The background of the slide is a close-up, slightly blurred image of the American flag, showing the stars and stripes. In the lower right quadrant, there is a faint, golden silhouette of a castle or fortress with multiple towers.

*PRESENTATION  
TO THE*

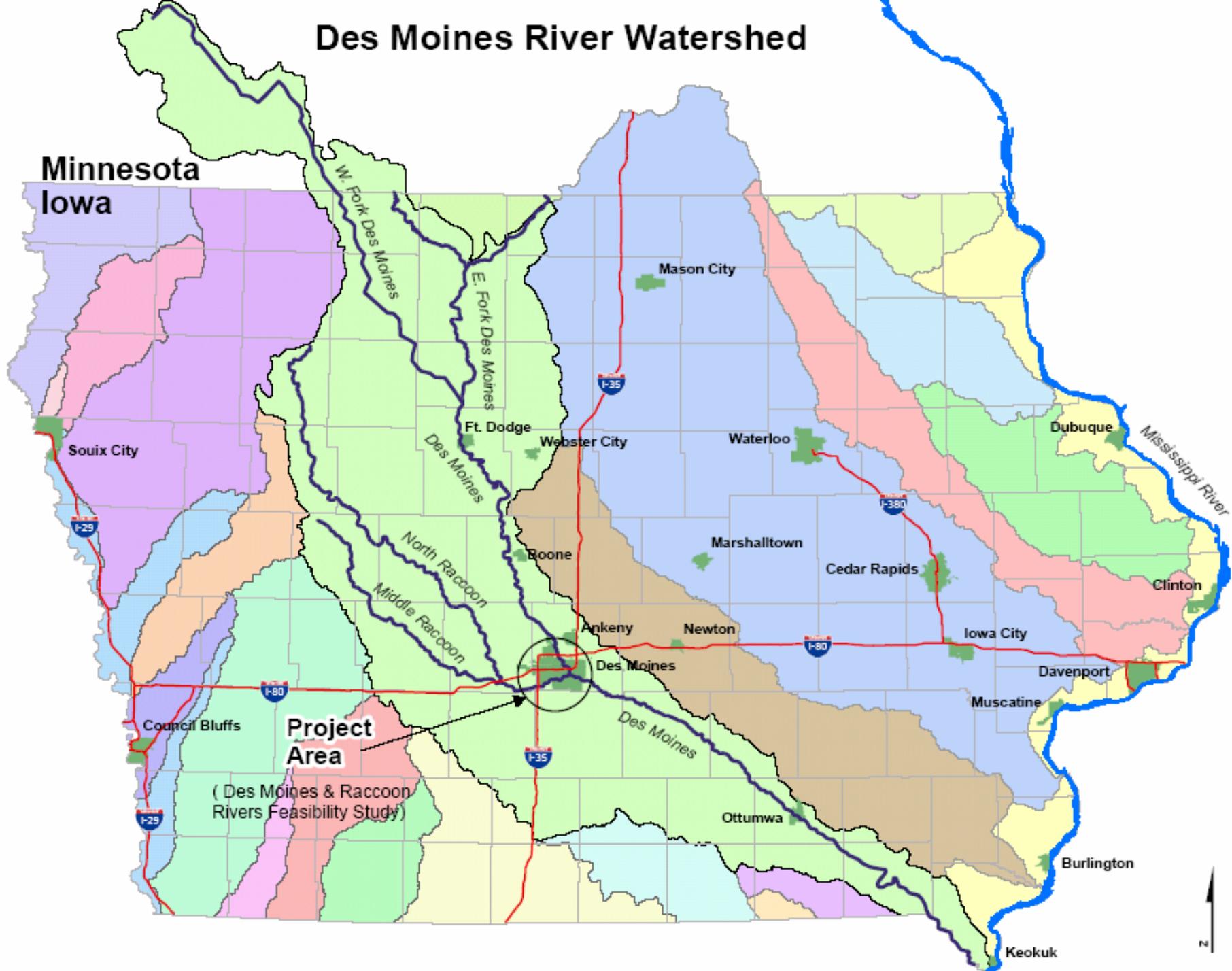
*CIVIL WORKS REVIEW BOARD*

*DES MOINES & RACCOON RIVERS  
FLOOD DAMAGE REDUCTION  
FEASIBILITY STUDY*

*MAJOR (P) MELODY SMITH, ACTING COMMANDER  
ARMY CORPS OF ENGINEERS ROCK ISLAND DISTRICT*

*OCTOBER 18, 2005*

# Des Moines River Watershed



Minnesota  
Iowa

Souix City

Mason City

Ft. Dodge

Webster City

Waterloo

Dubuque

North Raccoon

Boone

Marshalltown

Cedar Rapids

Clinton

Middle Raccoon

Ankeny

Newton

Des Moines

Iowa City

Davenport

Council Bluffs

**Project Area**  
(Des Moines & Raccoon  
Rivers Feasibility Study)

Des Moines

Muscatine

Ottumwa

Burlington

Keokuk

N

Saylorville Reservoir



Birdland Area

Central Place Area

Des moines iowa

Downtown Area

Des Moines River

Raccoon River



Image © 2005 EarthSat  
© 2005 TeleAtlas  
Image © 2005 DigitalGlobe

© 2005 Google



US Army Corps  
of Engineers®

# 1993 Flooding

## Des Moines, Iowa



**Downtown East, West & South**

*One Team: Relevant, Ready, Responsive and Reliable*

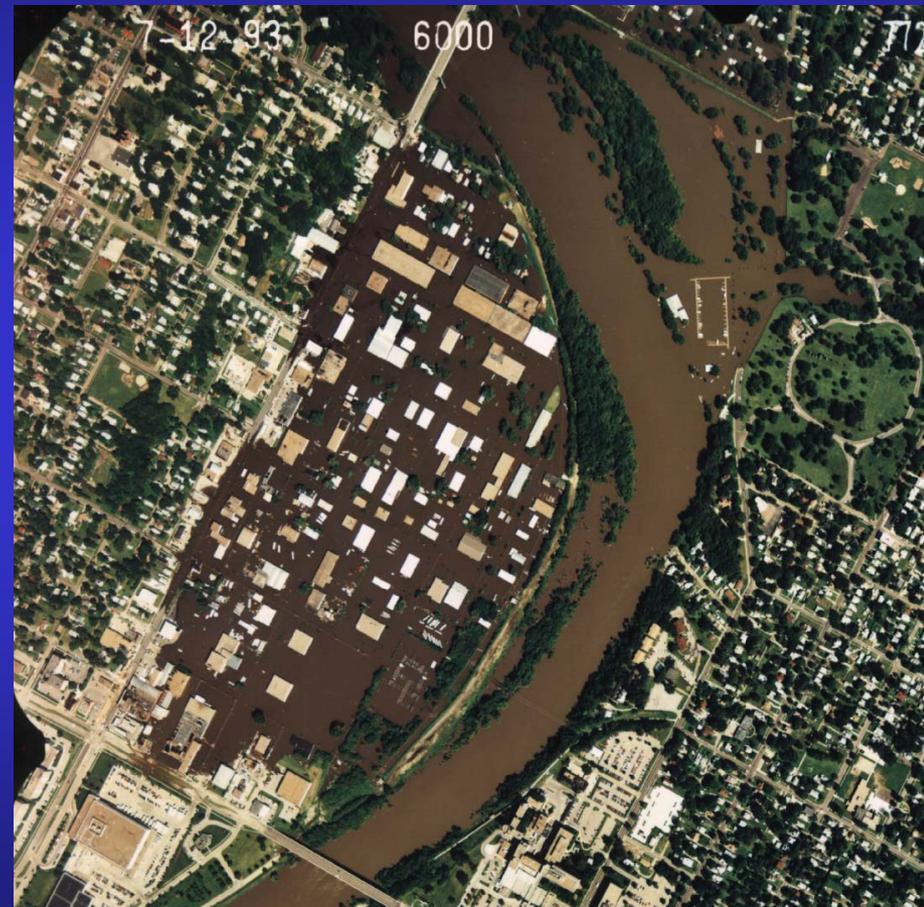


US Army Corps  
of Engineers®

# 1993 Flooding Des Moines, Iowa



**Birdland Park**



**Central Place**

*One Team: Relevant, Ready, Responsive and Reliable*



US Army Corps  
of Engineers®

# Summary of Recommended Plan



**The recommended plan is comprised of 5 reaches**

- **Reconstructing & Raising Birdland Park & Central Place Levees**
- **Improving 19 closures in downtown levee system**
- **Recreational trail on Birdland Levee**
