

CHAPTER 5

RECOMMENDED PLAN

CHAPTER 5 THE RECOMMENDED PLAN

PLAN DESCRIPTION

The recommended plan as shown in figure 5-1, is Hancock Creek channel portion of the NED plan. On Hancock Creek, 1,500 feet of concrete U-wall channel will begin just upstream of Houston Street and extend downstream to Burnet Road. A box culvert will divert some water around the shopping center and will flow back into Hancock Creek below the shopping center. The U-wall channel will continue from the shopping center to below Hancock Drive and then transition into a grass-lined channel ending about 700 feet downstream of Hancock Drive. The total length of improved channel on Hancock Creek is 3,200 feet.

DESIGN

The Hancock Creek channel improvements will be approximately 3,200 feet long and begin just upstream of Houston Street where the natural channel will transition to a grass-lined channel with a 40 foot wide bottom and 1 vertical on 3 horizontal side slopes. The Houston Street bridge will be replaced by a new multiple box culvert of four 8-foot high by 10-foot wide concrete boxes. Downstream of Houston Street the channel will be a 40-foot concrete U-wall channel which is approximately 10 feet deep and will extend downstream to Burnet Road. The existing box culverts under the shopping center and Burnet Road will remain. A new 10-foot by 10-foot box culvert will be routed on the south side of the shopping center between two buildings. This box culvert will tie back into the creek just downstream of the culverts which run under the shopping center. A concrete U-wall channel with a 50-foot bottom width will extend from the shopping center to approximately 120 feet below Hancock Drive. The existing multiple box culvert at Hancock Drive consisting of three 8-foot by 8-foot boxes will remain. Three new 8-foot by 8-foot boxes will be constructed adjacent to and on the same grade as existing boxes. The channel will have a depth of 8 to 9 feet. The channel will then transition to a 25-foot bottom width grass-lined channel with 1 vertical on 3 horizontal side slopes. The channel will transition back to the natural channel 700 feet downstream of Hancock Drive.

RELOCATIONS

The improvements to Hancock Creek will require bridge relocations at Hancock Drive, North Loop Boulevard, and Houston Street. The existing multiple box culvert at Burnet Road which goes under the shopping center will remain in place. The proposed box culvert at the shopping center will be constructed between the shopping center buildings and adjacent commercial buildings and under Burnet Road.

Utility relocations on Hancock Creek will include water, sewer, gas, electric, and telephone lines. Sewer alterations will include approximately 1,560 linear feet of 24-inch diameter pipe, and 3,120 linear feet of 8-inch diameter pipe.

DISPOSAL

The city of Austin has identified a couple of disposal sites for the material excavated from the project. These sites are located near southeast Austin. One site is a gravel pit which would be more than sufficient for the material. This site is located near the intersection of FM 973 and Harold Green Road. Another site is located in the same general vicinity. The area is open land, located about 1.5 miles west of U.S. Highway 183 and just south of the Colorado River near a mobile home park. There are several other gravel pits in southeast Austin and west of Austin which may be available for use as disposal sites when construction begins. The haul distance to the sites which the city has identified averages approximately 10 miles. No problems are anticipated with disposal of the excavated waste materials. Approximately 5 acres will be needed for disposal of the material.

