

Virginia Recs

SOUTHERN CALIFORNIA
RAPID TRANSIT DISTRICT

1060 SOUTH BROADWAY • LOS ANGELES, CALIFORNIA 90015 • TELEPHONE (213) 749-6977

JACK R. GILSTRAP
GENERAL MANAGER

August 23, 1972

Mr. Don Hill
Principal
Peat, Marwick, Mitchell
& Company
1025 Connecticut Avenue, N.W.
Washington, D.C. 20036

Dear Mr. Hill:

Attached is your copy of the fully executed contract for project control and systems management services in connection with the District's alternative rapid transit corridors and systems technical study.

As required by the contract, this letter will serve as notification to commence work as of September 5, 1972. We are looking forward to meeting with Mr. Reiss, your on-site Project Manager, on that date. If you have any questions concerning scheduling and activities projected for the 30-day pre-period, please call Frank Barnes at (213) 749-6977, Ext. 231; he will be coordinating our staff efforts with Mr. Reiss.

Again, we are very pleased to have you with us and look forward to the challenging months ahead.

Cordially,

George L. McDonald
Manager of Planning
and Marketing

Attachment (on file with the District Secretary)

bcc: Executive Staff
F. Barnes
R. de la Cruz

S.C.R.T.D. LIBRARY



DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

AUG 18 1972

Rees

Mr. Ray Remy
Executive Director
Southern California
Association of Governments
Suite 400
1111 West Sixth Street
Los Angeles, California 94607

Re: Project No. CA-09-0022
Consultant Contract

Dear Mr. Remy:

We have reviewed and concur in the consultant contract between the SCRTD and Peat, Marwick, Mitchell and Company in the maximum amount of \$111,730. This concurrence of the contract between the Transit District and PNM is consistent with the procedures agreed to by SCAG, as technical study project sponsor and the District. The concurrence is subject to these conditions:

1. Part 6, Modification of Estimated Cost, should be deleted since it authorizes a best efforts type of contract and leaves the District open to an overrun of costs. The standard type of CFFF contract used by grantees is the CFFF completion or ceiling type. This type plus an agreement by the consultant to complete all services for the cost and fee stated should present no difficulty.
2. A detailed cost breakdown by individual work task must be submitted to UMTA.

These conditions have been discussed by Alex Della-Valle of my staff and several Transit District representatives.

Sincerely,

Dee V. Jacobs
Acting Associate Administrator

cc: Mr. Gilstrap, SCRTD

RECEIVED

AUG 21 1972

General Services
U.S. G.P.O.

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

MEMO TO Virginia L. Rees

August 24, 1972

IN RE: Contract dated August 23, 1972 with Peat, Marwick, Mitchell & Co. as Consultant to render project control and system management services in connection with technical study of alternative rapid transit corridors, etc. (UFTA Project No. CA-09-0022)

Attached for your file is original executed copy of the above described contract.

Enc.

GEORGE L. McDONALD

cc John Curtis)
 R. T. Powers) with copy of
 J. B. Seatchard) contract

RECEIVED

AUG 24 1972

SECRETARY

Contract No. _____

THIS CONTRACT by and between PEAT, MARWICK, MITCHELL & CO., (herein called "Contractor") and the SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT (herein called "District"),

WITNESSETH:

WHEREAS, District desires to engage a qualified consultant to render project control and system management services in connection with a technical study of alternative rapid transit corridors and systems which is to be partially financed by the United States Department of Transportation, Urban Mass Transportation Administration, through the Southern California Association of Governments, and

WHEREAS, Contractor is qualified and willing to perform such services;

NOW THEREFORE, in consideration of their mutual covenants, the parties agree as follows:

1. SCOPE OF WORK

Contractor shall provide all necessary project control and systems management services for District's technical study of alternative transit corridors and systems and shall prepare all necessary reports in connection therewith, as hereinafter set forth, in accordance with District's

Request for Proposals, and enclosed Summary Work Statement dated April 28, 1972, and Contractor's Proposal dated May 15, 1972, all of which documents are attached hereto and incorporated herein as though fully set forth.

2. TIME OF COMMENCEMENT AND COMPLETION

Contractor shall commence services hereunder upon notification by District and shall complete same within 9 calendar months thereafter, excluding time required by District to review and approve the Phase I and Phase II reports specified on pages IV-8 and IV-11 of Contractor's Proposal, and excluding the time required by Contractor to redraft and print the final report as specified in paragraph 4D below.

Contractor shall not commence Phase II (Preliminary Engineering) until District has approved Phase I (Plan Refinement) progress report.

3. DATA TO BE MADE AVAILABLE TO CONTRACTOR

District shall cooperate with Contractor in making available related data, information, reports, plans, maps and other materials available to the District and necessary to successfully complete the work described herein. District shall further assist Contractor by contacting organizations and persons related to the project and enlisting their aid and support in furnishing needed information. All information, data, reports, maps, etc., as are existing and available to District, and necessary for the carrying out of the work, shall be made available to Contractor without charge.

4. ITEMS TO BE DELIVERED

Contractor shall, in connection with services rendered by it, prepare and deliver to District the following reports:

A. Monthly Reports

1. Progress reports. Five copies prior to the 6th of each month, which shall contain a narrative description of the work performed during the previous month including a report of the activities of all Contractor personnel assigned to the project, and of any difficulties or delays encountered; and a schedule of planned activities during the next monthly period and any difficulties or delays anticipated.

2. Financial Reports. Five copies in balance sheet format as required by UMTA "Accounting Procedures" which shall be submitted prior to the 6th of each month.

B. Project Control and Systems Management Reports

1. An overall Technical Development Plan and a Project Implementation Plan for each of the 4 functional areas described in Contractor's Proposal.
2. Monthly technical evaluation reports on the work programs of each of the 4 functional area consultants, prior to the 6th of each month.
3. Monthly management and financial reports on the status of the overall project including work efforts of the functional area consultants, prior to the 6th of each month.

C. Preliminary Report on Phase I (Plan Refinement)

1. One reproducible and 20 typewritten copies, which shall incorporate submissions of the 4 functional area consultants describing their Phase I activities and results as well as describing matters of general content that are not individually associated with the 4 functional areas. District shall specify the format of the report and its organization. Report shall include a limited number of multicolor illustrations and figures, if specified by District.
2. During Phase I, a feasibility report on Commuter Rail Service which shall incorporate submissions of the 4 functional area consultants.

D. Final Report

Five typewritten copies of a draft final report describing in full detail the (1) nature and objectives of the overall project, (2) work performed, and (3) analysis of project results; incorporating written submissions of the 4 functional area consultants describing their activities during the project and their results, and describing matters of general content that are not individually associated with the 4 functional areas. District shall specify the format of the report and its organization.

District shall review and comment on the draft final report within 30 days of receipt of the draft copies.

Upon receipt of draft final report, District shall promptly forward the same to UMTA for its required review and tentative approval.

Contractor shall incorporate District comments into the report, and, within 20 days after receipt of comments from the District, shall submit 20 typewritten copies along with one reproducible copy of the final report. A limited number of multicolor illustrations and figures will be included.

5. COMPENSATION

In consideration of said services District shall pay Contractor a sum not to exceed \$111,730, as follows: a fixed fee of \$9,225, plus a sum (herein called "Estimated Cost") for direct and indirect costs, not to exceed \$102,505, computed and payable as follows:

A COSTS

District shall reimburse Contractor for all direct and indirect costs as are allowable under subpart 1-15.2 of the Federal Procurement Regulations (41 CFR 1-15.2) in an amount not to exceed \$102,505. Until determination of allowable costs by audit, Contractor shall bill District using actual labor rates and the Indirect (provisional overhead) rates set forth on the "Cost and Price Analysis" included in Contractor's Proposal dated May 13, 1972.

B. PAYMENT

Contractor monthly shall submit invoices to District showing costs incurred for the preceeding month. Invoices shall also include a percentage of Contractor's fixed fee. The fixed fee applied to each invoice shall bear the same

proportional relationship to monthly allowable costs incurred as the total fixed fee bears to the Total Estimated Cost. All invoices shall be taken from Contractor's books of account, and shall be supported by a statement of costs incurred by Contractor in the performance of this contract and claimed to constitute allowable costs. Contractor shall have available copies of payroll distribution, receipted bills and other documents reasonably required by District.

District shall pay Contractor a sum equal to 90% of the amount invoiced, and shall withhold 10% until such time as a determination is made that all contract requirements have been accomplished. Final payment shall be made upon determination by District that all requirements hereunder have been completed which determination shall not be unreasonably withheld.

6. TERMINATION

District may terminate this contract at any time by giving Contractor written notice thereof. Upon termination District shall pay Contractor its allowable costs to date of termination plus its allowable costs which are reasonably necessary to effect such termination. In addition, District shall pay to Contractor that part of the fixed fee which relates to contract work accomplished to date of termination versus all work required hereunder.

7. CHANGES

District may, from time to time, require changes in the scope of the services of Contractor to be performed hereunder. Such changes,

including any increase or decrease in the amount of Contractor's compensation, which are mutually agreed upon by and between the parties, shall be incorporated in written amendments to this Contract.

8. EQUAL EMPLOYMENT OPPORTUNITY

In connection with the execution of this Contract, Contractor shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin, and shall take affirmative actions to insure that applicants are employed, without regard to their race, religion, color, sex, or national origin. Such actions shall include employment, upgrading, demotion, or transfer; recruitment, or recruitment advertising; layoff, or termination; rates of pay, or other forms of compensation; and selection for training including apprenticeship.

9. ASSIGNABILITY

Contractor shall not assign any interest in the Contract, and shall not transfer any interest in the same without the prior written consent of District thereto: Provided, however, that claims for money due or to become due to Contractor from District hereunder may be assigned to a bank, trust company, or other financial institution without such approval. Notice of such assignment or transfer shall be furnished promptly to District.

10. INTEREST OF CONTRACTOR

Contractor presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed hereunder.

Contractor further covenants that in the performance of this Contract no person having any such interest shall be employed.

11. AUDIT AND INSPECTION OF RECORDS

Contractor shall permit the authorized representatives of District, the U.S. Department of Transportation and the Comptroller General of the United States to inspect and audit all data and records of the Contractor relating to his performance under the Contract.

12. INTEREST OF MEMBERS OF CONGRESS

No member of or delegate to the Congress of the United States shall be admitted to any share or part of this Contract or to any benefit arising therefrom.

13. INTEREST OF PUBLIC OFFICIALS

No member, officer, or employee of District or of a local public body during his tenure or from one year thereafter shall have any interest, direct or indirect, in this contract or the proceeds thereof.

14. IDENTIFICATION OF DOCUMENTS

All reports, maps, or other documents completed as part of this contract, other than documents exclusively for internal use within the District shall carry the following notation on the front cover or a title page (or in the case of maps, in the same block) containing the name of District.

"The preparation of this report has been financed in part through a grant from the U.S. Department of Transportation, Urban Mass Transportation Administration, under the Urban Mass Transportation Act of 1964, as amended."

In addition, the date (month and year) the document was prepared and the name of District shall appear on the front or title page.

15. COPYRIGHT

No reports, maps, or other documents produced under this Contract shall be the subject of an application for copyright by or on behalf of the Contractor.

16. UMTA APPROVAL

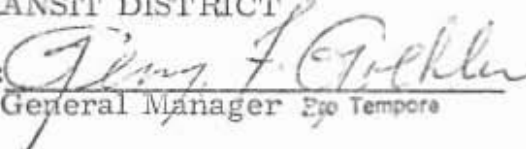
The parties agree that this contract and any subsequent modifications hereof shall be approved by UMTA prior to becoming effective.

DATED:

August 23, 1972

SOUTHERN CALIFORNIA RAPID
TRANSIT DISTRICT

By:


General Manager *Ego Tempore*


APPROVED AS TO FORM



RICHARD T. POWERS
General Counsel

PEAT, MARWICK, MITCHELL & CO.

By:


1025 Connecticut Avenue, N.W.
Washington, D. C. 20036

April 28, 1972

Gentlemen:

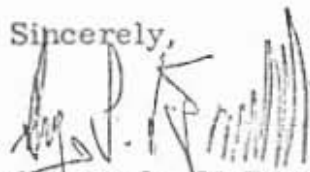
The Southern California Rapid Transit District anticipates the need for project control and systems management consultant services in connection with a technical study of alternative transit corridors and systems. Your firm has been suggested as one that might have capabilities in this field.

The enclosed request for proposal describes the nature of the project, and outlines the items to be included in your proposal, should you wish to respond.

If you have any questions regarding the technical aspects of this project, please contact Mr. John Curtis, Manager of Rapid Transit and Surface Planning. His telephone number is (213) 749-6977, extension 231.

We would be pleased to receive a proposal from your firm.

Sincerely,



George L. McDonald
Manager of Planning
and Marketing

Enclosure

REQUEST FOR PROPOSAL
TECHNICAL STUDY OF
ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

The Southern California Rapid Transit District anticipates the need for the services of a project control and systems management consultant in connection with a technical study of alternative transit corridors and systems for the Los Angeles Metropolitan area. The services performed by such a consultant are expected to include the following specific functions:

- Work Scheduling
- Project Coordination
- Budget Control
- Progress Reporting
- Work Product Evaluation

This project is described briefly in the attached summary work statement and organization chart. It is expected that the total budget for this study will not exceed six hundred thousand dollars (\$600,000).

In order to avoid conflict of interest and to insure a thorough evaluation of the work product of the study program consultants, the consultant selected to perform the project control function will be excluded from consideration for the performance of the four detailed study functions. This exclusion will not prevent the consultant from bidding on any future projects for the District. The consultant retained for this effort shall maintain an office in the Los Angeles area for the duration of the project. The District will contract directly with the study program consultants, however, they will be under the supervision of the project control consultant.

Should your firm be interested in providing project control services to the SCRTD for this project, you should submit 15 copies of a proposal, not to exceed seventy-five (75) pages in length, to the Manager of Planning and Marketing, Southern California Rapid Transit District, 1060 South Broadway, Los Angeles, California 90015, on or before 5:00 p. m., Monday, May 15th, 1972. Proposals received after that time will not be considered. Proposals should contain the following items:

- A brief technical description outlining the approach to the project as your firm sees it. This section is not to exceed ten (10) pages.

- A project work flow chart related to the technical description.
- Your comments and suggested revisions to the summary work statement, together with a time schedule to ensure completion of the project within eight (8) months of awarding of the study consultant contracts.
- A tentative work program related to the work statement and time schedule.
- A description of the organization that your firm recommends for use in this project.
- Resumes of the experience of any personnel who would be assigned to this project. The project manager proposed by your firm must be identified. He will be expected to devote one-hundred percent (100%) of his time to the project. Failure to produce the designated project manager will be grounds for cancellation of the contract and selection of another consultant by the District. Resumes of corporate officers and principals who would not be directly involved in the project should not be included.
- A brief description of the history and background of your firm including location of principal offices, number of personnel and other pertinent information.
- Descriptions of similar or related projects successfully completed by your firm in the recent past.
- Names, titles, addresses, and telephone numbers of five client references with whom your firm has worked on previous similar or related projects. The District may contact any or all such persons for verification of your performance.
- The fees, rates and total amount to be charged by your firm. SCRTD would prefer to negotiate a cost plus fixed fee (CPFF) contract. A time and material contract will be considered only upon presentation of an excellent justification. The prices quoted in your proposal shall be effective for not less than six-months from the date of submission.

It is anticipated that the project control consultant's services will not exceed \$125,000. All materials, concepts and ideas in the proposal shall become the property of the Southern California Rapid Transit District upon submission thereof. The District reserves the right to utilize said materials, concepts and ideas in whatever manner it chooses. The District further reserves the right to negotiate a contract with any one or none of the firms responding to this request for proposal, based solely upon its judgment of the qualifications and abilities of said firms. No costs incurred prior to the execution of the contract shall be reimbursable as a part of this project.

Selection or non-selection of a firm for this project will not prejudice the ability of said firm to bid on and receive a contract for future projects with the Southern California Rapid Transit District. Similarly, it will not restrict the District's ability to negotiate with and retain other firms for subsequent projects. In any case, the District's judgment shall be final.

This study is contingent upon the receipt of a Technical Study Grant from the Urban Mass Transportation Administration (UMTA). Prospective consultants are advised that they shall be responsible for meeting the requirements of that agency. Allowability of costs will be determined pursuant to Federal Procurement Regulations, Part I, Section 15, in effect on the date of contract award.

SUMMARY WORK STATEMENT

TECHNICAL STUDY OF ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

The objective of this study is to create an action program intended to develop a rapid or improved public transit system to serve the travel needs of the Los Angeles Metropolitan Area.

Various urban development corridors shall be studied with regard to transit types and system procedures, and a determination shall be made as to the nature and magnitude of the demand for transit service in these corridors. The use of existing railroad facilities for commuter service and the development of an expanded bus system shall also be studied.

The study will review all major corridors in the area, including those identified as having top priority in the Southern California Rapid Transit District 1968 Rapid Transit Plan, to assess the demand for transit services within them, so as to allow the determination of their relative priorities.

On the basis of this review the most appropriate corridors for inclusion in an action program will be selected for development of the specific detail necessary for a construction grant application.

I. PLAN REFINEMENT

A. Analyze Transit System Needs and Possible Solutions and Develop System Performance Criteria.

In this phase of the study, the travel demands will be analyzed; performance criteria will be developed; pertinent types of data, such as existing and projected land use, will be gathered; the alternative forms of transit service will be evaluated; the environmental impact of the various transit alternatives will be considered; and the various financing plan possibilities will be examined.

EVALUATE TRANSIT NEEDS AND TRAVEL DEMANDS

Available demographic, land use and socio-economic data will be reviewed to assist in conceptualizing the nature of the present and potential travel demand in the areas served by the several transit corridors. This information will be the basis for finalizing the transit development concepts to be studied in the several corridors. General performance criteria will be developed for a regional transit system so that decisions regarding route and station locations, hardware configuration and operating policies may be made.

Initially, existing and projected land use data will be collated. Agencies such as SCAG, LARTS, SCRIS,

EXAMINE
GENERAL
PLANS

Bureau of Census and various City and County departments will be the source of appropriate information.

Analysis of the General Plans of the various jurisdictions will be performed with emphasis on projected land use, circulation and service systems. These data will be checked for consistency and will then be analyzed to evaluate travel patterns in the corridors.

DEVELOP
PERFOR-
MANCE AND
ENVIRON-
MENTAL
CRITERIA

Performance criteria for a regional transit system will be developed. The diversity of needs must be recognized so that general criteria may be developed that will be adequate for the general area and not just the needs of a single corridor or system. Consideration will be given to frequency of service, safety, speed, comfort, convenience, secondary feeder systems and other necessary characteristics. Consideration will be given to each system's ability to attract riders who have other means of transportation available to them as well as those who do not. In developing these criteria, full consideration will be given to the effect that the transit system will have on the environment and the community. These criteria shall be used in later phases of the study to select a system hardware configuration and to set operating policies that will best serve the region.

EXAMINE
ALTERNATIVE FORMS
OF TRANSIT
SERVICE

Based primarily upon transportation needs and available technology, the most promising alternatives for transit service will be evaluated against the criteria developed. Among the alternatives will be various modes of modern rapid transit, an expanded bus system, a commuter rail service or a combination of the above.

EXAMINE
FINANCING
PLANS

A preliminary examination of all relevant financing plans will be conducted. All sources will be explored including federal grants, and state support; property taxes, including benefit assessment districts and tax allocation bonds; and motor vehicle taxes, including vehicle registration fees and gas sales taxes. Multi-burden taxation programs will be explored.

B. Define Alternative Routes and Systems.

This phase of the study is to develop preliminary route alignments within the corridors and to select operating systems suited to the region. It also includes the development of very preliminary construction cost estimates and tentative schedules of capital requirements for construction in the corridors. The feasibility of commuter service on railroad lines, and the concept of a sophisticated grid-type or other bus service system as complementary to or as an alternative to rapid transit development will also be analyzed.

CONDUCT
PRELIMI-
NARY SYSTEM
PLANNING

PREPARE
RIDERSHIP
ESTIMATES

REVIEW
EXISTING AND
NEW TECH-
NOLOGY

Three tasks are necessary as follows: 1) conduct preliminary system planning tasks including the study of route alignments, station locations for each corridor and preliminary cost estimates, utilizing information from previous District studies together with studies by various City and County agencies; 2) prepare ridership estimates for each corridor; 3) review the features of existing modern operating transit systems and review new technology rapid transit and feeder systems to determine those systems which may be suited for use by the District. With respect to railroad commuter service, existing lines will be evaluated in terms of operational feasibility, investment required to assure provision of service at a proper standard of reliability and safety, and practicable methods of providing for operation of the trains. These systems, including the concept of a sophisticated grid-type or other bus system as an alternative, will be evaluated in terms of the performance criteria.

