



BEST PRACTICE GUIDE TO LOCAL GOVERNMENT DISASTER PLANNING

**OUR RESILIENT
HERITAGE** ★ ≡
2022-2032
**TEXAS STATEWIDE
HISTORIC PRESERVATION PLAN**

TEXAS
HISTORICAL
COMMISSION 
REAL PLACES TELLING REAL STORIES

MAY 2023

ACKNOWLEDGMENTS

GOVERNOR GREG ABBOTT

TEXAS HISTORICAL COMMISSION

- John L. Nau, III, Chair
- Catherine McKnight, Vice Chair
- Garrett Donnelly, Secretary
- Donna Bahorich
- Earl Broussard
- Jim Bruseth
- Monica Zárate Burdette
- John W. Crain
- Renee Dutia
- Lilia Garcia
- David Gravelle
- Laurie Limbacher
- Tom Perini
- Gilbert E. Peterson
- Daisy Sloan White
- Mark L. Wolfe, Executive Director

PLANNING TEAM AND CONTRIBUTORS

The Lakota Group, Chicago, Illinois

Blanton & Associates, Inc., Austin, Texas

SWCA Environmental Consultants,
San Antonio, Texas

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The 2022-2032 Texas Statewide Historic Preservation Plan included the creation of several related publications: the *Statewide Assessment of Disaster-Related Threats and Recommendations*; the *Best Practice Guide to Local Government Planning*, and the *Historic Property Owners' Handbook*. These documents are posted on the THC website: [Texas Historical Commission](https://www.thc.texas.gov/)

BASTROP COMPLEX FIRE OF 2011, PHOTO COURTESY OF MARK WINSLETT



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ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation	NTHP	National Trust for Historic Preservation
CDBG	Community Development Block Grant	OTHM	Official Texas Historical Marker
CHC	County Historical Commission	RTHL	Recorded Texas Historic Landmark
ESHFP	Emergency Supplemental Historic Preservation Fund	SAL	State Antiquities Landmark
CLG	Certified Local Government	SHPO	State Historic Preservation Office
DOE	Determination of Eligibility	TARL	Texas Archeological Research Laboratory
FEMA	Federal Emergency Management Agency	TAMU	Texas A&M University
GIS	Geographic Information System	TCP	Traditional Cultural Places
HABS	Historic American Building Survey	TDA	Texas Department of Agriculture
HAER	Historic American Engineering Record	TDEM	Texas Division of Emergency Management
HPF	Historic Preservation Fund	THC	Texas Historical Commission
HTC	Historic Texas Cemetery	THPO	Tribal Historic Preservation Office
HUD	U.S. Department of Housing and Urban Development	THSA	Texas Historic Sites Atlas
NOAA	National Oceanic and Atmospheric Administration	TMSP	Texas Main Street Program
NHL	National Historic Landmark	TPTF	Texas Preservation Trust Fund
NPS	National Park Service	TPWD	Texas Parks and Wildlife Department
NRI	National Risk Index	TSTC	Texas State Technical College
NRHP	National Register of Historic Places	TSU	Texas State University
		TxDOT	Texas Department of Transportation
		USDA	U.S. Department of Agriculture
		WMA	Wildlife Management Area



HOUSTON HIGHWAY FLOODING DURING HURRICANE HARVEY



HANDBOOK PURPOSE

This is a companion document to *Our Resilient Heritage—2022-2032 Texas Statewide Historic Preservation Plan* and its accompanying *Statewide Assessment of Disaster-Related Threats and Recommendations*. The latter report provides much more detail on how to identify disaster risk to historic properties. This handbook is a simplified supplement that provides key information to local government planners of all experience levels for easy access when preparing for future or imminent disasters. While there are many types of historic properties, this document focuses primarily on buildings as they are the most common type that local agencies administer and protect.

The handbook briefly explains the definition of a historic property, noting that there is a difference in local government responsibilities between those that are owned by the jurisdiction and those that are privately owned but have local government oversight through zoning, landmark designation, and other local ordinances. It also supplies some best management suggestions for administering known historic properties and identifying new ones within your area of operations.

The handbook then describes how to identify the disaster risks that are most likely to be encountered in your area, using the Federal Emergency Management Agency’s National Risk Index and local history as reference points along with factors at the individual property level that should be considered. This document also presents disaster preparation suggestions for both long-term planning and where imminent disaster threats may be present.

The list of additional sources and links in the handbook’s final section offer government planners extended aid in their preparedness process.



HISTORIC PROPERTIES- AN OVERVIEW

The term “historic properties” has a particular meaning in preservation planning, in which it refers to the formal recognition of buildings, structures, objects, cemeteries, landscapes, and archeological sites (individually or in groups known as districts) at the federal, state, or local levels as being historically, architecturally, or culturally significant. State and local-level designations often come with legal protections to protect against a property’s inappropriate alteration or demolition.

SOME OF THE PRIMARY FACTORS THAT MAKE A PROPERTY ELIGIBLE AS HISTORIC INCLUDE:

AGE

Must normally be at least 50 years old

SIGNIFICANCE

Associated with a definable historic event, person, or trend, represents distinctive architecture or design, or has the potential to yield valuable archeological information.

INTEGRITY

Must retain the most important architectural features from its period of significance.

Local governments can manage historic properties in two ways. Properties may be directly owned and administered by the jurisdiction which is responsible for maintenance and insurance and for conducting demolition or renovation actions that conform to the applicable regulations. Examples of public properties that can be considered for historic property designation if they meet the criteria include:



Town/County Halls



Multi-Family Residences



Police Stations/
Fire Halls



Agency Buildings



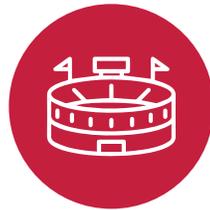
Schools/
Libraries



Public Housing



Convention/Conference/
Community Centers



Stadiums and
Cultural Centers



Public Pools and
Recreation Centers



Public Hospitals



Train/Bus
Stations



Bridges



Public Parks



Monuments



Public Cemeteries



Historic property designation is not limited to pristine buildings designed by renowned architects or in a recognized architectural style. Preservation benefits can also come by designating districts for “working class” neighborhoods built during an important period of a town’s development, groupings of rural agricultural buildings that once were an economic focal point, or public gardens that have been enjoyed for decades.

Another way that local governments administer historic properties is through zoning and ordinances that regulate privately-owned building demolition, construction, and rehabilitation projects in designated areas known as landmarks and districts. Residential and commercial historic districts are most common, though some jurisdictions may also oversee archeological sites or conservation districts.

Benefits and Responsibilities of Registering a Historic Property: Developing procedures to identify and manage historic properties can bring a number of benefits to local governments and town residents. Some are:

- ❑ Specific to disaster preparation, identifying historic properties in a community before a disaster allows these properties to be assessed in local hazard mitigation plans and to be potentially eligible for increased state and federal funds if they are damaged.
- ❑ Many Texans have a strong attachment to the way their town, city, or county developed historically. Each community's story is unique and preserving their historic properties can help current and future residents retain local identity and historical connections.
- ❑ Public buildings such as town halls, courthouses, and post offices often served as community focal points and are normally amongst Texas' oldest properties. Once a property is landmarked or registered, the owner of a public building may wish to install a plaque or interpretive marker to educate residents and visitors on the community's history. In other cases, owners of Recorded Texas Historic Landmarks (RTKLs) must purchase and display a marker as part of the designation process.
- ❑ When owners help register and administer their privately owned commercial or residential buildings as landmarks and historic districts, they can often feel a sense of pride.
- ❑ Many registered historic properties are eligible for financial incentives for preservation and rehabilitation projects. This includes federal and state historic preservation tax credits and a sales tax exemption on labor¹.

Owning or administering historic properties also comes with responsibilities. Some are:

- ❑ Jurisdictions that own historic properties must dedicate resources to maintain their properties and may be required to obtain additional state-level permits before embarking on rehabilitation or demolition (discussed below).
- ❑ Any work performed on a registered historic property must not significantly alter the property's main character-defining architectural or design features. That can require, using guidelines developed by the local community or a resource such as *The Secretary of the Interior's Standards for the Treatment of Historic Properties*.
- ❑ Local jurisdictions with historic property and district designation procedures must also develop building codes, permit processes, and ordinances that ensure owners manage their historic properties appropriately

¹ For additional information on federal and state historic preservation tax credit programs, see the following websites: [Texas Historical Commission: About Preservation Tax Incentives](#); [Federal Rehabilitation Tax Credit Program](#).

