

FOREWORD

This *Communications Reference Guide* (CRG) provides you with tools, techniques, and timelines for effectively planning, scheduling, and producing your communication products, which include print materials, electronic information and technology (EIT), outreach materials, and events. It also links you with your communications and marketing resources in the Office of Research and Technology Services (HRTS). Previously known as the *Quick Reference Guide* and posted on the Internet at www.tfsrc.gov, this document replaces previous versions of the *Quick Reference Guide* under the new name, *Communications Reference Guide*.

This guide will be useful to the Federal Highway Administration (FHWA) Contracting Officer's Technical Representatives (COTR) and their contractors and support staff, who develop research and technology (R&T) communication products to FHWA standards and regulations referenced in this publication. The CRG is available on the Turner-Fairbank Highway Research Center (TFHRC) Web site, www.tfsrc.gov. This guide augments the *FHWA Publications and Printing Handbook*. Although this guide is available as a printed version upon request, the most recent and up-to-date version is posted on the www.tfsrc.gov Web site.

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Director, Research, Development,
and Technology Services

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SI* (MODERN 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				
in ²	square inches	645.2	square millimeters	mm ²
ft ²	square feet	0.093	square meters	m ²
yd ²	square yard	0.836	square meters	m ²
ac	acres	0.405	hectares	ha
mi ²	square miles	2.59	square kilometers	km ²
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft ³	cubic feet	0.028	cubic meters	m ³
yd ³	cubic yards	0.765	cubic meters	m ³
NOTE: volumes greater than 1000 L shall be shown in m ³				
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)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in ²	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm ²	square millimeters	0.0016	square inches	in ²
m ²	square meters	10.764	square feet	ft ²
m ²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	ac
km ²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m ³	cubic meters	35.314	cubic feet	ft ³
m ³	cubic meters	1.307	cubic yards	yd ³
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact degrees)				
°C	Celsius	1.8C+32	Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.
(Revised March 2003)

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CHAPTER 1—INTRODUCTION

This *Communications Reference Guide* (CRG) provides you with tools, techniques, and timelines to effectively plan, schedule, and produce your print or electronic publications, marketing and outreach materials, and events. The CRG contains publication formatting requirements, editorial style preferences, printing/publishing policies and procedures, and examples. It also links you with communications and marketing resources in the Office of Research and Technology Services (HRTS), and alerts you to areas where expert guidance will make the publication process smoother, more efficient, more effective, and in compliance with Federal regulations. The CRG is available online on the Turner-Fairbank Highway Research Center (TFHRC) Web site at www.tfhrc.gov.

This CRG touches on the required editorial and formatting rules from the *FHWA Publications and Printing Handbook*⁽¹⁾ and the most recent versions of the *United States Government Printing Office Style Manual (GPO Style Manual)*,⁽²⁾ *Merriam-Webster's Collegiate Dictionary*,⁽³⁾ and *The Chicago Manual of Style*⁽⁴⁾ by the University of Chicago Press—which are cited in current contracts as required style reference books—and it also contains details that are specific to RD&T products.

This guide is for Federal Highway Administration (FHWA) staff members and contractors who produce research, development, and technology (RD&T) reports, fact sheets, technical flyers (TechBriefs, Product Briefs, and Application Notes), brochures, booklets, Web pages, articles, other publications, events, and marketing outreach.

The CRG is not meant to take the place of consulting with HRTS staff, nor will this guide make you an expert. The purpose is to provide you with the information basics you need to comply with the policies and procedures you must follow for meeting legislative mandates and communication product requirements, and to get your message across to your primary audience. Read the CRG in its entirety before beginning to write and format a publication.

CHAPTER 2—HRTS SERVICE AND SUBMISSION PROCESS

Communication products must present information clearly, concisely, and consistently in design, style, grammar, spelling, composition, and format. Many readers equate the quality of our research, the reliability of our innovations, and the competence of our research staff with the quality of FHWA’s communication products. Publications provide a permanent record of developments in technology, implementation, and research.

Our communication products represent FHWA. To present the most professional image of the Agency, FHWA products must be technically accurate and appropriately comprehensive. HRTS guides, oversees, manages, and produces a variety of communication materials to disseminate RD&T information to a wide range of customers in the transportation industry, legislators, scientists, associations, corporate America, and the public. The HRTS office supports this effort with editors, writers, designers, journalists, communication specialists, photographers, marketing professionals, Web programmers, and others.

Note: All communication products shall be edited.

PRODUCT CONSIDERATIONS

After identifying your audience(s) and defining your message(s), you must then determine the most effective way of reaching your audience.

- The first step in this process is to know your audience’s preference. Have you asked your audience(s) what they consider the most effective approach for communicating information about a specific type of knowledge, product, or service?
- What is the most appropriate mean(s) for transmitting the message(s)? A printed report may be best for one audience, an article for another audience, or a Microsoft® PowerPoint® presentation may be the most effective for yet another group.
- What resources are available for developing and distributing the product?
- What do you intend the audience to do with this communication product?

OFFICE OF PUBLIC AFFAIRS

If the subject of a document is not strictly RD&T related, the Office of Public Affairs must be consulted before the publishing process is begun. See chapter 9, “Guidelines for Media Relations.” The only exception to this requirement is technical research reports, which must be

reviewed by the office director in lieu of public affairs. The Office of Public Affairs has delegated authority to the office directors for reviewing all other publications for policy implications.

TECHNICAL REVIEW

A peer/technical review should be conducted before each document is submitted for editing and publishing. This review should contain the necessary checks and balances to ensure that FHWA continues to publish accurate and high-quality documents. The COTR, who is responsible for the technical accuracy of the material in a publication, may involve the principal investigator or Federal staff responsible for the technology or staff study. This peer/technical review group should include subject experts both internal and external to FHWA, as appropriate.

HRTS SERVICE REQUEST FORM

Before submitting your communication product to HRTS, obtain support from your office director for moving forward on your job request. Make sure that technical experts and stakeholders already have given technical reviews and approvals, and that the copy you submit is *final*. RD&T staff must receive a hard copy HRTS Service Request Form that is signed by an office or technical director, or other delegate. Office directors also may submit the HRTS Service Request Form by e-mail.

The office director's endorsement or approval indicates several things, that he/she:

- Knows of and has awareness of this publication.
- Endorses its publication and is willing to commit office funds to publish it (if appropriate).
- Assures that it has had the proper review by all stakeholders (i.e., headquarters and field offices), and supports the plan pertaining to the publication media, intended audience, use of the document, and distribution.
- Confirms that it is fully compatible with U.S. Department of Transportation (USDOT) and FHWA policies and positions, and that all potential sensitivities have been appropriately addressed.

The HRTS Service Request Form is available in the HRTS administrative assistant's office or on the www.tfhr.gov Web site under "Services." See appendix A for a copy of the form.

PRINT DISTRIBUTION FORM

When you submit your print job, you also must submit an electronic Print Distribution Form, available from HRTS. The electronic form contains office addresses for all FHWA headquarters and field offices. For external distribution, an electronic Microsoft Excel document or self-adhesive mailing labels must be submitted with the communication product. See chapter 10 for additional details about publication distribution.

PRODUCT DEVELOPMENT AND DELIVERY

Use the following estimated times as a broad guideline for final HRTS communication product development and delivery:

- Job is received—This means intake form is completed and approved and that all submission requirements are met.
- First edit—14–30 days.
- COTR review—30 days or less.
- Second edit—14 days.
- COTR review—14–30 days.
- Third edit—7 days.
- COTR review—14–30 days.
- Layout/design—2–20 days.
- Final quality review—7 days.
- Printing—14–42 days (2 to 6 weeks depending on type of job).
- Distribution—7–14 days.
- Web files—7–28 days, depending on job and number of other jobs (this is done concurrently with printing).

<p>NOTE: Layout and design can go through additional steps depending on approvals. This adds time and expense to jobs.</p>
--

THE EDITING PROCESS

All communication products are edited electronically (using track changes) for consistency and adherence to acceptable style, punctuation, and grammar. COTRs must make a special request for hard copy edits. Edits normally will include checking sections for basic problems, grammar, and *GPO Style Manual* adherence. The process also includes analyzing, changing text to read well, and checking for organizational problems within the document (removing or indicating repetitive information, ensuring parallelism in headings and text, etc).

