LOUISIANA

TRANSPORTATION

RESEARCH

CENTER

Research Manual

2003 Edition

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FOREWORD

The purposes of this manual are as follows:

- To define the policies and procedures for the Louisiana Transportation Research Center (LTRC) research program and its various functions.

- To ensure that all research is conducted, managed, documented, and implemented in conformance with legal requirements and policies of LTRC, the Louisiana Department of Transportation and Development (DOTD), and the Federal Highway Administration (FHWA).

- To ensure that the programs, projects and products generated by LTRC are provided for the benefit of DOTD, its employees, and other transportation agencies and users.

- To guide research administrators and managers in the successful and efficient initiation, conduct and implementation of the research work program.

This manual is intended for LTRC employees and individuals and agencies conducting contract research. The first chapter explains the organization, staffing, and purpose of the center. The remainder of the manual is organized to follow the development of a research project from the initial writing of problem statements and proposals to the approval, conduct, and implementation of research studies. Samples of forms have been grouped at the end of the chapter in which they are discussed. The LTRC Guide for report preparation and the LTRC Cooperative Research Agreement are included as appendices to the manual. A list of terms is given in Chapter 1.

1. INTRODUCTION TO LTRC

1.1 DESCRIPTION

The Louisiana Transportation Research Center (LTRC) is a cooperative research, technology transfer, and training center administered jointly by the Louisiana Department of Transportation and Development (DOTD) and Louisiana State University (LSU). The primary goal of LTRC is to improve the transportation system in both Louisiana and the nation by conducting research, disseminating information, and assisting state and local transportation agencies.

1.2 LOCATION

LTRC is located on the LSU campus in Baton Rouge. The official address for both postal and other deliveries is as follows:

Louisiana Transportation Research Center
4101 Gourrier Avenue
Baton Rouge, LA 70808-4443
Tel (225) 767-9131
Fax (225) 767-9108
E-mail: ltrc@ltrc.lsu.edu
Website: www.ltrc.lsu.edu

1.3 AUTHORITY FOR LTRC

LTRC was created by the 1986 regular session of the Louisiana Legislature via Act 137 (originating as Senate Bill No. 520), which was approved on June 26, 1986. This legislation (amended 1988,1995) established the purposes and functions of LTRC in addition to the basis for administration and funding of the organization.

1. Purposes of LTRC

A. Establish cooperation between all parties with concern for the enhancement of the transportation system of the State of Louisiana.

B. Introduce new technology.

C. Enhance higher education in the general transportation field.

D. Benefit Louisiana economically by enhancing job opportunities.

E. Promote research, technology transfer, and training.

2. Functions and Duties of LTRC

A. To develop and conduct a nationally recognized short-range and long-range transportation research program in order to implement more efficient planning, design, construction, operation, and maintenance practices and to enhance traffic safety.

B. To offer education and training programs in both fundamental and state-of-the-art practices in transportation and related areas by offering training courses, demonstration projects, and conferences.

C. To develop, implement, and refine a technology transfer program which shall provide a mechanism for conveying modern transportation systems practices and procedures to municipalities and parishes.

D. To maintain cooperative relationships with the Transportation Research Board, the research divisions of other state highway and transportation departments, universities, and national and international technical associations and agencies.

E. To report and publish research findings which contribute to fundamental knowledge and facilitate the implementation of enhanced technologies which may result in more economical practices in transportation systems engineering.

F. To provide DOTD with short-term problem solving assistance.

3. Funding

The funding for the LTRC program is supported by both DOTD and the federal government. Part of these funds is derived through the Federal Highway Administration's State Planning and Research (SP&R) Program and other federal and self-generated sources.

4. Contractual Agreements

LTRC may enter into contractual agreements only with the approval of the Secretary of DOTD or his designee, and said agreements

must conform with the contracting policies of DOTD.

1.4 TERMS AND DEFINITIONS

ASSOCIATE DIRECTOR, RESEARCH - The Associate Director of the Louisiana Transportation Research Center, Research Section, administers the state and federally funded research programs of the DOTD.

ASSOCIATE DIRECTOR, TECHNOLOGY TRANSFER - The Associate Director of Technology Transfer administers the state and federally funded T^2 program and is responsible for the training activities of DOTD.

CHANCELLOR - The Chancellor of Louisiana State University.

CONTRACT- The basic contract under which research is conducted for LTRC by a contractor. The standard contract form for research is included in Appendix A. The term contract as used herein refers to the combination of documents (study proposal, cooperative research agreement, research procedures manual, approval research project modification, and task order, if applicable) which constitute the legal basis for the research study.

CONTRACTOR - Any agency, institution, organization, individual, or other party which has entered into a signed agreement with the DOTD/LTRC to conduct research or provide training.

COOPERATIVE RESEARCH AGREEMENT - A contract between DOTD/LTRC and a contracting research agency which forms the legal basis for all research projects for the specified period. Individual studies during the period of the contract are activated and approved by task order.

CFR , TITLE 23 - Code of Federal Regulation, Title 23; the source document for rules and regulations governing transportation research activities involving federal funds, and which is published by the Federal Highway Administration.

DOTD - The Louisiana Department of Transportation and Development, P. O. Box 94245, Baton Rouge, Louisiana 70804-9245

DIRECTOR - The Director of the Louisiana Transportation Research Center.

DIRECT COST - Expenses which include but are not limited to salaries, wages, equipment, supplies, travel, reproduction, services, and equipment rental.

FHWA - The Federal Highway Administration of the U.S. Department of Transportation.

IMPLEMENTATION - Adoption of research results to provide new and innovative practice.

INDIRECT COSTS - Costs for general and research administration and overhead incurred in the research project for which no charge is made elsewhere in the study.

LSU - The Louisiana State University and Agricultural and Mechanical College, Baton Rouge, LA 70803.

LTRC - The Louisiana Transportation Research Center, 4101 Gourrier Avenue, Baton Rouge, LA 70808.

LTRC ENGINEER ADMINISTRATOR OR MANAGER - The LTRC staff member with responsibility and authority over the general technical area to which an individual research project is assigned.

NCHRP - National Cooperative Highway Research Program, a pooled fund program directed toward the solution of problems of national significance sponsored by the state highway agencies and FHWA and administered by the Transportation Research Board (TRB), National Academy of Sciences.

NONEXPENDABLE EQUIPMENT - Equipment having a useful life of more than one year and an acquisition cost of more than $1,000 per unit.

PEER EXCHANGE - The process by which LTRC partners with other state transportation, FHWA representatives, academics, and other transportation partners to share information on the research and implementation process toward the result of improving such processes.

LTRC POLICY COMMITTEE - An appointed committee with responsibility for advising and assisting the Director in the coordination of the research education and training programs by reviewing activities and recommending policies, research projects and program funding levels; and by reviewing and assessing both the implementation of research results and the overall effectiveness of programs.

POOLED FUND STUDY - A study in which funding is provided by two or more state highway agencies or FHWA.

PRINCIPAL INVESTIGATOR - The person principally in charge of and

accountable for a research project whose duty is to plan and coordinate the work in accordance with the approved work plan and report the results. The principal investigator for contract research shall be a staff member of the contractor having technical competence and responsible charge in the field in which the research is being conducted.

PROBLEM STATEMENT - A concise description of the transportation related problem(s) for which solutions through research are deemed feasible.

LTRC TECHNICAL COORDINATOR - An LTRC staff engineer, with responsibility and authority to act as liaison between the contractor and LTRC in guiding, inspecting, and monitoring the technical progress of a research project.

PROJECT REVIEW COMMITTEE (PRC) - An advisory committee appointed by the Director with a major responsibility for assisting the LTRC Engineer Administrator or Manager in the development of acceptable research problem statements, requests for proposals, review of research proposals, oversight of approved research projects, and implementation of findings.

RECORDS - The official paper or evidence which documents the findings, data collected, work-time spent, and monies expended for each individual research project.

RESEARCH - A systematic, controlled inquiry involving analytical and experimental activities which primarily seek to increase the understanding of underlying phenomena. Research can be basic or applied:

1. BASIC RESEARCH - Involves the study of phenomena whose specific application has not been identified; the primary purpose of this type of research is to increase knowledge.

2. APPLIED RESEARCH - Involves the study of phenomena relating to specific, defined characteristics of a system; the primary purpose of this type of research is to answer a question or solve a problem.

RESEARCH ADVISORY COMMITTEE (RAC) - An advisory committee appointed by the Director to review and prioritize rate research problem statements selected by RPICs. This committee is composed of key DOTD technical staff and field personnel and an FHWA representative.

RESEARCH IN PROGRESS (RIP) – A database managed by the Transportation Research Board containing active research projects.

RESEARCH PROJECT MODIFICATION AGREEMENT - An addendum to the contract document which authorizes the modification or continuation of a research study with respect to time, budget, personnel, objective, scope, or work plan.

RESEARCH PROBLEM IDENTIFICATION COMMITTEE (RPIC) - Advisory committees appointed by the Director, composed of DOTD employees, academics, governmental agencies and other transportation industry representatives, with responsibility for developing, reviewing, and prioritizing research problem statements.

RESEARCH PROJECT/STUDY - An individual research investigation having the limited aim of supplying, implementing, or confirming a specific theory, design, or data.

RESEARCH PROPOSAL - A document which establishes the necessity for a research undertaking, clearly defines the objectives, provides a detailed work plan for achieving the objectives with cost estimates and time schedules, and indicates how the research findings are expected to be used and implemented.

RFP - Request for Proposals, a document prepared to solicit formal research proposals from prospective researchers.

SECRETARY - The Secretary of the Louisiana Department of Transportation and Development.

SP&R - The State Planning and Research Program, Part II, managed by LTRC.

STUDY BUDGET - The total funds allocated for the accomplishment of an individual study for the period of time specified.

TASK ORDER - The contract document which authorizes approval and initiation of an individual research project between LTRC and a university (contractor) under the provisions of the Cooperative Research Agreement.

TECHNOLOGY TRANSFER ENGINEER- The LTRC staff member with responsibility and authority over the technology transfer, training, and implementation assistance activities.

TRB - Transportation Research Board

TRIS - Transportation Research Information Service, a computerized storage and retrieval system operated by Transportation Research Board

containing abstracts of completed research.
WORK ORDER (NOTICE TO PROCEED) - Written notice from the department authorizing the date that a non-university contractor may proceed with the research project for a specific period of time to accomplish the objectives of the study.

WORK PLAN - The section of the study proposal which contains the detailed description of the methods and procedures (including approved modifications) which will be used to conduct the study.

WORK PROGRAM - The schedule of tentative LTRC research activities planned to be undertaken in one fiscal year (July 1 through June 30).

1.5 ADMINISTRATION

The administration of LTRC's activities is provided by the center's Director and Associate Directors.

DIRECTOR - The Director is the chief administrative officer of LTRC and is responsible to the DOTD Chief Engineer.

