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Texas' Walled City

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Throughout history cities have built protective walls to keep inhabitants safe from enemy armies, from wild animals, and from destructive forces of nature.

This year a small Texas town is surrounding itself with a wall to protect its residents from an enemy which has descended upon them many times in the past.

The town's name gives a clue to its vulnerability. Three Rivers, Texas, lies in the floodplain of three rivers: the Nueces, the Frio, and the Atascosa.

Three Rivers has suffered many floods in its 68-year history, but its citizens remember most vividly the flood associated with Hurricane Beulah in 1967. James Nance, mayor of Three Rivers, recalls that was the time when over half of his town was under water. Nine feet of water covered the local school buildings, and three feet stood in the downtown business district.

Shortly after the 1967 flood, the worst ever recorded in that area of the state, Nance and other community leaders contacted their U.S. Representative, Kika de la Garza, to see what could be done to prevent Three Rivers from "going under" another time.

Within two years, the U.S. Army Corps of Engineers had a design and the authority to construct a flood control project to protect Three Rivers from future flooding. The design consisted of levees, concrete walls, and holding ponds which would completely encircle the flood prone area of town.

There was, however, one catch. As in all local flood protection projects undertaken by the Corps, the land acquisition and easements had to be provided by the city or some other local interest. According to estimates, the town--with less than 2,000 population at the

time--would have to come up with a quarter of a million dollars to meet the Corps requirements for land and easements.

For the next nine years, little action was taken on the project. Minor floods kept residents aware of their vulnerable location, however, and prime land in the downtown area remained undeveloped. Congressman de la Garza and the Corps of Engineers kept the project updated and ready for implementation.

Eventually, residents passed a bond issue in 1978 to provide local funds for the project. Then the long process of buying land and easements began. Nance himself shouldered much of the responsibility for acquisition of the 348 acres of easements required for the levee, the holding pond and drainage work. One-third of the acreage required was for "borrow areas" where dirt would be removed and used to build the levee.

Part of the land needed was donated, but the city had to purchase the rights to use most parcels. A few locations required condemnation proceedings which cost the city additional time and money for legal fees. Another major cost to the city involved relocation of nine houses.

Nance obtained the last easement for the project in January of 1981. Two months later, the Corps contracted with Sherwood Construction Company to build the entire project to be completed before the end of the year.

Three Rivers residents will then be able to relax when rain is in the weather forecast for they will be completely surrounded by a flood protection "wall." Four and one-half miles of wall will be in the form of a 100-foot-wide earthen levee rising 18 feet above natural ground level. Where space is too limited for the levee, 12-foot-high concrete walls will protect the city from flood waters.

The remainder of the project, protecting Three Rivers on its northern side, is a holding pond designed to contain runoff from as much as 17 inches of rain. While the levee and holding pond hold the flood waters of the rivers away from the downtown area, a new drainage system will carry rain falling inside the wall to the holding pond to be released when floodwaters outside have subsided.

When complete, the wall will mean that the two-thirds of the bustling town of 2,500 will no longer be considered a high flood risk. It will also mean that the prime building areas near the downtown area and an industrial area around the expanding Sigmor refinery will be ripe for development.

One Small Eample

The wall and drainage work to protect Three Rivers from future flooding will cost federal and local taxpayers an estimated seven million dollars. The project is an expensive remedy to a problem created because a small town was built in an area certain to flood.

The Three Rivers project, however, is but one small example of urban flood control projects in the state. Widely diverse flood problems plague towns and cities across the state and literally demand millions of future tax dollars for solutions.

- There are, for instance, 1,200 Texas communities identified by the Corps of Engineers as having present or potential flood problems.
- Every one of the state's largest cities--Houston, Dallas, San Antonio, El Paso, Fort Worth, and Austin--have major developments in flood prone areas.
- Both Dallas and Fort Worth have continuously planned or constructed flood control projects for more than 50 years, yet there are still flood control projects on the drawing board in both cities.
- The Corps of Engineers has designed a $160 million project to construct 155 miles of floodwater channels for flood protection in the Rio Grande Valley.
- In semi-arid El Paso, where they call streambeds "arroyos," a $90 million project is underway to carry flood flow from mountain slopes through and around El Paso into the Rio Grande.
- Streams are called "bayous" in Houston, but when they flood, the results are disastrous. Recent widely-publicized flood damage in Houston is evidence enough that even though there have been several major Federal flood control projects to protect the city, there is much yet to be done in floodplain planning and protection.
- A flood control project begun in San Antonio in 1955 is certainly the best known and most loved project in Texas. Concrete-lined channels move the San Antonio River through the downtown area in such an attractive way that tourists from all over the world come to enjoy this unique, but not yet completed, flood control project.

