

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

Minutes of Special Meeting of
the Board of Directors of the District

August 27, 1968

Upon notice duly given, the Directors of the Southern California Rapid Transit District met at a special meeting in the District Board Room, 1060 South Broadway, Los Angeles, California, at 9:15 a.m. on August 27, 1968, at which time President Don C. McMillan called the meeting to order.

Directors Kermit M. Bill, A. J. Eyraud, Jr., Leonard S. Gleckman, David K. Hayward, Herbert H. Krauch, Michael E. Macke, Don C. McMillan and Douglas A. Newcomb were present. Directors Charles E. Compton, Gordon R. Hahn and Norman Topping were absent.

Also present were Acting General Manager & General Counsel Milton McKay; Assistant General Manager in charge of Rapid Transit Development Jack R. Gilstrap; Chief Engineer Richard Gallagher; Director of Rapid Transit Planning John Curtis; Treasurer & Auditor H. L. Black; Secretary Virginia L. Rees; and the public.

Rescission of Resolution No. R-68-9 adopted August 20, 1968, and Adoption of the New Resolution in Lieu Thereof

At the request of President McMillan, Director Kermit M. Bill, Vice-Chairman of the Rapid Transit Planning & Finance Committee, reported that since the adoption of Resolution No. R-68-9 on August 20, 1968, which requested the Board of Supervisors to consolidate the District's bond election to be held November 5, 1968 with the statewide General Election to be held on the same date, the Committee had been advised by the Registrar of Voters

that if a short form bond proposition is used at the November 5, 1968 election, he would be required to place a copy of the long form proposition in each of the some 35,000 voting booths established in the 7500 precincts located within the District. And Director Bill further stated that, to accommodate the Registrar of Voters, the Acting General Manager has advised that Resolution No. R-68-9 be rescinded and a new revised long form proposition incorporated in a new resolution be adopted and submitted to the Board of Supervisors for approval.

After discussion, upon motion of Director Bill, seconded and unanimously carried, the following resolution was adopted:

RESOLUTION NO. R-68-14

RESOLVED, that Resolution No. R-68-9 adopted August 20, 1968 be and hereby is rescinded.

After discussion, upon motion of Director Bill, seconded and unanimously carried, the following resolution was adopted:

RESOLUTION NO. R-68-15

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT, CALIFORNIA, REQUESTING THE BOARD OF SUPERVISORS OF THE COUNTY OF LOS ANGELES TO CONSOLIDATE THE BOND ELECTION OF SAID DISTRICT TO BE HELD NOVEMBER 5, 1968, WITH STATEWIDE GENERAL ELECTION TO BE HELD ON SAME DATE.

WHEREAS, this Board has commenced proceedings for the calling of a bond election in the district to be held on November 5, 1968; and

WHEREAS, it is desirable that said bond election be consolidated with the statewide general election to be held on the same date and that within the district the precincts, polling places and election officers for the two elections be the same,

and that the Board of Supervisors canvass the returns of the district bond election and that said general election and said district bond election be held in all respects as if there were only one election;

NOW, THEREFORE, the Board of the Southern California Rapid Transit District, California, DOES HEREBY RESOLVE, DETERMINE AND ORDER as follows:

Section 1. That the Board of Supervisors of the County of Los Angeles be and it is hereby requested to consolidate the bond election to be held in said district on November 5, 1968, with the statewide general election to be held on said date.

Section 2. That the exact form of the proposition to be voted upon at said bond election as the same shall appear on the ballot is as follows:

RAPID TRANSIT: To reduce traffic congestion and improve public transportation by establishing a modern smog-free rapid transit system and expanded local transportation network by the acquisition and construction of any or all improvements, works, property or facilities including stations, parking areas and other facilities necessary or convenient therefor and the refunding of bonds constituting a district liability, together with incidental costs, shall the Southern California Rapid Transit District incur a bonded indebtedness in the principal amount of Two Billion Five Hundred Fifteen Million Dollars and shall a special sales and use tax be levied within the district at a maximum tax rate of up to one-half of 1 percent to be used as the primary source of funds to pay principal and interest on said indebtedness as provided in the ordinance calling the election?

