

21st-Century Trinity River COMMON VISION

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ABSTRACT

For most of the past 150 years, the dream for the Trinity River in north central Texas was that of a federally-funded navigation canal with barges transporting goods more than 300 miles to and from the Gulf of Mexico. An 1898 promotional button proclaimed the dream: “Dallas – The Inland Seaport of Texas.”

Since the riverbanks would be lined with industry, water quality was unimportant. The State Health Department in 1925 characterized the Trinity as a “mythological river of death.” Since then the DFW region has grown into America’s largest metropolitan region located on an inland waterway, with a population now exceeding 6 million.

When the 19th-Century dream of a barge canal died in the early 1980’s because of changing federal priorities, it was replaced by new local pressures to fill and reclaim significant portions of the floodplain. Studies by the U.S. Army Corps of Engineers with the North Central Texas Council of Governments demonstrated the devastating effects that massive reclamation would have on existing properties, especially to the downstream Dallas levee system.

From these important discussions emerged an unprecedented local/state/federal partnership to more comprehensively address the problems and opportunities of the river corridor and watershed towards a multi-objective Trinity River COMMON VISION for the 21st-Century:

- **SAFE** Trinity River, with stabilization and reduction of flooding risks
- **CLEAN** Trinity River, with fishable and swimmable waters
- **ENJOYABLE** Trinity River, with recreational opportunities linked by a Trinity Trails system within a world-class greenway
- **NATURAL** Trinity River, with preservation and restoration of riparian and cultural resources
- **DIVERSE** Trinity River, with local and regional economic, transportation and other public needs met.

This paper describes the evolution and remarkable progress of the Trinity River COMMON VISION over the past 20 years. It highlights such successful regionwide projects as the innovative Corridor Development Certificate process to stabilize and reduce flood risks, the Trinity Trails system, and integrated stormwater management quantity/quality initiatives.

It also presents specific examples from the region’s three largest cities – Dallas, Fort Worth and Arlington – as partners in this unique cooperative program. The Trinity River COMMON VISION has received numerous awards, including being named in 1997 one of the 25 top “Innovations in American Government” by the Ford Foundation. All illustrate the movement from independent to coordinated actions, from structural to nonstructural approaches, from the 19th-Century barge canal to a 21st-Century Trinity River COMMON VISION.

INTRODUCTION

“The river a little narrow deep stinking affair.”

This was the first impression of A.W. Moore in 1846 upon seeing the Trinity River near present-day Dallas. For most of the next 150 years, it was believed by many civic leaders that the economic future of the region depended upon navigation of the “little narrow deep stinking” Trinity River, from Fort Worth and Dallas southward more than 470 kilometers to the Gulf. Thus the ultimate use of the river in the urban area was envisioned to be barge traffic with heavy industry along its banks.

If some raw sewage found its way downstream towards Houston, what was wrong with that? Indeed, in 1925 the Trinity River was characterized by the State Health Department as a “mythological river of death” because Dallas led the state in deaths associated with typhoid (TSBH, 1925).

To assure an adequate long-term drinking water supply, each of the major branches in the upper watershed has been impounded with manmade reservoirs. Thus the Trinity River as it flows through the urban core faces great extremes, with low flows composed almost totally of treated wastewater to massive floods with the potential for billions of dollars in damages and untold loss of life across its 620 square kilometer floodplain.

In 1981, the U.S. Army Corps of Engineers (USACE) officially killed the dream of navigation by determining that a federally-sponsored project was no longer feasible. With the Metroplex in the middle of a development boom, the Corps received numerous unrelated requests for federal Section 404 permits to reclaim portions of the Trinity flood plain for commercial and residential development.

Because of concern that potential cumulative impacts could not be adequately assessed through individual permit reviews, the Fort Worth District of the Corps and NCTCOG launched a regional initiative that is still going strong two decades later.

ABOUT NCTCOG

The North Central Texas Council of Governments (NCTCOG) is the voluntary association of more than 200 cities, counties and special districts in a 16-county region. NCTCOG is an association of, by and for local governments. NCTCOG assists its members in planning for common needs, cooperating for mutual benefit, and recognizing regional opportunities for improving the quality of life.

