North Central Texas Council of Governments

Integrating Transportation and Stormwater Infrastructure (TSI) Project Update Meeting

May 2026

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.

TSI Study Overview

TSI: *Integrating **T**ransportation and **S**tormwater **I**nfrastructure*

- **Proactive vs. Reactive**
- **Regional "System" Approach**

www.nctcog.org/tsi

Objective: a "roadmap" for communities

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TSI Study Objectives

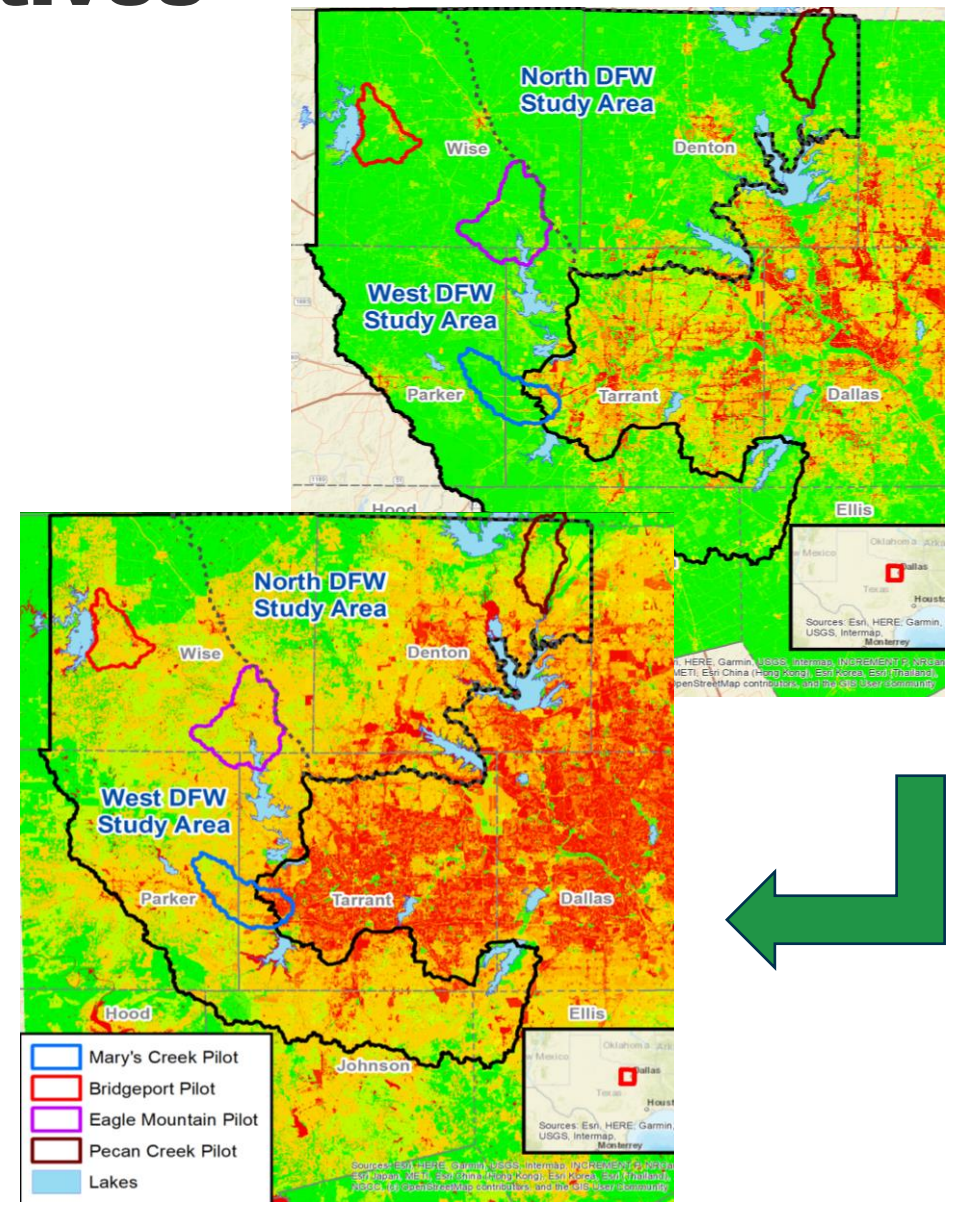
$10+ million comprehensive planning study

- Proactive planning
- Stormwater, environmental, and transportation infrastructure integration
- Safety of residents, property, and infrastructure
- State-of-the-art flood hazard area models
- Flood warning system framework
- Innovative infrastructure, nature-based solutions, and regulatory approach resources
- Tools, literature, and data

Expected completion:

- **Fall 2026**

2020 % impervious



2070 % impervious

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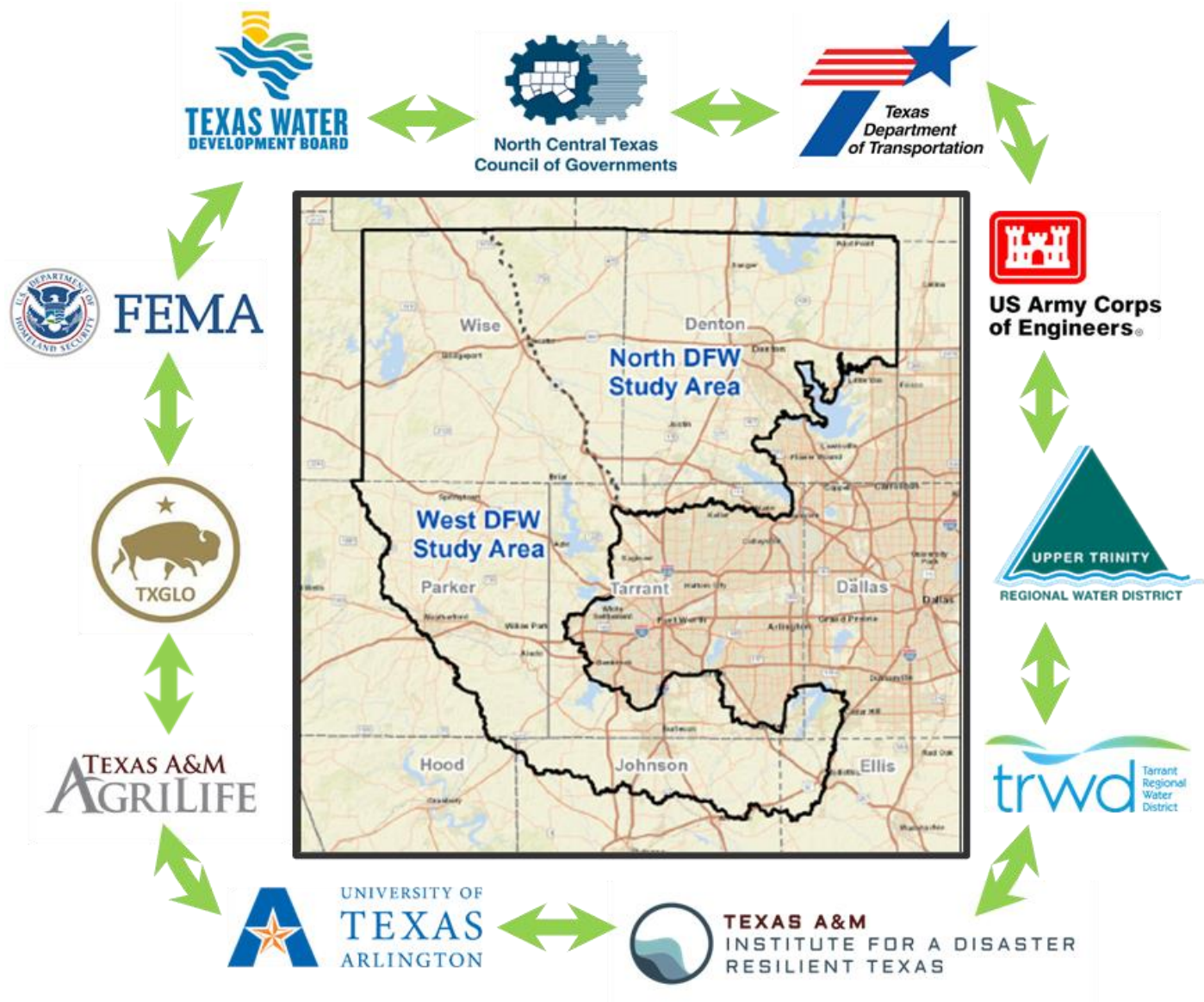
TSI Study Partners

