

RESEARCH AND DEVELOPMENT PROJECT
REPORTS PREPARATION GUIDE

Research and Development Branch
Office of Materials and Research
Georgia Department of Transportation

RESEARCH AND DEVELOPMENT PROJECT REPORTS PREPARATION GUIDE

Purpose of this guide – This is intended to be a guide for the preparation of research and development (R & D) project reports which are prepared by or for the Georgia Department of Transportation. The information contained herein is provided to produce some degree of uniformity in R & D reports and to ensure that applicable Department and Federal Highway Administration regulations are followed. This guide has been prepared based on past experience and incorporates procedures and standards, which have proven to work well. In addition, the guide will help to promote a more efficient procedure in administering research and development project reports.

The guide consists of two parts. The first part contains general information and the second part details the format and elements of reports. Progress reports are also required for each research project, but information on these reports is contained in a separate guide. Any questions on reports should be directed to the Research and Development Branch.

PART I – GENERAL INFORMATION

- A. Need for reports – All research and development projects require the preparation, submission, review, and approval of appropriate written reports to document the projects objectives, activities, findings, conclusions, and recommendations and to permit other appropriate persons to understand, evaluate, and duplicate the research project.
- B. Type of reports – Reports may be interim, technical, or special in nature, but in any case a final report must be prepared for each project.

The type of report to be prepared for each project along with the due dates are outlined and discussed in the research project proposal.

1. Interim – An interim report or reports may be required for a long-term project to report on various work phases as they are completed thus allowing a prompt dissemination and implementation of project results.
 2. Technical – Technical reports document work of a technical or complex nature which is significant to the project and which merits separate documentation from other reports.
 3. Special – Special reports may result from informal research work, special research projects, or as an outcome of a unique aspect of a formal research project. In addition, special progress reports may be required for particular projects, which are informal reports desired for quick information purposes and which do not require review or approval; they are also not generally published.
 4. Final – A final report is required for all projects and should cover activities of the entire project from beginning to end. It should incorporate appropriate data and information from other reports prepared for the project and should be able to “stand alone” as documentation of all project work.
- C. Composition and style of writing - The report should be clear, complete, concise, and written in an understandable style. This is especially important because many people reading the report may not be familiar with the subject matter or it’s technical aspects. Sometimes a researcher is so involved in a project that they forget that others do not know as much about the project as they do, and this usually results in the reader becoming “lost”. Aim at providing a report which can be understood and used by all those who may be concerned

with its subject.

An introduction should be contained in each report to introduce and explain the research project itself and the scope of the report to the reader. A good background statement is important in producing understanding. Tables and figures should be used whenever possible as they help to present clear and concise information in a summary form thus eliminating the necessity for lengthy description and explanation in the text. In addition, they make the report more usable in an operational situation and assist in implementing project results. Photographs are very helpful for the same reasons and should be used when applicable. All technical aspects, terms, etc. should be thoroughly explained for the unfamiliar reader. Where lengthy data or information in tables, figures, or text exists consider placing this information in an appendix to avoid cluttering the text and disrupting the reader's train of thought.

Above all aim at producing a "readable report" because if project reports are not read the effectiveness and success of the project itself is greatly reduced.

D. Report submittal, review, approval, printing, and distribution –

1. Submittal – All reports which are to be published (excludes progress reports) are first prepared in draft form and are submitted in the required number of copies (usually 10, but reference project proposal and/or contract for the exact number) to the Research and Development Branch for review, comments, and approval by appropriate personnel within the Department and the Federal Highway Administration (FHWA) if Federal funds are involved. This draft should be reproduced by photocopying or similar means and should be bound with staples or other appropriate binding. The draft should be in a completed form having all the elements of a report.

2. Review – The review process normally takes one to two months to complete depending upon the particular project. Upon completion of this review, comments are returned in writing to the researcher for consideration and incorporation into the final report document.

3. Approval – Usually approval of the report and acceptance for publication are also given in letter transmitting review comments to the researcher, but in some cases a second review may be necessary before approval is given. For contract projects, all reports must be approved and accepted before final payment can be made. Upon approval of the report and necessary revisions, the report should be prepared for printing as outlined below.

