



# Information for Authors

*(Updated March 10, 2010)*

## ***A Guide for Preparing and Submitting Manuscripts for Presentation at the TRB Annual Meeting and for Publication in TRB's Journal***

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TRANSPORTATION RESEARCH BOARD  
OF THE NATIONAL ACADEMIES



# Information for Authors

To submit a paper to the Transportation Research Board (TRB) for presentation at the TRB Annual Meeting or for publication in the *Transportation Research Record: Journal of the Transportation Research Board*, or both, follow the instructions in this guide. Authors are encouraged to submit all papers to TRB via the Internet. This guide is updated periodically; authors should review all information in this guide before submitting papers for consideration. This guide covers the organization and formatting of peer review and final versions of manuscripts, as well as instructions for submission. Papers that do not follow the guidelines may not be considered for presentation or publication.

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## WHAT'S NEW FOR 2010

### **One Deadline and Paper Submissions Must Be in Portable Document Format (PDF)**

TRB has implemented a single deadline for paper submission for the 2010 Annual Meeting—this is a change from the dual deadlines that were in effect previously. **Papers must be submitted before midnight, Saturday, August 1, 2009.**

To improve the efficiency of the paper submission process, **paper submissions must be in PDF for the 2010 Annual Meeting.** Non-PDF files will not be accepted, and TRB will not convert files to PDF. Authors are encouraged to line-number the text of their papers before converting the files to PDF; the line-numbering facilitates the paper review process. Authors should check the PDF for accuracy before submitting the file to TRB.

See the “Critical Dates” and “Manuscript Submission” sections for more details.

New guidelines for paper discussions are presented in the section, “Submitting Discussions for Papers.”

### **IMPORTANT:**

**Hard deadline for submitting final manuscripts of papers accepted for publication in a *Transportation Research Record* (TRR) is March 15, 2010.**

TRB will strictly enforce the March 15 deadline for submitting the final version of all papers to be published in a TRR.

**Authors should note that final versions of all papers to be published must be resubmitted in a different format** (see the “For Publication” subsection under “Organization of Manuscript”)—this is not a change, but authors often overlook this final step.

### **Searching and Citing TRR Papers**

Two tools are now provided to assist authors in conducting literature reviews and identifying TRR references for papers: TRR for Authors and TRR Online. See “References” in the “Manuscript Specifications” section for more details. TRR for Authors is accessible to authors only during limited times of the year and provides access to the full text of the publications. TRR Online is available year-round and provides access to abstracts of publications; full text is available for a subscription or a pay-per-view fee. See [www.TRB.org/TRROnline](http://www.TRB.org/TRROnline) for links and details.

In 2008, the Thomson Reuters Institute for Scientific Information measured the citation impact factor of TRR at 0.259, the highest score for the journal yet. This continues an upward trend, a reflection of the continuing efforts of the TRR Publication Board, established in 2006, and of TRB staff and authors to increase TRR’s citation impact factor.

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## CRITICAL DATES

### June 1

TRB paper submission website opens. Authors who enter at least their abstract into the TRB paper submission website will have online access to the more than 10,000 papers that have been published in the *Transportation Research Record* since 1996 for background and references.

### August 1

Deadline for submitting complete papers for presentation at the next Annual Meeting and for publication in the next *Transportation Research Record* journal series. Papers must be in PDF format and must be submitted before midnight, August 1, 2010. