



North Central Texas
Council of Governments

Integrating Transportation and Stormwater Infrastructure

Common Recommendations from the Denton County Greenbelt Plan and Watershed Protection Plans

July 2026



*The Texas General Land Office
provided guidance, oversight,
and funding for this study.*



*This study was also funded by the Texas Water
Development Board and Texas Department of
Transportation.*



Integrating Transportation and Stormwater Infrastructure (TSI)

Common Recommendations from the Denton County Greenbelt Plan and Watershed Protection Plans for Application Across the TSI Study Area

NCTCOG: Jason Heflin and Elizabeth Sin

1 Introduction

The North Central Texas Council of Governments (NCTCOG) study team reviewed the Denton County Greenbelt Plan (DCGP) and Watershed Protection Plans (WPPs) from Cedar Creek, Eagle Mountain, Hickory Creek, and Village Creek-Lake Arlington. The WPPs focused on water quality, but some common recommendations are applicable to flood prevention, including methods of education and outreach, funding sources, and policy recommendations.

By analyzing these existing plans, the integrating Transportation and Stormwater Infrastructure (TSI) study can build on proven practices, align with regional priorities, and develop integrated solutions that address both water quality and flood resilience. This review ensures that the TSI framework incorporates lessons learned from prior efforts and leverages opportunities for collaboration across jurisdictions.

2 Education and Outreach

Educating the public and stakeholders were common themes found throughout each WPP and the DCGP. Below is a list of some of the common methods found (Village Creek-Lake Arlington Watershed Protection Partnership, 2019; UTRWD, 2017; Cedar Creek Watershed Partnership, 2008)

- Brochures
- Public awareness campaigns
- Speaking engagements
- Training programs
- Establishing a brand
- Collaborating with other agencies
- Targeting specific audiences
- Educating the public on “why” this is important

- Make information about each watershed public
- Define the driving forces/goals
- Increase knowledge and acceptance of physical Best Management Practices (BMPs)

3 Funding Sources

Recognizing the need for diverse funding sources for creation, implementation, and maintenance of these various plans was prevalent throughout each plan as well. Below is a compilation of the sources that were mentioned. A separate and detailed funding memo was created to compile various financial assistance programs available to support projects related to flood control, stormwater management, and mitigation.

- Federal funding sources (Village Creek-Lake Arlington Watershed Protection Partnership, 2019; UTRWD, 2017)
 - Agricultural Water Enhancement Program
 - Clean Water Act-state water pollution control grants
 - Clean Water Act-nonpoint source grant program
 - Conservation Reserve Program
 - Conservation Stewardship Program
 - Cooperative Watershed Management Program
 - Environmental Quality Incentives Program
 - Environmental education grants
 - Rural Development Program-water and environmental
 - Water Resources Development Act-environmental restoration program
 - Community Development Block Grants
 - General Obligation Bonds
- State funding sources (Village Creek-Lake Arlington Watershed Protection Partnership, 2019; UTRWD, 2017)
 - Agricultural Water Conservation Program
 - Agricultural Conservation Easement Program
 - Clean Water State Revolving Fund
 - Economically Distressed Area Program
 - Landowner Incentive Program
 - Outdoor recreation grants
 - Regional water supply and wastewater facility planning program
 - Supplemental Environmental Projects Program
 - Texas Capital Fund
 - Texas Clean Rivers Program
 - Texas farms and ranch lands conservation program
 - Water Quality Management Plans
- Local funding sources (Village Creek-Lake Arlington Watershed Protection Partnership, 2019; UTRWD, 2017)
 - Stormwater or environmental service fees
- Market-based funding (City of Denton, 2008)
 - Establish a baseline condition for a credit market
 - Performance above baseline would generate credits
 - Below baseline would require the purchase of credits

- Mitigation banking (UTRWD, 2017)
 - Value of mitigation bank is defined by compensatory mitigation credits
- In-lieu fee programs (UTRWD, 2017)
 - Money paid to government or non-profit to satisfy compensatory mitigation requirements associated with department of army permits (Clean Water Act) is used for restoration, establishment, enhancement, and preservation of aquatic resources
- Private funding sources (UTRWD, 2017)
 - Texas Water Action Collaborative
 - Foundations (North Texas Community Foundation, Dixon Water Foundation, etc.)

4 Policy Recommendations

Identified below are common recommendations that could be applied elsewhere in the TSI study area. These recommendations are also relevant to flood control measures.

- Identifying and implementing BMPs (City of Denton, 2008, Village Creek-Lake Arlington Watershed Protection Partnership, 2019; UTRWD, 2017; Clayton et al., 2012; Cedar Creek Watershed Partnership, 2008)
 - Physical BMPs
 - Stormwater/wastewater collection and treatment facilities
 - Conceptual BMPs
 - Plans, education and outreach, personnel, funding
- National Pollutant Discharge Elimination System (NPDES) Program and Texas Pollutant Discharge Elimination System (TPDES): Regulates point sources that discharge pollutants
 - Municipal separate storm sewer systems (MS4s) permitting (City of Denton, 2008; Village Creek-Lake Arlington Watershed Protection Partnership, 2019; UTRWD, 2017; Cedar Creek Watershed Partnership, 2008)
 - MS4s are stormwater conveyance systems owned by the state, city, town, village or other public entity
 - Ditches, curbs, gutter, storm sewers
 - Permittee must develop a management plan that will describe stormwater control practices that will minimize the discharge of pollutants during events
 - See Table 1 for Phase I and Phase II MS4s in the TSI Study Area.
 - Construction activities
 - Post-construction runoff controls
 - Industrial activities
- Conservation easements (UTRWD, 2017; Village Creek-Lake Arlington Watershed Protection Partnership, 2019)
 - Written agreement between a landowner and government entity or land trust whereby the landowner voluntarily restricts certain uses of the property in perpetuity to protect its natural, productive or cultural features
 - Including tax exemptions to landowners