C. Select Most Promising Corridors and Modes of
Transit Service.

SELECT MOST
PROMISING
CORRIDORS
AND MODES

Upon completion of the three previously noted efforts, the most promising corridors or segments of the overall initial rapid transit system will be selected for further consideration.

PROGRESS
REPORT AND
DECISION
POINT

At this point in the study, a progress report will be made available to appropriate agencies.

II PRELIMINARY ENGINEERING

A. Examine All Aspects of Each Corridor.

In this phase of the study, each selected corridor or segment will receive a more detailed engineering study; an examination of estimated capital and operational costs; a determination of probable impact on the existing bus system; preparation of tentative operational plans; and examination of probable ridership; and examination of socio-economic benefits; an examination of environmental impact; and an examination of relevant financing plans.

CONDUCT
MORE
DETAILED
ENGINEERING

A more detailed engineering study will be conducted for each of the selected corridors in sufficient depth to determine engineering feasibility, planning and environmental acceptability of route alignment, the potential for sharing freeway or other rights-of-way, system configuration, station location, and cost of construction.

DEVELOP
CAPITAL
COST ESTI-
MATES

Cost estimates will be developed for each corridor utilizing engineering estimates of the quantities of each item of construction required, together with current unit cost estimates. This will lead to the development that would be needed to construct the initial system.

PREPARE
TENTATIVE
OPERATIONAL
PLANS

Information from both previous and ongoing studies by the District, the Southern California Association of Governments, the Los Angeles Regional Transportation

Study, the City of Los Angeles, the County of Los Angeles, the Bureau of the Census, and other agencies will be collated as a basis for forecasting potential transit trips in the selected corridors. Tentative operational plans, including those for secondary feeder services, and revisions in existing bus service will be prepared for each corridor.

DEVELOP
OPERATING
COST ESTI-
MATES

Unit operating costs will be developed and examined for reasonableness against similar data from existing systems, where possible. Operating expenses will be estimated for each corridor. Items to be examined will include equipment requirements such as fleet size, vehicle miles and vehicle hours. Forecasts of personnel requirements including operators, station personnel, and supervisors needed will be prepared along with estimates of pay hours. Energy requirements will be reviewed and resource capabilities will be assessed. Maintenance and other costs will also be estimated. The financial results of operation that would be associated with each corridor system will be assessed. Forecasts of revenues and expenses for the transit service along each corridor, including secondary feeder systems, will be developed.

FORECAST
RIDERSHIP

The operational plans, with route alignments and station locations developed in an earlier phase of the study, and the information gathered from other studies will be utilized to forecast ridership at various fare levels for the corridors and systems under consideration. These forecasts will estimate the number of daily riders diverted from the bus system and attracted from automobiles. Modes of access to transit system will be investigated. Station-by-station patronage volumes will be estimated and daily and peak period line load tables will be prepared.

EXAMINE
IMPACT ON
EXISTING
BUS SYSTEM

The impact of the proposed transit service on the existing bus system will be examined in terms of increases or decreases in revenues and expenses that would occur.

B. Analyze Socio-economic Effects of Rapid Transit Lines.

In this phase, the socio-economic impacts that will result from establishing the rapid transit alternatives will be investigated. Existing studies will be reviewed for pertinent data and rider and community effects will be presented.

Existing reports and data developed by the District and other agencies such as the City Planning Department, Community Analysis Bureau and other agencies at all levels of government will be collected. Pertinent data from these sources, together with projections of population and land use will be assembled as a basis for the study of socio-economic impacts that would occur from the transit improvements.

INVESTIGATE
RIDER AND
COMMUNITY
BENEFITS

Rider characteristics for each corridor will be investigated. The impact on travel time, and auto cost, including operating, parking and ownership costs will be considered. The effect of the line on mobility, including such items as employment and housing access, and the ability to reach health and welfare services, educational facilities, and cultural activities will be determined.

The impact on the community at large will be investigated for the alternatives. The economic effect on auto and truck operations resulting from any change of traffic conditions will be estimated. The impact of altered access to downtown, airports, and employment centers will be described. The effect on real estate values and business conditions as well as the effect on life styles that would result from transit construction and operation will be

discussed for each corridor. Direct input from community groups in the selected corridors will be solicited by the District.

EXAMINE
ENVIRONMEN-
TAL IMPACT

An investigation will be made regarding the broader environmental trade-offs and impacts of the proposed system. Such direct effects as air pollution, noise pollution and visual impacts will be examined in detail.

EXAMINE
FINANCING
PLANS

This phase of the study will consider all relevant financing plans. Those that are feasible within the time constraints of an action program will be investigated. All potential financing plans will be screened. They will then be ranked by feasibility of timely implementation as well as by their ability to meet capital requirements. Those plans that could be effected in the near future and would result in significant dollar amounts will be given priority for in-depth investigation. Those plans that require legislative or other action but which show promise of success will also be considered. The plan or plans that have the greatest potential for meeting the needs, both as to dollar amounts and time phasing, of each corridor will be selected.

PROGRESS
REPORT AND
DECISION
POINT

At the conclusion of this phase of the study, a progress report will be made available to all participating agencies and a major decision point of the study will be reached.

C. Selection of System and Preparation of Grant

Application.

SELECT
SYSTEM

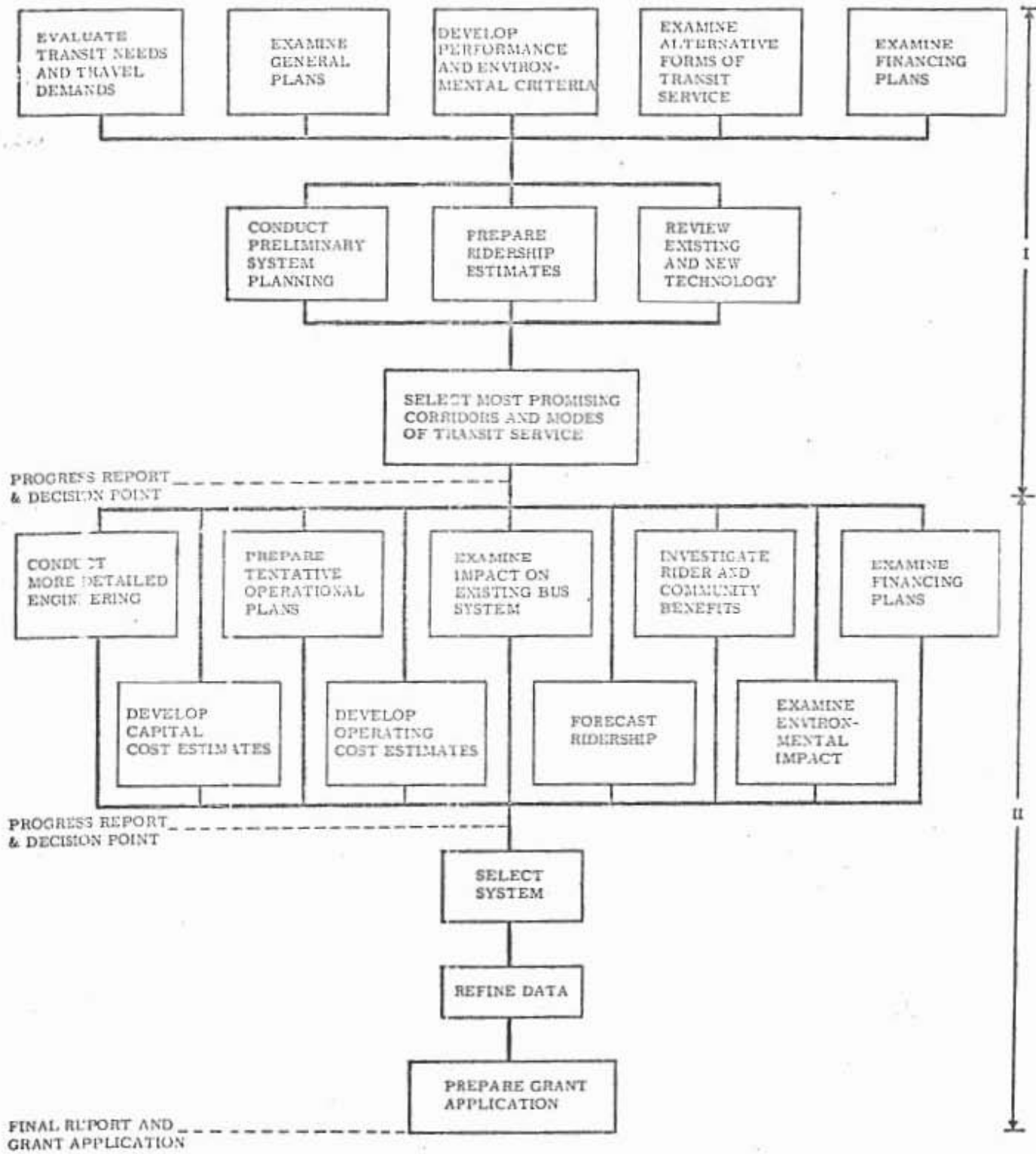
The conclusion to this study will be the selection of the corridor segments and modes of transit service. All data pertaining to the selected transit system shall be refined and consolidated for inclusion in a final report.

REFINE
DATA

PREPARE
GRANT APPLI-
CATION

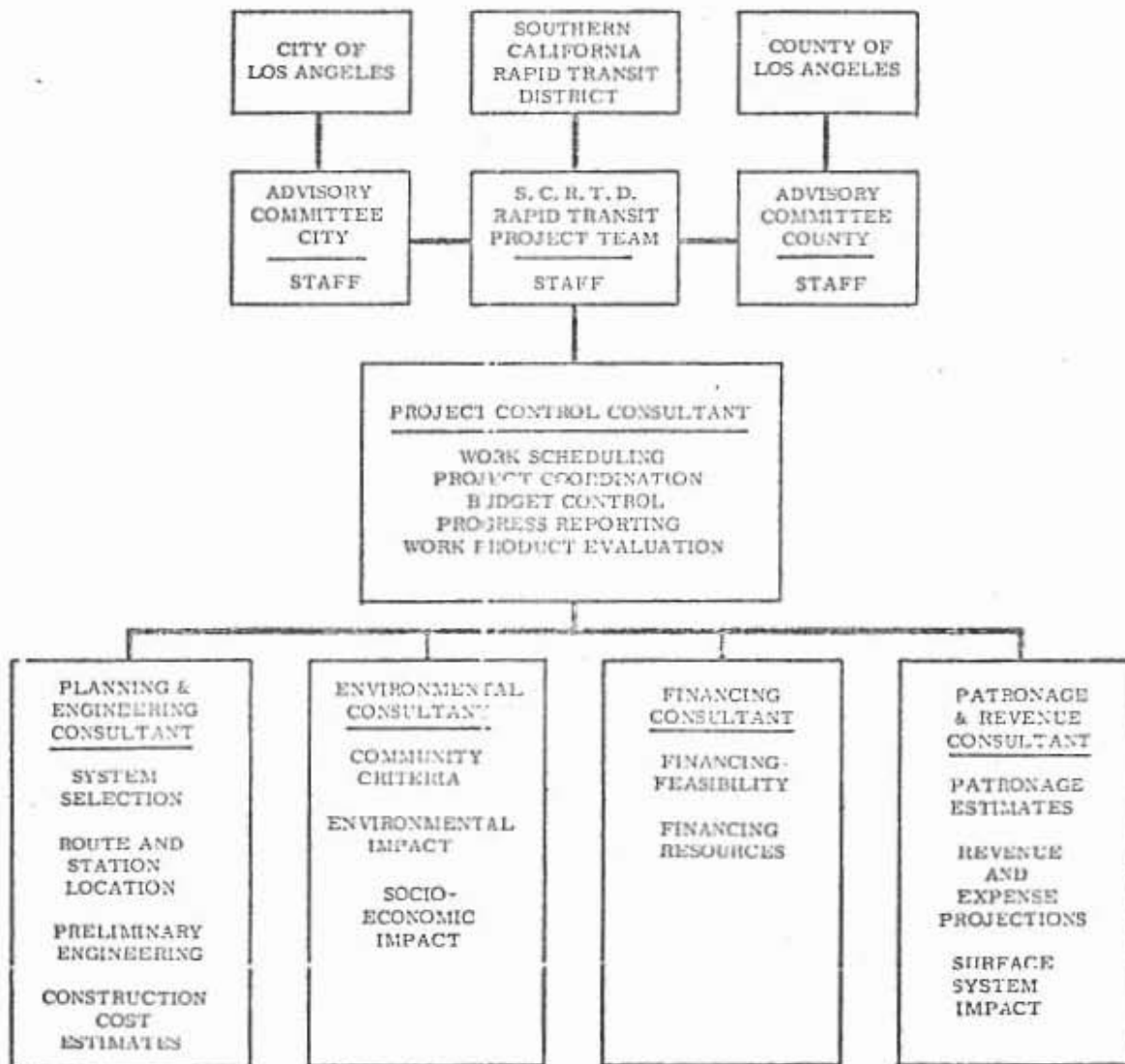
A detailed capital grant application to the federal government will be prepared as a final product of this study.

WORK FLOW CHART
 TECHNICAL STUDY OF
 ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS
 SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT



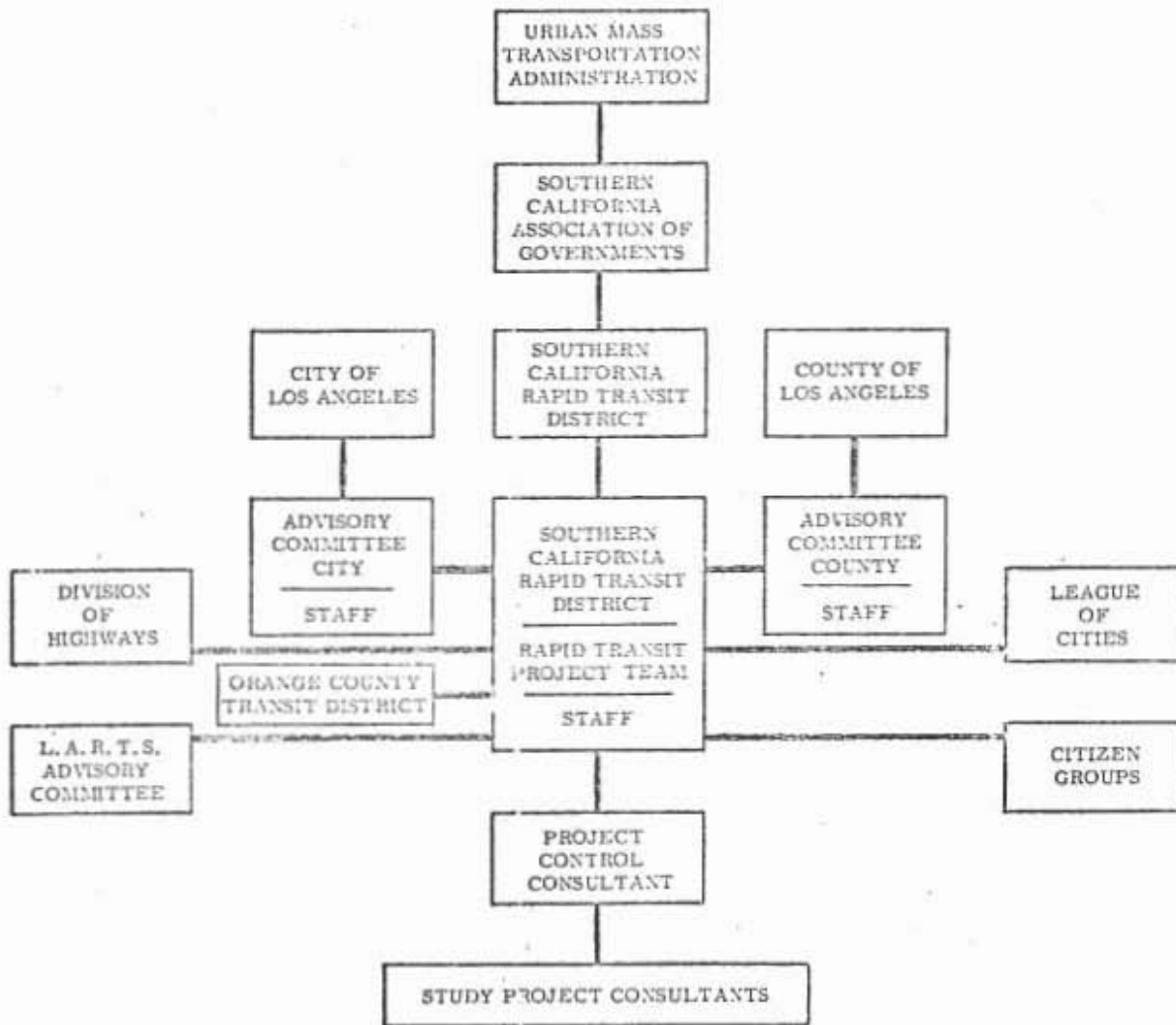
FUNCTIONAL ORGANIZATION

TECHNICAL STUDY OF ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT



PARTICIPATING AGENCIES

TECHNICAL STUDY OF
ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT



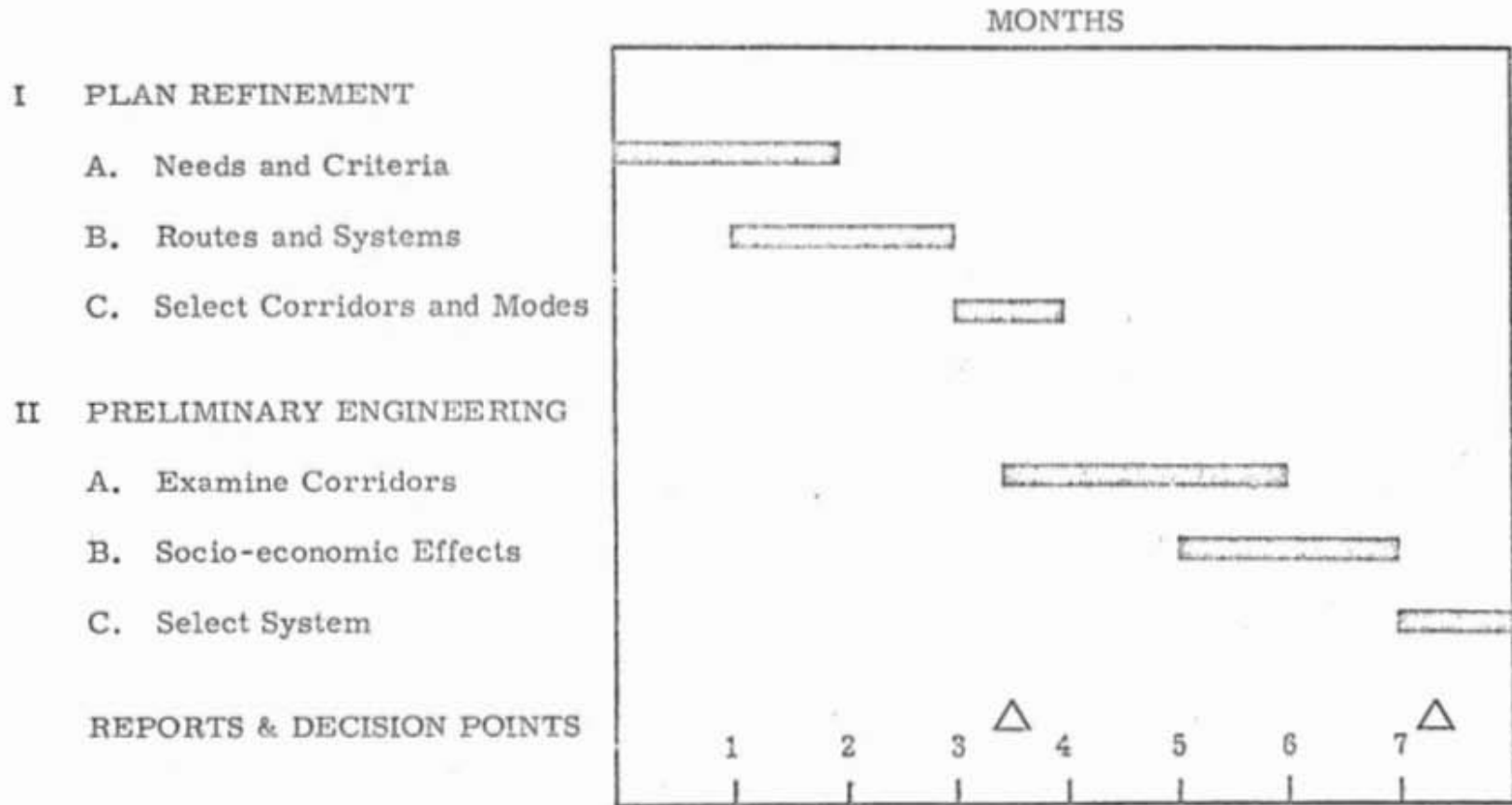
CONSULTANT PARTICIPATION MATRIX
 TECHNICAL STUDY OF
 ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS
 SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

