure that your research methodologies avoid bias. Research criteria should be based on credible data that is as up to date and as complete as possible.

### **BEST PRACTICE: REVIEW, REVISE, KEEP CURRENT!**

*Design and use good data collection and records management processes. Inventory data, and other data sets, can be used and updated for many years and for a variety of projects and programs.*



## Getting Started

A specific inventory should be assessed according to the goals and capacity (time, funding, etc.) of the program, which can be influenced down the line by the findings of the general inventory. If the purpose of the retrofit program is to address buildings that are repeatedly damaged by floods, it is likely that the list of buildings, or the location of repeated flooding, is known or easily accessible. If, however, the program seeks to address a hazard that affects the population at large, such as earthquakes or hurricanes, an inventory will be necessary to narrow down the geographic area or identify the more vulnerable buildings.

Before you start, check what data your community already has, maybe some inventorying has already been done. Try to identify all existing data sources that might provide applicable information. This could save significant time and money. However, it is unlikely that data sources will provide all of the specific data you are looking for; be prepared to fill in gaps and seek help from appropriate experts when needed.

As is true of many steps, conducting an inventory is widely dependent on resources (i.e., time, funding and expertise). Data collection can be time-consuming and costly, but keep in mind that some activities may be fundable through certain grant sources. For instance, FEMA may fund this type of effort if the inventory work is conducted to support activities outlined in your community's HMP. You can talk to your State Hazard Mitigation Officer or regional FEMA Mitigation Planner for more information!

### EXAMPLE:

*A mitigation program in Thurston County, Washington, addresses properties and homes that have been repeatedly damaged by floods. The project is limited to properties in an SFHA, where a certain level of flooding has a 1% chance of occurring in any given year. The program used this flood zone to set bounds for the project area, which helped prioritize structures for retrofitting.*

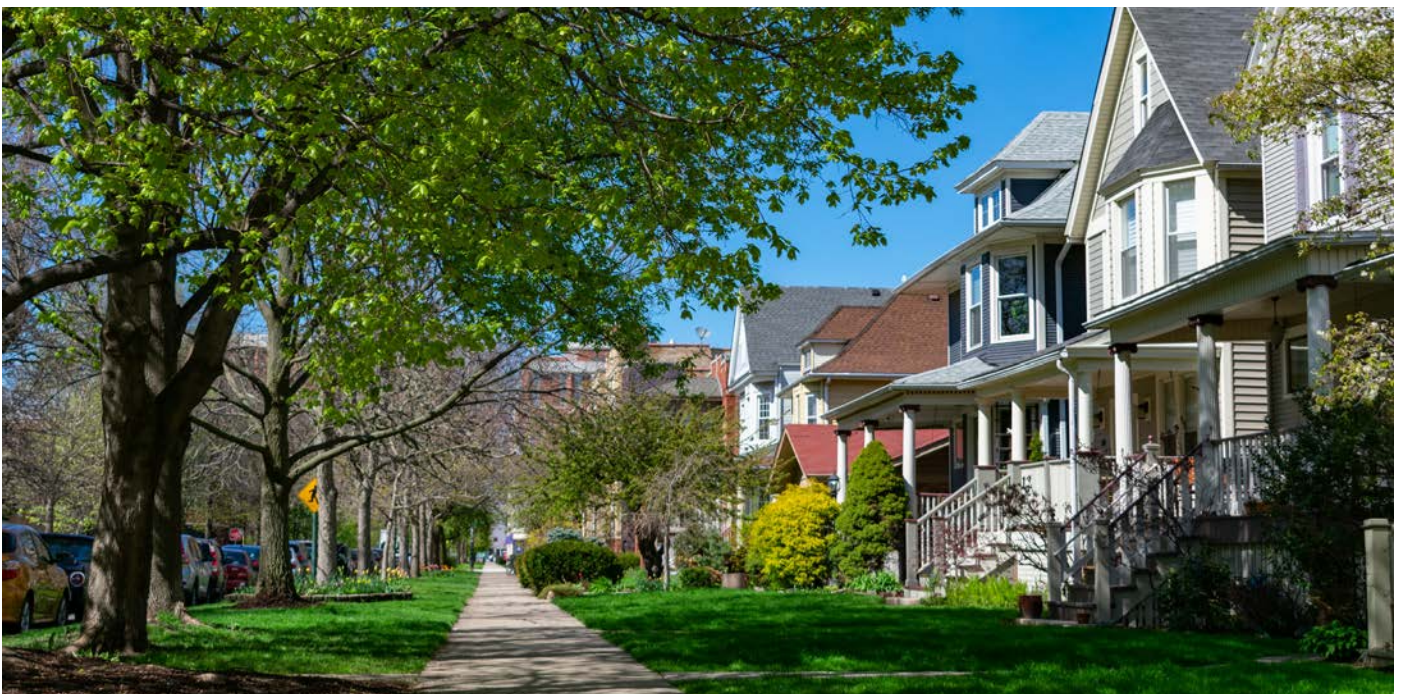


FIGURE 6: Knowing your building stock is one of the first steps to creating a retrofit program.

## Build the Inventory

Keeping the hazard in mind, structural factors to consider during the inventory include:

- Building materials.
- Building design.
- Building location in relation to other buildings (placement on block).
- Degree of openness.
- Building size.
- Building age.

Some of this data, such as building materials, number of stories or building size, may be obtained during a field survey, sometimes known as a dashboard survey. Depending on the size of your jurisdiction and the focus of the program, this method of data collection can be time and resource intensive, requiring expert engineers and builders to be on site. Often, this requires a team of field researchers to observe a building from the street, recording what they can see from outside of the building. It is worth noting that this option may not be ideal for all projects and communities. Gauge whether there is trust in local officials before sending a team to assess buildings from the outside. If you plan to do this, it is best to communicate with the community ahead of time to ensure transparency — this will help you build positive relationships with local stakeholders with whom you will likely interact later in the process. If your retrofit program only targets commercial buildings in a specifically vulnerable part of town, a survey might be easily accomplished with local staff, university program participation or email surveys to business and building owners. Use the expertise of researchers and firms with the capacity and experience to conduct field research.

The findings of your inventory analysis will affect the design of the retrofit program. For instance, for a seismic event, one might consider multi-story buildings with first-floor garages (soft story) as “extremely vulnerable,” single-story storefronts made of unreinforced masonry as “moderately vulnerable,” and single-family homes with a room over a garage as “somewhat vulnerable.”<sup>1</sup>

### EXAMPLE:

*To address the most vulnerable buildings first, the city of Palo Alto, California, organized buildings into three categories based on occupancy load and age. This allowed them to prioritize buildings for seismic retrofits. As time went on, the program made an additional assessment to gauge all potential vulnerabilities using the city’s tax assessor records. They focused on the year built and conducted site inspections to determine the type of building.*

<sup>1</sup> Keith A. Porter and Kelly Cobeen. “Informing a retrofit ordinance: a soft-story case study,” *Proc. 2012 Structures Congress*, Chicago IL, March 29-31, 2012.

Next, take a holistic approach and consider community and neighborhood characteristics, such as local demographics, population density, and types of businesses or housing. You'll want to identify any social criteria that increase the vulnerability of these buildings. For instance, part of your town may be made up of vacant unreinforced masonry buildings that are vulnerable to damage in the event of an earthquake; however, they may have a lower priority than a neighborhood of single-family, soft-story homes that house a majority low-income population. Here are other examples of social factors that might be used to prioritize buildings:

- Number of occupants, by hours occupied.
- Number of occupants, by building size.
- Building use (residential: own/rent, commercial, public, industrial, etc.).
- Socioeconomic status.
- Historical and community value.

Depending on the information available, this part of the process may provide a great opportunity to build trust and relationships with community members through organized outreach. While gathering your data, help community members to understand these local efforts; in return, you may generate buy-in and support.

When building an in-depth inventory is not an option, consider developing proxies to model the effects of hazards in your community or a focus area. For instance, if you know your jurisdiction passed a building code in 1970 that addressed hazards, it may be safe to assume that all buildings constructed after this date meet structural standards for building safety. In this case, you can narrow your search to buildings built before 1970. You can also use your existing permitting process to flag buildings that do not meet code, and add those to your inventory of vulnerable buildings.

Establish data collection and management systems early in the inventory process; it will benefit you in the long run. Consider storing the data where it will be accessible to future program staff, ensuring redundancy and easy access. See **Section 4.9** for more information on data collection and management.

#### ADVICE FROM A PRACTITIONER:

**Track your data! Poor data tracking and collection can lead to needing to redo and recollect inventory data. By keeping good records and properly managing data, you can save time and resources that would otherwise be used collecting and recollecting the same type of information.**

– George Hoyt, *Chief Building Official, City of Palo Alto, California*

## Parcel Assessor Data

*This can be an excellent source for building information, but be aware of its limitations.*

*Assessor data was created for tax purposes and can have limited, absent or under-represented parcel information. This can depend on a number of factors (e.g., whether a building is taxable, the way certain building types are assessed, etc.).*

*Parcel data will generally include building square footage, year built, number of stories, occupancy/use and location. Also check at the county and state levels.*

## SECTION 2:

# CONSIDER THE CONTEXT



### Consider the Context

- Examine hazard retrofit options – Which options work best for your building stock?
- Review community priorities – Who are your participants, and what is important to them?
- Analyze market profile – Which businesses are available to support the program?
- Consider the implementation team – Who can you partner with and how can they help?

Identify potential barriers community members may face as they seek to participate in the program and constraints that have inhibited retrofitting in the past.

Statistic and demographic data sources table, FEMA retrofit and construction guides

**Before launching a retrofit program, you will need to deepen your understanding of the context in which your program will be implemented. Although iteration is always necessary, it is easier to develop and execute a program when you are fully informed about your community’s needs, resources and potential limitations. This information is most useful when it is obtained as you conduct your building inventory and before you design the program.**

Explore the following elements before shaping your program. This process will help you decide what type of retrofits the community needs, what kind of standards to use, who your most valuable partners will be and what potential funding sources to explore.

### EXAMPLE:

*When establishing their retrofit program, the aptly named Earthquake Brace + Bolt (EBB) program decided that the most appropriate retrofit activity to meet their needs was bracing and bolting. These strategies were chosen over more intensive seismic retrofit activities because they are simple and effective, they apply to many building types, and they prevent one of the biggest issues during seismic events: homes falling off their foundations.*





## 2.1 HAZARD RETROFIT OPTIONS

Once you’ve narrowed down the hazards of concern, get familiar with retrofit approaches to reducing risk and choose the one that fits your community best. Review any engineering research on reducing the risk for this hazard and find the guidelines that other organizations or jurisdictions have used as standards. What qualities unique to your jurisdiction might inform a set of standards for the local building stock? Also take into account your building inventory. For instance, does a retrofit project work for a single-family home but not for multi-unit properties, or for commercial buildings and not industrial buildings?

Depending on the hazard, there could be a number of retrofit options that can reduce your community’s risk. They vary in cost, level of effort and complexity. Choosing the option that aligns best with your program is crucial for success. The table below outlines sample retrofit and mitigation actions for different hazards, but this list is not exhaustive. You can find more information on retrofit options and other mitigation actions in the following FEMA guides:

- FEMA P-737, [Home Builder’s Guide to Construction in Wildlife Zones: Technical Fact Sheet Series](#).
- FEMA 232, [Homebuilders Guide to Earthquake Resistant Design and Construction](#).
- FEMA 530, [Earthquake Safety Guide for Homeowners](#).
- FEMA P-804, [Wind Retrofit Guide for Residential Buildings](#).
- FEMA P-1037, [Reducing Flood Risk to Residential Buildings that Cannot be Elevated](#).
- FEMA P-936, [Floodproofing Non-Residential Buildings](#).
- FEMA P-499, [Home Builder’s Guide to Coastal Construction, Technical Fact Sheet Series](#).

**TABLE 3: RETROFIT OPTIONS BY HAZARD**

HAZARD	SAMPLE RETROFIT OPTIONS
<b>Floods</b> 	<ul style="list-style-type: none"> <li>▪ Elevation.</li> <li>▪ Relocation.*</li> <li>▪ Dry floodproofing.</li> <li>▪ Wet floodproofing.</li> </ul>
<b>High Winds</b> 	<ul style="list-style-type: none"> <li>▪ Securing the roof system.</li> <li>▪ Improving the water intrusion resistance.</li> <li>▪ Securing the exterior wall covering.</li> <li>▪ Tree fall prevention measures.*</li> <li>▪ Protecting exterior equipment.</li> </ul>
<b>Seismic Events</b> 	<ul style="list-style-type: none"> <li>▪ Foundation bolting.</li> <li>▪ Weak- and soft-story bracing.</li> <li>▪ Anchoring concrete and masonry walls.</li> <li>▪ Hillside bracing.</li> </ul>
<b>Wildfire</b> 	<ul style="list-style-type: none"> <li>▪ Installing ignition-resistant materials (roofs, fences, decks, siding, etc.).</li> <li>▪ Fuels reduction.*</li> <li>▪ Creating defensible space.*</li> </ul>

\*Non-structural mitigation actions that pair well with retrofits.

Source: [FEMA P-55](#), Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas

## 2.2 COMMUNITY PRIORITIES AND PARTNERS

To get to know your community, look not only at statistics and demographics, but also at what drives your community.

### Community Priorities

- Most communities have plans that establish community goals, such as general plans and master plans. Identify existing plans, programs and policies; take advantage of existing resources, and consider the following questions:
- What has your community already designated as a priority?
- How do your community goals, plans or ordinances align with retrofit activities? Look for opportunities to align and integrate.
- Does your economic development strategy promote resilient infrastructure?
- What work is already being done or attempted by municipal programs and local nonprofits?
- Where is there crossover that will support these activities?

Finding this information ahead of time will give you evidence to strengthen both applications for grant funding and political support.

Furthermore, look into any constraints in your community that have kept retrofitting from being completed in the past. Is the target geography in a floodplain or environmentally sensitive area that requires particular design standards? Does a growth moratorium in the zoning code make construction permits hard to obtain?

### Community Resources

- *Comprehensive, General and Master Plans.*
- *HMPs.*
- *Economic Development Plan or Strategy.*
- *Green Infrastructure/Sustainability Goal or Resilience Plan.*

#### EXAMPLE:

*Known as the “Fire Facilities and Emergency Response Levy,” this program in Seattle, Washington, integrates seismic retrofits with historic preservation requirements, upgrading the fire stations to modern fire safety and other standards (such as emergency conservation measures), and illustrating the ability of a single program to address multiple priorities.*





FIGURE 7: Acquaint yourself with existing data and resources to better understand your community.

**TABLE 4: COMMON STATISTIC AND DEMOGRAPHIC RESOURCES**

RESOURCE/LOCATION	TYPES OF INFORMATION
U.S. Census Data ( <a href="http://Data.Census.Gov">Data.Census.Gov</a> )	All census data.
U.S. Census – QuickFacts ( <a href="http://Census QuickFacts">Census QuickFacts</a> )	Statistics for all states and counties, and for cities and towns with a population of 5,000 or more.
U.S. Census – My Tribal Area ( <a href="http://census.gov/tribal">census.gov/tribal</a> )	Demographic, economic, social and housing data collected for the American Indian and Alaska Native population.
Department of Housing and Urban Development ( <a href="http://HUD Exchange">HUD Exchange</a> )	HUD low to moderate income area numbers.
General/Comprehensive Plan – Housing Element (community-specific)	Building stock.
Engineering Evaluations (community-specific)	Building data – such as materials used and year built.
Assessor Records (community-specific)	Building data – such as number of stories, number of units, and year built.
General Plan – Housing Element (community-specific)	Building stock.

## Program Participants

Gathering data on who will be able to participate in your program is an integral step as you prepare to design your program. Consider the following:

- How do participants and other people use the building?
- Are the building owners also the residents, or are the residents mostly renters?
- Are the home/building owners mostly from a particular income bracket?
- What language do most of the home/building owners speak?
- Are the majority of the homeowners elderly or young?
- Are multi-generational homes common in your community?
- Are many of the building owners absentee or out of state?
- Has there been accelerated population growth lately, or new residents from out of state who may not be knowledgeable of local hazard risks?
- Are the properties owned and managed by a corporation or by an individual owner?

Knowing your community will help you determine how to target program incentives or regulations around retrofit activities. Knowing your community will also help you obtain feedback and communicate expectations for home or building owners early on—a key communication tool to help recruit and maintain an interested pool of participants.

It is also important to consider what barriers your community members will face as they seek to participate in the program. Get to know ahead of time whether home or building owners might be affected by psychological, motivational, financial, bureaucratic, structural or legal barriers in the retrofit process. What is their risk tolerance? What is enough motivation to induce action?

Internally, you and your team can ask yourself the following questions to identify potential barriers you may face in working with community members. Overall, do participants have the **Capability, Motivation** and **Opportunity** to do what is being asked of them?

### EXAMPLE:

*Hayward, California, first designed a program that only accounted for part of their population: homeowners in their primary residence. However, around 50% of Hayward's residents are renters. To make sure they understood the effects of any retrofit costs that might be passed through to renters, the city wanted to take a closer look before jumping into a mandatory retrofit. They adopted a mandatory building screening ordinance first to get a sense of the scale of the problem and determined the number of buildings that needed to be retrofitted and the potential cost. They also conducted information sessions with rental housing authority members, interviewed developers and networked with stakeholders to ensure everyone was on the same page.*



**TABLE 5: QUESTIONS TO HELP IDENTIFY POTENTIAL BARRIERS**

<b>CAPABILITY</b> Do they understand?	<b>MOTIVATION</b> Are they motivated?	<b>OPPORTUNITY</b> Do they have the means?
<ul style="list-style-type: none"> <li>▪ Will they understand what is being asked?</li> <li>▪ Do community members know about their risk?</li> <li>▪ Do they have all the necessary information?</li> <li>▪ Will they need assistance to apply?</li> <li>▪ Can they physically do what is being asked?</li> </ul>	<ul style="list-style-type: none"> <li>▪ What will their emotional response be to this program?</li> <li>▪ What is their degree of desire for something like this?</li> <li>▪ Will it feel personally relevant to them?</li> <li>▪ Do they have any pre-existing beliefs or opinions that could act as a barrier?</li> <li>▪ Has there been a negative history with government organizations in the past?</li> <li>▪ Are they averse to government assistance?</li> <li>▪ Are they relationship-oriented and prefer face-to-face encounters?</li> </ul>	<ul style="list-style-type: none"> <li>▪ Is this something they can afford?</li> <li>▪ How will this program benefit them financially?</li> <li>▪ Do they have the time to implement the program?</li> <li>▪ Is there a norm of others also doing this?</li> <li>▪ Will they be able to pay for the project up front?</li> </ul>



**FIGURE 8: Knowledge is power – ask questions to better understand your community.**

## External Stakeholders

Potential external stakeholders are those beyond the individual home or building owner. Read up on and get to know the agencies and organizations that work with homeowners, renters and commercial building tenants. From homeowners associations to renter advocacy organizations, business improvement districts, chambers of commerce, realtor associations, housing authorities, trade unions, social workers, and insurance agencies, many stakeholders will have an interest in, and an opinion on, a government effort to regulate or incentivize retrofit activities.

### EXAMPLE:

*The city of San Francisco started its program by convening a resident-led advisory committee to help inform local officials of community priorities for the program. Eighty self-elected volunteers from the community gathered to inform policy decisions. They received a risk assessment and decided what would be mandatory vs. voluntary, what buildings would be prioritized, what the program goals were, what their funding recommendations were, and what tenant and owner protections should be. They gave these recommendations to a board, which voted for a version of the advisory committee's recommendations.<sup>2</sup>*

### BEST PRACTICE: INCLUDE STAKEHOLDERS EARLY

*To gain support, invite stakeholders to the table early in the process. This may take the form of a working group or action committee. Learn from them and ask them to play a role in developing the goals of the program, early and often. Ensure that information-sharing is bidirectional so that stakeholders and their networks feel agency in the process and can inform the program design from the start.*



FIGURE 9: Engage stakeholders early and often to ensure buy-in.

<sup>2</sup> Porter and Cobeen, "Informing a retrofit ordinance: a soft-story case study."

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## 2.3 BUILDING STOCK

As you conduct the building inventory, it is important to have a basic understanding of the building stock in the area. Brush up by reviewing demographic information from the U.S. Census, the housing goals and policies of your jurisdiction’s General Plan, local tax assessor records and by reaching out to your building or planning department. This will help you design a program that targets the most vulnerable buildings. In general, you should know:

- The number of buildings in your community.
- Any significant or designated buildings (buildings that are eligible or designated as historic according to listings, state register or the National Register of Historic Places).
- Building types (single-family residential, multi-unit, commercial, industrial, mixed use).
- If most buildings can be reasonably retrofitted.
- If buildings are in a floodplain or other environmentally hazardous or sensitive area.
- The building codes that are in place.

Understanding your historic building stock will be integral to moving a program forward. A “historic property” is any district, building, structure, site or object that is eligible for listing in the National Register of Historic Places. The State Historic Preservation Office and Tribal Historic Preservation Office developed an [Historic Preservation Assistance Checklist](#) detailing the actions that can be taken prior to, during and after a presidentially declared disaster and resources that may be available to assist you in the protection of cultural and historic resources.



For further information on building inventories, see **Section 1.3**.



**FIGURE 10:** Communities have a wide variety of buildings - your inventory can help you understand your unique composition.

## 2.4 MARKET PROFILE

A successful retrofit program depends on having a local pool of construction businesses, building inspectors and material suppliers in the private sector to perform retrofits. Even the best-designed programs will flop if the private sector does not have an incentive to perform retrofit projects. Before designing your program, get to know the regional industry. Then develop a list of qualified (licensed, insured and skillset-ready) and interested businesses with whom to communicate as your program develops. You can find local construction or engineering firms through the chamber of commerce, trade organizations, unions, the state licensing board or the Department of Labor. If local labor and tradesmen are doing the work, they will have a solid understanding of, and connection with, the community in which they are working. Note that if your community is applying for a grant, you need to follow the appropriate federal, state and local procurement standards. Researching this ahead of time will put you well on your way.

### EXAMPLE:

*Flagler County, Florida, put out bids for all of their retrofit projects at one time, and they request bids for single elements of all homes. For instance, they chose to contract all the roofing work on 10 homes to one business, and all the window and doors to another. Whoever offered the lowest qualified bid on each separate job won the contract. Having a large number of projects, even if they cover just one element of a home, may be a more attractive option to construction companies.*



FIGURE 11: Working with local engineers, inspectors, and contractors is essential for a successful program.