There are many variables that can affect the time and expense of communication products. You can avoid delays by submitting final text that does not need major rewrites or changes; providing quality, high-resolution photography or artwork if necessary; and providing original drawings or illustrations at the beginning of the cycle. (When submitting electronic files especially for layout, please submit high-resolution files at dpi 300 or greater for printing purposes.) Other factors that might delay a project include your availability for reviews and responses to questions, and whether or not your communication product needs black-and-white, two-color, or four-color processing.

Responsibility for Corrections

The editor will provide a summary edit sheet that describes the edits in the document. In addition, the editor will contact the requestor before completing an edit if the job looks like it has major problems.

The COTR is responsible for reviewing all editorial changes and answering queries as requested by the editor. In the case of reports, the COTR who submitted the report or his/her contractor are responsible for reviewing all electronic edits or in the case of hard copy edits, reviewing and incorporating all changes into the document. This time should be built into a COTR's contract.

Expediting the Editing Process

You will save considerable time by submitting a final publication and 508 materials (explained in chapter 3) that already have gone through your peer/technical review process. Additionally, reviewing edited materials quickly after they have been edited by HRTS will expedite the process.

Frequently, publications can be edited and returned to the COTR more quickly than the estimated timeframe. However, the publication process also relies on how quickly you and your contractor make the corrections indicated by the editor, and return the communication product back to HRTS with a corrected hard copy, electronic copy (CD-ROM), and the original, marked-up document (when applicable).

Standard Proofreading Marks Used in Editorial Reviews

The following table provides a selection of the most commonly used proofreading marks. See the *GPO Style Manual* for a more complete list.

Table 1. Editing symbols and their meanings.

Symbol	Meaning	Symbol	Meaning
⎵	Insert 1 en dash	⏶	Move up
⎶	Insert 1 em dash	⏷	Move down
#	Insert space	☐	Center horizontally
sp	Spell out	w.f.	Change wrong font
<i>ital</i>	Italicize—used in margin	Let it stand—used in text
—	Italicize—used in text	<i>stat</i>	Let it stand—used in margin
<i>caps.</i>	Capitalize—used in margin	^	Caret—general indicator used to mark position of error
≡	Capitalize—used in text	¶	Insert paragraph
↵	Delete	↷	Transpose—used in text
Ⓢ	Delete and close up space	∨	Superior
○	Close up	∧	Inferior
☐	Move right	⊙	Insert period
☐	Move left	↱	Insert comma

CHAPTER 3—POLICIES AFFECTING ALL PUBLICATIONS

Any research, development, and technology publication, Web site, or other communication product—including published, printed, reprinted, electronic, and Internet material, and CD-ROMs sponsored or funded by FHWA RD&T offices—*must be published or posted through HRTS*. This ensures compliance with various publishing guidelines and Federal regulations, consistency across products, and high standards for both academic and general communications. (Refer to the *FHWA Publications and Printing Handbook*.) The HRTS office sets guidelines for publishing RD&T communication products and has coordinated with other offices involved in the process, including RD&T staff managers, FHWA Office of Public Affairs, and FHWA publishing services.

Note: The Office of Public Affairs must provide initial and final clearance approvals for all publications—even if the publication will be published only electronically or on the Internet. This includes CD-ROMs, multimedia documents, and Internet-only publications. The only exception to this is RD&T reports, which must go through the HRTS editorial process.

Recognizing the important role that information plays in Federal and non-Federal decisionmaking, Congress passed the Data Quality Act as part of the Treasury and General Government Appropriations Act for Fiscal Year 2001. In brief, the Data Quality Act (also known as the Information Quality Law) requires all Federal agencies to strive toward issuing the highest quality information that is accurate, timely, and responsive to the needs of the public. The act also requires agencies to provide a means for the public to “challenge” information that appears to be inaccurate, or that does not comply with the Office of Management and Budget (OMB) “Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies.”

In addition to the Freedom of Information Act, the Paperwork Reduction Act, the Paperwork Elimination Act, the Data Quality Act, and the Presidential Memorandum of June 1, 1998, about using *plain language*, products must comply with current policy requirements of Section 508 of the Rehabilitation Act (see below) for electronic information and technology dissemination.

Under Federal law (Title 44 of U.S. Code), all printing and duplicating must be done through the Government Printing Office (GPO). No more than 10 copies may be generated outside a GPO contract. In addition, a document published by USDOT must be prepared in accordance with the instructions and guidelines provided in the latest versions of the *GPO Style Manual*, USDOT and FHWA orders as summarized in the most recent version of the *FHWA Publications and Printing Handbook*, and the accessibility requirements in Section 508 of the 1998 amendments to the Rehabilitation Act of 1973.

ELECTRONIC PUBLISHING OF COMMUNICATION PRODUCTS

Each time you prepare a publication for printing, you also must prepare an electronic version for online use on an FHWA Web site. All electronic and Internet publications must be compliant with Section 508 of the Rehabilitation Act. Electronic documents must be placed on an approved Web site URL or a Web address (such as www.fhwa.dot.gov/); please ensure that your electronic files are formatted correctly.

SECTION 508 OF THE REHABILITATION ACT

Section 508 of the Rehabilitation Act states that all electronic products produced by Government agencies must be accessible to persons with disabilities, including those persons with vision, hearing, cognitive, and mobility impairments. The Paper Reduction Act and FHWA require that printed publications must be available in electronic format; final printed documents must provide minimum 508 Compliance requirements.

Section 508 affects *all* communication products published by FHWA in print or electronic format. All FHWA publications must conform to the requirements outlined in Section 508 of the Rehabilitation Act and the U.S. General Services Administration (GSA) Federal IT Accessibility Initiative (www.section508.gov). See www.access-board.gov/508.htm for more information about Section 508 guidelines. Section 508 affects the following research, development, and technology products:

- Electronic documents, reports, brochures, etc., which are the main final products of FHWA research and development (see www.access-board.gov, “Web-based Intranet and Internet Information and Applications (1194.22)”).
- CDs and any electronic files, databases, report databases, and applications housed on them or used to install them, such as an install shield program (see www.access-board.gov, “Software Applications and Operating Systems (1194.21),” and “Web-based Intranet and Internet Information and Applications (1194.22)”).
- PowerPoint presentations if they are distributed through CD, Web, etc.—and if they contain graphic elements that need a text-based alternative (such as hypertext markup language (HTML) or an ASCII text file).

Note: A PowerPoint presentation that is presented live by a speaker would be considered accessible, because the speaker is available for any questions about graphic content. However, that same presentation distributed on a CD-ROM, without the benefit of a speaker present, must have an accessible text version for any non-text element provided on the CD-ROM.

- Movies, videos, audio files and Web movies (see www.access-board.gov, “Video and Multimedia Products (1194.24),” “Software Applications and Operating Systems (1194.21),” and “Web-based Intranet and Internet Information and Applications (1194.22).” When a Web page requires that an applet, plug-in, see [http://www.access-board.gov/sec508/guide/1194.22.htm#\(m\)](http://www.access-board.gov/sec508/guide/1194.22.htm#(m))).
- Web files including database applications/research databases, search engines, and interactive tools (see www.access-board.gov, “Software Applications and Operating Systems (1194.21),” and “Web-based Intranet and Internet Information and Applications (1194.22)”).
- Stand-alone (or unmanned) kiosks such as a computer or television screen showing a presentation or video at a conference or trade show (see www.access-board.gov, “Video and Multimedia Products (1194.24)” and “Self Contained, Closed Products (1194.25)”).

ENSURING CONTRACTOR PUBLICATION COMPLIANCE

Communicate the importance of contractors preparing documents and provide the Web site addresses listed above. The information should be attached to all statements of work and contracts for preparing publications, Web sites, multimedia presentations, and other electronic communication products. While Section 508 currently does not apply to one-time purchases of \$2,500 or less, you are strongly encouraged to comply with the applicable accessibility standards. Please note that if your intent is to print or publish the final product on a Web site, it must meet the 508 accessibility requirements for electronic posting regardless of the dollar value of the purchased product.

If your contract calls for HTML file delivery in addition to a Microsoft Word file, see chapters 4 and 8, “Guidelines and Styles for All Publications,” and “Electronic Publishing,” and coordinate with HAIM-40, HAIM-20, or HRTS-2 for additional guidance. Before being HTML-coded and deployed, any new RD&T Web publication or Web site must be edited in Microsoft Word format by the HRTS editors.

