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パナマ運河代替案調査外交取極
及び
準備委員会最終報告書

昭和60年10月

国際協力事業団
企画部

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及び
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昭和60年10月

国際協力事業団
企画部

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目 次

第一部 パナマ運河代替案調査委員会に関する外交取極

1. NOTE FROM THE UNITED STATES OF AMERICA TO JAPAN	1
2. NOTE FROM JAPAN TO THE UNITED STATES OF AMERICA (Translation)	2
3. ANNEX	5
ARRANGEMENT CONCERNING THE COMMISSION FOR THE STUDY OF ALTERNATIVES TO THE PANAMA CANAL	
4. ANNEX 訳文	13

第二部 パナマ運河代替案調査準備委員会最終報告書

NOTE FROM THE UNITED STATES OF
AMERICA TO JAPAN

Excellency:

I have the honor to inform Your Excellency that the Governments of the United States of America and the Republic of Panama, in accordance with Article XII, paragraph 1 of the Panama Canal Treaty signed September 7, 1977, have decided to establish the Commission for the Study of Alternatives to the Panama Canal (hereinafter referred to as the "Study Commission"), as set forth in the exchange of notes between the Governments of the United States of America and the Republic of Panama signed on (date) and in the "Arrangement Concerning the Commission for the Study of Alternatives to the Panama Canal" annexed to that exchange of notes, copies of which are appended hereto.

Taking into account the interest previously expressed by the Government of Japan in participating in the Study of Alternatives to the Panama Canal, I have the further honor to propose on behalf of the Government of the United States that the Government of Japan participate jointly with the Governments of the United States of America and the Republic of Panama in the Study Commission as a Member Government in accordance with the aforementioned Arrangement.

I have the further honor to suggest that if the foregoing proposal is acceptable to the Government of Japan this Note and Your Excellency's Note in reply indicating acceptance shall constitute an agreement between our two governments which shall enter into force on this date.

Accept, Excellency, the assurances of my highest consideration and esteem.

Attachment: Exchange of Notes between the Republic of Panama and the United States of America, and the Annex entitled "Arrangement Concerning the Commission for the Study of Alternatives to the Panama Canal"

NOTE FORM JAPAN
TO THE UNITED STATES OF AMERICA

(Translation)

Excellency:

I have the honor to acknowledge the receipt of Your Excellency's Note of today's date which reads as follows:

"I have the honor to inform Your Excellency that the Governments of the United States of America and the Republic of Panama, in accordance with Article XII, paragraph 1 of the Panama Canal Treaty signed September 7, 1977, have decided to establish the Commission for the Study of Alternatives to the Panama Canal (hereinafter referred to as the "Study Commission"), as set forth in the exchange of notes between the Governments of the United States of America and the Republic of Panama signed on (date) and in the "Arrangement Concerning the Commission for the Study of Alternatives to the Panama Canal" annexed to that exchange of notes, copies of which are appended hereto.

Taking into account the interest previously expressed by the Government of Japan in participating in the Study of Alternatives to the Panama Canal, I have the further honor to propose on behalf of the Government of the United States that the Government of Japan participate jointly with the Governments of the United States of America and the Republic of Panama in the Study Commission as a Member Government in accordance with the aforementioned Arrangement.

I have the further honor to suggest that if the foregoing proposal is acceptable to the Government of Japan this Note and Your Excellency's Note in reply indicating acceptance shall constitute an agreement between our two governments which shall enter into force on this date."

I have the honor to confirm that the foregoing proposal is acceptable to the Government of Japan and that Your Excellency's Note, together with this reply, shall constitute an agreement between our two Governments, which shall enter into force on the date of this reply.

I avail myself of this opportunity to renew to Your Excellency the assurances of my highest consideration.

Attachment: Exchange of Notes between the Republic of Panama and the United States of America, and the Annex entitled "Arrangement Concerning the Commission for the Study of Alternatives to the Panama Canal"

the alternatives to the Panama Canal considered by the Study Commission.

If the Government of the United States of America is in agreement with the content of this Note, on the foregoing basis, I have the honor to propose that this Note, together with Your Excellency's affirmative Note of acceptance, shall constitute an agreement between our two governments for the establishment of the Study Commission, which shall enter into force on the date of Your Excellency's reply."

I have the honor to confirm that the foregoing is acceptable to the Government of the United States of America and that Your Excellency's Note, together with this reply, shall constitute an agreement between our governments, which shall enter into force on this date.

Accept, Excellency, the assurances of my highest consideration and esteem.

Attachment: Annex entitled "Arrangement Concerning the Commission for the Study of Alternatives to the Panama Canal".

Excellency:

I have the honor to refer to Your Excellency's Note of today's date regarding the establishment of a Commission for the Study of Alternatives to the Panama Canal, which states:

"I have the honor to refer to Article XII, paragraph 1 of the Panama Canal Treaty, signed on September 7, 1977; to the exchange of notes between the Government of the Republic of Panama and the Government of the United States of America of September 30, 1982, and its annexes, concerning the establishment of the Preparatory Committee for the Study of Alternatives to the Panama Canal; and to the invitation of the same date to the Government of Japan to participate in said Committee and the latter's subsequent acceptance thereof.

I have the further honor to refer to the Final Report of the Preparatory Committee of June 28, 1985, submitted for the consideration of the Governments of the Republic of Panama, the United States of America, and Japan, in which said Committee recommends the establishment of the Commission for the Study of Alternative to the Panama Canal (hereinafter referred to as the "Study Commission").

His Excellency,

Jorge Abadia Arias

Minister of Foreign Affairs

of the Republic of Panama

After considering the aforementioned recommendations of the Preparatory Committee, I am pleased to inform Your Excellency's Government that the Republic of Panama proposes the establishment of the Study Commission, in accordance with the Annex entitled "Arrangement Concerning the Commission for the Study of Alternatives to the Panama Canal", which forms an integral part of this note.

The Government of the Republic of Panama proposes that the Government of the United States of America join with it in inviting the Government of Japan to participate in the Study Commission as a Member Government with the Republic of Panama and the United States of America and to make such an invitation simultaneously with this exchange of Notes.

It is understood that nothing expressed in this exchange of Notes shall be interpreted as an obligation or intention of the Parties to construct or execute any of

ANNEX

ARRANGEMENT CONCERNING THE COMMISSION FOR THE STUDY
OF ALTERNATIVES TO THE PANAMA CANAL

ANNEX

ARRANGEMENT CONCERNING THE COMMISSION FOR THE SURVY OF ALTERNATIVES TO THE PANAMA CANAL

Section 1

The Study Commission

The Member Governments shall participate jointly in the Study of Alternative to the Panama Canal (hereinafter referred to as the "Study") and for this purpose agree to establish the Commission for the Study of Alternatives to the Panama Canal (hereinafter referred to as the "Study Commission").

Section 2

Location

The headquarters of the Study Commission shall be in Panama City, Republic of Panama.

Section 3

Objectives

The Objectives of the Study Commission are:

- (a) to identify potential transportation alternatives to the Panama Canal in the Republic of Panama;
- (b) to study these alternatives in accordance with the terms of reference contained in the Final Report of the Preparatory Committee for the Study of Alternatives to the Panama Canal (hereinafter referred to as the "Final Report") in order to develop the information necessary to evaluate the feasibility of each alternative;
- (c) to select the best alternative and study it in detail; and
- (d) having studied in detail the best alternative, to develop conceptual plans for that alternative for the consideration of the Member Governments of the Study Commission.

Section 4

Organization

- (a) The Study shall be directed by the Study Commission, made up of a Board of Commissioners and a supporting Secretariat. Project management assistance and Study components shall be carried out by individual contractors under the supervision of the Board of Commissioners and Secretariat.
- (b) The Board of Commissioners
- (i) The Study Commission shall be directed by a Board of Commissioners. Each Member Government shall name to the Board one Commissioner and up to three Deputy Commissioners.
 - (ii) The Board of Commissioners shall be the highest organ of the Study Commission and shall exercise its responsibilities to: direct and execute the Study; establish and develop policy guidelines in accordance with the terms of reference approved in the Final Report; approve budgets and contracts; approve reports of the Study; and submit a Final Study Report for consideration by the Member Governments.
 - (iii) The Board of Commissioners shall have one Chairman and two Deputy Chairmen, whose positions shall rotate annually in an order to be determined by the board of Commissioners at its first meeting.
 - (iv) Each Member Government shall have one vote on the Board of Commissioners. All decisions shall be made by the unanimous vote of the Member Governments.
 - (v) The Board of Commissioners shall hold ordinary and extraordinary sessions and shall meet at least four times each year in the Republic of Panama, unless all Member Governments, through their Commissioners, agree otherwise.
 - (vi) Each Member Government shall be represented in all meetings of the Board of Commissioners, which cannot be held in the absence of a Member Government.
- (c) The Secretariat
- (i) The Board of Commissioners shall be supported by a Secretariat. The Secretariat shall be composed of experts designated by the Member Governments, other subordinate personnel, and an Information Center. Each Member Government shall name up to four experts to the Secretariat and shall designate one of them as Principal Delegate.
 - (ii) The Secretariat shall be directed by an Executive Director, assisted by a Technical Director and a Financial Director. These positions shall be occupied by the three Principal Delegates and shall rotate annually among them in an order to be determined by the Board of Commissioners, with the understanding that the Chairman of the Board of Commissioners and the Executive Director shall not be of the same nationality at the same time.

- (iii) The Secretariat shall assist the Board of Commissioners in the technical and administrative aspects of the execution of the Study; shall administer the contracts approved by the Board of Commissioners; shall administer the funds and resources of the Study Commission; and shall establish and maintain an Information Center.
- (d) The Contractors
The various components of the Study shall be executed by contractors and agencies such as consulting firms, universities, research institutions, and agencies of the Member Governments.
- (e) Languages
The official languages of the Study Commission shall be Spanish, English and Japanese.

Section 5

Resources

- (a) A budget of \$20 million shall be allocated for the work of the Study Commission.
- (b) Each Member Government shall, subject to its budgetary appropriations, contribute, in cash and/or in kind, one-third of the budget of \$20 million.
- (c) Contributions other than cash shall be credited towards payment of a Member Government's contribution to the Study Commission, subject to the approval of the Board of Commissioners.
- (d) Once the Detailed Plan of the Study is developed by the Study Commission and the Study has commenced, should there be additional requirements to comply with the Scope of the Study, appropriate representations to the respective Member Governments may be made by the Study Commission.

Section 6

Legal Capacity

The Study Commission shall have legal capacity, in accordance with the laws and regulations of the respective Member Governments:

- (a) to contract;
- (b) to lease or rent real property;
- (c) to acquire and dispose of personal property; and
- (d) to institute legal proceedings.

Section 7

Privileges and Immunities

The Member Governments shall, to the extent permitted by their respective laws, recognize the Study Commission as an international organization and, as a consequence, the Republic of Panama shall accord privileges and immunities including the following:

- (a) The Study Commission and its property and assets, wherever they be found, shall enjoy immunity against lawsuits and all forms of legal process, except in those particular cases in which the Study Commission expressly waives its immunity.
- (b) The Study Commission shall be exempt from all direct tax, customs, importation or related duties, except for transportation expenses, warehousing and similar services, with regard to items for official use, with the understanding that items imported into the Republic of Panama can be sold in the national territory, so long as the legal requirements of the Republic of Panama are met.
- (c) The members of the Board of Commissioners and the Secretariat of the Study Commission who are not nationals of the Republic of Panama and are duly accredited by a Member Government to act in its name, and the members of their family who are part of their household, shall enjoy the same privileges, exemptions, and immunities as those granted to foreign diplomatic agents and members of their family who are part of their household, in accordance with the provisions which regulate the subject.
- (d) The employees of the Study Commission who are not nationals of the Republic of Panama and perform technical and administrative services shall be granted the privileges and immunities which are granted to technical and administrative employees of international organizations in the Republic of Panama.