- **Estimated cost = \$10.1 million**
- **Benefit-to-Cost Ratio = 2.5**
- **Net Annual Benefits = \$ 1 million**



US Army Corps  
of Engineers®

# Project Study Authorization



***“Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on the Des Moines River, contained in House Document 651, 78th Congress, with particular reference to the Upper Des Moines River and the tributaries thereof, to determine the feasibility and justification of improvements for flood control and related purposes.” (Adopted July 1, 1958)***

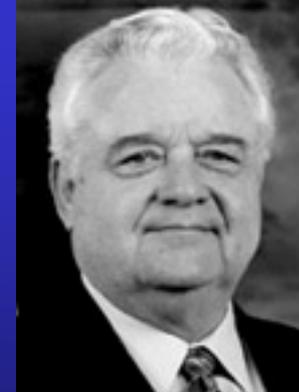
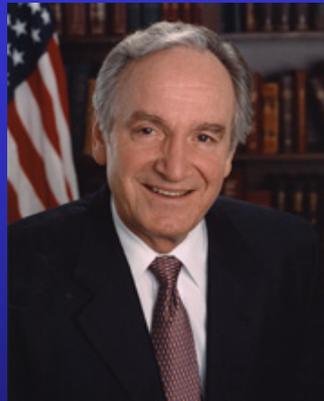


US Army Corps  
of Engineers®

# Support for the Project



- **City of Des Moines, Iowa (Project Sponsor)**
- **Senators Tom Harkin & Charles Grassley**
- **Congressman Leonard Boswell (IA-3)**



*One Team: Relevant, Ready, Responsive and Reliable*



US Army Corps  
of Engineers®

# Partnerships & Contributors



- **City of Des Moines Iowa (Sponsor)**
- **Polk County Conservation Board**
- **U.S. Fish & Wildlife Service**
- **Iowa Department of Natural Resources**





US Army Corps  
of Engineers®

# Planning Process (ER 1105-2-100)



- 1. Specify problems & opportunities**
- 2. Inventory & forecast conditions**
- 3. Formulate alternative plans**
- 4. Evaluate effects of alternative plans**
- 5. Compare alternative plans**
- 6. Select recommended plan**



US Army Corps  
of Engineers®

# Existing Conditions



- **500-year event flood damages = \$326 million**
- **Residential parcels = 856**
- **Commercial parcels = 651**
- **Public parcels = 21**



US Army Corps  
of Engineers®

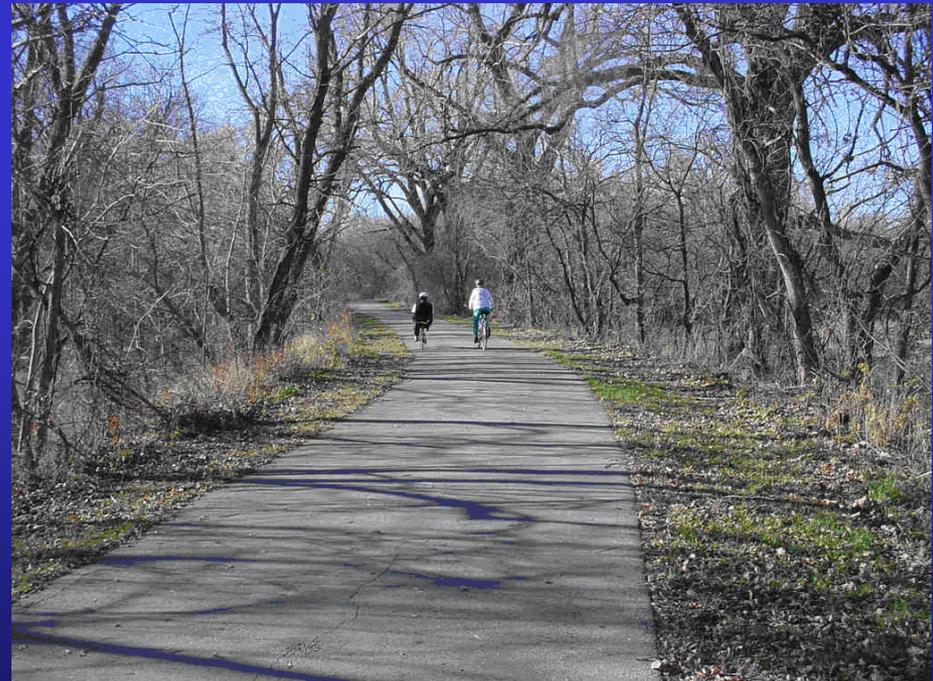
# Alternative Plans



## Evaluated:

- Flood damage reduction measures at 11 reaches
- Ecosystem restoration
- Recreation

