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STATE OF TEXAS

TRAVIS COUNTY

TWDB Commitment No. G1001314

TEXAS WATER DEVELOPMENT BOARD

and

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

AMENDMENT NO. 1

This Contract made and entered on November 23, 2021 is hereby amended as follows:

1. Section I, Article I, DEFINITIONS, Items 12 and 13 are amended to read as follows:

   12. PROJECT COMPLETION DATE – August 31, 2026

   13. CONTRACT EXPIRATION DATE – April 30, 2027

2. Section II, Article IV, COMPENSATION AND REIMBURSEMENT, Item 11 is amended to read as follows:

   GRANTEE shall submit payments and documentation for reimbursement billing according to the PAYMENT REQUEST SCHEDULE and in accordance with the approved Task and Expense Budgets contained in EXHIBIT C to this CONTRACT. GRANTEE may modify individual Task and Expense Budget task or expense categories to the extent that the resulting change in the amount in any one task or expense category does not exceed 20% of the original total amount authorized by this CONTRACT for that same task or expense category. Larger deviations require approval by EXECUTIVE ADMINISTRATOR, which will be documented through an Approved Budget Memorandum to the TWDB contract file. GRANTEE must provide written explanation for all overages and reallocations of Task and Expense Budget amounts. Reallocations of amounts between task and expense categories authorized under this paragraph will not change the TWDB SHARE OF THE TOTAL PROJECT COST. GRANTEE may not add new task or expense categories or assign costs to a task or expense category that did not include a cost in the original Task and Expense Budget included in this CONTRACT.

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3. Section II, Article XI, CORRESPONDENCE, is amended to read as follows:

All correspondence between the parties must be made to the following addresses:

For **TWDB**:

Contract Issues:
Texas Water Development Board Attention:
Flood Planning
P.O. Box 13231
Austin, Texas 78711-3231
Email: floodplanning@twdb.texas.gov

Payment Request Submission: Texas Water Development Board Attention:
Outlays and Escrows
P.O. Box 13231
Austin, Texas 78711-3231 Email:
outlays@twdb.texas.gov

Physical Address:
Stephen F. Austin State Office Building 1700
N. Congress Avenue
Austin, Texas 78701

For the **GRANTEE**:

Contract Issues:
Sue Alvarez, P.E. NCTCOG
616 Six Flags Drive
Arlington, Texas 76011
Email: salvarez@nctcog.org

Payment Request Submission:
Richard Matyiku
NCTCOG
616 Six Flags Drive
Arlington, Texas 76011
Email: rmatyiku@nctcog.org

Physical Address:
North Central Texas Council of Governments
C/O Kate Zielke, Environment and Development Department
616 Six Flags Drive Arlington, Texas 76011

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4. EXHIBIT B, SCOPE OF WORK, is replaced as shown in Attachment 1 of this amendment and denoted as AMENDED SCOPE OF WORK.

5. EXHIBIT C, TASK AND EXPENSE BUDGETS, is replaced as shown in Attachment 2 of this amendment and denoted as AMENDED TASK AND EXPENSE BUDGETS.

All other terms and conditions of the TWDB Contract for Commitment No. G1001314 as amended remain in effect.

IN WITNESS WHEREOF the parties hereto cause this Amendment to be duly executed.

TEXAS WATER DEVELOPMENT BOARD

By: _____
Bryan McMath
Executive Administrator

Date: 9/18/2024

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

By: Mike Eastland
Mr. Mike Eastland
Executive Director

Date: 9/18/2024

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Attachment 1:
EXHIBIT B, AMENDED SCOPE OF WORK