Section 3. That said Board of Supervisors is hereby authorized to canvass the returns of said district bond election, and that said bond election and said statewide election shall be held in all respects as if there were only one election, and only one form of ballot shall be used.

Section 4. That said Board of Supervisors is hereby requested to issue to all officers of said county charged with duties pertaining to said statewide election instructions to take any and all steps necessary for the holding of said consolidated election.

Section 5. That the Secretary of said district is hereby directed to file a certified copy of this resolution with the Board of Supervisors of said county and with the Registrar of Voters of said county.

President McMillan thereupon turned the meeting over to Vice-President Krauch, and left the meeting to attend a press conference on the proposed changes in the District's bus routes.

Vice-President Krauch presided over the meeting thereafter.

Report of Chief Engineer Richard Gallagher

Chief Engineer Gallagher presented to the meeting his report, entitled "Report on Proposed Work Program and Organizational and Budgetary Requirements for Effective Transition into Design and Construction Engineering Phase of the Rapid Transit Project," dated August 20, 1968. A copy of the Report is attached to these Minutes as Exhibit 1.

During the presentation of the Chief Engineer's Report, President McMillan returned to the meeting.

After discussion, upon motion duly made, seconded and unanimously carried, the Chief Engineer's Report dated August 20, 1968, presented to this meeting, was referred to the Coordinating Committee, the Rapid Transit Planning & Finance Committee, and the Operations & Budget Committee for study and recommendations by each Committee, and, further, that a copy of the Report be furnished to each of the Directors so that all members will be fully informed.

President McMillan extended an invitation to the Board to make a tour to see first hand some of the work being done by the Metropolitan Water District, and the Acting General Manager was directed to arrange for such

a trip at the earliest date possible and extend an invitation to the Board members and to members of the Staff.

There being no further business, the meeting adjourned.

Suzanne K. Reed
Secretary

REPORT ON PROPOSED WORK PROGRAM AND
ORGANIZATIONAL AND BUDGETARY REQUIREMENTS FOR
EFFECTIVE TRANSITION INTO THE DESIGN AND CONSTRUCTION
ENGINEERING PHASE OF THE RAPID TRANSIT PROJECT

Prepared for:

Board of Directors
Southern California Rapid Transit District

By:

Richard Gallagher, Chief Engineer

August 20, 1968

REPORT ON PROPOSED WORK PROGRAM AND ORGANIZATIONAL
AND BUDGETARY REQUIREMENTS FOR EFFECTIVE TRANSITION
INTO THE DESIGN AND CONSTRUCTION ENGINEERING PHASE OF
THE RAPID TRANSIT PROJECT

By

Richard Gallagher
Chief Engineer

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

Introduction

Seventy- one days from today we expect the local electorate to approve one of the largest bond issues in the history of the United States. Because of the effect of cost escalation and the very tight project time schedule, it is absolutely essential that the District be prepared to proceed promptly and productively after the election, with the major thrust of the rapid transit project. To do so requires the acceleration of certain preliminary activities now under way and the initiation of others during the next four to five months. A plan of these vital project activities and the basic organizational and budgetary requirements for effective management of this gigantic project constitute the subject of this report. Incidental to the main subject of the report will be statements indicating work completed to date and the current status of the project. It is important to realize that these efforts to get ready for final design will not be wasted. This work will have to be done regardless of the date of bond issue approval, and the cost will be comparatively minor.

Some of the members of the Board may not be familiar with my background, and I should like to say that the judgments and recommendations in this report are based on many years of experience as technical director and administrative

head of major public works organizations and activities. This report is intended to be the first of a series of progress reports to the Board.

Program of Project Activities Over Next Four to Five Months

The program of project activities over the next four to five months breaks down into two general categories, namely (1) work now in progress that should be continued and (2) new activities that should be initiated during this period.

Project Activities Now in Progress

I should like first to discuss eleven activities, each representing continuation of work in progress and essential to the start of final design:

1. Preparation of a master project schedule is an essential task that has been under way for about two months. Among other things, this work involves the definition of final design and construction packages for which specific contracts will be awarded.