Consultant Partners:

- Freese and Nichols, Inc.
- Halff Associates, Inc.
- Highland Economics



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Criticality of Transportation/Stormwater Integration

- High transportation and stormwater infrastructure costs
- Failures disrupt access, reliability, and system performance
- Flooding risks concentrated at road crossings and bottlenecks
- Upstream development overwhelms downstream systems

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Project Example: TSI Integration

- Integrated transportation, stormwater, and environmental elements
- Static control structure limiting the discharge and generating storage volume

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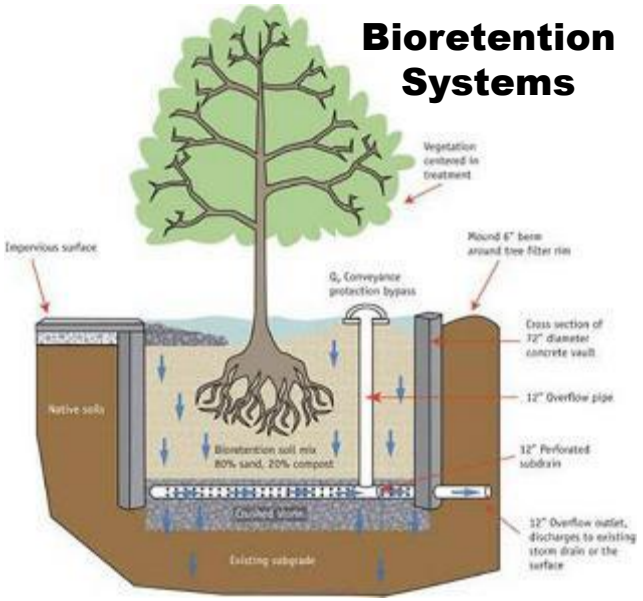
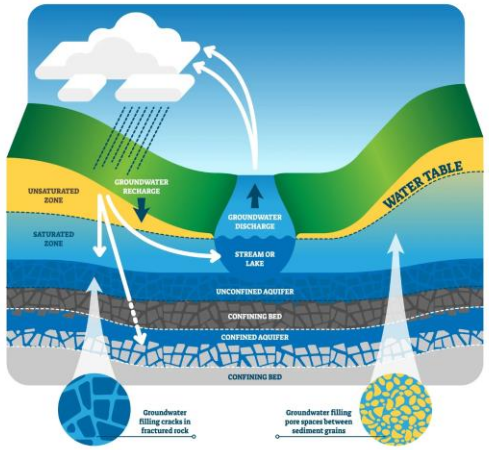
TSI Integration: Menu of Options

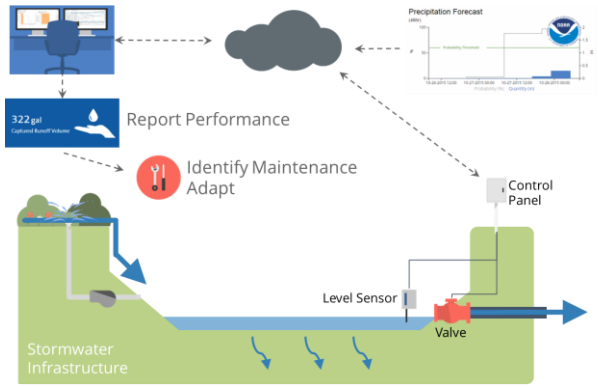
Bioretention Systems



Groundwater Recharge/Reuse



Smart Stormwater Infrastructure



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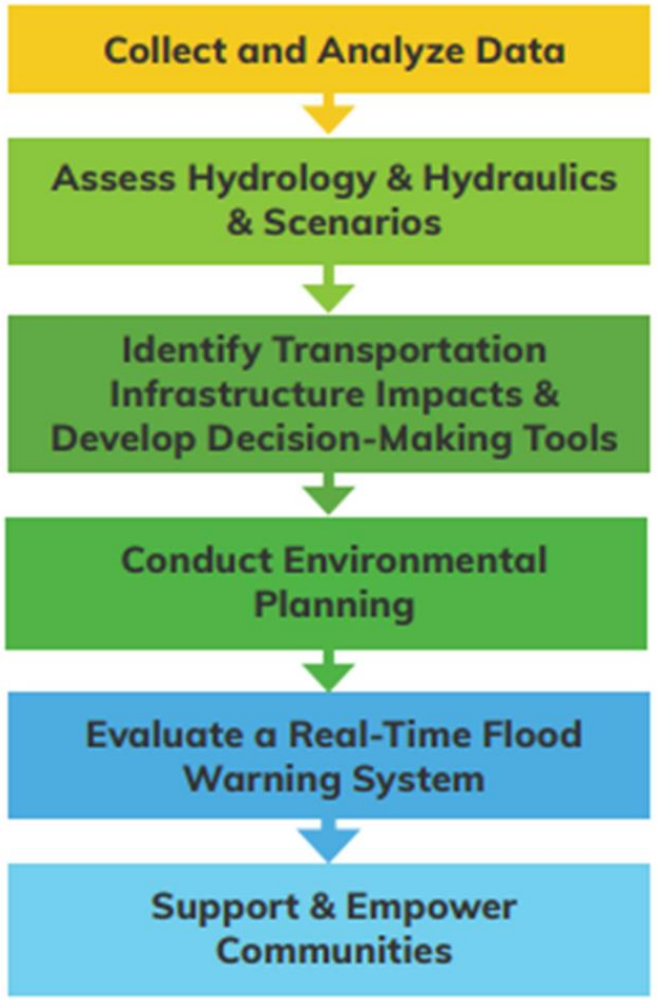

Menu of Options Examples

OPTIONS

- Hydrology and Hydraulic Modeling Enhancements
- Alternatives Analysis
- Transportation and Detention/Retention Integration
- Transportation Planning Linkages
- Flood Control Prioritization
- Green Stormwater Infrastructure Implementation
- Flood Early Warning Systems Planning
- Funding Opportunities
- Policy Recommendations

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Estimated Study Timeline

We Are Here

Fall 2025/Winter 2026
Training, workshops, site visits

Winter/Spring 2026
Complete Hydrologic & Hydraulic (H&H) model, policy recommendations

Spring 2026
Seek stakeholder feedback

Summer 2026
Present final products

Summer/Fall 2026
Submit deliverables to funding agencies

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Menu of Options

Visit the Breakout Stations for More Information

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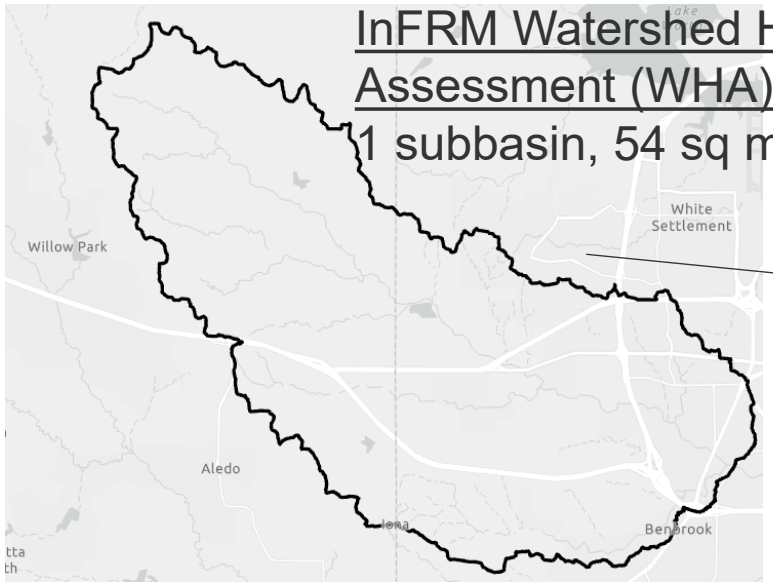
Hydrology & Hydraulic Modeling Enhancements