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EXHIBIT B

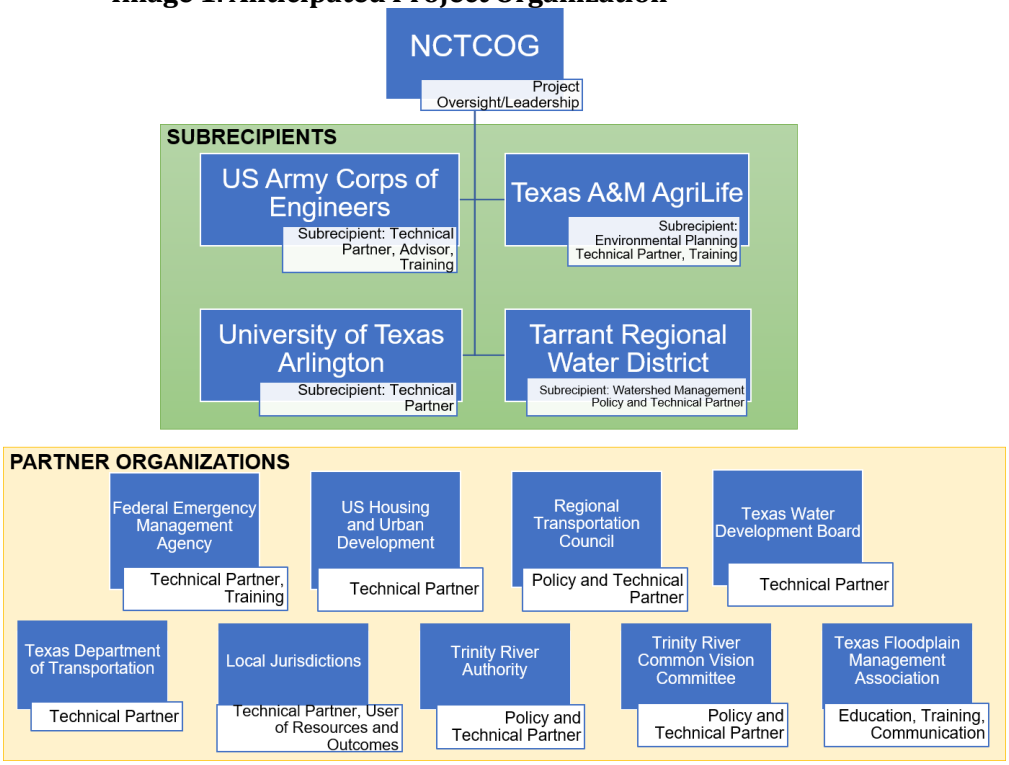
SCOPE OF WORK

Integrated Transportation and Stormwater Management

a. **Project Organization**:

The North Central Texas Council of Governments (NCTCOG) will be the lead agency for the Project, providing oversight, administration, and leadership of the tasks, deliverables, subrecipients, and coordination activities with partner organizations and technical advisors. NCTCOG will have at least four partner organizations that will be subrecipients who receive subawards. These organizations include the US Army Corps of Engineers (USACE), Tarrant Regional Water District (TRWD), Texas A&M AgriLife, and University of Texas at Arlington (UTA). Other government and university resources will be evaluated based on the project needs, and NCTCOG will procure contractors as needed to complete this Project. Other organizations will be supporting partners and will provide a variety of technical and policy assistance throughout the Project. USACE Fort Worth District will be a key partner agency, providing needed hydrology and hydraulic (H&H) modeling upon which all of the integrated transportation and environmental planning, tools, and resources will be built. NCTCOG, USACE, TRWD, Texas A&M AgriLife, and UTA constitute the Project Team.

Image 1. Anticipated Project Organization



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b. **Description of how flood protection needs of the entire watershed will be considered:**

The Project Area is defined by a combination of watershed boundaries, NCTCOG service area boundaries, and existing impervious areas, but is focused on a large, western portion of the North Central Texas (NCT) region. The Project Area encompasses 85 cities, eight counties, and covers 2,816 square miles. The
population of the Project Area is forecast to grow to 2,044,176 residents (NCTCOG), a 126% percent increase over the current population of 904,427 (ACS, 2018). From 2006 to 2016, the Project Area experienced an 18% growth in impervious surfaces. This growth in impervious cover, coupled with the expected future growth will lead to a number of local and regional challenges such as with long-term transportation infrastructure maintenance, increased stream erosion, water quality degradation, increased sediment deposition in downstream reservoirs, and loss of open space, to name a few. With more than 7,000 miles of streams and over 274,000 acres of 100-year floodplain, there are many opportunities to support a proactive planning approach to advance concepts of integrated long- range planning in the Project Area to minimize encroachment into flood-prone areas, evaluate opportunities for providing ecosystem enhancements, and developing more resilient transportation infrastructure.

Flood protection needs of the communities within the Project Area will be explored throughout multiple Project Tasks, including, but not limited to: pre-and post-surveys; development of an Upper Trinity River Basin Transportation - Stormwater Infrastructure Plan (Plan) that identifies projects for future implementation to minimize overall life cycle costs, address vulnerable assets, decrease flood risk, and provide environmental and ecosystem benefits to accommodate future population growth and respond to changing storm frequency, duration, and intensity; and an evaluation of how communities might fund the planning stormwater infrastructure through federal, state, and local funding opportunities.

Phase One Project Area

Due to the large geographic scope of this project and current availability of funds, NCTCOG will initiate a comprehensive integrated stormwater and transportation planning process for a smaller focus area that has been selected from the larger Project Area. The HUC 10 watersheds shown in Exhibit A will be the Phase One Project Area, herein described as the Phase One Area, and includes 48 cities, 7 counties, and has a population of approximately 442,171 (2018 ACS).

The Phase One Area will be used to provide proof of concept and will allow the Project Team to establish the hydrology and hydraulic modeling, community engagement, data collection, infrastructure and environmental integration processes and standard operating procedures that can then be applied to the larger Project Area in subsequent phases, as additional funding becomes available.

