ITD Research Program Report Process and Style Guide

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Introduction

Chapter 1
Introduction

This is a guide to assist researchers in writing final reports, which are mandatory for all projects funded by the Idaho Transportation Department (ITD) Research Program. Strict adherence to the Guide is required: a portion of the funding ITD uses for research projects comes from the Federal government and the department must comply with Federal Highway Administration (FHWA) regulations regarding reporting research activities and results (23 CFR 420.207). These regulations—and therefore, this guide—cover a variety of topics, including the organization, formatting, and writing style used in reports. While this guide is intended to be comprehensive, it may not address all issues faced by an author. Authors are strongly encouraged to contact the Research Program staff, with any questions prior to submitting their report for review.

Purpose of Reports

Final reports are intrinsic to the research process, being necessary to communicate findings and facilitate implementation of recommended improvements. A final report should demonstrate that the investigators accomplished or addressed all objectives outlined in their project task order or contract. A final report should provide links between the knowledge gained, problems encountered, and the operational implementation of this knowledge.

Final reports are used by transportation professionals and researchers across the state and country. Each report is available on the ITD Research website (http:/itd.idaho.gov/highways/research). Hard copies of each report are sent to the Idaho State Library, the Federal Highway Administration, and other transportation libraries. Electronic copies are also provided to the Transport Research International Documentation (TRID) and the Transportation Libraries Catalog (TLCat).

Report Quality

The Principal Investigator (PI)—lead researcher—is responsible for the quality of the final report. The most valid and important research findings will be of little value to the Department, practitioners, and other agencies if they are not communicated clearly and precisely.

The acceptability of each report is judged by three criteria:

1. Project objectives are fulfilled as set forth in the contract.
2. Documentation is adequate.
3. Presentation is clear.

The research document must be thoroughly edited for technical accuracy, grammar, clarity, and formatting prior to the document's initial submission to ITD. Reports should be complete, be organized appropriately, provide correct facts and documentation, and be edited for uniform style and usage. Final reports must be of professional quality: i.e., equal in quality to a thesis or professional journal article.

Time and effort devoted to the preparation of a quality report are clearly worthwhile investments because poorly organized and poorly written reports will not be acceptable in fulfilling contract requirements and will be returned for additional editing before the report is considered compete. Costs for report editing should be included in the budget for research projects. Drafts that are poorly written, poorly organized, or in any way deemed unreadable or inaccurate will be returned for revision; drafts submitted to the Research Program should reflect the best effort of the authors and be considered final.

Report Preparation and Review

The following is a brief overview of the review process for final reports:

1. Submit outline to ITD for review (PI). The outline should provide more than just section titles. It should contain key content and include a fairly comprehensive overview of key findings, conclusions, recommendations, and implementation activities.
2. Meet to discuss report outline and identify needed organizational and content changes (PI and ITD staff).
3. Prepare draft report.
4. Provide draft report to approved peer reviewer(s) (PI).
5. Provide draft report to approved editor for grammatical and stylistic review (PI).
6. Revise draft report to reflect comments from peer and editorial reviewers.
7. Submit draft report to ITD Research Program Manager for initial review (PI). This draft will be reviewed by ITD Research staff, the project manager (PM), technical advisory committee members, and FHWA-Idaho.
8. Return draft with comments from all stakeholders (ITD Research Program staff).
9. Revise draft report to address all review comments (PI).
10. Submit revised draft to ITD (PI).
11. Final review of the report (ITD staff).
12. Revise draft to address final review comments and resubmit to ITD Research Program Manager (RPM).
13. Print and distribute approved final report (ITD Staff).

Participant Responsibilities

Chapter 2
Participant Responsibilities Checklist

The responsibilities of the key participants in the report development process are detailed in the bulleted lists below. Participants should check off each task as it is completed and return the completed checklist to ITD's Research Program Manager. Printable versions of these checklists are provided in Appendix A of this guide.

Principal Investigator(s)

- Submit detailed outline to ITD Research Program Manager for review.
- Verify that all objectives of the signed task order are addressed in the report outline.
- Meet with ITD staff to discuss ITD's comments on report organization and content.
- Produce the draft document using the electronic template.
- Adhere to the guidelines in this document.
- Check that all data is accurate.
- Verify that the draft discusses proposed implementation activities to address report Recommendations.
- Obtain advanced approval of the individuals who will conduct reviews.
- Have draft document peer reviewed prior to submitting document to ITD.
    - Provide peer review checklist to peer reviewer(s).
- Have draft document editorially reviewed prior to submitting to ITD.
    - Provide editing checklist to editor(s).
- Incorporate comments/changes from reviews.
- Submit draft report and all signed checklists to ITD.
- Address all technical and editorial comments compiled by ITD's Research Program.
- Produce the final draft amended with ITD/FHWA corrections for the final review.

ITD Project Manager and Technical Advisory Committee

- Review report outline submitted by Principal Investigator.
- Meet with researchers to discuss outline and provide comments on report organization and content (in person or via video is preferable).
- Arrange for an independent peer review of the draft report.
- Review the draft report for technical accuracy and provide comments to ITD Research Program staff within 3 weeks of receipt.
- Hold draft review meetings as needed to discuss needed changes to reports.
- Arrange for additional research if needed (with research staff).

FHWA-Idaho

- Review the draft publication for technical accuracy and clarity and provide comments to ITD Research Program Manager.
- Participate in any draft review meetings scheduled to discuss needed changes to reports.
- Review revised drafts of reports submitted by researchers.

ITD Research Program Staff

- Distribute report outline to ITD project manager, the Technical Advisory Committee, and FHWA Idaho for review.
- Distribute draft report to all stakeholders for review.
- Review draft publication for the inclusion of all required elements.
- Review the draft publication for errors, omissions, clarity, and organization; ensure all FHWA/DOT requirements are met; and verify all literature references cited.
- Address authors' questions.
- Compile all comments from ITD and FHWA stakeholders and return to the Principal Investigator.
- Review and respond to comments from ITD project manager and FHWA-Idaho staff during the review meeting on the publication.
- Review revised report drafts submitted by researchers.
- Approve final report.
- Print and distribute final report.
- Post report on the ITD Research website.

Report Editors

- Ensure that the title is an appropriate reflection of the content (and vice versa).
- Verify that Metric Conversion form is included if the report contains units of measurement.
- Verify that FHWA DOT F 1700.7 form is included and completely and correctly filled out.
- Verify that all pages are numbered in the correct format.
- Verify that the Table of Contents, List of Tables, and List of Figures are complete and the page numbers cited are accurate.
- Verify that the headers and footers retain the formatting provided in the electronic template.
- Ensure that report organization is logical and appropriate.
- Ensure report tone, organization, and included elements are appropriate for the audience.
- Ensure grammar is correct and sentences are clear, direct, and concise.
- Ensure that the report is cohesive and complete, while maintaining brevity.
- Ensure that terminology, and tone, and voice remain consistent throughout the report.
- Ensure that tense is appropriate and consistent throughout report.
- Double-check all formatting for consistency and proper use.
- Verify that acronyms, symbols, and abbreviations are defined within the text where they are first used.

- Ensure that all Appendices are referenced in the text and that the Appendices are arranged to reflect the order in which they are referenced in the text.
- Ensure that tables and figures are referenced in the text before, and relatively close to, where they appear in the report.
- Ensure that table and figure titles are an appropriate reflection of the content.
- Ensure that tables and figures are formatted, numbered, and labeled correctly.
- Ensure that tables and figures are used correctly to support the text.
- Ensure that all numbers and equations are correct.
- Correct all spelling errors in the text and graphics.
- Verify every reference used by the authors.
    - Check spelling of author's names, journal titles, and report titles.
    - Check dates, volume, issue number, and page numbers.
    - Check that all references are cited in the text.
    - Check that all in-text citations/end references align.
    - Check that all hyperlinks work.
- Ensure that all extraneous materials are moved to Appendices or eliminated.

Peer Reviewers (Chosen by PI and Approved by ITD PM)

- Ensure report tone, organization, and included elements are appropriate for the audience.
- Ensure that all numbers and equations are correct.
- Ensure that table and figure titles are an appropriate reflection of the content (and vice versa).
- Evaluate technical merit of content.
- Review appropriateness of the methods and data employed by the researchers.
- Verify that research Findings, Conclusions, and Recommendations are supported with sufficient evidence.
- Identify weaknesses in the presentation of Findings, Recommendations, and Implementation Activities and provide suggestions for improvement.

Elements and Organization of the Research Report

Chapter 3
Elements and Organization of the Research Report

The following are the required elements of all final reports. All elements are listed in the order in which they should appear. Each major section should be titled and begin on an odd-numbered (right hand) page to clearly cue readers that a new chapter has begun. The elements listed here are described in more detail following this list.

Front Cover

- Cover Page.
- Disclaimer Notice.

Front Matter

- Technical Report Documentation Page (Form DOT F 1700.7).
- Metric Conversion Chart.
- Acknowledgements.
- Table of Contents.
- List of Tables.
- List of Figures.
- List of Abbreviations, Acronyms, and Symbols.
- Abstract or Executive Summary.

Report Body

- Introduction.
- Literature Review.
- Findings.
    - Chapters.
    - Sections.
    - Subsections.
- Conclusions and Recommendations.

Back Matter

- Literature Cited.
- Appendices.

Back Cover

- Blank.

Front Cover

The Front Cover, as provided in the electronic template, must adhere to these guidelines:

- Front Cover should not be numbered.
- Provide the full title.
- Provide the name of the principal and co-investigators, and their institution or company.
- Provide the publication date.
- Backside of Front Cover:
    - The Disclaimer Notice is to be aligned with the bottom margin on the back of the Front Cover.
    - The final line of the disclaimer should be in bold type and centered.
    - The two variations of this statement are available for review in Appendix B.
        - One is for projects funded solely with State SPR funds.
        - One is for projects funded with both Federal and State funds.

Front Matter

Technical Report Documentation Page (Form DOT F 1700.7)

This form is required in all reports. Appendix C shows an example of this form. It is also provided in the research report electronic template.

The following form sections should be completed by the Principal Investigator: 4, 5, 7, 9, 13, 16, and 17.

Instructions for completing these items are provided here:

- **Item 4.**
    - **Title and Subtitle:** The title should be the same as that of the report. When a report is prepared in more than one volume (see chapter 4 for more information about volumes), this block should show the main title plus the volume number and subtitle for the volume being reported.
- **Item 5.**
    - **Report Date:** Indicate the month and year report was completed. It should be the same as what is shown on the report cover page.
- **Item 7.**
    - **Author(s):** Give name(s) as listed in the same order as on the cover page.
- **Item 9.**
    - **Performing Organization Name and Address:** Give the name and address, including zip code, of the organization responsible for the research and preparation of the report. This should be the same as the name and address appearing on the title page.