4. Printing – Either the project proposal and/or contract indicates the printing responsibilities, procedures, and the number of report copies required for each project. The researcher should provide the R & D Branch with a camera-ready copy of the report with all the text, figures, tables, photographs, etc. being originals. Information is given in other parts of this guide as to which is expected in the camera-ready copy. The report should be assembled ready for printing with no further work required by the R & D Branch. Upon completion of printing, the report original will be maintained in the permanent files of the R& D Branch.

5. Distribution – After printing is complete, the R & D Branch distributes the report to appropriate personnel within and outside the Department. Normal distribution is as follows: (1) one copy to each member of the Department’s Research Advisory

Committee, (2) one copy to other appropriate personnel in the Department, (3) copies as requested to the Federal Highway Administration, (4) two copies to the National Technical Information Service (NTIS) who is the clearinghouse for all reports resulting from Federally sponsored or participating studies, (5) two copies to the Transportation Research Board of the National Academy of Science, and (6) other individuals and agencies depending on the particular project.

PART II – FORMAT AND ELEMENTS OF REPORT

The information contained in this section provides a guide relating to the report format and various elements of the report. Any items not covered are left to the discretion of the writer or the R & D Branch should be contacted for guidance or a reference can be consulted such as A Manual for Writer of Term Papers, Theses, and Dissertations by Kate L. Turabian. References are made in the following attached exhibits to illustrate the various items where appropriate.

A. General Elements

1. Paper – The paper should be white and 8 1/2 by 11 inches in size. Oversize pages which require folding should be avoided if possible as they create delays and problems in printing. If information cannot be presented legibly on the 8 1/2 x 11 inch format consider preparing on a larger, proportional size format and then reducing to 8 1/2 x 11. Also, since most reports are printed on both sides of a page, use can be made of the two page format by, for example, splitting a figure in the middle and putting part of it on the left page and part on the right page.
2. Spacing – All reports should be typed double-spaced.
3. Margins – Margins should be at least 1 1/4 inches on each side and 1 inch at the top and bottom for all pages in the report including those containing

tables, figures, etc. Side margins are particularly important as printing is usually done utilizing both sides of a page and if adequate margins are not available the printed matter may extend into the binding area.

4. Page numbers – All pages in both drafts and final revised versions should be numbered. Pages in the preliminaries or front matter of the report should be numbered with small Roman numerals (i, ii, etc.) at the bottom center of each page. Begin numbering the pages of the remaining portion of the report with the Introduction (or first major heading in the body of the report) and number in the bottom center of the page with Arabic numerals (1, 2, etc.). Usually the page number is omitted on the very first page. In numbering the pages themselves, the following guides should be followed:
 - a. Draft – Each page should be numbered consecutively following above rules. All reproduction by photocopying or similar means is done only one side of a page.
 - b. Final Revised Version – Reports are sometimes printed utilizing both sides of a page to produce a concise report. The writer and typist should consider this printing procedure when preparing the final version of the report (after considering and incorporating all comments from the Department and Federal Highway Administration as applicable) which will constitute the “camera-ready” copy that will be used in printing. The foregoing general guide covered in item four above should be followed with the addition of the following: (1) all major headings such as the preliminaries or front matter (abstracts, table of contents, list of tables, etc.) chapters, appendixes, etc., should begin on the right-hand page, and (2) all right-hand pages should be odd numbered and all left-hand pages should be even

numbered (printing tradition). All pages should be numbered in this manner when the camera-ready copy is transmitted to the R & D Branch so that it can be printed with no further revision. In almost all cases it will be necessary to renumber the pages (from those in the draft) and make changes in the table of contents, etc for two sided printing.

