“Show Me” Statewide Hazard Mitigation Planning Utilizing Risk MAP Products A Case Study for Success in Missouri

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Agenda

- **Mitigation in Missouri**
  *A History of Planning Put into Practice*

- **Strategy for the 2018 State Hazard Mitigation Plan Update**
  *Overview of the Planning Process*

- **Enhancements to the Hazard Identification and Risk Assessment**
  *Flood Hazard and Risk MAP Products*
  *Earthquake Hazard and Dataset Enhancements*

- **Plan Implementation and Assistance to the Local Planner**
  *Missouri Hazard Mitigation Viewer*
  *Loss Avoidance Analysis Tool*
  *Technical Assistance Workshops - Mitigation Planning*
  *Microsoft Footprints*
  *Freeboard Grids*
  *Mitigation Profile Tool*
Missouri
Mitigation Planning History

- **2004** - First DMA 2K Plan
  Originally, states were required to update every 3 years
- **2007** - Update
- **2010** - Update
- **2013** - Update
  Now, states are required to update every 5 years
- **2018** – Current
  Approved by FEMA on July 29, 2018
# FEMA Hazard Mitigation Funding

<table>
<thead>
<tr>
<th>Project Type</th>
<th>2002-2012 Number of Projects</th>
<th>2002-2012 Estimated Funding Amount</th>
<th>2013-2017 Number of Projects</th>
<th>2013-2017 Estimated Funding Amount</th>
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<td>Tornado Safe Rooms</td>
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<td>$159,925,978</td>
<td>62</td>
<td>$68,575,060</td>
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<td>Bridge Replacements</td>
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<td>Low Water Crossings</td>
<td>8</td>
<td>$888,246</td>
<td>2</td>
<td>$432,896</td>
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<tr>
<td>Streambank Stabilizations</td>
<td>2</td>
<td>$92,267</td>
<td>---</td>
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</tr>
<tr>
<td>Basin</td>
<td>1</td>
<td>$1,333,333</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Culvert</td>
<td>2</td>
<td>$553,625</td>
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<td>Water Supply Interconnects</td>
<td>1</td>
<td>$66,701</td>
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<td>Buried Electric Lines</td>
<td>10</td>
<td>$11,959,530</td>
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<td>State 5% Initiative Projects</td>
<td>12</td>
<td>$1,753,866</td>
<td>10</td>
<td>$598,378</td>
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</table>
2018 Update Strategy: Overview of 15 Tasks

- Task 1: Planning Process Updates
- Task 2: Hazard Identification and Risk Assessment Update
- Task 3: Climate Change Impact Analysis
- Task 4: Integrate Local Plans
- Task 5: Risk Assessment of State Owned/Operated Facilities
- Task 6: Update Exposure (Assets) and Development Trends
- Task 7: Update Mitigation Strategy & Priorities
- Task 8: Update State Mitigation Capabilities
2018 Update Strategy: Overview of 15 Tasks

- Task 10: Enhanced Plan Basic Elements
- Task 11: Loss Avoidance Study
- Task 12: Plan to Mitigate Response / Recovery Facilities
- Task 13: Integration of Mitigation into Post Disaster Recovery (PA 406 Mitigation)
- Task 14: Accessible Risk Assessment Data Layers and PDF Map-maker for Local Planner Access
- Task 15: Plan Document and Processing
Flood Risk Assessment Utilizing Risk MAP Products

Building Exposure

- 2013 Plan – Default Census Block Inventory
- 2018 Plan – Structure Inventory Dataset developed by Missouri GIS Department (MSDIS)
  - Point for every roof line in every county within the State
  - Attributed with Type of Structure
  - MSDIS dataset was intersected with the depth grids outside of the Hazus environment to give estimated # of structures, by type, exposed to risk of flooding with the estimated depth of water for the 12 Risk MAP Counties
  - These numbers were reported as part of the Risk Assessment table by county
Flooding Analysis