<p>Note: Contract deliverable schedules shall include sufficient time for editing and the editorial process through HRTS.</p>

CHAPTER 4—GUIDELINES AND STYLES FOR ALL PUBLICATIONS

All Agency publications must be prepared in an accessible, electronic format for online use on an appropriate FHWA Web site (such as www.fhwa.dot.gov/ or www.tfhr.gov). Even if a printed version is prepared, an electronic version of the document **MUST BE PREPARED** and must meet the accessibility requirements of Section 508 of the Rehabilitation Act.

TWO-COLOR VERSUS FOUR-COLOR PRINT

The use of multiple colors increases both the cost and the production time for a publication; therefore, additional color should be used only when it is necessary to ensure that the publication achieves its communication goal. Most reports and other publications whose sole goal is to disseminate information can easily convey the information with the use of a single color (almost always, but not necessarily, black ink). A second color of ink can considerably enhance the appearance of a publication and increase the design options available to the graphic designer. The creative use of two colors often negates the need for additional colors. Four-color printing should be used only when the supporting visual elements (e.g., photographs, graphs) require full color to accurately convey the message, or when there are other special considerations. The office director's approval is required to authorize the additional cost.

CHOOSING THE INTERNET INSTEAD OF PRINT

To avoid duplicate production costs, program offices can have publications designed for Web site display only. Keep in mind that a high-quality Web design can be just as costly as a printed design. Internet publishing is especially useful for documents containing information that needs to be issued quickly, that may change rapidly, or that is of interest but is seldom used. You also may want to consider Internet publishing if you have a small audience, for example, fewer than 500 readers. If your document fits any of these categories, it may be most appropriate to create an HTML-coded, Web-only document for an FHWA Web site.

You should expect an electronic HTML file to have a different look and layout from that of a printed document for two reasons. Duplication of a print design on a Web page will increase file size, which will subsequently increase the amount of seconds it takes for a viewer to see your Web page. See chapter 8, "Minimum Requirements for FHWA Web Pages."

Print and Web Designs

In some instances, a communication product will need extensive design for both print and Web media. Consider taking one or two graphic elements from your print document and having your graphic artist apply those elements into a Web page design.

This will ensure consistency between the print and electronic publications, and will help reduce graphic design costs.

Make sure you let your designer know from the start that you would like a few graphic elements that you can include on an Internet or CD-ROM version.

Note: Web sites require a template so that the FHWA Web site style is consistent. (See Web site details in chapter 8.)

Internet Newsletters

The Agency recommends that program offices prepare newsletters strictly as electronic documents or Internet publications.

SECTION 508 AND PUBLICATION CONTENT

Normally, there are two distinct components necessary to post an electronic publication on a Web site—the written portion (i.e., content) and the HTML programming portion. Both must provide compliance with Section 508, however, each has a different role. There are two reviews that will take place before posting a Web page on the Internet—an editorial review by HRTS-2 or HAIM-20 and a technical review by HAIM-40.

Writing content, gathering information, creating visuals, and collecting photos for a publication or Web site is normally the function of a program specialist or writer. The person who performs this function is usually referred to as a content producer/writer or publication writer. A content producer/writer is normally responsible for fulfilling the information content portion of Section 508. Research and development information and publications that are written and posted on a Web site should be edited by HAIM-20 or HRTS-2. Because the information falls under the jurisdiction of “public information,” the Office of Public Affairs also must review it.

Publication Writers/Web Content Producers

Whether you are writing a report or publication, or writing text specifically for a Web page, you should use the following Section 508 guidelines when creating material that will be posted on a Web site:

- 1) Write the content in plain language.
- 2) Write 508 captions or text for non-text elements in plain language. Be specific.
- 3) Select colors and include graphics, charts, photos, etc., that have high contrast.

- 4) Design Web pages so that all information conveyed with color is also available without color. For example:
 - a. Label each line in a graph or make each line a distinct pattern such as dashes, exes, dots, thin lines, thick lines.
 - b. Label or number each bar in a bar graph.
 - c. Do not refer to color alone as a differentiator within text, such as, “the red line,” “the blue text,” “the green button.” Instead of saying, “The red sign on this page...,” use, “The red stop sign shown in figure 1 ...”
- 5) Create simple tables whenever possible containing one vertical header column and one horizontal header row, rather than nested tables with multiple subheadings.
- 6) Ensure that a text equivalent, such as a transcript, is provided for audio files that will be included with an electronic publication or highlighted on a Web page. Audio is considered a non-text element.
- 7) Similarly, a (silent) Web slide show presentation does not need to have an audio description accompanying it, but does require text alternatives to be associated with the graphics. See below for 508 captions or “text for non-text elements.”
- 8) When deciding what text and the order of text to include on an electronic or Web form, place labels adjacent to data input fields, not in separate cells of a table. Label each data field. Whenever possible, write any detailed instructions for completing a specific field before that field. Instead of this:

Name: (Use only upper case letters)

Label your form in this manner:

Name (Use only upper case letters):

Web Site Technical Coders/Programmers

The programming portion of posting a publication on the Web consists of HTML coding (or other types of programming such as Java™, JavaScript™, Visual Basic®, etc.). It is normally a technical function carried out by a technical programmer under the auspices of an information technology office. A programmer must program a Web site using specific standards and programming language rules in accordance to FHWA requirements and Section 508. The programming portion of a publication or Web site also will undergo a review by a technical group (HAIM-40), for adherence to Section 508 and FHWA programming standards.

COTRs and technical programmers who will work on a Web site or who will provide HTML files or a Web site as a final deliverable should see chapter 8 for more specific guidelines on programming an FHWA Web site.

508 CAPTION REQUIREMENT

The HAIM-20 and HRTS-2 publication groups now require that anyone who submits a report or publication for print or electronic posting also must submit an electronic “508 captions” file in addition to the final publication file.

The separate 508 captions file should contain a listing of all the descriptions of “non-text elements” within a publication—including but not limited to every photo, chart, graph, pie chart, flowchart, diagram, and equation.

What to Include in 508 Text for Non-Text Elements

To write a 508 caption (text equivalent), writers may find it easiest to cover a figure with a hand and to describe what the relevance of the non-text element is within a document. The Access Board (the governing body responsible for enforcing accessibility standards) defines text equivalent:⁽⁵⁾

What is meant by a text equivalent?

A text equivalent means adding words to represent the purpose of a non-text element. This provision requires that when an image indicates a navigational action such as "move to the next screen" or "go back to the top of the page," the image must be accompanied by actual text that states the purpose of the image. This provision also requires that when an image is used to represent page content, the image must have a text description accompanying it that explains the meaning of the image.

How much information actually needs to be in the text equivalent?

The text information associated with a non-text element should, when possible, communicate the same information as its associated element. For example, when an image indicates an action, the action must be described in the text. The types of non-text elements requiring actual text descriptions are limited to those elements that provide information required for comprehension of content.

Format for 508 Text for Non-Text Elements

For every figure, graph, photo, formula, equation, chart, etc., shown in a publication or Web document, use the following FHWA format for the 508 caption:

- Figure 1. Graph. Name of graph. [Insert 508 caption for graph.]
- Figure 2. Photo. Name of photo. [Insert 508 caption for photo.]
- Figure 3. Formula. Name of formula. [Insert 508 caption for formula.]
- Figure 4. Chart. Name of chart. [Insert 508 caption for chart.]
- Figure 5. Equation. Name of equation. [Insert 508 caption for equation.]

Examples of 508 Text for Non-Text Elements

These examples show 508 captions that were used in actual FHWA reports:

Figure 1. Photo. Participants in showcase. More than 40 participants in the Arkansas Interstate Rubblization and Rehabilitation Showcase stare down at and take photographs of the huge pit of “rubblized concrete” during a field exercise on I-40.

Figure 2. Pie Chart. Percent of respondents by truck volume corridor categories. Pie chart depicts the following distribution of respondents: 23 percent from corridors with fewer than 5,000 trucks per day, 24 percent from corridors with 5,001 to 10,000 trucks per day, 15 percent from corridors with 10,001 to 15,000 trucks per day, and 38 percent from corridors with 15,001 to 20,000 trucks per day.