Section 8

Study Contractors

- (a) The Study Commission may authorize contracts with natural or juridical persons Panamanian or foreign, (hereinafter referred to as "Study Contractors") to fulfill the Study components and assure the efficient and normal operation of the Study, allowing real and relevant participation of natural and juridical Panamanian persons.
- (b) Goods imported into the Republic of Panama by the Study Commission for the exclusive use of the development of the Study will be free of the payment of import taxes. Such goods may be used by the Study Contractors in the completion of their contracts with the Study Commission. Said use shall be regulated by Panamanian authorities and the Study Commission in their respective spheres of competence.

(c) In accordance with the laws and regulations of the Republic of Panama, income earned by Study Contractors for services performed within the territory of the Republic of Panama shall be taxable by the Republic of Panama irrespective of the source of the funds used to compensate the Study Contractors for such services. It is understood that none of the Member Governments waive their right to impose income taxes, according to their respective laws and regulations, on the income and activities of the Study Contractors.

Section 9

Participation of Other Governments

Governments other than the Member Governments, and international financial institutions, may participate in the Study, subject to the decision of the Study Commission and in accordance with the conditions and procedures adopted by it.

Section 10

Acceptance of the Final Recommendations

Participation in the Study Commission shall not prejudice the acceptance by each Member Government of the final recommendations which shall be presented by the Study Commission. No action taken by the Board of Commissioners or by any Commissioner or Deputy Commissioner shall effect the freedom of each Member Government to reject the final recommendations presented by the Study Commission.

Section 11

Implementation

This Arrangement shall be implemented in accordance with the laws and regulations of the respective Member Governments.

Section 12

Duration

This Arrangement shall remain in force for five years and thereafter may be extended for additional fixed periods by consent of all the Member Governments.

Section 13

Amendment

This Arrangement may be amended by consent of all the Member Governments.

(訳文)

附属書 パナマ運河代替案調査委員会に関する取極

第1項 調査委員会

加盟政府は、パナマ運河代替案調査(以下「調査」という。)に共同で参加し、このため、パナマ運河代替案調査委員会(以下「調査委員会」という。)を設立することを合意する。

第2項 所在地

調査委員会の本部は、パナマ共和国のパナマ市に置く。

第3項 目的

調査委員会の目的は、次のとおりとする。

- (a) パナマ共和国における潜在的なパナマ運河輸送代替案を明らかにすること。
- (b) 各代替案の実行可能性を評価するために必要な情報を開発するため、パナマ運河代替案調査委員会の最終報告書(以下「最終報告書」という。)に記載された事項によってこれらの代替案を調査すること。
- (c) 最適代替案を選択し、かつ、当該代替案を詳細に調査すること。
- (d) 最適代替案を詳細に調査した後、調査委員会の加盟政府による検討のため、当該代替案の概念計画を作成すること。

第4項 組織

- (a) 調査は、理事会及びこれを補佐する事務局から成る調査委員会が指揮する。調査運営補助及び調査項目は、理事会及び事務局の監督の下に、個々の請負人が実施する。
- (b) 理事会
 - (i) 調査委員会は、理事会が指揮する。各加盟政府は、1人の理事及び3人までの副理事を指名する。
 - (ii) 理事会は、調査委員会の最高機関であり、調査を指揮し及び実施し、最終報告書において承認された事項によって政策方針を策定し及び立案し、予算及び契約を承認し、調査の報告を承認し並びに加盟政府による検討のため最終調査報告書を提出するという責務を遂行する。
 - (iii) 理事会には、1人の議長及び2人の副議長を置くものとし、これらの者の地位は、理事会がその第1回会合において決定する順序に従って1年ごとに交替する。
 - (iv) 各加盟政府は、理事会において一の票を有する。すべての決定は、加盟政府の全会一致の票決で行われる。

- (v) 理事会は、通常会合及び特別会合を開催するものとし、理事を通じてすべての加盟政府による別段の決定が行われない限り、パナマ共和国において毎年少なくとも4回会合する。
- (vi) 各加盟政府は、理事会のすべての会合に代表者を出席させるものとし、一の加盟政府が欠席する場合には、理事会の資金及び財源を管理し並びに情報センターを設置し及び維持する。

(c) 請 負 人

調査の種々の項目は、コンサルタント会社、大学、研究機関、加盟政府の機関等の請負人及び機関が実施する。

(d) 言 語

調査委員会の公用語は、スペイン語、英語及び日本語とする。

第5項 財 源

- (a) 調査委員会の活動のため、2,000万ドルの予算を割り当てる。
- (b) 各加盟政府は、その予算の範囲内において、2,000万ドルの予算の1/3を現金又は現物で拠出する。
- (c) 現金以外の拠出については、理事会の承認を条件として、調査委員会に対する加盟政府の拠出の払込分として貸記する。
- (d) 調査委員会により詳細調査計画が作成され、調査が開始された後、調査の範囲と合致するために追加の要請が生ずる場合には、調査委員会は、各加盟政府に対し適当な申入れを行うことができる。

第6項 法律上の能力

調査委員会は、各加盟政府の法令に従って、次の法律上の能力を有する。

- (a) 契約を締結すること。
- (b) 不動産を賃貸借すること。
- (c) 動産を取得し及び処分すること。
- (d) 訴えを提起すること。

第7項 特権及び免除

加盟政府は、自国の国内法で認められた範囲内で、調査委員会を国際機関として認定し、その結果として、パナマ共和国は、次の特権及び免除を含む特権及び免除を調査委員会に与える。

- (a) 調査委員会並びにその財産及び資産は、その所在地のいかんを問わず、調査委員会がその免除を明示的に放棄した特定の場合を除くほか、訴訟及びあらゆる形式の訴訟手続の免除を受ける。
- (b) 調査委員会は、公用に供する物品について、運送費、蔵入れ及びこれらに類する役務を除くほか、すべての直接税、関税、輸入税又は関連のある税を免除されるものとし、パナマ共和国

に輸入された物品がパナマ共和国の法的要件を満たす場合に限り、パナマ共和国の領域内において売却することができる旨を了解する。

- (c) パナマ共和国の国民でない調査委員会の理事会及び事務局の構成員で加盟政府により正当に信任された者及びその世帯に属する家族は、関連規定に従い、外国の外交官及びその世帯に属する家族と同様の特権及び免除を享受する。
- (d) パナマ共和国の国民でない調査委員会の使用人で技術的及び事務的役務に従事する者は、パナマ共和国における国際機関の技術的及び事務的使用人に与えられる特権及び免除を与えられる。

第8項 調査請負人

- (a) 調査委員会は、調査項目を達成し及び調査の効率的かつ正常な実施を確保するため、パナマの自然人及び法人の実質的及び適切な参加に考慮を払い、パナマ又はパナマ以外の自然人又は法人（以下「調査請負人」という。）による請負を認可することができる。
- (b) 調査委員会が専ら調査の実施のために使用するためパナマ共和国に輸入した物品については、輸入税の支払を免除する。調査請負人は、調査委員会よりの請負を遂行するときは、これらの部品を使用することができる。その使用に当たっては、パナマの関係当局及び調査委員会がそれぞれの権限の範囲内で規制を行う。
- (c) パナマ共和国の法令に従い、調査請負人がパナマ共和国の領域内で遂行した業務により得た収入については、その業務に対する調査請負人の報酬の資金源にかかわらず、税を課することができる。いかなる加盟政府も、調査請負人の収入及び活動について、自国の法令に従い、所得税を課する権利を放棄しない旨を了解する。

第9項 他の政府の参加

加盟政府以外の政府及び国際金融機関は、調査委員会の決定を条件として、調査委員会が採択する条件及び手続に従って、調査に参加することができる。

第10項 最終勧告の受諾

調査委員会への参加は、調査委員会が提出する最終勧告を各加盟政府が受諾することを予断するものではない。理事会又はいずれの理事若しくは副理事によるいかなる行動も、調査委員会が提出する最終勧告を各加盟政府が拒否する自由に影響を及ぼすものではない。

第11項 実 施

この取極は、各加盟政府の法令に従って実施する。

第12項 有効期間

この取極は、5年間効力を有するものとし、その後はすべての加盟政府の合意により更に一定期間延長することができる。

第13項 改正

この取極は、すべての加盟政府の合意により改正することができる。

**Preparatory Committee
on the Panama Canal
Alternatives Study**

FINAL REPORT

Panama - United States - Japan

Panama, June 1985

REPORT OF THE PREPARATORY COMMITTEE

TABLE OF CONTENTS

	Page
Executive Summary, Conclusions and Recommendations	i
Introduction	vi
Objectives of the Preparatory Committee	ix
<u>PART I - Basic Arrangements Relative to the Creation of a Study Organization</u>	1
1.1. Study Objectives	2
1.2. Study Organization	4
<u>PART II - Technical Aspects</u>	30
2.1. Study Arrangements	31
2.1.1. Study Outline	32
2.1.2.1. Detailed Study Outline	36
2.1.2.2. Detailed Description of Study Outline (Third Level of Ela- boration)	61
2.1.3. Study Procedure	63
<u>PART III - Budgetary and Financial Aspects</u>	82
3.1. Study Budget and Schedule	83
3.2. Cost Sharing and Study Financing	97
<u>Figures</u>	
1a. Organization for the Administration of the Panama Canal Alternatives Study	7A
1b. Organization of the Secretariat of the Panama Canal Alternatives Study	9A
2. Detailed Plan of Study, Diagrammatic Study Procedure	65
3. Study Budget	85
4. Schedule of the Study Commission	87

EXECUTIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

EXECUTIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Article XII (1) of the Panama Canal Treaty between the Republic of Panama and the United States, signed in Washington on September 7, 1977, recognizes that a sea-level canal may be important for international navigation in the future. Consequently, it states that, "during the duration of this Treaty, both parties commit themselves to study jointly the feasibility of a sea-level canal in the Republic of Panama...."

By exchange of notes on September 30, 1982, the Governments of the Republic of Panama and the United States of America agreed to establish a Preparatory Committee for the study of alternatives to the Panama Canal, including a sea-level canal. The signatories of the exchange of notes agreed to invite the Government of Japan to join the aforementioned Committee as a full member, which Japan accepted.

Subsequently, each country appointed a Representative and the Preparatory Committee was constituted in accordance with the above mentioned exchange of notes and its annexes.

The Preparatory Committee held seven formal meetings from 1982 to 1985, and reached agreement on the recommendations contained in this Final Report which the Committee submits to the member governments for their consideration.

I. Study Objectives

The objectives of the Study Commission are:

- a) to identify potential transportation alternatives to the Panama Canal in the Republic of Panama;
- b) to study these alternatives in accordance with the Terms of Reference contained in the Final Report of the Preparatory Committee for the Study of Alternatives to the Panama Canal in order to develop the information necessary to evaluate the feasibility of each alternative;
- c) to select the best alternative and study it in detail;
- d) having studied in detail the best alternative, to develop conceptual plans for said alternative for the consideration of the Member Governments of the Study Commission.

In accordance with the exchange of notes of September 30, 1982, the Preparatory Committee developed the Terms of Reference for a study which would fulfill these objectives.

2. The Study Outline

This section briefly describes the Study in outline form and identifies the general subject matters which would be analyzed in the Study.

3. The Detailed Study Outline

This section describes in detail the subjects which would be analyzed in the Study.

4. Study Procedure

This section contains guidelines for the execution of the Study, and explains the structural relationship between the different Study components.

5. The Organization of the Study

This section describes the entities that will direct and execute the Study, to wit: (1) a Board of Commissioners consisting of representatives of the member countries and responsible for the execution of the Study; (2) a Secretariat, with an Information Center, made up of representatives from the three countries working under the direction of the Board of Commissioners for the managerial, technical and financial administration of the Study and (3) contractors, which will carry out the studies.

