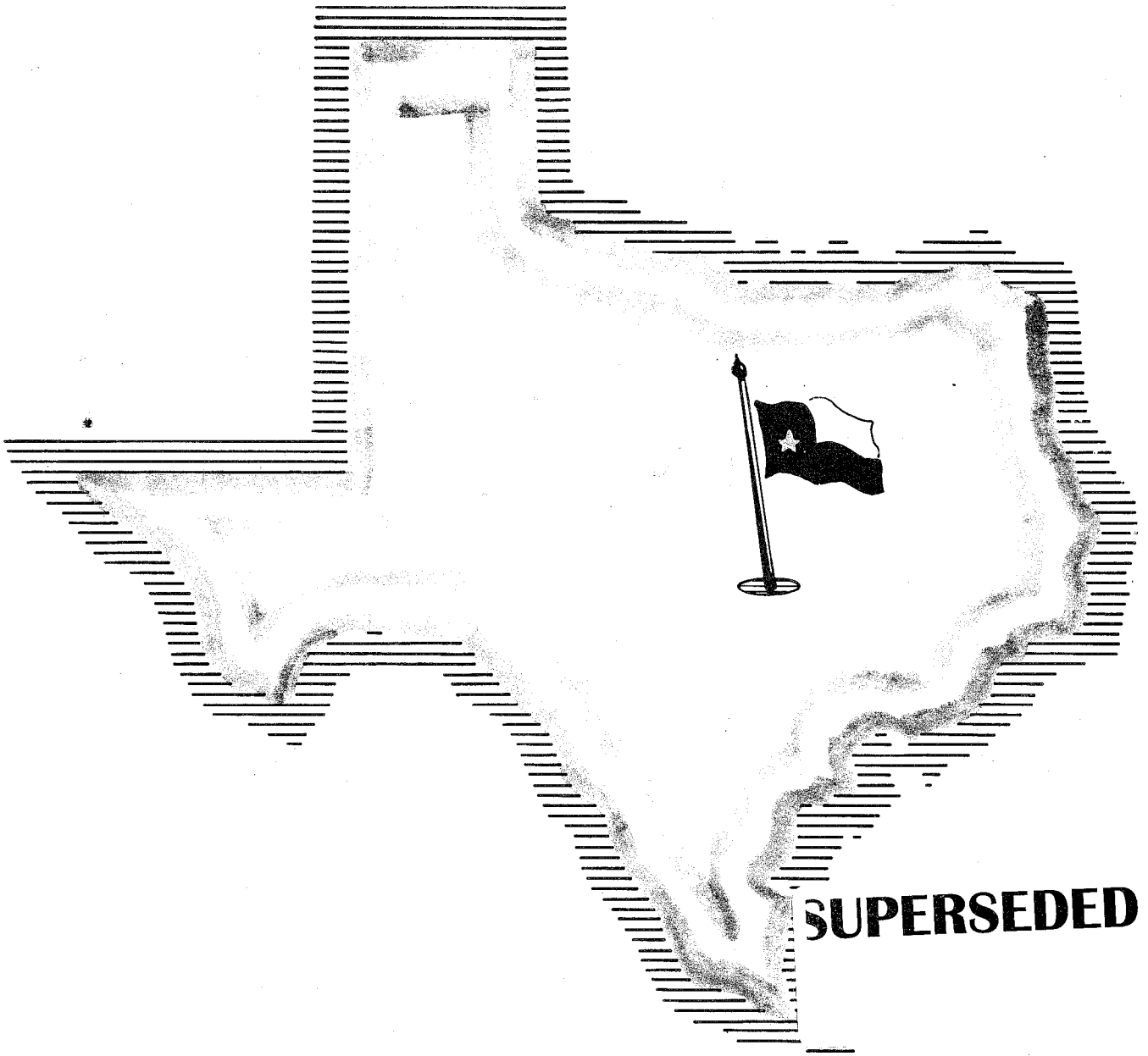
MANUAL OF PROCEDURES FOR RESEARCH STUDIES



SUPERSEDED

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
1979

TRANSPORTATION PLANNING DIVISION
RESEARCH SECTION

MANUAL OF PROCEDURES

FOR THE CONDUCT OF

COOPERATIVE RESEARCH AND TECHNICAL STUDIES

Research and Technical Studies Conducted for
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION
in cooperation with
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
and
URBAN MASS TRANSPORTATION ADMINISTRATION

September 1, 1979

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I. INTRODUCTION

The Department and various research agencies conduct a cooperative program of highway research and development on a cost-reimbursable contract basis. The authority for research with outside agencies is based on state legislation and joint cooperative research agreements. The Federal Highway Administration Federal-Aid Highway Program Manual, as it pertains to Research and Development, is the Departmental guide for the conduct of the cooperative research effort and frequently used portions are included herein for appropriate guidance and compliance. The purpose of this Departmental manual is to outline administrative procedures for highway research in logical sequence so that this work can be more efficiently handled between the agencies concerned. This manual shall be for the administrative conduct of highway research studies and is a guide to fulfilling the Cooperative Research Agreement. The manual shall be revised periodically as necessary.

II. TERMS AND DEFINITIONS

A. Department. The State Department of Highways and Public Transportation.

B. Research and Development Committee. The Committee appointed by the Engineer-Director to recommend policy and direct the Cooperative Research Program of the State.

C. State Planning Engineer, Transportation. The Engineer appointed by the Engineer-Director to administer the Cooperative Research Program of the State.

D. Engineer of Research. The individual who carries out the directives of the State Planning Engineer, Transportation. He is a staff member of D-10 and serves as the Secretary to the Research and Development Committee.

E. Area Advisory Committee. The advisory committee for matters pertaining to the specific Cooperative Highway Research studies assigned in a program area. The Committee is composed of representatives from throughout the Department with expertise in the appropriate research program area.

F. Area Advisory Council. A Council composed of the Chairmen of the Area Advisory Committees that functions to advise the Research & Development Committee as to research priorities and provides suggestions for guidance of on-going research studies.

G. Area Coordinator. The Secretary to the Area Chairman who also coordinates area activities.

H. Research Agency. Any agency that has entered into a signed agreement with the Department to do planning, research, development, demonstration, or technical studies.

I. Study Supervisor. The principal investigator in charge of a study.

J. Study Contact Individual. The Department liaison individual between the Study Supervisor, the Area Coordinator, and Engineer of Research.

K. Cooperative Research Agreement. The basic contract under which studies are conducted on a cooperative basis between the Department and the Research Agency.

L. Cooperative Highway Research Program Agreement. An annual contract agreement between the Research Agency and the Department which activates the approved studies under the terms of the Cooperative Research Agreement.

M. Departmental Research Program. A program consisting of individual studies performed within the Department and activated by the approval of the Engineer-Director on a fiscal year basis.

N. Research Study. An individual investigation having the limited aim of confirming a specific theory, supplying the design or data needed to complete a task, or researching a study objective.

O. Demonstration Study. A study designed to apply research study results on an actual demonstration basis to show their value and applicability to familarize field personnel concerned. (Demonstration study administration procedures will be the same as for research studies.)

P. Technical Study. An investigation having the limited objective of confirming a specific theory, supplying the design or data needed to complete a task, or reaching a study objective.

Q. Study Proposal/Renewal. A document submitted by the Research Agency or by the Department requesting initiation or continuation of a study. The document outlines the problem statement, objectives, work plan, budget, duration of the study, and other pertinent data.

R. Study Agreement. The executed Study Proposal/Renewal (upon execution by the Research Agency and the Department) for each individual study under the Cooperative Research Agreement. The Study Agreement shall become a part of the Cooperative Research Agreement.

S. Work Plan. The section of the Study Proposal/Renewal which contains the detailed description of methods and/or procedures which will be used to conduct the study.

T. Study Budget. The total money required for the accomplishment of a specific study for a specified period of time.

U. Direct Cost. Expenses which include but are not limited to salaries, wages, travel, supplies, services, reproduction, equipment, and equipment rental.

V. Indirect Cost. Cost covering clerical, accounting, bookkeeping, ordering and other similar services rendered to the study for which no charge is made elsewhere in the agreement. The charges cannot be in excess of 7% of all reimbursable expenses incurred, and are not applicable for the services of consulting personnel.

W. Research Fund Authorization (RFA). A document authorizing the expenditure of monies for a specific period of time to accomplish the objectives of a specified approved study.

X. Equipment. For the purpose of classification and acquisition, equipment is defined under the following headings:

1. Agency-Owned Equipment. The instruments, machines, and apparatus which have been acquired and are used in the regular administrative functions of teaching, research, and scientific studies by the Research Agency.

2. Expendable Equipment. Equipment purchased for the accomplishment of a specific study which will be fully used or expended on the work and will have no residual value on completion of the study.

3. Non-Expendable Equipment. Equipment purchased and owned by the Department specifically required for the execution of a study or studies. The equipment retains value after each specific study assignment.

Y. Fiscal Year. A twelve-month period beginning September 1 and ending August 31.

Z. Records. The official papers or evidence that describe the study findings, data taken, work time spent monies expended, etc.

III. ORGANIZATION AND RESPONSIBILITIES

This chapter explains the organization and responsibilities of the various committees and individuals that are required to administer and operate the Cooperative Highway Research Program. The responsibilities of each individual or committee within the organization are spelled out with the understanding that additional duties may be assigned when necessary by the Engineer-Director. (See Figures 1 & 2, pages 5 & 6)

A. Research and Development Committee

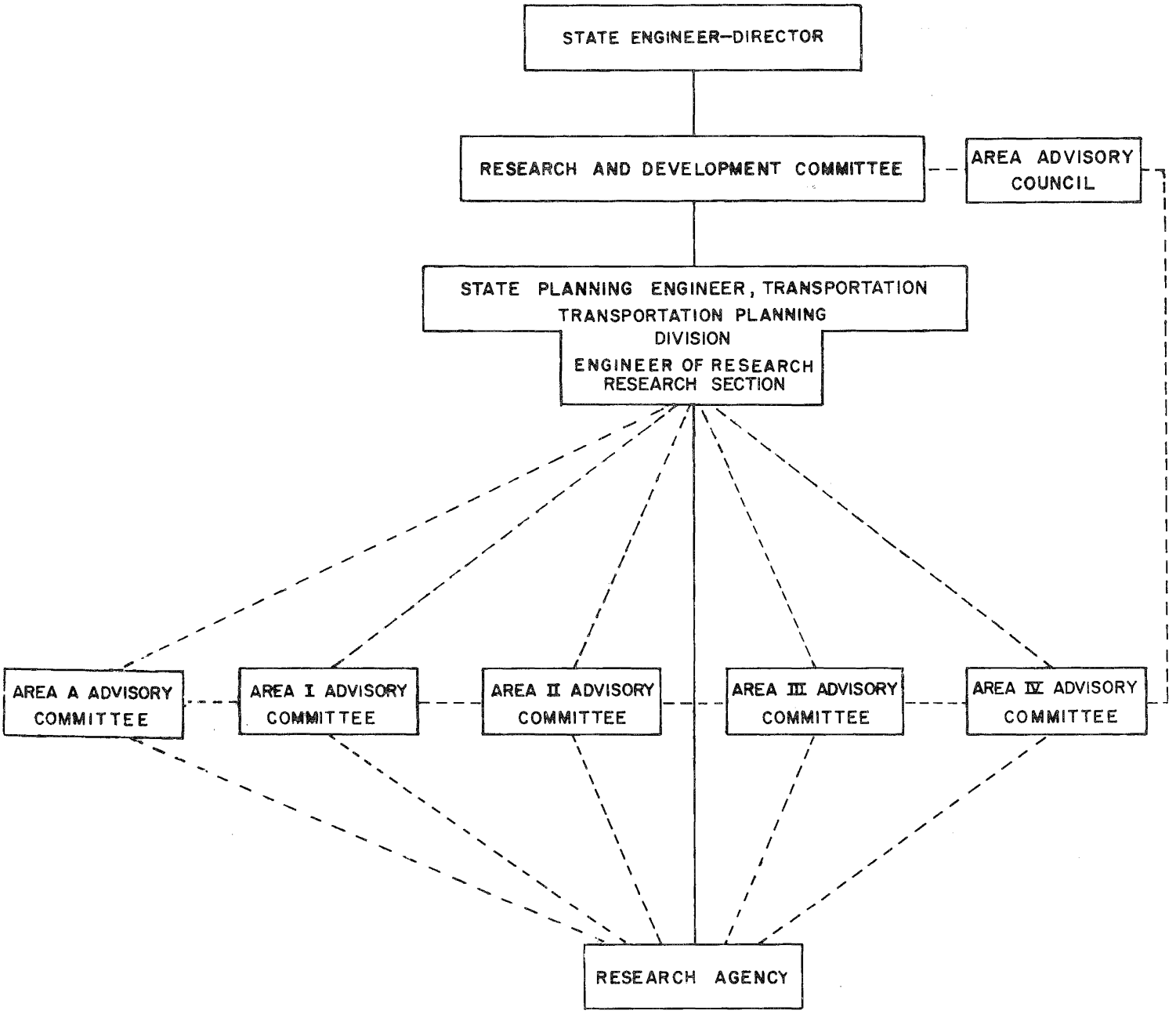
1. The members of the Research and Development Committee are appointed by the Engineer-Director.
2. Responsibilities
   a. To provide policy and direction to the Department's Research Program.
   b. To recommend the final Research & Development Program on an annual basis for approval by the Engineer-Director each fiscal year, taking into consideration recommendations received from the Area Advisory Council.

