US Army Corps of Engineers
Rock Island District

DES MOINES AND RACCOON RIVERS FEASIBILITY STUDY NEWSLETTER

FEBRUARY 2000

CORPS OF ENGINEERS AND CITY OF DES MOINES ENTER INTO PARTNERSHIP TO IDENTIFY FLOOD DAMAGE REDUCTION OPPORTUNITIES

On September 13, 1999, the Rock Island District of the U.S. Army Corps of Engineers and the City of Des Moines entered into a partnership agreement to identify opportunities for flood damage reduction within the City. This partnership approach is a new initiative by the Corps of Engineers to improve cooperation with local governments affected by flooding and is the result of a long history of the Corps and the City working to reduce flooding in Des Moines. The focus of the partnership will be the Des Moines and Raccoon Rivers and the major tributaries.

Prior to the partnership being established, the Corps undertook a reconnaissance study to determine if there was adequate justification to proceed with a partnership. This reconnaissance study focused on historical incidences of flooding in Des Moines, including the events of 1993. The results of the reconnaissance study indicated adequate justification for further investigation. This investigation will take nearly four years to complete and will result in a feasibility report with recommendations on improvements to the flood protection system in the City. This feasibility report will include computerized analyses of the rivers that will model how various levels of flooding impact the City. The report will evaluate economic impacts from flooding and examine improvements that can be made to the flood protection system. In addition, the environmental impacts of proposed improvements will be evaluated in accordance with the National Environmental Policy Act (NEPA).

The United States Congress has given the U.S. Army Corps of Engineers authority to assist the City of Des Moines with development of flood damage reduction projects. Over the years, the flood control system along the rivers has developed through a series of City and Federal projects that provide varying levels of protection. One of the goals of the feasibility study will be to identify projects that will qualify for Federal funding to bring the flood protection system up to a consistent standard of protection.

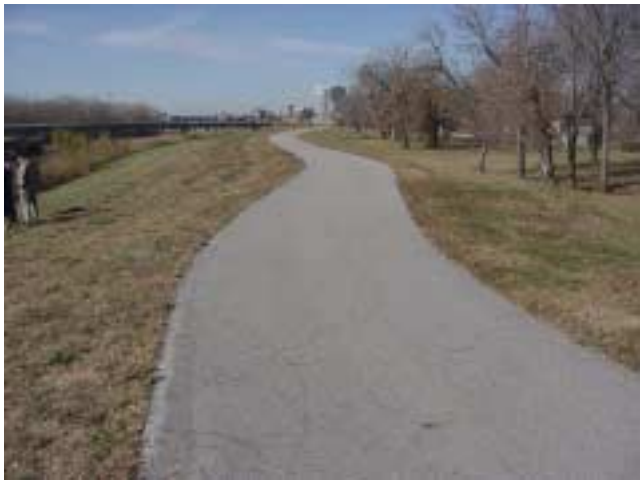
This investigation will be completed in phases, with the initial phase being the completion of the detailed hydrologic (rainfall and related runoff) and hydraulic (the way the water flows in the river) modeling. To support this effort, the City has been surveying cross sections of the river. The cross-section areas will be used in computer models that calculate water levels along the river. The results of these models will be used to evaluate alternative improvements and their ability to provide improved flood protection. Future phases will include development and evaluation of flood damage reduction alternatives at specific locations throughout the City. Alternatives will be evaluated based on their engineering, economic, environmental, cultural, and social feasibility.

The study team is comprised of representatives from the Rock Island District, Corps of Engineers, and from the City of Des Moines. Study disciplines include planning, engineering, geotechnical, hydrology, hydraulics, economics, survey, real estate, environmental/cultural, social analysis, and public involvement.

AREAS OF STUDY

During the reconnaissance study, the Corps of Engineers and the City identified seven areas warranting further review. During the feasibility study, the Corps of Engineers and City of Des Moines study team will be gathering data to allow for analyses of each of the areas.

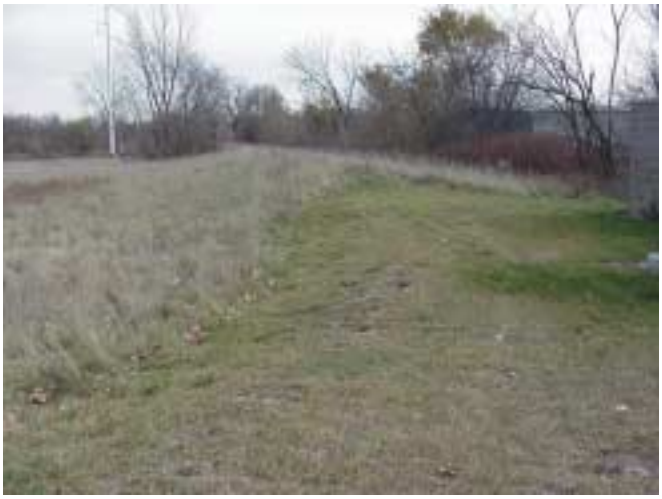
Des Moines River Levee Between Southeast 6th Street and Southeast 14th Street – The Southeast 6th to Southeast 14th Streets area along the north and east side of the Des Moines River, immediately southeast of the downtown area, is protected by a flood levee. The levee protecting this 0.5-mile stretch of the northern left floodplain was constructed by the City, and was incorporated into the federal levee system constructed in the late 1960s (the Des Moines Local Flood Protection Project Stage I). During the 1993 flood, this section of levee experienced severe erosion. Since that time, modifications have been made to help improve the reliability of the levee. However, this stretch of levee continues to erode even after the rehabilitation attempts. Additional levee protection measures will likely be required to continue to protect the affected 200 acres of commercial, residential, and public facilities from flooding. This area includes a portion of the east Des Moines Downtown Business District and the Des Moines Department of Public Works facilities complex.