ASSOCIATE DIRECTOR, RESEARCH - The Associate Director, Research, is responsible to the Director of LTRC.

ASSOCIATE DIRECTOR, TECHNOLOGY TRANSFER - The Associate Director, Training and Technology Transfer, is responsible to the Director of LTRC.

POLICY COMMITTEE - The LTRC Policy Committee is composed of eleven members, one of whom is the Director of LTRC, three appointed by the Secretary of the DOTD, one from each of the six public universities that have a college of engineering with a civil engineering department and that is appointed by the president or chancellor of the respective university, and one member who is the dean of a college of engineering of a nonpublic institution of higher education selected by the committee from a list submitted by the Louisiana Association of Independent Colleges and Universities. The FHWA is an invited observer of the committee. The chairman of the Policy Committee is elected by the committee. The term of office for Policy Committee members is two years. The committee meets at least twice a year to review the activities of LTRC. The major responsibilities of the Policy Committee are to coordinate the transportation research program by:

1. Reviewing and recommending research and technology transfer programs.
2. Reviewing and recommending fiscal year budgets.
3. Reviewing the activities and progress of research programs.

1.6 ORGANIZATIONAL CHART

The chart shown in figure 1-1 relates the basic functional relationships of LTRC staff positions. A detailed list of LTRC personnel indicating titles, responsibilities, and telephone numbers supplements this manual, and updates may be obtained from the Director's office upon request.

1.7 EEO STATEMENT

The Louisiana Transportation Research Center assures equal opportunity for all qualified persons without regard to race, color, religion, sex, national origin, age, handicap, or marital status in participation, treatment, or employment in the programs and activities which LTRC operates. The implementation of all research programs shall be in accordance with the policy of the Federal Highway Administration to ensure compliance with Title VI of the Civil Rights Act of 1964. Anyone having questions or complaints regarding equal opportunity at LTRC should contact the Civil Rights Office, Room 404, Louisiana Department of Transportation and Development, P.O. Box 94245, Baton Rouge, Louisiana 70804-9245. Persons believing they have been discriminated against contrary to federal law are entitled to make an inquiry or file a complaint with the U.S. Equal Employment Opportunity Commission, 601 South Street, New Orleans, LA 70130.

LTRC FUNCTIONAL RELATIONSHIPS

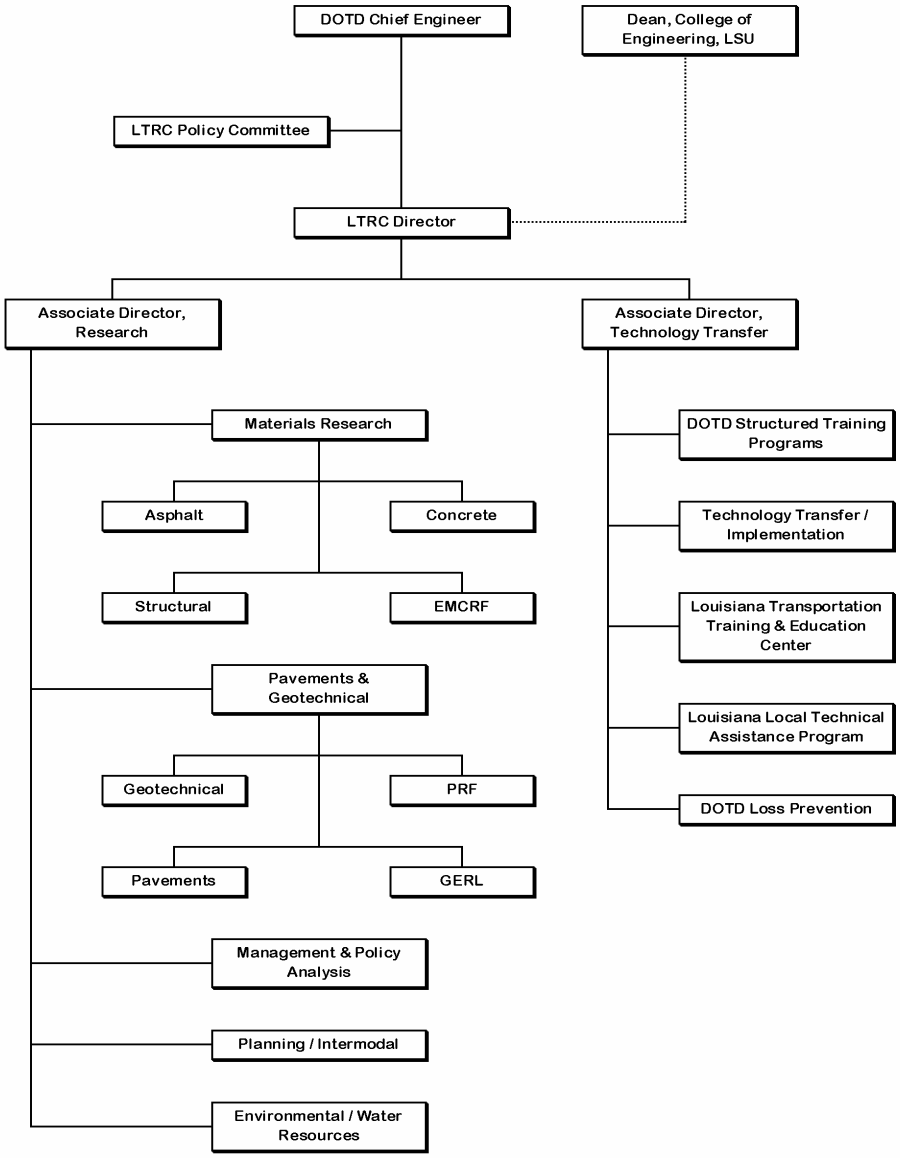

FIGURE 1-1

2. INITIATION AND APPROVAL OF NEW RESEARCH PROJECT

2.1 ANNUAL WORK PROGRAM

The basic research activities of the LTRC are scheduled and budgeted on an annual basis for the period beginning July 1 of each year and ending June 30 of the following year. This plan for research activities is referred to as the annual work program, and the scheduled period coincides with the fiscal year for both LTRC and DOTD.

2.2 DEVELOPMENT OF WORK PROGRAM

The annual work program is formulated based on studies to be conducted either internally, by contract through one of the state's universities or other contract professional services. Studies are identified for funding using state and federal funds under the SP&R program, for financing with state funds, or with self-generated funding. Research problem statements are welcomed by LTRC at any time; however, they are formally solicited from LTRC, DOTD, universities, and transportation industry representatives biennially. The statements are ranked by Research Problem Identification Committees (RPIC) and the Research Advisory Committee (RAC) for funding. RFPs are issued for the contract research portion of the program. LTRC staff will also generate studies for the work program. The LTRC Policy Committee reviews the work program and provides recommendations to LTRC. The SP&R portion of the work program is reviewed and approved by FHWA, and each individual research proposal must be approved by the DOTD Secretary. The process for development and approval of the work program is depicted in figure 2-1.

1. Problem Statements

Research problem statements are solicited biennially from the transportation community at large. The problem statement is a concise description of a transportation-related problem for which solutions through research are deemed feasible. Problem statements received by LTRC in this process are assigned to Research Problem Identification Committees (RPIC) for rating according to need and implementation potential. The top problem statements from each RPIC are then submitted to the Research Advisory Committee, who also evaluates the problem statements according to need and implementation, resulting in a priority list

used by LTRC to determine funding. This priority list is incorporated in the Work Program.

In addition to the biennial solicitation, unsolicited problem statements may be submitted to the Director at any time. A Project Review Committee will be formed by the Director to make recommendations according to figure 2-1 and section 2.4, paragraph 1.

A. Format and Content of Problem Statements

The form, content and purpose of a problem statement (Figure 2-2) are described as follows:

(1) PROBLEM TITLE – A concise, descriptive title of the problem.

(2) PROBLEM STATEMENT – A brief statement of problem, including some indication of its magnitude and impact on the highway program.

(3) RESEARCH PROPOSED – A brief description of those research, development, or evaluation activities proposed to resolve the problem.

(4) PROBLEM IMPLEMENTATION OF RESULTS – A brief description should state how it is anticipated that the results of the proposed research will be applied. This description should include a statement of the anticipated benefits from solving the problem.

B. Responsibility of Research Problem Identification Committees (RPICs)

RPICs will be formed to assist the LTRC staff in the formulation and refinement of problem statements. Members of RPICs shall be appointed by the Director from the personnel of LTRC, DOTD, universities and private industry; the FHWA shall be an invited observer of the committee. Selection shall be based upon the expertise and interest of each individual relative to the technical subject matter. The RPICs are chaired by an appropriate DOTD member with a LTRC staff member serving as facilitator. RPIC members shall be briefed by the chairperson on the pertinent facts of the proposed research and shall receive copies of the problem statements, along with any additional information to assist them in

the decision-making process. The RPIC's responsibility is to develop a refined problem statement or recommend disposition of the problem statement if research is not deemed a viable solution. In addition, each RPIC, as technical experts shall develop additional problem statements according to DOTD needs. Each committee shall provide a priority list of problem statements based on need and implementation potential.

C. Responsibilities of Research Advisory Committee (RAC)

Members of the RAC shall be appointed by the Director and be comprised of DOTD staff and field personnel, RPIC chair, LTRC staff and an FHWA representative, with expertise appropriate to the technical areas included in the problem statements. The RAC shall be chaired by the LTRC Associate Director, Research. Each problem statement will be presented to the RAC by the RPIC chair or LTRC facilitator of the sponsoring RPIC. The problem statements will be evaluated based on research need or importance and implementation potential. A resulting priority list will be recommended.

2. Work Program

The work program will be prepared on an annual basis. A summary section by funding source shall provide a ready reference for the program as a whole. The remainder of the work program shall be composed of individual research project descriptions providing pertinent project information (similar to figure 2.3). These research project descriptions should be divided by funding category (SP&R, state, self generated) and further sub-divided by active or proposed projects.

2.3 RESEARCH PROPOSALS

A research proposal is a document which establishes the necessity for a research project, clearly defines the objectives, provides a detailed work plan for achieving the objectives, defines the deliverables and indicates how the research findings are expected to be implemented.

1. Development of Proposals

Research proposals are developed internally by LTRC staff or externally through the RFP process. The RFP is a document prepared to solicit proposals from prospective contract researchers. The problem statement forms the basis for the solicitation

document. Research proposals are generated in the following manner.

A. Solicitation through RFP

Problem statements which have been recommended by RPICs and identified by LTRC for contract work are developed into RFPs and distributed to universities (or other potential research contractors) for solicitation of technically competitive proposals. Interested parties are encouraged to contact the appropriate LTRC Engineer Administrator or Manager for discussion.