Figure 3. Histogram. Frequency with which drivers find available parking at truck stops and rest areas. Histogram depicts the following frequencies for truck stops (9 percent almost always, 25 percent frequently, 51 percent sometimes, 12 percent rarely, and 4 percent almost never) and rest areas (2 percent almost always, 9 percent frequently, 41 percent sometimes, 34 percent rarely, and 14 percent almost never).

Figure 4. Equation. PR subscript LH. PR subscript LH equals the sum of the following: 8 days times 24 hours per day minus T subscript driving minus T subscript home minus T subscript load/unload minus T subscript shipper/receiver, end of sum, that sum divided by T subscript driving, to that quotient add the quotient of 5 minutes divided by 60 minutes, the sum of which equals 0.7833.

GRAPHICS

Do not submit second generation or previously printed materials as graphics. Do not use tape; correction fluid; photocopies; or fuzzy, dark, or faded artwork.

When submitting electronic files especially for layout, please submit high-resolution files at dpi

300 or greater for printing purposes. See “Designing and Formatting Your FHWA Publication” in the *FHWA Publications and Printing Handbook*.

EDITORIAL STYLES FOR ALL PUBLICATIONS

All FHWA publications follow the style guidelines in the following order: *FHWA Publications and Printing Handbook*⁽¹⁾ and the most recent versions of the *United States Government Printing Office Style Manual (GPO Style Manual)*,⁽²⁾ *Merriam-Webster’s Collegiate Dictionary*,⁽³⁾ and *The Chicago Manual of Style*⁽⁴⁾ by the University of Chicago Press. Therefore, when looking up a particular style, use the above order for prioritizing conflicting styles.

Metric

According to the U.S. Code of Federal Regulations (23 CFR 420.121(p)), Federal research reports shall provide units of measurement using the SI (metric) system. (The American Society for Testing and Materials publication, *Standard Practice for Use of the SI International System of Units: The Modernized Metric System (ASTM E380-89a or later)* should be followed.)

Research reports prepared under FHWA planning and research grants must contain metric units, however, they may contain dual units with metric units first and English units in parentheses.

Contact the Strategic Communications Team (HRTS-2) if you have questions. Section 205(c) of the National Highway System Designation Act of 1995 was amended to give the State transportation officials sufficient flexibility to decide whether to prepare all reports and documents using the English units, metric measurements, or dual measurements. Section 121(d) of the Transportation Equity Act for the 21st Century made this exception permanent. See the Update on Metric Use Requirements June 1, 2001 memo at

<http://www.fhwa.dot.gov/programadmin/contracts/0601metr.htm>. **Punctuation**

- Use a hyphen between the elements of compound numbers from twenty-one to ninety-nine (when they must be spelled out) and in compound adjectives with a numerical first element (see *GPO Style Manual*). For example:

24-inch ruler	four-lane highway
8- by 12-inch page	3-to-1 ratio
3-m-wide screen	

For further guidance in hyphenation and compounding, see *GPO Style Manual*.

- Use an em dash—instead of a hyphen—as shown here to set off a particular phrase. There should be no spaces around the em dash.

- When parentheses or brackets are used to enclose an independent sentence, the period falls inside as in the following example. (See sample here.) If the enclosed matter is part of a sentence, the period falls outside (when the enclosed matter completes the sentence).
- Periods and commas should be placed inside quotation marks; semicolons fall outside quotation marks.
- Use a comma after each member within a series of three or more words, phrases, letters, or figures used with “and,” “or,” or “nor.”
- Use semicolons to separate groups of items only when commas are already used within each group. For example, “He checked the streets, highways, and lanes; the subways, bus routes, and airlines; and the theaters, museums, and art galleries.” In other instances in which intervening commas are used and confusion may result, use semicolons to separate elements containing commas.

Numbers and Measurements

- Any number that begins a sentence is spelled out. Numbers from one through nine are spelled out. Use numerals for numbers 10 and above.
- However, if a number 10 or above is in the same sentence with a lower number, use numerals for all.
- Units of money, measurement, and time (actual or implied) are expressed in numerals. These do not affect, and are unaffected by, other numbers in a sentence. Therefore, when using a monetary, measurement, or time reference in the sentence, only use a numeral to depict other numbers if the number is 10 or greater.
- Numbers and their units of measurement should not be separated on two lines. Also, keep words that depend on each other for meaning together on the same line of type by using non-breaking spaces (in Microsoft Word, go to insert, symbol, special characters). (For example: chapter 5, 25 millimeters (mm), and 31 percent.)

Abbreviations

Use *GPO Style Manual* abbreviations for units of measurement. Abbreviations used for units of measurement are the same for both singular and plural. However, for Section 508 compliance and to avoid confusion with the word, “in,” do not abbreviate “inch,” except where it is necessary for space in tables and figures. Do not use periods after these abbreviations, except for “in.” in place of inch or inches (again, only where it is necessary for space in tables and figures). Examples of some commonly used units are the following (see *GPO Style Manual*):

mi for mile(s)	in ³ for cubic inch(es)
mi ² for square mile(s)	m for meter(s)
mi/h for miles per hour (not mph)	ft for foot (feet)

km/h for kilometers per hour	ft ³ for cubic foot (feet)
in. for inch(es)	lb for pound(s)
in ² for square inch(es)	lbf/in ² (not psi)
ft /s for square foot (feet) per second	s for second(s)

“Percent” and most other symbols such as \$, &, #, etc., should be spelled out in the text. Some symbols may be used in figures, tables, and references (see *GPO Style Manual*).

See appendix J, “List of Preferred Terminology and Abbreviations,” for terms that are unique to FHWA.

Some Unique GPO Styles

Some common *GPO Style Manual* rules are listed below to aid in the writing process.

- Common nouns such as table 1, chapter 2, sample A, reference 4, appendix A, etc., should not be capitalized within the text.
- The word “State” should be capitalized when referring to a geographic or governmental entity.
- The words “Federal” and “Government” are capitalized, whether they appear together or alone, when referring to the Federal Government. The word “Nation” is capitalized when used as a synonym for the United States.
- Acronyms should be established by spelling out the term the first time it is used followed by the acronym in parentheses, such as Federal Highway Administration (FHWA). If the publication or report has many acronyms, a list of acronyms may be included after the list of tables.
- The prefixes and suffixes listed below generally do not require a hyphen when joined with other words:

multi	super	pre
micro	under	re
like	post	semi

TIME AND MONEY SAVINGS

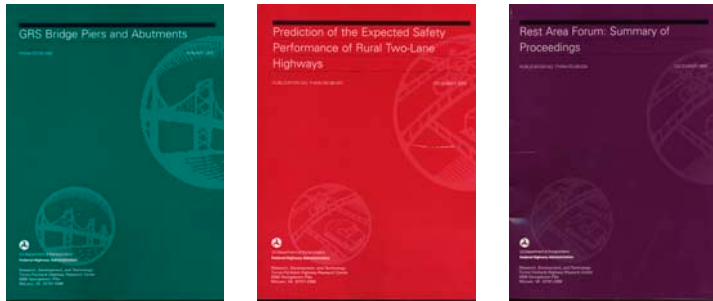
You can save time and money by:

- Submitting your 508 compliance captions file when you submit the first draft of your communication product, reports, brochures, technical flyers, etc. Both the draft and the 508 captions can go through the editorial process at the same time.

- Ensuring that employees and contractors working on your publications are familiar with the Section 508 Web sites and the specific rules that apply to each of your projects.
- Communicating the “simple table” concept to your employees and contractors. (A simple table contains only one row of horizontal and one row of vertical headers). Complex tables with more than a single row of headers can add a tremendous amount of time to converting a document into HTML.
- Planning a project from the start with Section 508 in mind to save money and time in the long run.

CHAPTER 5—PREPARING A RESEARCH REPORT

RESEARCH REPORTS



Purpose

To communicate the full details of an experiment or research project, its results, data collected from analysis, or findings and recommendations.

Audience

Transportation technical staff.

Style

- Usually more than 30 pages.
- One-color cover (appropriate color indicates the FHWA RD&T team that generated the research and report) prepared by HRTS with a standard cover design graphically depicting the area of research. HRTS uses 12 different woodcuts to represent different areas of research: Environment, Human Factors, International, ITS, Motor Carrier/Freight, Pavement, Planning, Policy, Right-of-Way, Safety, Structural/Bridges, and Training.

