Planning to Reduce Future Flood Risk

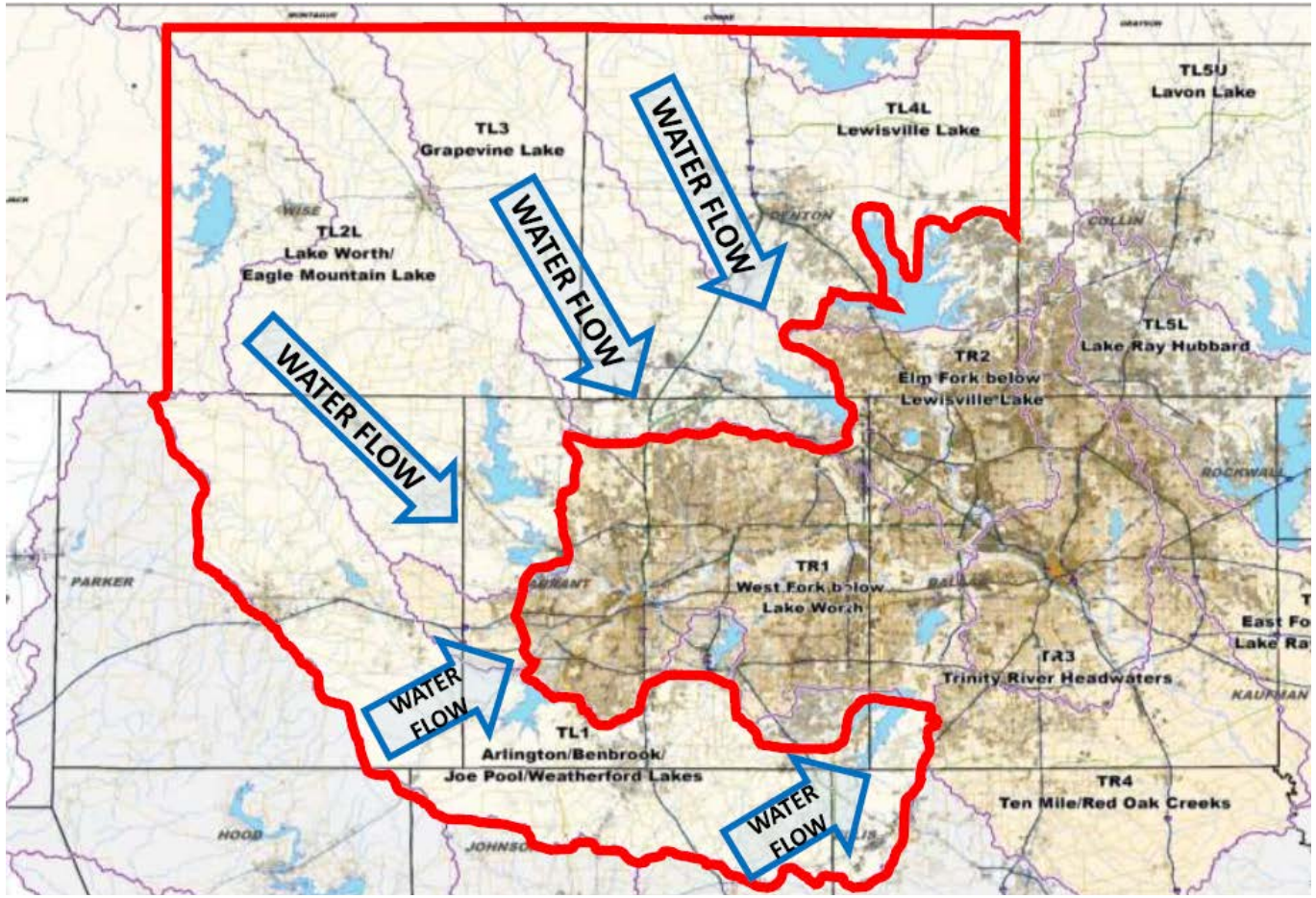
RSWMCC Meeting | December 12

Funded by the Texas General Land Office, Community Development Block Grant, Disaster Recovery Program.

Also Funded by the Texas Water Development Board and Texas Department of Transportation.