While thousands of historic properties have been recognized in Texas, there are many others that are eligible but have not yet been designated because communities often do not have sufficient resources or knowledge of the process. See the final section in the handbook for helpful information. Property owners may list historic properties in the National Register of Historic Places at the federal level or apply for designation as historic landmarks at the state and local levels. Applying for federal or state historic designation is voluntary.

Federal Definition of Historic Property: The National Park Service (NPS) is the federal agency responsible for national historic preservation programs, including the National Register of Historic Places (NRHP), heritage documentation programs such as the Historic American Buildings Survey and Historic American Engineering Record, and Historic Preservation Fund money that is distributed through the State Historic Preservation Office at the Texas Historical Commission (THC). The NRHP was created in 1966 with the passage of the National Historic Preservation Act, which established that sites, districts, buildings, structures, and objects that are at least 50 years old can be listed in the NRHP if they meet at least one of the following criteria:

- A. are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. are associated with the lives of persons significant in our past; or
- C. embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. have yielded, or may be likely to yield, information important in prehistory or history.

In addition to having significance in one of the above categories, to be NRHP-eligible a property must also retain historic integrity. There are seven aspects of integrity: location, setting, association, design, materials, workmanship, and feeling. A property does not need to retain all seven aspects but must retain enough to convey its significance. The aspects of integrity most important for conveying its significance will depend on applicable significance criteria. The NPS has numerous bulletins available online about applying the NRHP criteria and assessing integrity.² The THC also has resources available to help you nominate a property to the NRHP.³

State Historic Property Recognition: The State of Texas does not have a specific regulatory definition of historic property in the same manner as the National Historic Preservation Act. State agencies such as the THC and the Texas Department of Transportation (TxDOT) generally follow their guidelines and the THC uses other internal processes to recognize important Texas historic resources, even if they have not been recognized or assessed for eligibility for listing in the NRHP. Several types of state designations for historic properties exist.

² [National Park Service: Publications of the National Register of Historic Places](#)

³ [Texas Historical Commission: National Register of Historic Places](#)

The Antiquities Code of Texas and State Antiquities Landmarks (SALs) are exceptional local and state historic properties recognized through the Antiquities Code of Texas (ACT), enacted in 1969.⁴ The ACT, administered by the THC, concerns resources located on non-federal lands. Its purpose is to identify and manage important public historic properties, including archeological sites, for current and future generations of Texans. All political subdivisions of the state, which include cities, counties, municipal utility districts, river authorities, universities, and school districts must follow the requirements of the ACT.

The Antiquities Code contains provisions to designate State Antiquities Landmarks (SALs). A district, building, structure, object, or archeological site designated a SAL receives the highest legal protection under Texas law with proposed alterations or demolition to SALs subject to review and permitting by the THC at least 60 days before any work commences. In addition, when proposed work (demolition, rehabilitation, or ground disturbance) will affect a SAL-designated public building or publicly owned lands impacting five or more acres, or involve 5,000 or more cubic yards of earth moving, the local agency must submit an application to the THC for an antiquities permit at least 60 days before any work commences.⁵ The THC will evaluate the proposed activities, determine if a permit is needed, and if so, help guide the agency through the process. Historic buildings and other aboveground historic resources must be listed in the NRHP before they can be designated as SALs, but archeological sites do not have the same prerequisite.

Public agencies (as well as private community organizations and individuals) may submit a historic property that meets the criteria for official SAL designation. Upon receipt of a complete nomination, the THC determines if the property is eligible for designation and schedules the nomination for consideration at one of the commission's public meetings. Nominations are first considered by the Antiquities Advisory Board, which makes recommendations to the THC. The Commission allows a comment period prior to a final designation vote at their next scheduled meeting. The criteria for evaluation and the designation process are explained in greater detail in the Rules of Practice and Procedure for the Antiquities Code of Texas (Texas Administrative Code, Title 13, Chapter 26).⁶ It is important for local government planners to become familiar with this regulation as it will apply to any public buildings and lands that meet the criteria.

Recorded Texas Historic Landmarks (RTHLs) are buildings and structures at least 50 years old that are recognized by the state as being historically and architecturally significant under Texas Government Code Chapter 442, Section 442.006 (f). Nearly 4,000 properties have received this honor to date. Both private and public buildings can be nominated for RTHL designation; if privately owned, the owner must agree to its listing. The THC has review authority on the building's exterior or structure and the property owners must display a RTHL marker.

4 [Texas Antiquities Code](#)

5 [Texas Historical Commission: State Antiquities Landmarks forms](#)

6 [Texas Administrative Code, Title 13, Part 2, Chapter 26.](#)

Purchasing and publicly displaying a RTHL marker is a required component of the designation process. Properties designated as RTHLs are expected to retain their exterior historical features and integrity. Alterations and exterior changes to an RTHL cannot occur without first notifying the THC at least 60 days beforehand and allowing the agency to review the proposed project actions and provide its comments. If alterations are performed that are deemed inappropriate, a property can lose its RTHL designation. Nominations for RTHLs are generally accepted in the spring and are first made by contacting the local County Historical Commission.⁷ The THC has developed a brochure that details the benefits of recording a property as an RTHL and how to nominate it.⁸

Official Texas Historical Markers (OTHM)s are found in all 254 Texas counties and recognize a wide variety of individual historic properties as well as important Texas community events, people, organizations, military sites, and cemeteries. These markers are educational in purpose and number over 13,000, making the program one of the most visible to residents around the state. While the markers themselves do not automatically assign legally protected historic property status, those associated with individual buildings and structures often can receive that status. Like RTHLs, applications to erect an OTHM are first made through the local County Historical Commission.

Cemetery Preservation Program: The THC estimates that there are 50,000 or more places of human interment in Texas, many of them unmarked and therefore subject to destruction from development. They are part of Texas' cultural heritage, and community planners who are aware of the existence of unrecorded cemeteries are encouraged to contact the THC so that these burial places can be included in the official inventory. Texas has several regulations that govern the designation and protection of cemeteries. The THC can provide technical assistance through the Cemetery Preservation Program and has developed guidelines to aid interested parties in this effort, including installing a historical marker.⁹

Texas Main Street Program: Historic businesses and homes located in downtown settings can have particular importance to the feeling and characteristics of those communities. These areas can amplify local tourism and the general quality of life to their residents. Unfortunately, many downtown areas have become rundown and neglected over time. Texas, through the THC, was a very early supporter of assisting towns and cities in recognizing and revitalizing these historic districts through the creation of the Texas Main Street Program. This effort is tied to a national program developed in 1981 by the National Trust for Historic Preservation called Main Street America. It can provide resources, including revitalization toolkits, to those planners who wish to work with the THC by identifying eligible historic properties and finding financial resources to reestablish them as a focal point of the community.¹⁰

Family Land Heritage Program: The Texas Department of Agriculture started the Family Land Heritage Program in 1974 to recognize farms and ranches that have been in continuous operation by the same family for at least 100 years. Over 3,700 properties have been recognized in this manner, spread over 220 counties. Farms and ranches recognized by the program are not automatically designated as historic properties but may be eligible for other programs such as RTHL designation or listing in the NRHP based on surviving

7 [Texas Historical Commission: Apply for a Historical Marker](#)

8 [THC: Recorded Texas Historic Landmarks](#)

9 [Texas Historical Commission: Cemetery Preservation](#); [Texas Historical Commission: Historic Texas Cemetery Designation](#)

10 [Texas Historical Commission: Texas Main Street](#); [Main Street America: Main Street Resource Center](#)

buildings or their significance to local history. Those who qualify for the program receive a certificate and can obtain a Texas Century Farm or Ranch plaque to display on their property. The family's history is also formally documented in the Department of Agriculture's Family Land Heritage Registry. Information on applying for this designation can be found on the department's website.¹¹

Local Designations for Historic Properties: Historic properties can also be recognized exclusively at the local level of government and can be supported by counties or County Historical Commissions for activities such as surveys. This is particularly encouraged for disaster planning purposes since inventories of historic properties recorded before a disaster occurs enable adequate resiliency preparations. Moreover, only by knowing what historic properties are present can a local community assess a disaster's aftereffects on their cultural heritage and repair damage in an appropriate way. Otherwise, historic properties can be lost forever through uninformed demolition or alterations.