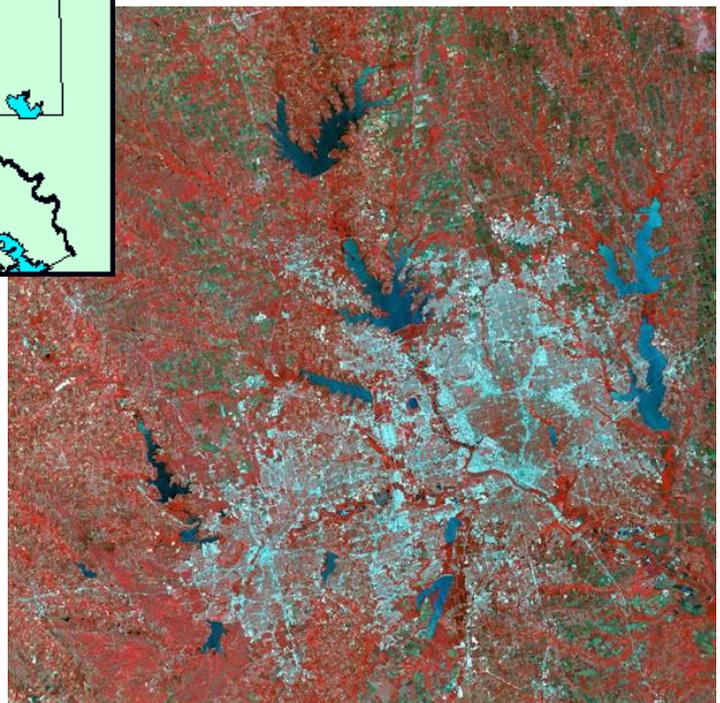
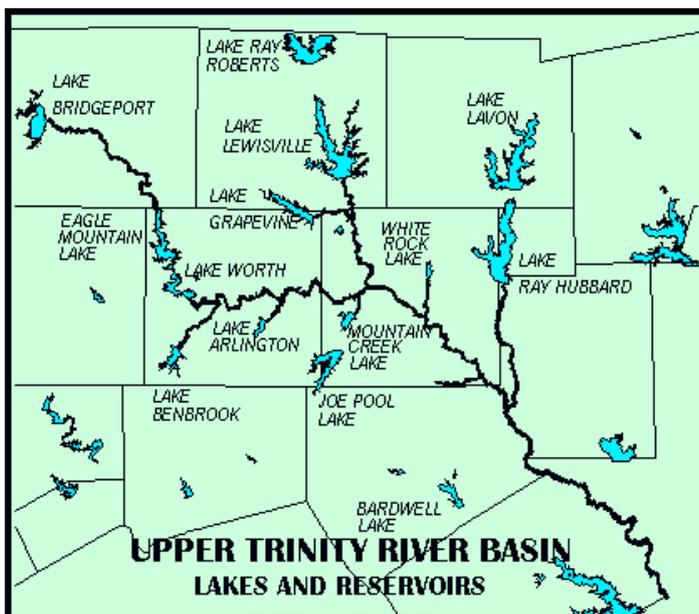
NCTCOG is the designated regional planning agency for comprehensive planning as well as functional programs such as solid waste, mobile source air quality, and water quality management. NCTCOG has actively addressed key water resources issues since developing the first areawide water quality plan approved by the U.S. Environmental Protection Agency in the nation. Besides sustaining the areawide water quality planning process, NCTCOG coordinates one of the largest urban storm water programs in the country. Most particularly, NCTCOG serves as local sponsor for one of the U.S. Army Corps of Engineers’ largest floodplain feasibility studies as described in this paper.

THE BEGINNINGS

This cooperative effort began in the early 1980's with the preparation by the USACE of a Regional Environmental Impact Statement (EIS) to address the cumulative impacts of its individual permitting decisions. A working group of staff professionals from the affected local governments and NCTCOG provided input. The Draft Regional EIS first compared the cumulative impacts of two opposite philosophical approaches for utilizing the river corridor -- maximum environmental quality vs. maximum development -- and found that maximum development would result in flood flows that would overtop existing levees in Dallas and Irving.

Given the seriousness of these preliminary findings, a special Strategy Committee of elected officials was formed and each local participant provided funding support on a pro-rata basis to NCTCOG as convener and facilitator. As expected, local involvement in the USACE's preparation of the Final Regional EIS was much more intense, with many meetings and several new development scenarios crafted between the two extremes.

The Final Regional EIS found that these more moderate development scenarios would not only result in the Dallas Floodway levees still being overtopped with catastrophic results, but that properties in upstream cities would also sustain considerable flood damages. Thus no city could assure adequate flood protection for itself by itself -- only a common approach could be successful.



