

AD-A110 269

CORPS OF ENGINEERS ST PAUL MN ST PAUL DISTRICT
GRAND FORKS - EAST GRAND FORKS URBAN WATER RESOURCES STUDY. ENE--ETC(U)
JUL 81

F/6 13/2

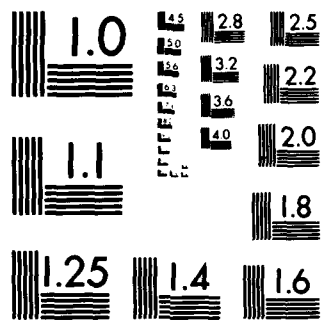
UNCLASSIFIED

ML

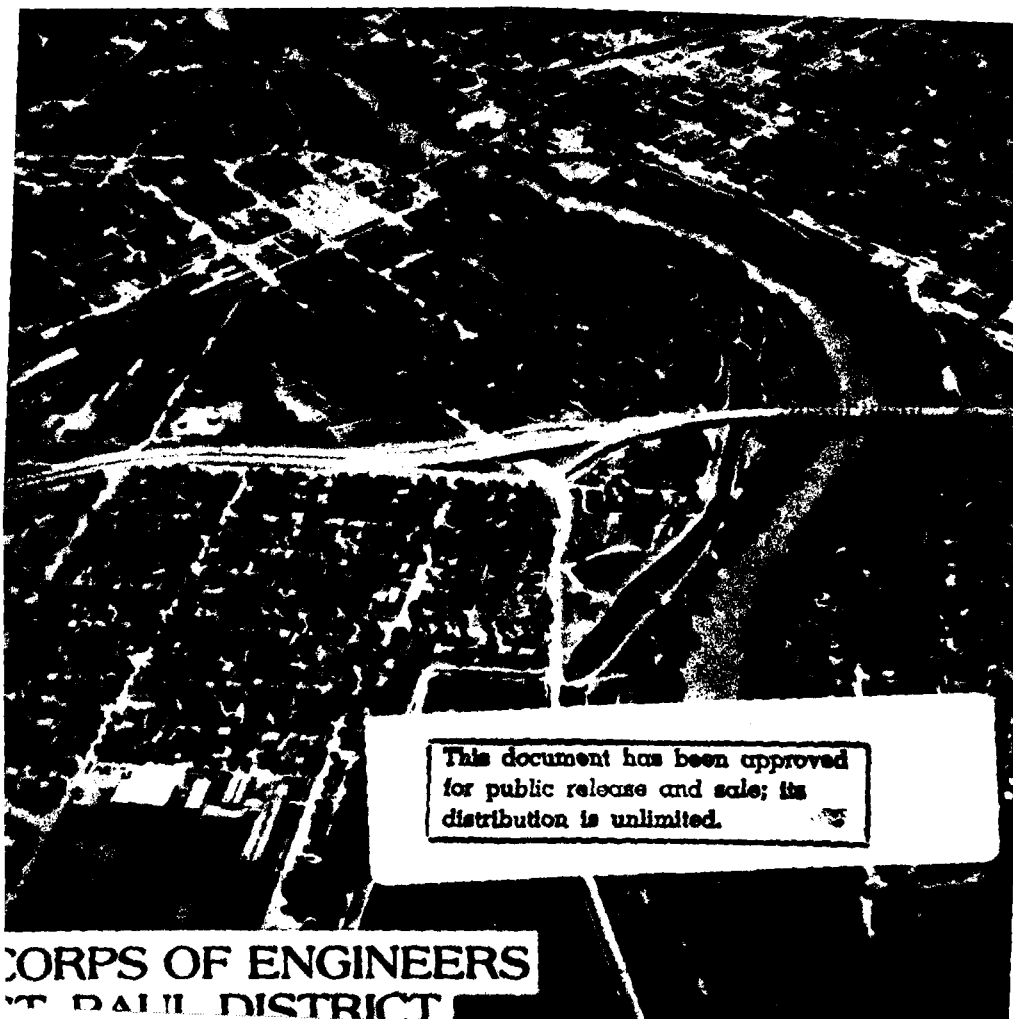
1.1
1.1.1



END
DATE
FILMED
2-82
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



This document has been approved
for public release and sale; its
distribution is unlimited.

CORPS OF ENGINEERS
AT BULL DISTRICT

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
	AD-A110269	
4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED	
GRAND FORKS-EAST GRAND FORKS URBAN WATER RESOURCES STUDY; Energy conservation and recreation appendix; Public involvement appendix.	Final:	
7. AUTHOR(s)	6. PERFORMING ORG. REPORT NUMBER	
	8. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
Army Corps of Engineers, St. Paul District 1135 USPO and Custom House St. Paul, Minnesota		
11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE	
	July 1981	
	13. NUMBER OF PAGES	
	82	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report)	
	Unclassified	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report)		
Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
This report is one of ten		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
Recreation Energy Conservation Urban Planning		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
The goal of the Corps of Engineers Urban Study Program is to provide planning assistance to local interests in variety of water resource areas, some not within traditional Corps areas of responsibility. The St. Paul District conducted the Grand Forks-East Grand Forks (GF/EGF) Urban Water Resources Study which was a cooperative effort around local, state and federal agencies. Primary attention was given to flood control, water supply and wastewater management; supporting investigations addressed recreation and energy conservation.		

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

→ The recreation investigation consists of the leisure time analysis conducted in stage 2 of the urban study by the Heritage Conservation and Recreation Service, Department of the Interior. The leisure time analysis compared the study area's recreational needs to the available and planned facilities and identified unsatisfied needs.

The thermography investigation was conducted in spring 1978 in response to the public's growing awareness of energy conservation and the Corps' desire to make the public aware of the urban study in a meaningful, useful fashion. The investigation consisted of aerial infrared photography, public displays of photographs, and distribution of information on energy saving practices. This investigation was a one-time effort with no plans for follow-up.

PREFACE

The St. Paul District, Corps of Engineers, conducted the Grand Forks-East Grand Forks Urban Water Resources Study, a cooperative effort between local, State, and Federal agencies to address water and related land resources problems in the 14-township study area. Problems which were analyzed include water supply, wastewater management, and flood control.

This document is one of ¹⁰~~11~~ constituting the overall urban study report:

Summary Report
Background Information Appendix
Plan Formulation Appendix
Water Supply Appendix
Wastewater Management Appendix
Flood Control and Urban Drainage Appendix
Flood Emergency Plan for Grand Forks, North Dakota
City of East Grand Forks, Minnesota, Civil Defense
Flood Fight Plan
combined { Energy Conservation and Recreation Appendix
Public Involvement Appendix
Comments Appendix

This appendix reports on two investigations:

- Recreation investigation
- Thermography investigation

1 The recreation investigation consists of the leisure time analysis conducted in stage 2 of the urban study by the Heritage Conservation and Recreation Service, Department of the Interior. The leisure time analysis compared the study area's recreational needs to the available and planned facilities and identified unsatisfied needs. A preliminary evaluation was made of the recreational potential of water supply, wastewater management, and flood control and urban drainage measures considered in stage 2.



Accession For	
NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By _____	
Distribution/ _____	
Availability Codes	
Dist	Avail and/or Special
A	

Subsequent urban study findings negated this preliminary evaluation. The urban study's water supply and wastewater management investigations have been completed and their findings and recommendations turned over to local interests. Implementation of the recommended plans is at the discretion of these interests in conjunction with appropriate State and Federal agencies. Brief assessments of the recreational potential of the recommended plans are included in the respective appendixes.

The urban study's flood control investigations progressed to a point where it was appropriate to transfer the investigations to other Corps programs for completion. Studies of recreational facilities related to flood control measures are tied to the timetable for completing the flood control investigations.

The thermography investigation was conducted in spring 1978 in response to the public's growing awareness of energy conservation and the Corps' desire to make the public aware of the urban study in a meaningful, useful fashion. The investigation consisted of aerial infrared photography, public displays of the photographs, and distribution of information on energy-saving practices. This investigation was a one-time effort, with no plans for follow-up.

GRAND FORKS-EAST GRAND FORKS
URBAN WATER RESOURCES STUDY

RECREATION INVESTIGATION

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, COMPS OF ENGINEERS
ST. PAUL, MINNESOTA

TABLE OF CONTENTS

<u>ITEM</u>	<u>PAGE</u>
INTRODUCTION	1
PURPOSE AND SCOPE	2
RECREATION MARKET AREA	2
OUTDOOR RECREATION SUPPLY	3
DEMAND ANALYSIS	7
NEED ANALYSIS	15
EXISTING RECREATION PLANNING EFFORTS AND INSTITUTIONAL ORGANIZATIONS	15
GRAND FORKS	15
EAST GRAND FORKS	17
GRAND FORKS AIR FORCE BASE	18
GRAND FORKS COUNTY	18
NORTH DAKOTA	19
MINNESOTA	21
FISH AND WILDLIFE SERVICE	23
SOIL CONSERVATION SERVICE	23
HERITAGE CONSERVATION AND RECREATION SERVICE	23
SUMMARY	23
CONCLUSIONS	28
POTENTIAL RECREATION RESOURCES	29
RECREATION EVALUATION OF ALTERNATIVE PLANS	34
FLOOD CONTROL	34
WATER SUPPLY	38
WASTEWATER	39
URBAN DRAINAGE	39
CONCLUSIONS	40
EFFECTIVENESS OF ALTERNATIVES IN SATISFYING RECREATION DEMAND	40
FLOOD CONTROL	41
WATER SUPPLY	43
WASTEWATER	43
URBAN DRAINAGE	43
CONCLUSIONS	46

LIST OF TABLES

<u>NUMBER</u>		<u>PAGE</u>
1	GRAND FORKS-EAST GRAND FORKS 1975 RECREATION MARKET AREA SUPPLY INVENTORY	3
2	GRAND FORKS-EAST GRAND FORKS RESOURCE UNIT LAND CLASSIFICATION	5
3	GRAND FORKS-EAST GRAND FORKS STANDARDS - 1975 SUPPLY COMPARISONS	6
4	SUPPLY-DEMAND-NEED ANALYSIS, 1975	9
5	DEMAND-NEED ANALYSIS, 1980	10
6	DEMAND-NEED ANALYSIS, 2000	11
7	DEMAND-NEED ANALYSIS, 2030	12
8	INSTITUTIONAL ANALYSIS	24
9	SITE ANALYSIS SUMMARY	30
10	ALTERNATIVE PLANS - EVALUATION FOR RECREATION	36
11	EAST GRAND FORKS, ALTERNATIVE PLAN EFFECTIVENESS TO SATISFY RECREATION DEMAND	42
12	GRAND FORKS, ALTERNATIVE PLAN EFFECTIVENESS TO SATISFY RECREATION DEMAND	44

LIST OF FIGURES

<u>NUMBER</u>		<u>PAGE</u>
1	TOTAL DEMAND, GRAND FORKS-EAST GRAND FORKS RECREATION MARKET AREA	14
2	NORTH DAKOTA PLANNING REGIONS	20
3	MINNESOTA ECONOMIC DEVELOPMENT REGIONS	22
4	POTENTIAL RECREATION SITES	32
5	POTENTIAL RECREATION SITES	33

RECREATION INVESTIGATION

INTRODUCTION

The Corps of Engineers Grand Forks-East Grand Forks Urban Water Resources Study sought to provide urban water resource plans compatible with national development goals. Authority for the study was contained in a resolution of the Senate Committee on Public Works adopted on 30 September 1974.

The Heritage Conservation and Recreation Service, Department of the Interior, cooperated with the St. Paul District, Corps of Engineers, in this study by coordinating and integrating the leisure time plans and projects of Federal, State, regional, county, and city governments. In this role, the Service identified needs and problems and proposed solutions to optimize major leisure time opportunities that would also protect and enhance the environment. Recommendations for plan implementation emphasized programs that can be administered by State and local entities.

Authorization for the Mid-Continent Regional Office of the Heritage Conservation and Recreation Service to participate in the Grand Forks-East Grand Forks Urban Water Resources Study was given in the following documents:

Public Law 89-72, Federal Water Project Recreation Act
Department of the Interior Manual 516.3.3D

Heritage Conservation and Recreation Service Manual 260.2.1,
260.2.2

St. Paul District, Corps of Engineers, letter of concurrence for
study participation, dated 13 January 1977

PURPOSE AND SCOPE

The Corps of Engineers urban water resources program is an integrated approach to local water and related land resource planning that is consistent with State and Federal requirements while trying to address local needs. The program elements vary with each specific study area location, but generally include recreation, fish and wildlife conservation, environmental enhancement and protection, regional water supply and wastewater management, flood control, wise use of floodplain lands, and water quality control. The Grand Forks-East Grand Forks study included water supply, wastewater management, flood control, and allied purposes, including recreation.

Urban expansion and the increased amount of leisure time of a growing population make careful recreation planning important to the quality of life in metropolitan areas. Parks, open spaces, and natural areas are needed to provide opportunities for pursuit of leisure time activities and visual relief from the urban landscape.

The goal of the leisure time segment of the Grand Forks-East Grand Forks Urban Water Resources Study was to formulate a plan for the development, use, and conservation of recreation resources along the Red River of the North and the Red Lake River as well as within the total study area that would provide opportunities for leisure time activities. The plan covers a broad range of opportunities and sets forth positive objectives for recreation development for the target years 1980, 2000, and 2030.

RECREATION MARKET AREA

The recreation market area for the Grand Forks-East Grand Forks urban study coincides with 14 township boundaries and was based on the premise that the majority, or 85 percent, of anticipated recreation use would be

generated within the 14-township area. The recreation market area population, existing as well as projected for 1980, 1990, 2000, 2020, and 2030, was taken from the Demographic Analysis and Population Projections prepared by Dr. Richard Ludtke, University of North Dakota.

OUTDOOR RECREATION SUPPLY

An inventory of the Grand Forks-East Grand Forks recreation market area leisure time supply is included in table 1. Information for this inventory was obtained from the North Dakota State Comprehensive Outdoor Recreation Plan computer print-out completed in 1975 and the recreation plans for Grand Forks and East Grand Forks. Sites listed include public sites and private areas, such as tennis clubs, that offer leisure time opportunities. The table details the ownership and administration of the recreation lands and lists the acres, miles, and number of facilities for 17 activities. An analysis of this inventory reveals 5,718 acres (2,314 ha) of land is available for leisure time use. Of this total, 1,015 acres (411 ha), or 18 percent, is privately owned. Natural or environmental areas, 4,078 acres (1,650 ha), constitute 71 percent of the area available.

Table 1 - Grand Forks-East Grand Forks 1975 recreation market area supply inventory (1)

Entity	Recreation lands	
	Owned	Administered
Federal	1,650 acres (668 ha)	1,650 acres (668 ha)
State	2,548 acres (1,031 ha)	2,548 acres (1,031 ha)
County	25 acres (10 ha)	25 acres (10 ha)
City	451 acres (183 ha)	458 acres (185 ha)
School board	12 acres (5 ha)	12 acres (5 ha)
Quasi-public	10 acres (4 ha)	10 acres (4 ha)
Private	<u>1,015 acres (411 ha)</u>	<u>1,015 acres (411 ha)</u>
TOTAL	5,711 acres (2,312 ha)	5,718 acres (2,314 ha)

Table 1 - Grand Forks-East Grand Forks 1975 recreation
market area supply inventory⁽¹⁾ (cont)

<u>Recreation facilities</u>	
<u>Activity</u>	<u>Amount</u>
Picnicking	210 tables
Bicycling	1.5 miles (2.4 km)
Camping	210 sites
Swimming (pool)	20,000 sq. ft. (1,858 sq. m)
Ice skating	15 rinks
Sledding	3 acres (1.2 ha)
Playing outdoor games	72 acres (29.1 ha)
Golf	4 courses
Hunting	3,132 acres (1,267.6 ha)
Hiking	0 miles
Horseback riding	40 miles (64.4 km)
Tennis	32 courts
Canoeing	21 miles (33.8 km)
Ice hockey	17 rinks
Snowmobiling	80 acres (32.4 ha)
Fishing (stream)	10 miles (16.1 km)
Fishing (pond)	61 acres (24.7 ha)

(1) Supply inventory includes all existing recreation development plans developed within the recreation market area.

Table 2 categorizes recreation lands by the "Resource Unit Land Classification System." An analysis of the table indicates that, within each category, State and private interests own the greatest percentage of lands suitable for leisure time use. Natural and environmental lands constitute the largest category, with over 4,000 acres (1,619 ha).