2. Since the Los Angeles County Surveyor has an established network of horizontal and vertical control points in this area, and since his forces are ready and equipped to do such precise survey work, we have jointly worked out a draft of an agreement providing that that office will perform this work for the District. This agreement is ready to be submitted for your approval.

3. Design criteria for final design are being developed--considering the best of those used by WMATA and BARTD, together with those recommended by our Joint Venture Consultants, other consultants yet to be retained and by the various professional engineering societies and manufacturers. For example, we must establish the maximum gradient of the track since the gradient has important influence on vehicle speed, power consumption, braking effort required stopping distance, operating cost, and, of course, project costs.

4. Negotiations are being conducted with the Southern Pacific Company and the State Highway Department regarding joint use of their rights of way. When I joined the District early in 1967, it came to my attention that the District had instructed the Joint Venture Consultants to drop the idea of the SPRR right of way in the median strip of the San Bernardino Freeway for rapid transit. After George Heinle and I made a detailed inspection of the alternate routes and some "back of the envelope" cost comparisons, and after noting that our District Act provides the right to take the matter before the State Public Utilities Commission, I was convinced, and recommended to the Board, that the District should seriously attempt to gain the use of this right of way. The Board then authorized the General Counsel to file our request for a determination from the Public Utilities Commission and those hearings started.

About six weeks ago, at the Southern Pacific Company's request, we commenced direct negotiations with them. These talks are proceeding very well, and it is hoped that we will be ready to present a right of way agreement for your consideration in the near future. The use of the of the Southern Pacific right of way will mean that our line serving the San Gabriel Valley Corridor will be constructed for \$40 million less than the next most feasible alternate.

They state that if we can come to agreement on the San Gabriel Corridor there will be no problem in working our "joint use" arrangements on other corridors.

5. Liaison committees have been and are being formed which are comprised of representatives of contractors, public utilities, and architectural and engineering professional groups. The contractors committee is already active, and the public utilities committee and professional committees are partially formed.

Not only will we benefit from their counsel, but also designers and contractors will be kept better informed on various aspects of the project thus helping to minimize the contingency element in bids on design and construction work, which in turn should result in lower bids.

6. Good working relationships are being maintained with the technical staffs of local and state governmental agencies within the District. We recognize the importance of these relationships and make calls and attend professional meetings to maintain and expand these contacts which may prove to be helpful in obtaining timely resolution of problems concerning rights of way, utility relocation and other matters. Incidentally, over a period of many years while engaged in public works activities at city, county, and state levels of government, and as a private consultant in the civil and transportation engineering fields, I developed extensive contacts with technical and administrative people at all levels of government, not only in California but also nationally. These contacts are proving very helpful.

7. We are taking every opportunity to develop good contacts with equipment manufacturers, other rapid transit properties and construction organizations engaged in relevant work so as to broaden our sources of information and advice.

8. Alternative methods of design and construction are being explored. One of the primary duties of the Chief Engineer's Office is to pursue possibilities for achieving significant reductions in project cost and time. Accordingly, we have concentrated our efforts in two major cost areas of the project, namely, tunneling and subway station construction. Promising investigations on tunneling, tunneling equipment, excavation removal, and tunnel linings are now in progress by Neil Richards. The realization of minor percentage reductions in costs in

these areas can result in major dollar savings in the total project cost. In the Final Report it was conservatively assumed that each subway station would be built by the conventional open-cut methods. However, wherever possible it will be advantageous to minimize the tearing up of streets and construct the stations by the "inside-out" method. Not only will this method reduce project costs and time, but also it will minimize interference with the use of surface streets--thus benefiting vehicular traffic, pedestrians and merchants. (See renderings).