B. Proposals by LTRC

LTRC research personnel may offer research proposals at any time when they are included in the approved work program as proposed studies. However, in addition to the work program, LTRC engineers may also submit proposals based on emerging technologies or issues or in direct response to immediate problems of DOTD.

(1) IN-HOUSE PROPOSAL – A proposal in which the principal investigator is a staff member of LTRC with primary responsibility for all phases of the research.

(2) SUPPORT PROPOSAL – A proposal developed by LTRC staff to support a contract research project by providing personnel support, facilities for testing, equipment, data collection and/or other activities related to the contract research project.

2. Proposal Form and Content

This section provides the basic requirements for the form, sequence and content of the research proposal. The proposal shall contain, but is not limited to, the following essential elements (figure 2-4 shows required forms):

A. PART I- IDENTIFICATION - The title sheet, which includes the amount of funding requested; duration of the project in months with beginning and ending dates indicated; a concise descriptive title for the proposed study; the name and business address of the organization which will conduct the

work; the major subdivision of that organization responsible for the research and the name, title, mailing address and telephone number of the principal investigator.

B. PART II - APPROVAL - For LTRC use in the process of modification and/or approval of the proposal.

C. PART III - AMOUNTS REQUESTED FOR PROJECT - This part of the proposal requires an itemized list of the funds requested for the proposed research by types of expense and fiscal year (July 1 through June 30).

(1) PERSONNEL - List the names, positions and percentage of time (based on a 40-hour work week) to be spent on the project for all persons involved in the research, including PI, Co-PI, and graduate students, if applicable. When the percent time spent on the project varies with a given period (e.g. spring, fall, summer) the individual periods and appropriate percent time shall be listed separately for each. The amounts requested for each person listed must not exceed the proportion of total salary computed from the percent time spent on the project for that person. The salaries used as the basis for computing individual personnel costs shall be exclusive of the cost of employee benefits; however, that percentage used by the contracting agency to compute employee benefits shall be shown where indicated on the form and costs computed and included in totals.

(2) NON-EXPENDABLE EQUIPMENT- Itemize only non-expendable equipment which is to be purchased specifically for the performance of the study. Non-expendable equipment includes any items having a useful life of more than one year and an acquisition cost of more than $1000 per unit.

(3) CONSUMABLE SUPPLIES- This item includes the estimated cost of all expendable equipment, materials and supplies. Any item for which the cost exceeds $300 must be listed individually.

(4) TRAVEL - Itemize expenses for trips to be made in connection with the research project and state the purpose of the trip. Expenses incurred for out-of-state

travel should be listed separately from those for in-state travel. When travel expenses are requested for conferences, conventions and seminars in connection with the research, each instance must be separately identified and justified.

(5) OTHER EXPENSES – Itemize all miscellaneous expenses associated with the project which are not included in the agency's computation of indirect cost, such as those required for reference materials, copying, computer time and software, photography, etc. All costs to be incurred for equipment rental or use of subcontractors/consultants associated with the project should be listed in this section.

(6) TOTAL DIRECT COST - The sum of total estimated costs for items (1) through (5).

(7) TOTAL INDIRECT COST - This item is intended to provide reimbursement for general and research administration and overhead expenses incurred by the contracting agency in the prosecution of the research project for which no charge is made elsewhere in the study. The total indirect costs shall not exceed 25 percent of the total direct costs, excluding costs for non-expendable equipment. The actual percentage used and method of application shall be described in the proposal and shall be verifiable through audits by DOTD, FHWA and their representative.

(8) TOTAL COSTS - The sum of total estimated costs for items (6) and (7).

D. PART IV - BIOGRAPHICAL SKETCHES - Provide brief biographical sketches for the professional personnel indicated by Part III, Section (1), to be actively engaged in the study so that required expertise can be determined.

E. PART V - TITLE VI STATEMENT - This portion of the proposal shall include a statement that the agency or contractor will comply with the provisions contained in Title VI of the Civil Rights Act of 1964.

F. PART VI - PROPOSED RESEARCH - This portion of the proposal is the basic guide to the study containing the

detailed description of the approach the PI intends to employ to complete the study and its potential for implementation. This portion shall contain the following elements in the sequence indicated:

(1) PROBLEM STATEMENT – Proposer's understanding of the problem to be solved through research.

(2) OBJECTIVES OF RESEARCH - Provide concise statements to describe the specific aims of the work proposed and relate them to long-term goals.

(3) METHODOLOGY - This section should describe the details of the researcher's approach to solving the problem:

(a) WORK PLAN - For each phase of the proposed research, itemize and discuss the tasks necessary to fulfill the objectives. A preliminary literature search should be accomplished and demonstrated in the discussion. The discussion should include principles or theories to be used; devices, processes, materials or systems to be developed; possible solutions to the problems; critical experiments to test the applicability of the theory, the type and range of variables to be used or considered; and the methods of data analysis to be used including statistical methods. The preparation of the final report should be acknowledged. A draft final report should be scheduled for delivery at least 90 days prior to the project completion date to permit time and charges for revisions.

(b) WORK SCHEDULE - A time chart in the format shown in figure 2-5 shall indicate the proposed time schedule of completion for each task (and subtask when applicable) discussed in part (a). This should include periodic PRC meetings, preparation of progress, interim (if applicable) and final reports and other deliverables.

(c) STAFFING PLAN - The responsibilities and time allocation of personnel to the required tasks should be briefly stated for each fiscal year for the duration of the project. Also include a table or chart indicating

personnel by task with hours or percent of time and cost per task.

(d) DELIVERABLES - A list of all deliverables along with a brief statement describing each one should be presented in this section.

(4) FACILITIES AVAILABLE - The general facilities at the disposal of the proposing agency which are relevant to the study should be described, along with major items of permanent equipment to be used.

(5) STATE OF THE KNOWLEDGE

(a) PREVIOUS WORK BY RESEARCHERS - The researchers should list and describe briefly any previous work they have done pertinent to the proposed study. Personal publication on the subject area or closely related work should be cited. (List no more than five). It should be demonstrated that previous work has not attempted to solve the problem using the same approach.

(b) RESULTS OBTAINED BY OTHERS - Describe the results of literature search for information on the findings of others pertinent to the proposed study. The findings available through TRIS are required for all studies.

(c) SIGNIFICANCE OF RESEARCH - The importance of the proposed work should be explained in this section. Adequate explanation must be given about how the proposed research will extend, modify, or refine the previous work of others.

(6) IMPLEMENTATION - An assessment by the researcher of the areas of potential application of anticipated research findings. The form in which the findings might be reported (mathematical model or formula, test procedure, specification, design procedure, etc.) should be described. The specific area of practice that would be changed by the findings and those organizations or groups that might benefit from the new technology should be identified. The responsibility for and means of technology transfer

relative to the study should be proposed when possible.

(7) AMOUNTS REQUESTED - Provide justification for the itemized amounts shown in Part III for nonexpendable equipment, equipment rental, travel, and other items. It is required that the manner in which indirect costs are calculated and applied be stated.

G. PART VII - LIST OF REFERENCES - A numerical list of references used in the text of the proposal should be included in the order referred to in the text.

2.4 REVIEW AND APPROVAL OF RESEARCH PROPOSALS

The sequence of events necessary to obtain approval of a research proposal is described below:

1. PRC RESPONSIBILITIES – A PRC will be established by the Director when (1) a priority problem statement that has been recommended by the biennial RPIC solicitation process is ready for funding, (2) an unsolicited problem statement is received, (3) a internal proposal is developed based on a proposed study included in the work program, and (4) an internal proposal is developed in response to emerging technology or issues or in response to an immediate need of the department. The PRC will act in an advisory capacity to both LTRC and the Policy Committee throughout the life of a project including implementation activities. Specific responsibilities of the PRC include:

A. The development of RFP for those problem statements selected for contract research through the RPIC process or submitted as an unsolicited problem statement, the PRC shall first determine the need for the research based on their expertise and a preliminary literature search to be provided by the LTRC Research Administrator or Technical Coordinator. A positive response will require development of the RFP by the PRC.

B. Review of Proposals

Copies of proposal(s) should be sent to the PRC prior to this meeting along with the proposal review forms. PRC members should have the completed review form at this meeting and be ready to discuss their comments.

2. POLICY COMMITTEE RESPONSIBILITIES - Research studies included

in the annual research work program recommended by the PRC and approved by the Director shall be submitted for the review and recommendation of the LTRC Policy Committee Chair. The Policy Committee Chair may recommend acceptance, rejection or revision of a study.

Research studies not included in the work program may be sent to Policy Committee members for review at the discretion of the Chair.

3. DIRECTORATE SPONSOR FOR IMPLEMENTATION - Each proposal will be sponsored by the appropriate DOTD Directorate Head. By recommending approval, the Directorate Head acknowledges that if the research is successful, solutions will be implemented.

4. SECRETARY, DOTD - Proposals recommended for approval by the Chair of the Policy Committee shall be submitted to the Secretary of DOTD for review and approval. This is the final step in the approval process.

5. FEDERALLY FUNDED STUDIES - Proposals listed in the annual research work program are eligible for FHWA funding within the research program management certification process guidelines. Federally funded proposals not included in the work program must be submitted to the FHWA Division Office as work program modifications.