Table 2 - Grand Forks-East Grand Forks resource unit land
classification

<u>Type of area</u>	<u>Owned and administered</u>	
Parks, playgrounds, playfields, and play areas	Federal	50 acres (12 ha)
	State	90 acres (36 ha)
	County	25 acres (10 ha)
	City	458 acres (185 ha)
	Private	1,015 acres (411 ha)
	School board	12 acres (5 ha)
	Quasi-public	10 acres (4 ha)
Natural and environ- mental areas	Federal	1,600 acres (656 ha)
	State	<u>2,458 acres (995 ha)</u>
TOTAL		5,718 acre (2,314 ha)

Table 3 illustrates the comparison of available supply to the standards developed by the National Recreation and Park Association. The available instant capacity of the various sites and facilities is also shown.

Table 3 - Grand Forks-East Grand Forks standards -
1975 supply comparisons

Facilities	Supply	Standards (1)	Available instant capacity
Picnicking	210 tables	5 persons per table	1,050 persons
Bicycling	1.5 miles	80 persons per mile	120 persons
Camping	210 sites	4 persons per site	840 persons
Swimming (pool)	20,000 square feet	4 persons per 100 square feet	800 persons
Ice skating	15 rinks	Not available	--
Sledding	3 acres	Not available	--
Playing outdoor games	72 acres	50 persons per acre	3,600 persons
Golf	4 courses	8 persons per hole	576 persons
Hunting	3,132 acres	Not available	--
Hiking	0 miles	20 persons per mile	--
Horseback riding	40 miles	20 persons per mile	800 persons
Tennis	32 courts	4 persons per court	128 persons
Canoeing	21 miles	Not available	--
Ice hockey	17 rinks	Not available	--
Snowmobiling	80 acres	Not available	--
Fishing (stream)	10 miles	Not available	--
Fishing (pond)	61 acres	Not available	--

(1) Standards developed by the National Recreation and Park Association.

Table 4, "Grand Forks-East Grand Forks Supply-Demand-Need Analysis," shows supply in activity occasions. Using standards provided in the North Dakota and Minnesota State Comprehensive Outdoor Recreation Plans, supply was converted to acres, miles and sites. The supply is assumed to remain constant through project years 1980, 2000, and 2030 and was used for projecting needs shown on tables 5, 6, and 7. Activity occasions for hunting (upland game, waterfowl, and big game), hiking, horseback riding, canoeing, and snow skiing were not calculated because standards have not been established.

DEMAND ANALYSIS

Only 17 recreation activities were listed in the supply data. However, 23 were selected for consideration in the demand and need analysis based on the demand for recreation use that can be expected within the Grand Forks-East Grand Forks recreation market area. The activities selected are listed below.

Playing outdoor games	Golf
Bicycling	Tennis
Swimming (pool)	Camping
Swimming (beach)	Ice hockey
Picnicking	Ice skating
Horseback riding	Sledding
Fishing	Power boating
Canoeing	Snow skiing
Water skiing	Sailing
Snowmobiling	Hunting (upland game)
Hiking	Hunting (waterfowl)
	Hunting (big game)

Demand was determined as follows:

Total demand in activity occasions = market area demand +
(15 percent of market area demand/85 percent)

where

Market area demand = participation rate x market area population

The demand was calculated for the years 1975, 1980, 2000, and 2030 (tables 4, 5, 6, and 7). Participation rates were based on and interpolated from information supplied in the North Dakota and Minnesota State Comprehensive Outdoor Recreation Plans. These rates were not held constant, but varied for each year.

Table 4 - Supply-demand-need analysis, 1975

Activity	Supply		Resident demand (activity occasions)	Total demand (1) (activity occasions)	Need (2)	
	Activity occasions	Facilities			Activity occasions	Facilities
Picnicking	50,867	210 tables	226,318	266,257	-215,390	-889 tables
Bicycling	60,150	1.5 mi; 2.4 km	972,932	1,144,626	-1,084,476	-27 mi; -43.5 km
Camping	46,448	210 sites	181,664	213,723	-167,275	-756 sites
Swimming (pool)	244,434	20,000 sq. ft; 1,858 sq m	488,319	574,493	-330,059	-3 pools
Fishing	1,735	61 ac; 24.7 ha	227,649	267,822	-266,087	-9,813 ac; -3,971.3 ha
Snowmobiling	6,480	2 mi; 3.2 km	167,826	197,442	-190,962	-29 mi; -46.7 km
Swimming (beach)	0		71,194	83,758	-83,758	-10 beaches
Ice Skating	112,500	15 rinks (3)	119,551	140,649	-28,149	-4 rinks
Sledding	3,857	3 ac; 1.2 ha	83,991	98,813	-94,956	-74 ac; -29.9 ha
Playing outdoor games	958,272	72 ac; 29.1 ha	568,768	669,139	+289,133	0 ac
Golf	194,790	4 courses	114,686	134,925	+59,865	0 courses
Hunting (4) (5) (upland game)	—	1,566 ac; 633.8 ha	53,256	62,654	—	—
Hunting (4) (5) (waterfowl)	—	1,566 ac; 633.8 ha	57,585	67,747	—	—
Hunting (5) (big game)	0		29,696	34,936	-34,936	—
Hiking (5)	0		42,411	49,896	-49,896	—
Horseback riding (4) (5)	—	40 mi; 64.4 km	78,814	92,722	—	—
Tennis	65,316	32 courts	57,419	67,552	-2,236	-1 court
Canoeing (5)	—	21 mi; 33.8 km	16,490	19,401	—	—
Water skiing	0		20,889	24,575	-24,575	-3,915 ac; -1,584.4 ha
Power boating	0		79,286	93,278	-93,278	-4,351 ac; -1,760.8 ha
Ice hockey (5)	91,800	17 rinks	32,845	48,641	+43,159	0 rinks
Snow skiing	0		7,451	8,766	-8,766	—
Sailing	0		3,732	4,391	-4,391	-164 ac; -66.4 ha

(1) Includes 15-percent nonresident demand.

(2) + indicates surplus; - indicates need.

(3) This total is also included in the ice hockey supply.

(4) No standards were available; therefore, supply and needs in activity occasions could not be calculated.

(5) No standards were available; therefore, needs in acres or miles could not be calculated.

Table 5 - Demand-need analysis, 1980

Activity	Resident demand activity occasions	Total demand ⁽¹⁾ activity occasions	Need ⁽²⁾	
			Activity occasions	Facilities
Picnicking	252,786	297,395	-246,528	-1,016 tables
Bicycling	1,149,733	1,352,627	-1,292,477	-31 mi; -49.9 km
Camping	225,095	264,818	-218,370	-986 sites
Swimming (pool)	554,569	652,433	-407,999	-3 pools
Fishing	250,708	294,951	-293,216	-10,813 ac; -4,376.0 ha
Snowmobiling	178,906	210,478	-203,998	-30 mi; -48.3 km
Swimming (beach)	82,580	97,153	-97,153	-11 beaches
Ice skating	134,028	157,680	-45,180	-6 rinks
Sledding	90,080	105,976	-102,119	-80 ac; -32.3 ha
Playing outdoor games	787,274	926,205	+32,067	0 ac
Golf	142,189	167,281	+27,509	0 courses
Hunting ⁽³⁾ (Up- land game)	61,283	72,098	--	--
Hunting ⁽³⁾ (Water- fowl)	68,138	80,162	--	--
Hunting ⁽³⁾ (Big game)	32,525	38,265	--	--
Hiking ⁽³⁾	52,202	61,414	-61,414	--
Horseback riding ⁽³⁾	103,727	122,032	--	--
Tennis	73,028	85,915	-20,599	-9 courts
Canoeing ⁽³⁾	19,779	23,269	--	--
Water skiing	54,631	64,272	-64,272	-10,239 ac; -4,143.7 ha
Power boating	90,892	106,932	-106,932	-4,987 ac; -2,018.2 ha
Ice hockey	42,584	50,099	+41,701	0 rinks
Snow skiing ⁽³⁾	8,444	9,934	-9,934	--
Sailing	4,674	5,499	-5,499	-205 ac; -83.0 ha

(1) Includes 15-percent nonresident demand.

(2) + indicates surplus; - indicates need.

(3) No standards were available; therefore, needs in acres or miles could not be calculated.

Table 6 - Demand-need analysis, 2000

Activity	Resident demand activity occasions	Total demand(1) activity occasions	Need(2)	
			Activity occasions	Facilities
Picnicking	365,758	430,304	-379,437	-1,565 tables
Bicycling	2,567,696	3,020,818	-2,960,668	-73 mi;-105.4 km
Camping	399,268	469,727	-423,279	-1,913 sites
Swimming (pool)	819,586	964,218	-719,784	-6 pools
Fishing	342,496	402,936	-401,201	-14,796 ac;-5,987.9 ha
Snowmobiling	220,080	258,918	-252,438	-39 mi;-62.8 km
Swimming (beach)	128,126	150,737	-150,737	-18 beaches
Ice skating	193,899	228,117	-115,617	-16 rinks
Sledding	126,631	148,978	-145,121	-113 ac;-45.7 ha
Playing outdoor games	1,057,627	1,244,267	-285,995	-18 ac;-7.2 ha
Golf	261,482	307,626	-112,836	-2 courses
Hunting(3) (Upland game)	93,219	109,670	--	--
Hunting(3) (Water- fowl)	115,346	135,701	--	--
Hunting(3) (Big game)	44,826	52,737	--	--
Hiking(3)	81,207	95,538	-95,538	--
Horseback riding(3)	130,196	153,171	--	--
Tennis	147,631	173,684	-108,368	-53 courts
Canoeing(3)	33,909	39,893	--	--
Water skiing	99,021	116,495	-116,495	-18,559 ac;-7,510.8 ha
Power boating	140,066	164,784	-164,784	-7,686 ac;-3,110.5 ha
Ice hockey	88,998	104,704	-12,904	-2 rinks
Snow skiing(3)	12,463	14,662	-14,662	--
Sailing	8,174	9,616	-9,616	-359 ac;-145.3 ha

(1) Includes 15-percent nonresident demand.

(2) + indicates surplus; - indicates need.

(3) No standards were available; therefore, needs in acres or miles could not be calculated.

Table 7 - Demand-need analysis, 2030

Activity	Resident demand activity occasions	Total demand ⁽¹⁾ activity occasions	Need ⁽²⁾	
			Activity occasions	Facilities
Picnicking	642,446	755,819	-704,952	-2,929 tables
Bicycling	3,443,223	4,050,851	-3,990,701	-100 mi; -144.6 km
Camping	904,465	1,064,076	-1,017,628	-4,599 sites
Swimming (pool)	1,476,467	1,737,020	-1,492,586	-13 pools
Fishing	558,516	558,516	-556,781	-20,533 ac; -8,309.7 ha
Snowmobiling	304,101	357,766	-351,286	-54 mi; -86.9 km
Swimming (beach)	247,991	291,754	-291,754	-35 beaches
Ice skating	337,964	397,605	-285,105	-41 rinks
Sledding	197,950	232,882	-229,025	-178 ac; -72.1 ha
Playing outdoor games	1,657,772	1,950,320	-992,048	-63 ac; -25.5 ha
Golf	590,781	695,036	-500,246	-8 courses
Hunting ⁽³⁾ (Upland game)	178,060	209,482	--	--
Hunting ⁽³⁾ (Water- fowl)	248,609	292,481	--	--
Hunting ⁽³⁾ (Big game)	73,123	86,027	-86,027	--
Hiking ⁽³⁾	167,353	196,886	-196,886	--
Horseback riding ⁽³⁾	170,598	200,704	--	--
Tennis	384,548	452,409	-387,093	-190 courts
Canoeing ⁽³⁾	71,765	84,429	--	--
Water skiing	222,476	261,736	-261,736	-42,493 ac; -17,196 ha
Power boating	269,187	316,691	-316,691	-14,772 ac; -5,978.3 ha
Ice hockey	241,192	283,755	-191,955	-35 rinks
Snow skiing ⁽³⁾	22,444	26,405	-26,405	--
Sailing	18,812	22,132	-22,132	-322 ac; -130.4 ha

(1) Includes 15-percent nonresident demand.

(2) + indicates surplus; - indicates need.

(3) No standards were available; therefore, needs in acres or miles could not be calculated.

A "total demand" chart (figure 1) indicates that the greatest demand is for bicycling, which exceeds 4 million activity occasions by target year 2020. Playing outdoor games is the next activity, followed by swimming (pool), camping, picnicking, golf, fishing, tennis, ice skating, snowmobiling, power boating, hunting (waterfowl), swimming (beach), ice hockey, water skiing, sledding, hunting (upland game), hiking, horseback riding and, of lesser importance, hunting (big game), canoeing, snow skiing, and sailing.

TOTAL DEMAND
GRAND FORKS-EAST GRAND FORKS RECREATION MARKET AREA

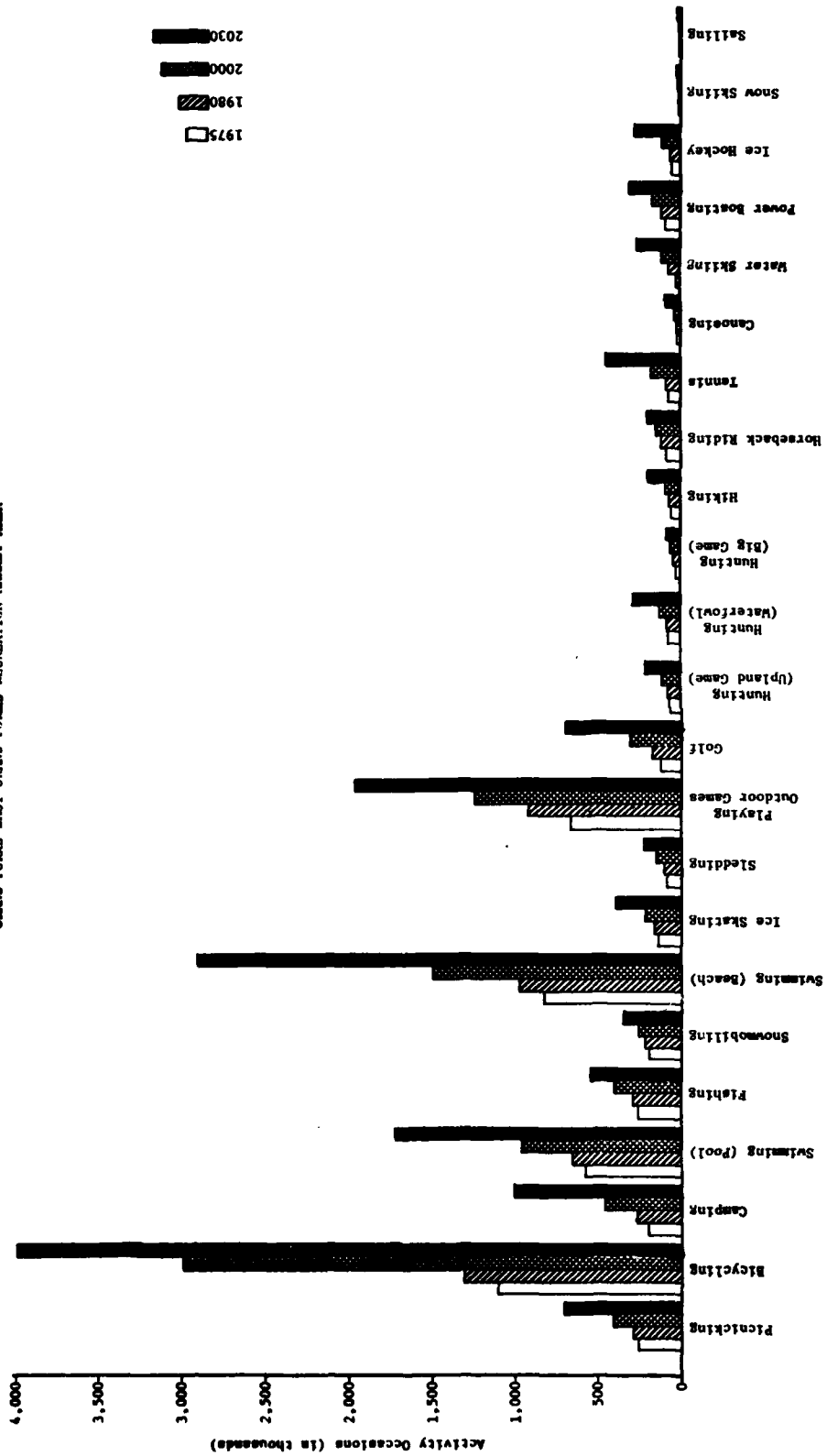


Figure 1

NEED ANALYSIS

To assess needs, the 1975 supply was subtracted from the total demand for each of the target years (tables 4, 5, 6, and 7).

$$\text{SUPPLY} - \text{DEMAND} = \text{NEED}$$

Where demand exceeded the available supply, a need is indicated by a (-). Where demand did not exceed the available supply, a surplus is indicated by a (+). Using standards supplied by the North Dakota and Minnesota State Comprehensive Outdoor Recreation Plans, needs in activity occasions were converted to acres (ha), miles (km), and sites for planning purposes. Current needs are shown for 20 of the 23 activities listed on table 3. Significant deficits exist for all activities except tennis, playing outdoor games, golf, and ice hockey.