REAL ESTATE

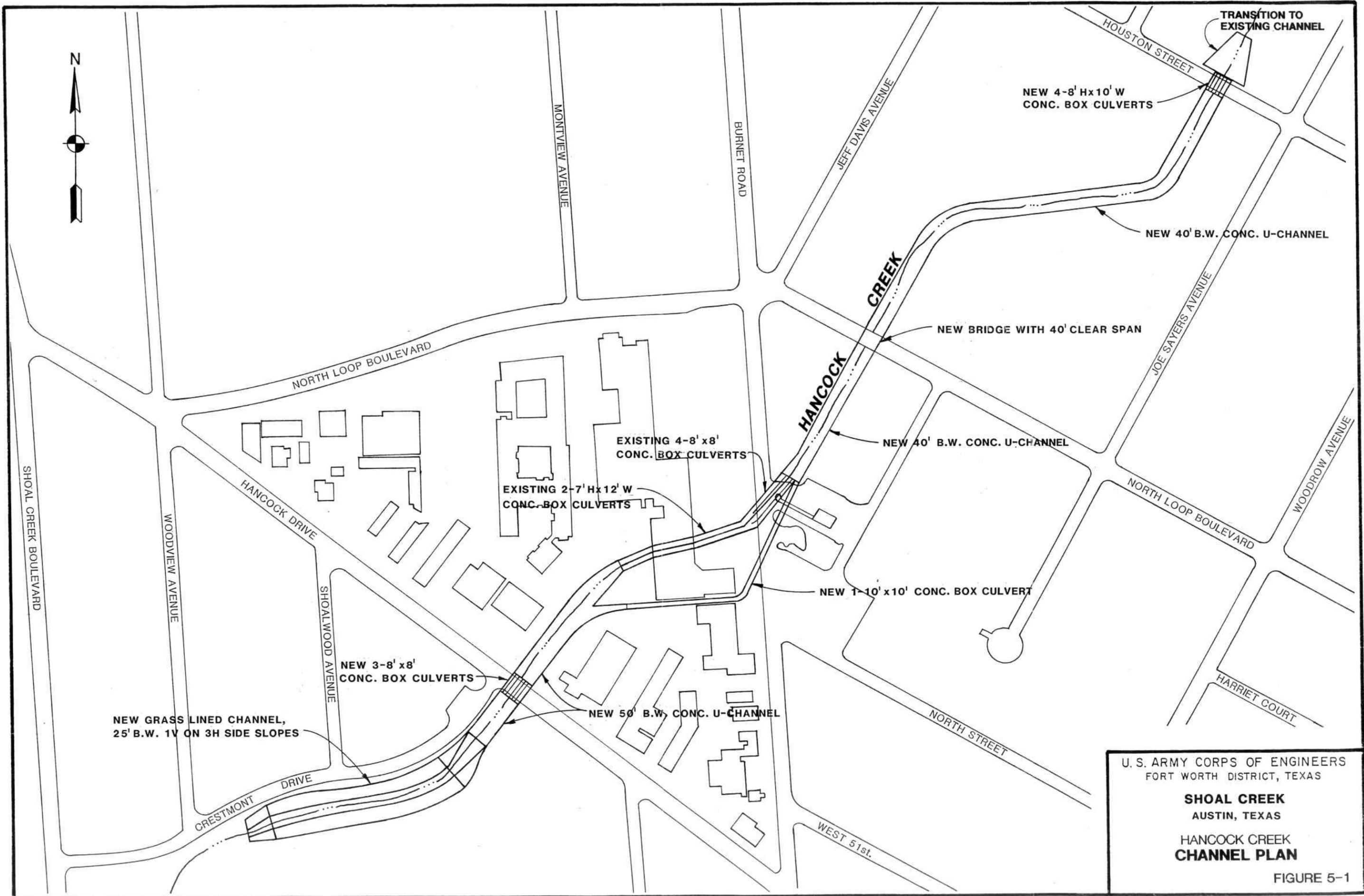
Property along the proposed Hancock Creek channel improvement will extend from just above Houston Street to approximately 700 feet downstream of Hancock Drive. A channel easement on approximately 3.1 acres will be acquired for the construction of the channel. An estimated 0.7 acres of temporary work area easement will be required for construction of the project. More details of the real estate required are shown in the Real Estate Appendix. No permanent residential or commercial structures would be relocated or purchased. The total cost of real estate acquisitions is estimated to be \$552,900. The real estate costs are based on a gross appraisal prepared in September 1989. Detailed real estate information for this project is contained in the appendix H.

CONSTRUCTION

Project construction would involve removal of an estimated 40,500 cubic yards of material. During construction, protective measures cited in the environmental guidelines for the civil works program of the Corps of Engineers would be enforced for such things as erosion, dust control, and proper debris disposal methods. Construction of the Hancock Creek Channel is expected to take approximately two years.

OPERATION AND MAINTENANCE

The Federal Government and the city of Austin will enter into a local cooperation agreement under which the city would accept the project after completion and insure maintenance and operation in accordance with Federal regulations. The major items of operation and maintenance of the completed project include: mowing the grassed portion of the channel, periodic cleanout of the concrete portion of the channel and drainage systems, and repair of erosion damage to the slopes of the channel. Subsequent to completion of this project, an operation and maintenance manual would be prepared by the Fort Worth District and furnished to the city of Austin.