9. Special equipment management is being studied by Mr. Richards for potential savings. In this large project the contractors will need many items of specialized equipment and material representing high cost and long lead time. For example, it takes over a year to obtain delivery of a mechanical mole for tunneling and about eight or nine months on tunnel shields. Their high costs make it imperative that we take advantage of every opportunity to realize maximum utilization of such items. There may be as many as 25 separate tunnel contractors, and instead of the usual practice of letting each one bid on the basis of furnishing all his own equipment, we are convinced that we will get lower bids if the District purchases and furnishes such specialized equipment. By proper scheduling of tunnel contracts and the furnishing of specialized equipment and materials, the District may be able to effect savings in time and cost reductions amounting to millions of dollars. The advisory committee of the Associated General Contractors has already considered this matter and concurs.

10. Disposal of excess excavation is another related problem receiving our attention. Enough material will be removed during construction to make 3,000 acre feet of fill, and we intend to make every effort to use this material to the District's advantage so as to effect reduction in project costs.

11. Other important items on which we are currently working in hopes of effecting savings in project cost are the establishment of research projects to get needed design data on (a) airflow and heat buildup in subways; (b) the use of single-phase A. C. propulsion power, coupled with regenerative braking; and (c) we would also like to be able to arrange for a test track along the San Bernardino Freeway which, incidentally, could serve both engineering and public relations needs.

Ever since the spring of 1967, when Mr. Heinle first brought up the matter, we have been interested in, and have been questioning the Joint Venture on, the possible cost savings and heat reduction effects which might be obtained from the use of single-phase A. C. for propulsion power coupled with the use of regenerative braking. Several months ago we formally requested the Joint Venture to have their Project Electrical Engineer do a detailed study and analysis thereon. We have just reviewed the results of this work and it looks encouraging.

Project Activities that Should Be Initiated

The foregoing activities are now in progress and work should continue along these lines. I should like to indicate now the new activities that should be initiated and completed during the next four to five months.

1. A number of basic surveys and preliminary investigations must be started very soon because it is essential that as much as possible of this work be completed before the start of Final Design, now scheduled for January 1, 1969.

These investigations and their approximate costs are as follows:

(See Table Next Page)

Estimated Cost Up To
January 1, 1969, For
First Two Corridors

Establishment of First Order Horizontal and Vertical Survey Control Points	\$ 66,000
Aerial Topographic Survey	45,000
Initiation of Tunnel Airflow Research Project Needed for Final Design (at Cal Tech)	15,000
Soil Borings	33,000
Initial Ground Surveys	25,000
Geological Consultants	10,000
Tunnel Consultant	5,000
Earthquake and Structural Vibration Consultant (for all corridors)	<u>13,000</u>
Total	\$ 212,000

Note: Estimated expenditures on above items up to November 5 - \$93,000.

2. The final profile grade should be determined. It is highly desirable that this work be completed before the start of Final Design.
3. The scope of the Engineer-Architect contract for Final Design must be developed prior to negotiations leading to selection of, and contract with, the firms which will perform Final Design. The contract should provide for full and complete control by the Chief Engineer of the District.
4. The Principal A&E firms to be retained for Final Design must be selected as soon as possible. Regarding the A&E selection process in 1966, which resulted in the present Joint Venture's being retained to do the preliminary engineering, records show that it was made clear to them and other firms that when it came to Final Design the District would open up the field so that all major interested and qualified firms would be considered. It is extremely important that a fair and effective procedure be followed in selecting the Principal A&E

group. It is, therefore, proposed that the Board appoint a five-man Qualification Review and Advisory Committee composed of Deans of colleges of engineering and architecture in the general area, with one additional well known and impartial professional engineer now heading a public agency. I would propose to serve as the Secretary of this committee. This committee would review the letters of interest and statements of qualifications submitted by engineer and architect firms in response to a general solicitation and/or invitation by the District. After this committee reviews the qualifications, it would make a determination as to which firms were qualified for a project of this type and magnitude, and the chairman would then present the group's findings to the Engineering Committee of the District Board. The latter committee, on which I would again propose to serve as Secretary, would invite those firms recommended by the Qualifications Review and Advisory Committee to make their presentations. Upon completion thereof, the Chief Engineer would make his recommendations to the Engineering Committee which would then make its recommendation to the entire District Board for final selection.