6. The Study Budget

The Study Budget is estimated at U.S. \$20 million which will provide a basis for the work of the Study Commission.

7. Financing of the Study

The governments of Panama, Japan, and the United States, subject to the appropriation of funds, each agree to provide one third of the U.S. \$20 million.

INTRODUCTION

INTRODUCTION

The Republic of Panama, the United States of America and Japan joined together in the Preparatory Committee for the Study of Alternatives to the Panama Canal for the purpose of preparing the terms of reference for studies contained in this Final Report.

The decision of the three countries was based on recognition of the importance of the Panama Canal to world commerce and on the need to study, on a timely basis, measures for confronting future demand for transit and interoceanic communication through the Republic of Panama and to consider the effect of such measures on Panama and the international community.

In order to fulfill the purpose of the three Governments, the Representatives of the Republic of Panama, the United States of America and Japan, who constituted the Preparatory Committee, held seven formal meetings between 1982 and 1985 in Panama, Washington and Tokyo and conclude their work with this Final Report that is being presented as a recommendation

to the member Governments. The Preparatory Committee has prepared the Terms of Reference of the Study in order to provide the member Governments with necessary and timely information concerning the best alternative to the Panama Canal.

OBJECTIVES OF THE PREPARATORY COMMITTEE

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By exchange of diplomatic notes on September 30, 1982, the governments of the Republic of Panama and the United States of America agreed to establish a Preparatory Committee to consider means of conducting a feasibility study of a sea-level canal through the Republic of Panama and other alternatives to the Panama Canal, in accordance with Paragraph 1 of Article XII of the Panama Canal Treaty of 1977. Based upon the agreement reached by the exchange of notes, the two countries simultaneously invited the Government of Japan to participate in the said Preparatory Committee as a full member, and the latter accepted the invitation.

The above-mentioned exchange of notes set forth an agreement that the Preparatory Committee will make recommendations to the member governments regarding a feasibility study, and specifically directed the Preparatory Committee to prepare and agree upon the terms of reference for a feasibility study specifying the objectives of such a feasibility study, its administrative and organizational structure, its budget and funding sources, and a study schedule.

This Final Report of the Preparatory Committee fulfills the goals set forth in the exchange of notes.

PART I - BASIC ARRANGEMENTS RELATIVE TO THE CREATION
OF A STUDY ORGANIZATION

1.1 STUDY OBJECTIVES

STUDY OBJECTIVES

The objectives of the Study and of the Study Commission are:

- a) to identify potential transportation alternatives to the Panama Canal in the Republic of Panama;
- b) to study these alternatives in accordance with the terms of reference contained in the Final Report of the Preparatory Committee for the Study of Alternatives to the Panama Canal (hereinafter referred to as the Final Report) in order to develop the information necessary to evaluate the feasibility of each alternative;
- c) to select the best alternative and study it in detail; and
- d) having studied in detail the best alternative, to develop conceptual plans for said alternative for the consideration of the Member Governments of the Study Commission

1.2. STUDY ORGANIZATION

STUDY ORGANIZATION

It is a principle of the study organization that all three countries will participate in a meaningful way in all aspects of the Study.

The Study shall be managed by a Study Commission consisting of a Board of Commissioners and a supporting Secretariat. Project management assistance and component study elements shall be carried out by individual contractors under the supervision of the Board of Commissioners and Secretariat. Figure (1a) contains a diagram of the organization.

Board of Commissioners

The Commission shall be directed by a Board of Commissioners with representatives of the governments of the Republic of Panama, Japan, and the United States. Each shall appoint one Commissioner to the Board, and each Commissioner shall be assisted by from one to three Deputy Commissioners. Each government shall designate a Deputy to act as its principal representative in the absence of its Commissioner. The decisions of the Board shall be

made by unanimous agreement of the three Commissioners. The Board or its members is empowered to refer policy matters to their governments, as appropriate.

The Secretariat

The implementing agency, on behalf of the Board is the Secretariat, consisting of government appointed technical experts from the Republic of Panama, Japan and the United States, not to exceed four from each country.

Study Execution

The various components of the Study shall be executed by contractors and agencies, such as private consulting firms, universities, and non-profit institutions. The Commission may, if it determines that it is in the best interest of the study, contract with agencies of participating governments to carry out individual component studies. The Commission may consult with one or more independent advisors.

ORGANIZATION OF THE COMMISSION
FOR THE PANAMA CANAL ALTERNATIVES STUDY

Board of Commissioners (Level I)

Nature and Composition

The execution of the Study and management of the Commission shall be the sole responsibility of a Board of Commissioners appointed by the Republic of Panama, Japan, and the United States, acting within the limits imposed by their governments. Each Government shall appoint one Commissioner and from one to three Deputy Commissioners.

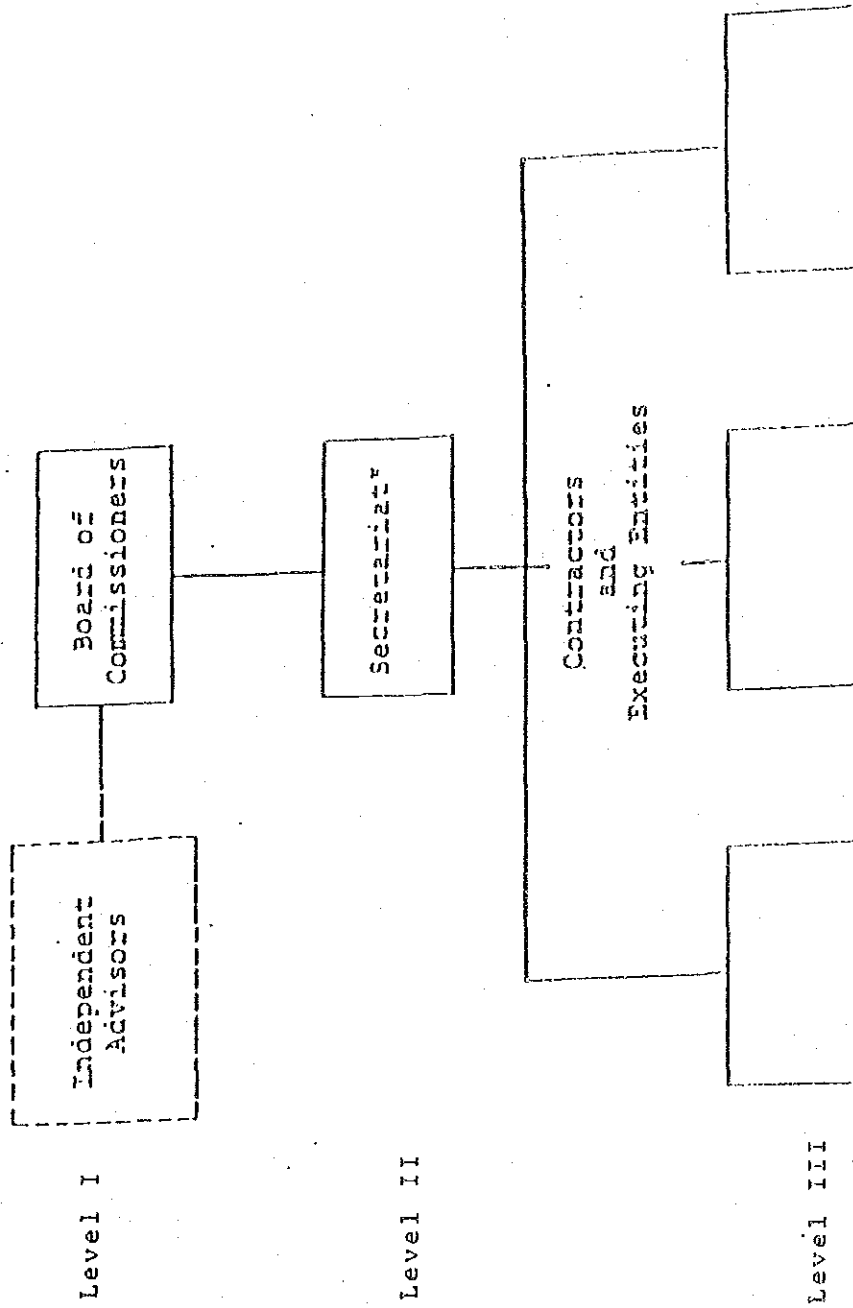
The Board of Commissioners shall be headed by a Chairman, selected from among the Commissioners. The Commissioners of the other two countries shall be appointed as Deputy Chairmen. These positions shall rotate annually among the three countries in an order agreed upon by the Commissioners.

Functions of the Board of Commissioners

In executing their responsibilities the Commissioners shall fulfill the following functions, among others:

- o Direct the Study pursuant to the Terms of Reference referred to in the Executive Summary;

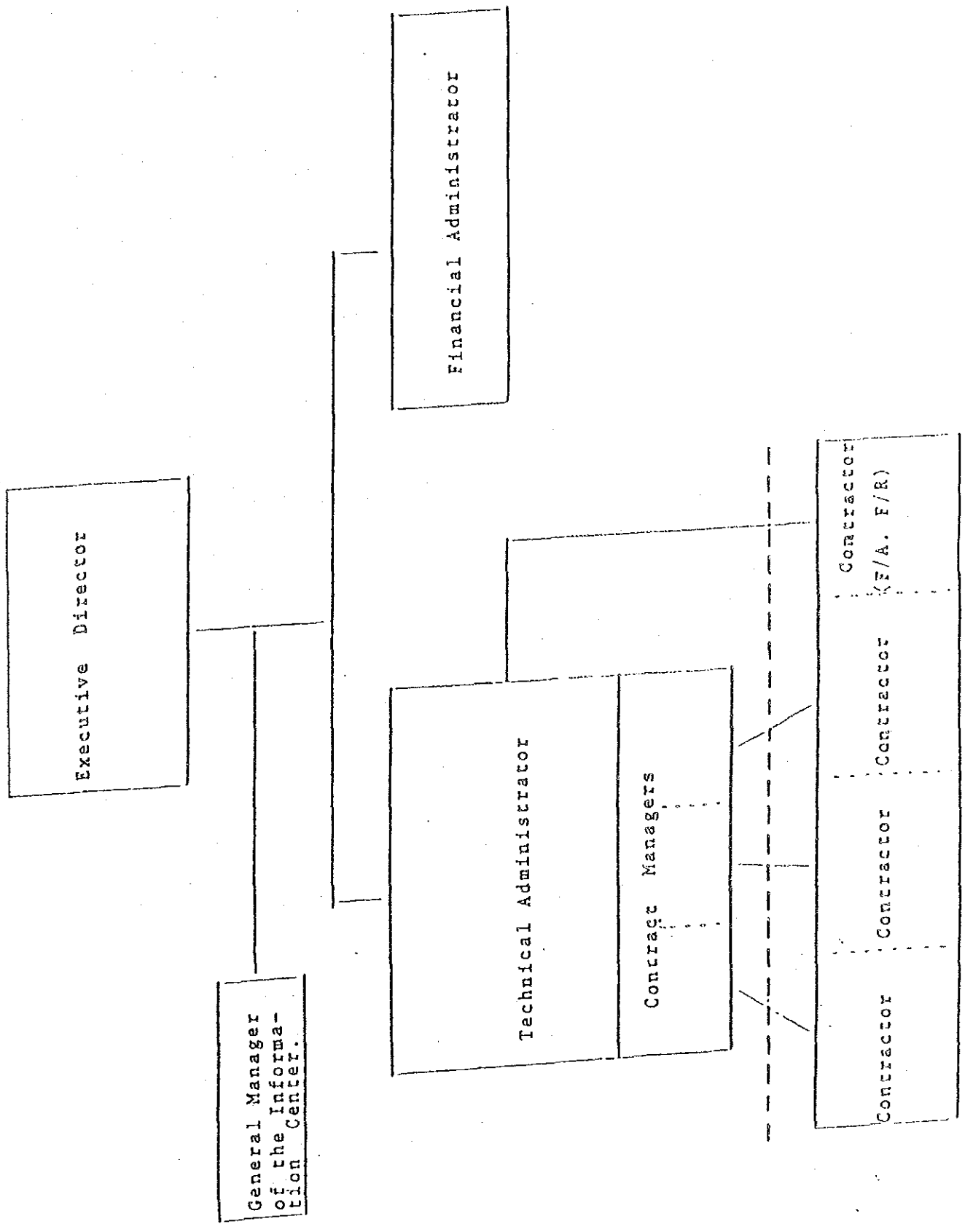
Figure 1a,
Study Commission for the Administration
of
the Panama Canal Alternatives Study