Everyone Pays

Urban flood control projects--necessary because Texas cities have developed in the path of flood swollen rivers--must be financed by the taxpayer. Most projects financed federally through the Corps of Engineers or paid for locally through bond issues fall into the following broad categories:

- Floodwaters held by dams upstream to be released in a controlled flow when flood danger has passed.
- Floodwaters diverted away from a developed area, as in Three Rivers, with earthen mounds called levees or with concrete walls.
- Natural stream channels improved by widening, dredging, clearing, lining with concrete, or raising stream banks.

Many other costs associated with urban flooding are borne by the entire community--not just those citizens who choose to live or build in the floodplain. A community must offer emergency services and maintain streets and utilities in flood prone areas if citizens are allowed to build there. Drainage improvements such as channelization, levees, and regulatory procedures cost a city whether there is ever a flood or not.

Citizens outside the floodplain pay another price in inconvenience as vital services such as transportation, medical, electrical, gas, and telephone are disrupted because of flooding in specific areas.

Future Alternatives

It would be impossible physically and economically to move the thousands upon thousands of Texans who now live in the floodplain. It is both logical and feasible, however, to define the floodplain in a city and then to regulate future activity in that area. Floodplain planning and management in urban areas is essential, both in developed areas where protective measures must be taken and in areas not yet developed.

Texas cities have been timid in using their zoning powers and their plat approval authority to regulate development in floodplains within their city limits or their extra-territorial jurisdiction. This is due in part because legal precedents on the limits of floodplain regulations are not firmly established at this time.

Local floodplain regulations, however, are authorized in Texas by state law. The Water Code declares that any political subdivision may adopt floodplain regulations for Federal flood insurance purposes and may provide appropriate relief from flood losses through sound land use regulations.

The following are some of the legal tools available to Texas cities to reduce flood losses in the future.

1. Zoning may be used to implement and enforce detailed plans from land use planning programs. Designated floodways may be reserved by establishing lines that clearly define flood zones.

2. Subdivision regulations may be used to specify such things as widths of streets, curbs and gutters, lot sizes, elevations of land to avoid area flooding, size of floodways, and other requirements affecting the welfare and safety of the community.

3. Building codes can contain provisions that assure the structural soundness of buildings during flood periods.

4. Flood-conscious governmental policies limit the extension of public roads, utilities, and other services into flood prone areas and play an important indirect role in shaping the overall development in the floodplain.

5. Continuing study and review of floodplain management and keeping citizens informed are important in maintaining long-range appropriate land use.

Texas cities have an obligation to do their utmost in protecting developed areas from flooding. They have an even more urgent responsibility, however, to see that undeveloped areas do not become flood protection burdens in the future.

Floods are not natural disasters. They are not disasters at all unless man has moved into the path of a flood-swollen river.

The land adjacent to river channels is the natural, normal, proper conveyance for the transmission of floodwaters. Unfortunately this same land has been the most attractive for man to develop. Floodplains have offered the most fertile farmland, the most desirable locations for factories, the most convenient locations for transportation and power, and often the most attractive places to build houses.

The need for floodplain management in Texas is well documented in a study by John McNeely and Ronald Lacewell. The two agricultural economics professors at Texas A&M University have written a series of four books on land and water management in Texas.

All four books published by the Texas Agricultural Experiment Station are valuable to Texans interested in the control and management of the state's surface waters. Even though the books were published between 1975 and 1978, information and ideas presented remain current and useful.

Free copies of the following are available by writing the Texas Water Resources Institute, College Station, TX 77843, or calling (713) 845-1851:

Rural Land Resource Problems... A Need for Planning
Surface Water Development in Texas
Water Resources Uses and Issues in Texas
Flood Plain Management