5. If possible, even in advance of the funding of our project, agreements should be developed with the technical staffs of on-line communities covering the necessary street closings, relocation of municipal utility lines, and other items. To give these agreements "status" pending the sale of our bonds, in lieu of "letters of intent" which for one or two reasons did not work out well for BARTD, I propose that we endeavor to obtain official resolutions from the various city councils adopting these agreements "in principle". It is planned to begin this process as soon as the Board has officially adopted route and station locations, and we have come to final decision on grade, alignment, and the exact location and sizes of station sites and parking areas in each corridor. We have been in

close contact with BARTD on the problems inherent in this process, and are thus able to profit from their experience. It took BARTD almost two and a half years before they awarded their first construction contract--our schedule allows half that time!

6. Standard specifications must be developed as well as standard details and engineering office and field procedures. There will be scores of private engineering firms and contractors at work on this project and the work will encompass areas under the jurisdiction of many governmental agencies and public utilities. Therefore, our specifications must be generally accepted by professional engineers in all of these firms and agencies and by the construction industry. We have made an investigation to ascertain the particular standard specification in use by the "on-line" agencies for the various types of construction, and we have this base from which to start.

7. A cost accounting and budget control system for this project must be developed. This system must be tailored to the project and formulated primarily to facilitate the management of the project. Clearly, this system must be ready at the start of Final Design--which means January 1, 1969.

The following chart (9-A) presents these existing and proposed Project Engineering Functions in an orderly picture and shows how they are interrelated. This is the very beginning of what will be a truly mammoth Critical Path Method (CPM) chart for the entire project.