TASK	Planning & Engineering Consultant	Environmental & Socio-economic Consultant	Financing Consultant	Patronage & Revenue Consultant
Evaluate Transit Needs and Travel Demands	●			○
Examine General Plans	○			
Develop Performance and Environmental Criteria	○	●		
Examine Alternative Forms of Transit Service	○	○		
Examine Financing Plans			●	
Conduct Preliminary System Planning	○			
Prepare Ridership Estimates				●
Review Existing and New Technology	○	○		
Select Most Promising Corridors and Modes of Transit Service	○	○	○	○
Conduct More Detailed Engineering	○	○		
Develop Capital Cost Estimates	○			
Prepare Tentative Operational Plans	○			●
Develop Operating Cost Plans	○			○
Examine Impact on Existing Bus System				○
Forecast Ridership				○
Investigate Rider and Community Benefits		●		○
Examine Environmental Impact		●		
Examine Financing Plans			●	
Select System	○	○	○	○
Refine Data	○	○	○	●
Prepare Grant Application				

● = Major Participation

○ = Minor Participation

PROJECT SCHEDULE
TECHNICAL STUDY OF
ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT



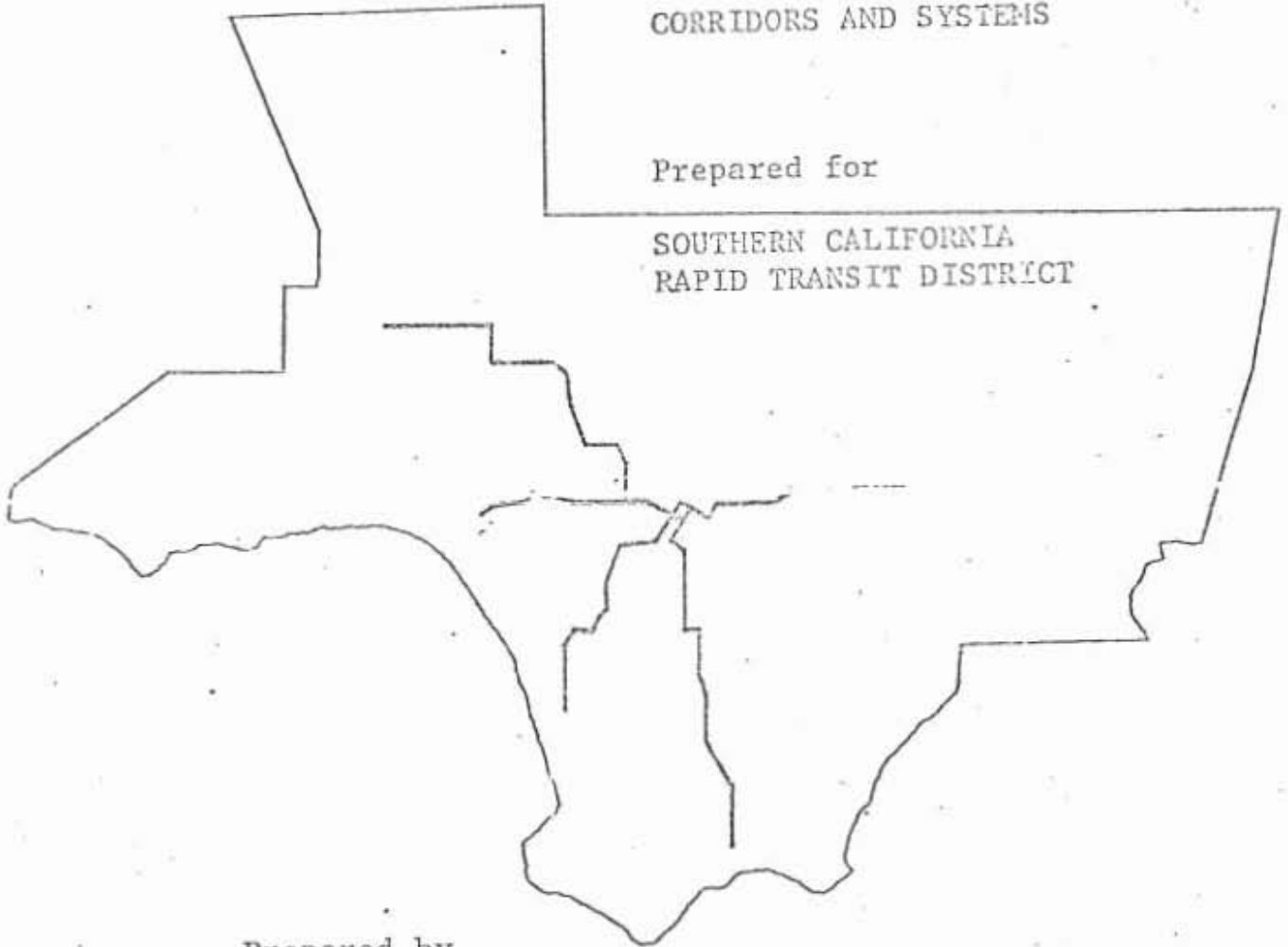
A Proposal For

PROJECT CONTROL AND
SYSTEMS MANAGEMENT
of a Technical Study of

ALTERNATIVE TRANSIT
CORRIDORS AND SYSTEMS

Prepared for

SOUTHERN CALIFORNIA
RAPID TRANSIT DISTRICT



Prepared by

PEAT, MARWICK, MITCHELL & CO.
LOS ANGELES, CALIFORNIA

May 1972

PEAT, MARWICK, MITCHELL & CO.

CERTIFIED PUBLIC ACCOUNTANTS

555 SOUTH FLOWER STREET

LOS ANGELES, CALIFORNIA 90071

May 15, 1972

Southern California Rapid Transit District
1060 South Broadway
Los Angeles, California 90015

Attention: Mr. George L. McDonald,
Manager of Planning and Marketing

Gentlemen:

Peat, Marwick, Mitchell & Co. takes pleasure in submitting our proposal to become the project control consultant for the SCRTD technical study of Alternative Transit Corredors and Systems.

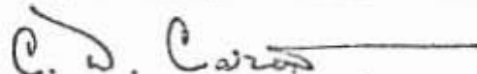
Our approach and organization that we will use in conducting the project control activities are described in Sections I, II and V. Technical material describing the conduct of the planning, engineering, patronage, environmental, and financial studies is contained in Sections III and IV.

PMM is highly qualified to undertake the assignment, since we have extensive experience in mass transportation planning and systems management of large projects in many fields. Especially noteworthy is the fact that we are under contract with the Urban Mass Transportation Administration as a systems manager for a large program, so that the control techniques being developed in that work can be used in Los Angeles.

Please feel free to call me at 972-4333 if you have any questions regarding our proposal. Technical matters should be referred to Mr. Dan G. Haney, our engagement manager, at (415) 697-8420. We would welcome the opportunity of presenting our plan in person, so that you could gain first-hand appraisal of the capabilities of our staff.

Very truly yours,

PEAT, MARWICK, MITCHELL & CO.



C. William Caron, Partner

CC:CG

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I. TECHNICAL DESCRIPTION

Purpose, Objectives, and Performance Requirements

PMM, as the Systems Manager (SM), will be responsible for the overall planning and integration of the technical study and for the preparation of periodic reports citing program status and activities, progress, and financial status. PMM will perform the activities in accordance with the RFP.

The systems management concept has been especially successful where program complexity, scale, and functional integration of end-products into an operating system have been critical concerns. The most visible success of the systems management concept has been with the NASA Apollo program.

On projects of lesser magnitude, the systems management approach is especially useful when it is difficult to specify in advance, with precision and detail, the functions and performance of the end-products, e.g., in situations involving complex planning and engineering projects. One striking feature of these situations is the difficulty in specifying successful performance, i.e., agreeing in advance what constitutes a meaningful acceptance test and work product evaluation.

The problem of complexity, scale, and potential ambiguity in the principal end-products (architectural, engineering, and operational plans; costs; ridership; and financial plans) associated with the SCRTD technical study is justification for SM effort. Other incentives for SM are as follows:

- o The SM role within the responsible organization has been most successful when it was the principal repository within the project organization of the end-product user interest and viewpoint. For the SCRTD program, SM is the focus where, for example, the SCRTD planner will be represented throughout the development of the methodology.
- o The SM concept is important to SCRTD since its internal work load is increasing and the

organization needs 'expédient', efficient, and careful management and consistent outputs from the transit corridors and systems technical study.

PMM feels that the appropriate SM approach for the study should have the following characteristics and elements:

- o The project organization will contain a systems management function to carry out the development and monitoring of the requirements specifications for SCRTD and to provide input to the consultants performing technical planning and systems evaluation.
- o In the initial stages, a high level of attention and key technical resources of the SM will be concentrated on developing the performance requirements specifications of all outputs or end-products, concentrating on the four functional areas: planning and engineering, environmental, financial, and patronage and revenue.
- o During the project, the SM will monitor and report on progress, assist in identifying technical cost, and schedule problems, and make recommendations to SCRTD as to management decisions.
- o In the decision-making stages, the SM will provide the coordination and data assembly role in which evaluation results are brought together for the system selection decisions.

These elements will be reflected in the specific SM contractor scope and method to be carried out during this study.

Conceptual System Management Function and Technical Approach

Briefly stated, the principal requirements and purposes of the system manager include:

1. translating SCRTD goals into project outputs,
2. specifying system management plans,
3. measuring technical progress and controlling costs and work scheduling.

The processes that are included in system management follow. Each is intended to assure meeting one or more of the program requirements.

Translating SCRTD Goals into Project Outputs. The performance requirements for end-products must have as minimum objectives:

1. Preparation of transit system corridor plan and preliminary engineering specifications, including the development of system engineering characterization of transit systems (engineering characteristics, route and station locations, and cost) and their performance characteristics (level of service, capacity, speed, etc.); estimates of socio-economic impact of each selected system will be required to completely characterize each system.
2. Development of environmental and community impact evaluations.
3. Development of financial plans and alternative packages.
4. Forecasts of revenue and patronage.

The Systems Manager's role (and challenge) will be to develop explicit and comprehensive requirements specifications for each consultant so that these objectives can be pursued concurrently. This is a critical first step in the overall system management process and will provide the first control element, called the Technical Development Plan (TDP). Later, more detailed plans for the work will be documented in a

Project Implementation Plan (PIP).* Performance of the SM function will be evidenced by a complete description of system management documents and their use, i.e., the technical development plan, project implementation plan, and progress reports.

The TDP must be the primary explicit technical project management instrument. PFM proposes to develop the TDP with two principal processes discussed below.

A Work Program (WP). This will provide a definition of work elements (carried to the work package level in the PIP). The WP will be the repository of and reflect the identification of end-products and intermediate products defined in the development of system performance requirements specification process. Figure 1 is PFM's preliminary top level (TDP level) program. It follows consultant team designation in the RFP except that economic analysis tasks have been broken out from the engineering tasks. Figure 2 shows a way a top level item might be expanded following PIP preparation. In the conduct of the work, PFM would provide greater detail at both the TDP and PIP levels. The PIP level contains many intermediate products as well as end-product components, as adapted by PFM. These items will generally constitute work packages; cost and schedule plans and controls will be built around these work packages. PFM feels that costs and schedules can be related to discrete outputs with reasonably high confidence, facilitating improved control and management decision making.

A System Management Organization. This charts all participating units and identifies their roles and functions. A description of the organization design rationale that PFM proposes is contained in Section V of the Proposal.

System Management Plan. The System Management Plan provides the mechanism for staging and controlling the activities of the individual consultants by specifying the

*TDP and PIP are commonly-used systems management techniques in UMTA.

PLANNING & ENGINEERING	Item 1									Intermediate and end products to be developed
SOCIOECONOMIC & COSTS	Item 2									See Figure 2 for example of PIP level of expansion
ENVIRONMENTAL	Item 3									
FINANCIAL	Item 4									
PATRONAGE & REVENUE	Item 5									

Figure 1

TECHNICAL DEVELOPMENT PLAN
STRUCTURE

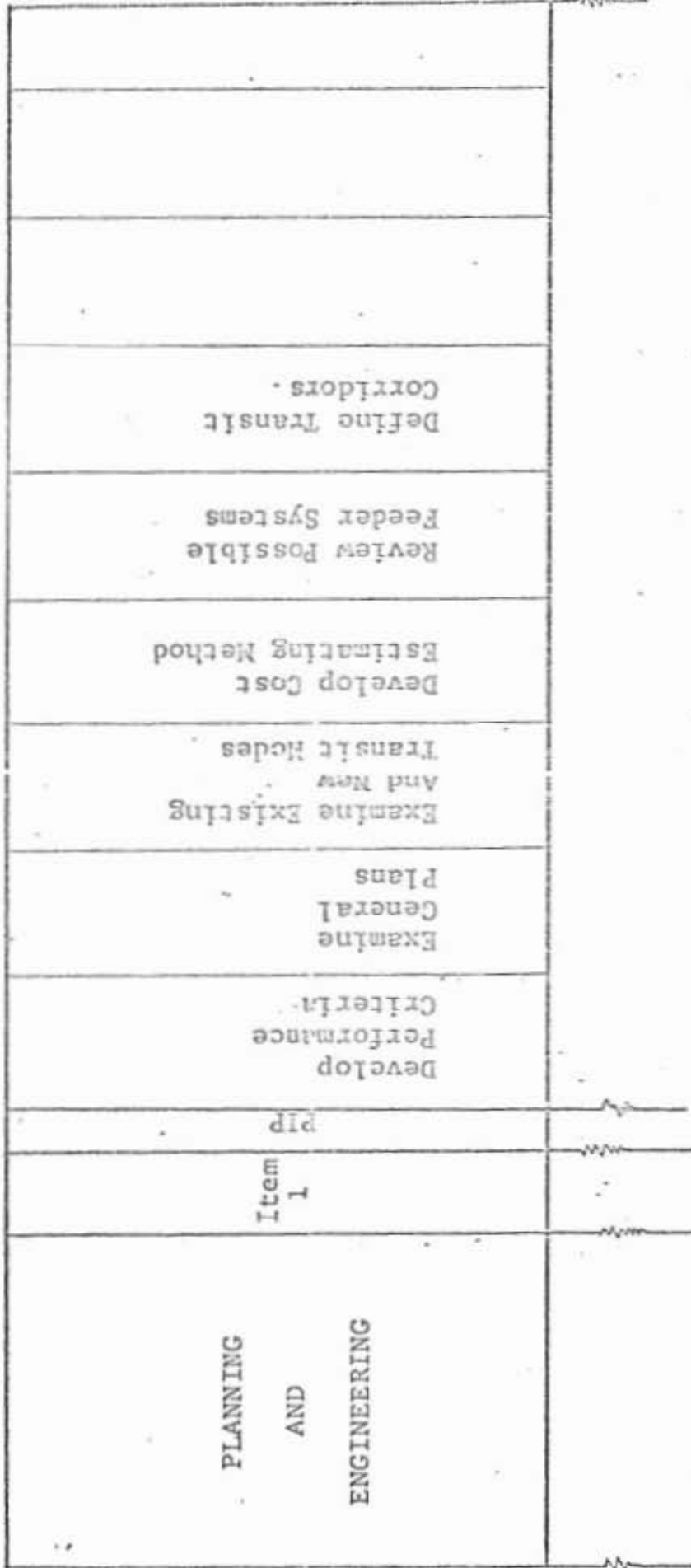


Figure 2

PROJECT IMPLEMENTATION
PLAN STRUCTURE

PMM

May 1972

end-products of each PIP work element and the associated integration, evaluation, interface, and data management plans. Five components of the System Management Plan are discussed below.

Operational and Functional Requirements Specification Plan. This is prepared for each end-product in the study as well as their structural and operational relationship. Here, the responsibilities of individual consultants are detailed. Individual performance requirements specifications will comprise part of this package when developed.

Project Integration Plan. This plan describes the development of a rationale for integration of various activities. Each specific consultant function will be described as part of this package.

Technical Evaluation Plan. This plan is used for assessing the quality of technical work at key output points and relating schedule and cost plans with technical plans. The Technical Evaluation Plan will be an assembly of points or milestones when intermediate products and other results are available for technical quality review. Typical technical evaluation milestones will be keyed to production of performance specifications, designs and plans, data and inventories, acceptance test procedures and requirements, and acceptance test reports. The Technical Evaluation Plan will be the principal technical management instrument of the Project Manager.

Interface Management Plan. This will be used for assuring technical functions and operational interface of all work performed.

Data Management Plan. This defines the categories of data to be assembled during this study and the transfer of data to the Systems Manager and other contractors, including:

- o system generic characteristics

- o socioeconomic and other evaluation data
- o data related to the operating requirements of individual planning efforts

Measuring Schedule Progress and Controlling Costs. Another set of plans will be used to measure schedule progress and control costs. They are described briefly below.

Work Program Network and Time Schedule. This network will be stored on the Systems Manager's computer (in Los Angeles) providing immediate scheduling access and updating convenience and rapid reporting of status to SCRTD. The network will be structured by elements of the WP. Special interface keys will be created for use with the Interface Management Plans. The preliminary work program and time schedule are presented in subsequent sections.

Resource Utilization and Cost Plan. This presents the manloading and cost/time distributions and consolidates them into work packages.

Work Authorization Plan. This plan details a schedule for allocating and controlling costs, contract performance provisions, and authorization of tasks to specific firms.

Management Reporting System. This will be used for reporting resource inputs, costs, and activity progress to the System Manager. This system will be invoked for periodic reporting; reporting will be at the work package level and higher; cost and schedule controls will be tied to the Technical Evaluation Plan.

The relationship of TDP and PIP is important for effective system management (see Figure 3 for TDP and PIP elements).

Once work begins, PMM will monitor and evaluate progress through the following modes:

	TDP Level	PIP Level
Translating SCKTD Goals into Project Outputs	Work Program to WPP "Item" Level System Management Organization	WPP Items down to work package level, principally characterized by intermediate products in the technical evaluation plan example and by major project milestones shown in Work Program Network Extension to describe performing PCM individuals and consultant organizations
Specifying System Management Plans	Operational and Functional Requirements Plan Project Integration Plan Technical Evaluation Plan Interface Management Plan Data Management Plan	Extension to design specification of end products Extension to specific integration steps Extension to plan for technical review and acceptance of intermediate and end products Development of interface specifications among end products (No direct extension; information to be contained in requirements specification and design specification of end product)
Measuring Technical Progress and Controlling Costs	Work Authorization Plan Work Program Network Plan Cost and Resource Plan Management Reporting System	Specific work descriptions (counterpart work authorizing documents will be utilized by SCKTD) Development needed to work package level (See WP above) Development needed to work package level (See WP above) Extended to define particular contents of technical progress, resource, and cost reporting

Figure 3
RELATIONSHIP OF TDP ELEMENTS
TO PIP ELEMENTS
PCM
May 1972

1. When key intermediate products are ready, acceptance tests and evaluations are to be conducted. They will be identified in the Technical Evaluation Plans in each PIP. A formal technical quality review of the material produced will be made on-site by the Project Manager with the assistance of PMM's Engagement Manager. In conducting these reviews and evaluations, the above plans will form the principal references.
2. Between the key output points identified in the Technical Evaluation Plans, the FMM systems management team will work with the performing group on a day-to-day basis or as needed to aid in the development of plans and systems engineering studies. Noteworthy occurrences will be reported in written form using standard periodic report formats.
3. Routine monthly reports on resource and financial expenditures and network event completions will be generated and used as an input to updating the TDP and PIP's. These reports will cover technical progress (technical evaluation), schedule conformance, costs incurred, and resource utilization. The contents of the TDP's and respective PIP's will provide the monitoring reference material.