Mother Nature Makes Her Point

Although no proof was required, Mother Nature stepped in anyway. Major floods occurred in May/June 1989, April/May 1990 and December/January 1992 in the upper Trinity River. Over a dozen lives were lost during the 1989 flood events within the Metroplex, and hundreds of millions of dollars of damages were sustained.

Also alarming was that the 1990 flood nearly reached the design elevation of the Dallas Floodway levee (approximately four feet below the top of the levee) for an event much less powerful than even the mis-named "100-year" flood. Upstream reservoirs designed to capture runoff actually prevented more serious flooding.

During the 1980's, the Trinity River also experienced several major fish kills associated with depressions in dissolved oxygen during rise events. Extensive followup studies by the state determined that ambient dissolved oxygen concentrations in the river have improved and rise-associated dissolved oxygen effects have waned. Reduced effluent ammonia levels have resulted from implementation of in-plant nitrification requirements. Thus, toxicity became the main factor impacting the system by the late 1980's.

Cooperative Efforts Are Launched

In the late 1980's, NCTCOG adopted a Regional Policy Position on the Trinity River Corridor that affirmed, among other key points, that local governments must be the stewards of the Trinity River Corridor, that individual local goals can only be achieved through cooperative management, and that a comprehensive approach addressing flood damage reduction, recreation, and environmental quality must be pursued.

Upon the request of the affected local governments, the United States Congress authorized the USACE to undertake a Reconnaissance Study to determine if feasible flood protection plans could be identified to reduce the risk of flooding, as well as address water quality, recreation, environmental enhancements and other allied purposes.

The USACE studied a variety of flood control options in particular, and found at least a dozen with positive benefit-cost ratios that merited further attention in the Feasibility Study phase. It was now time for local governments to act. Each of the nine cities, three counties and two special districts with development and regulatory authority for the Trinity River Corridor executed interlocal agreements with NCTCOG establishing a formal structure for cooperative planning. A Steering Committee of elected officials was formally appointed to provide policy guidance, along with a staff task force for technical support.

NCTCOG was identified as the administrative agent to coordinate the efforts and to enter into a 50-50 cost-sharing agreement with the USACE for the Upper Trinity River Feasibility Study (UTRFS). Even at this stage it was recognized that a more comprehensive Common Vision was needed and would be pursued not only with the USACE but other local, state and federal partners. Thus, the interlocal agreements were written very broadly to allow a wide range of cooperative activities. (NCTCOG, 2003)

The Common Vision, which is the popular name for the UTRFS, addresses needs and opportunities on a watershed basis with the United States Army Corps of Engineers as the federal partner, NCTCOG as the "official" local sponsor, and the other local jurisdictions as implementing cost-share partners under the interlocal agreements with NCTCOG.

This creative umbrella arrangement assures consistent and fair planning among all entities, while preserving project-specific implementation decisions to the affected local governments. The cooperative efforts are ongoing, with another \$10 million of cooperative studies authorized in 2005, bringing the total to more than \$30 million to date. (<http://www.nctcog.org/envir>)

This unprecedented local/state/federal partnership is more comprehensively addressing the problems and opportunities of the river corridor and watershed towards a multi-objective Trinity River COMMON VISION for the 21st-Century:

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A SAFE TRINITY RIVER, WITH STABILIZATION AND REDUCTION OF FLOODING RISKS

If the “big flood” (Standard Project Flood) were to occur today, more than 12,000 homes and more than 13 million square meters of commercial property would be damaged, resulting in over \$4 billion in flood damages in 1990 dollars, and untold loss of life. And we can tell you the specific location and depth of water for each and every structure!

Primary attention of the *Feasibility Study* has been directed at improving methods used to quantify the risk of flooding along the corridor, and determining the specific projects for which more detailed planning and implementation will be pursued. The five major initiatives to stabilize and reduce the flooding risk are:

- stabilize the flood risk with the innovative Corridor Development Certificate process
- restore levee protection in downtown Dallas and elsewhere
- reduce flood risks through specific projects identified in Phase I of the *Feasibility Study*
- minimize property damage and loss of life by improved flood warning and emergency response
- protect financial security and investments with greater participation in flood insurance

Success Story: Corridor Development Certificate Process Stabilizes the Flood Risks

The Regional EIS and Regional Policy Position called for stricter regulation of development within the Trinity River Corridor to stabilize the flood risks. After several years of detailed discussions, an innovative Corridor Development Certificate (CDC) process emerged. Local governments still issue the development permit under the National Flood Insurance Program, but regional requirements have been added (and adopted by each city in its floodplain ordinance):