By the target years 1980, 2000, and 2030, needs continue to increase for the activities exhibiting 1975 deficits as well as for all of the activities. This analysis indicates that a number of activity needs will undoubtedly never be fulfilled but illustrates where effort should be directed.

EXISTING RECREATION PLANNING EFFORTS AND INSTITUTIONAL ORGANIZATIONS

The major existing recreation planning programs in the study area are conducted by the Grand Forks Park District and the city of East Grand Forks.

GRAND FORKS

In 1974, the Grand Forks Master Park and Open Space Plan was prepared by the Bureau of Governmental Affairs, University of North Dakota. The objective of the plan is to provide for the location, land

acquisition, and development of parks and open space in the Grand Forks area. The plan will also serve as a guide to assist public officials in the development of a sound park and open space system. The plan criteria included division of the city into planning districts on the basis of walking distance, population, and transportation barriers; analysis of existing population characteristics by planning districts; and use of published standards for recreation facilities in 50 comparable and 3 other North Dakota cities.

The study findings recommended development of facilities, in order of importance, as follows: (1) bike paths, (2) swimming pools, (3) tennis courts, (4) ice skating areas, (5) playground sites, and (6) campgrounds. The park plan recommendations recognized that acreage deficiencies would occur by 1990 and suggested implementation of one additional community-wide park; one additional special-use area (such as sport fields, golf courses, recreation buildings, and other limited-use facilities); two subcommunity parks through expansion and/or development of two existing parks; eight additional neighborhood parks; four tot lots and two mini-parks; bicycle/hiking trails encircling the city, running parallel to English Coulee and the Red River of the North and linking the north and south portions of the city; and a bicycle lane system along major traffic corridors throughout the city. In addition, neighborhood parks should be co-located with the elementary schools, with cooperation between the school district and the park district, to maximize use of school indoor facilities and park outdoor facilities. In new subdivisions, an 8-percent land dedication of the owners' total gross acreage should be provided for parks. The Grand Forks Park District has implemented a number of these recommendations such as the 8-percent dedication requirement, co-location with schools, and acquisition of several of the sites identified in the plan.

The Grand Forks City Planning Office is presently developing a riverfront plan for the Red River of the North. The major emphasis of the plan is development of a trail system. This effort is in accord with the Grand Forks Master Park and Open Space Plan.

EAST GRAND FORKS

The East Grand Forks Recreation Facilities Study was prepared by the Recreation Administration, University of North Dakota, in 1976. The objective of this plan was to collect data for recreation areas and facilities planning; determine needs for present and future land acquisition; determine location and development of park areas; and provide data for an updated 5- to 10-year master plan. The plan criteria were similar to those of the Grand Forks Master Park and Open Space Plan, but also included a survey of the existing facilities and areas, an analysis of existing population by age groups, and an integration of citizens' opinions into the study process.

The plan's recommendations were to provide budget priorities for adequate maintenance and development; acquire land in the extreme north and south areas and in the northeastern segment of the city; provide 6 percent of landowners' total gross acreage in new subdivisions for parks with a minimum of 2 acres (if the minimum is not met, the city should receive cash in lieu of); develop land at 10th Avenue North between 8th and 9th Streets North as a tot lot and park to beautify that entrance to the city; develop marked bike routes through the city, as well as bike and hike trails running parallel to the Red River of the North and Red Lake River; develop a former landfill; develop a softball complex; and develop water-based facilities to improve the appearance and provide greater use of floodplain areas. This plan was developed in 1977, and implementation has not yet occurred to any great extent.

GRAND FORKS AIR FORCE BASE

An outdoor recreation plan for the Grand Forks Air Force Base, North Dakota, was developed by the Natural Resources Section, Environmental Policy and Assessment Branch of the Environmental Planning Division. The plan identifies and delineates outdoor recreation sites or potential sites and will serve as the single source for control, development, and management of outdoor recreation resources. However, the outdoor recreation program on this installation is severely limited by the terrain and climatic conditions. The area provides ideal flying and missile operation conditions, but few outdoor recreation opportunities. Another limiting factor is the physical size and layout of the base. Areas currently used for outdoor recreation (i.e., snowmobiling, motorcycling, and horseback riding) are small and further limit large scale participation. Existing and future developments are expected to be used by base personnel only.

GRAND FORKS COUNTY

The Grand Forks County Recreation Plan was developed by the Association of North Dakota Geographers, University of North Dakota, in 1974. The plan concluded that urban population will continue to increase while rural population will continue to decrease. The following recommendations were made:

- The county should organize a county recreation board and hire a director.
- The county should be responsible, in part, for bicycling, hiking, snowmobiling, picnicking, and camping.
- The county should construct three parks so that county citizens have the option of more sites closer to home.
- The county should construct hiking, bicycling, and snowmobiling trails.

- The county should construct a large multipurpose master recreation site.
- The county fairgrounds should be sold and the money used to acquire land for the three parks and the multipurpose site.
- All methods of financing acquisition should be pursued by the recreation board and its director.

The recommended areas for county parks generally correspond to sites 23 and 1 (see pages 32 and 33) as identified in the recreation potentials of the Corps of Engineers Urban Water Resources Study.

NORTH DAKOTA

The 1975 North Dakota State Comprehensive Outdoor Recreation Plan was prepared by the North Dakota State Outdoor Recreation Agency. The purpose of the plan is to develop a planning framework for governmental units in meeting outdoor recreation needs of the future. The primary objective of the State plan is to identify deficiencies in outdoor recreation opportunities; determine a planning guideline to correct these deficiencies; and recommend action programs that will enable the appropriate units of government to manage and preserve the recreation resources in the most effective manner.

The plan identifies the study area as being located within planning region 4 which consists of Grand Forks, Pembina, Walsh, and Nelson Counties (see figure 2). The needs for recreation facilities within the region include swimming, picnicking, camping, playgrounds and playfields, ice skating, golf, boating, tennis, hockey, hunting, and bicycling.

NORTH DAKOTA PLANNING REGIONS

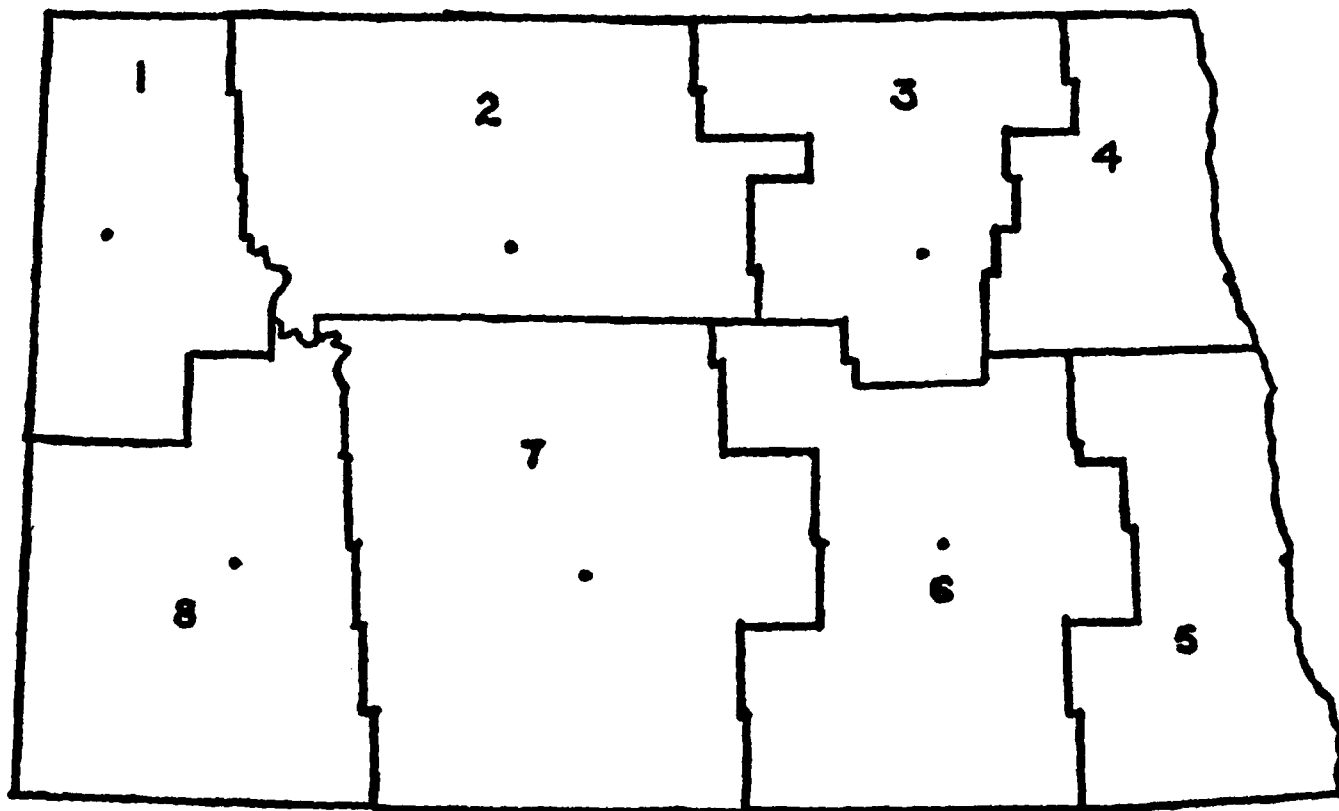


Figure 2

8 The State has acquired land and developed Turtle Creek State Park, located on the extreme western fringes of the study area. Long-range plans include acquisition of an additional 217 acres identified as site 30. Proposed activities would consist of camping, picnicking, hiking, nature study, snowmobiling, bicycling, and horseback riding.

MINNESOTA

The Minnesota State Comprehensive Outdoor Recreation Plan was prepared by the Bureau of Environmental Planning and Protection, Minnesota Department of Natural Resources, in 1974. The purpose of the plan is to provide a guide and framework for management, protection and development of the outdoor recreation system. This will be done by presenting background information, outlining needs and deficiencies, setting priorities, and presenting alternatives for action.

Polk County is located in planning region 1 (see figure 3), which also includes Kittson, Roseau, Marshall, Pennington, Red Lake, and Norman Counties. The needs for recreation facilities in the 7-county region were identified as swimming, boating, playgrounds and playfields, tennis, picnicking, camping, hiking, snowmobiling, and ski touring.

MINNESOTA ECONOMIC DEVELOPMENT REGIONS

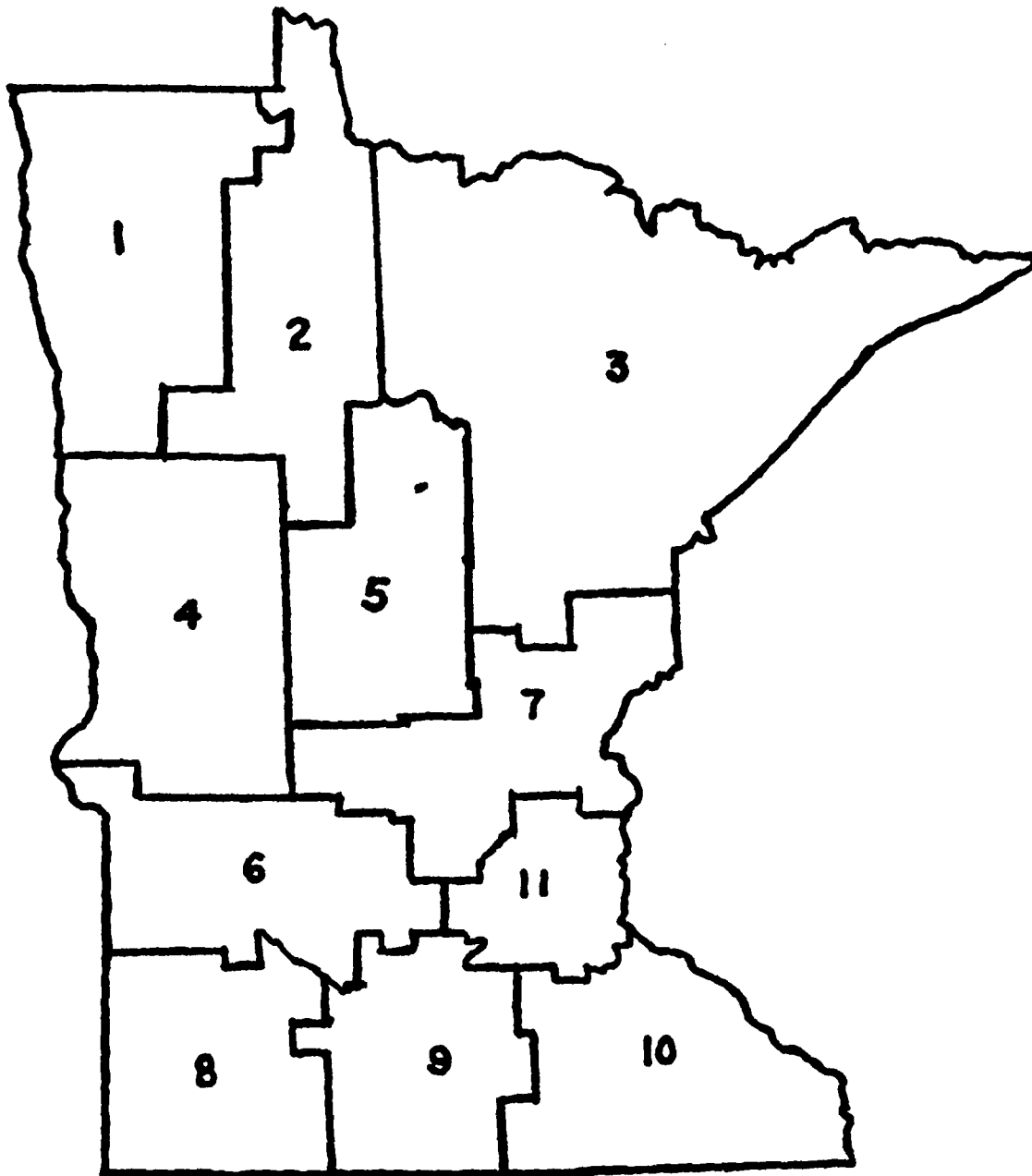


Figure 3

FISH AND WILDLIFE SERVICE

The Fish and Wildlife Service is responsible for administration of the Kelly Slough area. No recreation planning has been carried out for the area, but the Service realizes the significant potential for recreation. Recreation studies are planned for the near future.

SOIL CONSERVATION SERVICE

The Soil Conservation Service provides planning assistance to private landowners for small watershed projects which have recreation potential. However, no such assistance has been requested to date.

HERITAGE CONSERVATION AND RECREATION SERVICE

The Heritage Conservation and Recreation Service is assisting the St. Paul District, Corps of Engineers, by providing the recreation planning effort for the Grand Forks-East Grand Forks Urban Water Resources Study.

SUMMARY

A summary of the various entities in the study area is given in table 8, Institutional Analysis.