B. State Planning Engineer, Transportation, Transportation Planning Division

1. The Engineer appointed by the Engineer-Director to direct the Cooperative Research Program of the Department. He will function as a member of the Research & Development Committee.
2. Responsibilities
   a. To conduct the research, funding, reporting and development of the recomended annual Research Program for approval by the Research & Development Committee.
   b. To secure and disseminate information, monitor all research activities and promote implementation of research results to the optimum extent.

C. Engineer of Research

1. The Engineer of Research funcitons as secretary of the Research and Development Committee and Ex-Officio member of each Area Advisory Committee. He is responsible to the State Planning Engineer Transportation, for overall supervision and management of the Research Section.
2. Responsibilities
   a. To carry out such functions as directed by the State Planning Engineer, Transportation.
   b. To correlate the established Research and Development Program with the Federal Highway Administration, other agencies, and the Department.
   c. To recommend studies, equipment for purchase, Advisory Committee members, study contact individuals, and to perform other functions as designated by the State Planning Engineer, Transportation.
   d. To review, approve and distribute study reports.
   e. To recommend implementation of research study results.
   f. To recommend demonstration studies.
   g. In conjunction with the Committee Chairman and the Area Coordinator, to call meetings of the Area Advisory Committee when the need arises.
   h. To direct the administration and operation of the Research Section. (See Figure 3, page 7)

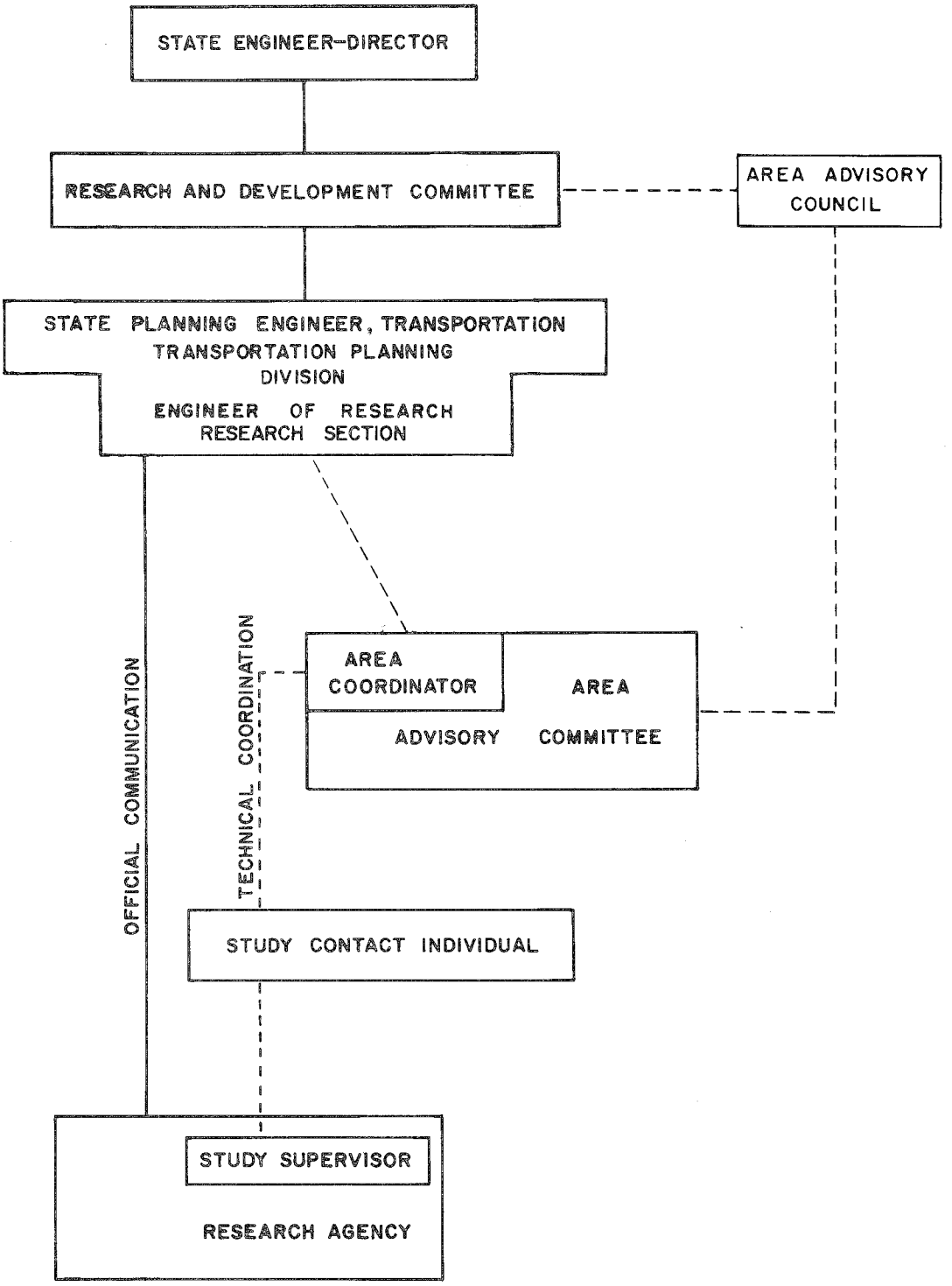


ORGANIZATION AND FLOW CHART

FOR

COOPERATIVE RESEARCH PROGRAM

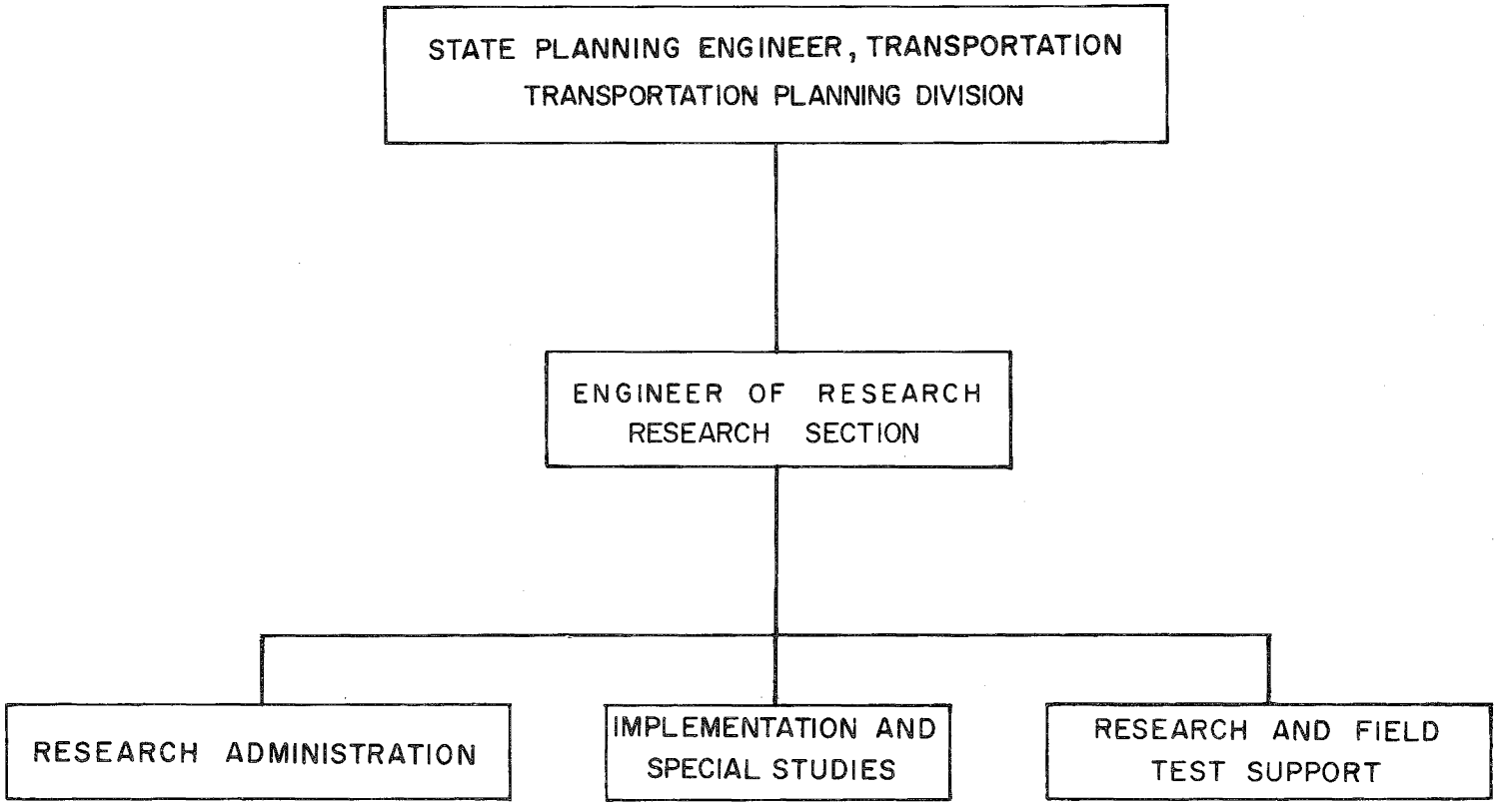
Figure No. 1



ORGANIZATION AND COMMUNICATION FLOW CHART FOR RESEARCH PERSONNEL

Figure No. 2

ORGANIZATION CHART
D-10 RESEARCH



RESEARCH SECTION

Figure No. 3

C. Area Advisory Committee

1. Organization

The Area Advisory Committee is composed of Department personnel and consists of a chairman elected by its members, an area coordinator, and members. The number of members will vary in accordance with the needs of the study area concerned. They will be selected from those Districts and Divisions having expertise in the appropriate Research Program area. The Area Coordinator will act as the secretary of the Committee. (See Figure 4, page 9)

2. Responsibilities of Area Advisory Committee
   a. To function as an advisory committee for the studies assigned in the general area.
   b. To anticipate and recommend research needs in the assigned area of responsibility.
   c. To assist in the dissemination and application of study recommendations, preferably in the form of a committee report, and to implement research findings and conduct demonstration studies.

D. Area Advisory Council

1. The Area Advisory Council is composed of the chairmen of each of the Area Advisory Committees.
2. Responsibilities

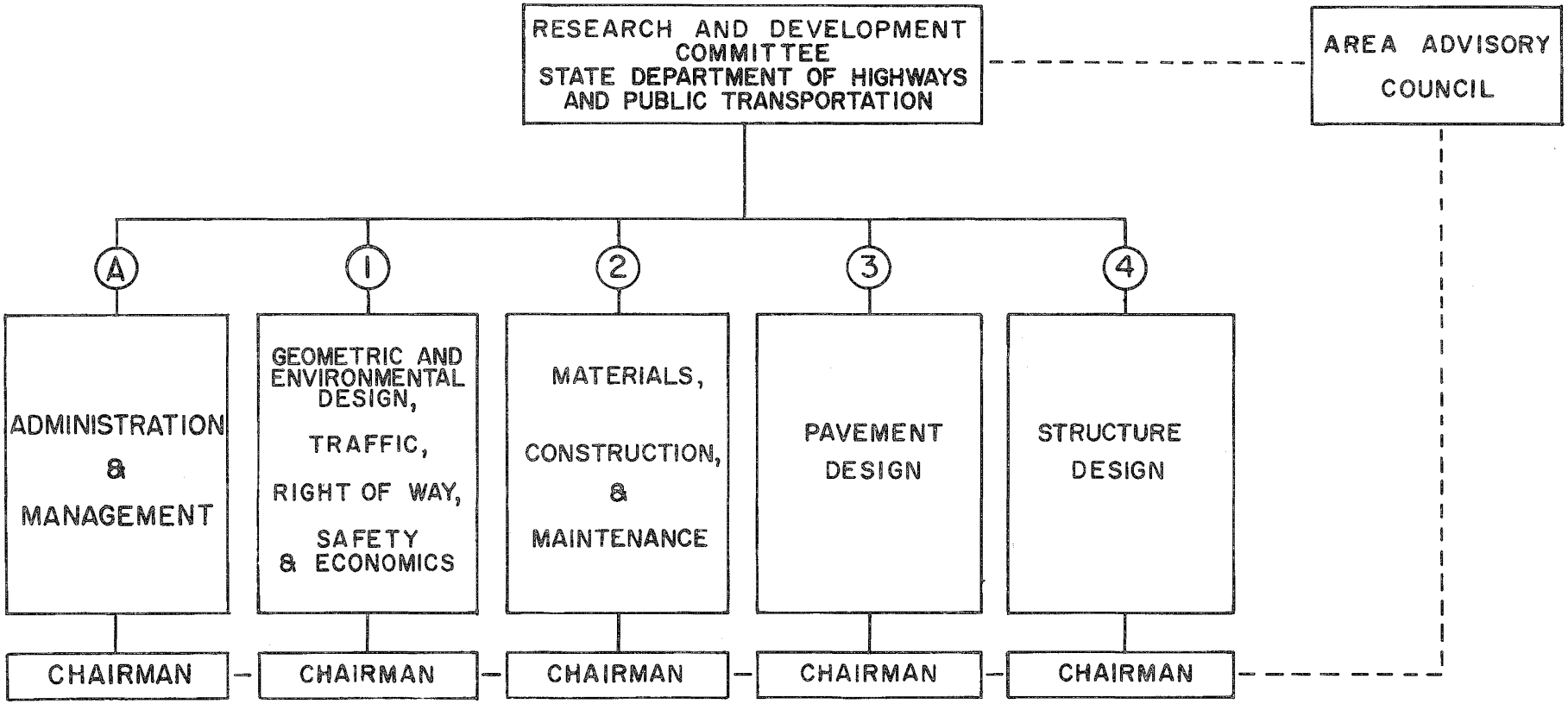
To function in an advisory capacity to the Research & Development Committee in recommending research program priorities, providing suggestions for guidance of on-going research studies, and encouraging implementation of research results in all areas. (See Figure 4, page 9)

E. Area Coordinator

1. The Area Coordinator is a member of the Area Advisory Committee.
2. Responsibilities
   a. To perform the duties of the secretary of the Area Advisory Committee.
   b. To express the wishes of the Area Advisory Committee in regard to area studies within the scope of the committee.
   c. To handle routine matters connected with the area of research assigned. This includes, but is not limited to, the review of the study reports, study proposals and study renewals.
   d. To recommend appropriate application of area research results to Departmental specifications, standards, techniques, etc.
   e. To coordinate appropriate matters with the area committee members, contact individuals, study supervisors, and the Engineer of Research.
   f. In conjunction with the committee chairman, to call meetings of the Area Advisory Committee when the need arises.

