WELCOME & INTRODUCTIONS
DISCUSSION ITEMS
Trinity Common Vision
Trinity River Corridor Interlocal Agreement - 1989

NINE CITIES
Arlington
Carrollton
Coppell
Dallas
Farmers Branch
Fort Worth
Grand Prairie
Irving
Lewisville

THREE COUNTIES
Dallas County
Denton County
Tarrant County

PROGRAMMATIC PARTNERS
NCTCOG Environment & Development
U.S. Army Corps of Engineers
Federal Emergency Management Agency
Texas Water Development Board

TWO SPECIAL DISTRICTS
Tarrant Regional Water District
Trinity River Authority
Trinity River Common Vision Program
Timeline & Background

1990 Upper Trinity River Basin Reconnaissance Report
Interlocal Agreements signed by member cities & Congress authorize the Upper Trinity River Feasibility Study (UTRFS). These studies by the Corps of Engineers simulated the cumulative impacts of flooding in the Dallas-Fort Worth area based on different levels of floodplain development.

1990 Flood Management Task Force
Flood Management Task Force formed and CDC criteria developed based on ROD

Record of Decision
Results suggest that damages from a major flood could total more than $11 billion if floodplain development is unregulated. A comprehensive floodplain management program could cut losses to $4 billion.

Corridor Development Certificate (CDC) Manual
1st Edition of the Corridor Development Certificate (CDC) Manual was produced in 1991. We are currently on the 4th edition

Over 200 projects have been permitted along the Trinity River in the Dallas/Fort Worth Metroplex using the CDC process. Models are continuously being refined and updated to reflect new construction and redevelopment.
CDC Program Goals
Corridor Development Certificate Program

**Limits Impact**
Limits (but does not eliminate) the impact of floodplain encroachments for regulated streams on downstream areas

**Review Process**
Establishes a consistent regional criteria and review process

**Funding Stream**
Provides a funding stream for updates and state-of-the-art models and modeling tools
CDC Program Goals
Corridor Development Certificate Program

Provides Oversight
Provides oversight for projects constructed in the 100 year floodplain

Allows Development
Allows development in the floodplain

Project Review
Allows all Flood Management Task Force (FMTF) members to review projects for the entire regulatory footprint
Why is the Trinity River Corridor So Important to Flood Prevention?

ACTIVE FLOOD STORAGE

- Benbrook
- Joe Pool
- Lavon
- Grapevine
- Lewisville
- Ray Roberts
- CDC Corridor
Common Vision Work Program and Activities Update

- CDC Permitting
- FEMA L-273 Four Day Course
- Elected Officials Seminar
- FY19 Work Program – Additional Technical Item Outcomes
CDC Permits in Fiscal Year 2019

- 10 Applications Received This Fiscal Year
- 216 Total Applications Since CDC Inception
Floodplain Management through the NFIP

23rd annual Class held November 2018 – Class was full with a wait list!

24th Annual Class to be held November 18-21. Registration opened last week.

Annual Combined Elected Officials Seminar/CRS Users Group

Held July 18, 2019.

Guest speakers from Texas A&M Agrilife and TFMA
FY 19 Work Additional Work Program Items: NFIP-CDC Model Consolidation Update

CDC/NFIP Model Consolidation Team Update – Stephanie Griffin, City of Grand Prairie and Team Chair

- Background
- Goals and Objectives
- Team Membership
- Scope of Work
- Deliverables
Background

- Only applies to FEMA LOMCs within CDC corridor
- CDC model looks at current and future conditions
- NFIP looks at current conditions only
- FEMA, NCTCOG and USACE partnership to combine and geo-reference the CDC and NFIP HEC-RAS models
  - Dual purpose models to administer both programs
  - Maintain current models
Team Members

- Stephanie Griffin, Team Chair - City of Grand Prairie
- Jim Keith - Freese and Nichols
- Amy Cannon - City of Arlington
- Kim Dewailly - City of Dallas
- Lisa Biggs - City of Fort Worth
- Craig Ottman - TRWD
- Mike Danella - USACE
- Landon Erickson - USACE
- Alan Johnson – FEMA
- Jacob LeSue - Dewberry
- Mia Brown - NCTCOG
Advisory Group