U. S. ARMY CORPS OF ENGINEERS
 FORT WORTH DISTRICT, TEXAS

SHOAL CREEK
 AUSTIN, TEXAS

HANCOCK CREEK
CHANNEL PLAN

FIGURE 5-1

PLAN ACCOMPLISHMENTS

The major benefits that will result from the plan are reduction of existing flood damages to structures along Hancock Creek. Average annual benefits of \$1,187,400 are estimated for the existing improvements in the area. The plan has residual damages of \$742,000. The level of protection of the plan varies throughout the length of the creek. Table 5-1 provides an estimation of the level of protection of the project by reach. There are no induced damages downstream of the recommended plan.

TABLE 5-1
LEVEL OF PROTECTION AND PERCENTAGE DAMAGE REDUCTION
RECOMMENDED PLAN

HANCOCK CREEK

<u>Reach</u>	<u>Existing Level</u>	<u>Modified Level</u>	<u>Percent Damage Reduction</u>
1A	2	10	10
1B	1	2	15
2A	5	100	95
2B	5	50	92
3	10	100	97
4	2	5	53
5	2	2	6
Hancock Overall Range	1 to 10	2 to 100	62

EFFECT OF THE PLAN ON THE ENVIRONMENT

The selected plan will minimize the adverse environmental impacts. The channelized portions are limited to extensively developed areas along Hancock Creek which are relatively low in wooded habitat. Therefore, the channelization of the recommended plan will have no significant effects on wildlife. No significant impacts to water quality and aquatic life are expected to occur as a result of the recommended plan.

ECONOMICS OF THE SELECTED PLAN

This section of the report presents a detailed cost estimate for the selected plan and the flood control benefit analysis. The costs determined and the benefits assigned to the plan evaluated encompass only those that are tangible or quantifiable. In calculating both costs and

benefits, prices were set at the February 1991 level and a 50-year period of analysis (1996-2046) at 8-3/4 percent interest rate.

COSTS

First Cost. The economic cost of the selected plan described includes estimates for lands and damages, construction, engineering and design, supervision and administration, and contingencies. Construction cost data for the channel were developed using material, equipment, and labor costs typical for work of this nature in the Austin vicinity in February 1991. Table 5-2 gives the detailed first cost estimate for the selected plan.

**TABLE 5-2
COST ESTIMATE
RECOMMENDED PLAN
(February 1991 price level)**

Cost Acct No. Item	<u>Amount</u>
01 LANDS AND DAMAGES	\$ 442,300
Contingencies 25%±	<u>110,600</u>
TOTAL LANDS AND DAMAGES	\$ 552,900
02 RELOCATIONS	
Roads and bridges	190,300
Utilities	<u>195,200</u>
Subtotal	\$ 385,500
Contingencies 25%±	<u>93,700</u>
TOTAL RELOCATIONS	\$ 479,200
09 CHANNEL	3,485,900
Contingencies 25%±	<u>844,700</u>
TOTAL CHANNEL	\$ 4,330,600
18 CULTURAL RESOURCES	800
Contingencies 25 %±	<u>200</u>
TOTAL CULTURAL RESOURCES	\$ 1,000
30 ENGINEERING AND DESIGN	741,000
31 SUPERVISION AND ADMINISTRATION	<u>530,000</u>
TOTAL PROJECT FIRST COST	\$ 6,634,700

Annual Charges. To be comparable with benefit estimates, the project first cost was converted to an equivalent average annual basis. To that, estimates of average operation and maintenance costs and annual equivalent charges for replacement of features not expected to function properly over

the entire period of analysis were added. For the purpose of determining the total investment, construction was assumed to be phased and a two year construction period was assumed. Table 5-3 provides a breakdown of annual charges for the Recommended Plan.

TABLE 5-3

**HANCOCK CREEK CHANNEL PLAN
AVERAGE ANNUAL CHARGES**

Total First Cost	\$ 6,634,700
Interest During Construction	589,000
Total Investment	\$ 7,223,700
Interest and Amortization (50 years at 8-3/4%)	641,800
Annual operation, maintenance and replacements	5,000
Total Annual Charges	\$ 646,800

BENEFITS

This section presents information on the economic evaluations performed to calculate the benefits accruing to the selected plan of improvement for Hancock Creek. The benefits assignable to this plan encompass only those that are tangible and quantifiable.