- applies consistent and specific regionwide criteria, such as no rise in the 100-year flood elevation, and maximum allowable loss of valley storage for 100-year and Standard Project Flood discharges of 0% and 5% respectively
- the Corps reviews every CDC request for its flood impact, not just Section 404 applications
- every other local government along the corridor is given 30 days to review and comment upon the development request
- NCTCOG tracks the process through its Trinity River Information Network (TRIN), using its GIS capabilities (and soon to be added to NCTCOG's Internet pages)

While the individual city still makes the final call, it is well understood that a bad decision will land them in court opposed by other cities and the USACE's public interest findings. Almost a decade after its initiation the process is still working ... with no court cases ... yet.

A CLEAN TRINITY RIVER, WITH FISHABLE AND SWIMMABLE WATERS

As an urban river, the Trinity is directly impacted by both point and nonpoint sources of pollution. Over the last several decades, the focus of pollution control has been the phase-out of many smaller, inefficient sewage plants through consolidation into several major "joint system" treatment facilities with high-quality effluent. NCTCOG's *Upper Trinity River Basin Comprehensive Sewerage Plan* was the first regional plan approved by the U.S. Environmental Protection Agency (USEPA) in the early 1970's.

The region's attention in the 1990's shifted from river dissolved oxygen impacts due to wastewater treatment plants, to nonpoint sources of pollution across a full range of parameters. In 1990, the USEPA established a storm water permitting program under the National Pollutant Discharge Elimination System. Phase I of the program regulated discharges of storm water through permits for large and medium municipalities (population greater than 100,000) and selected agencies and industries. There are seven large cities in the region and two local districts of the Texas Department of Transportation that meet this criterion.



Consequently, NCTCOG established a regional cooperative program with these entities that is recognized statewide and nationally as a model of successful cooperation. Then in 1999, the USEPA finalized its Phase II rules, to bring in the remaining small municipalities within the urbanized areas. The program was delegated by the USEPA to the Texas Commission on Environmental Quality (TCEQ).

In anticipation of these rules, NCTCOG expanded its Regional Storm Water Management Program in 1998 to include the small systems. The expanded program, affecting more than 100 local governments, educates local governments on the regulatory requirements, and pursues a wide range of cost-shared regionally developed initiatives (RDI's) to implement storm water best management practices. It is guided by a Regional Storm Water Management Coordinating Council (RSWMCC).

Success Story: *integrated* Storm Water Management Design Manual for Site Development

An example of a Regionally Developed Initiative is the integrated Storm Water Management (iSWM) Design Manual for Site Development released in January 2006 by NCTCOG. It was prepared by NCTCOG and a consultant team with cost-share funding from more than 60 communities.

This iSWM Design Manual outlines the most current and applicable storm water management techniques and provides criteria and rationales for the selection of structural and nonstructural storm water quality and quantity best management practices (BMPs) in the design of the storm water management system for a new development or significant redevelopment. iSWM provides guidelines for a community to establish a successful comprehensive storm water management program. It provides innovative infrastructure and site development approaches for addressing storm water quantity, stormwater quality, and streambank erosion.

Finally, it is an essential element for the region in achieving broader Safe, Clean & Green environmental corridor goals. Adoption of iSWM by a municipality as part of its management plan addresses the specific permit requirements for post construction water quality management. With more than a year's experience implementing iSWM, Fort Worth says that it has been "surprisingly well received," resulting in "major improvements in development control." (Fort Worth 2007).

A GREEN TRINITY RIVER, THAT IS BOTH NATURAL AND ENJOYABLE, WITH RIPARIAN AND CULTURAL RESOURCES PRESERVED AND RESTORED, AND RECREATIONAL OPPORTUNITIES LINKED BY A TRINITY TRAILS SYSTEM, WITHIN A WORLD-CLASS GREENWAY

An 1846 placard seeking emigration to the Peters Colony in what is now North Central Texas noted:

"... this country contains, for its territory, the largest body of the richest and most fertile lands of any in North America; and no country is more abundantly watered by rivers, creeks, rivulets, and springs of the purest and most wholesome water."

Certainly Mr. Peters took license in his rhetoric -- he even claimed Dallas was an inland port -- but understand that the region has been recruiting folks to move here for 150 years! Yet what they found may have surprised them.