Des Moines River levee between SE 6th and SE 14th Streets

Birdland Park Levee – The Birdland Park area contains 170 acres of residential and commercial property. This area includes the North High School complex and Birdland City Park, in addition to numerous commercial establishments. The area is mapped in the National Flood Insurance Program as having 100-year flood protection by an existing levee constructed by the City in the 1890s. This levee was overtopped during the 1993 flood, causing extensive flood damages. This levee requires upgrading to meet current Corps of Engineers flood protection levee standards. A comprehensive analysis of the levee height and structure will be conducted, along with street closures and other related structures.

Central Place Levee – The Central Place Business District is on the near north side of the City. This area was redeveloped as a commercial area in the 1970s and 1980s, and now is home to numerous commercial properties. The area is protected from flooding by a levee constructed by the City of Des Moines and is mapped in the National Flood Insurance Program as having 100-year flood protection. The levee was overtopped during the 1993 flood, causing extensive flood damages. Following the 1993 flood, the City undertook several measures to improve the level of protection provided by the levee (shown below); however, the levee still requires upgrading to meet the current Corps of Engineers flood protection standards.



Portion of Central Place Levee

The Central Place area is unique since it is lower than the normal river levels and, therefore, all runoff from the area must be pumped. The interior areas are presently serviced by four (4) large stormwater pump stations, which were constructed by the City.

Four Mile Creek – Prior to the era of regulated flood plain development, areas of Four Mile Creek from Des Moines' north city limits southerly to the creek's confluence with the Des Moines River on the east side of Des Moines were developed. The most intensive area of development is from East Aurora Avenue downstream to East University Avenue. This development has occurred on both sides of the creek. The Four Mile Creek 100-year floodplain contains approximately 270 structures including residences,

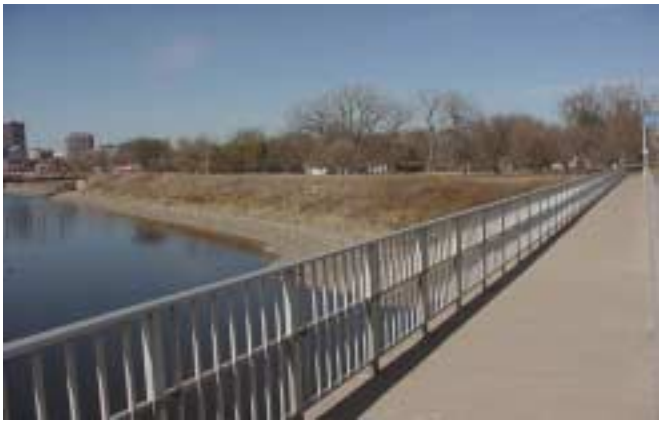
mobile homes, and a few businesses. The area has experienced frequent flash flooding, with flood damages occurring on at least twelve occasions since 1947. The most recent flooding occurred in 1998. The flash flooding nature of Four Mile Creek means there is very little response time to flooding events. In order to increase the actual warning time for these natural disasters, the City has installed a flood-warning system to allow adequate time to evacuate people from the flood area. However, the flashy nature of the stream does not allow adequate response time to protect property and properties have been repeatedly damaged by flooding over the years. In some cases, it is impractical to protect these structures from flooding; therefore, removal of the structures from the floodplain is the only alternative. The City has undertaken an effort, in cooperation with the Federal Emergency Management Agency (FEMA), to relocate residents and remove some flood-prone structures from the floodplain in the Williams Street area.

This partnership feasibility study will evaluate various alternatives that will minimize property damage during these flash floods.

Walnut Creek at Grand Avenue – Walnut Creek flows through an 84-square-mile watershed located west of the City in the western suburbs and Dallas County. The creek has experienced flash flooding on numerous occasions, including 1973, 1986, 1990, 1993, 1997, and 1998. The recently completed Corps of Engineers' West Des Moines – Des Moines Local Flood Protection Project provides comprehensive flood protection to the developed western right bank floodplain areas near the creek's confluence with the Raccoon River. The study area of concern is the unprotected developed floodplain area located on the east bank of the creek in the vicinity of Grand Avenue in the City. The 100-year floodplain in this area from 64th and Center Streets downstream to North Valley Drive contains several residences and businesses.