Menu of Options: Hydrology Modeling Enhancements

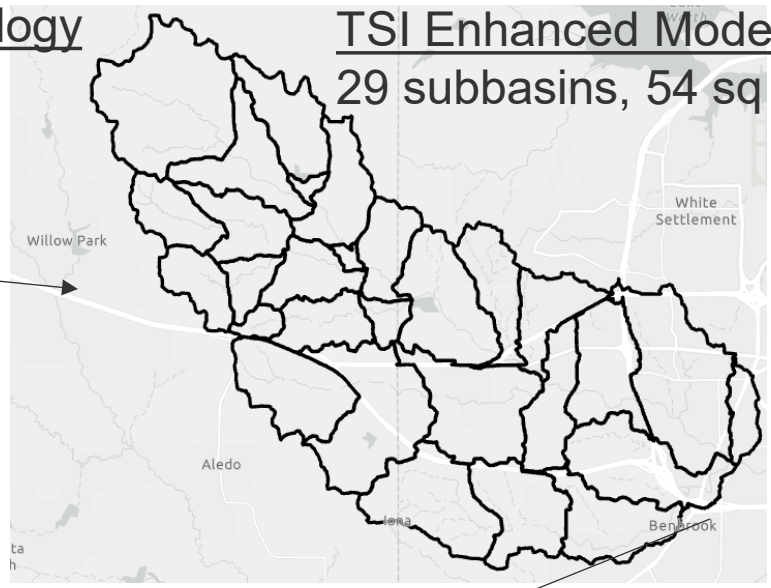
Available H&H datasets are being leveraged and enhanced

Hydrology Enhancements:

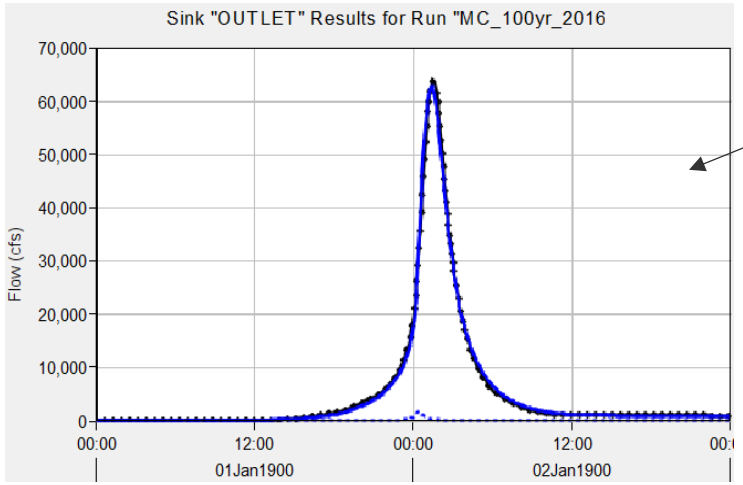
- Additional subbasins
- Future land use
- Future valley storage



InFRM Watershed Hydrology Assessment (WHA)
1 subbasin, 54 sq miles



TSI Enhanced Model
29 subbasins, 54 sq miles



Calibrated to WHA at outlet but also includes results at additional locations in watershed

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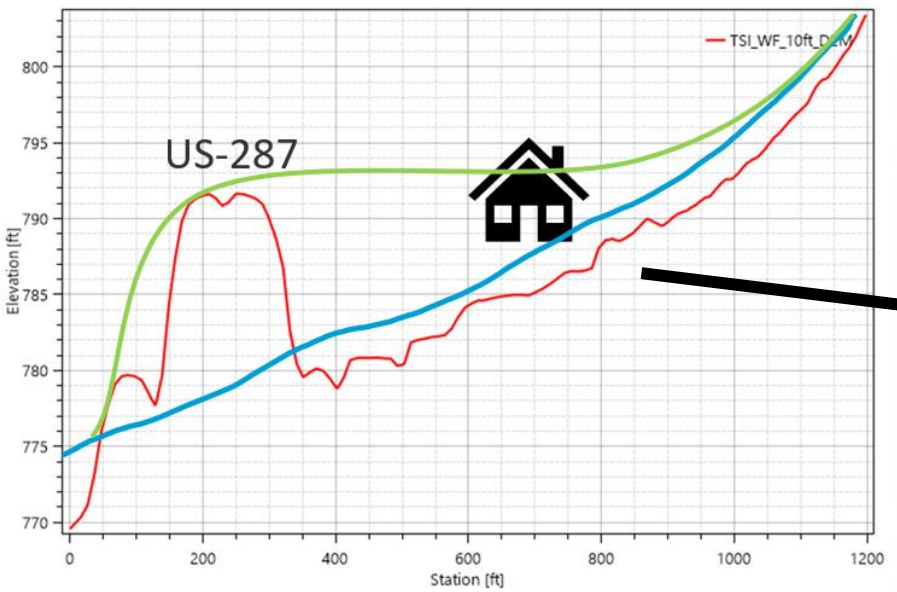
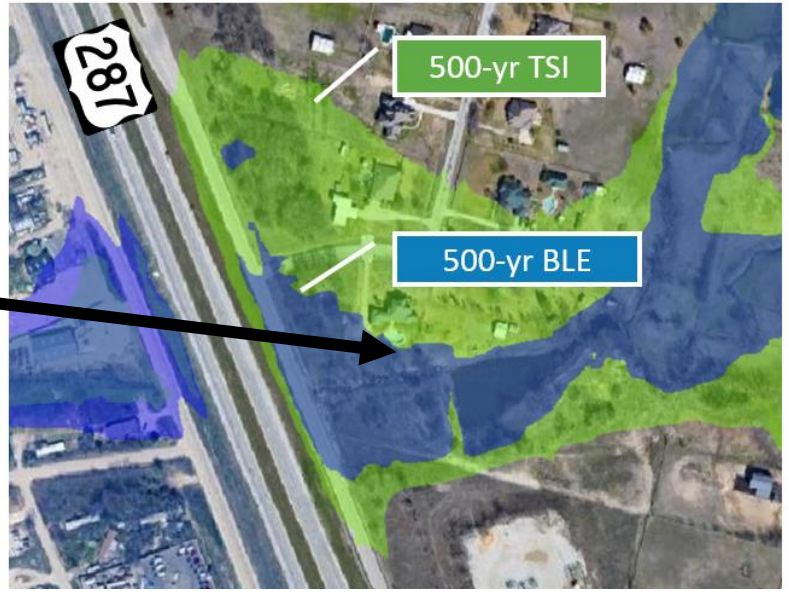
Menu of Options: Hydraulic Modeling Enhancements

Available H&H datasets are being leveraged and enhanced

Hydraulic Enhancements:

- Addition of TxDOT Bridges
- Future discharges
- Other enhancements





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Alternatives Analysis for Flood Mitigation

