



Commerce Street Bridge during the May 25, 1908, Trinity River flood that inundated Dallas.

## Trinity River Corridor Project Chronology

*A hundred years ago floodwaters swamped a growing city on the banks of the Trinity River, a historic touchstone for Dallas. The 1908 Dallas flood killed 5, left 4,000 homeless and caused millions of dollars in property damage. It unleashed decades of efforts to build a modern floodway system to protect Dallas as it quickly grew to become one of the nation's 10-largest cities and focal point of a metro area of 6.5 million people. Protection efforts included building sump areas and pumps, flood-control reservoirs upstream and fortifying levees to contain an 800-year flood.*

- 1911** – Landscape architect George E. Kessler produces a master plan for the growing city, which included a levee system to control the Trinity River. It's not until 1919 that a revised Kessler Plan is embraced that includes levees, streets, playgrounds, parkways, parks and rail transportation facilities. Planning and funding take nine more years.
- 24 June 1928** – Construction begins on a massive floodway improvement project. One thousand men are employed for 700 working days. Up to 15 draglines, working 24 hours a day, move 22 million cubic yards of dirt to build the East and West Levees and move the river a half mile west to the middle of the floodway.
- 1930s** – Impact of tight finances from the Great Depression hurts operations and maintenance of the levee system.
- 1942** – The levees hold an April flood – largest peak flow since the 1908 flood – but worries persist about the poor shape of the levees.
- 1945** – 49<sup>th</sup> Texas Legislature refinances existing levee debt and reorganizes Dallas levee districts to provide a revenue stream from the state. Law's language acknowledges another flood like April 1942 could break the levees.
- 1948** – U.S. Army Corps of Engineers Galveston District documents the poor condition of the Dallas levees, including numerous levee slides, severe levee cracking and levee subgrade issues regarding potential seepage.
- May 1949** – Trinity River flood kills 11 in Fort Worth and causes \$11 million in damages to the business district.
- 1950** – In the 1949 flood's wake, Congress commissions a new Corps of Engineers District in Fort Worth to carry out flood control projects in the Upper Trinity Basin in Dallas and Fort Worth, and to take over construction of a series of upstream reservoirs: Lake Lewisville (impounded 1955), Grapevine Lake (1952) and Benbrook Lake (1952).
- 1950s** – Major Corps Dallas Floodway reconstruction project begins. It deepens the river channel, modifies levees to flatten the levee slope to 3-1, increases the levee crown width to 16 feet and improves the interior drainage system. The Dallas Floodway in this iteration is designed to carry 226,000 cubic feet per second (identified as the Standard Project Flood providing protection against a flood likely to happen once every 800 years) with four feet of levee freeboard.
- 1958** – Dallas Floodway reconstruction project completed.
- 1960** – Two major forces over time combine to reduce the effectiveness of the newly completed Dallas Floodway for decades onward. First, significant urbanization in Dallas-Fort Worth increases the runoff produced by the Trinity River watershed upstream. This increases the water flow volume anticipated for the Floodway's Standard Project Flood 800-year event. Second, a significant land use change just downstream from the Floodway also cuts the system's capacity. Thousands of acres of primarily privately owned farmland gradually reverts to woodlands and creates a more robust Great Trinity Forest that slows the discharge of waters from the Floodway.
- 1968** – The state-authorized Dallas County Flood Control District expires under sunset provisions and its Floodway maintenance and operations are assumed by the cities of Irving and Dallas within their respective boundaries. The Corps continues its oversight and inspections and coordinates with both cities.
- 1986** – Joe Pool Lake comes online for additional flood control capacity.
- 1988** – The Fort Worth District begins studying the Upper Trinity River Basin, focusing on flood risk management. Twelve areas found to be at a greater risk of flooding and warranting further study.



**June 1989 flooding, above, is the worst in the Dallas Floodway in 40 years. Storms return in the aftermath of Hurricane Norma in October. The president declares Dallas County a disaster area.**

**1989** – Two flood events. One, in May-June, causes \$12 million damages from Eagle Mountain Lake in Fort Worth to South Dallas to Kaufman County. Several drownings result. Mansfield records overnight rainfall May 16-17 of 13 inches; Lake Arlington emergency spillway is used for the first time. It's the worst Dallas flood in 40 years. Trinity River crests at 43.3 feet in Dallas. Later in October storms from the aftermath of Hurricane Norma do \$6 million damage. President declares Dallas County a disaster area: 30 homes destroyed, another 450 homes and businesses damaged.

**1990** – Yet another major flood becomes the flood of record for the Dallas Floodway. Heavy rains all April climax in two storms April 24-27 and May 1-4. Damage totals \$300 million to Trinity River Basin; 28 counties in the basin declared disaster areas by the state including Dallas, Denton, Collin and Tarrant counties. Trinity River crests at 47.1 feet in Dallas, highest since 1908. Some 200

houses and business are flood-damaged in Rochester Park, two dozen houses damaged in Southeast Dallas and Oak Cliff. Local damages pegged at \$30 million.

**1991** – Major flooding in April, October and December. Rainfall breaks 51-inch annual record set in 1932. A 20-year flood in December sends the Trinity River crest over 44 feet at Dallas. Nine deaths attributed to the floods and \$242 million in damages. Rochester Park Levee is partially constructed when the flood hits. Dallas and Tarrant counties declared disaster areas.

