SUMMARY

TSI Technical Advisory Group Meeting
Thursday, May 1, 2025
2pm- 3:30pm, Virtual Meeting via Microsoft Teams

integrating **Transportation & Stormwater Infrastructure**

I. Duke-TRWD Conservation Priority Mapping Project

Katie Myers, the Rural Programs Supervisor at Tarrant Regional Water District (TRWD), presented a collaborative project with graduate students from Duke University's Master of Environmental Management program. The project focused on prioritizing land conservation to protect water supply, particularly within TRWD-managed watersheds, and aimed to mitigate sedimentation and manage runoff to preserve water quality and flood control infrastructure. Using tools like ArcGIS Pro and Excel analysis, the students developed a spatial framework to evaluate areas for permanent land conservation, considering factors like land cover, slope, soil erodibility, and proximity to riparian areas. Social factors, such as development pressure, income levels, and land ownership, were also assessed to determine feasibility for conservation efforts, along with the proximity to existing protected areas to enhance ecological connectivity.

The analysis produced a prioritized conservation map, highlighting areas where land conservation actions would have the greatest impact, although adjustments to the weighting of factors may be needed for more accurate results. Myers emphasized the project's value in providing both a meaningful professional experience for the students and a resource for TRWD to enhance its long-term environmental goals. She noted that the collaboration was cost-effective for TRWD, as it involved voluntary support from Duke University, and she expressed interest in continuing this partnership for future projects. Kate Zielke acknowledged the relevance of the findings to the broader TSI study, especially with respect to open space conservation and flood mitigation, and encouraged stakeholders to view the full presentation once available.

II. Update on Project Progress

Kate Zielke provided an overview of the TSI study for newcomers. The TSI study is focused on mitigating current and future flood risks in collaboration with technical partners such as NCTCOG, the U.S. Army Corps of Engineers, TRWD, UTA, Texas A&M AgriLife, and consultants from Halff Associates and Highland Economics. She highlighted progress including three rounds of advisory and steering committee meetings, training workshops, and community outreach. Resources like the local government FAQ are available on the TSI website. The study began with a literature review and has involved H&H (hydrology and hydraulics) pilots, SOP drafting, and GIS-based multi-criteria analyses, with AgriLife and UTA contributing to optimization and modeling efforts in the northern part of the study area.

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III. Stacking Model for Flood Prioritization

Yufan Zhang, a postdoctoral researcher with Dr. Jaber at Texas A&M AgriLife, presented his work on identifying key areas for green stormwater infrastructure (GSI) implementation as part of the TSI study. The aim of the analysis was to map both flood susceptibility—based on natural and built environmental factors—and vulnerability, assessing the community and infrastructure's sensitivity to flooding. This model, developed using GIS, integrates a wide range of environmental, infrastructural, and socioeconomic data, providing a spatial planning tool to guide GSI interventions like detention ponds and constructed wetlands. By using 14 conditioning factors such as topography, land cover, and infrastructure metrics, along with innovative techniques like kernel density analysis, the study offers a comprehensive view of flood risk across various regions. Additionally, social vulnerability indices were incorporated to measure community resilience to flooding, giving a fuller picture of areas in need of mitigation efforts.

The model also considers future conditions projected for 2045, accounting for anticipated changes in land use, precipitation, and traffic density. Factor weights were determined through the Analytic Hierarchy Process (AHP), based on expert input, and the model's effectiveness was validated through observed flood data and receiver operating characteristic (ROC) curve analysis. The final output includes prioritization maps that identify areas where flood risk reduction strategies can be most effective and cost-efficient. These interactive GIS products are publicly accessible and will support future planning efforts, including the evaluation of vulnerable transportation infrastructure. Kate Zielke highlighted the importance of this work in identifying both current and future flood risks, and mentioned that similar models would be extended to the North study area.