Local governments can preserve their heritage and promote benefits such as tourism by developing processes to designate individual public and private properties as historic landmarks or to establish historic districts. Historic preservation ordinances require an advance review of proposed for at designated historic properties as part of the permitting process. This ensures that key historic architectural features remain and governs demolitions and new construction to protect the integrity of surrounding historic properties. Local governments can enact various types of oversight encompassing entire historic properties or limited parts such as exteriors or what is visible from a public way. The NTHP's website offers a good overview of the local preservation law framework.¹²

Certified Local Governments: Towns and cities with many known or potential historic properties may wish to become a Certified Local Government (CLG). This program was created by an amendment to the National Historic Preservation Act of 1966 and is administered by the NPS. It provides funding opportunities and technical support to local governments to help enable historic property management. The CLG program is a partnership between the federal agency, the THC, and the local community that obtains the certification that involves agreeing to adopt national historic preservation standards for historic districts or other significant historic properties. The benefits of becoming a CLG include regular support from the THC's Certified Local Government Program staff, technical workshops, access to historic officers and preservation commissions across the state for advice, and access to grants to help develop and sustain an effective local preservation program critical to preserving historic resources in the community.¹³

¹¹ [Texas Department of Agriculture: Family Land Heritage](#)

¹² [National Trust for Historic Preservation: Local Preservation Laws](#)

¹³ [THC: Certified Local Governments](#)



IDENTIFYING AND MANAGING HISTORIC PROPERTIES IN YOUR JURISDICTION

This section discusses how to manage known historic properties and assist local preservation planners in identifying new historic properties within your jurisdiction before a disaster occurs. The specific needs will depend on several factors, including the number of historic properties in your jurisdiction, the amount of staff resources you have, if your municipality is a Certified Local Government, and whether you manage only public properties or if you also oversee landmarks and historic districts comprised of privately owned buildings.

Local governments typically identify and designate a specific office or person as the point of contact for owners of historic properties, both public and private. Larger communities with many historic properties would benefit from creating a formal historic preservation officer position. The person in this position would keep records current and review building permits and renovation plans for historic preservation ordinance compliance. For small communities or those with fewer financial resources, this position could be a building department official for the hazard mitigation plan staff, or a historic preservation officer. Maintaining a designated office or position will help promote continuity in maintaining historic property records and inventories for future disaster planning needs.

“ If not already performed, it is recommended that your local government formally identify a specific office within the administration to be the designated point of contact for historic properties and their organization. ”

Create a Historic Property Databases: A comprehensive disaster assessment depends upon the quality of historic property information available. There are two key ways to prepare a dataset for effective planning decisions. First, as much as possible, all historic properties within the assessed area must be inventoried. Second, the data must be accurate and current, to recognize changes that have occurred to the inventoried properties over time. It is crucial to develop a historic inventory database using software such as Microsoft Excel. Essential historic property data include type, name, age, address, and reason for its historic importance. Take digital photographs of each historic property from several angles and with an imprinted timestamp and store them in the same location as the Excel file. Retake photographs every few years as part of a new survey update project to record current conditions. In addition, photograph publicly-owned historic properties when building changes have occurred as part of a building permit or Certificate of Appropriateness issued by a building department or a historic preservation commission. Protocols that require public building maintenance departments to submit information annually can aid in this effort. Back up all digital data to a cloud-based server and agency hardware to protect it from disaster.

Insurance for Historic Properties: Historic properties must retain their historic characteristics to keep that designation. Those damaged by a disaster will normally need to be repaired using appropriate time-period construction materials and methods, such as those outlined in the *Secretary of the Interior's Standards for Rehabilitation*. This can be more expensive than what is afforded under a standard insurance policy. For publicly owned historic properties, jurisdictions should develop their insurance policies after consulting with a historic preservation architect or building contractor. Insurance policy value should be measured appropriately and cover the “historic replacement cost” or “historic property valuation clause.” If you cannot find an insurance provider with historic property knowledge or policies, the NTHP has an insurance entity specifically focused on coverage for individual buildings.¹

Identifying New Historic Properties: If your community has not yet identified historic properties or believes additional historic properties could be present, there are several steps that can be taken. First, gather information to narrow potential survey or reconnaissance areas for historic resources to a manageable level. Suggestions include:

- ❑ For publicly owned properties, including buildings, bridges, monuments, parks, etc., collect information from the agencies that own or operate them. Identify their date of construction and background about the architect, if applicable, to determine their potential historic status.
- ❑ Use online tools such as the THC’s Texas Historic Sites Atlas and TxDOT’s Historic Resources of Texas Aggregator to find historic properties that have already been recorded in your area. Both tools allow historic preservation planners to see important information within their areas of operations for disaster planning, including historic properties that have been defined through surveys for private development as well as through state and federal projects.
- ❑ Conduct outreach to the appropriate County Historical Commission, as well as local museums, library archivists, non-profits, historical groups and neighborhood / business associations to see if they have records or knowledge of potential historic buildings or districts.²

1 [MDP: National Trust Insurance Services](#)

2 [THC: What are County Historical Commissions](#)

Next, record the identified resources and determine if they would be eligible for historic property designation under one or more of the categories discussed in the previous section. This happens through one of two primary mechanisms: determinations of eligibility or a historic resources survey.

A determination of eligibility (DOE) is typically undertaken by a property owner seeking an NRHP listing. The owner prepares the DOE and submits it to the THC's National Register coordinator, who then issues an official THC response stating whether the property meets NRHP eligibility criteria. A DOE can also be completed as part of the state or federal historic preservation tax credit programs.

Local communities can also commission historic resources surveys to identify historic properties, either individually or to define districts. Historic preservation professionals are recommended for help confirming the survey boundary, preparing a historic context through archival research, and defining the period of significance. These professionals can also photograph and document each property in relation to the NRHP guidelines. A preservation professional can help assess whether properties will be categorized as Eligible/Contributing or Not Eligible/Non-Contributing based on comparing current architectural or design elements with the original construction, determining any alterations that have been made, and assessing whether the property retains sufficient integrity to convey historical significance.

Potential funding sources and materials to explore recording historic properties in your area include:

- THC Funding and Assistance Guide
- THC Texas Preservation Trust Fund and Certified Local Government programs
- Main Street America
- HUD Community Development Block Grants
- NPS Underrepresented Community Grant Program
- NPS Paul Bruhn Historic Revitalization Grant Program

An approach to conducting surveys is to use specialized software developed for historic resource surveys. Two examples of this are the CRSurveyor application developed by the National Alliance of Preservation Commissions and the Arches Project, an open-source management system developed by the Getty Conservation Institute and World Monuments Fund.³ Using this type of system reduces up-front costs, especially with the use of community volunteers, with the information kept on file digitally for use in future documentation work. This type of system helps reduce consultant costs by using community volunteers for inputting information. It also maintains information in an accessible digital format. Digital survey forms should include fields for historic context and property significance evaluations for state and federal-level historic property designations and tax credit programs.

Regardless of the means used, communities are strongly encouraged to discuss their plans and results with the THC to maximize their benefits from the process, and to enable their data to be uploaded to the Texas Historic Sites Atlas so that state and federal agencies are aware of these historic properties in the event of a future disaster. In addition, it is highly recommended that an updated list of all historic properties (individual and in districts) be

³ [National Alliance of Preservation Commissions: CRSurveyor](#); [Getty Conservation Institute: Arches Project](#).

provided to your local building department so that they are aware of the property's special status and needs during permit requests.

Creating and Administering Historic Districts: Creating a historic or conservation district requires the acceptance by vote of a majority of residents or businesses within the area. Design guidelines will need to be developed and the municipality's zoning, building codes, permitting processes, and other city ordinances will need to adjust. These regulate demolition and construction activities through administrative review or issuing formal Certificates of Appropriateness when significant alterations are requested such as changing exterior features, erecting an addition, constructing a new structure in a historic district, and/or relocating or demolishing a landmark or structure within an historic district.⁴ If your jurisdiction is considering establishing a district for the first time, the THC has developed online resources that can help your decision-making even if your community is not a Certified Local Government. Reach out to THC's State CLG Program Coordinator for further advice.⁵ The THC has also prepared a sample ordinance to assist municipalities with this effort.⁶ The NTHP's website offers Frequently asked questions and a procedural overview.⁷

Two exemptions under federal and state law can be very useful for local governments administering historic properties; both can also be applied to publicly owned properties. In 1997, the Texas Legislature enacted a windstorm exemption for historic properties that are NRHP-eligible or NRHP-listed, RTHLs, or at least 50-years old, is designated by a municipality as historic landmarks and registered as such with the THC. The exemption allows owners to preserve their property's historic integrity by repairing with historically appropriate materials even if these materials do not meet current hurricane code standards. The second exemption refers to the National Flood Insurance Program, which allows for historic properties to forego elevation after being substantially damaged by a flood if that action would substantially impact a property's historic integrity. Local jurisdictions may exempt historic buildings by codifying this in their local ordinance's definition of substantial improvement or by issuing variances for historic structures. If the latter option is chosen, improvements allowed under the variance must be the minimum necessary to preserve a property's historic character and not result in inappropriate alterations that make it no longer recognized as historic.⁸ Not all insurers are knowledgeable about these two exemptions and so if they will be adopted by your community specific procedures should be clearly outlined in your permitting procedures. THC staff can assist in this process.