**TABLE 6: GET TO KNOW YOUR MARKET**

TOPICS TO EXPLORE	CONSIDER...
<p><b>Profile your market.</b> First and foremost, see if the community has an adequate number of businesses to bid on and complete building retrofits within the program’s timeline.</p>	<p><i>What type and size of projects are local companies more likely to choose?</i></p> <ul style="list-style-type: none"> <li>▪ Knowing more about businesses’ area of expertise will help you determine how much program funding and how many projects can be used in a grant cycle. It will also help you determine your program staff’s capacity, as certain businesses and homeowners need more assistance than others.</li> <li>▪ You should also consider the barriers the private sector might face. For example, recruiting enough private industry participation can be difficult in areas where the cost of labor and housing is high. If retrofit activities are small, low-cost projects, finding a contractor to commit to a single project may be difficult. In this case, you may consider grouping projects or adding incentives to recruit their participation.</li> </ul>
<p><b>Training and certification.</b> Will these businesses require specific training to inspect or retrofit a building?</p>	<p><i>What kind of expertise is needed?</i></p> <ul style="list-style-type: none"> <li>▪ Research the methods that other jurisdictions or organizations have used to train and certify general contractors, architects and engineers in the appropriate standards.</li> <li>▪ For instance, the <a href="#">California Earthquake Authority’s EBB program</a> requires all licensed general contractors on their directory to take the free FEMA Seismic Retrofit Education training.</li> <li>▪ Similarly, the <a href="#">Association of Bay Area Governments</a> maintains a list of contractors who have attended their one-day workshop on Seismic Retrofit of Wood Frame Buildings, which allows homeowners to confirm that their contractor is in good standing.</li> <li>▪ This kind of accreditation can build trust in the supply chain and drive more demand from customers.<sup>3</sup></li> </ul>
<p><b>Supplies.</b> Where will the retrofit supplies come from?</p>	<p><i>Are these supplies easy to obtain at any time of year?</i></p> <ul style="list-style-type: none"> <li>▪ For example, certain building materials can be in short supply during winter or in hurricane season. Especially in rural areas, knowing which local companies are familiar with the targeted work areas can help.</li> </ul>
<p><b>Licensing requirements.</b> What type of licensing will be required?</p>	<p><i>Get acquainted with the requirements by both your local jurisdiction and your grantor for working with private industry.</i></p> <ul style="list-style-type: none"> <li>▪ Research how other government departments work with local businesses and suppliers to perform government-funded projects in local homes. For instance, your community might already receive Community Development Block Grant (CDBG) or Department of Energy funding to work on residential homes.</li> <li>▪ Learn from other departments that receive these funds to determine the best way forward.</li> </ul>

<sup>3</sup> Niall Kerr and Mark Winskel, “Household investment in home energy retrofit: A review of the evidence on effective policy design for privately owned homes,” *Renewable and Sustainable Energy Reviews* 123 (2020).

## 2.5 IMPLEMENTATION TEAM

This stage of program planning is the perfect time to establish a list of the prospective partners you need to design and implement your program. Retrofit programs are often administered by small teams in low-capacity departments. They survive and flourish by building strong partnerships and interagency agreements with other city departments, agencies, nonprofit organizations and private sector businesses. Giving other government offices advanced notice and a thorough understanding of your work can smooth the partnership-building process.

The following are a few elements of the program in which you might want to collaborate or partner with other departments or organizations:

- **Grants.** Find out what local department has the capacity and skill set to help train you or to apply for grants on your behalf.
- **Permits.** Will the retrofit program require permits from the planning and building department? Will certain buildings require a historic design review? Learn more about their systems and how you might draw up cross-department agreements and processes.
- **Standards.** Will you potentially use engineering standards established by a third-party organization? Reach out to them to learn what kind of training or capacity-building programs they have in place or are willing to develop.
- **Communications.** Does your local emergency management department already provide communication and outreach related to hazard risks? Consider partnering with them to improve program participation.
- **Training.** In some jurisdictions, local libraries provide home maintenance and repair courses for first-time home buyers in low-income neighborhoods. How can you partner with them to provide the necessary resources to help homeowners apply for the program? Does a local community college offer training or certification in the trades? Reach out to them to strategize how you might integrate retrofit standards in the future.

### EXAMPLE:

*The Strengthen Alabama Homes (SAH) program relies on two external nonprofits to run their statewide program. The first nonprofit, the Insurance Institute for Business and Home Safety (IBHS), sets the program's retrofit standards to mitigate different levels of wind damage to homes (e.g., fortifying the roof is the Bronze level, while hardening the roof as well as doors, windows and ventilation is the Silver level). All evaluators and contractors involved in retrofit construction through the Alabama program must be trained through the IBHS fortified program. IBHS also offers training for insurance agents, underwriters, suppliers, etc. who want to learn more about mitigation activities. The other nonprofit, Smart Home America, helps the state with education and outreach to chambers of commerce, code official offices and community groups to inform them about the program and IBHS standards. Education has been key to the program's success, as the public needs to understand IBHS standards before they can take advantage of the funding.*

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## 2.6 FUNDING CONSIDERATIONS

Your next task will be to explore funding options. **Section 3** takes a deep dive into funding — refer to that section for more information on recommended steps and details.

Certain funding requirements may not align with your community’s needs; knowing the stipulations of each funding source is central to success. Keep the following details in mind when exploring your funding options:

- **Identify the federal and state programs.** Review **Appendix B.3** for more on available funding sources and programs.
- **Requirements and guidance of these programs.** Consider:
  - Minimum preliminary requirements—Do you need an approved HMP, Community Economic Development Strategy, General Plan or floodplain ordinance to apply?
  - Project parameters—Income, jurisdiction size and geographic requirements.
  - The overall grant timeline—How long do you have to spend the grant funds? How long will it take for funding to be approved?
  - Application requirements—A Benefit-Cost Analysis (BCA), for example.
  - Program stipulations—You may need to meet federal- and/or state-specific EHP requirements, e.g. the National Environmental Policy Act, National Historic Preservation Act (NHPA), Endangered Species Act, or the California Environmental Quality Act, or even requirements of local city-level historic design review.
  - Grant cycle—When is the grant notification released? When are applications due?
  - Funding availability – How often does this funding source become available? Is it a one-time program or a recurring opportunity? If it is recurring, does the funding amount remain consistent or does the amount fluctuate largely?
  - Alignment and integration—Is the proposed project in line with mitigation strategies in the current state or local mitigation plan? (Required for certain FEMA grants.)
- **Similar programs funded in the past.** Are any of those retrofit programs? Do any have goals, hazards or community characteristics similar to yours?
- **Successful applicants.** Talk with communities that have successfully won the grant that looks like the best fit for your community; your State Hazard Mitigation Officer (SHMO) may be able to point you toward similar communities. Ask about successes and roadblocks they encountered.

Applying for grant funding can be time-consuming and difficult. You should not initiate the process until you are fully prepared. Make sure you are pursuing the appropriate funding source before you start the application.

Narrowing down your initial list of funding opportunities early on will help when you are designing your program. Large grant funding programs often have stringent requirements; therefore, retrofit programs may need to be designed according to those requirements. The more you know ahead of time, the fewer last-minute changes to program processes you will need to make.

## SECTION 3: DETERMINE FUNDING



### Determine Funding

- Examine project costs – What level of funding do you need?
- Discover funding options – What funding sources are available?
- Evaluate options – Do the requirements, timelines and commitments match your team/program capacity?

Build relationships with funding source contacts and communicate often.

Build better funder relationships worksheet, Funding evaluation checklist

Okay, here it is, the dollars-and-cents discussion. Funding is one of the biggest challenges you will need to tackle for any project. While this conversation began in **Section 2.6**, this section provides more in-depth guidance for your funding journey.

Please note, the activities in **Sections 3** and **4** can be done simultaneously. There is no perfect path to designing a retrofit program, so be sure to review the information in both sections before making decisions.



FIGURE 12: Assess all funding options available that work for your program's needs.



## 3.1 REVIEW PRIORITIES

Before you take a deep dive into funding, take a moment to review your priorities and goals. Many funding options may be available, and it is important that you choose the funding source that best supports your community’s goals, rather than choosing a goal because of what you can get from a potential funding source.

Look over the information you gathered while doing your research, most importantly the “Community Priorities and Partners” section (**Section 2.2**); keep this information in mind to help you choose options that align with your community’s priorities.

It is understood that not every community has the ability to raise additional funds, as in the example below, but the example illustrates the power of committing to your priorities.

### EXAMPLE:

*While most assume that homeowners want to pay as little as possible for retrofits and are unlikely to go beyond the bare minimum, this was not the case for a community in Sacramento County, California. Homeowners in a 725-unit condominium development, 90 units of which had repetitive flood damage, understood their flood risk and the need to invest in mitigation efforts; the homeowners association are voting to assess funds to add to what the county was able to get from other sources. Their contribution will raise about \$4.2 million.*

### BEST PRACTICE: REVIEW PRIORITIES

*Your program is tailored to your community, but funding options usually are not. It is generally worth spending the time to find funding that fits your community goals first. Once these goals have been adequately met, you can adapt your project/program to fit additional funding sources.*

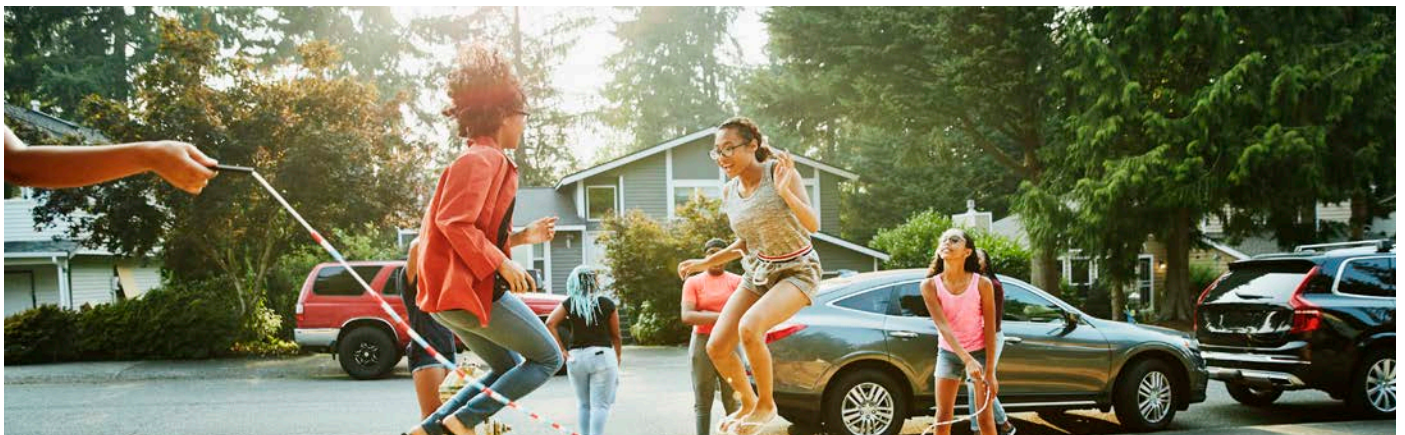


FIGURE 13: The health and safety of residents is often at the core of community priorities.

## 3.2 EXAMINE PROJECT COSTS

After you have reviewed your community’s priorities and identified a project and/or solution, be realistic about the level of funding you will need. As you are reviewing your research, note and consider (or discuss, if you have not already identified) the following:

- How much does it cost to retrofit a single property?
- Is the cost reduced as the number of retrofits increases?
- How much of the cost is your target demographic able to take on? Are they willing to cover that cost?
- Can you manage the program with current staff or will new staff (and added cost) be required?
- Taking these things into account, how much do you need to cover for the program to work?

Think about the range of costs associated with retrofitting the building type(s) you have chosen to address to the desired standard. This includes costs like the construction, permitting fees, temporary accommodations for home and building tenants, and code compliance or updates that could be triggered. Knowing these things will help you identify how many structures you can retrofit with each potential funding source.

Think about what portion of the retrofit costs you want, or are able, to cover for the owners, if any. This includes considering your target demographic and assessing the portion of the costs that demographic can realistically take on. The difference between what the owner can afford and what your community can afford will need to be covered by the funding option(s) you choose.

### EXAMPLE:

*The SAH program uses standards of wind mitigation specified by the IBHS—Bronze, Silver and Gold—to retrofit homes. The program covers home retrofits (up to \$10,000) for the Bronze or Silver level. Because the Gold level can be cost prohibitive once the house is built, the program does not cover it.*



FIGURE 14: The cost of retrofit construction should be explored when considering funding needs.

## 3.3 DISCOVER FUNDING OPTIONS

Potential funding sources are all around you; funding can come from local, regional, state, federal, private and nonprofit sources. Common funding sources include:

- Local impact or utility fees.
- Grants tied to state propositions.
- Federal grants.

See **Appendix B.3** for a list of possible funding sources.

Consider all potential funding options, so you have the best chance to find a funding source that aligns with your goals. Evaluate the possibility of layering and integrating funding to maximize your opportunities. When considering your benefit cost analysis, whether formally or not, look at both the dollars and the commitments required of your staff. For example, funding source X may provide more dollars but require you to hire a new staff member to manage the funding, whereas funding source Y provides fewer dollars, but can be managed by your current staff.

Note, FEMA and other federal funding sources require a “non-federal” or local match, a cost share from the community. This will play a vital role as you design your program.

### BEST PRACTICE: CHOOSE WISELY

*Keep in mind that the largest-dollar funding source is not always the best fit. Higher dollar funding sources often come with very detailed and complex application and management processes.*

### Look Internally

When researching funding options, a good place to start is with the funding sources and opportunities your community already uses. Your HMP has a list of current and potential funding sources for hazard mitigation (additional sources may have been identified during your research in **Section 2.6**). Seeing what is already being used can help you consider different funding sources and see sources to build on or layer with others.

### EXAMPLE:

*Many people with flood insurance have up to \$30,000 available for a one-time use on mitigation activities through the NFIP's ICC coverage. ICC is available to homeowners making a claim for a building that a local floodplain administrator designates as substantially or repetitively damaged. Thurston County, Washington staff work with some homeowners to apply for these FEMA dollars, which represent an existing funding source for mitigation projects.*

## Reach Out

Reach out to communities that are similar to yours, in terms of size and demographics, to ask what types of funding they use and how they manage the funds. Learning how other communities manage different types of funding may help you determine if you would need additional support.

In addition, reach out to other offices and partners (who may have been identified in your research in **Section 2.5**) who can point you toward various funding options:

- Your SHMO.
- Regional offices of federal agencies.
- Federal and state work groups, like the U.S. Army Corps of Engineers' Silver Jackets.

You can also review local, state and federal office and agency websites, or business improvement districts, for information on available funding. As you review and research this information and make lists of current and potential funding sources, make sure to include their contact information.

While researching funding sources, it is also important to look into the management aspects associated with external funding sources. Determine whether your team has the personnel, experience and expertise required to successfully manage the funding options you consider. It is best to know ahead of time whether you will need additional support or resources to manage the funding you are interested in.

### ADVICE FROM A PRACTITIONER:

**Learn from everyone around you. Talk to other communities and find out how they found and managed funding. Use all of your options for help.**

– Laura Nelson, *Senior Emergency Management Planner, Office of Emergency Management, Flagler County, Florida*

### EXAMPLE:

*The Arc Tampa Bay is a nonprofit organization that serves people with behavioral and mental disabilities. While attending a Local Mitigation Strategy group event, the Arc's grant writer met a representative from Florida's Hurricane Loss Mitigation Program (HLMP) and learned about their funding for residential retrofit programs.*

## Stay Informed

As you reach out to different funding sources, ask them to add you to communication and email lists to receive funding notifications, application and proposal deadlines, and other funding information. This way, you won't miss important deadlines and other important information will be sent directly to you.

### EXAMPLE:

*Florida's HLMP keeps a list of people who reach out to them. Before the funding becomes available, HLMP notifies everyone on their list about the upcoming application period.*

### ADVICE FROM A PRACTITIONER:

**Reach out to other communities to see how they did their programs, and base new programs on those by tailoring it to your community needs. There is no need to reinvent the wheel and make more work for yourself than necessary.**

– Tanya Davis-Hernandez, *AICP, Director of Development Services, City of Lauderdale Lakes, Florida*

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## 3.4 EVALUATE OPTIONS

Now that you know your options, the next critical step is to look into specific requirements and processes for each funding program. During this stage, you will find out what you and your team need to do to apply for and receive funding.

### Thoroughly Assess Requirements

Before you dive in, thoroughly assess and understand the program requirements – this will help you narrow down the options. To do this, carefully read the fine print, any printed materials that are provided and look at the funding source website, if available. If you have any questions or need clarification, reach out directly to the funding source. It is vital you understand all the requirements before deciding on a funding option.

Eligibility requirements can vary by funding source. Generally, funding programs require an explanation of the need, outlined objectives, a detailed plan for addressing needs, a plan for delivering services or a business plan, a budget, information on staff responsibilities or services, financial responsibilities, and an evaluation plan. See **Appendix B.3** for a checklist of things to keep in mind when evaluating funding options.

#### BEST PRACTICE: WEIGH THE OPTIONS

- *Know the funding requirements, processes, timelines and long-term commitments before getting started. Scope your program according to the requirements and your team's capacity.*
- *Avoid the pitfall of choosing the first funding source that you hear about. Remember that every community is different, and what works for one community may not be effective for another. Consider all options available to you before making a determination.*



FIGURE 15: Consider the unique needs of your community when evaluating funding options.

Other programs may have more stringent requirements and application elements. For instance, FEMA programs require each structure to be reviewed by FEMA for compliance with federal laws and Executive Orders to protect the environment and historic resources; a calculated BCA of 1 or higher; compliance with federal, state and local procurement laws; and a 25% non-federal match. State programs may have different requirements.

Keep in mind that requirements are not always related to upfront eligibility. Some grants may require long-term commitments, such as a local sponsor or maintenance of a project.

It is also important to look into what, if any, of your costs can be covered by funding. For instance, if you know you'll need additional staff or assistance with administrative costs, look for funding programs that will meet these needs by providing funds for additional support. If you feel your team needs technical expertise, funding programs that provide training on their technical program requirements, such as EHP review and BCA, might be a good option to pursue.

It is also prudent to note whether a funding option is a grant, loan, reimbursement or something else altogether. Among these options, consider what type of funding might work best for your program. You'll want to know when, at what interval, and in what way you will receive the funds and how it can be disbursed. Knowing this information and specifics about funding recurrence has important implications for program sustainability.

**ADVICE FROM A PRACTITIONER:**  
Certain grants require local match, but match doesn't need to be funds or expenses – it can come from many sources. We found that money spent by homeowners [beyond the \$3,000 provided by the program] could be considered a match.

– Janiele Maffei, Chief Mitigation Officer,  
California Earthquake Authority

### EXAMPLE:

*A program in St. Lucie County, Florida, uses a variety of grant sources to ensure their staff is completely grant funded. One is the HLMP, in which \$15,000 of the \$194,000 in funding is available to communities as an administrative and indirect cost fund. The county also pursued funds from HUD's CDBG, HOME and SHIP programs, to cover the rest of its administrative costs.*



FIGURE 16: Make the most of funding.

## Fully Understand Processes and Timelines

Deadlines can sneak up on you and timelines can vary greatly between funding options and sources. To stay ahead, ensure you understand each stage of the application process and are tracking deadlines and due dates. Many funding options run on a funding cycle, usually coinciding with the fiscal year, but not all will be cyclical. Those that work within a fiscal year may require you to complete your application, provide funding, and complete all construction within a short timeframe.

One thing you can do to gauge funding program timelines and appropriately scope your program cycle is to determine how long it takes to retrofit one structure to your chosen standard. Knowing how long it takes to retrofit one structure and approximately how many structures can be completed simultaneously will tell you how many structures you could realistically complete in one funding cycle. Consider all of these factors as you evaluate financing options so that you can accurately scope your program and determine which option can provide you the time, money and support you need to successfully complete the work within the funding cycle.

### ADVICE FROM A FUNDER:

**Get started early! As soon as you have the funding, get going because the timeline is short, projects and construction take time, and [HLMP doesn't] have extensions. Start immediately!**

– Jake DeSalvo, HLMP Grant Manager, State of Florida

### BEST PRACTICE: SPEND AWARDED FUNDS

*It is considered a best practice to spend all the funds you are awarded by any funding source. One way to address this and be prepared is to have a waiting list, or additional buildings lined up for the program, in case some buildings are deemed ineligible or some owners drop out.*

## Assess Layering and Integration Opportunities

While you are reviewing various funding options, keep an eye out for different types of funding that can be layered or integrated with other programs. Pursuing funding from a variety of funding sources may allow you to cover more costs and different types of expenditures.

### EXAMPLE:

*Some communities in Florida layer funding from HLMP with support from other sources. Nonprofit organizations like The Arc contribute funds to fill in gaps to ensure buildings serving their target population, such as group homes, are covered in retrofit programs. Bradenton, Florida, supplements its community's HLMP funds with CDBG monies to support retrofits that specifically address affordable housing and related infrastructure development.*

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## 3.5 GET TO KNOW FUNDING SOURCE CONTACTS

### Build Relationships and Understanding

As you made your list of potential funding sources, you took note of their contact information. Now is the time to reach out to your preferred funding sources. Establishing these relationships early in your program development journey has many benefits, such as connecting you to funding notification and outreach lists, and creating an open line of communication as you develop your application.

Once you are acquainted with the funding source contacts, make sure to reach out to them with your questions and information requests as you review their requirements and processes.

Also, ask for a list of communities that have successfully received this funding. Talk to some of these communities to find out what it is like working with the funding source. Ask what they recommend for successful engagement with the funding source contact. You want to find out if the person/department is easy to get in touch with, responsive and helpful. At the same time, you can ask the communities for suggestions on how to write a compelling application and make a good case for your needs.

Use the worksheet Establish a Personal Relationship in **Appendix C.3** to learn how you can establish effective working relationships with funding source contacts. This can also be used to develop any working relationship in the program, including with private sector contacts.