Integrated Transportation and Stormwater Infrastructure (TSI) Initiative

- Integrate stormwater management, urban development, transportation, and environmental planning
- Identify impacts and alleviate risks from flooding
- Get ahead of growth
- Reduce costs



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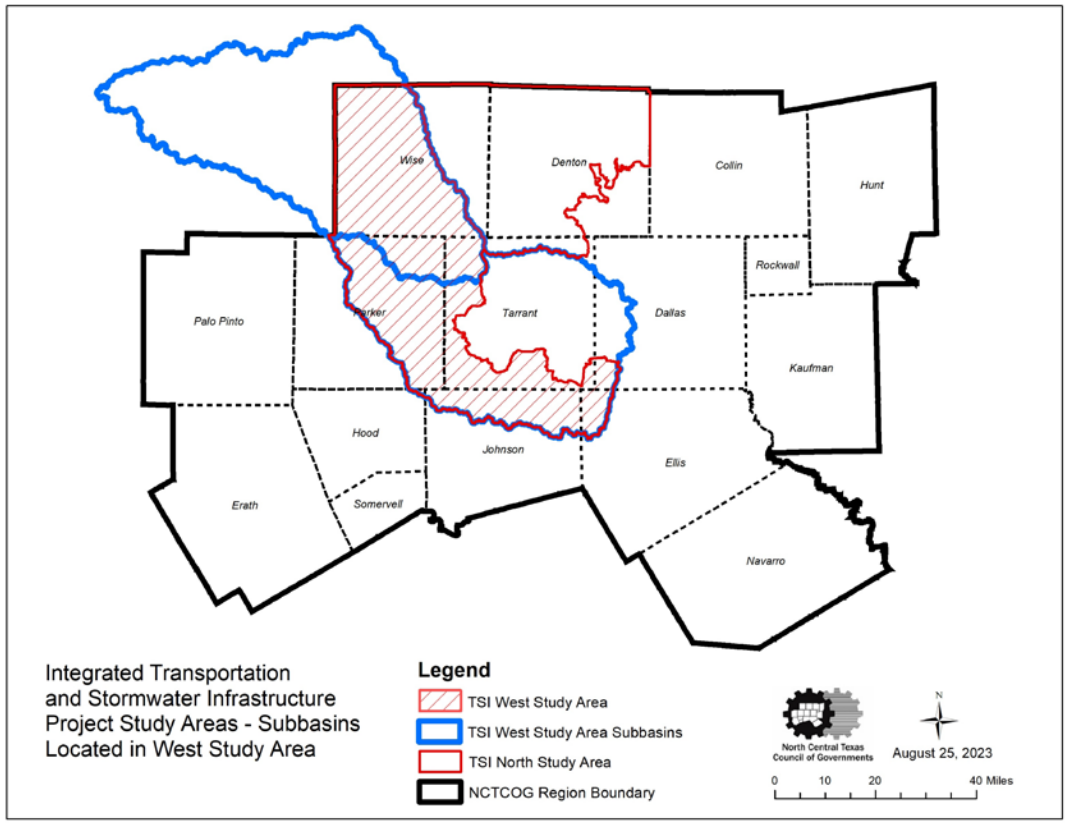
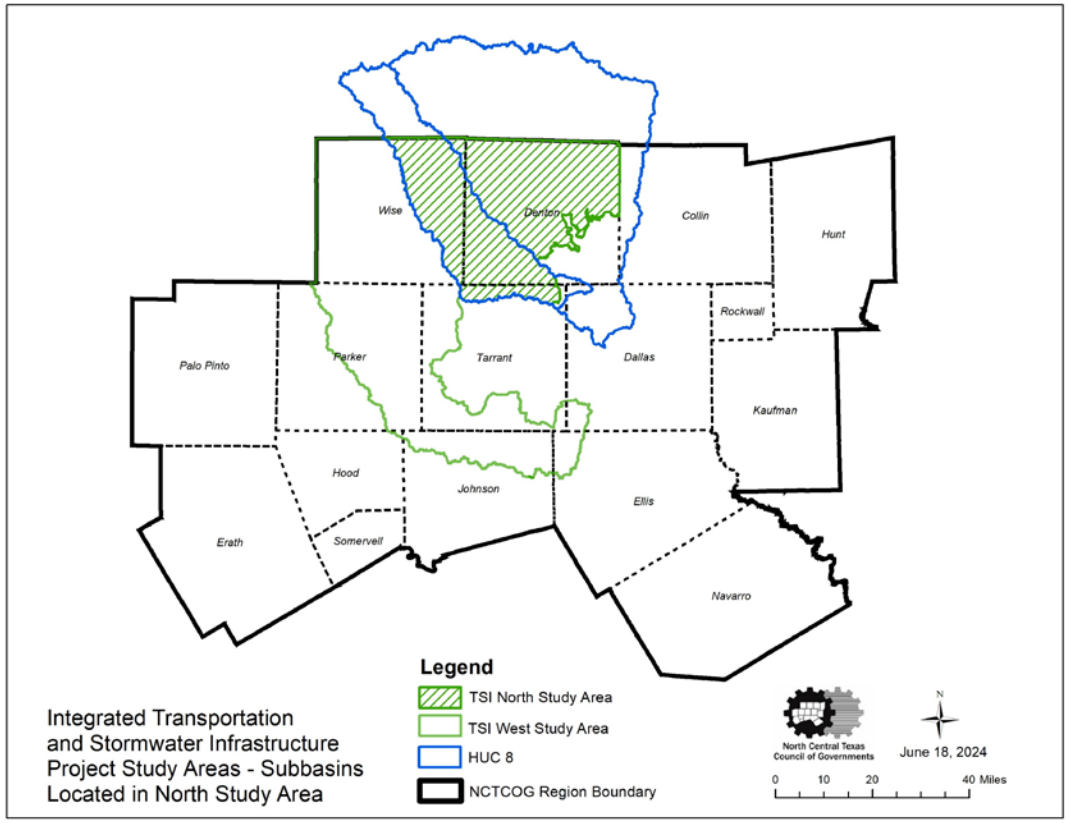
West and North Study Areas