Table 8 - Institutional analysis

County & State	Agency	Level of government	Jurisdiction	Financial resources	Inter-relationship	Floodplain zoning	Land Dedication ordinance	Planning
Grand Forks - North Dakota	Grand Forks Park District, Grand Forks, North Dakota	Local (special district)	City limits + 2-mile fringe area	13.5 Mill Levy Assess, Federal grants, fees, Bond issues, spec Assess	School District Private Developers Federal/State East Grand Forks University of North Dakota City-County	No	No, a city ordinance	Excellent - adequate staff is available
Grand Forks - North Dakota	Planning Office, City of Grand Forks, North Dakota	Local (city)	City limits + 2-mile fringe area	Bikeway funds through Highway Department	Park District University of North Dakota	Yes	Yes 8 percent	Fair - some planning is occurring for riverfront
Grand Forks - North Dakota	Park Board, William Mitchell, Thompson, North Dakota	Local (town)	Town limits	Limited for O&M of the city park	None	Yes	No	None
Grand Forks - North Dakota	Park Board, Kay Carroll, Emerald, North Dakota	Local (town)	Town limits	General funds Federal grants	Park Board State/Federal	No	Yes, but limited	Very minimal - Just starting to recognize recreation
Grand Forks - North Dakota	Town of Merrifield, Robert Fortin, RRL, Grand Forks, North Dakota	Local (town)	Town limits	None available for park and recreation	None	No	No	None
Grand Forks - North Dakota	Park Board, Gerald Negie, Marvel, North Dakota	Local (town)	Town limits	Limited for O&M of the city park	None	Yes	No	Very minimal

Table 8 - Institutional analysis (cont)

County & State	Agency	Level of government	Jurisdiction	Financial resources	Inter-relationship	Floodplain zoning	Land dedication ordinance	Planning
Grand Forks - North Dakota	Town of Mekinock, Ross Erickson, Arvilla	Local (town)	Town limits	None available for park and recreation	None	No	No	None
Grand Forks - North Dakota	School District, Grand Forks, North Dakota	Local (special district)	City limits + 8 miles south, 7 miles west, 4 miles north	General funds	Park District University of North Dakota City-county	No	No	Minimal planning is accomplished in conjunction with school activities
Grand Forks - North Dakota	Park Board, Grand Forks, North Dakota	Local (county)	Unincorporated areas within county	None for park and recreation	Very minimal	Yes	No	No recreation planning is occurring
Grand Forks - North Dakota	Red River Planning Council, Grafton, North Dakota	Regional	4 North-eastern counties	None for park and recreation	Minimal involvement with entities in study area	No	No	No recreation planning is occurring
Grand Forks - North Dakota	University of North Dakota, Grand Forks, North Dakota	State	Campus lands	State appropriations, fees, Federal grants	Park District, City of Grand Forks-East Grand Forks	No	No	Some planning occurring as a result of course work
Folk - Minnesota	Parks and Recreation Department, East Grand Forks, Minnesota	Local (city)	City limits	General funds, fees, Federal grants, Bond issues	Grand Forks Park Board, School District, State/Federal University of North Dakota, Private Developers	No	No	Good - has adequate staff

Table 8 - Institutional analysis (cont)

County & State	Agency	Level of government	Jurisdiction	Financial resources	Inter-relationship	Floodplain zoning	Land dedication ordinance	Planning
Polk - Minnesota	School District, East Grand Forks	Local (Special District)	City limits + 5-mile fringe area	General funds	City	No	No	Minimal planning is accomplished in conjunction with school activities
Polk - Minnesota	County Commissioners, Crookston Minnesota	Local (County)	Unincorporated areas within county	Limit for one county park	None	Yes	No	Some recreation planning for parks and potential park sites.
Polk - Minnesota	Northwest Regional Development Commission, Crookston, Minn.	Regional	7 northwestern counties	None for park and recreation	Minimal involvement with entities in study area	No	No	No recreation planning is occurring
All counties - North Dakota	Parks & Recreation Department, RR2, P.O. Box 139, Mandan, North Dakota	State	Statewide	Legislative appropriations, park fees	County-city, Park District, Federal, other State agencies	No	No	Excellent - has adequate staff
All counties - Minnesota	Department of Natural Resources	State	Statewide	Legislative appropriations, park fees	County-city	No	No	Excellent - has adequate staff
All counties - North Dakota	Heritage Conservation and Recreation Service - MCRO, P.O. Box 25387 Denver Federal Center, Denver, Colorado 80225	Federal	10-State Mid-Continent Region	Legislative appropriations	Federal, State-County-City-Towns, Park District, Univ. of North Dakota, Private	No	No	Excellent - has adequate staff

Table 8 - Institutional analysis (cont)

County & State	Agency	Level of government	Jurisdiction	Financial resources	Inter-relationship	Floodplain zoning	Land dedication ordinance	Planning
All counties - Minnesota	Heritage Conservation and Recreation Service Lake Central Region, 3653 Research Park Drive, Ann Arbor, Michigan	Federal	6 State Lake Central Region	Legislative appropriations	Federal-State-county-city-towns-private	No	No	Excellent - has adequate staff
North Dakota & Minnesota	U.S. Army Corps of Engineers, St. Paul District	Federal	North Dakota & Minnesota	Legislative appropriations	Federal-State-county-city-towns-private	No	No	Excellent - has adequate staff
North Dakota & Minnesota	Fish & Wildlife Service	Federal	North Dakota & Minnesota	Legislative appropriations	State	No	No	Not providing any recreation planning
Grand Forks - North Dakota	Grand Forks Air Base	Federal	Air Base	Legislative appropriations	None	N.A.	N.A.	Any planning is done for Air Base lands only

CONCLUSIONS

Conclusions from this analysis follow.

There is a lack of involvement in recreation planning and programs, particularly at the local level of government, with the exception of the Grand Forks Park District and East Grand Forks.

The counties should become more actively involved to fill a void in planning efforts within the unincorporated areas. The county could also provide technical assistance to communities that do not have the funds or expertise to conduct these efforts on their own.

The regional planning commissions should take a more active role in park and recreation planning functions. They do, however, participate in the A-95 review of Federal projects.

A continuous problem for all entities is the need for more money. Public bodies are constantly striving to promote and develop new funding methods.

The primary source of recreation dollars is general funds, which may fluctuate substantially from year to year. In some instances, funds collected are earmarked for park and recreation programs and activities. The North Dakota Century Code (40-49-03) allows the establishment of park districts and the authority to assess a tax levy for park and recreation planning, land acquisition, capital improvements, and associated operation and maintenance. This gives the districts a stable funding base.

The Land and Water Conservation Fund Act of 1964 and the now-defunct Housing and Urban Development Open Space Program have provided a source of funding for State and local entities through a matching grant program. This has resulted in an increase in the public recreation estate but has also increased problems in operation and maintenance because many communities experience difficulties in providing adequate funds for this purpose.

Recreation program fees, user fees, and entrance fees are important supplements to general revenue sources. The smaller communities have difficulty in establishing recreation fee programs because they lack trained personnel to organize and conduct programs. Bonds are another source of financial support; however, this is generally restricted to larger cities which can carry a large bonded indebtedness.

The financial squeeze that public entities experience forces them to consider alternative ways to provide leisure time programs. One such alternative is to promote and develop agreements and cooperative arrangements among the various entities. Cooperative programs allow joint use and joint funding of facilities, sites, and areas, thereby reducing the need for additional land acquisition and new construction. More cooperative programs are needed among all levels of government, especially at the county level.

POTENTIAL RECREATION RESOURCES

The supply-demand-need analysis indicates a significant demand and need for a variety of recreation activities at present but also for the target years 1980, 2000, and 2030. It is apparent that all future needs cannot be accommodated within the study area but, through potential site selection, evaluation, acquisition, and development, a portion of these needs could be met on this acreage.

This site identification and evaluation system considers only existing undeveloped lands that could be acquired and developed with facilities to accommodate anticipated activities. Many of the deficit facilities could be constructed on existing park or open space sites presently in public ownership. Thirty-five sites were identified and evaluated. A specialized form for this evaluation was developed and each site was inspected on the ground. A composite of these evaluations is included as table 9, Site Analysis Summary.

Table 9 - SITE ANALYSIS SUMMARY

Table 9 - SITE ANALYSIS SUMMARY																								
Site Acres	ACTIVITIES													Year available			Resource unit potential		ADMINISTRATION					
	Picnic	Swimming	Camping	Fishing	Hiking	Snowmobiling	Attend sporting events	Outdoor concerts	Trail bike riding	Hunting	Walking for pleasure	Playing game or sports	Mature study	Bicycling	Horseback riding	Tennis	Golf	Canoeing		Year available			Regional Parks General	Community Neighborhood Playgrounds
																				1980	2000	2030		
1 128	X		X	X	X	X					X	X	X	X	X				X	X	X	X	Grand Forks County	
2 18	X	X						X			X	X									X	X	Park Board	
3 80											X	X									X	X	East Grand Forks	
4 10	X	X			X			X			X	X									X	X	Park Board	
5 8	X			X	X	X					X	X									X	X	East Grand Forks	
6 6	X	X									X	X									X	X	Park Board	
7 6	X			X	X	X					X	X									X	X	Park Board Home-owners Association	
8 18	X	X						X			X	X									X	X	Park Board	
9 115	X		X	X	X	X					X	X									X	X	Polk County	
10 2	X				X						X	X									X	X	East Grand Forks	
11 4	X			X	X	X					X	X									X	X	Park Board	
12 0.5	X										X	X									X	X	Park Board	
13 12	X			X	X						X	X									X	X	Park Board & City	
14 1					X						X	X									X	X	Park Board and Cemetery	
15 9					X	X			X												X	X	East Grand Forks	
16 57	X	X	X	X	X	X	X	X	X		X	X									X	X	Polk County	
17									Not available														East Grand Forks	
18 2	X										X	X									X	X	Park Board	
19									Same as Site 13															Religious Group
20 10	X	X			X	X	X	X			X	X									X	X	Park Board	
21 25	X	X		X	X	X	X	X			X	X									X	X	Park Board	
22 6	X	X		X	X	X	X				X	X									X	X	Park Board	
23 156	X		X	X	X	X					X	X									X	X	County and Park Board	
24 110	X		X	X	X	X					X	X									X	X	County and Park Board	
25									Not available														Park Board	
26											X	X									X	X	Polk County	
27 64	X		X	X	X	X	X	X			X	X									X	X	East Grand Forks	
28 26	X	X		X	X	X	X				X	X									X	X	Polk County	
29 166	X		X	X	X	X	X				X	X									X	X	State of Minnesota	
30 217	X		X	X	X	X	X				X	X									X	X	State of Minn. Dak.	
31 10	X				X		X	X			X	X									X	X	Thompson	
32 5	X	X			X	X					X	X									X	X	Merrifield	
33 30	X		X	X	X	X					X	X									X	X	County and Park Board	
34 57	X		X	X	X	X					X	X									X	X	Grand Forks County	
35 12	X		X	X	X						X	X									X	X	Manvel	
36 5	X	X		X	X						X	X									X	X	Mekinock	
37 5	X	X		X	X						X	X									X	X	Decorado	
38 45	X		X	X	X	X					X	X									X	X	County	
TOTAL 1,433.5																			66.5	746	602	1,178		255.5

A total of 1,433.5 acres has been identified as having potential to accommodate the deficit recreation activities. Of this total 255.5 acres could be developed as community and neighborhood parks, playgrounds, and playfields. The remaining 1,178 acres would be available for regional parks, general parks, and recreation areas. These resource unit designations are defined as follows:

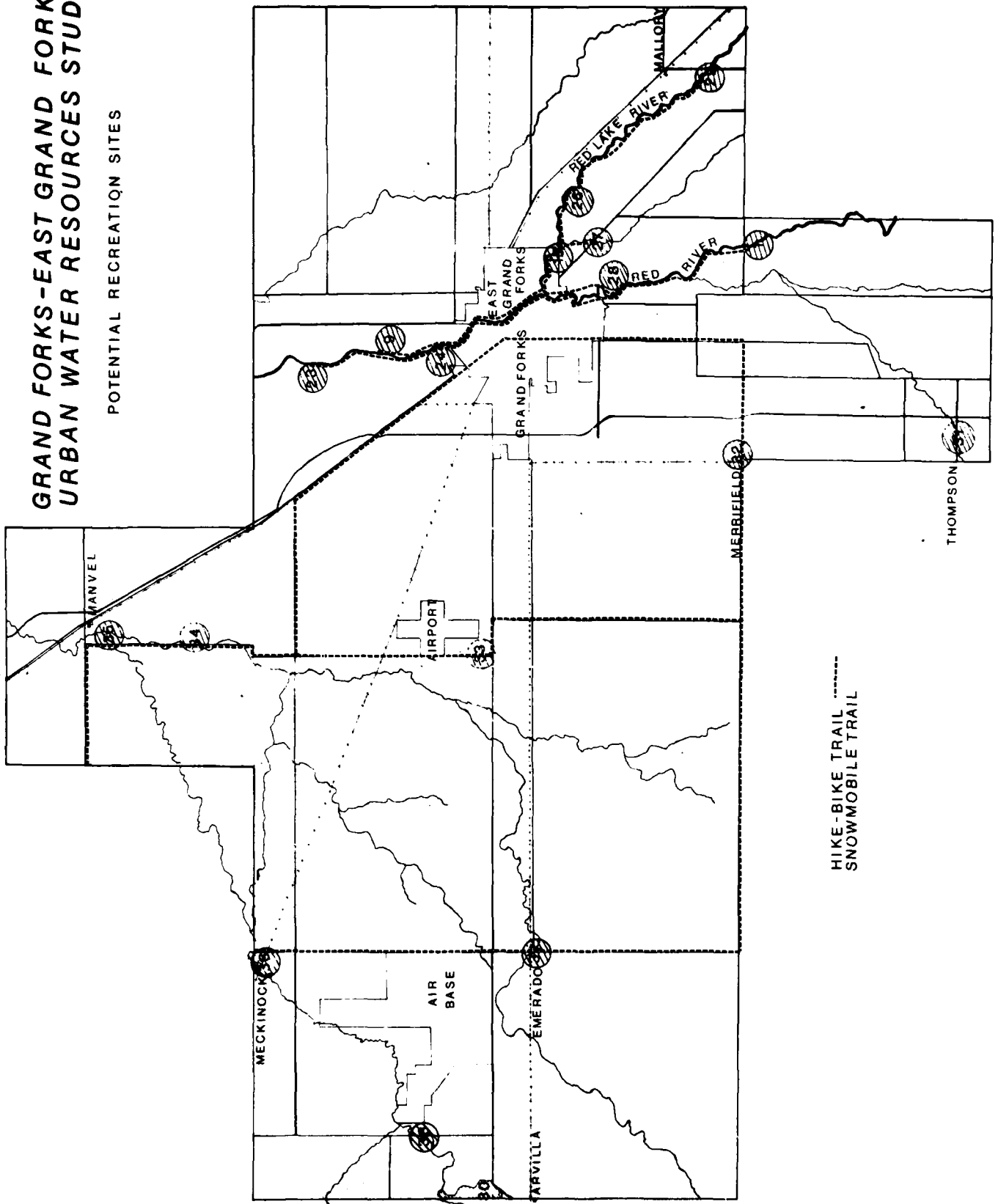
a. Community and neighborhood parks, playgrounds, and playfields - Physiographic features of these units are adaptable to intensive recreation use and development. An attractive natural setting is desirable; however, man-made settings are acceptable. These units have no specific size criteria, and they generally receive a consistent level of use throughout most of the year.

b. Regional parks, general parks and recreation areas - These areas have varied topography, interesting flora and fauna, and attractive natural or manmade settings, and offer a wide range of recreation opportunities. They generally consist of large tracts of land which can accommodate extensive day, weekend, and vacation use.

These various sites are identified by a number and shown on figures 4 and 5. Figure 4 illustrates specific site locations in Grand Forks and East Grand Forks. Figure 5 identifies the sites located outside the city limits but within the 14-township recreation market area. Most of the sites are located along the drainageways flowing through the study area, because the best natural settings occur along these stream courses and water-related or water-oriented activities could be provided. In addition to specific sites, a system of potential trail locations is identified.

GRAND FORKS-EAST GRAND FORKS URBAN WATER RESOURCES STUDY

POTENTIAL RECREATION SITES



The authorized project plan and modified plans A and B would have no effect on existing or potential recreation sites because the proposed levees and floodwalls would be confined to the existing emergency levee. However, river access and use could be somewhat restricted, notably for segments adjacent to the floodwalls. Potential trails could benefit from these three alternatives because hiking, biking, and horse and snowmobile trails could be provided on the crest of the levees. The trails should be coordinated with the levee construction and included as a cost of the project. The levee side slopes might also be used for snow sledding, tubing, and practice skiing if they are not too steep. Levee borrow areas should be reviewed to ensure that they are not within identified potential recreation sites and do not adversely affect those sites.

The new development plan for the north and south areas would not affect existing sites but could conflict with potential sites 3 and 5 as identified on figures 4 and 5. The north plan levee could encroach on site 3 and the south plan levee could encroach on site 5. Therefore, the exact locations would require close monitoring to ensure that no significant acreage would be lost for the levee construction. Benefits for the potential trail system and limited winter activities would be similar to those for the three alternatives previously discussed. River access and use could be somewhat restricted with this alternative, especially at the floodwall locations (see table 10).

Grand Forks

The alternatives considered for Grand Forks include nonstructural measures, flood barriers, diversion channel, off-channel storage, and channel modifications.