Inputs for Level II Analysis

FEMA Regulatory Products

FEMA RiskMAP Products

FLOOD INSURANCE STUDY
FEDERAL EMERGENCY MANAGEMENT AGENCY
VOLUME 1 OF 2

BOONE COUNTY,
MISSOURI
AND INCORPORATED AREAS

COMMUNITY NAME COMMUNITY NUMBER
ANIMAL, CITY OF 296742
BOONE COUNTY 296734
CENTRALIA, CITY OF 296550
COLUMBIA, CITY OF 296536
HARRINGTON, CITY OF 295713
HARRISON, CITY OF 296246
HARTSFORD, VILLAGE OF 295627
HARTSFORD, TOWN OF 295685
HARTSFORD, CITY OF 295637
HARTSFORD, VILLAGE OF 295685
HARTSFORD, CITY OF 295637

Flood Risk Database

Flood Risk Report
Lower Missouri-Moreau Watershed, Missouri

Report Number 01
06/29/2015
Final
Flood Depth Grids

Inputs for Level II Analysis

- Raster (grid) of water depth
- Depth is calculated as the difference (in feet) between the water surface elevation and the ground
- Produced for 10%, 4%, 2%, 1%, and 0.2% annual chance events

St. Charles County example
Flood Risk Assessment Utilizing Risk MAP Products

**DFIRM 100-year Depth Grid**

**HAZUS-MH 100-year Depth Grid**
Flood Risk Assessment Utilizing Risk MAP Products
Used for supplemental geospatial analysis for damaged structure counts

http://www.msdis.missouri.edu/data/datalist.html#facstruc
Example of the MSDIS Structures – Andrew County

There are 22,168 structures in Andrew County.

For Andrew County, 915 structures out of 22,168 are vulnerable to risk of flooding.

- Agriculture = 145
- Commercial = 14
- Government = 15
- Industrial = 2
- **Residential = 213**
- Residential-Sub (sheds, etc) = 526
Flood Risk Assessment
Results – Building Exposure

Source: MIISDIS Structure Points, Hazus Flood Model, NFHL
# Flood Risk Assessment Results

## Top Ten Counties for Countywide Building Exposure

<table>
<thead>
<tr>
<th>County</th>
<th>Structural Damage</th>
<th>Contents Loss</th>
<th>Inventory Loss</th>
<th>Total Direct Loss</th>
<th>Total Income Loss</th>
<th>Total Direct and Income Loss</th>
<th>Loss Ratio</th>
<th># Hazus Bldgs Risk</th>
<th>MSDIS</th>
<th># Substantially damaged</th>
<th># Displaced People</th>
<th># Shelter Needs</th>
<th>Countywide Building Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adair</td>
<td>$7,445,000</td>
<td>$6,613,000</td>
<td>$225,000</td>
<td>$14,283,000</td>
<td>$35,000</td>
<td>$14,318,000</td>
<td>0.29%</td>
<td>17</td>
<td>39</td>
<td>0</td>
<td>329</td>
<td>33</td>
<td>$2,599,614,000</td>
</tr>
<tr>
<td>Andrew</td>
<td>$29,193,000</td>
<td>$17,870,000</td>
<td>$373,000</td>
<td>$47,436,000</td>
<td>$223,000</td>
<td>$47,659,000</td>
<td>1.69%</td>
<td>78</td>
<td>213</td>
<td>23</td>
<td>998</td>
<td>238</td>
<td>$1,724,819,000</td>
</tr>
<tr>
<td>Atchison</td>
<td>$18,643,000</td>
<td>$16,334,000</td>
<td>$745,000</td>
<td>$35,722,000</td>
<td>$64,000</td>
<td>$35,786,000</td>
<td>2.31%</td>
<td>24</td>
<td>57</td>
<td>9</td>
<td>286</td>
<td>50</td>
<td>$806,754,000</td>
</tr>
<tr>
<td>Audrain</td>
<td>$7,605,000</td>
<td>$9,862,000</td>
<td>$318,000</td>
<td>$17,785,000</td>
<td>$45,000</td>
<td>$17,830,000</td>
<td>0.28%</td>
<td>26</td>
<td>61</td>
<td>0</td>
<td>336</td>
<td>130</td>
<td>$2,689,090,000</td>
</tr>
<tr>
<td>Barry</td>
<td>$21,248,000</td>
<td>$38,569,000</td>
<td>$2,998,000</td>
<td>$62,815,000</td>
<td>$277,000</td>
<td>$63,092,000</td>
<td>0.57%</td>
<td>34</td>
<td>72</td>
<td>1</td>
<td>590</td>
<td>140</td>
<td>$3,736,121,000</td>
</tr>
<tr>
<td>Barton</td>
<td>$16,684,000</td>
<td>$14,973,000</td>
<td>$523,000</td>
<td>$32,180,000</td>
<td>$85,000</td>
<td>$32,265,000</td>
<td>1.18%</td>
<td>111</td>
<td>235</td>
<td>15</td>
<td>1,109</td>
<td>370</td>
<td>$1,414,960,000</td>
</tr>
<tr>
<td>Bates</td>
<td>$16,291,000</td>
<td>$10,483,000</td>
<td>$586,000</td>
<td>$27,360,000</td>
<td>$41,000</td>
<td>$27,401,000</td>
<td>0.99%</td>
<td>36</td>
<td>78</td>
<td>4</td>
<td>742</td>
<td>82</td>
<td>$1,650,150,000</td>
</tr>
<tr>
<td>Benton</td>
<td>$14,831,000</td>
<td>$11,997,000</td>
<td>$306,000</td>
<td>$27,134,000</td>
<td>$61,000</td>
<td>$27,195,000</td>
<td>0.60%</td>
<td>17</td>
<td>29</td>
<td>3</td>
<td>396</td>
<td>68</td>
<td>$2,478,458,000</td>
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<tr>
<td>Bollinger</td>
<td>$17,686,000</td>
<td>$17,040,000</td>
<td>$383,000</td>
<td>$35,109,000</td>
<td>$152,000</td>
<td>$35,261,000</td>
<td>1.71%</td>
<td>39</td>
<td>76</td>
<td>3</td>
<td>783</td>
<td>215</td>
<td>$1,035,129,000</td>
</tr>
</tbody>
</table>