F. Study Contact Individual

1. The study contact individual is the Departmental individual appointed by the Division sponsoring the specific study.



AREAS OF RESEARCH

FIGURE NO. 4

2. Responsibilities

   a. To function as a liaison individual between the study supervisor, the area research coordinator and the Engineer of Research on matters related to his assigned study.
   b. To maintain surveillance of the assigned study, noting its progress and direction, cognizant of its objectives as outlined in the study agreement.
   c. To render a quarterly report on study progress. (See Figure 14, page 38. See also page 37, paragraph 6.)
   d. To recommend appropriate application of research study results to Departmental specifications, standards, techniques, etc.
   e. To keep the assistant contact individual informed on all matters of significance, such as meetings, test schedules etc. Also, to obtain comments and recommendations regarding the review of draft copies of reports, resolve differences, consolidate the recommendations and submit the comments to the State Planning Engineer, Transportation.

3. The Assistant Contact Individual shall assist the contact individual in each of the above responsibilities in his area of expertise.

G. Study Supervisor

1. The Study Supervisor will be responsible for the conduct of the study under the direction of the agency or division. The individual selected will be indicated on the Study Agreement.
2. Responsibilities
   a. To conduct the study in accordance with the approved study agreement.
   b. To direct the personnel working on the study and to execute the work in accordance with the approved plan of research.
   c. To maintain a close liaison with the study contact individual.
   d. To document the study and render required reports.
   e. To assist as required in the implementation and demonstration of study results.
   f. To render a quarterly report on research progress. (See Figure 13. See also page 34, paragraph 5.)

IV. FORMING THE ANNUAL RESEARCH PROGRAM

A. General

The Cooperative Research Program of the State Department of Highways and Public Transportation is initiated on an annual basis. Study work plans are approved for one year at a time, and funding does not overlap from one fiscal year to the next. The Department's fiscal year begins on September 1st and terminates on August 31st of the next year. Studies approved for activation on September 1st are products of almost a year's preparation, which involves problem statement review and prioritization, review of the resulting proposals which address the higher priority problems, and acceptance of the best proposals for our highest priority research needs. Many of the studies needed in a given fiscal year must be deferred because of budget restraints.

The following procedure is adhered to for the usual fiscal year program development, although study proposals may be submitted at any time during the year.

B. Initiation Steps

1. Problem statements are requested from the Department's divisions and districts for submission to the four Research Area Advisory Committees. (See Figure 5, page 12)

2. Each Research Advisory Committee meets to establish the priority of the problem statements in line with Departmental needs, and to formalize its recommendations for the Research and Development Committee.

3. After the Area Advisory Committee meetings have taken place, the chairmen of the areas (collectively known as the Area Advisory Council) meet with the Research and Development Committee to recommend the highest priority problems for research. The R & D Committee synthesizes the council's recommendations into a composite of priority research needs.

4. The Research Agencies respond to these priority problem statements with proposals for research (see Chapter V, page 16). One unsigned copy of the proposal (or renewal, if the study is continuing from the last year) is submitted to the State Planning Engineer, Transportation, on or before April 1st for review and recommendations.

5. The State Planning Engineer, Transportation, will distribute copies of the proposal/renewal for recommendations as follows:

   a. 1 to each member of the R & D Committee
   b. 1 to each contact division
   c. 1 to the appropriate area coordinator
   d. 4 (or 5, if proposal) to the FHWA

6. The Research and Development Committee, with the recommendations of the Area Advisory Council, will evaluate and recommend a Research and Development Program commensurate with Departmental needs and available funds.

RESEARCH PROBLEM STATEMENT

YEAR _____

I. PROBLEM TITLE: _____

_____

II. PROBLEM STATEMENT: _____

_____

_____

_____

_____

_____

_____

III. RESEARCH PROPOSED: _____

_____

_____

_____

_____

_____

_____

IV. URGENCY: _____

_____

_____

V. SUBMITTED BY: _____

_____

_____

_____

_____

Figure 5
Research Problem Statement Form

7. After the studies are approved by the Federal Highway Administration, a recommended fiscal year program is formulated by the Research and Development Committee.

8. The State Planning Engineer, Transportation, will notify the appropriate Department employees and agencies of studies approved for the fiscal year, and will request four signed copies of the Study Proposal/Renewal Agreements and four signed copies of the Cooperative Research Program Agreement from the Research Agency. (See Figure 6, pages 14 & 15)

9. The recommended Cooperative Research Program is then sumitted to the Engineer-Director for approval in the form of a cooperative Research Program Agreement between the Department and each Research Agency. The Department's in-house research program is submited as an Activation Order for signature.

10. When the overall program has been approved by the Engineer-Director, the State Planning Engineer, Transportation, distributes fully executed copies of the individual proposal/renewal agreements as follows:

    a. 2 copies to the Research Agency
    b. 1 copy to the Finance Division (D-3)
    c. 1 copy to the Research Section (D-10R)
    d. 1 Xerox copy to the contact division(s)

11. The Cooperative Research Program Agreements are distributed similar to the individual proposal/renewal agreements above, except that copies are not furnished to the contact division(s). The Department's Activation Document is sent to D-3 and D-10R only.

12. Based upon the above Activation Document and Cooperative Research Program Agreements, the annual Cooperative Research Program is submitted to FHWA for approval.

13. Upon notification by the State Planning Engineer, Transportation, D-3 will issue a Research Fund Authorization (RFA) for each approved study, thereby authorizing funds and setting up an account with the Department for study charges.

    Monies allocated under Budget Item C for the Department will not be issued at this time. Issuance of these funds must be requested by the Research Agency.

    In the case of Departmental in-house research, the Budget Item C may set aside funds for another district or division of the Department, or for assistance by one of the Research Agencies. These funds, likewise, will not be issued by D-3 unless authorized by the Departmental study supervisor.

    All RFA requests must be submitted formally to the State Planning Engineer, Transportation, containing, as a minimum, the following information:

    a. The research study involved
    b. The amount of money to be issued
    c. The party to receive the funds
    d. The intended use of the funds.

    The State Planning Engineer, Transportation, will forward the request to D-3 for action. No charge will be accepted on any study unless authorized by an RFA. RFA's automatically terminate on August 31st.

(Name of University, if applicable)

and

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

COOPERATIVE HIGHWAY RESEARCH PROGRAM AGREEMENT

For Fiscal Year September 1, 19__, through August 31, 19__

State and Federal Aid Projects

Research Agency: _____

The program listed on Exhibit A attached hereto and described in the respective project agreements is hereby approved for activation under the terms of a Cooperative Research Agreement dated _____, _____, between the _____ and the State Department of Highways and Public Transportation relative to highway research. The conduct of each study is contingent upon availability of funds. Transfer of funds between approved projects during the fiscal year may be made when requested in writing by the Director of the _____ and approved by the Research and Development Committee of the State Department of Highways and Public Transportation.

The conduct of the work shall comply with all governing rules and regulations pertaining to the use of federal research funds as set forth in the applicable policy and procedures documents of the U.S. DOT, FHWA and the Department. This includes Volume IV, Chapter 1, Section 2, Subsection 2, of the FHPM and the DHT "Manual of Procedures for Research Studies." In case of conflict in requirements between Federal Guidelines and Texas State Department of Highways and Public Transportation Manual, the manual provisions will govern. The FHPM requires that the following procedures be included in this agreement. The FHPM numbers are indicated for convenience as follows:

Paragraph 6a(5) - Disputes which may arise shall be resolved by the signatories of this agreement, or their designated representatives, through negotiation and satisfactory to FHWA if appropriate.

Paragraph 6a(6) - As between the parties hereto (name of agency) _____ agrees to accept responsibility for the acts of its subcontractors, agents or employees and to save FHWA harmless from claims and liability due to negligent acts of its subcontractors, agents or employees but only to the extent of its legal authority so to do.

TEXAS STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION		(Name of Research Agency)	
_____	_____	_____	_____
State Planning Engineer, Transportation	Date	(Title of Agency Head and name of Research Agency)	Date
_____	_____	_____	_____
Engineer-Director	Date	President (Name of University if appropriate)	Date

Figure 6
Cooperative Highway Research Program Agreement

Exhibit A

---

and

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

COOPERATIVE HIGHWAY RESEARCH PROGRAM AGREEMENT

For Fiscal Year September 1, 19 __through August 31, 19 ___

State and Federal Aid Projects

RESEARCH STUDY RENEWALS

Study No.	Title	Study Budget
	Total (Renewals)	

RESEARCH STUDY PROPOSALS

Study No.	Title	Study Budget
	Total (Proposals)	
	Total Research Study Program	

Figure 6 (Continued)

V. THE STUDY PROPOSAL/RENEWAL

A. General

Each study accepted into the Department's yearly program must be represented by a study proposal or renewal statement. A new study is termed a proposal; a study which is being extended for another year is called a renewal.

Study proposals may be submitted by the Research Agency or the Department to the State Planning Engineer, Transportation, any time during the year as the need arises. The cost of preparing the proposal will be borne by the submitting agency.

Following is a discussion of the various parts of the proposal/renewal. It should be remembered that certain study proposals or renewals may require information which has not been anticpated in the following discussion.

B. Discussion of the Parts of the Proposal/Renewal

1. The signature page. (See Figure 7, page 17)

   a. Fiscal Year - The Department's fiscal year runs from September 1st through August 31st.

   b. Study Type - A study is designated as either Type A or B.

      (1) Type A Study - The total cost exceeds $50,000 or more than two years are required for completion. This is a large-scale study which is regional or national in scope.

      (2) Type B Study - The total cost is $50,000 or under, or it requires two years or less to complete. This is a small-scale study involving local or regional problems. It can also be an exploratory, survey or feasibility study; an experimental construction study; or an implementation effort.

   c. Study Title - The study title should be a short but descriptive statement of the specific objective of the study. General titles omitting important key words are discouraged and are subject to Departmental change. For example, the title "A Study of Pavement Characteristics" is poor because it does not define the type of pavement studied nor the characteristics. A better title may be "A Study of Fatigue Characteristics of Selected Asphalt Pavements".

   d. Study Number - The study number will be supplied by the Department. Study numbers consist of four parts. In our example number, 1-10-63-50, the first number from the left (the "1") indicates the agency performing the study, in accordance with an established code. The second number is the Departmental division responsible for monitoring the study progress, in this case D-10, the Transportation Planning Division. The third number is the year the study began. The fourth number is the definitive study number, assigned on a consequtive basis as the new studies are approved. Once assigned, the definitive study number is never used for another study.

STUDY PROPOSAL/RENEWAL
AGREEMENT

BETWEEN
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

AND

_____

_____
(Agency)

For Fiscal Year: 198___-198___ Study Type _____

Study Title: _____

_____

Study Number _____ _____ _____ ____ Federal No. _____
Agency Div. No. Beg. Yr. No.

This is the _____ year of a _____ year study.

Estimated Total Study Cost: $_____

Expenditures through August 31, 19___(Renewals only) $_____

Estimated Cost for: September 1, 19___ to August 31, 19__ $_____

Estimated Additional Cost to Completion of Study: $_____

Proposal/Renewal Prepared by: _____ Date: _____

Study Supervisor: _____ Title _____

Recommended for Approval:

_____ Date: _____
(Official Title-Agency Head)

_____ Date: _____
State Planning Engineer, Transportation
Transportation Planning Division

_____
Date Approved by FHWA

Figure 7
Proposal/Renewal Agreement Signature Page Page 1 of ___

e. Federal Number - The federal number indicates the FHWA's HPR (Highway Planning and Research) year of funding. This number is supplied by the Department.

f. This is the ____ year of a ___ -year Study - The first space indicates how many years the study has been active, including the present year being renewed. The second space indicates the researcher's forecast of the total number of years the study will be active.

g. Estimated Total Study Cost - The projected cumulative cost for all years the study is to be active.

h. Expenditures through August 31, 19__ - The total estimated study expenditures from the beginning of the study through the last approved year of activity.

i. Estimated Cost for September 1, 19__ to August 31, 19__ - The total estimated study budget for the fiscal year's work being proposed.

j. Estimated Additional Cost to Completion of Study - This figure represents the difference between the amount discussed in g above and the total of the amounts indicated in h and i, above.

k. Proposal/Renewal Prepared by _____ and Date - The name of the person(s) preparing the proposal/renewal and the date prepared. If it is modified prior to approval, the date shall represent the latest modification.

l. Study Supervisor and Title - The name and title of the individual responsible for carrying out the study and the title of the academic or other position held by the supervisor at the research agency. The study supervisor must provide a biographical data sheet with each study proposal submitted. This should be concise, perferably one page, and relevant to the study concerned. Data sheets are not required on renewals unless there has been a change of supervisory personnel or the addition of a major objective. (See Figure 8, page 19)

m. Signature Space for Agency Head and Date of Signature - Below the space provided should appear the signatory's offical title and agency affiliation.

n. Signature Space for the State Planning Engineer, Transportation, and Date - This signature is required on all proposals/renewals.

o. Date Approved by FHWA or UMTA - This date is supplied by the Department when FHWA program approval is received, or when UMTA approval of the specific technical study is received.

p. Page Number - The signature page is always the first page of the agreement. The page numbering will be designated with the specific number of the page followed by the total number of pages in the agreement. If the agreement has ten pages, then the signature page would be designated as "Page 1 of 10"; the next page would be "Page 2 of 10" and so on.