Project Impact

Integrating transportation, environmental, and stormwater planning will have enormous regional benefits for multiple parties, including cities, counties, developers, transportation

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entities, and utilities responsible for water supply. While comprehensive regional transportation planning is performed on a 5-year cycle, stormwater and environmental infrastructure generally are not comprehensively planned. Shifting planning paradigms to include these additional planning areas will afford an opportunity to increase resiliency by decreasing the risk of flooding in a large geographic portion of the NCT region. The benefits of this Project include those directly resulting from the Project and those potentially realized with separate funding and implementation after completion of the Project. These combined benefits include, but are not limited to:

- Minimize the increase in stormwater runoff resultant from growth and development by evaluating regional stormwater management features.
- Minimize the impact of growth and development on transportation infrastructure by stabilizing stormwater runoff levels and accounting for future conditions.
- Minimize the impact of growth and development on existing downstream communities.
- Extend the design life of transportation and stormwater infrastructure by planning for future conditions.
- Examine alternative hydrologic loadings, not just a 100-yr loading, to increase resiliency and reduce the risk of flooding.
- Reduce the threats of flooding to health, safety, and first responders by suggesting planning-level design for road crossings for adequate access during emergencies.
- Provide meaningful environmental features such as wetlands and riparian buffers.
- Reduce channel erosion and stream sediment transport and their impacts on the operation and maintenance budgets of transportation and infrastructure.
- Improve water quality through the comprehensive planning of environmental features.
- Provide regulatory tools for unincorporated areas and extra-territorial jurisdictions (ETJs) that county officials may use to regulate their floodplains in a more resilient and sustainable manner.
- Develop a planning model that could be replicated throughout the larger Project Area, State, and Nation.

The watersheds within the Project Area drain directly into the Trinity River so any increase in runoff and any adverse environmental impacts are transferred to downstream communities along the Trinity River including Fort Worth, Arlington, Grand Prairie, Dallas, and many others. Growth and development within the Project Area pose significant risks for increased runoff and environmental impacts across the major developed areas within the DFW region. Changing frequency, duration, and intensity of storms, when combined with increased impervious surface, present additional threats that need to be evaluated to make informed decisions and provide the maximum opportunity to minimize and mitigate future flood impacts. In addition to providing resources and tools to local government entities in the Project Area, the final deliverable of this Project is development of a replicable/transferable process to conduct a

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watershed- based stormwater infrastructure planning effort resulting in a plan with actionable strategies and implementation projects.

The NCT region will engage in a comprehensive planning effort integrating transportation planning, regional stormwater management planning, and environmental planning to address the health, safety, and welfare concerns while helping local governments manage their growth and development in an effective manner with respect to life cycle costs. To increase resiliency and to proactively prevent flooding, transportation, stormwater, and environmental planners will dissolve silos and incorporate stormwater management and environmental features into a comprehensive multi-infrastructure plan in the Phase One Area. The overall resultant products from this multi-year project will be a comprehensive Upper Trinity River Basin Transportation - Stormwater Infrastructure Plan (Plan) that can be replicated throughout the larger intended Project Area as additional funds become available to do so. The Plan will focus on elements to minimize overall life cycle costs, address vulnerable assets, decrease flood risk, and provide environmental and ecosystem benefits to accommodate future population growth in a more resilient manner. The Project will also assess hydrologic loading that will consider the threat from larger regional storms that exceed the 100-year, if appropriate.

c. **Identification of tasks**:

The following tasks will be conducted for the identified Phase One Area to establish a replicable process for the remaining portions of the larger Project Area.

Task 1.0: Data Collection and Analysis

Understanding existing conditions and accounting for environmental stressors to infrastructure in the Phase One Area is critical to establishing a strong foundation upon which to build future plans and project recommendations. A first and important deliverable will be a comprehensive literature review conducted to document similar studies that have been completed in other parts of the country and document best practices and lessons learned.

Existing data for the entire Project Area and the Phase One Area will be collected. A storage platform for sharing large data files will be acquired. Through identification of relevant data currently existing, a supplemental list of data that is not available but is desired or needed will be compiled based on stakeholder and project team input. Processing of datasets will be included in this task and will include development of GIS layers representing the entire project area. For example, individual land use maps and GIS files from cities will be collected. Data sets to be requested and/or developed could include, but are not limited to:

- Current and future land use maps, thoroughfare plans, other future infrastructure plans (ex. known water and wastewater master plans)
- Existing and projected future populations
- LiDAR, topographic and other spatial imaging data sets

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- Special areas of habitat and high/unique ecological value for preservation and enhancement
- Existing environmental/natural assets including slope, soils, swales, drainageways, wetlands, streams, aquifers, floodplains, native plant communities, agricultural land, steep lands, forests and woodlands, ecoregions, etc.
- Existing disturbances including buried/piped streams, contaminated areas (i.e. brownfields), abandoned development (including greyfields), spoil areas, hazard areas (i.e. floodplains), and degraded soils
- Changes to impervious surface over time
- Transportation collectors, arterials, and highways
- Existing cultural and historic assets including cultural and historic elements, important buildings, unique natural features, sites with special histories, or planned infrastructure expansions
- Attributes of composition, elevation, conveyance, performance, exposure, criticality, and adaptive capacity of stormwater management structures, transportation assets, and utilities
- Current status of water conveyance streams and features
- Development tracking
- Low water crossings
- Existing meteorology, hydrology and hydraulic modeling data (for active study area)
- Existing locations of green infrastructure installations
- Building footprints and parcel data
- Building elevations from building elevation certificates
- Repetitive losses
- Stormwater Phase II Permit Best Management Practices and Phase II Reports documenting implementation
- Existing detention structures and other stormwater management infrastructure

Task 1.0 Deliverables

- Literature Review Report including available Case Studies
- Memo documenting needed/desired datasets
- Memo documenting detailed metadata for those datasets that have been acquired
- Final maps and data sets for inclusion in reports, documents, presentations, models, etc.