Statewide Exposure = $709,564,189,000
Earthquake Risk Assessment
Data Enhancements
HAZUS

Type of Analysis
- Annualized loss scenario
- 2% annual chance in 50 years (2500-year scenario)

Data Enhancements
- Soils and liquefaction data
- Groundwater depth data
- Incorporation of
  - Hazardous materials facilities
  - Bridge data from MoDOT
  - State-owned facilities
  - Analysis of fire station capabilities
  - Additional educational and medical facility information
## Earthquake Risk Assessment Results

### Expected Fire Department Damage Summary by Hazus sub-region

<table>
<thead>
<tr>
<th>EQ Regions</th>
<th>Very High</th>
<th>High</th>
<th>Urban Moderate</th>
<th>Moderate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Department Damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with至少 Moderate Damage</td>
<td>85</td>
<td>127</td>
<td>197</td>
<td>112</td>
<td>521</td>
</tr>
<tr>
<td>with Complete Damage &gt; 50%</td>
<td>85</td>
<td>105</td>
<td>4</td>
<td>0</td>
<td>194</td>
</tr>
<tr>
<td>with Functionality &gt; 50% After Day 1</td>
<td>82</td>
<td>0</td>
<td>1</td>
<td>56</td>
<td>83</td>
</tr>
</tbody>
</table>

**PGA % gravity**
- 100% to 200%
- 120% to 160%
- 80% to 120%
- 60% to 80%
- 50% to 60%
- 40% to 50%
- 30% to 40%
- 20% to 30%
- 18% to 20%
- 16% to 18%
- 14% to 16%
- 12% to 14%
- 10% to 12%

