POLK COUNTY

HAMILTON DRAIN FLOOD CONTROL IMPROVEMENT PROJECT
Background

- Frequent Flooding
  - Low lying
  - Flat grades
  - Drainage from early 1900’s
  - Urbanized
  - System undersized
Background

• 1975 Engineering Study
  – Large storm sewer system
  – In excess of $16 million (1975)
  – Too expensive
Background

• Studies – 1980’s
  – Focus on regional detention
    • Culverts
    • Storm sewers
    • Channel improvements
  – Lower cost
Summary of Costs

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<tr>
<th>Priority</th>
<th>Immediate Needs</th>
<th>Lower &amp; East Area</th>
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<td>Priority 1</td>
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<td>Priority 5</td>
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Immediate Needs Subtotal $5,069,000
Future Needs $1,672,000
Total Needs Subtotal $6,741,000
Combined Total $5,872,000

Total Cost: $14,400,000
Background

• How to Finance?
• Storm Water Assessment
  – Implemented 1988
  – Polk County & City of Des Moines
    • Improvements
    • Maintenance
    • Numerous projects completed
Background

• Storm Water Assessment
  – Generates ~$140,000 per year
  – Last major improvement 1996
  – Fund balance: $1.4 million (2009)
  – $10+ million remaining
  – Need additional funding
Recommended Improvements, Probable Costs, and Funding for:

Hamilton Drain Watershed
**Background**

Increasing development and urbanization in northeastern Des Moines and central Polk County have resulted in flooding problems within the Hamilton Drain watershed. In order to address these problems, a long-range comprehensive plan for drainage improvements within the watershed was developed. A special watershed assessment fund was created to finance improvements in the 25 years since the development of the comprehensive plan, a number of projects have been constructed utilizing the Hamilton Drain Assessment fund. These drainage improvements have had a positive impact on controlling or reducing flooding within the watershed.

Several projects, identified in the comprehensive plan, are currently being proposed. These projects would provide increased flood protection within and downstream of the Hamilton Drain watershed.

**Proposed Improvements**

NE 3rd St. Detention Basin: A detention basin is proposed between NW 2nd Ave. and NE 3rd St., just north of N.E. 50th Ave. This 14.5 acre basin will be constructed with a combination of excavation and berming. An outlet control structure will be constructed on an existing pipe to carry flows under I-80. Construction of this basin also requires relocation of the upstream channel to the north along with storm sewer and open channel improvements to the east to divert flows to the basin.

NE 7th St. Detention Basin: This project consists of constructing a 4.4 acre stormwater detention basin by berming. The basin, near Saydel High School, will utilize the existing topography, which is very steep, to develop a storage volume.

NE 54th St. Detention Basin: A 5 acre detention basin is proposed between the Union Pacific Railroad lines north of NE 54th Ave. and east of NE 17th St. The required storage volume will be developed by berming within the existing low-lying area, avoiding significant excavation.

East Basins: Two regional stormwater detention basins are planned in the vicinity of the Delaware Ave. and NE Broadway Ave. intersection. Combined, these basins will provide approximately 11 acres of detention and work in reducing the peak discharge in this industrial area of the county. In addition to the detention basins, a number of outlet structures and railroad culverts will also be required.

Miscellaneous storm sewer and channel improvements are proposed throughout the Hamilton Drain Basin. These improvements will provide additional drainage for low-lying and poorly drained areas, reduce flooding in developed areas, and provide additional capacity to reduce roadway overtopping. The proposed storm and channel improvements are needed to protect land that is currently undeveloped or to control runoff flows from future development so it does not adversely affect existing development.

**Maintenance**

A number of areas within the watershed are in need of maintenance. Some of the maintenance items that need to be addressed include the removal of silt and debris from channels and culvert inlets, repairing erosion and stabilizing channel banks, and repairing and stabilizing scour at outlets. It is important that debris is removed and channels are stabilized in order to maintain the stormwater carrying capacity of the drainage system.

**Estimated Costs**

The following indicate an opinion of probable construction costs for drainage improvements identified within the Hamilton Drain Basin.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
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<tr>
<td>NE 3rd Detention Basin</td>
<td>$2,794,000</td>
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<td>NE 7th Detention Basin</td>
<td>$610,000</td>
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<td>NE 54th Detention Basin &amp; Associated Storm Improvements</td>
<td>$1,016,000</td>
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<td>East Basins</td>
<td>$1,980,000</td>
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<tr>
<td>Miscellaneous Storm Sewer and Channel Improvements</td>
<td>$3,550,000</td>
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<tr>
<td>Drainage Basin Maintenance</td>
<td>$200,000</td>
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<td><strong>Total</strong></td>
<td><strong>$10,150,000</strong></td>
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Funding

A special watershed assessment fund has been set up to collect tax revenue from properties within the Hamilton Drain basin. These funds are designated for construction of flood relief and drainage improvements within the Hamilton Drain Basin. The fund receives approximately $175,000 of tax revenue annually. A portion of this money is used for routine repair and maintenance. It is estimated that at the end of fiscal year 2008/2009 this fund will contain approximately $1.4 million. The improvements identified in the cost estimate above, exceed the financing currently available through the Hamilton Drain Assessment Fund; however assistance from other funding sources may be available.