Jurisdictions that oversee privately owned historic properties can also assist historic district property owners before and after a disaster by adjusting their tax codes to provide financial incentives. Under Title 1, Section 11.24 of the Texas Tax Code, county and local taxing authorities may grant property tax exemptions for buildings designated as Recorded Texas Historic Landmarks, State Antiquities Landmarks, or local landmarks.⁹ These jurisdictions can also assist their residents by promoting and coordinating other available tax credits. The Federal Historic Rehabilitation Tax Credit Program operated by the National Park Service and Internal Revenue Service provides a 20 percent income tax credit for the rehabilitation

4 [National Trust for Historic Preservation: 10 Steps to Establish a Local Historic District; Useful Community Development: Planning and Implementing a Local Historic District](#)

5 [THC: CLG Reference Center](#)

6 [THC: "Model Ordinance: Historic Landmark and District Zoning Ordinance."](#)

7 [National Trust for Historic Preservation: Preservation Ordinance Frequently Asked Questions](#)

8 [Floodplain Management Bulletin: Historic Structures, FEMA P-467-2 \(Washington, DC: FEMA, May 2008\); Floodplain Management Bulletin: Variances and the National Flood Insurance Program, FEMA P-993 \(Washington, DC: FEMA, July 2024\).](#)

9 [Texas Tax Code, Title 1, section 11.24 Historic Sites.](#)

of historic non-profit, income-producing buildings, which include rental housing, hotels, offices and commercial, industrial, and certain agricultural facilities.¹⁰ The Texas Historic Preservation Tax Credit Program also provides a parallel tax credit of 25 percent that can be applied to the state franchise tax or state insurance premium. It applies towards to qualified rehabilitation of a historic income-producing or non-profit building. Planners who wish to explore these options are encouraged to discuss them with the THC.¹¹

Further discussion on how to help public and private historic property owners prepare for disasters is presented in the “*Actions to Take Before a Disaster Happens*” section.

“ A comprehensive disaster assessment depends upon the quality of historic property information available. First, as much as possible, all historic properties within the assessed area must be inventoried. Second, the data must be accurate and current to recognize changes that have occurred to the inventoried properties over time. ”

¹⁰ [National Park Service: Tax Incentives for Preserving Historic Properties; United States Internal Revenue Service: Rehabilitation Credit \(Historic Preservation\) FAQs](#)

¹¹ [THC: Texas Historic Preservation Tax Credit Program](#)



ASSESSING AND PLANNING FOR DISASTER RISK TO YOUR HISTORIC PROPERTIES

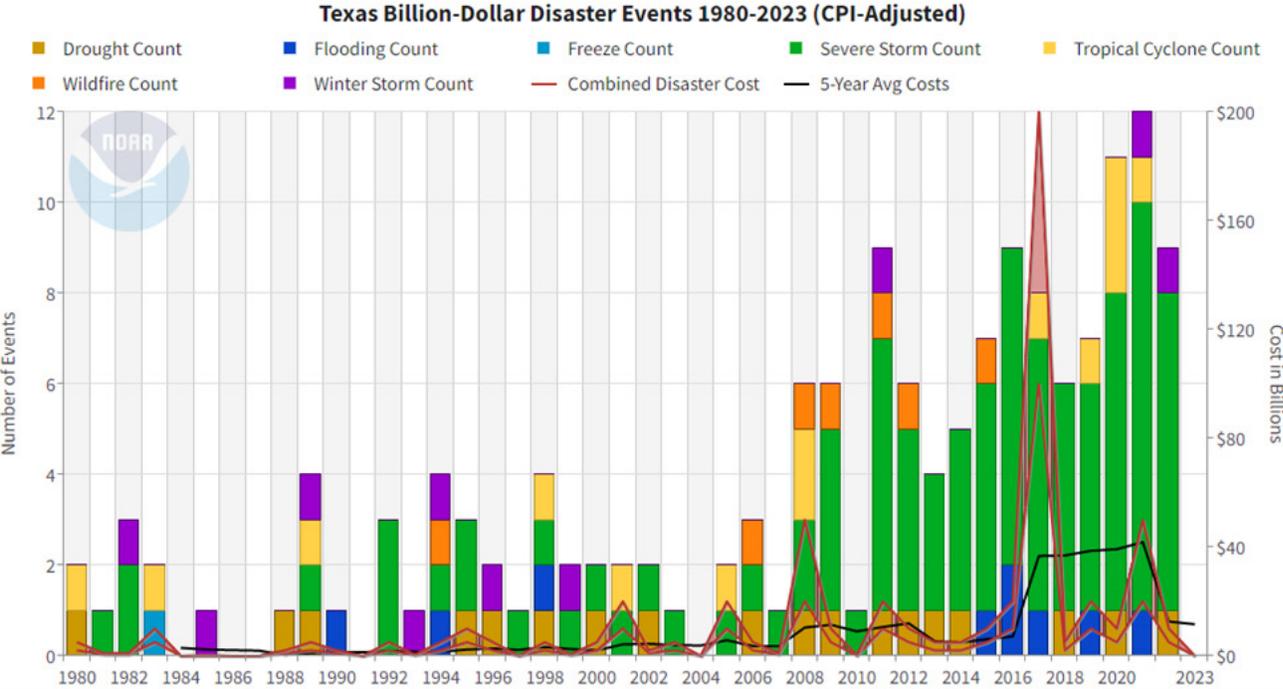
Disaster planning for historic properties correlates directly with the risks that the entire community faces. Knowing what types of disasters could affect your jurisdiction can be somewhat reliably determined by past events, but not entirely so. The graph below shows the dramatic increase in disaster frequency and severity within the state by the number of events that have caused over \$1 billion in damage, a threshold that is adjusted for inflation in the graph and does not include the many other disasters that caused a lesser dollar amount of damage. This suggests that the disaster risk types that Texas communities experience have not changed but the intensity of events when they occur can be higher than those past experiences.

REFUGIO COUNTY TIVOLI-CEMETERY, DAMAGED BY HURRICANE HARVEY



FREQUENCY AND COST OF DISASTER EVENTS IN TEXAS: 1980 TO APRIL 10, 2023

(SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION)



The Federal Emergency Management Agency (FEMA) has developed the National Risk Index (NRI) through a partnership with academia, private industry, and local, state, and federal governments. The NRI, updated on a regular basis, can help planners recognize the most likely types of risks that may be faced in their county or at the census tract level. Although the overall risk index value is focused on economic and resident risk rather than risk to physical properties, the model’s projected frequency at which each disaster category could occur offers planners helpful information. The *Statewide Assessment of Disaster-Related Threats and Recommendations* report provides additional guidance on using the NRI and the disaster types most prevalent for each Texas county.

Creating and Administering Historic Districts: After determining the likeliest disaster types to affect your community, create a disaster resiliency plan to protect historic properties within your jurisdiction. Evaluate each individual property, whether individual or in a district, in the following key areas:

- Function:** For example, historic properties with on-site staff or visitors will need to consider those factors in their mitigation plans, such as incorporating a tornado shelter.
- Size:** For example, to maximize available resources at large historic properties with multiple structures, prioritize mitigations for short- and long-term.

- ❑ **Location:** For example, historic properties in remote areas may need generators and satellite phones since they will likely be unable to receive immediate attention from emergency responders and will also experience significant periods of offline utility connections.
- ❑ **Geographic position:** For example, properties near waterways will be more likely to experience flooding. Properties near the coast will be more susceptible to high winds and storm surge.
- ❑ **Materials:** For example, materials used to construct historic properties such as stone buildings have less risk of wind and fire damage than wood-framed buildings.
- ❑ **Elevation:** For example, properties at higher elevations will generally experience reduced flood risk.
- ❑ **Architectural design features:** For example, flat roofs have increased risk of collapse from heavy ice or winter storm snowfall weight.
- ❑ **Landscaping on property:** For example, heavily wooded surroundings are at increased wildfire risk.
- ❑ **Condition:** For example, disaster mitigation measures like those listed in the following section can significantly benefit properties in need of repair.

