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QUICK FACTS

- The regional flood planning groups included more than 300 legislative, administrative, and policy recommendations in their 15 regional flood plans. Their policy recommendations were considered and helped inform the development of the legislative and other recommendations in this chapter.
- The Texas Water Development Board makes five legislative recommendations, shares four regional flood planning group recommendations, and includes six floodplain management recommendations.

The 2019 Texas Legislature passed Senate Bill 8, which directs the Texas Water Development Board (TWDB) to develop a state flood plan that must provide for orderly preparation for and response to flood conditions to protect against the loss of life and property; be a guide to state flood control policy; and should contribute to water development where possible. The state flood plan must include “legislative recommendations the Board considers necessary to facilitate flood control planning and project construction.”¹⁰

This chapter serves as a guide to state flood policy and includes legislative and floodplain management recommendations related to flood risk reduction, minimizing impact of flood risk, preventing increase of future flood risk, and aimed at protecting life and property. The TWDB based the recommendations in this plan largely on recommendations contained in the 2023 regional flood plans.

The regional flood planning groups were required under 31 Texas Administrative Code § 361.43 to develop and include in their plans

1. legislative recommendations that they consider necessary to facilitate floodplain management and flood mitigation planning and implementation;

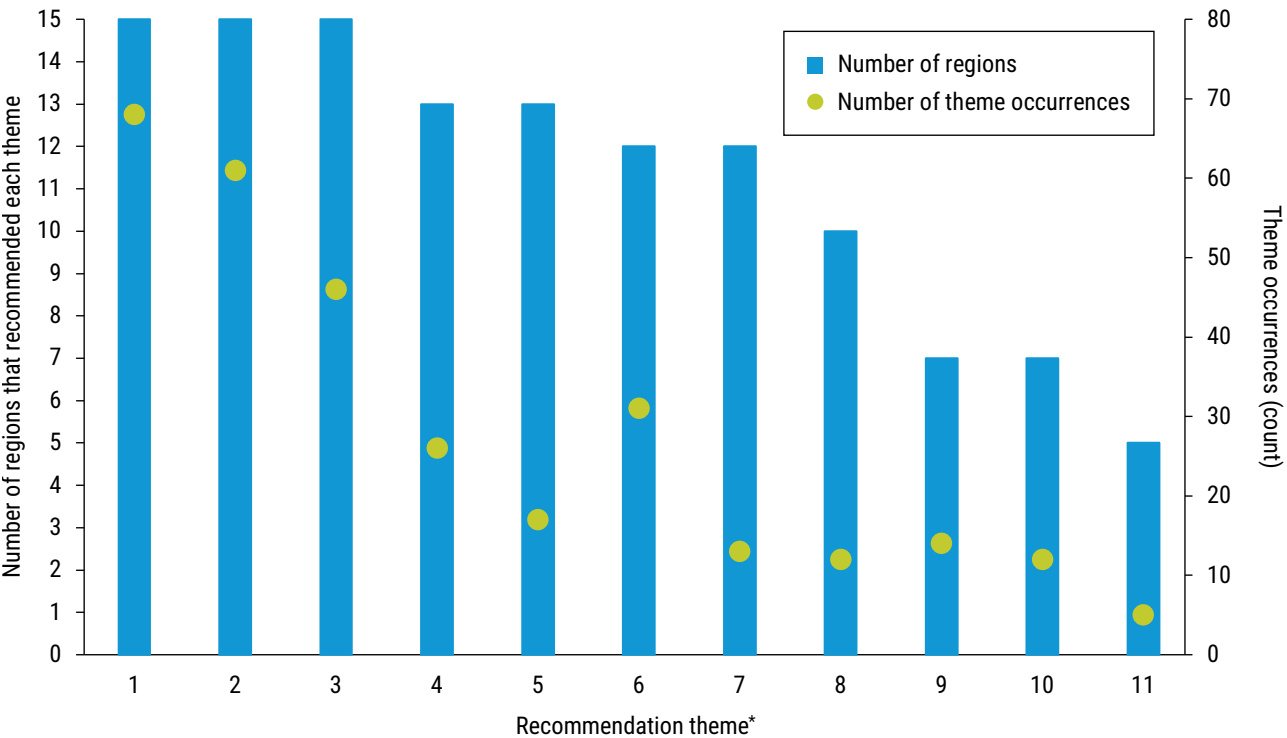
2. other regulatory or administrative recommendations that they consider necessary to facilitate floodplain management and flood mitigation planning and implementation;
3. any other recommendations that the regional flood planning group believes are needed and desirable to achieve its regional flood mitigation and floodplain management goals; and
4. recommendations regarding potential new revenue-raising opportunities, including potential new municipal drainage utilities or regional flood authorities, that could fund the development, operation, and maintenance of floodplain management or flood mitigation activities in the region.