- **Item 13.**
  - **Type of Report and Period Covered:** State interim report, draft report, final report, etc. Indicate the time period covered by the research in the following format (mm/dd/year – mm/dd/year).
- **Item 16.**
  - **Abstract:** This is a brief (250 words or less) factual summary of the most significant information contained in the report. An Abstract should state the purpose, methods, results, and Conclusions of the project and be written in non-technical language. Discussion of the study purpose should include a brief statement of key project goals and objectives. Discussion of study methods should include a short description of the research techniques used. Key study results should also be highlighted in the Abstract. The discussion of study conclusions should focus on the implications of the findings for department operations and key recommendations to improve existing procedures. Do not repeat the title of other items provided on this page. When a report consists of a number of volumes, include the title of each of the other volumes in each Abstract. If the report contains a significant bibliography or literature survey, mention it also.
- **Item 17.**
  - **Document Analysis/Descriptors:** This is a listing of terms/keywords that identify the major concept of the research. It is especially important to identify keywords and phrases that may not appear in the report title or Abstract to more broadly encompass the entire research area. This will expand the field of possible terms for literature searches so that researchers can broadly identify all research sources related to their topic area. Supplying keywords is particularly important for libraries that do not have the capability to search several different data fields, but must rely on keywords used as index entries for cataloging. For this reason, it is important to select specific and precise or short phrases that identify the principal subjects covered in the report. Authors can use the Transportation Research Thesaurus (TRT) to locate pertinent indexing terms (TRT is located at http://trt.trb.org/trt.asp?).

Metric Conversion Chart

A Metric Conversion Chart is required in all publications that include units of measurement. It is available for download from the ITD Research Website (http://itd.idaho.gov/highways/research/). This requirement is per the U.S. Code of Federal Regulations (23 CFR 420.121 (p)).

Appendix D and the electronic template provide this chart.

Acknowledgements

The acknowledgment page recognizes the individuals who and organizations that significantly contributed to the research project. Keep acknowledgments to less than a third of the page. Editors and peer reviewers should be thanked in this section.

Table of Contents

A Table of Contents should be included in research documents prepared for ITD.

The Table of Contents should adhere to the following standards:

- All sections and subsections listed by number and title.
- Page numbers included for all listed items.
- All titles should be aligned to the left margin.
- Front matter that appears before the Table of Contents (as well as the Table of Contents itself) should not be listed.
- The first listed item should be the Abstract or Executive Summary.

The Table of Contents will automatically format correctly if the styles in the electronic template are used. **To update the Table of Contents:** right click on the body of the Table of Contents and select "update entire table."

List of Tables

The List of Tables should adhere to the following standards (to be consistent with FHWA guidelines):

- All tables are listed by number and title.
- Page numbers are included for all listed items.
- Items should be listed in the order they appear in the document.
- All titles should be aligned to the left margin.

List of Figures

The List of Figures should adhere to the following standards (to be consistent with FHWA guidelines):

- All figures are listed by number and title.
- Page numbers are included for all listed items.
- Items should be listed in the order they appear in the document.
- All titles should be aligned to the left margin.

List of Abbreviations, Acronyms, Symbols, and Chemical Abbreviations

The List of Abbreviations should be presented as a table (such as provided in Appendix F) and adhere to the following standards:

- All abbreviations, acronyms, symbols, and chemical abbreviations used within the research document should be listed (excluding the standard Latin abbreviations, e.g. and i.e.).
- Items should be listed in the order they appear in the document.
- All entries should be aligned to the left margin.

Abstract or Executive Summary

Research documents shorter than 20 pages should include an Abstract. Research documents 20 pages or longer should include an Executive Summary. The Abstract/Executive Summary is an influential section of the publication as it is often read by managers, future researchers, department administrators, and other like parties.

Abstract

The Abstract should be written as a standalone statement. This Abstract can be the same as the Abstract used in Section 16 of Form DOT F 1700.7 if so desired. It should briefly (in no more than 250 words) convey the essential information.

An Abstract should:

- Describe the study purpose, methods, results, and conclusions.
- Omit background information, a Literature Review, and detailed description of methods.
- Avoid reference to other literature.
- Make it understandable to general audiences.

The Abstract should be concise and clear. Readers expect the Abstract to be direct and to the point.

Executive Summary

Like the Abstract, an Executive Summary should be written as a standalone document and be understandable to a general audience. An Executive Summary should provide a brief overview of the study purpose and objectives of the project, the key findings and conclusions, the recommendations made by the research team, and the proposed implementation activities. Keep this in mind and make sure that it is written in a manner that is easy for a busy person to skim and absorb. The Executive Summary should be no longer than five pages.

Use appropriate headings to clearly indicate how the material is organized. Tables and figures are also encouraged if they support or convey key information and concepts presented in the Executive Summary. Key Recommendations and implementation issues should have its own heading and be addressed at the end of the Executive Summary.

Report Body

Segment the report body into chapters numbered sequentially beginning with the number "1." Subheadings should be used throughout each chapter to guide the reader through its contents. Start each chapter on a new, odd-numbered page.

Introduction

The first chapter of the report should be the Introduction. The Introduction should discuss the purpose of the project as well as the study objectives and methodology. This section should provide the reader with a concise overview of the project, essentially setting the scene for the reader.

The Introduction should address the following:

- The purpose of the report (research objective).
- A description of the research problem and the historical background.
- Research goals and the basic approach to the project.
- The scope and limits of the research (describing what is and is not covered in the report).
- A brief overview of the general organization or the report.

Unlike the Executive Summary, it does not include discussion of research results, conclusions, recommendations, or implementation activities.

Literature Review

The Literature Review should discuss research previously conducted that will add something valuable to your research and provide crucial background information for understanding your own research.

Literature Reviews should include:

- An overview of the research topic
- The objectives of the Literature review
- Topical/categorical discussion of literature (e.g. those in support of a particular position, those against, and those offering alternative, etc.)
- Explanation of how each work is similar/dissimilar to other works
- Conclusions as to which pieces:
    - Are most convincing
    - Make the greatest contribution to their area of research

Findings

The Findings section's organization and content varies depending on the nature of the research project. Findings may include new and verified events, information of permanent value, significant data that contradicts previous theories, or information relevant to practical problems.

Conclusions and Recommendations

This section should first discuss the major Conclusions developed within this study. Matters of interest should be stated directly. The conclusion should provide positive and negative results of the research, Recommendations, and suggestions for action.

This section should also discuss the activities the PI(s) suggest be completed to carry forward the finding of the research. It should provide a brief overview of ways the procedures/concepts discussed may be implemented.

Back Matter

Literature Cited

References should adhere to the standards listed in the bulleted list below. Appendix E provides detailed examples of references. Sample references are also included in the electronic template.

- References should be cited as described in this manual, which follows the Chicago Manual of Style guidelines.
- A single series of Arabic numbers should be used, starting with 1.
- Within the text, references should be cited with a number in parenthesis, superscripted and placed outside the punctuation:

  GOOD EXAMPLE: This information comes from a book.(1)

- References should be listed in the order in which they appear in the text.
- Entries on the Literature Cited page should have one blank line between entries.
- All references must be cited.
- References should be placed at the end of the sentence.
- Multiple sources in one sentence should be listed as below.

  GOOD EXAMPLE: This sentence uses multiple sources of information.(#,#,#)

Appendices

Materials that provide necessary support for the information discussed in the body of the report, but that are too lengthy or would otherwise not enhance the main text, should be provided in an Appendix. Appendices may contain voluminous tables or graphs, samples of survey or analysis forms, standards or other pertinent documents referenced in the report body. The authors should refrain from including material that is only marginally related to the research.

Appendices should adhere to these standards:

- Each is labeled alphabetically.
    - Appendix A, Appendix B, etc.
- Page numbering should continue on from the report.
    - Do not restart the numbering for each appendix.

Appendices typically include the following types of material:

- Data needed to support the information contained in the main text of the research document.
- Comprehensive Literature Review.
- Large/multi-page tables or figures.
- Forms.
- Mathematical analyses.
- Work plans.

Back Cover

The front and back of the final page of the report is blank.

General Guidelines and Editorial Style

Chapter 4
General Guidelines and Editorial Style

This section of the guide details the basic style and format to be used in research reports produced for ITD. If these guidelines are unclear in any way, contact the Research Program Manager to obtain clarification prior to writing the research document.

Abbreviations, Acronyms, and Symbols

Appendix F provides many of the most common abbreviations, acronyms, and symbols.

Abbreviations

- Limit the use of abbreviations as much as possible.
- Use abbreviations in tables/figures, but spell the word out in footnotes and within the text.
- Only use an abbreviation in the text if it appears with a numeral.

GOOD EXAMPLE: 7mm or seven millimeters
BAD EXAMPLE: seven mm

- Abbreviations for academic degrees include periods after each element of the degree, but no internal space.

GOOD EXAMPLE: John Smith, Ph.D

Acronyms

- Limit the use of acronyms as much as possible. Unless an acronym will appear repeatedly, spell it out.
- Spell out each acronym and fully define it when it first appears within the research document.

GOOD EXAMPLE: This report was prepared for the Idaho Transportation Department (ITD).

- Use the acronym in all subsequent references.

GOOD EXAMPLE: ITD project managers have approved this research.

- Do not use the word “the” in front of acronyms.

BAD EXAMPLE: This project was approved by the ITD.

- If acronyms are used in the Executive Summary or Abstract, they should be spelled out again when first used within the body of the document.

Inches

- Abbreviate as: in.
- To avoid confusion with the word in:
  - Write out inches if it appears at the end of a sentence.
  - Leave inches spelled out if a sentence reads "in inches."

States/Countries

- Spell out state names.
- Spell out US as United States if used in a sentence that includes another country's name.

Symbols

- Symbols should be spelled out in the text.
  - If the report calls for the use of common symbols within the text, contact ITD for approval prior to use.
- Symbols may be used in tables and figures to conserve space.
- Always spell out "percent" within the text.

GOOD EXAMPLE: Of all respondents, 15 percent were against raising the speed limit.

- Within tables, % is preferable within columns and rows.

Temperature

- Use the degree symbol with Fahrenheit (F) and Centigrade (C).
- There are NO spaces between the 3 segments of the temperature.

GOOD EXAMPLES: 36ºF or 36ºC.

- Do not use the degree symbol with Kelvin temperatures.

Blank Pages

- Do not label blank pages with any phrase such as "This page was intentionally left blank."

Bulleted or Numbered Lists

- All lists within the report should be bulleted or numbered.
- Items in lists should be bulleted if they do not have a specific order of importance or chronological order.
- Items in lists should be numbered only if they have a specific order of importance or represent a sequence.
- Place a colon at the end of the text introducing the list.
- Use Word's default bullet style (as indicated in the electronic template).

- Ensure items in lists have parallel grammatical construction such as:
  - All items start with the same part of speech such as a noun or verb.
- All items are either complete sentences or fragment sentences.
- Place a period (or other appropriate punctuation) at the end of each item.
- Do not place "and" or "or" before the last item in the list.
- Place one blank line before and after the bulleted list.

Capitalization

Bureau

- Do not capitalize unless used in an official title or as a shortened version of an official title.

Department

- Do not capitalize unless used in an official title or as a shortened version of an official title.

Directional Words

(North, South, East, West, etc.)

- Capitalize directional words when used to designate a definite region or used as part of a proper name.

  GOOD EXAMPLE: Research was conducted in the Pacific Northwest.

- Do not capitalize directional words when used to describe a direction or position.

  GOOD EXAMPLE: The bus stop is located north of the intersection.

District

- Do not capitalize unless used in an official title or as a shortened version of an official title.

Division

- Do not capitalize unless an official title or a shortened official title.

Federal & Government

- Capitalize these words, whether they appear alone or together, when referring to the Federal Government.

Job/Position Titles

- Do not capitalize job or position titles such as manager, owner, or secretary.

  GOOD EXAMPLE: The manager of the hotel allowed the research team to conduct surveys in the lobby.

Nation

- Capitalize this word when it refers to the United States.