5. Tables and Charts – Tables and charts should be used as needed and should be listed in a list of tables with the table number, title exactly as shown on the table itself, and page number. The table number and title are usually placed at the top of the table. Each table should be discussed in the text and should appear on the same page or the next page after being mentioned in the text. Table numbers should be consecutive throughout the report. Margins should be the same as on a regular text page (a minimum of 1 ¼” on side, 1” at top and bottom). If numerous tables are to be presented consider placing them in an appendix in order to avoid cluttering the text and perhaps interfering with the reader’s train of thought. If the table must be placed on a page lengthwise, it should be oriented to be read from the right of the report. See Exhibits A and B for examples.
6. Figures, including photographs – Figures should be used as needed in accordance with the same guidelines for Tables and Charts, item Five above. Figure numbers and titles, are, however, placed under the figure. Photographs are very useful in reports and should be used whenever appropriate. Black and white photos are preferable, but color is acceptable. All photos should be “positives” (prints) and should be attached to and placed on the page on which they appear. The figure number should be written on the back of each photo for identification if the photo comes off the page. See Exhibit C.
7. Covers – The covers for the report are standardized for Department Research and

Development reports and will be provided by the Department in all cases. For projects where the contractor is responsible for printing, the covers will be available to the researcher in time for printing. See Exhibit D for an example.

B. Format and Contents – The format and outline of the contents for each report is generally as follows and in the order presented:

Preliminaries (Front Matter)

1. Inside title page – The inside title page gives appropriate identification of the project and report and is the first page inside the cover. It's content varies slightly depending on whether the project is conducted "in-house" (See Exhibit E) or by contract (See Exhibit F).
2. Acknowledgements – This section is optional and is provided to acknowledge the assistance of various types which the researcher has received during the course of the project.
3. Abstract – Each project report should include an abstract of less than 200 words which describes the study in general including objectives, procedures, and significant findings based on project work and the time period covered by the report. See Exhibit G.
4. Key words – Include a list of key words (at the bottom of the page containing the abstract) which best describes the report subject matter. See Exhibit G.
5. Table of Contents – A table of contents should be included containing preliminaries (front matter), major division of the report, appendixes, references, etc. See Exhibit H.
6. List of Tables – See Exhibit I.
7. List of Figures – See Exhibit J.
8. Other elements may be added as needed.

Body of Report

9. Introduction – Include an introduction to explain the project in general and include brief statements on the background of project, reason for being conducted, objectives, scope, significance, and anticipated results and implementation aspects.
10. After the introduction, the report should be divided into logical divisions depending on the subject matter and should contain information on the study procedure employed, findings, conclusions, and recommendations (including suggested implementation) although the chapters or headings need not bear these exact titles.
11. List of references or bibliography – An appropriate listing should be given for publications suggested for reference and/or consulted during the course of the project. See Exhibit K.
12. Appendix – Include in the appendix any material which is not appropriate for inclusion in the text due to length, technical nature, etc. See Exhibit L for titling guide.

EXHIBITS

TABLE 1

TITLE OF TABLE

NOTES:

- (1) Type table number and title at top of page
- (2) Maintain minimum margins of 1 ¼ inch on sides and 1 inch at top and bottom

(EXAMPLE)

TABLE 2

TITLE OF TABLES

NOTES:

When tables (or figures) are oriented lengthwise on paper, always prepare so as to be read from the right side as indicated here.

EXHIBIT C

NOTES:

- (1) Type figure number and title under figure.
- (2) Maintain minimum margins of 1 ¼ inch and 1 inch at top and bottom.

Exhibit D

(Example Title Page---to be used by units of Georgia
Department of Transportation conducting research)

Departmental Research

GDOT Research Project No. xxxx

Title of Project only if different from Title of Report

Final (or Interim or Technical) Report

TITLE OF REPORT IN CAPITALS

By

Name

Title

Unit of Department Conducting Research
Georgia Department of Transportation

In cooperation with

U.S. Department of Transportation
Federal Highway Administration

Month, Year

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 Department of Transportation of the State of Georgia or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

(Example Title Page—to be used by contractors
conducting research for the Georgia Department
of Transportation)

Contract Research

GDOT Research Project No. xxxx

Title of Project only if different from Title of Report

Final (or Interim or Technical) Report

TITLE OF REPORT IN CAPITALS

By

Name
Title

Name of Contractor

Contract with

Department of Transportation
State of Georgia

In cooperation with

U.S. Department of Transportation
Federal Highway Administration

Month, Year

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 Department of Transportation of the State of Georgia or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

ABSTRACT

Each project report must include an abstract of less than 200 words describing the study in general and including objectives, procedure, significant findings and principal conclusions and recommendations.