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Project Area Details

- 85 cities and portions of 8 counties
- 126% increase in population (2020 – 2045)
- 60% undeveloped (2015)
- 19% growth in impervious surface (2006 – 2016)
- > 7,000 miles of streams and > 274,000 acres of 100-year floodplain

Photo courtesy of City of Newark

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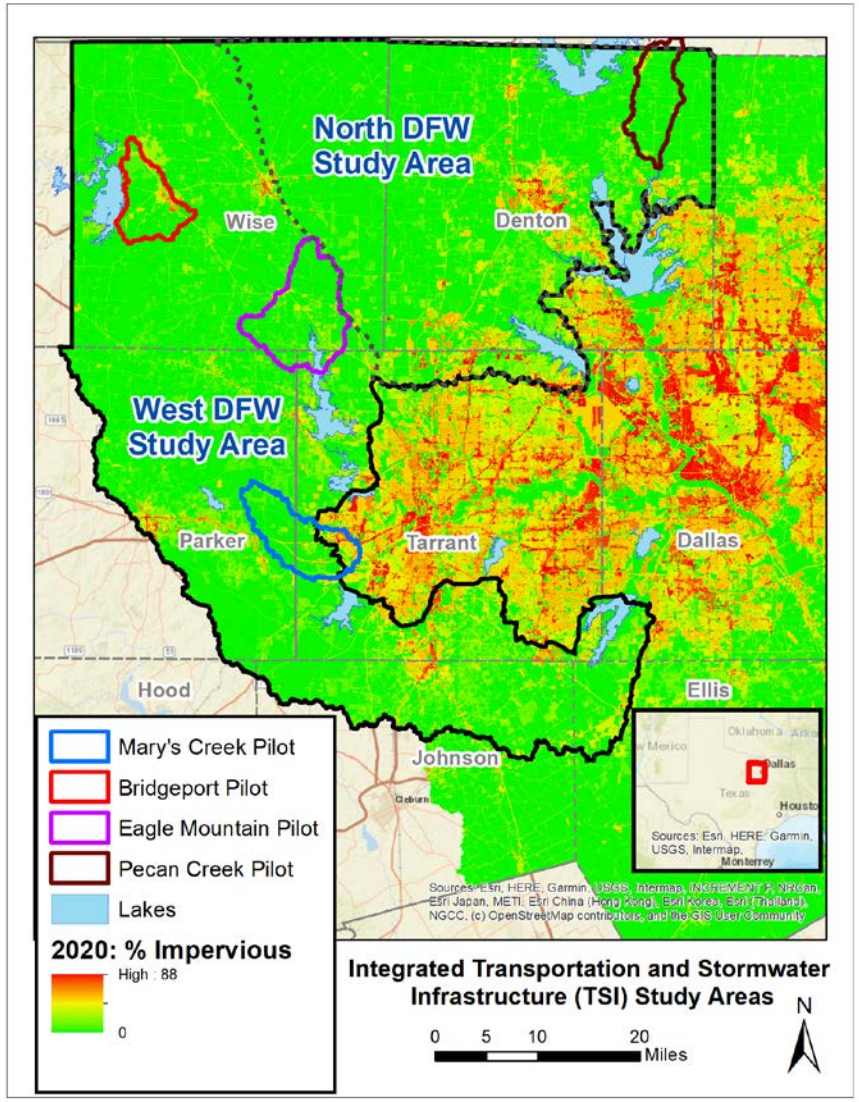
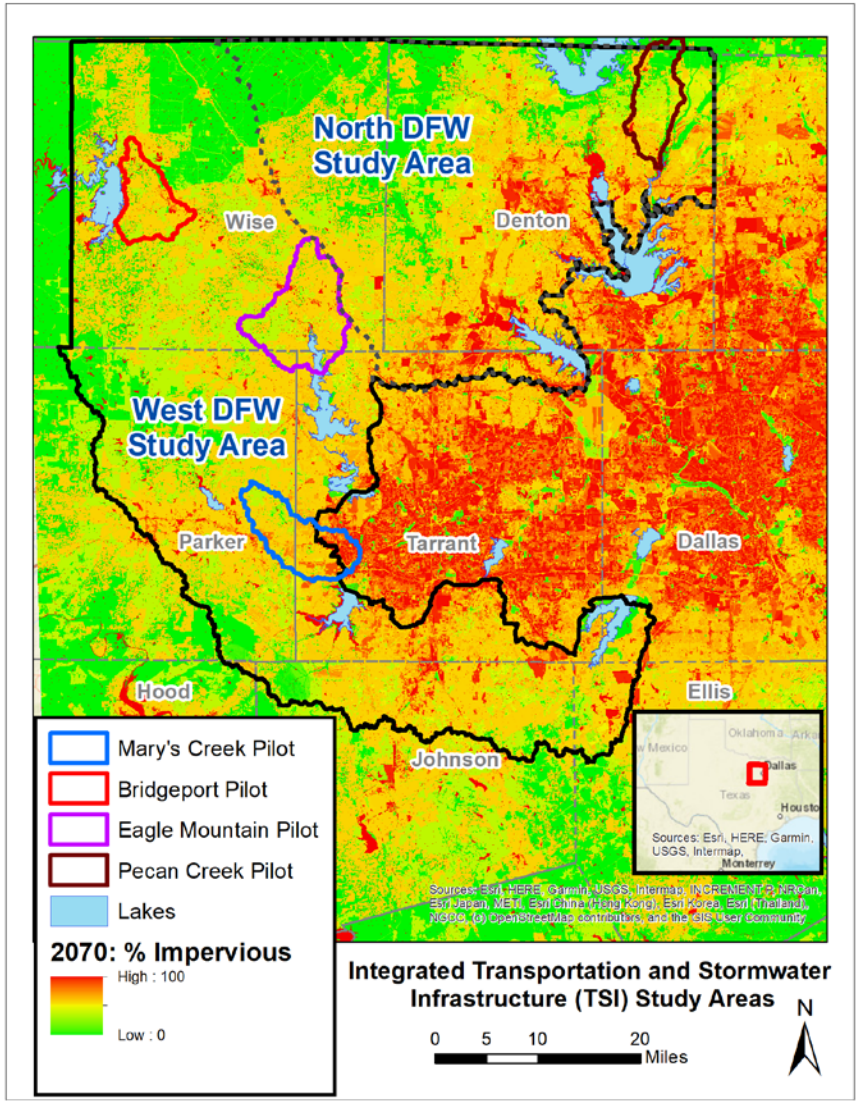
Typical Urbanization Adds Impervious Surfaces

2020 (6.4% Impervious) → **2070 (35.2% Impervious)**





GSI/NBS Suitability Index (GIS Stacking Model)