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Task 2.0: Stakeholder Engagement

There are eighty-five cities, eight counties, multiple transportation providers, two major regional water providers, one major regional wastewater provider and numerous other partners and stakeholder groups that will be engaged in the larger Project Area. In the smaller Phase One Area, 48 cities and seven counties (Dallas, Ellis, Hood, Johnson, Parker, Tarrant, and Wise) will be the key stakeholders, in addition to the water and wastewater providers and other stakeholders. Stakeholder engagement throughout the larger Project Area will be important as additional funds are secured to support additional modeling and planning integration elements that will be piloted in the Phase One Area. The Project Team will provide engagement opportunities, including, but not limited to: establishing a Technical Advisory Group, conducting training opportunities, preparing and issuing surveys, conducting site visits, and establishing a Steering Committee composed of elected officials and city managers.

Existing Federal Emergency Management Agency (FEMA) funding was leveraged to begin initial outreach and engagement in the Project Area in the Winter of 2021. Additional FEMA funding will be leveraged to support equity-based engagement in the Project Area. The FIF funds will allow NCTCOG to expand the stakeholder engagement to a three-year period and ensure adequate funds are available to do robust engagement to all communities and impacted parties. TRWD will be a key partner in assisting with community outreach and engagement, as most of the Project Area is in their service area boundary and many cities are drinking water customers of TRWD.

This task is focused on ensuring local government representatives and partner organizations maintain engagement in the process and ownership of the final project outcomes and implementation actions. Regional project update meetings will be conducted in order to inform stakeholders of the project status and solicit any needed feedback. Through this Task, the Project Team will:

- Establish a Technical Advisory Group and other advisory groups as needed.
- Establish a Steering Committee of elected officials and city managers.
- Develop a Stakeholder Engagement Plan for outreach to cities, towns, counties, and other stakeholders, including developers.
- Design a strategy to provide local governments with preliminary output (data available prior to final report) from hydrology and/or hydraulics models in a highly visual, interactive format, such as an ArcGIS StoryMap.
- Conduct a minimum of six training workshops throughout the project area, offered in-person and virtually, and record each training for long-term training availability on the Project website. Training topics will be identified through survey responses, sub-area discussions and feedback, and will incorporate training on incorporating best management practices and the Project results (e.g. models, data, infrastructure design elements) into community processes and decision- making.
- Hold on-going coordination meetings to ensure appropriate/required collaboration with resource agencies, technical committees, project partners, transportation providers, developers, and a broad range of stakeholders through individual meetings and small group discussions. Public meetings will be conducted as the need is identified in collaboration with city, county, and other project partners.
- Conduct a Regional Project Update Workshop in person or virtually approximately once per year to provide an overall update to the stakeholders on the activities underway, resources developed, engagement opportunities, and next steps.
- Develop engagement assets such as frequently asked questions and answers document, brochures, public awareness campaigns, local government and partner recognition programs, or other identified strategies to ensure long-term engagement and ownership of the project outcomes amongst local governments and the communities in the project area.

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- Presentations to interested parties, such as engineering professional associations and conference attendees.

Additionally, at least three communities in the larger Project Area do not participate in the National Flood Insurance Program (NFIP) and do not currently enforce floodplain management ordinances that are at least equivalent to the NFIP minimum standards. In accordance with Flood Infrastructure Fund standards, NCTCOG staff will reach out individually to the three communities of Corral City (also known as Draper), Annetta North, and Newark, Texas, to encourage and, if requested, meet with and assist these non-NFIP Communities to draft and adopt floodplain ordinances that meet the NFIP minimum standards. NCTCOG staff also will reach out to any other non-NFIP communities that are identified. Model floodplain ordinances developed by the TWDB will be provided to each non-NFIP Community for their consideration.

Task 2.0 Deliverables:

- List of Technical Advisory Group members, meeting agendas, summaries, etc.
- List of Steering Committee members
- Stakeholder Engagement Plan
- StoryMap or other interactive visualization tool
- Six (6) Training workshops including agendas, presentations, sign-in sheets, Q&A, evaluations, etc.
- Meeting agendas, presentations, sign-in sheets for all in-person/virtual meetings with partners and stakeholders, including documentation of correspondence with the non-NFIP communities of Corral City (also known as Draper), Annetta North, and Newark, Texas.
- At least three (3) Regional Project Update Workshops including agendas, presentations, sign-in sheets, Q&A, evaluations, etc.
- Public information to include, but not limited to, study fact sheets and FAQ documents for local governments and public, public campaigns, recognition programs, etc. (identified as project needs materialize and as budget will support)
- PowerPoint slides, registration, and attendance by individual Project Team member/s presenting on the Phase One Area study at professional meetings or conferences.