KEY WORDS: Include “key words” which best describe the report subject matter

Abstract

This study for Georgia was one of several such test programs conducted by state highway departments in order to extend and verify the Case Method dynamic testing techniques for prediction of the bearing capacity of a pile.

A selected construction pile, after being statically tested was instrumented with force and acceleration transducers and restruck several times. Dynamic measurements were recorded on analog magnetic tape and later analyzed. After returning to the laboratory, the data were automatically converted to digital form and stored for later processing.

An automated prediction scheme, known as the Case Method uses both measured force and acceleration to compute the total ultimate pile strength. This procedure is simple enough to be incorporated in a special field computer which can be used for on-site capacity determination.

A more elaborate computational procedure involving a large general purpose computer uses the measured data to predict not only the resistance but also its distribution along the pile. This method uses the one-dimensional wave equation to obtain the solution.

Key words: capacity prediction, setup, soil resistance, energy plots, Maintained load (M.L.) test, Constant Rate of Penetration (C.P.R.) test, Case Pile Wave Analysis Program (CAPWAP)

(Example)

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	X
ABSTRACT AND KEY WORDS.....	X
LIST OF TABLES.....	X
LIST OF FIGURES.....	X
*INTRODUCTION.....	X
*PROCEDURE.....	X
*FINDINGS.....	X
*CONCLUSIONS.....	X
*RECOMMENDATIONS.....	X
REFERENCES.....	X
APPENDIXES	
Appendix A—Title.....	X
Appendix B—Title.....	X

*These headings are presented only as a guide for the type of information to be contained in a report and specific headings should be developed for each individual report.

(Example)

LIST OF TABLES

Table	Page
1. Title of Table 1 as it appears on Table in body of report.....	X
2. Title of Table 2.....	X
3. Title of Table 3.....	X
4. etc.	X

(Example)

LIST OF FIGURES

Figure	Page
1. Title of Figure 1 as it appears on Figure in body of report.....	x
2. Title of Figure 2	x
3. Title of Figure 3	x
4. etc.	x.

Note: If a list of references or bibliography is included use the standard format as illustrated below. A good reference is A Manual for writers of Term Papers, Theses, and Dissertations by Kate L. Turabian.

REFERENCES

1. National Association of Motor Bus Owners, Bus facts, 31st. Edition Page 6.
2. “Financing of Georgia’s Highway, Road and Street Program:, Summary Report, Wilbur Smith and Associates, Dec. 1998.
3. Bates, J.W., “Development and Use of a Statewide Origin and Destination Data Bank”, GHD Research Assistant Project 2-99, State Highway Department of Georgia, 1994.
4. Ibid.
5. Bates, J.W., “Comprehensive Planning for Rural Regions—A Case Study”, Research Assistance Project No. 2-94, State Highway Department of Georgia, 1994.
6. Bates, J.W., “Development of Models for Regional Transportation Studies—Project Design”, Research Assistance Project No. 2-96, State Highway Department of Georgia, 1996.
7. Arrillage, B., “Development of a State-wide Traffic Model for the State of Georgia—Draft Literature Review”, GHD Research Project No. 9101, State Department of Georgia, 1991.
8. Bates, J.W., “Development and use of a Statewide Origin and Destination Data Bank”,Op.Cit.
9. Ibid.
10. Dixon, W.J., “Biomedical Computer Programs”, University of California Press, Los Angles, 1992.
11. Draper, N.R. and Smith, H., Applied Regression Analysis, John Wiley and Sons, Inc., New York, 1993.
12. County and City Data Book, Bureau of the Census, 1995.
13. Draper, N.R. and Smith H., Op. Cit., p. 86.

Appendix A

Title of Appendix

Note: If appendixes are used, appendix designation and title may be placed on one page and appendix matter beginning on next right-hand page or both title and matter can be contained on the same page.)