Menu of Options: Alternative Types

- Optimization Analysis 
- Detailed Alternatives 
- No Action Alternatives 

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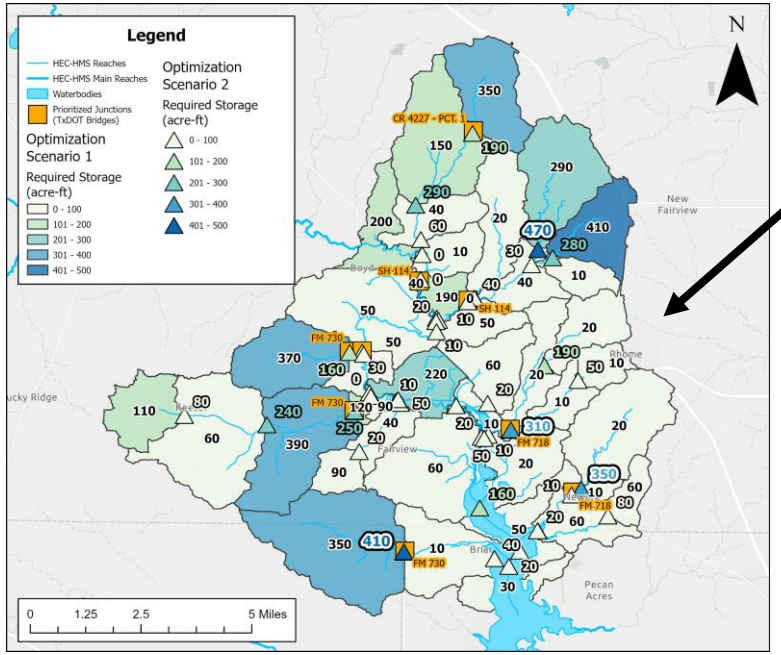
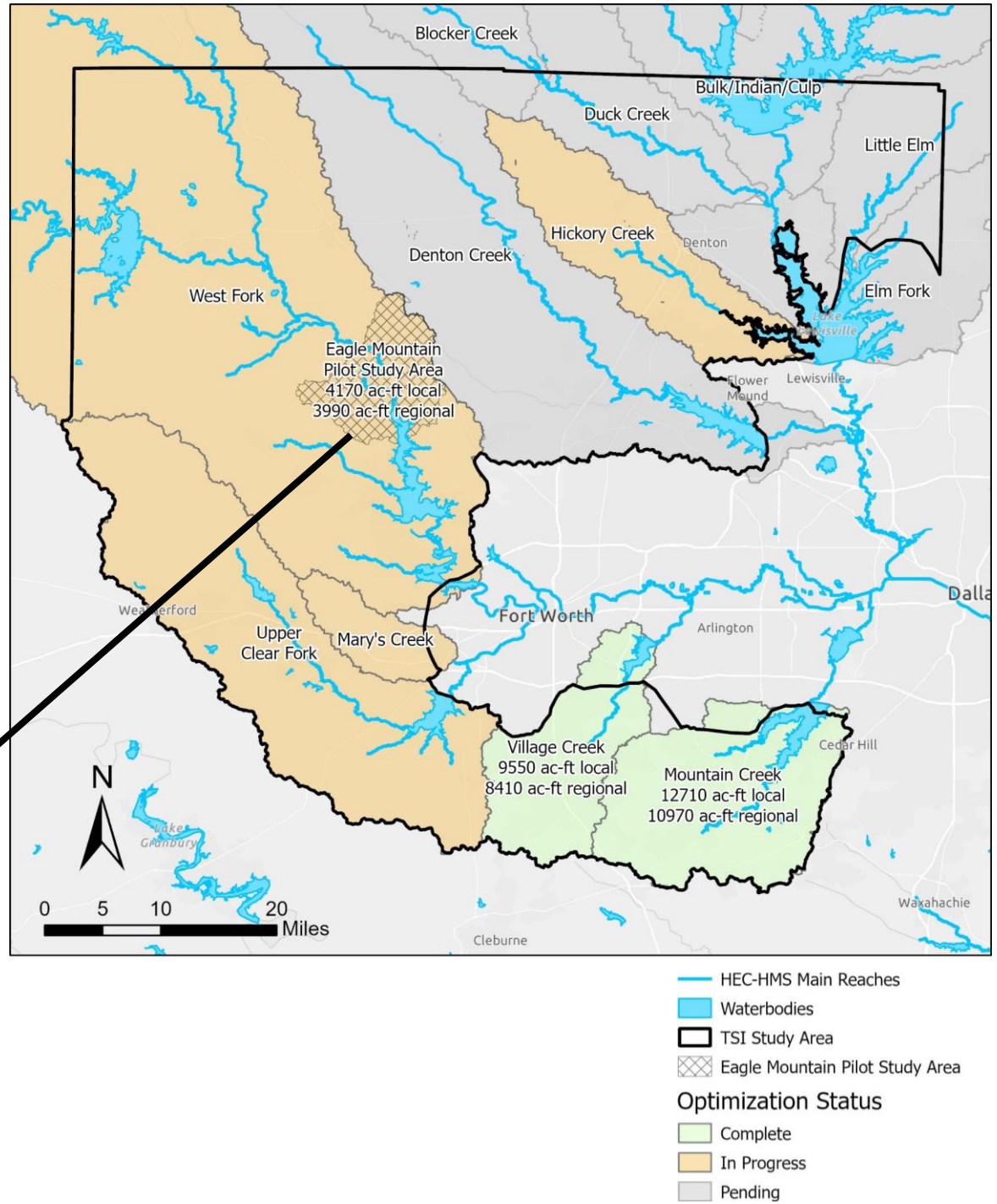
Optimization Analysis

Identify optimal **storage** volumes for locations to mitigate future increases in peak discharge

- Scenario 1
  - Subbasin (local)
- Scenario 2
  - Junction (regional)





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Detailed Alternatives

Identify effects from potential projects

1. Location identification
2. Screening
3. Conceptual project definition
4. Detailed project evaluation
5. Refinement

Detention

- Impounded
- Excavated

Improvements

- Transportation
- Flood Risk Reduction

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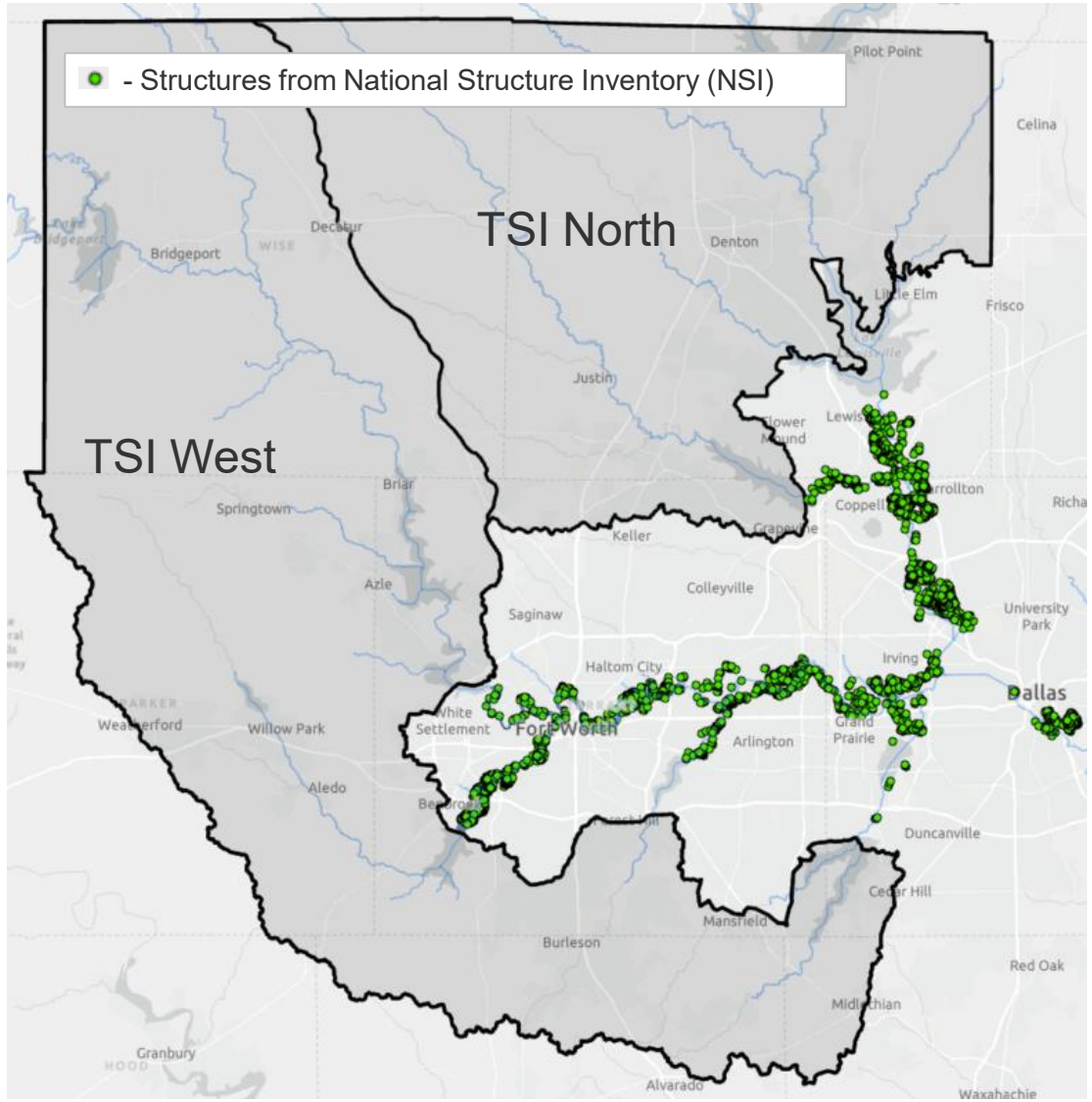
No Action Alternatives