- Edith Marvin, NCTCOG
- Ron Wanhanen, FEMA
- Jerry Cotter, USACE
Team Goals and Objectives

- Establish policies and procedures to keep both models simplified and in sync with permit actions for each program
- Incorporate policies and procedures into the CDC Manual and the NFIP LOMC instructions
- Identify resources and funding needs
Scope of Work

- Includes 20 tasks
  - 18 have been completed
  - 2 are in progress
- Team has met 12 times since May 21, 2018

Current activities

- Preparing memo summarizing activities accomplished and proposed updates to CDC-NFIP programs and permitting processes
- Developing one page summary of updates/changes and new features
Schedule

- Oct 2019: Meet with Advisory Group to review draft memo
- Nov 2019: Present memo to Floodplain Management Task Force for review and comment
- Jan 202: Seek approval of memo from Floodplain Management Task Force
Deliverables

- Final recommendation memo
- Documentation to be incorporated into NFIP and CDC program documents
With the Steering Committee's approval of the FY20 Work Program, NCTCOG staff will set up a website to provide access to the CDC model and eventually streamline CDC application submission, as guided by the Consolidation Team’s process flow chart.

The flow chart and updated submission process will necessitate an update to a 5th edition CDC Manual, anticipated to be made during FY21.

This will also coincide with the addition of the East Fork Trinity communities to the Common Vision Program.
FY 19 Work Additional Work Program Items:
East Fork Integration

- Mesquite
- Sunnyvale
- Crandall
- Combine
- Forney
- Hutchins
- Wilmer
- Seagoville (joined Aug. 2019)
- Balch Springs
- Kaufman County
- Ellis County
FY 19 Work Additional Work Program Items: East Fork Integration

- **April 2016-January 2017**: Four interest meetings held.
- **September 14, 2017**: TCV Steering Committee votes to approve the continued pursuit of the East Fork Addition.
- **June 22, 2018**: Meeting in Kaufman County to review the program and collect comments on a draft resolution.
- **September 19, 2018**: CDC Manual/Application training held in Mesquite at the communities’ request.
- **May 1, 2019**: Dallas County hosts a meeting in Wilmer for East Fork community staff.
- **August 7, 2019**: Balch Springs and Dallas County host a meeting for East Fork elected officials.
FY 19 Work Additional Work Program Items
LOMR Process Improvements

- FEMA Region 6 staff and contractors have visited with FMTF to address concerns regarding LOMR processing times and communication regarding current models.
Communities can see each other’s gauge readings and better prepare for storms.

The cooperative contract with OneRain for Contrail software launched on North Texas SHARE in August 2018.

- Early adopters get a $500 discount off the annual subscription fee.
- McKinney and TRWD have subscribed, and Frisco is working with SHARE on subscribing.

### OneRain Price List

<table>
<thead>
<tr>
<th>System (Annual Fees)</th>
<th>Pricing</th>
</tr>
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<tbody>
<tr>
<td>StormData Services</td>
<td>$4,950.00</td>
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<tr>
<td>GARR (Gauge-Adjusted Radar Rainfall)</td>
<td>Included</td>
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<tr>
<td>- OneRain’s real-time rainfall estimates</td>
<td></td>
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<tr>
<td>- Calibrates radar rainfall estimates to gauges</td>
<td></td>
</tr>
<tr>
<td>- Processes rainfall custom overlays within maps</td>
<td></td>
</tr>
<tr>
<td>10m x 10m, 5-minute resolution</td>
<td></td>
</tr>
<tr>
<td>5-minute update of estimates</td>
<td></td>
</tr>
<tr>
<td>Customer, Central Administrative Support, NCTOG Managed Services, Support Model (Annual Cost)</td>
<td>Included</td>
</tr>
<tr>
<td>- Website administrative support</td>
<td></td>
</tr>
<tr>
<td>- Managed Homepage and Dashboards</td>
<td></td>
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<tr>
<td>- Assistance with Member Entity</td>
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<thead>
<tr>
<th>Implementation/Technical/Learning Services (One-Time Fees)</th>
<th>Pricing</th>
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<tbody>
<tr>
<td>Implementation Services – Client Setup and Configuration</td>
<td>$1,500.00</td>
</tr>
<tr>
<td>Implementation Services – Hardware, OneRain Custom Serial to IP Connection Kit</td>
<td>$1,500.00</td>
</tr>
<tr>
<td>- Digi PortServer custom configured</td>
<td></td>
</tr>
<tr>
<td>- Customized serial cable assembly</td>
<td></td>
</tr>
<tr>
<td>Implementation Services – Custom Dashboards and Control Widget Configuration</td>
<td>$1,000.00</td>
</tr>
<tr>
<td>- Enable control for external devices such as warning lights, automated barrier devices, sirens, etc.</td>
<td></td>
</tr>
<tr>
<td>- Manual test dashboard</td>
<td></td>
</tr>
<tr>
<td>Technical Services – Historical Data Load</td>
<td>OneRain to quote</td>
</tr>
<tr>
<td>Technical Services – Custom Data Feed</td>
<td>OneRain to quote</td>
</tr>
<tr>
<td>Technical Services – Datalight Data Analysis Software License</td>
<td>OneRain to quote</td>
</tr>
<tr>
<td>- Supports offline data analysis</td>
<td>OneRain to quote</td>
</tr>
<tr>
<td>Learning Services – Contrail ALERT? TDMA Manager Training</td>
<td>OneRain to quote</td>
</tr>
</tbody>
</table>
The Regional Flood Warning Software Platform provides a comprehensive look at rainfall and water levels across the North Texas region through a connected network of flood gauges made possible through partnerships with local municipalities and agencies.