Nouns Indicating

- Capitalize nouns followed by a letter or number that indicate a

Sequence	sequence. GOOD EXAMPLE: Part 1.
Official Titles	• Capitalize all official titles such as legislative acts, program titles, and proper nouns. GOOD EXAMPLE: Idaho Transportation Department.
Section	• Do not capitalize unless used in an official title or as a shortened version of an official title.
Shapes/Forms	• Capitalize letters are used to illustrate shapes or forms. GOOD EXAMPLES: A-frame, I-beam, etc.
State	• Do not capitalize unless used in an official title or as a shortened version of an official title.
Titles and Headings (within the report)	• Capitalize the first word in all titles. • Capitalize all words but articles (a, and, the) and prepositions (of, in, over, etc.).

Contractor Names and Logos

- Contractors' names are only permitted to appear within Block 9 of the Form DOT F 1700.7.
- Do not use contractors' names or logos anywhere else in the body of or appendices to the research document.
- Subcontractors' names are permissible if directly tied to understanding the research methods.
- Use only the ITD logo within the research document.

Degrees and Certifications

- List academic degrees prior to professional licenses, certificates, and affiliations.
- List academic degrees in the order they were awarded.

Footnotes

- Use footnotes rather than endnotes.
- Place a superscript number without parentheses to denote footnote references.[1]
- Place the superscript number after the end punctuation.[1]
- Footnotes must begin and end on the page on which the footnote is cited within the text.
- Footnotes should be single spaced.
- Indent the first line of the footnote with 4 spaces.

- Footnote numbering should start with 1.
- Footnote numbering should restart in each chapter.

Formatting

- All front matter, chapters, and back matter should be combined in one file.
- Use the current version of Word, Excel, or PowerPoint.
- All text and figures should fit on letter-size paper (8 ½ by 11 inches), although tables and graphs may be rotated to landscape format if necessary Foldout pages are not acceptable.
- Research documents should be formatted for double-sided (duplex) printing.
- Adhere to the styles set up in the electronic template.
- Begin each chapter, section of front matter, and section of back matter on the front of a page (an odd numbered page).
- Adjust formatting (insert line breaks, revise text, etc.) to ensure that there are no "orphans" in the document. Orphans are lines, headings, bullet points, etc. that are separated from the rest of the text they belong with due to a page break.
- Use 1.15 line spacing.
- Align text to the left margin. Do not use justified alignment.
- Margins are 1 inch top and bottom and 1 inch left and right.

Type Faces and Sizes

To adhere to FHWA guidelines, and because ITD uses Microsoft products, the following fonts should be used in all reports. If Cambria and Calibri are not available, please use Arial in place of Cambria and Times New Roman in place of Calibri.

- Cover Title: Cambria, 24 point.
- Cover Information: Calibri, 18 point.
- Disclaimer: Calibri, 11 point.
- Form DOT F 1700.7: Calibri, 9 point.
- Level 1 Headings (Chapter): Calibri, 18 point, Bold, Title Capitalization, Centered.
- Level 2 Headings: Calibri, 14 point, Bold, Title Capitalization, Aligned Left.
- Level 3 Headings: Calibri, 11 point, Bold, Title Capitalization, Aligned Left.
- Level 4 Headings: Calibri, 11 point, Bold, Italics, Title Capitalization, Aligned Left.
- Body Text: Calibri, 11 point.
- Table Title: Calibri, 11 point, Bold, Title Capitalization, Centered, placed above the Table, with 1 blank line between the Table Title and the Table.
- Figure Title: Calibri, 11 point, Bold, Title Capitalization, Centered, placed below the Figure, with 1 blank line between the Figure Title and the Figure.

Headers and Footers

- A line should be included separate the header and the footer from the text on the page.
- Even numbered page headers should provide the title of the report (Calibri, 11 point) aligned to the left margin of the page.
- Odd numbered page headers should provide the chapter number and title (Calibri, 11 point) aligned to the right margin of the page.
- Footers on all pages should include the page number (Calibri, 11 point), centered on the page.

Grammar, Word Usage, Style

- Refer to the Chicago Manual of Style for grammar, usage, and style decisions not addressed in this guide.
- Use an active voice.
- Ensure that the verb and subject of each sentence agree in person and number.
- Write in a narrative format.
- The use of "I" and "you" are unacceptable; however, words such as "our" and "we" are acceptable if used with discretion.
- The use of terms such as "the research team" and "our Findings show" are encouraged.
- Use Merriam-Webster's Collegiate Dictionary as the authority on spelling and word usage.

In-text Citations

- Cite information in the order in which it appears within the research document, beginning with "1."
- Cite information taken from published works by placing a number in parentheses in superscript at the end of the sentence or paragraph containing this material:

GOOD EXAMPLE: This information comes from a book.[(1)]

- Do not cite sources cited by other sources. Go to the original source.
- Do not cite sources you have not personally examined.
- Avoid unpublished references.

Numbers

When writing about numbers, remember these key ideas: (1) include numbers only if they serve a clear purpose and (2) convey the purpose of the numbers to the readers.

General

- Numbers and their units of measurement should not be separated (i.e., split between two lines).
- Always spell out numbers that begin a sentence.
- It is permissible to start a bulleted item with a digit rather than spelling the number out.

Dates

- Dates are written as month day and year.
- Do not use superscript (i.e. September 19th).

BAD EXAMPLE: September 19th, 2012.

- Use four digit year format (2009 not ’09).

GOOD EXAMPLE: April 15, 2010.

Fractions/Decimals

- Express decimals as numbers; do not spell them out.

GOOD EXAMPLE: 0.2.
BAD EXAMPLE: Two tenths.

- Never leave a decimal naked—have a number on both sides of the decimal point.

GOOD EXAMPLE: 0.01.
BAD EXAMPLE: .01.

- Do not leave a space between whole numbers and a fraction.

GOOD EXAMPLE: 2½.
BAD EXAMPLE: 2 ½.

- Use the symbol for fractions.

GOOD EXAMPLES: ¾, ⅝.
BAD EXAMPLES: 3/4 or 5/8.

- Spell out fractions that are not paired with a whole number.

GOOD EXAMPLE: Nearly one-fourth of the surveys were incomplete.

Large Numbers

- When numbers run to 4 or more digits include commas to divide thousands, hundreds of thousands, millions, etc.
- Use a numeral to express large numbers followed by million, billion, etc.

GOOD EXAMPLE: 5 million.

Money

- Units of money are written as numerals. These measurements are not affected by other numbers in the sentence.
- Use commas in when expressing 4 digits or more.

GOOD EXAMPLE: $4,000.
BAD EXAMPLE: $4000.

- Use the word cents when value is less than a dollar.

GOOD EXAMPLE: Gas prices were raised by 75 cents.

- Use a decimal only when cents are included.

GOOD EXAMPLES: $140 OR $140.50.

- When discussing multiple amounts, if any amount is uneven, all amounts should include a decimal.

GOOD EXAMPLE: Prices range from $60.00 to $150.75.

Ordinal Numbers

- Write out ordinal numbers.

GOOD EXAMPLE: In the twenty-first century…

Percentages

- Always spell out "percent" within the text.

GOOD EXAMPLE: Of all respondents, 15 percent were against raising the speed limit.

- Within tables, % is preferable in columns and rows.

Ranges

- Use the words from/to or between/and.
- Do NOT use a hyphen.
- Use an en dash to separate ranges in headings, tables, etc., but not within paragraphs.

Series of Numbers

- Spell out all numbers if all are under ten.
- Use numerals if ANY of the numbers is over nine.

GOOD EXAMPLE: On this segment, there are 3 northbound lanes, 3 southbound lanes, 1 turn lane, 15 road signs, and 1 signal.

Single- vs. Double-digit Numbers

- Within the text, spell out numbers one to nine and use numerals for the numbers 10 and above. Except as follows:
  - If you use 3 or more numbers under 10 in the sentence, make all the numbers numerals.
  - Use numerals in all instances, if number 10 or above is used in the same sentence as a single-digit number.

Time

- Use the 24-hour time system.

  GOOD EXAMPLE: The survey began at 1300.
  BAD EXAMPLE: The survey began at 1:00 p.m.

- Units of time are written as numerals. These measurements are not affected by other numbers in the sentence.
- Spell out period of time.

  GOOD EXAMPLE: The bridge was built twenty-five years ago.

Two Consecutive Numbers

- Write out the smaller number when two numbers occur together and one is part of a compound modifier.

  GOOD EXAMPLES: Three 30-pound barrels.
  25 four-mile segments.

Units of Measure

- Units of measure are written as numerals. These measurements are not affected by other numbers in the sentence.
- Put a space between the unit symbol and number.

  GOOD EXAMPLE: 8 kg.

- Do not pluralize a unit symbol.

  GOOD EXAMPLE: kg.
  BAD EXAMPLE: kgs.

- Metric measurements (if used) appear first, followed by the standard measurement in parentheses.

  GOOD EXAMPLE: Each vehicle traveled 55 km (34.17 mi).

- Use a hyphen between the number and the unit of measure only when these operate as an adjective.

  GOOD EXAMPLES: The boards were all 10-feet long
  The length of each board was 10 feet.

Page Numbering

- Covers and disclaimer are not numbered and not counted in the total page count.
- Page numbers are to be centered in the footer.
- Form DOT F 1700.7 is always the first numbered page and labeled "i."
- Include the front matter in the page count in block 21 of Form DOT F 1700.7
- Front matter is numbered in lowercase Roman numeral format.

  GOOD EXAMPLE: i, ii, iii.

- Report body is numbered in standard numeric format.

  GOOD EXAMPLE: 1, 2, 3.

- Appendices continue numbering from the body of the report. Do not restart numbering at the beginning of each appendix.

Punctuation

Commas

- When you have a list of three or more words, phrases, letters, or figures used with "and," "or," or "not" a comma goes between each member of the series.

  GOOD EXAMPLE: Streets, highways, and the Interstate.

- Place commas before end quotation mark, not after.
- A compound predicate does not need a comma.

  GOOD EXAMPLE: Preemption was developed for heavy rail and designed highway interfaces.

- Use commas after introductory clauses and phrases, and other clauses and phrases that would be confusing without commas.

  GOOD EXAMPLE: As described in the previous section, traffic signal timing is a complex endeavor.

- Use commas to set off non-restrictive (non-essential) clauses, phrases, and modifiers from the rest of the sentence.

  GOOD EXAMPLE: The traffic control plan, developed specifically for the summer concert season, may need to be updated in the future.

- Use a comma before a quotation.

  GOOD EXAMPLE: Jerry Champa stated, "There is an effort to use roundabouts to improve safety."

Dashes

- Dashes should be used sparingly—for dramatic effect.
- An en dash (–) is longer than a hyphen and is only to be used between periods of time when you might otherwise say "to."

GOOD EXAMPLE: The data represent traffic counts during these time periods: 2003 – 2005.

- An em dash (—) is used in place of commas, semicolons, colons, or parentheses to add emphasis.

GOOD EXAMPLE: The majority of the general public is happy with the state of Idaho's arterials—25 percent more than in neighboring states.

Hyphens

- Unlike dashes, hyphens are used to bring words together, not set them apart.
- Should be used between elements of compound numbers (when they are spelled out) from twenty-one to ninety-nine.
- Use in compound adjectives with a numerical first element.

GOOD EXAMPLES: 4-to-1 ratio, 8 ½-by-11-inch paper.

- Use hyphens when letters are used to represent shapes.