A disaster-specific resiliency plan can be developed for each property; however, incorporating disaster resilience considerations into the community's overall historic preservation plan is likely more efficient, especially for jurisdictions with multiple historic properties. This will allow the resiliency plan to align with your short- and long-term preservation goals, historic district preservation ordinances, and budget. Suggestions for what the resiliency plan addresses include the following:

- ❑ State clear goals and objectives that are tied to your community's preservation vision specifically designed for each historic property, and are achievable, measurable, and tied to a timeline.
- ❑ Define roles and responsibilities for implementing the resiliency strategies and action plan, including identifying staff, funding sources, and other implementation partners.
- ❑ Develop a roadmap for implementing the plan, including timelines, budgets, and responsible parties.
- ❑ Identify the most critical historic properties that need protection given their cultural significance to your community. Prioritize the properties or areas that are best aligned with your preservation plan goals and are most vulnerable to a disaster based on their current condition, weaknesses, and potential threats.
- ❑ Establish how regulatory mechanisms, such as zoning, historic preservation ordinances, and conservation easements, will be enacted to protect your historical properties or landmarks. Determine how your community will manage and permit demolition and construction activities after a disaster occurs. This can include identifying specific resiliency standards for floodproofing, elevating, wildfire urban interfaces, and tornado/hurricane wind ratings, as appropriate. It can also specify

which construction materials will be permitted and/or include a provision that historic materials must be salvaged during demolition so that they may be reused for the repair of other historic buildings.

- ❑ Outline clear and concise emergency response procedures for each type of hazard identified in the risk assessment. This may include evacuation procedures, emergency shutdown protocols, and detailed instructions for how to secure the property.
- ❑ Identify a post-disaster emergency response team of relevant stakeholders, including staff, local emergency management officials, fire departments, and historic property owners.
- ❑ Summarize the steps and procedures to follow after a disaster. This should include damage assessment protocols, state and federal agency coordination, salvage and recovery techniques for historic materials, restoration and reconstruction plans, and post-disaster monitoring and evaluation.
- ❑ Regularly review and update the plan as needed to reflect changing personnel, updated regulations, new information, and emerging preservation and disaster risk challenges (or successes) to ensure they remain effective and relevant. Incorporate lessons learned from drills, exercises, and actual incidents to continuously improve the plan's effectiveness.

For the best effect, this plan should be shared and incorporated into the community's overall hazard mitigation plan. Most Texas communities and many local agencies that receive federal funding are required to maintain such a plan as part of their participation in the National Flood Insurance Program.¹ Incorporating a list of known historic properties into the local hazard mitigation plan will help ensure that historic properties are properly managed before and after a disaster strikes, especially if a severe disaster triggers state or federal agency coordination.

This will also help the community obtain grants for mitigation purposes, as it will be planned in concert with overall community needs. FEMA's Hazard Mitigation Grant Program will consider funding individual historic properties that are included within their community's plan² and plan sources. As of 2023 FEMA also has several programs for communities with larger areas, multiple historic properties, and the potential for substantial infrastructure changes. These include the Flood Mitigation Assistance Grant, Building Resilient Infrastructure and Communities, Pre-Disaster Mitigation Grant Program, and the Safeguarding Tomorrow Revolving Loan Fund. HUD also provides mitigation support to communities through its Community Development Block Grant Mitigation program. For communities that are susceptible to wildfire disasters, the US Department of Agriculture offers up to \$250,000 to develop a community wildfire protection plan and additional funds to implement it.³

1 [FEMA: Create a Hazard Mitigation Plan](#)

2 [FEMA: Property Owners and the Hazard Mitigation Grant Program](#)

3 [USDA: Community Wildfire Defense Grant Program](#)

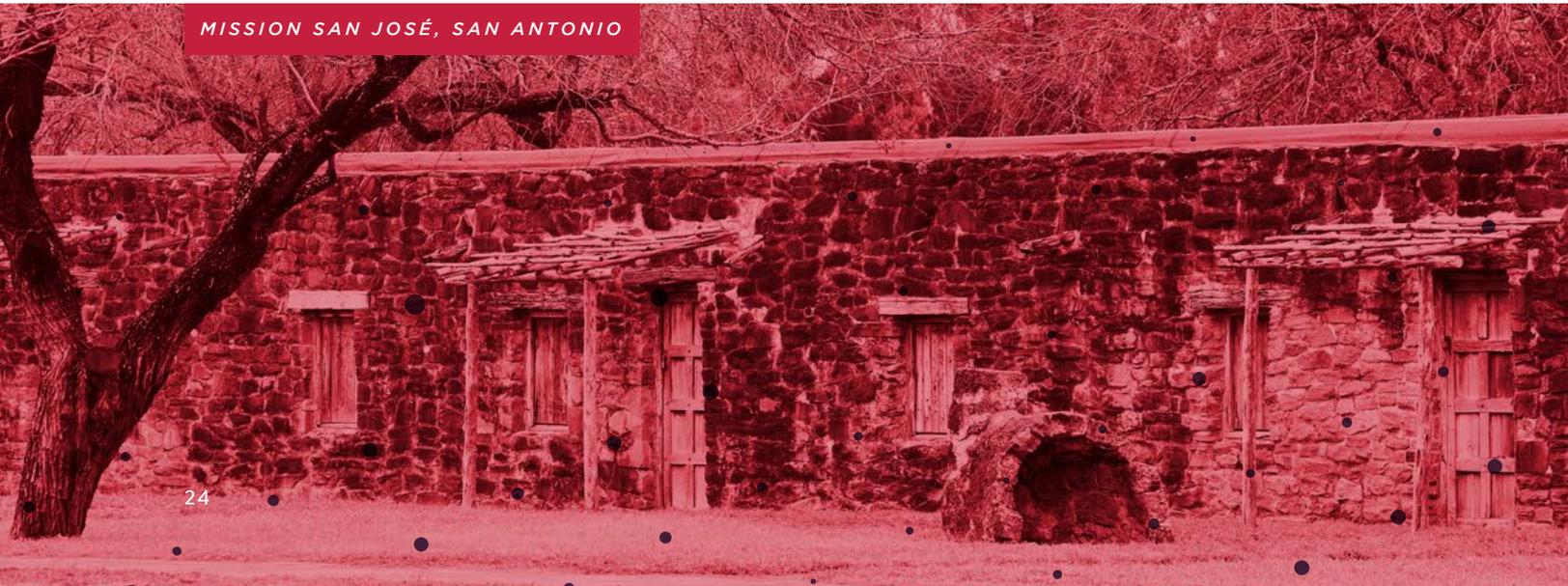


ACTIONS TO TAKE BEFORE A DISASTER HAPPENS

After disaster strikes, it can be difficult to determine what effect it specifically had on a historic property, unless the property's condition beforehand was fully documented and regulatory controls were already in place. This is why the preceding sections stress the need to inventory historic properties, keep up-to-date records, institute historic preservation ordinances where appropriate, and develop a disaster plan. Without these measures, historic properties that would have been eligible for post-disaster funding may lose that option and/or owners can implement inappropriate alterations during repairs which then result in the property no longer being eligible for its designation.

The following section reiterates some points discussed earlier and provides additional suggestions on actions to take before a disaster occurs, with specific reference to the most common disaster types encountered in Texas. Please note that any modifications to a historic property should be coordinated with historic preservation architects, experts and/or the THC to ensure these alterations are appropriate and will not adversely affect a property's historic and architectural significance.

MISSION SAN JOSÉ, SAN ANTONIO



GENERAL CONSIDERATIONS

Local governments should consider the following when planning for disaster events:

- ❑ Create and maintain documentation on all historic properties in your jurisdiction and keep copies on cloud-based servers in the event your agency servers are impacted by disaster.
- ❑ Develop relationships with your community disaster planning officials to raise awareness of historic properties. Include the current list of historic properties and disaster resiliency sections in your community's hazard mitigation plan.
- ❑ Ensure publicly owned historic properties have sufficient insurance. Coverage should include a policy that covers "Historic Replacement Cost" and enables repairs that comply with the *Secretary of the Interior's Standards for Rehabilitation*.
- ❑ Develop a post-disaster checklist and staffing plan with backups identified in case primary staff are unable to respond due to effects on themselves. Conduct annual training and education with staff and stakeholders on disaster preparedness, response, and recovery procedures.
- ❑ Amend building codes and ordinances to state how designated historic properties should be repaired to minimize inappropriate alterations. While this document focuses on natural disasters, electrical fires from older wiring can be a serious threat to historic buildings and neighboring structures. It is recommended that local building codes specify that wiring must be checked during major rehabilitation projects of historic properties and, if substandard, that it be replaced to meet the current code.
- ❑ Develop communication protocols to ensure effective communication among staff, stakeholders, and emergency responders during a disaster. Include emergency contact information, communication channels, and backup communication methods in case of disruptions.
- ❑ Store essential mitigation materials in advance of a disaster and keep them stockpiled on the property. Items such as plywood to cover building windows and sandbags to floodproof building entrances will often not be available after a disaster warning is sent out.
- ❑ If a disaster is anticipated soon, monitor reliable weather news sources (NOAA Weather Radio preferred) to avoid speculation or confusion that can come from multiple news sources.