**Rainfall Map**
View live data of rainfall across the region.

**Current Stage Level Map**
View live data of the current stage level of flood gauges across North Texas.

**How to Join**
Communities of North Texas can join the program for a cost savings on flood warning hardware and software. Communities can view and integrate all other communities data for a comprehensive look at the region as a storm moves across.

**Disclaimer:** FloodDataNTX is an interactive mapping application developed by the North Central Texas Council of Governments through a cooperative contract with Omella, Inc. The data and information presented may not be presented in real-time and should not be assumed to be asset conditions in the indicated area on the map. Neither FloodDataNTX nor the sponsoring agencies including the North Central Texas Council of Governments and member municipalities participating in this program assume any legal liability or responsibility, or make any guarantees or warranties as to the accuracy, completeness, or suitability of the information for any specific purpose. The public is urged to closely monitor information provided by local emergency management organizations during emergency situations.
Action Items
NCTCOG staff are seeking approval of the 2018 Trinity Common Vision Steering Committee Meeting Summary.
NCTCOG staff are seeking approval of the FY 2020 Trinity Common Vision Work Program.

Additional Technical Activities for 2020 (page 2):

- Continued Participation in the Model Consolidation Committee
- Website for CDC application process.
- Continued support of the East Fork Integration, as well as Denton Creek and a long-term vision of expansion.
- No change to the cost shares.
Presentation Items
Related Activities Update
Trinity River National Recreation Trail

- Trinity Nature Conservancy has worked with NPS on designation for the Trinity River.
- Designation is anticipated in June 2020.
- This effort was awarded the Conservation Wrangler designation by Texan By Nature.
- TNC is working with communities on signage and possible additional launches.
- Thank you to the Trinity River communities for your efforts and support!
<table>
<thead>
<tr>
<th>Year</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>• Joined CTP&lt;br&gt;• Created Master Plan</td>
</tr>
<tr>
<td>2009</td>
<td>• NCTCOG Participates in Map Mod</td>
</tr>
<tr>
<td>2012</td>
<td>• West Fork Trinity and Elm Fork Trinity Discovery</td>
</tr>
<tr>
<td>2013</td>
<td>• Village Creek Flood Risk Project</td>
</tr>
<tr>
<td>2014</td>
<td>• Bear Creek Flood Risk Project</td>
</tr>
<tr>
<td>2015</td>
<td>• Cedar and Denton Watershed Discovery&lt;br&gt;• Lynchburg and Irving Creek Flood Risk Studies</td>
</tr>
<tr>
<td>2016</td>
<td>• East Fork Trinity Discovery&lt;br&gt;• Silver Creek and McAnear Creek Flood Risk Studies</td>
</tr>
<tr>
<td>2017</td>
<td>• Richland-Chambers Watershed Discovery&lt;br&gt;• Town Creek and Clear Fork Tributary Flood Risk Studies</td>
</tr>
<tr>
<td>2018</td>
<td>• Marys Creek Flood Risk Study</td>
</tr>
<tr>
<td>2019</td>
<td>• Waxahachie Creek and Harriet Creek Flood Risk Studies pending award</td>
</tr>
</tbody>
</table>
Integrated Stormwater Management - iSWM