RESEARCHER'S BIOGRAPHICAL DATA

NAME: AGE: DATE PREPARED:

TITLE:

EDUCATION:

AREA OF SPECIALIZATION:

EXPERIENCE:

PROFESSIONAL LICENSES:

PUBLICATIONS:

OTHER INFORMATION: (i.e., society memberships, honors, patents, etc.)

Researcher's Biographical Data

Figure 8

2. The Itemized Budget Page - (See Figure 9, page 21)

Careful consideration should be given in making the individual item cost estimates in order that the total estimates will be as accurate as possible. This procedure will make it possible for money available to be programmed to the best advantage in establishing an overall research program.

a. Direct Costs - This category includes costs directly attributable to attainment of the study objective. These costs include salaries, travel, supplies, equipment, etc.

(1) Salaries and Wages - All salaries and wages as well as full or fractional man-year equivalents are required for the following three categories:

(a) Professional services
(b) Subprofessional and Technical services
(c) Clerical services

(2) Expendable Supplies and Miscellaneous Expenses - The following items should be included, if applicable:

(a) Goods and Supplies - These include office supplies; minor parts and materials; minor equipment; electrical, plumbing and building supplies; computer cards; laboratory supplies; stationery; photographic film; paper and reproduction supplies.

(b) Postage

(3) Operating Expenses

(a) Travel This includes private car mileage, per diem, public transit fare, etc. - Out-of-State travel must have prior Departmental approval. (See page 44, paragraph E)

(b) Other Operating Costs - Includes reference materials and books, registration fees, photographic developing; maintenance and repair of study equipment; freight, etc.

(4) Equipmental Rental - List items to be rented and estimated cost.

b. Indirect Costs - These are clerical, accounting, bookkeeping, ordering and other similar services rendered to the study for which no charge is otherwise made. (See page 3, paragraph V)

c. Services and Equipment to the provided by the Department - If the Department's aid is to be enlisted in any phase of the study, funds must be budgeted in order to issue the appropriate RFA at a later date. (See page 13, paragraph 13) Failure to include this item will nessitate an amendment to the agreement prior to issuance of funds. Possible items for budgeting are:

(1) District or Division Testing - Materials testing, dynaflect, Mays Meter, Benkleman Beam, core drilling, skid testing, etc. Prior contact with Departmental personnel for cost estimates is recommended.

Study Number and Title

Estimated Budget for the Period September 1, 19___ to August 31, 19___

A. Direct Costs

Salaries and Wages

Professional Services	(	man-yr.)	_____
Subprofessional and Technical Services	(	man-yr.)	_____
Clerical Services	(	man-yr.)	_____
Total Salaries and Wages			_____

Expendable Supplies and Misc. Expenses

Goods and Supplies		_____
Postage		_____
Total Supplies		_____

Operating Expenses

Travel		_____
Other Operating Costs		_____
Total Operating Expenses		_____

Equipment Rental (List equipment) _____

Total Direct Cost _____

B. Indirect Costs _____

C. Services and equipment to be provided by the Department

District or Division Testing	_____
Equipment Purchase (List equipment)	_____
Other (specify)	_____
Total Departmental Services	_____
Total Study Cost	_____

Figure 9
Proposal/Renewal Itemized Budget Page

Page 2 of ___

2c (continued)

(2) Equipment Purchase - List items to be purchased. Purchase of research equipment is made through Departmental channels; therefore, funds must be made available to the Department from the study account.

3. The Body of the Proposal/Renewal

a. Study Problem Statement - This should be a clear and concise statement of the problem to be addressed by the proposed research.

b. Background and Significance of Work - This should include:

(1) A description of the findings of a literature search, or other indication of existing technology on the subject. A computer information search will be made by the HRIS for the Department for any new study or new task in an existing study. These searches will be requested for all high-priority problem statements after the annual Research Advisory Council meeting. However, the researchers are responsible for making their information needs known to the Department as soon as possible. These searches will be made available to the researcher for reference during development of the proposal. The HRIS computer search should accompany the submission of the proposal to the Department. (For further details on HRIS and other sources of information, see Chapter IX paragraph L, page 45.)

(2) An indication of the researcher's understanding of the underlying principles involved.

(3) A discussion of the researchers's approach to the problem.

c. Objective of the Study - Each study has a clearly defined objective (or objectives) supported by the tasks which mark specific phases of the research. The objective should be phrased in positive terms (i.e. "to develop", "to determine", or "to measure" rather than "to investigate" or "to study"). The objective statement should be supported by a concise description of the results being sought. The description should include anticipated formal reports (interim and final) as they relate to specific study tasks or objectives, if there is more than one study objective.

Scheduling of tasks to accomplish the objective will be shown on the Time Phase Chart (the Schedule of Research Activities). (See Figure 10, page 23 See also discussion on page 25, paragraph g)

If a renewal includes a new objective, it must be clearly designated as such and fully justified in light of the original proposed study and recent Departmental problem statements.

Where some latitude exists in the selection of the scope of a study, maximum and minimum objectives should be stated, indicating the range the study may have and remain a profitable endeavor. In this case, the maximum and minimum applications, benefits, costs and study duration should also be stated.

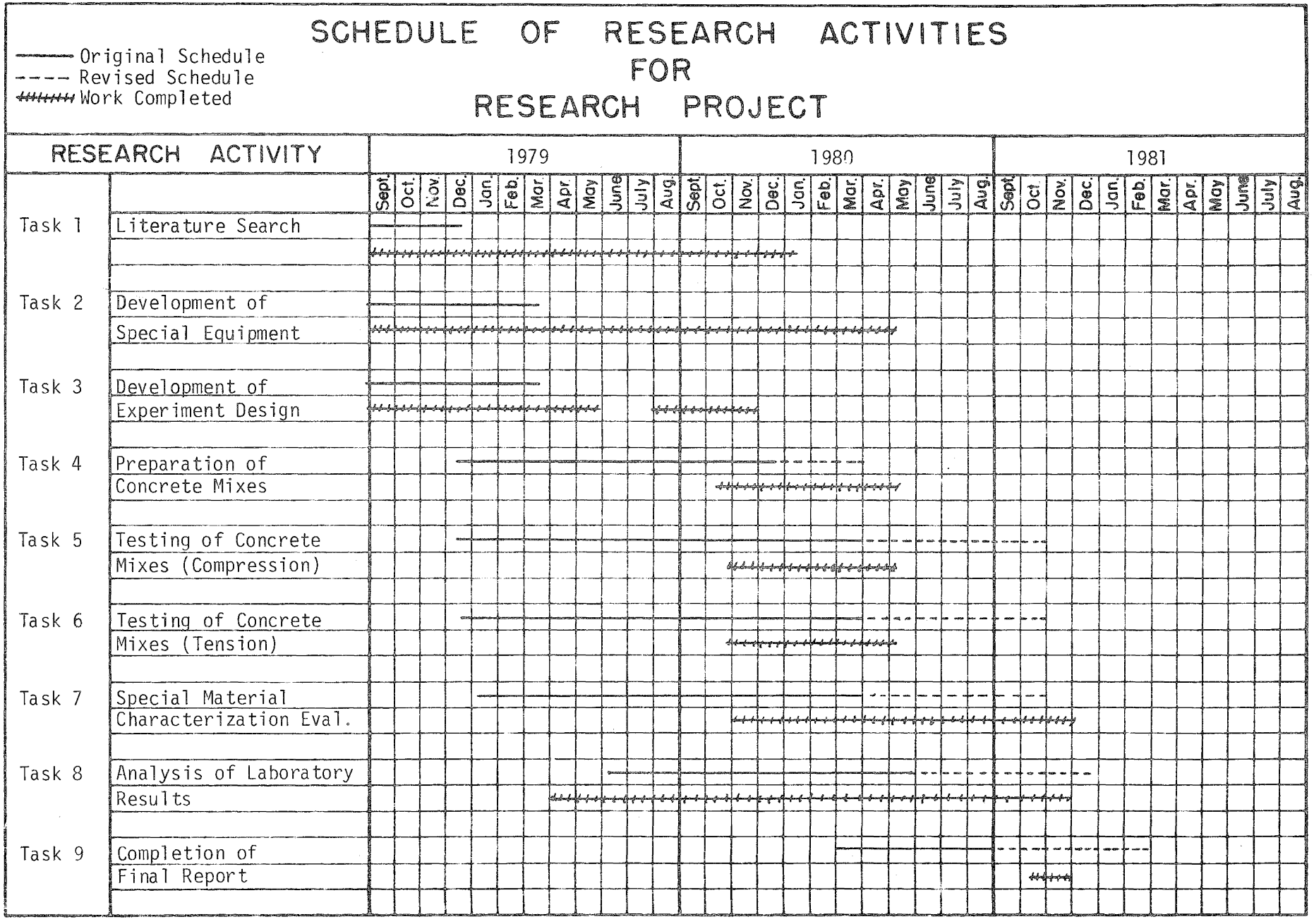


Figure 10 - Time Phase Chart

d. Implementation (Application of Research Results) - The HP&R research and development program ordinarily directs its primary research effort toward the solution of operational problems. Most of the research performed under this program, other than theoritical studies, is undertaken with the expectation that the findings can be translated into immediate practice. The proposal should include the researcher's assessment of potential areas for application of the research findings, such as changes in specifications or standards, policy statements and other Department practices. For theoretical studies the researcher should indicate the potential of the new knowledge in the ultimate solution of problems. Preparation of this portion of the proposal may be facilitated if the researcher discusses the subject with Departmental personnel concerned with operations in the area to be studied. For studies which are expected to provide results which may be utilized either during the progress of a study or shortly after completion, the proposal should include the researcher's assessment of:

(1) The form in which the findings might be reported (mathematical model or formula, laboratory test procedure, design techniques etc.)

(2) The organization logically responsible for application of the results. (i.e., American Association of State Highway and Transportation Officials, Federal Highway Administration, State Department of Highways and Public Transportation, etc.)

(3) The specific medium of practice that would be changed by the findings. (i.e., AASHTO Standard Specifications, State Department of Highways and Public Transportation Standard Specifications, etc.)

(4) The means by which the research findings might best be conveyed to operational people for utilization or application (circulation of written report resume, personal contact between Departmental research and operating engineers, demonstration, movie, slide-tape presentation, etc.)

e. Benefits - Benefits anticipated from the study findings should be indicated. These may be discussed in terms of savings in time money, energy, increased safety, better service or improved aesthetic quality. Reduction in the initial cost of a product or an improvement in its durability are also possible benefits.

f. The Work Plan - The Work Plan should be outlined in considerable detail as a guide to the study supervisor during the course of the study. Not only will this Work Plan be of value to the study supervisor, but to all connected with the program. It should fully describe the plan or approach that the supervisor intends to use and specify how the study will be structured and performed, showing how and when each element of the objective will be accomplished. The elements of the activity required to accomplish the objectives, with estimated timing, should be summarized on a chart as shown in Figure 10. (See also discussion on page 25, paragraph g)

(1) The work plan of a research study should contain the following information:

(a) Principles or theories to be used
(b) Possible solutions to the problem
(c) Critical experiments to test the applicability of the theory
(d) The kind and range of variables to be tested
(e) Facilities available
(f) Data analysis and statistical procedures

(2) If the study is a development study, the following items should be included in the work plan:

(a) The device, process, material or system to be developed
(b) The research upon which the development is to be based
(c) The method to be used to solve the problem
(d) The kind and range of variables considered in the development
(e) Facilities available
(f) Data analysis procedures to be used, including statistical methods

g. Time Phase Chart - A time phase chart will be included with each proposal/ renewal. The chart will show the objectives and tasks, and anticipated interim and final reports as they relate to the completed tasks. The chart shall be maintained throughout the duration of the study, updated versions being included with each study renewal. If additions or deletions in the objectives or tasks from the last year's agreement have been effected, the updated time phase chart should reflect these changes. An example of an acceptable chart is shown in Figure 10, page 23.

h. Level of Effort - This is an estimate of the percentage of the total effort and manpower the attainment of each objective or task represents. The presentation of this information in terms of each study year is desirable.

i. Facilities available - The general facilities at the disposal of the researcher for the conduct of the work should be discussed.

j. Staffing Plan - This should indicate the capabilities and staff organization and functions of the study personnel, with information on their availability and necessary augmentation to properly conduct the study.

k. Computer Programs - Any computer programs planned for development under the study should be noted. If there are none anticipated, this fact should be addressed. Computer programs developed for use by the Department must be programmed so that they will operate without modification on the Department's computer system. Futhermore, except in unusual cases, core storage requirements for each program should be restricted to 100,000 Bytes. Plans for all proposed automated procedure developments must be coordinated with the Division of Automation (D-19) for review of hardware and system requirements. Funds may be required for testing programs on the Department's computer system, and if so, the requirements should be included in the study budget. (For a further discussion of computer programs, refer to page 45, paragraph K)

VI. REPORTS

A. Purpose of Reports

Reporting procedures are designed to:

1. Assure establishment and maintenance of an adequately documented official record of all research and development studies;

2. Insure that work progress on a study is proceeding in accordance with the terms of a contract or agreement;

3. Provide for early disclosure of significant scientific and technical breakthroughs or the solution of problems;

4. Provide for final documentation and dissemination of technical findings; and,

5. Promote the implementation of study results.

B. Types of Reports

1. Interim and Final Reports

a. Submission and Publication Requirements

(1) Interim Reports - Interim Reports are to be submitted when major tasks or objectives of a study are completed as stipulated in the approved work plan, or when significant scientific breakthroughs are realized.