**Combined feasible reaches into a single recommended plan.**



# Des Moines and Raccoon Rivers Feasibility Study Recommended Plan

**Birdland Park  
Levee, Reach 1**

**Central Place  
Levee, Reach 2**

**Downtown West  
Levee, Reach 4**

**Downtown East  
Levee, Reach 3**

**Four Mile Creek,  
Reach 10**

**Walnut Creek at  
Grand Avenue,  
Reach 9**

**Leetown Creek,  
Reach 11**

**Des Moines Water  
Works Levee,  
Reach 7**

**Downtown South  
Levee, Reach 5**

**Raccoon River  
Section 205  
Levee, Reach 6**

**Red Rock Remedial  
Works Levee**

**Des Moines-  
West Des Moines Levee,  
Reach 8**

**LEGEND**

- Existing Levee
- - - New Levee Alignment



Note: Recommended Plan Components Shown in Red





US Army Corps  
of Engineers®

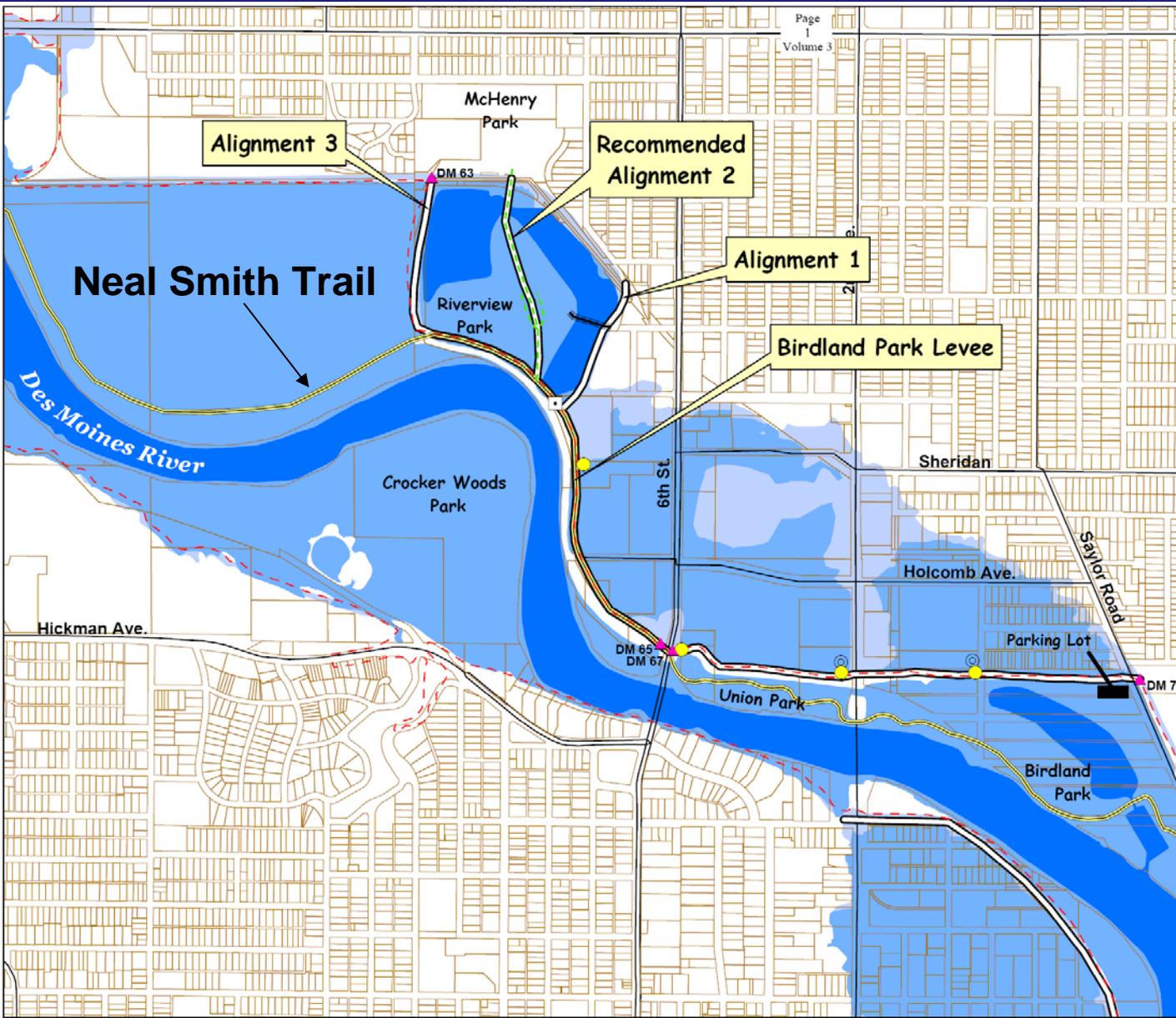
# Measures Screened from Further Consideration



- **Reservoirs**
- **Channel modification & bypass channels**
- **Non-structural measures**
- **Ecosystem restoration**