The nonstructural concept considers six plans: flood warning and forecasting services, flood insurance, floodplain regulations and practices, evacuation and relocation, flood proofing, and emergency floodfighting and relief activities. Potential recreation sites would benefit from several of the nonstructural plans. Floodplain regulations would preserve the sites from development and maintain the existing open space and greenbelt concepts. However, the kinds and amounts of recreation facilities would be restricted because the sites would be allowed to flood. Potential trails, as well as river access and use, would benefit considerably under the floodplain regulations approach since there would be no development to restrict or prevent this use. The evacuation and relocation plan would benefit potential sites, trail development, and river access and use because the evacuated areas could be converted to park and open space acreage.

The flood barrier solutions to flood control include levees, floodwalls, road raises, and closures across road and rail crossings. Although these barriers are normally viewed as incompatible with recreation sites, they would be considered a benefit to existing parks in the Grand Forks area by providing protection for recreation facilities. However, in the evaluation of potential sites, these flood control measures are not considered to be beneficial because acreage would be required for their construction. Specific sites that could be affected are 7, 11, 13, and 24, as identified on figures 4 and 5. The barriers, especially the levees, would benefit potential trails because trails could be constructed on their crests. River access and use would be restricted in some areas, especially at floodwall locations.

and would be beneficial to potential sites and trails. The location of a storage facility would have to be carefully selected to avoid damage to potential recreation areas. A greater variety of water-related activities could then be provided, such as boating, water-skiing, canoeing, sailing, and swimming.

The groundwater and reuse alternatives would provide little recreation potential except for possible trail locations along the major waterline system (see table 10).

WASTEWATER

Under sections 201 and 208 of the Clean Water Act (amended 1977), some recreation benefits could be realized from the three wastewater alternatives of (1) treatment, (2) nonstructural, and (3) storage. The construction of any new treatment plants should consider recreation as a secondary benefit and additional land provided around the plants as natural open space sites. The construction of interceptor sewer lines can be co-located with hiking-biking trails, and partial funding could be made available from the Environmental Protection Agency. Any higher level of wastewater treatment would probably improve the water quality which, in turn, would make the river more desirable for recreation use. The nonstructural and storage alternatives appear to offer few recreation benefits (see table 10).

URBAN DRAINAGE

The alternatives for urban drainage can be classified under two categories: storage and conveyance systems. The storage alternatives that would benefit recreation include dry and permanent impoundments and channel storage. The dry impoundment areas could be incorporated into existing or potential recreation sites and used for certain activities during the dry cycles. Permanent impoundments would provide considerable benefits to the study area, which is deficient in flat water acreage.

A permanent impoundment would not only help to alleviate these needs but could also make this system an integral part of the flood control and water supply alternatives. Channel storage would be of some value to recreation, but the benefits would depend on the extent and location of the areas and on any channel modifications that might be necessary. The potential trail systems would benefit from all three storage concepts, although the most benefits would result from the permanent impoundment plan.

The conveyance system approach would offer little recreation benefit with the possible exception of trails, which could be co-located with the conveyance routes.

CONCLUSIONS

From the analysis of alternatives and table 10, the flood control alternative of reservoir storage, the water supply alternative of off-channel storage, and the urban drainage alternative of permanent impoundments would provide the most benefits for recreation. The storage alternatives would also help reduce problems of the primary uses and still be within the overall study efforts.

The next most favorable water resource plan for recreation consists of the nonstructural flood control and wastewater treatment alternatives. This concept is geared toward potential rather than existing sites. The best plan for existing recreation areas would be a combination of storage and flood barrier alternatives and, in particular, the floodwall concept. This combination appears to be the most effective in protecting existing parks from flooding. The cost of flood cleanup, loss of revenue, site relocation, and development and protection of Federal investments in these areas are the justification for this level of protection.

EFFECTIVENESS OF ALTERNATIVES IN SATISFYING RECREATION DEMAND

An important consideration of water resource planning is to evaluate not only the recreation potential of alternatives but also their effectiveness

in satisfying demand. This portion of the leisure time analysis for Grand Forks-East Grand Forks considers this goal. The evaluation is based on a general view as the time and effort required for a detailed analysis for specific sites will be more meaningful when the final plan is selected.

FLOOD CONTROL

East Grand Forks

The three East Grand Forks flood control alternatives - authorized, "A" modified, and "B" modified - would all accommodate demand for the same activities (see table 11). The extent of this demand fulfillment would depend on the length and type of the flood barriers that would provide trails for biking, snowmobiling, hiking, and horseback riding. The flood control alternatives would provide no opportunities for 15 activities and would have an adverse impact on fishing and canoeing. The new development flood control alternative would provide for few activities and thus have little effect on satisfying overall recreation demand.

Table 11 - East Grand Forks, alternative plan effectiveness to satisfy recreation demand

Activity	Flood control			New develop- ment		Diver- sion	Water supply			Wastewater		Urban drainage	
	Authorized	A- modified	B- modified				Off- channel storage	Ground- water	Reuse	Treat- ment	Non- structural	Storage	Conveyance
Picnicking	0	0	0	-									
Bicycling	+	+	+	+									
Camping	0	0	0	-									
Swimming (pool)	0	0	0	-									
Fishing	-	-	-	-									
Snowmobiling	+	+	+	+									
Swimming (beach)	0	0	0	0									
Ice skating	0	0	0	0									
Sledding	+	+	+	+									
Playing outdoor games	0	0	0	-									
Golf	0	0	0	0									
Hunting (Upland game)	0	0	0	0									
Hunting (Water- fowl)	0	0	0	0									
Hunting (Big game)	0	0	0	0									
Hiking	+	+	+	+									
Horseback riding	+	+	+	+									
Tennis	0	0	0	-									
Canoeing	-	-	-	-									
Water skiing	0	0	0	0									
Power boating	0	0	0	0									
Ice hockey	0	0	0	-									
Snow skiing	+	+	+	+									
Sailing	0	0	0	0									

(+) - Denotes effectiveness to help satisfy demand.

(0) - Denotes no effect to help satisfy demand.

(-) - Denotes adverse effectiveness to help satisfy demand.

Same as
Grand Forks

Same as Grand Forks

Same as Grand Forks

Grand Forks

Nonstructural measures would be effective in meeting some of the demands for nine recreation activities (see table 12). The remaining 14 activities would either not be available or would be detrimentally affected as a result of this alternative.

If flood barriers, especially floodwalls, are viewed as the only means of protecting against flooding, their ability to accommodate demand increases since they would protect existing sites. However, if flooding were prevented by other means, recreation potential offered by flood barriers would be considerably lower. The actual amount of demand satisfaction would depend on the length and types of the flood barriers.

The diversion channel alternative indicates potential only for activities requiring trails; i.e., bicycling, snowmobiling, hiking, and horseback riding. The length of the diversion channel would dictate how many miles of trails could be provided to accommodate a portion of the demand. Four activities would be adversely affected and no demand satisfaction would be provided for the remaining 15 activities.

- The reservoir storage alternative would provide opportunities for the majority of activities as shown on table 12. The extent of meeting the demand for these activities would depend on reservoir size and location. This alternative could have adverse impacts on hunting upland game since habitat area might be destroyed as a result of reservoir construction. Six activities would not be affected by reservoir storage (see table 12).

Channel modification could eliminate the potential for nine activities and would help reduce demands only for snowmobiling and canoeing.

Table 12 - Grand Forks, Alternative plan effectiveness to satisfy recreation demand

Activity	Flood control				Water supply				Wastewater			Urban drainage	
	Non-structural	Flood barriers	Diver-sion channel	Reservoir storage	Channel modification	Garrison Diversion	Off-channel storage	Ground-water	Reuse	Treat-ment	Non-structural	Storage	Conveyance
Picnicking	+	+	-	+	-	0	+	0	0	+	0	+	0
Bicycling	+	+	+	+	-	0	+	+	0	+	+	+	+
Camping	-	+	-	0	-	0	0	0	+	0	0	0	0
Swimming (pool)	-	+	0	+	-	+	+	0	0	+	0	+	0
Fishing	+	+	0	+	-	0	+	0	0	+	+	+	0
Snowmobiling	+	+	+	+	+	0	+	+	0	+	+	+	0
Swimming (beach)	0	0	0	+	0	0	+	0	0	0	0	+	0
Ice skating	-	0	0	0	0	0	0	0	0	0	0	0	0
Sledding	0	+	0	+	0	0	+	0	0	0	0	+	0
Playing outdoor games	+	+	-	+	0	0	+	0	0	+	0	+	0
Golf	-	+	0	0	-	0	0	0	0	0	0	0	0
Hunting (Up-land game)	0	0	-	-	0	0	-	0	0	0	0	0	0
Hunting (Water-fowl)	+	-	0	+	-	+	+	0	+	+	0	+	0
Hunting (Big game)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hiking	+	+	+	+	-	0	+	+	0	+	+	+	+
Horseback riding	+	+	+	0	0	0	0	0	0	+	0	0	0
Tennis	-	+	0	+	0	0	0	0	0	+	0	0	0
Canoeing	+	-	0	+	+	+	+	0	0	+	0	+	0
Water skiing	0	0	0	+	0	0	+	0	0	0	0	+	0
Power boating	0	0	0	+	0	+	+	0	0	0	0	+	0
Ice hockey	-	0	0	0	0	0	0	0	0	0	0	0	0
Snow skiing	0	+	0	+	0	0	+	0	0	0	0	+	0
Sailing	0	0	0	+	0	+	+	0	0	0	0	+	0

(+) - Denotes effectiveness to help satisfy demand.

(0) - Denotes no effect to help satisfy demand.

(-) - Denotes adverse effectiveness to help satisfy demand.

WATER SUPPLY

The Garrison Diversion alternative for water supply would increase streamflow in the Red River of the North. Consequently, fishing, waterfowl hunting, canoeing, power boating, and sailing activities could be available to help fulfill demands. This alternative would contribute nothing toward alleviating the recreation demand for the remaining activities.

The off-channel storage water supply alternative would be effective in reducing the demands for the same activities identified in the reservoir storage flood control alternative (see table 12). The amount of demand satisfaction would depend on the storage facility size and location.

The groundwater and reuse alternatives would offer few activity potentials except for bicycling, snowmobiling, hiking, horseback riding, swimming (pool), and waterfowl hunting. These two water supply alternatives would have no impact on satisfying demand for the majority of activities.

WASTEWATER

Of the three wastewater alternatives of treatment, nonstructural, and storage, treatment appears to provide the most opportunities to satisfy demand. Picnicking, bicycling, fishing, snowmobiling, playing outdoor games, hunting (waterfowl), hiking, horseback riding, tennis, and canoeing would be most affected. The wastewater alternatives would have no effect on demand fulfillment for the remaining 13 activities.

URBAN DRAINAGE

The storage alternative would be similar in meeting recreation demand to the flood control and water supply storage concept (see table 12).

The conveyance alternative would provide little recreation potential except for future trails for bicycling, hiking, and horseback riding.

CONCLUSIONS

The greatest potentials to help satisfy recreation demand for a variety of activities would result from the flood control alternative of reservoir storage, the off-channel storage alternative for water supply, and the urban drainage alternative of storage. As discussed in other urban study documents, reservoir storage was not economically viable nor was off-channel water supply storage found to be needed or cost-effective. However, the urban drainage investigation recommended that temporary and/or permanent ponding areas be used in Grand Forks to prevent increases in runoff from developing areas.

The Water Supply and Wastewater Management Appendixes include brief discussions on the recreational potential of the recommended measures. The Flood Control and Urban Drainage Appendix presents the urban study's findings up to the point when the flood control investigation was transferred to other Corps programs for completion. The recreational potential of flood control measures will be assessed in conjunction with these continuing investigations.

GRAND FORKS-EAST GRAND FORKS
URBAN WATER RESOURCES STUDY

THERMOGRAPHY INVESTIGATION

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ST. PAUL, MINNESOTA

TABLE OF CONTENTS

<u>Item</u>	<u>Page</u>
PURPOSE	1
THERMOGRAMS	1
INFORMATION DISPLAYS	2
PUBLIC RESPONSE	3
CONCLUSIONS	4
RECOMMENDATIONS	5

PURPOSE

In spring 1978, the Corps sponsored a thermography study of the Grand Forks-East Grand Forks area. The study was conducted as part of the Grand Forks-East Grand Forks Urban Water Resources Study and recognized public concern over energy use and waste. Grand Forks, East Grand Forks, and the Minnesota Energy Agency cooperated with the Corps in this project which was intended to draw public attention to the importance of energy conservation and provide a medium for informing the public of the objectives and alternatives of the Corps urban study.

THERMOGRAMS

Thermograms are photographic prints which depict the amount of infrared radiation emitted by an object in relation to the ambient air temperature. Thermograms taken from an aircraft using a scanner to pick up the radiated energy can be used to identify temperature differences between building rooftops and the surrounding air. The amount of energy - heat - being radiated will indicate whether a house or building is properly insulated.

The Minnesota Energy Agency contracted with Mead Technology Laboratories to obtain the photographs during early spring 1978. Thermograms were taken from a 2,500-foot altitude covering 18 cities including Grand Forks, North Dakota, and East Grand Forks, Minnesota. The Corps financed the cost of the photography (\$2,500) for these two cities, and the Minnesota Energy Agency provided supporting technical services. The quality of the thermograms covering Grand Forks and East Grand Forks was generally good. An exception was an 80-square-block area of Grand Forks which did not have photo coverage because of a camera malfunction.

On 7-8 August 1978, the Minnesota Energy Agency held a seminar in the two cities to train local authorities in interpreting the infrared photographs and in effectively disseminating the energy conservation information. Interpreting thermograms takes skill and practice. Light areas on thermograms generally indicate heat losses. However, a number of variables can affect the way the images appear. The variables include emissivity, ventilation, vegetation, function of buildings, automatic gain, rooftop level variations, and edge effects.

Because of the many variables in interpretation, the Grand Forks-East Grand Forks thermograms were not intended to yield quantitative results. They were used as a public involvement tool to enhance the public's interest in energy conservation. Had the intention been a precise interpretation, the cost and effort would have been much greater because of the need to collect field data to determine each building's structure, insulation, and function.

INFORMATION DISPLAYS

The interpretation of thermograms for the general public was supplemented with home energy conservation information at displays in the two cities during the fall of 1978. This information was provided by the Minnesota Energy Agency to make homeowners aware of insulating and weatherproofing practices that might reduce energy waste.

Grand Forks and East Grand Forks personnel were selected to operate the information dissemination centers. The Grand Forks Planning Department hired a local community leader to coordinate its information center, which was open from 18 September to 3 November 1978. East Grand Forks gave the responsibility for the task to the building inspector as part of his duties. East Grand Forks operated its information center from 3 to 12 October 1978.

A display listing alternative solutions to identified water resource problems was placed in the Grand Forks information center. Grand Forks was chosen for the display for several reasons:

- Grand Forks requested assistance from the Corps in organizing an information center.
- Most of the target audience resides in Grand Forks.
- The Grand Forks information center was scheduled to be open for 7 weeks.

Because of a shortage of manpower and the short time the East Grand Forks center was to be in operation, a display was not prepared for East Grand Forks.

PUBLIC RESPONSE

Grand Forks has a population of approximately 45,000 people, of which an estimated 1,100 persons visited the information center to view the thermograms. Included were representatives of 15 businesses, mainly real estate agencies. Personnel from educational institutions also visited the center; the University of North Dakota was particularly interested in viewing its campus on the thermograms.

According to the Grand Forks information center coordinator, visitors were predominantly young married couples, followed by the elderly and retired, and the middle-aged. No count of the visitors by age group was made.

Neighborhood representation was fairly uniform; both old and new homeowners came to view the thermograms. In areas where the aerial photographic coverage was missing, homeowners expressed disappointment, but many came to discuss the energy efficiency of their houses despite the lack of photo coverage.

East Grand Forks has a population of approximately 9,000 people

of which more than 500 persons visited the information center. Representatives of educational institutions and businesses also came to view the thermograms.

According to the East Grand Forks information center coordinator, the visitors were predominantly couples in the 25 to 40 age group, followed by the 40 to 55 age group, and a small number of elderly persons. No count of the visitors by age group was made. The majority of homeowners who visited the center live in the newer neighborhoods where homes are generally 10 to 15 years old.

CONCLUSIONS

The Corps had two principal objectives for its participation in the thermography analysis. One was the dissemination of information on energy conservation. This objective was achieved in that more than 1,600 persons in the two cities obtained home energy conservation information. Through the news media, publicity about the information centers directed the attention of many other home and building owners to the energy conservation issue.

The thermography program and the energy conservation information were popular with the general public. People were concerned about conserving energy and were eager to obtain energy-saving tips from the information centers. Some people had already insulated their houses between the time the photographs were taken (March 1978) and the time the thermograms became available (September 1978); these people were curious about the effectiveness of their insulation job.