IV. Expansion of Corridor Development Certificate Process

Vincent A Geracci from the U.S. Army Corps of Engineers presented an update on the expansion of the Corridor Development Certificate (CDC) program into the TSI study area, emphasizing its role in short-term, strategic floodplain management. While other TSI efforts focus on long-term modeling and flood risk identification, the CDC program offers communities a more immediate approach to managing floodplain development. Originally developed in the 1980s to address development pressures along the Trinity River, the CDC program provides regional floodplain development standards aimed at preserving flood storage capacity and preventing increased flood elevations while maintaining local jurisdictional authority. Geracci discussed the program's criteria, such as no increase in 100-year flood elevations and

limits on flood storage reductions, and highlighted its benefits, including cumulative impact modeling and peer review among participating communities.
The Corps has initiated a pilot study in the City of Weatherford to explore the feasibility of extending the CDC program to the TSI region. This pilot involves Town Creek as a test case, where the Corps is working with updated hydrology and land use data to develop preliminary inundation mapping and refine the CDC modeling process. Future steps include completing the modeling, consolidating the HEC-RAS model package, and creating guidance for other communities interested in adopting CDC criteria. Geracci also mentioned the development of a template to assist communities in applying for Floodplain Management Services funding to support similar initiatives.
Kate Zielke thanked Geracci for his presentation and emphasized the significance of the CDC pilot in advancing floodplain management within the TSI study area, offering practical solutions for communities.

V. Hydrology in North Study Area

Sam Sarkar (Halff Associates) provided an update on the Hydrology and Hydraulics (H&H) modeling efforts in the TSI North Study Area, outlining the progress made and the methodology used for the project. As the technical lead, Sam emphasized that the modeling efforts are designed to be replicable in other regions, ensuring that the methodologies developed can be reused in future studies. The work follows a standard operating procedure (SOP) to maintain consistency across the North and West study areas, and adheres to protocols established by the Army Corps of Engineers. Sam highlighted that the hydrology modeling started with the delineation of sub-basins and the development of the Hydrologic Modeling System (HMS) model, which has been tailored to the higher spatial resolution of the TSI North area.
Looking ahead, Sam discussed the next steps in the modeling work, which include completing the routing for all sub-basins, incorporating precipitation data, and beginning the calibration process. In addition to the hydrology modeling, the team will transition to the hydraulic analysis as part of the broader TSI process. Sam also mentioned that the H&H group is considering pilot areas for the full TSI process, which would provide more detailed and grant-ready datasets for future funding applications. The priority will now shift toward refining these pilot studies and developing SOPs for hazard assessments and alternative analysis. These efforts aim to ensure consistency and support future analysis within the TSI study.

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VI. Denton County Greenbelt Plan

Blake Alldredge (UTRWD) presented an update on the Upper Trinity Regional Water District's efforts to protect watersheds in Denton County through the Denton County Greenbelt Plan, a key initiative aimed at preserving floodplains and water quality. UTRWD, which serves 29 communities in Denton and Collin counties, partners with the North Central Texas Council of Governments (NCTCOG) on the TSI study. Alldredge emphasized the growing threats of urban development near floodplain areas and the importance of watershed management to mitigate pollution, protect reservoirs, and reduce water treatment costs. The Greenbelt Plan, finalized in 2017, identified nearly 1,000 miles of riparian corridors for conservation, promoting strategies such as conservation easements, green stormwater infrastructure, and cluster development to preserve natural landscapes. Alldredge explained how the Greenbelt Plan aligns with the TSI's flood mitigation and water quality goals, citing examples such as the 2015 floods in Denton County. He also highlighted the social and economic benefits of preserving green infrastructure, such as improved mental health from access to nature and significant economic returns from recreation and tourism. Furthermore, Alldredge shared findings from the Texas Land Trust Council, demonstrating the financial value of conservation efforts, including savings in water treatment costs and disaster mitigation. He concluded by stressing that while 12 entities have adopted the Greenbelt Plan, the focus is on implementing conservation easements and sustainable practices that will drive real impact in flood risk reduction and long-term water protection.