While all TDP and PIP elements are significant for monitoring and evaluating the SM objectives, once work is authorized, the Systems Manager will rely heavily on the Technical Evaluation Plans, the Interface Management Plan, the Network Work Program and Time Schedule, and the Resource Utilization and Cost Plans. Any programmatic or technical redirection will result from this monitoring and evaluation process and will be approved by SCRTD.

II. PROJECT WORK FLOW

In carrying out the systems manager responsibilities, PPM will complete the steps and prepare the plan documents described in Section I. This section of the proposal portrays how the work tasks to be performed by the systems manager will interrelate with one another. As indicated in Section I, the activities of the SM will vary widely, depending on the status of the project with respect to the work program and schedule. Figure 4 presents the three types of activities in which the SM will be engaged, in the form of an overall work flow diagram, related to time. As indicated, some SM functions need to be started prior to the start of work on the technical studies.

Greater detail of the project work flow, related to the early SM functions, i.e., to develop systems control plans, is shown in Figure 5. This illustration relates the sequence of development of the individual control elements.

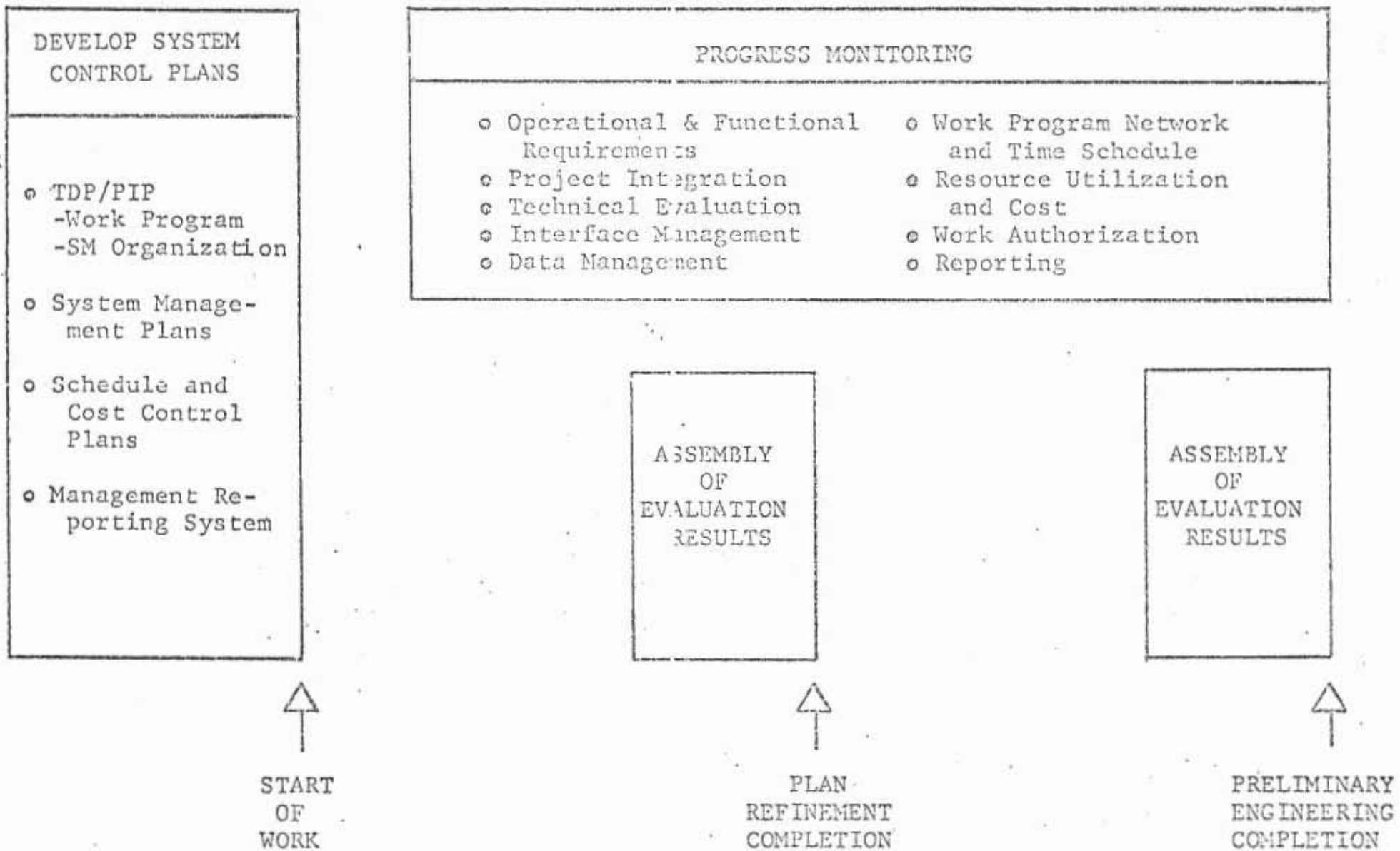


Figure 4

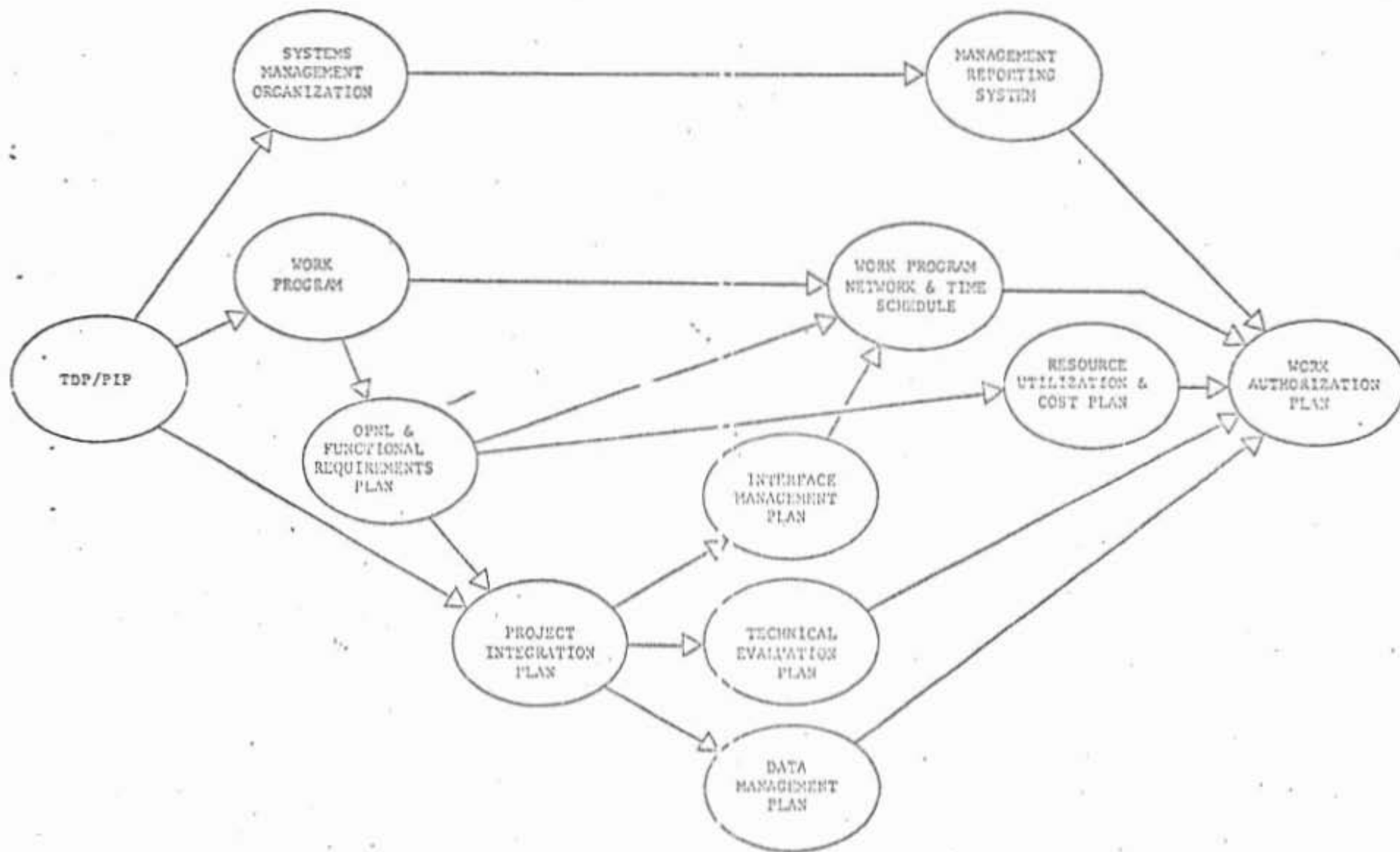


Figure 5.

WORK FLOW CHART-PLAN DEVELOPMENT

PMM

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III. COMMENTS ON THE WORK STATEMENT

The following comments on the preliminary summary work statement are offered from the standpoint of attempting both to develop a means of ensuring project control and to improve the technical quality and comprehensiveness of the study. The suggestions made here are documented more specifically in the Work Program discussion, Section IV.

We are presuming that the technical study will use all available analytical tools that have been developed and implemented for the Los Angeles Region. This includes the patronage model and the evaluation procedure developed for SCAG, as well as the transit planning package recently implemented by the California Division of Highways.

Community Involvement

Although SCRTD, through its public relations department, will and should take the lead in organizing the study for the desired degree of community involvement, we believe that such activities should be defined more precisely in the Work Statement. This will permit all consultants to plan and schedule (as well as cost) their work better. The structure of the community involvement activities, e.g., what groups will be involved, what they will be asked to do, as well as the scheduling of the activities and the consultant responsibilities would be desirable items to add.

Previous Transit Studies

A review of previous transit studies in the SCRTD region should be conducted as part of the start-up activities. Here, we refer principally to the rapid transit work that was completed in 1968, but also to all other transportation work in the region as well. SCRTD, SCAG, and LARTS studies should be included.

Corridor Definition

In order to permit the patronage and revenue consultant to prepare his data and forecasting procedure as early as possible, we suggest that the corridors that are to be studied in the Plan Refinement portion of the study be defined at least in terms of their approximate location at the earliest possible point. This will allow the consultant to begin coding networks that will be used later in the Plan Refinement portion of the study.

Technology Survey

Two activities are described in Stage I that entail study of systems technology. These are the tasks, "Examine Alternative Forms of Transit Service," and "Review Existing and New Technology."

We suggest that these two activities be compressed into a single task that is begun at the earliest stage in the project, and that such a task be oriented to selecting the technologies that will be pursued throughout the remainder of the project.

Feeder Service

Since the ultimate success of a regional transit system will depend on the ease with which passengers can travel from door-to-door, we believe that a specific activity be defined to study potential feeder service. If effective means can be found for getting travelers to the station to begin their trip and to carry them to their final destination at the end, system patronage should increase.

The assumed feeder modes and their cost, travel time, and frequency of service performance should be defined at an early point in the study.

Traveler and Community Benefits

The preliminary summary work statement has identified a number of evaluation activities to be accomplished by the planning and engineering consultant and the environmental consultant. These activities include assessing benefits to transit system riders, automobile travelers, users of the existing bus system, various members and groups in the community; and assessing effects on the environment.

The responsibilities for conducting these evaluations is not defined in the document, but the wording and task structure implies such an assignment. In any event, we suggest a division of responsibility for these analyses as follows: The planning and engineering consultant should be responsible for analyzing all direct traveler effects. (We use the term traveler to include riders of the new transit system, persons who would be expected to continue to use their private automobile or the existing bus system, and truckers.) The environmental consultant should be responsible for analyzing all indirect effects. These include the effects that fall into the social, community, and environmental categories.

This recommendation stems largely from the types of staff normally employed by the firms in the two categories. The engineering firms are usually not strong in sociology, environmental, and other relatively soft sciences; and firms who do have such skills do not normally work in transportation with detailed travel data.

Summary of Evaluations

Since all four study project consultants will be developing data that will be used at the end of Stage I, Plan Refinement, and Stage II, Preliminary Engineering, we suggest that additional tasks be added to assemble the evaluation data into a meaningful framework for decision-making.

This summary of evaluations probably should best be accomplished by the project control consultant, since he will be evaluating

the work products of the other four consultants at the time that the evaluations are being completed.

Methodology

Because of the tight time schedule that has been established for this study, it will be imperative to assure that all information interfaces between consultants are clearly understood. One way of reducing the possibilities of misunderstanding is for each contractor to work out critical elements of methodology early in the study so that he and others can clearly define what the input and output data will be for each task and how such data will relate to the activities in other tasks.

We suggest establishing a number of tasks whose sole purpose would be to develop and refine the methodology that will be used. The products of these tasks would be specific identification of input and output data that will result from the later task analyses. The methodology tasks that are recommended are the following:

- o Patronage methodology
- o Capital cost methodology
- o Operating cost methodology
- o Traveler benefit methodology
- o Community and environmental methodology

Interaction of Corridors

As presently worded, the study is designed to pursue various aspects of attractiveness of transit systems on a corridor-by-corridor basis. Only at the very end of the study, as we read the work statement, are the corridors assembled into a system.

Such an approach is attractive from the standpoint of simplifying the analysis burden, but may not result in the most desirable set of corridors at the end of the study.

The reason for this possibility is that individual corridor ridership may be different from system ridership. In other words, if ridership estimates are developed only for individual corridors, they may not reflect the possibility that substantial amounts of potential inter-corridor ridership exists.

The magnitude of this potential is unknown at the present time. However, it may be substantial if major traffic attractors exist along corridors at points other than downtown. The existence of major hubs of activity in the Wilshire district and in the aerospace complex in the vicinity of Los Angeles International Airport may create substantial ridership opportunities for persons wishing to travel to these locations and who live along other corridors.

We recommend that the results of the five-corridor studies conducted in 1967-68 be reviewed--especially the Coverdale and Colpitts patronage report--to assess whether potential inter-corridor travel is of sufficient magnitude to consider restructuring the study so as to include consideration of system-wide travel.

Report Preparation

Preparation of reports on the technical work accomplished by the four consultants will consume a substantial amount of time and manpower. We suggest establishing explicit tasks for these activities, to facilitate planning, budgeting, and control.

Scheduling of Activities

Based on the eight-month time period for the total project, we suggest that Stage I, Plan Refinement, be completed 3-1/2

months from the start of work. A project schedule, showing the starting and completion dates for each of the study phases, is presented in Figure 6.

To enable final details of the work scope and consultant interfaces to be established in a consistent manner, we recommend that the project control consultant begin work one month prior to project start for the technical consultants..

A more detailed schedule in the form of a modified PERT diagram is presented in Section IV.

SCHEDULE -- MONTH FROM PROJECT START

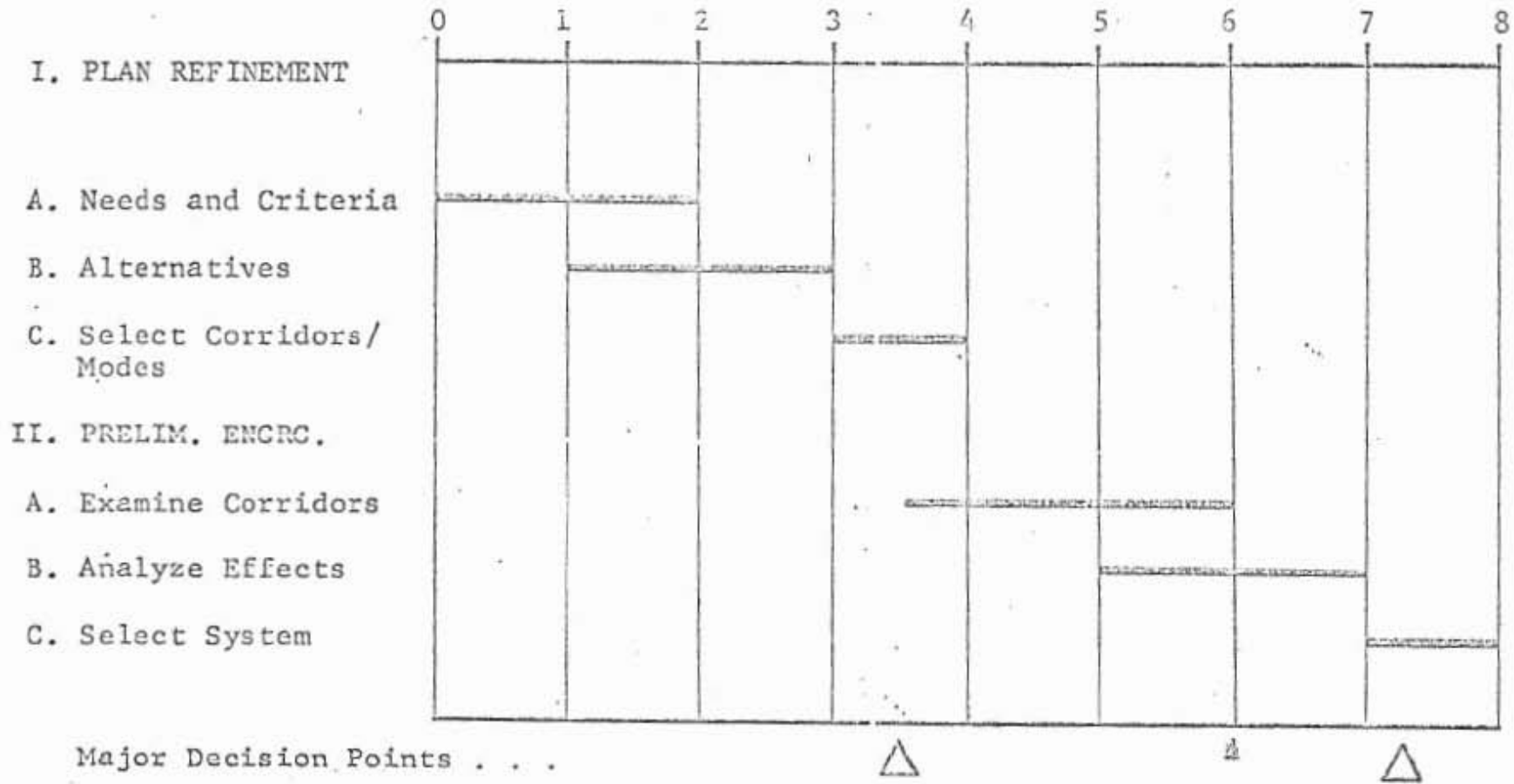


Figure 6
PROJECT SCHEDULE
PMM May 1972

SC-110-10000

IV. WORK PROGRAM

SUGGESTED REVISED
SUMMARY WORK STATEMENT

and

WORK PROGRAM
(Figure 7)

MODIFIED PERT DIAGRAM
(Figure 8)

SUMMARY WORK STATEMENT

TECHNICAL STUDY OF
ALTERNATIVE TRANSIT CORRIDORS AND SYSTEMS
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

The objective of this study is to create an action program intended to develop a rapid or improved public transit system to serve the travel needs of the Los Angeles Metropolitan Area.

Various urban development corridors shall be studied with regard to transit types and system procedures, and a determination shall be made as to the nature and magnitude of the demand for transit service in these corridors. The use of existing railroad facilities for commuter service and the development of an expanded bus system shall also be studied.

The study will review all major corridors in the area, including those identified as having top priority in the Southern California Rapid Transit District 1968 Rapid Transit Plan, to assess the demand for transit services within them, so as to allow the determination of their relative priorities.

On the basis of this review the most appropriate corridors for inclusion in an action program will be selected for development of the specific detail necessary for a construction grant application.

A summary statement of the project approach is presented next, followed by a Work Program that describes specific tasks.

I. PLAN REFINEMENT

A. Analyze Transit System Needs and Possible Solutions and Develop System Performance Criteria

In Phase I-A of the study, the travel demands will be analyzed; performance criteria will be developed; pertinent types of data, such as existing and projected land use, will be gathered; the alternative forms of transit service will be evaluated; the environmental impact of the various transit alternatives will be considered; and the various financing plan possibilities will be examined.

B. Define Alternative Routes and Systems

Phase I-B of the study is to develop preliminary route alignments within the corridors and to select operating systems suited to the region. It also includes the development of very preliminary construction cost estimates and tentative schedules of capital requirements for construction in the corridors. The feasibility of commuter service on railroad lines, and the concept of a sophisticated grid-type or other bus service system as complimentary to or as an alternative to rapid transit development will also be analyzed.

C. Select Most Promising Corridors and Modes of Transit Service

Upon completion of Phases I-A and I-B, a preliminary selection will be made in Phase I-C of corridors and modes to be carried into preliminary engineering.

