Richland County Public Works Flood Response

SC-APWA Conference
Presentation Objectives

- Understand What Caused the Flood
- Review Flood’s Impact to Richland County Public Works
- Review Public Works Response Efforts
- Develop Long Term Recovery Path Forward
  - County’s Post-Disaster Needs
  - How to Fund These Needs
  - Develop a Long Term Recovery Plan
The Set-Up: What Caused the Historic Flood?
High Pressure System Pushed Warm Air on Shore

Category 5: Joaquin
The Set-Up: What Caused the Historic Flood?
Low Pressure System Brings Storms from the South
The Set-Up: What Caused the Historic Flood?
High/Low Systems Created Historic Flooding Event
Storm System Generated Historic Rainfall Throughout Midlands & Coastal South Carolina

Radar-Estimated Storm Total Rainfall
Friday 7pm to Sunday 7pm
Richland County Flooding Was Among Worst Hit In State of South Carolina
Flooding Along Gills Creek Basin Travelled South To Arcadia Lakes and Forest Acres
Rainfall in Lower Richland Drained into Low Lying Areas of Hopkins, Gadsden and Eastover
48 Hour Rainfall Surpassed All Prior Records

- Aug. 16-17, 1949: 7.69”
- 1,000 Year Record: 13.80”
- October 3-4, 2015: 21.24”
Impacts of the Flood
Over 200 Dams in Richland County (Green)
20 Dams Failed (Red)
Pre-Flood Aerial Imagery (2013)
Lower Gills Creek Watershed
Post-Flood Aerial Imagery
Lower Gills Creek Watershed
Post-Flood Aerial Imagery
I-77 Near SR-48
Flood Impacts
Summary of Major Flood Impacts / Damages

- 50 Road Closures
- 20 Failed Dams
- 267 Roads Damaged
- 247 Individuals Sheltered
- 304 Wells Tested Positive for Coliform/E. Coli
- Mosquito Count Unprecedented
Richland County Public Works Department
Flood Response Activities
• Developed Operations Center on October 6, 2015
• Center for Public Works Communication
• Road evaluations main objective.
  ▪ Maj/Mod/Minor Damage
  ▪ Debris
  ▪ Utilities broken/exposed
  ▪ Pictures
• Progress report to administration daily
Floods Impacts on Richland County Roads and Bridges

- 3310 County roads evaluated & classified (800 miles)
- 270 roads experienced damage
  - 48 major damage
  - 66 moderate damage
  - 156 minor damage
- 50 roads initially closed
  - 5 still closed due to Bridge or Dam breaks
- Damages were countywide with heaviest impacts in Lower Richland
Floods Impacts on Richland County Roads and Bridges

50 County Roads Closed Due to Flooding
5 County Maintained Roads Still Closed Due to Catastrophic Bridge or Dam Damages
Public Works Department
Road and Bridge Repair Activities

Initial Emergency Road Repairs Performed with Assistance of National Guard

15 Major Damaged Roads Repaired by National Guard
Public Works Crews Handled remaining repairs
Emergency Private Road Repairs

- 200+ requests received for “One Time Emergency Road & Drainage Repairs on Private Property”
- 60 Repairs completed
- Continue to receive 5-10 requests per day
Construction Sites

Conducted Proactive Assessments of all Construction Sites
Long-Term Recovery
PREPAREDNESS
ONGOING

PRE-DISASTER PREPAREDNESS
Examples include:
• Pre-disaster recovery planning
• Mitigation planning and implementation
• Community capacity- and resilience-building
• Conducting disaster preparedness exercises
• Partnership building
• Articulating protocols in disaster plans for services to meet the emotional and health care needs of adults and children

SHORT-TERM RECOVERY
Examples include:
• Mass care/sheltering
  • Provide integrated mass care and emergency services
• Debris
  • Clear primary transportation routes
• Business
  • Establish temporary or interim infrastructure to support business reopenings
• Emotional/psychological
  • Identify adults and children who benefit from counseling or behavioral health services and begin treatment
• Public health and health care
  • Provide emergency and temporary medical care and establish appropriate surveillance protocols
• Mitigation activities

INTERMEDIATE RECOVERY
Examples include:
• Housing
  • Provide accessible interim housing solutions
• Debris/infrastructure
  • Initiate debris removal
  • Plan immediate infrastructure repair and restoration
• Business
  • Support reestablishment of businesses where appropriate
  • Support the establishment of business recovery one-stop centers
• Emotional/psychological
  • Engage support networks for ongoing care
• Public health and health care
  • Ensure continuity of care through temporary facilities
• Mitigation activities
  • Inform community members of opportunities to build back

LONG-TERM RECOVERY
Examples include:
• Housing
  • Develop permanent housing solutions
• Infrastructure
  • Rebuild infrastructure to meet future community needs
• Business
  • Implement economic revitalization strategies
  • Facilitate funding to business rebuilding
• Emotional/psychological
  • Follow-up for ongoing counseling, behavioral health, case management services
• Public health and health care
  • Reestablishment of disrupted health care facilities
• Mitigation activities
  • Implement mitigation strategies

This recovery continuum describes overlapping recovery activities by phase.