Existing Inundation Reduction Benefits. Average annual benefits were determined by subtracting residual flood losses from the without project annual flood losses. Since future hydraulics are not expected to change, benefits to existing development are expected to remain constant over time. Reaches 2B, 3, and 4 of Hancock Creek have the greatest amount with \$1,090,100, or about 92 percent of the total. Table 5-4 displays a summary of the existing flood reduction benefits for the Recommended Plan, by reach.

TABLE 5-4

EXISTING AVERAGE ANNUAL DAMAGES, RESIDUAL DAMAGES AND BENEFITS
(February 1991 Prices and Level of Development)

<u>Reach</u>	<u>Annual Damages</u>	<u>Residual Damages</u>	<u>Annual Benefits</u>
	(in thousands of dollars)		
HANCOCK CREEK			
1A	127.8	114.4	13.4
1B	199.8	170.7	29.1
2A	46.6	1.0	45.6
2B	512.9	43.5	469.4
3	373.6	11.9	361.7
4	490.3	231.3	259.0
5	<u>178.4</u>	<u>169.2</u>	<u>9.2</u>
Subtotal	\$ 1,929.4	\$ 742.0	\$ 1,187.4

Benefit Summary. The benefits attributable to the recommended plan were calculated based on a 50-year project life (1996-2046) and an 8-3/4 percent interest rate. Subsequent to the completion of the economic analysis, consideration was given to other potential types of flood control benefits which would accrue to the recommended improvements. Two additional benefit categories identified were vehicular damage reduction and insurance cost reduction benefits. Estimates of the project benefits which would accrue to this plan are presented in table 5-5.

TABLE 5-5

SUMMARY OF AVERAGE ANNUAL FLOOD CONTROL BENEFITS
(February 1991 price and level of development)

<u>Category</u>	<u>Benefits</u>
Inundation Reduction	\$ 1,187,400
Vehicular Damage Reduction	39,300
Insurance Overhead Reduction	3,000
Total	\$ 1,229,700

ECONOMIC JUSTIFICATION

The normal measure of economic feasibility is the benefit-to-cost ratio being greater than or equal to 1.0. The average annual cost for the Recommended Plan is \$646,800. Average annual benefits are estimated to be \$1,229,700. This results in a benefit-to-cost ratio of 1.9 to 1.0. Additional details of the Recommended Plan are included in the appendix E.

DIVISION OF PLAN RESPONSIBILITIES

COST APPORTIONMENT

Sharing of costs between Federal and non-Federal interests for the project is based on standard requirements established as Federal policy in Public Law 99-662. Under this law, non-Federal interests would be required to furnish all lands, easements, and rights-of-way, including all relocations of bridges and utilities. Non-Federal interests would be required to furnish a cash contribution equal to 5 percent of the total flood control project cost and would also be responsible for operating and maintaining the project features after construction. Additionally, if the non-Federal share of project costs is less than 25 percent of the flood control costs an additional cash payment will be required. The non-Federal interests will be required to provide a minimum of 25 percent of the flood control cost and 50 percent of the separable recreation costs. The Federal Government would be responsible for all remaining flood control construction cost. Table 5-6 shows the apportionment of the first cost and annual operation, maintenance, and replacement (OM&R) costs between Federal and non-Federal interests, in accordance with the policies outlined above.

NON-FEDERAL RESPONSIBILITIES

Prior to commencement of construction, local interests must agree to meet the requirements for non-Federal responsibilities as outlined below and in future legal documents.

- a. Provide a cash contribution equal to 5 percent of the total flood control project costs;
- b. Provide without cost to the United States, all lands, easements, and rights-of-way, including borrow and dredged material disposal areas, necessary for construction and maintenance and operation of the project;
- c. Perform all relocations and alterations of buildings, utilities, highways, railroads, bridges (other than railroad bridges), sewers, and related and special facilities determined to be necessary for construction and maintenance of the project;
- d. Provide an additional cash payment when the sum of items (a) and (b) is less than 25 percent of the flood control project costs (if the sum of items (a) and (b) should exceed 50 percent of total flood control project costs, local contributions in excess of 50 percent will be reimbursed by the Federal Government);
- e. Maintain and operate the project after completion and provide any needed replacements or rehabilitations of any of its components;

TABLE 5-6
COST APPORTIONMENT
 (February 1991 price level)