Annual Work Program Development Process

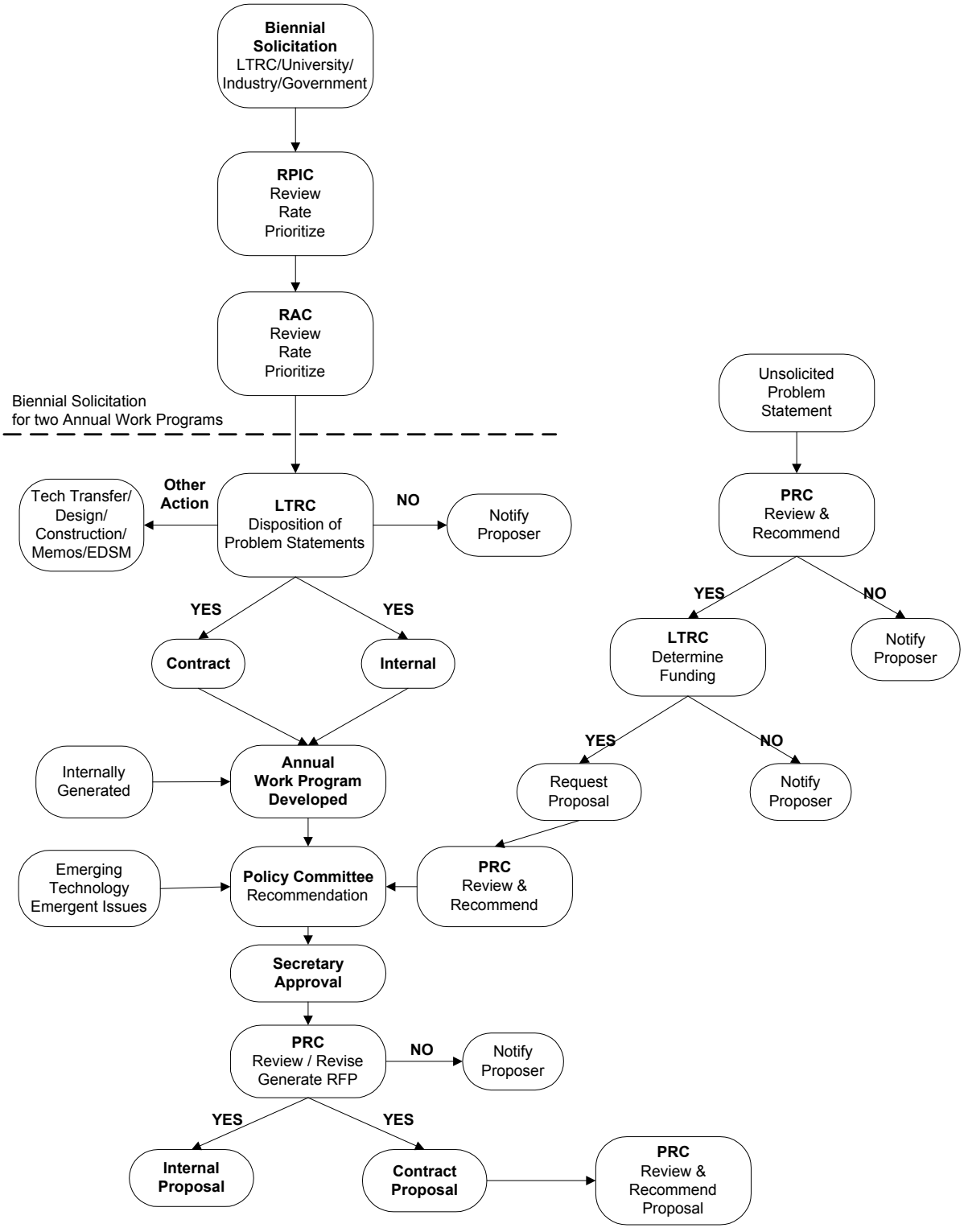

Figure 2-1

LTRC USE ONLY
PROBLEM STATEMENT NO.
DATE OF RECEIPT

LTRC PROBLEM STATEMENT SOLICITATION

1. PROBLEM TITLE:

(GIVE A BRIEF AND APPROPRIATE NAME TO THE PROBLEM YOU ARE PROPOSING)

2. PROBLEM STATEMENT:

(BRIEFLY DESCRIBE THE PROBLEM YOU ARE PROPOSING)

3. PROPOSED RESEARCH:

(DESCRIBE THE APPROACH YOU ENVISION TO SOLVE THE PROBLEM)

4. POTENTIAL IMPLEMENTATION AND BENEFIT:

(DESCRIBE HOW YOU FORESEE THE RESULTS WILL BE IMPLEMENTED AND HOW THE TRANSPORTATION COMMUNITY WILL BENEFIT. HIGHER PRIORITIES WILL BE GIVEN TO STATEMENTS WITH SIGNIFICANT IMPLEMENTATION POTENTIAL)

5. SUBMITTED BY:

NAME_____ AFFILIATION_____ TEL#

PLEASE SUBMIT TO: LTRC DIRECTOR, 4101 GOURRIER AVE. BATON ROUGE, LA 70808

Figure 2-2

LTRC Annual Research Program
Fiscal Year 2002 – 2003
SPR 0010(25)

Title:						
Funding Source:						
State Project Number:			Project Start Date:			
Research Project Number:			Completion Date	*(original)*		
Research Agency:			Completion Date	*(revised)*		
Principal Investigator:						
BUDGET STATUS						
Total Budget			**Estimated FY 2002 – 2003 Budget**			
Total Cost	*(original)*		**Total**			
	(revised)					
Est. Expended to Date			Salaries			
FY 2001 – 2002 Budget			Equipment	*(expendable)*		
FY Funds	*(original)*		Equipment	*(non-expendable)*		
	(revised)		Travel			
Est. FY Expenditure			Other			
PURPOSE AND SCOPE						
FISCAL YEAR 2001 – 2002 ACCOMPLISHMENTS						
FISCAL YEAR 2002 – 2003 PROPOSED ACTIVITIES						

Figure 2-3

LOUISIANA TRANSPORTATION RESEARCH CENTER RESEARCH PROPOSAL	(LTRC USE ONLY) Page 1 DATE OF RECEIPT
	LTRC PROJECT NO.
	STATE PROJECT NO.
PART I: GENERAL INFORMATION	
1. AMOUNT REQUESTED (SAME AS PART III) $	2. DURATION OF PROJECT ANTICIPATED START DATE _____ ACTUAL START DATE _ DURATION IN MONTHS _ ENDING DATE _____
3. TITLE OF RESEARCH PROPOSAL (PLEASE BE BRIEF)	
4. NAME AND BUSINESS ADDRESS OF PROPOSER (INDIVIDUAL, INSTITUTION, FIRM, OR CORPORATION)	5. NAME, TITLE, AND MAILING ADDRESS OF PRINCIPAL INVESTIGATOR (BEARING SCIENTIFIC RESPONSIBILITY)
TELEPHONE NUMBER AND EXTENSION OF BUSINESS OFFICE	TELEPHONE NUMBER AND EMAIL ADDRESS OF PRINCIPAL INVESTIGATOR
6. MAJOR SUB-DIVISION THAT WILL CONDUCT RESEARCH	7. NAME AND TITLE OF CO-PRINCIPAL INVESTIGATOR
PART II: APPROVAL	
RECOMMEND BY THE ASSOCIATE DIRECTOR LTRC, RESEARCH Harold R. Paul, P.E.	DATE
RECOMMENDED BY THE DIRECTOR, LTRC Joe T. Baker, P.E.	DATE
RECOMMENDED BY CHAIRMAN, LTRC POLICY COMMITTEE William H. Temple, P.E.	DATE
RECOMMENDED BY IMPLEMENTATION SPONSOR William H. Temple, P.E.	DATE
APPROVED BY THE DOTD SECRETARY Kam Movassaghi, Ph.D., P.E.	DATE
APPROVED MODIFICATIONS: (LTRC USE ONLY)	

Figure 2-4

PART III AMOUNTS REQUESTED FOR PROJECT (For period of time indicated in Part 1 Item 2) Page 2							
ITEM		Percent of Time on Project	FUNDS (Omit Cents)				
			Tot. Proj. Cost	Fiscal Year	Fiscal Year	Fiscal Year	Remaining
1. PERSONNEL							
	Total Salaries and Wages						
	Plus _____ % for Employee Benefits						
	Total Personnel Costs						
2. NON EXPEND-ABLE EQUIPMENT							
	Total Non-Expendable Equipment						
3. CONSUMABLE SUPPLIES							
	Total Consumable Supplies						
4. TRAVEL							
	Total Travel						
5. OTHER EXPENSES							
	Total Other Expenses						
6. TOTAL DIRECT COSTS							
7. TOTAL INDIRECT COSTS (attach documentation to substantiate indirect cost rate used and method of application in Part VIII)							
8. TOTAL COSTS (Total of 6 & 7)							

Figure 2-4 (continued)

Part IV - BIOGRAPHICAL SKETCHES - Provide brief sketches for professional personnel already selected who are to be actively engaged in this project. The following questions should be completed with co-principal researcher immediately following principal researcher, followed by other professional personnel.

NAME OF PRINCIPAL INVESTIGATOR			TITLE	
DATE OF BIRTH	PLACE OF BIRTH	SEX	CITIZENSHIP US OTHER (SPECIFY)	
EDUCATION (DEGREES CONFERRED - IDENTIFY HONORARY DEGREES IN FIELD)	DEGREE	INSTITUTION CONFERRING	FIELDS	YEAR

OTHER RESEARCH TRAINING AND EXPERIENCE, PARTICULARLY IN AREA COVERED BY THIS APPLICATION	LOCATION	NATURE	YEAR
FIELDS OF PRESENT MAJOR SCIENTIFIC INTEREST IN ORDER OF CHOICE			

NAME OF C0-PRINCIPAL INVESTIGATOR			TITLE	
DATE OF BIRTH	PLACE OF BIRTH	SEX	CITIZENSHIP US OTHER (SPECIFY)	
EDUCATION (DEGREES CONFERRED - IDENTIFY HONORARY DEGREES IN FIELD)	DEGREE	INSTITUTION CONFERRING	FIELDS	YEAR

OTHER RESEARCH TRAINING AND EXPERIENCE, PARTICULARLY IN AREA COVERED BY THIS APPLICATION	LOCATION	NATURE	YEAR
FIELDS OF PRESENT MAJOR SCIENTIFIC INTEREST IN ORDER OF CHOICE			

Figure 2-4 (continued)

PART V **TITLE VI STATEMENT**

The attention of the proposed research contracting agency or institution is directed to the need to comply with the requirements of Title VI of the Civil Rights Act of 1964.

_____ (Name of Contracting Agency) acknowledges that we are aware of the requirements of Title VI and will not discriminate on the basis of race, creed, sex, or national origin and will endeavor to involve the members of minority groups in the conduct of the proposed contract research study.

TECHNICAL RESEARCH PROPOSAL

Details of the proposed plan and other necessary data shall be typed (double-spaced) in accordance with the sequence and requirements defined in Chapter 2 of the LTRC Research Procedure Manual. Continue numbering pages in sequence for the entire proposal using the continuation sheet.