While much of the region is gently rolling grassland and prairie, other portions were indeed densely forested as shown on historic maps. Dallas was initially referred to as the Cedars by Native Americans because of its trees (long gone). One of the colonists, John B. Billingsley, recorded in his journal about Dallas:

“About the first of June the buffalo came in from the western plains and the prairies were alive with them. Thousands of them were to be seen. Deer, antelope, wild horses, and wolves were numerous. Bear, wild turkeys, and all kinds of wild varmints ranged the bottoms and thickets along the water courses.”

About the only place to see buffalo now in North Central Texas is penned behind fences at the Fort Worth Nature Center. Yet proposals for a Trinity River Greenway as part of the COMMON VISION include more than 30,000 square kilometers of existing parks and preserved open space, and about twice that of other potential greenway areas.

There are already several significant and large natural areas within the Trinity River Corridor either under local stewardship or in the planning or acquisition phases, including but not limited to:

- The Fort Worth Nature Center is the largest city-owned nature center in the nation. Occupying 14 square kilometers acres around the northern portion of Lake Worth and West Fork, the Center offers about 40 kilometers of nature trails, a large variety of nature programs, and some of the most unique natural features in the region.
- River Legacy Parks is a 5-plus square kilometer forest floodplain park that is Arlington’s segment of the Trinity River Greenway, and is considered the “crown jewel” of its parks system. Much of the land is preserved as wild; educational programs reach thousands of students annually; and a \$4 million Living Science Center with interpretive displays and a movie about the river opened in the summer of 1996. Arlington was the first city to complete its entire trails segment along the Trinity.
- The Great Trinity Forest is currently a dream of Dallas that is quickly becoming real. It encompasses more than 30 square kilometers with bottomland hardwoods in and along the Trinity floodplain in South Dallas, but is so well hidden that few know of the area’s existence. As a Dallas citizen’s committee report noted: *“By giving it a name, the people of Dallas have given it prominence in our civic consciousness that it never had before.”* Efforts will concentrate on preservation and public acquisition where needed.

Success Story: Trinity Trails System

When the COMMON VISION began almost two decades ago, the Trinity River was a joke to most people ... usually linked by the media to pollution or unfortunate fatalities. To even think about a multi-jurisdictional trails system was ridiculous.

Yet a Trinity Trails Advisory Committee was established, with the mission “to cause to be built a continuous public-access recreation corridor with a multi-use trail along the Trinity River Corridor in North Central Texas and northward to the Red River.”

After almost two years of detailed effort, the Trinity Trails Advisory Committee in early 1996 adopted a proposed alignment for most of the 400-kilometer “spine” of the regional system along its three forks - West Fork, Elm Fork and the main stem near downtown Dallas.



A greenway linking Lakes Lewisville and Ray Roberts was preserved by the USACE with local city partners, and a groundbreaking ceremony for the trails segment was dedicated on June 1, 1996 -- National Trails Day -- with the unveiling of the official logo for the Trinity Trails System.

Over the past decade, significant portions in many cities have been constructed, including the entire length within the City of Arlington's jurisdiction. Now the question is not whether but when it will be finished. Indeed, not just along the main corridor but throughout the region, a "green infrastructure" network is emerging. It combines lands that support natural ecosystem values and functions, with lands that provide associated benefits for people. A true world-class greenway.

FORT WORTH TRINITY RIVER VISION

Fort Worth has a bold new 21st-Century vision for the Trinity River. It will transform and double the size of downtown by removing the existing levees and bypassing floodwaters. It will also feature the river as a focal point throughout the city's neighborhoods. Implementation is already underway. (<http://www.trinityrivervision.org>). (TRWD, 2003)

The master plan was prepared as one of the cost-shared projects of the Trinity River Common Vision. "Instead of the city and businesses turning their back to the river, they will face it. The Trinity River Vision Master Plan will shape how the city relates to the river and how Fort Worth is viewed by residents and visitors for decades to come," said Wayne Owen of the Tarrant Regional Water District, which is the lead agency for the project. (TRWD, 2002).

Perhaps the most striking feature and centerpiece of the 21st-Century vision is the removal of the existing levees, with redeveloped business and residential properties facing a new town lake as their front door. The Master Plan accomplishes this with a bypass channel just north of downtown to reroute flood waters from the Trinity, with floodgates at each end similar to the world-famous Riverwalk in San Antonio, Texas. This will create a 13-kilometer long waterfront with continuous public access, almost triple San Antonio's water edge.