The planning groups included more than 300 administrative, legislative, and regulatory recommendations in the 15 regional flood plans. These recommendations were developed to address items that benefit and/or can be implemented at the local, regional, or state level. They were generally aimed at supporting flood risk reduction and supporting implementation of the regional flood plans, including exploring innovative ways of funding flood risk reduction activities.

The TWDB carefully reviewed all policy recommendations made by the planning groups for consideration by the Texas Legislature, organized and categorized them into major themes, and summarized them (Figure 2-1). An individual region

¹⁰ TWC § 16.061(b)(5)

Figure 2-1. Summary of administrative, legislative, and regulatory recommendations made by the regional flood planning groups



* Themes:

1. Infrastructure/stormwater/project design standards and infrastructure programs (dams, levees, roadways, channels, low water crossings)

2. Funding and financial mechanisms

3. Public education, outreach, interjurisdictional collaboration, and admin training

4. Data, mapping, and modeling updates

5. Small/rural jurisdiction assistance
6. Floodplain ordinances and regulatory authority

7. Drainage utility fee authority

8. Improving benefit-cost analyses

9. Nature-based solutions, green infrastructure, conservation easements, open space preservation

10. Federal program participation and collaboration

11. Statewide building code

may have made multiple recommendations that fall within a single theme. Because each regional flood planning group independently developed its own sets of recommendations, the grouped recommendations in this chapter are based on similar, but not identical, recommended language and are not meant to imply identical language was used by all the groups.

If one region did not make a particular recommendation, it should not be construed as opposition to the recommendation. Each region put forth its own unique set of recommendations and did not select from a pre-defined list of recommendations. The planning group recommen-

dations strongly informed the TWDB legislative recommendations.

2.1 TWDB legislative recommendations

The TWDB generally based its legislative recommendations on those included in the 2023 regional flood plans. An early working draft of potential policy recommendations was provided to the public for feedback as part of a public Board work session on April 4, 2024. All written and verbal comments were considered before for-

mulating the following TWDB recommendations for consideration by the Texas Legislature.

2.1.1 Legislative recommendation 1: Flood funding and financial mechanisms

The legislature should consider allocating dedicated funding for ongoing flood mitigation efforts through the Texas Water Development Board, including flood risk reduction solutions through the Flood Infrastructure Fund, and continued funding for regional flood planning groups, flood risk modeling, and mapping. [Supported by Regions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]

2.1.2 Legislative recommendation 2: Community financial and technical assistance

The legislature should consider establishing and funding a targeted technical assistance program specifically aimed at small, remote, rural, or otherwise socioeconomically disadvantaged communities to develop and/or perform floodplain management activities to protect Texas' most vulnerable communities against loss of life and property. [Supported by Regions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15]

- Targeted assistance for historically disadvantaged communities
- Technical assistance for small, remote, and rural communities

2.1.3 Legislative recommendation 3: Low water crossing safety

The legislature should consider expanding funding to enhance safety at low water crossings, prioritizing improvements based on traffic counts, roadway type, and existing risk levels through structural enhancements and flood warning systems. [Supported by Regions 9, 10, 11, 12]

Low water crossings are prone to frequent flooding and swift water flow conditions, posing a high risk to public safety and loss of life. Funding should be prioritized for low water crossing

improvements based on traffic volume, roadway characteristics, existing risk levels, and the potential use of signage and flood gates.