#### BEST PRACTICE: BUILD RELATIONSHIPS

*Build relationships with funding source contacts and communicate with them often. An existing relationship with funding contacts can be advantageous when you hit bumps during the application and implementation phases and you need to ask pressing questions. You can work together to streamline your program and create a smoother process.*

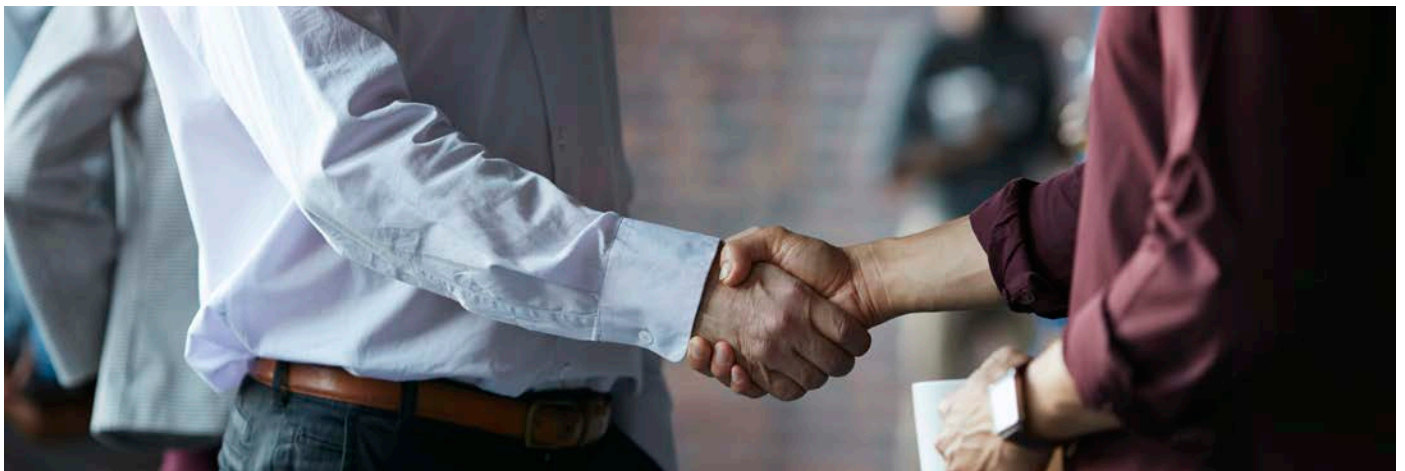


FIGURE 17: Building relationships with funding source contacts can help you on your journey.



## 3.6 SELECT FUNDING

Choose funding that aligns as closely as possible with your goals, capacity, community and needs. If you can't find any funding option that fits your goals, you may need to adjust your program to align with a funding option. When this is the case, be creative! Consider changes that will still allow you to reach your community's long-term goals.

Once you have chosen one or more funding options, begin the application process. In **Section 5**, you can find more information on applying for funding and getting ready to start your program. While applying for funding can seem daunting, the good news is that it will get easier with experience. Many communities that have applied for and managed a variety of funding types find that when they are faced with a new funding opportunity, they can rely on their previous experience to successfully navigate the new territory.

Eventually, you may want to include funds for retrofit programs in your regular budget, so you don't have to rely so heavily on external sources. Once your program has been established, you will have the data and stories needed to highlight its many benefits. That will help you build a stronger case for including the funding in your regular budget. In addition, the more cross-sector support these projects have, the more likely they are to be completed. It can even be beneficial to collaborate with several jurisdictions or communities on a single project that will benefit all involved. Remember, always work from where you are; assess what you have, and evaluate what is needed to work toward the community's long-term goals.



FIGURE 18: Consider the long- and short-term goals of your program when selecting funding.

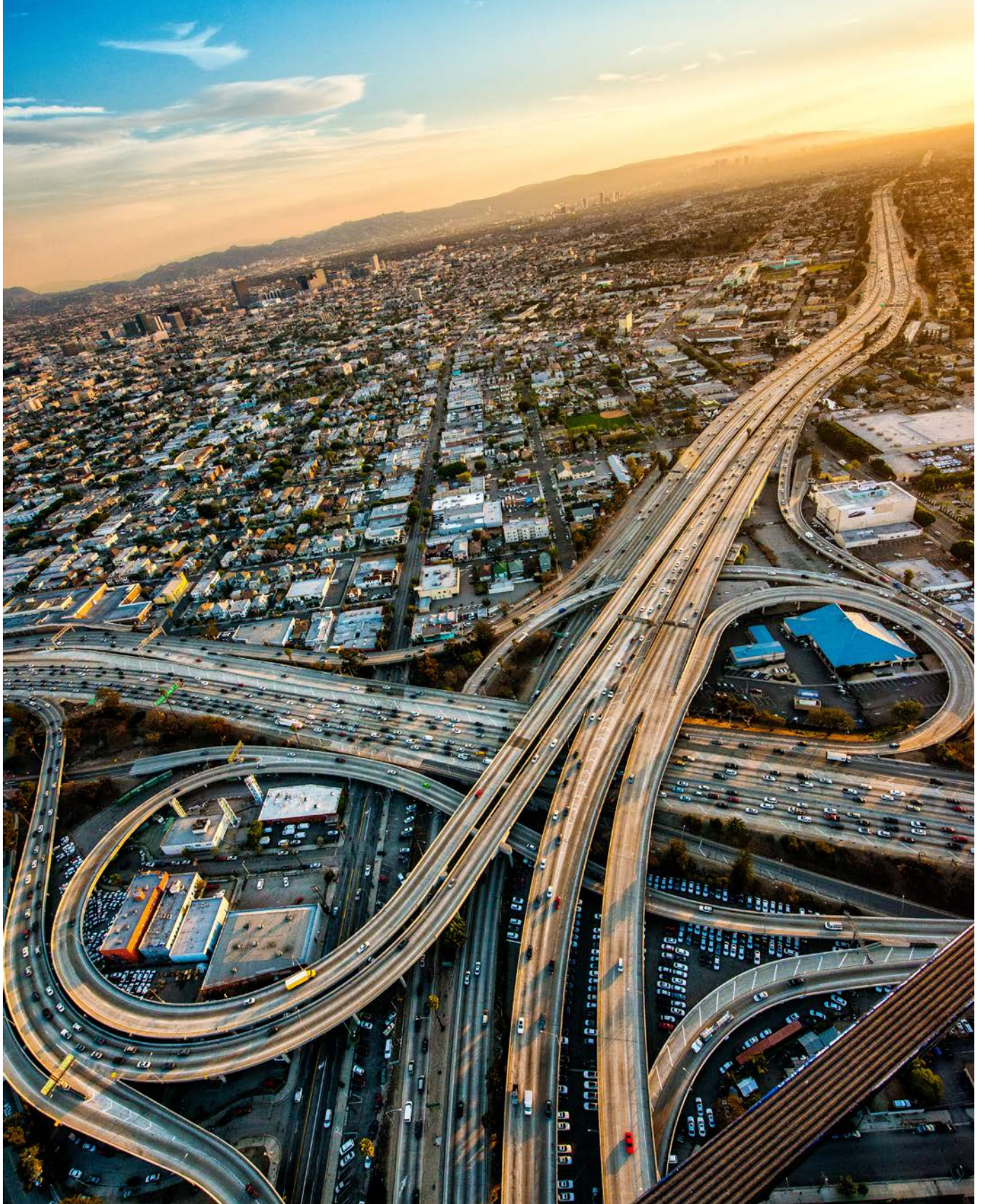


FIGURE 19: While it can feel like an circuitous process, funding is essential for program success.

# SECTION 4: DESIGN THE PROGRAM



## Design the Program

- Establish program goals and timelines – What do you want to accomplish and when?
- Establish retrofit standards – What standard is required to achieve the desired level of safety?
- Design an ordinance – Will it be mandatory or voluntary, and how will you apply it?
- Design an outreach/recruitment program – How will you motivate people to participate?
- Design the application process – How will people apply, and how will you select participants?
- Design a contractor/inspector program component – Who is eligible to participate and what training will be required?
- Design an evaluation process – How will you measure success and refine program processes?

In order to garner and maintain engagement from your whole community, use positive incentives as motivators, while also ensuring the program structure does not marginalize or exclude community members or groups.

S.M.A.R.T. Goals, Program examples, E.A.S.T. framework

At this stage in your preparations, you should clearly understand what needs to be retrofitted and the resources available to support your retrofit program. This is the time to design the program and its goals. Please note, as stated previously, that the activities in **Sections 3 and 4** can be done concurrently; be sure to review the information in both sections before making decisions.



FIGURE 20: Design a program that works for the whole community.

Keep in mind these proven tips and principles for developing a successful retrofit program:<sup>4,5</sup>

- **Keep it simple.** Work to reduce administrative burdens for participants, businesses and program staff – especially in the application process.
- **Communicate.** Engage regularly with community members and stakeholders to ensure transparency. Provide opportunities for continual bidirectional information sharing and collaborative decision-making to help shape your project and garner local support.
- **Be flexible.** Be prepared to iterate. You will need to adjust and redesign parts of the program as you work through the early stages, to meet the needs of participants, businesses and government. The more flexible the program design is at the beginning, the more effectively it can be adjusted.
- **Ensure stability and reliability.** Work to build the confidence of your residential and business communities; if the program is reliable, local construction, material and inspection businesses will adjust to meet the demands for retrofit activities.
- **Innovate, but don't complicate.** Get creative and design innovative program processes where needed, but avoid complexity. Lean on successful systems where they exist. For example, don't bother designing a new outreach campaign if your town has a reliable and tested method for communicating with residents.
- **Elevate equity.** Know that the design of your retrofit program has real implications for marginalized groups in your community. Be sure to consider how your program will either reproduce inequities or encourage social justice in minority communities, across income levels, and among differently abled populations.



**FIGURE 21: Work with your colleagues to design a program that is flexible, reliable and equitable.**

<sup>4</sup> Erin Rose, Beth Hawkins and Bruce Tonn, "Evaluation of the US Dept. Of Energy Weatherization Innovation Pilot Program (2010-2014)," *Oakridge National Laboratory* (2017).

<sup>5</sup> Niall and Winskel. "Household Investment in Home Energy Retrofit: Designing Effective Policy."

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## 4.1 ESTABLISH THE PROGRAM'S MAIN GOALS

The program's goals will shape every element of its design. Plan accordingly.

Develop an overarching main goal based on your program's primary concern. Are you concerned about a large unfortified housing stock? If so, design the program's barriers to be as low as possible, with few eligibility requirements. Maybe your goal is decreasing the risk for marginalized or under-represented residents. Design the program's outreach, funding amounts, requirements and application processes around the needs of residents who have low incomes or are typically marginalized. Should the program work to stimulate the building economy? Shape it around business priorities and property market conditions.

See **Appendix B.4** to learn how to make Specific, Measurable, Achievable, Relevant and Time-bound Goals. Your inventory's vulnerable buildings and the selected funding source can help you determine which buildings to target early in your program. The following parameters can help narrow down your target audience and refine your goals:

- **Geography.** Choose a limited zip code, neighborhood or hazard zone.
- **Building type.** Choose buildings made of certain materials, with certain designs or with a certain number of units.
- **Funding type.** Target the buildings that most closely align with the funding source's parameters (such as a mixture of buildings to balance benefit-cost ratios or environmental and historic preservation considerations).
- **Income level.** Target buildings according to the owner's income level or need for assistance.

Once you understand what you plan to achieve through this program, set any necessary sub-goals. Keep in mind, the buildings targeted for retrofits are likely to change over time, be prepared to adjust your program accordingly.

### BEST PRACTICE: FOCUS FOR SUCCESS

*Programs with a streamlined focus and singular goals tend to be more successful than those with multiple goals. A single goal alleviates complications for both program administrators and participants. If elements of your program add steps that do not help you reach your top goal, work to eliminate that element or step.*

*Often, programs that meet multiple goals for the community require either a longer timeline or more resources, or they limit the number of buildings they can retrofit. If your program has multiple goals, remember to keep them streamlined and simple.*



FIGURE 22: Narrow your focus and streamline your process for success.

### EXAMPLE:

*The SAH program has one main goal: to create a lower risk housing market by retrofitting as many homes as possible. To do this, the program's design prioritized the number of homes hardened. SAH has minimal eligibility criteria for homeowners — the homeowner's only requirement is to maintain insurance. The application process was also streamlined. It works on a first-come, first-served basis. Homeowners shoulder much of the administrative work by filling out the online application, paying for inspections up front, and managing the building contract, construction, and certification. This simplified, streamlined process allows the program to fund approximately 1,000 retrofits every year. In the end, the program is accomplishing exactly what it set out to do: increase the state's number of fortified homes.*

When establishing your goals and developing your program, consider the whole community. Does your intended program consider and plan for providing resources to those who are most in need or at risk? Programs centered on ensuring equity and access will help you avoid unintentionally creating additional barriers that exclude or marginalize community members who already have fewer resources and assistance available to them.



### EXAMPLE:

*California State Assembly Bill 548, approved on September 4, 2019, requires the California Earthquake Authority to (1) provide outreach to low-income households to increase awareness of the EBB program, and (2) set aside at least 10% of the available funds each year to provide supplemental grants to low-income homeowners selected to participate in the EBB program.*

To reference more examples of successful programs with tailored goals, see **Appendix B.4**.

## 4.2 ESTABLISH IMPLEMENTATION TIMELINES

Next, establish a timeline. This will set the stage for the first retrofit projects. The following table outlines components that should be considered in your program timeline.

**TABLE 7: PROGRAM TIMELINE CONSIDERATIONS**

PROJECT KICKOFF	APPLICATIONS	RETROFITTING	GRANT AND PROGRAM MANAGEMENT
<ul style="list-style-type: none"> <li>Public outreach and recruitment of home/building owners and stakeholders.</li> <li>Private sector recruitment and training.</li> </ul>	<ul style="list-style-type: none"> <li>Home/building owner application period.</li> <li>Local application review and preliminary selection.</li> <li>Document collection.</li> <li>Preliminary selection of grant applications.</li> <li>In-depth review by funder.</li> <li>Reselection of applicants to meet grantor's requirements, program adjustments according to funding parameters.</li> </ul>	<ul style="list-style-type: none"> <li>Award and financial process—beginning grant timeline.</li> <li>Home inspections, requests for bids, bidding and procurement.</li> <li>Permitting, construction and certification.</li> </ul>	<ul style="list-style-type: none"> <li>Payment and close-out processes.</li> <li>Ongoing monitoring, evaluation and iteration.</li> </ul>

### BEST PRACTICE: MANAGE YOUR TIMELINE

- Start small!*
- Get organized! Prepare before applying for funding from an outside source.*
- Build a realistic schedule! Leave time for slower steps, external dependencies and delays.*
- Communicate! Set owner expectations early and often; this may be a multi-year process.*
- Have a contingency plan! Keep a backup list of eligible buildings – you may need to adjust your choices according to BCA calculations, contractor availability or other complications.*

When developing a timeline, align the allotted number of retrofits with the amount of time the grant and budget allow. Start small so you can meet grant timelines and spend the entire grant's budget. Incremental action allows you to meet grant requirements and avoid potentially losing funding.

To gain an accurate understanding of the time and effort required to implement the program, consider beginning with a pilot round which can address a limited type of vulnerable buildings or a targeted geography. Once you have established proven program processes and have a trained staff, scale up the program to address more buildings, geographies or building types.

### EXAMPLE:

*In 2014, FEMA and the Portland, Oregon, Office of Emergency Management approved a pilot project to use federal emergency funds to seismically retrofit several dozen homes. The initial program retrofitted 23 homes and successfully demonstrated that homes are a powerful leverage point for action. It delivered simultaneous outcomes for multiple public policy objectives. The program has now reached 8,500 homes and is continuing to grow.*

To avoid delays, most programs have contingency plans that identify unselected but eligible applicants. This can be useful when participants drop out of the program or when the grantor's review deems a selected property ineligible. Having a pool of potential applicants can prevent delays.



FIGURE 23: Start small and consider establishing a pilot before launching a larger program.



## 4.3 ESTABLISH RETROFIT CONSTRUCTION STANDARDS

Now it's time to decide what type of retrofit standards are most applicable for your targeted buildings and hazard of concern. Consider the following elements.

- **Integrate and align with building codes.** Work with your local building code officials to understand the current codes, and see if they align with your program's goals. If they align, these codes can often be used as the standard for the retrofit program. If they do not, consider whether the building codes need to be adjusted or improved, or if a new code should be written and passed into law. You'll also want your local building code officials to confirm whether the buildings retrofitted through your program will need to be brought up to all codes, including the Americans with Disabilities Act. Confirm this before moving forward.
- **Establish the retrofit standards.** Local jurisdictions can hire expert engineers to analyze vulnerable building stock and establish a building standard to inform a specific retrofit activity. Alternatively, engineering standards and suggestions may already exist. Check with external organizations or governments in nearby geographies that are making similar retrofits; you may be able to use some of their techniques, information or advice as models for your community.
- **Minimum standards.** Whenever possible, establish a minimum building and construction standard. Your program can require standards that are higher than the minimum, or, in working to align codes, you can help inform improvements to the minimum standards required by your community building ordinances. Your building and construction standard should have clear guidelines and designs that can be evaluated when each retrofit is complete. While considering these guidelines, include the cost of various standard levels and how each reduces risk, as this will affect the progress of your program.

### EXAMPLE:

*Florida requires every building to have a "full envelope" retrofit that addresses the total exposure of the home, leaving no vulnerable pieces. To do this, the state hires wind inspectors qualified through a state standards program. They evaluate each home and develop a report on what the retrofit must accomplish.*



FIGURE 24: Ensure contractors know program retrofit standards.

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## 4.4 DESIGN AN ORDINANCE

A local ordinance acts as a guidebook and authority for a building retrofit program. Local ordinances must be modeled on information about the community, such as the stakeholders involved, socioeconomic capacity, social characteristics of the community and political willingness. Building retrofit ordinances can be mandatory, voluntary or a blend of the two.

### Mandatory Retrofit Ordinances

An ordinance might make the retrofit of a particular building profile mandatory by a goal date (with caveats and exceptions), with penalties or disincentives for buildings that do not comply. These mandatory ordinances can have triggering mechanisms, compliance criteria and enforcement mechanisms written into them to ensure success.

While mandatory ordinances do not require incentives, it is still possible to incentivize or encourage participation to make the program more appealing to the public, or to help alleviate financial burdens of required retrofits. Enlisting the help of a community champion to spread awareness, for example, can help engender trust and excitement, even if the retrofits are obligatory.

When you consider a mandatory retrofit ordinance, think about the barriers and lack of resources your community may face. If you feel this is an ideal approach, plan to work with the building owners/residents to help identify local programs that could assist those with a lower socioeconomic status, capacity, etc. in completing such actions. The incorporation of mandatory ordinances can be problematic and result in challenging community relationships and possible distrust. Also, enforcement mechanisms should not be unnecessarily punitive or exacerbate inequity within the community.



FIGURE 25: Ordinances are important building blocks of your retrofit program.

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## Triggering Mechanisms

To flag the need for compliance, an ordinance can include triggers for mandated retrofit screenings. These may apply, for instance, when someone requests a permit or is selling a building. Some communities mandate that building owners provide a structural evaluation performed by licensed engineers.

## Demonstrating Compliance

The retrofit ordinance may stipulate that building owners must take certain steps to demonstrate ordinance compliance. For example, building owners may be required to submit a final affidavit with photographed proof of their building's retrofit. Jurisdictions may require a post-construction inspection and documentation.

## Enforcement Mechanisms

The ordinance may include mechanisms to penalize building owners whose retrofits are delayed or noncompliant. This can come in the form of fines, liens against the building and, in some cases, misdemeanors and criminal offenses. The jurisdiction may also withhold permits, subject owners to health and safety code proceedings, send owners a notice to vacate and abate the building, or demolish the structure. Some jurisdictions may even send hazardous building notices to all of the financial interests involved in the structure, including investors, mortgage lenders and tenants.

### EXAMPLE:

*In January 2019, Oakland, California, passed a city ordinance mandating the seismic retrofit of certain vulnerable buildings built before 1991. Owners of two-story, soft-story buildings with five or more residential units must submit a seismic evaluation by a licensed engineering professional. They must then complete the mandatory retrofit construction by a deadline. If building owners miss their deadline to complete this work, the ordinance allows the Planning and Building Department to issue fines and penalties according to the level of noncompliance. For example, the owner may be required to send written notice to all parties with financial interest, including tenants, that the building is hazardous. The ordinance gives the city the ability to create a violation case through its Code Enforcement Office. The ordinance also allows a record of noncompliance to be filed with the county, labeling the building as noncompliant in case it is put up for sale.*

## Voluntary Ordinances and Incentivization

In lieu of mandating action, some communities choose to set standards for voluntary building retrofits. These ordinances often include a mandatory screening or building evaluation that notifies the jurisdiction of the state of the building and its vulnerability to hazards.

An ordinance may detail specific **planning incentives** offered to building owners who voluntarily retrofit their properties, such as:

- Waiving fees for building and construction permits, plan checks and applications.
- Zoning variances, such as building height increases, floor area ratio increases or relaxed onsite parking requirements.
- Transferring development rights through incentives of zoning variances that can be used either on site or on an alternative piece of property.

### **Behavioral science insight:**

Positive incentives can be a great way to drive action because they create an external motivation to achieve them. People often need to be motivated to behave in a certain way. Often, we think of this in terms of internal motivation, which is our personal desire to act, our enjoyment of the task, or our beliefs “pushing” us into action. However, effective incentives, such as gaining achievements, rewards and praise create an external motivation, which “pulls” us toward a behavior. When used effectively, incentives can create both an external motivation and a justification for someone to act accordingly.



To find out more ways to use behavioral science to drive action in your community, and especially to encourage individuals to participate in a voluntary program, see **Appendix C.4**.

### **EXAMPLE:**

*Palo Alto, California, has had an ordinance to address seismically vulnerable buildings since 1986. It mandated an engineering evaluation of structural deficiencies for vulnerable buildings. Building owners may deduct the cost of the engineering review from the fee collected for future construction work on structural inadequacies specified in the engineering report. The city further incentivizes retrofits by allowing owners of unreinforced masonry buildings in the downtown commercial district to increase their floor space by 2,500 square feet, or up to 25% of the existing building area, without being required to expand their parking area requirements if they retrofit. This incentive could be used at the building’s site, or it could be transferred to another property or used by another property owner. This program has been successful over the years. Only a handful of buildings still need retrofits.*

Jurisdictions may also integrate **financial incentives** into their mandatory or voluntary retrofit ordinances. This may come in the form of:

- Grants, loans and tax rebates.
- Long-term financing through municipal bonds.
- Private financing through local banks: pre-negotiated loan agreements for retrofits or flexible loan origination fees, interest rates and payment terms.
- Catastrophe Savings Accounts: pre-tax accounts that work like Health Savings Accounts.
- Tax credits for funds spent on retrofitting.