- Agricultural management measures (Clayton et al., 2012; UTRWD, 2017; The Cedar Creek Watershed Partnership, 2008; Village Creek-Lake Arlington Watershed Protection Partnership, 2019)
 - Riparian buffer
 - Rotational grazing
 - No-till farming
 - Cover crops
 - Terracing
 - Series of earthen embankments constructed to slow water flow
 - Grassed waterways
 - Natural or constructed channels that use plants to concentrate and slow water flow
 - Grade stabilization
 - Structures to reinforce lakesides, gullies, and stream banks
- Urban management measures (City of Denton, 2008; Clayton et. al., 2012; UTRWD, 2017; Village Creek-Lake Arlington Watershed Protection Partnership, 2019)
 - Riparian Buffers
 - Ordinance or development standard to have setback of at least 25 feet for streambank stabilization and up to 100 feet for water quality protection.
 - Discontinue mowing and other plant removal methods within 25 feet on both sides of streambank to allow native vegetation to grow.
 - Green Stormwater Infrastructure (rain gardens, rainwater harvesting, bioswales, etc.)
 - Pet waste management
 - Management of lawn residue and waste
 - Voluntary urban nutrient management
 - Outreach to encourage behavioral changes
 - Trail development

Table 1. Phase I and Phase II MS4s in the TSI Study Area (Census Bureau, n.d.)

Phase I	Phase II*				
Arlington	Azle	Double Oak	Keller	Prosper	Dallas County
Dallas	Bartonville	Everman	Kennedale	Providence Village	Denton County
Fort Worth	Benbrook	Flower Mound	Lake Dallas	Reno	Ellis County
	Briaroaks	Forest Hill	Lake Worth	Roanoke	Johnson County
	Burleson	Frisco	Lakeside	Sanctuary	Parker County
	Cedar Hill	Grand Prairie	Lakewood Village	Sansom Park	Tarrant County
	Celina	Grapevine	Lewisville	Shady Shores	Wise County
	Copper Canyon	Haslet	Little Elm	Southlake	
	Corinth	Hickory Creek	Mansfield	Trophy Club	
	Cross Roads	Highland Village	Midlothian	Westlake	
	Cross Timber	Hudson Oaks	Oak Point	White Settlement	
	Crowley	Justin	Pelican Bay	Willow Park	
	Denton				

*Communities listed are fully or partially located within an urban area (UA) with a population of at least 50,000 (Dallas-Fort Worth-Arlington UA, Denton-Lewisville UA, McKinney-Frisco UA), but may have received a waiver for approved reasons.

5 Conclusion

Several themes emerged from this review that can guide future planning and implementation. Education and outreach are critical for building public awareness and stakeholder engagement, and communities can adopt strategies such as targeted campaigns, training programs, and collaborative branding to strengthen support for watershed and flood management initiatives.

Diversifying funding sources is another key takeaway, as sustainable implementation depends on leveraging federal, state, local, private, and market-based resources to cover planning, construction, and maintenance costs.

Finally, policy recommendations and BMPs offer actionable steps for reducing flood risk and improving water quality, including conservation easements, riparian buffers, green stormwater infrastructure, and agricultural and urban management measures. By applying these recommendations, communities within the TSI study area can create comprehensive strategies that promote watershed health and enhance resilience to flooding.

6 References

Cedar Creek Watershed Partnership. 2008. "Cedar Creek Watershed Protection Plan." Accessed December 28, 2022.

<http://nctx-water.tamu.edu/media/1475/ccwpp.pdf>.

Census Bureau. n.d. TIGERweb Interactive Map. Accessed February 17, 2026.

<https://tigerweb.geo.census.gov/tigerweb2020/>.

Clayton, B., Mechell, J., Waidler, D., Wolfe, C. 2012. "Eagle Mountain Watershed Management, Texas A&M AgriLife Communications." Accessed December 29, 2022.

<https://www.nctcog.org/getmedia/4598eb01-149d-46c3-94fe-827df8ba64d8/Eagle-Mountain-WPP-Fact-Sheet.pdf>.

Denton, City. 2008. "Control of Nonpoint Source Loads in the Hickory Creek Sub-basin of the Lake Lewisville Watershed as a Component of a Watershed-Based Water Quality Trading Program." Accessed December 28, 2022.

<https://www.cityofdenton.com/DocumentCenter/View/596/Hickory-Creek-Watershed-Protection-Plan-PDF>.

Village Creek-Lake Arlington Watershed Protection Partnership. 2019. Accessed December 28, 2022. "Village Creek-Lake Arlington Watershed Protection Plan."

<https://cms9files.revize.com/trinityriverauth/Documents%20Center/Basin%20Planning/Village%20Creek/VCLAWPPfinal.pdf>.

Upper Trinity Regional Water District (UTRWD). 2017. Denton County Greenbelt Plan For the Future, Chapter. 5 Implementation Strategies.