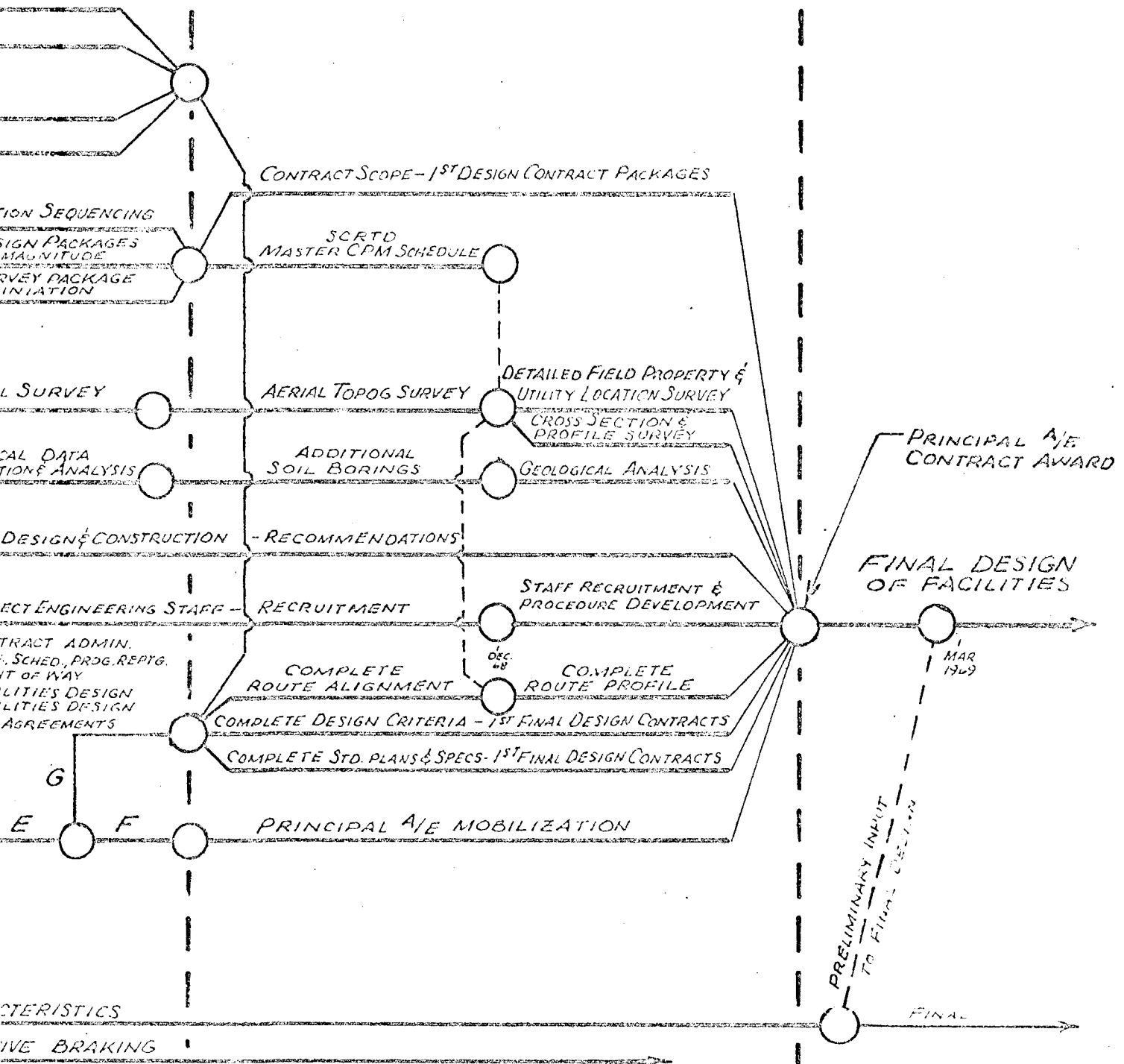
Project Expenditures

The projected cost of the foregoing activities that are planned for the next four to five months is \$297,000. Seventy-one per cent of this total, or \$212,000, is represented by certain basic surveys and preliminary investigations to be conducted by private firms and personnel from other governmental agencies,

6 NOV. 1968

1 JAN 1969

INTENT APPROVING AGREEMENTS-IN-PRINCIPAL WITH VARIOUS AGENCIES



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SIGN PACKAGES
MAGNITUDE
RVE PACKAGE
INIATION

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TIONE ANALYSIS

DESIGN & CONSTRUCTION - RECOMMENDATIONS

ECT ENGINEERING STAFF - RECRUITMENT

TRACT ADMIN.
SCHED., PRG. REPTG.
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AGREEMENTS