- Loss of valley storage in the TSI study area impacts downstream areas
- 10,000+ structures potentially impacted by valley storage loss in the TSI study area
- Economic benefits for preserving valley storage can be calculated



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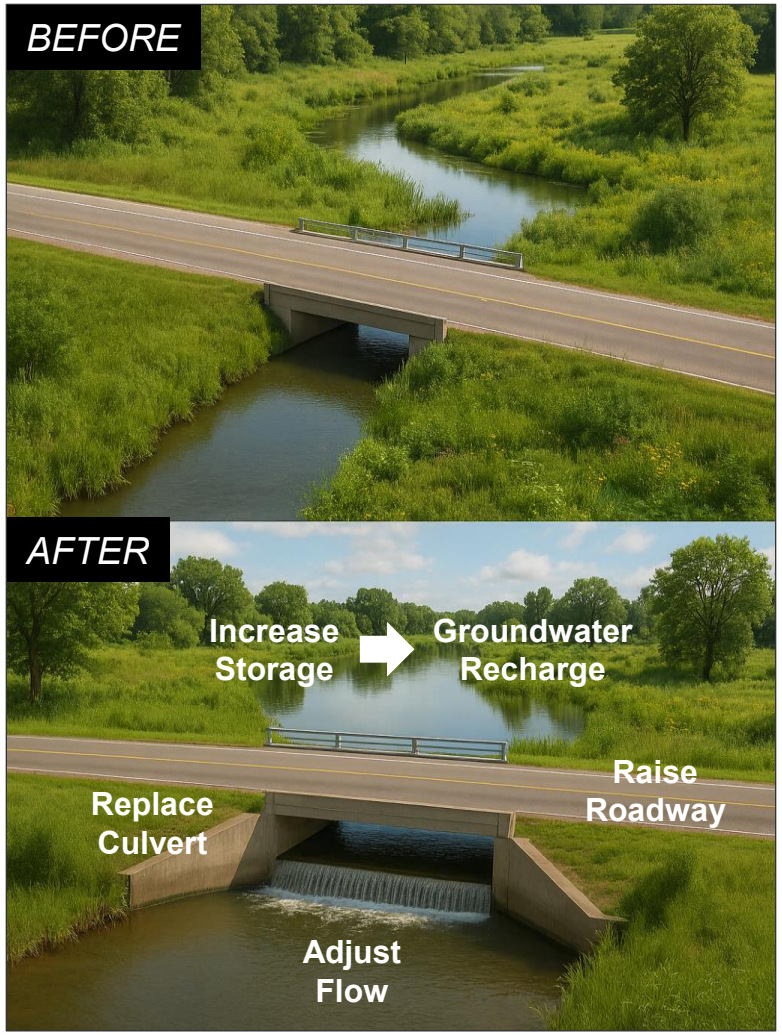
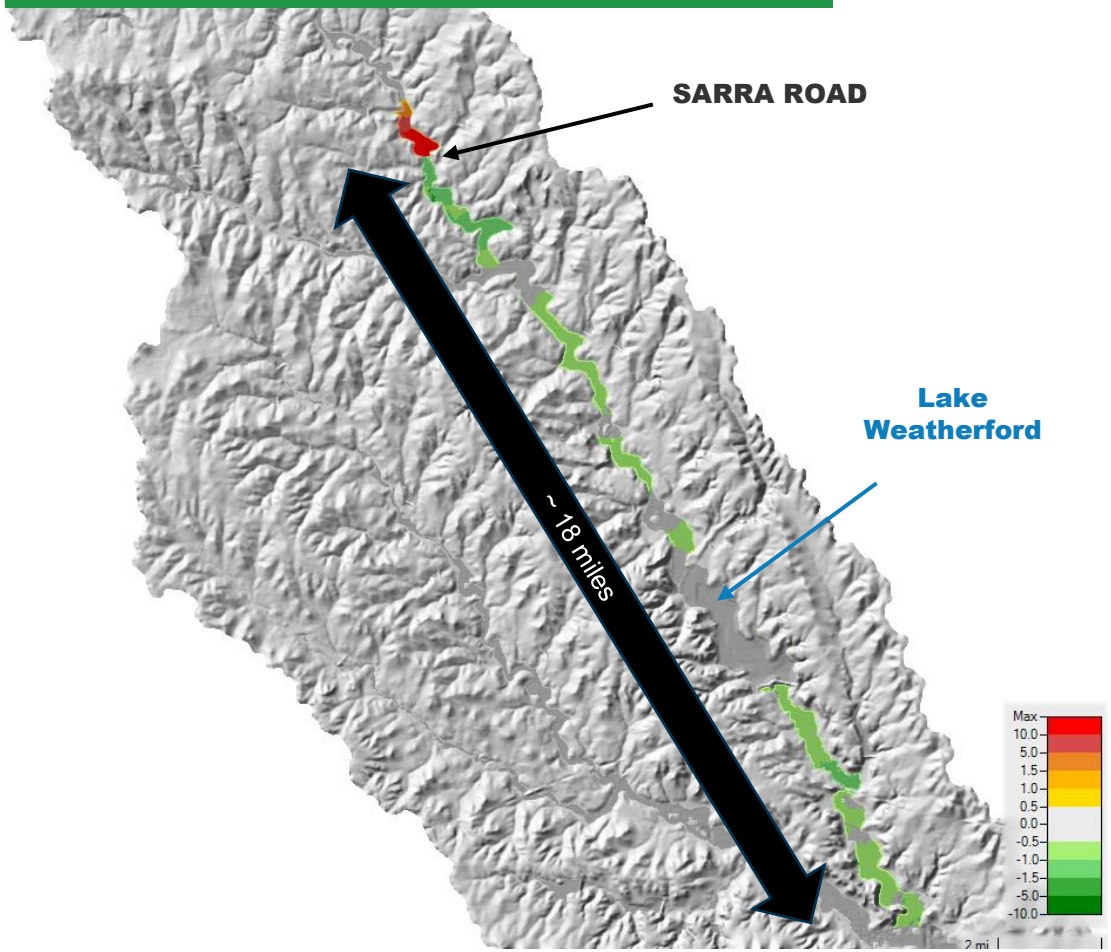
Transportation Integration – Outcomes & Next Steps