2.1.4 Legislative recommendation 4: Flood early warning systems

The legislature should consider prioritizing and expanding funding for implementing flood early warning systems on a regional scale, with emphasis on rural areas, to enhance public safety and reduce flood risk to communities. [Supported by Regions 11 and 12]

Flood early warning systems are vital tools for alerting residents and business owners to imminent flooding events, through various communication channels including social media, radio, and reverse 911 calls, prompting timely evacuations and temporary floodproofing efforts.

2.1.5 Legislative recommendation 5: Enhanced dam and new levee safety programs

The legislature should consider developing a levee safety program and enhancing the existing Dam Safety Program to further identify and assess risks to dams and levees. [Supported by Regions 1, 2, 3, 6, 7, 8, 10, 11]

- Creation of a levee safety program [Supported by Regions 1, 2, 3, 6, 8, 10]
- Assistance for local units of government ("sponsors") owning high-hazard dams built by the Natural Resources Conservation Service in partnership with the Texas State Soil and Water Conservation Board with the costs associated with evaluation, repair, maintenance, and upgrade of dams. [Supported by Regions 1, 2, 3, 6, 7, 8, 11]
- Assistance for private dam owners and other governmental dam owners with the costs associated with evaluation, repair, maintenance, and upgrade of dams. [Supported by Regions 1, 2, 3, 7, 8, 11]
- Resources for high and significant hazard dam emergency action plans

Nationwide, approximately 25,000 miles of levees reduce risk to more than 17 million people that live and work behind them. They also reduce risk to almost \$2 trillion in property value and much of our nation's critical infrastructure (USACE and FEMA, n.d.). Texas does not have a state levee safety program nor a state agency that is specifically tasked with inventorying, inspecting, and identifying risks associated with levees. Consequently, the number of people and amount of property value at risk in Texas are unknown.

2.2 Regional flood planning group legislative recommendations

The following recommendations are not TWDB recommendations. The agency is providing the following regional flood planning group recommendations in this state flood plan for consideration by the Texas Legislature. Texas Water Code (TWC) § 16.062(h)(1) requires the regional flood planning groups to identify legislative recommendations they consider necessary to facilitate floodplain management and flood mitigation planning and mitigation. The TWDB considered all regional legislative recommendations when forming its five legislative recommendations. Regional flood planning groups that support each recommendation are listed with the respective recommendation.

2.2.1 Regional flood planning group recommendation 1: Authority of counties, including regarding drainage fees

Consider providing counties with authority to establish and collect drainage fees, at their own discretion, in unincorporated areas. [Recommended by Regions 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15]

Clarify regulatory authority of counties regarding floodplain management. [Recommended by Regions 1, 3, 7, 8, 9, 11, 13]

Note that Chapter 232 of Local Government Code contains authority related to ensuring adequate drainage regarding subdivision platting.

Under Local Government Code, Title 13, Subtitle A, Chapter 552,¹¹ municipalities in Texas have statutory authority to establish public utilities to provide various services to their residents, including drainage. Municipal public utilities can assess and collect user fees to fund operations and maintenance for land acquisition and implement drainage improvement and flood risk reduction problems. These funds create a direct and reliable source of revenue to assist in the implementation and long-term maintenance and repair of drainage and flood risk reduction projects. This same authority is not currently granted to unincorporated areas of counties. This limits counties' abilities to self-finance flood mitigation and drainage projects and provide adequate ongoing maintenance of drainage and flood mitigation infrastructure. Regional flood planning groups recommend that the Texas Legislature should provide counties with authority to establish drainage utilities and assess drainage fees.