Why iSWM?
- Flooding and streambank erosion due to increased runoff
- Water quality concerns / stormwater regulations
- Loss of natural features
- Interest in green infrastructure
- Comprehensive approach needed
- Regional consistency and equity

iSWM Resources
- Technical Manual
- Criteria Manual

Certified Communities:
- Denton (Silver)
- Grand Prairie (Silver)
- Kennedale (Silver)
- Frisco (Silver)
- Fort Worth (Silver)
- Irving (Silver)
NOAA Atlas 14

- **What is it?**
  - A non-regulatory product that informs us of how much rain to expect in a 100-yr storm event.
  - Released September 2018 after extensive peer review

- **Benefits**
  - Better understanding of risk from extreme precipitation events
  - Infrastructure design, bridges, culverts, wastewater, and water supply
  - Use in updated NFIP floodplain mapping, TxDOT design manuals, and community design manuals.
  - Preparedness and mitigation planning

- **Access**
The TWDB released the State Flood Assessment to the 86th Texas Legislature in December 2018, identifying $36 billion in statewide flood funding needs. [Link to report](http://www.twdb.texas.gov/publications/reports/special_legislative_reports/doc/State-Flood-Assessment-report-86th-Legislation.pdf?d=15025.900000007823)
Senate Bills 7 & 8 – State Flood Plan and Texas Infrastructure Resiliency Fund

> SB 8 was signed into law, providing guidance for creating a State Flood Plan

> 9/1/21: TWDB shall adopt guidance principals for regional flood plans and designate flood planning regions corresponding to each river basin

> TWDB has gathered public comment on the designation and structure of regions, how money should be distributed, and many other issues. These considerations can be viewed in this document:

> 1/10/23: Each flood planning group shall submit a regional flood plan to TWDB

> 9/1/24: A state flood plan must be prepared and adopted by TWDB

> An updated flood plan will be prepared and adopted every 5 years
Senate Bills 7 & 8 – State Flood Plan and Texas Infrastructure Resiliency Fund

- Senate Bill 7 was signed into law, creating the **Texas Infrastructure Resiliency Fund** and its accounts. The funding of the accounts are dependent upon the proposed constitutional amendment, HJR 4, passing in November.
  - Four accounts in the fund
    - Floodplain Management Account
    - Hurricane Harvey Account
    - Federal Matching Account
    - Flood Plan Implementation Account (added after the state flood plan is completed; only for projects in plan)
  - TWDB is still deciding how much of the funds will be available as loans or grants

*Now is the time for communities to create a list of shovel-ready projects.*
$4.3 billion has been set aside for Texas from CDBG-DR funds for mitigation.

- All NCTCOG counties except Collin, Hunt, and Rockwall are eligible.
  - While at least 50% of funds must be spent in HUD Most Impacted & Distressed Areas (MID), the 13 eligible NCTCOG counties are State MID and can still compete for funds.
  - 50% of all CDBG-MIT funds must benefit low-to-moderate income (LMI) persons.
CDBG-MIT Funding

- TDEM is charged with creating a state action plan for these funds, to be completed by February 3, 2020.
  - There will be a 45-day public comment period prior to submission of the plan.
  - There will be 4 public hearings for feedback- 2 before and 2 after the public comment period.
- No requirement for a tie-back to the qualified disaster.
- There will be a big focus on regionalism.
- The application period is anticipated to open in May 2020.
- The GLO/TDEM webinar recording about these funds can be viewed here: https://www.youtube.com/watch?v=HHrvPgvXWkU&feature=youtu.be
16-County Watershed Management Effort

- Menu of Regionally Recommended Standards in Watershed Management for New Development Within County Regulated Areas.
- Developed by our counties at a March 2017 Roundtable.
- Presented to the 16-County Watershed Management Forum on July 12, 2017.
- NCTCOG Executive Board endorsed this effort in October 2017.
- Dallas, Denton, and Kaufman Counties have fully or partially adopted these standards.