II. PRELIMINARY ENGINEERING

A. Examine All Aspects of Each Corridor

In Phase II-A of the study, each selected corridor or segment will receive a more detailed engineering study; an examination of estimated capital and operational costs; a determination of probable impact on the existing bus system; preparation of tentative operational plans; and examination of probable ridership; and examination of socioeconomic benefits; an examination of environmental impact; and an examination of relevant financing plans.

B. Analyze Socioeconomic Effects of Rapid Transit Lines

In Phase II-B, the socioeconomic impacts that will result from establishing the rapid transit alternatives will be investigated. Existing studies will be reviewed for pertinent data and rider and community effects will be presented.

Existing reports and data developed by the District and other agencies such as the City Planning Department, Community Analysis Bureau, and other agencies at all levels of government will be collected. Pertinent data from these sources, together with projections of population and land use will be assembled as a basis for the study of socioeconomic impacts that would occur from the transit improvements.

C. Selection of System and Preparation of Grant Application

Phase II-C will complete the study by the selection of the most promising alternatives and the preparation of a grant application to UMTA for capital funds.

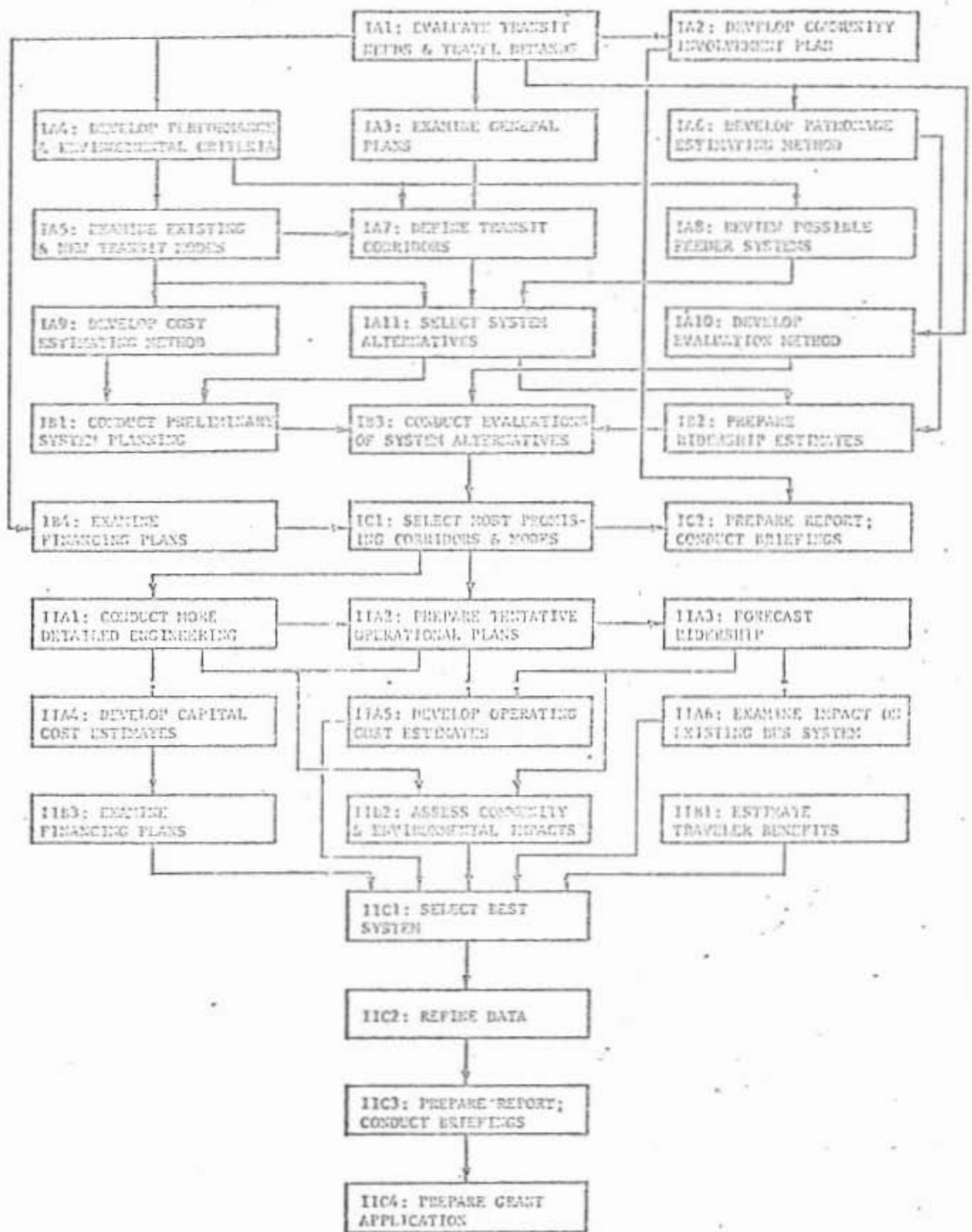


Figure 7

WORK PROGRAM

PMM May 1972

Individual Tasks in the Work Program

IA1:
EVALUATE
TRANSIT
NEEDS AND
TRAVEL
DEMANDS

Available demographic, land use, socioeconomic, and transportation data will be reviewed to assist in conceptualizing the nature of the present and potential travel demand in the areas served by the several transit corridors. This information will be used to select transit development concepts to be studied and the corridor alternatives that will be considered. General criteria will be developed for a regional transit system so that decisions regarding route and station locations, hardware configuration, and operating policies may be made.

Initially, existing and projected land use and transportation data will be collated. Agencies such as SCAG, LARTS, SCRIS, Bureau of Census and various City and County departments will be the source of appropriate information. Also, previous transit studies, both in the region and elsewhere, will be reviewed.

IA2:
DEVELOP
COMMUNITY
INVOLVEMENT
PLAN

SCRTD and its consultants will develop a plan for community involvement during appropriate phases of the work program. This will include elected officials and professional planners associated with concerned organizations, as well as the general public. The experience and analysis of the 1968 transit system proposition results will provide a basis on which to concentrate communications efforts.

IA3:
EXAMINE
GENERAL
PLANS

Analysis of the general plans of the various jurisdictions will be performed with emphasis on projected land use, circulation, and service systems. These data will be checked for consistency and will then be analyzed to evaluate travel patterns in the corridors.

IA4:
DEVELOP
PERFOR-
MANCE AND
ENVIRON-
MENTAL
CRITERIA

Performance criteria for a regional transit system will be developed. The diversity of needs must be recognized so that general criteria may be developed that will be adequate for the general area and not just the needs of a single corridor or system. Consideration will be given to frequency of service, safety (both rider safety and public safety), speed, comfort, convenience, pricing, secondary feeder systems, coordination and integration of existing and future systems, and other necessary characteristics. Consideration will be given to each system's ability to attract riders who have other means of transportation available to them as well as those who do not. In developing these criteria, full consideration will be given to the effect that the transit system will have on the environment as well as social and community effects. These criteria will be used in later phases of the study to select a system hardware configuration and to set operating policies that will best serve the region.

IA5:
EXAMINE
EXISTING
AND NEW
TRANSIT
MODES

Based primarily upon transportation needs and available or soon-to-be available technology, the most promising alternatives for transit service will be evaluated. This task will review the features of existing modern operating transit systems and new technology rapid transit and feeder systems to determine those systems which may be suited for use by the District. Among the alternatives will be various modes of modern rapid transit, an expanded bus system, a commuter rail service, or a combination of the above. With respect to railroad commuter service, existing lines will be evaluated in terms of operational feasibility, investment required to assure provision of service at a proper standard of reliability and safety, and practicable methods of providing for operation of the trains. These systems, including the concept of a sophisticated grid-type or bus system as an alternative, will be evaluated in terms of the performance criteria, and a number of promising candidates will be identified.

IA6:
DEVELOP
PATRONAGE
ESTIMATING
METHOD

A method will be developed for estimating patronage of the modes to be studied. The method will be structured to provide zone-to-zone and station-to-station volumes, as well as total passenger flow through individual systems. It will provide patronage estimates for variations in travel time, frequency of service, fares of the transit system, and for similar characteristics of the feeder system. Characteristics of the competing highway system will be defined, and highway networks will be prepared, from previous LARTS work, to facilitate analysis of transit systems. The method will be developed to prepare revenue estimates, related to fare assumptions and patronage results. Maximum use of existing models will be used, particularly the modal split model recently developed by SCAG and the planning package used by the California Division of Highways.

IA7:
DEFINE
TRANSIT
CORRIDORS

Based on data analyzed in earlier tasks, a number of transit corridors for initial application will be selected for study. Information on potential demand will be used to define segments of transit development for each corridor. Potential and future land use and population, as well as potential transit modes will provide the technical input, and performance and environmental criteria will be used to make the selection.

IA8:
REVIEW
POSSIBLE
FEEDER
SYSTEMS

Potential transportation systems that might be used to provide collection and distribution feeder service will be identified and analyzed. In addition to the use of conventional bus and automobile, systems such as dial-a-bus, public automobile service, and CBD modes will be studied. Based on the analysis, and on the performance criteria developed earlier, a limited number of feeder concepts will be selected for subsequent study.

IA9:
DEVELOP
COST
ESTIMATING
METHODS

Methods and data for estimating capital and operating costs will be developed for use in financial analyses and system selection. Methods for estimating individual cost elements and for deriving a total system cost cash flow picture will be prepared. Capital cost elements will include right-of-way acquisition, guideway construction, maintenance and storage facilities, stations, vehicles, and the control system. Operating cost elements will include labor, power/fuel, and maintenance expenses. Costs will be developed for individual corridors and corridor segments.

IA10:
DEVELOP
EVALUATION
METHODS

Based on system performance and environmental criteria, and on the specific characteristics of the system alternatives, an overall evaluation framework will be developed. This framework will permit financial analyses, ridership estimates, cost and revenue estimates (for the transit system, the feeder systems, and the existing bus system), traveler benefits, community impacts, and environmental impacts to be assembled to provide a consistent and comprehensive basis for decision making. In this task, analysis methods for the individual evaluation elements of traveler benefits, community impacts, and environmental impacts will also be developed.

IA11:
SELECT
SYSTEM
ALTERNATIVES

This task will provide the basis for the plan refinement work to be conducted in Phase IIB. Possible transit modes, corridors and corridor segments, and feeder systems will be assembled into total transit system alternatives. The selection will be based primarily on the criteria developed in Task IA4. Speeds, fares, and other data necessary for patronage estimating will be defined.

IB1:
CONDUCT
PRELIMINARY
SYSTEM
PLANNING

The preliminary system planning task will include the study of route alignments and station locations for each corridor and the preparation of preliminary cost estimates, utilizing information from previous District studies together with studies by various City and County agencies.

IB2:
PREPARE
RIDERSHIP
ESTIMATES

Individual estimates of transit system ridership will be prepared for each corridor, using the patronage model developed earlier. Zone-to-zone and station-to-station volume estimates will be developed, along with station flows and feeder system ridership. Revenue estimates will also be developed for each alternative.

IB3:
CONDUCT
EVALUATIONS
OF SYSTEM
ALTERNATIVES

This task will provide the analytical results that will be used to carry out the plan refinement decisions. Data will be assembled from other tasks and integrated with data developed within this task on traveler benefits, community impacts, and environmental impacts.

IB4:
EXAMINE
FINANCING
PLANS

A preliminary examination of all relevant financing plans will be conducted. All sources will be explored including federal grants, and state support; property taxes, including benefit assessment districts and tax allocation bonds, and motor vehicle taxes, including vehicle registration fees and gas sales taxes. Multi-burden taxation programs will be explored.

IC1:
SELECT MOST
PROMISING
CORRIDORS
AND MODES

Upon completion of Tasks IB3 and IB4, the most promising corridors or segments of the overall initial rapid transit system will be selected for further consideration.

IC2:
PREPARE
REPORT;
CONDUCT
BRIEFINGS

At this point in the study, a progress report will be made available to appropriate agencies, detailing the criteria, the system candidates that were considered and subsequently selected, and the evaluation results that were used to make the selection. Briefings and meetings will be held as designated in the Community Involvement Plan.

IIA1:
CONDUCT
MORE
DETAILED
ENGINEERING

A more detailed engineering study will be conducted for each of the selected corridors in sufficient depth to determine engineering feasibility, planning and environmental acceptability of route alignment, the potential for sharing freeway or other rights-of-way, system configuration, station location, and cost of construction.

IIA2:
PREPARE
TENTATIVE
OPERATION-
AL PLANS

Information from both previous and ongoing studies by the District, the Southern California Association of Governments, the Los Angeles Regional Transportation Study, the City of Los Angeles, the County of Los Angeles, the Bureau of the Census, and other agencies will be collated as a basis for preparing tentative operational plans, including those for secondary feeder services, and revisions in existing bus service for each corridor.

IIA3:
FORECAST
RIDERSHIP

The operational plans, with route alignments and station locations developed in an earlier task of the study, and the information gathered from other studies will be utilized to forecast ridership at various fare levels for the corridors and systems under consideration. These forecasts will estimate the number of daily riders diverted from the bus system and attracted from automobiles. The effect of variation in the performance on patronage and cost of modes of access to transit system will be investigated. Station-by-station patronage volumes will be estimated and daily and peak period line load tables will be prepared. Revenue estimates will also be developed.

IIA4:
DEVELOP
CAPITAL
COST ESTI-
MATES

Cost estimates will be developed for each corridor utilizing engineering estimates of the quantities of each item of construction required, together with current unit cost estimates. This will lead to the development that would be needed to construct the initial system.

IIA5:
DEVELOP
OPERATING
COST ESTI-
MATES

Unit operating costs will be developed and examined for reasonableness against similar data from existing systems, where possible. Operating expenses will be estimated for each corridor. Items to be examined will include equipment requirements such as fleet size, vehicle miles and vehicle hours. Forecasts of personnel requirements including operators, station personnel, and supervisors needed will be prepared along with estimates of pay hours. Energy requirements will be reviewed and resource capabilities will be assessed. Maintenance and other costs will also be estimated. The financial results of operation that would be associated with each corridor system will be assessed. Forecasts of expenses for the transit service along each corridor, including secondary feeder systems, will be developed.

IIA6:
EXAMINE
IMPACT ON
EXISTING
BUS SYSTEM

The impact of the proposed transit service on the existing bus system will be examined in terms of increases or decreases in revenues and expenses that would occur.

IIB1:
ESTIMATE
TRAVELER
BENEFITS

Traveler characteristics for each corridor will be investigated. The impact on travel time, and auto cost, including operating, parking, and ownership costs will be considered. The economic effect on auto and truck operations resulting from any change of traffic conditions will be estimated. The impact of altered access to downtown, airports, and employment centers will be described.

IIB2:
ASSESS
COMMUNITY
ENVIRON-
MENTAL
IMPACTS

The impact on the community at large will be investigated for the alternatives. The effect of the line on mobility, including such items as employment and housing access, and the ability to reach health and welfare services, educational facilities, and cultural activities will be determined. The effect on real estate values

and business conditions as well as the effect on life styles that would result from transit construction and operation will be discussed for each corridor. Direct input from community groups in the selected corridors will be solicited by the District. An investigation will be made regarding the broader environmental trade-offs and impacts of the proposed system. Such direct effect as air pollution, noise pollution, and visual impacts will be examined in detail for each transit corridor.

IIB3:
EXAMINE
FINANCING
PLANS

This Task of the study will consider all relevant financing plans. Those that are feasible within the time constraints of an action program will be investigated. All potential financing plans will be screened. They will then be ranked by feasibility of timely implementation as well as by their ability to meet capital requirements as developed from the capital cost estimates. Those plans that could be effected in the near future and would result in significant dollar amounts will be given priority for in-depth investigation. Those plans that require legislative or other action but which show promise of success will also be considered. The plan or plans that have the greatest potential for meeting the needs, both as to dollar amounts and time phasing, of each corridor will be selected.

IIC1:
SELECT
SYSTEM

The conclusion to this study will be the selection of the corridor segments and modes of transit service.

IIC2:
REFINE
DATA

All data pertaining to the selected transit system will be refined and consolidated for inclusion in a final report.

IIC3:
PREPARE
REPORT;
CONDUCT
BRIEFINGS

At the conclusion of this task of the study, a progress report will be made available to all participating agencies, community briefings and meetings will be held to disseminate the results of the study.

1000

[Redacted text]

[Redacted text]

MONTHS FROM PROJECT START

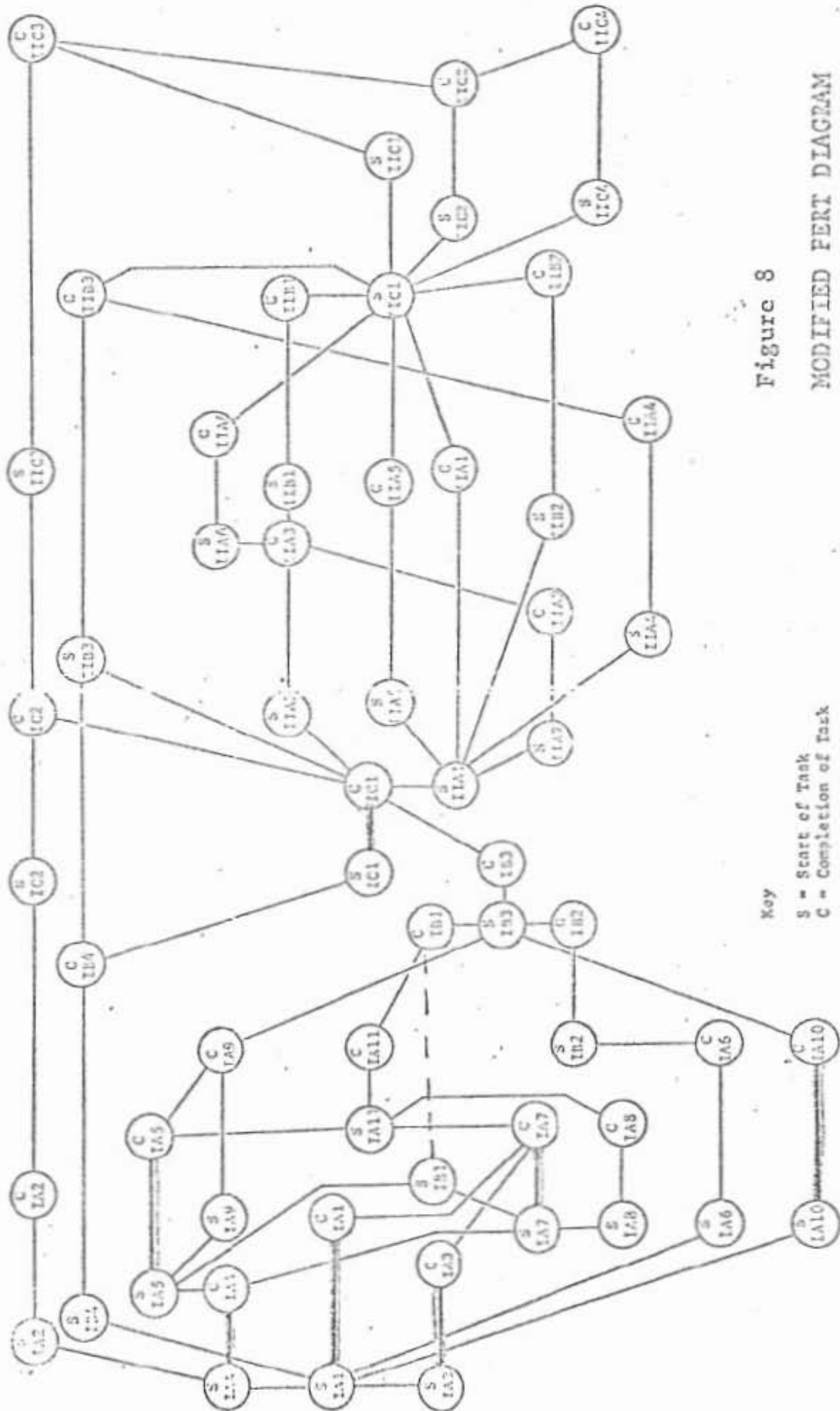


Figure 8

MODIFIED PERT DIAGRAM

FMM MAY 1972

V. ORGANIZATION

Because of the fact that SCRTD intends to retain the contractual authority for the work to be undertaken by the four study project consultants, we propose an alternative organizational arrangement to that presented in the Request for Proposal. The suggested organization will place PMM in a staff, rather than a line, position in relation to the SCRTD program manager. In this position, PMM will undertake the roles as specified by the Request for Proposal:

- Work scheduling
- Project coordination
- Budget control
- Progress reporting
- Work product evaluation

However, the final responsibilities for decisions on the conduct of the work, the funding, and system selections will remain with SCRTD, as advised by PMM.