	<u>First Costs</u>		<u>Annual Operation,</u>	
	<u>Flood Control</u>		<u>Maintenance, and</u>	
	<u>Federal</u>	<u>Non-Federal</u>	<u>Federal</u>	<u>Non-Federal</u>
Lands		\$ 552,900		
Relocations		479,200		
Channel	\$4,330,600			\$ 5,000
Cultural Resources	1,000			
Engineering and Design	703,000	38,000		
Supervision and Administration	<u>490,000</u>	<u>40,000</u>		
Subtotal	\$ 5,524,600	\$1,110,100	\$ 0	\$ 5,000
Cost Sharing Reallocation <u>1/</u>	<u>- 548,900</u>	<u>+ 548,900</u>		
Total	\$ 4,975,700	\$ 1,659,000	\$ 0	\$ 5,000

1/ Non-Federal interests are required to provide a minimum of 25 percent of the total flood control cost. Five percent must be a cash contribution.

f. Hold and save the United States free from damages due to construction and subsequent operation and maintenance of the project, except damages due to the fault or negligence of the United States or its contractors;

g. Make cash contribution for project costs assigned to project features other than flood control, including 50 percent of the cost of recreation development;

h. Prevent encroachment which could interfere with proper functioning of the flood control project;

i. For any project for local flood protection, participate in and comply with applicable Federal flood plain management and flood insurance programs (i.e. the National Flood Insurance Program), pursuant to Section 402, Public Law 99-662;

j. Publicize, at least annually, the fact that the project will not provide protection from the occurrence of storms greater than the project design flood;

k. Comply with the provisions of the "Uniform Relocation Assistance and real Acquisition Policies Act of 1970," Public Law 91-646, approved 2 January 1971, and with the requirement of Section 221, Public Law 91-611, approved 31 December 1970, as amended.

l. Comply with the requirement of Section 2 of Public Law 89-72 with respect to the recreational features of the project.

m. Comply with Title VI of the Civil Rights Act of 1964 (Public Law 88-352).

PLAN IMPLEMENTATION

The plan of improvement recommended in this report will be subject to a series of reviews and legislative processes before it can be completed as a Federal project. The following steps are involved in the review and implementation process:

- o Review of Feasibility Report by the Division Engineer, Southwestern Division, Corps of Engineers.
- o Release of Division Engineer's Notice.
- o Review by states and agencies.
- o Public Meeting and finalization of Feasibility Report.
- o Review of the Report by the Washington Level Review Center.
- o Preparation of the Board of Engineers for Rivers and Harbors (BERH) Report.

- o Preparation of the Chief of Engineers Report.
- o Approval of Report by the Assistant Secretary of the Army for Civil Works.
- o Report to Congress.
- o Project Authorization.
- o Preparation and Approval of Design Memorandum.
- o Preparation of construction plans and specifications.
- o Review of plans and specifications by the Division Engineer.
- o Review of the Local Cooperation (Cost Sharing) Agreement by the Chief of Engineers.
- o Approval of the project for construction by the Assistant Secretary of the Army for Civil Works.
- o Consummation of the Local Cooperation Agreement between the Corps and the city of Austin.
- o Local sponsor acquires the necessary real estate for construction and maintenance of the project.
- o Receipt of the Sponsor's 5 percent cash contribution prior to initiation of construction.
- o Chief of Engineers allocates construction funds.
- o Award construction contract.

Formal agreement of local cooperation (LCA) will be required before construction of the project can begin. Budgeting for work items is accomplished two years in advance. All funding is subject to appropriations by Congress.

PUBLIC AND AGENCY COORDINATION

Close coordination has been maintained throughout this study with the city of Austin officials, as well as interested State and Federal agencies and the general public. On August 12, 1987, a public meeting was held in Austin to discuss the results of the June 1987, Draft Interim Report. At this meeting opposition to the plan which was presented was expressed. Alternatives to this plan were developed and are presented in this report. On October 27, 1987, alternative plans were presented to the Austin city council. These plans were referred to the city staff for recommendation.

Another public meeting was held on July 18,1990. The city has reviewed the report and elected to proceed with implementation of the Hancock Creek portion of the NED plan which was presented.

Coordination has been maintained with the U.S. Fish and Wildlife Service throughout this study. Their Coordination Act Report is included in the environmental assessment.