Statewide retrofit programs might also negotiate with the insurance industry to offer significant discounts on homeowner’s insurance. By passing legislation, Alabama’s SAH program negotiated with insurance companies to guarantee a premium discount of up to 50% for homes retrofitted to the program’s highest standard. Many programs, such as the NFIP, offer discounted insurance rates after retrofit activity.

See **Section 3** and **Appendix B.3** for more information.

## Phased Implementation

Where passing a mandatory retrofit ordinance is not politically feasible, many jurisdictions first pass an ordinance mandating that a licensed engineer screen a certain profile of building for structural risks. This is a valuable tool, as it informs the community and political leadership of the level of risk that the building stock faces. However, mandatory screenings rarely lead to retrofits if they are not accompanied by incentives that encourage building owners to act. This type of ordinance precedes mandatory retrofit ordinances, often by a decade or more, and community officials often use the results of the screenings to prove that a mandatory ordinance is needed. See **Appendix B.4: City of Hayward**.

### BEST PRACTICE: ADDRESS PASS-THROUGH COSTS

*Be sure to address “pass-through costs” in your retrofit ordinance. This is the cost tenants pay when a building owner implements a structural retrofit. Jurisdictions should decide whether to allow or prohibit costs from being passed through to tenants. When doing so, it is essential to consider the nature of the affected community — determine if your community members can take on additional costs before moving forward with this stage. Be sure to include renters’ organizations, real estate associations and advocacy groups when addressing these issues, and gain their support in the formation of the ordinance. Develop a solution that matches the capacity of residential populations and landlords. For example, a retrofit program in the rent-controlled city of Oakland did not allow pass-through costs to tenants until their most recent round of retrofit funding. Since it is considered capital improvement work, landlords who retrofit their multi-unit buildings are allowed to pass through up to 70% of actual costs to tenants, phased over 25 years.*



FIGURE 26: The path to your retrofit program requires the buy-in of community and political leadership.

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## 4.5 DEFINE PROGRAM ROLES AND RESPONSIBILITIES

### Designate a Host Department

The department and staff that lead the retrofit program are key to its success. While having a team of experts focused solely on administering the program may be ideal, very few jurisdictions have the capacity to devote more than a staff member or two to their programs. When the right partnerships are made between governmental departments, a retrofit program can be successful with limited personnel. See **Appendix B.4: St. Lucie County**.

### Source Expert Personnel to Staff the Program

Selecting personnel with specific expertise allows low-capacity jurisdictions to meet program goals.

People with the following skill sets are often needed:

- Building code officials, building inspectors and certifiers.
- General contractors.
- Grants specialists.
- Accountants or budget specialists.
- Project managers.
- Engineers.
- Communication experts.
- Legal experts.
- IT specialists.
- Emergency management specialists.
- Mapping or Geographic Information System specialists.
- Customer service representatives.
- Program managers.
- Community liaisons.

## BEST PRACTICE: JOIN FORCES AND KNOW YOUR STRENGTHS

*Take advantage of diversity in expertise and create a cross-departmental arrangement, where one department hosts the program and serves as a “one-stop shop” and others provide services, expertise or assistance.*

*For example, community development departments tend to have more experience in working on residential construction projects through CDBG funds, emergency management offices typically have more experience in educating the public on their risk to hazards, and planning and building departments are often more familiar with the permitting and construction process.*

A program may consist of only a few staff. In this case, a small team may partner with a mapping expert in the planning department to identify vulnerable properties, a building inspector in the permitting department to verify construction standards, and a grants expert in accounting to manage external funding.

### EXAMPLE:

*The city of Oakland’s seismic retrofit program mandates that multi-unit building owners retrofit their properties over the next 5 years. Due to the city’s housing shortage and rent control laws, the Building Department partners with the Rent Adjustment Office to help address the community’s concerns about the program’s potential impact on renters, ensuring that rental protections are adhered to. The program is also staffed by engineers with technical building expertise, website developers to manage the online application platform, and a public information officer who releases information about the program to the community.*

Retrofit programs are truly a team effort, and the more diversified the personnel available to contribute, the more successful the program will be. When assembling the team, consider:

- Knowing the skill sets you have available will help when you apply for external grants. Many grant applications ask you to detail which staff will be dedicated to the program and how their expertise will contribute to the program’s success.
- It may also be necessary to recruit specialized program staff that can help meet a grant-specific program requirement, such as an environmental reviewer or a benefit-cost analysis expert. Depending on the scale of the program, coordinating with the funder to hire certified reviewers may expedite the approval and funding process.
- Make sure that someone on your team is well-versed on the building construction industry. The retrofit process will require project management for construction budgets, schedules and materials. Many programs hire general contractors or builders with experience in home construction or multi-unit development. Other programs rely on third-party organizations or processes for this part of the program (see below for more information about the potential involvement of the private sector).
- For large-scale programs, consider recruiting an advisory committee to provide expertise during decision-making processes.

## EXAMPLE:

The city of Berkeley, California, received Hazard Mitigation Grant Program funding from FEMA to seismically retrofit multi-unit residential buildings. As with the expenditure of any federal funds, this required EHP review of participating properties. The city of Berkeley followed in the footsteps of the city of Oakland, California, and their successful collaboration with FEMA. To expedite the review and maintain building owner participation, the city of Berkeley worked with FEMA and, together, they identified a Secretary of Interior-qualified architectural historian within their city staff who was already reviewing structures for local regulations and permitting. In order to facilitate this process with the city of Berkeley, FEMA worked with the State Historic Preservation Officer and reached an agreement that allowed the city's architectural historian to act as a first line reviewer to expedite the reviews. This streamlined the review required under Section 106 of the NHPA and helped Berkeley preserve locally significant buildings.



## EXAMPLE:

South Carolina's Safe Home program legislation requires a 20-member appointed advisory committee that meets quarterly. This committee is made up of insurance agents, NFIP representatives, emergency management leaders, members from realtor associations and county or municipal association members. The members act as decision makers and subject matter experts, providing expertise and direction, as needed.



FIGURE 27: Forming a strong team will help you weather the storm.



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## Keep a Service-Oriented Mindset

Providing high-quality service is integral for a sustainable and successful program. When developing program roles and responsibilities, take note of which roles will interact directly with the community, home and building owners, and contractors. For people in client-facing roles, consider both their expertise and their “customer service” skills.

Designing a customer service delivery system will help you bring building owners, general contractors and the public through the program. The most successful programs are those that have created user-friendly avenues for accessing program information and program staff. Here are a few considerations to keep in mind:

### Increase the Program’s Ease of Access:

- Go beyond posting an email address such as “info@mail.gov” – link people directly to forms and actions that they need.
- If possible, develop official phone hours, office hours, webinars and workshops in which the public can speak to staff during application cycles.
- Having a staff member available to offer technical assistance builds trust between general contractors, homeowners and governmental entities.

### Emotional Intelligence is Critical:

- Emotional intelligence is delivered through empathy, self-awareness and positive social skills that prioritize the customer’s feelings.
- Train program staff in customer service delivery. It is important to remember that these programs disrupt the lives of homeowners and tenants; application paperwork and building construction can be stressful. Be sure to designate friendly staff who are available to answer questions and calm concerns during this process.
- Partner with similarly missioned organizations that have an active presence in targeted communities. Equip them with materials and training they can deliver to their constituents.
- Develop the IT infrastructure to serve as a platform for each step of the project process. Take into account the program’s goals and audience when developing the IT infrastructure.

### Create a “Human” Customer Service:

- Most of the time, customers want to speak directly to a person who can help.
- Be friendly and personable and include small yet frequent “human touches” in communication, such as including a simple handwritten Post-It note, wishing the customer well by name.
- Communicate to the customer that solving their problems is the priority.

## **BEST PRACTICE: CHOOSE APPROPRIATE REPRESENTATIVES**

*Remember that the best technical expert is not always the best customer service representative; choose a staff member with strong emotional intelligence and interpersonal skills.*

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**Behavioral science insight:**

Providing timely information and multiple touchpoints with customers can increase their likelihood of following through with the program. This is based on the concept of feedback from learning theory and the concept of priming from cognitive psychology. If a customer is previously familiar with an idea or stimulus (i.e., a retrofit program) they are primed to identify the stimulus more quickly each time, thus promoting behavior toward that stimulus.<sup>6</sup>



Relationship-building is invaluable in a program that directly affects residents and their homes. This is particularly true for smaller communities with complicated retrofit needs. Program administrators from across the nation say that one-on-one contact and caring customer service are the most important pieces of a successful retrofit program.

**EXAMPLE:**

*Thurston County, Washington, has been retrofitting homes for decades. This rural community that floods frequently had dozens of repeatedly damaged homes that needed to be elevated in order to avoid future flooding damages. Home elevations are complicated projects requiring intensive involvement by program staff. However, residents in Thurston County are known for being self-sufficient, “do-it-yourself” types. Many homeowners do not file insurance claims after flooding—they simply clean up on their own. It is only appropriate, then, that when the local Floodplain Manager, Tim Rubert, has funding to elevate a home, he does not simply tuck a mailer into a utility bill to announce the opportunity. Instead, Mr. Rubert makes every effort to get to know the people whose homes are eligible for a retrofit. He meets individuals personally to discuss home elevations. This one-on-one contact has been essential to get homeowners’ buy-in. “You can’t just come and go, either,” he says, “You’ve got to have coffee, chit chat, get to the information, chit chat more, and then you leave. Investing in relationships—getting the personal touch—is the big part. Don’t treat them like they’re a number.”*

See **Section 4.6** for additional information on customer outreach.



**FIGURE 28:** Meet your community where they are to increase engagement.

<sup>6</sup>Erin Rose, Beth Hawkins and Bruce Tonn, “Evaluation of the US Dept. Of Energy Weatherization Innovation Pilot Program (2010-2014),” Oakridge National Laboratory (2017).

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## Document Internal Program Processes

It is important to design internal program processes that take staffing, turnover and interdepartmental agreements into consideration. Write a detailed position description for each member inside and outside of the immediate implementation team. Are you partnering with the permitting office? Write up an agreement stating what the program needs from their planners. Will your program depend on external inspectors who will be hired by homeowners? If these inspectors are not provided by a third-party organization that trains inspectors, be sure you have clear expectations, processes and forms that document what the program requires of them.

Have these staffing processes in place before launching the retrofit program. And remember, return to these designs for future iterations; once the program has begun, prepare to revise initial expectations.

## Roles of the Building Owner and Private Sector

Do not forget about the roles held by the building owner and the private sector.

### The Building Owner

The building owner plays an integral role in most retrofit programs. Beyond applying for the program and providing information on their building, owners often manage their contract between the general contractor and the construction company. When developing your retrofit program, keep in mind that the program must be developed in a way that allows the building owner to:

- Understand the limitations of the project's scope of work and the grant's budget, if one is given.
- Understand the completion and certification process.
- Understand their responsibility in the safety of, and communication with, all occupants.
- Understand their obligations once the project is complete.
- Know what they are responsible for according to the program's guidelines: ongoing maintenance, deed restrictions, tax implications and resale limitations. This is no small task for building owners, and program administrators must often provide customer service and technical assistance throughout the project.

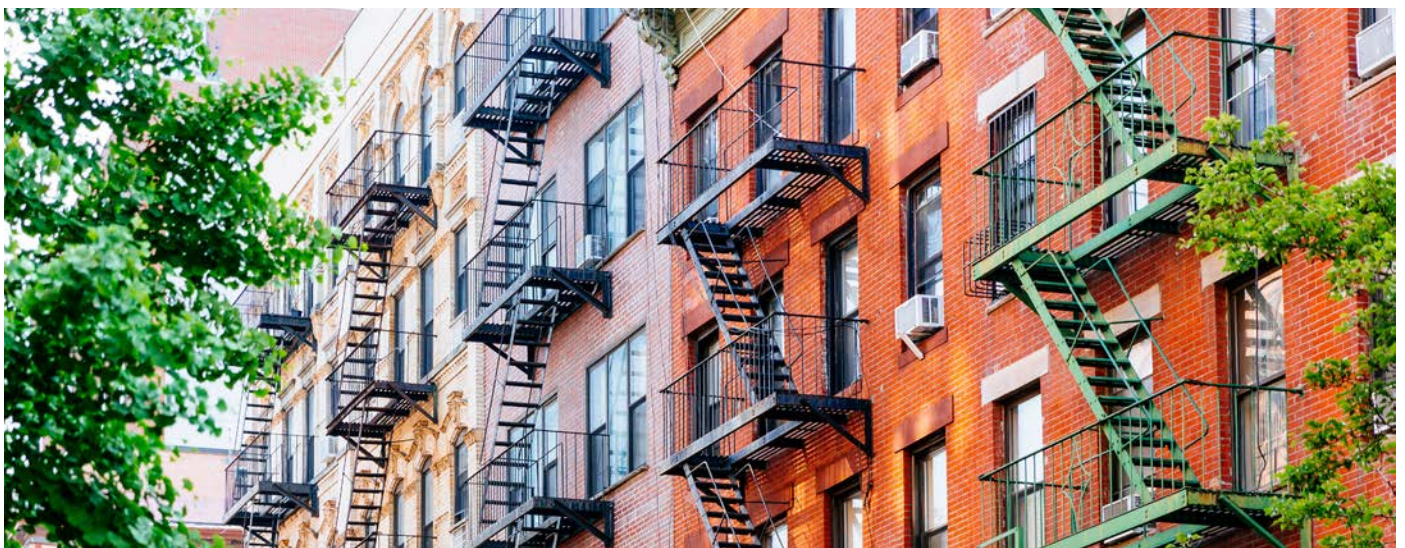


FIGURE 29: Getting multi-unit building owners on board can help protect many more people in your community.

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## The Private Sector

As noted above, many retrofit programs partner with the private sector to complete specific tasks in the program. Consider integrating private sector services into the program design; the following are common integration opportunities:

- Hazard-specific building inspectors can evaluate the scope of retrofit work that a professional will need to perform.
- General contractors, engineers or building code inspectors that specialize in seismic, wind or fire retrofitting can be hired to identify vulnerabilities, recommend a scope of work for the retrofit and certify the work once it is completed.
- General contractors are needed to provide bids and construction services.
- Material suppliers can help you know what materials are available and when (e.g., during disaster events/seasons, such as hurricane and fire seasons, inventory of certain materials may be very low).
- Insurance agents or realtors can get the word out about the retrofit program. Many programs create formal partnerships with insurance companies to adjust policy premiums after the retrofit work is complete.

### EXAMPLE:

*The city of North Lauderdale, Florida, hires wind mitigation inspectors. The inspectors evaluate homes to identify retrofit needs and work with general contractors to explain the scopes of work. Once a contractor has completed the work, the wind mitigation inspector re-evaluates the home.*

## The Not-For-Profit Sector

When developing your retrofit program, consider whether existing and potential nonprofit and academic partners can support your program.

For example, a rental housing association may provide community education, advocacy or applicant support during the program. Technical organizations may have established building guidelines that the program can use as a credible standard. Universities may have written materials and data that can be used to inform building owners. For example, the University of Hawaii has the *Homeowner's Handbook to Prepare for Natural Hazards*.

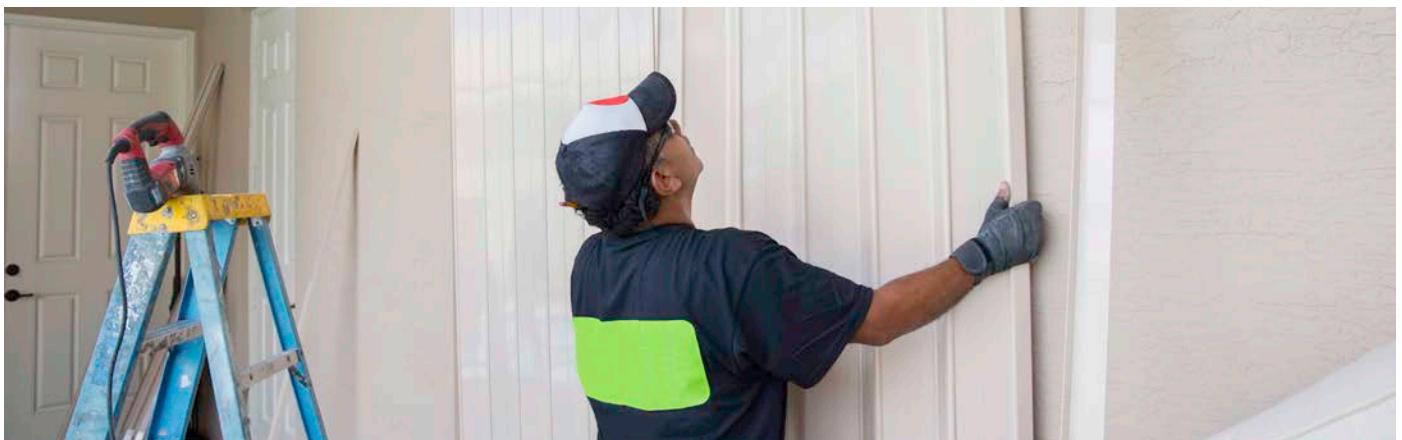


FIGURE 30: Private sector partners are key for program implementation.

## 4.6 DESIGN AN OUTREACH/RECRUITMENT PROGRAM

Outreach and recruitment can involve educating individuals about their own risk to natural hazards, in addition to securing their commitment to a construction project. Communities that experience hazards regularly are more likely to participate than those who are new to experiencing hazards. This is an example of the availability principle: our decisions are often swayed by how easily we can think of examples of a specific object or event. Communities that have experienced historic marginalization may not even be aware of the actions that can be taken and resources that are available. Even if a community has experienced a hazard event, their focus may be on how to recover, rather than better ways to prepare for the future. Leveraging the availability principle to tie recent experiences to local risks will help ensure shared awareness across the community.

How you notify homeowners, recruit them to participate in your retrofit program and set up channels for feedback will depend on many factors, including a targeted geography and whether the retrofit is mandatory or incentivized. The steps you have taken to learn about your community's demographics, engage local stakeholders and create a building inventory will help you develop a public announcement campaign.

There are many good ways to engage with your audience. One way is to follow the EAST Framework – *Four Simple Ways of Encouraging Behavior*. EAST applies four principles of behavior that can encourage an audience into action:



- **Make it EASY.** People have a preference for tasks that are easy to achieve.
- **Make it ATTRACTIVE.** You need to capture attention and incentivize people's behavior.
- **Make it SOCIAL.** Showing the behavior of others influences people to act in a similar way.
- **Make it TIMELY.** The timing of information can be critical to responsiveness.

For more information on how to use this framework to design an outreach program, review the worksheet in **Appendix C.5**.



**FIGURE 31:** Town halls and other outreach events can help recruit participants and build community support.

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## Program Engagement: Lessons Learned

Here are some lessons learned by other communities with retrofit programs. The lessons are accompanied by behavioral insights that provide a science-based perspective on creating a successful outreach campaign.

### 1. Start small.

As you ease into running your program, target a group of building owners to recruit. This group can come from the geography and population with the highest risk, or from your inventory of buildings known to have been repeatedly damaged in past events. Starting small allows your program to go through a round of pilot projects that will inevitably highlight any barriers or program designs that need adjustment. See **Appendix B.4: Sacramento**.

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#### **Behavioral science insight:**

*Using specific values, characteristics, income or geography to target your outreach messaging and tactics can produce more successful outcomes. This is based on the concept of “values-beliefs-norms.” When an individual or event highlights the relevance of behavior based on a person’s norms, it can elicit behavior connected to these norms. Starting small will allow you to customize your outreach materials for a more targeted group, which can produce more favorable outcomes.<sup>7</sup>*



### 2. Be creative.

The launch does not need a multi-million dollar advertising campaign. In fact, many communities with successful retrofit programs receive overwhelming public interest in their program with minimal advertising. Depending on the community, however, traditional public announcement platforms can be easily ignored. In addition to posting program information on your jurisdiction’s web page, look for simple but fresh marketing outlets to get the word out. Small communities have successfully reached homeowners using social media platforms like Facebook, NextDoor and Angie’s List.

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#### **Behavioral science insight:**

*No matter what outlet you choose, keep the program’s options and language simple. Behavioral science studies reveal that individuals can usually consider only a limited number of options. Your messaging should eliminate unnecessary options to avoid confusion. In your outreach, you can also take advantage of the “loss aversion” concept by making your retrofit programs time-limited offers. This concept explains that people are more likely to act to avoid loss than to gain.*



<sup>7</sup> Roy, “How the application of behavioral science in recovery act whole-home retrofit programs improved outcomes.”

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### 3. Build trust.

Program administrators need to work to gain trust in their communities, particularly as they start a new program. Homeowners may be more receptive to outreach when the messaging comes through trusted sources. Recruit your city/tribal council, private sectors and not-for-profit sectors to carry your program’s message into the community. Send program information to real estate agencies, homeowners associations, insurance agents, mortgage brokers, general contractors and hardware stores—show them how they can use the program to benefit their businesses. Ask fire stations, healthcare agencies, religious and community organizations, and other trusted institutions to post program information at their neighborhood sites. Recruit organizations like fire safe councils, local housing organizations, or neighborhood associations to get the word out about your program. Working with local community organizations is key to successful projects. See **Appendix A: Strengthen Alabama Homes**.

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#### **Behavioral science insight:**

*This is consistent with the trusted messenger concept, which explains that interpersonal communication with a credible messenger can sway an individual’s behavior. Outreach and marketing through established community leaders and groups, or outreach efforts paired with existing community events, can be very effective in this regard.*



### 4. Rely on success.

Do not underestimate the power of “word of mouth,” person-to-person advertising. After the initial announcements, many communities with retrofit programs successfully recruit participation through word of mouth. Building owners who have benefitted from a good retrofit program tend to spread the word; they act as a trusted advisor for new participants. See **Appendix A: California Brace + Bolt Program**.

#### **EXAMPLE:**

*After Oakland, California, passed a mandatory seismic retrofit ordinance for buildings designated as “soft story,” program administrators mailed post cards to the people who owned these buildings, to notify them of the program and let them know that more information was on its way. The city developed a website for the program and planned a workshop for building owners. To spread the word and recruit workshop participation, the city worked with the local rental housing association, and the program’s information officer promoted it through a social networking campaign. Finally, staff participated in a local earthquake fair to recruit program participation from engineers and general contractors. The workshop was a success—engineers, landlords and city staff gathered to network, learn from each other and gain a fuller understanding of their roles in the program. City staff were particularly thankful to be able to work closely with building owners, to approach them as partners and learn to work with them. Building a diverse stakeholder team with support from the inside and the outside has been key to the program’s success.*

Below is a table with outreach and communication strategies that communities have used successfully.