FEMA's Hazard Mitigation Grant Program (HMGP) was established to fund drainage and flood control projects in developed areas where existing drainage facilities are inadequate. The purpose of this program is to reduce the risk of future property damage and injury or loss of life. HMGP provides funding for projects that increase carrying capacity such as larger culverts or storm sewers and projects that provide increased holding capacity such as detention basins. All of the improvements proposed within the Hamilton Drain Basin fall into these categories.

The HMGP program provides funding for 75% of project costs (including engineering and administrative costs). The State of Iowa will also provide 10% matching funds. The remaining 15% of the project can be covered by the Hamilton Drain Assessment Fund. A breakdown of the proposed funding is shown in the table below.

<table>
<thead>
<tr>
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<th>Total Project Cost</th>
<th>HMGP 15%</th>
<th>State 10%</th>
<th>County 15%</th>
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<td>Admin Engineering, ROW Acquisition, Legal, Environmental, Geotechnical</td>
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<td><strong>$11,050,000</strong></td>
<td><strong>$1,650,000</strong></td>
<td><strong>$1,085,000</strong></td>
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While Polk County's portion of the project costs exceed the current balance of the Hamilton Drain Fund by approximately $400,000, the proposed projects could be completed in stages over the next 4 or 5 years. The additional receipts received into the fund during this period will cover the remainder of the County's portion of the project costs.
FEMA HMGP

• Hazard Mitigation Grant Program
  – 2008 Iowa floods
  – Presidential disaster declaration
  – 2009 - $250 million for Iowa
FEMA HMGP

• Purpose
  – Mitigate loss of life and property from future disasters.

• Types of Projects
  – Safe rooms for schools & communities
  – Buy-outs for frequently flooded properties
  – Structure elevation
  – Flood mitigation
FEMA HMGP

• Eligibility
  – Local Hazard Mitigation Plan (funding available)
  – Mitigate a known hazard
  – \textbf{Cost effective}

• Project Costs
  – Federal: 75%
  – State: 10%
  – Local: 15%
Hamilton HMGP Application

- Notice of Intent – May 2009
- Needs were well documented
- Improvements identified in County’s hazard mitigation plan
- Matching funds available
- Cost Effective
  - Benefit / Cost Ratio?
Benefit Cost Analysis

- Residential / Business Losses
  - Records are difficult to obtain
    - Lost or not kept
    - Damaged in another flood
    - New owners
    - Not always cooperative
    - Time consuming to pursue
Benefit Cost Analysis

- Loss of service
  - Water
  - Sewer
  - Power
- No records
- Record of Septic Backups
  - Septic not allowed
Benefit Cost Analysis

• Roadway Flooding
• Costs to the County
  – Flood damage to County infrastructure
    • Road damage
    • Shoulders
    • Debris
    • Cleanup
    • Overtime
  – County had record of costs
  – Costs were minimal compared to project
Benefit Cost Analysis

- Roadway Flooding
- Costs to the Public
  - FEMA considers cost of detour
    - Mileage
    - Time
Benefit Cost Analysis

• Roadway Flooding
  – Polk County had excellent records
  – Numerous roads impacted
  – Frequent closures
  – Some higher volume roads affected
Benefit Cost Analysis

- Roadway Flooding
  - Detour length
  - Detour time
  - Current traffic volumes
  - Calculate past cost to public
Benefit Cost Analysis

• Projected Future Cost
  – Frequency of closure
  – Obtained hourly rainfall data
  – Determined recurrence interval
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<th>Year</th>
<th>Roadway Closed</th>
<th>From</th>
<th>To</th>
<th>Date Closed</th>
<th>Duration (days)</th>
<th>Storm R.I. (Yrs.)</th>
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<th>Detour (Miles)</th>
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Benefit Cost Analysis

• B / C Calculation
  – Challenges with BCA software
  – Assistance from Homeland
  – Cost: $12,500,000
  – Benefits: $16,000,000
  – Finally…Success!!!