# Birdland Park Levee – Reach 1



Page 1  
Volume 3

## Des Moines & Raccoon Rivers Feasibility Study Reach 1 - Birdland Park

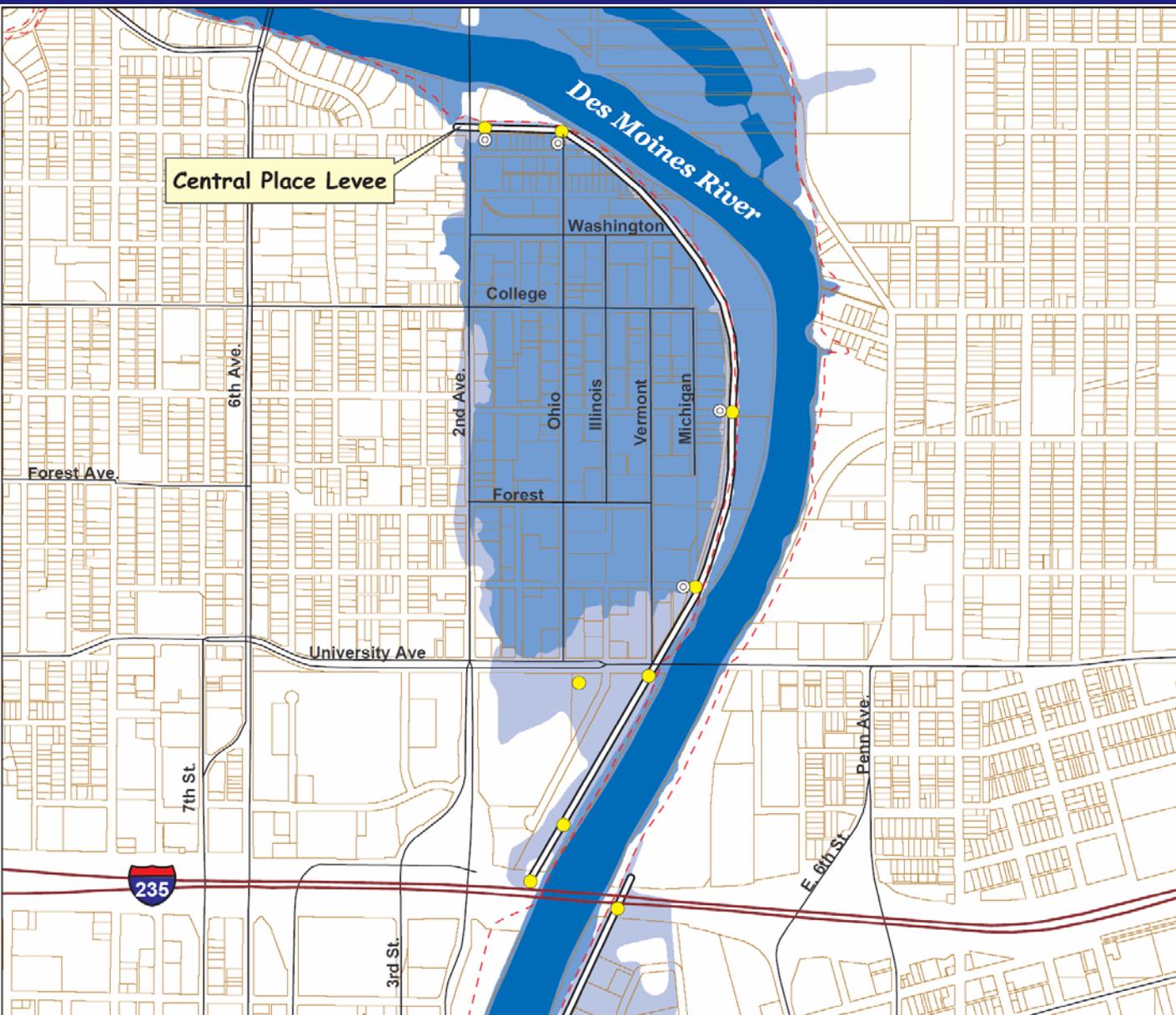
- General Criteria**  
 Existing Levee: Non-Federal  
 Year Built: 1950  
 Existing Levee Elevation City Datum: 32
- Economic Criteria**  
 500-Year Event Damage: \$27,700,000  
 Residential Parcels: 49  
 Commercial/Industrial Parcels: 30  
 Public Parcels: 1
- Infrastructure**  
 Bridges: 2  
 Gatewells: 5  
 Pump Stations: 2

**Legend**

- 100 Year Flood Zone (Source: USACE 2004)
- 100 Year Flood Zone (Source: FEMA 1988)
- 500 Year Flood Zone (Source: FEMA 1988)
- Parcels
- Neal Smith Trail
- Gatewells
- Pump Stations
- Levees
- Roads
- Proposed Bike Trail
- Bridge
- Closures
- Gated Culvert

500 250 0 500 Feet

# Central Place Levee - Reach 2



## Des Moines & Raccoon Rivers Feasibility Study Reach 2 - Central Place

### General Criteria

Existing Levee: Non-Federal  
 Year Built: 1950  
 Existing Levee Elevation City Datum: 33.98

### Economic Criteria

500-Year Event Damage: \$47,000,000  
 Residential Parcels: 1  
 Commercial/Industrial Parcels: 109

### Infrastructure

Bridges: 1  
 Gatewells: 8  
 Pump Stations: 4  
 Public Parcels: 2

### Legend

- |  |   |  |                  |
|--|---|--|------------------|
|  | 100 Year Flood Zone<br>(Source: USACE 2004) |  | Levees           |
|  | 500 Year Flood Zone<br>(Source: FEMA 1988)  |  | Interstate Hwys. |
|  | Gatewells                                   |  | Roads            |
|  | Pump Stations                               |  | Parcels          |
- 500 250 0 500 Feet
- N  
W E  
S

# Downtown East Federally-Constructed Levee – Reach 3

## Des Moines & Raccoon Rivers Feasibility Study Reach 3 - Downton East

### General Criteria

Existing Levee: Federal  
Year Built: 1965-1972  
Existing Levee Elevation City Datum: 33.7