All published reports will be provided to the Department as soon as possible after approval and in no case later than 90 days after acceptance. If the 90-day deadline cannot be met, the Department should be notified as soon as possible of the approximate date the report will be published.

(2) Final Reports - A final report is required upon completion of each research study. It shall completely document all data gathered, analyses performed, and the results achieved. Also, it should list all inventions identified or certify that no invention was identified. For studies where a number of interim reports have been published, the final report may be a summary of all prior work, provided that adequate detailed documentation of the work completed has been published previously. All terminated study reports shall be submitted for review and approval at the the time of study termination (usually August 31st). If additional time to prepare the report is needed, a formal written request should be submitted to the Department prior to the August 31st deadline. In special cases a time extension is allowed. However, timely submission of reports is a requisite for federal participation in the study funding.

b. Uniform Provisions for Interim and Final Reports

(1) The report will include on completed Report Standard Title Page. This page will be the first right-hand page following the cover. If the report has a title page, it shall appear after the Report Standard Title Page. (See Figure 11, page 27)

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle		5. Report Date
		6. Performing Organization Code
7. Author(s)		8. Performing Organization Report No.
9. Performing Organization Name and Address		10. Work Unit No.
		11. Contract or Grant No.
12. Sponsoring Agency Name and Address		13. Type of Report and Period Covered
		14. Sponsoring Agency Code
15. Supplementary Notes		
16. Abstract		
17. Key Words	18. Distribution Statement	

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price

Form DOT F 1700.7 (8-69)

See directions on following page

Figure 11
Standard Title Page

GUIDELINES FOR FILLING OUT THE TECHNICAL REPORT DOCUMENTATION PAGE

Item 1. Report No. - The standard title page for each report should have a unique alphanumeric designation. As an example, research report 209-2F, published in 1979, will be presented as:

Operating Administration	State	Year of Issue	Serial No.
FHWA	TX	79	209-2F

The number should be written: FHWA-TX-79-209-2F.

Item 2. Government Accession No. - Leave blank.

Item 3. Recipient's Catalog No. - Leave blank.

Item 4. Title and Subtitle - The title should be the same as the report. Use all capital letters for the title. When a report is prepared in more than one volume, this block should show the main title plus the volume number and the subtitle for the volume being reported.

Item 5. Report Date - Indicate at least the month and year of the date shown on the report.

Item 6. Performing Organization Code - Leave blank.

Item 7. Author(s) - Give name(s) in conventional order (John R. Doe) and list the author's affiliation if it differs from the performing organization (Item 9).

Item 8. Performing Organization Report No. - Write the report number. (Such as 209-2F).

Item 9. Performing Organization Name and Address - Give Research Agency's name, city, state and zip code. List no more than two levels of the organization.

Item 10. Work Unit. (TRAIS) - Leave blank.

Item 11. Contract or Grant No. - Insert the complete study number. If this space is left blank, the report will not be accepted by NTIS.

Item 12. Sponsoring Agency Name and Address - Insert: Texas State Department of Highways and Public Transportation; Transportation Planning Division; P. O. Box 5051, Austin, Texas 78763.

Item. 13. Type of Report and Period Covered - Indicate either interim report, final report, etc. For interim reports, indicate the time period covered - if applicable.

Explanation
Figure 11

Item 14. Sponsoring Agency Code - Leave blank.

Item 15. Supplementary Notes - Indicate that the study was conducted in cooperation with the U.S. Department of Transportation, Federal Highway Administration. In addition, insert the study title if it is different from the report title.

* Item 16. Abstract - Include a brief (not to exceed 200 words) factual summary of the most significant information contained in the report. This should include advice on how the results of the research can be used or applied, when applicable. If the report contains a significant bibliography or literature review, it should be included.

** Item 17. Key Words - Select terms or short phrases that identify the principal subject in the report, and that are sufficiently specific and precise to be used as index entries for cataloging. The authorized term index in the HRIS publication "Highway Research in Progress" may be helpful in this regard.

Item 18. Distribution Statement - If applicable, insert the words "No Restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161." Otherwise, leave blank and describe the situation in the accompaning correspondence.

Item 19. Security Classification (of this report) - Insert the word "Unclassified".

Item 20. Security Classification (of this page) - Insert the word "Unclassified".

Item 21. No. of Pages - Insert the total number of pages, including title page and other front-matter pages.

Item 22. Price - Leave blank.

* This abstract may replace the one required previously in the front of the report.

** These key words may replace these previously required at the bottom of the abstract.

Explanation
Figure 11 (continued)

(2) A summary (preferably one page) will be included in the report, consisting of a clear, concise, popular statement of any significant developments, discoveries, breakthroughs, or other events, together with their meaning, potential application, and subsequent benefit to the Department. This summary should be prepared in popular language (devoid of complicated scientific terminology) so that persons in other disciplines may achieve an understanding of the research presented.

(3) Each report should contain a summary statement on research implementation. This statement should point out practical applications of the research findings, recommend procedures for implementation of expected benefits and/or recommend additional work needed to achieve implementation. The statement should be prepared as a cooperative effort between the researcher and appropriate state contact personnel.

(a) The implementation statement should answer such questions as:

[1]. Do the findings warrant

[a] the application of new procedures?
[b] the issuance of new specifications, standards, or designs?
[c] the use of new materials?
[d] the development of new equipment?

[2]. Do the findings indicate

[a] the rejection of proposed new procedures?
[b] a determination that no problem existed?
[c] an implementation for other positive benefits?
[d] a justification of other research needed?

(b) The report should indicate the proposed means and mechanisms for translating the research product into applicable form for use by operating personnel.

(c) The potential benefits to be derived from implementing the research findings should be in terms of savings in time, money, lives and energy, increased safety, better service, improved esthetics, enhanced capability of solving transportation problems that may accrue in the highway engineering profession, and other user and nonuser benefits. Where dollars are involved, an effort should be made to estimate the first-year savings and the expected subsequent average annual savings anticipated from application of the research results.

(d) If the findings were positive, but not suitable for immediate application, the report should indicate the extent of additional work needed to produce results suitable for implementation; i.e. additional research, development or field testing.

(4) A credit reference to the FHWA, such as the following, will be given:

"Prepared in cooperation with the U.S. Department of Transportation, Federal Highway Administration."

(5) A disclaimer statement similar to the following will be included:

"The contents of this report reflect the views of the author(s) who is (are) responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration. This report does not constitute a standard, specification, or regulation."

(6) A final report will also include the following statement, if applicable:

"There was no invention or discovery conceived or first actually reduced to practice in the course of or under this contract, including any art, method, process, machine, manufacture, design or composition of matter, or any new and useful improvement thereof, or any variety of plant which is or may be patentable under the patent laws of the United States of America or any foreign country."

A further discussion of patent requirements may be found on page 55, paragraph M.

(7) After a report has been accepted and published, the material contained therein is to be regarded as information in the public domain, and its further use (both oral and written) does not require approval. However, appropriate credit to FHWA as specified above is required.

(8) Unless otherwise instructed, the agency should submit ten (10) draft copies of the report to the Department for approval. The draft copies of the report will be distributed by the State Planning Engineer, Transportation, as follows:

(a) 5 draft copies of a Final Report to FHWA
(b) 4 draft copies of an Interim Report to FHWA
(c) 1 copy to File D-10
(d) 1 copy to the Area Coordinator
(e) 1 copy to each Division concerned (Attn: Contact Individual or Assistant)

(9) The research agency or researcher shall be free to copyright material or reports with the provision that the Department and FHWA reserve a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, the work for Government purposes.

(10) Research reports should be written in language which can be readily understood by those who will apply the study findings. For example, if additional research is needed, the language should be such that the researchers who will continue the work can readily assimilate and use the findings of the work completed. Reports on studies which are expected to produce an implementable product in the form of a device, procedure or the like must be written in a manner understandable to the user and in sufficient detail to permit the practicing engineer to the implement the items.

(11) All reports shall contain a metric conversion sheet in the front of the report similar to the one presented in Figure 12, page 33.

(12) All report pages shall be numbered consecutively, beginning with page 1 which is the first page of the body of the report. Appendices shall not be numbered differently than the report. Page numbers will continue uninterrupted through any appendices to the final page of the report.

2. Summary Reports

When a summary report is prepared it should accompany the final and interim draft report for approval. This report is a highly condensed version of an interim or final report and is oriented to the highway administrator responsible for setting policies, procedures, and engineering practices. The report should present the study's technical aspects, conclusions, and recommendations clearly and concisely so that the significance of the completed work can be quickly assimilated and can provide a basis for management decision. Concepts should be presented in plain language with study details omitted or briefly summarized. The provisions of paragraphs B1 b(4) (5) (7) (8) (9) (10) (pages 31 and 32) apply to summary reports. The following format may be used:

a. Introduction - A brief statement of the problem and study objectives.

b. Conclusions and Recommendations - A clear statement of study findings and their meaning to the highway administrators.

c. Implementation Guidelines - A practical statement of the innovations in policies, procedures, and engineering practices which will implement the findings, and the expected benefits of such innovations.

e. Demonstration Proposals - Objectives for experimentation or demonstration which may be undertaken before the innovations are adopted as standard practice.

f. References - Other study reports.

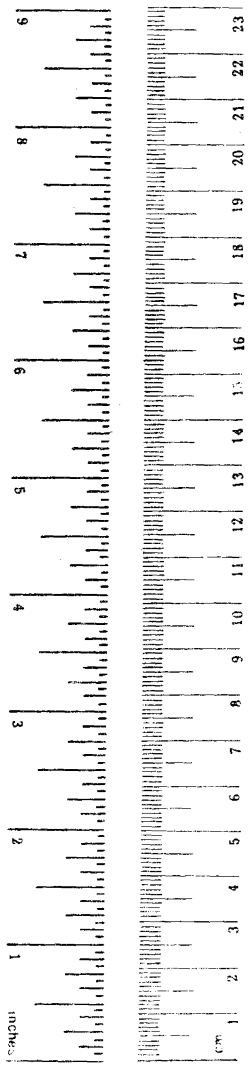
3. Film Reports

Where motion pictures, film clips, or sets of slides are produced in connection with a study, a minimum of one reproducible copy of the film or slide documentation is required for the Department. Additional copies may be requested on an individual basis. The master copy of any film produced should be available for subsequent use as necessary. The provisions of paragrpahs B1 b (4) (5) (7) (9) and (10) (pages 31 and 32) apply to film reports.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

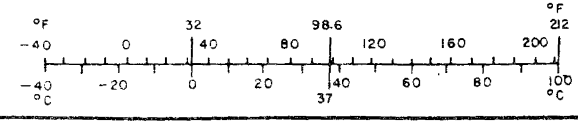


Figure 12
Metric Conversion Factors

Motion pictures which cost more than $500 to produce and are not specified in the approved agreement for the study require the prior approval of the Department.

4. Papers or Articles Presented or Published

   a. Papers (articles and bulletins) which contain significant technical findings from a study, previously undisclosed, shall not be presented publicly or published without prior approval by the Department.

   b. Submission of technical papers to professional or technical organizations such as the Transportation Research Board should be concurrent with submission through normal channels to the Department. This will allow sufficient time to satisfy the requirement for prior Departmental review and approval.

   c. All papers should contain the credit reference and disclaimer statement specified in paragraphs B1b (4) and (5) (page 31).

   d. In unusual cases, when the scheduled time for the preparation of a paper containing previously undisclosed findings does not permit time for formal review and acceptance, an abstract of the paper and notification of intent to present the paper should be submitted through normal channels for concurrence. To protect the interests of the sponsoring agencies, such presentations should contain (1) a statement that the sponsoring agencies have not reviewed the paper, (2) the disclaimer statement, and the credit reference specified on page 31 in paragraph B1b (4) and (5). Draft copies of these papers should be submitted to the Department for review and acceptance as soon as completed.

   e. Papers containing subject matter and technical findings substantially similar to that covered in a report which has been previously approved for publication do not require may further Departmental review or approval but should include the disclaimer statement and credit reference specified in paragraph B1b (4) and (5) (page 31).