GOOD EXAMPLE: U-bolt.

Parentheses/ Brackets

- If they are used to establish an independent sentence, the period falls inside the brackets/parentheses.

GOOD EXAMPLE: When using parenthesis and brackets the punctuation rules vary based on usage. (See the example in Figure 1.)

- Enclosed matter that is part of a sentence, the period falls outside.

GOOD EXAMPLE: When using parenthesis and brackets the punctuation rules vary based on usage (as shown in this example).

Periods

- Should be placed inside quotation marks.

Quotation Marks

- To denote a sign or label, place the wording in quotes.

GOOD EXAMPLE: "Stop Sign."

- Place commas and periods within quotation marks.

  GOOD EXAMPLE: "Professional development helps maintain competence within the profession," explained Aliyah Horton.

- Place a question mark inside quotation marks if the quote is a question. But if the quoted material is not a question, put the question mark outside the quotation marks.

  GOOD EXAMPLES: Aliyah Horton responded to the question, "What is the purpose of professional development?"

  How does Main Street fit into the "network function"?

- Semicolons and colons are placed outside quotation marks unless they are part of a quotation.

  GOOD EXAMPLE: These elements varied between "Concept No. 1: Diamond Interchange"; "Concept No. 2: Split Couplet"; and "Concept No. 3: Parclo A/B."

Semicolons

- Are used to separate a group of items only when commas are already used within each group.

  GOOD EXAMPLE: A survey was performed on I-84, I-184, SH-40; New York Canal, Ridenbaugh Canal, and Settler's Canal; and the city streets of Boise, Meridian, and Eagle.

- Can be used in place of a period to join to closely related sentences.

  GOOD EXAMPLE: Roundabouts could be implemented within the interchange; traditional intersection types are also acceptable options.

- Fall outside the quotation marks.

Spaces after Punctuation

- Use only one space following punctuation.

Tables and Figures

Appendix G provides examples of different types of tables and figures and describes the appropriate data types to be used in each. Note: when numbering tables and figures, do so manually. Do not use Word's auto-numbering feature.

Data Accuracy

- Double check all data for accuracy.
- If a figure or table is taken from another source, cite the source in the same manner as other references.
- Double check spelling within graphics.
- Double check that all the functions work.
- Double check that all math adds up correctly.

Equations and Formulas

- Insert one space on each side of symbols used as conjunctions.

  GOOD EXAMPLE: A = 0.99.

- Center equations horizontally on the page.
- Equations are treated as figures.
- Equations are noted on the List of Figures.
- Number each equation sequentially as a figure.
- Provide a unique title for each equation.
- When using a formula that uses a symbol, math, or scientific fonts, save the formula as a.jpg and insert it into the document.
  - If desired, Word's Equation Editor is acceptable to use.
- Multiplication use "x" not the word "by."

Figures

- Do not mix figures and tables in the same graphic.
- Ensure the text immediately prior to a figure introduces the figure.
- Do not abbreviate the word figure within the text.
- Spacing
  - Place 1 blank line between the text and the figure.
  - Place 1 blank line between the figure and the figure title.
  - Place 1 blank line between the figure title and the text.
- Provide a title for every figure.
  - Do not place a period at the end of the title.
  - Center the title entry horizontally under/below the figure and bold the caption.
  - Use proper title capitalization (see capitalization).
  - Center the title horizontally on the page.
- Title should state the type of graphic:
  - Photo, Illustration, Formula, Chart, or Equation

  GOOD EXAMPLE: Figure 5. Map of Idaho.

- Center figures horizontally on the page.

- Figures should be numbered sequentially with whole numbers (1, 2, 3).
    - Do not use decimals in figure numbering (1.1, 1.2, etc.).
- Format figures to appear on no more than one portrait-oriented page.
    - If needed, figures can be rotated to landscape page orientation.
- Do not use smaller than 9 point font in any figure.
- To resize figures, right click on it and select "Size" (note in some versions "Format Picture" must be selected). Click the "Lock Aspect Ratio" check button. Now the image can be resized using "Size and Rotation" or "Scale" while keeping the height and width proportionally correct.

Graphs/Charts

- Graphs and charts should be saved as Excel files and kept available in the case that changes need to be made.
- Do not embed titles in Excel files. Create titles within Word.
- Center graphs/charts horizontally on the page.
- Ensure that any colored charts/graphs are still understandable and clear when printed in black and white.
- Within the text, do not make reference to the colors within the graphics.

Images (photos and illustrations)

- Use a high resolution to ensure the graphics are clear and readable when printed.
- Recreate any images that are not of high enough resolution to be clear when printed.
- Images should be saved as .jpg files and inserted into the document.
- Do not submit a photocopy of a previously used graphic.
- Do not tape, glue, or white-out graphics for use in the research document.
- Center images horizontally on the page.
- Ensure that any colored images are still understandable and clear when printed in black and white.
- Within the text, do not make reference to the colors within the graphics.

Legends

- Provide legends for all maps and graphics.
- Include all parts of the map or illustration that require description.

Maps

- All publications will contain, at a minimum, a general area map showing the location of the project within the state.
    - Use arrows and text boxes to denote work areas.
- Maps should be used to clarify points and/or items of interest.
- Include a directional arrow for all maps.

Tables

- Do not mix figures and tables in the same graphic.
- Ensure the text immediately prior to a table introduces the table.
- Do not abbreviate the word table in the text.
- Provide a unique title for every table.
    - Do not place a period at the end of the title.

    - Use proper title capitalization (see capitalization).
    - Center the title horizontally on the page.
    - Place 1 line between the introductory text and the table title.
    - Place 1 line between the table title and the table.
    - Place 1 line after the title and the table.
- Center tables horizontally on the page.
- Tables should be numbered sequentially (1, 2, 3, etc).
    - Do not use decimals in table numbering (1.1, 1.2, etc.).
- Format tables to appear on no more than one portrait-oriented page.
    - If needed, tables can be rotated to landscape page orientation.
- Long tables can be split between pages.
    - Repeat header row at the top of each page.
    - Consider whether table would be best provided in an Appendix.
    - Heading should be Table #. Title, (Cont.)
- Use proper title capitalization for all column headings.
- Use abbreviations in headings only when space does not allow the words to be spelled out.
- Bold and center all column and row headings.
- Provide a blank row before the total.
- Totals should be in bold font.
- Single space all table content.
- Do not use smaller than 9 point font within any table.
- Do not leave any cell blank. If there is no data, enter a dash or "No Data."
- Use a footnote below tables to indicate what any uncommon symbols or abbreviations stand for.
    - Indent second line of each footnote to match the first line of text.
    - Use superscript letters without parentheses to denote footnote references.[A]
    - Single space footnotes.
    - Indent the first line of each footnote four spaces.
    - Begin each footnote at the left margin of the table text.
- Align numerical data at the decimal point.
- Use gridlines to separate table cells.
- Use "autofit" table property to make the best use of space.
- Unit of measurement for the column should be put in the column heading surrounded by parentheses.

Volume Format

- When a document exceeds 400 pages it should be divided into 2 or more volumes.

Word Choice

- Instead of “&” use “and.”
- Instead of “center line” use “centerline.”
- Instead of “right of way” use “Right-of-way.”
- Instead of “work site” use “Worksite.”
- Instead of “guard rail” use “Guardrail.”
- Direction words like “southwest” are one word. Directional words like “south central” are two words. Consult a dictionary to determine whether the direction words you are using are one or two words.
- Instead of “e-mail” use “email.”
- Instead of “Web site” use “website.”
- Instead of “web page” use “webpage.”

Writing Style and Tone

Chapter 5
Writing Style and Tone

Use Active Voice

As a general rule, you should use active voice when writing research reports for ITD. In an active sentence, the subject performs the action. For example, in the sentence "ITD completed the research" *ITD* serves as both the subject of the sentence and the actor (the entities performing the action in the sentence).

In passive voice, the target of the action becomes the subject instead of the object. Using our previous example, the passive sentence would read, "The research was completed by ITD." The subject of the sentence is *research*, but *research* isn't doing anything. The focus of the sentence changed from *ITD* to *research*. Passive voice is appropriate and necessary in some situations, but may make the sentence awkward or vague.

In some passive sentences the actor gets lost completely, as seen in the example, "A decision was made to complete the research." Eliminating the actor can be confusing and often leads to longer, more complicated sentence structures. The active version of this sentence, "ITD decided to complete the research," is much easier to read and understand.

Two reasons to avoid writing in the passive voice are:

- The form can lead to awkward sentences and obscured meaning.
- It often leads to longer, more complex sentences.

Understand Your Audience

Individual readers have varying expectations when they read documents. As you write and edit your report, you should consider who your audience will be and what expectations they may have. The audience is composed of not only the primary readers (such as ITD engineering and research staff), but also secondary readers (department management, lawmakers, and others who may have limited knowledge of the subject). While the primary audience is your main focus, it is important to remember that reports should be understandable to secondary audiences as well.

It is up to you to write and edit the report to meet the needs of all the expected audience members. However, there are a few common sense limitations that you should keep in mind:

- Avoid using jargon or acronyms when feasible,
- Provide key background information, so that individuals who are not experts in the field can understand the content of the document,
- Use headings and summary paragraphs to help readers navigate through the document, and

- Find a sense of balance that will give those that want the detail the level of information they need; but make sure those that just want an overview can easily find that as well.

Avoid Long Introductory Clauses

Long introductory clauses can be difficult to understand. To that end, the reader should generally not have to read more than seven words before arriving at the sentence's subject.

- BAD EXAMPLE:
    - According to page 618 of the AASHTO publication dealing with signal warrants, a signal is not needed at this intersection.
- GOOD EXAMPLE:
    - A signal is not needed at this intersection according to page 618 of the AASHTO signal warrants publication.

Make Paragraphs and Chapters Cohesive

Establishing clear linkages between sentences and paragraphs makes a document easier to read. Several methods can be used to help of providing such a link.

- **Arrange information in a logical order** – Organize the material you present in your report so that it has a logical flow.
- **Use linking works to connect ideas** – A variety of words or phrases than can be used to link together sentences and paragraphs. Use linking words to help readers understand the relationship between the ideas you present. Several examples of the use of linking works are provided below:
    - First, the computer decided to start making a funny noise. Then, smoke poured out of the CPU.
    - The computer ran beautifully, until I accidentally kicked it. Then it wouldn't run at all.
    - Generating the report takes a great deal of time. However, it should be done by the deadline.
    - The software runs just fine on the existing computer. As a result, I do not need a faster computer, as this one works just fine.
    - The computer runs very slow sometimes. For example, when I run a graphics-intensive application, the entire system bogs down.
- **Use repetition to highlight key points** – Highlight key points by repeating them in the executive summary, report body, and conclusions section of the report. The main ideas presented a chapter can also be underscored by presenting this in headings and introductory paragraphs.

Use Consistent Language

Reports are not intended to be creative writing. Consistency is critical to creating an understandable report. Choose one way to refer to any given topic, item, person, location, etc., and use it throughout the report. If necessary, define the term the first time you use it. As an example of this concept, you

would not want to refer to the "principal investigator," the "primary investigator," and the "lead researcher" all in the same report. Every time the principal investigator is referred to, the same term should be used. Consistent language must also be applied to and referenced units of measure.