Task 3.0: Integrated Transportation, Stormwater, and Environmental Planning

Task 3 constitutes the integrated, comprehensive planning activities that will incorporate outcomes of stormwater infrastructure planning, transportation infrastructure assessments, and environmental features planning to develop an Upper Trinity River Basin Transportation - Stormwater Infrastructure Plan (Plan). Because flood risk cannot be mitigated alone by assessing opportunities to integrate innovative stormwater features with transportation infrastructure, the Project Team will look beyond transportation infrastructure to assess other areas that could serve as nature-based solutions to mitigate stormwater runoff in the Phase One Area. Additional tools and resources that will inform the Plan will be developed in this Task, resulting in the final compiled Plan report and web-based maps.

Subtask 3.1 Project Area Hydrology and Hydraulics Assessment and Scenarios: The Project Team will leverage latest methods and state-of-the-art technology to complete comprehensive H&H studies within

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the Phase One Area. This relies on applicable existing models, FEMA's Base Level Engineering (BLE) data, InFRM/USACE Trinity River Watershed Hydrology Assessment (WHA) and new storm shifting tools, and impervious surface Geographic Information System (GIS) layers to estimate storm runoff for future conditions (i.e., how much water and where it will flow). The Project Team will analyze current conditions (i.e., existing/baseline conditions and land use) versus future changes (future land use), including loss of valley storage, runoff estimations to inform the need for areas of low impact development, green infrastructure, or on-stream structures for regional detention.

The project team will:

- Investigate and add detail to the Trinity River Watershed Hydrology Assessment (WHA) hydrologic model: For Phase One Area, complete investigation and data collection for existing and future conditions and add select subbasins to HEC-HMS model to produce additional discharge points.
- Investigate and update FEMA generated BLE hydraulic models: For the Phase One Area, complete investigation and data collection for existing and future conditions, leverage latest available BLE (and other hydraulic models, if necessary) and enhance models with hydraulic structures (and including survey/bathymetry data as appropriate) to create more detailed information for the calculation of resultant 2-yr through 100-yr, standard frequency, riverine elevations.
- Perform storm shifting to simulate the impact of larger regional storms over Phase One Area: Perform necessary modeling and analysis of historic regional storm/s to determine impact if similar event/s occurred over the Phase One Area.
- Conduct H&H modeling to support additional tasks, including the optimization study that will identify opportunities for and measure effectiveness of green infrastructure and nature-based solutions.

Subtask 3.1 Deliverables:

- Updated Trinity River Watershed Hydrology Assessment (WHA) hydrologic model
- Final Plan content describing updates to the Trinity River Watershed Hydrology Assessment (WHA) hydrologic model and model results
- Updated FEMA generated BLE hydraulic models
- Final Plan content describing updates to the FEMA generated BLE hydraulic models and model results
- Final Plan content describing storm shifting results
- Final Plan content describing results from additional H&H modeling including the optimization study results
- Final Plan content describing the optimization results

Subtask 3.2. Assess Transportation Infrastructure Impacts and Develop Decision-Making Tools: As the transportation network is developed, residential, commercial, and industrial development follow close behind. Transportation infrastructure is impacted by non-stationary stormwater trends associated with growth and development, which can be exacerbated if facilities are built and/or sustained with limitations and/or vulnerabilities associated with design, composition, capacity, elevation, maintenance practices, or other attributes. Often transportation infrastructure is built to required design levels at the time of initial construction, but during its design life, those design attributes and functionality requirements change over time. These changes can shift the infrastructure status to be inadequate, deficient, or even obsolete after

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upstream growth and development has occurred. This Task will evaluate existing and future hydrologic models to determine existing and future transportation facilities at risk of flooding based on future development scenarios. An optimization study will identify at-risk facilities that could be candidates for flood mitigation. The Project Team will engage with TxDOT and local transportation authorities to determine how and to what extent stormwater infrastructure and transportation infrastructure can be integrated.

Several third-party programs exist that rate the sustainability of transportation infrastructure. These include The Institute for Sustainable Infrastructure's Envision framework, Federal Highway Administration's INVEST, and the Sustainable Transport Council's Greenroads Rating System. The project team will review these programs and identify how flood risk reduction and stormwater management could be incorporated into these or a similar program.

To assess transportation infrastructure impacts and develop decision-making tools, the Project Team will:

- Provide contributions to the H&H optimization study that identifies which at-risk facilities could be candidates for flood mitigation. Utilize H&H outputs to: develop a map of flooding hot spots; model ideal locations and sizing for smaller/regional ponds and other drainage/flood control structures; evaluate the feasibility of roadway embankments as detention structures; evaluate discharge appurtenances as outlet works; and develop planning-level design criteria.
- Develop a lifecycle benefit-cost analysis including return on investment (ROI) for at-risk transportation facilities that are candidates for flood mitigation.
- Evaluate short-term and long-term land use and transportation regulatory tools, green infrastructure applications, and adaptability strategies that may provide flooding mitigation effects.
- Test scenarios of flood control and mitigation best practices measures, land use strategies, environmental features, and environmentally sustainable design applications, to identify and aid in determining potential lifecycle benefits and impacts.
- Based on the outcomes of the lifecycle benefit-cost analyses and scenario testing, develop performance measures and evaluation criteria to inform transportation project selection/prioritization processes and address merit/eligibility requirements for future local/regional/State transportation plans, asset management/resiliency initiatives, and/or various relevant formula/discretionary grant opportunities
- Investigate the delivery, management, technology, and maintenance strategies aimed at improving operational capabilities and reducing risk from flooding of prioritized low-lying facilities.
- Identify plans, programs, projects, and implementing agencies that can leverage H&H data to improve transportation routing and safety (i.e., Waze for routing).
- Evaluate programs that rate the sustainability of transportation infrastructure and identify ways flood risk reduction and stormwater management could be incorporated into these or similar programs.