To accomplish an appropriate client/project control consultant/technical consultant relationship, a matrix-type organization is proposed as shown on the attached organization chart (Figure 9). The staff role of PMM will be directly related to SCRTD, but will also cut across the line responsibilities of the four study project consultants. Normal day-to-day information flow will be through the PMM system manager staff structure, but ultimate authority and responsibility will channel through the line organization.

The internal PMM organization that is proposed is shown in Figure 10. As indicated, the PMM staff will be divided into two specialty areas. Systems management support staff will carry the responsibility for work scheduling project coordination, budget control, and progress reporting. The technical management and evaluation support staff will be responsible for work product evaluation.

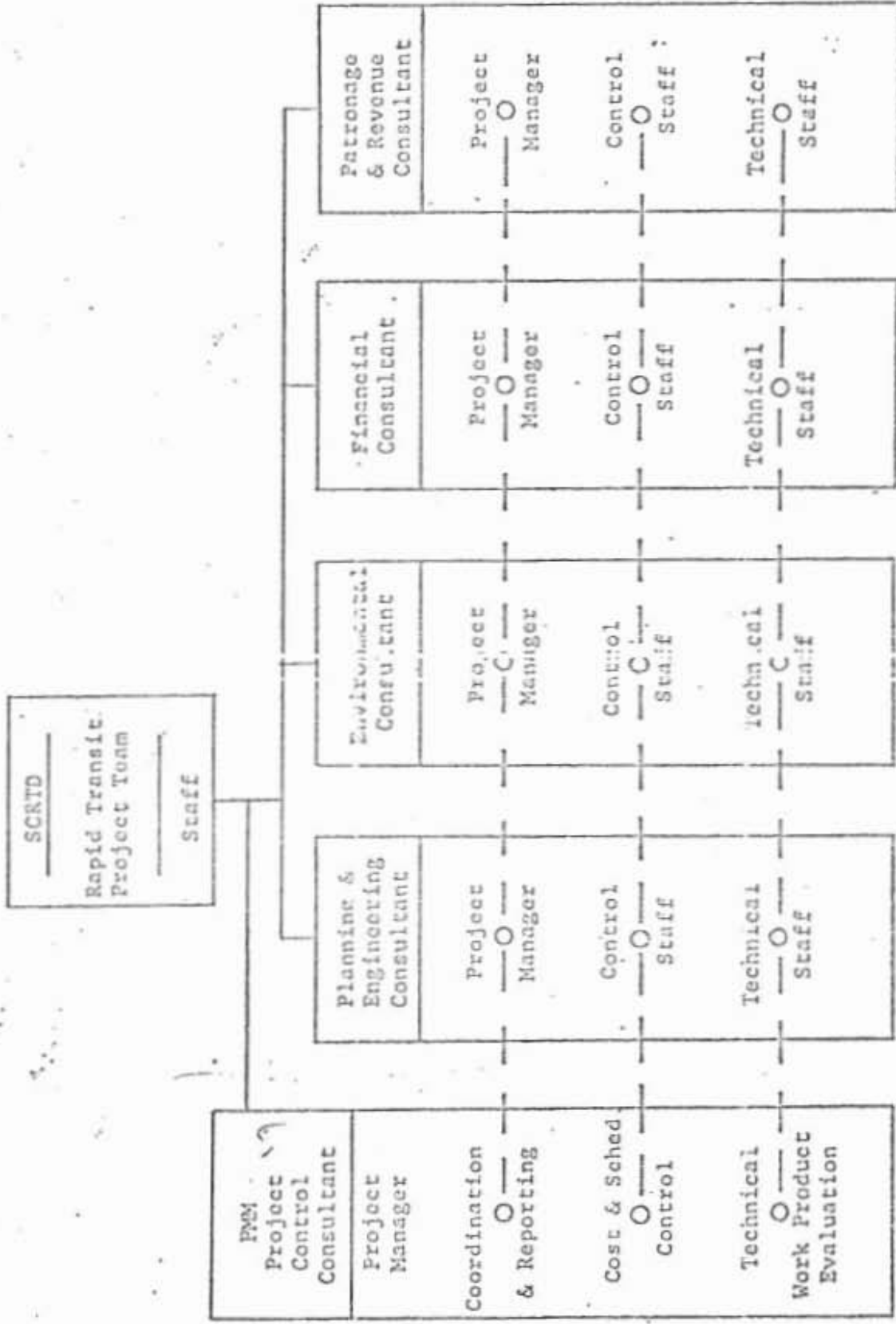


Figure 9

OVERALL PROJECT ORGANIZATION

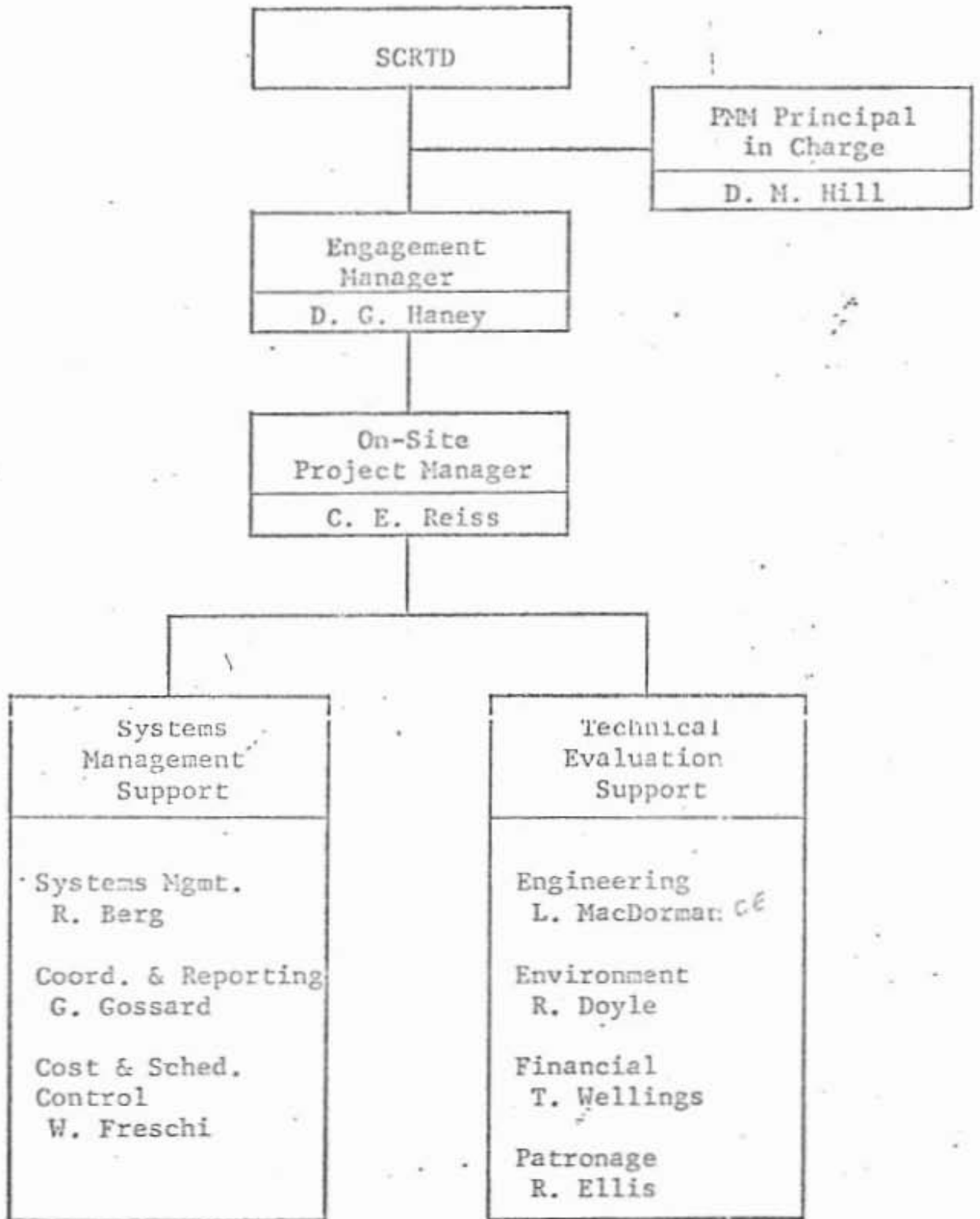


Figure 10

INTERNAL PPM PROJECT ORGANIZATION

VI. STAFFING

PMM has designated Charles E. Reiss as the full-time project manager for this project. Mr. Reiss will be based in our Los Angeles office and will be on immediate call to SCRTD staff. However, if for some unforeseen reason beyond PMM's control, Mr. Reiss is unavailable, PMM will nominate Robert F. Steinkraus as project manager.

The overall engagement manager for the project will be Dan G. Haney. Mr. Haney will spend approximately 30% of his time on the project, and will carry the technical responsibility for work product evaluation as well as the overall responsibility for the project.

The PMM principal-in-charge will be Donald M. Hill. Mr. Hill will attend all meetings at major review points in the project.

Biographies of these and other staff are included in the following pages.

RICHARD D. BERG

Mr. Berg is a Manager in the Los Angeles office of Peat, Marwick, Mitchell & Co. and has been involved in the development and implementation of major development planning and control systems in both the private and public sector.

Mr. Berg's recent experience includes management of a project to develop and implement a schedule planning system consistent with HUD requirements for the Inglewood Redevelopment Agency. This required identification of all project elements and the development of a control network integrating the efforts of all project participants. His other assignments include:

- Development of a scheduling, planning, and control system for a \$200 million real estate development. This involved close coordination with city, state, and county agencies as well as professional disciplines of architecture and engineering.
- Presentation of FMR and Facility-Management Seminars for personnel managing, NASA's worldwide facilities.
- Conduct of a major optimum land use study for a major international landholder.
- Study of minority hiring practices to assist in the development of an industrial park located in a minority area.
- Feasibility analysis of several minority business projects in Los Angeles. These included determination of business capabilities of minority entrepreneurs, counseling and guidance in business principles and concepts, market feasibility studies, and financial projections.

- Management review of a major industrial firm with over \$600 million in annual sales. This review included an organization study and detailed evaluation of the estimating, budgeting, scheduling, and cost control systems.
- Developed a district oriented Planning, Programming, Budgeting System (PPBS) now adopted for statewide implementation by the State of California.

Mr. Berg was formerly associated with North American Aviation where he directed management surveys of the cost, schedule, and technical performance for a \$1.5 billion space program. He has developed and presented numerous seminars on advanced management concepts in both the private and public sector.

Mr. Berg received a bachelor of science degree in business economics from North Dakota State University and a master of business administration degree from the University of Southern California.

ROBERT H. DOYLE

A PFM Manager, Mr. Doyle has a broad background in regional and environmental planning, with experience in the administration of planning programs at both local and federal levels of government.

Prior to joining FPM&Co., Mr. Doyle was President of INTER-PAM Corporation, an association of land use planners, architects, engineers, and other consultants in related fields. During 1967 and 1968, Mr. Doyle was with the U.S. Department of Housing and Urban Development, Washington, D.C. As Director of the Division of Planning Assistance he administered the Section 701 Program, which involved supervision of the award of \$45 million in planning grants throughout the United States. As Acting Director of the Office of Planning Standards he was responsible for the development and evaluation of planning standards, requirements, and procedures associated with water, sewer, open space, urban beautification, advance land acquisition, and mass transit programs.

Mr. Doyle was the first Director of the East Central Florida Regional Planning Council, which serves the seven counties most directly affected by the presence of Cape Kennedy. He conceived, programmed, and managed a \$1 million effort that provided the basis for long-range airport, highway, waterway, commercial, industrial, open space, recreational, and agricultural plans for the Region. Mr. Doyle also assisted professional planning departments, and he organized the Orange-Seminole-Osceola Joint Planning Commission, which now serves as the official transportation/land use agency for the Orlando Metropolitan Area.

Since joining FPM&Co., Mr. Doyle has been or is currently responsible for an airport system study for the Nashville Metropolitan Region; an airport system study for Volusia County, Florida; and a downtown plan for the City of Tallahassee (Florida). He was instrumental in the development of the "multi-plan" approach to airport system planning, whereby master plans for two or more interrelated airports are prepared simultaneously, thus permitting common financial, management, environmental, and operational matters to be resolved on a system-wide as well as an individual basis.

Mr. Doyle's other experience includes a three-year tenure as Joint Planning Director for the City of Brunswick and Glynn County, Georgia (1959-1962); member of the engineering faculty at Georgia Institute of Technology and Clemson University; land planner for Robert and Company, Atlanta, Georgia; and consultant planner with Hill and Adley Associates of Atlanta.

Mr. Doyle holds the B.S. degree in civil engineering from the University of Kentucky, the B.S. degree in architecture (with honors) from Clemson University, and a Master of City Planning degree from Georgia Institute of Technology. He is the author of several articles, including "Soil Surveys and the Regional Land Use Plan," Soil Science Society of America, 1966.

Mr. Doyle is a full member of the American Institute of Planners (AIP) and the American Association of Planning Officials (AAPO). He is a member of the AIP National Board of Examiners and recently was named to a special committee formed to work with the American Law Institute in development of a model land development code. Mr. Doyle has for many years been a member of the Georgia Institute of Technology Summer Institute in Urban Planning.

RAYMOND H. ELLIS

Dr. Ellis, a Manager in the PMS Transportation Research Group, participates in research and operational studies on transportation systems planning. Since joining PMS, he has directed projects encompassing many aspects of intraurban and intercity transportation.

Dr. Ellis has directed several studies of urban transportation with focus on problems of public transportation and the parking system, including:

- An airport access project to develop a transferable methodology for analyzing airport access problems in cities throughout the country and to formulate a short-term airport access improvement program for the Baltimore-Washington region
- Demand analysis and concept definition studies for an innovative public transportation system for a "new town"
- Development and implementation of a parking systems analysis framework which estimates parking demand and simulates the operation of the parking system at present and in the future
- Development of a comprehensive system evaluation framework for fringe parking and intermodal passenger transportation

Dr. Ellis has directed the following studies of intercity transportation focusing on problems of passenger travel at the corridor and national levels and on problems of freight transportation:

- Analyses of current patterns of intercity travel and traveler characteristics in the Northeast Corridor
- Development of multimodal recommendations for improving intercity transportation in the Northeast Corridor between 1970 and 1985
- Development and implementation of a demand forecasting framework for national intercity passenger travel, estimating modal demands so that competition among modes is explicitly considered

- Development of the ACCESS Characteristics Estimation System (ACCESS), a computer methodology which simulates the access phenomenon and estimates access characteristics to common carrier intercity terminals
- Development of a systems analysis framework for the inland waterway system

He has also participated in highway safety activities, in transportation planning for the Model Cities program, in the development of a modal choice model, and in the structuring of an evaluation framework for statewide transportation planning.

Dr. Ellis received the Doctor of Philosophy degree in transportation systems engineering from Northwestern University. His graduate program included work in transportation engineering, operations research, information sciences, geography, and economics. His doctoral research explored quantitative strategies for incorporating consideration of community consequences into the urban transportation planning methodology. This research developed a framework that enables the transportation planner to structure his approach for estimating community impact and to measure the contribution of alternative plans to the achievement of higher level social and community goals.

Dr. Ellis holds the M.S. degree in urban transportation planning from Northwestern University and the B.S. degree in civil engineering from Swarthmore College. His graduate work at Northwestern was financed by a National Science Foundation Engineering Traineeship.

Prior to his doctoral research, Dr. Ellis was a lecturer at Northwestern University, during which time he organized and presented a graduate course in transportation engineering. He was also associated with the Tri-State (New York-New Jersey-Connecticut) Transportation Commission, where he created a program to maintain the quality and improve the usefulness of home interview survey data.

Dr. Ellis is a member of the Operations Research Society of America, the Highway Research Board, the American Society of Civil Engineers, the Institute of Traffic Engineers, and the Regional Science Association. He is also a member of the honorary societies of Sigma Xi, Sigma Tau, and Chi Epsilon.

functional areas of the firm. Subsequently, he was administrator of the southwest division of a large actuarial consulting firm and was licensed as an agent to deal in marketable securities and life and disability coverage.

Mr. Freschi's education includes a bachelor of arts degree in economics from Georgetown University and a master's degree in business administration from the University of California at Los Angeles.

WILLIAM J. FRESCHI

Mr. Freschi is a Senior Consultant in the Los Angeles office of Peat, Marwick, Mitchell & Co., specializing in program management and control.

While a member of the management consulting department, Mr. Freschi has participated in and managed a number of significant engagements in both the public and private sectors, including the following:

- Assisted in the design of a Program Planning and Budgeting System (PPBS) for the State Department of Education including the revision of the State Accounting Manual, delivery of a series of two-day seminars to the business managers of the State's school districts, and implementation of the system in several school districts. Work included review of the district's transportation departments.
- Implemented recommended changes and trained the members of one of the State of California's internal audit sections in the principles and use of program management and control and operations audit techniques.
- Performed a detailed study of an urban renewal project for one of the country's largest urban redevelopment agencies and was then asked to perform a comprehensive operations review of the entire agency to recommend revised program management and control methods.
- Analyzed and programmed a large urban unified school district's budget parameters to develop a resource planning model of multiyear operating and financial projects for program management and control.

Prior to joining the firm, Mr. Freschi was involved with both private industry and government agencies. He performed financial and operational audits in the western divisions of a major aerospace contractor analyzing and reporting on all

GARY L. GOSSARD

Mr. Gossard is a Consultant in our Los Angeles management consulting department. During his industrial and consulting experience, Mr. Gossard has specialized in the application of industrial engineering techniques and systems analysis to solve the varied problems of project and operation management. Since joining Fiat, Marjick, Mitchell & Co. he has participated in a broad range of engagements including:

- Design and implementation of project information and control systems for several federally funded public agencies.
- Project development and economic analysis for a community shopping complex.
- Operations review of a major urban renewal agency emphasizing improved program control.
- Cost benefit analysis of city tax assessing and collection practices.
- Development of a least-cost distribution and warehousing network for an international food processor.
- Facilities analysis, space and equipment utilization, and layout design for both office and production areas.

Prior to joining IBM, Mr. Gossard was responsible for the long-range planning of manufacturing control and management information systems at Hughes Aircraft Company. His previous responsibilities at Hughes included the direction of program planning, manpower forecasting, and direct labor performance reporting. Additional industrial experience has included responsible positions in the areas of procurement and transportation.

Mr. Gossard was graduated with honors from the University of Southern California with a bachelor of science degree in industrial engineering. He is a past president of the national industrial engineering honor society, a senior member

of the American Institute of Industrial Engineers, and a director of the American Production and Inventory Control Society. Mr. Gossard is a registered professional engineer in the State of California.

DAN G. HANEY

Mr. Haney, a Traffic Manager, is involved in traffic transportation planning and airport planning activities. His areas of expertise include transportation systems evaluation, demand and modal choice analysis, and financial, operations, and cost analyses of passenger and cargo transportation systems.

As Director of the Transportation Planning and Evaluation Department at Stanford Research Institute, Mr. Haney had technical and administrative responsibility for the activities of a research group concentrating on evaluation studies of complex systems. He was in charge of the demand and economic analysis portion of SRI's study of future transportation systems for the Department of Housing and Urban Development, thereby gaining valuable insights into questions of patronage estimating, economic evaluation, technical forecasting, and national demand estimating for new systems. Among other assignments, he directed the development of a computer program package for multimodal transportation analysis and evaluation, and managed a wide variety of projects on benefit-cost analysis of various types of transportation and transit systems, effects of transportation systems on community values, development of a state-level transportation analysis method, regulation of urban transportation, and air-ports demand forecasting. He has also developed demand, modal split, and evaluation models, together with supporting cost and value parameters.

Mr. Haney was awarded the Bachelor of Industrial Engineering degree and the Bachelor of Business Administration degree from the University of Minnesota, and was a member of the Honors Cooperative Program in Industrial Engineering of Stanford University.

Mr. Haney's military service includes three years as an Electronics Officer in the U.S. Navy.