Menu of Regionally Recommended Standards in Watershed Management For New Development Within County Regulated Areas

1. Design infrastructure to fully developed conditions with approved land-use maps if data is available.
2. Begin protection at the most upstream end of the watershed above Federal Emergency Management Agency Limit of Detel Study.
3. Maintain unfiltered valley storage areas.
4. Protect against and reduce erosive velocities.
5. Match pre-developed site runoffs.
6. Verify there is adequate downstream conveyance.
7. Require flowfrom fully developed (if data is available) and changing watershed conditions.
8. Define written operation and maintenance responsibilities.
9. Size conveyance of street and storm systems adequately to safely convey traffic.
10. Create stream buffers and preserve open space, limit clearing and grading.
11. Consider regional (on or offstream) detention incentives.
12. Implement Conservation and/or Cluster Development incentives.
13. Encouraging low impact development techniques and/or green infrastructure.

These regionally recommended standards in watershed management were developed by the North Central Texas Commissioners Watershed Management Roundtable held on March 24, 2017.
Transportation Stormwater Initiative

Jerry Cotter - USACE
TSI Project: INTEGRATED PLANNING OF REGIONAL TRANSPORTATION AND STORMWATER MANAGEMENT TOGETHER AS A SYSTEM OF IMPROVEMENTS: PREVENTION VS. RESPONSE

Date: 12 September 2019

Audience: Trinity River Common Vision Steering Committee

Jerry L. Cotter P.E., Chief Water Resources

U.S. Army Corps of Engineers, Fort Worth District
Flooding: #1 Cause of Natural Disasters

Texas Far Outpaces ALL of the States In Flood Related Fatalities & Flood Related Damages

5 Year Tally of Flood Fatalities

(Source: Gregory Waller, Service Coordination Hydrologist, NWS – West Gulf River Forecast Center, http://www.nws.noaa.gov/dm/hasstast.shmm, 11/18 TFMA)
What Flooding Disasters Do

- Destroy infrastructure (roads, bridges, waste water, water supply)
- Destroy property (homes, automobiles, belongings)
- Loss of life
- Ruin family photos and heirlooms
- Disconnect people - friends, schools, work, and familiar places
- Alter relationships
- Permanent harm to culture and way of life
- Impacts those least able to manage
- Long-term consequences to the health (mental) and collective well-being of those effected
- Loss of pets
- Destroy natural ecosystems that are integral parts of communities
- Disrupt populations in ways that are difficult to articulate, let alone assign monetary worth

I'm safe
I thought I was safe
Why Is This Happening

North Texas neighborhoods are flooding more than ever before. Why?

BY BILL HANNA AND LUKE BANKER

Tropical Storm Patricia - Corsicana, TX
October 2015

- Rainfall totals of 24” in 24 hours
- Tropical storm
- Less than 50 mi from DFW Communities
Dallas-Fort Worth, May-June 2015 Flooding

- 20” to 30” across entire upper Trinity River
- Surcharge 6 projects in DFW metroplex
- Surcharged 10 projects in Fort Worth District AOR

2.3 Million ac-ft stored in the 6 projects
Storms Exceeding Infrastructure and NFIP Standards

- Regional observed storms
  - USACE extreme storm database
- 24-hour rainfall for 10 mi²
- Plotted in descending order
- Grey band is current design standard (100-year) for all of TX
- Blue X’s points are 2010-2017 storms that exceed 100-year
- 18 events exceeded the 100-yr design standard
Storms Exceeding Infrastructure and NFIP Standards
Water surface resulting from regional storms exceeding infrastructure design standards with future impervious cover, etc. 

I thought I was SAFE!
Growth and Development Increases Flooding

- Floodplains are among the most valuable ecosystems on earth, they are also one of the most threatened
- Growth and development increases impervious cover and runoff
- Growth and development depletes storage
- Flooding increased
- Negative societal impacts

Kazemi, Hamidreza (Kasra. (2014). Evaluating the effectiveness and hydrological performance of green infrastructure stormwater control measures. 10.18297/etd1744
Future 100 year water surface with increased imperviousness cover, storm drains and channels.