* See Figure 1b for organization of the Secretariat

- o Develop rules of procedure and a work plan for the Board and Secretariat;
- o Develop a reporting schedule for reporting progress on the Study to the participating Governments;
- o Delegate necessary authority to the Secretariat to enable it to execute effectively the Study on behalf of the Board;
- o Manage the Study consistent with the budget approved by the participating Governments;
- o Approve the Detailed Plan of Study developed by the Secretariat;
- o Approve the selection of alternatives to be studied;
- o Obtain the timely approval of the member Governments of the selection of the best alternative for detailed study;

- o Administer the budget for the Study, under the general guidelines of the Terms of Reference;
- o Approve the annual budget of the Secretariat for conducting the Study;
- o Develop procedures and guidelines to govern the awarding of contracts;
- o Approve the selection of contractors and executing entities;
- o Provide periodic progress and status reports to the participating Governments;
- o Develop personnel policies for the staff;
- o Authorize final payments prior to the close of any contract;
- o ¹⁷⁰¹² Approve the Final Report of the Study for submission to participating Governments;



- o Prepare and submit the Final Report of the Commission to participating Governments, including a proposal for the implementation of the recommended alternative;
- o Develop guidelines for the management of the Study in accordance with the Terms of Reference;
- o Perform functions other than those specifically indicated here that are necessary for the completion of the Study, or that may be entrusted to it by the participating Governments.

Work Schedule

The Board shall hold regular and ad hoc meetings. They shall take place in Panama under normal circumstances, but may also take place elsewhere by mutual agreement. Meeting frequency and location will be determined by the Board. There shall be four regular meetings

per calendar year, unless all three countries, through their Commissioners, agree that the number of such regularly scheduled meetings shall be adjusted otherwise.

No meeting of the Board may be held without the participation of at least one Commissioner, or another duly authorized substitute representative, from each of the three participating countries. The Executive Director of the Secretariat shall normally attend meetings of the Board which may invite other members of the Secretariat to attend meetings, as appropriate. The Board may also invite independent advisors to attend regular and ad hoc meetings.

The Board shall make its decisions by unanimous agreement. The Board shall refer any matters that they are not able to resolve to their Governments for resolution through appropriate channels.

Each Government shall notify the others of the names of the Commissioners that it designates. Governments sending participants to the meetings of the Board shall follow the same notification procedures.

The Secretariat (Level II)

Nature and Composition

The Secretariat shall assist the Board on technical aspects of Study execution, contract management, and management of the funds and resources of the Study Commission. It shall consist of a body of government-appointed experts, and will also include an Information Center. The members of the Secretariat may not be from private firms under contract to the Commission.

The Republic of Panama, Japan and the United States shall each appoint from two to four representatives to the Secretariat, with one representative from each country designated principal delegate. Principal delegates shall serve as liaison between their country's Government and other members of the Secretariat.

In order to assure that the Study will be managed in the most effective manner, and to assure continuity of management, participating Governments are encouraged to appoint members of the Secretariat for as long a duration as possible.

The authority of the Secretariat shall be shared by an Executive Director, a Technical Administrator and a Financial Administrator; these three posts shall rotate annually among the three countries. This division of authority is described below and in Figure 1b. With the approval of the Board, the Secretariat shall contract for professional services such as lawyers and accountants to assist the Commission in the administration of its affairs.

1) The Executive Director:

The Secretariat shall have an Executive Director who shall administer the general business of the Secretariat. The Executive Director shall coordinate the development of the Detailed Plan of Study and be responsible for the overall implementation of said Plan. He shall serve as the Board's agent, except as may be otherwise specified in the Terms of Reference. The Executive Director shall refer unresolved problems or disputes among the principal delegates

to the Board of Commissioners for resolution. If an issue must be resolved before a meeting of the Board the Executive Director may act unilaterally. In such cases his decision shall be referred to the Board for confirmation at the next meeting. He shall be assisted by two deputies. The Executive Director and his deputies shall be principal delegates of the Governments of Panama, Japan and the United States. The Executive Director shall be the Secretariat's liaison with the Board. The position of Executive Director shall rotate annually among the representatives of the three countries.

2) The Technical Administrator:

The Technical Administrator shall supervise the activities of a group of Contract Managers. They shall be appointed, in approximately equal numbers, from among the Government experts on the Secretariat. They shall manage and administer contracts, for their duration, in accordance with the Detailed Plan of Study.

Each Contract Manager shall represent the Secretariat in its relations with contractors and

other agencies involved in the execution of component studies. They shall report through the Technical Administrator to the Executive Director. They shall maintain all technical documents and records necessary for contract management.

The Technical Administrator shall negotiate contracts for the Secretariat, and implement necessary changes approved by the Board. He shall administer Study contracts and review and certify component studies, technical reports, and other documents. He shall approve and certify as complete the non-financial aspects of all component study contracts before they are referred to the Financial Administrator and Executive Director for payment. He shall prepare periodic technical progress reports for the Secretariat.

The Technical Administrator shall be assisted by two Deputies, who shall be delegates of the other two countries. He shall report to the Board through the Executive Director. The position of Technical Administrator shall rotate annually.

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The Secretariat will, on the basis of the Detailed Plan of Study, make a proposal to the Board of Commissioners as to the distribution of the study components (other than the study component to "Conduct Feasibility Analysis and Write Final Report") among the member countries and other participating countries.

The distribution of contracts will be consistent with the source and proportion of each Government's contribution to the Study Budget. The Board of Commissioners will approve all such distribution. The Japanese portion of the components studies will be contracted by JICA. //

3) The Financial Administrator:

The Financial Administrator shall be responsible for managing the Study budget, and shall report through the Executive Director to the Board. He shall represent the Board on all matters pertaining to budget and finance, including payments to contractors after approval of the Technical

Administrator and Executive Director. He shall develop a financial management system for the Study, and submit annual Study budgets for the review of the Secretariat and approval of the Board. He shall maintain all financial records and documents necessary for contract management and provide quarterly and annual financial reports to the Secretariat and the Board. He shall evaluate financial aspects of all contracts and certify that all financial and procurement procedures have been met, and that all documents are in accordance with the contract specifications and/or terms of agreement. He shall be assisted by two Deputies, who shall be delegates of the other two countries. The Financial Administrator shall prepare an annual financial statement of the Commission's operations which shall be submitted to the Board and be subject to audit by an internationally recognized accounting firm at the request of the Board.

Operation and Procedures of the Secretariat

The Executive Director and the two Administrators shall make decisions independently, in accordance with the Terms of Reference and consistent with the authority delegated to the Secretariat by the Board, except in the following matters in which decisions shall be made by mutual agreement:

- Detailed Plan of Study;
- reports by the Secretariat to the Board;
- recommendations of contractors;
- changes in contract specifications;
- payments to contractors.

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The Executive Director shall refer unresolvable disagreements and disputes among the delegates on the Secretariat, and disagreements over unilateral decisions to the Board.

All contracts, regardless of the source of funds or the method of contracting (e.g., by private contractor, government agency or in-kind contribution), shall be administered by the Secretariat. The prevention of delays, cost overruns, defaults, etc. are the joint responsibility of the Board.

Functions of the Secretariat

The functions of the Secretariat shall include:

- o Administer the execution of the Detailed Plan of Study on behalf of the Board;
- o Acquire sufficient office space and administrative staff;
- o Develop rules of procedure for the Secretariat for submission to the Board for approval;
- o Develop a Detailed Plan of Study consistent with these Terms of Reference for submission to the Board for approval;

- o Based upon the Detailed Plan of Study and consistent with the Terms of Reference, recommend to the Board the division of the Study into components for contracting;
- o Develop the Detailed Terms of Reference and contract specifications for each study component, as specified in the Detailed Plan of Study;
- o Develop cost estimates for each study component, consistent with the budget specified in the Terms of Reference;
- o Prepare an annual budget for implementation of the Detailed Plan of Study for submission to and approval of the Board;
- o Administer the Study Budget;
- o Develop a management plan and schedule for the successful completion of the study for submission to and approval of the Board;

- o Develop rules of procedure and a work plan for the execution of the component studies for submission to and approval of the Board;
- o Direct the technical aspects of the Study in accordance with the Detailed Plan of Study;
- o Request proposals from potential contractors for each study component;
- o Evaluate proposals and negotiate contracts;
- o Recommend study component contractors to the Board for approval;
- o Award contracts and/or agreements to implement the Detailed Plan of Study approved by the Board;
- o Monitor and assess work in progress for all Study components to assure compliance with the Detailed Plan of Study and contract specifications;

- o Provide appropriate guidance to contractors or agencies to ensure efficient progress of their work;
- o Issue instructions to contractors or agencies in relation to claims and to alterations to conditions of contracts;
- o Prepare and certify documents necessary for the payment of contractors;
- o Compensate contractors, and account for payment in kind for work performed by governmental agencies;
- o Prepare periodic reports to the Board on the progress of the Study. Such reports are to be prepared no less than four times per year, in a timely manner, to coincide with regular meetings of the Board;
- o Prepare the Draft Final Report of the Study for submission to the Board for approval;

- o Perform other functions, as directed by the Board, for the successful completion of the Study.

Work Schedule

The Secretariat is a full-time entity. It shall have its headquarters in the Republic of Panama. It shall exist throughout the life of the Study and have a full-time staff.

Information Center

The Information Center shall provide support to the Secretariat and shall collect and maintain information used or developed during the Study. It shall be supervised by a General Manager, selected from among the technical experts assigned to the Secretariat, who shall report to the Executive Director. All material held by the Center shall be available to Study contractors and participating governments.

Functions of the Information Center

Functions of the Information Center include:

- o Develop procedures for information storage, retrieval and distribution;
- o Maintain access to all data, maps, drawings, computer programs and documentation, etc., relevant to the study;
- o Provide information to authorized contractors and/or government entities for use in the study;
- o Develop and maintain a management information system for the Secretariat, to include computer services, to monitor the schedule and status of all study activities, with the approval of the Technical Administrator;
- o Maintain progress reports and contractor documents for use by the Commission;

- o Provide data to non-participating governments and the general public, on a reimbursable basis, with the approval of the Executive Director;
- o Maintain a public document file, approved by the Executive Director, where press releases and public available information may be routinely provided to the public upon request;
- o Provide administrative staff support, translators, etc., and perform other related duties as determined by the Executive Director, to assist the Board and the Secretariat in fulfilling their respective functions.

Study Contractors (Level III)

Nature and Function

The Study shall be divided into specific areas (identified as study components) as determined by the Secretariat and

approved by the Board. These components shall be consistent and compatible with the Study Outline and the Study Procedure contained in these Terms of Reference, and the Detailed Plan of Study to be developed by the Secretariat. They may be performed by private contractors, universities, professional organizations, governmental and quasi-governmental agencies, or other appropriate entities under contract to the Commission, hereinafter called contractors. The Secretariat shall negotiate and administer these contracts as provided in the Terms of Reference, with the approval of the Board.