After the information centers closed in November 1978, people continued to visit the city halls to view the thermograms. Interest in the thermograms continued throughout the winter.

The thermography program was not as successful in achieving the

Corps other goal - making the public aware of the urban study. The assumption was that public interest in the energy issue could be used as an opportunity to increase public awareness of the urban study. However, the approach that was used - a visual display with no hand-out materials or personal representative - did not attract sufficient public attention to accomplish this goal.

RECOMMENDATIONS

Financing of aerial infrared photography is a relatively inexpensive public involvement technique for an urban study. Based on experience gained from the thermography study for the Grand Forks-East Grand Forks area, the following recommendations would make the use of thermograms a more effective tool for encouraging public involvement in an urban study:

- Allot sufficient manpower and man-hours to achieve the desired objectives.
- Determine the number of urban study displays to be prepared - one display to serve two cities or two displays.
- Carefully plan the content of the display; be sure it fulfills its purpose.
- Place the urban study display in a strategic location in the information center to attract a maximum amount of attention without overwhelming the energy conservation displays.
- Assign a Corps representative to be present to answer questions concerning the urban study.
- Distribute brochures, progress reports, and summary reports to the visitors.
- Display the Corps address and telephone number and the names of Corps personnel for visitors to contact for further information on the urban study.
- Prepare a questionnaire for visitors to complete as a method of feedback. The questionnaire could ask:
 - age, sex, head of household
 - address, name, phone number

- age of house, size of house
 - type of insulation in the house
 - problems of heating or cooling the house
 - awareness of the urban study
 - any concerns about water resources in
the community
 - have they seen the display
 - do they wish to be placed on the urban study's
mailing list
- Tabulate the number of visitors to the information center.
 - Arrange to have the displays secured during the information
center's off-hours to prevent vandalism.

**GRAND FORKS-EAST GRAND FORKS
URBAN WATER RESOURCES STUDY**

PUBLIC INVOLVEMENT APPENDIX

**DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
ST. PAUL, MINNESOTA**

PREFACE

The Corps of Engineers' Urban Study Program is aimed at providing planning assistance to local interests in a variety of water resource and related land resource areas, including water supply, wastewater management, flood control, navigation, shoreline erosion, and recreation. In areas of traditional Corps responsibility (such as flood control), the Corps may implement and construct projects shown feasible in the urban study. In other areas (such as wastewater management), Corps involvement carries only through the planning stage; findings are turned over to local interests for incorporation into their broad urban comprehensive planning effort. Implementation is at the discretion of local interests in conjunction with appropriate State and Federal agencies.

The St. Paul District, Corps of Engineers, conducted the Grand Forks-East Grand Forks (GF/EGF) Urban Water Resources Study, which was a cooperative effort between local, State, and Federal agencies. The GF/EGF urban study spanned a time of transition in the Corps' urban study program. In mid-1978, directives were issued deleting the third and last stage of urban studies. At that time, the second stage of the GF/EGF urban study was nearing completion, but commitments for stage 3 studies had been made to local interests and involved State and Federal agencies. Therefore, the GF/EGF urban study was allowed to proceed to stage 3.

During the first stage, the 14-township study area was selected, broad topical problems to be addressed (water supply, wastewater management, and flood control) were identified, and a "plan of study" was developed.

The plan of study outlined the general approach the study would follow. During stage 2, the topical problems were broken down into explicit problem areas. Investigators formulated a broad array of alternatives to resolve the study area's problems. The alternatives were evaluated to eliminate those which were not suitable or cost effective. The stage 3 study examined in detail those alternatives that passed the stage 2 screening. Alternatives were reassessed to determine their cost effectiveness and environmental and social impacts.

This particular document is 1 of 11 constituting the GF/EGF urban study report:

Summary Report

Background Information Appendix

Plan Formulation Appendix

Water Supply Appendix

Wastewater Management Appendix

Flood Control and Urban Drainage Appendix

Flood Emergency Plan for Grand Forks, North Dakota

City of East Grand Forks, Minnesota, Civil Defense Flood Fight Plan

Energy Conservation and Recreation Appendix

Public Involvement Appendix

Comments Appendix

Several mechanisms were used to promote public involvement. Study participants were involved through:

1. The executive group (representing major Federal and State agencies and city governments), which was responsible for policy decisions.
2. The agency committee (composed of executive group agencies; other concerned Federal, State, and regional agencies; city and county officials; and representatives of the business and academic communities), which reviewed draft reports and ensured compliance with appropriate regulations.
3. The citizens group (consisting of Grand Forks' and East Grand Forks' planning commissions), which reviewed study findings and recommendations from the communities' and citizens' perspectives.

Meetings of the above groups were supplemented by public meetings and workshops designed to disseminate information to the general public and solicit feedback. In addition, Corps representatives presented status reports at city functions and before organized groups of citizens and local officials.

Information mailed to study participants and other interested or concerned individuals or organizations included:

1. Draft technical reports and appendixes sent to participants for review and comment.
2. Progress and summary reports mailed to all interested persons to keep them up to date on study events and results.

Pamphlets and narrated slide programs were produced in concert with certain of the urban study's final products. They were of particular value in making the public aware of key study findings and recommendations, such as those regarding community and self-help flood fight measures.

This Public Involvement Appendix discusses the variety of public involvement techniques used throughout the urban study and documents significant coordination activities.

TABLE OF CONTENTS

<u>ITEM</u>	<u>PAGE</u>
PURPOSE AND OBJECTIVES	1
THE WORK PLAN	3
STUDY MANAGEMENT ORGANIZATION	4
EXECUTIVE GROUP	4
STUDY WORK GROUP	6
CITIZENS GROUP	6
PUBLIC INVOLVEMENT TECHNIQUES	7
PUBLIC MEETINGS	7
WORKSHOPS	7
WRITTEN MATERIALS	8
CHRONOLOGY OF THE PUBLIC INVOLVEMENT PROGRAM	8
STAGE 1	8
STAGE 2	13
STAGE 3	18
ANALYSIS OF THE PUBLIC INVOLVEMENT PROGRAM	28
STUDY ORGANIZATION	28
MEETINGS	29
WRITTEN MATERIALS	29
DISPLAYS	30
PAMPHLETS AND SLIDE PROGRAMS	30
CONCLUSION	30

TABLES

<u>NUMBER</u>		
1	SIGNIFICANT COORDINATION ACTIVITIES, STAGE 1	10
2	SIGNIFICANT COORDINATION ACTIVITIES, STAGE 2	14
3	SIGNIFICANT COORDINATION ACTIVITIES, STAGE 3	20

FIGURES

1	GENERAL RELATIONSHIP OF PLAN DEVELOPMENT STAGES AND FUNCTIONAL PLANNING TASKS	2
2	STUDY ORGANIZATION	3

STAGE 3 PUBLIC INVOLVEMENT APPENDIX

PURPOSE AND OBJECTIVES

The Grand Forks-East Grand Forks Urban Water Resources Study planning process was divided into three stages (see figure 1). The primary purpose of stage 1 was to identify water and related land resource management problems and concerns. Stage 2 emphasized development and preliminary evaluation of a wide range of alternative solutions. Stage 3 focused on a more detailed assessment of the impacts of the alternatives passing the stage 2 screening.

The study was fully and continuously coordinated with the public.⁽¹⁾ The objective of the public involvement program was to keep the public informed and actively involved in the planning process to ensure that the study responded to public needs and preferences to the maximum extent possible within the bounds of local, State, and Federal programs, responsibilities, and authorities. The comprehensive public involvement program was an essential element in the success of the urban study.

Specific objectives were to:

1. Present information that would assist the public in defining water resources problems, concerns, objectives, and priorities and understanding the Corps' responsibilities and planning process and ways in which individuals and groups could participate effectively.
2. Create a climate within which mutual trust and free exchange of ideas would be possible and develop channels through which the public could express its concerns, preferences, and priorities.

(1) The "public" is defined as any affected or interested non-Corps of Engineers entities. These entities include other Federal, regional, State, and local government entities and officials; public and private organizations; and individuals.

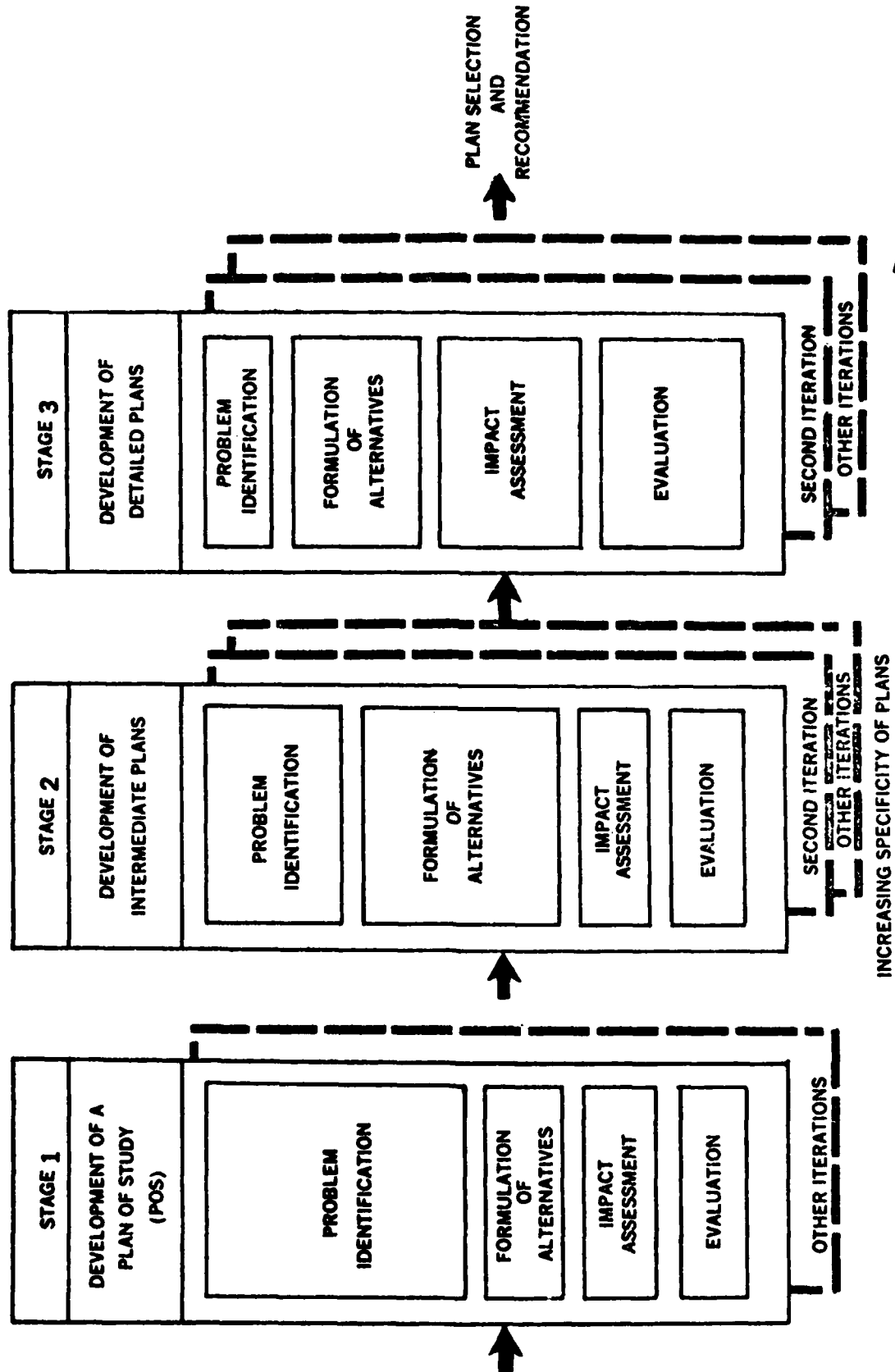


Figure 1 - General relationship of plan development stages and functional planning tasks.

3. Provide structured opportunities for the public to influence the formulation and evaluation of alternatives, clarify and weigh conflicts, and achieve, if practicable, consensus regarding a course of action.

4. Actively promote effective coordination and exchange of information between the Corps' urban study and plans and programs of other Federal, State, and local agencies.

THE WORK PLAN

The role of public involvement in the urban study can be viewed in five phases.

1. Identification of needs: The determination of study area needs, desires, and growth goals was the major objective of the first phase of public involvement. With assistance from local interests and State and Federal agencies, the plan of study was prepared. A major task was to make direct and indirect contact with the interested public; those who desired to be involved in the planning process were identified and placed on the urban study's mailing list to receive information.

2. Development of alternative plans: The major objective of the second phase was a continual exchange of ideas between the public and planners to assist in the development of alternative plans. This objective was accomplished by informing the public of various technologies and management practices available, assessing feedback, readjusting the plans to reflect this feedback, and preparing materials for public reassessment.

3. Analysis of plans: The objective was to present plans and associated impacts to the public to obtain different views on the acceptability of the plans. The components of alternative plans and evaluation techniques were presented to the public and responses were obtained. The alternative plans were then refined through an iterative process.

4. Display of alternatives: The objective of this phase was to present the final set of alternatives to as wide a spectrum of the public as possible in a way that the public could make intelligent decisions about the acceptability of the plans.

5. Selection of final alternatives: Public acceptance and approval of the plans developed were the objective of this final phase. Presentation and display of the plans were made and the responses of the public recorded. Modifications to the final plans were made where necessary.

STUDY MANAGEMENT ORGANIZATION

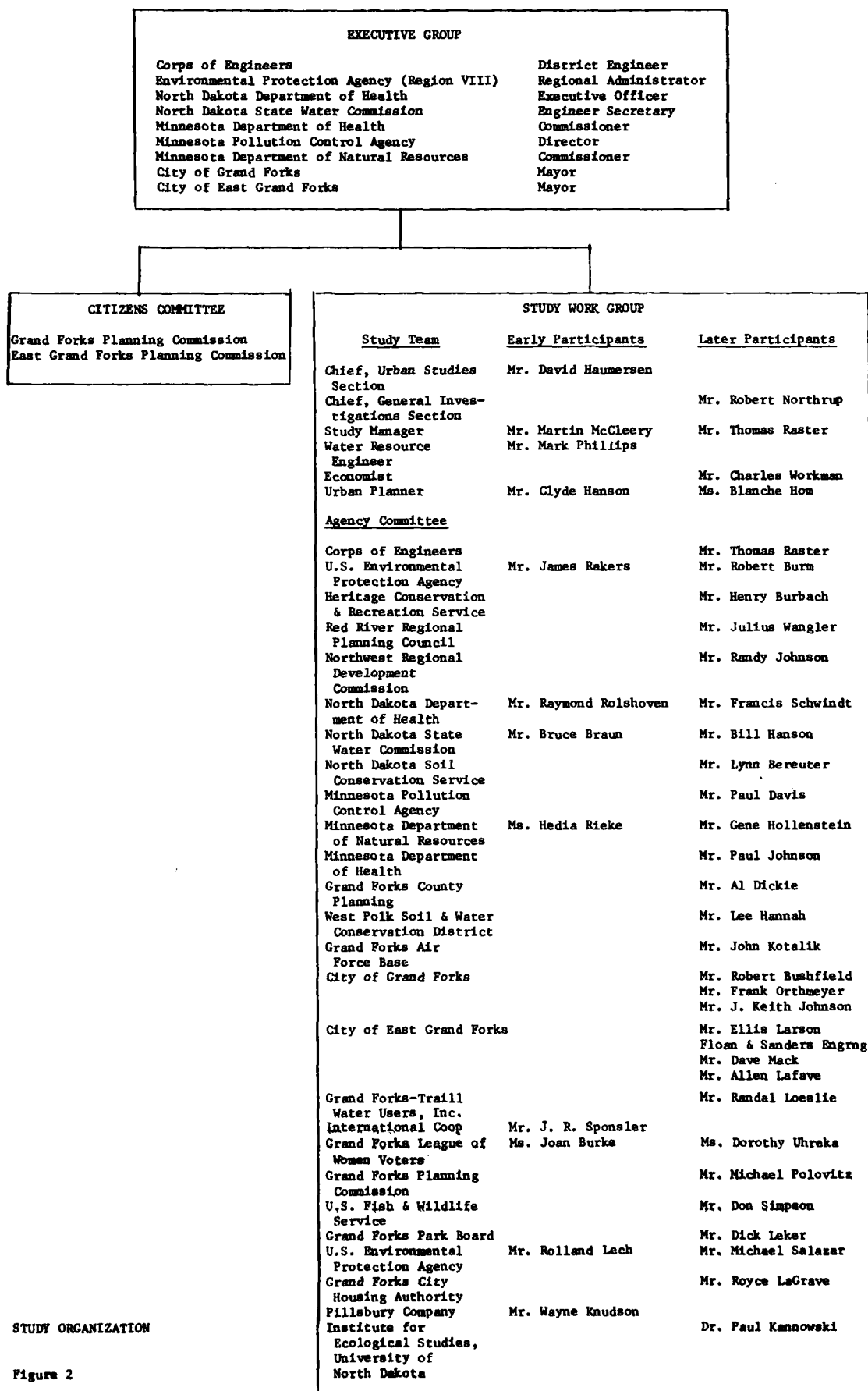
The active participants in the urban study were organized into three main groups: the executive group, the citizens group, and the study work group (figure 2).