While at Stanford Research Institute, Mr. Haney authored numerous reports, including:

- "Development of a Systems Analysis Method for Statewide Transportation Planning"

- "Benefit-Cost Analysis of Highway Improvement Projects"
- "Benefit-Cost Analysis of Five Corridor Rapid Transit Systems"
- "Future Urban Transportation Systems" (with various subtitles)
- "Value of Time for Passenger Cars: A Theoretical Analysis and Description of Preliminary Experiments"

He was also coauthor of the following reports (among others):

- "The SRI Network Analysis Program (SNAP) Package"
- "Effects of Transportation Systems on Community Values"
- "Surface Effect Ship Economic Opportunity Study"
- "Economic Feasibility of Passenger Hydrofoil Craft in U.S. Foreign and Domestic Commerce"
- "Review of High-Speed Rail Transportation"
- "A Manual for Conducting Highway Economy Studies"

In addition, Mr. Haney is the author of the following papers:

- "Measurement of Community Values in Transportation Network Evaluation," presented to the ASCE/ASME National Meeting, July 1971
- "Consistency in Transportation Modal Split and Evaluation Models," Highway Research Record 348, 1971
- "Consistency in Transportation Demand and Evaluation Models," presented to the Highway Research Board, January 1972
- "Problems, Misconceptions, and Errors in Benefit-Cost Analysis of Transit Systems," Highway Research Record 314, 1970
- "Waterborne Systems," presented to the SRI Transportation Symposium, 1964
- "Use of Two Concepts of the Value of Time," presented to the Highway Research Board, 1963

Mr. Haney is a registered industrial engineer in the state of California. He is a member of the Highway Research Board Task Force on Application of Economic Analysis to Transportation Problems, the Operations Research Society of America, and the Scientific Research Society of America.

DONALD M. HILL

Mr. Hill is a PMS Principal associated with the firm's transportation research and regional planning group, in which areas he has a wide range of experience. Representative engagements in which Mr. Hill has participated since joining PMS&Co. are summarized below.

- Travel demand studies in the Northeast Corridor for the U.S. Department of Transportation, Office of High Speed Ground Transportation
- Application of mathematical programming techniques for complex transportation scheduling and traffic assignment problems
- Regional planning and transportation impact studies in Eastern Massachusetts, Washington, D.C., and Salt Lake City, Utah
- Transportation and land use studies for the Metropolitan Toronto Planning Board and Region Transportation Study
- Travel and motivation surveys of over 50,000 North American households and travelers
- Goods movement studies
- Analysis of travel behavior for several North American cities, including New York, Boston, Washington, Philadelphia, Toronto, Edmonton, and Victoria
- Tourist study of expenditures, attitudes, and motivation of visitors to the Province of Alberta, Canada
- Recreation and tourist study of the Canadian Maritime Province to prepare a master development plan for the Atlantic Development Board

Mr. Hill's areas of professional competence include traffic studies in the United States, Canadian, and European regions with expanding economies, corridor and regional travel demand studies, metropolitan and urban transportation and land use studies, market and travel surveys, regional impact planning studies, and cross-modal transportation analysis.

Mr. Hill holds the degree of Bachelor of Arts (with Honors) in mathematics and physics and Master of Arts in statistics and operations research from the University of Toronto. His professional associations include the Highway Research Board, the Transportation Research Forum, the Western Council for Travel Research, the Institute of Traffic Engineers, and the American Society of Planning Officials.

During 1965-66 Mr. Hill was a special lecturer in the Civil Engineering Department, University of Toronto Graduate School, for the course "Comprehensive Regional Transportation and Land Use Planning Process."

Among the numerous published articles authored by Mr. Hill in the field of transportation research are:

- "Travel Mode Split in Assignment Programs," Highway Research Board Bulletin 347, 1962
- "Development of a Model for Forecasting Travel Mode Choice in Urban Area," Highway Research Board, Highway Research Record 38, 1963
- "An Evaluation of the Needs of the Pedestrian in Downtown," Highway Research Board Annual Meeting, 1964
- "A Growth Allocation Model for the Boston Region," A.T.P. Journal, 1965
- "Prototype Development of a Statistical Land Use Prediction Model for the Greater Boston Region," Highway Research Board Annual Meeting, 1965
- "A Model for Prediction of Truck Traffic in Large Metropolitan Areas," Transportation Research Forum, 1966
- "Methodology for Developing Activity Distribution Models by Linear Regression Analysis," Highway Research Board Annual Meeting, 1966
- "Studies of Trends of Travel between 1954 and 1964 in a Large Metropolitan Area," Highway Research Board Annual Meeting, 1966
- "Application of a Modal Split Model for Transit Planning in Cities and Large Metropolitan Areas," Modal Choice and Transit Planning Workshop, Cleveland, 1966
- "New Concepts in Facilities Planning," The Transportation Executive and Decisions for Profit Seminar, Denver, Colorado, 1968

LITTLETON C. MACDORMAN

Mr. MacDorman is Principal in Charge of Transportation Planning and Traffic Engineering for Peat, Marwick, Mitchell & Co.'s Washington, D.C. office. In this capacity, he has been responsible for a variety of studies and engagements, some of which are summarized below:

- Analysis and evaluation of bus transit systems in urban areas
- Travel demand surveys, inventories, and comprehensive transportation planning for major urban areas
- Development of an action program and implementation of plans and procedures to improve access to major airport facilities
- Development of simulation networks, determination of passenger and freight impedances, design of travel surveys, assessment of present plans and policies, forecasts of access characteristics of common carrier terminals, and analysis of the location and functions of terminal systems for intercity travel
- Traffic operations improvements which increase the capacity and safety of roadways in urban areas
- Design and calibration of activity allocation models which describe future land use patterns as a function of developmental policies
- Development of advanced techniques to assist in the evaluation of urban parking programs
- Development of operational computer programs for transportation planning
- Economic feasibility study of an industrial airport

Prior to joining P.M., Mr. MacDorman was employed as a highway research engineer with the District of Columbia Department of Highways and Traffic, where he was head of the Analysis Unit for the Washington Metropolitan Area Transportation Study.

His responsibilities included the analysis of travel volumes for location and design, the economic and statistical evaluation of transportation systems, and the development of feedback techniques for travel modes. Mr. MacDorman provided services to the Maryland State Roads Commission and the Virginia Department of Highways.

Earlier, as a designer for Whitman, Reardon and Associates in Baltimore, Maryland, Mr. MacDorman was involved in the design of numerous highway and airfield projects, including such facilities as the Baltimore Harbor Tunnel and Andrews Air Force Base, Maryland. His duties included alignment and grade determination, geometric layout for interchanges and channelized intersections, cost estimates, and pavement design.

Mr. MacDorman was also employed by Buchart Engineering for the design of highway facilities in Pennsylvania, Indiana, and West Virginia. As an associate engineer for Buchart,

Mr. MacDorman was responsible for various location and traffic studies undertaken by the firm. He made analysis for alignment, grade, interchange type, and spacing justification and prepared cost estimates and economy studies for reports to the Pennsylvania Turnpike Commission, the Pennsylvania Department of Highways, and the West Virginia State Road Commission.

Mr. MacDorman received the B.S. degree in civil engineering from the University of Maryland and the M.S. degree in civil engineering from The Catholic University of America.

Mr. MacDorman is a registered professional engineer in nine states and the District of Columbia. He is a member of the American Society of Civil Engineers, the Highway Research Board, and the American Society of Planning Officials, and is a member of several technical committees of the Highway Research Board and the Institute of Traffic Engineers. He is the author of publications on the subjects of system and network capacity, the sensitivity of highway economic factors, pedestrian travel characteristics, and the economics of public transportation.

In the area of quality assurance, he was principal consultant on master quality reliability and test requirements and specifications. Field operations: develop and document field logistics and test procedures.

Mr. Reiss holds B.S. degree from the U.S. Naval Academy and has completed studies for advance degree in engineering management.

Mr. Reiss has extensive consulting experience in all fields of project and systems management, specifically in program technical and support management. Since joining the professional staff of Peet, Marwick, Mitchell & Co., he has participated in logistics and configuration management planning and seminars and in the development of technical planning documents for major Army and Navy research and development programs. Selected efforts include systems engineering and analysis; development of management plans and analysis of requirements for the Army F-16 and H1H projects; Navy remote sensor systems projects, program management development and review of program plans, selection, and evaluation documents; and procedures for Navy remote sensor and the Army's H1H project. He has also worked in training, preparation, and implementation of logistics and configuration seminars for the Naval Materiel Command and Mark 48 projects.

As the project engineer for Booz Allen Applied Research, Mr. Reiss directed major DOD studies in development of project technical and administrative controls and coordination. Selected efforts include: management information systems; development and implementation of computer base technical and video data management storage and retrieval systems for the AAFSP and Mohawk projects; configuration of data management, specifications of requirements, and development of RFP for DOD programs; cost and budget analysis; compilation, analysis, and presentation of program/project life cycle costs, budget allocations, and funding appropriation for the shipyard research and development, modernization, and ASV programs. Program management; development of program plans, implementing instructions and procedures for DOD projects. Systems engineering; analysis and qualifications of systems performance, reliability, maintainability, and supportability factors; system and equipment trade-off, including cost effectiveness analysis as well as other prerequisite requirements for DOD projects.

As regional director of engineering for the Washington Engineering Services Co., he provided support to the MIT/IL on the Apollo project, specifically in the areas of technical data management, development and support of microfilm and recording efforts to release technical (design) data, including change and revision accountability for over 300,000 documents.

Mr. Steinkraus, senior consultant in PMA's Washington, D.C., office, is engaged in project management and systems activities relative to initiating and planning the acquisition of major defense systems. He has recently managed teams of consultants involved in the preparation of documentation generation of management systems required during the program initiation phase of defense systems' life cycle. During this time, Mr. Steinkraus made significant contributions to development of an innovative project management and information system, generation of requests for proposals and associated source selection evaluation plan, production of complete integrated logistics support management systems with supporting PERT network, technical analysis of project summary work breakdown structures and data requirement, and drafting of configuration management plans.

Prior to the foregoing engagements, Mr. Steinkraus provided management assistance to a major military R&D center. Concentration was on preparation of documentation, planning, and schedules required in what was then known as the conceptual and validation phases of that development program. This included efforts involving formulation of requests for proposals, initiation and coordination of the data called in support of the R&D, participation in development of the associated source selection and evaluation plans, providing input to and administering a systems development plan, and drafting specific portions of project system engineering management plan.

Mr. Steinkraus has contributed to the development and presentation of seminars concerning the plans and procedures required by project managers during the initiation phase of major weapon systems acquisition cycle. He has also participated in presentations to the government and industry concerning specifics of the formal source selection and evaluation process used by the government.

Prior to joining PMA, Mr. Steinkraus was a member of the staff of Logistics Systems Management, Inc. where he was a Senior Logistics Analyst and Director of Training Programs. During this time, he provided his assistance to the project manager of the major ship system development and instructed in the Naval Warfare Command ILS Management Course. Mr. Steinkraus also participated in presentations of somewhat the same information to industry. Mr. Steinkraus joined Logistics Systems Management, Inc. following a distinguished career in the U.S. Marine Corps.

He voluntarily retired as a Colonel having attended schools through top level, held command positions at all echelons, served on joint staffs, held several assistant chiefs of staff positions, and served the Commandant on his staff at Headquarters Marine Corps.

A PGM Manager and an LPA Associate, Mr. Wellings has had more than 20 years of experience in all aspects of management, finance, business administration, public accounting, and airport financial planning. With PGM, Mr. Wellings is responsible for airport rates and charges, financial feasibility, cost effectiveness analyses, airport management and organization studies, cost accounting installations, and airline negotiations.

Mr. Wellings participated in a study for the Los Angeles Department of Airports regarding the feasibility of a tracked air cushion vehicle rapid transit system to link Los Angeles International Airport with the San Fernando Valley, was responsible for a feasibility study of proposed suburban transportation/office center complexes in Rockland County, New York for the New York Metropolitan Transportation Authority, and is participating in a master plan study for the Southeast Pennsylvania Transportation Authority (Philadelphia area) to develop recommendations for physical facilities, equipment, and financial planning.

Mr. Wellings also prepared an air trade study, master plan, lease review and policy recommendations, and management analyses for Duluth International Airport and was responsible for the cost effectiveness study of the proposed expansion program for Atlanta Airport.

Other projects for which Mr. Wellings has had or currently has primary project responsibility include financial/management studies for the Greensboro/High Point/Winston-Salem (North Carolina) Regional Airport; Port Columbus (Ohio) International Airport; Douglas Municipal Airport (Charlotte, North Carolina); Fresno Air Terminal (California); Welf Cook Municipal Airport (Indianapolis, Indiana); Wilkes-Barre/Scranton Airport (Pennsylvania); Miquelina International Airport (Venezuela); Dayton Municipal Airport (Ohio), Orlando Jetport (Florida), Palm Beach International Airport (Florida), and Guatemala City Airport (Guatemala).

In the area of airport master planning, Mr. Wellings is currently responsible for the master plans for Daytona Beach Regional Airport (Volusia County, Florida) and Nashville Metropolitan Airport (Tennessee).

Mr. Wellings has been or is currently responsible for financial feasibility studies for Philadelphia International and San Francisco International Airports; financial feasibility studies, budgets, cost/benefit analyses, and revenue maximization for the Dallas-Fort Worth Regional Airport; organizational review, lease policy, and rates and charges studies for Memphis International Airport; rates and charges studies for Birmingham Municipal Airport; and air trade analyses, airport management and organization studies, rates and charges, cost accounting installations, master plan review, lease review and policy recommendations, and financial feasibility studies for Friendship International Airport (Baltimore, Maryland).

Mr. Wellings holds the M.B.A. degree from American University (Washington, D.C.) and the B.S. degree from the U.S. Naval Academy. He is a certified public accountant in the State of California, a member of the American Institute of Certified Public Accountants, the California Society of Certified Public Accountants, and the Committee on Relations with Facilities and Students of the San Francisco chapter of the California Society of Certified Public Accountants.

VII. HISTORY AND BACKGROUND OF PPM

Peat, Marwick, Mitchell & Co. (PPM) is a large diversified, international management consulting and public accounting firm that serves an important array of government clients as well as nonprofit and commercial organizations. The firm has more than 100 affiliated offices in the United States and Canada, as well as approximately 160 offices in other major metropolitan centers of the world. The PPM staff includes more than 1,000 individuals devoting full time to management consulting activities in the United States.

Offices of PPM of pertinence to this project are as follows:

- o Los Angeles 555 South Flower Street
Los Angeles, California 90071
(213) 972-4325
- o Washington 1025 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 223-9525
- o Burlingame, California P.O. Box 8007
San Francisco International Airport
San Francisco, California 94128
(415) 697-8420
- o Boston 2000 Tower Building
Prudential Center
Boston, Massachusetts 02199
- o New York City 345 Park Avenue
New York, New York 10022
(212) 758-9700
- o San Francisco 601 California Street
San Francisco, California 94108
(415) 981-8230

VIII. DESCRIPTION OF RELATED PROJECTS

Peat, Marwick, Mitchell & Co. is uniquely qualified to undertake the assignment of project control consultant because of extensive experience in two areas:

- o System management projects in a variety of fields;
- o Technical studies of mass transportation

The combination of these two types of experience will enable PMM to not only undertake control, coordination, and reporting functions, but also to exercise its experience in mass transportation planning by becoming actively involved in technical matters.

Before discussing related projects in these two areas, it is appropriate to document two studies that represent combined responsibilities of systems management and mass transportation planning. These are the UMTA New Systems Requirements Analysis Program and the Southeastern Pennsylvania Transportation Authority Master Plan.

PMM is under contract with UMTA as a systems manager for the New Systems Requirements Analysis Program being conducted for the Office of Research, Development, and Demonstration. This program has two main objectives: the design and development of a set of public transportation demand analysis techniques and associated computer programs that will facilitate the evaluation of proposed public transportation systems, and the application of the techniques to a sample set of urban areas to determine the requirements for new systems in these areas.

Four specific types of experience are required to successfully carry out this program;

- o new systems and innovative concepts experience;
- o systems engineering and program management skills;

- o transit systems planning and familiarity with the transit industry; and
- o subcontract management experience and procedures.

PMM, as a part of this program, will undertake certain technical projects as internal assignments. In addition, the firm will carry overall systems management responsibility.

The systems manager is responsible for the overall planning and integration of the program and regular periodic reports citing program status and activities, progress, and financial status of all projects. The systems manager will:

- a. Develop a Technical Development Plan and from time to time make revisions thereto, coordinated with assigned UMTA Program Demonstration staff.
- b. Develop Project Implementation Plans (PIP) and from time to time make revisions thereto, coordinated with assigned UMTA Program Demonstration staff. Specifications will be prepared for all project work defined in the PIP's.
- c. Provide technical direction for all on-going project work and regularly review and evaluate the status of each project. All significant milestone achievements will be evaluated and reported.
- d. Plan and conduct component, system, and operational demonstration tests, setting forth test objectives, constraints, criteria; and procedures, and prepare final test reports.
- e. Recommend procedures for the implementation of the new systems requirements analysis by the UMTA and cities.
- f. Document each of the work items in addition to a comprehensive final report for each major goal of the New Systems Requirements Analysis Program.

- g. Insure that all computer programs developed for this program task will operate on the IBM 360 computer under minimum version of the (full) operating system and will be written in accordance with Urban Transportation Planning Battery Programming Conventions of the Federal Highway Administration, Department of Transportation.
- h. Coordinate with related work currently under way or about to be undertaken by the Federal Highway Administration, the Office of the Secretary of Transportation, and other DOT agencies concerning transportation needs estimates, "third generation" planning model development, and other pertinent topics.

One copy of a recent report to UMTA on this project, entitled "Technical Development Plan for New Systems Requirements Analysis Program." has been enclosed with our submittal.

PiM has been selected to undertake systems manager responsibilities for the Southeastern Pennsylvania Transportation Authority (SEPTA). As prime consultant, PiM will be responsible for the overall consultant effort as well as those he undertakes. Supporting the prime consultant will be subcontractors, each responsible for one or more of the other functional objectives and their associated work elements. The prime consultant will have the following responsibilities:

- a. Review the preliminary work program and prepare a critical progress path of all services required to carry out the program.
- b. Establish a preliminary group of a prime and no more than four subcontractors, preferably less, for preparing the proposal and negotiating with SEPTA.
- c. Refine the work program within the technical performance criteria with SEPTA, arriving at a final work program, schedule, and budget.

- d. Assist in the inter-agency coordination of this study, including the organization and operation of the Technical Coordinating Committee. At each meeting present progress reports, answer any questions, evaluate all recommendations, and incorporate the appropriate ones into the program.
- e. Carry out the consultant portion of the study, supervising all subcontractors, reviewing their monthly progress and evaluating in terms of original critical progress path and budget, and approving all requests for progress payments.
- f. Maintain flexibility in work program to permit necessary changes.
- g. Prepare and present to SEPTA all progress reports and other information at the time necessary for conformance with all federal and state requirements.
- h. Provide all personnel to perform the consultant services required by this project. Such personnel shall not be employees of or have any contractual relationship with SEPTA. All personnel engaged in performing the services under this contract shall be fully qualified and shall be authorized and permitted under federal, state, and local laws to perform such services.
- i. Coordinate, through the Planning-Marketing Department, with all SEPTA operating divisions to use their knowledge as inputs to applicable areas of the Study.
- j. Attend meetings with other interested agencies and citizens, providing them with information and evaluating their recommendations.
- k. Ensure the compatibility of the master plan program with the SEPTA-DVRPC roles agreement dated October 18, 1971.

1. Prepare the reports identified in the technical performance criteria based upon the information and planning of each appropriate work element, including preparing a final draft report consolidating the work of all disciplinary teams.
- m. Assist SEPTA in the preparation of the final report after appropriate review and comment of the draft.

Systems Management Experience

Members of the consulting staff have considerable understanding of the management problems of technically oriented organizations, particularly those responsible for the development of complex defense and aerospace systems. Consulting assignments with government organizations as well as leading electronics and aerospace firms have been concerned with organization, particularly the relationships among functional, project, and corporate staff organizations; project planning and control; systems engineering; logistic planning; configuration management; performance evaluation; and proposed strategy.

Besides supporting system manager clients, PMM routinely utilizes system management techniques for the management of its engagements of a large-scale and long-term duration. Representative engagements include:

- o MK 48 Torpedo Weapon System - Navy;
- o Langley Research Center R&D Management System - NASA;
- o Integrated Planning, Programming, Budgeting & Reporting System - Air Force Laboratories & Test Centers;
- o Project Maintaining System - Office of Economic Opportunity;

- o Program Planning System and Training - National Highway Safety Bureau;
- o Integrated Accounting and Management System - Fairfax County, Virginia;
- o Life Cycle Planning and Control System - Office of the Secretary of Defense;
- o Computer-Assisted Program Management Simulation Exercise.