5. Researcher's Quarterly Progress Reports

For all studies in the research program, quarterly progress reports shall be submitted by the researcher for each quarter. The quarter periods are September 1st through November 31st, December 1st through March 31st, April 1st through June 30th, and July 1st through August 31st. The first report is due at the end of the first quarter in which a study has been in an approved status for over 60 days, and as shortly after Dec. 1, March 1, June 1 and Sept. 1 as possible, but no later than the 10th of the month. The quarterly report rendered on September 1st is known as the annual report. Ten (10) copies of the progress reports are required and the State Planning Engineer, Transportation, will make distribution as follows:

a. 4 copies to FHWA
b. 1 copy to the Area Coordinator
c. 1 copy to each Division concerned (Attention - Contact Individual or Asst. Contact Individual)
d. 2 copies File D-10

The reports shall contain sufficient information to enable technical coordinators to evaluate the progress and possible future course of a study. The following should be included in each report: (See Figure 13, page 36)

a. Heading - pertinent data to identify the study.

b. Progress - summarization of work accomplished; specifically, items completed during the quarter ahead of schedule and those tasks behind schedule should be described. An estimate of the percentage of the total work accomplished through the quarter should be given.

   This percentage of work completed is based on a single year's work plan only, not on the entire study.

c. Finances - figures should be given showing the total estimated cost of the study, total amount of money spent to that date, estimated budget for the current year and expenditures for the current year to date.

d. Interim or Final Reports - an estimate should be given as to when the Department can expect submission of the next research report. The specific tasks or objectives of the study being incorporated into the reports should be identified.

e. Other Pertinent Information

   (1) Problems - technical problems, including comments or requests for assistance, should be described. Also, a change in principal investigator or indications of insufficient funds should be reported.

   (2) Research Implementation - a brief description of the potential application of significant technical information developed during the quarter should be given, as well as a description of steps being planned to implement these findings.

   (3) Planned Work - a description of work planned for the next quarter will be given.

   (4) Modifications - any planned modification to the work plan, changes in work tasks, proposed. Additional objectives, and in particular, any planned renewal of the study will be mentioned in detail, as well as a description of steps being planned to implement these findings. Changes in study personnel will also be noted. (See page 44, paragraph F)

   (5) Multi-discipline Studies - large studies involving a team effort of several disciplines may require periodic conferences in addition to quarterly reports. A complete record of such meetings shall be made and a copy furnished to the Department.

   (6) Third Quarterly Report (submitted June 1) - the third quarterly report will be expanded to give a more detailed up-to-date progress report. This report shall accompany and supplement the renewal statement when it is submitted for the next fiscal year program. The renewal statement, therefore, can be substantially shortened when supplemented by this quarterly report.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

COOPERATIVE RESEARCH STUDY QUARTERLY PROGRESS REPORT

_____
Research Agency

Date: _____

_____
Study Supervisor

Study No. _____ Title _____

_____

Date Study was Approved _____ Scheduled Termination Date _____

Total Estimated Study Cost $_____ Study Budget This F. Y. $_____

Study Expenditure for Previous Year(s)$_____

Current F. Y.	Sept.-Nov.	Dec.-Feb.	Mar.-May	June-Aug.
$Spent This Quarter				
$Spent This F. Y.*				
%Of Budget Used *				
%Of Scheduled Work* Accomplished				

Use the back of this sheet to elaborate on the following items, referring to each by number.

NOTE: If this is the third quarterly report (for March through May) and the study will be renewed next fiscal year, refer to the Manual of Procedures for Research studies, Chapter VI "Reports", paragraph 5e(6).

1. Summarize work accomplished this quarter. Specify tasks completed ahead and behind schedule.

2. Do you recommend implementation of any study findings now? If so, explain.

3. Indicate significant events and problems encountered. (technical problems, insufficient funds, etc.)

4. Do you recommend changes in tasks or objectives, finances, work schedule, principal investigators etc.? Advise when formal request for approval will be made.

5. Please indicate the estimated submission date of the next report, and the study objectives or tasks to be included therein.

6. Indicate any nonexpendable equipment purchased on the study during the past quarter.

7. Work plan for next quarter.

* Figures shown each quarter are cumulative from the beginning of fiscal year through the quarter reporting.

Figure 13

(7) Equipment Purchases - a description of all nonexpendable equipment purchased on the study during the quarter will be given.

6. Contact Individual's Quarterly Progress Report

Each contact individual is required to render a progress report on each study assigned. One copy of the report shall be sent to the State Planning Engineer, Transportation, by October 15th, January 15th, April 15th and July 15th. An example of an acceptable format for the progress report is found in Figure 14, page 38.

7. Research Implementation Report

Upon completion of each research study, and for three consequtive years thereafter, a form similar to the example in Figure 15, page 39, will be filled out by the Department's Research Implementation Section. The Implementation Section will coordinate the development of the Implementation Report with the researcher and the divisions concerned. If a completed study is determined to have no implementation potential, a statement to this effect in the initial Implementation Report will be satisfactory, and no further reporting will be required.

The initial Implementation Report will be submitted with the draft final report for each study, with subsequent annual reports submitted as a package within ninety days following completion of the fiscal year work program (by November 30th).

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

CONTACT REPRESENTATIVE
RESEARCH STUDY REPORT

I. RESEARCH STUDY NO. _____

II. RESEARCH STUDY TITLE _____

_____

III. DATE OF REPORT _____

IV. NAMES OF PERSONS INVOLVED _____

_____

V. Is the study progressing according to the work plan and objectives of the study as stated in the agreement?

_____

_____

_____

_____

VI. Has any of the research progressed to the point that implementation of the results should be started by the Department?

_____

_____

_____

VII. Have there been any minor personal changes or minor modifications of tasks on the study? _____

_____

VIII. REMARKS _____

_____

_____

CC: Division Head
Study Supervisor
Engineer of Research
Area Coordinator

_____
Contact Representative

Figure 14

RESEARCH IMPLEMENTATION REPORT

1. State	2. Study No.	3. Study Cost	4. Completion Date
5. Reporting Period (Show date of this report in the blank) _____study completion _____1 year later _____2 years later _____3 years later			
6. Study Title			
7. Objectives (Brief description)			
8. Findings (Brief description)			
9. Implementation Status			
10. What means, if any, have been used or are proposed to aid in implementing the findings? Describe.			
11. Estimated annual savings and other benefits from use of research			
12. Benefit/Cost Ratio_____			
13. Can other states implement or benefit from this study? How?			
14. Additional Comments:			

Figure 15
Research Implementation Report

VII

GUIDELINES FOR ASSESSING AND IMPLEMENTING RESEARCH RESULTS

A. General

The research performed was designed to meet the needs of the Department and therefore the findings of each study must be carefully assessed for use. Unless this essential step is carried out, the value of the research cannot be realized. The study is assessed for implementation potential several times during its life.

1. In the Study Proposal/Renewal (See page 24, paragraph d) - The researcher offers his assessment of the potential implementability of research results.

2. In the Researcher's Quarterly Progress Report (See page 35, paragraph e(2)) - The researcher presents a brief description of the potential application of significant technical information developed during the quarter.

3. In the Contact Representatives Quarterly Report (See Figure 14, page 38, item VI) - The study Contact Individual discusses any results of the study he feels should be implemented by the Department.

4. In the Research Report (See page 30, paragraph (3) - The researcher makes a statement of the implementability of the findings presented in the report.

5. In the Research Implementation Report (See page 37, paragraph 7) - At the time of study termination, the Implementation Section renders a report assessing the implementability of the research results.

B. Assessing Research Results.

In the evaluation of study results certain considerations are essential. The following points are presented as an aid and should not be considered as all-inclusive:

1. Do the study results have potential application?
2. Are the results practical for application to the highway system?
3. Where in the highway system can the results be applied?
4. Will the use of the results enhance the state-of-the-art?
5. What will be the economic result if the findings are applied to the highway system?
6. Should a demonstration of the results be made to the interested Divisions or Districts?

C. Implementing Research Results.

In order for the results of the study to be of value they must be appropriately implemented for use in the highway system. This may be accomplished by use of the following suggested procedures:

1. Apprise responsible individuals of the significance of the findings. (The value of personal contact cannot be overemphasized.)
2. Conduct demonstrations for organizations as appropriate.
3. Recommend that the results be integrated into the highway system by their inclusion into specifications, standards, procedures, methods or techniques.

VIII. EQUIPMENT, MATERIALS AND SUPPLIES

Guidelines for the determination of eligibility for participation in the purchase of equipment and instruments are:

1. the item is not of a nature normally used or required in the regular administrative or engineering operations of the contractor,
2. the item is required for, and will be used primarily on, work incident to the contract, and
3. the cost is considered reasonable.

It is required that certification of equipment items included in direct costs have been excluded from the indirect costs when submitting billings.

Supplemental to the definitions for classes of equipment given in Chapter II, paragraph X, page 3, the following methods and procedures for equipment acquisition, approval for purchase, reimbursement, and final disposition are given:

A. Agency-Owned Equipment. This equipment shall be available for the work of the study without rent or depreciation charges.

B. Expendable Equipment, Materials and Supplies. The estimated cost of this equipment shall be included in the budget as a separate category under "Expendable Supplies - and Miscellaneous Expenses (see page 20)," but each individual item does not have to be listed unless the unit cost exceeds $500. D-3 will be the Division responsible for determining the specific items of equipment, materials and supplies eligible for reimbursement under this category. Upon acceptance of the final report, such items shall be disposed of by the research agency and credit given to the study, if appropriate.

C. Non-Expendable and/or Special Equipment. The acquisition of equipment of this class for a research study may be handled in either of the following ways:

   1. The items may be rented by the research agency from the supplier and charged to the study upon written approval of the rental rate by the Department. This procedure should be used only if the items are not available for use from within the Cooperative Research Program.

   2. Equipment and instruments should be purchased by the Department in accordance with the cooperative Research Agreements (See paragraph 2c(2), page 22). The following steps should be used in purchasing equipment:

      a. All requests will be submitted to the State Planning Engineer, Transportation for correlation.

      b. If the requested items are not specifically itemized in the proposal, an explanation and justification as to the need must accompany the request. All purchases of nonexpendable equipment shall be reported in the next Researcher's Quarterly Report (See paragraph e(7), page 37).

c. Request should be made at least ninety (90) days prior to researcher's actual need for the equipment.

d. Upon receipt, if the equipment is found operationally satisfactory, the researcher must acknowledge receipt in writing to the State Planning Engineer, Transportation. This letter should contain all information which identifies the equipment:

(1) Equipment description - this includes the brand or trade name and model number
(2) Serial number - if no serial number is available then a Departmental tag number should be requested.
(3) Location of the equipment
(4) Date purchased
(5) Cost
(6) If the item is constructed, major component parts should be listed

3. If included in the approved budget, research and development equipment, devices, or systems may be built by the research agency. (Modification costs required to alter or change available equipment to perform a research function are also included in this category.) Component parts and materials may be purchased either by the research agency or the Department, with costs reimbursable when work order identity and properly supported vouchers are submitted. Component parts costing more than $500.00, not itemized in the proposal, will require specific approval from the Department. Requisitions for component parts to be purchased by the Department will be handled as indicated above.

Under the above procedures, actual maintenance and repair costs may be charged to the study.

All equipment, purchased or constructed, belongs to the Department and is to be identified accordingly. File D-4 is the Division responsbile for maintaining the equipment inventory. Disposition of equipment will be handled through the State Planning Engineer, Transportation, in coordination with File D-4. Expendable equipment, materials and supplies shall be disposed of by the research agency and credit given to the study as appropriate. The State Planning Engineer, Transportation, should be kept informed of the permanent location of research equipment.

It is the responsibility of the research agency (in the case of a Departmental study, the study supervisor), to insure the safekeeping and proper use of research equipment.

4. All nonexpendable research equipment will be inventoried by a Departmental representative once a year. Adequate prior notice of the representative's visit will be given to insure full cooperation of the research agency.

5. Upon completion of a study, a complete record of nonexpendable equipment shall be submitted to the Department with the final report. The record should include notes concerning the condition of the equipment and the agency's recommendation for disposition.

IX. GENERAL ADMINISTRATION, OPERATING PROCEDURES AND SERVICES

A. General

Smooth operation of the Cooperative Research Program depends to a limited extent upon written rules, procedures and regulations. Its success hinges to a far greater degree upon dedicated individuals doing what is required to make each task succeed. However, with dedicated individuals doing what is required and a few standard procedures and guidelines, recurring tasks can be accomplished with minimum effort. This chapter covers a few things that will be helpful to persons just entering the Cooperative Research effort as well as experienced researchers.

B. Notification Regarding Special Tests

In many studies special tests are required which have a unique significance to concerned persons. It is obvious that their witnessing of the test may prove to be of considerable benefit. In such cases, arrangements should be made for appropriate personnel to be present during the testing. The essential information should be telephoned to the Engineer of Research. In turn, the appropriate people will be notified both in the Department and the Federal Highway Administration.

C. Purpose And Use of Technical Memorandums

It is frequently advantageous for individuals involved in the Cooperative Research effort to communicate in writing with one another on technical matters. The means for this has been provided through the Department's and Research Agencies' Technical Memorandums. The Technical Memorandum should not be used as a means for official correspondence. Policy, procedures, action items, budget matters or other official commitments are not to be included in Technical Memorandums. Neither should a Technical Memorandum be referred to in official correspondence or in a report. It is signed by the writer, and as a matter of courtesy the Engineer of Research is provided an information copy to enable him to keep abreast with current developments. An advantage of the Technical Memorandum is that it is the most rapid means of mail communication. It goes directly from the writer to the addressee, by-passing all official channels.