The Technical Administrator, with the two Deputies, shall manage the study component identified in the Study Procedures and Study Budget as "Conduct Feasibility Analysis and Write Final Report" (F/A F/R). The Secretariat shall encourage private companies and entities from each of the three countries to form consortia, in which the entities from each country shall participate in a substantially equal manner, and shall invite bids from these consortia. The Secretariat shall recommend to the Board one

consortium to conduct this study component. The Board shall select one consortium, taking into account the

recommendations of the Secretariat. The Secretariat shall consult with JICA concerning the selection of this consortium. The participation of Japanese companies or entities in such a consortium shall be funded by JICA.

④ The Organization Chart of the Secretariat, Figure 1b, recognizes the special relationship between the Secretariat and the contractor selected to carry out the study component identified in the Study Procedures and Study Budget as "Conduct the Feasibility Analysis and Write Final Report" (F/A F/R). This contractor must be assured that all other Study components will be compatible with the input requirements it needs to successfully conduct the Feasibility Analysis. The "F/A F/R" contractor would advise the Secretariat in the development of the Detailed Plan of Study and Schedule in order that it will receive necessary input data in a timely manner. Accordingly the "F/A F/R" contractor will contact and coordinate, through the Secretariat, the other Study component contractors on a constant basis. The "F/A F/R" contractor would have no supervisory authority over other Study component contractors.

Functions of the Study Contractors.

Functions of the Study contractors shall include:

- o Execute the terms of each contract or agreement, under the direction of the Technical Administrator consistent with the approved Detailed Plan of Study;
- o Provide periodic status reports to the Secretariat;
- o Advise the contract manager concerning developments or problems possibly requiring modification of the Detailed Plan of Study or contract;
- o Submit draft and final reports to the Technical Administrator for approval;
- o Provide the Information Center copies of all approved Study material, data, computer programs, developed as part of the study contract, as directed by the contract manager;

- o Assist in the development of the detailed analysis of the best alternative as contracted.

PART II - TECHNICAL ASPECTS

2.1. STUDY ARRANGEMENTS

2.1.1. STUDY OUTLINE

STUDY OUTLINE OF
THE PANAMA CANAL ALTERNATIVES FEASIBILITY STUDY

- I. OBJECTIVES OF THE FEASIBILITY STUDY
- II. BACKGROUND ON PREVIOUS STUDIES
- III. SCOPE OF THE STUDY
 - A. Historical Review and Analysis
 - 1. Geographical, Economic, Political, Social and Ecological Situation of Panama
 - 2. Biological Inventory
 - 3. Historical Trade Analysis
 - 4. Present Status of the Panama Canal
 - 5. Significance of the Panama Canal for International Trade
 - 6. Status of Competitive Transportation Systems
 - B. Prospects of Future Transportations Systems
 - 1. Regional and Global Aspects
 - 2. Technological Aspects
 - 3. Other Aspects

- C. Forecast of Traffic Demand
 - 1. Commodity Projections
 - 2. Trade Route Analysis
 - 3. Ship Characteristics
 - 4. Other Considerations

- D. The Prospects of the Present Canal.*
 - 1. Adequacy of Present Canal
 - 2. Evaluation of Need for Alternative

- E. Identification of Alternatives to the Panama Canal
 - 1. Improvement and Expansion of Present Canal
(e.g., third set of locks, Lopez Moreno Proposal, etc.)
 - 2. Sea-Level Canal
 - 3. Complementary Systems (pipelines, railroads, highways, etc.)
 - 4. Others

* It is understood that the Gaillard Cut-Widening Project currently under study by the Panama Canal Commission is independent of the Feasibility Study. However, the Feasibility Study will include consideration of such improvements.

F. Feasibility Analysis of Each Alternative

1. Engineering and Architectural Aspects
2. Operational Aspects
3. Administrative and Management Aspects
4. Safety Considerations
5. Financial Aspects
6. Economic Aspects
7. Environmental Aspects
8. Impact of Each Alternative on the Political,
Economic and Social Life and Geography of
Panama
9. Impact on Users
10. Sensitivity Analysis
11. Others

G. Appraisal and Selection of the Best Alternative

H. Detailed Investigation of the Best Alternative

IV. STUDY FINDINGS AND RECOMMENDATIONS

2.1.2.1. DETAILED STUDY OUTLINE

DETAILED STUDY OUTLINE OF THE PANAMA CANAL
ALTERNATIVES ~~FEASIBILITY~~ STUDY

I. OBJECTIVES OF THE FEASIBILITY STUDY

The objectives of the Feasibility Study of Alternatives to the Panama Canal are:

- a) to study the possible alternatives to the present Panama Canal;
- b) to recommend the best alternative to the participating governments.

II. BACKGROUND ON PREVIOUS STUDIES

Basic information accumulated through previous studies of the Panama Canal and other relevant studies should be collected in order to avoid duplication of efforts. To accomplish this, it is necessary to review and analyze existing studies related to the Isthmus of Panama and international transport. Data collected from the studies will be arranged according to subject, period, scope and depth. New information necessary for successful completion of the Feasibility Study will also be identified.

III. SCOPE OF THE STUDY

A. Historical Review and Analysis

This section includes the collection, investigation and evaluation of historic and current data in order to provide a basis (understanding) for the best estimate of future trends and the evaluation of the impact of the alternatives for the Feasibility Study.

1. Geographic, Economic, Political, Social and Ecological Situation of Panama in the 20th Century

1.1 Geographic - Includes the spatial organization and regional structure and evolution of the physical and human and economic geography of Panama and its natural resources, and relevant aspects of the historic function of the isthmus.

1.2 Economic - Includes study of the Panamanian economy, its structural characteristics, its evolution and current situation.

- 1.3 Political - Includes study and analysis of the political structure of Panama, its trends and evolution.
- 1.4 Social - Includes study and analysis of the social and cultural aspects of Panama, their trends and evolution.
- 1.5 Ecological - Includes study and analysis of the ecological aspects of Panama, their trends, and changes.

2. Biological Inventory

A detailed inventory will be prepared of the biota of the geographic areas subject to the influence of each alternative including marine, terrestrial, lacustrine, fluvial and atmospheric ecosystems. The inventory should identify species with potential economic value and sensitive or ecologically important species.

The biological inventory should describe the qualitative and quantitative nature of those organisms most likely to produce adverse ecological effects as a result of any of the alternatives. Special emphasis will be placed on any alternative that would permit movement of

organisms from one ocean to another. Most species in nature experience fluctuations in their seasonal, annual and long-term abundance. Therefore, it will be necessary to continue this inventory for a sufficient period to document these natural changes.

These studies will distinguish between man-induced perturbations and natural increases and decreases in the highly diverse species of the tropical area.

3. Historical Trade Analysis

This part of the Section will review and analyze historical trends in international trade as they may relate to the evaluation of each Canal alternative. This will include study of:

- a) international commerce: routes and markets, modes of transport, trends in production and trade and major international events as they may affect international commerce;
- b) Panamanian commerce: trends in principal imports and exports, their origin and destination, volume and modes of transport, and the evaluation of port infrastructure.

The trade route analysis must be classified by commodity and include an analysis of the relationship between vessel size, operating costs, routes and markets.

4. Present Status of the Panama Canal

The study and analysis of the organization, administration, operation, maintenance and safety of the Panama Canal is covered in this section. The evolution of its economic and financial situation will be studied, as well as the traffic structure in terms of cargo volume and number of ships.

5. Significance of the Panama Canal for International Trade

Influence of the Panama Canal on international trade and the effects it has had on maritime technology, trade routes and transportation costs will be analyzed.

6. Status of Competitive Transportation Systems

This section will undertake the study and analysis of the evolution of transportation systems competitive with or complementary to the Panama Canal.

B. PROSPECTS OF FUTURE TRANSPORTATION SYSTEMS

This section will include the study of those regional and global economic, technological and other similar factors that will determine the future of sea, land and air transportation systems as they relate to Canal alternatives.

1. Regional and Global Aspects

This section will consider the present composition of economic and production centers and its influence on the commercial interchange between their respective markets. It will include an evaluation of the factors which could be influential in the relations between new centers of supply and demand in the evolution of principal world centers and the overall long term impact of those relations on international transport.

2. Technological Aspects

This part will include the study of changes in sea, land and air transportation technology as well as other technology which is likely to affect the evaluation of alternatives of the Panama Canal in the Feasibility Study.

3. Other Aspects

C. FORECAST OF TRAFFIC DEMAND

The purpose of this section is to forecast the demand for transisthmian cargo movement.

1. Commodity Projections

The commodity demand analysis will be made on the basis of a nonconstraining isthmian canal and other alternatives. Consideration will be given to trade flow patterns for those commodities that might be transported by isthmian routes. Commodities will be identified and classified by their common market and transportation characteristics. Based upon the historical trade analysis, the Study will forecast the volume of commerce that could use isthmian routes by geographic origin, destination and trade route. The frequency and distribution of ships by size will be identified.

2. Trade Route Analysis

The trade route analysis is critical to defining

future demand for transisthmian passage. This section will address the following aspects of this subject:

- 2.1 the economic development of centers of production and consumption (factors which have historically determined trade route usage);
- 2.2 technological factors which have resulted in substantial modifications to transportation systems and their effects on the Panama Canal route;
- 2.3 the viability of current trade routes;
- 2.4 development of new trade routes;
- 2.5 sensitivity of the use of each trade route to changes in vessel operating costs, including tolls.

3. Ship Characteristics

This section will provide a profile of the vessels capable of transiting the existing Canal and examine vessel characteristics and capabilities required to transport shipments derived from the commodity projections and trade route analysis. This would include a realistic assessment of trends in vessel technology. Ship characteristics will be linked to

the shipping requirements of particular nations and be commodity specific. The Study will explore the potential requirements for vessel support services at ports to assure infrastructure compatibility.

D. THE PROSPECTS OF THE PRESENT CANAL

This section will analyze the present and future adequacy of the Panama Canal to meet traffic demand and will serve as the basis for the evaluation of alternatives to the Canal.*

1. Adequacy of Present Canal

Based on the findings in III-A, B and C of this Study this Section will determine the adequacy of the present Panama Canal by analyzing:

- 1.1 the present and future cargo demand in relation to volume and number of transits;

* It is understood that the Gaillard Cut-widening Project currently under study by the Panama Canal Commission is independent of this Study. However, this Study will include consideration of such improvements.

- 1.2 the composition and size of the maritime fleet
and the number of larger vessels unable to transit;
- 1.3 the change in ship mix (fleet composition) and
its effects upon the Canal operation;
- 1.4 the measurement of delays in transit and their
causes;
- 1.5 the maintenance requirements, including a
projection of expected rehabilitation,
maintenance and operating costs.

2. Evaluation of Need for Alternatives

The need for an alternative to the present Canal will be analyzed from the viewpoint of traffic demand and service characteristics. Consideration will be given to structural integrity of the present Canal, its capacity and its ability to meet future traffic demand.

E. IDENTIFICATION OF ALTERNATIVES TO THE CANAL

The identification of alternatives to the Panama Canal is closely related to traffic demand projections, the prospects of the present Canal and the analysis of future transportation systems.

This section will also include presentation of the methodology and criteria used to identify and classify alternatives to the Canal..

The range of options of alternatives considered should include:

1. Improvement and Expansion of the Present Canal

This includes a wide variety of Canal alternatives other than routine maintenance and rehabilitation, such as a third set of locks, the Lopez-Moreno proposal, the "terminal lake" plan and others that have yet to be developed. A wide range of lock sizes would be considered providing a capability to transit vessels as large as those that would use a sea-level canal. Specifically, these options will require, among others, an increase of depth, widening of the Canal, a larger water reservoir, a water management system and analysis of the navigation and operating systems, etc.