**TABLE 8: OUTREACH AND COMMUNICATION STRATEGIES**

EVENTS	COMMUNICATIONS
<ul style="list-style-type: none"> <li>▪ Public meetings.</li> <li>▪ Information sessions.</li> <li>▪ Webinars.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Government and partner websites.</li> <li>▪ Social media (paid and organic posts).</li> <li>▪ Press releases.</li> <li>▪ Email newsletters.</li> <li>▪ Brochures, flyers and print materials.</li> <li>▪ NextDoor and other community-focused websites.</li> <li>▪ Billboards.</li> <li>▪ TV/radio advertisements.</li> <li>▪ Robo-calls to constituents.</li> </ul>

Refer to **Appendix B.4** for a sample outline of an engagement and outreach plan, based on the EPA’s [Regional Resilience Toolkit](#).

### **BEST PRACTICE: COMMUNICATE WITH STORIES**

*No matter how much we think of ourselves as rational, measured beings, humans respond far more with their heart than their head. In fact, 1,000 years of evolution means that we’re hardwired to prefer storytelling. Many indigenous communities use storytelling as a way to pass history and knowledge from generation to generation, and this practice has successfully shaped perspectives and actions taken. To this day, it remains a valuable way of sharing important information to keep communities safe and well.*

**How can this help us?**

*Stories are memorable. A Stanford study showed that people remember stories up to 22 times longer than facts alone. Constituents may not remember the data related to seismic retrofits, but they will probably remember the stories related to earthquakes and be more likely to participate in a retrofit program.*

*Stories also provide context and understanding. They help us understand our world, consider things outside our day-to-day life and connect us to things we may not have considered. This is particularly relevant for newcomers to hazard-prone areas or communities that are newly at risk due to climate change.*

*Ultimately, stories are persuasive. When we share stories, we allow people to connect or empathize with another’s circumstances. They may start to consider that they, too, have a family to think about and should be more prepared for a flood.*

*So, when creating an outreach program, make sure to create vivid imagery for your audience. Avoid bloodless facts and vague generalizations. Instead, construct a richly detailed emotional narrative.*



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## 4.7 DESIGN THE APPLICATION PROCESS

The application process for the building owner should reflect the main goals of the program. If the program is primarily focused on recruiting participants with low incomes, design an application process that takes possible technology gaps into consideration, provides multiple avenues to apply, and offers extensive customer service and technical assistance for each step. If the purpose of the program is to complete the largest number of retrofits possible, simplify the process to have very few hurdles, requirements or complexities.

Things to consider when developing your application process:

- **Eligibility.** How is eligibility defined? For instance, do you have to be in a certain area, does your house have to have been built prior to a certain date, are you still eligible if you have previously completed a retrofit?
- **Touchpoints.** How many touchpoints would you like to have before the application period? Will those be formal touchpoints in the form of a notice of intent, or will they be customer dependent?
- **Timing.** Will the application be available at a certain date? Will owners have a limited amount of time to apply, or will applications be open as long as funding is available?
- **Selection.** Will applicants be accepted into the program on a first-come, first-eligible basis, or will there be a separate selection process?
- **Application delivery.** Will you use paper applications or an online portal (or both)?
- **Information.** Will applicants be required to provide personal and building documentation and in-depth information during the application period or after the preliminary selection?
- **Training.** Will you provide training for interested building owners beforehand on how to build an application?
- **Languages.** Be sure to include documentation in the diverse languages spoken in the community.
- **Contact and questions.** Who will handle incoming questions and concerns? Ensure that information is easy for community members to access — provide details on various points of contact and the type of information one might seek from each, to streamline inquiries.

Sample applications and application processes can be found in **Appendix B.4**.

While retrofits can be complicated, it is important to keep the application process as simple and straightforward as possible. Develop a user-friendly application with clear instructions. Clearly indicate what documentation is required to apply for the program. Give examples of these documents ahead of time, and tell owners where they can find the information. Documentation may include:

- A building’s evaluation.
- Pictures.
- Year of construction.
- Home deeds or titles of ownership.
- Tax information, tax assessor information.
- Proof of income.
- NFIP verification of a repetitive loss property.
- Proof of insurance.

### **BEST PRACTICE: CLARIFY PROCESS DETAILS**

*Establish a notification of funding process and timeline. Clearly identify the steps that will bring the owner through the application process. You might start off with a notice of funding opportunity that informs owners about the grant, the application date and the process.*

*Develop the IT or communications infrastructure to serve as a platform for each step of the project process. Making the program web page the one-stop shop for program applications, owner document submissions, inspector evaluation submissions, contractor bids and final certification will minimize confusion.*



**FIGURE 32:** Monitoring and evaluation can help your program continually improve.

## 4.8 DESIGN A CONTRACTOR/INSPECTOR PARTNERSHIP PROGRAM COMPONENT

Private sector general contractors and inspectors are essential to the retrofit process. Therefore, it is crucial to establish how they will be eligible to participate in the program. If they are required to be trained in a specific type of building code or retrofit work, you will need a way for building owners to recognize which contractors they can hire to work on their buildings. Depending on the restrictions of your funding, your program may be able to keep a directory of trained and qualified contractors.

### BEST PRACTICE: ESTABLISH A QUALIFICATION PROCESS

*Establish a way for contractors and inspectors to be trained on the program's construction standards, if this type of training or certification is not available through other licensing boards or organizations. Even when it is offered elsewhere, it is important to establish a way for local companies to be trained in the program's processes and expectations.*

*Establish how contractors/inspectors will demonstrate their competency in the program. Will they need to take a test, attend a workshop or submit paperwork annually to remain qualified?*

### EXAMPLE:

*The EBB program uses FEMA-trained contractors. To ensure proper retrofits, EBB offers free FEMA seismic retrofit training to California-licensed general contractors. FEMA-trained contractors are added to the EBB Contractor Directory. If hiring a contractor, homeowners must choose one from the directory at [EarthquakeBraceBolt.com/ContractorListing](https://EarthquakeBraceBolt.com/ContractorListing). They can search for contractors by zip code, company name or contractor license number.*



FIGURE 33: Consider training contractors and inspectors on your retrofit standards.

Things to consider:

- Work with your local licensing board to offer continuing education credits for the training your retrofit program offers.
- Create multiple ways for builders to access information about the program: schedule public meetings, workshops or webinars where engineers and contractors can network, learn about the program and learn from each other.
- Make sure the standards are easily accessible and clearly laid out. Work with the Building and Code Enforcement Department to ensure consistency across programs.
- Develop a protocol or process for resolving problems with businesses, contractors or inspectors.
- Create draft scopes of work for building owners and contractors that include a completed retrofit inspection and certification as a responsibility of the contractor.
- Establish a procurement process that is clear to building owners and contractors, and complies with your funding requirements.
- It is not guaranteed that contractors/inspectors will want to participate in your program; so it is important to clearly illustrate the benefits they could gain by participating.

### EXAMPLE:

*The South Carolina Safe Home program developed a training for code officials. The program received permission from the code officials' organization to allow those taking the retrofit training to receive continuing education/licensing credits. The program requires an annual follow-up meeting every year as a refresher.*

*Contractors also receive background checks and testing, and licenses must be up to date and in good standing. If the program has a problem with a contractor, its advisory committee, which is outlined in the legislation and meets quarterly, reviews the case and decides if the contractor will remain in good standing.*

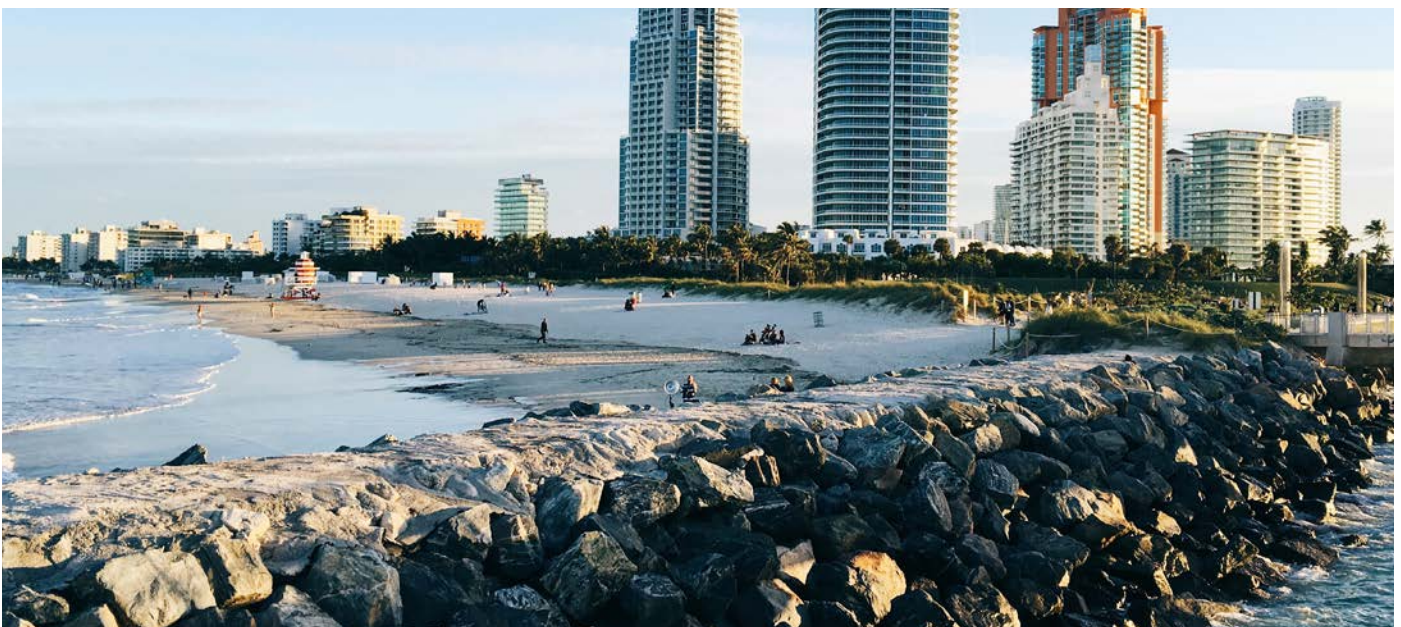


FIGURE 34: As our risks and hazards change, it is important to keep contractors up-to-date on the latest retrofit requirements.

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## 4.9 DESIGN A PROCESS FOR MONITORING, EVALUATION AND ITERATION

Establishing a retrofit program is an iterative process, requiring continuing work to refine, streamline and match participant and departmental needs. Begin with the expectation that change is a healthy and necessary part of the program. Flexibility will allow the program to adjust with time and with changing political and economic climates.

A monitoring and evaluation process will provide documented evidence to support the need for those changes. To assess your program and measure success, consider the following elements of your program. What's working? What could use an adjustment? What can be simplified or updated?

- **Outreach and recruitment efforts.** Determine their effectiveness by type of media, neighborhood, income level or building type.
- **The application process.** Is it working? Are technological improvements available?
- **Assess feedback.** Evaluate the feedback you receive from your team, program participants, community members and stakeholders.
- **Assess the data.** Look into the range of costs across building types, participant demographics, the average amount of time each contractor takes to complete a project, scopes of work that differ between inspectors and contractors.
- **Identify successes .** Document as a way to share the wins.
- **Go back to your goals.** Are you meeting them? Do you need to update or re-evaluate any elements of the program to make it more successful?

### BEST PRACTICE: ESTABLISH TOUCHPOINTS

*Establish touchpoints from the beginning that will allow you to monitor the program's process, evaluate its success and change areas that need to be improved. This will give you documentation and accountability with homeowners, the grant funder and the public.*

### EXAMPLE:

*The South Carolina Safe Home program, started in 2007, is constantly changing, adjusting to growing pains, making updates, and creating efficiencies as they learn. The program, initially run using a paper application process, now uses a more efficient and user-friendly online application. This shift has benefited both applicants and reviewers. To address another pain point, the program re-evaluated and adjusted their project approval process to streamline efforts and reduce the backlog of inspections. Long wait times for reviews led applicants to drop out of the program. Staff members now have the authority to approve applications, and the program convenes an advisory committee to review more complicated cases, as needed. This has allowed the program to keep up to date and ultimately made it stronger.*

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In addition to tracking and evaluating the success of your program on your own terms, your funding sources may outline their own data requirements. It will benefit you to track these metrics up front, to save you time later. Some communities set up systems to record and track metrics electronically, using online application processes as a data collection system as well. The following outlines common data and metrics that you may be required to track; review guidance from your funding source to clarify what you are responsible to report on.

Common data funders require programs to track and report items such as these:

**Expenditures:**

- Housing.
- Public facilities and improvements.
- Public services.
- General administration and planning.

**Beneficiaries by:**

- Racial/ethnic category.
- Income.
- Gender.

**Contractor information:**

- Type of retrofit/mitigation action (shutters, roof, brace and bolt).

**Structure information:**

- Year built.
- Size of building (single-family, multi-family, commercial).
- Type of construction (wood, masonry, concrete block).

**EXAMPLE:**

*From the beginning of their program, Pompano Beach, Florida, has used stringent tracking requirements — mirroring those of HUD — to stay on top of their data collection. They are used to collecting info for HUD, so it is not a new process. Their funding source, HLMP, requires less stringent metric tracking, but the community aimed to have more detailed information for their program’s future interactions.*

# SECTION 5: PREPARE



Prepare

- Pass the ordinance – How will you gather support from key stakeholders?
- Solicit participation from owners and the private sector – What communication tools and/or events can you use to reach potential participants?
- Train staff and partners – What do they need to know to successfully run the program?

Tailor your outreach messaging to the values and characteristics of the individuals to whom you are communicating.

Messaging framework

By this point, you have designed your program and have a plan to set it in motion. Now you want to finish laying the groundwork for your program’s success. Here you will inform your community, apply for funding, and prepare your staff and partners for your program’s implementation.



FIGURE 35: It takes input from the whole community to properly prepare before implementing a program.

## 5.1 PASS THE ORDINANCE

In **Section 4.4**, you designed your retrofit ordinance. Now it's time to get it passed. However, before a policy is adopted and retrofitting begins, jurisdictions need to build support for the policy. The good news is, as you have been reaching out to various groups throughout this process, you have been planting seeds to garner support for your ordinance. Ensure that your outreach includes communication with:

- The public.
- Community leadership/decision-makers.
- Public interest groups and community organizations (e.g., tenant rights groups, building owners associations, homeowners'/rental housing associations).
- Public safety, planning commission or a design review board.
- Tribal council, board of supervisors or city council members (as a champion for your program).

In particular, public interest groups and community organizations can influence policy and the actions of elected officials who will pass the ordinance.

By communicating clearly about the reality of the hazards, the vulnerability of target buildings and the importance of the policy in addressing these concerns, you can build consensus and limit disagreement and resistance among decision makers. In addition, by interacting with key stakeholders early, you will know potential concerns and be able to address them. For example, if you're in a community where parking is a big issue and these retrofits will take away parking, either temporarily or permanently, you can create a game plan to preempt these complaints.

In addition to gathering support from key stakeholders, you should try to enlist the support of a high-level champion who has authority to make decisions. Having key leadership on board can help expedite the process and encourage other decision makers to follow suit. Be sure to work with your champion to get the policy adopted so that you can begin to implement your program.

Remember: if passing a mandatory retrofit ordinance is not politically feasible, consider first passing an ordinance mandating a screening by a licensed engineer. A screening helps inform political leadership of the level of risk. This type of ordinance can be a precursor of mandatory retrofit ordinances, and the results can be useful in proving that a mandatory ordinance is needed.

### BEST PRACTICE: EVERYONE'S A SPOKESPERSON

*Equip your team with the right resources to be good spokespeople for the retrofit program.*

*Some, if not all, of your team should be:*

- *Informed on the policy and its technical and social aspects.*
- *Adept at communicating with both policymakers and the public about the importance of the policy.*
- *Knowledgeable about local politics and the political process.*



## 5.2 SOLICIT OWNER AND PRIVATE SECTOR PARTICIPATION

Continue working through the phases of your tailored outreach plan, as developed in **Section 4.6**. At this point, you've already identified the population and private sector partners (e.g., contractors and insurance agents) and may have started reaching out to them.

The information you send to your target population could cover their specific building type and hazard risk, information about the program, and the upcoming application process. As you send them information, you can also invite them to events to meet program staff and private sector partners, virtually or in person. This is also a good time to open up your website and application portal, so participants can peruse information and ask questions at their leisure.

No matter what your outreach plan looks like, be sure to set participants' expectations early. Be clear about program aspects, timelines and requirements, so participants understand what the program is and what it is not. Some jurisdictions have found that participants falsely assume that they can have maintenance or renovations done during the retrofit work, since a contractor will be doing the work. This underscores the need to provide clear and consistent information.

### **BEST PRACTICE: SET EXPECTATIONS EARLY**

*To foster a relationship of trust, you need to be clear about what you expect of the participant, and what the participant can expect of you and your team.*

Your program is more likely to succeed if potential participants and private sector partners understand the program and trust the program team. You could consider setting up an event for private sector partners to learn about the program and meet program staff. To expand understanding and build trust, communicate clearly, ask for feedback, listen and take responsibility for comments and concerns, and follow through on commitments. This is essential for community buy-in and the overall success of your program.

When dealing with the public, it is also beneficial to understand how to appeal to different individuals' particular values. The following table provides some messaging examples to engage with particular archetypes (typical examples of a certain person or thing), based on their values and worldviews.

**TABLE 9: MESSAGING FRAMEWORK BY ARCHETYPE<sup>8</sup>**

ARCHETYPES	VALUES	MESSAGING TO CONNECT TO VALUES
<b>Hierarchical Individualist</b>	<ul style="list-style-type: none"> <li>▪ Strong leaders and clear social pecking order.</li> <li>▪ Personal freedom within a traditional social structure.</li> <li>▪ Tradition, law and order.</li> </ul>	<p>Show how these retrofit efforts allow them to have more personal freedom and autonomy, while also following the law.</p>
<b>Hierarchical Communitarian</b>	<ul style="list-style-type: none"> <li>▪ Strong community values in a traditional social structure.</li> <li>▪ Efforts that place group interest above the needs and priorities of individuals.</li> </ul>	<p>Stress how their efforts will help reinforce the community’s values, such as safety and responsibility.</p>
<b>Egalitarian Individualist</b>	<ul style="list-style-type: none"> <li>▪ Freedom and individual rights for everyone, regardless of context.</li> <li>▪ Unrestricted opportunities for individuals to compete as desired.</li> </ul>	<p>Focus on how the program can help all building owners increase self-reliance and resilience.</p>
<b>Egalitarian Communitarian</b>	<ul style="list-style-type: none"> <li>▪ Community stewardship.</li> <li>▪ Equal access and participation for everyone regardless of class, gender, race, age and other context.</li> <li>▪ Open to change.</li> <li>▪ Protecting and lifting those left behind.</li> </ul>	<p>Stress any elements of the program (grants, priority lists, translations) that seek to help marginalized communities.</p>



<sup>8</sup> Jennifer Briselliamet. “Designing Science Communication a Rhetorical Toolset.”

## 5.3 DETERMINE A PRIORITY LIST OF BUILDINGS

Based on the general inventory that you developed early on, you'll want to find the specific buildings and homes that you will retrofit within a specific funding cycle. Narrow down your general inventory to a priority list. This list will be partially determined by your funding source, the amount of funding available, and the number of homes or buildings you can retrofit in one funding cycle. Keep in mind, you'll want to have a backup list in case some prioritized buildings or homes fall through, drop out of the program or turn out to be ineligible.

There are a variety of other ways to pull together this priority list. You can use an application process similar to the SAH and South Carolina's Safe Home programs, which accept applications until all the money is spoken for. You can also narrow down a priority list by pulling together responses from your outreach and advertising efforts. Build a list of those who responded to these efforts, indicated interest in the program and are ready to retrofit.

Another way to build this list is selecting buildings based on their risk. You'll want to prioritize buildings that are within the highest risk tier and then find owners who are ready to get started. Finally, you can use information and priority lists or areas from other programs, such as HUD's CDBG and HOME programs, or Florida's SHIP program, to identify potential participants.

Once you have your specific inventory and some form of commitment or intent, including a list of backup options, you'll need to gather all the necessary data about these buildings. Some funding sources require data collection and documentation describing how you prioritized the list, as discussed in **Section 4.9**. Carefully examine the information requirements as you move into this stage.



FIGURE 36: Prioritize buildings to be retrofitted within each funding cycle.

## 5.4 PREPARE APPLICATION AND APPLY FOR FUNDING

Applying for grant funding can be time-consuming and difficult. You will benefit from waiting to initiate the funding application until you are fully prepared. For more information on finding the appropriate funding source, review **Sections 3.3** and **3.4**.

It is also best to have all your information and application elements organized before the funding process opens. Have your list of buildings and other required information ready to go. Once funding opens up, apply as quickly as possible to avoid cutting into your project timeline.

### EXAMPLE:

*The city of Berkeley, California, used one of their previously successful applications as a template for a new application; they updated the information and data as needed, rather than starting from scratch. In the end, it saved the city time and resources.*

If you can, it is also a good idea to have somebody who has not been involved in the program read your application. Remember that the people reviewing your application may have no prior knowledge of your program or all of the work you've put into developing it.

Remember that it can take a funding source a while to review applications. This is where your relationship with a responsive funding source contact comes in. If possible, ask the contact for suggestions on where and how to find information if you are unsure. Be diligent and work with your team to gather all information required by your funding source. Refer to **Appendix C.2** for more tips on building a strong relationship with your funding source.

### BEST PRACTICE: PREPARE AHEAD OF TIME

*Carefully gather and prepare your information ahead of time so that you can apply quickly and get going. Timelines are often short, and you don't want to spend more time than necessary on completing the application(s).*

Once you submit your application, while you are waiting to hear back, prepare to hit the ground running. When your program gets funded, get to work! Since timelines can be short, preparing what you can ahead of time will allow you to make the most of the time you have remaining after receiving the funds. For example, you want to have a process for collecting data and information for your funding source before you start implementing your program.

Hopefully, all your hard work and preparation pay off, your application is accepted and your program is funded. But if your application is not accepted, this by no means suggests that these efforts were wasted. Follow up and ask for feedback on your application so you can learn from the experience and improve for the next funding cycle or grant opportunity. In the future, you can use this as a baseline for applications.