I thought I was SAFE!
Uncertainties in Determining Flood Risk Potential

- The most commonly used techniques to estimate flood and rainfall frequencies rely on observations.
- Need record length 3-4 times estimated return interval.
- Short Observation Periods - On average TX has 50 years of stream record and 70 years of precipitation records.
- Significant variability and/or non-stationarity observed in flood flow and rainfall frequency estimates.

1:100 probability changes for blocks of years.
- > 1:4 chance of being flooded over a 30 year mortgage.
- > 1:2 chance of flooding over life of the structure (80 years).

Perfect 100 year water surface.
Common Vision: Progress We Have Made

- 6 multi-purpose reservoirs (1952-1987)
- 2 federal levee systems
- DFW Flood Control System
- Water supply system
- Total cost $2.5 billion
- Benefits: $100 billion +

Must be operated as a system

1. Design infrastructure to fully developed conditions with approved land-use maps if data is available
2. Begin protection at the most upstream end of the watershed above Federal Emergency Management Agency Limit of Detail Study
3. Maintain unfilled valley storage areas
4. Protect against and reduce erosive velocities
5. Match pre-developed site runoffs
6. Verify/require adequate downstream conveyance
7. Require freeboard from fully developed (if data is available) and changing watershed conditions
8. Define written operation and maintenance responsibilities
9. Size conveyance of street and storm systems adequately to safely convey traffic
10. Create stream buffers and preserve open space; limit clearing and grading
11. Consider regional (on or off stream) detention incentives
12. Implement Conservation and/or Cluster Development incentives
13. Encouraging low impact development techniques and/or green infrastructure
What?

WHERE: Proposed Study Area

How?

PROJECT TASKS & COST COMPONENTS

- Implementation (Products and Technical Tools)
- Project Management and Organization
- Plans to Offset Future Transportation and Indirect Development Impacts
- Land Inventory and Site-Specific Design Considerations
- Inventory of Stormwater Management Structures
- Inventory of Relevant Data

- What?
  - Integrate regional transportation planning, regional stormwater management planning, and environmental planning to develop consolidated, adaptive infrastructure.

- How?
How?: Realistic Meteorological and Hydrologic Loading

- Existing conditions 100-yr
- Future conditions 100-yr
- Alternative meteorological and hydrologic loading
  - Leverage regional storm catalog
  - Storm transposition using HEC-MetVue
- Realistic indication of flooding potential
Regional storms exceeding infrastructure and/or future 100 year water surface with increased imperviousness cover, storm drains and channels.
Return on Investment

- 2017 “Natural Hazard Mitigation Saves” report by: National Institute of Building Sciences Institute, Multi-hazard Mitigation Council (MMC),
  - Investment in stormwater infrastructure returns $5 to $7 for every $1 invested
  - Lower community flood insurance premiums
  - Provides connected open space
  - Increased safety from flooding
  - Human health benefits
  - Recreation benefits
  - Attract and retain talent

Products and Benefits

- **Transportation Infrastructure**
  - Structure Elevation / Culverts / Model Growth
  - Transportation “LEED” Certified (Ray Roberts / Lewisville)
  - Green Parkway Widths / Detention
  - Safety
    - Technology/routing
    - Better prioritization of low lying structures

- **Flooding**
  - Numerical models (meteorology, hydrology, hydraulics)
  - Reduced risk
  - Regulatory products
  - Designated stormwater areas
    - Tree farms, Wetlands, Mitigation banks, Detention areas

- **Environmental Stewardship (ES) and ES as a Revenue Element**
  - Environmental areas
  - Horse farms
  - Preserve riparian areas
  - Mitigation areas/wetland banking
  - Eco-tourism

- **Stormwater infrastructure plans**
- **Emergency preparedness**
- **Emergency response**
- **Groundwater recharge**
- **Open space and connected open space**
A working group of partners and stakeholders to carry out a comprehensive planning effort in Wise County and portions of Dallas, Denton, Ellis, Johnson, Parker, and Tarrant counties
INTEGRATED PLANNING OF REGIONAL TRANSPORTATION AND STORMWATER MANAGEMENT TOGETHER AS A SYSTEM OF IMPROVEMENTS: PREVENTION VS. RESPONSE

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