PROPOSAL FOR INTEGRATED PLANNING OF REGIONAL TRANSPORTATION AND STORMWATER MANAGEMENT TOGETHER AS A SYSTEM OF IMPROVEMENTS: PREVENTION VS. RESPONSE

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North Central Texas Council of Governments
WHERE: Greater Focus on Vulnerable Area
WHY: Comprehensive, collaborative planning will dissolve silos and improve delivery of consolidated, adaptive infrastructure before expected population growth makes addressing these issues more difficult and costly.
HOW:
Integrate regional transportation planning, regional stormwater management planning, and environmental planning to develop consolidated, adaptive infrastructure.

PROJECT TASKS & COST COMPONENTS

- Inventory of Relevant Data
- Inventory of Stormwater Management Structures
- Land Inventory and Site-Specific Design Considerations
- Plans to Offset Future Transportation and Indirect Development Impacts
- Project Management and Organization
- Implementation (Products and Technical Tools)
Flooding continues to be a challenge in North Texas

Threats: Increased flooding and safety risks; cost of infrastructure, stormwater, environmental restoration

Solution: Innovative partnerships and integrated infrastructure
Perspective: 5 year tally of flood fatalities
Texas far outpaces all of the states in flood related fatalities

(Source: Gregory Waller, Service Coordination Hydrologist, NWS – West Gulf River Forecast Center, http://www.nws.noaa.gov/om/hazstats.shtml, 11/18 TFMA)
Hurricane Harvey Storm

- Rainfall totals up to 60”
- Approaching or exceeding maximum rainfall possible
- 23,000 + mi² (CT, RI, DE, NJ)
- One of the largest storms in continental US history
- Blocking factors
- OFF THE CHARTS!
Storms Exceeding Infrastructure and NFIP Standards

- Regional observed storms
  - USACE extreme storm database
- 24-hour rainfall for 10 mi²
- Plotted in descending order
- Grey band is current design standard (100-year) for all of TX
- Blue X’s points are 2010-2017 storms that exceed 100-year
- 18 events exceeded the 100-yr design standard
Storms Exceeding Infrastructure and NFIP Standards
Uncertainty - 100 Year Base Flood Elevations (BFE)

- The most commonly used techniques to estimate flood and rainfall frequencies rely on observations.
- Need record length 3-4 times estimated return interval.
- Short Observation Periods - On average TX has 50 years of stream record and 70 years of precipitation records.
- Significant variability and/or non-stationarity observed in flood flow and rainfall frequency estimates.

1:100 probability changes for blocks of years
- > 1:4 chance of being flooded over a 30 year mortgage
- > 1:2 chance of flooding over life of the structure (80 years)

Perfect 100 year water surface.
USACE Dallas-Fort Worth - Flood Reduction and Water Supply System

- Devastating floods, 1908, 1942, 1949
- 6 multi-purpose reservoirs
- 2 federal levee systems
- DFW Flood Control System
  - 7.4 million people
  - $100 billion in damages prevented
  - $2 - $3 billion annually
- Water supply system
- Total cost $2.5 billion
- **Must be operated as a system**
Return on Investment

- 2017 “Natural Hazard Mitigation Saves” report by: National Institute of Building Sciences Institute, Multi-hazard Mitigation Council (MMC),
- Prepared at the direction of the U.S. Congress
- Riverine flooding – for $1 invested in mitigation strategies and higher standards (versus recovery from flooding actions), communities save $5-7

What Will This Project Deliver

- Inventory of existing data, information and structures
- Develop state-of-the-art data, tools & analysis for:
  - Modeling
  - Emergency response
  - Emergency preparedness
  - Planning infrastructure and neighborhoods
  - Regulating the floodplain
- Develop planning level storm water infrastructure
- Develop environmental areas
- Develop environmental mitigation areas
- Groundwater recharge
- Open space connectivity opportunities
- Roadmap or documentation to allow duplication of this effort elsewhere
WHO: Project Team Members

A working group of partners and stakeholders to carry out a comprehensive planning effort in Wise County and portions of Dallas, Denton, Ellis, Johnson, Parker, and Tarrant counties.
PREVENTION VS. RESPONSE

Transportation Infrastructure
- Structure Elevation / Culverts / Model Growth
- Mechanical Culverts?
- Transportation “LEED” Certified (Ray Roberts / Lewisville)
- Green Parkway Widths / Detention

Safety
- Technology / Routing
- Prioritization / Low Lying Facilities

Stormwater
- Minimize / Reduce Downstream Detention
- Tools, Data, Experts
PREVENTION VS. RESPONSE CON’T.

Environmental Features
  Tree Farms / Intentional Saturation
  Filtration / Recharge

Wetland and Stream Bed Mitigation Banking

Environmental Stewardship as a Revenue Element
  Mitigation Banking
  Horse Farms
  Eco-Tourism
CONTRIBUTIONS:
Partners are critical to making this possible

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<tr>
<th>Texas General Land Office (GLO)</th>
<th>US Housing and Urban Development (HUD)</th>
<th>US Army Corps of Engineers (USACE)</th>
<th>Federal Emergency Management Agency (FEMA)</th>
<th>Texas Department of Transportation (TxDOT)</th>
<th>Texas Water Development Board (TWDB)</th>
<th>Regional Transportation Council (RTC)</th>
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Project Funding Goal: $10 Million

*Project Has Begun With Getting the Money*
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