Recovery activities by phase:

- **Access and understand risks and vulnerabilities**
- **Long-term**
- **Stronger**
- **Mitigation activities**

RECOVERY CONTINUUM – DESCRIPTION OF ACTIVITIES BY PHASE

Could Last 2 – 3 Years

Expect 4 – 7 Years
HMGP and County Workgroups

- Blue Ribbon Committee
  - Municipal/government stakeholders
  - Non-profits
  - Citizens
  - Watershed groups

- Hazard Mitigation Grant Program Working Group
  - Public Works
  - Planning
  - Building
  - EMD
  - PIO
  - And the list goes on...
## HMGP Project Priorities

<table>
<thead>
<tr>
<th>Priority Ranking</th>
<th>Project Category</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential Property Acquisition/Buyouts</td>
</tr>
<tr>
<td>2</td>
<td>Storm Water Drainage Management</td>
</tr>
<tr>
<td>3</td>
<td>Housing Reconstruction/Rehabilitation</td>
</tr>
<tr>
<td>4</td>
<td>Non-Residential Property Acquisition/Buyouts</td>
</tr>
<tr>
<td>5</td>
<td>Data/Offsite IT Infrastructure</td>
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<tr>
<td>6</td>
<td>Flood Studies</td>
</tr>
<tr>
<td>7</td>
<td>Mitigation of Flood Damage to Fire Suppression Water Capacity &amp; Supply Systems</td>
</tr>
<tr>
<td>8</td>
<td>Conservation Easements</td>
</tr>
<tr>
<td>9</td>
<td>Public Outreach</td>
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<tr>
<td>10</td>
<td>Replacing County Emergency Operations Center (EOC)</td>
</tr>
</tbody>
</table>
## Priority 2: Storm Water Drainage Management

Submitted Pre-applications

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Federal Share</th>
<th>Local Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stabilize the ditch line using and retrofit the regional detention pond (Danton Drive). (SR)</td>
<td>$191,152.50</td>
<td>$63,717.50</td>
</tr>
<tr>
<td>Stabilize the ditch line to reinforce the stream banks and prevent excessive erosion (Devil’s Ditch). (SR)</td>
<td>$312,000.00</td>
<td>$104,000.00</td>
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<tr>
<td>Stabilize the ditch line using regenerative storm water conveyance and remove sediment from the pond (Spring Valley/Little Jackson Creek). (SR)</td>
<td>$1,125,000.00</td>
<td>$375,000.00</td>
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<tr>
<td>Re-establish the existing ditches that the County has easements in Lower Richland.</td>
<td>$750,000.00</td>
<td>$250,000.00</td>
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<tr>
<td>Storm water drainage improvements (Gills Creek &amp; Devil’s Ditch). (SR)</td>
<td>$100,000.00</td>
<td>$33,333.33</td>
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<tr>
<td>Update inventory of storm water assets; inspect pipe and infrastructure and any maintenance issues. (SR)</td>
<td>$1,500,000.00</td>
<td>$500,000.00</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>$3,978,152.50</strong></td>
<td><strong>$1,326,050.83</strong></td>
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</tbody>
</table>
Community Development Block Grant Disaster Recovery

- $23,000,000 allocation to Richland County
  - Housing
  - Infrastructure
  - Economic Development
- Federal Register effective date: June 22
- Public Stakeholder Outreach meetings
- Identify and prioritize programs and projects
  - Unmet needs
- Publish Action Plan for public comment
- Submit Action Plan to HUD
Public Outreach Process

- 12 Public outreach meetings over two weeks
- CDBG-DR Program overview
- Open forum to get feedback from citizens
- Many people still reporting flood recovery needs
- Assistance requests for
  - Rehabilitation
  - Buyouts
  - Rental
  - Infrastructure
  - Other household needs
County Unmet Needs

- Estimated $251,608,891.87
- Housing Rehabilitation
  - HMGP buyout match
  - Repairing homes in and out of SFHA
  - Rental structure repair
- Infrastructure
  - Projects to mitigate future flood damages
- Economic Development
  - Small business forgivable loans
  - $10,830,995 gap
Lessons Learned
Post Disaster Opportunities

- Emergency Personnel (special cases)
- Emergency Management Training
- Communication Strategy (between departments)
- Communication Strategy (public)
- Better use of Software and Information (pre and post flood)
- Data Collection (pre and post flood)
- Focus on Asset Management
Questions?