**1989-1991** – The extended rainy period for the Upper Trinity River Basin upends predictions. Design engineers for Lake Benbrook in Fort Worth, which was completed in 1952, had estimated that the Trinity River flood control reservoir would rise as high as the 710 foot spillway elevation only once every 40 years, and that elevations of 715 feet or greater would be reached only once every 100 years. Yet the lake levels reached 717 feet in May 1989, 718 feet in May 1990, and 713 feet in December 1991, contributing to the flooding downstream in Dallas.

**1994** – Central Wastewater Treatment Plant Levee, originally built in 1940s, is raised by the City.

**1998** – Dallas voters authorize the largest bond package in city history – \$246 million – to fund flood control, transportation and recreation projects in the Trinity River Corridor.

**1999** – Congress adds Rochester Park and Central Waste Water Treatment Plant levees to Dallas Floodway Extension project.

**2001** – Dallas Floodway Extension Project initiated to construct a chain of flood control wetlands, the Cadillac Heights and Lamar Levees, improve existing Rochester Park and Central Wastewater Treatment Plant Levees and add recreation features immediately downstream of the existing Dallas Floodway.

**2003** – City of Dallas writes the long-range Balanced Vision Plan to reclaim the Trinity River as a great natural resource and unique public domain and a model of environmental stewardship that embodies the spirit of the Kessler Plan idea of nearly a century before.

**2004** – Cell D is the first Chain of Wetlands in the Dallas Floodway Extension Project to be excavated. Plantings and ecosystem management begin in 2005.

**29 August 2005** – Hurricane Katrina hits New Orleans. More than 1,500 lives are lost. Heavy rainfall delivered 14 inches in a 24-hour period. Surge and waves caused 50 major levee breaches and 169 of the system's 350 miles of protective structures were compromised. Approximately 80 percent of New Orleans was flooded. The nation's costliest disaster forced the Corps to improve how it evaluates levee safety and its overall Levee Safety Program.

**November 2007** – The Dallas Floodway Project was authorized for construction by Congress in the Water Resources Development Act of 2007 at a total project cost of \$459 million, with an estimated Federal share of \$298

million and non-Federal share of \$161 million. The project will focus on restoring a 800-year level of protection for the section of the Dallas Floodway System upstream from the abandoned Atchison, Topeka and Santa Fe trestle, past downtown Dallas to several miles beyond the confluence of the West Fork and Elm Fork of the Trinity River.

**3-5 December 2007** – Corps conducts Periodic Inspection No. 9 for East and West Levees and Periodic Inspection No. 1 for Rochester Park and Central Waste Water Treatment Plant Levees, all located in the Dallas Floodway System. In the post-Katrina era, the Corps changes its levee inspection and reporting methodology, which slows writing of this Periodic Inspection report.

**2008** – Cell G is the last of the Lower Chain of Wetlands in the Dallas Floodway Extension Project to be excavated. Four operating wetland cells are now lowering floodwaters in the Dallas Floodway upstream by speeding flows downstream and reducing the flood risk for Dallas.

**31 March 2009** – Final Periodic Inspection report delivered to the city rates the Dallas Floodway System “unacceptable” meaning that it would not contain a Standard Project Flood (an event that has a one-in-800 chance of happening in any given year). The Federal Emergency Management Agency then de-accredits the Dallas Floodway and begins the process of re-drawing a new 100-year floodplain map for the city. Of 214 items, the Corps inspection rated 91 “acceptable,” 80 “minimally acceptable” and 43 “unacceptable.” Those items deemed unacceptable fell into the

following categories: insufficient levee crest height, encroachments and penetrations that could impact levee performance (or reduce levee access for maintenance/flood-fighting), damaged gate closures, cracking in the levees, erosion, vegetation, siltation and channel instability.



**A mature Cell D wetland in 2011. The Dallas Floodway Extension wetlands built by the U.S. Army Corps of Engineers lowers the flood risk for Dallas and creates new habitat.**



**A March 2006 flood near the Pavaho Sump in West Dallas. Construction now under way at the Pavaho Pump Station should improve interior drainage outside the levees.**

**March 2009** – Fort Worth District establishes Trinity Program Office embedded at Dallas City Hall to aid collaboration and communication with the levee sponsor to remedy issues highlighted in the Periodic Inspection.

**June 2009** – Corps approves city’s Floodway Maintenance Deficiency Correction Plan.

**October 2009** – Corps approves city’s Standing Wave feature as a Section 208 recreation project.

**December 2009** – Corps approves construction of Margaret Hunt Hill Bridge.

**August 2010** – Corps approves construction of the Pavaho Pump Station that will improve interior drainage outside the levees in the West Dallas neighborhood.

**July 2011** – U.S. Army Corps of Engineers determines that a new Risk Assessment process is necessary. It will

be utilized for the Dallas Floodway Feasibility Study that will assess what needs to be done to bring the levees back to the 800-year level of protection. The process will eliminate future re-work. It is an approach for identifying the most effective ways to reduce risk as low as reasonably practical within cost constraints..

**31 October 2011** – HNTB, the city's engineer consultant, files a final draft of Section 408 application. It is a plan to provide a 100-year level of protection to Dallas to meet FEMA insurance requirements for drawing a new floodplain map. If the Corps of Engineers approves Section 408 application, construction would start and finish during 2012.