SPECIAL CONSIDERATIONS FOR MUSEUMS AND LIBRARIES

Public museums and libraries will have different mitigation preparation needs as their historic properties are often not the buildings themselves but the many unique and irreplaceable objects, artwork, and texts that they contain. The Institute of Museum and Library Services' website details methods and grants that may assist in post-disaster recovery needs. The Heritage Emergency National Task Force, a joint venture between FEMA and the Smithsonian Institution, provides education and training to museum and library leaders, first responders and emergency managers to help prepare for disasters and address their aftermath.¹ The American Institute for Conservation also offers tip sheets, support, and assistance through their National Heritage Responder program.²

¹ Contact the Heritage Emergency National Task Force via email: culturalrescue@si.edu.

² The National Heritage Responder program can be accessed online. Individuals can email NHRpublichelpline@culthralheritage.org and institutions can call (202) 661-8068.



GALVESTON CO CRENSHAW CEMETERY, DAMAGED BY HURRICANE IKE

CRENSHAW FAMILY CEMETERY
 VIRGINIA NATIVE AND CIVIL WAR VETERAN JAMES CRENSHAW WED HENRIETTA BARKER ELLIOTT IN KENTUCKY IN 1870. TWO YEARS LATER, WITH THEIR FIRST CHILD, THEY MOVED TO BOLIVAR PENINSULA AND CONSTRUCTED A TWO-STORY HOUSE IN THIS VICINITY. JAMES, A SUCCESSFUL FARMER, TRANSPORTED HIS PRODUCE ACROSS THE WATER TO GALVESTON MARKETS USING HIS FLEET OF NINE BOATS. THE COUPLE EVENTUALLY HAD TEN CHILDREN; TWO YOUNG DAUGHTERS DIED, ONE IN 1885, THE OTHER IN 1882, AND THE FAMILY BURIED THEM HERE IN A GROVE OF OAK TREES CLOSE TO THEIR HOUSE.

THE FAMILY'S HOME SURVIVED THE 1900 GALVESTON HURRICANE; AFTER THE STORM, THE J.A. CRENSHAW LEFT THE PENINSULA. TWO SONS REMAINED, AND DAUGHTER HELEN CRENSHAW WED NEWELL W. ATKINSON IN EDNA, TEXAS, IN 1905. THE LAND CONTAINING THE BURIAL GROVE REMAINED IN FAMILY HANDS, BUT THE HOUSE DISAPPEARED EXCEPT FOR A PORTION OF THE FOUNDATION. IN 2003, TWO DESCENDANTS OF HELEN CRENSHAW NEWELL ATKINSON DONATED LAND TO BE USED AS A BURIAL GROUND FOR THE CRENSHAW FAMILY. THIS IS THE HISTORIC CRENSHAW FAMILY CEMETERY.



A disaster-specific resiliency plan can be developed for each property; however, incorporating disaster resilience considerations into the community's overall historic preservation plan is likely more efficient, especially for jurisdictions with multiple historic properties.



HIGH WIND EVENTS (TORNADOES, TROPICAL STORMS, AND HURRICANES)

A tornado is a violently rotating column of air extending from the ground to the supercell thunderstorm above it, which is defined by a rotating updraft and strong vertical wind shear. Tornadoes generally develop within moist and warm air that advances alongside or ahead of colder air fronts. Most tornadoes are weak, but those with funnel speeds above 110 miles per hour are categorized as strong and have significant risk to cause major damage (see chart). The course of a tornado is unpredictable and, due to the manner in which it reaches the ground surface, it is possible for one side of a street to experience destruction while buildings on the other side survive comparatively unscathed. Strong winds can cause damage to historic properties directly by causing them to shift in position, affecting their structural integrity. In the case of buildings, strong winds can blow out windows and doors or remove roofs, thereby also exposing their interiors to any accompanying or future precipitation. Winds can also cause nearby trees to fall onto historic properties as well as other forms of indirect damage.

THE ENHANCED FUJITA TORNADO SCALE

EF CATEGORY	GUST WIND SPEED (MPH)	DAMAGE LEVELS
0	65 TO 85	<i>SEE NATIONAL WEATHER SERVICE: THE ENHANCED FUJITA SCALE (EF SCALE)</i>
1	86 TO 110	
2	111 TO 135	
3	136 TO 165	
4	166 TO 200	
5	>200	

Tropical storm and hurricane season along the Texas Gulf Coast typically runs from June 1 to November 30; however, it is possible to have a high wind event outside of those dates. Between 1851 and 2016, 289 hurricanes reportedly affected the continental United States. Sixty-three of these (21.7 percent) struck Texas, 20 of which were major hurricanes classified as Category 3 or above.³ Hurricanes can damage historic properties directly through high winds (see chart) and tornado formation. Substantial damage can also occur through heavy rainfall and storm surge (water violently being rapidly driven onshore); review the flood mitigation section below. Tornadoes associated with hurricanes most often happen in rain bands far away from the center of the hurricane, but they can occur near the eyewall. These tornadoes are usually weaker than “standard” tornadoes, described above, and are normally short-lived but can still cause heavy localized damage to aboveground historic properties caught in their path.

³ [Texas Comptroller of Public Account: Fiscal Notes: A Storm to Remember: Hurricane Harvey and the Texas Economy.](#)

THE SAFFIR-SIMPSON HURRICANE SCALE

EF CATEGORY	GUST WIND SPEED (MPH)	DAMAGE LEVEL	TYPICAL DAMAGE IMPACTS
1	74 TO 95	<i>VERY DANGEROUS WINDS WILL PRODUCE SOME DAMAGE</i>	<i>WELL-CONSTRUCTED FRAME BUILDINGS COULD HAVE DAMAGE TO ROOF, SHINGLES, VINYL SIDING AND GUTTERS. LARGE BRANCHES OF TREES WILL SNAP, AND SHALLOWLY ROOTED TREES MAY BE TOPPLED.</i>
2	96 TO 110	<i>EXTREMELY DANGEROUS WINDS CAN CAUSE EXTENSIVE DAMAGE</i>	<i>WELL-CONSTRUCTED FRAME BUILDINGS COULD SUSTAIN MAJOR ROOF AND SIDING DAMAGE. MANY SHALLOWLY ROOTED TREES WILL BE SNAPPED OR UPROOTED AND BLOCK NUMEROUS ROADS.</i>
3	111 TO 129	<i>DEVASTATING DAMAGE CAN OCCUR</i>	<i>WELL-BUILT FRAMED BUILDINGS MAY INCUR MAJOR DAMAGE OR REMOVAL OF ROOF DECKING AND GABLE ENDS. MANY TREES WILL BE SNAPPED OR UPROOTED, BLOCKING NUMEROUS ROADS.</i>
4	130 TO 156	<i>CATASTROPHIC DAMAGE CAN OCCUR</i>	<i>WELL-BUILT FRAMED BUILDINGS CAN SUSTAIN SEVERE DAMAGE WITH LOSS OF MOST OF THE ROOF STRUCTURE AND/OR SOME EXTERIOR WALLS. MOST TREES WILL BE SNAPPED OR UPROOTED, AND POWER POLES DOWNED. FALLEN TREES AND POWER POLES WILL ISOLATE RESIDENTIAL AREAS.</i>
5	>156	<i>CATASTROPHIC DAMAGE WILL OCCUR</i>	<i>A HIGH PERCENTAGE OF FRAMED BUILDINGS WILL BE DESTROYED, WITH TOTAL ROOF FAILURE AND WALL COLLAPSE. FALLEN TREES AND POWER POLES WILL ISOLATE RESIDENTIAL AREAS.</i>

Mitigation measures to consider:

- Conduct regular maintenance to prevent structural damage. Inspect every public historic building at least once a year and make necessary repairs as needed to maintain their resiliency.
- Install strapping to reinforce the roof and foundation, and/or retrofit internally weak structural areas to current building code.
- Install impact-resistant glass or shutters on windows and doors. These may require special design to conform to the overall appearance of the historic building.
- Reinforce the foundation, walls, and large doorways using brackets or other supports.
- Hire a professional arborist to assess the condition of any large trees near historic properties to identify health or rot issues that could increase their likelihood of breaking and falling during high winds. Trim trees and overhanging branches for the same reason.
- Install lightning protection through lightning rods, grounding wires, and surge protectors.