The TWDB provides a summary of key relevant authorities here. Despite the existing authorities, described below, many of the regional flood planning groups identified the need to establish authority for drainage fees and utilities in unincorporated areas. The attorney general has made it clear that the county authority requested by the regional flood planning groups does not currently exist.¹² Currently, counties may establish a "flood control fund" and impose ad valorem taxes according to Transportation Code 256.006 and 256.054.¹³

Of approximately 1,450 cities and counties in Texas, fewer than 150 communities have a dedicated drainage fee according to the 2023 Nationwide Stormwater Utility Survey performed by Western Kentucky University.

¹¹ statutes.capitol.texas.gov/Docs/LG/htm/LG.552.htm

¹² www.texasattorneygeneral.gov/sites/default/files/opinion-files/opinion/2005/ga0366.pdf

¹³ <https://statutes.capitol.texas.gov/docs/TN/htm/TN.256.htm#:~:text=Sept.%201%2C%201995.-,Sec.%20256.006.-,USE%20OF%20FLOOD>

As the state National Flood Insurance Program coordinator, the TWDB is working with the Federal Emergency Management Agency (FEMA) and several Texas counties to resolve concerns regarding implementation of National Flood Insurance Program requirements for floodplain management.

2.2.2 Regional flood planning group recommendation 2: Statewide floodplain management standards for infrastructure and buildings for flood risk reduction

The legislature should consider developing and adopting statewide, minimum design standards for infrastructure and building to reduce loss of life and property from flooding. All statewide design standards must be simple and flexible enough to accommodate the broad range of development needs and flood risk conditions across Texas. [Recommended by Regions 1, 6, 7, 11]

Texas does not have statewide drainage design standards. Though some state agencies, like the Texas Department of Transportation, have drainage design standards that are specific for infrastructure they own and operate. Texas Water Code § 16.3145 states, “The governing body of each city and county shall adopt ordinances or orders, as appropriate, necessary for the city or county to be eligible to participate in the National Flood Insurance Program.”¹⁴ The TWDB provides templates for communities to adopt floodplain management ordinances but does not have detailed drainage design standards. Also, the Texas Water Code requirement does not have an enforcement mechanism.

2.2.3 Regional flood planning group recommendation 3: Statewide building codes regarding flood risk

The legislature should consider updating consistent, statewide building codes in a manner to

make Texas eligible for maximum federal Building Resilient Infrastructure and Communities funding regarding flood risk. [Recommended by Regions 6, 7, 10, 11, 13]

Statewide, minimum building codes are needed for improving Texas’ eligibility for federal funding programs like the Building Resilient Infrastructure and Communities program (FEMA, 2023). Statewide codes should take into consideration existing, widely used building codes, including the International Building Code and International Residential Code.

2.2.4 Regional flood planning group recommendation 4: Transportation infrastructure considerations

Studies suggest that more than 70 percent of all flood fatalities occur to motorists that became victims of roadway flooding. Texas consistently leads the nation in flood deaths, and the majority of those deaths are in vehicles. Many accidents, rescues, and deaths occur at low water crossings, and most occur at night (TxDOT, 2021). Several regional flood planning groups made recommendations relevant to transportation.

The legislature should consider the following:

- *Local regulation integration for Texas Department of Transportation [Recommended by Regions 2, 3, 4, 8, 9, 12]:* In areas where local regulations exceed state minimum criteria, state entities should prioritize compliance with local standards to enhance flood resilience at the community level.
- *Critical infrastructure (roadways and bridges) protection: [Recommended by Regions 2, 3, 5, 6, 7, 8, 9, 12, 13]:* It is essential, particularly for critical infrastructure like evacuation routes and emergency roads, for state entities to meet the National Flood Insurance Program minimum standard for flood protection equivalent to or greater than the 1 percent (100-year) annual chance storm event.