EXECUTIVE GROUP

The executive group was chaired by the District Engineer, St. Paul District, and included officials of the U.S. Environmental Protection Agency, Region VIII; North Dakota State Water Commission and State Health Department; Minnesota Department of Natural Resources, Pollution Control Agency, and State Health Department; and the mayors of Grand Forks and East Grand Forks. The District Engineer had overall responsibility and authority for the administration and management of the study.

The executive group was responsible for the following functions:

1. Making policy decisions and directing the general course of the study.
2. Monitoring progress, assessing causes for delays, analyzing proposed actions, taking appropriate actions, and setting priorities within each agency's purview as required to maintain schedules.



STUDY ORGANIZATION

Figure 2

3. Reviewing results of study efforts, coordination, and public involvement activities; recommending revisions as required to achieve overall study objectives; and approving modification of the technical appendixes.

4. Assigning specific individuals to serve on the agency committee of the study work group.

STUDY WORK GROUP

The study work group had two components: the Corps of Engineers study team and the agency committee. The study team organized and carried out the public involvement program. The agency committee was composed of staff members of agencies represented on the executive group and other agencies concerned with the urban study. The agency committee reviewed and approved draft reports and periodically reviewed the planning objectives, study methodologies, specific water resource needs, and proposed alternatives. Each member served as a liaison with his or her agency to ensure that study proposals met each agency's policies and regulations and that no study efforts were duplicated.

CITIZENS GROUP

The citizens group assisted the Corps of Engineers in helping the public understand the water resource investigation process and advised the study team of the study area's desires and concerns in water resources development.

Specific responsibilities of the citizens group were to:

1. Review proposed plans to ensure that they were practical and implementable.
2. Provide local information and suggest alternative solutions.
3. Monitor study progress and recommend remedial actions if the study threatened to fall behind schedule.
4. Review modifications to the plans.

The mayors of Grand Forks and East Grand Forks were delegated the responsibility for forming a citizens group to represent their city. Each appointed his city's planning commission.

PUBLIC INVOLVEMENT TECHNIQUES

Besides the citizens and study work groups, other public involvement techniques were used to encourage public participation and provide a forum for communication between the public and the planners.

PUBLIC MEETINGS

Public meetings, open to all, were formally organized, announced, and recorded. The purpose of the meetings was to inform the public about the urban study, give all interests an opportunity to fully and publicly express their views on urban water resource issues, obtain and exchange information to be used in the planning process, and contribute to interagency coordination.

The meetings were chaired by the District Engineer or Deputy District Engineer. The District Engineer or members of the study team summarized study progress and results, including social, economic, environmental, and technical considerations. After the presentations, written and verbal comments from the public were solicited and recorded in official transcripts.

WORKSHOPS

Workshops were held in the study area at the request of the public or the study manager when there was a need to discuss issues. The workshops were well-publicized and open to the general public.

The workshops used the following format. The study team made a presentation. Small groups were then formed and asked to address issues and report their questions and conclusions back to the entire workshop. Notes of the presentations, discussions, and conclusions were recorded.

WRITTEN MATERIALS

Written materials were distributed to the public to ensure informed, effective participation in the planning process. These materials included draft reports, progress reports, summary reports, information packets, news releases, and meeting announcements.

The study team distributed draft technical reports and appendixes to the agency committee, citizens group, and executive group for review and comment.

Periodic newsletters were distributed to all interests to provide updated information on the study's status and solicit questions and comments.

Summary reports of study efforts were published at the end of each stage and distributed to all interests. The Stage 1 Summary Report focused on identified problems and needs, possible solutions and alternatives, and the need for public concern and involvement. The Stage 2 Summary Report briefly outlined alternative plans considered and recommended plans for further study. The Stage 3 Summary Report described the overall urban study process, presented the resulting conclusions and recommendations, and discussed the implementation process for feasible plans.

The news media were kept informed of urban study progress and public involvement opportunities through news releases, information packets, personal contacts, and meeting announcements.

CHRONOLOGY OF THE PUBLIC INVOLVEMENT PROGRAM

STAGE 1

Public involvement activities in stage 1 included initial contacts with the public, coordination of study efforts between agencies and organizations, development of the study groups, and selection of public involvement techniques.

The initial draft plan of study was prepared in April 1976 by the Corps. It was reviewed by Federal, State, regional, and local government agencies and organizations. Comments were incorporated into the revised draft completed in July 1976 and distributed for review. Comments received at the public meeting in August 1976 were incorporated into the September 1976 revised draft. Additional comments were received in November 1976 from meetings and letters, and the final plan of study was completed and distributed in January 1977.

The first public meeting was held on 26 August 1976 in Grand Forks. The purpose of the meeting was to obtain views and comments from local citizens. Before the meeting, an announcement was distributed to all interests, including the news media. The Corps' Deputy District Engineer conducted the meeting, which was attended by over 40 people. The Deputy District Engineer indicated the authority under which the study was being performed, defined problems that had been identified, and outlined the urban study's program methodology. After this presentation, members of the audience expressed their views on the study concerning levees and bank stabilization, storage reservoirs, municipal and industrial wastewater treatment systems, recreational aspects, citizen participation and involvement, and financial funding of the study efforts.

The agency committee first met on 10 November 1976 in Grand Forks. The purpose of the meeting was to receive comments from member agencies and special interests regarding the draft scope of work for stage 2 studies and obtain letters of assurance from the various government agencies to finalize the stage 1 plan of study report.

The following table of significant coordination events in stage 1 is dominated by meetings between local, State, and Federal agencies conducting, reviewing, or affected by the study's investigations. The table also shows other key developments, such as completion of contractors' reports and their distribution for review.

Table 1 - Significant coordination activities, stage 1

<u>Date</u>	<u>Event</u>
14 May 1975	Letter to Grand Forks city planner requesting preparation of "first-cut" plan of study. Information and direction provided on preparing the plan of study.
11 Jun 1975	Meeting with Corps of Engineers and engineering and planning representatives for Grand Forks and East Grand Forks concerning plan of study preparation.
10 Jul 1975	Grand Forks city planner reviewed "first-cut" plan of study elements with Corps study team in St. Paul District office
17 Jul 1975	Meetings with local officials of Grand Forks and East Grand Forks to discuss the "first-cut" plan of study and area problems.
14 Aug 1975	Separate meetings in Grand Forks and East Grand Forks with Senator Walter F. Mondale, local officials and citizens, and Corps personnel concerning area flood problems and proposed urban study program.
3 Oct 1975	Second draft plan of study sent to local officials and citizens for review.
21 Oct 1975	Separate meetings with Grand Forks and East Grand Forks city councils to review second draft plan of study and obtain more information on study area problems. Field inspection of problem areas with city officials.
17 May 1976	Review of the April draft plan of study with North Central Division and Office of the Chief of Engineers in North Central Division offices. Decision made to proceed with the study and refinement of the plan of study and clarify wastewater management study efforts.

Table 1 - Significant coordination activities, stage 1 (cont)

Date	Event
26 May 1976	Copies of the April draft plan of study provided to the two Federal Environmental Protection Agency offices and two State agencies concerned with pollution for review and guidance on proposed Section 201 and Section 208 wastewater study requirements.
26 May 1976	Copies of the April draft plan of study provided to the U.S. Fish and Wildlife Service in Denver and Minneapolis, the North Dakota State Water Commission, and the Northwest Regional Development Commission in Minnesota for review and comment.
10 Jun 1976	Meeting with Region V Environmental Protection Agency and Minnesota Pollution Control Agency representatives in St. Paul District office concerning wastewater management elements of the study.
30 Jun 1976	Meeting with North Dakota State Department of Health and State Water Commission in Bismarck concerning wastewater management elements of the study.
12-13 Jul 1976	Meetings with Grand Forks and East Grand Forks city engineers to discuss recent wastewater planning developments and needs.
13 Jul 1976	Meeting with Grand Forks City Engineer to review the April draft plan of study and wastewater treatment needs.
28 Jul 1976	Meeting with Minnesota Pollution Control Agency representatives concerning wastewater management needs for East Grand Forks.
20 Aug 1976	Mailing of the July draft plan of study.

Table 1 - Significant coordination activities, stage 1 (cont)

<u>Date</u>	<u>Event</u>
24 Aug 1976	Initial meeting with Region VIII Environmental Protection Agency to discuss the wastewater needs of the study.
26 Aug 1976	Initial public meeting to include cities' endorsement for continuation of the study.
26 Aug 1976	Meeting with representatives of the U.S. Department of the Interior, Heritage Conservation and Recreation Service, Denver, Colorado, regarding its participation in the recreation studies.
15 Sep 1976	Mailing of the September draft plan of study.
21 Sep 1976	Meeting with the cities of Grand Forks and East Grand Forks, North Dakota State Department of Health, Minnesota Pollution Control Agency, and Environmental Protection Agency, Region VIII, regarding wastewater studies and local participation.
27 Oct 1976	Meetings with Grand Forks and East Grand Forks city engineers to review the stage 2 scopes of work for wastewater studies.
8 Nov 1976	Meeting with the Minnesota Pollution Control Agency to update the September draft plan of study information relating to wastewater treatment at East Grand Forks.
10 Nov 1976	Agency committee meeting in Grand Forks to review the September draft plan of study and stage 2 scopes of work for flood control, water supply, and wastewater problems.
19 Nov 1976	Meeting with the Minnesota Pollution Control Agency to review scopes of work discussed at the 10 November 1976 agency committee meeting.

Table 1 - Significant coordination activities, stage 1 (cont)

Date	Event
29 Nov 1976	Meeting with North Central Division representatives to review the September draft plan of study and their 19 October 1976 comments. Some additional modifications to the plan of study were agreed upon. The revised plan of study was to be forwarded by mid-January 1977.

Meetings make up the largest number of significant coordination activities because they were held when coordination was important to the study's continued progress and, therefore, warranted inclusion in this table. It was impractical to list every coordination event, including all telephone calls and correspondence with other agencies, local officials, Corps of Engineers higher authorities, contractors, etc., and our consultant's contacts with various government agencies, local officials, and residents. Particularly significant items are cited in table 1, but a complete list would swamp important coordination events in a sea of less significant contacts involved in the day-to-day conduct of the study, gathering and dissemination of data, contracts with consultants, arrangements for meetings, etc.

STAGE 2

Stage 2 emphasized the development of a broad range of alternative plans to solve water resource problems. Public involvement activities included building a consensus on problem definitions, reinforcing confidence in the planning process, providing a forum for discussion and approval of detailed work plans, and developing a procedure for review of draft reports.

A series of sponsors meetings was held. The objective was to establish a working liaison between the study team and the cities' planning departments. The first meeting was held on 20 January 1977 to discuss work items. At this meeting, the formation of the citizens group was discussed with the suggestion that the cities' planning commissions act as members of the citizens group.

The first public involvement workshop was held on 8 March 1977 in Grand Forks. Its purpose was to actively involve segments of the public in the planning process through small group interaction. Before the meeting, announcements were mailed to interests and news releases were distributed to the local media. The workshops attracted over 40 participants including representatives of local, State, regional, and Federal agencies and interested citizens. A slide presentation outlined the urban study program including the main concerns of water supply, wastewater, and floodplain management. Following the slide presentation, participants were divided into small groups to discuss the water resource problems and needs and possible solutions. The participants contributed new ideas, concerns, and thoughts.

Descriptions of the urban study were exhibited at a display booth at the Food, Fuel, and Future Fair in Grand Forks on 28-30 October 1977. The purpose of the display was to draw the public's attention to the study area's water resource problems and needs and provide information about the urban study to the public.

The meetings and contacts of stage 2 are summarized in the following table.

Table 2 - Significant coordination activities, stage 2

Date	Event
6 Jan 1977	Interagency meeting on the Red River of the North basin study's water supply analysis.
14 Jan 1977	January draft plan of study mailed to the executive group and agency committee.
20 Jan 1977	Sponsors meeting in Grand Forks to review the stage 2 work plan outline and the status of major and supporting studies. Several committee members offered information and assistance on study items.

Table 2 - Significant coordination activities, stage 2 (cont)

Date	Event
21 Jan 1977	Agency committee meeting to review stage 2 work plan.
2 Feb 1977	Meeting of the North Dakota 208 Non-Point Task Force to discuss the direction this type of planning will be taking in North Dakota.
7 Feb 1977	Meeting with representative of Floan and Sanders Engineering (consulting engineers for East Grand Forks) to discuss stormwater problems.
8 Feb 1977	Meeting with Frank Orthmeyer, Grand Forks city engineer, to discuss stormwater problems.
10 Feb 1977	February issues of progress report and summary report were distributed using the general mailing list.
15 Feb 1977	Meeting with Raymond Rolshoven, North Dakota Department of Health, to discuss his comments on the stage 2 scope of work.
7 Mar 1977	Meeting with Ellis Larson, East Grand Forks Planning Commission clerk, to discuss the planning commission's involvement in the urban study.
8 Mar 1977	Problem Definition and Plan Formulation Workshop held in Grand Forks to review the Stage 1 Summary Report and solicit further concerns and alternatives from the general public.
16 Mar 1977	Draft Social and Environmental Inventory distributed to the agency committee.
20 Mar 1977	March issue of progress report distributed using general mailing list.

Table 2 - Significant coordination activities, stage 2 (cont)

Date	Event
13 Apr 1977	Meeting with the Grand Forks city engineer and East Grand Forks consulting engineer to discuss interior levee drainage and urban drainage.
19 Apr 1977	Field trip to inspect the urban drainage study area of Grand Forks.
26 May 1977	North Dakota 208 Non-Point Task Force meeting in Bismarck, North Dakota.
6 Jun 1977	Sponsors meeting to introduce Stanley Consultants staff and discuss data needs and cooperation agreements.
7 Jun 1977	Agency committee meeting in East Grand Forks to review stage 2 progress, introduce the Stanley Consultants study manager, and listen to a presentation on the Social and Environmental Inventory by Paul Keranen of Wehrman, Chapman Associates, Inc.
22 Jun 1977	Minutes of agency committee meeting, written by Grand Forks planning staff, distributed to agency committee.
23 Jun 1977	Stage 2 draft Recreation Study distributed to agency committee.
27 June 1977	Distribution of final consultant's report entitled "Grand Forks/East Grand Forks Social and Environmental Inventory" to agency committee, study area mayors and chambers of commerce, and State highway departments and historical societies.
27 Jul 1977	Meeting in Grand Forks with the North Dakota State Department of Health and the city to discuss the scope of work for the combined sewer water quality survey.

Table 2 - Significant coordination activities, stage 2 (cont)

Date	Event
18 Aug 1977	Distribution of Water Supply Problem Identification report to the agency committee.
26 Aug 1977	Distribution of Demographic Analysis to the agency committee.
2 Sep 1977	Distribution of Wastewater Problem Identification report to the agency committee.
14 Sep 1977	Meeting with the East Grand Forks Planning Commission (citizens committee) to make a status report and explain the role of a citizens committee.
15 Sep 1977	Meeting with the East Grand Forks City Council to discuss local effort-sharing requirements.
15 Sep 1977	Sponsors meeting to confirm that the list of problems designated for further study for wastewater and water supply studies was complete. Study area population projections were also discussed.
27 Sep 1977	Distribution of final "Demographic Analysis and Population Projections" for the study area.
26 Oct 1977	Distribution of October 1977 issue of the progress report using general mailing list.
28-30 Oct 1977	Display booth at the Food, Fuel, and Future Fair, Grand Forks Armory.
2 Nov 1977	Meeting with Grand Forks Citizens Committee - briefing on study progress.
2 Dec 1977	Meeting of Corps, local, State, and Federal representatives to discuss recreation work plan.