**ADVICE FROM A PRACTITIONER:**

**Take a first pass at the application, then put it away. After a while, revisit your work. Looking at it with fresh eyes lets you see if there is anything you missed or if anything could be better.**

— Vicki White, *Housing and Community Development Manager, City of Bradenton, Florida*



**FIGURE 37:** While waiting on funding decisions, continue to refine your program processes.

## 5.5 TRAIN STAFF, PROGRAM PERSONNEL AND PARTNERS

Once everything is set and ready to go, train your program personnel and private sector partners on the specific aspects needed for your program. You want to make sure your program personnel have the knowledge to work confidently with participants and help them through the steps and application process. Some program personnel, such as grant reviewers, auditors or financial officers, may need specialized training and approvals from the funding source, in addition to state-specific requirements.

You may also want to provide staff (e.g., permitting officials, compliance officers) with some training, especially if they will be interacting with members of the community and potential participants. You want them to have at least basic information on the program to process paperwork and direct people to the right resources and staff.

As mentioned in **Sections 4.8**, you might need to train partners, such as qualified contractors, to ensure that their work is consistent with the standards and requirements of the program. Training partners also enables them to discuss the program with owners. Some partners may even be able to advertise and say that they have been trained on the program, which can help owners choose contractors or engineers with confidence. The more support you can give your partners, the better they will be able to help you maintain the standards of your program and help it succeed.

In the end, each community and program is unique and will have their own tasks to complete before implementing their retrofit program. Make sure you and your team and partners have all the resources, information and training you need to succeed before your program “goes live.”

### BEST PRACTICE: KEEP IN TOUCH

*Provide regular partner training and support. Some communities hold an initial partner training and then a yearly refresher, so partners can hear about program updates and changes. Get feedback on what information or topics your partners would like covered in the training. Having consistent touchpoints with your partners keeps everyone on the same page.*



FIGURE 38: Training staff will help your program succeed.

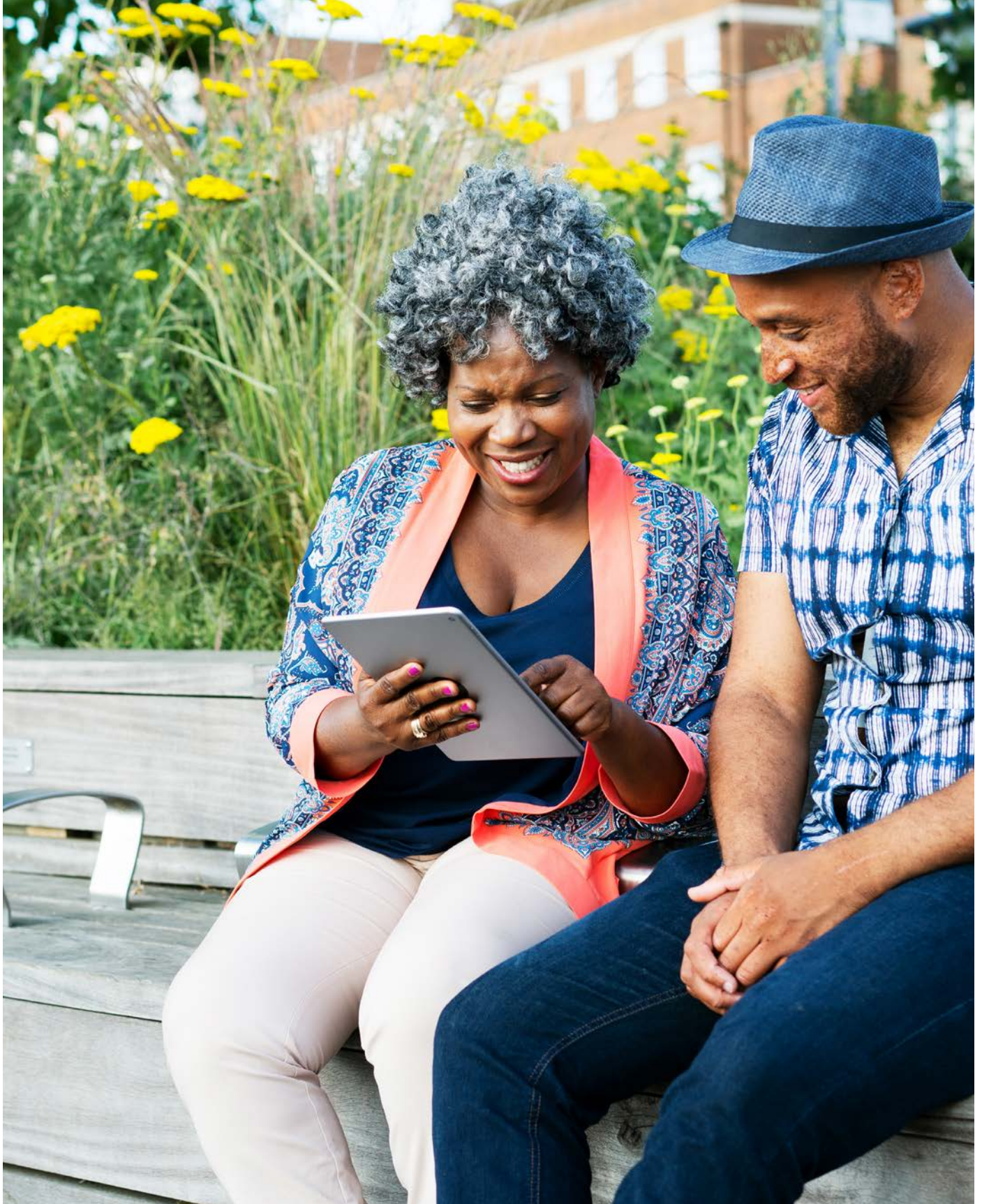


FIGURE 39: Make information available to your community throughout your preparations to encourage support.

# SECTION 6: IMPLEMENT



Implement

- Begin the program – How will you kick it off and distribute information?
- Monitor, evaluate, respond and adapt – What is working? What can you simplify or update?

Maintain clear and consistent communication with participants, staff and partners.

Sample outreach plan, Program evaluation guide

After months of planning, research, writing and relationship building, you have finally made it to the implementation phase of your program. This is a huge feat—even more so if this is your community’s first retrofit program. After all the work you did throughout the previous sections, you’re ready to go.



FIGURE 40: Implementing your program will require outreach to both the community and the private sector.



---

## 6.1 IMPLEMENT THE PROGRAM

You have prepared all your information and trained your staff and partners. Now you can notify the public that your program is ready to serve them.

### Outreach

While designing your program, as outlined in **Section 4.6**, you came up with a plan for outreach and communication that fits your needs and goals. Some communities choose to observe the beginning of their programs with a publicized kickoff meeting or event and invite media to attend. However, it is important to remember that while you can look to other communities for ideas and inspiration, there is no one-size-fits-all outreach strategy; your outreach must be aligned with your program goals, target audience and realities on the ground. See **Appendix B.4** to see how you can create a tailored outreach plan.

#### EXAMPLE:

*The California Earthquake Authority holds a press conference for their EBB program each time they move into a new community. They leverage relationships built among trusted sources: city halls, council members, building departments, emergency managers, rotary clubs, etc. to get the word out. While they do send mail to residents, disseminating information from sources that residents trust has proven more successful and less expensive.*

### Keep Up Customer Service

In **Section 4.5**, you learned how to design customer service into your retrofit program. Now it's time to put this work into action. By providing good customer service, you are ensuring that your staff is available to help residents through the process, information is easily accessible and the process is straightforward.

In addition to developing customer service delivery systems, such as dedicated email addresses, phone hours, office hours, webinars and workshops, you will also need to keep your staff trained on the program so they are prepared to answer customer questions. Keep track of common customer questions and identified challenges, so you can address them and provide a more streamlined process. Remember: keep the program as simple and clear as possible for customers. What may seem simple to you, a trained government employee, can look like a complicated mess to your constituents.

#### EXAMPLE:

*Initially, Oakland, California, was not getting much public support for its program because people didn't understand seismic risk and its importance. They decided to hold workshops for building owners, in which owners were able to ask questions; get information about their own seismic risk; learn about the program and its timeline; and hear from, and network with, contractors and engineers. They could also start the application process with help from the staff. After learning more about the program and seismic risk, owners were more supportive of the program.*

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## Support Your Partners

In addition to keeping lines of communication open, supporting your partners means paying or reimbursing contractors in a timely manner. Several communities expressed the difficulties they have faced in finding enough qualified and quality contractors. Supporting your contractors and other partners will help maintain their trust and willingness to work with your program team.

### ADVICE FROM A PRACTITIONER:

**Don't sit on payments. Get them out to your partners as soon as you can. If jurisdictions do not pay contractors in a timely manner, they may have had to front thousands of dollars to do the retrofit work for the homeowner. Contractors, especially small contractors, are not able to sustain this. This is one way that communities could lose good contractors. If they don't get paid on time, the program might not be sustainable for them and they will drop out.**

— Vicki White, *Housing and Community Development Manager, City of Bradenton, Florida*



FIGURE 41: Keep lines of communication open - virtually or in-person.

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## 6.2 MONITOR, EVALUATE, RESPOND AND ADAPT

### Program Metrics and Evaluation

As you designed your program, you considered metrics for evaluating it (see **Section 4.9**). Now that your program is underway, you can decide if those metrics are appropriate and whether they truly align with your program goals. As a reminder, be sure to have a monitoring, evaluation and reporting process in place at the beginning of the program, and evaluate your program at regular intervals along the way. This can only help, as many funding sources require quarterly reports from grantees.

As you monitor and collect data for program evaluation, collect data that you can use for future funding cycles or future funding opportunities. If there was a funding option you wanted to use, but you didn't have the right information, you can begin collecting the required data and adapt your program so that you can apply for the next round.

### Adapt and Update

As soon as you begin to implement your program, you may find that you need to change the way you manage or deliver various elements. It is best to be ready to adapt the program from the beginning and rely on backup plans and strategies (where possible) that you considered in the design phase of your program.

As you prepare for the next cycle/year of your program, update the aspects that did not work and streamline the process. This does not mean that you won't make any more changes, but it is important to continue only the practices that help your program reach its goals.

#### EXAMPLE:

*The city of Pompano Beach, Florida, is always ready to take advantage of available and additional funding. When a local organization realized that they did not have the capacity to administer the grant they were awarded through HLMP, the Pompano Beach program was able to absorb those funds, essentially doubling the funds available for retrofits. After demonstrating that the program could appropriately use these additional funds in a timely manner, the HLMP program awarded them additional funds in 2017 and 2018.*

Many program administrators say that experience is very important and is often one of the main reasons they can manage their programs. Once a community has gone through a few cycles, they find it easier to overcome missteps and challenges. Of course, relying on staff with previous experience in managing other programs, projects and grants can be helpful; however, even if your staff is less experienced, practice makes perfect.

You worked so hard to get here! But remember, adapting, changing and reevaluating your program is part of the process and will lead to successes. See **Appendix B.6** for more resources on program evaluation and adaptation.

#### BEST PRACTICE: MOTIVATE ACTION

*Use behavior change techniques to incentivize voluntary retrofitting. The tactics detailed in **Appendix C** can help your program be more effective in motivating owners into action.*



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# CONCLUSION

This toolkit was assembled with lessons learned, advice and input from dozens of communities and their work on building retrofits. Even so, each community is unique. Consider these lessons learned and put them into the context of your community to make your program your own.

Your program, like your community, is not a static entity. Whether you are creating your first building retrofit program or exploring ways to improve an existing one, know that your program will continue to change. Natural hazard events and factors such as demographic shifts and changes in funding programs can fundamentally alter the design and implementation of your program over time.

Stay connected to your community and your larger network of practitioners and funders to adapt to and address these shifts. After all, the guidance in this document reflects the experiences and expertise of people who have implemented retrofit programs in communities across the country. We hope that in highlighting their advice, examples and best practices, you will be encouraged to engage in further peer-to-peer learning and develop a program that will work to meet your community's unique risk reduction needs and priorities.



FIGURE 42: Your program will need to adapt as your hazards and community change.



FIGURE 43: Maintain a birds-eye view to monitor how your program can evolve to meet your community's needs.

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# APPENDIX A: CASE STUDIES

Appendix A contains information on retrofit programs cited throughout the Natural Hazard Retrofit Program Toolkit, and links to more information about them. The purpose of Appendix A is to provide you with a more complete narrative of each community's experience with retrofit programs and an increased understanding of how the communities worked to address hazard risk through building retrofits.

## A.1. Thurston County, Washington

*Referenced in Sections 1.3, 3.3 and 4.5.*

Thurston County regulates construction in Special Flood Hazard Areas (SFHAs), which experience river, stream and groundwater flooding. The Thurston County floodplain manager has been retrofitting homes in floodprone areas around the county since 2007. Every year, the county targets a handful of homes that have flooded in the past and need to be elevated above flood levels. To fund these elevations, the county combines grant funds from a variety of state and federal sources, such as Community Development Block Grants (CDBGs), the Washington State Department of Ecology, the Washington State Chehalis Flood Basin and FEMA.

Thurston is a rural county in western Washington with many low-income residents living in the floodplain. When retrofit grants require a financial match from a local resident (approximately 25% of the project cost), homeowners cannot afford to contribute. To help homeowners meet this local match, the floodplain manager works with the National Flood Insurance Program (NFIP) to access the Increased Cost of Compliance (ICC) fund. This fund is accessible to homeowners who purchase flood insurance through the NFIP and whose homes have been declared substantially or repetitively damaged in flood events by the local jurisdiction. This fund provides up to \$30,000 for qualified insured buildings to be floodproofed, relocated, elevated or demolished.

To access these funds, participating jurisdictions must include a substantial damage and/or repetitive loss provision in their floodplain management ordinance. Thurston County adjusted their floodplain ordinance to include these provisions, and the floodplain manager regularly requests \$20,000 or more per retrofit project from the ICC fund. Because of the additional funding, the county is able to include seismic and wind retrofit elements during the flood elevation projects. For more information on how to update your floodplain management ordinance to meet the ICC requirements, [click here](#).

Thurston County updates their ordinance every few years to ensure its effectiveness and accountability. It recently incorporated its "critical area" ordinances into their floodplain management ordinance to ensure that development in sensitive areas takes flooding into account.

Learn more at: <https://www.thurstoncountywa.gov/planning/Pages/flood.aspx>.

## A.2. City of Oakland, California

*Referenced in Sections 4.4, 4.5, 4.6 and 6.1.*

Given Oakland's location along the Hayward Fault, the city is working to seismically strengthen their buildings to better enable Oakland to withstand the short- and long-term effects of a major disaster. A 2009 ordinance (12966 CMS) mandated that owners of certain residential buildings provide simple and low-cost information to the city about their buildings' ground-floor structural supports (dimensions, materials, photographs, floor plan). The 2009 ordinance did not require any type of structural retrofit.

Before the city of Oakland passed the [mandatory retrofit ordinance for soft-story buildings](#) with five or more units, the city implemented a voluntary program for soft-story buildings. To incentivize action, this program

offered a reimbursement of up to 75% of the cost of a seismic retrofit. They funded these retrofits in part through FEMA's Hazard Mitigation Grant Program (HMGP). Reimbursements were intended to help building owners afford retrofit costs, and avoid any pass-through costs to tenants, a priority concern for a city with extremely high housing costs and specific rent control. To address the housing shortage and rent control laws, the city's Building Department partnered with the Rent Adjustment Office to help address the community's concerns about the program's potential impact on renters, ensuring that rental protections are followed. It also assisted building owners who may not have had the funds to afford a full retrofit.

The program is staffed by engineers with technical building expertise and a public information officer that releases information about the program to the community. When program developers recognized their need for support with benefit-cost analysis (BCA) calculations, they worked with an engineer to help with this task.

Learn more at: <https://www.oaklandca.gov/topics/ssretrofit>.

### **A.3. California Earthquake Brace + Bolt Program**

*Referenced in Sections 2.1, 2.4, 4.1, 4.6, 4.8 and 6.1.*

Together, the California Earthquake Authority (CEA) and the Governor's Office of Emergency Services created the California Residential Mitigation Program (CRMP). Earthquake Brace + Bolt: Funds to Strengthen Your Foundation is the first incentive offered by CRMP to help Californians strengthen their homes against damage from earthquakes.

The seismic retrofit involves bolting, or bolting and bracing, homes to their foundation in compliance with California Existing Building Code Chapter A3. This incentive program offers grants of up to \$3,000 to qualified homeowners with eligible houses in a select number of higher-earthquake-risk ZIP codes. For qualifying homes that are properly retrofitted, CEA offers a premium discount of up to 25%.

In the first few years of the program, administrators were surprised to find that eligible homeowners were highly skeptical of what they saw as "free money," or the grants awarded to homeowners to help retrofit their homes. Program staff had to spend a hefty amount of time and energy convincing residents they were not being scammed. It took building trust through word of mouth and working through local officials, emergency management departments, and organizations like the Rotary Club, to build enough trust to gain statewide acceptance of the program. Eventually, local press picked up on the program and the program has an annual press conference during the application period. Today, there are more homeowners excited to participate in the program than there is funding.

Learn more at: <https://www.earthquakebracebolt.com/>.

### **City of Hayward, California - A Participant of Brace + Bolt**

*Referenced in Sections 1.2, 2.2 and 4.4.*

The city of Hayward sits directly on top of the Hayward Fault—a massive fault that is predicted to produce a significant earthquake in the next 30 years. To address this risk, the city passed a mandatory unreinforced masonry building retrofit ordinance in the 1990s, with no additional incentives for action. The ordinance was successful, and the majority of building owners complied with the mandate and retrofitted their buildings.

In the mid-2010s, the city sought to continue to address their risk by passing a mandatory seismic retrofit ordinance for soft-story buildings. However, due to the fear that such an ordinance would exacerbate already high residential rental prices, the public and political pushback made a mandatory ordinance impossible. Around 50% of the housing stock in Hayward is rental housing, and a significant portion of the residents are lower-income. To avoid burdening residents, the city passed an ordinance mandating hazard evaluations for soft-story buildings. While this ordinance provided seismic standards for construction, and resulted in valuable evidence supporting the need of widespread retrofits, it did not incentivize action on the part of



homeowners. As of 2020, the city is revisiting the possibility of passing a mandatory retrofit ordinance that will not pass the costs of retrofits on to tenants.

#### **A.4. South Carolina Safe Home Program**

*Referenced in Sections 1.2, 4.5, 4.8, 4.9 and 5.3.*

The South Carolina Safe Home program, administered by the South Carolina Department of Insurance, provides matching and non-matching grant funds to help coastal property owners retrofit their homes to make them more resistant to hurricane and high-wind damage. The funds provided by this program are for the sole purpose of retrofitting owner-occupied, single-family homes.

Grant awards are based on the total annual adjusted gross household income of the applicant, adjusted for family size relative to the county area median income, or the state median family income, whichever is higher. These statewide and countywide income figures are published annually by the United States Department of Housing and Urban Development (HUD).

Any homeowner in the state can apply for funding; however, the majority of those who receive grants live in areas that are most vulnerable to hurricane-force winds. For homeowners who must pay out of pocket for their retrofit, the state offers an income tax credit for the overage costs. They are also encouraged to submit a certificate of completion, or completed mitigation form, to their insurance company to receive a reduction in their insurance premiums. Homeowners are also able to contribute to a pre-tax Catastrophe Savings Account, similar to a Health Savings Account, which can be used during a declared disaster.

For more information, visit <https://www.doi.sc.gov/605/SC-Safe-Home>.

#### **A.5. Strengthen Alabama Homes (SAH) Program**

*Referenced in Sections 1.2, 2.5, 3.2, 4.1, 4.3, 4.4, 4.6 and 5.3.*

SAH provides grants to residents of Baldwin and Mobile counties in Alabama for residential wind mitigation on existing, owner-occupied, single-family homes. Funding for this program comes from the insurance industry in the state. The mitigation standard adopted by the SAH program is known as the FORTIFIED Home™ program, and it was developed by the Insurance Institute for Business and Home Safety.

A FORTIFIED evaluation is a required step in this retrofit program and provides homeowners and contractors an understanding of the work needed to mitigate a home. A certified FORTIFIED Evaluator™ performs an initial review of the current condition of the home, and provides documentation of the steps needed to reach either the FORTIFIED Bronze or Silver level. As mitigation continues, the Evaluator works with your chosen contractor to document all the work and submit the home for certification.

These grants pay 100% of the cost of mitigation (up to \$10,000). If there are any costs above the grant award amount, these will be the responsibility of the homeowner. Homes with a FORTIFIED designation in Alabama receive discounts on the wind portion of their homeowner's insurance premium. Additionally, a new study from the University of Alabama shows that FORTIFIED homes sell for nearly 7% more than non-FORTIFIED homes.

The program partners with an organization called Smart Home America to do educational outreach about hazards and their retrofit program. They educate on building standards and how they make a difference during hazard events.

Learn more at: <https://strengthenalabahomes.com/>.

## **A.6. Florida’s Hurricane Loss Mitigation Program (HLMP)**

*Referenced in Sections 3.3, 3.4, 4.9 and 6.2.*

Florida’s Division of Emergency Management created the HLMP to act as a specialized, state-funded mitigation program aimed at minimizing damages caused by hurricanes. The program began as an active response to the devastation brought by Hurricane Andrew, specifically to the state’s insurance market. With an annual budget of \$7 million, provided by the Florida Hurricane Catastrophe Trust Fund, the program funds activities that promote property resiliency through retrofits made to residential, commercial and mobile home properties; the promotion of public education and public information; and hurricane research activities.

Through partnering with local housing authorities and nonprofit organizations, the Division has been able to promote wind and flood mitigation and provide retrofit funding to residential and commercial properties. Funded activities include retrofits, inspections, and construction or modification of building components designed to increase a structure’s ability to withstand hurricane-force winds and flooding. The \$194,000 reimbursement grant may also be used for Local Mitigation Strategy projects. The Retrofit Program utilizes the Florida Building Code as its standard for all retrofitting. Grant funds awarded under the HLMP qualify as state financial assistance under the Florida Single Audit Act.

Learn more at: <https://www.floridadisaster.org/dem/mitigation/hurricane-loss-mitigation-program/>.

### **City of Pompano Beach, Florida – A Participant of HLMP**

*Referenced in Sections 4.9 and 6.2.*

Since 2016, the city has implemented the state’s HLMP and has been very successful. The program includes retrofits, inspections, construction and mitigation activities. When funding becomes available annually, the city puts out a public notice and maintains a waiting list of up to 100 people, but typically retrofits approximately 10–11 homes per funding cycle. The city usually focuses their efforts on assisting low-income households, and they’ve found that their work is often concentrated in discrete areas of town.

