RESILIENT ST. VRAIN PROJECT

Planning, Design and Construction to Reduce Future Flood Risk

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Senior Civil Engineer
City of Longmont, Colorado
September 2013 Flood

- Impacted all of northeastern Colorado along the South Platte River Basin
- +9 inches of rain in 24 hours
- +17 inches of rain in 10 days
- Annual Exceedance Probability = $1/1000$ (0.1%)
- ~14 inches = Average Annual Rainfall
St. Vrain Creek Watershed

LONGMONT, COLORADO

RESILIENT ST. VRAIN PROJECT
By the Numbers

Federal Disaster 4145

- 18 counties
- 120 miles of State Highways damaged
- 76,000 homes and 750 businesses damaged
- $4 Billion in total damages
- 10 confirmed fatalities

Longmont

- $100 Million in flood related damages
- $55 Million in FEMA Public Assistance
- City WWTP shut down for 3 days
- City water system never shut down
- 0 reported casualties
Resilient St. Vrain Project

• Hygiene Road Cut
• Sediment and Debris Removal
• Rebuild Channel Banks
• Heron Lake Relief Channel
**Resilient St. Vrain Project**

**Master Plan**
- 8 river miles of St Vrain Creek
- 10 years to complete

**Project Goals**
- Protect people, property and infrastructure
- Reduce future flood risk and safely convey 100-year flood flows
  - Remove 818 acres and 526 structures from the floodplain
- Restore St. Vrain Greenway trail
- Maintain or improve natural environment
  - Incorporate natural channel design
- Recognize previous planning efforts
RSVP Master Plan

LONGMONT, COLORADO

RESILIENT ST. VRAIN PROJECT
Natural Channel Design
### Hydrologic Evaluation

#### 100-year Peak Discharge (cfs)

<table>
<thead>
<tr>
<th>St. Vrain Creek</th>
<th>Existing Regulatory Discharge</th>
<th>Current Revised Discharge</th>
<th>Estimated Peak Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hwy 36 (Lyons, CO)</td>
<td>8,880</td>
<td>12,100</td>
<td>23,000</td>
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<tr>
<td>Airport Road</td>
<td>9,580</td>
<td>13,200</td>
<td>14,000</td>
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<tr>
<td>Hwy 287 (Main St.)</td>
<td>10,580</td>
<td>15,200</td>
<td>14,500</td>
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<tr>
<td>below Left Hand Creek</td>
<td>14,850</td>
<td>17,400</td>
<td>18,500</td>
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<tr>
<td>above Boulder Creek</td>
<td>16,440</td>
<td>17,500</td>
<td></td>
</tr>
<tr>
<td>South Platte River</td>
<td>16,520</td>
<td>23,400</td>
<td>23,500</td>
</tr>
</tbody>
</table>

±30% - 40% increase in 100-year storm

2013 Flood 100-year to 500-year event
Permitting

- NEPA EA– FONSI
  - Section 7 Biological Assessment
  - Section 106 Cultural Resources
  - Section 401 Certification
- Avian Protection Plan (CPW)
- Colorado SB 40 Certification (CPW)
- USACE 404 Permits
- Floodplain Permitting
## Project Costs

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Design &amp; Permitting</td>
<td>$15.0M</td>
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<tr>
<td>Sandstone Ranch Reach</td>
<td>$8.5M</td>
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<tr>
<td>City Reach 1</td>
<td>$12.5M</td>
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<tr>
<td>City Reach 2A</td>
<td>$7.5M</td>
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<tr>
<td>City Reach 2B</td>
<td>$8.0M</td>
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<tr>
<td>BNSF RR Bridge</td>
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<td>Izaak Walton Reach</td>
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<td>City Reach 3</td>
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<td>RSVP TOTAL</td>
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<td>Sunset Street Bridge</td>
<td>$3.4M</td>
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<td>Main Street Bridge</td>
<td>$6.0M</td>
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<tr>
<td>South Pratt Parkway Bridge</td>
<td>$6.5M</td>
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</tbody>
</table>
Funding Partners

- FEMA
- City of Longmont, Colorado
- Colorado Division of Homeland Security & Emergency Management
- Department of Public Safety
- Colorado Department of Local Affairs
- U.S. Department of Transportation
- Federal Highway Administration
- US Army Corps of Engineers
BNSF Railroad Bridge
Lessons Learned

• Collaboration
  • Public Meetings
  • Funding Partners
  • Creek Coalitions and Ditch Companies

• Permitting
  • Federal Nexus between funding partners (e.g. FEMA/USACE/HUD/FHWA)

• Look Beyond
  • Know your watershed and upstream risks
  • Neighboring Jurisdictions
Design Team

JACOBS
CH2M
CONFLUENT DESIGN
HINES INC
MIG
Recreation Engineering & Planning
DEERE & AULT
CONSULTANTS, INC.
Water Resources, Civil & Geotechnical Engineering
SAM
WILSON & COMPANY
ERO

ERO Resources Corp.
QUESTIONS?

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