Menu of Options: Transportation – Facilitating Detention/Retention



Reduced Flow Downstream



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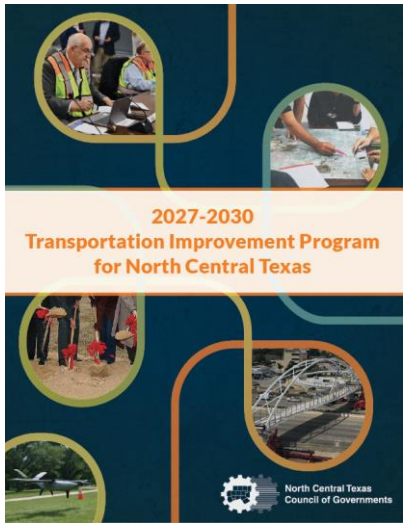
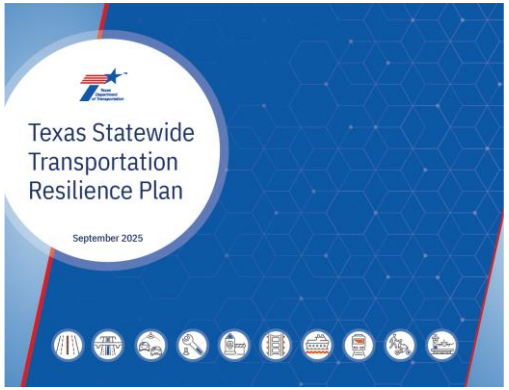
Example: Sarra Road – Parker County

Menu of Options: Link TSI & Transportation Planning



- Using new data, analysis, & tools from TSI Study
- Increase use of nature-based solutions in road designs
- Opportunities for linking transportation & flood mitigation
- Technical, administrative, & policy support



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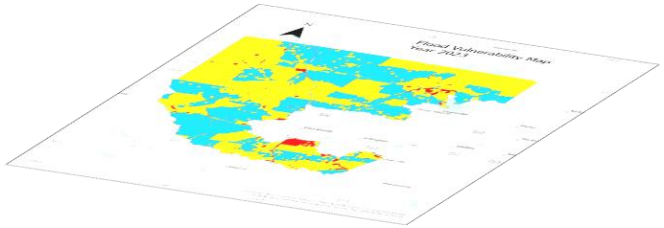
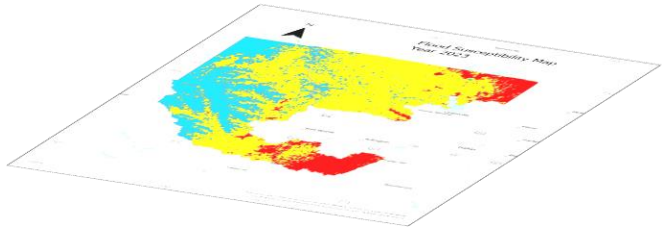
Environmental & Economic Considerations

Menu of Options: Flood Control Prioritization

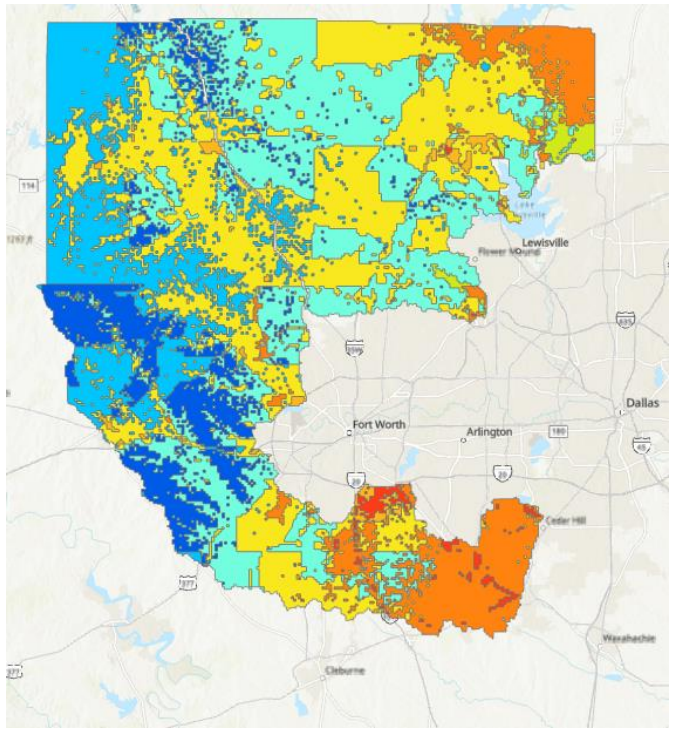
Flood vulnerability map



Flood susceptibility map

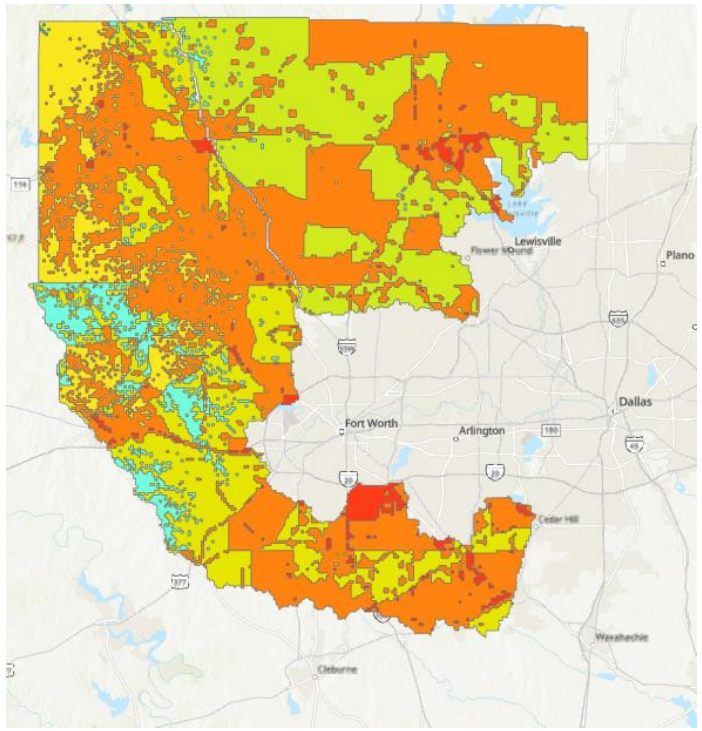


2023



HS & HV
HS & MV
MS & HV
MS & MV
LS & HV
MS & LV
LS & MV
LS & LV

2045



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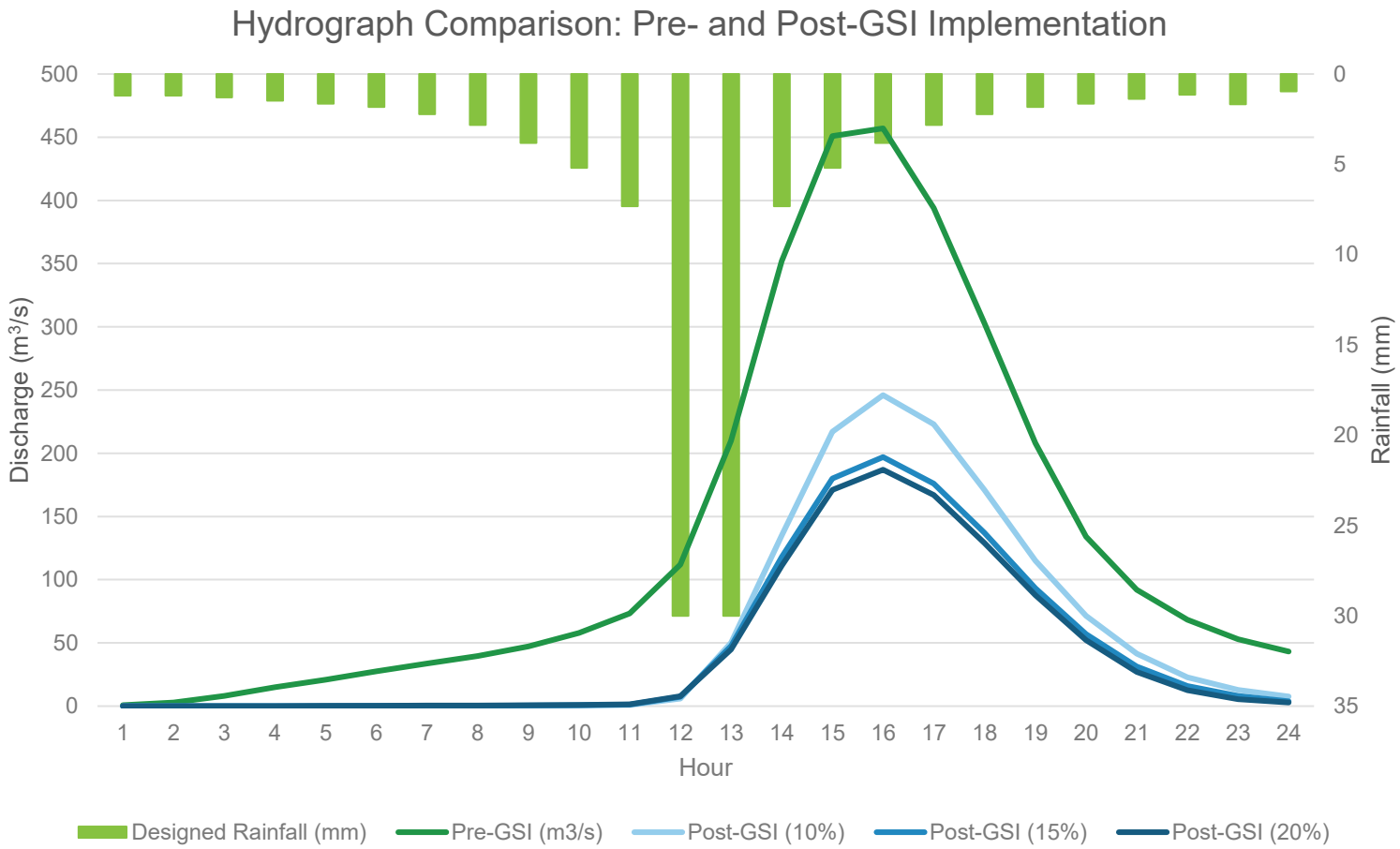
Menu of Options: Green Stormwater Infrastructure