Downtown Levee System – The system of levees protecting the downtown area from flooding by the Des Moines and Raccoon Rivers is part of the federally constructed Des Moines Local Flood Protection Project completed in 1971. The levee system contains three major reaches of levee protecting both the right and left banks of the Des Moines and Raccoon Rivers and the area between the confluence of the two rivers. The protected areas contain over 1,800 acres of highly urbanized commercial, retail, industrial, residential, and public facilities at the central business core of the City.

The existing levee system was designed to provide 100-year flood protection. This system, designed in the 1960s, has numerous street and sewer closures that penetrate the line-of-protection at the design flood level. This situation causes the City to take multiple operational actions during a flood event. These actions include sandbagging, installing earthen closures, and placing and operating portable pumps. However, as demonstrated during the 1993 flood, floodwaters on both the Des Moines and Raccoon Rivers can rise rapidly, making the successful execution of these operations difficult. The feasibility study will look at weaknesses in the operation of the levee system and evaluate improvements that can be made.



This levee system is one of three that protects the downtown Des Moines area from the Des Moines and Raccoon Rivers flooding.

7th Ward Ditch South of University Avenue – The 7th Ward Ditch is a nine-square-mile drainage area on the near east side of Des Moines. Since the 1980s, the City has constructed several storm water detention basins and channel enhancements to improve the drainage and flood characteristics of the upper drainage area upstream of Easton Boulevard. Downstream of Easton Boulevard, the 7th Ward Ditch is a combination of underground storm sewer and overland corridor for approximately two miles - including the western edge of the Iowa State Fairgrounds. The underground storm sewer exits to an open ditch near East 30th Street and Dean Avenue. The City is currently in the process of constructing improvements to this underground sewer. Low-lying developed properties in this area and downstream towards the confluence with Four Mile

Creek frequently experience poor drainage and backwater flooding from Four Mile Creek. The feasibility study will evaluate steps that can be taken to improve both the storm sewer outlet and flood protection from the influence of Four Mile Creek.

CITY UTILIZES STATE-OF-THE-ART SURVEY TECHNIQUES TO PROVIDE DATA FOR FLOOD STUDY

The City of Des Moines, in partnership with the Corps of Engineers, is utilizing state-of-the-art satellite-based survey equipment to provide information for the flood protection system analyses. This equipment – known as Global Positioning System, or GPS – utilizes the same technology the military uses to locate objects. City surveyors will be performing surveys along the selected rivers and streams using GPS equipment, including using a boat to survey the river bottom.

For many years, surveyors relied on manual equipment to provide survey information that determined the location of objects and the topography. More recently, equipment utilizing radio waves was used to determine the distance between objects. Today's GPS equipment uses a worldwide satellite constellation to establish the location and elevation of a particular point with signals transmitted by the satellites to the ground equipment. The information is then used by a computer, where it can be utilized for the analysis. This process provides several advantages to the City. The equipment allows the survey data to be collected with a minimum of property disruption and is also a big labor and time saver, as it allows much of the data collection to be done by one person.

WHAT'S NEXT

The study team is now in the process of performing surveys of the rivers and streams necessary for determining updated flood levels. This information will be used to evaluate the costs and potential benefits of various alternatives to reduce flood damages. The surveys are anticipated to be complete in the spring of 2000.

PUBLIC INVOLVEMENT COMMENTS/QUESTIONS

The public will be kept informed and will have the opportunity to be involved throughout the study. This newsletter is a major part of this effort. Currently, four study newsletters are scheduled. A public meeting/workshop will be held at the study's mid-point and again at the study's conclusion. Additionally, the Rock Island District, Corps of Engineers, plans to develop a web page on the Internet that will provide Des Moines and Raccoon Rivers Feasibility Study information; e.g., newsletters, study map, and other pertinent data. For information about the Rock Island District and other Corps of Engineers offices, visit their web site at http://www.mvr.usace.army.mil/. The Des Moines and Raccoon Rivers Feasibility Study web page will be located at this site.

We welcome your input. If you have comments and/or questions regarding this study, please contact Mr. Dennis Hamilton, Project Manager, by telephone at 309/794-5634, fax at 309/794-5710, or e-mail at dennis.w.hamilton@usace.army.mil. If you prefer, you may write to Mr. Hamilton at the following address:

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If you are aware of someone who may wish be added to the study's mailing list to receive this newsletter and future study mailings, please ask him/her to contact Mr. Ralston or Ms. Sue Simmons, Rock Island District, Corps of Engineers. Ms. Simmons may be contacted at the Rock Island District address listed above, by telephone at 309/794-5573, or by e-mail at suzanne.r.simmons@usace.army.mil.