PART VI **SUMMARY OF PROPOSED RESEARCH**

Figure 2-4 (continued)

RESEARCH STUDY WORK SCHEDULE

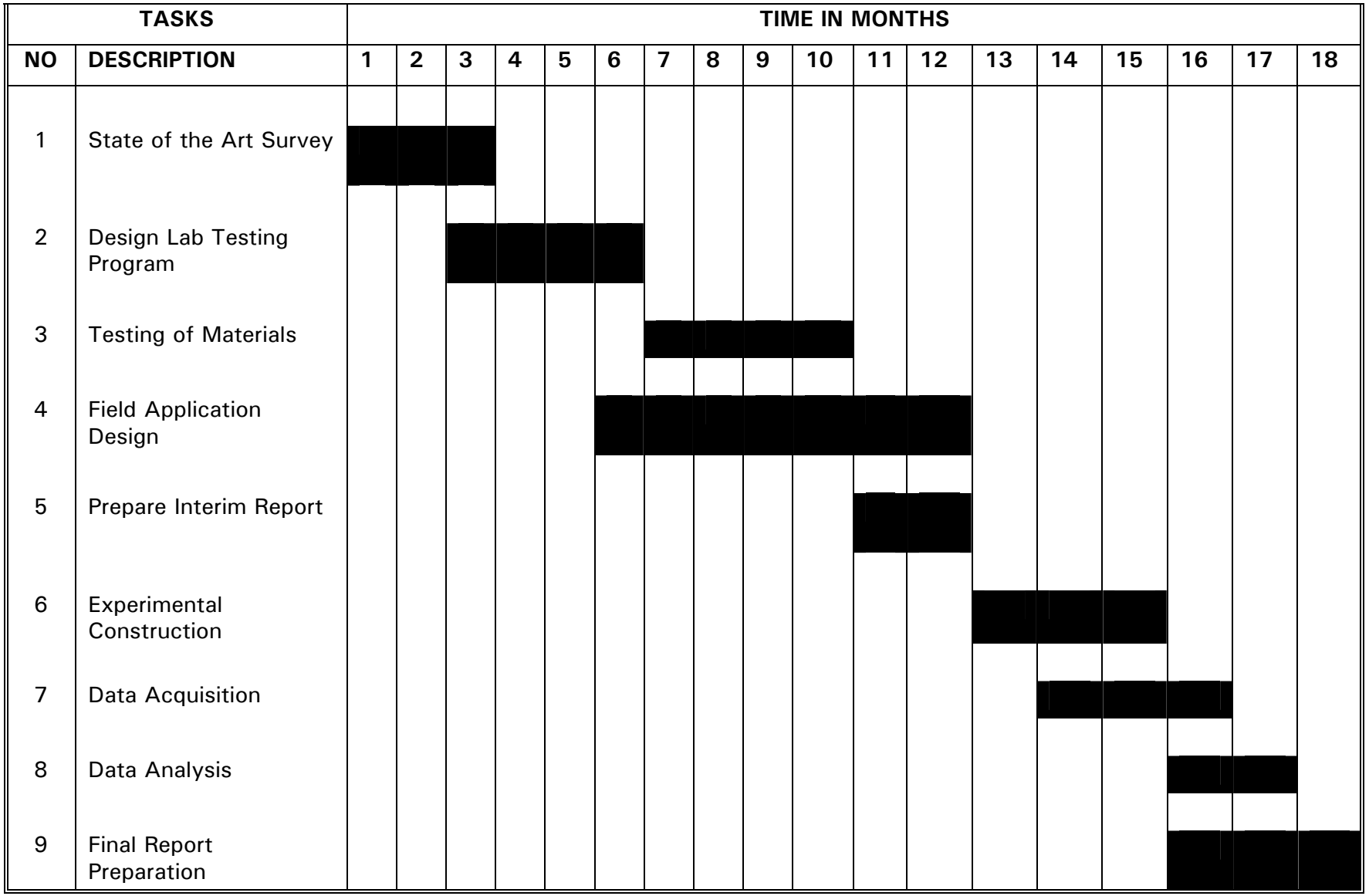

Figure 2-5

LOUISIANA TRANSPORTATION RESEARCH CENTER

PROPOSAL REVIEW FORM

PROBLEM STATEMENT NO. _____

_____

TITLE:

SUBMITTED BY: NAME _____

AFFILIATION: _____

Please rate each proposal individually and provide your assessment of rating points for each category A-E. Total the rating points in item F.	**POINT RATING**
A. OBJECTIVE AND APPROACH OF THE WORK (20 pts) 1. Proposal reflects conceptual understanding of problem **(10 max)** 2. Are the objectives and approach proposed **(10 max)** a. clear and easy to understand? b. likely to produce the deliverables required?	
B. PROCEDURE (20 pts.) 1. Is the overall procedure or methodology **(10 max)** a. adequately described? b. appropriate to the study? 2. Are the experimental methods and/or data analysis techniques **(10 max)** a. adequately described? b. appropriate to the study?	
C. BUDGET AND TIME SCHEDULE (15 pts) 1. Is budget within requirements? **(5 max)** 2. Is the budget reasonable for scope, personnel, and travel necessary to accomplish study requirements? **(10 max)**	
D. PERSONNEL (35 pts) 1. What is your evaluation of the qualifications, experience and management ability of the principal investigator and support staff relative to their specific assignments? **(25 max)** 2. Is the apportionment of personnel level (time allocated) to accomplish specific tasks appropriate and realistic? **(10 max)**	
E. FACILITIES AND EQUIPMENT (10 pts) 1. In your estimation, are available facilities and equipment listed adequate to accomplish study requirements? **(5 max)** 2. Is need for purchase of equipment listed adequately documented and justified? **(5 max)**	
F. OVERALL POINT TOTAL	

G. IS PROPOSAL ACCEPTABLE ___ **YES** ___ **NO**

H. COMMENTS

YOUR COMMENTS BELOW WILL BE HELPFUL TO ASSIST LTRC IN MAKING FINAL DECISIONS. ATTACHED CONTINUATION SHEETS FOR ADDITIONAL COMMENTS, IF NECESSARY.
(LIST IMPROVEMENTS NEEDED OR DEFICIENCIES IN PROPOSAL.)

INDIVIDUAL RATING PROPOSAL _____

Figure 2-6

3. CONDUCT OF RESEARCH PROJECTS

3.1 TYPES OF STUDIES

Research projects resulting from the proposal selection process may be categorized by funding source as follows: (1) federal, (2) state, (3) combined (SP&R), or (4) self-generated funding, such as that from private industry, NCHRP, or NSF. Requirements outlined in this manual for contract research will apply to research projects regardless of their funding source. Research projects conducted by LTRC staff or through contract will address local, regional and/or national problems such as exploratory, survey, feasibility studies; experimental construction incorporating new products or procedures studies; or implementation efforts.

3.2 CONTRACTUAL AGREEMENTS

DOTD/LTRC has executed a Cooperative Research Agreement (Appendix A) with each Louisiana University providing engineering services. Once a proposal has been selected and approved by the Secretary, a Task Order (figure 3-1) will be issued by LTRC. The Task Order indicating the investigative agency, study length and funding, along with the research parties, the Task Order indicates the starting date and serves as the notice to proceed with the study. No work may begin until the Task Order has been executed.

Contracts with agencies, universities, firms not subject to the Cooperative Research Agreement will be prepared by LTRC. Upon signature of the contract by both parties, a notice to proceed will be issued.

3.3 CONTRACT MANAGEMENT

Each contract research study is monitored by a LTRC Engineer Administrator or Manager who is responsible for coordination and overall surveillance of the research study. The LTRC Engineer Manager will review all invoices, progress reports, interim and final reports, and requests for changes in contract time and funding. The LTRC Engineer Manager should be contacted prior to preparing monthly invoices if the research investigator or the agency business office is uncertain about how specific expenditures should be invoiced. This will help avoid

unnecessary delays in providing reimbursement for work accomplished, equipment purchased, and other budgeted items. An LTRC Technical Coordinator will be assigned to oversee technical issues in the conduct of the study.

3.4 STUDY IDENTIFICATION

An LTRC research project number is assigned for record keeping and indicates the fiscal year in which the study begins and the LTRC group monitoring the study. An example is LTRC project number 02-1GT. The problem statement for this study was initiated in fiscal year 02-03 and the research was assigned to the Geotechnical group.

3.5 PRE-STUDY CONFERENCE

Prior to the starting date of the study, the LTRC Engineer Administrator or Manager will arrange a pre-study conference (kick-off meeting) with the research investigator and the PRC to review such items as study objectives, the time sequence of activities scheduled, and equipment or travel needs. The conference will provide an opportunity for discussion of concerns or comments and administrative and reporting requirements previously outlined by the PRC unless these items have been resolved. The meeting will also enable the investigator to have questions answered concerning administrative details. Specific attention toward potential implementation activities will also be discussed.

3.6 CONTRACT MODIFICATIONS

During the conduct of a study, it may become necessary to modify the original study proposal. All such proposal changes affecting the budget, time, personnel, objective, scope, and work plan shall be justified by the principal investigator subject to the approval of LTRC and should be directed to the LTRC Engineer Manager. Study modifications shall be requested using the Research Project Modification Agreement (figure 6-1) and initiated by the Principal Investigator, approved by the university or institution research head, and submitted to LTRC for approval. A revised budget sheet must be attached to any request which changes budget items. The agreement should be completed and signed in triplicate.

4. STUDY REPORTS

4.1 GENERAL OBJECTIVES

All reporting for research should be designed to accomplish the following objectives:

1. To maintain proper records for responsible documentation of study results.

2. To ensure that progress agrees substantially with the research proposal and to indicate changes which have been made from the original work plan.

3. To provide for early disclosure of significant findings which may be implemented or problems with which the staff of LTRC, DOTD, or the FHWA may be able to assist.

4. To provide for final documentation of technical findings.

5. To report on implementation activities

All reports will be submitted to the appropriate LTRC Engineer Administrator or Managers.

4.2 BIANNUAL PROGRESS REPORTS

A Biannual Progress Report shall be prepared by the Principal Investigator for June 30 and December 31. These reports shall be submitted to the LTRC Engineer Administrator or Manager by June 15th and December 15th respectively. Progress reports are required until submission of the draft of the final report. These reports shall contain sufficient information to enable the LTRC Engineer Administrator or Manager to evaluate the progress and possible future course of the study.

The following should be included, as indicated on the biannual progress report form shown in figure 4-1.

1. Study Identification

2. Budget Status

3. Accomplishments This Period

Identify and briefly discuss technical achievements and tasks completed over the period represented by the report. Detail any proposed modifications of the work plan and advise when a formal request for approval will be made. Include any problems on which assistance is needed, changes in personnel, or equipment needs. Explain problems with respect to funding, progress, time, or delays in study tasks.

4. Proposed Activities Next Period

Describe the work planned for the next reporting period. State the expected date of the Interim or Final Report if it will be submitted during the next period. Describe anticipated changes in scope, time, budget, etc.

5. LTRC Manager's Assessment

This portion of the biannual report should be completed by the LTRC Engineer Administrator/Manager monitoring the project. Information regarding study progress and accomplishments resulting from PRC meetings will be documented in this section.

6. Implementation Assessment

The technology transfer manager will provide information regarding benefits and recommended implementation strategies. Items that can be immediately implemented should be identified.

4.3 FORMAL RESEARCH REPORTS

All formal research reports shall be prepared in accordance with the publication "LTRC Publication Guidelines." A copy will be provided to the PI at the study kick off meeting. It is the responsibility of the PI to ensure that all reports submitted have been edited. Reports submitted needing substantial editing or not in compliance with the guidelines will be returned immediately. Edit costs are acceptable charges to be included in the study proposal.

1. Interim Reports

Interim Reports are to be submitted as outlined in the research proposal or upon request of LTRC. The report will present a complete documentation of all technical data and analysis, including results achieved. No report shall be authorized for publication until approved by LTRC. Ten copies of the initial draft interim report will be submitted for review and approval by LTRC. The corrected final copy shall be submitted in hard copy camera ready format and an electronic format.