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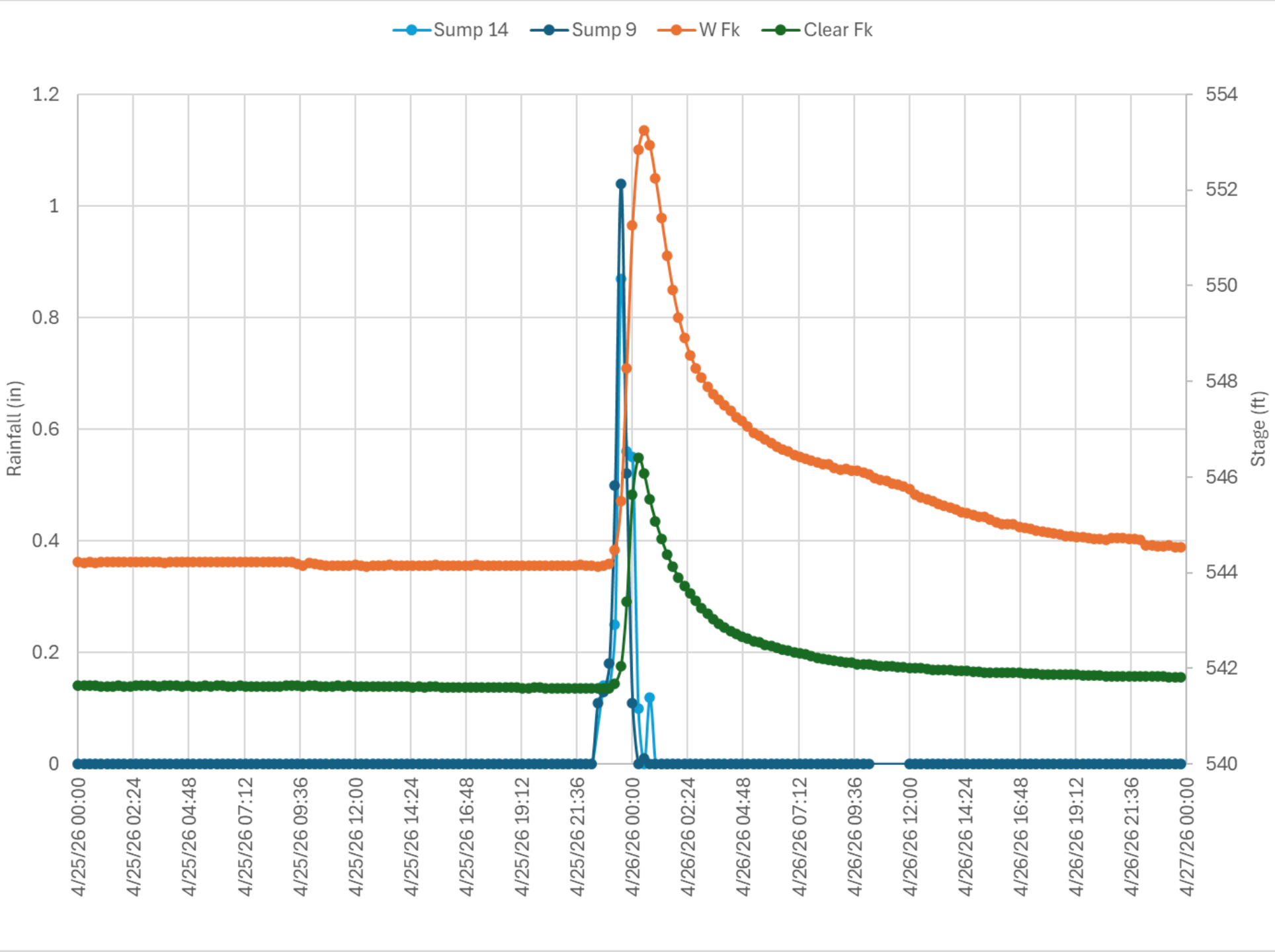
Flood Early Warning System Master Planning