Subtask 3.2 Deliverables

- Final Plan content describing opportunities to integrate stormwater and transportation infrastructure identified via optimization study outputs and collaboration with transportation partners, including lifecycle cost analysis and impact assessment for at-risk existing and future transportation infrastructure in the Project Area.

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- Maps of future vulnerable areas, at-risk transportation facilities, and strategies for flood mitigation.
- Final Plan content identifying short-term and long-term land use and transportation regulatory tools, green infrastructure applications, and adaptability strategies.
- Final Plan content describing scenarios of flood control and mitigation best practices measures, land use strategies, environmental features, and environmentally sustainable design applications, to identify benefits and impacts.
- Final Plan content identifying performance measures and evaluation criteria to inform transportation project selection/prioritization processes and address merit/eligibility requirements for future local/regional/State transportation plans, asset management/resiliency initiatives, and/or various relevant formula/discretionary grant opportunities.
- Final Plan content describing the delivery, management, technology, and maintenance strategies aimed at improving operational capabilities and reducing risk from flooding of prioritized low-lying facilities.
- List of plans, programs, projects, and implementing entities that can leverage H&H data to improve transportation routing and safety.
- Inventory of transportation/stormwater infrastructure data sets.
- Final Plan content identifying how programs that rate the sustainability of transportation infrastructure could incorporate flood risk reduction and stormwater management.

Subtask 3.3 Environmental Planning: Existing natural resources in the Project Area provide stormwater detention capabilities that minimize or reduce downstream flood risk. Identifying, conserving, and preserving existing natural pervious surfaces, and providing a plan for new environmental features in the Phase One Area is a key outcome of the Plan. Currently, creation of new environmental areas such as wetlands and prairie areas is accomplished piecemeal in conjunction with mitigation actions associated with construction of incremental portions of transportation and other infrastructure. The Plan will utilize outputs from the optimization study to define appropriate and comprehensive green stormwater infrastructure (GSI) and nature-based solutions (NBS) to support intentional saturation of the stormwater runoff determined in Subtask 3.1. This task will encompass estimates of future land use, possible mitigation needs for transportation infrastructure, and return on investment (ROI) calculations for GSI and NBS applications. Through this Task, the Project Team will:

- Evaluate existing environmental sustainability work efforts/products in the region, such as watershed protection plans and the Denton County Greenbelt Plan, that should be integrated into the Phase One Area, and replicated in other portions of the Project Area.
- Identify the appropriate project type, location, and size of GSI and NBS resulting in a map of locations for conservation/preservation or restoration; the map contents will be incorporated into the optimization study. Project types, size, and locations will be identified to provide environmental benefits and outcomes, such as improved water quality, reduced stormwater runoff, and reduced heat island impacts. This may include, but is not limited to:
    - Existing/future on- and off-stream natural and constructed systems
    - Existing/future open space and other areas of significant preservation/conservation importance to affected communities, including those where sustaining those features may elicit supplemental benefits (quality of life, economic/cultural vitality, noise/air pollution mitigation, etc,)
    - Existing/future tree canopy and tree planting opportunities (e.g. maintaining riparian

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buffers and other strategies)

- Existing/future nature-based solutions that are man-made (e.g. constructed wetlands, potential compensatory mitigation banks, etc.)
- A GSI/NBS suitability index that can measure effectiveness of and rank potential locations for GSI and NBS applications based on geological/ecological, social, and environmental parameters.
- A GIS visualization tool (or components of a larger tool or StoryMap) that communicates outputs from the optimization study. The tool will relate flooding risk/potential/vulnerability with GSI and NBS. This visualization tool will identify ideal locations for implementing GSI and NBS. The tool may be standalone or a component of a larger tool that communicates Subtask 3.3 outcomes from the TSI Project.