- ❑ Store pre-cut plywood on-site to rapidly secure windows and doors.
- ❑ Evaluate objects around the historic property for their potential to become airborne projectiles during high winds and secure them with anchors or include their removal and storage in the hazard mitigation plan.
- ❑ Tornadoes can develop with very little warning and follow unpredictable paths, making advance preparations nearly impossible. Construct or retrofit a nearby reinforced shelter that can safely hold the total number of people inhabiting the historic property.
- ❑ For historic districts, adopt building permit procedures or adjust local building ordinances to enable and regulate the Texas Windstorm Exemption, discussed in the previous section.

FLOODING EVENTS (COASTAL AND INTERIOR)

Coastal flooding occurs when sea water from the Gulf of Mexico inundates or covers normally dry coastal landforms. It can result from short-term or longer-term events. The primary short-term event comes from water rapidly driven onshore by hurricanes, tropical storms, or other high-wind occurrences. Storm surge and waves can batter aboveground historic properties close to the shoreline and cause erosion that destroys archeological features and moves or redeposits artifacts to other locations. Storm surge can also reverse a waterway's course, making it flow upstream or overflow its banks, which can cause channel erosion and flood damage miles inland.

Interior flooding is flooding away from the Gulf Coast and generally results from slow-moving storms inundating an area with rainfall. Streets in urban areas that receive a lot of rain in a short time can easily flood if there is a large number of paved streets, sidewalks, and other impervious surfaces. However, the area that received the rainfall will not necessarily be the place that floods. As watersheds collect and funnel water downstream, the effects multiply and ultimately overflow the creek or riverbanks many miles from the original rainfall event. Interior flooding can be exacerbated by several factors such as flash floods (heavy rain in areas where the soil has baked dry), burn scars after wildfire events, snowmelt, or dam and event failures.

Floodwater can affect historic properties in two primary ways. Interior areas will typically experience flooding from rising waters due to heavy rainfall that overwhelms the stormwater drainage capacity or by streams or rivers overflowing their banks, spilling into the area. Resources close to the coast are also at risk of extreme tidal surges that can extend a wall of water directly onto properties; this possibility can also exist in interior areas directly downstream from reservoirs if dams fail.

Mitigation measures to consider:

- ❑ Identify a historic property's precise elevation through a civil survey and compare that to the current FEMA floodplain map to determine flood risk. Given these maps are based on historical data rather than future projections, purchasing a National Flood Insurance Program policy is recommended, even if not in a designated high-risk flood area.
- ❑ Floodplain category Zone V is a very high-risk flood zone in coastal areas. The "V" stands for "velocity" because this zone can face damage from strong waves during storm surge as well as from higher flood levels. Retrofit historic buildings located within this zone to improve their ability to withstand storm surge.¹
- ❑ Ensure buildings have adequate drainage systems. This can include installing gutters and downspouts, clearing out any debris from drainage systems, and redirecting water away from buildings. The landscapes around buildings can also be graded to direct water away.
- ❑ Clogged or damaged drainage systems can cause water to accumulate around buildings. Regularly inspect and clear drainage systems to avoid this possibility.
- ❑ Implement erosion controls for historic properties located near streams or riverbanks.
- ❑ Plant vegetation and trees around buildings to help absorb water and reduce the risk of minor flooding events. This can include creating green roofs, rain gardens, and bioswales.
- ❑ Apply a waterproof coating to floors or walls to help prevent water from seeping into the building. This can include adding a waterproof membrane to the foundation, installing sealant around windows and doors, and using waterproof materials for flooring.
- ❑ Explore retrofitting nonresidential buildings using dry floodproofing methods if elevation is not desired or possible.²
- ❑ Store sufficient sandbags on site to secure low areas rapidly, particularly doors and other openings. Also consider inflatable barriers.
- ❑ Elevate HVAC systems at least two feet above the projected base flood elevation to prevent prolonged outages that will result in interior mold growth.
- ❑ Establish design guidelines for historic districts that allow for elevation after a disaster in a manner that will not destroy the historic setting. If elevation is not feasible, adopt policies, procedures, and local building ordinances to follow the FEMA elevation exemption, as discussed in the previous section.

1 [Homeowner's Guide to Retrofitting: Six Ways to Protect Your Home From Flooding, FEMA P-312 3rd ed \(Washington, DC: FEMA, June 2014\).](#)

2 [Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings Located in Special Flood Hazard Areas in Accordance with the National Flood Insurance Program, NFIP Technical Bulletin 3 \(Washington DC: NFIP, January 2021\).](#)

WILDFIRE EVENTS

A wildfire is an uncontrolled, destructive fire that originates in woodland or brush and then spreads quickly over an area. If conditions are right, it can spread very quickly, decimating any combustible building in its path. Prolonged drought can greatly exacerbate the situation by creating very dry timber and brush that, in turn, increase the probability of a wildfire starting as well as its geographic spread and severity. Wildfires pose the greatest risk to rural aboveground historic properties located near easily combustible materials such as forests, brush, or maturing crops. However, wildfires can also spread and threaten or consume buildings in urban areas. For example, in the Bastrop and West and Central Texas areas in 2011 and 2022, over 300 wildfires occurred in leading to a state-level disaster declaration.³

Wildfires can be one of the most difficult disaster types for historic property managers to mitigate. Standard treatments often involve using materials that are not compatible with the original construction. Some measures that can be explored include:

- ❑ Contact local fire authorities for advice on how to best protect your historic buildings from wildfires. These officials will have the most up-to-date information on fire prevention and protection measures in your area.
- ❑ Clear vegetation and debris around buildings to help reduce the risk of fire spreading to the buildings. A minimum of 30 feet of clearance around the structure is recommended; remove tree limbs within 15 feet of the ground surface, thin a 15-foot-wide distance between tree crowns and ensure no part of a tree is within 6 feet of buildings. If this level of protection is not possible since a property is on a slope, focus mitigations on the downslope area, as fire spreads more easily uphill.
- ❑ Remove vegetation that touches historic buildings, particularly ivy, and clear leaf debris and other organic buildup from rain gutters.
- ❑ Conduct regular maintenance, such as cleaning gutters and removing dead vegetation, leaves, and pine needles to help prevent embers from igniting the building.
- ❑ Install sprinkler systems to help protect the building from wildfires by keeping grass and nearby vegetation healthy and less prone to ignite. Interior sprinkler systems can also help minimize when a fire enters a building.
- ❑ Class A-rated noncombustible roofing materials and metal, tile, or slate roofing materials are more fire-resistant than wood or asphalt shingles. Class A fire resistant siding, windows, and doors are also preferred but can only be used in certain cases where they will not harm a property's historic integrity.
- ❑ Wood fences can become an unintentional fuel source. If installing a new fence in wildfire-prone areas, specify metal. If wood fencing is required, heavy/thick wood is less prone to ignite than boards with thinner wood.
- ❑ Cover any historic building exterior air vents with 1/4-inch or smaller corrosion-resistant mesh to prevent embers from entering the building.
- ❑ Texas A&M Forest Service operates a wildfire tracking system that is updated continuously during a wildfire event. Monitor this system regularly during wildfires located within 100 miles of a historic property.

3 [Federal Motor Carrier Safety Administration: Texas Wildfire Disaster 2022](#)

WINTER STORM EVENTS (FREEZING TEMPERATURES AND SNOWFALL)

Texas generally experiences more temperate climates than northern states. Extended periods of very cold weather can cause electrical failures and freeze water pipes, which in turn can cause flooding inside buildings later. Winter storms can also result in abnormally high snow and ice loads; the weight can further damage buildings by collapsing roofs. The most recent example of a severe winter storm was designated Uri in 2021. The total damage experienced is estimated to be \$80 to \$130 billion.⁴ This is more than the economic cost of Hurricane Harvey in 2017, mainly due to its much larger footprint as it affected all 254 counties.⁵ Winter storms pose the greatest threat to buildings on historic properties.

Mitigation measures to consider:

- Check insulation levels at exterior floors, exterior walls, attics, and other unheated accessible areas to ensure they meet current recommended R-rated insulation levels. Focus particularly on wrapping any exposed water pipes in high-rated insulation.
- Install heavy curtains or blinds over windows to help keep heat inside the building.
- Maintain the roof in good condition to prevent leaks after heavy snowfall and reduce heat loss.
- Add caulking or weather stripping to exterior doors and windows.
- Carefully use portable space heaters in areas of a building that are particularly cold or in need of extra heat.
- Ensure adequate ventilation to prevent moisture buildup in a building, which can cause damage to wood and other materials. Proper ventilation can also help prevent freezing. Set up automated systems to alert building managers or caretakers if temperature or humidity levels fall outside safe ranges.
- Regularly inspect building exteriors and repair cracks or holes to prevent cold air from entering.
- Open faucets to slowly drip during the entire period of freezing temperatures.
- Identify where the main water shutoff valve is located and know how to operate it in the event of a leak.
- Hire a professional arborist to assess the condition of any large trees near a historic property to verify that they can sustain ice and snow buildup without breaking.
- In some cases, temporary covers or enclosures may be used to protect a building from freezing temperatures. For example, a temporary roof or enclosure may be erected over an exposed section of a building during construction work or repairs.
- Reinforce the roof of a building with additional support beams or steel trusses to help distribute the weight of heavy snow and prevent structural damage.
- Install gutter systems to help prevent ice dams and direct water away from a building's foundation.