Environmental

Topographical
Elevation, Slope, Aspect, Curvature, TWI, TRI

Meteorological
Rainfall intensity, Temperature

Land use/cover
NDVI, Curve number, NRCS BMPs

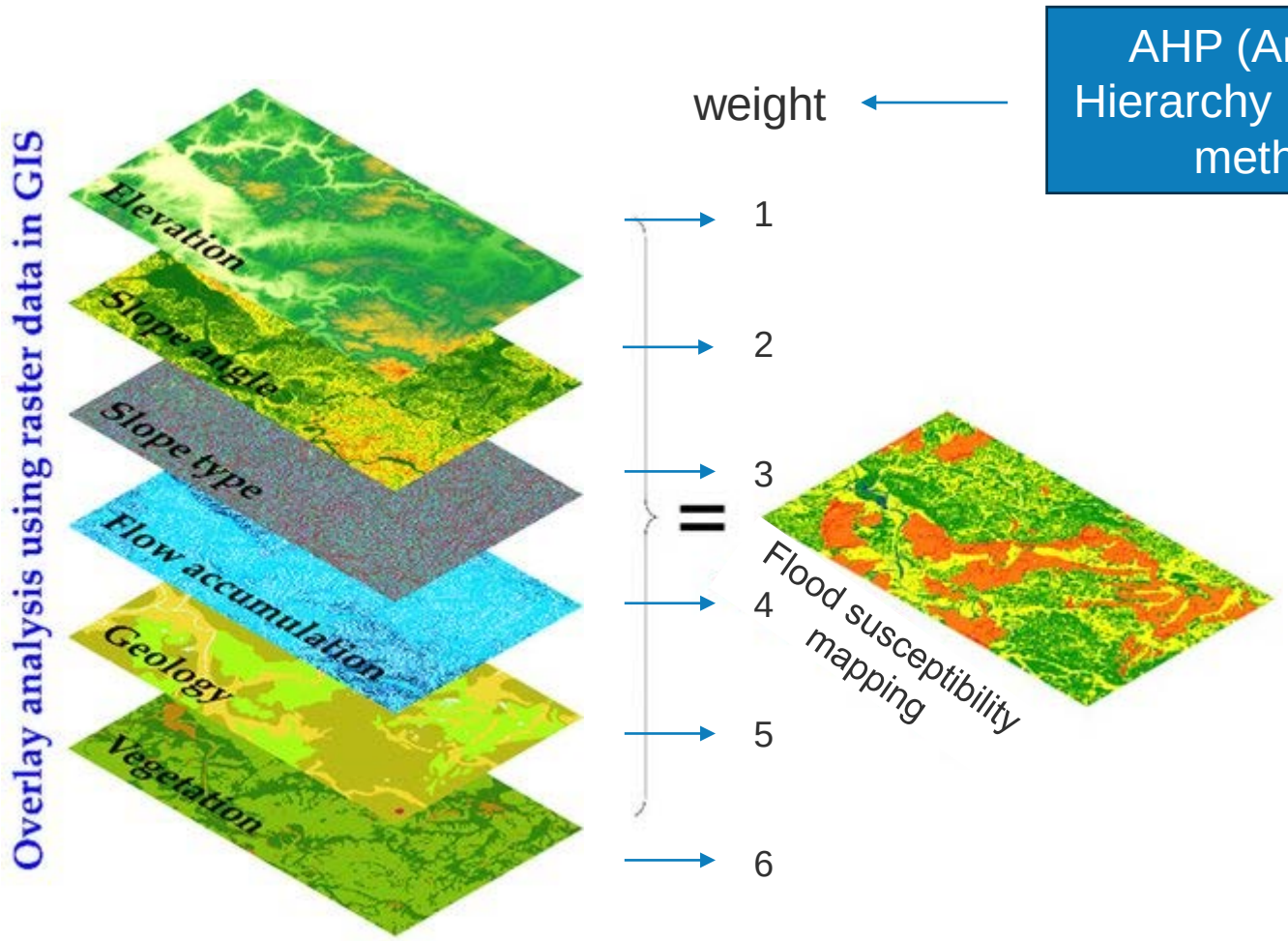
Hydromorphological
Distance from river, Stream density, Time of concentration

Socio-economical

Social vulnerability index, Population density

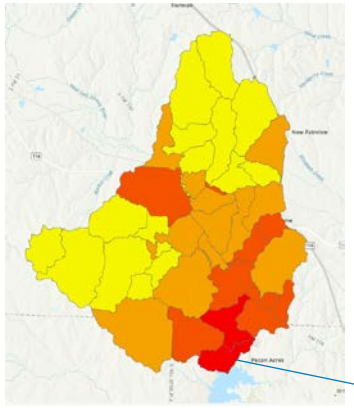
Infrastructural

Distance from transportation network, Distance from detention pond, Distance from USGS streamflow monitoring gauges



