City of Rockford
Keith Creek Greenway
Flood Mitigation Project

March 10, 2010
Introduction – Problem Overview

- 1890’s Building of homes along Keith Creek
- 1920’s Home construction nears completion
- 1926 Flood devastates new homes
- 1938 Flood again causes damage to homes
- 1939 WPA program assist with channel project
- 1941 Flood Control Dam built on North Branch
- 1941 Flood Control Dam not built on South Branch
- 1952 Flood of Record causes damages to homes
- 2006 & 2007 Floods continue to harm homes
Introduction – City Buyout Program

• 2008 Acquisition of flood damaged homes begins
• Goal established to remove the highest damaged and most at risk homes (approx 128 homes)
• Homeowners offered pre-flood fair market value
• Acquisition program follows the Uniform Relocation Act guidelines and uses certified appraisal firms
Introduction – Solution Options

- Recognize there is not one measure will solve this long-term flooding problem
- Home buy-out first phase toward a long term solution
- Channel work needed to help flooding, water quality, and sustainable neighborhood design
- Construct a small flood control dam on the south branch of the creek
- Community buy-in to the vision of the approach
Rockford - Background

- 65 square mile area
- 80,000 parkway trees
- 14 watersheds
- 365 detention basins
- 3 dams: Alpine, Page Park, Levings Lake
- 123 bridges

- 821 miles of water main
- 75 miles of alley
- 1,500 miles of road
- 500 miles of storm sewer
- 140 miles of streams
Keith Creek – Background Cont...

Keith Creek - In the 1930’s....
Keith Creek – Background Cont...

Keith Creek - Now....
• Watershed Characteristics:
  • Approximately 18 miles of Channel
  • Main channel is regulated by Alpine Dam
Keith Creek – H&H Model Development

- FEMA Effective Hydraulic Model
  - HEC-2 Hydraulic Model
  - Developed in the late 1970's
Keith Creek – H&H Model Development

• USACE and City of Rockford Coordination

• **Performed Detailed Survey**
  - 55 Bridge and Culverts
  - Over 240 Cross-Sections

• **Developed HEC-HMS model**

• **Created Steady-State HEC- RAS Model**
  - Modeled 8 miles of Channel
Keith Creek – H&H Model Development

• Conversion from Steady State to Unsteady
  – Increase level of detail in hydrologic model
  – Combine Main Channel with South Branch
  – Added more cross sections in project area
  – Included Alpine Dam in hydraulic model

• Allowed investigation of…
  – Effects of projects on overbank storage
  – Timing of flows from South Branch
### Keith Creek – H&H Model Development

- **Modeling Results – 100 Year Flowrates**

<table>
<thead>
<tr>
<th>Location</th>
<th>FIS Flows (cfs)</th>
<th>MWH Flows (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Alpine Dam</td>
<td>900</td>
<td>1,447</td>
</tr>
<tr>
<td>Rock River Confluence</td>
<td>1,144</td>
<td>2,746</td>
</tr>
</tbody>
</table>
### Keith Creek – H&H Model Development

- **Modeling Results – Flood Elevations**

<table>
<thead>
<tr>
<th>Location</th>
<th>FIS WSEL (ft)</th>
<th>MWH WSEL (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Branch Confluence</td>
<td>745.0</td>
<td>745.9</td>
</tr>
<tr>
<td>Churchill Park</td>
<td>730.9</td>
<td>731.7</td>
</tr>
<tr>
<td>8th Street</td>
<td>726.0</td>
<td>725.9</td>
</tr>
<tr>
<td>Rock River Confluence</td>
<td>703.2</td>
<td>703.4</td>
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</table>
• Charles Street Overflow
  – 800 feet of Diversion Channel
  – 1,000 feet of Stream Channel Widening and Restoration
    • Extending from 18th to Charles Street
  – Flood Level Reduction = 3 feet
Keith Creek – Proposed Flood Control Solutions

• Churchill Park Restoration Plan
  • *Restoration and Stabilization of Eroding Banks*
    - Removal of existing concrete-line channel
    - Lowering and re-meandering of channel
    - Establishment of native vegetation
Keith Creek – Proposed Flood Control Solutions

• Churchill Park Restoration Plan Cont…
  • *Increase Conveyance*
    - Modifications to several restrictive bridge crossings
  • *Increase Flood Storage*
    - Excavation in Overbank Areas

• Maximum Flood Reduction = 3 Feet
Keith Creek – Proposed Flood Control Solutions

- South Branch Flood Control Project
  - Eliminate Street Flooding
  - Earthen Embankment Dam

<table>
<thead>
<tr>
<th>Dam Height</th>
<th>WSEL Drop Miracle Mile Culvert (ft)</th>
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<tr>
<td>20-foot</td>
<td>1.0</td>
</tr>
<tr>
<td>30-foot</td>
<td>4.0</td>
</tr>
<tr>
<td>40-foot</td>
<td>8.0</td>
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</table>
Funding - Opportunities

• Traditional Disaster Grant Programs
• Non-Traditional Federal/State Programs
• Sales Tax for Infrastructure
• Public-Private Partnerships
• Long-Term Bonding
• New Utility Tax
Funding – Road Blocks

- Traditional Grant funding timeline challenges
- Community Buy-in challenges
- Size of Project Needs ($30 Mil)
- Federal Interest Process
- State of Illinois funding challenges
Funding – Lessons Learned

• Recognize that everyone's priorities change very quickly
• Don’t be bashful about developing your project, but recognize that you need to build flexibility into the financial strategy very soon
• NIMBY can be an obstacle and a benefit
• Projects that change a Neighborhood dynamic are political, financial, and culturally challenging. In our case the challenge dates back to the 1930’s
Where are we now?

- 112 homes have been acquired and are awaiting funding for their deconstruction
- Buy-in by our citizens help to make this project sustainable throughout all phases
- Development of a multi-phase approach to mitigate future flood loss
- Continue to meet with stakeholders to complete the different phases of this project
Moving Forward

- Remove physical and non-physical obstructions to this project
- Create a safe walkable neighborhood
- Establish an environmentally enhanced riparian stream corridor near the confluence with our river
- Improve connectivity with existing neighborhood destinations through pathway and roadway improvements
- Promote the efforts of this project throughout the state and region