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| Connecticut Department of  Transportation |
| Research Report Development Guide |
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|  |
| Revised July 2018 |

**Foreword**

This guide provides information to the researcher(s) so that reports submitted to Connecticut Department of Transportation (CTDOT) conform to the desired format. Acceptability of final reports depends on (1) fulfillment of project objectives as set forth in the contract, (2) adequacy of documentation, and (3) clarity of presentation. Reports should be complete in all their parts, organized appropriately to serve their purposes, accurate in matters of fact and documentation, and edited for basic uniformities of style and usage. Furthermore, all text and artwork should be suitable for publication with minimal editing so as to reduce the need for extensive modifications that will delay publication and may result in unintended changes of meaning.

**Note:** For convenience, a template for formatting the front matter (title page, technical documentation page, disclaimer, acknowledgements, metrics table, table of contents, list of figures, and list of tables etc.) has been provided below.

CTDOT follows the [Transportation Research Board (TRB) guidelines for preparation of final research reports](http://onlinepubs.trb.org/onlinepubs/archive/NotesDocs/CRPReportsPrep.pdf) and this CTDOT Research Report Development Guide is adapted from the TRB version to accommodate the publication requirements of CTDOT.

**Title of the Report**

**Prepared by**:

Name of the author(s) [First name, MI, Last name] with designation

Example: John A. Smith, P.E.

**Report Number**:

Report number will be generated by the CTDOT Research Section

**Interim or Final Report**

**Date of the Report**

**Research Project**:

Project number as established by the CTDOT Research Section (e.g. SPR-xxxx)

**Name of the performing organization**

Example: University of Connecticut

School of Engineering

Department of Civil and Environmental Engineering

**Submitted to:**

Connecticut Department of Transportation

Bureau of Policy and Planning

Research Section

Colleen A. Kissane

Transportation Assistant Planning Director

***Note: Please adjust the cover page material (title, authors, report number, type of report and date) to fit within the cut-out section of the standard report cover, as applicable.***

**TECHNICAL REPORT DOCUMENTATION PAGE**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1. Report No. | 2. Government Accession No. | | | 3. Recipients Catalog No. | | |
| 4. Title and Subtitle | | | | 5. Report Date | | |
| 6. Performing Organization Code | | |
| 7. Author(s) | | | | 8. Performing Organization Report No. | | |
| 9. Performing Organization Name and Address | | | | 10. Work Unit No. (TRIS) | | |
| 11. Contract or Grant No. | | |
| 13. Type of Report and Period Covered | | |
|
| 12. Sponsoring Agency Name and Address | | | |
|
| 14. Sponsoring Agency Code | | |
|  | | |
|  | | |
| 15. Supplementary Notes  For SPR Project: A study conducted in cooperation with the U.S. Department of Transportation and Federal Highway Administration  For CCTRP Project: This research study was sponsored by the Joint Highway Research Advisory Council (JHRAC) of the University of Connecticut and the Connecticut Department of Transportation.  The research was conducted under the Connecticut Cooperative Transportation Research Program (CCTRP) through the Connecticut Transportation Institute of the University of Connecticut, <http://www.cti.uconn.edu/cctrp/> | | | | | | |
| 16. Abstract | | | | | | |
|  | | | | | | |
| 17. Key Words | | | 18. Distribution Statement  No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA. 22161 | | | |
| 19. Security Classif. (Of this report)  Unclassified | | 20. Security Classif.(Of this page)  Unclassified | | | 21. No. of Pages | 22. Price  N/A |

**DISCLAIMER**

**Example:**

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

For CCTRP project: The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the University of Connecticut or the Connecticut Department of Transportation.  This report does not constitute a standard, specification or regulation.

**ACKNOWLEDGEMENTS**

**Example:** ***This is an example. Please amend as necessary.***

The author(s) wish to acknowledge the support of personnel from the Federal Highway Administration, Connecticut Department of Transportation, and the University of Connecticut. (Names here)