FORMAT FOR RESEARCH REPORTS

Standard research reports must follow the guidance in this CRG regarding formatting and font, type size, symbols, margins, page numbering, bullets, columns, and other elements as the preferred style. The report must be consistent throughout in format and style. The author of a research report should adhere to these preferences unless there is a clear, compelling reason to deviate.

Any deviation from the specified standards must be accompanied by a written explanation that specifies the reason that a format requirement was not followed. (An author may need to reformat a document if the HRTS office determines that the standard format or style is preferred.)

Submit all reports as a Microsoft Word file. The document will be printed in black ink unless otherwise specified. Should a report need to be printed in color, FHWA must receive a justification in writing indicating why color is necessary. After special permission, the author must layout the document in an acceptable graphic format.

ORDER OF ELEMENTS IN REPORTS

As discussed earlier, documentation adheres to both *GPO Style Manual* standards and FHWA-specific style requirements as outlined in this guide. All of the components of a document are listed in this section in the order in which they should appear. However, please note that it is not necessary to use all elements in all reports. (For example, if a report does not contain references, there would be no need for a reference section in the report.)

COVERS	Front Cover Inside Front Cover (R&D Foreword and Disclaimer Notice) ¹
FRONT MATTER	Technical Report Documentation Page (Form DOT F 1700.7) Preface (if any) Metric Conversion Chart Table of Contents List of Figures (including equations) List of Tables List of Abbreviations and Symbols
BODY OF REPORT	Page 1 Introduction Main text separated into chapters Conclusions Recommendations
BACK MATTER	Appendices (Use consecutive pagination, do not use A-1, etc.) Glossary Acknowledgements

¹ Use the statement shown on the inside front cover of this guide in all research reports.

References
Bibliography
Index

BACK COVERS

Cover 3 (blank)
Cover 4 (blank)

Note: Contractors' names may not appear in the report, except in block 9 of the Technical Report Documentation Page (form DOT F 1700.7). Contractor logos may not appear at all. Paid consultants should not be acknowledged anywhere else in FHWA publications.

If an acknowledgement page must be used, it must be part of the appendix; however, it should not contain contractor, author, or company names. See appendix I for a sample.

The Foreword

Publications containing technical material must have a foreword on the inside front cover. The foreword, signed by the office director, should contain information useful to readers:

- Purpose of the report, manual, or study.
- Content summary.
- Interested audience.
- Previous printings of the publication.
- Publication status: preliminary, interim, or final.

Every FHWA report must contain the standard disclaimer notice and quality assurance statement below:

Notice

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in this document.

The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this report only because they are considered essential to the objective of the document.

Quality Assurance Statement

The Federal Highway Administration (FHWA) provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.

Type Arrangement and Typefaces

- The preferred font is Times New Roman, sized at 12 point for both headings and text.
- Type styles in the text must match those in the front matter and table of contents for all headings and subheadings. This includes font, capitalization, punctuation, bolding, italics, and other attributes.
- Margins must be at least 25 mm (1 inch) on all sides, including on pages with figures and tables.
- Single-spacing is preferred if superscript and subscript do not touch the next line of type. Use the superscript and subscript features in Microsoft Word.^(sample superscript)
- Paragraphs are not indented. There should be two returns (i.e., one blank line) between paragraphs.
- Right margins should not be justified because type with ragged margins is easier to read and edit.
- Use a laser or letter-quality printer.
- Ensure that words are correctly divided, mathematical symbols or formulas are not divided between lines, and spacing is not excessive or erratic.

- Widows and orphans should be avoided. Please do not leave a single line of text at the top or bottom of a page.

Note: When using special math or scientific fonts in equations and formulas, create a .jpg, .bmp, or .gif graphic file of the equation and insert it into the document as a figure. Not all computers, printers, and operating systems can interpret special math and scientific fonts.

Volume Format

Volume designates an individually bound book. When a report exceeds 400 pages of reproduction copy (including figures, tables, appendices, and front matter), it should be divided into two or more individual volumes, with each containing a separate publication number and Roman numeral (Volume I, Volume II, etc.) as part of the subtitle. It should also be listed on the Technical Report Documentation Page (form DOT F 1700.7) in the abstract portion of the form. Indicate the following information within the abstract:

This volume is the first in a series. The other volume in the series is:
FHWA-HRT-##-### Volume II: *Name of Publication*

References and Bibliography

- References and citations in the text should use superscript numbers enclosed in parentheses or brackets. Place them after the end punctuation. If there is more than one reference, separate them with commas, but no spaces. Example:

“This guide contains many references.^(1,5,7)”

For more than three references, use a separate sentence in parentheses. Example:

“This guide contains many references. (See references 1, 5, 7, and 18.)”

- In the list of references in the appendix and in the bibliography, any style may be used as long as it is consistent and all reference elements are included (authors, title, publication number, publisher’s name and city, publication date).
- References must be consistent in punctuation, the order of elements, and the amount of information supplied. When chapters or articles in larger volumes are referenced, please be mindful to provide inclusive page numbers, which can shorten the time it takes a reader to track down a particular reference. If the editors find that the reference style in the document is inconsistent, FHWA’s standard style will be required.

- Use a single series of Arabic numbers beginning with 1 and continuing through the document and appendices.
- Each reference must be cited. Materials not cited may be listed in a bibliography placed at the end of the volume on the page(s) following the references.

Pagination

- The Technical Report Documentation Page (form DOT F 1700.7) is always unnumbered page i. (See sample form in appendix D.)
- Include front matter in the page count in the number of pages (block 21) of the form 1700.7.
- Front matter should use lower case Roman numerals such as ii, iii, etc. Start numbering with Arabic “1” at the introduction or, if there is no introduction, at the start of chapter 1.
- Use only one series of Arabic numbers from the first page of the report to the last. *Do not number appendix pages as A-1, B-1, etc.*
- Decimal numbers, hyphenated numbers, or numbers combined with letters for chapters, sections, or subsections should not be used as page numbers. Minimize the use of paragraph and subparagraph numbers.
- Page numbers should be centered 12.7 mm (0.5 inches) up from the bottom edge of each page and should stand alone with no dash on either side of the number. Page numbers are centered for consistent appearance in single- and double-sided printing.
- Chapters must begin on the right-hand page (i.e., an odd-numbered page). Insert blank pages to achieve this effect. Blank pages are counted in the page number sequence, but no number is printed on the page. Do not label “this page intentionally left blank” when adding a blank page to start a new chapter on a right-hand page. Individual chapters, appendices, etc., should not have title pages.

Table of Contents

- A table of contents is useful in most reports of more than 10 pages and is required in all reports of 30 or more pages.
- At a minimum, chapter headings and first level headings should be included in the table of contents, and the text and punctuation in the table of contents must reflect the exact text used in the body of the document. The idea is to create a section that is useful to the reader. See the table of contents sample in appendix F.
- Do not list front matter on the table of contents. List only the body of the text from page 1 through the appendices.

- Type styles in the table of contents should match those used in the report. Like the headings in text, each level of subordination must consistently use a particular type treatment, such as all capitals, bold, etc.

Headings

- To delineate different parts of a lengthy document, material is separated into chapters, and lengthy chapters are separated internally with subheadings. Because the titles of chapters and the next level of heading will be presented in the table of contents, it is important to use headings that will be most useful to readers.
- Do not number subheadings. There are four levels of headings; each is a subset of the level above it. See the following box for preferred heading styles.

CHAPTER 1. MAJOR SECTION HEADING

The chapter headings are all caps, bold, and centered. Chapter numbers, when used, may be Arabic or Roman and may be followed by a period and one or two spaces (please be consistent throughout all chapter heads). There should be three returns (i.e., two blank lines) after a chapter heading.

FIRST LEVEL HEADING

All caps, bold, and flush left (i.e., at the left margin). No numbering is required. There are only two returns (i.e., only one blank line) after this and all subordinate headings.

Second Level Heading

Initial caps, bold, and flush left. Follow with two returns.

Third Level Heading

Initial caps, bold, italics, and flush left. Follow with two returns.

Fourth Level Heading: Initial caps, bold, followed by a colon, and flush left. Follow with two returns. This subhead level is not often required.

Figures and Tables

A figure is a non-text visual element shown as a graph, photo, formula, equation, chart, diagram, illustration, etc. Each visual element must be separate and must have its own figure number and caption. Do not combine multiple graphic elements into one large figure. In addition, text elements should not be grouped as part of the figure. See figure 1.