2. Final Reports

A draft of the final report (10 copies) will be submitted to LTRC three months prior to the ending date of the study. This three-month period shall be accounted for in the study proposal work plan and budget. This will allow the LTRC and the PRC ample time to review the report and provide comments to the principal investigator. The principal investigator should then be able to make needed corrections to the report prior to exhausting study time and funding. The report will present a complete documentation of all technical data gathered, analysis performed, and results achieved. The accepted final report shall be submitted in both hard-copy, camera ready and electronic formats.

When an acceptable final report cannot be submitted to LTRC by the completion date of the study, the principal investigator shall submit a request for a time extension not to exceed 90 days. If the final report is not submitted within the approved time extension period, a stop order will be issued on any other LTRC study the researcher is conducting, and the researcher will be barred from submitting other proposals until the final report is received. If all of the above actions fail to result in submission of a final report, consideration will be given to citing the study for lack of compliance and requesting return of the funds expended or a negotiated portion thereof. A 10% retainage fee per invoice will be imposed on all contracts to ensure compliance with these requirements.

3. LTRC Technical Summary

A technical summary for each study shall be prepared by the Principal Investigator at the conclusion of the study with the draft final report. A sample format is provided in figure 4-2. The summary in electronic format should not exceed two, single-

spaced, typewritten pages and should include the following elements:

A. REPORT TITLE AND AUTHOR

B. INTRODUCTION - Identify the researchers and research agency and summarize the study. The cooperation of the FHWA and joint coordination with other agencies shall be acknowledged, as appropriate.

C. STUDY OBJECTIVES

D. RESEARCH APPROACH

E. CONCLUSIONS AND RECOMMENDATIONS

F. IMPLEMENTATION STATUS

G. STUDY CONTACT(S) - name, title, address, telephone number

H. DISCLAIMER STATEMENT - in accordance with Chapter 6

The LTRC Engineer Administrator/Manager shall include a copy of the technical summary at the time of the request for the PRC review of the draft report and indicate whether statewide, nationwide, or other distribution of the technical summary is intended.

4. Summary Reports

A summary report may be required if the final report exceeds 50 pages. This report will be an abbreviated version of the final report not to exceed 20 pages, inclusive. The summary report will be for general distribution; the full report will be for limited distribution as determined by the LTRC Engineer Manager.

5. Publication

Following review and final approval of the interim or final report and technical summary by LTRC, the Principal Investigator shall submit an original report in **camera-ready condition** and also in **electronic format** to the LTRC Engineer Administrator or Manager. LTRC will be responsible for the publication of all reports.

6. Distribution

The LTRC Engineer Administrator/Manager will recommend the distribution of all final, interim, summary, and technical summary reports. The Report Distribution Checklist (figure 4-3) should be completed and final distribution approved by the Associate Director, Research and the Director.

LTRC BIANNUAL RESEARCH PROGRESS REPORT
Louisiana SPR 0010(26)
For Period Ending: June 30, 2003

Title:	
Funding Source:	

State Project Number:			Project Start Date	
Research Project Number:			Completion Date (original)	
Research Agency			Completion Date (revised)	
Principal Investigator:				
BUDGET STATUS				
TOTAL BUDGET			Funds Expended (%)	
Total Cost (original)			Time Expended (%)	
Total Cost (revised)			Progress (%)	
Total Expenditures				
FISCAL YEAR BUDGET				
F.Y. Funds (original)				
F.Y. Funds (revised)				
F.Y. Expenditures (to date)				

PART I. PRINCIPAL INVESTIGATOR

Accomplishments this period (use additional sheets if necessary) (include any problems on which assistance is needed)

Proposed activities next period (use additional sheets if necessary)

PART II. LTRC MANAGER'S COMMENTS

PART III. LTRC TECHNOLOGY TRANSFER MANAGER'S COMMENTS

Assessment of Benefits and recommended implementation strategies

Figure 4-1

TECHNICAL SUMMARY

LOOP Environmental Monitoring Program
2000-2001 Vegetation and Wildlife

Summary of Report Number 370

P.I.: Douglas Labar, Helen Bostock, Amy Roberts and Scott Courtright, C-K Associates

LTRC Contact:
Art Rogers, P.E.
Phone (225) 767-9166

INTRODUCTION

The Louisiana Offshore Oil Port (LOOP) facilities in coastal Louisiana provide the United States with the country's only Superport for off-loading deep draft tankers. The facilities are located south of New Orleans in Lafourche Parish in southeast Louisiana and in adjacent offshore waters west of the Mississippi River Delta. LOOP is operated by LOOP LLC., a private corporation jointly owned by Shell Oil Company, Texaco Inc., Ashland Inc., Murphy Oil Company, and Marathon Pipeline Company.

The LOOP pipeline, which connects the facilities to onshore storage and distribution systems, traverses the major wetland habitats in the Louisiana coastal area. The 159 km pipeline crosses the near-offshore Gulf of Mexico near Fourchon through beach/barrier headland, estuary, and bottom land hardwood and bald cypress/water-tupelo swamp forests within the estuary. Four salinity zones-saline, brackish, intermediate, and fresh-are traversed, each providing a unique habitat supporting a variety of species. The coastal marshes of Louisiana are among the most productive ecosystems in the world, supporting a wide variety of estuarine-dependent organisms.

OBJECTIVES

The goal of the vegetation and wildlife portion of the Louisiana Offshore Oil Port (LOOP) Environmental Monitoring Program was to measure the immediate and long-term impacts of LOOP-related pipeline construction and operation on surrounding wetland plant communities and associated waterfowl, wading-bird, furbearing mammal, and alligator populations.

RESEARCH APPROACH

To meet the objectives of the LOOP Environmental Monitoring Program, two primary indices were used to determine environmental change. First, species composition and density were used to signify changes in the physical and chemical environment. Changes in species presence, diversity, and abundance typically indicate a change in the quality of an ecosystem. Second, net primary production was used to determine the quantity of production of the ecosystem. Results indicate a change in the physical environment.

Principles of sampling design, data collection, and analysis were used to determine which variables were the most important causal agents. Surveys were conducted with respect to spatial and temporal variability as related to identifiable changes caused by the pipeline. Statistical methods were used to evaluate main effects, interactional effects between and among variables, and one-way effects between variables; test hypothesis; and determine spatial and temporal trends.

The different parts comprising the 2000-2001 monitoring program are discussed by component in the report. They are: beach elevation, beach vegetation, general biological overflight, muskrats wading bird/seabird rookeries vegetation biomass, clovelly radial transects, wading birds and pelicans.

CONCLUSIONS

FIGURE 4-2

In an effort to meet the requirements of the LOOP Environmental Monitoring Program, the surveys summarized above were performed in 2000-2001. Overall, the LOOP pipeline corridor appeared to be in good environmental condition as a result of the construction and operation of the LOOP pipeline. Construction impacts to vegetation, wildlife, and hydrology did occur in 1978 through 1981; however LOOP did attempt to minimize these impacts by backfilling the canal, plugging waterbody crossings, plantings on the beach, etc. A portion of the LOOP pipeline has become a shallow waterbody; however, wading birds and waterfowl find this an attractive habitat. No survey conducted could attribute direct impacts to the environment as a result of the continued operation of the LOOP pipeline. The most significant action item for LOOP is to provide repair and/or maintenance to some plugs in the project area. Erosional processes were observed from the complex channelization of the marsh. This appears to be a result of natural coastal processes with many causes and the LOOP pipeline does not appear to have hastened this process.

RECOMMENDATION

In an effect to meet the requirements of the LOOP Environmental Monitoring Program, the surveys detailed in the final report were performed in 2000-2001 during the course of the work, the following recommendations were developed to better improve the scientific merit and the cost effectiveness of the surveys.

1) The LOOP Environmental Monitoring Program should be continued in an effort to collect and evaluate data.
2) Beach elevation – the beach elevation survey, the axial photograph and mapping survey should be consolidated since beach erosion and land loss are closely related.

FIGURE 4-2 (contin

3) Beach vegetation – this survey was performed in January 2001. It is recommended that this survey be conducted in a different time of the year in April/May at the beginning of the growing season or in August/September at the end of the growing season but not in January when plants are brown and dormant.

4) General biological overflight – it is recommended that this survey be continued. This survey generates only subjective data.
5) Vegetation biomass – this survey was designed to be conducted in fresh, intermediate, brackish, and saline marshes; however, over the years, the location and number of experimental and control transects have been changed and/or decreased. Net primary production is an important indicator of the health of an ecosystem; however, the experimental design needs to be modified in such a way to allow the evaluation process to derive the maximum use form the data collected.

LTRC DISTRIBUTION CHECKLIST

STUDY TITLE_____ REPORT NO.

TYPE OF REPORT □ FINAL REPORT □ INTERIM REPORT □ TECH ASST

GROUP ADMINISTRATOR

DOTD

□ LTRC PROJECT MANAGER (1)
□ PROJECT REVIEW COMMITTEE ( )
□ SECRETARY, DEPUTY SECRETARY & DEPUTY ASST SECRETARIES (4)
□ CHIEF ENGINEER (1)
□ POLICY COMMITTEE (8)
□ ADMINISTRATORS (15)
□ DOTD CHIEFS, ASSISTANT SECRETARIES (7)
□ DISTRICT CONSTRUCTION ENGINEERS
□ DISTRICT MAINTENANCE ENGINEERS (9)
□ DISTRICT TRAFFIC ENGINEERS (9)
□ DISTRICT LABORATORY ENGINEERS (9)
□ DISTRICT DES/WATER RES ENGINEERS
□ DISTRICT PROJECT ENGINEERS (46)
□ OTHERS

LA UNIVERSITIES

□ DEANS, COLLEGE OF ENGINEERING (6)
□ PRINCIPAL INVESTIGATORS ( )

STATES

□ AASHTO RESEARCH ADVISORY COMMITTEE (RAC), 62 COPIES
□ OTHERS
□ TRB ( ) _____ DISKETTE -- Y N
□ LAPA MAILING LIST (24)
□ CAAL MAILING LIST (30)

Figure 4-3

LTRC DISTRIBUTION CHECKLIST (continued)

NATIONAL INFORMATION CENTERS

- ☐ NATIONAL TECHNICAL INFORMATION SERVICE (10)
  5285 Port Royal Road Springfield, Virginia 22161
- ☐ UNIVERSITY OF CALIFORNIA (2)
  TRISNET Repository, Institute of Transportation and Traffic Engineering, Berkely, CA 94720
- ☐ NORTHWESTERN UNIVERSITY (2)
  TRISNET Repository, Transportation Center Library, Evanston, Illinois 60201
- ☐ TRANSPORTATION SYSTEMS CENTER (2)
  TRISNET Repository, Kendall Square, Cambridge, Massachusetts 02142
- ☐ DEPARTMENT OF TRANSPORTATION LIBRARY (2)
  400 7th Street, SW, Washington, D.C. 20590
- ☐ DEPARTMENT OF TRANSPORTATION R&D HRTS-10 (5)
  400 7th Street, SW, Washington, D.C. 20590
- ☐ FEDERAL HIGHWAY ADMINISTRATION (1)
  5304 Flanders Drive, Suite A Baton Rouge, LA 70808

☐ RESOURCE CENTERS (4)

EASTERN, 10 South Howard Street, Suite 4000, Baltimore, MD 21201
SOUTHERN, 61 Forsyth Street SW, Suite 17T26, Atlanta, GA 30303-3104
MIDWESTERN, 19900 Governors Highway, Suite 301, Olympia Fields, IL 60461-1021
WESTERN, 201 Mission Street, Suite 2100, San Francisco, CA 94105

☐ EXECUTIVE DIRECTOR, AASHTO ( )

STATE LIBRARY-PUBLIC DOCUMENTS DEPOSITORY (26)

☐ LTRC STOCK 25 COPIES TOTAL COPIES

RECOMMENDED FOR APPROVAL

EDITOR	DATE
LTRC MANAGER	DATE
ASSOCIATE DIRECTOR	DATE
DIRECTOR, (approved)	DATE

Figure 4-3 (continued)

5. FISCAL PROCEDURES

5.1 FISCAL YEAR

The LTRC fiscal year is defined as a 12-month period starting July 1 of each year and terminating on June 30 of the following year. Research project budgets are approved on the basis of expenditures by fiscal year, and expenditures in excess of that amount allocated for a fiscal year will not be reimbursed unless prior arrangements for extension of funds have been made.