### Economic Criteria

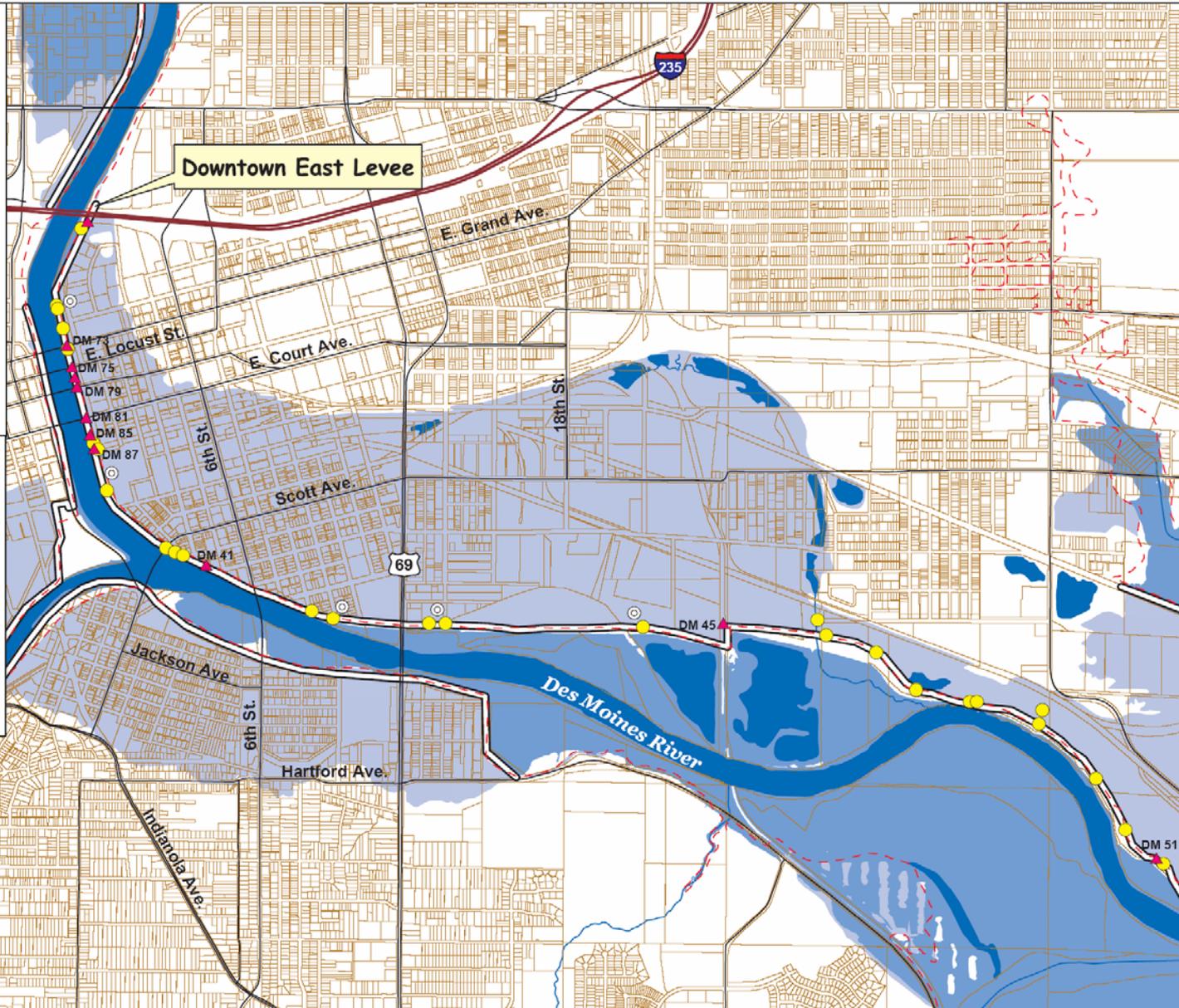
500-Year Event Damage: \$143,000,000  
Residential Parcels: 227  
Commercial/Industrial Parcels: 272  
Public Parcels: 9

### Infrastructure

Bridges: 10  
Gatewells: 27  
Pump Stations: 5  
Utility Crossings: 3

### Legend

- |  |                  |
|--|------------------|
| 100 Year Flood Zone (Source: USACE 2004) | Levees           |
| 100 Year Flood Zone (Source: FEMA 1988)  | Interstate Hwys. |
| 500 Year Flood Zone (Source: FEMA 1988)  | Roads            |
| Parcels                                  | Closures         |
| Gatewells                                | Pump Stations    |
- 1,000 0 1,000 2,000 Feet
- 



# Downtown West Federally-Constructed Levee – Reach 4

## Des Moines & Raccoon Rivers Feasibility Study Reach 4 - Downtown West

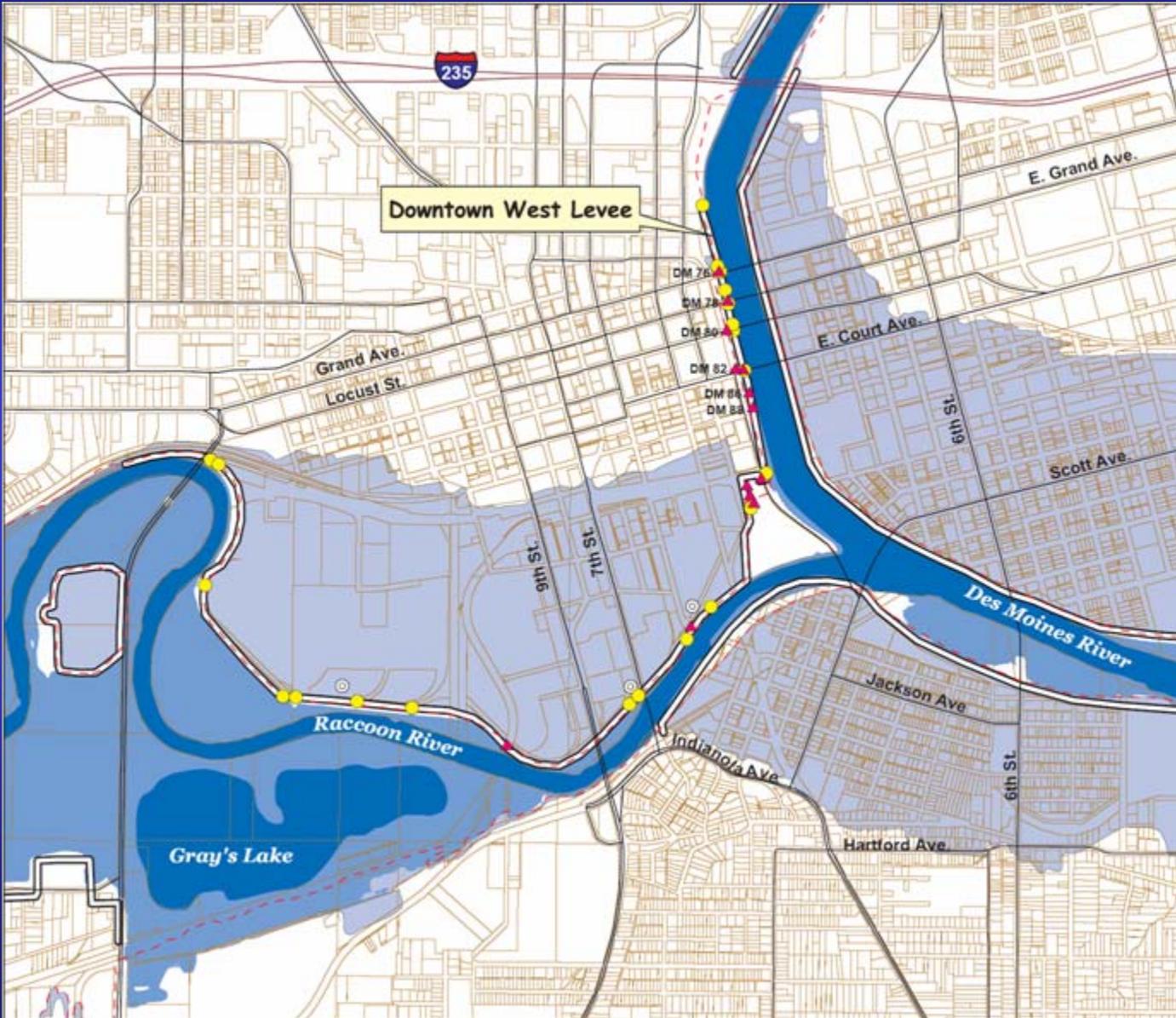
**General Criteria**  
 Existing Levee: Federal  
 Year Built: 1965-1972  
 Existing Levee Elevation City Datum: 33.7