2. Sea Level Canal

Sea-Level Canal options would be limited to Routes 10

and IAS, as identified in the 1970 report of the "Atlantic-Pacific Interoceanic Canal Commission," unless there are compelling reasons for considering other sea-level canal routes or alternatives. Information from this report, as appropriate, will require updating and additional investigation to reflect current conditions.

3. Complementary Systems

Complementary systems such as pipelines, rail and truck landbridges, or even conveyor systems should be studied separately and in combination with the present or an improved canal.

4. Other Alternatives

Other alternatives may be introduced by the Study Commission.

F. FEASIBILITY ANALYSIS OF EACH ALTERNATIVE:

This section will analyze the engineering, economic, financial management and environmental feasibility of

each alternative. It will also include the results of an evaluation of the impacts of each alternative on the political, economic and social life and on the geography of Panama and the impacts on user countries.

The feasibility analysis of alternatives will be conducted in stages, and will be carried out at the same level of detail for each stage and for each alternative, and will include the following:

1. Engineering and Architectural Aspects

All directly related engineering and architectural aspects of each alternative will be evaluated, including the direct requirements upon the physical infrastructure of Panama.

Indirect engineering and architectural aspects of alternatives will also be required for use in analyzing the impact of each alternative on the political, economic, and social life and on the geography of Panama.

The following specific engineering aspects will be included:

- o design criteria based upon generally accepted engineering standards;
- o preliminary design of main features;
- o an appropriate estimate of construction cost based on generally accepted standards for feasibility studies;
- o a management and operation plan (with special attention paid to the availability of water);
- o estimates of annual operation and maintenance costs;
- o useful life analysis, with estimates of frequency and cost of major rehabilitation, including the estimated cost of major components required to be replaced before the end of the project life; and
- o design modifications based on the findings of the environmental impact studies.

2. Operational Aspects

This Section will describe the routine operating

characteristics of each alternative, including the time required for transit. Each alternative will be studied at the same level of detail, including the operational aspects of complementary systems.

Operational aspects must be consistent with all other Study components, particularly the engineering and architectural aspects. Special attention will be paid to unusual and high-technology items (e.g., tidal gates) and the availability of sufficient water to provide reliable depths for navigation.

The operation and maintenance costs of each alternative will be quantified, including navigation aids, safety considerations and auxiliary operating equipment (e.g., tugs, firefighting, utilities, etc.). The cost and administrative procedures for the operation of each alternative must be consistent with all other aspects of the Feasibility Study, particularly the administrative and management aspects. The number and cost of employees required for the administration and management of each alternative will also be defined and estimated.

3. Administrative and Management Aspects

This section will describe the juridical-administrative organization of the entity responsible for the management and administration of each alternative.

Plans for the administration and management of each alternative will also be defined and evaluated. The responsibility for the management of each alternative should be made explicit.

This section will also analyze the human and other resources required for the construction, operation, maintenance and safety of each alternative.

The Study should recommend the organization required to implement the phases of construction and operation of each alternative.

4. Safety Considerations

This Section will identify the various aspects associated with routine maintenance for safe operating conditions for each canal alternative. In addition to

safety considerations, this section will summarize the potential operating hazards of each option and describe what steps are proposed to satisfy these concerns. This section will also identify and estimate the cost of any adjustment related to the safety systems that would be required by the development of each alternative. A study will also be made as to procedures required to return to normal operating conditions after an accident insofar as it affects the capacity or operating characteristics of each alternative.

5. Financial Aspects

The purpose of the financial analysis is to evaluate the financial viability, identify potential sources of funds and elaborate a financial plan for each alternative.

The financial analysis will include an evaluation of capital and financial costs as well as operating costs and revenues.

A Cash flow analysis for each alternative will be developed and the amount of funding which the project could support will be determined. Different methods and

combinations of funding will be analyzed including government and private contributions, loans, grants, transfers, financial guarantees and others. The financial administration will be analyzed for each alternative.

6. Economic Aspects

The economic analysis will determine the viability of the Canal alternatives from the point of view of the users and the Republic of Panama.

All benefits and costs will be identified for both the users and the Republic of Panama.

Direct and indirect benefits and costs will be evaluated separately as well as combined.

Generally accepted evaluation methods should be used, such as Calculation of the Internal Rate of Return, the Benefit-Cost Ratio evaluation and calculation of the project's Net Present Value.

7. Environmental Analysis

Studies should be undertaken to determine the most

probable effects of each alternative on the ecology of the local, regional and international environments. This will also include the study of measures to be taken to avoid possible negative consequences of each alternative and, if not fully avoidable, the development of measures to mitigate them.

Factors to be considered in undertaking an environmental analysis include, but are not limited to, the physical, biological and human effects of each alternative which have a bearing on the local, regional and international environments.

The analysis should consider the stages of construction, operation and maintenance of the alternatives.

For any Canal alternative which changes the salinity of the existing barrier, a more intensive environmental investigation must be performed to assess the associated risks. Organisms which might cause the greatest environmental consequences will be identified in the biological inventory. Special attention will need to be given to species such as parasites and predators that might have an economic impact on local, regional and

international fisheries. Examination of terrestrial and fresh water habitats should be undertaken in the areas adjacent to sites identified by the various alternatives.

In addition to biological effects, the impact upon water quality in lakes, estuaries and coastal environments should be determined.

8. Impact of Each Alternative on the Political, Economic and Social Life and Geography of Panama

The Panama Canal is a central factor in the life and economy of Panama as a nation. Any change in the location, operation, or configuration of the Canal will have an effect on this nation's geography, economy and society. These potential impacts will be described and compared in this Section.

Impacts would be distinguished between short-term (i.e., during construction) and the long-term consequences of operating each alternative on a routine basis. Special attention will be paid to the impact on the population, human settlements, spatial organization, urbanization, internal communications, employment and income generated

by the alternative and their effect upon Panama's national economy. Impacts (e.g., employment multiplier effects) on peripheral economic activities will also be presented. The effect upon community cohesion will be analyzed and the compatibility of each alternative to the national land-use plans will also be studied. The requirements that may result from the impact evaluation of each alternative will be analyzed.

9. Impact on Users

This section will describe how significant shipping and receiving nations will be affected by each alternative. All direct impacts, including effects upon markets serviced by ships using the interoceanic passage will be quantified. Indirect impacts will be evaluated only to the extent that they are exceptionally significant to user countries.

10. Sensitivity Analysis

The feasibility analysis of each alternative should include an analysis of sensitivity of the Study result

(such as benefits and costs) to changes in principal variables. Such a sensitivity analysis should be adequate to evaluate the uncertainty inherent in the data, principal assumptions and projections. Probability and risk analyses should also be performed.

11. Other Aspects

Contingencies should allow for other Study aspects not envisioned at this time.

G. Appraisal and Selection of the Best Alternative

The appraisal, selection and recommendation of the best alternative will be presented and justified to the Study Commission for the preliminary approval of the participating governments.

H. Detailed Investigation of the Best Alternative

The selected alternative will be presented in detail. The reasons for the recommendation will be

summarized, assurance of its feasibility confirmed, and conceptual-plans for implementation presented. Preliminary design of the best alternative will be verified, and with the objective of development overall costs estimates to an accuracy of \pm 15 percent (plus or minus fifteen percent).

IV. STUDY FINDINGS AND RECOMMENDATIONS

This Section will present the Study findings and final recommendations.

2.1.2.2. DETAILED DESCRIPTION OF STUDY OUTLINE
(LEVEL III OF DETAIL)

2.1.2.2. Detailed Description of Study Outline (level III
of detail).

This level (III) of detail of the Study Outline will be prepared by the Study Commission prior to Study implementation.

2.1.3 Study Procedure

PHASE I.— CONDUCT BACKGROUND STUDIES
AND ESTABLISH DATA BASE

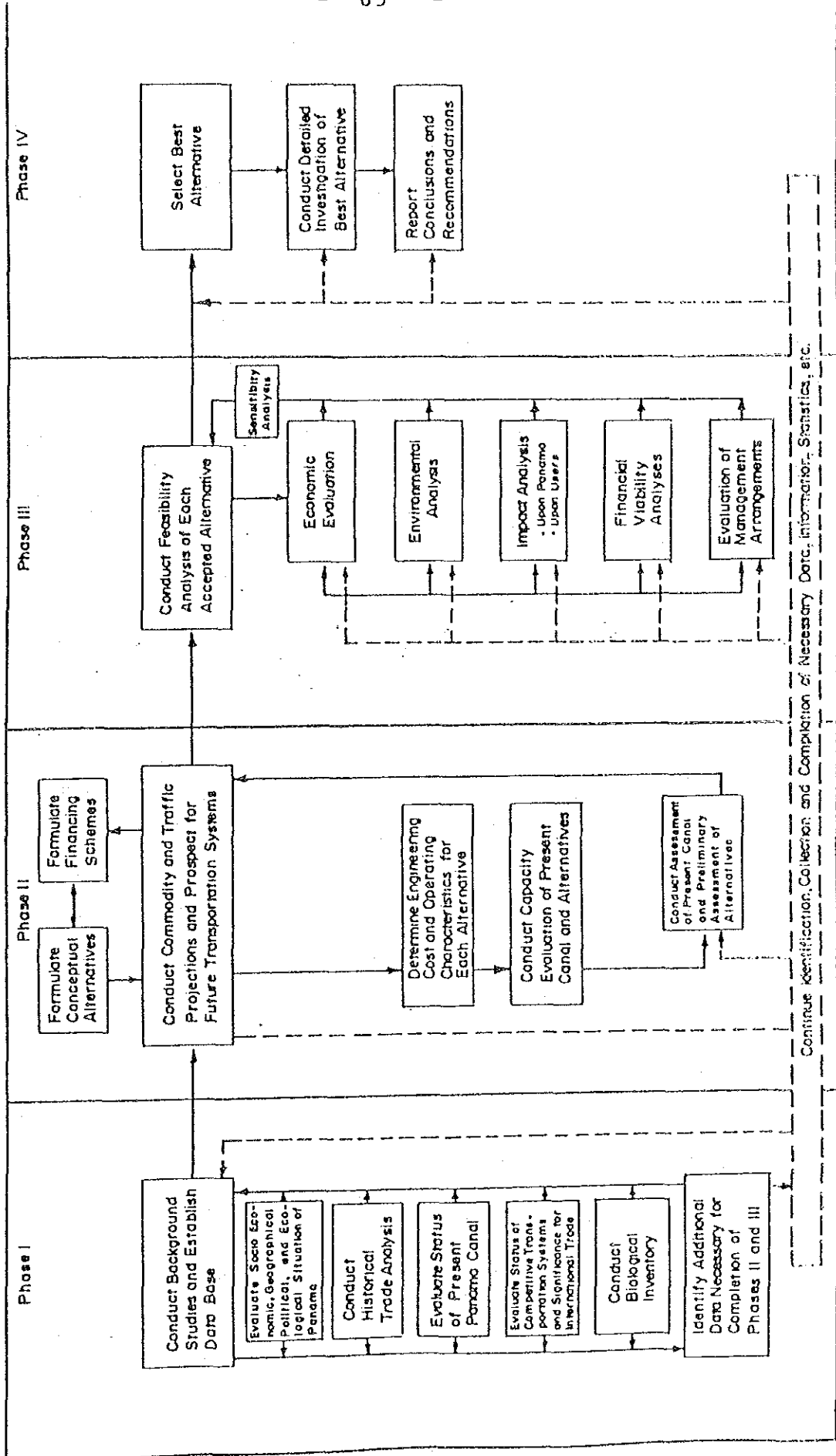
The purpose of Phase I of the Study is to review past reports, conduct background studies and establish a data base for use in the feasibility evaluation, as shown in Figure 2.