In addition, the vision plan more than doubles the Trinity trails along the main river and tributaries. It will create up to 32 trailheads to give residents easy river access. It will provide 26 square kilometers of nature interpretive and naturalized areas that will preserve or improve flood protection in several neighborhoods. The total public investment could exceed \$300 million, with a meaningful portion coming from a new local tax financing district. Billions of dollars in private investments are anticipated.

Says Congresswoman Granger, “We can transform the river as the heart of the community, something Major Arnold envisioned 155 years ago when he ensconced his troops on the beautiful Trinity River bluffs. Citizens see the vision. The business community sees the vision. And now it is time for those of us in positions of responsibility to see the vision. I commit to do everything I can to see that the Trinity River Vision Plan becomes reality, just as the railroads of the 1800’s became reality.” (FWST, 2004)

ARLINGTON NON-STRUCTURAL APPROACH

As with the other communities along the river, the City of Arlington’s Comprehensive Plan until the mid-1980’s reflected the 19th-Century vision of the Trinity becoming a barge canal, with the land on both sides of the river zoned for industrial uses. And the city’s approach to addressing flooding in neighborhoods was often to channelize the creek.

Now more than 5.3 square kilometers along the Trinity River, extending the entire length of Arlington’s river segment, are preserved as the River Legacy Park. A key to the innovative Corridor Development Certificate (CDC) process discussed previously is the preservation of valuable valley storage within the 100-year floodplain. The River Legacy Park has been specifically designed with this in mind. Floodwaters covered virtually all of the park this past spring.



And along one of the city's major tributaries, 140 homes subject to flooding have been purchased and removed as one of the cost-shared projects of the Trinity River Common Vision.

DALLAS TRINITY RIVER CORRIDOR PROJECT

All other projects along the river are dwarfed by Dallas' Trinity River Corridor Project, which seeks to implement a truly multi-objective billion-dollar program to "flow new life into Dallas." The second largest public works project in the city's history after Dallas/Fort Worth International Airport, it encompasses everything from restored wetlands and the Great Trinity Forest, to a major roadway link and landmark bridges designed by Santiago Calatrava, to significant urban waterfront development.

There is something for everyone to like ...and dislike ... in Dallas' interpretation of a safe, clean, enjoyable, natural and diverse river corridor for the 21st century.
(<http://www.trinityrivercorridor.org>)

"A decade from now, people driving into Dallas will see the city's river not as an obstacle to overcome, but as a destination to discover", says Laura Miller, Dallas' Mayor who just left office. She was once a vocal opponent of the project. "Our changing relationship to the water, I predict, will enliven every aspect of urban life in our city." (City of Dallas, 2003)

The Trinity River Corridor Project encompasses at least the following major elements:

- Chain of Wetlands now under construction, extending about 10.3 kilometers downstream of the current floodway area, to reduce flooding, improve water quality and offer new habitat for migratory birds
- Great Trinity Forest, which will be the largest urban park in America at more than 24 square kilometers when fully acquired, with a major interpretive center, equestrian center, and trails among predominantly forested lands.
- Urban Lake/s, with one or more lakes to be built within the current Dallas Floodway, whose levees would also be raised by about 0.6 meters and reinforced, all to bring it back within the original design flood
- At least three signature bridges designed by world-renowned Spanish architect Santiago Calatrava spanning the river in a coordinated and complementary manner. One is already under construction
- A new tollway providing relief to five roadways that now enter/exit downtown Dallas and are routinely congested
- Extensive urban development/redevelopment with a vision that "the Trinity River Corridor is a unified collection of diverse neighborhoods and business centers at the heart of a thriving Dallas, connected by a ribbon of blue water and green spaces that is the Trinity River."
(HNTB Consultants, 2005)



The overall Dallas project will cost at least \$1.2 billion, and could approach \$2 billion if additional elements being discussed are added. About \$246 million comes from a 1998 city bond election. Another \$110 million is being raised from private funding and possibly new public funds. The remainder would come from government partners such as the United States Army Corps of Engineers, North Texas Tollway Authority and others.

BOTTOM LINE

This unique and successful intergovernmental partnership called the Trinity River Common Vision has been recognized by the United States Army Corps of Engineers as a 21st-Century model for its civil works program. Among its many awards, the Trinity River Common Vision program was selected in 1997 as one of the top 25 *Innovations in American Government* by the Ford Foundation.

It's happening ... moving from independent to coordinated actions, from structural to nonstructural, from a 19th-Century barge canal to a 21st-Century Trinity River COMMON VISION.

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