**METRIC CONVERSION FACTORS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **APPROXIMATE CONVERSIONS TO SI UNITS** | | | | |
| **SYMBOL** | **WHEN YOU KNOW** | **MULTIPLY BY** | **TO FIND** | **SYMBOL** |
| **LENGTH** | | | | |
| **in** | inches | 25.4 | millimeters | mm |
| **ft** | feet | 0.305 | meters | m |
| **yd** | yards | 0.914 | meters | m |
| **mi** | miles | 1.61 | kilometers | km |
| **AREA** | | | | |
| **in2** | square inches | 645.2 | square millimeters | mm2 |
| **ft2** | square feet | 0.093 | square meters | m2 |
| **yd2** | square yard | 0.836 | square meters | m2 |
| **ac** | acres | 0.405 | hectares | ha |
| **mi2** | square miles | 2.59 | square kilometers | km2 |
| **VOLUME** | | | | |
| **fl oz** | fluid ounces | 29.57 | milliliters | mL |
| **gal** | gallons | 3.785 | liters | L |
| **ft3** | cubic feet | 0.028 | cubic meters | m3 |
| **yd3** | cubic yards | 0.765 | cubic meters | m3 |
| NOTE: volumes greater than 1000 L shall be shown in m3 | | | | |
| **MASS** | | | | |
| **oz** | ounces | 28.35 | grams | g |
| **lb** | pounds | 0.454 | kilograms | kg |
| **T** | short tons (2000 lb) | 0.907 | megagrams (or "metric ton") | Mg (or "t") |
| **TEMPERATURE (exact degrees)** | | | | |
| **oF** | Fahrenheit | 5 (F-32)/9 or (F-32)/1.8 | Celsius | oC |
| **ILLUMINATION** | | | | |
| **fc** | foot-candles | 10.76 | lux | lx |
| **fl** | foot-Lamberts | 3.426 | candela/m2 | cd/m2 |
| **FORCE and PRESSURE or STRESS** | | | | |
| **lbf** | poundforce | 4.45 | newtons | N |
| **lbf/in2** | poundforce per square inch | 6.89 | kilopascals | kPa |

**TABLE OF CONTENTS**

**Example:**

[Title Page i](#_Toc440546735)

[Technical Report Documentation Page ii](#_Toc440546739)

[Disclaimer iii](#_Toc440546736)

[Acknowledgments iv](#_Toc440546737)

[Standard Conversions Table v](#_Toc440546738)

[Table of Contents vi](#_Toc440546740)

[List of Figures vii](#_Toc440546741)

[List of Tables viii](#_Toc440546742)

CHAPTER 1 [Introduction and Background 1](#_Toc440546743)

1.1 Xyz [2](#_Toc440546743)

1.2 Xyz [4](#_Toc440546743)

1.3 Xyz [6](#_Toc440546743)

CHAPTER 2 [Research Approach 7](#_Toc440546743)

2.1 Xyz [7](#_Toc440546743)

2.2 Xyz [8](#_Toc440546743)

2.3 Xyz [8](#_Toc440546743)

CHAPTER 3 Findings and Applications [10](#_Toc440546743)

3.1 Xyz [11](#_Toc440546743)

3.2 Xyz [11](#_Toc440546743)

3.3 Xyz [12](#_Toc440546743)

CHAPTER 4 Conclusions, Recommendations and Suggested Research [14](#_Toc440546743)

CHAPTER 5 Implementation of Research Results [15](#_Toc440546743)

5.1 Xyz [15](#_Toc440546743)

5.2 Xyz [18](#_Toc440546743)

5.3 Xyz [2](#_Toc440546743)1

References [24](#_Toc440546743)

Appendix [29](#_Toc440546743)

A. Xyz [A-1](#_Toc440546743)

B. Xyz [B-1](#_Toc440546743)

C. Xyz [C-1](#_Toc440546743)

D. Xyz [D-1](#_Toc440546743)

**LIST OF FIGURES**

**Example:**

[Fig. 1.1 Xyz 1](#_Toc447202374)

[Fig. 1.2 Xyz 2](#_Toc447202375)

[Fig. 1.3 Xyz 2](#_Toc447202376)

[Fig. 1.4 Xyz 3](#_Toc447202377)

[Fig. 1.5 Xyz 5](#_Toc447202378)

[Fig. 2.1 Xyz 7](#_Toc447202379)

[Fig. 2.2 Xyz 9](#_Toc447202380)

[Fig. 3.1 Xyz 10](#_Toc447202381)

[Fig. 3.2 Xyz 10](#_Toc447202382)

[Fig. 3.3 Xyz 13](#_Toc447202383)

**LIST OF TABLES**

**Example:**

[Table 1.1 Xyz 20](#_Toc447202293)

[Table 1.2 Xyz 20](#_Toc447202294)

[Table 2.1 Xyz 21](#_Toc447202295)

[Table 2.2 Xyz 22](#_Toc447202296)

[Table 2.3 Xyz 23](#_Toc447202297)

[Table 3.1 Xyz 24](#_Toc447202298)

[Table 3.2 Xyz 26](#_Toc447202298)

[Table 3.3 Xyz 29](#_Toc447202298)

**Body of the Report**

Report chapters should be structured in a concise and logical manner that is suitable to the subject matter, clearly describing the research approach, findings, conclusions, and recommendations. The recommended sequence of chapters is outlined below, with a description of the typical content for each chapter. However, it is understood that the structure of some reports may not conform to this sequence.