Phase I studies will include the following:

1. Evaluate the Geographic, Economic, Political, Social and Ecological Situation of Panama

This will present, historically, the role of Panama in world commerce. It will recognize Panama's unique geographic location, and how this has destined it for a unique status in trade between nations. Phase I studies will attempt to document the influence the Canal has had on the geographic, social, demographic and economic evolution of Panama, and serve as a basis for the Impact Analysis in Phase III. Phase I studies

Figure 2
Panama Canal Alternatives Study
Detailed Plan of Study
Diagrammatic Study Procedure



will also document the ecology of Panama which may be sensitive to a major change in the Canal's configuration and serve as input for the Phase III Environmental Analysis.

2. Conduct a Historical Trade Analysis

A significant portion of international trade has or could potentially have passed through the Panama Canal. A trade analysis by commodity, shipping patterns, nation of origin and destination, and trade route will provide one basis for Phase II traffic and capacity evaluation. The frequency distribution of ships and transits by size (dimensions and deadweight tons,) must also be analyzed.

3. Evaluate the Status of the Present Panama Canal.

Maintaining the present Canal is one option to be considered and evaluated during the Study. An analysis of the present Canal will provide basic operating data, including an evaluation of its ability to serve traffic into the next century. This will serve as input to the Phase II Capacity

Evaluation, and provide a basis for estimating the cost to operate and maintain this facility as compared to other Panama Canal options under evaluation. It is understood that the Panama Canal Commission's Gaillard Cut-Widening project currently under study is independent of this Feasibility Study. The capacity evaluation of the present Canal will take the status of this project into consideration.

4. Evaluate the Status of Competitive Transportation Systems and Significance for International Trade

Transportation systems competitive to the Panama Canal do exist; others are being planned. Each competitive system would be evaluated for use in Phase II to determine how much traffic will likely use a competitive alternative rather than the Canal Option under evaluation. This will also serve as a basis for the Phase III Economic Evaluation and Financial Viability Analysis.

5.- Conduct Biological Inventory

The present knowledge of the biology of the Isthmus of Panama is rudimentary. This lack of knowledge makes it difficult to properly assess the impact of proposed alternatives. Thorough qualitative and quantitative study of the organisms in the area is necessary to evaluate potential alternatives. The preliminary results of this Phase I inventory should help identify particular target species for further intensive study under the Phase III Environmental Analysis. The biological inventory should be designed so that it may continue beyond the feasibility stage, and even into construction, if needed. Phase I is designed to initiate all critical data collection activities and background studies which will be needed as the Study progresses. Data collection, as indicated in Figure 2, continues throughout Phases II, III and IV as information is refined and new requirements are discovered.

PHASE II -- CONDUCT COMMODITY AND TRAFFIC PROJECTIONS
AND PROSPECTS FOR FUTURE TRANSPORTATION SYSTEMS

Phase II of the Study Procedure includes the quantification of demand for a transisthmian canal and each alternative under evaluation.

Options to be evaluated, in addition to the maintenance of the present Canal, will include but not be limited to:

- a. A Sea-level Canal;
- b. Improvement and Expansion of the Present Canal; and
- c. The Present or Improved Canal, Augmented by Complementary Systems.

In considering the third category, it may be desirable to consider a combination of other transportation modes in Panama suited to particular cargoes such as pipelines, slurry transportation, overland conveyors or landbridge (rail and highway). Improvement plans under study by the Panama Canal

Commission are independent of this Study; analysis of the option of maintaining the present Canal would consider any such improvement as being in place.

All alternatives should be approved by the Study Commission, prior to evaluation.

1. Conduct Commodity and Traffic Projections

Central to Phase II of the Study is the need to conduct commodity and traffic projections which could potentially utilize isthmian routes. Although every advantage should be made of existing studies, the Study Commission should not rely solely on these as substitutes for a comprehensive set of current commodity and traffic projections. Long-range aggregate traffic projections should be conducted for homogeneous commodity groups (e.g., coal, etc.), by origin and destination.

Traffic must be projected beyond the year 2000 as will be the evaluation of alternatives under consideration.

Analysis should include likely diversions of traffic from the isthmus to other routes and vice versa.

The projection methodology and analytical procedure should be designed so as to allow updating throughout the Study and thereafter.

2. Formulate Financing Schemes

Funding for any subsequent project is most likely to come from a variety of sources such as government contributions, loans, multinational development banks and commercial bank lendings. The funding conditions must be explicit. The financial analysis must be integrated into nearly every other aspect of the Study. This will include the effects on Phase II traffic projections under alternative traffic schedules. Financing schemes for the operation, maintenance and rehabilitation of each alternative should also be included. All financial assumptions must be compatible with all other study assumptions, particularly where grants are involved. All financial assumptions to be used in the Study should be approved by the Study Commission prior to their use.

3. Conduct Capacity Evaluation of Present Canal and Alternatives

One requirement of the Phase II Study Procedure displayed in Figure 2 is to develop an acceptable procedure for

measuring and evaluating the capacity of each alternative. This section will analyze the present and future adequacy of the Panama Canal and alternatives in meeting traffic demand. Because the Economic Analysis in Phase III is directly dependent upon the Capacity Evaluation of each alternative as critical input, special care must be taken to develop an acceptable capacity methodology.

4. Determine Engineering Cost and Operating Characteristics for Each Alternative

The objective of this component is to prepare preliminary design and cost estimates for each alternative. Each alternative must be examined at a consistent and comparable level of detail, and be based on generally accepted standards and procedures. Information obtained here will serve as input for nearly every aspect of Phase III as shown in Figure 2.

Detailed designs for each alternative are not necessary; however, general layout plans should be prepared. Major engineering requirements should be quantified.

Special attention must be paid to the water supply requirements from Gatun, Madden and Miraflores Lakes.

The Phase IV Detailed Plan should include a scheme for the overall execution of the project, including construction schedules and manpower requirements.

An analysis of the operating characteristics of each option under consideration is essential to estimate the annual capacity and operating cost of each alternative.

Where special provisions are required to accommodate exceptional users, (e.g., maximum size vessels requiring one-way traffic), operating requirements should be made explicit. Special attention should be paid to new technology items such as a biological barrier or a tidal gate for a sea-level canal. Operating aspects of each alternative must be consistent with the Evaluation of Management Arrangements of Phase III.

5. Conduct Assessment of Present Canal

The capacity of the present Canal, with scheduled improvements to meet traffic demand, is evaluated in Phase II. In addition to the physical operational capacity, the

evaluation should include estimates of future cost. The Gaillard Cut-Widening project will be evaluated during Phase II, in a manner consistent with its status at the time of the feasibility analysis.

6. Conduct Preliminary Assessment of Alternatives

Phase II of the Study concludes with the preliminary assessment of all Panama Canal alternatives. This could be viewed as a pre-feasibility screening.

Although some alternatives may prove infeasible during this evaluation, a sufficient number should be carried through Phase III evaluation in order to ensure an adequate basis for comparability. It is important that the Study demonstrate that a full range of alternatives was considered and how the recommended plan compares with the next best alternative.

PHASE III -- CONDUCT FEASIBILITY ANALYSIS
OF EACH ACCEPTED ALTERNATIVE

As displayed in Figure 2, the feasibility of each of the Panama Canal alternatives will be evaluated on the basis of an:

1. Economic Evaluation;
2. Environmental Analysis;
3. Impact Analysis Upon Panama;
4. Impact Upon Users;
5. Financial Viability Analysis;
6. Evaluation of Management Arrangements;
7. Sensitivity Analysis.

These evaluations and analyses are interdependent, and require integration.

1. Economic Evaluation

In the economic evaluation, the study will rely on generally accepted standards and methodologies. The use of more than one methodology is advisable in order to present a balanced perspective of the economic merits of each alternative. The Study Commission will approve the methodologies and standards to be used.

2. Environmental Analysis

The objective of this Phase III component is to identify the environmental risks associated with each alternative. In addition, it must provide a firm foundation on which the environmental impact analysis of the chosen alternative will be based. The environmental analysis will provide scientific data that will permit the assessment of risks to the physical and natural environment, sites of historical, biological or archeological significance and to human populations in the adjacent area. Unlike other construction projects, some of the alternatives to be studied would have the potential of having local, regional and global environmental effects. Therefore, alternatives which are determined to have potential negative consequences, should be designed so as to avoid or fully mitigate them.

A definitive environmental analysis cannot be completed on a sea-level canal or any option which would significantly increase the salinity of the canal within the scope of this Study. The environmental analysis must, however, be sufficient to differentiate the basic environmental implications of one alternative as

compared to another, or the assurance (via the design of the alternative) that environmental degradation caused by the alternative will be no greater than that caused by the present Canal.

3. Impact Analysis Upon Panama

Any alternative adopted will be of great importance to Panama. The evaluation for each alternative should include an in-depth study of the geographic, economic, political, social and ecological effects on Panama. Each alternative must include an evaluation of the positive and negative impacts. Impacts upon community and regional growth and development, among others, would need to be evaluated. The benefits to Panama will be quantified, as well as costs and/or other potential negative effects. The social and regional development impact of construction will also be evaluated.

4. Impact Analysis Upon Users

The impact upon users is derived from the Commodity and Traffic Projections, which trace the flow of commerce

between nations. Income transfers and impacts upon a nation's balance of trade will not be quantified.

5. Financial Viability Analysis

Since financial viability depends in part on the underlying criteria (e.g., self-liquidation, amortization, etc.), the relevant criteria must be defined early and be consistent with other Study aspects, as shown in Figure 2. Financial analysis methodology should include generally accepted techniques such as calculations of the internal rate of return, cash flow analysis, etc. The Study Commission should approve critical financial assumptions.

6. Evaluation of Management Arrangements

Closely associated with the question of financial management are the administration and general management arrangements for each alternative. The responsibility for the management of each alternative should be made explicit, particularly where multiple modes of transportation are involved (e.g., pipeline, rail transshipment, etc.) or where the financing arrangements dictate the need to define in explicit

terms the rights, responsibilities and obligations of each participating nation. The Study Commission should approve all assumptions pertaining to the management arrangements.

7. Sensitivity Analysis

Some variables may be unpredictable or small changes in them could significantly influence the project's cost, design or benefits. Such variables must be subjected to a sensitivity analysis within the range of expected variation. Critical Variables to the selection of the recommended alternative should be monitored throughout the Study.

PHASE IV -- SELECT BEST ALTERNATIVE

Phase IV of the Feasibility Study calls for the selection of the best alternative. Phase IV will describe the procedure used to select the best of those alternatives evaluated in Phase III. All alternatives evaluated in Phase III will be critiqued. The critique will describe the advantages and disadvantages of each alternative and explain why the recommended alternative was selected as best. The critique will address the following aspects:

1. Engineering and Architectural;
2. Operational (Including Safety);
3. Administrative and Management;
4. Financial;
5. Economic;
6. Environmental;
7. Impact on Political, Economic and Social Aspects
and Geography of Panama; and
8. Impact on Users.

This final phase of the analysis, following preliminary acceptance of the recommendations by the board of Commissioners,

will include a refined evaluation of the recommended alternative based upon the above listed aspects. The final report of the Study Commission will be written and presented to the participating governments. The scope of this Study will require the development of conceptual implementing plans, rather than the elaboration of plans to go into final design.

PART III - BUDGETARY AND FINANCIAL ASPECTS.

3.1. STUDY BUDGET AND SCHEDULE

STUDY BUDGET AND STUDY SCHEDULE

Introduction

As shown in Figure 3 the Study Budget is estimated at \$20 million which will provide a basis for the work of the Study Commission. Approximately \$14,750,000 would be contracted for Study component activities. Approximately \$1,200,000 will be for the Information Center. Approximately \$4,050,000 is budgeted for administrative expenses such as staff support, office space, travel costs and related expenses, which includes contingencies.

Also as shown in Figure 3, this budget assumes a 5 year duration for the Study, including six months for start-up and another six months for phase down. The greatest requirement for funds would be in years 2, 3 and 4.