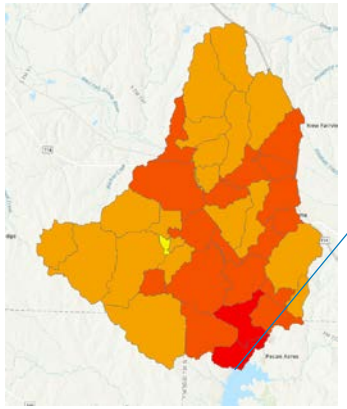
Optimizing Locations for GSI and NBS

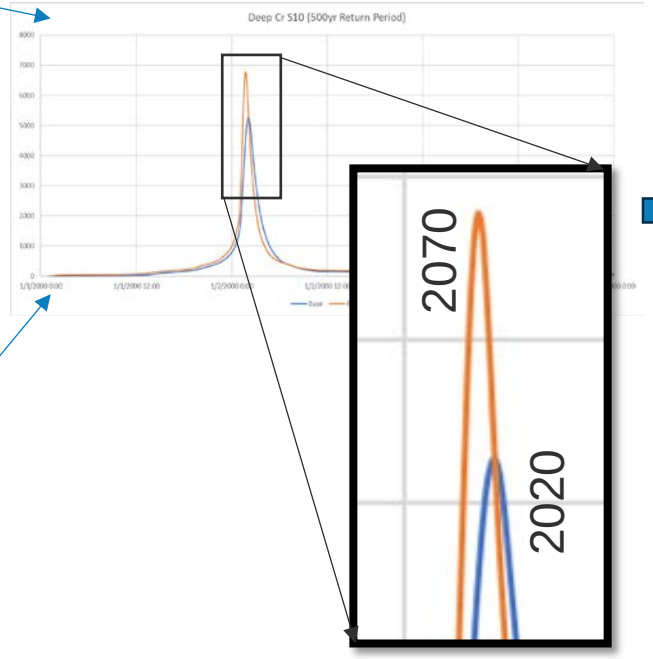
2020



Increased Imperviousness

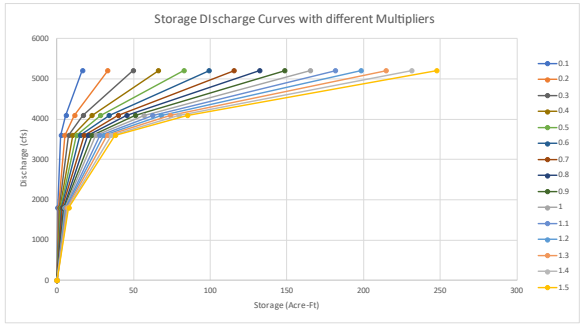
2070





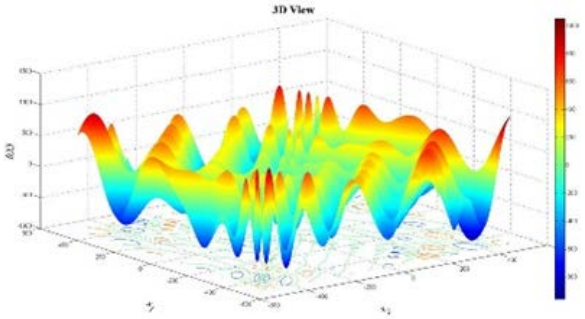
Increase in Flow

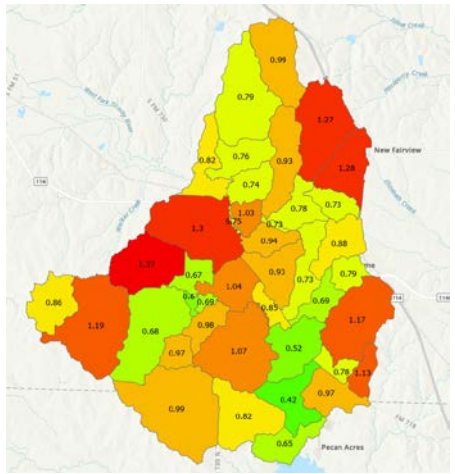
Setting Up HEC HMS Model with Reservoirs at Each Subbasin