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DURES

RUCTION (AGC) AND UTILITY COMMITTEES

PRINCIPAL A/E
CONTRACT AWARD

FINAL DESIGN
OF FACILITIES

1
MAR
1969

PRELIMINARY INPUT
TO FINAL DESIGN

FINAL

SCRTD OFFICE OF CHIEF ENGINEER
PROJECT ENGINEERING FUNCTIONS
PRIOR TO 1 JANUARY 1969

DRAWN BY	APPVD. BY	FILE NO
D.W.K.	R.G.	21-02-
13 AUG 1968	14 AUG 1968	

20 AUG 1968

DEVELOPMENT OF TYPICAL DRAFTS OF AGREEMENTS, RESOLUTIONS & LETTERS OF INTENT

INSIDE-OUT STATION CONSTRUCTION INVESTIGATION

PRECAST CONCRETE TUNNEL LINER INVESTIGATION

DESIGN CRITERIA ANALYSIS & DEVELOPMENT

STANDARD SPECIFICATION ANALYSIS & DEVELOPMENT

PROJECT ELEMENT DETERMINATION

NOMINAL CONSTRUCTION PACKAGES
SCOPE & MAGNITUDE

CONSTRUCTION
FINAL DESIG.
SCOPE & MA
R/W & SURVEY
DELIN

CONTROL SURVEY
CONTRACT AWARD

CONTROL S

GEOLOGICAL CONSULTANT
CONTRACT AWARD

GEOLOGICAL
INVESTIGATION

TUNNEL CONSULTANT
CONTRACT AWARD

TUNNEL DE

ORGANIZATION ANALYSIS

CHIEF ENGINEER
REPORT TO BOARD

KEY PROJECT ENGINEERING
STAFF RECRUITMENT

KEY PROJECT

1. ASSIST. TO CHIEF ENGR
2. PLAN, SCHED, PROG. REPTS.
3. BUDGET, ESTIM, ACCOUNT
4. SURVEYING
5. EQUIP DESIGN

1. CONTRA
2. PLAN, SC
3. RIGHT C
4. FACILIT
5. FACILIT
6. R/W AGI

PRINCIPAL A/E SELECTION ACTIVITY DETAILS

- A. APPOINT A/E QUALIFICATIONS REVIEW COMMITTEE
- B. DEFINE SCOPE OF PRINCIPAL A/E RESPONSIBILITIES
- C. SOLICIT A/E STATEMENT OF INTEREST & QUALIFICATIONS
- D. REVIEW A/E QUALIFICATIONS - A/E Q.R. COMMITTEE
- E. RECOMMEND SELECTION TO BOARD - SCRUD ENGR COMMITTEE
- F. DRAFT PRINC. A/E CONTRACT & EXCHANGE LETTERS OF INTENT
- G. MOBILIZE SPECIALIZED STAFF OF SELECTED PRINC. A/E FOR SHORT TERM CONSULTATION