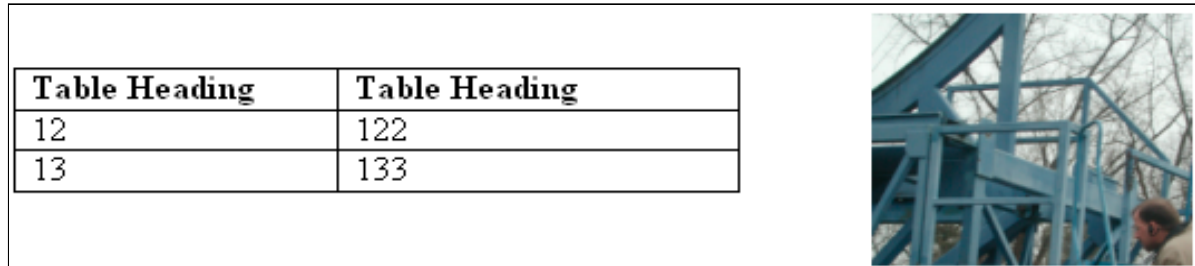


Figure 1. Unacceptable graphic. Sample of table depicted as part of the graphic.

Merriam-Webster’s Dictionary defines a table as “a systematic arrangement of data usually in rows and columns for ready reference.”⁽³⁾ Do not incorporate a table and table information into a figure (picture). A table should be depicted in a Microsoft Word or Excel text table format rather than as part of a figure or graphic. See table 2 and figure 2 below.

Text such as notes or tables should be included in the body as text rather than as part of a figure. For example, figure 1 and the combination of table 2 and figure 2 look similar, however, when a user clicks on figure 1 in Microsoft Word, it shows that the table and photograph are combined into a single figure. Instead, the figure and the table should be separate—one as a Microsoft Word table, and the other as a graphic (picture) as shown in table 2 and figure 2. (The easiest way to determine if a table or text is formatted correctly is to try to change information. A Microsoft Word table or text will allow someone to change information, while a picture format will not.)

Table 2. Sample of separate table.

Table Heading	Table Heading
12	122
13	133



Figure 2. Photo. Sample of separate graphic.

Do not combine more than one graphic element such as a photo, an illustration, and graph. Each element must be separated with its own figure number and caption. For example, do not do this:

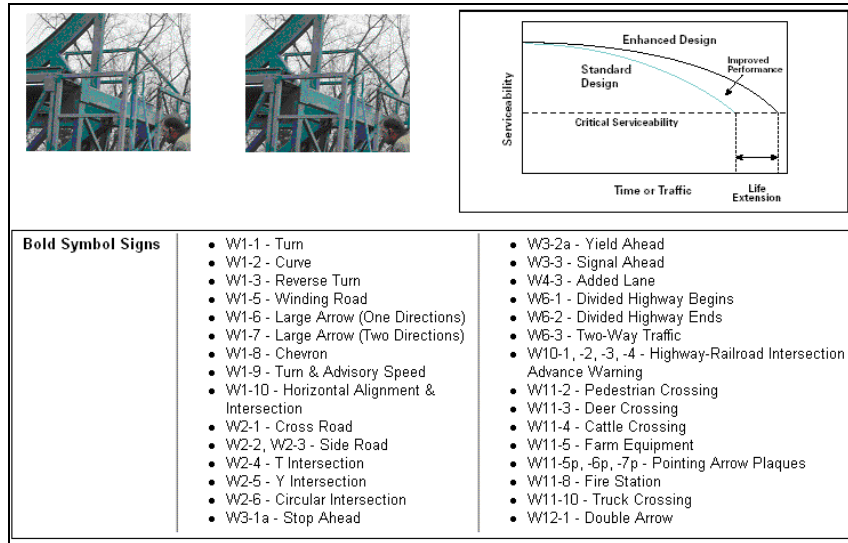


Figure 3. Multiple elements. Do not merge multiple elements as one figure.

The correct method to depict multiple elements is as separate figures, each with its own figure number and caption as in these examples:



Figure 4. Photo. Correct Format 1.



Figure 5. Photo. Correct Format 2.

Figure 6. Chart. Sample of correct chart.

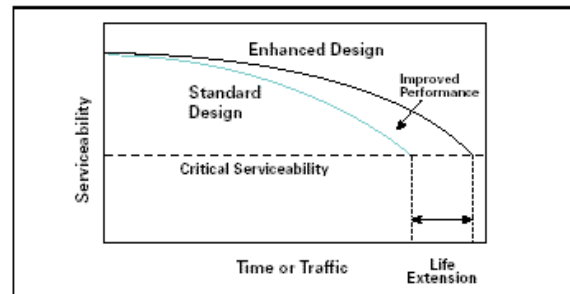


Table 3. Correct way to depict table from figure 3.

Bold Symbol Signs	<ul style="list-style-type: none"> • W1-1 - Turn • W1-2 - Curve • W1-3 - Reverse Turn • W1-5 - Winding Road 	<ul style="list-style-type: none"> • W3-2a - Yield Ahead • W3-3 - Signal Ahead • W4-3 - Added Lane • W6-1 - Divided Highway Begins
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- **Every table must have a unique caption *centered at the top*.** All tables must be numbered in a single sequence from the beginning of the volume through the appendices. Use this format for writing, punctuating, capitalizing, and centering table captions:

Table 1. [Insert caption for table.]

- All captions must be in the same type style and font size.
- A figure or table should be placed near the first mention in the text.
- Spacing before and after captions should be consistent throughout the document.
- For reports of 30 pages or more, lists of figures and tables are required and are placed immediately following the table of contents. Lists of figures and tables can be on the same page if both fit completely.
- Entries in the list of figures and the list of tables (in the front matter) must match the captions within the document, exactly (i.e., same wording, capitalization, punctuation, and type style).
- **Every figure must have a unique caption *centered at the bottom*.** All figures must be numbered in a single sequence from the beginning of the volume through the appendices. Figures include graphs, photos, formulas, equations, charts, etc. Use this format for writing, punctuating, capitalizing, and centering figure captions:

Figure 1. Graph. [Insert caption for graph.]

Figure 2. Photo. [Insert caption for photo.]

Figure 3. Formula. [Insert caption for formula.]

Figure 4. Chart. [Insert caption for chart.]

Figure 5. Equation. [Insert caption for equation.]

Note: Do not use special symbol, math, or scientific fonts for equations. Instead, insert an equation as a figure (.jpg format) and number the equation as a figure, instead of at the right-hand side as in older report formats.

Notice the similarity between the abbreviated figure captions and the 508 captions (text for non-text elements). The only difference between the two is the additional description of the figure.

Equations and Formulas

When using special symbol, math, or scientific fonts in equations and formulas, create a .jpg graphic file of the equation and insert it into the document as a graphic/picture.

Keep in mind that not all computers, printers, and operating systems can interpret special math

and scientific fonts. All equations must be numbered and captioned as a figure. See the following example:

$$PR_{LH} = \frac{8days \cdot 24hr / day - T_{DRIVING} - T_{HOME} - T_{LOAD/UNLOAD} - T_{SHIPPER/RECEIVER} + \frac{5min}{60min}}{T_{DRIVING}} = 0.7833$$

Figure 7. Equation. PR subscript LH.

Notice that the equation was created as a graphic object (figure) and pasted into this document as a picture. It was not created as “text” or a “text box” using a special font through Microsoft Word. The caption above shows the normal equation and caption, which would be reflected in a report.

On the other hand, the 508 caption for the above equation would show the exact same information, but it would be more detailed than simply providing the name of the type of figure depicted and the name of the equation. The 508 caption (which would be deliverable in a separate Microsoft Word file) would be the following:

Figure 7. Equation. PR subscript LH. PR subscript LH equals the sum of the following: 8 days times 24 hours per day minus T subscript driving minus T subscript home minus T subscript load/unload minus T subscript shipper/receiver, end of sum, that sum divided by T subscript driving, to that quotient add the quotient of 5 minutes divided by 60 minutes, the sum of which equals 0.7833.

Lists

Lists should be bulleted unless the sequence of items is critical; in which case Arabic (1, 2, 3, etc.) numerals followed by periods and one space may be substituted for bullets. In either case:

- Place a colon at the end of the text sentence preceding the list.
- Use the standard (Microsoft Word) round bullets.
- Use parallel rhetorical and grammatical structure, as in this list. Begin each entry with a verb.
- Begin each entry with a capital letter.
- End each entry with a period even if it does not form a complete sentence.
- Do not end the next-to-last item with “and” or “or.”