The use of the Technical Memorandum is encouraged within the guidelines covered in the above paragraph. Departmental personnel can obtain the Department's Technical Memorandum form No. 1292 through File D-10, and Research Agency personnel can obtain the form through their respective organizations.

D. Scripts, Photographs, And Publicity

Occasionally, organizations prepare scripts for various purposes regarding matters involving the Cooperative Research Program. In all cases approval should be obtained through established lines of communication. Permission to use Departmental photographs should be cleared in this same manner.

A file is maintained in the Department regarding Department research publicity. It consists of newspaper articles, magazine articles, etc. Therefore, it is desired that D-10 be provided copies of pertinent publicity for the file.

E. Out-Of-State Travel

Out-of-state travel is not authorized unless specifically approved by the Engineer-Director. Requests for out-of-state travel should be submitted for each case through normal administrative channels. If out-of-state travel is forseen as a necessary task or a research study, this should be addressed in the research proposal/renewal (See paragraph 2a(3)(a), page 20). Normally out-of-state travel is not approved.

F. Major Changes In Personnel

A major change in study personnel is to be submitted to the Department for approval. Minor personnel changes involving the study should be noted in either the Researcher's Quarterly or Annual report. (See page 35, paragraph e(4))

G. Change In Objective And Scope

Changes in the objective or scope of a study which may have a significant bearing on the research shall be fully documented and forwarded for approval to the Department. Minor tasks may be modified or deleted by agreement between the Departmental contact individual and the researcher, provided the modifications are documented in the Study Contact Individual's Quarterly Progress Report. (See Figure 14, item VII, page 38)

H. Method Of Study

When the basic method of study outlined in the agreement is to be changed to a degree which may substantially affect the outcome of research, such changes shall be outlined in detail and forwarded to the State Planning Engineer, Transportation for approval.

I. Specialized Services

Specialized services required beyond those itemized in a study work plan shall be forwarded to the State Planning Engineer, Transportation, for approval.

J. Files and Records

All records, which include working files, test data, correspondence, etc., must remain intact for a period of three (3) years after the study has been financially closed out. In certain cases this may mean that the files must remain intact for a period of approximately five (5) years since it may take two years after termination to close out all financial matters. Futhermore, files should be considered open for inspection by responsible Department and Federal Highway Administration personnel at any time.

K. Computer Programs

Computer programs developed as a result of research are the property of the Department. As products of tax-supported research, copies of programs are available at cost. Computer programs provided to concerns outside of the Department should be accompanied by the following disclaimer statement:

> Please be advised that no warranty is made by the Texas State Department of Highways and Public Transportation, the Federal Highway Administration, or (the name of the agency responsible for the program) as to the accuracy, completeness, reliability, usability, or suitability of the computer program and its associated data and documentation. No responsibility is assumed by the above parties for incorrect results or damages resulting from the use of the program.

Computer programs forseen as a result of research should be addressed in the proposal or renewal. (See page 25, paragraph k)

A listing of computer programs developed through the research program is available from the D-10 Research Section (See page 49, paragraph 8).

L. Research Services Available

1. Library Services

Library facilities are available through the Cooperative Research Program located at the Texas Transportation Institute to provide research library service to the State Department of Highways and Public Transportation and Research Agencies. Requests for services should be addressed to the Engineer of Research.

2. Highway Research Information Service (HRIS)

HRIS is an automated information storage and retrieval system developed by the Transportation Research Board with financial support from state highway departments and the Federal Highway Administration. An HRIS run is a collection of computer printout sheets, each of which is an abstract of a report, magazine article, or research project dealing with a specific topic. (See Figures 16 and 17, pages 46 and 47) Requests for such runs should be directed to the Research Section, File D-10. The subject requested should be stated in the most specific terms possible.

3. Research Digest

The Research Digest is published by the D-10 Research Section for the purpose of informing Departmental and Research personnel of publications available. The publications are generally available on a loan basis only.

4. Information Exchange

Many new research ideas, techniques, and procedures are developed by Departmental personnel which are of value on a state-wide basis. Those who have developed or discovered such new ideas are encouraged to share them with the Department as a whole. To facilitate dissemination of the information, contact D-10 Research Section by any appropriate means.

25 133186

MODIFICATION AND IMPLEMENTATION OF THE RIGID PAVEMENT DESIGN SYSTEM

Carmichael, RF
McCullough, BF

Texas University, Austin; Center for Highway Research; Austin, Texas; 78712; Res Rept 123-26
Federal Highway Administration; 400 7th Street, SW; Washington, D.C.; 20590
Washington, D.C.

Intrm Rpt{; #CFHR-1-8-69-123-26; Jan 75; 229 pp
#FHWA/RD-760S0450

SUMMARY:
A revised rigid pavement system computer program, RPS-3, is presented and documented. Details of model changes are explained. The most significant changes were made in the traffic delay cost subroutine, TDS. The program's modularization is outlined and each new subroutine is flow charted and explained. A discussion of RPS-3 implementation is also included, to serve as a guideline for the program's future use. The report also contains a complete set of sample RPS-3 problems and a complete input guide as well as a discussion of the most common errors encountered in the use of RPS-3. This report is also intended to be a User's Manual for the RPS-3 program.

National Technical Information Service; u7612
Federal Highway Administration

ORDER FROM:
National Technical Information Service; 5285 Port Royal Road; Springfield, Virginia; 22161; PB-251204/4ST

Figure 16

HRIS Computer Printout

IDENTIFICATION GUIDE FOR AN HRIS RECORD OF AN ON-GOING RESEARCH PROJECT

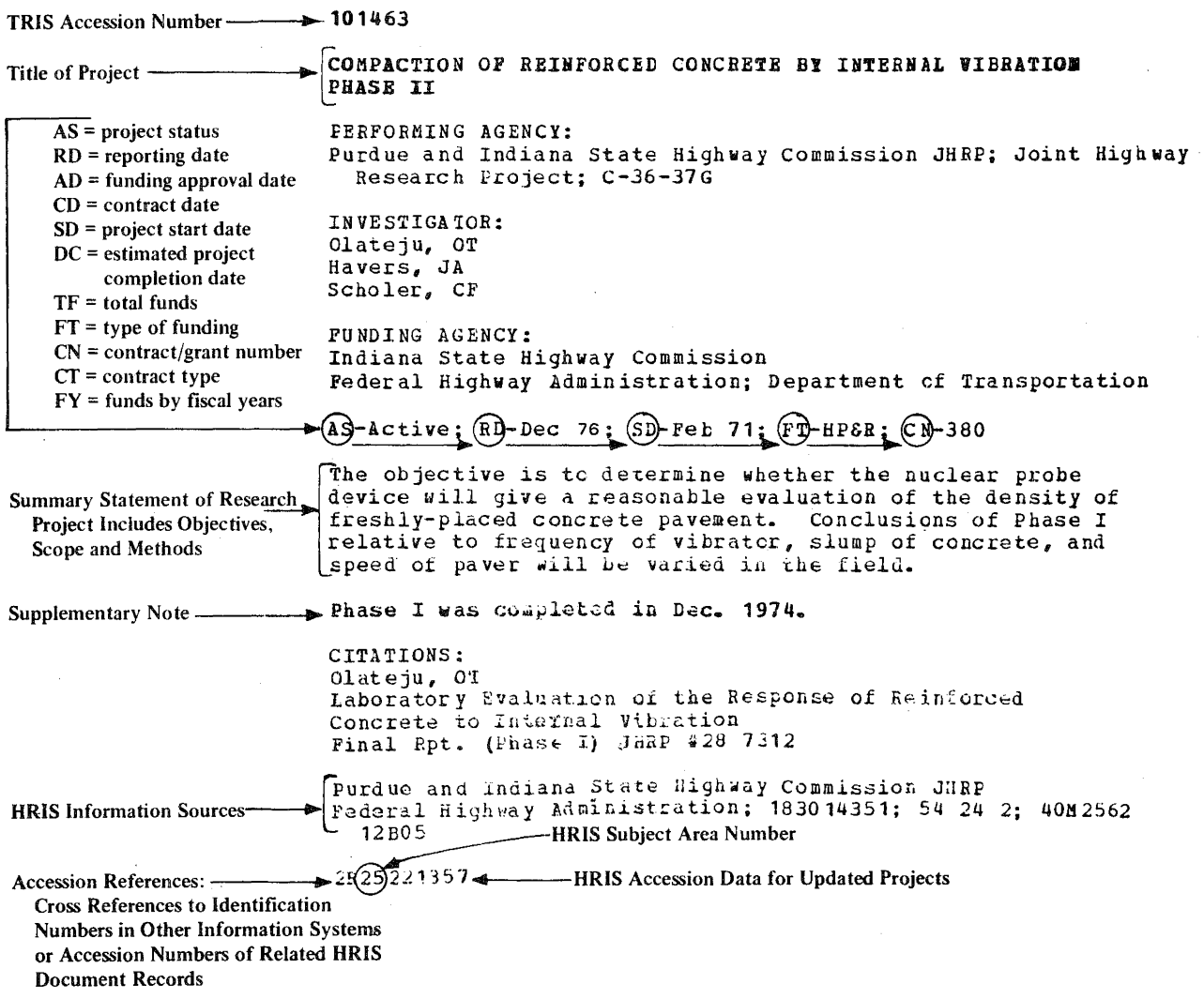


Figure 17

Identification Guide for HRIS Printouts

IDENTIFICATION GUIDE FOR AN HRIS RECORD OF A PUBLISHED WORK

JOURNAL ARTICLE

Document Record Number
TRIS Accession Number
HRIS Subject Area Number → 55 141072

Title → **A CAUSAL MODEL FOR ESTIMATING PUBLIC TRANSIT RIDERSHIP USING CENSUS DATA**

Authors → Dajani, JS; Duke University
Sullivan, DA; Duke University

Publication Data → High Speed Ground Transportation Journal; Planning Transport Associates, Incorporated; P.O. Box 4824, Duke Station; Durham, North Carolina; 27706

Document Data → V10 N1; 76; pp 47-57; 1 Fig.; 2 Tab.; 16 Ref.

Abstract → This paper applies a causal perspective to the study of travel behavior through the use of path analysis. The study develops a model of public transit use for work trips in the Raleigh and Durham, North Carolina Standard Metropolitan Statistical areas. The model is estimated with data from the 1970 Census of Population and Housing. It is successful in explaining 85 percent of the variance in use of public transportation. Auto ownership is the most influential variable determining use of public transportation.

RESEARCH REPORT

Document Record Number
TRIS Accession Number
HRIS Subject Area Number → 53 133169

Title → **FREEWAY STYLE DIAGRAMMATIC SIGNS IN NEW JERSEY**

Authors → Roberts, AW
Reilly, EF
Jagannath, MV

Publication Data → New Jersey Department of Transportation; Bureau of Operations Research; Trenton, New Jersey; 08625
Federal Highway Administration; Traffic Systems Division; Washington, D.C.; 20590

Document Data → Final Rpt.; #75-003-7757; Aug 74; 76 pp
#FHWA/HPR/T-0133

Abstract → Ninety-four freeway style diagrammatic signs were installed on I-287 in New Jersey, replacing 120 conventional signs at 22 interchanges. Traffic volumes and specific unusual maneuvers were counted and categorized for a seven-day period at each of 10 exit sites, both before and after the guide sign changes.

HRIS Information Source → National Technical Information Service; u7612

Availability → ORDER FROM:
National Technical Information Service; 5285 Port Royal Road; Springfield, Virginia; 22161; PB-250996/6ST

Document Order Data →

TECHNICAL PAPER IN A CONFERENCE PROCEEDINGS

Document Record Number
TRIS Accession Number
HRIS Subject Area Number → 64 138138

Title → **MEASUREMENTS BENEATH THE SURFACE OF EXPANSIVE CLAY**

Authors → Stevens, JB; Texas University, Austin
Matlock, H; Texas University, Austin

Publication Data → Transportation Research Record; Transportation Research Board; 2101 Constitution Avenue, NW; Washington, D.C.; 20418

Document Data → N568; 76; pp 35-47; 16 Fig.; 8 Ref.

Abstract → Several methods for predicting moisture movement and potential heave of expansive soils are available. In June 1973, a field experiment was initiated because a dearth of integrated field data precluded evaluation of these predictive methods.

SUPPLEMENTAL NOTE:
Presented at the 54th Annual Meeting of the Transportation Research Board.

Availability → ORDER FROM:
Transportation Research Board Publications Office; 2101 Constitution Avenue, NW; Washington, D.C.; 20418

Figure 17 (Continued)

5. Experimental Projects

The Department coordinates District or Division experimental projects with products, designs or operational practices. It also renders assistance, when requested, in planning and pursuing investigations, preparing reports and implementing results. Upon completion of a project or a phase thereof, the Department disseminates the results in an Experimental Projects Report.

6. Research Reporter

The Research Reporter is a summarization of results from research conducted through the Cooperative Research Program and from selected projects conducted by various Districts and Divisions. The Reporter also includes information on scheduled times for demonstration experiments, new or unusual equipment displays, or new or unusual construction techniques which benefit the Department.

7. Research Section Technical Files

The Research Section maintains a file of technical reports on transportation research. An estimated 10,000 reports are contained in this collection. Complete collections of TRB, NCHRP and Cooperative Research Program reports are available, as well as hundreds of reports from other agencies. A subject card file is maintained to access the collection under thousands of commonly used key words. For information on a specific subject, contact the Engineer of Research.