A

D

E

B

C

RESEARCH • HIGH SPEED VEHICLE IN TUBE CHARACTERISTICS

RESEARCH • USE OF SINGLE PHASE AC REGENERATIVE BRAKING

RESEARCH • TEST TRACK COMPONENTS

CONSTRUCTION CONTRACT PROCEDURES

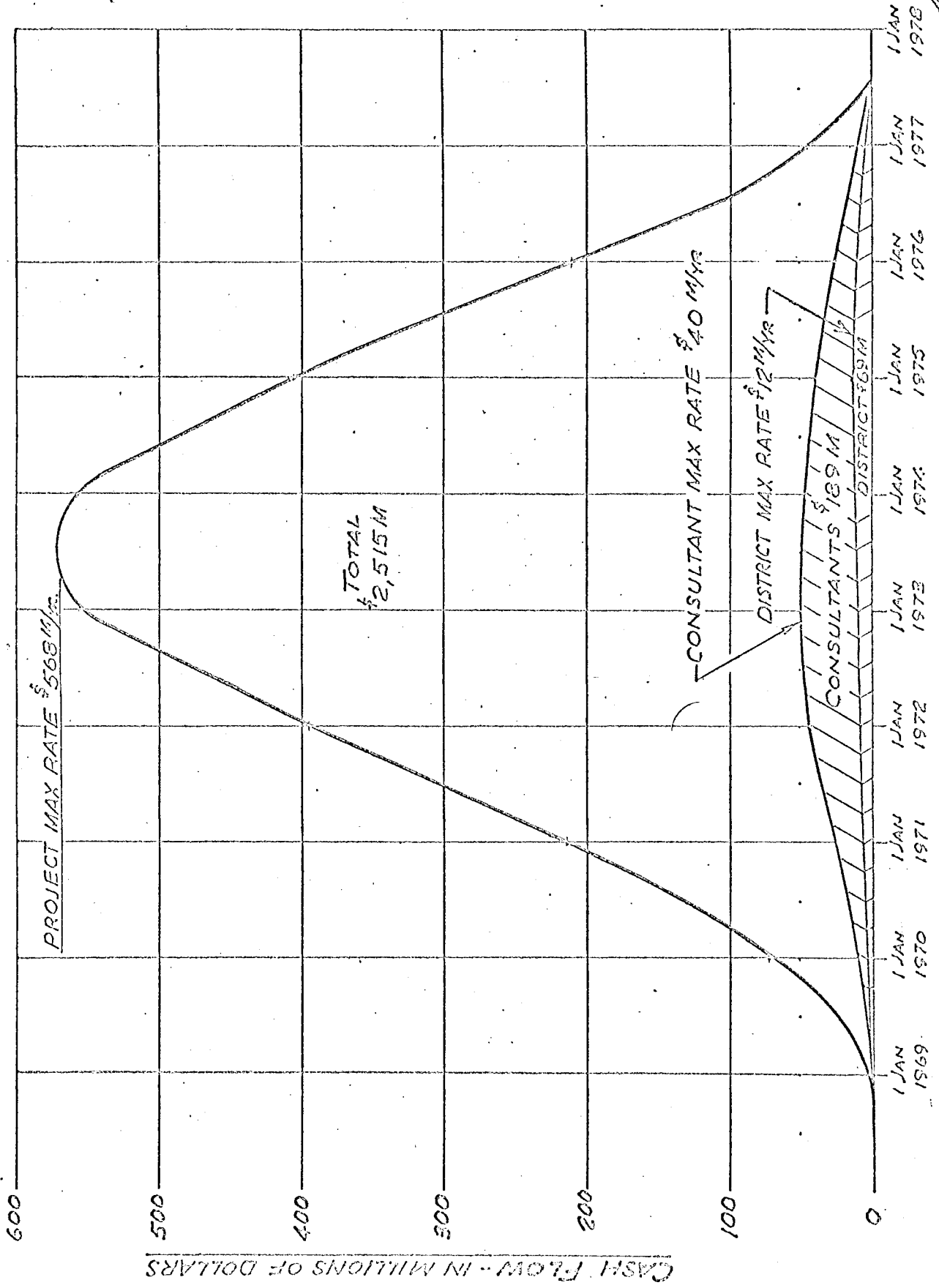
LIAISON WITH ENGINEERING (ASCE, CEAC, CSPE); ARCHITECTURAL (AIA); CONSTRUCTION

as set forth above. Twenty-two per cent, or \$20,000, will cover the salary expense of all engineering personnel in the Chief Engineer's Office, including that of proposed additional staff as explained below. Seven per cent, or \$20,000 is to cover the cost of the engineering and drafting services we may be able to obtain from our present Joint Venture Consultants. It is estimated that about \$135,000 of the total will be required up to November 5th. (\$93,000 for Consultants and \$42,000 for present staff and needed engineering and drafting assistance.)

Incidentally, it is a pleasure to report to you that, as a result of close and careful control, the work involved in Preliminary and Final Reports, documentation, changes due to public hearing, etc., as called for in the Joint Venture's contract with the District, has been completed for approximately \$350,000 less than the maximum amount provided in their contract. And, the Engineering Department has done its job during this entire period with four less employees than we have had authorization to hire.

Over the several-year period of the Rapid Transit Project, the rate expenditures will conform to the patterns shown in the chart on the next page, which indicates: total rate of expenditure, and curves showing the rates for private design engineering firms and consultants only, and for the District's engineering staff only. Please note the relatively small expenditure contemplated for the District's engineering personnel as compared to those for each of the other categories. Peak annual expenditures of the three groups are reached at different times. These peaks may go as high as \$570 million for construction work, \$40 million for private design engineering firms and consultants, and about \$12 million for the District. To illustrate its magnitude, at the peak year, project expenditures will be over ten times the size of the present District operation.

SCR TD - FIVE CORRIDOR SYSTEM (89 MILES)
ESTIMATED COSTS AND CASH FLOW



Project Organization Plan

There are three principal phases of evolution in a project of this nature and
e. Our rapid transit project is now in a transitional period from the planning,
siz
liminary design, and project promotional phase into the final design and con-
struction phase. Along about 1976 we will be phasing out of construction and into
str
operational phase.

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In this critical period of preparation for final design and construction now
ing us, it is essential that the District's Chief Engineer's Office, which is
fac
rged with the responsibility for this phase of the project, be carefully and
cha
ndly structured. There is need for a clearly defined and distinct project
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ganization to assure that the work will be under effective and proper control.
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ch has been learned from the experience of BARTD and other large public
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encies regarding project organization and management, the principal lessons
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ng that (a) the District should retain full and complete control of the project;
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the quality and extent of preliminary engineering has a direct effect upon the
(b)
cess of the project; and (c) that in major projects of this nature, which for
suc
next eight years will primarily involve the design and construction of large
le public facilities, it is advisable to place project control in the hands of
sce
sons whose primary experience has been in performance, management and
per
ontrol of engineering design and construction work for public agencies.

cor
The engineering organizational structure proposed for this project is shown
the following chart. (11-A)

on
Four technical departments are shown reporting to the Chief Engineer and
Project Director: Right of Way, Facilities Design, Equipment Design, and the
Pro
struction and Installation Department. The principal functions of each of
Con
se departments are indicated on the chart.

the