- Develop an environmental and wetland analysis:
  - Conduct a supply and demand analysis of wetland and stream compensatory mitigation credits associated with Section 404 of the Clean Water Act.
  - If a demand is identified, utilize H&H modeling to identify locations that could both meet estimated credit demand and reduce future flood risk. Identify planning-level focus areas and design criteria for wetland and/or stream restoration, enhancement, and/or creation.
  - Discuss ownership circumstances, revenue potential, and maintenance needs/costs of these environmental/mitigation actions.
- Develop cost-benefit calculations and return-on-investment (ROI) parameters on GSI and NBS practices, including preservation of floodplains, for use by local governments and developers. Information could include the potential to reduce capital, operation, and maintenance expenses for transportation and other infrastructure through reduction of channel erosion and sediment transport.
- Develop a funding strategy toolbox that local governments and partners could use for implementation of the identified projects. Utilizing existing organizations and tools, such as active land trusts and regional, state, and Federal GSI tools, will be a key goal to minimize duplication and ensure the most efficient use of funds.
- Determine how availability and use of these new resources/tools may impact National Environmental Policy Act (NEPA) documentation and decision-making at the project level, particularly as they relate to mitigation for indirect and cumulative impacts or environmental justice considerations.

Subtask 3.3 Deliverables

- Final Plan content documenting existing environmental sustainability work efforts/products in the region that could be replicated in other portions of the Project Area.
- Outputs from the optimization study, including maps of potential GSI and NBS locations, suitability index including effectiveness/ranking of project types and locations, and visualization tool (or component of larger tool or StoryMap).
- Final Plan content on feasibility of wetland/stream mitigation as flood reduction; planning-level focus areas and design criteria as appropriate; and circumstances for ownership, revenue, and maintenance of mitigation as appropriate.

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- Final Plan content on cost-benefit calculations and return-on-investment (ROI) parameters for GSI and NBS practices, including floodplain preservation. Content may include demonstrative fact sheets on GSI and NBS applications to communicate/illustrate project economics.
- Final Plan content on implementation funding strategies for use by local governments and others.
- Final Plan content highlighting recommended methodologies and documentation for addressing future flood risk, mitigation, and related economic/social equity issues in project-level transportation NEPA studies.

When possible and as applicable, evaluations of flood risk reduction solutions, including flood mitigation projects, should be consistent with "Technical Guidelines for Regional Flood Planning," Exhibit C to Regional Flood Planning Grant Contracts, which can be found at: https://www.twdb.texas.gov/flood/planning/planningdocu/2023/index.asp.

Each feasible flood mitigation alternative evaluated must identify and compare cost and benefits of projects. Quantification of cost will include engineering, permitting, easement and/or property acquisition, capital cost, operation and maintenance, and other costs as applicable. Quantification of benefit of the project will include the following items, as applicable:

1. Number of structures with reduced 100-year (1% annual chance) flood risk.
2. Number of structures removed from 100-year (1% annual chance) flood risk.
3. Number of structures removed from 500-year (0.2% annual chance) flood risk.
4. Residential structures removed from 100-year (1% annual chance) flood risk.
5. Estimated Population removed from 100-year (1% annual chance) flood risk.
6. Critical facilities removed from 100-year (1% annual chance) flood risk (#).
7. Number of low water crossings removed from 100-year (1% annual chance) flood risk (#).
8. Estimated reduction in road closure occurrences.
9. Estimated length of roads removed from 100-year flood risk (miles).
10. Estimated farm & ranch land removed from 100-year flood risk (acres). Estimated farm & ranch land at 100-year flood risk (acres) should only include farm and ranch land that are negatively impacted by flooding events and should not include land that benefits from floodplains for example rice fields.
11. Estimated reduction in fatalities (if available).
12. Estimated reduction in injuries (if available).
13. Pre-Project Level-of-Service
14. Post-Project Level-of-Service
15. Cost/ Structure removed
16. Percent Nature-based Solution (by cost)
17. Negative Impact (Y/N)
18. Negative Impact Mitigation (Y/N)

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19. Social Vulnerability Index (SVI)
20. Water Supply Benefit (Y/N)
21. Traffic Count for Low Water Crossings

The recommended solutions must be permittable, constructable and implementable.

The recommended flood risk reduction solutions must have no negative effect on neighboring areas in accordance with statutory requirements for regional flood plans (Texas Water Code § 16.062(i) and (j)(2)). Recommended flood risk reduction solutions, including flood mitigation projects, must meet the definition and requirements regarding no negative effect identified in Exhibit C to the Regional Flood Planning Contracts, Technical Guidelines for Regional Flood Planning, which can be found at: https://www.twdb.texas.gov/flood/planning/planningdocu/2023/index.asp. The flood mitigation projects identified from this FIF CAT 1 study must comply with 'no negative effect' to be included in the regional flood plans.

Subtask 3.4 Project Area Real-Time Flood Warning System Enhancements: The Project Team will evaluate the latest methods and state-of-the-art technology that could enhance existing (or complement ongoing development of) flood forecasting and warning system/s in the Project Area. This work will include an investigation into the best practices for meteorological and hydrologic and hydraulic modeling systems. To avoid duplication, the capabilities and opportunities to partner with or integrate information into existing regional flood warning platforms and tools will be evaluated.

Subtask 3.4 Deliverables:

- Final Plan content that identifies strategies to enhance existing (or complement ongoing development of) flood warning systems with meteorological and H&H data, and identifies needs related to partnership or data integration opportunities. This includes a "roadmap," based on H&H modeling, for creating a flood warning system that incorporates H&H and specific locations for sensors and other hardware.