abc
NEWS
April 26, 2026
Norwood
STOP
ALL WAY


abc
NEWS
April 26, 2026
MAYA


Sump 14
Sump 9
W Fk
Clear Fk
Rainfall (in)
Stage (ft)
1.2
1
0.8
0.6
0.4
0.2
0
554
552
550
548
546
544
542
540
4/25/26 00:00
4/25/26 02:24
4/25/26 04:48
4/25/26 07:12
4/25/26 09:36
4/25/26 12:00
4/25/26 14:24
4/25/26 16:48
4/25/26 19:12
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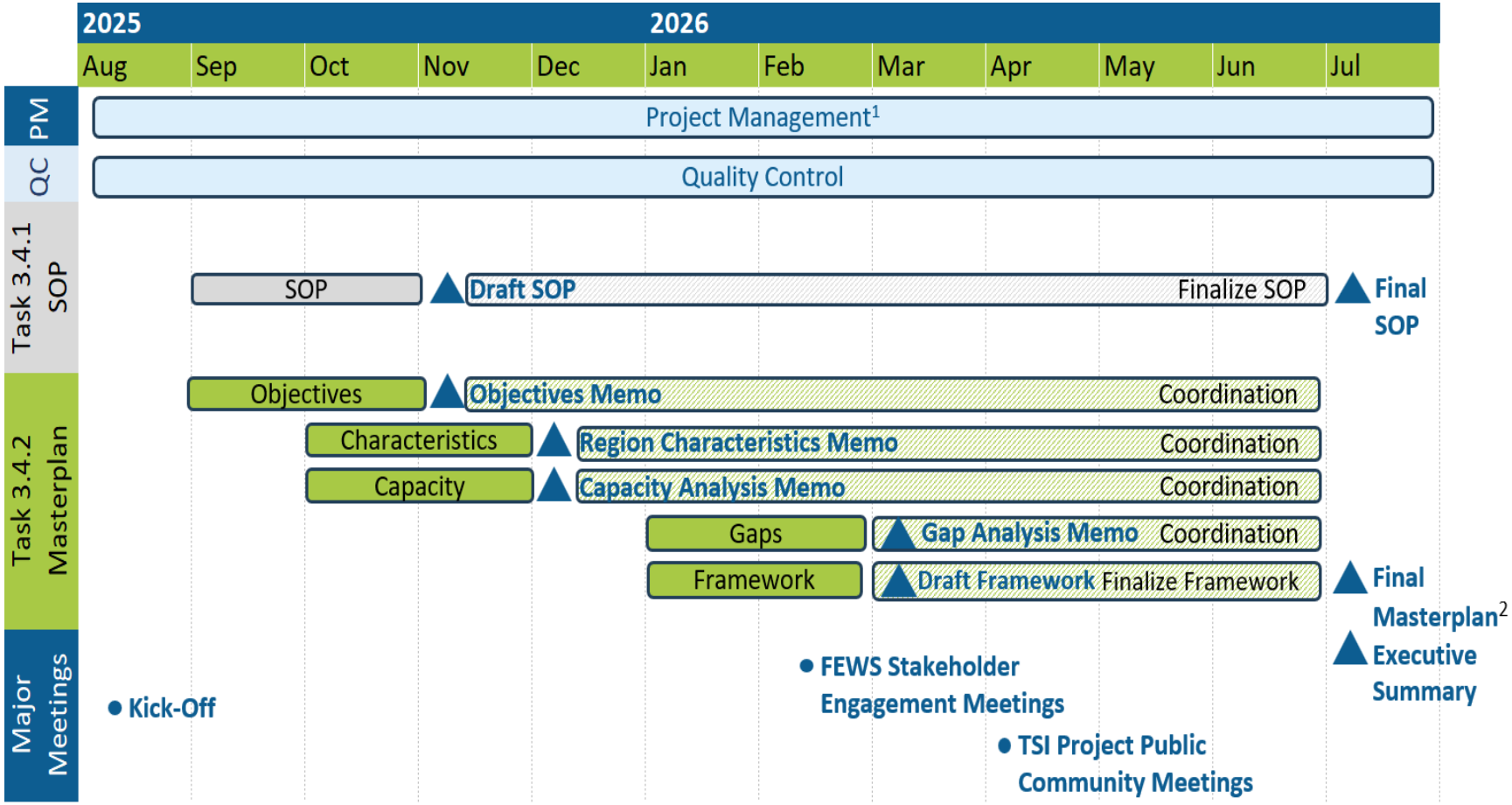
Menus of Options: Flood Early Warning System (FEWS)



1. Includes monthly status meetings with task leads and, as needed, team partners
2. Although it is not within the scope to develop a detailed implementation plan for the TSI region, it is a recommended next step

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Flood Early Warning Systems
– End to End –

1st Mile

Last Mile

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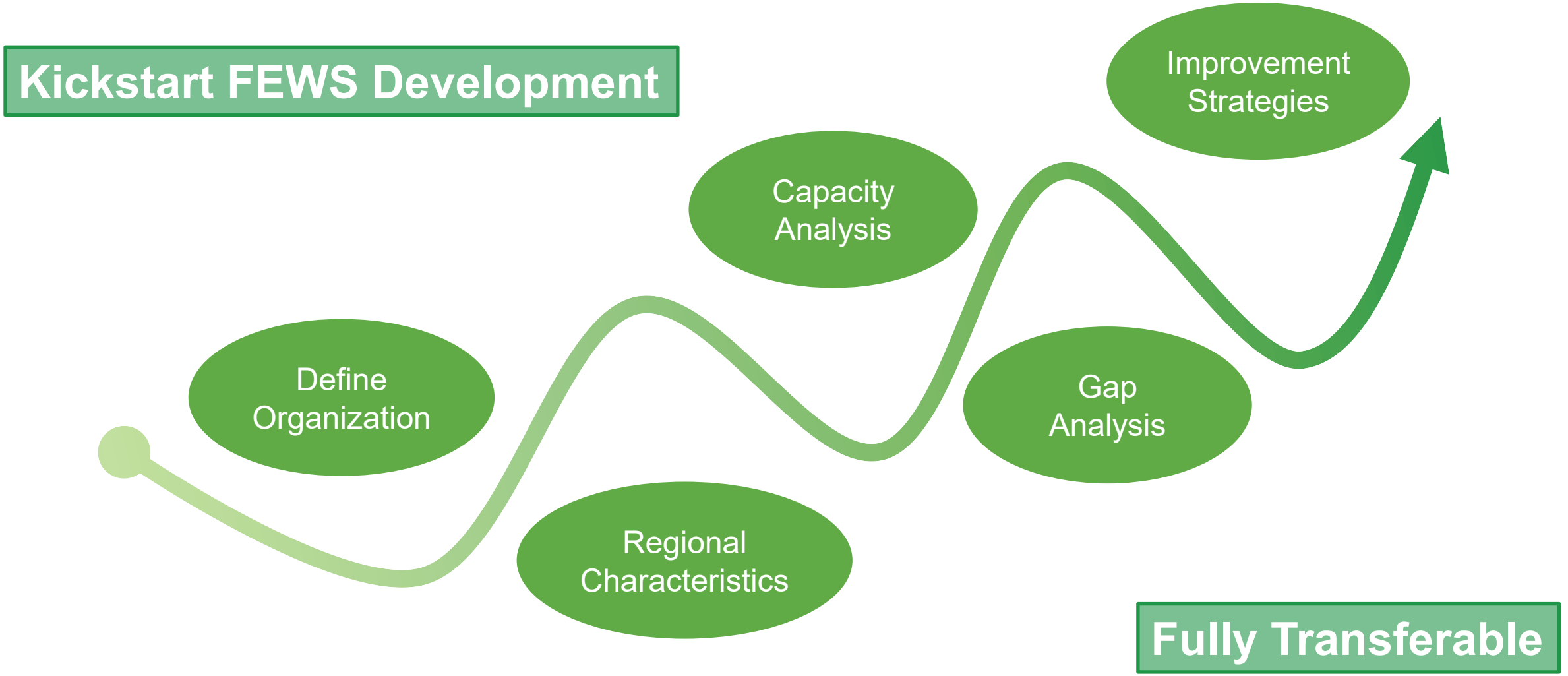
TSI Flood Warning Master Plan
Standard Operation Procedure



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Engagement, Funding, & Policy

Menu of Options: Funding Opportunities

- Downloadable Excel Spreadsheet
- FAQ

- Identifies funding opportunities to support implementation of TSI strategy recommendations

Topics include:

- Flood Hazard Mitigation
- Water and Stormwater Infrastructure
- Watershed Protection and Green Stormwater Infrastructure

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TSI integrating Transportation & Stormwater Infrastructure

TSI FUNDING OPPORTUNITIES TABLE – FREQUENTLY ASKED QUESTIONS

Menu of Options: Policy Recommendations

Higher Floodplain Strategies (examples):

- Require development be setback
- Preserve valley storage

Built Environment Strategies (examples):

- Reduced streets in floodplains
- Reduced Impervious Cover

Seeking feedback at Breakout Station #1

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How Does Valley Storage Loss Occur?

Images generated using Google Gemini

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How Does TSI Get Implemented?

TSI will…

- Leverage, enhance, and/or recommend expanding existing regulatory frameworks
- Identify and recommend TSI Flood Management Projects (FMPs), Flood Management Evaluations (FMEs), and Flood Management Strategies (FMSs)
- **Collaboratively** explore and promote other avenues for flood resiliency
- Find solutions that give more benefit than what projects may cost

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Breakout Sessions

Breakout Station #1:
Engagement, Funding, & Policy

Presenter: NCTCOG

Breakout Station #2:
H&H Modeling Enhancements

Presenter: USACE

Breakout Station #3:
Alternatives Analysis

Presenter: UTA, Halff, Freese & Nichols

Breakout Station #4:
Flood Early Warning Systems

Presenter: NCTCOG, UTA

Breakout Station #5:
Transportation Integration

Presenter: NCTCOG

Breakout Station #6:
Environmental & Economic Considerations

Presenter: AgriLife

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Presenters & More Information

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Story Map

www.nctcog.org/tsi

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Thank you for attending!

Please take the post-meeting survey

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