- Put two returns (i.e., one blank line) after the bulleted list. Short bulleted items (words, phrases, sentences) should be followed by a single return. Long bulleted items (paragraphs) should be followed by two returns.

Footnotes

- Use superscript figures without parentheses or brackets for footnote references (see *GPO Style Manual*).
- In each chapter, footnotes to text are numbered starting with “1” (see *GPO Style Manual*). Footnotes to tables or figures begin with 1 for each table or figure. Use superscript numbers (see *GPO Style Manual*).
- Footnotes must begin on the page carrying the footnote number. Avoid breaking a footnote between pages (see *GPO Style Manual*).
- Footnotes should be single-spaced. Indent the first line of each footnote four spaces.
- Asterisks, daggers, or italic superior letters may be used only when a numeral in a table or figure might cause confusion, such as being mistaken for an exponent (see *GPO Style Manual*).

Table 4. Research report—what to submit.

Black/White Print (.doc)	Two- or Four-Color Print (.doc and .qxd)	Web Site Only (.doc)	Deliverables for Research Reports
X	X	X	HRTS Service Request Form
X	X	X	Microsoft Word file of report and printed copy of report
X	X	X	Microsoft Word file of 508 captions and printed copy of captions
X	X	X	Completed Form DOT F 1700.7 (Technical Report Documentation Page)
X	X	X	Metric chart
X	X	X	Foreword (signed by office director) and Disclaimer
X	X		FWHA Distribution Form and either labels or a Microsoft Excel file with names and complete addresses
X	X	X	Tables, charts, graphs in separate native file formats (Microsoft Excel files for tables and .jpg or .tif files for graphic and computer-aided design (CAD) files)
X	X	X	Illustrations, equations, photos, figures in .jpg or .bmp file format
	X		GPO Form 952 (if you provide graphic layout of any files)
X	X	X	PDF file of the document after final edit

Acronym	Definition
PCC	– portland cement concrete (“portland” is lowercase when used in text)
PCI	– Precast/Prestressed Concrete Institute
PDF	– Portable Document Format
PDP	– professional development program
PI	– Principal Investigator
PIANC	– Permanent International Association of Navigation Congresses (now called International Navigation Association)
PIARC	– Permanent International Association of Road Congresses
PICRI	– Pavement Industry Cooperative Research Initiative
PIH	– Pan American Institute of Highways
PQA	– President’s Quality Award
PROMETHEUS	– Program for European Traffic with Highest Efficiency and Unprecedented Safety
PTRC	– Planning and Transport Research and Computation
QC/QA	– quality control/quality assurance
R&D	– research and development
R&T	– research and technology
RABA	– Revenue Aligned Budget Authority
RAC	– Research Advisory Committee
RCCC	– Regular Common Carrier Conference (ATA)
RD&T	– research, development, and technology
RFP	– Request for Proposal
RIDER	– Research and Information Databases and Electronic Resources
ROSAN	– Roadway Surface Analyzer
RSF	– Roadway Safety Foundation (AHUA)
RSPA	– Research and Special Programs Administration (USDOT)
RTAP	– Rural Transportation Assistance Program (FHWA)
RTCC	– Research and Technology Coordinating Committee
SAE	– Society of Automotive Engineers
SAFETEA	– Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003
SCOH	– Standing Committee on Highways (AASHTO)
SCOQ	– Standing Committee on Quality
SCOR	– Standing Committee on Research (AASHTO)
SFLHD	– Southern Federal Lands Highway Division

Acronym	Definition
SHA	– State highway administration
SHRP	– Strategic Highway Research Program
SIP	– State implementation plan
SMARTS	– Site Management and Retroreflective Tracking System
SMS	– safety management system
SMSA	– standard metropolitan statistical area
SNO	– Subcommittee for NRC Oversight (TRB)
SOW	– statement of work
SPC	– statistical process control
SPPR	– Subcommittee on Planning and Policy Review (TRB)
SPR	– State planning and research
SPS	– Specific Pavement Studies
STB	– Surface Transportation Board
STIPDG	– Summer Transportation Internship Program for Diverse Groups
STP	– Surface Transportation Program
STPP	– Surface Transportation Policy Project
STRAHNET	– Strategic Highway Network
SUPPS	– Shared United Performance Plan System
SWE	– Society of Women Engineers
T&I	– technology and innovation
T2	– technology transfer
TASC	– Transportation Administrative Service Center
TCRP	– Transit Cooperative Research Program (TRB)
TCSP	– Transportation and Community and Systems Preservation
TCT	– Technical Career Track
TDC	– Transit Development Corporation (APTA)
TDIP	– Technology Deployment Initiatives and Preservation
TEA	– 21 Transportation Equity Act for the 21 st Century
TFHRC	– Turner-Fairbank Highway Research Center
TIFF	– Tagged Image File Format
TIFIA	– Transportation Infrastructure Finance and Innovation Act
TIN	– Technology Innovation Network
TIP	– Transportation Improvement Program

Acronym	Definition
TMA	– Transportation Management Association
TMC	– Transportation Management Center
TNM	– Traffic Noise Model
TQM	– Total Quality Management
TRB	– Transportation Research Board
TRF	– Transportation Research Forum
TRI	– Trucking Research Institute (ATA)
TRIP	– The Road Information Program
TRIS	– Transportation Research Information Services (TRB)
TRL	– Transportation Research Laboratory
TReL	– Traffic Research Laboratory
TRRL	– Transportation and Road Research Laboratory (United Kingdom)
TSM	– Transportation System Management
UPACS	– User Profile and Access Control System
USACE	– U.S. Army Corps of Engineers
USCG	– U.S. Coast Guard (USDOT)
USDOT	– U.S. Department of Transportation
UTC	– University Transportation Center
UTCP	– University Transportation Centers Program (USDOT)
VMT	– vehicle miles traveled
VNTSC	– Volpe National Transportation Systems Center (USDOT)
VTI	– Road and Traffic Research Institute of Sweden
VWS	– virtual weather station
WFLHD	– Western Federal Lands Highway Division
WIM	– weigh in motion
WRA	– World Road Association (formerly PIARC, Permanent International Association of Road Congresses)
WSCG	– Western States Concrete Group

APPENDIX L—SAMPLE PAGE OF A RESEARCH WEB REPORT

In addition to adhering to the HAIM Web guidelines listed in chapter 8 and the Section 508 guidelines on www.access-board.gov/508.htm for HTML development and programming, FHWA research report Web pages contain the top blue banner on each page, and the bottom footer to brand the report as an FHWA report.