**Economic Criteria**  
 500-Year Event Damage: \$68,800,000  
 Residential Parcels:  
 Commercial/Industrial Parcels: 182  
 Public Parcels: 3

**Infrastructure**  
 Gatewells: 22  
 Pump Stations: 2  
 Bridges: 11  
 Utility Crossings: 6

### Legend

- 100 Year Flood Zone (Source: USACE 2004)
  - 100 Year Flood Zone (Source: FEMA 1988)
  - 500 Year Flood Zone (Source: FEMA 1988)
  - Gatewells
  - Parcels
  - Pump Stations
  - Levees
  - Interstate Hwys.
  - Roads
  - Closures
- 1,000 500 0 1,000 Feet
- 



# Downtown South Federally-Constructed Levee – Reach 5

## Des Moines & Raccoon Rivers Feasibility Study Reach 5 - Downtown South

### General Criteria

Existing Levee: Federal  
Year Built: 1965-1972  
Existing Levee Elevation City Datum: 33.7

### Economic Criteria

500-Year Event Damage: \$39,200,000  
Residential Parcels: 579  
Commercial/Industrial Parcels: 58  
Public Parcels: 8

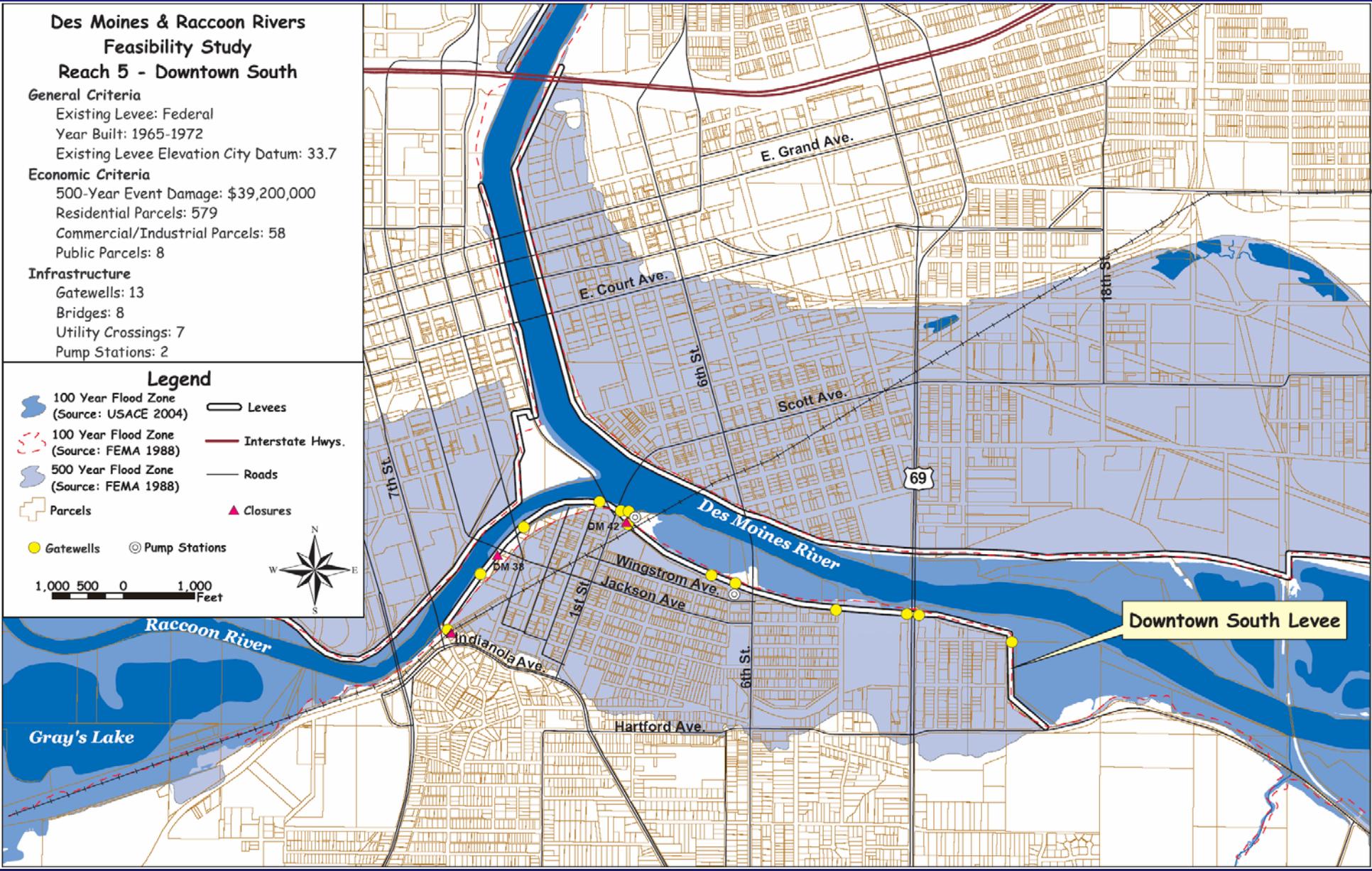
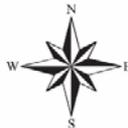
### Infrastructure

Gatewells: 13  
Bridges: 8  
Utility Crossings: 7  
Pump Stations: 2

### Legend

- 100 Year Flood Zone (Source: USACE 2004)
- 100 Year Flood Zone (Source: FEMA 1988)
- 500 Year Flood Zone (Source: FEMA 1988)
- Parcels
- Gatewells
- Pump Stations
- Levees
- Interstate Hwys.
- Roads
- Closures

