

Integrated Transportation and Stormwater Infrastructure (TSI)

Subarea Meetings – April / May 2023

U.S. Billion-Dollar Disasters in 2022



Flooding Fatalities and Damages

Texas far outpaces other states in flood related fatalities and floodrelated damages

Source: Gregory Waller, Service Coordination Hydrologist, NWS – West Gulf River Forecast Center,

ats.shtml. 11/18 TFMA

http://www.nws.noaa.gov/om/hazst



TSI Subarea Meetings

Extreme Storms... A History Lesson



Extreme Storms (2010 – 2019)





TSI Subarea Meetings

Urbanization Challenges



If large areas of the floodplain are filled, then there will be an increase in the land area needed to store flood waters. This means your home or business may be impacted.

Case Study: Development in Fort Worth, TX (North)





Stormwater Challenges

- No regionwide data
- Piece-meal/lacks connectivity
- NOAA Atlas 14 rainfall estimates
 - Required for infrastructure design, planning, and delineation of flood risk
 - 2022 FLOODS Act
 - 10-year updates





Transportation Challenges

- Transportation spending is high and growing
- Rate of deterioration for transportation infrastructure increasing
- Needs far outweigh resources



http://www.dallasbond.com/



Integrated Transportation and Stormwater Infrastructure (TSI) Initiative

- Integrate stormwater management, urban development, transportation, and environmental planning
- Develop plan for risk awareness and resiliency
- Identify impacts and alleviate risks from flooding





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





Why Collaboration is Important

- Dissolve silos
- Improve delivery of consolidated, adaptive infrastructure
- Get ahead of growth
- Reduce costs





Collect & Analyze Data

Mapping, Modeling, and Policy Recommendations





Processes

Document

1. Proactive Planning

- Reimagine transportation design to integrate stormwater, environmental, and flood reduction benefits
- Protect current and future infrastructure
- Develop model for replication





2. Reduce Flooding

- Reduce flooding downstream of rapidly growing upstream communities
- Increase resiliency to flooding disasters
- Inform decision-making
- Implement stormwater infrastructure with transportation infrastructure





3. Tools and Resources

- Empower communities to adopt higher floodplain management standards
- Develop GIS-based tools and resources





4. Local-Scale Innovation

- Enhance Trinity River Watershed Hydrology Assessment
- Enhance existing hydraulic models such as Base Level Engineering
- Emergency management modeling tool
- Optimization study for drainage/flood control structures





5. Community Roadmap

- Produce planning-level design for transportation, stormwater detention, and environmental benefits
- Integrate these layers to identify what needs to be built and achieved
- Establish ways to fund planned infrastructure





How Can *WE* Accomplish This?

- TSI benefits from valuable flood hazard awareness and resiliency information that reduces uncertainty related to flood risk
- Enables us to further enhance and integrate this information at a regional scale
- Without this information, it would require extensive effort on the front end of the project to get here

Leverage existing Flood Risk Management initiatives...



... to innovate at a regional scale



A Call for Local Data



GROW. Future comprehensive (land use) plans; thoroughfare plans; stormwater infrastructure; data on hotspots for population and employment growth.





PRESERVE. Areas to preserve for parks, open space and environmental conservation; culturally important sites that do not have state or national historic designation.

PROTECT. Low-water crossings and areas that flood repeatedly; existing detention ponds or constructed wetlands.

Please email data to Matthew.T.Lepinski@usace.army.mil



TSI Subarea Meetings

Developers, Realtors, and Insurance Agents

- Concerns about future flooding risk
- Data these industries could share
- How these industries would like to engage in the TSI study
- Study outcomes that would assist these industries





Literature Review Findings

Transportation planning organizations across the U.S. have conducted similar studies



None has comprehensively addressed:

- Hydrology and hydraulics
- Future land use
- Transportation and stormwater infrastructure
- Environmental planning
- Economic analysis

Literature Review Findings

11 percent of the state's population is exposed to moderate to high riverine flood risk as defined on FEMA's flood insurance risk maps







Bridgeport Area



Pilot Study Areas



Mary's Creek Area

Upcoming TSI Activities

Green Asset Management Workshop

With Environmental Protection Agency and City of Denton

Tuesday, May 16 from 9 a.m. to 3 p.m.

Hybrid – MS Teams or In-Person (registration required) at NCTCOG

NCTCOG Flooding, Stormwater, and Water Quality Programs Webinar

Wednesday, June 21 from 1 p.m. to 2:30 p.m.

MS Teams – See NCTCOG E&D event calendar <u>https://www.nctcog.org/envir/events</u>

Technical Advisory Committee Meeting

Next meeting coming this summer

MS Teams

Speak with a study team member if you would like to participate



Breakout Stations

Breakout Station 1:

Existing programs support local governments and others as they seek to reduce their flood risk.

Presenter: Jai-W Hayes-Jackson, NCTCOG

Breakout Station 3:

Study team engineers are seeking data and information on historical flooding to validate their models.

Presenters: Dr. Daniel Li, UT-Arlington, and Matt Lepinski, USACE

Breakout Station 5:

The study team plans to produce maps, models, and policy recommendations. But what would **you** like the study to produce?

Presenter: Kate Zielke, NCTCOG

Breakout Station 2:

Municipalities and counties are taking steps to protect their communities. Can your community do more?

Presenter: Erin Blackman, NCTCOG

Breakout Station 4:

Developers and builders are key partners in implementing green infrastructure. Agricultural lands double as green infrastructure.

Presenters: Dr. Fouad Jaber, Texas A&M AgriLife, and Michelle Wood-Ramirez, Tarrant Regional Water District

integrating Transportation & Stormwater Infrastructure

Project Funders

- Texas Water Development Board
- Federal Highway Administration
- Texas Department of Transportation
- Federal Emergency Management Agency



Today's Presenters



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