Virtually all of these engagements required the management, development, or use of complex software.

Management Information System Development And Implementation

Studies are conducted to determine the information required for decision making. These studies are utilized to develop report formats and procedures for report distribution. A data base is defined by identifying the data elements to be collected and the source of each data element. Information retrieval routines and report generation procedures are developed and (typically) programmed for use on appropriate data processing equipment.

PMM has developed management information systems for a variety of governmental, industrial, and institutional organizations. These information systems have ranged in scope from the highly automated, Navy-wide financial management information system to a project information system for the State of California Feather River Project.

National Aeronautics and Space Administration--Office of Manned Space Flight. PMM assisted the NASA Office on Manned Space Flight (ONSF), to design, develop, and validate a management information system. This system provides the ONSF with

complete management and trade-off capability for the Manned Space Flight Program. The effort involved:

- o the design and development of a management information system and resource simulation model to aid in the analysis of schedule and resource (funding and manpower) trade-offs between various NASA Manned Space Flight programs and projects;
- o the design and development of a computer program for the timely processing of data in support of the above management information system; and
- o a pilot test to demonstrate the validity and utility of the system and the computer program.

U.S. Department of the Army - Office of the Chief of Research and Development. PNM designed, validated, and implemented a comprehensive, computer-based management information system for the Office of the Chief of Research and Development, U.S. Army General Staff. This management information system meets the planning and control requirements of R&D planning, resource allocation (trade-off analysis), and project monitoring. The system is data-oriented and includes predictive techniques for cost estimating and for integrating financial and nonfinancial information (schedule and technical). It is also compatible with RDT&E data requirements for:

- o DOD programs and reprogramming;
- o DOD and BOB budget;
- o DOD and BOB apportionment;
- o Army control program;
- o Army allocation of RDT&E funds
- o Manpower planning in terms of strengths, man-years, and dollars.

This effort included the design of all data inputs, data storage and retrieval, computer logic, system maintenance procedures, and internal Army instructions. The system is being implemented on the IBM 7090 computer and will ultimately contain 12 data records, 600 data elements, and a data code consisting of 11 functional categories.

Langley Research Center. PMM is currently under contract to the Langley Research Center, NASA, to design the following decision situations in an R&D management information system:

- o R&D planning;
- o project management;
- o resource management;
- o financial management; and
- o external reporting.

Resources Agency of California, Department of Water Resources, State of California. PMM assisted in the design of a comprehensive project management system for planning, scheduling, and monitoring the design and construction efforts of the California Department of Water Resources. PMM was also awarded a follow-on contract with the Resources Agency of California to apply the system to the management of the Feather River Project, a 10-year, \$2 billion construction program designed to transport water from northern to southern California.

For this project, PMM acted in an advisory capacity during the programming of the system reports. An analysis of data processing equipment was conducted to ensure that design of the system did not overextend practical limitation of the existing data processing equipment. Through integration of accounting file processing with coded network calculations, it was possible to structure all input reports to allow processing by existing

equipment. Computer breakouts were designed on a project and functional basis. In addition, precise computer programming techniques were developed to produce cost figures and to refine forecasts of manpower needs.

India, U.S. AID Project. In conjunction with the Planning Commission, Government of India, PMM advised and trained the management organizations of about 20 major industrial enterprises in the application of modern management techniques. By a broad application of the "systems management approach," PMM assisted in strengthening the Indian economy by balancing the aims of the governments' five-year plan with the development plans of individual firms. PMM was involved in projects including:

- o Installation, in the Planning Commission, of a project information room. This Center displays the progress of all new public construction and the operating status of all existing major products and industries. The Center provides financial data, production figures, and other coordinated economic data for the Planning Commission and encourages the maintenance of standardized management reporting systems for all projects.
- o Development of a manual of feasibility studies to provide the information requirements for all contemplated new public sector projects;
- o Design and preparation of a program of technical assistance for applying management techniques to the planning and control of the national and state agricultural programs in India, including use of cost-benefit analysis of investment planning of agricultural input production units; integrated reporting from ministries with supporting responsibilities; and planning and control structures based on regional units, which can then be aggregated and integrated with the existing agricultural administrative structure;
- o Development of systems and procedures for accelerating preconstruction progress of public sector

projects and reducing delays in obtaining the approval and funding sanctions of the Government of India;

- o Development of a manual that presents a master network plan for petrochemical and fertilizer plant construction and provides a useful schedule and cost reporting system for the project;
- o Development of a plan for more simplified approaches to national raw materials allocation, and review of present procedures of allocation;
- o Development and presentation of courses in project planning and scheduling (PERT and CPM); project formulation, materials management, and management accounting to government officials and private industry executives;
- o Study of a major metropolitan transportation service, with a view to operational and financial reorganization and planning;
- o Development of comprehensive traffic analyses for the national airline;
- o Studies of steel, rail, and coal industries and recommendations for locating and sizing new coal mines and washeries;
- o Development of a program of work, including a material planning and scheduling system for a major shipyard;
- o Presentation of a report introducing network planning into the construction of a large dock facility;
- o Study of production planning, materials management, and financial planning and control, as

well as systems for reporting to management; for the heavy electricals manufacturing industry.

Studies In Intergovernmental Relations

Studies are conducted on the financial, organizational, and administrative interrelationships among federal, state, county, city, and regional governmental units. These studies are undertaken to determine the nature and extent of participation of each governmental unit involved in a program or group of programs designed to satisfy a specific requirement for public service. Recommendations are developed concerning modifications to intergovernment organization or procedures, additional assistance or financing available through other governmental units, and modifications to the budget and program structure to facilitate the efficient accomplishment of governmental objectives.

The conduct of a study of intergovernmental relations is typically an important part of the studies that have been conducted by the firm in the areas of economic planning, regional development, and transportation planning. In addition, the firm has conducted studies for the specific purpose of identifying the impact on multigovernmental participation in such projects as the Federal Highway Safety Program and movement-to-shelter portion of the Civil Defense Community Shelter Program, discussed previously.

Model Cities Engagements. Model cities engagements for the cities of Portland, Maine, and Providence, Rhode Island, have been developed successfully by PMM. The Model Cities Act was established by Congress to pour millions of dollars into long-range planning of "total environment" (recreational-school-housing) projects for blighted areas.

In competition with some of the nation's leading consulting firms, the model cities agency for the City of Portland engaged PMM as prime contractor to coordinate three separate but inter-related studies:

- o development of a comprehensive educational program to meet the present and future needs of the model cities neighborhood;
- o development of the concept design, plan, and space requirements for the proposed model cities community school complex; and
- o analysis of the housing market and funding strategies to be used in the model cities neighborhood.

A two-phase contract awarded by the model cities agency for the city of Providence calls for PMM to develop and install a project control system that will be used during the planning period of the model cities program. The second phase will include developing detailed monthly status reports and updating all project assignments and budgets. Follow-on work will involve (a) developing alternative funding plans to meet program strategies and (b) delineating the first-year finance plan.

New York State Department of Transportation Capital Grant Program. PMM assisted the New York Department of Transportation in the establishment of guidelines for the administration of the State Capital Grant Program. Our work involved the following tasks:

- o review of existing pertinent statutes, policies, and procedures (federal, state, and local);
- o specification of state capital grant requirements;
- o development of procedural guidelines for surveillance and control during implementation;

- o development of procedural guidelines for project application, review and approval.

The resultant handbooks and guidelines will assure:

- o rapid and timely processing of grant applications;
- o complete and accurate applications;
- o compatibility of state, federal, and local policies and procedures for grant approval and project implementation;
- o an adequate framework for project surveillance, control, and fund allocation; and
- o the application of standard criteria to all grant applications.

Planning/Scheduling Models

National Aeronautics and Space Administration. PMM developed and programmed a large-scale computer simulation model for analyzing the impact of funding and schedule constraints, joint facility constraints, program acceleration and stretch-out, production quantity changes, etc., on the overall Manned Space Flight Program. The simulation program employs a network representation of project activities and is linked to a quadratic programming model for allocation of aggregate cost streams to activities over time. It is currently being pilot tested for operational use.

As an extension of the above project, PMM has developed and is currently implementing computer programs to generate alternative production and launch schedules and assignment of units to configurations; allocations of experiments to launch vehicles under multiple constrained resources, such as payload weight, volume, power, etc.; and cost impacts and time-phasing due to schedule and allocation changes.

Banking Industry. PMM has developed an asset allocation model for use by savings banks and savings and loan association management in determining the best utilization of available short- and long-term funds. The model employs linear programming to solve for optimal changes in each asset and liability category for each of three future planning periods within legal and policy constraints. The model is programmed for remote use on a time-shared computer installation to provide a rapid response capability and direct access by the user.

Educational Institutions. PMM has developed a simulation model for planning the resource utilization of colleges and universities. This program is resident on a time-sharing computer installation and was used in a seminar for college and university management. The basic structure of the model facilitates its extension for application of actual planning situations in any college or university.

Railroad Industry. For a large eastern railroad, PMM designed a simulation of traffic delays in a proposed railroad tunnel whose layout had not been fully specified. Several configurations were studied involving different rules for sharing track between competing railroads. The principal result of the study was the set of simulated delays generated by each configuration and priority arrangement. These were used to arrive at an estimate of the impact on train service of alternative proposals for tunnel layout and use.

New Jersey Turnpike Authority. A queueing simulation model has been developed of traffic flow through interchanges on the New Jersey turnpike for purposes of planning land requirements for each hour of the day. Linear programming was then used for scheduling weekly jobs for toll collectors to "best" meet the requirements.

U.S. Army. PMM has developed for the Army an improved procedure for forecasting the number of permanent change of station (PCS) moves of all Army personnel, by type of move by

month, up to one year in advance; and reporting the actual number of such moves on a monthly basis. This effort has involved a detailed study of virtually all existing and planned manual and computer-based reporting systems concerned with Army personnel activities. The projection systems were based on several techniques including time-series analysis of historical data; multiple and simple linear regression analysis; and the use of exponential smoothing as a means of isolating the main component of the moves.

Maryland Advisory Council for Higher Education. PMM assisted the Maryland Advisory Council for Higher Education by developing a computer model that forecasts the demand for higher education in Maryland for as much as twelve years in advance. The demand was predicted by the student's county of residence, sex, and type of higher education demanded. To accomplish this task, PMM designed the computer model, defined the data to be collected, supervised the data collection, and participated in data reduction. PMM staff members programmed the forecasting model.

New York State Education Department. For the New York State Education Department, PMM developed a set of cost and performance evaluation models for local school district use. These models were statistically derived using stepwise multiple linear regression and have proved to be effective in analyzing the operating problems of the school district.

U.S. Department of Transportation, Development of SST Financial Analysis Model. PMM developed an SST Financial Analysis Model for the Department of Transportation. In doing this, PMM produced a computer program which analyzed alternative financial structures in terms of return on investment in relation to various economic (e.g., sales) conditions. The program also looked at SST program feasibility in terms of cash flow versus capital requirements and exposure to financial risk. The programming was done in FORTRAN IV for the IBM 360/30.

In the course of developing the model, PMM reviewed the formulae, procedures, and calculations within the existing structure to determine if any reevaluation in methodology was necessary. In addition, major design effort was devoted to creating a more efficient system in terms of time, space, and flexibility.

The technical approach PMM used called for an executive routine written in COBOL, which was used for Input/Output and Report Generation. The executive would, in turn, call FORTRAN subroutines to perform any mathematical calculations. Higher-level languages were used because they are more easily followed and understood by the users than is Assembly Language. Overlay procedures were employed, and the program was designed for background mode so that it would not interfere with the Airman's Notification System. The Boeing model was incorporated within the overall system.

Technical Studies of Mass Transportation

Over the past ten years, PMM has conducted a broad range of studies which demonstrate its capability, technical and operating experience, and systems knowledge to manage engagements related to urban mass transportation.

The pertinent engagements can be classified under the following categories:

- o mass transit improvement programs;
- o transit-related new systems;
- o long-range mass transportation programs;
- o mass transit terminal, transportation center, and fringe parking studies;
- o management, organization, legislative, and financial studies for mass transportation authorities;
- o financial services to transit clients

A selected set of projects are described in the following paragraphs.

Bogota INTRA Transit Study, INTRA Colombia Transit Regulatory Agency, Bogota, Colombia. PMM made a detailed review of the franchised and independent bus operators in Bogota. A detailed plan for consolidation of the franchised operations, and realignment of the routes was made.

Patronage surveys and analyses were conducted. Capital and operating costs experienced by the individual operators were studied and recommendations for cost reductions were made. A computer model was developed and applied to develop operational timetables for the bus operators.

A Case Study of Bus Transit in a Selected Urban Area, Federal Highway Administration, Office of Urban Planning, Mass Transit Branch. A most significant recent effort in the area of bus transit systems was conducted by PMM for the FHWA. Fundamentally, the objective of the study, entitled "Evaluation of a Bus Transit System in a Selected Urban Area," was to evaluate bus transit as a viable and economically feasible alternative to the construction of more highways for automobile travel. Objectives in a subsequent study were directed toward the determination of how certain aspects of bus transit policy and system design contribute to the overall attractiveness of improved public transportation. More than two years in duration, the study revealed substantial information concerning the impact of service improvements, differing fare structures and automobile parking rates, and transit collection and distribution systems. Above all, it revealed that bus transit could be considered an economically acceptable alternative to the construction of more highways. The study in many ways answers the question of financial substitution of highway funds for transit development.

Southeastern Michigan Transportation Authority (SEMTA) Travel Behavior Analysis, Southeastern Michigan Transportation Authority, Detroit, Michigan. Under an UMTA Technical Studies

Grant, PMM is conducting a travel behavior and market analysis study to assist SEMTA in determining the best form of public transportation for each different market in the Detroit area. The first objective of this study is to determine the relationships which describe the sensitivity of urban travel behavior to such socioeconomic factors as income, age, sex, race, and trip purpose, as well as to system service characteristics. Travel demand data from many U.S. metropolitan areas will be used in this analysis. The second objective of the study is to establish the appropriate transit service characteristics for each of the market sectors in the Detroit area by utilizing these relationships and to analyze short- and long-range bus improvement programs.

Urban Mass Transportation Technical Study Bi-State Metropolitan Planning Commission. PMM is conducting an Urban Mass Transportation Technical Study with UMTA funding for the Quad Cities metropolitan area (Davenport-Rock Island-Moline, Illinois). The study is focused on the development of a short-range transit improvement program including the formulation of community goals and objectives, the conduct of transit and special activity group surveys, the analysis of market demand, the development of improved public transportation systems, the appraisal of existing transit properties, the structuring of an organizational and management entity, the analysis of funding sources and constraints, the development, and the estimation of demand for the futuristic systems.

High-Speed Ground Access System Study, Los Angeles International Airport. PMM was retained by the City of Los Angeles Department of Airports in 1970 to prepare an analysis of the financial feasibility of operating a proposed tracked air cushion vehicle (TACV) high-speed transit system from the San Fernando Valley to the Los Angeles International Airport and an intra-airport ride system (IAT) that interfaces with the TACV. This study is based on review and evaluation of previous analyses of potential system ridership, on systems operations, and on estimates of operating income, expenses, capital costs, debt requirements, and revenues. The n-Dimensional Logit Model,

calibrated for the Baltimore-Washington Airport Access Study, was used to evaluate system ridership estimates. This model estimates the diversion of travel from other modes (private automobile, taxi, limousine, and rental car).

Massachusetts Bay Transportation Authority Planning Program, Massachusetts Bay Transportation Authority, Boston, Massachusetts. PMM is currently under contract to the Massachusetts Bay Transportation Authority and has prepared a series of detailed traffic and transit studies on all parts of the Boston region. These studies include analyses of past and present travel patterns, user characteristics, and transportation system service and cost levels, leading to the derivation of relationships describing travel mode choice and other travel behavior. Based on these relationships, travel forecasts were carried out to estimate ridership and revenue changes resulting from proposed alternative transit improvements.

National Capital Transportation Agency, Washington, D.C. Travel movement forecasting methods were analyzed and their relative applicability for transportation planning needs was assessed for the National Capital Transportation Agency, Washington, D.C. Statistical analyses of travel movement data for Washington and a number of other cities were made to derive relationships describing transit travel behavior in terms of motivating factors such as time, cost, convenience, user income, and trip purpose. In addition, these relationships were applied to forecast relative usage of road and transit facilities in future years under varying conditions of automobile travel speeds, level of transit service, and similar factors.

Development of a Modal Split Model, San Diego County Comprehensive Planning Organization. PMM has been retained by the San Diego County Comprehensive Planning Organization to develop a modal split model. The n-Dimensional Logit Model, a recent advance by PMM in the development of modal

split modeling, will be used in this project. In addition to its other desirable functions, Logit has the capability of forecasting the modal split of two or more modes simultaneously. For San Diego, Logit is being considered for the analysis of preferences among automobile, transit, taxi, and change-mode (auto and transit) alternatives.

Study of the Relationship of Highway Construction to Public Transportation Services, Federal Highway Administration. P.M. has conducted a policy study for FHWA which will result in a report to Congress on:

- o the use of existing highway facilities for highway public transportation service;
- o the need for additional highway facilities or the adjustment of existing facilities to accommodate highway public transportation service;
- o the appropriate funding of such additional highway facilities.

One of the major tasks in this study was the determination of nationwide needs for highway public transportation facilities. For the purpose of this study, highway public transportation facilities are defined as highways or highway components constructed or adjusted to accommodate public transportation (e.g., exclusive busways, reserved lanes for buses, preferential entry, bus access ramps, bus turnouts, shelters, traffic control devices, etc.). Thirty urbanized areas were selected for detailed analysis of existing and needed highway public transportation facilities.

Analysis of Socioeconomic Factors of Fringe Parking, Federal Highway Administration. P.M. was recently awarded a contract to conduct a research and development project entitled "Fringe Parking and Intermodal Passenger Transportation" for the Office of Planning, Bureau of Public Roads, Department

of Transportation. The objectives of this project are as follows:

- o to identify and evaluate socioeconomic and environmental factors which determine demand for fringe parking;
- o to develop criteria (for both public and private investment) which can be used to measure the efficiency of a fringe parking area as an economic investment;
- o to investigate the nonuser impact of fringe parking facilities.

In Phase I of this effort, PPM prepared a detailed work plan, performed a thorough literature search, developed information from surveys and/or interviews with knowledgeable officials and experts in the field, and undertook on-site inspections of representative fringe parking facilities so that the operations and characteristics of a variety of fringe parking facilities can be compared. Phase II involved development of criteria to measure the economic efficiency of a particular project as a public or private investment. Areas investigated included the financing, ownership, operation, and management of fringe parking facilities.

IX. CLIENT REFERENCES

Mr. Robert Dial
Urban Mass Transportation Administration
Washington, D.C.
(202) 426-4047

Mr. Thomas Lipscomb
General Manager
Southeastern Michigan Transportation Authority
Detroit, Michigan
(313) 962-9800

Mr. Don Morin
Federal Highway Administration
Washington, D.C.
(202) 426-0210

Mr. Cal Perrine
Transportation Systems Center (DOT)
Cambridge, Massachusetts
(617) 494-2000

Mr. William Schoenfeld
Deputy General Manager
Los Angeles International Airport
Los Angeles, California
(213) 646-4267

X. COST

Peat, Marwick, Mitchell & Co. proposes to undertake the project on a cost-plus-fixed-fee basis. The estimated cost is shown below. These costs, and the entire proposal, will remain in effect until November 15, 1972.

Direct Labor

Principals	50 hours @ \$25.52 =	\$ 1,276
Managers	600 hours @ 17.46 =	10,476
Sr. consultants	1,500 hours @ 13.30 =	19,950
Consultants	1,000 hours @ 9.60 =	9,600
Support staff	200 hours @ 4.95 =	<u>990</u>

Total Direct Labor	\$ 42,292
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<u>Overhead</u>	114% of \$42,292	48,213
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Direct Expenses

Personnel relocation	5,000
Travel expenses	4,000
Miscellaneous expenses	<u>3,000</u>

Total Direct Expenses	<u>12,000</u>
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Total Direct Labor, Overhead, and Direct Expenses	\$102,505
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Fee	<u>9,225</u>
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Total Estimated Cost	<u><u>\$111,730</u></u>
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