The Symbiotic Nature of Urban Development and Floodplain Management

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Project Location - City of Celina

City of Celina – Explosive Population Growth

• City was established in 1876
• Population has nearly tripled since 2010
• Current population 30,000
• Fastest-growing city in North Texas
• Projected buildout population is approximately 378,000
Study Area – Little Elm Creek

City Limits

History of Development:
2017
History of Development:
2022

- Rapid development pace to keep up with population

History of Development:
2023

- Rapid Urban Development
- Responsible Floodplain Management

Balancing Goals

- Development friendly
- Reclaim valuable land for development
- Efficient development application process
- Preserve natural beauty of the area.
- Protect existing and future communities from increased flood risk
Robust Standards

- Increase uniformity of H&H analysis
- Provide a common “measuring stick”
- Expedite City and FEMA approvals
- Limit variables left to engineering judgment
- Reduce liability on developers

First and Only

- Different hydrologists = Different Answers
- Standardization matters

H&H Challenges with Development
Increase Modeling Speed with New Tools

- Look for opportunities to reduce Copy/Paste & Manual Entry
- Make full use of GIS and Excel – HMS 4.9 is GIS compatible
- Use latest tools available
  - RAS Mapper features in RAS 6.1 – Geometry and Manning’s layer
  - Use elevation control points to process LiDAR
- Use full capabilities of DSS Vue 3.2.3
- Use text editing code – “hack”
  - Edit .pdata text in bulk – faster data entry
Next Steps

- Synergy
  - No longer City vs Developers
  - Teamwork and collaboration between City and Development community
- The community is the ultimate winner
  - Development provides for population growth
  - Increases to public safety
  - Reduction in flooding risks
- Master H&H Models
  - Consistent starting point for all developments
  - Shorter timeframes for developing and reviewing flood studies
  - Greater confidence in modeling results and developments

Conclusions