Subtask 3.5 Managing Land through Strategic Planning and Development Regulations: While there are many steps to implementation of regional GSI and NBS, there are regulatory and strategic planning elements which counties and municipalities could adopt in a relatively short-term timeframe to reduce their future flood risk. Deliverables from this task will focus on development of model regulatory strategies and tools for which cities and counties could integrate into their existing development and planning processes.

Subtask 3.5 Deliverables:

- Final Plan content documenting:
  - Identification of potential options or incentives to provide for conservation and preservation of flood-prone and/or environmentally sensitive areas such as purchase of development rights, cluster development, etc.
  - Inventories of existing zoning, building codes, and stormwater ordinances enabling the

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integration of GSI and NBS, including regional efforts such as integrated Stormwater Management resources.

- Initiatives and constraints to expand the Corridor Development Certificate (CDC) process into the Project area, including H&H modeling considerations.
- Propositions for model development codes and recommended floodplain management ordinances.
- Inventories of city planning and development documents into which model code and ordinances can be incorporated, including comprehensive plans, building code updates, design criteria manuals, capital improvement programs, development review checklists, etc.
- Actions/recommendations targeted for implementation within planning and development documents and processes for both counties and municipalities.

- Analysis of stormwater management fees and anticipated revenue based on future growth.

Task 4: Project Management and Project Replication

Subtask 4.1 Project Management

This task includes fulfillment of funding administrative requirements, including contracting and procurement; project team oversight; quarterly reporting and coordination with funding agencies; maintenance of project website; task memos; and compilation of the Draft and Final Upper Trinity River Basin Transportation - Stormwater Infrastructure Plan (Plan).

A critical step of this project is to develop a detailed scope of work for each Task and project element outlined here. For each major task, NCTCOG and subrecipients would refine the scope and identify specific deliverables for each element.

Subtask 4.1 Deliverables:

- Contracting and procurement documentation, as well as recordkeeping for subcontractor and subrecipient meetings.
- Project Team kick-off meeting and subsequent coordination meetings.
- Quarterly reports and other required funding agency documentation; coordination meetings with funding agencies.
- Project website development and maintenance.
- Task memos and Draft and Final Upper Trinity River Basin Transportation - Stormwater Infrastructure Plan (Plan).
- Detailed scopes of work for each project element.

Subtask 4.2 Replicate and Amplify Outcomes

The Project Team will document the processes developed throughout this Project including data, methods, tools, analyses, and standard practices required to integrate transportation and stormwater infrastructure planning. This documentation will allow for easy replication for the remaining larger Project Area in NCT, and for the duplication and amplification of the Project outcomes in other portions of the State and Nation by any type of entity and at varying geographic scales.

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Subtask 4.2 Deliverables:

- Report documenting the standard processes, methods, tools, and analyses for replication of the project activities and amplification of the positive individual and collective stormwater, infrastructure, and environmental outcomes.

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Attachment 2:
EXHIBIT C, AMENDED TASK AND EXPENSE BUDGET

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TASK BUDGET

TASK	DESCRIPTION	AMOUNT
1	Data Collection and Analysis	$311,315
2	Stakeholder Engagement	$628,383
3	Integrated Transportation and Environmental Planning	$4,345,608
Subtask 3.1	*Phase One Project Area Hydrology and Hydraulics Assessment and Scenarios*	*$2,307,395*
Subtask 3.2	*Assess Transportation Infrastructure Impacts and Develop Decision-Making Tools*	*$538,505*
Subtask 3.3	*Environmental Planning*	*$1,016,090*
Subtask 3.4	*Phase One Project Area Real-Time Flood Warning System Enhancements*	*$210,562*
Subtask 3.5	*Managing Land through Strategic Planning and Development Regulations*	*$273,056*
4	Project Management and Project Replication	$714,694
Subtask 4.1	*Project Management*	*$548,446*
Subtask 4.2	*Replicate and Amplify Outcomes*	*$166,248*
TOTAL		**$ 6,000,000**

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EXPENSE BUDGET

CATEGORY	AMOUNT
Salaries & Wages[1]	$660,000
Fringe[2]	$322,080
Travel[3]	$13,920
Subcontract Services	$4,625,000
Equipment	$0
Other Expenses[4]	$205,172
Overhead[5]	$173,828
Profit	$0
TOTAL	**$6,000,000**

[1] Salaries and Wages is defined as the cost of salaries of engineers, draftsmen, stenographers, surveyors, clerks, laborers, etc., for time directly chargeable to this CONTRACT.

[2] Fringe is defined as the cost of social security contributions, unemployment, excise, and payroll taxes, workers' compensation insurance, retirement benefits, medical and insurance benefits, sick leave, vacation, and holiday pay applicable thereto.

[3] Travel is limited to the maximum amounts authorized for state employees by the General Appropriations Act, Tex. Leg. Regular Session, 2017, Article IX, Part 5, as amended or superseded.

[4] Other Expenses is defined to include expendable supplies, communications, reproduction, postage, and costs of public meetings directly chargeable to this CONTRACT.

[5] Overhead is defined as the costs incurred in maintaining a place of business and performing professional services similar to those specified in this CONTRACT.