Varying Storage Values to Best Reduce the Peak Flow

Optimized Storage Values generated from HMS Runs





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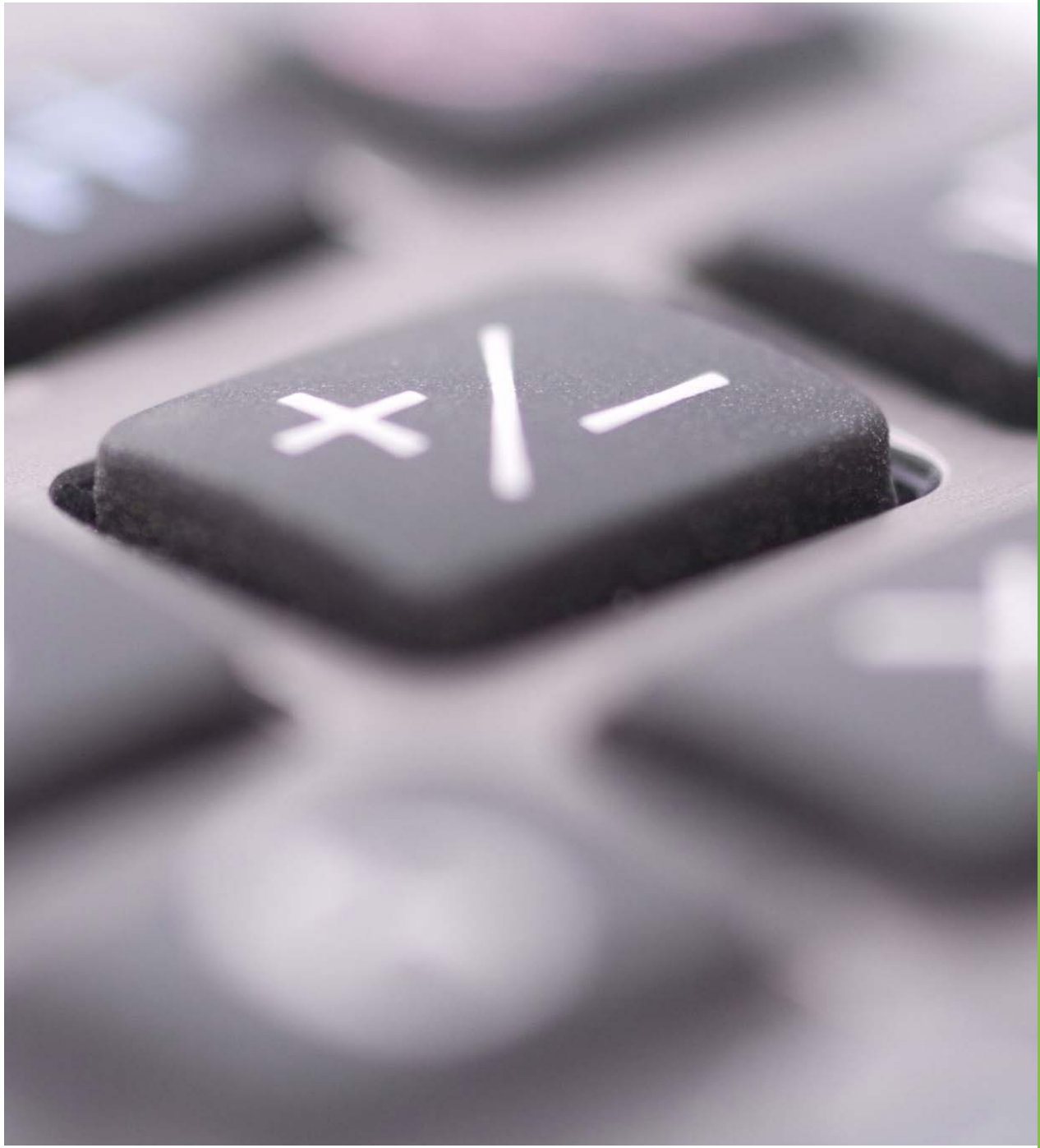
Additional Environmental Planning Products

- Menu of GSI and NBS solutions
- Online map of high flood risk and high opportunity for GSI and NBS to reduce flood risk and improve water quality
- Cost-benefit analyses of GSI and NBS
- Hydrologic and hydraulic modeling pre- and post-GSI and NBS
- Report on methodology for replication outside immediate study area



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MS4 Permit Compliance Support

- Permit compliance re: Minimum Control Measures relative to Post-construction Controls
- Meets Post - construction control MCMs in both Phase 1 and Phase II MS4 Permits
- Deliverables include recommendations for related policy, ordinances, and implementation

Photo courtesy of TAMU Agrilife- Extension

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Member Surveys on MCM Support by NCTCOG

- 2019 Stormwater Survey indicated:
  - MCM for Construction Site Stormwater Runoff was identified as the top concern followed closely by MCM for Post-Construction Stormwater Management.
  - Development of **regional recommendations for stormwater management** (e.g. model ordinances and contracts, guidance documents, templates, and checklists) was the most valued NCTCOG provided resource (55.56% of responses) second only to **trainings on a variety of topics for various audiences** (66.67% of responses).
  - This project can help address both of these identified opportunities.