5.2 REIMBURSEMENT OF EXPENDITURES

Claims for reimbursement of contract research expenditures shall be submitted on a monthly basis on the monthly invoice form shown in Figure 5-1 (other invoice formats may be approved on a case by case basis). Claims received by LTRC on or prior to the tenth day of the month following the month of the expenditures will generally be authorized for reimbursement in the month received and paid within 30 days. LTRC reserves the right to withhold 10% of the contract amount until all required deliverables have been submitted and are accepted by LTRC. The monthly invoice form shall contain the information in the following subsections (attach to invoice form when additional space is required).

1. Identification

The study shall be identified by title, state and research project number, research agency, and period for which the invoiced charges were incurred.

2. Equipment

The cost of nonexpendable equipment (having an acquisition cost of more than $1000 per unit and useful life of more than one year) or rental charges shall be listed, along with the voucher number, date of payment, description of equipment, number of items, and total costs. Also attach a copy of the manufacturer's invoice indicating serial and model number. Nonexpendable equipment or rental charges for equipment not included in the proposed budget shall require the approval of the LTRC Engineer Administrator/Manager prior to incurring the expense. Payment shall not be allowed for costs of service and repairs on equipment owned and normally maintained by the contractor.

3. Materials, Rentals, and Services

List individually any expendable equipment, consumable material, or supply item purchased for the project which exceeds $300 in unit cost or for which the aggregate cost exceeds $1000. Computer software is normally budgeted as a supply item. However all computer software purchased with study funds, if approved in the proposal, shall become the property of LTRC upon completion of the study.

Fees for rentals included in the proposal budget or authorized by LTRC should be listed in this section.

List and identify costs incurred for computer charges, reproductions and copying, telephone use, and other services associated with the project. List only those items which are not included in the computation of the agency's indirect cost percentage.

4. Personnel Costs

Include the names of authorized personnel and the corresponding charges showing hourly or monthly rate, number of hours or percent of time worked on the project, and the percentage used for employee benefits.

5. Travel Costs

Costs incurred for authorized travel shall include the name of the traveling party, destination, dates, and purpose of the travel. Refer to Chapter 6 for the details of conditions under which travel is authorized.

6. Indirect Costs

The total of all costs included on the invoice shall be shown, with the percentage used for indirect costs indicated. Indirect costs shall be computed on all direct costs (including benefits), excluding equipment costs.

When sub-contracts are used in the conduct of research, each sub-contractor shall provide a separate budget including direct and indirect costs. Indirect charges by the prime contractor for the sub contract costs will not be accepted, unless the majority of work by the sub-contractor is at the prime's facilities. In that case, the prime contractor can charge only indirect costs on the sub-

contractor's direct costs.

7. Balance

The fiscal status of the project shall be indicated by completing this portion of the invoice.

8. Certification

The invoice shall be certified correct and just by affixing the signature of the contract agency's auditor.

5.3 COST RECORDS

The contractor and its subcontractors shall maintain all books, documents, papers, accounting records, and other evidence pertaining to costs incurred relative to the project and shall make such materials available at their respective offices during the contract period and for three years from the date of final payment under this contract, for inspection by the DOTD and/or Legislative Auditor, and when federally funded, the U.S. General Accounting Office, or any other authorized representative of the federal government under state and federal regulations effective the date of the contract. Copies thereof shall be furnished if requested.

5.4 AUDITING

DOTD routinely conducts an audit of the research contractor prior to the initiation of a research project and upon termination of the project; however, DOTD may conduct an audit at any time it is deemed necessary.

5.5 BUDGET MODIFICATIONS

Requests for changes in an approved research project which affect funding shall be in accordance with Chapter 3.

Louisiana Transportation Research Center MONTHLY INVOICE FOR RESEARCH PROJECTS	DATE
	RESEARCH AGENCY:
PROJECT NAME	STATE PROJECT NUMBER:
PERIOD FROM: TO:	LTRC STUDY NUMBER:

1. EQUIPMENT

ARTICLES OR SERVICES DESCRIPTION	DATE OF PAYMENT	VOUCHER NUMBER	QUANTITY	AMOUNT

2. MATERIALS, RENTALS AND SERVICES

ARTICLES OR SERVICES DESCRIPTION	DATE OF PAYMENT	VOUCHER NUMBER	QUANTITY	AMOUNT

3. PERSONNEL COSTS

NAME	HOURLY OR MONTHLY RATE	HOURS OR PERCENT	CHARGE
TOTAL			$
EMPLOYEE BENEFITS AT %			$
TOTAL PERSONNEL COSTS			$

4. TRAVEL AMOUNT

MILEAGE MILES AT PER MILE	
SUBSISTENCE – NAMES	
OTHER EXPENSES (SPECIFY)	
TOTAL TRAVEL	

SUMMARY OF INVOICED COSTS

1. EQUIPMENT _____
2. MATERIALS, RENTALS AND SERVICES
3. PERSONNEL
4. TRAVEL

SUBTOTAL
INDIRECT COSTS @ _____%
VOUCHER TOTAL

FY FUNDS CANNOT BE EXCEEDED WITHOUT AUTHORIZATION

"I CERTIFY THAT THE ABOVE BILLING IS CORRECT AND JUST AND THAT NEITHER PAYMENT NOR CREDIT HAS BEEN RECEIVED."

BY:

AUDITOR

P.I.'s:

BALANCE	FOR FISCAL YEAR	FOR PROJECT
STUDY BUDGET	$	$
PREVIOUS PAYMENTS	$	$
PREVIOUS BALANCE	$	$
AMOUNT DUE THIS INVOICE	$	$

DO NOT WRITE IN THIS SPACE

CHECKED BY:
APPROVED:
DATE:

Figure 5-1

6. GENERAL OPERATING PROCEDURES

6.1 FILES AND RECORDS

Responsibilities for the maintenance and ownership of files and records are as follows:

1. LTRC

A pending file will be established for each problem statement submitted to LTRC. Subsequent proposals and all records of PRC meetings, evaluations, and correspondence pertaining to each proposal and problem statement will be maintained in this file. The file shall be identified by the research project number to be assigned if and when the project is approved. Once a project has been approved, the pending file will be made active and maintained.

2. Contractor

The contractor shall maintain records of all data, findings and conclusions, reports, and other evidence and supporting documentation pertaining to the study in accordance with generally accepted research practice. Accounting records shall be maintained to support all costs invoiced for the project (see Chapter 5). These records shall be kept up-to-date and made available to representatives of LTRC, DOTD, and FHWA during the conduct of the study and for a period of three years from the date of final payment to the contractor for completion of the project.

3. Ownership of Documents and Records

All data collected by the contractor and all reports, documents, notes, drawings, and files collected or prepared in connection with research projects, except the contractor's personnel and administrative files, shall become the property of LTRC, and LTRC shall not be restricted in use of said documents in any way.

6.2 TRAVEL

Charges for travel shall be in accordance with the formal written policy and allowances of the Division of Administration. Authorized travel made in connection with a research project shall be reimbursable under the following conditions:

1. In-State Travel

Travel within the confines of the state of Louisiana necessary to the routine duties required for completion of the project and for which provision is made in the approved study budget.

2. Out-of-State Travel/Non-Routine Travel

Travel outside the confines of Louisiana (or within the state for the purpose of attending conferences, conventions, seminars, or to make presentations relative to the project) when included in the approved study budget. A written request shall be submitted for LTRC approval at least three weeks prior to the anticipated date of departure. Such requests shall include the name(s) of person(s) making the trip, purpose of the trip, anticipated dates of travel, and an itemization of costs to be incurred.

6.3 EQUIPMENT

All equipment owned by the contractor and not included in the approved study budget for purchase or rental is considered routine equipment and shall be available for use on the project without charges of any nature made against the project. The cost of wear and tear, maintenance, service, operation, insurance, and depreciation are to be addressed in the indirect costs specified in the approved study budget.

1. LTRC Equipment

The use of LTRC equipment and facilities by contract researchers may be arranged with the approval of the Director. When the use of such equipment is not stated in the study proposal, the conditions under which it may be used shall be determined by the Director.

2. Nonexpendable Equipment

Those items having a useful life of more than one year and an acquisition cost of more than $1000 per unit purchased specifically for a study are considered nonexpendable. This category of equipment includes items fabricated for the study from items charged to the study budget and meeting the above definition. All nonexpendable equipment, devices, or systems either built or purchased are the property of LTRC upon completion of the study. All computer software and reference publications purchased with study funds shall become the property of LTRC upon completion of the study whether budgeted as non-expendable equipment or

supplies.

3. Expendable Equipment

Those minor items of equipment not meeting the definition of non-expendable equipment are considered as having no residual value upon termination of the study and become the property of the contractor.

4. Disposition of Nonexpendable Equipment

All nonexpendable equipment purchased or built using study funds becomes the property of LTRC upon completion of the study. For contract research, the principal investigator shall submit upon completion of the study an itemized list of all such nonexpendable equipment, including a description of the item, date of purchase, purchase price, service history, and condition of equipment. The contractor shall make disposition of the equipment in accordance with directions of LTRC as follows:

A. *Transfer To Another Project* - The equipment may be transferred to another LTRC research project for subsequent use. In this event, the amount of the residual value of the equipment, as determined by LTRC, shall be credited to the original study project and charged to the project to which it is transferred.