⁴ [Jess Donald, "Winter Storm Uri 2021: The Economic Impact of the Storm," Fiscal Notes \(Austin, TX: Texas Comptroller of Public Accounts, October 2021\).](#)

⁵ [TDEM: Texas Serve Winter Storm DR-4586, Winter Storm Uri](#)

- ❑ Install snow guards on the roof to prevent snow from sliding off in large chunks, which can be dangerous for people walking below and can cause building damage.
- ❑ Install de-icing systems, such as heating cables or mats, on the roof to prevent ice buildup and ice dams.
- ❑ Prepare a snow removal plan to prevent buildup during heavy precipitation periods.

HAIL AND ICE STORM EVENTS

Hail is a type of solid precipitation that can occur during strong thunderstorms when water particles in the upper, colder parts of the atmosphere freeze before falling to the ground. Many counties in Texas experience hail on a regular basis with little damage; however, under certain conditions, hail greater than the size of a baseball can occur (see graph).⁶ This can cause considerable damage to aboveground historic properties, particularly to roofs of historic residences. Other parts of historic buildings and most structures will usually not experience significant impact.

Ice storms are similar to hail since they are a form of precipitation. The difference is that raindrops form in the clouds and fall as a liquid and the ground surfaces are cold enough to immediately freeze the rain on contact. At least 0.25 inches of ice must accumulate before a rainstorm is normally designated as an ice storm. The risks to aboveground historic properties are greatest. The additional weight of large ice accumulations can damage or collapse buildings and structures such as bridges. Mitigation measures are the same as in the preceding section on winter storm events.

Mitigation measures to consider:

“ Public museums and libraries will have different mitigation preparation needs as their historic properties are often not the buildings themselves, but the many historical objects, artwork, and texts that they contain, which can be unique and irreplaceable. ”

⁶ [National Weather Service: Severe Thunderstorms](#)

THE NOAA/TORRO HAIL SYSTEM

SCALE	INTENSITY CATEGORY	TYPICAL DIAMETER (IN)	SIZE COMPARISON	TYPICAL DAMAGE IMPACTS
H0	HARD HAIL	UP TO 0.33	PEA	NO DAMAGE
H1	POTENTIALLY DAMAGING	0.33-0.6	MARBLE	SLIGHT GENERAL DAMAGE TO PLANTS
H2	POTENTIALLY DAMAGING	0.6-0.8	DIME	SIGNIFICANT DAMAGE TO VEGETATION
H3	SEVERE	0.8-1.2	NICKEL TO QUARTER	DAMAGE TO GLASS AND PLASTIC STRUCTURES, PAINT AND WOOD SCORED
H4	SEVERE	1.2-1.6	PING PONG BALL	WIDESPREAD GLASS DAMAGE
H5	DESTRUCTIVE	1.6-2.0	GOLF BALL	DESTRUCTION OF GLASS, DAMAGE TO TILED ROOFS
H6	DESTRUCTIVE	2.0-2.4	EGG	BRICK WALLS PITTED
H7	VERY DESTRUCTIVE	2.4-3.0	TENNIS BALL	SEVERE ROOF DAMAGE
H8	VERY DESTRUCTIVE	3.0-3.5	BASEBALL	MODERATE STRUCTURAL DAMAGE
H9	SUPER HAILSTORMS	3.5-4.0	GRAPEFRUIT	EXTENSIVE STRUCTURAL DAMAGE. RISK OF SEVERE OR FATAL INJURIES.
H10	SUPER HAILSTORMS	>4.0	SOFTBALL AND UP	EXTENSIVE STRUCTURAL DAMAGE. RISK OF SEVERE OR FATAL INJURIES.

- Include provisions that cover hail damage in insurance policies for publicly owned historic properties.
- Hire a contractor after significant hail events to examine the roof for damage and possible replacement.
- Install impact-resistant roofing materials such as metal, slate, tile, and asphalt.
- Install protective screens over skylights and other vulnerable areas to help prevent hail or ice from damaging the building.
- Trim surrounding trees, as overhanging branches near a building can break and become projectiles during hailstorms.
- Install historically appropriate shutters on windows and doors to provide an additional layer of protection against hail. Installing hail guards over these areas can also provide an extra layer of protection.
- Install lightning protection such as lightning rods, grounding wires, and surge protectors; historic buildings are particularly susceptible to lightning, which can accompany hailstorms.

- ❑ Install protective netting over the roof and any vulnerable areas. The netting should be strong enough to withstand the force of the hailstones and securely fastened to the building to prevent it from blowing away.
- ❑ Maintain gutters and downspouts; blocked or damaged gutters can cause water to back up and damage the roof while poorly functioning downspouts can cause water to accumulate around the foundation and lead to structural damage.



JEFFERSON CO MCGAFFEY CEMETERY, DAMAGED BY HURRICANE IKE



ADDITIONAL INFORMATION SOURCES

The Federal Emergency Management Agency (FEMA) is responsible for coordinating and providing assistance to state and local governments in the aftermath of presidentially declared disasters. FEMA directly conducts damage assessments to determine the extent of damage to historic properties (especially public buildings) and assess their eligibility for disaster assistance. FEMA will coordinate its response with the THC and the Advisory Council on Historic Preservation through programmatic agreements to ensure that historic preservation standards and guidelines are followed in the recovery process. FEMA also has programs to support hazard mitigation measures to reduce the risk of future disasters and protect historic properties. Websites for more information include:

- [National Risk Index](#)
- [Ready.Gov \(with Department of Homeland Security\)](#)
- [Floodplain Management Bulletin - Historic Structures](#)

The **Texas Department of Emergency Management (TDEM)** is the state agency responsible for coordinating and managing state-level emergency response and recovery efforts during disasters. The agency collaborates with local communities to develop their hazard mitigation plans. TDEM supplies guidance and resources to local jurisdictions during and after a disaster, such as coordinating search and rescue operations, debris removal, and temporary protective measures. Their assistance includes historic properties when these have been identified.

- [Disaster Portal](#)
- [TexasReady.Gov \(with Texas Department of State Health Services\)](#)

The **Texas Historical Commission (THC)** has a large role in disaster recovery for historic properties in Texas. When disasters involve publicly owned or administered historic properties, the THC helps by collaborating with local communities as well as state and federal agencies to assess the disaster's impact. This can include coordinating emergency stabilization and salvage efforts to protect historic buildings from further damage. The THC also provides expertise on historic preservation techniques, materials, and best practices for post-disaster rehabilitation, and assists with regulatory compliance and permitting requirements.

- [Disaster Resources for Historic Properties](#)
- [Texas Historic Sites Atlas](#)
- [Texas Statewide Preservation Plan](#)
- [County Historical Commission Outreach](#)
- [Texas National Register of Historic Places](#)
- [Texas Main Street Resources](#)
- [Cemetery Preservation](#)

OTHER INFORMATION WEBSITES

National Fire Protection Association

- [Codes and Standards](#)

National Institute of Building Sciences

- [Climate Adaptation, Mitigation and Resiliency](#)

National Institute of Building Sciences

- [National Hurricane Preparedness](#)
- [Weather Radio Coverage and Channels](#)

National Park Service

- [Disaster Resources for Historic Property Owners](#)
- [Publications of the National Register of Historic Places](#)
- [Secretary of the Interior's Standards for the Treatment of Historic Properties](#)
- [Guidelines on Flood Adaptation for Rehabilitating Historic Buildings](#)

National Trust for Historic Preservation

- [Disaster Recovery](#)
- [Flood Insurance and Historic Buildings](#)
- [Main Street America Resource Center](#)
- [National Trust Insurance Services](#)

National Weather Service

- [Disaster Preparedness](#)
- [Tornado Safety](#)
- [Wildfire Preparedness](#)

Texas A&M University

- [Fires & Wildfires](#)

Texas Department of Transportation

- [TxDOT Historic Resources Aggregator](#)
- [Hurricane Evacuation Routes](#)

Texas State Law Library

- [Texas Building Codes](#)

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