Write Concisely

Simple, straightforward writing is best, particularly when you are writing for busy readers (such as those who will be reading your research report). Consider the following tips when writing and revising ITD research reports to make your report more concise:

- Avoid redundancy in statements.
- Eliminate un-needed words by shortening phrases to clauses and shortening clauses to single words, where possible.
- Avoid intensifiers (words like very, exceptionally, extremely).
- Eliminate un-needed phrases.
- Eliminate clichés.
- Remove language that is overly technical.
- Revise abstract ideas to be more concrete when possible.

Make Subject Topics

A sentence's subject is a grammatical function, whereas a sentence's topic is what the sentence is about. Whenever possible, it is best to make the topic operate as the subject of the sentence.

- BAD EXAMPLE:
    - It (subject) is unlikely that the improvements (topic) will be in place by 2012.
- GOOD EXAMPLE:
    - The improvements (subject, topic) are not likely to be in place by 2012.

Use Parallel Construction

Parallel construction shows that two or more ideas are equally important by stating them in grammatically parallel form: noun lined up with noun, verb with verb, or phrase with phrase. To write parallel constructions, put two or more coordinate items into the same grammatical form. The likeness clarifies the relationship for the reader.

- BAD EXAMPLE:
    - I like swimming, skiing, and to hike in the mountains.
- GOOD EXAMPLE:
    - I like swimming, skiing, and hiking in the mountains.

Take care to use parallel structure within bulleted and numbered lists. Each item in a list should have a similar grammatical structure.

Place Subject and Verb in Close Proximity

It is easier for readers to understand sentences that are written in subject-verb-object form. Also, the closer the subject and verb are, the easier it is to understand.

- BAD EXAMPLE:
    - A significant number (subject) of policy documents related to access management have been developed (verb) by ITD.
- GOOD EXAMPLE:
    - ITD (subject) has developed (verb) a significant number of policy documents related to access management.

Avoid Nominals

Nominals are verb words that describe an action but have been turned into a noun word instead of a verb word. It is best to avoid this construction and keep these words in their verb form.

- BAD EXAMPLE:
    - ITD's intention (nominal) is to leave the existing permitted approaches.
- GOOD EXAMPLE:
    - ITD intends to leave the existing permitted approaches.

Appendix A
Editing Checklist

Appendix A
Editing and Activities Checklist

Principal Investigators

- ☐ Submit detailed report outline to ITD Research Program Manager for review.
- ☐ Produce the draft document using the electronic template.
- ☐ Adhere to the guidelines in this document.
- ☐ Check that all data is accurate.
- ☐ Verify that all objectives listed in the signed task order are clearly addressed in the report.
- ☐ Verify that the implementation plan is discussed.
- ☐ Obtain advanced ITD approval for the individuals who will conduct peer reviews and perform report editing.
- ☐ Have draft document peer reviewed prior to submitting document to ITD
- ☐ Have draft document editorially reviewed prior to submitting to ITD.
- ☐ Incorporate comments/changes from reviews.
- ☐ Address all technical and editorial comments compiled by the Research Section.
- ☐ Produce the final draft amended with ITD/FHWA corrections for the final review.

ITD Project Manager and Technical Advisory Committee

- ☐ Review report outline submitted by Principal Investigator.
- ☐ Review the draft report for technical accuracy.
- ☐ Arrange for a second technical expert to review the draft publication.
- ☐ Review and respond to comments from ITD Research staff and FHWA-Idaho staff during the review meeting on the publication.
- ☐ Arrange for additional research if needed (with research staff).

FHWA-Idaho

- ☐ Review the draft publication for technical accuracy and clarity and provide comments to ITD Research Program Manager.
- ☐ Review /respond to comments from ITD Research staff in the review meeting on the publication.

ITD Research Program Staff

- ☐ Distribute report outline to ITD project manager, the Technical Advisory Committee, and FHWA Idaho.
- ☐ Distribute draft publication to all stakeholders.
- ☐ Review draft publication for the inclusion of all FHWA/DOT requirements.
- ☐ Review the draft publication for errors, omissions, clarity, and organization.
- ☐ Verify all literature cited references.
- ☐ Address authors' questions.
- ☐ Compile all comments from ITD and FHWA stakeholders and return to the Principal Investigator.
- ☐ Review and respond to comments from ITD project manager and FHWA-Idaho staff during the review meeting on the publication.
- ☐ Review final publication for completeness.
- ☐ Distribute publication per distribution rules.
- ☐ Post report on the ITD Research website.

Report Editors

- ☐ Ensure that the title is an appropriate reflection of the content (and vice versa).
- ☐ Verify the Metric Conversion form if units of measure are referenced within the report.
- ☐ Verify that FHWA F1700.7 form is included and completely and correctly filled out.
- ☐ Verify that all pages are numbered in correct format.
- ☐ Verify that the table of contents (list of figures, tables, etc.) is complete and the page numbers accurately reflect where items appear in the report.
- ☐ Verify that the headers and footers retain the formatting provided in the electronic template.
- ☐ Ensure that report organization is logical and appropriate.

- ☐ Ensure report tone, organization, and included elements are appropriate for the audience.
- ☐ Ensure grammar is correct and sentences are clear, direct, and concise.
- ☐ Ensure that the report is cohesive and complete, while maintaining brevity.
- ☐ Ensure that term use and tone of voice are consistent throughout.
- ☐ Double-check all formatting for consistency and proper use.
- ☐ Verify that acronyms, symbols, and abbreviations are defined within the text after first use.
- ☐ Ensure that table and figure titles are an appropriate reflection of the content (and vice versa).
- ☐ Ensure that tables and figures are formatted, numbered, and labeled correctly.
- ☐ Ensure that tables and figures are used correctly to support the text.
- ☐ Ensure that all numbers and equations are correct.
- ☐ Correct all spelling errors in text and graphics.
- ☐ Verify every reference used by authors
    - Check spelling of author's names, journal titles, and report titles.
    - Check dates, volume, issue number, and page numbers.
    - Check that all references are cited in the text.
    - Check that all in-text citations/end references align.
- ☐ Ensure that all extraneous materials are moved to appendices or eliminated.

Peer Reviewers

- ☐ Ensure report tone, organization, and included elements are appropriate for the audience.
- ☐ Ensure that all numbers and equations are correct.
- ☐ Ensure that table and figure titles are an appropriate reflection of the content (and vice versa).
- ☐ Evaluate technical merit of content.
- ☐ Review appropriateness of the scope the topic.
- ☐ Note any ethical concerns related to the report content and recommendations.
- ☐ Identify weaknesses in the report's content or presentation of findings, recommendations, and implementation plan and provide suggestions for improvement.
- ☐ Verify that the research is valid and the conclusions are supported.

Principal Investigator:	_____	Date:	_____
Reviewer 1:	_____	Date:	_____
Reviewer 2:	_____	Date:	_____
Reviewer 3:	_____	Date:	_____
ITD Staff:	_____	Date:	_____

Appendix B
Disclaimer Notice

Appendix B
Disclaimer Notice

The second example below is rarely used. The "federal funding in conjunction with state funding" disclaimer is almost always the appropriate choice.

Sample Disclaimers

Federal Funding in Conjunction with State Funding:

This document is disseminated under the sponsorship of the Idaho Transportation Department and the United States Department of Transportation in the interest of information exchange. The State of Idaho and the United States Government assume no liability of its contents or use thereof.

The contents of this report reflect the views of the author(s), who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official policies of the Idaho Transportation Department or the United States Department of Transportation.

The State of Idaho and the United States Government do not endorse products or manufacturers. Trademarks or manufacturers' names appear herein only because they are considered essential to the object of this document.

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Appendix C
FHWA Form F 1700.7

Appendix C
FHWA Form F 1700.7

1. Report No.	2. Government Accession No. Leave Blank	3. Recipient's Catalog No. Leave Blank
4. Title and Subtitle RESEARCH TITLE		5. Report Date Date published
		6. Performing Organization Code
7. Author(s) LIST ALL AUTHORS First name, middle initial, last name.		8. Performing Organization Report No. Add the billing code
9. Performing Organization Name and Address		10. Work Unit No. (TRAIS) Leave Blank
		11. Contract or Grant No. SPR ###
12. Sponsoring Agency Name and Address Idaho Transportation Department Division of Highways, Resource Center, Research Section PO Box 7129 Boise, ID 83707-7129		13. Type of Report and Period Covered Final or Interim Report mm/dd/yyyy - mm/dd/yyyy
		14. Sponsoring Agency Code Leave Blank
15. Supplementary Notes e.g. Project performed in cooperation with the Idaho Transportation Department and FHWA.		
16. Abstract Approximately 200 word description of the project.		
17. Key Words KEYWORDS	18. Distribution Statement Copies available online at http://itd.idaho.gov/highways/research/	
19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. No. of Pages Add the total # of pages 22. Price

Appendix D
Metric Conversion Chart

Appendix D
Metric Conversion Chart

METRIC (SI*) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS					APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol	Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH					LENGTH		
in	inches	25.4		mm	mm	millimeters	0.039	inches	in
ft	feet	0.3048		m	m	meters	3.28	feet	ft
yd	yards	0.914		m	m	meters	1.09	yards	yd
mi	Miles (statute)	1.61		km	km	kilometers	0.621	Miles (statute)	mi
		AREA					AREA		
in^2	square inches	645.2	millimeters squared	cm^2	mm^2	millimeters squared	0.0016	square inches	in^2
ft^2	square feet	0.0929	meters squared	m^2	m^2	meters squared	10.764	square feet	ft^2
yd^2	square yards	0.836	meters squared	m^2	km^2	kilometers squared	0.39	square miles	mi^2
mi^2	square miles	2.59	kilometers squared	km^2	ha	hectares (10,000 m^2)	2.471	acres	ac
ac	acres	0.4046	hectares	ha					
		MASS (weight)					MASS (weight)		
oz	Ounces (avdp)	28.35	grams	g	g	grams	0.0353	Ounces (avdp)	oz
lb	Pounds (avdp)	0.454	kilograms	kg	kg	kilograms	2.205	Pounds (avdp)	lb
T	Short tons (2000 lb)	0.907	megagrams	mg	mg	megagrams (1000 kg)	1.103	short tons	T
		VOLUME					VOLUME		
fl oz	fluid ounces (US)	29.57	milliliters	mL	mL	milliliters	0.034	fluid ounces (US)	fl oz
gal	Gallons (liq)	3.785	liters	liters	liters	liters	0.264	Gallons (liq)	gal
ft^3	cubic feet	0.0283	meters cubed	m^3	m^3	meters cubed	35.315	cubic feet	ft^3
yd^3	cubic yards	0.765	meters cubed	m^3	m^3	meters cubed	1.308	cubic yards	yd^3
Note: Volumes greater than 1000 L shall be shown in m^3									
		TEMPERATURE (exact)					TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (°F-32)	Celsius temperature	°C	°C	Celsius temperature	9/5 °C+32	Fahrenheit temperature	°F
		ILLUMINATION					ILLUMINATION		
fc	Foot-candles	10.76	lux	lx	lx	lux	0.0929	foot-candles	fc
fl	foot-lamberts	3.426	candela/m^2	cd/cm^2	cd/cm²	candela/m^2	0.2919	foot-lamberts	fl
		FORCE and PRESSURE or STRESS					FORCE and PRESSURE or STRESS		
lbf	pound-force	4.45	newtons	N	N	newtons	0.225	pound-force	lbf
psi	pound-force per square inch	6.89	kilopascals	kPa	kPa	kilopascals	0.145	pound-force per square inch	psi

Appendix E
Literature Cited

Appendix E
Literature Cited

If you want additional information on the Chicago Manual of Style many links are available on the Internet. This section will show you how to properly punctuate the reference, cite the publication in-text and set up your footnote(s). When citing legal works, please use: The Bluebook: a Uniform Systems of Citation.