Source: HSIP Freedom, USGS, Hazus-MH
# Earthquake Risk Assessment Results

## Expected Medical Facility Damage Summary by Hazus sub-region

<table>
<thead>
<tr>
<th>EQ Regions</th>
<th>Count</th>
<th>With at Least Mod. Damage</th>
<th>Complete Damage Probability</th>
<th>PGA % gravity</th>
<th>Functionality &gt; 50 % After Day 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>53</td>
<td>53</td>
<td>0.84 - 0.99</td>
<td>&gt; 200%</td>
<td>0</td>
</tr>
<tr>
<td>High</td>
<td>69</td>
<td>68</td>
<td>0.66 - 0.83</td>
<td>160% to 200%</td>
<td>0</td>
</tr>
<tr>
<td>Urban Moderate</td>
<td>218</td>
<td>35</td>
<td>0.51 - 0.67</td>
<td>120% to 160%</td>
<td>38</td>
</tr>
<tr>
<td>Moderate</td>
<td>46</td>
<td>3</td>
<td>0.35 - 0.5</td>
<td>80% to 120%</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>386</td>
<td>159</td>
<td>0.18 - 0.34</td>
<td>60% to 80%</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0 - 0.17</td>
<td>50% to 60%</td>
<td></td>
</tr>
</tbody>
</table>

Source: HSIP Freedom, USGS, Hazus-MH
Earthquake Risk Assessment Results

Expected Education Facility Damage Summary by Hazus sub-region

<table>
<thead>
<tr>
<th>EQ Regions</th>
<th>Educational Facility Count</th>
<th>With at Least Mod. Damage</th>
<th>With Complete Damage &gt; 50%</th>
<th>With Functionality &gt; 50% After Day 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High</td>
<td>149</td>
<td>149</td>
<td>37</td>
<td>0</td>
</tr>
<tr>
<td>High</td>
<td>160</td>
<td>136</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Urban Moderate</td>
<td>1,621</td>
<td>54</td>
<td>3</td>
<td>251</td>
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<tr>
<td>Moderate</td>
<td>149</td>
<td>0</td>
<td>0</td>
<td>94</td>
</tr>
<tr>
<td>Total</td>
<td>2,079</td>
<td>339</td>
<td>40</td>
<td>345</td>
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Source: HSIP Freedom, USGS, Hazus-MH
Plan Implementation and Assistance to the Local Planner

- Missouri Hazard Mitigation Viewer
  *Providing risk assessment data*

- Loss Avoidance Analysis Tool
  *Quantifying success of past mitigation projects*

- Technical Assistance Workshops – Mitigation Planning
  *Assisting local planners to use the GIS data to analyze for potential mitigation actions*

- Microsoft Footprints
  *Combining MSDIS datapoints with the Microsoft building footprints*

- Freeboard Grids
  *Creating grids that show the BFE +1’, +2’ and+3’*
The 2018 Plan is not only a document, the maps and data are available online and available for download by local planners.

- This uses the ArcGIS Online Platform
- It can be hosted by SEMA
- The draft maps are currently located at either of the two links below
- Has the ability to “clip and ship” the data behind the maps.

or
http://amecei.maps.arcgis.com/apps/webappviewer/index.html?id=d97d80d5cff04996bff54b2250e47d83
Local Planners and RPCs will have access to the State Plan Datasets
Every Map in the Plan is On-line AND the data can be exported for local plans.
Map Viewer, continued
Missouri Hazard Mitigation Viewer

Layer List
- Operational layers
  - MissouriHM2018
  - Admin. Boundaries / Disaster Regions
  - Dams
  - Fire/WUI
- Local Plan Integration
  - Dam Failure
  - Drought
  - Earthquake

Drought
- County

<table>
<thead>
<tr>
<th>OBJECTID</th>
<th>NAME</th>
<th>STATE_NAME</th>
<th>STATE_FIPS</th>
<th>CTY_FIPS</th>
<th>FIPS</th>
<th>Region</th>
<th>Region_ID</th>
<th>Fake</th>
<th>Dam</th>
<th>Drought</th>
<th>Earthquake</th>
<th>Fire</th>
<th>He</th>
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<tbody>
<tr>
<td>79</td>
<td>Boone</td>
<td>Missouri</td>
<td>29</td>
<td>019</td>
<td>29019</td>
<td>Northeast Region</td>
<td>5</td>
<td>23427</td>
<td>high</td>
<td>mod</td>
<td>high</td>
<td>high</td>
<td>high</td>
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</table>
Demonstrating State Mitigation Capabilities
  - Assessment of Mitigation Effectiveness

“The enhanced plan must document the system and strategy by which the state will conduct assessment of completed mitigation actions and include a record of the effectiveness (actual cost avoidance) of each mitigation action.”