**Important Notes**

1. Begin each chapter or appendix on a new page.
2. Paginate the front matter (title page, technical documentation page, disclaimer, acknowledgements, metrics table, table of contents, list of figures, list of tables etc.) with lowercase Roman numerals at the bottom of the page.
3. Paginate the body of the report consecutively with Arabic numerals at the bottom of the page.
4. **Arial, Times New Roman or Calibri font, font size 12,** should be used for the text. Section heading should be in bold and font size 14; and, subsection headings should be in bold and font size 12. **The font size for technical documentation page should be 10.**
5. Call out the artwork (tables and figures) in the text (for example, “Fig. 1”) to indicate the position of the artwork. Provide clear and concise captions for all the tables and figures. **Avoid long captions.**
6. **Each reference must be cited within the main text.** Do not include references that are not cited in the main text.

**Executive Summary** (as applicable)

The Executive Summary is often the most influential part of the report and should be written with the busy transportation administrator in mind. The Executive Summary should provide a readable yet condensed description, explained within the context of the project scope and objectives, of the research findings, recommendations, products, and conclusions. The summary should contain only information essential to gain an understanding of the findings and how they relate to the solution of operating problems–it is NOT an abbreviated version of the full report.

**CHAPTER 1 Introduction and Background**

Discussions of the problem and findings of the preliminary literature search that led to the study, current knowledge that can help in solving the problem, and the objectives and scope of the completed research are presented in this section**. It is important to include any previous publications relevant to the subject including the studies that have contradictory outcomes to the present study.** This chapter should not contain the details of any survey that may have been performed, any forms that may have been used in soliciting information or details regarding test procedures or mathematical analyses that may have been used. All such details are to be provided in appendixes.

**CHAPTER 2 Research Approach**

This chapter presents the approach used in addressing the problem.

**CHAPTER 3 Findings and Applications**

A “finding” is the result of an examination. This chapter should include, as appropriate, data; principal mathematical formulas developed; what the findings mean, in terms of use in standards, specifications, policies, and procedures; what the findings add to an understanding of the problem and what effects they have on economy, safety, amenities, and convenience; an assessment of their limitations; and, other information. However, details should be presented in the appendixes. Design charts, spreadsheets, software, and other items of immediate use to practicing engineers or other users may be presented here or presented in the appendixes.

**CHAPTER 4 Conclusions, Recommendations and Suggested Research**

The conclusions should emphasize the most important findings and may extend the findings beyond conditions specific to the project. Successful applied research will result in specific recommendations that should facilitate implementation of the findings and should be accompanied by information on potential benefits that can be expected from using the research products. If the project findings have revealed specific areas where further research would be valuable, these areas should be described in this chapter.

**CHAPTER 5 Implementation of Research Results**

A plan for implementing the research results/products should be outlined in this chapter.

***Chapter Sections***

Within the chapter structure, subheadings should be used to separate subject matter. Properly used headings help readers, especially readers with limited time.

**References**

The listing of references demands absolute accuracy. At a minimum, authors should supply enough information so that readers can verify the reference.

1. List the references together at the end of the main text of the report.

1. Numerical list of references: If using numerical listing of references, the reference lists should be numbered in the order in which they are cited in the text. Cite the reference in the text by an Arabic numeral in parentheses at the pertinent point. Example: Beskow (14) says…
2. Author-year list of references: If using author-year referencing, the reference list should be alphabetical and cite the reference in the text as indicated in the examples below:

* Single author: (Jones, 2005)
* Two authors: (Jones and Smith, 2005)
* Three or more authors (Jones et al., 2005)

2. Be sure that -

(a) Names are spelled correctly and consistently.

(b) Initials and dates are correctly given.

(c) The title of the article is given as published.

(d) ACS (American Chemical Society) abbreviations are used for periodicals and other standard publications.

3. **Avoid unpublished references**. Also, do not use expressions such as “Paper prepared for presentation…,” or “Paper presented at…” if publication has occurred.

4. Make sure that references agree with text. Text revisions may require renumbering or other reference changes and vice versa. **Each reference must be cited within the main text. Do not include references that are not cited in the main text.**

**Appendixes**

Generally, appendix materials are provided for researchers, developers of manuals and guidelines, and other users of the research results, who are interested in the maximum degree of technical detail provided by the project effort.

In some cases, appendixes may not be necessary or may be minimal in number and content; in others, appendixes may be larger than the body of the report. Each appendix must be designated by letter and title, and references to appendixes should be made, as necessary, at appropriate places in the text.

Appendixes may include the following items:

1. Manuals, guidelines, and proposed specifications;

2. Documentation and further elaboration of research findings;

3. Forms, checklists, and worksheets;

4. Mathematical analyses;

5. Project statement and project work plan (including any approved revisions);

6. Bibliography – Note: Bibliographies, unlike reference sections, list sources consulted, but not necessarily cited in the text. Reference sections list only the sources cited in the text.

Paginate appendixes with letters and Arabic numerals at the bottom of the page (i.e., A-1, A-2,…, B-1, B-2, and so forth).

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