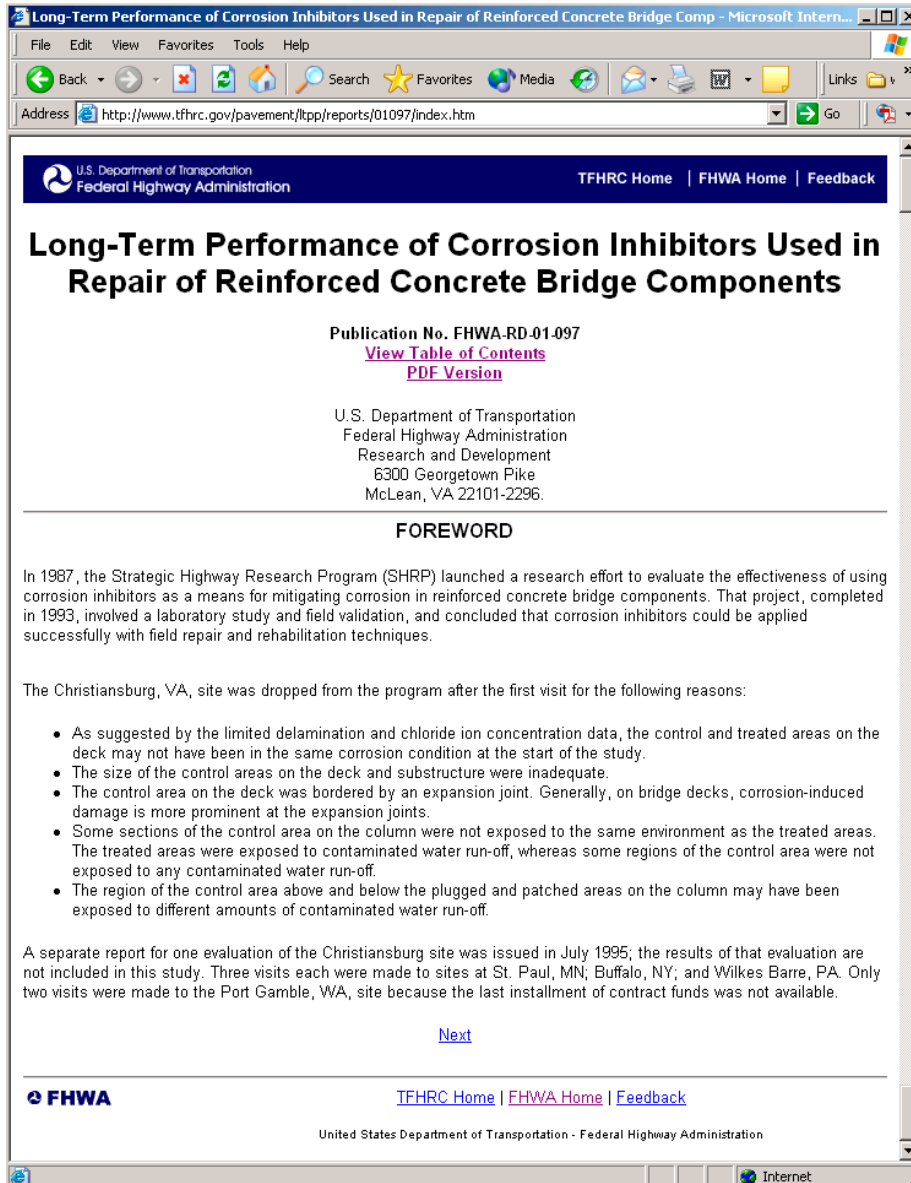


Figure 9. Screen shot. Research report Web page.

APPENDIX M—FHWA LOGO

Use one of the following two FHWA logos on publications, PowerPoint presentations, and other communication products you prepare.

The logo can be printed or depicted in any color, but **the entire logo must be in the same color**. You can enlarge or shrink the size of the logo, but you must **keep the same design proportions** shown below. (For example, don't move the triskelion symbol, enlarge the symbol, or reduce the size of the type.) Consult with the Management Services Division (HAIM-20), the Strategic Communications Team (HRTS-2), or a graphic designer for help deciding how large to make the mark and signature in proportion to the other information on your cover.

If you have any questions on the use of the FHWA logo, please contact HRTS-2 or HAIM-20.



U.S. Department of Transportation
Federal Highway Administration

Figure 10. Illustration. This is the correct two-line version of the FHWA logo.



U.S. Department
of Transportation
**Federal Highway
Administration**

Figure 11. Illustration. This is the correct four-line version of the FHWA logo.

Page 2

7. File Information - List information for all files (including graphics) used in the document to be output or attach a file directory printout which includes: File name; size, and format; and program

List files here:

8. Color Identification Information

Color System Used: PANTONE Toyo TRUMATCH RGB
 CMYK (process colors) Other _____
 Trapping: Supplied Do not trap Create traps as necessary

9. Miscellaneous Checklist

Do the files provide for bleeds (if any)? Yes No
 Are all graphics linked properly (no cutting & pasting or "store in pub")? Yes No
 Are all graphic elements "up-to-date"? Yes No
 Were changes made to any file(s) after the visual was made? Yes No
 If yes, explain _____

10. Notes/Special Instructions

Recommendations for submitting "Electronic Mechanicals"

- If you are providing files in PostScript format only, remember these are printer driver files and usually cannot be manipulated or changed by GPO or the contractor. Therefore, if any author's alterations are required you will have to provide updated files.
- If any file has been changed for the benefit of the printout (e.g., making an image smaller to show bleeds on a printout) be sure to change the file back before making the disk you are submitting.
- After making the printout, remove any "for position only" images in the files and replace them with an ID number (referenced to the printout and supplied copy) to speed up film output and thus hold down costs.
- If any holding lines (keylines) are used in the file to indicate illustration size and position, indicate on the printout whether these lines print or not.
- On the supplied printout, clearly identify any halftones or other copy being supplied as separate camera-ready copy.
- Clearly mark any miscellaneous instructions that would have been on an overlay (e.g., folding and perforating marks), on the printout or by other means.
- Label all disks with the agency name, project name, the date the disk was made and the requisition or SF-1 number. In addition, show a disk number and total number of disks sent (e.g., 1/5).
- Keep an exact duplicate of all disks and visuals submitted to GPO.
- To avoid false expectations, any requested enhancements to data supplied (e.g., added trapping) should be discussed with GPO ahead of time.

For additional assistance in completing this form and submitting electronic mechanicals, see GPO Circular Letter No. 354 and Technical Report No. 31, or call your Customer Service Representative or Regional Printing Procurement Office.

Mention of any brand name product as an example is not meant as an endorsement of that product nor of its manufacturer.

APPENDIX O— FHWA MULTIMEDIA MODEL RELEASE FORM

U.S. Department of Transportation
Federal Highway Administration (FHWA)

Name: _____ **Location:** _____ **Date:** _____

I hereby grant to FHWA the absolute and irrevocable right and permission, in respect of the photographs or audio or videotape recording and their transcripts, that it has taken or has had taken of me or in which I may be included with others, to copyright the same, in its own name or otherwise (and assign my rights throughout the world in such photograph and audio and video recordings and their transcripts), to use, reuse, publish, and republish, and otherwise reproduce, modify and display the same, in whole or in part, individually or with other photographs, and with any copyrighted matter, in any and all media now or hereafter known, for illustration, promotion, art, advertising and trade, or any other purpose whatsoever; and to use my name in connection therewith if it so chooses.

I hereby release and discharge FHWA from any and all claims and demands arising out of, or in connection to, the use of the photographs, including without limitation any and all claims for libel or invasion of privacy. FHWA may sell, assign license, or otherwise transfer all rights granted to it hereunder.

This authorization and release shall also inure to the benefit of the specific legal representatives, licensees, and assigns of FHWA, as well as the staff representative(s) (if any) for whom it took the photographs.

I am of full age and have the right to contract in my own name. I have read the foregoing and fully understand the contents thereof. This release shall be binding upon me and my heirs, legal representatives and assigns. I further release FHWA from any responsibility for injury incurred during the photography or audio or videotaping session.

Signed: _____

(If minor, parent or legal guardian must sign.)

Printed Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Fax Number: _____

Date: _____

APPENDIX P—FHWA MULTIMEDIA CHILD MODEL RELEASE FORM

U.S. Department of Transportation
Federal Highway Administration (FHWA)

Name: _____ **Location:** _____ **Date:** _____

I hereby grant to FHWA the absolute and irrevocable right and permission, in respect of the photographs or audio or videotape recording and their transcripts, that it has taken or has had taken of me or my child, _____, or in which I or my child may be included with others, to copyright the same, in its own name or otherwise (and assign my rights throughout the world in such photograph and audio and video recordings and their transcripts), to use, reuse, publish, and republish, and otherwise reproduce, modify and display the same, in whole or in part, individually or with other photographs, and with any copyrighted matter, in any and all media now or hereafter known, for illustration, promotion, art, advertising and trade, or any other purpose whatsoever; and to use my name in connection therewith if it so chooses.

I hereby release on behalf of myself and my child and discharge FHWA from any and all claims and demands arising out of, or in connection to, the use of the photographs of my child and me, including without limitation any and all claims for libel or invasion of privacy. FHWA may sell, assign license, or otherwise transfer all rights granted to it hereunder.

This authorization and release shall also inure to the benefit of the specific legal representatives, licensees, and assigns of FHWA, as well as the staff representative(s) (if any) for whom it took the photographs.

I am of full age and have the right to contract in my own name and in the name of my child. I have read the foregoing and fully understand the contents thereof. This release shall be binding upon my child, and my heirs, legal representatives, assigns, and me. I further release FHWA from any responsibility for injury incurred during the photography or audio or videotaping session.

Signed: _____

(If minor, parent or legal guardian must sign.)

Signer's Name _____

Child's Name and Age: _____

Address: _____

City, State, Zip: _____

Phone: _____

Fax Number: _____

Date: _____