¹⁴ <https://statutes.capitol.texas.gov/Docs/WA/htm/WA.16.htm#:~:text=September%201%2C%202007.-,Sec.%2016.3145,-NATIONAL%20FLOOD%20INSURANCE>

- *Minimum elevation standards for roadways [Recommended by Regions 6, 10, 12]:* Public infrastructure, including roadways that serve as an evacuation route, to the extent practical, should follow design criteria that requires new and reconstructed infrastructure to be designed and constructed at elevations at or above the 1 percent (100-year) annual chance storm event, with consideration of future flood risk, including as a result of increased urbanization.

2.3 TWDB general recommendations for floodplain management

Per Texas Water Code § 16.061(a)(2), the state flood plan must “be a guide to state and local flood control policy.” As such, this plan includes several broad recommendations regarding floodplain management that can reduce the risk to life and property from flooding. The following recommendations are aimed at protecting lives and property and are based on recommendations from regional flood planning groups as well as the TWDB’s experience working closely with Texas communities. These general recommendations may be implemented locally, ideally at the watershed level, and are provided for consideration by anyone in Texas looking to reduce flooding threats to life and property in their local or regional community by better managing the floodplain.

Floodplain management, land use, infrastructure design, and other practices play a key role in reducing existing risk and impact to life and property and, importantly, avoiding increase or the creation of new flood risk by addressing future development within the areas known to have existing or future flood risk.

The planning groups developed recommendations regarding forward-looking land use and

floodplain management practices and economic development strategies that should be implemented by entities within each flood planning region. When doing so, they recognized the extent to which past development decisions may have increased flood risks—including residual risks—and considered broad floodplain management and land use approaches that will avoid increasing flood risks and negatively affecting neighboring areas.

There are a wide variety of means by which states and local communities may implement floodplain management practices to reduce flood risk. The regional flood planning groups made over 150 floodplain management recommendations in their 2023 regional flood plans. Figure 2-2 provides a summary of the broad range of recommendations the TWDB considered when developing the general floodplain management recommendations. Additional detailed recommendations regarding floodplain management best practices are in Chapter 5.