B. *Transfer To LTRC* - The equipment (including service manuals, accessories, tools, wiring diagrams, etc.) may be transferred to LTRC for its use and the amount of residual value, as determined by LTRC, credited to the project if the equipment is to be used for purposes other than research. Each piece of equipment or computer software so transferred shall be assigned an inventory number in accordance with DOTD property control procedures.

The disposition of all nonexpendable equipment shall be documented by LTRC upon project completion utilizing the form shown in figure 6-1, copies of which shall be maintained in the project files for the study. Additionally, LTRC will maintain a complete file documenting the disposition of all nonexpendable equipment acquired as a direct result of research project expenditures.

6.4 PROGRESS INSPECTIONS

During the progress of a research project, representatives of LTRC, DOTD, and FHWA (for federally funded studies) shall have the right to inspect the progress of the work and the facilities used by the contractor in the conduct of the study. They shall be provided reasonable access to all personnel associated with the study.

6.5 REPORTS

All reports required by LTRC shall be in accordance with Chapter 4. The author shall be free to copyright material developed under the contract with provision that LTRC, DOTD, and FHWA reserve a royalty-free, nonexclusive, and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use, the work for government purposes. LTRC, DOTD, or FHWA may initiate a request for publication of the final or interim reports or any portions thereof. Both parties to the contract shall have equal responsibility to review and approve material for publication, except that LTRC reserves the right to initially publish the final report.

In the event of failure of agreement between LTRC and the contractor relative to publication of the final report, or of any progress reports during the contractual period, LTRC reserves the right to publish independently, in which event the non-concurrence of the party shall be set forth as technical comments in the report in a clearly identified section such as "sponsor's or contractor's comments." After acceptance of the final report, the contractor, LTRC, and FHWA are free to use the data and results without restriction except as noted above. Whenever the contractor uses the data and the results, due credit will be given to LTRC, DOTD, and FHWA (when applicable).

All reports published by LTRC and/or the contractor shall contain a disclaimer statement similar to the following:

"The contents of this report reflect the view 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 Louisiana Transportation Research Center, the Louisiana Department of Transportation and Development, or the Federal Highway Administration (FHWA funded only). This report does not constitute a standard, specification, or regulation."

Publication by either party shall give credit to the other party and to FHWA, unless, due to failure of agreement on any report of the study, the FHWA or either of the parties to the contract requests that its credit

acknowledgment be omitted.

When research is not supported by federal funding, the above requirement pertaining to FHWA does not apply.

6.6 PUBLICATION OF PAPERS, ARTICLES, AND PRESENTATIONS

The presentation of study findings by formal papers, articles, or bulletins shall not be made without the prior approval of LTRC. All such publications and presentations shall contain disclaimer statements similar to that given in Section 6.5. The sponsoring agencies shall be credited and copies submitted to LTRC prior to presentation or publication.

6.7 THESES AND DISSERTATIONS

Although the prior approval of LTRC is not required, a copy of all theses and dissertations which are a result of research projects sponsored by LTRC shall be furnished to the Director, and the sponsorship of LTRC shall be acknowledged. Theses and dissertations are not acceptable in lieu of other reporting requirements.

6.8 PATENT RIGHTS

The proprietary rights of any special equipment or procedure developed as a result of contract research are governed by the provisions contained in the example of the contract illustrated in Appendix A.

6.9 COMPUTER PROGRAMS

Computer programs developed by a contractor as a result of LTRC sponsorship of a research project are the property of LTRC and shall be modified as directed by LTRC for compatibility with LTRC/DOTD equipment.

6.10 CORRESPONDENCE

Unless otherwise indicated, all correspondence, forms, reports, invoices and other documentation for a research project should be directed to the appropriate LTRC Engineer Manager.

Louisiana Transportation Research Center
DISPOSITION OF NONEXPENDABLE EQUIPMENT

LTRC PROJECT NO.			STATE PROJECT NO.		DATE			
STUDY TITLE								
DESCRIPTION OF ITEM	NO. OF ITEMS	PURCHASED FOR PROJECT NO.	ORDER OR INVOICE NO.	DATE OF PURCHASE	PURCHASE PRICE	ESTIMATED SERVICE LIFE	DEPRECIATED VALUE	TRANSFERRED (AGENCY/PROJ. NO)
METHOD OF DEPRECIATION:								
INTENDED USE OF EQUIPMENT:								
LTRC GROUP ENGINEER ADMINISTRATOR:								

Figure 6-1

7. ASSESSING AND IMPLEMENTING RESEARCH

7.1 GENERAL INFORMATION

Each research activity is undertaken with the specific intent of eventually providing solutions to transportation problems or generating useful information. The findings of each study must be carefully assessed to determine those which offer potential benefits if implemented. Implementation is the logical follow-up and application of research results to provide the basis for adopting innovations into practice. It is the primary goal of LTRC to develop and manage a research program which emphasizes implementable products. The two criteria used in selection and ranking of research problem statements are (1) importance of the problem to the Louisiana Transportation Community and (2) implementation potential, on an equal ranking basis. Research study proposals are required to contain clearly identified products. Implementable products often fall into one or more of several categories: (1) products which are of immediate interest to the funding agency, which provide the basis for decision making; (2) products which identify the reasons for underlying causes; or data relationships which may be used to explain, improve, or develop processes, (3) products which enhance the ability of researchers to conduct research.

7.2 ASSESSMENT

Each research project should be evaluated at various stages to determine whether the results or findings have potential which merits implementation.

1. Assessment Periods

A Research Assessment and Implementation Report shall be completed by the Technology Transfer Engineer Administrator/Manager in conjunction with LTRC Engineer Manager at the following times for the duration of each study:

A. Final Report – following the receipt of final reports to LTRC

B. Significant Achievement - when a significant breakthrough or development results from the study.

2. Assessment Criteria

In the evaluation of study results the following considerations are essential. These points are presented as an aid and are not intended to be all inclusive:

A. Do the study findings have potential application?

B. Are the results practical for application to the transportation system or some other area?

C. Where in the transportation or other applicable area can the findings be applied?

D. Will the findings have impact on the state of the art?

E. Will the findings result in the application of new or modified procedures?

F. Will the findings result in revision of existing specifications, standards, and design procedures or the issuance of new ones?

G. Will the findings result in the modification, development, and use of materials or equipment?

H. Will the findings show other positive benefits such as reduced costs, greater efficiency, safer highways, greater convenience, aesthetics, etc.?

I. What will be the economic result of applying the findings to the transportation and/or other applicable systems?

J. Do the findings show no conclusion but suggest other research needed?

K. Who will benefit from the findings?

L. What strategies would be most effective in implementation?

3. Implementation of Research

The typical objective of the implementation phase of research is to create an atmosphere leading to improvement, to encourage efficiency, and to reduce costs. Successful implementation of findings requires a determined effort by both the research community and the potential user, who must be convinced of the

applicable benefits.

A. *Responsibility for Implementation* - The LTRC Engineer Administrator/ Manager and the Technology Transfer Engineer Manager have joint responsibility for insuring that study findings with potential for application are implemented. The strategies for implementation should be determined in conjunction with the Project Review Committee and the principal investigator, and recommended to the Directors for Research and Technology Transfer. The feasibility of implementation should be documented in accordance with Section 7.2.1 and recommendations formally submitted using the Research Assessment and Implementation Report. Research projects should be cost-effective, and the anticipated benefits are of paramount importance to the justification and continuation of research activities.

   In accordance with the DOTD Secretary's direction each proposal must be recommended for approval by a DOTD Director. Such recommendation commits the Director to ensure that successful research products/deliverables are implemented. Should the Director not choose to implement successful research, he must address his reasons to the Secretary in writing.

B. *Implementation Strategies* - The method of relating the potential benefits of study findings to the appropriate individuals or groups must be carefully considered. The following implementation strategies should be considered:

   LTRC Publications - The following LTRC publications will be considered for Technology Transfer purposes.

   (1) Project Capsule- shall be developed, published and distributed by the Technology Transfer Engineer Manager for each immediately following approval of the proposal.

   (2) Interim Reports

   (3) Final Reports

   (4) LTRC Technical Summaries - These are required for each study upon completion and may be generated during the study when appropriate.

(5) Technology Transfer - The applicability of findings for inclusion in the LTRC Technology Today and Technology Exchange Newsletters should be considered.

Distribution of reports should be based upon the applicability of findings to DOTD and other state and federal transportation agencies, academic institutions, industry and allied organizations, professional technical organizations, state public libraries, and local cities, parishes, and rural governmental entities which may benefit. For all research undertaken with federal funding it is required that each interim report and final report be submitted to the federal source stated in the report distribution checklist.

C. *Issuance of Memoranda* - Recommendations may be made by memoranda to incorporate findings into transportation or other applicable systems by their inclusion into specifications, standards, procedures or techniques for design, planning, construction, maintenance or administrative functions. In addition, the appropriate LTRC Engineer Administrator/Manager shall prepare a memorandum to the appropriate DOTD Director for the distribution of each interim report, final report, and technical summary published.

D. *Formal Presentations/ Publications*- Study findings may be implemented through formal presentations or papers by the researchers at conferences and seminars, articles in technical trade journals, meetings, and demonstrations for potential users.

E. *News Releases*- Should be coordinated through the Director's office.

F. *Development of Formal Training Materials* - Either written or audiovisual training presentations should be initiated when necessary to implement findings.

G. *Experimental Projects* - Findings may be incorporated into a project for further evaluation.

H. *Development of Study Proposals* - Findings may warrant further research or evaluation in the study area.

I. *Personal Contact* - The importance of personal contact with

those individuals who may implement findings and benefit from them cannot be overemphasized. The use of seminars and workshops are encouraged.

J. LTRC Web Site – LTRC capsules, technical summaries, interim and final reports will be posted on the LTRC web site.

4. Peer Exchange Process

A quality research program depends upon its ability to implement timely solutions to the problems of the department and the transportation industry. It is the effective utilization of the staff and management-developed procedures and processes that ensure the attainment of this objective. One technique designed to improve the quality of the program is a peer exchange and examination of the LTRC RD & Technology Transfer activities. For this purpose, LTRC will disclose information and documentation regarding its management processes. LTRC will select the peer exchange team from sources such as FHWA (at least two members of the peer exchange team must be selected from the FHWA list of qualified peer reviewers), universities, TRB, and other state transportation agencies.

The peer exchange will be charged with examination of the LTRC management system described in this manual, reviewing scope of the research work, examples of a project as it advances through the system, including the solicitation, selection, contract process, project progress, staff training, and technology transfer activities, and assessing the overall effectiveness of the program and its implementation process. In addition, other topics of specific interest will be addressed during the exchange. The peer exchange team will develop a written report of its findings for LTRC. The report will be presented to the Secretary and Chief Engineer at a meeting closing the Peer Exchange.