

## **Supporting Studies**

### **Leading up to and verifying USACE Central City Project**

#### **Mid-1980s: Growing concern about flooding due to population growth**

There was general understanding that flood hazards had already increased during the years subsequent to construction of the floodway system in the 1950s and that the level of flood protection in the regional system had deteriorated. Responding to that concern nine municipalities, three counties and TRWD petitioned Congress for a new study authority to examine the issue.

#### **April 22, 1988: U.S. Senate Committee on Environment & Public Works Resolution**

In response to the request, Senate EPW authorized USACE to investigate the potential flooding problems and opportunities in the Upper Trinity River Basin to provide improvements in the interest of flood protection, environmental enhancement, water quality, recreation, and other allied purposes.

#### **Fall 1988: Trinity River and Tributaries Environmental Impact Statement**

With Senate authorization, the Trinity River and Tributaries Environmental Impact Statement (TREIS) was prepared by USACE to address the increase in floodplain development that was occurring in the Upper Trinity River basin. The TREIS raised awareness that a large area of floodplain lands within the Upper Trinity River Basin could be developed outside the jurisdiction of the USACE which would cause increases in flooding frequency to adjacent and downstream areas. This awareness led to one of the main conclusions of the TREIS planning efforts, existing regional floodplain management policies were inadequate to maintain existing levels of flood protection within the region's major urban areas. Development in areas outside USACE jurisdiction will further increase flooding frequency.

#### **1988-1990: Development of the Corridor Development Certificate Process**

In response to the TREIS finding for greater floodplain management policies to limit the continued increases in flooding frequencies, the Corridor Development Certificate (CDC) program was initiated. It is a joint effort of the NCTCOG, the USACE, and member NCTCOG cities and counties with jurisdiction over the Trinity River floodplain. It investigates the adjacent and downstream impacts of site-specific impacts.

#### **March 1990: Upper Trinity River Basin, Trinity River, Texas -- Reconnaissance Report**

The TREIS and CDC heightened regional awareness relative to flood hazards. The study affirmed that urban development had exceeded previously projected expectations causing increased runoff and peak discharges. The process generated broad recognition that flood hazard could (and would) deteriorate in the future. The report also found that while adherence to the CDC and the mitigation outlined in the TREIS could stabilize the existing flooding situation, following these guidelines would not restore the level of protection that had been lost in the decades between the 1950s and the 1980s. Eleven flood control concepts were identified for future studies.

### **August 1990: USACE/NCTCOG Upper Trinity River Regional Feasibility Study**

Following the Reconnaissance Report, USACE and the North Central Texas Council of Governments (NCTCOG), acting as local sponsor for the original 13 concerned governments, executed a Feasibility Study Cost Sharing agreement to conduct joint investigations into water resource problems. The original intent of the Feasibility Study was to conduct more rigorous investigations of the flood control concepts preliminarily identified in the Reconnaissance Report. This same agreement has provided the operating framework for a number of site-specific investigations of flood control projects throughout the region, of which the Central City project investigation later became one.

### **1995: USCAE Upper Trinity River Basin, Texas Information Paper, “A Benefit-Cost Analysis”**

In 1995, an “information paper” was issued by USACE containing the study results of the flood control concepts that were identified in the Reconnaissance Report to date. Some 88 feasible multi-purpose measures were identified and evaluated. Of particular significance was a finding that a detention structure on the West Fork in Wise County would mitigate flood hazards in Tarrant County; however, the citizens in Wise County strenuously objected to further study of the concept, local sponsorship faded and the Boyd Detention Structure in Wise County died by 1999.

### **1999: Streams & Valleys “Tilley Plan”**

The intense public dialog surrounding preparation and release of the Information Paper generated additional planning activity at the local level in Fort Worth. Streams & Valleys, an independent non-profit, initiated a broad scale community-based effort to develop a Master Plan for the river in Tarrant County. This plan, completed in 1999, was often referred to as the “Tilley Plan.” The Master Plan focused on recreation-oriented improvements; however, the plan recognized the flood protection function of the Trinity River Floodway System. As TRWD began to implement portions of the Tilley Plan, focus shifted back to the USACE and the opportunities identified in the Information Paper because there was a high degree of compatibility between many of the initiatives identified in the Information Paper and the Tilley Plan.