General Notations

Authors

- Senior author's name is inverted, Jones, Thomas
- Two authors are listed as they appear on the title page. Only the first author is inverted, place the word "and" between the two authors NOT an ampersand (&).
- Three to ten authors are listed as they appear on the title page. Only the first author is inverted followed by a comma, then subsequent names followed by a comma. The word "and" is between the last two authors NOT an ampersand. John, Leroy, Joe Smith, and William Smith.
- Eleven or more authors: list first three authors, followed by "et al"
    - John, Leroy, Joe Smith, William Smith, et al.
- Anonymous can stand in place of an unknown author.
- Editors are listed in the same format as the authors.
- Full names should not be supplied for Authors who always use or prefer initials. If initials are used, place a period after the first initial and a space. Smith, J. E.
- Corporate or organization authors are listed on the title page as the author it is listed as the author in the citation even if it is also listed as the publisher.

Titles

- Book Titles and subtitles are italicized.
- First word of the title and all subsequent major words are capitalized.
- Colon between the title and subtitle is followed by a space.

Chapters

- Individual sections within conference proceedings are treated as a book chapter.
- Initial word in the title of the book chapter is capitalized as are all other major words.

Place of Publication

- A colon is placed between the place of publication and the publisher.
- Cities that are probably unknown or could be easily confused by the reader should be followed by the 2-digit State abbreviation code.
- Washington, DC is always followed by the DC.
- Use the first city mentioned on the title page, eliminate the others.
- If the place of publication is unknown, use n.p.

Publisher

- Eliminate such titles as Inc., Ltd., Co., Publishing Co.
- Joint publishers are both listed and separated by a slash.
    - Federal Highways Administration / U.S. Forest Service.

Articles

- Provide enough information that the end user can locate the article: Author, Title of Article, Title of Publication, Volume Number, Issue Number, Page Numbers, Date, and if online the URL.
- In footnotes only cite the specific page from which the reference was found.
- If the journal volume is denoted in Roman numerals, convert to Arabic.
- Eliminate issue numbers.
- When a journal uses only issue numbers, a comma follows the journal title.
    - "Title of article. *Journal Title*, no. issue number (date): page numbers.
- Year as the volume number, divide it from the journal title with a comma and do not put the date in parentheses.
- If the journal might be confused with another title of the same name, add the place of publication or the publisher in parentheses after the Journal Title.
    - *Journal of Zoology* (London) volume number: page numbers.

Editions

- Editions other than the first are listed as Title, # ed. within the citation.
- Revised Edition is abbreviated rev. ed.
- Numbered editions are listed as 2nd ed., 3rd ed.

Multivolume Books

- Volume numbers are always given in Arabic even if they are listed as Roman numerals in the original.
- If the publication is cited as a whole, the total number of volumes is listed after the title of the work.
    - Author's last name, first name. *Title of Book.* Number of volumes. Place of Publication: Publisher, Date.
- In the note field, if you are citing to a specific volume, the volume number and the title of that specific volume is given (if there is one).
    - Author's name (Inverted), Title of Book, vol. #, Title of the Individual *Volume* (Place of Publication: Publisher, Date), page number.
- Author of an individual volume and general editors in multivolume sets, the author of the individual volume is listed and the editor/author follows the title of the series. The footnote and the bibliography references vary slightly.
    - Literature Cited:
        - Authors name of the Individual Volume (inverted), "*Title of the Volume." Edited by Editors name (not inverted). V*ol. # of *Title of the Series*, edited by Editors's name (not inverted). Place of Publication: Publisher, Date.

Reference List Formatting

Book

Author's last name, first initial. Title of Book. City of publication: Publisher, Date.

1. **Bollen, R. E.** *Pavement Traffic Marking: Materials and Application Affecting Serviceability.* Washington, D. C.: Transportation Research Board, NCHRP Synthesis 17, 1973.

Book Chapter

Author's last name, first initial. "Title of the Chapter." Chapter # in Title of Book. City of Publication: Publisher, Date.

1. Hulbert, S. "Reflectorized Information Needs: Wet Pavement". pg. 4-5 in *Reflectorized Devices for Driver Information*. Washington, D. C.: Transportation Research Board, Transportation Research Circular No. 306, 1986.

Book with Translator

Author's last name, first initial. Title. Translated by Translator's Name. Place of Publication: Publisher, Date.

Dissertation or Thesis

Author's last name, first initial. "Title." PhD diss. or master's thesis, University Name, Date.

Electronic Book

Author's last name, first initial. Title of Book. Place of Publication: Publisher, Date. http:// complete hyperlink (accessed Month, Day, Year)

Electronic Government/Technical Publications

Author's last name, first initial. Title of Book. Place of Publication: Publisher Publication Number, Date. http:// complete hyperlink (accessed Month Day, Year).

Electronic Journal

Author's last name, first initial. "Title of Article." Title of Journal. Volume Number (Month Year) (accessed month day, year).

Email

Not listed in reference lists.

Government/Technical Publication

Author's last name, first initial. *Title of Book.* Place of Publication: Publisher Publication Number, Date.

1. **Campbell, P. G. and M. A. Post.** *Nontoxic Yellow Traffic Striping,* Washington, D. C.: Federal Highway Administration, Report No. FHWA-RD-78-1, 1978.

Journal Article

Author's last name, first initial. "Title of Article." Title of Journal. Volume Number (Month Year): page numbers.

1. **Csagoly, P. F. and Lybas, J. M.** "Advanced Design Method for Concrete Bridge Deck Slabs." *Concrete International,* Vol. 11, No. 5 (May 1989): 53-64.

Legal Citations

Consult the Research Program Manager or the *"Bluebook"* for assistance in formatting legal citations. A basic model of the "*Bluebook"* is available at http://www.law.cornell.edu/citation/.

Letters/Personal Communication

Rarely cited in the reference list.

Websites

Author inverted or owner. "Title." hyperlink (accessed month day, year).

3. **New York State Department of Transportation.** *New York State Department of Transportation Bridge Manual (US Customary Edition).* New York State Department of Transportation. 2008. https://www.nysdot.gov/divisions/engineering/structures/manuals/bridge-manual-usc. Accessed July, 2008.

In-Text Citations

E-mail

In an e-mail message to the author on March 27, 2006, John Doe revealed that ….

Letters/Personal Communication

In a letter to the author dated 27 March 2006, John Doe stated …

Appendix F
Acronyms & Abbreviations

Appendix F.
Acronyms and Abbreviations

List of Common Transportation Acronyms

A	
ACI	American Concrete Institute
ADOT	Arizona Department of Transportation
ADOT & PF	Alaska Department of Transportation and Public Facilities
ADT	Average Daily Traffic
AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ADA	American with Disabilities Act
AHTD	Arkansas State Highway Transportation Department
ALDOT	Alabama Department of Transportation
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ASCE	American Society of Civil Engineers
ATR	Automatic Traffic Recorder
AUTC	Alaska University Transportation Center
AWOS	Automated Weather Observation System
B	
BLM	Bureau of Land Management
BMP	Best Management Practice
BPR	Bureau of Public Roads
BSU	Boise State University
C	
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
CDOT	Colorado Department of Transportation
ConnDOT	**Connecticut Department of Transportation**

D	
DDOT	District of Columbia Department of Transportation
DelDOT	Delaware Department of Transportation
DOD	Department of Defense
DOI	Department of the Interior
DOT	Department of Transportation
E	
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESAL	Equivalent Single Axle Load
F	
FAA	Federal Aviation Administration
FDOT	Florida Department of Transportation
FEIS	Final Environment Impact Statement
FHWA	Federal Highway Administration
FR	Federal Register
G	
GAO	General Accounting Office
GDOT	Georgia Department of Transportation
GIS	Geographic Information System
GPS	Global Positioning System
H	
HDOT	Hawaii Department of Transportation
HMA	Hot Mix Asphalt
I	
IC	Idaho Code
IDAPA	Idaho Administrative Procedures Act
IDOT	Illinois Department of Transportation
IDOT	Iowa Department of Transportation
INDOT	Indiana Department of Transportation
IRI	International Roughness Index
ISU	Idaho State University
ITD	Idaho Transportation Department
K	
KDOT	Kansas Department of Transportation
KYTC	Kentucky Transportation Cabinet

L	
LADOTD	Louisiana Department of Transportation and Development
LTAP	Local Technical Assistance Program
LTPP	Long Term Pavement Performance
M	
MaineDOT	Maine Department of Transportation
MassDOT	Massachusetts Department of Transportation
MDT	Montana Department of Transportation
MDOT	Maryland Department of Transportation
MDOT	Michigan Department of Transportation
MDOT	Mississippi Department of Transportation
MN/DOT	Minnesota Department of Transportation
MoDOT	Missouri Department of Transportation
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
N	
NAPA	National Asphalt Pavement Association
NCDOT	North Carolina Department of Transportation
NCHRP	National Cooperative Highway Research Program
NDOR	Nebraska Department of Roads
NDOT	Nevada Department of Transportation
NDDOT	North Dakota Department of Transportation
NEPA	National Environmental Protection Agency
NHDOT	New Hampshire Department of Transportation
NIATT	National Institute for Advanced Transportation Technology
NJDOT	New Jersey Department of Transportation
NMDOT	New Mexico Department of Transportation
NPS	National Park Service
NTSB	National Transportation Safety Board
NYSDOT	**New York State Department of Transportation**
O	
ODOT	Ohio Department of Transportation
ODOT	Oklahoma Department of Transportation
ODOT	Oregon Department of Transportation
OSHA	Occupational Safety and Health Administration
OTREC	Oregon Transportation Research Education Consortium

P	
PCA	Portland Cement Association
PCC	Portland Cement Concrete
PennDOT	Pennsylvania Department of Transportation
Q	
QC	Quality Control
QA	Quality Assurance
R	
RFI	Request for Information
RFP	Request for Proposal
RFQ	Request for Qualifications
RIDOT	Rhode Island Department of Transportation
RITA	Research and Innovative Technology Administration
ROW	Right-of-way
S	
SCDOT	South Carolina Department of Transportation
SDDOT	South Dakota Department of Transportation
SHRP	Strategic Highway Research Program
SI	International System of Units (Metric)
SPR	State Planning and Research
T	
T2	Technology Transfer
TCRP	Transit Cooperative Research Program
TDOT	Tennessee Department of Transportation
TransNow	Transportation Northwest
TRB	Transportation Research Board
TxDOT	Texas Department of Transportation

U	
UBC	Uniform Building Code
UDOT	Utah Department of Transportation
UI	University of Idaho
U. S.	United States
USACE	U. S. Army Corps of Engineers
USC	United States Code
USDOT	U. S. Department of Transportation
USFS	U. S. Forest Service
USFWS	U. S. Fish and Wildlife Service
UTC	University Transportation Center
V	
VDOT	Virginia Department of Transportation
VMT	Vehicle Miles Traveled
Vtrans	Vermont Agency of Transportation
W	
WASHTO	Western Association of State Highway and Transportation Officials
WIM	Weigh In Motion
WisDOT	Wisconsin Department of Transportation
WSDOT	Washington State Department of Transportation
WTI	Western Transportation Institute
WVDOT	West Virginia Department of Transportation
WYDOT	Wyoming Dept. of Transportation

List of Common Mathematical Abbreviations

m	meter
m^2	Squared meters
m^3	Cubic meters
^oC	Degrees Celsius
^oF	Degrees Fahrenheit
in^2	Square inches
in.	Inches
ft	Feet
ft^2	Square feet
ft^3	Cubic feet
yd	yard
yd^3	Cubic yards
mi	miles
in^3	Cubic inches
lb	Pound
mi/h	Miles per hour
km/h	Kilometers per hour

Appendix G
Effective Charts and Graphs

Appendix G
Effective Chart and Graphs

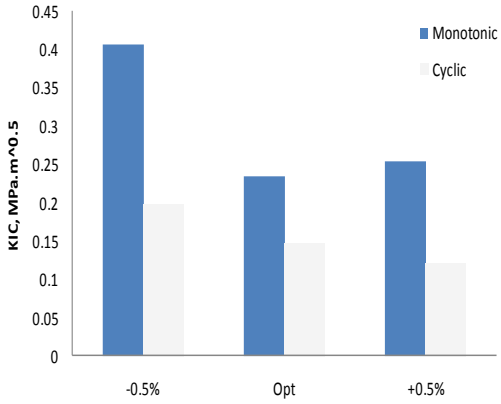
The information in this appendix is intended to provide guidance on which types of charts and graphs are appropriate for which types of information.