VII. Outreach to Local Governments

a. Local Government FAQ
b. Community Site Visits
c. County Watershed Workshop
d. Upstream/Downstream Workshop

Kate Zielke provided an update on TSI study outreach efforts. She encouraged everyone to explore the Local Government FAQ on the TSI website (nctcog.org/tsi), which outlines the benefits of local government involvement in the study. Kate highlighted the ongoing community site visits, with another visit scheduled in Salina. Interested parties can contact TSI via email at tsi@nctcog.org or reach out to Kate directly to schedule additional visits.

Kate also discussed an upcoming county watershed workshop focusing on transportation, stormwater, and floodplain management, originally planned for May but rescheduled for June due to a scheduling conflict. The hybrid

workshop will be hosted in-person at NCTCOG and virtually via Microsoft Teams. She also previewed a workshop in the fall that will bring neighboring communities together to discuss growth impacts. Kate thanked the Texas Water Development Board, Texas Department of Transportation, and the Texas General Land Office for funding the West and North study areas, with FEMA also supporting stakeholder engagement. Additionally, Kate shared upcoming events in May, including the Rise Coalition meeting, the Trinity River Common Vision Flood Management Task Force, and the Regional Storm Water Management Council. For more information or to participate, contact Kate directly or use the TSI email at tsi@nctcog.org.

VIII. Next Steps and Upcoming Events

Kate Zielke outlined upcoming work for the TSI study, which includes additional technical work, policy research, and further development of recommendations. She emphasized that community site visits will continue, with several important events planned for May, including the Rise Coalition meeting on sustainable growth, the Trinity River Common Vision Flood Management Task Force meetings, and the Regional Storm Water Management Council meetings. Kate also mentioned the recent meeting of the I Swim group to discuss updates to the iSWM Manual. Those interested in contributing to the update process can reach out to Katie Hunter at *khunter@nctcog.org*. Kate reminded participants that the presentation slides would be available on the TSI website.

Kate thanked the speakers and participants for their contributions and encouraged anyone with further questions to stay on after the meeting. She then transitioned to Aaron Hoff (TRWD), who discussed the growing importance of flood control reservoirs managed by the NRCS and SCS, which have become a significant focus for flood management at both state and local levels. Aaron noted the value of using these reservoirs as an engagement point with counties, especially in light of recent successes in leveraging city involvement with TCEQ permitting requirements for high-hazard dams. He suggested that this strategy could be a high-value approach for future engagement, referencing discussions with Collin and Parker Counties. Aaron encouraged the Technical Advisory Group to consider this approach to advance flood control and hazard management strategies, thanking them for their attention.

*This content was co-created with the use of a Generative AI tool and has been reviewed by staff for accuracy.

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Attendance List	
Name	Organization
Blake Alldredge	UTRWD
Susan Alvarez	NCTCOG
Rob Armstrong	Huitt-Zollars
Maureen Barrett	White Settlement
Erin Blackman	NCTCOG
Travis Clegg	Westwood
Landon Erickson	USACE
Joan Flowers	LJA
Vincent Geracci	USACE
Stephanie Griffin	Halff
Bret Higginbotham	USACE
Aaron Hoff	TRWD
Katie Hunter	NCTCOG
Fouad Jaber	AgriLife
Brandi Kelp	Fort Worth
Larissa Knapp-Scott	LJA
Justin Kozak	The Nature Conservancy
Maribel Martinez	NCTCOG
Eileen Murphy	GLO
Katie Myers	TRWD
Jeff Neal	NCTCOG
AJ Prebensen	Fort Worth
Sam Sarker	Halff
Elizabeth Savage	Black & Veatch Corporation
Cintia Ortiz	Parker County
Bill Smith	Weatherford
Hunter Teel	LJA
Samantha White	Duke University
Allison Wood	Huitt-Zollars
Yufan Zhang	AgriLife
Kate Zielke	NCTCOG