Figure 3
Panama Canal
Alternatives Feasibility Study
Budget and Study Schedule

PHASE	WORK ITEMS		COST IN THOUSANDS OF DOLLARS					
			1st.	2nd.	3rd.	4th.	5th.	
I A	Evaluate socio-economic, geographical, political, ecological situation of Panama	500	XXXXXXXXXX					
B	Conduct historical trade analysis	400	XXXXXXXXXX					
C	Evaluate Status of present Panama Canal	200	XXXXXXXXXX					
D	Evaluate states of competitive trans systems	300	XXXXXXXXXX					
E	Conduct biological Inventory....	1,700	XX					
F	Establish data base & Information Center	1,200	XX					
	Sub-Total Phase I	4,300						
II A	Formulate conceptual alternatives	100		XXXXX				
B	Conduct commodity & traffic projections considering other transportation systems.....	1,000		XXXXXXXXX				
C	Formulate Financing Schemes....	150		XXXXXXXXXX				
D	Determine engineering cost & operating characteristics for each alternative.....	2,700			XXXXXXXXXXXXXXXXXXXX			
E	Conduct capacity evaluation of present canal & alternatives.	600		XXXXXXXXXX				
F	Conduct preliminary assessment of present canal & alternatives	400		XXXXXXXXXX				
	Sub-Total Phase II	4,950						
IIIA	Economic Evaluation	600			XXXXXXXXXXXXX			
B	Environmental Analysis.....	1,100			XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
C	Socio Economic Impact Analysis on Panama and Users....	1,400			XXXXXXXXXXXXX			
D	Financial Viability Analysis...	400			XXXXXXXXXXXXX			
E	Formulate and evaluate management alternatives	400			XXXXXXXXXXXXX			
F	Conduct Feasibility analysis...	1,600			XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
	Sub-total Phase III	5,500						
IV	Selection and investigation of best alternatives: Write Final Report	1,200					XXXXXXXXXXXXX	
	Administrative cost and contingencies.....	4,050			XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX			
	Total Study Cost	20,000	1,600	4,300	6,500	5,600	2,000	

The Figure 4 presents as an example, how the study components may be formulated.

Example of Study Component formulation

1. Demand Analysis

This Study component would begin with a historical trade analysis (Phase I-B), and serve as a basis for traffic projections. An evaluation of competitive transportation systems will also be necessary to quantify and project demand for trans-isthmian passage at Panama, compared with alternative modes and/or routings (Phase I-D). The principal output of this Study component would be a set of alternative commodity and traffic projections (Phase II-B). The cost estimate for this study component assumes the development of a computer model for analyzing the effects of different trade assumptions upon the utilization of each Canal alternative, versus competitive routings. The methodology and computer programs should allow for continuous updating.

2. Formulate Alternatives and Determine Engineering Cost

After formulation of conceptual alternatives (Phase II-A), the engineering cost and operating characteristics of

FIGURE 4
PANAMA CANAL ALTERNATIVES STUDY
STUDY BUDGET BY STUDY COMPONENT.

Demand Analysis.....	1,700
IB	400
ID	300
IIB	1,000
Formulate Alternatives and Determine Engineering Cost	3,400
IIA	100
IID	2,700
IIE	600
Conduct Economic Evaluation	600
IIIA	600
Financial Viability Analysis, and Management Arrangements	950
IIC	150
IIID	400
IIIE	400
Environmental Analysis	2,800
IE	1,700
IIIB	1,100
Impact Analysis Upon Panama and Upon Users	2,100
IA	500
IC	200
IIIC	1,400
Conduct Feasibility Analysis	2,000
IIF	400
IIIF	1,600
Conduct Detailed Analysis of the Best Alternative and Write Final Reports	1,200
IVA	
Information Center	1,200
IF	
Sub-total	15,950
Administration expenses and contingencies	4,050
Total Study Cost	<u>20,000</u>

each alternative must be determined. This budget assumes that approximately six alternatives will be considered beyond this conceptual evaluation and that these will include at least one sea-level canal alternative, an additional lock plan, and a non-hydraulic alternative. The number and complexity of the alternatives considered will affect the cost of this Study work item. Maximum use will be made of past Studies, such as the Atlantic-Pacific Interoceanic Canal Commission report of 1970, and the studies currently being made by the Panama Canal Commission such as the feasibility of the Gaillard Cut widening project. This will help to minimize the cost of this Study. Field surveys and new data collection are not anticipated, although some data verification, and possible updating of hydraulic data for water supply considerations, may be needed. Similarly, restricting the sea-level canal alternatives to routes 10 and 14-S will also reduce budget requirements. The budget amount for this work item (Phase II-D) should be sufficient for purposes of feasibility evaluation. This Study component will also include an evaluation of the physical capacity of the present Canal and each alternative (Phase II-E). As shown in Figure 2, this Study component will be used as input for the preliminary assessment of the present Canal and alternatives, and Phase III final evaluation of alternatives.

3. Financial Viability Analysis, and Management Arrangements

The ability to finance a recommended alternative is central to its acceptability. The financial viability analysis and management arrangement component will evaluate various options for financing and managing an eventual project. Each alternative may provide financing opportunities, for private as well as public sector involvement. Alternative financing proposals must be formulated (Phase II-C) and evaluated (Phase III-D). Management arrangements (III-E) must also be formulated, and compatibility with the financing arrangements assured. Because management arrangements and financing are closely related, they are included within the same Study component. Management arrangements may also be affected by financing conditions and should not be formulated until after the financial requirements are specified.

4. Environmental Analysis

The environmental analysis consists of a biological inventory (Phase I-E) and the work item identified as the (Phase III-B) environmental analysis. The biological inventory

should begin as early as possible and continue throughout the entire feasibility study as described in the Study Procedure.

5. Impact Analysis Upon Panama and Upon Users

This Study component would include several work items involving the evaluation of the present Canal and its relationship to the socio-economic, geographical, political, and ecological aspects of Panama and its population. This would begin in Phase I with an evaluation of the effect the present Canal has had on Panama (Phase I-A). An evaluation of the status of the present Canal (Phase I-C) would also be conducted, to serve as a basis for Phase III impact analysis. The Phase III Analysis (Phase III-C) would evaluate each alternative within this context. Impact upon user countries would also be addressed, but primarily from a commercial perspective.

6. Conduct Economic Evaluation

This analysis will include the economic evaluation of each alternative (III-A) sensitivity analysis of critical Study variables (see Study Procedures).

7. Conduct Feasibility Analysis

This component is central to the the purpose of the entire Study effort. Early involvement, as shown in Figure 3, would be to assure that all Study components are designed for compatible integration into the final feasibility analysis. This can only be accomplished by a well-designed Detailed Plan of Study, and an exceptionally well-managed Study effort. This is the responsibility of the Secretariat. The Secretariat, with the contractor of this study component, would develop a Detailed Plan of Study and a system for scheduling and coordinating Study contractors. This component will include the preliminary assessment of the present canal and each alternative (II-F). The contractor for this Study component will integrate the results of all other Study components into the feasibility analysis (III-F).

8. Conduct Detailed Analysis of Best Alternative and Write Final Report

After the Board of Commissioners has approved the selection of the "best alternative", the Secretariat will direct that a detailed analysis of this alternative be

continued. An objective of this Study component would be to develop construction and cost estimates to within \pm 15 percent accuracy. Phase II and III Study component contractors may be directed to refine their input to the Study within the context of the selected alternative (Phase IV).

The Study component contractor, under the supervision of the Secretariat, would then write the draft version of the Feasibility Study and would write the "Final Report of the Study Commission" on behalf of the Secretariat. The Secretariat will then submit this report to the Board of Study Commissioners for approval. This Study component contract would be completed only upon final approval of the Feasibility Study.

9. Information Center

The Information Center is a service facility of the Secretariat, and will maintain a data base for the use of the Study Commission. The Information Center is not, however, responsible for developing study data for contractors. A further description of the Information Center may be found under the Study Organization. The General Manager of the

Information Center will be a member of the Secretariat, whose salary will be funded by his government. All the costs of operating the Center will come from the \$1.2 million appropriation.

10. Administrative Expenses

Administrative expenses include:

- a. General support staff, not provided directly by participating governments.
- b. Office space, equipment, rental, etc., and general overhead.
- c. Travel, per diem, and other expenses directly related to the administration of the study.
- d. Printing of reports of the Secretariat and Study Commission.
- e. Start-up and phase-down costs.

f. Legal services.

g. Translating services.

It is assumed that all office facilities will be provided at a single location, minimizing duplication of equipment and staff support. It is also assumed that staff and facilities for Commission meetings would be provided from available staff or hired on a temporary basis.

Once the Detailed Plan of the Study is developed by the Study Commission and the Study has commenced, should there be additional requirements to comply with the Scope of the Study, appropriate representations to the respective governments will be made by the Board of Commissioners.

3.2 COST SHARING AND STUDY FINANCING

Cost Sharing and Study Financing

The Study Budget is estimated at \$20 million which will provide a basis for the work of the Study Commission.

Accordingly the governments of Panama, Japan, and the United States, subject to the appropriation of funds, each agree to provide one third of the \$20 million.

Funding of the Study shall be provided in the form of cash, direct assignments by Member Governments, in-kind contributions, or other methods agreed upon by the participating Governments. Funding from Governments may consist of one or more of the aforementioned categories provided that some funding is in the form of cash.

The distribution of contracts will be consistent with the source and proportion of each Government's contribution to the Study Budget.

Each Government shall fund the full cost of the participation of its Commissioners and Deputy Commissioners whom it designates including, inter alia, compensation and travel expenses. The cost of meeting facilities and administrative support to the Board of Commissioners shall be provided from the Study Budget by the Secretariat.

Administrative costs shall be shared equally among the three countries, with the contributions of Japan and the United States being in cash.

The salaries of experts assigned to the Secretariat shall be paid by the participating Governments. Office facilities, staff support personnel hired by the Secretariat, travel expenses and other expenses of the experts directly related to their official duties, etc., shall be funded from the Study Budget.

The Secretariat shall develop procedures for Study contracting for the approval of the Board.

The Secretariat shall endeavor to minimize the fragmentation of Study components in meeting the need for an equitable cost-sharing arrangement.

Since it is possible that IDB contracting rules may apply to the Panamanian share of the Study Budget, permitting United States and Japanese contractors, and contractors of other nationalities, to participate within the Panamanian share of the study contracts, the

three participating Governments shall encourage the meaningful association of Panamanian contractors with those from the U.S., Japan, and other countries.

Study components shall be contracted or provided only with the approval of the Board. Funding methods shall be specifically indicated in each contract or agreement, and the specified final payment shall be made only after the Board determines that all terms of the contract have been met. Payments for study components contract services may be made by the Secretariat, except that the final payment shall be made only with the approval of the Board.

The Secretariat will manage all contracts. Panama, Japan, and the United States will share equally in management responsibility regardless of the source of the funds used to pay each contractor.

Contracts shall be guided by applicable rules relating to the source of the contribution.

Except for contributions to Administrative Expenses, contribution from Japan shall only be available through the Japan International cooperation Agency (JICA).

The contracting procedures of JICA (with regard to the Study Components other than Feasibility Analysis and Final Report Preparation) will be as follows:

(1) When JICA invites Japanese consulting firms or other entities to submit proposals, it shall use the contract specifications developed by the Secretariat.

(2) The proposals received by JICA shall be provided to the Secretariat for its review. After consultation with the Secretariat, and taking into due consideration the recommendations of the Secretariat and Board, JICA will award the contracts.

(3) Final payment by JICA shall not be made without the consent of the Board.

(4) Contracts relating to all Study components shall be administered and managed by the Secretariat. In the case of contracts funded by JICA, the Secretariat shall consult with JICA concerning contract administration and management.

JICA