### **1999: Clear Fork/West Fork Interim Feasibility Study**

USACE and TRWD entered into a cost-sharing agreement, conducted under the umbrella of the 1990 Upper Trinity River Feasibility Study, to prepare a comprehensive study of the Clear Fork and West Fork of the Trinity River in Fort Worth. TRWD entered into this cost-sharing agreement as a subset to the umbrella agreement because this body of work was for the investigation of a specific area with the Upper Trinity River Regional Area which would not have impacted that other parties to the original umbrella study of the region. Early scoping of the cost-shared Clear Fork/West Fork Interim Feasibility Study identified nine river segments having numerous opportunities for flood damage restoration and ecosystem restoration. Of particular interest was flooding and annual damages in the study area associated with the sump system for the Fort Worth Floodway. Several alternatives, including buyout programs and excavation to increase sump capacity were preliminarily evaluated, but no measures were found to be economically viable under the USACE Federal criteria.

### **June 2000: USACE Upper Trinity River Basin – Final Programmatic Environmental Impact Statement**

During the same period that TRWD and USACE were working on the Clear Fork/West Fork Feasibility Study, the Fort Worth District of the USACE was in the process of: completing a feasibility study on a flood control project along Johnson Creek in Arlington, initiating interim feasibility studies for Trinity River projects in Dallas, and initiating another interim feasibility study with TRWD on the Riverside Oxbow Project in Fort Worth.

Because of the wide variety of initiatives being studied under the Clear/ West Fork Interim Feasibility Study, the USACE concluded that adequate evaluation of the cumulative impacts of these projects required a programmatic environmental evaluation. The National Environmental Policy Act of 1969 (NEPA) requires Federal agencies to fully document and evaluate the cumulative impacts of proposals, as well as the direct and indirect impacts. Accordingly, concurrent with the USACE/TRWD Clear Fork/West Fork Interim Feasibility Study, work was initiated on the USACE Upper Trinity River – Final Programmatic Environmental Impact Statement.

Most importantly, this EIS set the stage for focused evaluation of discreet segments of the river (such as the Central City Segment) for flood damage reduction, ecosystem restoration, and recreation purposes.

### **2001-2003: Streams & Valleys, City of Fort Worth, TRWD - Trinity River Vision Master Plan**

Jointly, local Fort Worth agencies and organizations undertook the creation of a new Master Plan for the river, titled “Trinity River Master Plan.” The purpose of the plan was to create a vision that would combine stormwater runoff, flood control and improved quality of life enhancements. The community-input process consisted of over 200 public meetings. In October 2001, the input was provided to several urban planning and hydraulic experts in a two-day public workshop that focused on the central city area of the Clear Fork and West Fork. The experts evaluated the community input and the condition of the current levees. The outside experts proposed the same plan that solved San Antonio’s flood challenges, a bypass channel and flood gates. Workshop participants believed the bypass channel concept could meet all of the community’s goals. The Master Plan was adopted by the City of Fort Worth, Tarrant County and TRWD in 2003.

### **April 2003: Trinity River Floodway Channel Realignment Study**

With the ability to focus on discreet segments of the river for flood damage reduction, and the community’s desire to pursue the viability of a bypass channel to resolve Fort Worth’s deteriorating level of flood protection, the technical feasibility of a bypass channel approach was explored. The technical companion engineering study was titled, *Trinity River Vision: Evaluation of the Trinity River Floodway Channel Realignment*. This study was funded by TRWD and a Texas Water Development Board grant.

### **May 2003: Riverside Oxbow Feasibility Study**

The USACE flood project from the early 1960’s left the Riverside Area in a challenged state. The area flooded regularly but when not inundated the area had little viability. The early flood management effort stripped the area of most of the indigenous environment. The Riverside

Study was to restore the condition that early flood management efforts had left behind. USACE technical evaluation and cost review studies led to the recommendation to move forward with federal efforts having received Approval by USACE Chief of Engineers. Project did not move forward for lack of support by OMB.

### **2003 – 2004: Central City Interim Feasibility Study**

The community's Trinity River Vision Master Plan for the river and the companion engineering study, Evaluation of the Trinity River Floodway Channel Alignment required focused resources and attention on the Central City segment of the Trinity River. To accomplish this effort, in May 2004, the USACE and TRWD agreed to modify the Project Management Plan for the West Fork/Clear Fork Interim Feasibility Study to focus exclusively on problems and opportunities in this river reach. Analysis from the Clear Fork / West Fork Interim Feasibility Study indicated that 86% of the Fort Worth levee system no longer provided the level of protection that is was designed to deliver – and Fort Worth had nearly doubled in size since the levees were designed.

### **2004-2006: USACE Upper Trinity River Central City Environmental Impact Statement**

Many prior studies had identified decades of deteriorating flooding conditions, enormous population growth contributing to increased flooding frequency and an understanding that 86% of the levees in Fort Worth were no longer adequate to protect the community. With that information, Congress authorized USACE to conduct the Environmental Impact Statement for the Central City Project to determine if there was technically sound and environmentally acceptable solution according to USACE criteria.