Member Surveys on MCM Support by NCTCOG

- 2024 Survey of Phase II Public Education Needs showed:
  - Majority of respondents plan to specifically address **Developers or Construction Site Operators** to meet MCM 1 requirements.
  - The pollutants most respondents plan to address was tied between:
    - Sediment Runoff from Construction Activities,
    - Pet Waste,
    - Illegal Disposal of Household Hazardous Waste,
    - Litter, trash containment, balloon releases, and
    - Grass clippings and leaf litter.
  - Anticipated outreach around this project may also be used to address these concerns.

Synergies Between TSI and SWMP

- Model ordinances
  - Opportunity for RSWMCC to influence language
- Public education and outreach materials
  - Could be compatible with permit requirements
- Integration of transportation and stormwater infrastructure
  - Potential for minimizing discharge of pollutants
- Developer outreach
  - Opportunity to promote BMPs and structural controls compatible with TSI
- Identified funding strategies
  - Implementing GSI and NBS

Photo courtesy of City of Newark

Benefits for Region

- Participation in Technical Advisory Group as stakeholders to project outcome;
- Potential flood flow reductions to downstream communities;
- Developer exposure to TSI concepts;
- Pilot expansion of Corridor Development Certificate Program’
- Updated methods for hydrologic and hydraulic models and for incorporating data into real-time flood warning systems.

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Estimated Study Timeline

Through Fall 2025
Continue training workshops and site visits to individual communities

Winter 2025/2026
Complete H&H modeling and identify transportation, environmental and other policy recommendations

March 2026
Conduct project update meeting to present findings and seek stakeholder feedback

June 2026
Conduct project update meeting to present final products incorporating stakeholder feedback

July 2026
Submit deliverables to funding agencies

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Funding Partners

Texas General Land Office / Department of Housing and Urban Development

Texas Water Development Board

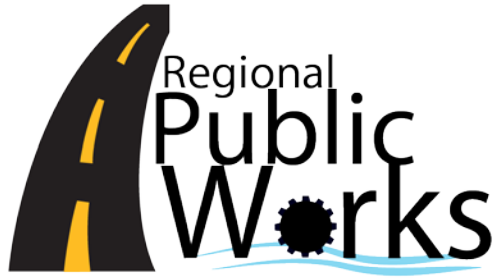
Texas Department of Transportation / Federal Highway Administration

US Army Corps of Engineers

Federal Emergency Management Agency

NCTCOG Public Works Council

NCTCOG Trinity River COMMON VISION Steering Committee



NCTCOG TSI Funding Breakdown

- West Area, **$6M** grant from Texas Water Development Board, et al
- North Area, **$4M** grant from Texas Government Land Office, et al
- Public Works Council……..$75,000
- *[Regional Stormwater Management Coordination Council?.....$45,000]*
- Trinity River COMMON VISION Steering Committee……..……$30,000

TOTAL LOCAL FUND MATCH $150,000

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Project Partners

West Study Area

North Central Texas Council of Governments

US Army Corps of Engineers

University of Texas at Arlington

Texas A&M AgriLife Extension Service

Tarrant Regional Water District

Freese and Nichols, Inc.

Halff Associates, Inc.

North Study Area

North Central Texas Council of Governments

Upper Trinity Regional Water District

Halff Associates, Inc.

Highland Economics, LLC

Contracts pending:

University of Texas at Arlington

Texas A&M AgriLife Extension Service

US Army Corps of Engineers

Authorization Request

- Amend FY 24-25 RSWMCC Work Plan to add TSI North Project Support, with budgeted project amount of $45,000, allocated out of deferred revenue from prior RSWMCC annual budgets;
- Project matches Federal local state assistance program funding for the USACE allowing continued project participation in the TSI - North Study Area;
- Authorization brings NCTCOG to a total of $150,000 in project matching funds when added to contributions from Public Works Council and Trinity COMMON VISION Steering Committee;
- Expenditure generally consistent with Texas Local Government Code Chapter 552, Municipal Utilities.

Resolution

- Move to amend the RSWMCC FY 25 Work Plan to add the following under "RSWMCC Focus Area":
  - Coordination with the integrated Transportation and Stormwater Infrastructure study, which may produce:
    - Model ordinances
    - Outreach materials
    - Strategies that could reduce flooding and pollution including post-construction controls
    - Recommendations to fund stormwater management activities

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TSI StoryMap

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