Focus on Priority Project Types
  - Floodprone Property Acquisition
    • Evaluation of cost savings realized by previous buyouts based on inundation areas of previous events
  - Tornado Saferoom Construction
    • Evaluation of use of constructed saferooms during previous tornado warning events
Loss Avoidance Tool User Guide

Loss Avoidance Analysis Tool User Guide

4 - Radio button for Type of Loss Analysis (symbol changes with...
Review of Chapter 6: Loss Avoidance Tool


Link to SEMA website
Loss Avoidance Tool

Map Operational and Tools (* Described in detail in later pages)

- Draw Tools
- Share Map
- Add Data (Arcgis Online, Webservices, Shapefile/CVS/GeoJson)
- Open Data/Spreadsheet
- Interactive Query Tools
- Interactive Select Tool
- Incident Analysis
- To View Legend
- To View Layers

Use buttons or Mouse Wheel to Zoom In or Out (Mouse wheel can be used)

Home/Full Scale button
Local HM Plan Outline Template with Meeting Kits

2-4 Workshops are given annually to local planners.
Workshops – How to Identify Mitigation Actions Using FRP

Five Workshops were given in 2018

Three Workshops are planned for 2019
Mitigation Actions:
Assessment of risk to structures in the updated floodplains

MSGIS CREATED A DATABASE OF STRUCTURES BY COUNTY
- The University of Missouri Geographic Information Systems Department (MSGIS) created a database of all structures statewide. This database was posted on their website at http://www.msdis.missouri.edu/data/structure.html.
- Aerial imagery was used to place a point on top of every structure. This is a snapshot in time and may need to be updated for your community for future construction.
- For every point created, it is labeled by property types such as:
  - Residential
  - Residential Sub
  - Agriculture
  - Commercial
  - Education
  - Government
  - Industrial
- No personal information about the structure such as address, value or ownership was added.

RISK ANALYSIS PERFORMED USING THE STRUCTURE FILE
- An intersection of the floodplain mapping data and the MGSIS Points for Dent County was performed using GIS software.
- The attributes of the structures were then updated with the flood zone they likely fall in with a 50-foot buffer around the point.
- This analysis is intended to be a starting point for community officials to understand the general nature of risk for the assets within their community.
- This additional database will be given to the community officials on a thumb drive along with the datasets for the Special Flood Hazard Areas (SFHA) and RISKMAP products.
- Planners, builders, developers and contractors can use this information to guide mitigation decisions.

MITIGATION ACTIONS
- Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters.
- Mitigation is taking action now, before the next disaster, to reduce human and financial consequences later by:
  - Planning
  - Property Protection
  - Public Education and Awareness
  - Natural Resource Protection
  - Emergency Services
  - Structural Projects

Mitigation actions fall into six broad categories:
- Prevention
- Property Protection
- Public Education and Awareness
- Natural Resource Protection
- Emergency Services
- Structural Projects

- Prevention projects may be government regulatory processes that influence the way land and buildings are developed. These may include planning and zoning, building codes, capital improvement programs, open space preservation and storm water management projects.
- Property Protection projects may involve the modification of existing property to protect them from harm. Examples include acquisition, elevation, relocation, structural retrofit, storm shutters and shutter-resistant glass.
- Public Education and Awareness projects are designed to inform citizens about the hazards and potential ways to mitigate them such as outreach projects, real estate disclosure, hazard information centers and education programs.
- Natural Resource Protection projects in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These could include sediment and erosion control, streams corridor restoration, watershed management, forest and

 mitigation actions

and includes warning systems, emergency response services and protection of critical facilities.

- Structural projects are actions that involve the construction of structures to reduce the impact of a hazard such as levees, dams, floodwalls, retaining walls and safe rooms.

THE RESULT: MORE ACCURATE MAPS AND A SAFER COMMUNITY
- It is important to keep in mind how comprehensive and thorough the process of developing these maps has been. The result will be worth the effort.
- The map in the next column shows the Special Flood Hazard Areas for Dent County and the potential impacted properties.