1,000 500 0 1,000 Feet



# Des Moines & Raccoon Rivers

## Flood Damage Reduction

### Feasibility Study Project Costs & Benefits

	<b>Project Cost Estimates</b>	<b>Total Annual Costs</b>	<b>Total Annual Benefits</b>	<b>Benefit- to-Cost Ratio</b>	<b>Net Annual Benefits</b>
Birdland Park 500-year Levee	5,012,000	342,000	440,000	1.3	98,000
Birdland Park Recreation Trail	244,000	17,000	117,000	7.1	100,000
Central Place 500-year Levee	3,863,000	265,000	901,000	3.4	636,000
Downtown East Closure Improvements	647,000	41,000	157,000	3.8	116,000
Downtown West Closure Improvements	262,000	17,000	74,000	4.5	58,000
Downtown South Closure Improvements	31,000	2,000	30,000	15.3	28,000
	10,059,000	684,000	1,719,000	2.5	1,036,000

5-5/8% Discount Rate, 50-Year Evaluation Period

# Cost Share Summary

<b>Estimated Implementation Costs: (October 2004 price level)</b>	
<b>Federal</b>	
Flood damage reduction (65%)	\$6,380,000
Recreation (50%)	\$122,000
Corps of Engineers – total	\$6,502,000
<b>Non-Federal</b>	
Flood damage reduction (35%) <sup>1</sup>	\$3,435,000
Recreation (50%)	\$122,000
City of Des Moines – total	\$3,557,000
<b>Total</b>	<b>\$10,059,000</b>
<sup>1</sup> \$963,000 of this amount is LERRD credit and the remainder is cash	

# Implementation Schedule

<b>Action Item</b>	<b>Estimated Completion Date</b>
Chief of Engineer's Report	Dec-05
Congressional Authorization and Appropriations	Sep-06
Execute Project Cooperative Agreement (PCA)	Jan-05
Complete Plans & Specifications	Jun-08
Real Estate Acquisition	Aug-08
Start Construction Contract	Nov-08
Complete Construction	Nov-10



US Army Corps  
of Engineers®

# Policy & Technical Review Process



- In-Progress Review Dec 2003
- Value Engineering (St. Paul District) Mar 2004
- Formal Independent Technical Review (St. Paul District) Nov 2004
- Alternative Plan Formulation Briefing (AFB) May 2005
- HQ Policy/Report Review Sep 2005



US Army Corps  
of Engineers®

# Systems/Watershed Context



- **Study area limited to the Des Moines city limits**
- **No systemic alternatives were identified**
- **Recommended Plan has no significant impacts to the watershed or ecosystem**
- **The plan was coordinated with Iowa DNR and USFWS**
- **The project enhances the current land uses in the watershed**



US Army Corps  
of Engineers®

# Environmental Operating Principles



- **Provided opportunity for public & stakeholders to have input**
- **Carefully considered their views**
- **Environmental consequences considered**
- **Unavoidable impacts mitigated**





US Army Corps  
of Engineers®

# Public Review Process



- **Newsletters**
- **Public meetings**
- **Project website with reports & presentations**
- **Formal public review**





US Army Corps  
of Engineers®

# Independent Technical Review Comments



- **St. Paul District performed ITR & VE**
- **No significant issues were identified**
- **All comments are resolved**



US Army Corps  
of Engineers®

# Policy Guidance Memo



## Documentation of analyses

- **HTRW clearance**
- **Endangered species clearance**
- **Incremental cost analysis for mitigation plan**



US Army Corps  
of Engineers®

# PDT Performance



- **Performed well under challenging conditions**
  - **Stop & start due to funding constraints**
  - **Changes in personnel**
- **Identified & addressed problems early in the study process**
- **Frequent communication, including team meetings**



US Army Corps  
of Engineers®



# Questions & Comments



---

*One Team: Relevant, Ready, Responsive and Reliable*



# City of Des Moines



**“I’ve seen a lot of disasters, but this is the biggest and widest-spread disaster I think we’ve ever had.” – Gov. Branstad, July 7, 1993**



*One Team: Relevant, Ready, Responsive and Reliable*



# Human Impacts





# Flood Fighting



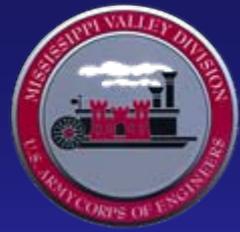
**National Guard troops charge** to the top of a Des Moines River levee near Southeast Eighth Street in Des Moines. The Guard helped shore up the levee, which was in danger of breaking.

