South St. Paul Levee Extension

February, 2014
Outline for today

• Project Purpose and Phasing

• Results of Phase 1 Study
  - Fatal flaw analysis of concept
  - ID possible alignments
  - Benefits/Costs

• Next Steps
PROJECT PURPOSE & PHASING
Project Purpose

• Evaluate the feasibility and impacts of extending the City’s flood control system

• Work funded under a $500,000 grant from MN State Legislature with 50/50 cost share to the City
Project Phasing

- Project split into 3 phases

  - Phase 1: Does a likely project exist
  - Phase 2: Define project alignments
  - Phase 3: Preliminary plans for permits

- Go/no-go decision by the City at the end of each phase
Phase 1 Study Objectives

- Evaluation of concept feasibility
  - Does a project likely exist
- Phase “1.5”
  - ID potential alignments
  - Benefit/Cost Ratios
RESULTS OF PHASE 1
Fatal Flaw Analysis of Concept

• Assessment of feasibility:
  - Environmental site conditions (potential contamination, threatened species, etc.)
  - Utility impacts
  - Regulatory issues and permitability
  - Stormwater and floodplain issues
  - Potential geotechnical issues
Fatal Flaw Analysis of Concept

• Assessment of feasibility:
  - Environmental site conditions (potential contamination, threatened species, etc.)
  - Utility impacts
  - Regulatory issues and permitability
  - Stormwater and floodplain issues
  - Potential geotechnical issues

NO FATAL FLAWS
Environmental Hazards

- Present but manageable
- Alignments avoid issues
Utilities

- Alignments avoid most utilities
- Major impacts to 120” storm sewer
Utilities

- Alignments avoid most utilities
- Major impacts to 120” storm sewer
Bluff and Local Drainage

- 120” storm sewer handles a significant amount of bluff drainage
FEMA Floodplain

• 708’ provides 100-year protection (FEMA certifiable)
• Existing levee built to 710’
FEMA Floodplain

- 710’ must tie-in to USACE levee
  - Major modification
- 708’ may or may not tie-in to USACE levee
  - Major or Minor mod.
Existing Closures

- Hardman Avenue
- Gatewell R
- Railroad Crossing
408 Permit

- **W/permit**
  - 100% PL 8499 funding for repairs
  - Elimination of existing closures
  - Abandon east/west portion of existing levee (for other uses)
  - Annual inspection required

- **W/out permit**
  - Faster implementation
  - Less inspection burden
Geotechnical

- No fatal flaws
- Existing data not on alignments
Geotechnical

- New data needed for design
- Area around wetland/pond most critical
Proposed Alignments

• Six alignments initially identified
• Alignments selected to cover range of protection (i.e., bookends)
• Alignments exclude Gun Club property
• Initial evaluation is qualitative
Proposed Alignments

1. Maximum protection
2. Follow the floodway
3. Connect high ground
   A. Without pond
   B. With pond
4. Exclude Riverfront
5. Minimize pump station
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## Alignment Selection

<table>
<thead>
<tr>
<th>Alignment ID</th>
<th>Description</th>
<th>Levee Length</th>
<th>Quantity of Fill</th>
<th>Likely Closures</th>
<th>FEMA Permitability</th>
<th>Overall Permitability</th>
<th>Potential Geotechnical Concerns</th>
<th>Utility Challenges</th>
<th>Transportation Challenges</th>
<th>Protected Property</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Protect maximum developable area</td>
<td>6</td>
<td>6</td>
<td>1 (tie)</td>
<td>6</td>
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<td>6 (tie)</td>
<td>1 (tie)</td>
<td>1 (tie)</td>
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<tr>
<td>2</td>
<td>Follow the floodway line</td>
<td>5</td>
<td>4 (tie)</td>
<td>1 (tie)</td>
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<tr>
<td>3A</td>
<td>Connect the high ground</td>
<td>2</td>
<td>2 (tie)</td>
<td>3 (tie)</td>
<td>2 (tie)</td>
<td>3 (tie)</td>
<td>3 (tie)</td>
<td>3 (tie)</td>
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</tr>
<tr>
<td>3B</td>
<td>Connect the high ground (with pond)</td>
<td>3</td>
<td>4 (tie)</td>
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</tr>
<tr>
<td>4</td>
<td>Exclude riverfront properties</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>1 (tie)</td>
<td>1 (tie)</td>
<td>6</td>
<td>6 (tie)</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>Minimize pump station</td>
<td>4</td>
<td>3</td>
<td>5</td>
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**Notes:**
- A rank of 1 is the preferred option; a rank of 6 is the least preferred.
- Transportation challenges were initially identified in the *South Concord Redevelopment Transportation Plan*. A major issue is bridging the Union Pacific main track which would be required of all the alignments in order to provide predictable, safe, and controlled access to the Danner or Dakota Bulk Terminal sites.
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</tr>
<tr>
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<td>Connect the high ground</td>
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Cost Estimation