Recently, a local organization was also awarded funding through HLMP, but they quickly realized they did not have the capacity to administer the grant. The Pompano Beach program was able to absorb those funds, essentially doubling the funds available for retrofits. After demonstrating that the program could appropriately use these additional funds in a timely manner, the HLMP program awarded them additional funds in 2017 and 2018.

From the beginning of the program, Pompano Beach has used more stringent tracking requirements, mirroring those of HUD, to stay on top of data collection. HLMP funding stipulates less stringent metric tracking, but the community aimed to have more detailed information for future iterations of their program.

# APPENDIX B: COMPANION TOOLS AND RESOURCES

Discover resources and ideas for your program development, planning and implementation efforts. Appendix B contains tools, resources and information to support the development of a building retrofit program that meets your community's unique needs and goals. The sections below correspond to the sections listed in the Natural Hazard Retrofit Program Toolkit.

## B.1. Assessing Risks and Vulnerabilities

### Hazard Evaluation

What risks does your community face? How have hazards affected your community? The resources below can help identify what hazards may impact your community. **Don't forget your local community's hazard mitigation plan! A lot of the hazard evaluation may already be complete.**

Additional hazard and risk information can be found in the following federal resources:

- Hazard Identification and Risk Assessment Resources, FEMA. <https://www.fema.gov/hazard-identification-and-risk-assessment>.
- Data and Tools resources, United States Geological Survey (USGS). <https://www.usgs.gov/products/data-and-tools/data-and-tools-topics/natural-hazards>.
- National Water & Climate Center, Natural Resources Conservation Service. <https://www.wcc.nrcs.usda.gov/>.
- USGS Earth Resources Observation and Science Center. <https://eros.usgs.gov/science>.
- National Oceanic and Atmospheric Administration, National Centers for Environmental Information. <https://www.ncei.noaa.gov/>.

For data on specific hazards, explore the following resources and data sets:

- Wildfire
  - U.S. Forest Service Wildland Fire Assessment Service - maps, data and ratings on the potential for severe fire: <http://www.wfas.net/>.
- Earthquake
  - USGS Earthquake Hazards Program - includes searchable archive, seismicity maps and statistics, information on faults and seismic hazards, and data for download: <http://earthquake.usgs.gov/>.
- Wind
  - FEMA P-804, "Wind Retrofit Guide for Residential Buildings." [https://www.fema.gov/sites/default/files/2020-08/fema\\_p804\\_wind\\_retrofit\\_residential\\_buildings\\_complete.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_p804_wind_retrofit_residential_buildings_complete.pdf).
- Flood
  - FloodSmart - the official NFIP website; includes resources for communicating flood risk and building awareness: <https://www.floodsmart.gov/>.
- Landslide
  - USGS Landslides Hazards Program - for landslide hazard maps and forecasts: <http://landslides.usgs.gov/>.
- Severe Weather
  - Applied Technology Council Windspeed website - provides users with site-specific windspeeds that are used when designing wind loads for buildings and other structures: <http://windspeed.atcouncil.org/>.

### Vulnerability Identification

What is at risk in your community? Which populations would be most affected by a hazard event? Consider the demographics and socioeconomic factors of your community, in addition to infrastructure, when

identifying vulnerabilities. **Again, this information is likely summarized in your local hazard mitigation plan.** The resources below can also help identify and quantify structures and community assets.

- American Community Survey. <https://www.census.gov/programs-surveys/acs>.
- Hazus. <https://www.fema.gov/flood-maps/products-tools/hazus>.
- Hazus Average Annualized Loss Viewer. <http://www.arcgis.com/home/item.html?id=cb8228309e9d405ca6b4db6027df36d9>.

## Inventory Analysis

Which community assets are most vulnerable to hazards? What information do you already have, and which assets will you include in your retrofit program? While this process falls heavily on local agencies and communities, other stakeholders such as federal or state agencies, academic researchers, nonprofit staff and consultants are valuable resources that can provide technical assistance or other resources.

Existing datasets that might lead a project down an actionable path:

- National Center for Education Statistics. <https://nces.ed.gov/pubs2006/ficm/content.asp?ContentType=Section&chapter=2&section=3>.
- Science Data Catalog, USGS. <https://data.usgs.gov/datacatalog/>.
- Critical Infrastructure Resilience Institute. <https://ciri.illinois.edu/>.
- SimCenter Computational Modeling and Simulation Center. <https://simcenter.designsafe-ci.org/>.

Additional resources to support the development of a building inventory:

- Regional Resilience Toolkit – 5 Steps to Build Large Scale Resilience to Natural Disaster, Environmental Protection Agency (EPA). [https://www.epa.gov/sites/production/files/2019-07/documents/regional\\_resilience\\_toolkit.pdf](https://www.epa.gov/sites/production/files/2019-07/documents/regional_resilience_toolkit.pdf).
- Open Geospatial Consortium, Data Implementation Standards. <https://www.ogc.org/docs/is>.
- Creating a Global Building Inventory for Earthquake Loss Assessment and Risk Management, USGS. <https://pubs.usgs.gov/of/2008/1160/downloads/OFO8-1160.pdf>.
- Central U.S. Earthquake Consortium Rapid Visual Screening App. <https://fema-p-154-rvs-cusec.hub.arcgis.com/>.
- Earthquake Engineering Research Institute. <https://www.eeri.org/>.
- National Earthquake Hazards Reduction Program. <https://www.nehrp.gov/>.

Use the worksheet and tools below to help you assemble your building inventory.

Following the steps in this toolkit, you have assessed your community's risks and identified which areas and/or construction types are most vulnerable to your identified hazard(s). Use the following worksheet, the Building Information Examples and the Community/Neighborhood Characteristic Examples to guide your inventory analysis. These tools will help you take a more holistic approach as you develop your inventory.

Use the Building Information Examples list to consider the building data you want to collect for your inventory. Use the Community/Neighborhood Characteristic Examples list to help you focus your inventory and start creating a priority list of buildings so that you can concentrate your efforts for the greatest impact in your current project cycle.

## INVENTORY ANALYSIS WORKSHEET AND TOOLS

### EXAMPLE LISTS

<p style="text-align: center;"><u><i>Building Information Examples</i></u></p> <ul style="list-style-type: none"> <li>▪ Building type</li> <li>▪ Building purpose/use</li> <li>▪ Age</li> <li>▪ Number of stories</li> <li>▪ Size</li> <li>▪ Building materials</li> <li>▪ Design</li> <li>▪ Degree of openness</li> <li>▪ Location</li> <li>▪ Location in relation to other buildings</li> </ul>	<p>Data Sources:</p> <ul style="list-style-type: none"> <li>- U.S. Census</li> <li>- County tax assessor parcel data</li> <li>- Local housing element</li> <li>- Local general or specific plans</li> <li>- Local zoning code</li> <li>- Open source maps (e.g. Google Earth/Maps)</li> </ul>
<p style="text-align: center;"><u><i>Community/Neighborhood Characteristic Examples</i></u></p> <ul style="list-style-type: none"> <li>▪ Demographics</li> <li>▪ Population density</li> <li>▪ Housing type (single or multi family, etc.)</li> <li>▪ Number of occupants (by building size, by hours occupied, etc.)</li> <li>▪ Socioeconomic status</li> <li>▪ Historical and community value</li> <li>▪ Business type (corporate, small, family-owned, etc.)</li> </ul>	<p>Data Sources:</p> <ul style="list-style-type: none"> <li>- U.S. Census</li> <li>- American community survey</li> <li>- Priority development areas</li> <li>- County quick facts</li> <li>- Local general or specific plans</li> <li>- Local housing element</li> <li>- Local zoning codes</li> <li>- County health department status reports</li> <li>- Local general plan or specific plans</li> <li>- Local housing element</li> <li>- Nonprofit or community-based organizations</li> </ul>

### KNOW WHAT YOU WANT TO KNOW

Based on your risk assessment, you know where the vulnerable assets are in your community and what hazard(s) you want to address. Consider these questions to focus your search criteria.

What are your objectives? What will you be addressing with your building retrofit program (e.g., certain vulnerable construction types, particular housing types, etc.)?

## INVENTORY ANALYSIS WORKSHEET AND TOOLS

What data will you collect? Consider the who, what, where, when, why and how for each building. Use the Building Information Examples and Community/Neighborhood Characteristic Examples above to help you define what data is required for your project.

*Remember, not all information is relevant for all projects, so choose and collect only the data that is important for achieving your objectives. Sometimes, less is more.*

**Who** uses the building? Owns it? Manages it?

**What** materials, techniques and codes were used in its construction?

**Where** is it located (in the community, in relation to other buildings, etc.)?

**When** was it built?

**Why** was it built? Was its original purpose different than its current use?

**How** is the building used (housing, commercial, industrial, etc.)?

### TAKE A STEP BACK

Take a whole-community approach, collaborate with others and look at how an inventory could contribute to larger community goals. Consider these questions as you look at the big picture. What community goals could an inventory help address and how?

## INVENTORY ANALYSIS WORKSHEET AND TOOLS

How could the data be used to support other ongoing or future projects? Can it be used to serve multiple purposes?

What colleagues and departments could you collaborate with? What datasets have they collected or used in the past?

Who is the target audience for the data? How will you present and deliver it for maximum impact and clarity?

### SURVEY THE EXISTING DATA

Before starting, try to find all the data that has already been collected. Try to use existing datasets, rather than starting from scratch. Maybe all the information you need has already been collected. Consider these questions as you look for available datasets.

What datasets do other departments, agencies, partners, organizations, etc. have?

## INVENTORY ANALYSIS WORKSHEET AND TOOLS

What information is available online from studies, research institutions, etc.?

Where else could you look for data?

Once you've surveyed the available datasets, see if they provide all the information you need. Is there any information you still need? If so, what?

### COLLECT INFORMATION TO FILL DATA GAPS

Now that you know what information you still need, you can plan how to fill the gaps. Consider these questions as you review your options for collecting the data you still need.

Where might you be able to find the information you still need? Can you find it with research, mail-in or online questionnaires for building owners, or will you have to conduct a field survey?



## INVENTORY ANALYSIS WORKSHEET AND TOOLS

If you must conduct a field survey, how will you do it and what technical expertise is required? Will you use current staff, volunteers, students, etc. to support the survey? What partners, organizations or agencies could you collaborate with?

### LOOK FORWARD

Clearly document your data collection and management efforts. Give some thought to the format of your data. If feasible, avoid using proprietary data formats that will prevent or limit others from using the data. That way, you and others can easily go back and collect more information, if needed.

How will you manage the data so that it will get updated regularly and not lose its value? How can you incorporate it into your larger planning efforts and budget for it in the future?

## B.2. Consider the Context

### Hazard Retrofit Options

Which retrofit options work best for your building stock?

Use the “Mitigation Ideas: A Resource for Reducing Risk to Natural Hazard” guidance developed by FEMA to identify and evaluate a range of potential mitigation actions for reducing risk to natural hazards and disasters: [https://www.fema.gov/sites/default/files/2020-06/fema-mitigation-ideas\\_02-13-2013.pdf](https://www.fema.gov/sites/default/files/2020-06/fema-mitigation-ideas_02-13-2013.pdf).

The FEMA guides below provide technical specifications for construction and planning considerations for specific natural hazards, and may provide ideas and options for your program.

- Coastal
  - FEMA P-55, “Coastal Construction Manual: Principles and Practices of Planning, Siting, Designing, Constructing, and Maintaining Residential Buildings in Coastal Areas” (Chapter 15: Retrofitting Buildings for Natural Hazards). [https://www.fema.gov/sites/default/files/2020-08/fema55\\_voli\\_combined.pdf](https://www.fema.gov/sites/default/files/2020-08/fema55_voli_combined.pdf).
  - FEMA P-499, “Home Builder’s Guide to Coastal Construction, Technical Fact Sheet Series.” [https://www.fema.gov/sites/default/files/2020-08/fema499\\_2010\\_edition.pdf](https://www.fema.gov/sites/default/files/2020-08/fema499_2010_edition.pdf).
- Wildfire
  - FEMA P-737, “Home Builder’s Guide to Construction in Wildlife Zones: Technical Fact Sheet Series.” [https://www.fema.gov/sites/default/files/2020-08/fema\\_p\\_737\\_0.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_p_737_0.pdf).
- Earthquake
  - FEMA 232, “Homebuilders Guide to Earthquake Resistant Design and Construction.” <https://www.wbdg.org/FFC/DHS/fema232.pdf>.
  - FEMA 530, “Earthquake Safety Guide for Homeowners.” [https://www.fema.gov/sites/default/files/2020-08/fema\\_earthquakes\\_fema-p-530-earthquake-safety-at-home-march-2020.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_earthquakes_fema-p-530-earthquake-safety-at-home-march-2020.pdf).
- Wind
  - FEMA P-804, “Wind Retrofit Guide for Residential Buildings.” [https://www.fema.gov/sites/default/files/2020-08/fema\\_p804\\_wind\\_retrofit\\_residential\\_buildings\\_complete.pdf](https://www.fema.gov/sites/default/files/2020-08/fema_p804_wind_retrofit_residential_buildings_complete.pdf).
- Flood
  - FEMA P-1037, “Reducing Flood Risk to Residential Buildings that Cannot be Elevated.” [https://www.fema.gov/sites/default/files/2020-07/fema\\_P1037\\_reducing\\_flood\\_risk\\_residential\\_buildings\\_cannot\\_be\\_elevated\\_2015.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_P1037_reducing_flood_risk_residential_buildings_cannot_be_elevated_2015.pdf).
  - FEMA P-936, “Floodproofing Non-Residential Buildings.” [https://www.fema.gov/sites/default/files/2020-07/fema\\_p-936\\_floodproofing\\_non-residential\\_buiildings\\_110618pdf.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_p-936_floodproofing_non-residential_buiildings_110618pdf.pdf).

### Community Priorities and Partners

Who are your participants, and what is important to them? What constraints have kept the community from retrofitting in the past? Identify potential barriers community members may face as they seek to participate in the program, and constraints that have inhibited retrofitting.

**The best place for information on your community is in your own backyard:**

- Comprehensive, general and master plans.
- Hazard mitigation plan.
- Economic development plan or strategy.
- Green infrastructure or resilience plan.

The resources below detail demographics and statistics, but also help you learn what drives your community. Many of the federal sources listed below were likely used in the development of your local plans.

- U.S. Census Data. <https://data.census.gov/cedsci/>.
- U.S. Census – QuickFacts. <https://www.census.gov/quickfacts>.
- U.S. Census – My Tribal Area. <https://www.census.gov/tribal/>.
- HUD Low-Mod Income Summary Data. <https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-local-government/>.

For a deeper dive into your communities' needs, capabilities and motivations, refer to Appendix C.1.

## Building Stock

What types of buildings are in your community and which ones will you be targeting with your program? **Again, your local plans and records hold a wealth of knowledge.** Consider reviewing your:

- General plan.
- Tax assessor records.
- Planning department.

Consider historic buildings and the local environment as well, as they have special implications. For historic buildings, consult the following Historic Preservation Assistance Checklist: <https://files.constantcontact.com/404477df701/263a282f-f815-44bd-b98c-74a7d449759b.pdf>.

And to start getting an idea of the critical habitats in your area, use these websites:

- Critical Habitat for Threatened & Endangered Species, U.S. Fish and Wildlife Service (USFWS). <https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77>.
- National Wetlands Inventory Mapper, USFWS. <https://www.fws.gov/wetlands/data/mapper.html>.

## Market Profile

Which businesses are available to support the program? **Consider consulting your local chamber of commerce or department of labor to best understand construction business, building inspector and material supplier options.**

Consider what kind of training or expertise is needed to inspect or retrofit a building. The following resource is an example of a training that contractors can take on seismic retrofitting:

- FEMA P-593 CD, Seismic Rehabilitation Training for One- and Two-Family Wood-Frame Dwellings. <https://www.earthquakebracebolt.com/Course/Public>.

The Association of Bay Area Governments Resilience Program also maintains a number of trainings for building contractors and inspectors, which can be found at <https://abag.ca.gov/tags/retrofit>.

## B.3. Determine Funding

### Funding Considerations

Depending on your funding source, the resources below provide a look at some requirements you may need to keep in mind when developing your program.

- BCA, FEMA. <https://www.fema.gov/benefit-cost-analysis>.
- Environmental and Historic Preservation Grants, FEMA. <https://www.fema.gov/environmental-and-historic-preservation>.
- National Environmental Policy Act, EPA. <https://www.epa.gov/nepa>.
- California Environmental Quality Act, California Governor’s Office of Planning and Research. <https://opr.ca.gov/ceqa/>.

Be sure to check your state and local environmental regulations, as they may have additional requirements.

### Discover Funding Options

First, examine project costs – what level of funding do you need? Then, explore the available funding options for your program.

Below is a table of potential local, state and federal funding sources. Though this focuses on states in FEMA Region 9, many state agencies and departments can also be sources of funding. Look for opportunities from emergency services or emergency management departments, natural resource departments (such as the U.S. Fish and Wildlife Service), and housing and community-related programs. It’s also worthwhile to reach out to other agencies with similar interests, like your state insurer’s office or your state congressional representatives, to express interest in this type of hazard mitigation investment.

#### FUNDING SOURCES BY JURISDICTION SCALE

SOURCE	POTENTIAL PROGRAMS/GRANTS
<b>Local</b>	
Local	<ul style="list-style-type: none"> <li>▪ Capital improvements project funding.</li> <li>▪ Authority to levy taxes for specific purposes.</li> <li>▪ Incur debt through general obligation bonds.</li> <li>▪ Incur debt through special tax bonds.</li> </ul>
<b>Federal</b>	
FEMA	<ul style="list-style-type: none"> <li>▪ <a href="#">HMGP</a></li> <li>▪ <a href="#">Building Resilient Infrastructure and Communities</a></li> <li>▪ <a href="#">Flood Mitigation Assistance Program</a></li> </ul>
HUD	<ul style="list-style-type: none"> <li>▪ <a href="#">CDBG Program</a></li> <li>▪ <a href="#">HOME Investment Partnerships Program</a></li> <li>▪ <a href="#">Office of Community Planning and Development</a></li> </ul>
U.S. Bureau of Land Management	<ul style="list-style-type: none"> <li>▪ <a href="#">Wildland Urban Interface Community Fire Assistance</a></li> </ul>
U.S. Department of Agriculture	<ul style="list-style-type: none"> <li>▪ <a href="#">Single Family Housing Repair Loans &amp; Grants – Rural Development</a></li> <li>▪ <a href="#">Programs and Services – Rural Development</a></li> </ul>

State	
Arizona Department of Emergency and Military Affairs State Hazard Mitigation Office	<ul style="list-style-type: none"> <li>▪ <a href="#">Governor’s Emergency Fund</a></li> </ul>
Arizona Department of Forestry and Fire Management	<ul style="list-style-type: none"> <li>▪ <a href="#">Hazard Fuels Mitigation Grants</a></li> </ul>
California Coastal Conservancy	<ul style="list-style-type: none"> <li>▪ <a href="#">Proposition 1 Grants</a></li> </ul>
California Department of Forestry and Fire Protection	<ul style="list-style-type: none"> <li>▪ <a href="#">Cal Fire Grant Program</a></li> </ul>
California Department of Water Resources	<ul style="list-style-type: none"> <li>▪ <a href="#">Integrated Regional Water Management Grant Programs</a></li> </ul>
California Governor’s Office of Emergency Services	<ul style="list-style-type: none"> <li>▪ <a href="#">Regional Catastrophic Preparedness Grant Program</a></li> </ul>
California State Water Resources Control Board	<ul style="list-style-type: none"> <li>▪ <a href="#">Storm Water Grant Program – Proposition 1</a></li> </ul>
Hawaii Department of Land and Natural Resources’ Division of Forestry and Wildlife	<ul style="list-style-type: none"> <li>▪ <a href="#">Fire Management Program</a></li> </ul>

**An important reminder:** If you are applying for federal funding via a state-managed program, published due dates may vary. Look for additional directions on how to apply and due dates published by the state office.

The following is a list of example programs across the United States. Explore your state for similar opportunities. Your state hazard mitigation office can be a helpful resource here. If needed, you can find a list of active state hazard mitigation officers at <https://www.fema.gov/state-hazard-mitigation-officers>.

### EXAMPLE PROGRAMS

STATE	DEPARTMENT/AGENCY RESPONSIBLE	PROGRAM NAME	FUNDING SOURCE
Alabama	Alabama Department of Insurance	<a href="#">SAH Program</a>	Insurance industry in Alabama
Oregon	Business Oregon	<a href="#">Seismic Rehabilitation Grant Program</a>	State bonds
Florida	Florida’s Division of Emergency Management	<a href="#">Hurricane Loss Mitigation Program</a>	Florida Hurricane Catastrophe Fund (tax-exempt state trust fund)
Florida	Florida Housing Finance Corporation	<a href="#">State Housing Initiatives Partnership</a>	Federally funded
Maryland	Fredrick County Office of Sustainability and Environmental Resources	<a href="#">Power Saver Retrofits Program</a>	Maryland Strategic Energy Investment Fund (Maryland Energy Administration)
Nebraska	Nebraska Department of Environment and Energy	<a href="#">Nebraska Weatherization Assistance Program</a>	Federally funded
New Hampshire	New Hampshire Office of Strategic Initiatives	<a href="#">Weatherization Assistance Program</a>	Federally funded (U.S. Department of Energy and the U.S. Department of Health and Human Services)
Utah	Salt Lake City Emergency Management	<a href="#">Fix the Bricks Program</a>	Federally funded (pre-disaster mitigation grant)
South Carolina	South Carolina Department of Insurance	<a href="#">South Carolina Safe Home Program</a>	Grant funds raised via premium taxes on wind insurance

## Evaluate Options

Which requirements match your program? Use the following checklist below to help evaluate funding options.

### FUNDING EVALUATION CHECKLIST

- Eligibility requirements
- Type of funding: grant, loan, reimbursement, seed money for revolving loan etc.
- Grant cycle/timing
  - When are applications due? Are you supposed to submit a Notice of Interest in advance and, if so, when are those due?
  - Time between application and award?
  - How soon might funds be allocated?
  - Is it a recurring opportunity? How many times can you apply?
- Period of performance
  - What work can be completed before award?
  - How long do you have to do the work?
  - Does your time allotment shrink if the funding source is late dispersing the funds?
- Match requirements
  - Is a match required? If so, how much?
  - What types of in-kind matches are allowed?
- Environmental and Historic Preservation requirements
  - Local, state, federal level
- Design and engineering
  - Level of design and engineering needed to apply, or funded by the project
- Funding limits
  - Costs covered/not covered
- Benefit cost requirements
- Customer service track record of funding source
- Contact list(s) you can join

*Remember: If you are applying for federal funding via a state-managed program, published due dates may vary. Look for additional directions on how to apply and due dates published by the state office.*

## Fully Understand Processes and Timelines

Which timelines and commitments best fit your team and program capacity? The following FEMA resources can be beneficial to understand what may be required of you for certain grants, especially those from FEMA.