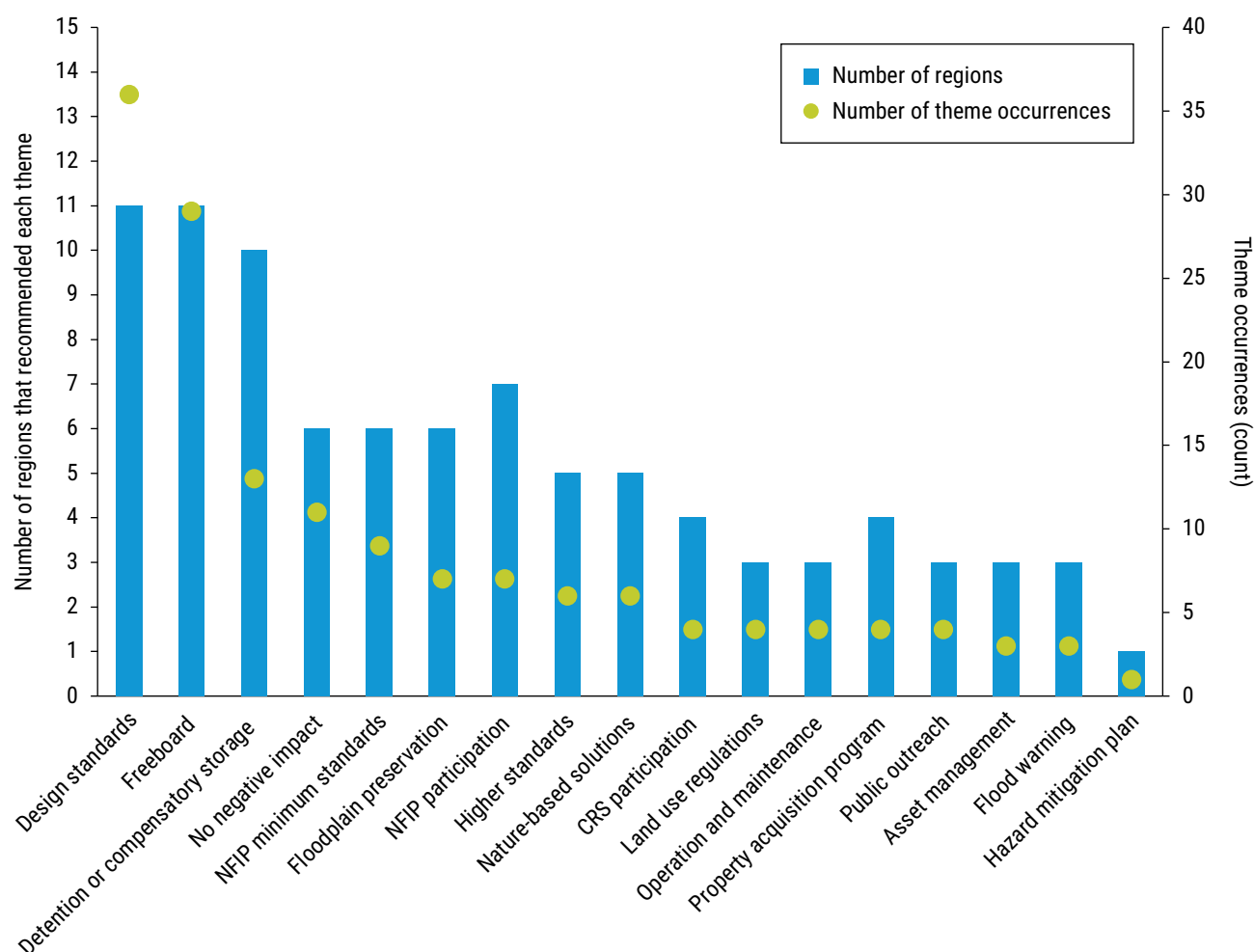
The following are floodplain management recommendations for consideration by communities and/or state agencies, as applicable.

2.3.1 Floodplain management recommendation A: Existing minimum FEMA floodplain standards required for cities and counties under Texas Water Code § 16.3145 and recommendations for higher standards

Table 2-1 summarizes existing requirements under FEMA’s National Flood Insurance Program standards and recommendations to consider for associated higher standards. The TWDB recommends considering the Federal Flood Risk Management Standard developed by FEMA, where appropriate, while developing the design guidelines or flood management standards.¹⁵

¹⁵ www.fema.gov/floodplain-management/intergovernmental/federal-flood-risk-management-standard

Figure 2-2. Summary of floodplain management recommendations made by the regional flood planning groups



CRS = Community Rating System

NFIP = National Flood Insurance Program

Implementing higher standards in floodplain management can result in savings in avoided damages from flood events. Prevention has been found to be a good investment. According to the National Institute of Building Sciences, U.S. disaster losses from wind, floods, earthquakes, and fires now average \$100 billion per year and in 2017 exceeded \$300 billion. The benefits and costs associated with mitigation measures, including adopting and strengthening building codes, upgrading existing buildings, and improving utilities and transportation systems, have also

been reported to save up to \$13 per \$1 invested (NIBS, 2020).

2.3.2 Floodplain management recommendation B: Enhance current floodplain management activities

- Encourage National Flood Insurance Program participation and adoption of minimum floodplain management practices for all Texas communities, including ensuring development is in line with current flood risk assessments.