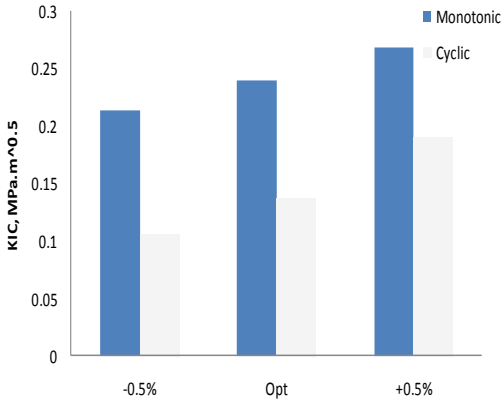
Bar Charts

All bar charts should be presented in a two-dimensional manner. Three-dimensional graphs skew the data, obscuring some portions and making other portions seem larger than reality.

Grouped Bar Charts

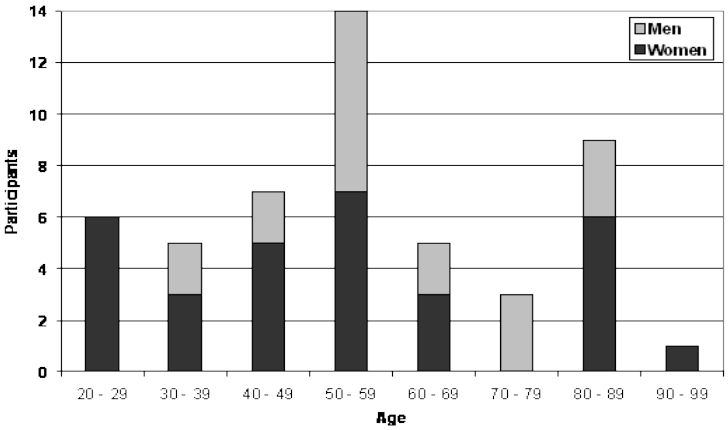
The grouped bar chart is used to compare two to three quantities for each item.





Subdivided Bar Chart

In the subdivided bar chart, different aspects of a category are stacked on top of each other. Totals are easy to compare in this style, quantities are not.



100-percent Bar Chart

The 100-percent bar chart shows the relative proportions of several elements that make up one category.

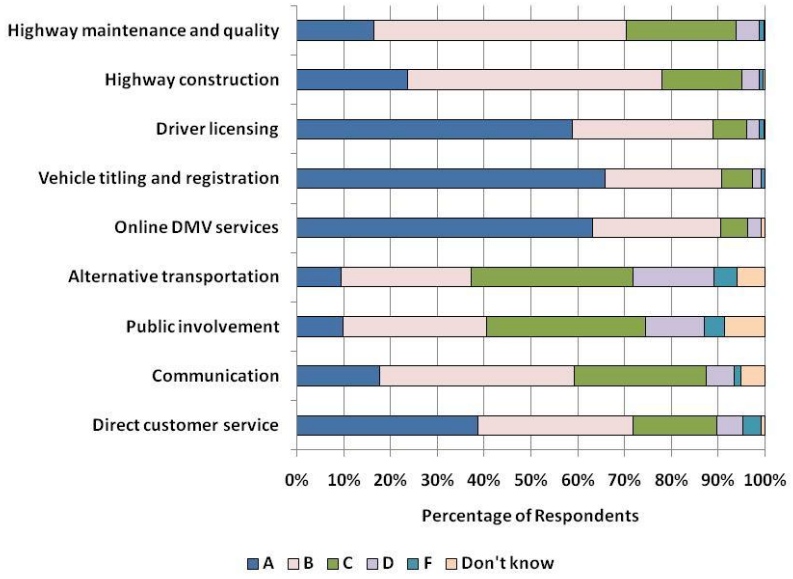
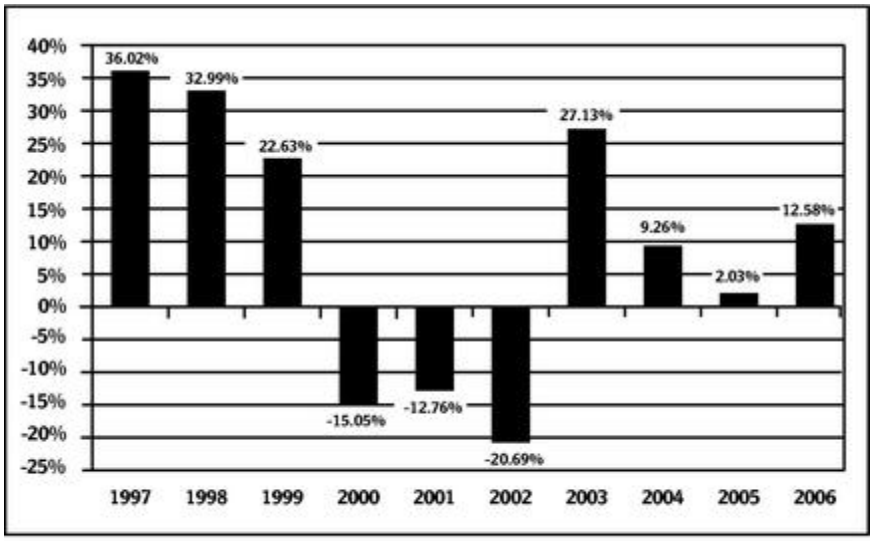


Figure 1: Overall Grades Awarded to ITD Services

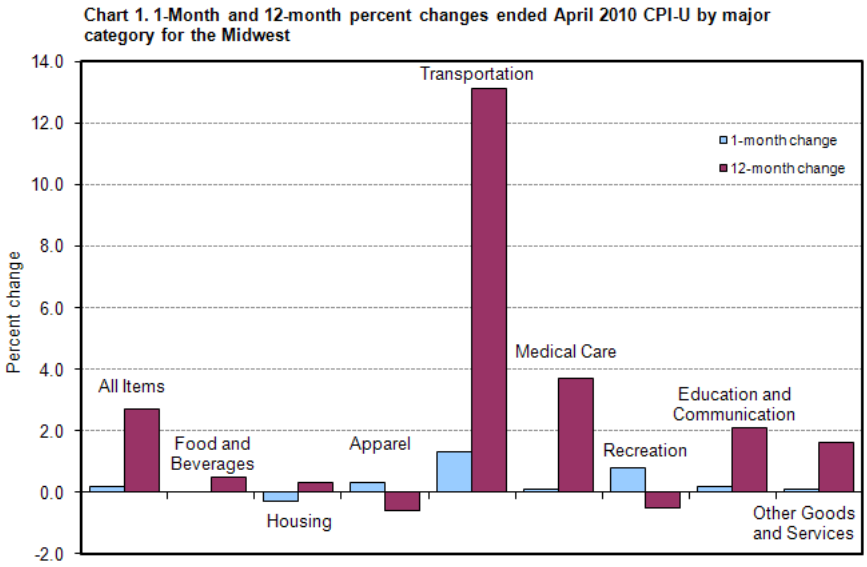
Deviation Bar Chart

The deviation bar chart shows how various quantities deviate from a norm. A deviation bar chart is best for information that has both positive and negative values.



Stratum Graph

The stratum graph shows a change in quantities over time.

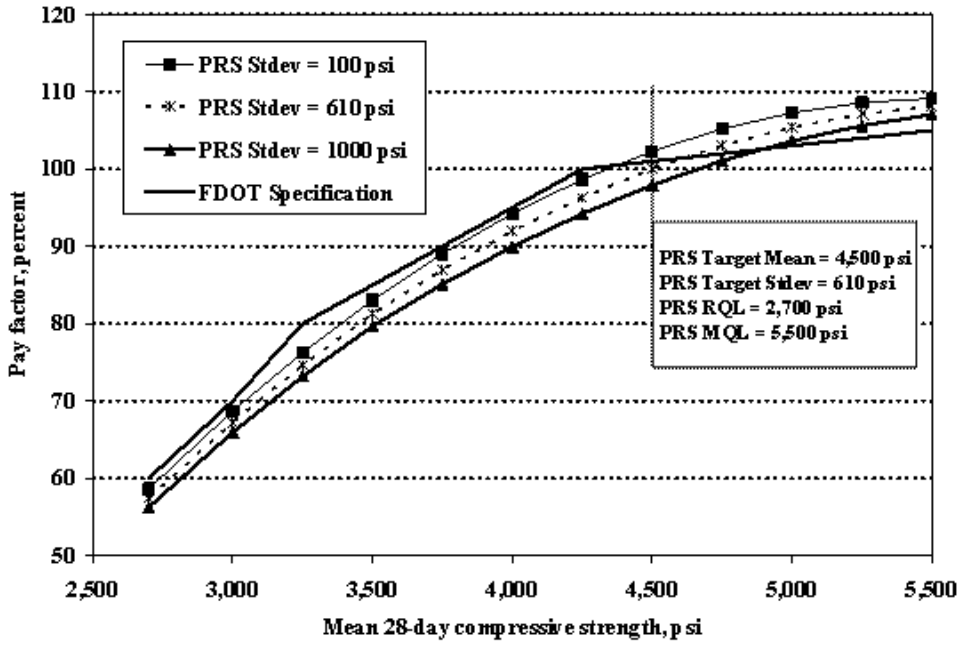


Pictographs

Pictographs are bar charts on which the bar is replaced by an image or series of information representing the data. Pictographs are hard to develop without skewing the data and best avoided.

Line Graphs

Line charts are used to show changes in quantity over time. A line chart focuses on the change over time, while a bar chart focuses on the quantities themselves.



Pie Charts

1. Pie charts should be restricted to no more than seven slices.
2. Pie charts should always be presented in a two-dimensional manner.
3. Pie slices should start at 12 o'clock and work clockwise from largest to smallest.
4. Include a miscellaneous category for all the small slices that would otherwise clutter the chart.
5. Double check that the percentages add up to 100.