- ICC Coverage, FEMA. <https://www.fema.gov/increased-cost-compliance-coverage>.
- BCA, FEMA. <https://www.fema.gov/benefit-cost-analysis>.
- Environmental and Historic Preservation, FEMA. <https://www.fema.gov/environmental-and-historicpreservation>.

## B.4. Design the Program

### Establish the Program’s Main Goals

What do you want to accomplish and when? When determining program goals, avoid unintentionally creating additional barriers that exclude or marginalize community members who already have fewer resources and assistance available.

When setting goals, consider the SMART guidelines. SMART is an acronym used to identify the characteristics of good objectives. SMART objectives identify who should do what, under what conditions, and according to which standards. SMART objectives are specific, measurable, achievable, relevant and time bound.

SMART Guidelines	
<b>Specific</b>	Objectives should address the five Ws: who, what, when, where and why. Objectives should specify what needs to be done, with a timeline for completion.
<b>Measurable</b>	Objectives should include numeric or descriptive measures that define quantity, quality, cost, etc. Their focus should be on observable actions and outcomes.
<b>Achievable</b>	Objectives should be within the control, influence and resources of exercise play and participant actions.
<b>Relevant</b>	Objectives should be instrumental to the mission of the organization and link to its goals or strategic intent.
<b>Time Bound</b>	A specified and reasonable time frame should be incorporated into all objectives.

Here are some examples of successful programs that demonstrate how tailored goals benefit a retrofit program:

- An example of designing a program according to a source of funding with stringent parameters: The [California Office of Emergency Services](#) worked with cities and communities to design their programs according to FEMA (funder) regulations (using Hazard Mitigation Assistance guidance to ensure that the goals of the community were addressed). For instance, retrofit homes that were recently burned in a wildfire were eligible for funding through the federal program.
- An example of designing a program according to prioritizing buildings in a particular hazard zone: [Thurston County, Washington](#) – the program addresses flooded properties and homes that have been repeatedly damaged by floods. The bounds of the project are within an area called the SFHA, the area having a 1% chance of occurrence in any one year. The program used the flood zone boundaries for the project area to prioritize structures for retrofitting. *See Appendix A for more information on Thurston County.*

- An example of designing a program according to building type: [Sacramento County, California](#), developed a program focused on a specific development where a multi-unit condo experienced repeated flooding. Of the 725 units, the program worked to elevate 90 units (17 two-story buildings) that had flooded four times in the past.

## Establish Retrofit Construction Standards

What standard is required to achieve the desired level of safety? How will you create clear guidelines and designs that can be evaluated?

The following resources offer more information on retrofitting methods for homeowners. For more technical guides, refer to the resources listed under Section B.2.

- FEMA P-312, “Homeowner's Guide to Retrofitting.” 3rd Edition (2014).  
[https://www.fema.gov/sites/default/files/2020-07/fema\\_homeowners-guide-to-retrofitting\\_guide.pdf](https://www.fema.gov/sites/default/files/2020-07/fema_homeowners-guide-to-retrofitting_guide.pdf).
- “Homeowner’s Handbook to Prepare for Natural Hazards,” University of Hawaii’s Sea Grant Program.  
<https://seagrant.soest.hawaii.edu/wp-content/uploads/2019/12/Hawaii-Homeowners-Handbook-Fourth-Ed.-final1.pdf>.

## Design an Ordinance

Will the ordinance be mandatory or voluntary, and how will you apply it? It is critical when developing an ordinance to ensure that the design of the ordinance does not unintentionally impact marginalized community members or groups. To find ideas on construction standards and ordinances, review the following examples:

- **Portland Seismic Design Requirements:** <https://www.portlandoregon.gov/citycode/28673>.
- **Santa Monica Seismic Retrofit Ordinance:**  
<https://www.smgov.net/uploadedFiles/Departments/PCD/Programs/Seismic-Retrofit/Ordinance%202537.pdf>.

The case studies used in this toolkit can also serve as good examples. More information on the following programs can be found in Appendix A.

- **City of Hayward, California: *Screening Versus Mandating*** – In the early 1990s, the city passed mandatory retrofit ordinances for unreinforced masonry and non-ductile buildings. The program mandated that commercial buildings be retrofitted, which was completed by the private building owners. But as times changed, the focus was put on soft-story retrofits due to the risk posed to residents. At this time, the city needed to better understand the elements of a soft-story program. So, they performed a sidewalk survey with the Earthquake Engineering Research Institute and the Association of Bay Area Governments to implement soft-story programs. With this program, the focus was on getting buildings screened for seismic vulnerability as opposed to mandating that the retrofit take place. However, the retrofit program was delayed due to political concerns about housing costs. See *Appendix A.3. for more information on the city of Hayward*.
- **Pompano Beach, Florida: *Voluntary Retrofit - Newer Codes and Older Buildings*** – This program tried to retrofit older buildings, but those buildings did not meet up-to-date building codes. For example, a new window could not be placed in an old window frame because window codes required a different size for the frame. Know these sorts of barriers before designing the ordinance. See *Appendix A.6. for more information on the city of Pompano Beach*.



## Define Program Roles and Responsibilities

What are the functions of each department, staff member and private-sector counterpart?

### Example of strategic department ownership

**St. Lucie County, Florida: Designate a Host Department** – In a community located on Florida’s Atlantic Coast, St. Lucie County’s Housing Division is a strong example of how a local jurisdiction implements the state’s HLMP with limited resources. In addition to the HLMP, which offers funds and manages the construction of wind retrofits on residential homes, the Division’s small staff of just three people manage grants from the HUD HOME Program and the CDBG Housing Rehabilitation Program, as well as the state of Florida’s SHIP Program. This familiarity with housing programs has allowed the Division to be particularly successful in residential hazard retrofits. Low turnover of experienced staff has been essential to the program’s success. The same division manager, construction specialist and financial specialist have worked together for the past seven years. Diversifying their tasks by skillset, they execute everything from grants management, to construction management, to environmental reviews. Their work results in real benefits to county residents. The local housing stock has improved, disasters prove less damaging, and homeowners receive significant annual deductions on their homeowner’s insurance. See Appendix A.6. for more information on Florida’s HLMP.

## Design an Outreach/Recruitment Program

How will you motivate people to participate? Using specific values, characteristics or geography to target your outreach messaging and tactics can produce more successful outcomes.

The following is pulled from the EPA’s “Regional Resilience Toolkit – 5 Steps to Build Large Scale Resilience to Natural Disasters” ([https://www.epa.gov/sites/production/files/2019-07/documents/regional\\_resilience\\_toolkit.pdf](https://www.epa.gov/sites/production/files/2019-07/documents/regional_resilience_toolkit.pdf)), and serves as a great outline for an engagement and outreach plan.

Providing timely information and multiple touchpoints with customers can increase their likelihood of following through with the program. Remember to make the program easy, attractive, social and timely to encourage participation and action. Refer to Appendix C.5. to guide you.

### Example of successful outreach

**Sacramento County, California:** To address a major flooding issue in a multi-unit condo system, [the county](#) held a town hall meeting with specific homeowners to discuss and remind them of their flood risk and what they can do to mitigate. The meeting with the owners of the 90 floodprone units (the subject of an HMGP FEMA grant) was a success and ultimately led to major buy-in favoring the retrofit program. The homeowners association requires a majority vote to provide funds to add to what the county was able to get from other sources. Their association contribution will raise about \$4.2 million, the county will provide \$1 million, and the grant will fund \$6.8 million.

### Sample Outline for an Engagement and Outreach Plan

1. Overview
2. Outreach and Engagement Goals and Outcomes
3. Target Audiences
  - Community-wide.
  - Targeted stakeholders, including decision makers, underrepresented groups and special interest groups.
4. Key Messages and Benefits by Audience
5. Outreach Tools and Materials
  - Communications and education.
  - Workshops and meetings: Meeting type, frequency and format.
6. Strategies and Tactics
  - Print.
  - Online.
  - In-person.
7. Implementation and Tracking

## Design the Application Process

How will people apply, and how will you select participants? Think about how eligibility will be assessed and consider touchpoints, timing, selection, application delivery, information required, languages, contact information and questions.

### Example applications and application processes

California's Earthquake Brace + Bolt program encourages homeowners living in program ZIP Codes (as owner-occupied residents) to register online or request a paper application over the phone during the 30-day open registration period. When registration is closed, the program's website allows interested individuals to sign up for Brace + Bolt Program news. The application collects information, known as "Qualified Questions," which is considered extremely important to identify eligible applicants and homes that qualify for the specific type of retrofit EBB allows under California Building Code, Chapter A3. Learn more at: <https://www.earthquakebracebolt.com/content/RegisteringforEBB>.

See *Appendix A.3. for more information on California's Earthquake Brace + Bolt Program.*

Salt Lake City Emergency Management's Fix the Bricks program is funded through FEMA's Pre-Disaster Mitigation Grant program. To identify homes for retrofits, the program hosts an online registration during open enrollment grant periods. The team then goes through applications on the waitlist based on the order they were received. To get on the waiting list, interested parties must complete the registration form here: <https://slc-gov.force.com/slccrm/s/Request?rt=a0F5G00000KpByFUAV&category=Safety>.

## Design a Process for Monitoring, Evaluation and Iteration

How will you measure success and refine program processes?

**City of Berkeley, California:** Upon receiving HMGP funding from FEMA, the [city of Berkeley](#) had hundreds of buildings that needed to be retrofitted. However, as with the expenditure of any federal funds, FEMA's grant required that every building go through the Environmental and Historic Preservation Review process. This can be a lengthy process and the additional time should be considered to keep everything on track. To expedite the review and maintain building owner involvement, FEMA implemented a strategy that the city of Oakland had developed, and worked with the city of Berkeley to identify a Secretary of the Interior-qualified architectural historian within city staff—already reviewing the structures for local regulations and permitting—in order to streamline the review required under Section 106 of the National Historic Preservation Act. By working with the State Historic Preservation Officer, FEMA reached an agreement that allowed the city's architectural historian to act as a first-line reviewer to expedite the reviews and also preserve locally significant buildings in Berkeley.

## B.5. Prepare

### Pass the Ordinance

How will you gather support from key stakeholders? What communication tools and/or events can you use to reach potential participants?

The following resource provides both procedural and practice-oriented tips to help cities write and implement an ordinance.

- Ordinances and Regulations: Practice Tips for Effective Legislation, The League of California Cities. <https://www.cacities.org/getattachment/530f101f-f778-47cf-8995-3fca3e8ba129/LR-Foley.aspx>.

## **B.6. Implement**

### **Monitor, Evaluate, Respond and Adapt**

What is working? What can you simplify or update?

Resources and templates for program monitoring can be found here:

<https://www.slideteam.net/monitoring-plan-ppt-infographics-example-introduction.html>.

The Center for Disease Control and Prevention, while for public health purposes, has an effective guide for program evaluation: <https://www.cdc.gov/eval/framework/index.htm>.

# APPENDIX C: BEHAVIORAL SCIENCE WORKSHEETS AND RESOURCES

Encourage action and participation by employing behavioral science tools and techniques in your program planning and implementation efforts. Appendix C contains behavioral science tools and insights to design an equitable and effective building retrofit program to support disaster resiliency in your community.

## C.1. How Well Do You Know Your Community?

When considering you community members' participation, here is a simple behavioral model that can be used to diagnose potential barriers. In order for any behavior to occur, consider the following question: Do community members have the Capability, Motivation and Opportunity to do what is being asked of them?

**Capability**  
Do they understand?

- Will they understand what is being asked?
- Do the community members know about their risk?
- Do they have all the necessary information?
- Will they need assistance to apply?
- Can they physically do what is being asked?

**Motivation**  
Are they motivated?





- What will their emotional response be to this program?
- What is their degree of desire for something like this?
- Will it feel personally relevant to them?
- Do they have any pre-existing beliefs or opinions that could act as a barrier?
- Are they adverse to government assistance?
- Are they relationship-oriented?

**Opportunity**  
Do they have the means?

- Is this something they can afford?
- How will this program benefit them financially?
- Do they have the time to implement the program?
- Is there a norm of others also doing this?
- Will they be able to pay for the project up front?

## C.2. Tailoring Your Message to Community Members

The table below showcases different responses to risk conversations to people with different worldviews. It highlights the importance of understanding your audience’s values so that you can appeal to their particular proclivities.

MESSAGING FRAMEWORK FOR RESPONSES TO KEY CHALLENGES BY ARCHETYPE				
	 Hierarchical Individualist	 Hierarchical Communitarian	 Egalitarian Individualist	 Egalitarian Communitarian
<b>MOTTO*</b>	“PERSONAL AMBITION IS A VIRTUE, NOT A VICE”	“NEEDS OF MANY OUTWEIGH NEEDS OF FEW”	“LIVE FREE OR DIE”	“ONE FOR ALL, AND ALL FOR ONE”
<b>VALUES</b>	<ul style="list-style-type: none"> <li>Believes in strong leaders and a clear social pecking order</li> <li>Focuses on personal freedom within a traditional social structure</li> <li>Supports unrestricted opportunities to compete and pursue individual interests</li> <li>Respects tradition and law and order</li> </ul>	<ul style="list-style-type: none"> <li>Believes in strong community values in a traditional social structure</li> <li>Supports efforts that place group interests above the needs and priorities of individuals</li> </ul>	<ul style="list-style-type: none"> <li>Believes in freedom and individual rights for everyone, regardless of context</li> <li>Supports unrestricted opportunities for individuals to compete as desired</li> <li>Focuses on equal opportunity, but not necessarily equal outcome</li> </ul>	<ul style="list-style-type: none"> <li>Believes community stewardship is the most important</li> <li>Are open to change more than keeping things the same</li> <li>Focus on protecting and lifting those left behind</li> <li>Support equal access and participation for everyone regardless of class, gender, race, age, or other context</li> </ul>
<b>RISK</b>	<ul style="list-style-type: none"> <li>Destabilization of traditional social and family structures</li> <li>Outsider interference and externally imposed restrictions</li> </ul>	<ul style="list-style-type: none"> <li>Policies that threaten traditional family or social hierarchies</li> <li>Individual behaviors that undermine the strength of a community</li> </ul>	<ul style="list-style-type: none"> <li>Government oversight and patriarchal social conventions</li> <li>Intrusions or restrictions on personal freedoms</li> </ul>	<ul style="list-style-type: none"> <li>Restrictions or participation on access for certain populations</li> <li>Conventions that reinforce social inequities or undermine community</li> </ul>

## C.3. Establishing Effective Working Relationships

When beginning a working relationship with a funder, or any professional contact, don’t leave your humanity at the door.

### Objective: Establish a Personal Relationship – Not a Transactional Relationship

- A personal relationship is far more collaborative and will prove more resilient in the long-term, which can benefit the both of you and make a mutually successful relationship.
- A personal relationship is built out of desire, mutual interest and conflict resolution, which makes them far more likely to resolve any barriers encountered. A transactional relationship is built out of necessity and self-interest, and is likely to falter at possible barriers.

### Behavioral Principles to Grow Personal Relationships

- Find Shared Goals – People are naturally “goal-oriented” and are motivated to achieve the goals that are set for them.
  - Establish the relationship around mutually achieving the desired goal (i.e. effective success of the retrofit program). This means the relationship will withstand barriers, as the both of you are focused on the goal, and not the problem.  
For example: “Your participation is key so that you and I can work together to protect these homes and communities.”
  - Give your contact regular progress updates on the program, whether it is successes or barriers, to show them you are both progressing toward the mutual goal.
- Have Operational Transparency – Being able to see the operations behind a service or process increases value and trust.

- Be as honest, truthful and open about the process as possible so that your contacts have full knowledge of any progress or issues.
  - This will establish significant trust and remove any sense of ambiguity for your contacts.
  - Tell them upfront what kind of problems you could expect to encounter ahead of time so that they are prepared.
3. Make Them Feel Valued – *We often act in ways that make us feel good about ourselves.*
- Ask for your contact’s advice and guidance on problems and be sure to listen to them - increasing their trust will make them more receptive to your relationship.
  - Use the power of “because” – when asking for advice, explain why that contact in particular is a great fit for the task. We feel good about ourselves when someone seeks our help and it makes us more responsive and invested in helping them in the future.
- “I’d really love to get your advice because you are an insightful/helpful person.”*
- “...because you have a keen eye for solutions.”*
- “...because you seem to care as much about protecting these communities as I do.”*
4. Be Personal – *Don’t forget the basics.*
- Smile often, use their name, use “we” rather than “I.”
  - Communicate with them on the phone or in person rather than email or text.

## C.4. Behavior Change Techniques

In addition to planning incentives, there are also behavior change techniques that can be applied to create significant psychological incentives, which can be more effective in motivating owners to take action:

1. Use Defaults – *We tend to go with options that are pre-selected for us.*
  - Frame the plan as automatically enrolling owners onto the ordinance and ask owners if they want to opt out of the incentives they will receive.
2. Use Loss Aversion – *The feeling of loss is twice as impactful as the feeling of gaining something.*
  - Instead of telling owners what they could gain through planning incentives, tell owners what they could stand to lose if they do not retrofit their property.
  - Communicate clearly what the potential implications might be for their building.
3. Use Scarcity – *We believe that scarce resources have a much higher value.*
  - To create a sense of scarcity, show the incentive as time bound and highly sought after by others.
4. Appeal to Their Self-Image – *We have a powerful desire to maintain a positive self-image, especially in the eyes of others.*
  - Frame the decision to retrofit their building as something that will positively increase their self-image. Owners may want to be seen as caring/protective/smart, and may not want to be seen as risk-taking/negligent/uncaring.
5. Idiosyncratic Fit – *We have a higher likelihood of joining programs when we believe we are a good fit.*
  - Make owners feel as if they, or their buildings, are a perfect fit for the program, therefore qualifying them for the incentives that come with voluntary retrofitting.
  - This effect can be increased by telling owners why they are a better fit for the program than other building owners.
6. Social Norms – *We are heavily influenced by the behavior of others.*
  - Where possible, show owners that they are in the minority by not taking part in the program.

- When they are not in the minority, indicate the number of like-minded people that are taking part in the program.

## C.5. The E.A.S.T. Framework

Use this framework when designing an outreach program. This framework applies four principles of behavior that can encourage an audience to take action:

1. Make it EASY – People prefer tasks that are easy to achieve.
2. Make it ATTRACTIVE – You need to capture attention and incentivize people’s behavior.
3. Make it SOCIAL – Showing the behavior of others influences people to act in a similar way.
4. Make it TIMELY – The timing of information can be critical to responsiveness.

### 1. How to make it EASY

- Use Cognitive Ease - *We have a preference for tasks that are easier and understandable.*
  - Make the program feel as easy to take part in as your possibly can. Start with one small or simple behavior for people to focus on achieving: *“All you have to do right now is this...”*
  - Break the whole process into small steps or chunks - Step 1. Step 2. Step 3.
  - When talking to people, focus mainly on what is required of them to increase simplicity.
- Make It the Default – *We tend to go with the flow of pre-set options, as it is easier to do.*
  - Making a behavior feel like the default increases its adoption. Tell the community that they have already qualified for the program and its incentives, and it is their decision to opt-out.
- Use Concrete Language – *We understand concrete words far easier than abstract concepts. Concrete words are generally defined as nouns that refer to physical or observable objects in the world. Tip: If you can draw it, then it is a concrete word!*
  - Simplify your message into language that someone with no prior knowledge about flood risk or retrofitting would understand.
  - Use concrete terms to describe the implications, or the benefits, of not acting. *“You would be protecting you homes, your families and your hard-earned money against flooding.”*
  - Use relevant terms – refer to the local neighborhoods and streets that could be damaged or protected.

### 2. How to make it ATTRACTIVE

- Give the Program a Name (Sapir-Whorf Hypothesis) – *Language defines how we interpret information and how we behave accordingly.*
  - Give a name to the program that people within communities will understand and, more importantly, want to take part in.
  - Rather than describing it as retrofitting, use language such as: “Home Disaster Protection,” “Safety Shield,” or “Flood-Guarding.”
- Use Scarcity – *We believe that resources that are in high demand, or limited in time or quantity, have a much higher value.*
  - Making your program feel like a scarce opportunity will increase its value to people and motivate them to take part. To create a sense of scarcity, you can show the incentive is time bound and highly sought after by others.
- Use Loss Aversion – *The feeling of loss is twice as impactful as the feeling as gaining something.*
  - Instead of telling communities what they can gain from retrofitting, tell them what they can lose if they don’t. People are highly motivated to avoid losses, and this is a simple way to use language to inspire action.
  - Communicate clearly what the potential implications might be for their properties and local neighborhoods.
- Appeal to Their Locus of Control – *This is the degree to which we believe we have control over our lives.*

- Frame participation in the program as a way for people to take control over their lives or potential disasters.

### 3. How to make it **SOCIAL**

- Make It a Social Norm – *We are heavily influenced by the actions of others.*
  - Communicating how many others are behaving in a certain way increases our likelihood to also perform an action.
  - Let them know they are in the minority and that the majority of communities take part in the program.
  - If they are not in the minority, then communicate the total number of people that have signed up.
  - Iterate how many other similar, like-minded communities have taken part.
- Appeal to Their Social Identity – *We act favorably toward, and are more receptive to, people we believe belong to similar social groups.*
  - Our lives are made up of social groups with others, based on our characteristics, traits, or likes and dislikes. Being a mother, being a local community member, being a homeowner, or being an Eagles fan are all examples of social groups.
  - Appeal to people using an identity they can relate to – *instead of introducing yourself as a FEMA representative, introduce yourself as a concerned homeowner.*

### 4. How to make it **TIMELY**

Consider when people are most likely to be receptive to your message – is there recent relevant news on severe weather conditions? Prompting people at the most relevant time is effective in motivating action.

- Use the Fresh Start Effect - *We are more likely to take action toward a goal after temporal landmarks because they feel like a fresh start.*
  - Speaking to communities at the start of a week, month or year can make people more open-minded and receptive to your proposals.
- Remember That People Are Present Biased – *We put greater focus on short-term costs than long-term gains.*
  - People find it hard to consider the value of long-term investments and often place a greater weight on the short-term costs.
  - You can work around this by giving more immediate benefits or figuring out a phased payment approach.





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