Potential Impacted Properties
- Structures: 150 structures, including 71 residential, 55 commercial, 32 agricultural, and 33 other non-residential.
- Structures by Flood Hazard Zone:
  - Zone A includes 274 structures for Zone A.
  - 63 structures for Zone AE.
  - 10 structures for Zone AH.
  - 99 structures for Zone A1.

Legend
- A
- AE
- Zone A
- Zone A1
- Zone AH
- X

Map Legend
- Zone A is a base level study with no Base Flood Elevations (BFEs) for the 0.2% annual chance flooding event shown on the map.
- Zone AE is a detailed study with BFEs and cross section elevations for the 0.2% annual chance flooding event.
- Floodway is the area where the highest potential damages could occur.
- Zone A1 is areas of shallow flooding.
- 0.2 PCT to the 0.49 (500-year) chance of flooding event.
- 0.7 PCT to the 0.26 (500-year) chance of flooding event.

Potential Mitigation Projects
- Considering that all critical facilities be located outside the flood-prone areas.
- Remove repetitive loss structures from the hazard areas.
- Elevate utilities and mechanical devices above the expected flood levels. Encourage tankless water heaters in limited spaces.
- Use building codes and permits to encourage development above or outside of the Special Flood Hazard Areas.
- Planting of trees and use of impervious materials in large parking lots.
Ongoing Technical Assistance and Training: Microsoft Building Footprints

Microsoft Building Footprints - Tiles

125 million building footprints deep learning generated by Microsoft for the USA.

Tile Layer by sbreyer_esri

Created: Sep 25, 2018   Updated: Oct 16, 2018   View Count: 718

Description

Microsoft recently released a free set of deep learning generated building footprints covering the United States of America. In support of this great work and to make these building footprints available to the ArcGIS community, Esri has consolidated the buildings into a single layer and shared them in ArcGIS Online. The footprints can be used for visualization using vector tile format or as hosted feature layer to do analysis.

Learn more about the Microsoft Project at the Announcement Blog or the raw data is available at Github.

Layers

Microsoft_Building_Footprints
Ongoing Technical Assistance and Training: At Flood Study Review and CCO meetings
Assessments of Risk to Structures

Risk Assessment data from the MSDIS
Points data is being transferred to the new Microsoft footprints
At Flood Study Review and CCO meetings

Freeboard Grids

In FY19 we are generating Freeboard grids as part of the FRP for the 1', 2' and 3' above BFE to assist local planners and officials in managing risk.
In Beta Testing: Flood Risk Reduction
Mitigation Feasibility Profile Tool

- Identify and Quantify Mitigation Alternatives
- Check Transportation Crossings of Zone AE studies
- Streamlined Method for finding Culverts and Bridges that may have undersized flow capacity
In Beta Testing: Flood Risk Reduction
Mitigation Feasibility Profile Tool

- Utilizes Data Developed During FEMA Flood Studies
- Inputs
  - Floodplain & Water Surface Grids
  - Streamlines & Stationing
  - Transportation Crossings
  - DEM
  - Buildings of Interest (Footprint or Point)
    - Flag Repetitive Loss Structures
    - Lowest Adjacent Grade (LAG), Highest Adjacent Grade (HAG); Can be estimated from DEM
First Identifies Areas of Potential Mitigation

- Flags steep changes in waters surface elevations across transportation crossings
- Determines potential for drop in water surface elevation by comparing to lower storm events
In Beta Testing: Flood Risk Reduction
Mitigation Feasibility Profile Tool

Evaluates Possible Benefits

- Intersects Adjacent Buildings with Water Surface Grids
- Compares Water Surface Elevations to Building LAG Elevations
- Determines Buildings that are likely to have Flood Risk Reduced from Mitigation
In Beta Testing: Flood Risk Reduction
Mitigation Feasibility Profile Tool

- ArcMap Add-In
- Interactive Profile View and Plan View
In Beta Testing: Flood Risk Reduction
Mitigation Feasibility Profile Tool

Summarizes Results in Output Features and Summary Report

- Building LAG & HAG
- Water Surface Elevations
- Model Flows
- Required Water Surface Decrease
  - Helps Determine Required Increase in Culvert Capacity
- Required Flow Decrease
  - Helps Determine Required Upstream Detention
QUESTIONS?

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