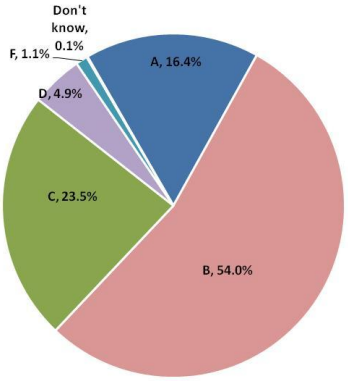
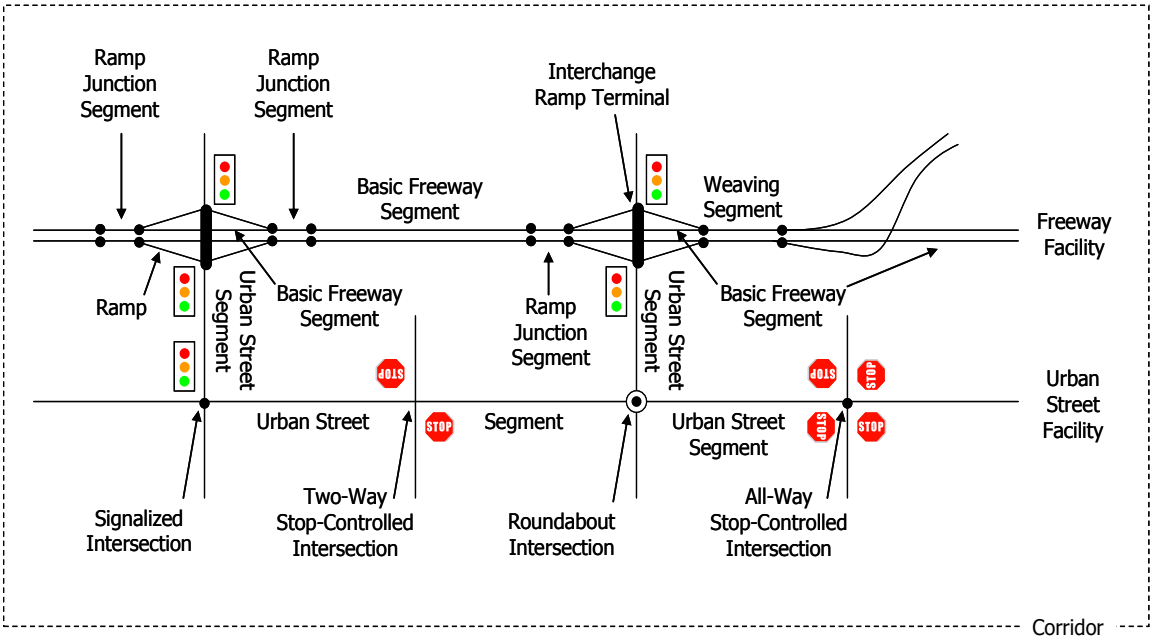


Figure 3. Overall Grade Awarded to Highway Maintenance and Quality

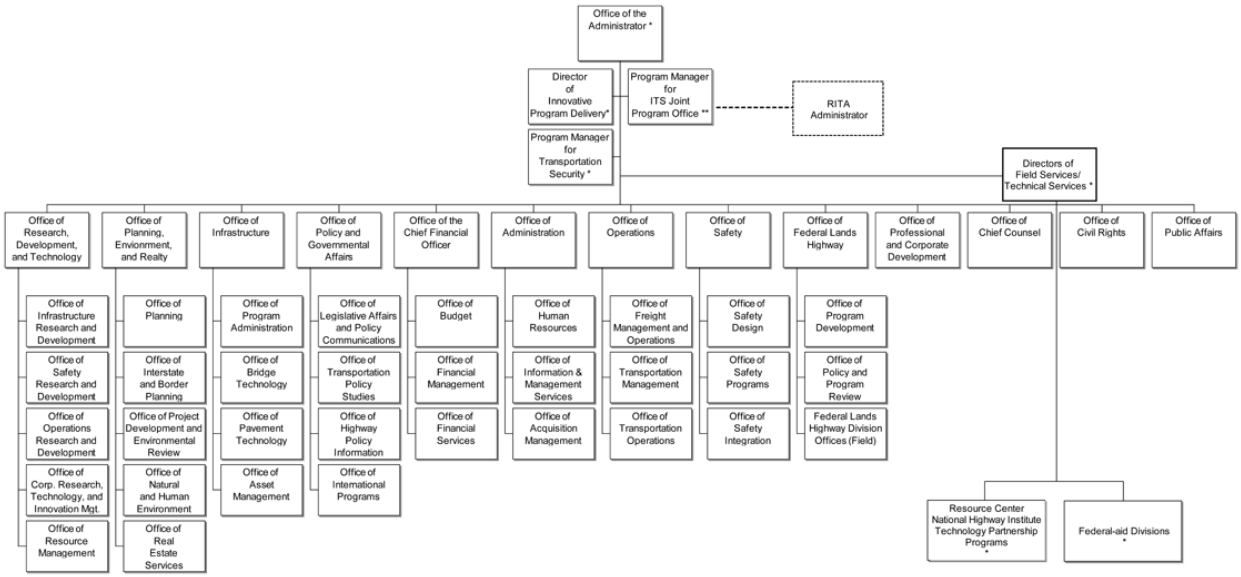
Diagrams

A diagram is a visual metaphor that uses symbols to represent items or their properties.



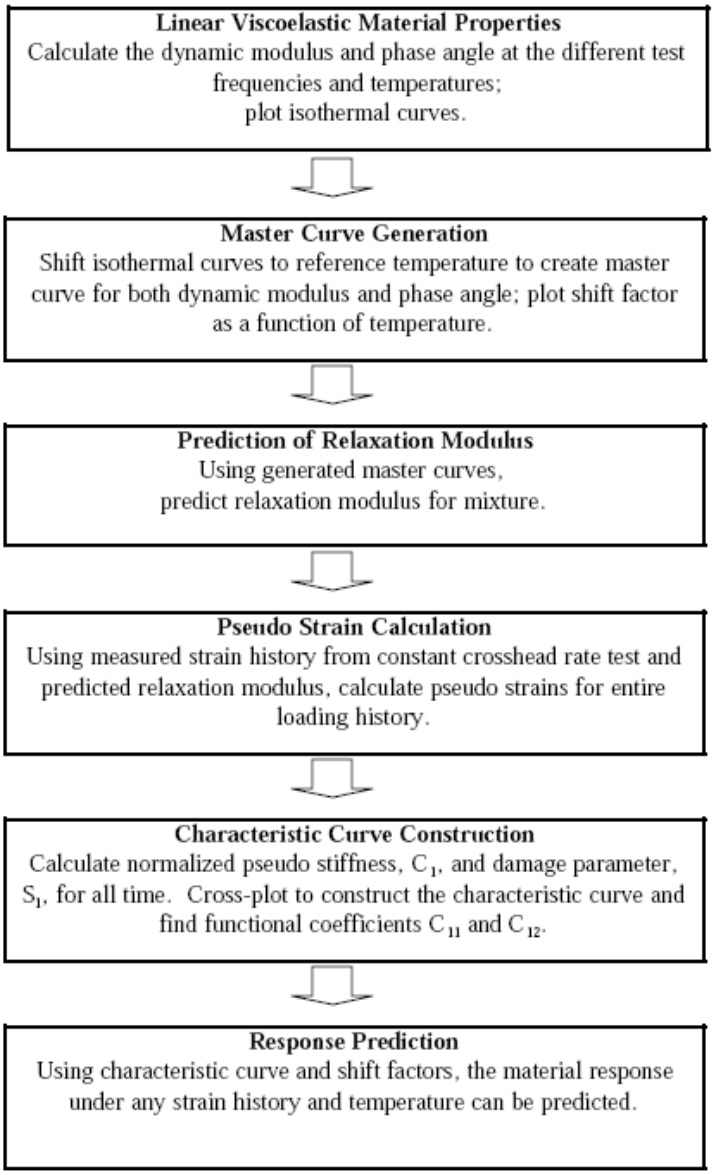
Organizational Charts

Organizational charts use simple, geometric shapes to show relationships between items.



Flowcharts

A flow chart is used to show the various stages in a process or procedure.



Appendix H
Writing Resources

Appendix H
List of Writing Resources

FHWA Communications Reference Guide

http://itd.idaho.gov/highways/research/forms/FHWA%20reference%20guide.pdf

Chicago Manual of Style

http://www.chicagomanualofstyle.org/home.html

The Chicago Guide to Writing about Numbers

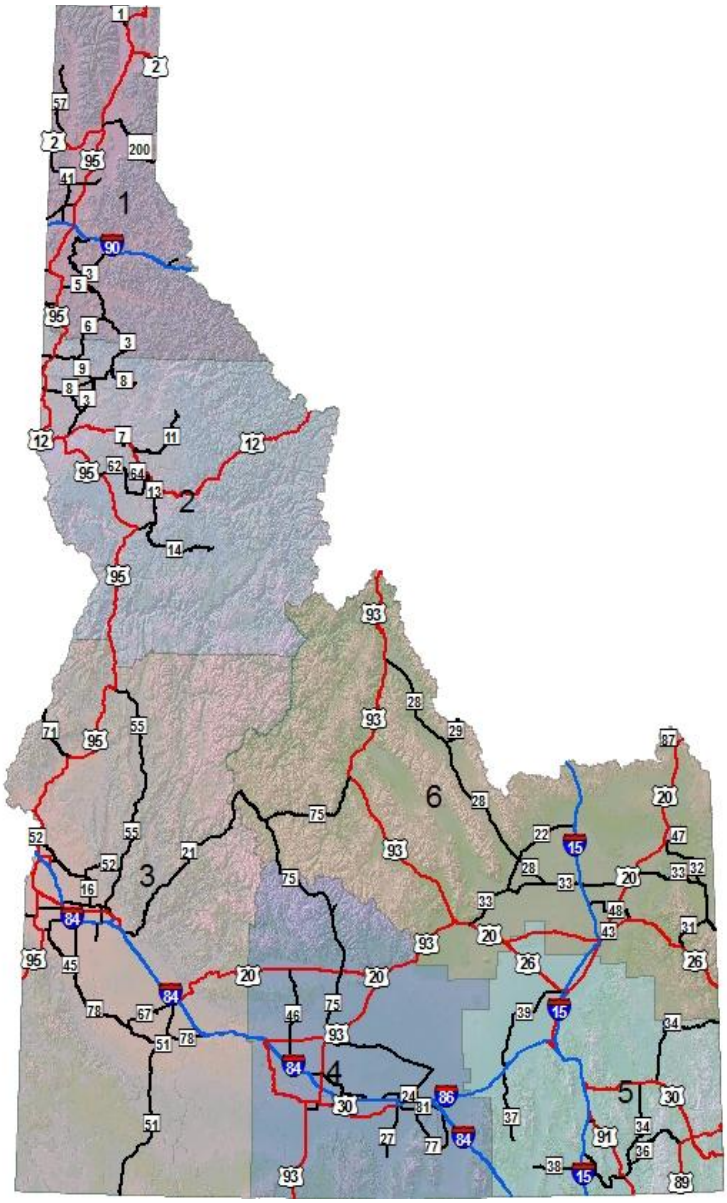
http://www.press.uchicago.edu/presssite/metadata.epl?mode=synopsis&bookkey=3630608

The Gregg Reference Manual

http://www.mhhe.com/business/buscom/gregg/

Strunk & White: The Elements of Style

http://chiron.valdosta.edu/mawhatley/Elements_of_Style.pdf

Appendix I
Map of Idaho

Appendix I
Map of Idaho