Table 2 - Significant coordination activities, stage 2 (cont)

Date	Event
14 Dec 1977	Distribution of draft Stage 2 Water Supply and Wastewater Appendixes:
9 Jan 1978	Distribution of Stage 2 Plan Formulation Appendix and draft Flood Control Appendix.
18 Jan 1978	Alternatives workshop in Grand Forks to hear a presentation from the consultants on their stage 2 alternatives.
16-17 Feb 1978	Sponsors meeting in study area to review draft reports.
Feb 1978	Issue of the progress report.

STAGE 3

In stage 3, the public involvement activities helped to identify impacts; evaluate alternatives; and lay the groundwork for successful local, State, and Federal implementation.

Members of the agency committee were divided into task groups focusing on water supply, wastewater, and floodplain management. The purpose of the task groups was to allow the representatives to concentrate their work efforts on specific water resource problems of particular interest to their respective agencies or organizations.

The cities of Grand Forks and East Grand Forks formed the Flood Emergency Plan of Action Task Groups. The purpose of these task groups was to work on a plan of action to guide emergency flood fights.

In coordination with the Minnesota Energy Agency and the cities of Grand Forks and East Grand Forks, the Corps of Engineers participated in an infrared aerial photographic (thermography) survey. The purpose of the survey was to provide building heat loss and energy conservation information to interested groups and individuals in the survey area. With the growing concern for preserving and conserving our natural environment, this survey was a significant first for this urban study and presaged even greater involvement in energy conservation issues in future urban studies.

The Corps and its contractors prepared sets of pamphlets and slide programs covering the following topics:

1. Grand Forks-East Grand Forks Urban Water Resources Study - Summarized the Corps' urban study program and the Grand Forks-East Grand Forks study in particular. Briefly identified the problems addressed in this urban study and its findings and recommendations.
2. Flood control investigation - Discussed the study area's susceptibility to flooding and results of analyses of preventive measures. Presented the recommended urban drainage master plan for Grand Forks' fringe areas.
3. Water supply investigation - Discussed suitability of alternative water sources. Presented program for water treatment plant construction through 2030. Presented drought emergency plan of action when water supply is drastically reduced.
4. Wastewater management - Discussed sewage treatment program for communities in the study area. Focused on solutions to Grand Forks' combined sewer overflows into the Red River of the North.
5. Grand Forks Flood Emergency Plan of Action - Described Grand Forks' multiphased flood fight plan. Outlined emergency evacuation preparation and routes.

6. East Grand Forks Flood Emergency Plan of Action - Discussed city's flood fight organization and evacuation plans. Presented self-help measures for residents outside the city's sphere of protection.

Thousands of pamphlets were presented to the cities for release to the public through mailings and at public functions. The topical pamphlets described specific problems that were addressed and the resulting findings and recommendations. The texts were relatively non-technical and brief to ensure that the layperson would not flounder in a sea of technical jargon. The reverse side of the pamphlets showed detailed maps of the study area, highlighting critical features (for example, the flood emergency plan of action pamphlets showed evacuation routes).

The automatically advancing, professionally narrated slide programs were from 10 to 20 minutes long and had from 60 to 100 slides. These programs had two goals: to provide local interests with an overview of the particular topic and to better introduce the study area and its unique problems, needs, and concerns to Corps higher authorities responsible for reviewing the urban study's findings. Copies of the slide program were presented to local officials for use in disseminating the study's results. These officials repeatedly expressed appreciation for these programs because of the succinct presentation of complex and, in some cases, politically volatile material.

The meetings and contacts of stage 3 are summarized in the following table.

Table 3 - Significant coordination activities, stage 3	
Date	Event
22 Mar 1978	Meetings with agency committee Water Supply and Wastewater Task Groups to review work plans for stage 3.
Mar 1978	Meeting with agency committee Flood Control Task Group to discuss work plans for stage 3.

Table 3 - Significant coordination activities, stage 3 (cont)

<u>Date</u>	<u>Event</u>
13 Apr 1978	Meeting with Grand Forks city engineer to determine work items for storm drainage management.
Mid-Apr 1978	Spring flood emergency in the urban area.
Early May 1978	First draft scope of work for stage 3 study distributed for review and comment.
30 Jun 1978	Draft stage 3 study work schedule identifying major work items distributed.
13 Jul 1978	Meeting with the Flood Control Task Group to discuss and review the draft scope of work for stage 3 floodplain management.
26 Jul 1978	First meeting of the East Grand Forks Flood Emergency Plan of Action Task Group to identify work items.
7-8 Aug 1978	Training seminar held for the Grand Forks - East Grand Forks thermography study. The Minnesota Energy Agency trained local authorities to interpret aerial photos.
18 Sep - 4 Nov 1978	Grand Forks thermography dissemination center open to the general public. Displays on the urban study available for viewing.
3-12 Oct 1978	East Grand Forks thermography dissemination center open to the general public.
13 Oct 1978	Stage 2 appendixes for water supply, wastewater, and floodplain management were distributed to be used as reference reports for stage 3 studies.

Table 3 - Significant coordination activities, stage 3 (cont)

<u>Date</u>	<u>Event</u>
15 Nov 1978	The Leisure Time Analysis report distributed for review.
22 Nov 1978	Meeting with the East Grand Forks Flood Emergency Plan of Action Task Group to review the progress and identify additional work items. A videotape produced by the Corps on the spring 1978 flood was presented for review and comment.
14 Dec 1978	Meeting with the city of Grand Forks to discuss the acceptability of the stage 2 wastewater report for satisfying the step 1 requirements of the Public Law 92-500 Construction Grants Program administered by the Environmental Protection Agency. The report found sewer separation to be the best solution to the city's combined sewer overflow problem.
9 Feb 1979	Progress report distributed to all interests.
8 Mar 1979	Meeting with the East Grand Forks Flood Emergency Plan of Action Task Group to review and discuss the work progress.
21-22 Mar 1979	Meeting with the city of Grand Forks, Environmental Protection Agency, North Dakota State Health Department, and an engineering consultant firm to discuss the study and report requirements for the combined sewer overflow problem to meet the Environmental Protection Agency's step 1 requirements.
Mid-Apr 1979	Emergency flood fight activities in Grand Forks and East Grand Forks.
30 Apr 1979	The first draft report of the Grand Forks Urban Drainage Master Plan was distributed for review and comment.
14 May 1979	The first draft report of the Grand Forks-East Grand Forks Drought Emergency Plan of Action was distributed for review and comment.

Table 3 - Significant coordination activities, stage 3 (cont)

Date	Event
30 May 1979	Meeting with city of Grand Forks to discuss assistance for repairing three areas of levees damaged by recent floods. The Corps did not approve the request.
6 Jun 1979	Public meeting held by the Grand Forks Planning and Zoning Commission to discuss the draft Urban Drainage Master Plan report submitted by the Corps and an engineering consultant firm. Secondary purpose of the meeting was to discuss the Soil Conservation Service's dam/diversion proposal for flood control on English Coulee.
11 Jul 1979	Meeting held by the Grand Forks County Water Management and Control Board to review and discuss the Soil Conservation Service's proposed English Coulee flood control plan. Attending were representatives of the Corps, city of Grand Forks, English Coulee Watershed Study Committee, Soil Conservation Service, North Dakota State Highway Department, and North Dakota State Water Commission.
31 Jul 1979	July 1979 issue of progress report distributed to all interests.
21 Aug 1979	Draft Low-Flow Frequency Analysis report distributed for review and comment.
6 Sep 1979	Revised draft Grand Forks Urban Drainage Master Plan report distributed for review and comment.
28 Sep 1979	Stage 2 Summary Report distributed for information only on previous study work efforts.

Table 3 - Significant coordination activities, stage 3 (cont)

<u>Date</u>	<u>Event</u>
21 Sep 1979	Low-Flow Frequency Analysis final report as part of the Stage 3 Water Supply Study is received from consultants.
5 Oct 1979	Draft Stage 3 Water Supply Study report received from consultants.
12 Oct 1979	Final Grand Forks Urban Drainage Master Plan report received from consultants.
25 Oct 1979	Draft Stage 3 Water Supply report distributed for review and comment.
29 Oct 1979	Draft Stage 3 Floodplain Management report received from consultants.
31 Oct 1979	Draft Stage 3 Floodplain Management report distributed for review and comment.
7 Nov 1979	Watershed Study Committee meeting held by city of Grand Forks and Soil Conservation Service to discuss English Coulee flood problems and solutions.
16 Nov 1979	Draft Stage 3 Wastewater report received from consultants.
20 Nov 1979	Draft Stage 3 Wastewater report distributed for review and comment.
26 Nov 1979	Draft Flood Control, Water Supply, Wastewater Management, Low-Flow Frequency Analysis, and Urban Drainage reports submitted to the St. Paul District by consulting firms were forwarded to the North Central Division for review and comment.

Table 3 - Significant coordination activities, stage 3 (cont)

Date	Event
28-29 Nov 1979	Agency committee meetings on flood control, water supply, and wastewater to discuss draft stage 3 reports.
29 Nov 1979	Meeting with East Grand Forks Civil Defense Director and city engineers to discuss the flood emergency plan of action.
21 Jan 1980	Meeting of Corps and contractor representatives with mayoral-appointed Grand Forks Flood Emergency Plan of Action Task Group regarding the proposed scope of the flood emergency plan of action's flood fight manual.
21 Jan 1980	Corps and contractor representatives presented stage 2 and 3 flood control findings at Grand Forks City Council meeting.
14-15 Feb 1980	Representatives of the Corps' Office of the Chief of Engineers, North Central Division, and St. Paul District and the contractors involved in the urban study's water supply, wastewater management, and flood control investigations attended checkpoint conferences on the stage 3 draft reports. Discussions covered potential improvements in analyses and draft reports.
21 Feb 1980	Draft East Grand Forks flood emergency plan of action flood fight manual received from consultants (who also serve as the city's Civil Defense Director and city engineers).
4 Mar 1980	Stage 3 draft reports on flood control, water supply, wastewater management, and energy conservation and recreation provided to Federal and State agencies, including Environmental Protection Agency; Fish and Wildlife Service; Soil Conservation Service; North Dakota State Water Commission and Department of Health; and Minnesota Department of Health, Pollution Control Agency, and Department of Natural Resources.

Table 3 - Significant coordination activities, stage 3 (cont)

<u>Date</u>	<u>Event</u>
5 Mar 1980	Meeting of Soil Conservation Service, Corps, and local (township, Grand Forks, and Grand Forks County) representatives to discuss English Coulee flood control alternatives.
21 Mar 1980	Corps, Soil Conservation Service, and consultant representatives met to discuss English Coulee flood damage analyses.
8 Apr 1980	East Grand Forks flood emergency plan of action's flood fight manual formally presented to the city by the Civil Defense Director and city engineer at meeting attended by local and Corps dignitaries.
25 Apr 80	Contractor's final report on Grand Forks' combined sewer overflow analysis received from consultant.
30 Apr 1980	Contractor's final combined sewer report forwarded to the Environmental Protection Agency and North Dakota State Department of Health to assist city's application for assistance through the Environmental Protection Agency's Construction Grants Program.
30 Apr 1980	Transmitted copies of contractor's draft Grand Forks flood emergency plan of action flood fight manual to agencies and local interests for review.
14 Jul 1980	Contractor's final stage 3 flood control report delivered.
23 Jul 1980	Corps representatives met with Grand Forks city officials and briefed new Mayor H. C. Wessman on urban study's status. The Corps provided copies of current water supply, wastewater management, urban drainage, flood control, and flood emergency plan of action reports and pamphlets.

Table 3 - Significant coordination activities, stage 3 (cont)

Date	Event
15 Aug 1980	Contractor's final editions of the water supply and wastewater slide shows delivered.
21 Aug 1980	Contractor's final editions of Grand Forks emergency plan of action flood fight manual delivered by consultant.
27 Aug 1980	Corps, Soil Conservation Service, and Grand Forks city and county representatives attended a meeting of the English Coulee Watershed Study Committee to discuss flood control alternatives and view contractor's slide show on Grand Forks flood control studies.
29 Aug 1980	Copies of the water supply and wastewater management slide shows and pamphlets presented to Grand Forks city officials.
17 Sep 1980	Final edition of pamphlet describing urban study's flood control studies delivered.
8 Oct 1980	Letter from the Environmental Protection Agency formally accepted the urban study's draft stage 3 wastewater management report as satisfying the step 1 requirements of its Construction Grants Program, making Grand Forks eligible for Federal assistance for the recommended sewer separation project.
7 Nov 1980	Contractor's professionally narrated slide show on Grand Forks flood emergency plan of action delivered by consultant.
17 Dec 1980	Corps and Minnesota Department of Natural Resources representatives held a coordination meeting to initiate joint preparation of a slide show, pamphlet, and displays related to East Grand Forks flood emergency plan of action.
7 Jan 1981	Corps representatives formally turned over the Grand Forks flood emergency plan of action's flood fight manual, slide show, pamphlets, and displays to the city at meetings with the mayor's appointed task group and the city's Planning Commission.

Table 3 - Significant coordination activities, stage 3 (cont)

Date	Event
25 Feb 81	Corps and Minnesota Department of Natural Resources representatives met with East Grand Forks Flood Control Study Team to discuss the East Grand Forks flood emergency plan of action's flood fight manual and the associated pamphlet and draft version of a slide show.

ANALYSIS OF THE PUBLIC INVOLVEMENT PROGRAM

The Grand Forks-East Grand Forks public involvement program used a number of strategies to inform, educate, encourage participation, and elicit feedback from the public on urban water resource problems and needs. Not all the public involvement techniques were completely effective or efficient, but many achieved the desired results.

STUDY ORGANIZATION

The executive group's role as study policy decision maker and director was useful in maintaining the direction and flow of study progress. The executive group strived to keep the study on track by discouraging major delays by subordinates over minor issues.

The actual study work efforts were done by members of the study team and agency committee. The study team maintained close coordination among the numerous agencies, organizations, and individuals interested in participating.

The participation of the citizens committee declined as the urban study progressed. During stage 1, the committee was actively involved when public relations between the government agencies and the private citizens were most critical.

As the urban study progressed into stages 2 and 3, emphasis shifted to development of alternative solutions involving professional and technical expertise of various agencies and organizations. Cooperation and coordination with the study area citizens were still very important, but the role the citizens played - reviewing, evaluating, and accepting solutions to the identified problems - was less apparent as more technical elements picked up the work load. The role of the citizens will become increasingly important again; for example, as the cities solicit approval from taxpayers and affected residents for recommended projects, such as Grand Forks' combined sewer separation project.

MEETINGS

In addition to the formal public meetings and workshops mentioned earlier, numerous informal meetings were held between agencies and organizations involved. The number of organizations involved in each meeting varied greatly, from 2 to 20. Nevertheless, each meeting was helpful to the overall study effort.

WRITTEN MATERIALS

The main reports and appendixes represent the essence of the urban study. Flood control, wastewater management, and water supply were the major technical appendixes. These investigations were supported by related studies, such as the low-flow, leisure time, urban drainage, institutional, and background information studies. The reports from these related studies were distributed to members of the agency committee for review and comment as drafts were prepared during each phase of study. These reports ultimately were incorporated into the appropriate major technical appendix or printed as separate documents.

Progress reports were distributed periodically to all members within the study organization and to several hundred other individuals and groups on the urban study mailing list. The progress report was a very effective

tool in reaching all areas of the public. However, the lack of response from the public even when comments were specifically requested was disappointing. The study team was careful to write the progress reports in simple and understandable language without losing pertinent information.

DISPLAYS

Display booths were set up at different public events, for example, at energy conservation or natural resources events. The displays were to give a general and brief overview of the urban study's purpose and findings. Each event was carefully evaluated for potential target audiences; time, money, and effort involved in preparation of displays; and potential amount of recognition the urban study could receive.

PAMPHLETS AND SLIDE PROGRAMS

The pamphlets and slide programs summarizing the urban study's final results were very successful. The pamphlets were brief, nontechnical, visually attractive, and contained information of continuing value (such as public information telephone numbers at Grand Forks' flood emergency headquarters) so that a layperson would be encouraged to keep his copy.

The slide shows were very popular with local interests and were very effective in conveying the study's findings. Care in selecting slides of the study area (rather than general topical slides) made local audiences especially attentive as they identified area features; this was particularly true of the dramatic flood scenes. Slide show effectiveness was enhanced because local audiences related to the problem/solution message.

CONCLUSION

The Grand Forks-East Grand Forks urban study public involvement program has been relatively successful in meeting its objectives. One unforeseen problem - the decreasing number of staff members on the study team - greatly hindered the program. The manpower shortage was primarily the result of government hiring freezes and reassignment of study team members to other studies. Despite this problem, the study team made great strides toward conducting an effective public involvement program.