  – 6 months for application
FEMA Approval

- FEMA Concerns
  - Environmental
  - Effectiveness of Improvements
  - Review Studies

- Project separated into two phases
Phase 1

- Preliminary design
- Phase 1 Environmental
- Cultural resources
- No wetland delineation
- No survey
Phase 1

• Environmental & Cultural Resources
  – No significant issues
    • Bats
    • Wetlands...
Phase 1

- Preliminary Design
  - Relied on original studies
  - Confirmed basin sizes
  - Accounted for development
  - 6 basins & misc improvements
  - Estimated cost: $13.5 million
  - Submitted report Sept. 2011 (2 ½ yr. from NOI)
Phase 1

- FEMA
  - 1980’s studies outdated
  - Throw them out
  - Model existing conditions to confirm road flooding
  - Confirm recommendations of studies
Phase 1

- Developed Hydraulic Model
  - XPSWMM-2D
  - Modeled each street flooding location
Phase 1

• Hydraulic Modeling Results
  – Verified street flooding
  – Corresponded to County records
  – Eliminated 2 ineffective basins
  – Reduced cost to $10 million
Phase 1

- Submitted Revised Phase 1
  - April 2012 (3 years)
- Various RFI’s
- EA review & comment period
- FEMA: Wetland concerns
- Wait…
Harkin Announces More than $7 Million for Flood Protection in Polk County

WASHINGTON, D.C. – Senator Tom Harkin (D-IA) today announced that Polk County has been awarded a federal grant of $7,044,750 from the FEMA Hazard Mitigation Grant Program (HMGP). The funding will be used to build structures to reduce flooding in the area.

Harkin was the chief sponsor of legislation that greatly expanded FEMA’s Hazard Mitigation Grant Program following the floods of 1993. The program provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. “This funding will be used to build new basins and improve water flow in an area where many homes and businesses have seen repeated flood-related losses and damages,” said Harkin. “Not only is this good news for residents in the community, but it will help relieve the economic burdens that come with repairing flooded buildings.”

Funding from this grant will be used to build four regional basins and make improvements to the storm sewer system in the Hamilton Drain Watershed in Northeast Des Moines and nearby areas outside of the city. Upon completion, the project will reduce flooding within the area and help avoid damages and economic losses due to frequent flooding in the area.
Phase 2

• Approved: March 2013 (4 years)
  – Final Design
  – Property Acquisition
  – Wetlands
  – Build it
  – 36 months
Phase 2

- Final Design
  - Straightforward
  - 4 Regional Detention Basins
  - Storm improvements
Phase 2

- Property Acquisition
  - 30 parcels impacted
  - $2.5 million+
  - Eminent Domain for 2 properties
Phase 2

• Wetlands
  – Minor impacts on 3 basins
  – Basin 1: 7.9 acres
Phase 2

• Wetlands
  – Basins 2A, 2B, & 3
    • Corps: Jurisdictional
    • Mitigate
  – Basin 1
    • Uncertainty
  – Let project...still no decision
Phase 2

- Wetlands – Basin 1
  - Wetland Credits
  - Limited Availability
  - Going Fast
  - Polk County purchased 15.4 credits from Voas Wetland Bank
  - 2 weeks later…Corps: Non-jurisdictional 😊
Phase 2

• Basin 1
  – Flat grades
  – Couldn’t get area to drain
  – Wet basin
  – Design Details:
    • Drainage Area: 340 ac.
    • Basin Area: 10 acres
    • Forebay: 3 ac-ft
    • Dry Storage: 40 ac-ft
    • Wet Pond Surface Area: 4.8 ac.
    • Wet Pond Depth: 9 feet
Phase 2

- Basin 2A
  - In front of Saydel High School
  - Limitations
    - Cross Country Course
    - Upstream structure
  - Design Details:
    - Drainage Area: 234 ac.
    - Basin Area: 4.7 acres
    - Dry Storage: 8.2 ac-ft
Phase 2

• Basin 2B
  – Next to Saydel High School
  – Design Details:
    • Drainage Area: 170 ac.
    • Basin Area: 2.4 acres
    • Dry Storage: 15.3 ac-ft
    • Water Quality Enhancements
Phase 2

- Basin 3
  - South of Interstate 80
  - In City of Des Moines
  - Required Condemnation
  - Design Details:
    - Drainage Area: 690 acres
    - Basin Area: 10.5 acres
    - Dry Storage: 49.9 ac-ft...
    - Water Quality Enhancements
• Project Closeout – January 2016
• ~7 years from NOI
• Final cost $8.5 million
QUESTIONS?

Steve Klocke, P.E.
Civil Engineer
sklocke@snyder-associates.com