• Preliminary cost estimate includes:
  - Geotechnical investigation
  - Engineering and design
  - Permitting and certification
  - Land acquisition
  - Construction
  - Maintenance
  - 20% contingency
Cost Estimation

- Costs quantified for 4 feasible alignments
- With/without transportation improvements

<table>
<thead>
<tr>
<th></th>
<th>Alignment 3A</th>
<th>Alignment 3B</th>
<th>Alignment 4</th>
<th>Alignment 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>w/o frontage road</td>
<td>$ 33.3</td>
<td>$ 9.6</td>
<td>$ 27.5</td>
<td>$ 7.6</td>
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<td>w/ frontage road</td>
<td>$ 36.3</td>
<td>$ 12.6</td>
<td>$ 30.5</td>
<td>$ 10.6</td>
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</tbody>
</table>

* cost in millions
Benefits

• Flood damage reduction to existing property
  – USACE method to determine federal funding eligibility

• Increased property value
  – Existing/Future land use
  – w/ & w/o transportation improvements (South Concord Redev. Trans. Plan)
  – Reduced flood insurance costs (BW Act)
Benefits

• Flood damage reduction to existing property
  - USACE method to determine federal funding eligibility

• Increased property value
  - Existing/Future land use
  - w/ & w/o transportation improvements ('South Concord Redev. Trans. Plan')
  - Reduced flood insurance costs (BW Act)
Benefits and Land Use

- Benefits based on increased land value over existing conditions
- Considered 4 future scenarios:
  - w/ & w/o transportation improvements
  - Two land use scenarios for each
- Land use values based on *South Concord Redevelopment Transportation Plan*
Land Use Scenarios

Figure 17

Baseline and future land use scenarios
City of South St. Paul, MN
### Benefits (increase over baseline)

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Alignment 3A</th>
<th>Alignment 3B</th>
<th>Alignment 4</th>
<th>Alignment 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>$</td>
<td>-</td>
<td>$</td>
<td>-</td>
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<tr>
<td>Low Value 1</td>
<td>$ 9.4</td>
<td>$ 9.9</td>
<td>$ 2.6</td>
<td>$ 4.5</td>
</tr>
<tr>
<td>Low Value 2</td>
<td>$ 15.9</td>
<td>$ 16.4</td>
<td>$ 9.1</td>
<td>$ 11.1</td>
</tr>
<tr>
<td>High Value 1</td>
<td>$ 33.7</td>
<td>$ 34.6</td>
<td>$ 16.6</td>
<td>$ 21.4</td>
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<tr>
<td>High Value 2</td>
<td>$ 54.3</td>
<td>$ 55.4</td>
<td>$ 31.5</td>
<td>$ 37.8</td>
</tr>
</tbody>
</table>

- values in millions
- Low Value – w/o transportation improvements
- High Value – w/ transportation improvements

- Zoning changes may be necessary to achieve land use assumed in high value scenarios
### Benefit/ Cost Ratios

<table>
<thead>
<tr>
<th>B/C Ratios</th>
<th>Alignment 3A</th>
<th>Alignment 3B</th>
<th>Alignment 4</th>
<th>Alignment 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Value 1</td>
<td>0.3</td>
<td>1.0</td>
<td>0.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Low Value 2</td>
<td>0.5</td>
<td>1.7</td>
<td>0.3</td>
<td>1.4</td>
</tr>
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<td>0.9</td>
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<td>1.0</td>
<td>3.6</td>
</tr>
</tbody>
</table>

- Zoning changes may be necessary to achieve land use assumed in high value scenarios.
Summary of Findings - Phase 1

• No fatal flaws identified
• Multiple alignments with B/C > 1
• B/C ≥ 1 for alignment 3B under all land use scenarios
• Greatest B/C estimated w/ transportation improvements
NEXT STEPS
Phase 2 Analysis

• ID feasible & preferred alignments
• Estimate alignment benefits and costs
• ID specific impacts to properties and City utilities
Phase 2 Analysis

• ID feasible & preferred alignments
• Estimate alignment benefits and costs
• ID specific impacts to properties and City utilities
Phase 2 Analysis - Tasks

• H & H modeling to refine drainage impacts and pumping needs
• Refine estimates of benefits and costs
• Contact property owners and other stakeholders
• Collection of site-specific data (e.g., soil borings) to clarify impacts to properties and utilities
Questions?