Table 2-1. TWDB recommendations for higher floodplain management standards

Description of select minimum FEMA NFIP standards ^a	Recommendations to consider for higher standard ^b
1 Managing flood risks to at least the 1 percent (100-year) storm event, in accordance with NFIP minimum standards.	Consider developing standards for a range of flood event frequencies starting with 50 percent (2-year) events up to 0.2 percent (500-year) events.
2 Restricting development and use of fill within SFHA to prevent increasing the risk of flooding.	Consider setting a baseline of criteria ensuring safe development in flood prone areas, including limiting construction within certain high-hazard areas, such as within 10 percent (10-year) annual chance floodplain, and considering flood mitigation approaches, such as detention requirements for new developments, as appropriate.
3 Requiring elevation of the lowest floor of all new residential buildings and substantial improvements to buildings in the SFHA to or above the BFE or the 1 percent (100-year) annual chance water surface elevation.	Consider requiring a minimum freeboard for finished first floor elevation of buildings, (e.g., 1 foot to 2 feet above the BFE and/or an elevation equivalent to a 0.2 percent [500-year] flood event, especially for critical infrastructure) for all new development and substantial improvements within the 1 percent (100-year) annual chance floodplain, as applicable.
4 Requiring that development in floodplains not increase the base flood elevation by more than 1 foot to ensure no negative impacts on other properties from proposed projects.	Consider adopting smaller allowance for increases to the base flood elevation (less than 1 foot) to limit negative impacts and the potential cumulative impacts of new developments, including those outside of floodplain.
5 Requiring certain construction materials and methods that minimize future flood damage, in accordance with NFIP minimum standard.	Consider meeting flood protection aspects of the 2018 or 2021 versions of International Building Code for all new development and substantial improvements within the 1 percent (100-year) annual chance floodplain, as applicable.

Note: When modifications to a building are made that exceed 50 percent of the replacement value, these modifications are considered by FEMA to be substantial improvements.

^a Currently required for all counties and cities under Texas Water Code § 16.3145.

^b Exceeding the minimum NFIP standards may lead to lower NFIP insurance costs, both at the individual property level and community-wide, if the community participates in the Community Rating System.

BFE = Base flood elevation, which is an estimate of the 1 percent flood level

FEMA = Federal Emergency Management Agency

NFIP = National Flood Insurance Program

SFHA = Special flood hazard area, which is the area within the 1 percent (100-year) annual chance floodplain

- Enhance coordination among state agencies for floodplain management. Improve education for state agencies that perform a variety of permitting functions, such as
 - Texas Parks and Wildlife Department for park properties,
 - Texas Department of Licensing and Regulation for mobile home installations, and
 - The Railroad Commission of Texas for propane tank installations. *[Supported by Regions 13, 14]*

2.3.3 Floodplain management recommendation C: Nature-based solutions

- Seek ways to provide funding and incentives for incorporating nature-based solutions, such as open space and floodplain preservation for development or drainage projects.
- Water needs space to flow. Consider leaving adequate space for water to flow today so it can prevent increasing or creating new flood risk to life and property in the future. *[Supported by Regions 1, 4, 5, 6, 10, 11, 13]*

2.3.4 Floodplain management recommendation D: Asset management

- Generate and maintain a statewide inventory and assessment of major flood infrastructure. This is a large effort that will require dedicated resources and funding at the local level.
- Provide statewide guidance on how to best manage drainage and floodplain assets.

2.3.5 Floodplain management recommendation E: Education and outreach

- Seek to improve awareness and ways to mitigate risk at low water crossings. Examples include improved mapping of locations, improved flood warning, and increased or prioritized grant funding.
- Improve public flood education and outreach. Improve coordinated messaging between all agencies (federal, state, regional, local). Increase targeted marketing campaigns through avenues like social media, print media, TV, and billboards.
- Increase regional and statewide activities related to flood warning. Support National Weather Service release of new Flood Inundation Mapping products in late 2023. Improve guidance and outreach related to developing flood warning systems and flood sensors.

2.3.6 Floodplain management recommendation F: State flood planning

- Maintain coordination between the Texas Division of Emergency Management's state hazard mitigation planning and the TWDB's state flood planning processes.
- Seek to incorporate state flood planning into other statewide planning processes, such as Texas Department of Transportation planning, Texas Parks and Wildlife Department planning, and Texas Facilities Commission planning.

References

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