### **February 2005: USACE Economic & Fiscal Impacts Study of Central City Project**

USACE hires University of North Texas, Economic Research Department, to conduct an economic analysis of the Central City project to determine the economic and fiscal impacts of the project as part of the USACE Environmental Impact Study for Central City.

### **April 2006: USACE Record of Decision for Central City Project**

During the EIS evaluation, USACE investigated three alternatives to Fort Worth's outdated levee system: no changes, raise the levees, or the introduction of a bypass channel option. No changes just accepted the given risk which failed to solve the issue. Raising the levees increased both the height and width of the levees. The expanded levee footprint required the taking of a disproportionately large footprint of the properties that the study was trying to protect thereby making the costs of the project disproportionate to the benefits. The channel provided the greatest benefits with the least negative impacts. The channel restores protection to over 2,400 acres of neighborhoods at a cost of \$435 million.

### **June 2006-2008: USACE Modified Central City Supplemental Environmental Impact Study**

At the request of the City of Fort Worth, USACE evaluates the benefits and costs of merging the USACE Central City Project and another local USACE project, Riverside Oxbow. The City asked for the study because previous flood management efforts stripped the area of its indigenous qualities. The City of Fort Worth hoped that the area could be repurposed to better handle both flood waters and deliver the original ecosystem restoration goals that was the main purpose of the original Riverside Oxbow project. To assure a comprehensive analysis the total

hydraulic system including the Central City and Riverside Oxbow areas and the channels upstream and downstream of these areas was evaluated.

**May 2008: USACE Independent Technical Review (ITR)**

Supplemental EIS process requires an independent review by another USACE District that has no knowledge of the Modified Central City Project. The outside technical review is a peer review that examines the data, findings and recommendations to affirm whether the flood challenges have been addressed and if there are any ways to mitigate (lessen) impacts of the project to be constructed.

**May 2008: USACE Independent Cost Review (ICR)**

Walla Walla, USACE, is the USACE Project Center for Excellence which performs all USACE ICRs for in the country. The ICR was required as part of the Supplemental EIS. Walla Walls performs independent cost reviews of all project cost estimates for the Modified Central City Project.

**2008: USACE Record of Decision for Modified Central City Flood Control Project**

During the EIS evaluation, USACE determined merging the previously authorized Central City Project with the previously federally recommended Riverside Oxbow Project provided greater outputs and execution efficiencies. Merging the two benefitted Central City because the original Central City Project required the acquisition of a great amount of private property to convert to flood needs. Merging Riverside mitigated that element because the flood needs could be handled using previously owned public property in Riverside Oxbow area that was already being used for flood purposes. Riverside Oxbow Project benefitted because the primary goal of that project was ecosystem restoration. Riverside Oxbow Project gained by merging because Central City is planting indigenous trees in the area to manage the Central City flood needs. The trees slow the water down providing both flood protection and the original Riverside Oxbow need, ecosystem restoration. The cost of the now Modified Central City Project incorporating the Riverside Oxbow Project literally doubled the scope of the original Central City Project. With a project size that doubled, respective costs to complete ran relative. The Modified Central City Cost with expanded scope are reported to be \$810 million.

**November 2014: UNT Economic Benefit Analysis of Modified Central City Project Which Incorporates Federally Recommended Riverside Oxbow Project**

With expanded scope and respective costs, all local partners had to put together a finance plan to cover additional local obligations. As part of that effort, TRWD reached out to the same UNT team that did the first Economic Analysis for USACE to get an updated study of financial benefits to help local partners put together a financing plan covering local costs.

**December 2016: Full Congressional Authorization of USACE Modified Central City Project**

Congress fully authorized USACE Modified Central City Flood Control Project which rolls the previously federally recommended Riverside Oxbow Project under the Central City Project name. Details: \$810 project. Standard cost-share for flood and ecosystem components. Federal share for recreation component capped at \$5.5 million (as opposed to standard 50/50 recreation split.)

**August 2018: Local Benefit-Cost Risk Analysis Study for WIIN Act Request**

Water Infrastructure Improvements for the Nation Act. Local partners use USACE defined footprint of at-risk properties that are no longer protected due to aging levee system. All value data was downloaded from the Tarrant Appraisal District to identify the value of the area at risk. TAD data in 2018 established that the value of the area at that time was already exceeding \$2.3 billion with a flood control project cost of \$810 million.