Using HMGP to Mitigate Urban Flooding in Huntsville, AL
W. Byron Hinchey, PE, CFM
Huntsville, Alabama

- Settled in 1805
- Cotton Trading Center

Flash forward 150 years

- 195,000 Population
- 220 mi² Area
- 8% Growth 2010-2017
- Largest City in AL by 2025
- Home to 62% of New Jobs in Alabama Last Decade
A Modern High-Tech City

- Redstone Arsenal
  - NASA Marshall Space Flight Center
  - U.S. Army Aviation and Missile Command
  - Missile Defense Agency
  - Federal Bureau of Investigation
- Toyota-Mazda Automotive Plant Under Construction
- #2 Highest Concentration of Engineers (U.S.)
- #2 Largest Research Parks (U.S.)
- #1 Best City for STEM Workers (Livability, 2019)
- #8 Best Places to Live by (U.S. News, 2018)
Alabama Watersheds

- 14 Watersheds
- 13 Flow Directly to Gulf
- 1 Takes the Scenic Route
City of Huntsville

- Entered NFIP 1979
- Effective FIRMs 2018
- Entered CRS 1991
- CRS Rating 8

Limestone County  Madison County
# Huntsville Watersheds

<table>
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<tr>
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<tbody>
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<td>1</td>
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<td>2</td>
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<td>3</td>
<td>Beaverdam Creek 2</td>
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<td>5</td>
<td>Indian Creek</td>
<td>69</td>
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<td>Huntsville Spring Branch</td>
<td>90</td>
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# Flood Mitigation Initiatives

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Aldridge Creek Flooding

- June 28, 1999
- 7" inch rainfall
- 2 hours
- Rainfall Frequency ~ 500 yr
- Flood Frequency > 100 yr
- About 300 homes flooded
Selected Mitigation Strategy

- Excavated high-flow bench (4 ½ miles)
- Expanded Bridges (3)
- Acquired homes in FW (34)
  HMGP Unmet Needs 1261
- Project Financing
  - $4.5M HMGP funds
  - $4.8M local funds
Mitigation Implementation
Mitigation Results

- WSEL Decrease
  - 3 ft. in Critical Areas
- Project Removed
  - 300 homes from FP
  - 99 homes from FW
- Later PMR
  - Removed >700 homes watershed-wide from FP
Huntsville Spring Branch Watershed

- Watershed Area 90 mi$^2$
- Lots of Zone AE Streams
- Heart of the City
- Largely Urbanized
- Altered Channels
HSB Flooding

- 1912
- 1963
- 1973
- 1990
- 2003
- 2005

Activities
- 1990’s USACE Studies
- 2000 Watershed Study
- 2003 USACE Feasibility Project
- 2006 DB / PC Flood Mitigation
- 2013 HSB Flood Mitigation
- 2016 HSB Flood Mitigation
Problem Statement
Dallas Branch Bypass Floodway
Dallas Branch Bypass
1.4 Miles
The Goal
Selected Alternative

Detention
Project Benefits

- Lower BFE up to 3 feet on Dallas Branch
- Eliminate Dallas Branch Overflow to the Bypass
  - Eliminates Inadvertent Floodway & Floodplain
- Reduce flow in Bypass by 78%
  - 4500 cfs to 1000 cfs
  - Reduces Residual Floodway & Floodplain
- Reduce Flood Risk for 600 Structures
- Reduce Average Annual Damages
  - $7 million to $4 million
Project Timeline

- 2005 - Hurricane Katrina (DR-AL-1605-0217)
- 2006 - Phased HMGP Application
  - Phase 1 (Planning & 90% Design)
  - Phase 2 (100% Design & Construction)
- 2008 - Phase 1 Funding Approved
- 2010 - Phase 2 Funding Denied (appeal filed)
- 2011 - Phase 2 Funding Denied (final appeal filed)
- 2013 - Complete 100% Design (local funds)
- 2016…Election
- 2017…Hurricanes Harvey & Irma
- 2018 - Phase 2 Funding Awarded ($15.9 million)
- 2019 - Updated BCA…Construction Start TBA
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