8. Listing of Research Studies and Reports

A complete listing of all Cooperative Research Program studies and reports Special Studies, Experimental Project reports, and UMTA Technical Study Reports is available from the Engineer of Research. The document is indexed by subject and author. A special index of computer programs is also included. The listing is updated on an annual basis, and published each January.

9. Monthly Research Study Expenditure Ledger

Each month the Automation Division (D-19) prepares a computer listing which details study account expenditures. The Research Section distributes the individual study ledgers to the study agency for its information and assistance in maintaining budget control. An example of an in-house study expenditure ledger is shown in Figure 18, page 50. All study account ledgers for Departmental (In-house) studies follow this format. Following Figure 18 is an explanation.

Figure 19, page 54, is an example of a ledger showing a research study conducted by a Research Agency. The expenditures on a Research Agency's ledger are shown as a lump sum taken from a specific voucher, because the agency's billing is supported by detailed documentation submitted by the Research Agency at the time of monthly billing. Study supervisors should contact their respective agency's accounting office for questions concerning charges. General knowledge of the ledger format can be gained by reviewing the explanation following Figure 18.

DET-TAIL	JOB NUMBER	CTY NO	CONTRACT NUMBER	SO UT	MO INC	EXP FNC	K O	VOUCH	P N	EXPENDITURES THIS MONTH		CUMULATIVE EXPEND BY FUNCTION		TOTAL FUNDS	D-43 ACTIVE BALANCE
0302	00005030	000	09780S00												
				50	3	801	9	10	1	3,222.40					
				50	3	801	4	2042	1	111.36					
				50	3	801	4	2043	1	41.04					
						801			1	3,374.80	*	23,238.72	*		
						801			2	.00	*	.00	*		
						801			4	.00	*	.00	*		
						FUNC TOT				3,374.80	**	23,238.72	**		
				50	3	802	9	10	1	2,566.73					
				29	3	802	9	35	1	12.96					
						802			1	2,579.69	*	18,539.00	*		
						802			2	.00	*	.00	*		
						802			4	.00	*	.00	*		
						FUNC TOT				2,579.69	**	18,539.00	**		
						803			1	.00	*	703.80	*		
						803			2	.00	*	.00	*		
						803			4	.00	*	.00	*		
						FUNC TOT				.00	**	703.80	**		
				29	3	804	9	35	1	8.99					
				59	3	804	9	85	1	125.96					
				50	3	804	9	220	1	109.99CR					
						804			1	24.96	*	1,892.76	*		
						804			2	.00	*	.00	*		
						804			4	.00	*	.00	*		
						FUNC TOT				24.96	**	1,892.76	**		
				50	3	805	9	10	1	2,525.90					
						805			1	2,525.90	*	19,855.40	*		
						805			2	.00	*	.00	*		
						805			4	.00	*	.00	*		
						FUNC TOT				2,525.90	**	19,855.40	**		
				50	3	807	9	10	1	1,400.10					
				59	3	807	9	85	1	27.42					
						807			1	1,427.52	*	10,996.96	*		
						807			2	.00	*	.00	*		
						807			4	.00	*	.00	*		
						FUNC TOT				1,427.52	**	10,996.96	**		
				43	3	808	9	65	1	15.94					
				50	3	808	3	2041	1	650.00					
						808			1	665.94	*	2,649.81	*		
						808			2	.00	*	.00	*		
						808			4	.00	*	.00	*		
						FUNC TOT				665.94	**	2,649.81	**		
					JOB	FND BF								142,448.00CR	
					JOB	CUR TOT				10,598.81	**	77,876.45	**	142,448.00CR	64,571.55CR

Figure 18
Study Expenditure Ledger for an In-House Study

Explanation of Figure 18
Monthly Research Study Expenditure Ledger
for a Departmental In-House Study

1. The example ledger is dated March, 1979. This indicates that all charges contained on the ledger represent those received by D-3 through March 31, 1979.

2. Detail Column - (right justified)

   This column indicates the FHWA HPR year of activity. The example "0002", indicates the 1978-79 fiscal year, known as HPR-0010(2). The "0002" represents the "2" in parentheses in the HPR number. The 1979-80 HPR year will be 0010(3). The detail column will show "0003".

3. Job Number Column - (right justified)

   The job number is a composite number made of the definitive study number (which may be one, two, three or even four digits) (See page 16, paragraph B1d) followed by a code number (always two digits) which represents the division, district or agency for whom the account is intended. The example number is 5050. The first "50" from the left is the definitive study number. The last two digits, in this case again "50", indicate D-10.

   Division accounts are represented by the division number + forty. D-10 thus is represented by 50 (10 + 40 = 50). D-18 would be 58 (18 + 40). For example, if the job number were to represented a D-19 account under study 203, the job number would be 20359.

   District accounts are shown as the definitive study number followed by the district number. A District 1 account under study 116 would be represented as 11601; for District 12, the account would be 11612. Research Agency numbers are as follows:

   27 - Texas Transportation Institute (A&M)
   28 - Center for Highway Research (U.T. Austin)
   29 - U.S. Geological Survey
   30 - Texas Southern University

   For example, the Texas Transportation Institute account under study 205 would be 20527.

4. CTY NO Column - Not used.

5. Contract Number Column -

   This column, for HPR studies, depicts a composite number showing the month the HPR year began (9 for September), the specific HPR year (78 for 1978-79) and the number 0800 which indicates HPR studies.

6. SO UT (Source Unit) Column -

   This two-digit number represents the code number of the district or division submitting the charge. The numbers follow the examples described in paragraph 3 above with few exceptions. Some D-4 charges are shown as "29". Charges submitted from D-3, based on monthly Research Agency billings, are shown as "66". (See Figure 19, page 54)

7. MO INC (month incurred) Column -

This column indicates the month in which the charge was billed to the Department.

8. EXP FNC (Expenditure function) Column -

The charges for each study are broken down primarily by expenditure function, and secondarily as to type of charge (salary, travel, etc.). The expenditure functions are as follows:

801	Study Management
802	Secretarial
803	Drafting & Artwork
804	Editing and Publishing
805	Engineering
806	Planning
807	Material Testing and Technical Support
808	Implementation
809	D-3 Audit

9. KD (Kind) Column and VOUCH (Voucher) Column -

Specific charges are grouped into one of four kinds:

Kind no.	Description	Remarks
2	Material and supply purchase voucher	The VOUCH Column will indicate the number of the voucher on which the billing may be found.
3	Service purchase voucher	The VOUCH Column will indicate the number of the voucher on which the billing may be found
4	Travel Expense voucher	The VOUCH Column will indicate the number of the voucher on which the billing may be found.
9	Journal Voucher Distributions	This kind will contain most of the remaining charges to the study. The VOUCH Column will indicate a two- or three-digit number which will explain the specific charge. These numbers are known as "JV" numbers. The list on page 53 indicates most of the "JV" numbers found on a research study ledger.

Explanation
Figure 18 (continued)

J.V. Numbers

Number	Description
10	Salary Payroll
15	Hourly Payroll
20	District Equipment Rental
25	Camp Hubbard Equipment Rental
30	District Warehouse Stock
35	Camp Hubbard and Other Austin Divisions Warehouse Stock
40	Suspense Clearance
55	Planning and Research Service Charge
65	Depreciation
70	D-9 Testing Service
85	Automation Graphics Charges
210	Adjustments

10. PN (Participating/Non-Participating) Column -

This number indicates whether the FHWA is participating in the funding (1), or not participating in the funding (2).

11. EXPENDITURES THIS MONTH Column -

This column shows expenditures incurred for the month being reported. Note that the expenditures are primarily divided by function number, and secondarily by kind and voucher or JV number. For example, in order to determine the total expenditures for salaries (JV 10) the JV 10's in the VOUCH column for Expenditure Functions (EXP FNC) 801, 802, 805 and 807 must be totaled.

The expenditures for each EXP FNC are subtotaled under FUNC TOT (function total). At the bottom of the example, under JOB CUR TOT (Job current total), the total study expenditures for the month of March are shown.

12. CUMULATIVE EXPEND (Expenditures) BY FUNCTION Column -

This column shows the cumulative of expenditures broken down by EXP FNC for the study from the first of the fiscal year through the month being reported. At the bottom of the example, under JOB CUR TOT (Job Current Total), the total study expenditures for the current fiscal year, through March, are shown.

13. TOTAL FUNDS Column -

This column shows the total funds made available by RFA to the account. The "CR" indicates a credit, or that the number is positive. If an RFA has been issued from, or to, the account, the following scenario will be noted:

Voucher 352	3,000	(The amount of money issued by an RFA. A 352 is a "payment to contractor").
JOB FND BF	32,000 CR	(The amount allocated originally by RFA when the study began).
JOB CUR TOT	29,000 CR	(The amount of funding available in the account to date).

14. D-43 ACTIVE BALANCE Column -

The number in this column, always found on the row marked JOB CUR TOT, represents the amount of money remaining unspent of the total study funds. This number is the difference between the total cumulative expenditures and the current total funding. If this number lacks the CR suffix, the account is overdrawn by the indicated amount.

PROJECT LEDGER MONTH OF MARCH 1979 SUB 30 PREFIX 3 & 4 PAGE 74

DEF-TAIL	JOB NUMBER	CTY NO	CONTRACT NUMBER	SO UT	MO INC	EXP FNC	K U	VOUCH	P N	EXPENDITURES THIS MONTH		CUMULATIVE EXPEND BY FUNCTION		TOTAL FUNDS	D-43 ACTIVE BALANCE
0002	00030127	000	09780800												
				66	2	807	3	2606	1	2,738.07					
						807			1	2,738.07	*	9,231.69	*		
						807			2	.00	*	.00	*		
						807			4	.00	*	.00	*		
						FUNC TOT				2,738.07	**	9,231.69	**		
					JOB	FND BF								24,000.00CR	
					JOB	CUR TOT				2,738.07	**	9,231.69	**	24,000.00CR	14,768.11CR

Figure 19

Study Expenditure Ledger for a Study
Conducted by a Research Agency

M. Patent Rights

Patent rights provisions are included in this manual to assure an equitable allocation of rights in inventions resulting from HP&R-sponsored research and development contracts, to promote their expeditious development so that the U.S. public can benefit from early use of the inventions and to assure their continued availability. The following FHWA provisions shall be followed by the research agency and researcher. In case of conflict between FHWA provisions and State law or research agency provisions, the latter will govern. Subject Invention, as used herein, shall mean any art, process, method, machine, manufacture, design or composition of matter, or any new and useful improvement thereof, or any variety of plant which is or may be patentable under the patent laws of the United States of America or any foreign country.

1. Invention identification and disclosure

a. The Research Agency shall establish and maintain effective procedures to assure that Subject Inventions are promptly identified. These procedures should include the maintenance of records that are reasonably necessary to document the conception and/or the first actual reduction to practice of inventions resulting from this contract.

b. The research agency should furnish the Department the following:

(1) A complete technical disclosure for each Subject Invention, within 6 months after conception or first actual reduction to practice, and prior to any sale, public use, or publication of such invention known to the contractor. The disclosure should identify the contract and the inventor, and be sufficiently complete to convey a clear understanding of the nature, purpose and operation of the invention.

(2) A statement with the final report listing all Subject Inventions or certifying that there were no such inventions. (See page 31, paragraph (6))

(3) Patent agreements to effectuate the provisions of this clause obtained from all persons in the research agency who perform any part of the work under this contract except clerical and manual labor personnel.

2. Disposition of principal rights

a. The Research Agency or researcher agrees to assign to the Department and U.S. Government the entire right, title and interest throughout the world in and to each Subject Invention, except to the extent that rights are obtained by the Research Agency or Researcher under paragraph b. below.

b. As to each Subject Invention upon which the Research Agency or Researcher files a patent application, the Research Agency may reserve a revocable, non-exclusive, paid-up license for the practice of such invention throughout the United States, its territories and possession, Puerto Rico, and the District of Columbia, and in any foreign country where the contractor files a patent application.

3. Filing of domestic patent applications

With respect to each Subject Invention in which the Research Agency or Researcher elects to retain rights pursuant to paragraph M2 above, the Research Agency or researcher shall have a domestic patent filed within 6 months after submission of the invention disclosure.

With respect to Subject Inventions, the Research Agency or researcher shall promptly notify the Department of any decision not to file. For each Subject Invention on which a patent is filed, the Research Agency or researcher shall:

a. Within two months after each filing, deliver to the Department a copy of the application as filed, including the filing date and serial number.

b. Include the following statement in the second paragraph of the specification of the application and any patents issued on a Subject Invention: "The United States Government has rights in this invention pursuant to the contract between (identify the Research Agency or Researcher) and (identify the Department) dated (date)."

c. Within 6 months after filing the application, deliver to the Department a duly approved, executed and recorded legal instrument in a form specified by FHWA fully confirmatory of all rights to which the United States Government is entitled, and provide FHWA an irrevocable power to inspect and make copies of the patent application.

d. Provide the Department with copies of the patent within 2 months after a patent is issued on the application.

4. Forfeiture of rights in unreported Subject Invention

The Research Agency or researcher shall forfeit to the SDHPT and the United States Government all rights in any Subject Invention which he fails to report at or prior to the time he files a patent application thereon or submits the statement required in the final report as specified in Chapter VI, paragraph B1 b(6).

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