DAVID PETERSON/THE REGISTER

*One Team: Relevant, Ready, Responsive and Reliable*



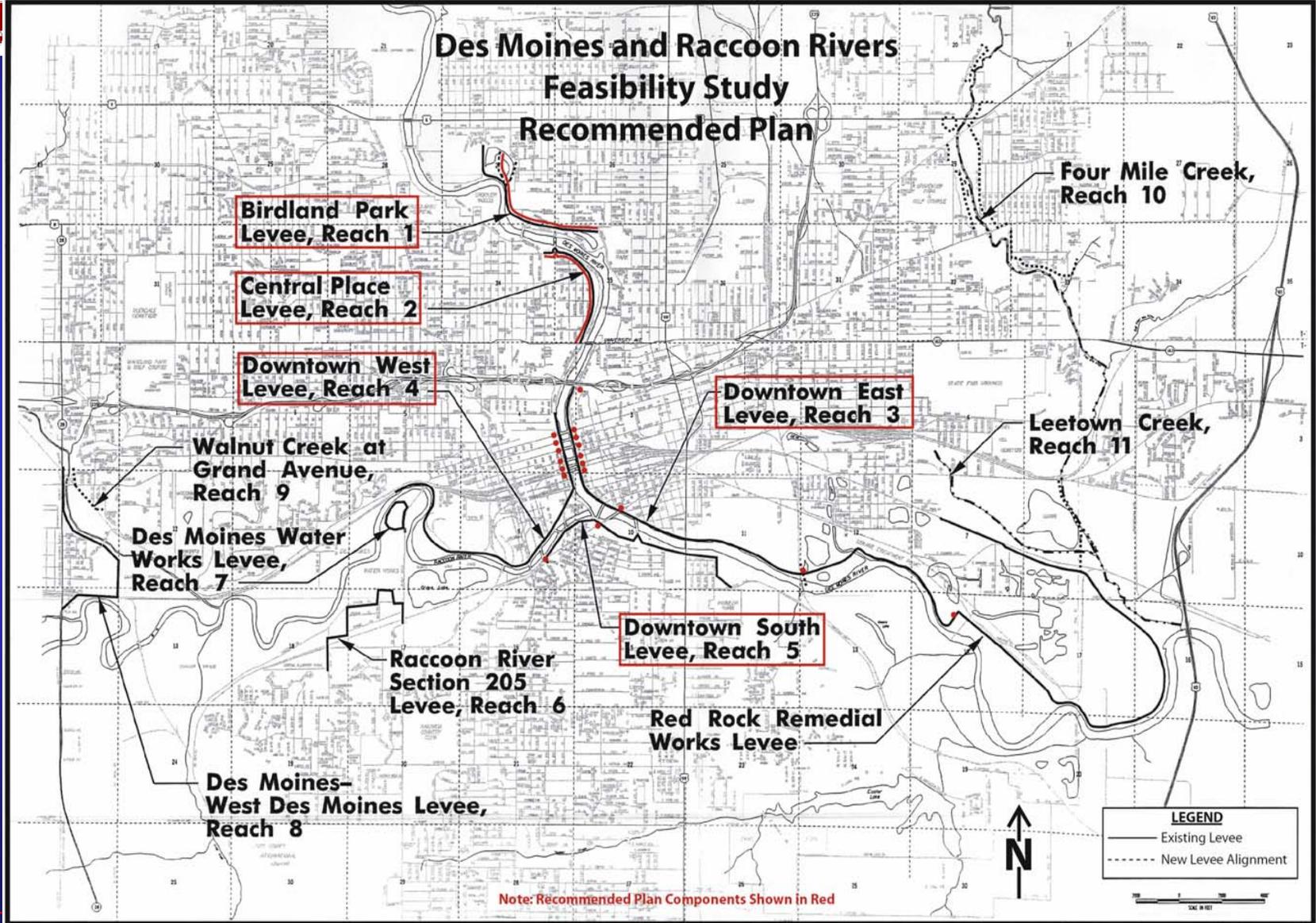
# Community Effort



*One Team: Relevant, Ready, Responsive and Reliable*



# Looking Toward the Future



*Presentation  
to the*

***CIVIL WORKS REVIEW BOARD***

***Des Moines and Raccoon Rivers  
Flood Damage Reduction  
Feasibility Study***

*by*

***Michael B. Rogers***

*Director of Programs  
Mississippi Valley Division*

*October 18, 2005*



US Army Corps  
of Engineers®

# Rationale for MVD Support



- **Concur with MVR Commander's findings and recommendations**
- **Report complies with all applicable policies and laws in place at this time**
- **Anticipate a favorable response to the draft Chief's Report**
- **Plan supported by sponsor and congressional delegation**



US Army Corps  
of Engineers®

# Certification of Legal and Policy Compliance



- **Legal certification by MVR Counsel on  
20 Sep 2005**
- **Technical and policy compliance:**
  - MVP performed ITR
  - All ITR comments resolved
  - MVP ITR Team certified on 4 April 2005
  - MVR study team certified on 27 Sep 2005



US Army Corps  
of Engineers®

# MVD Quality

## Assurance Activities



- MVD reviewed ITR comments/responses to ensure appropriate resolution
- Active participation by vertical team
- Worked with MVR to successfully resolve HQ review comments
- MVR certified that project is technically, legally, and policy complaint
- MVD concurs that project is technically, legally, and policy complaint



US Army Corps  
of Engineers®

# MVD



## Recommendation

- **Approve Final Feasibility Report**
- **Release report for State and Agency Review**
- **Complete Chief's Report NLT 31 Dec 05 to meet contingent authorization**

---

# Civil Works Review Board

*Significant Policy Review Concerns*

## Des Moines and Raccoon Rivers Project Des Moines, Iowa

Cynthia Jester

Office of Water Project Review

Policy and Policy Compliance Division

Washington, DC – October 18, 2005



## Des Moines and Raccoon Rivers Project

---

# HQUSACE Policy Compliance Review Team RECOMMENDATION

Release the report and EA for S&A Review



## Des Moines and Raccoon Rivers Project

---

### Areas of Policy Concern:

- HTRW
- Threatened and Endangered Species
- Incremental Cost Analysis for Mitigation Plan
- NEP Plan vs LPP



## Des Moines and Raccoon Rivers Project

---

### HTRW

Concern: HTRW Assessment revealed slightly elevated levels of metals and benzo(a)pyrene in soil samples in Birdland Park, Central Place, Downtown West and Downtown East.

Reason: Construction of CW projects in HTRW-contaminated areas should be avoided if possible. If unavoidable, the non-Federal sponsor is responsible for any required response action.

Resolution: The non-Federal sponsor received a letter from Iowa Department of Natural Resources stating that due to the very low levels of contaminants, no further investigation of the site would be required.

Resolution Impact: Concern resolved



## Des Moines and Raccoon Rivers Project

---

# Threatened and Endangered Species

Concern: Draft report stated that there was the potential to affect Federal Threatened & Endangered species but that no determination was made. Ongoing coordination with USFWS.

Reason: Ongoing coordination is appropriate at this stage of study but issue of endangered species must be resolved prior to finalization of report.

Resolution: USFWS letter in final report states “no objection to selection of the preferred alternative”. The report has been modified and language regarding a “potential threat” has been removed from report because issue was resolved with USFWS.

Resolution Impact: Concern resolved



## Des Moines and Raccoon Rivers Project

---

# Incremental Cost Analysis for Mitigation Plan

Concern: Draft report did not present a standard incremental cost analysis for the proposed mitigation measures to be undertaken at the respective mitigation areas.

Reason: Guidance for CW projects requires evaluation of the cost-effectiveness of mitigation measures.

Resolution: An incremental cost analysis of different measures to incorporate all habitat outputs on the mitigation site was added to the Mitigation Plan.

Resolution Impact: Concern resolved



## Des Moines and Raccoon Rivers Project

---

### NED Plan vs LPP

Concern: The NED plan had not been identified and recommended in the draft report, as required in ER 1105-2-100.

Reason: NED plan must be identified and recommended unless the recommended plan qualifies for "Categorical Exemption".

Resolution: The sponsor identified a desired maximum level of protection; residual risk is not unreasonably high; the plan desired by sponsor has greater net benefits than smaller scale plans and thus the recommended LPP satisfies the requirement for a "Categorical Exemption". The report has been revised to correctly label the selected plan.

Resolution Impact: Concern resolved





US Army Corps  
of Engineers®

# Summary of Project Briefing



## Recommend Proceeding with State and Agency Review:

- **\$10.1 million Recommended Plan with 2.5 BCR**
- **Strong support by the City of Des Moines**
- **Formulated using Corps principles and guidelines**
- **The plan is complete, acceptable, effective and efficient**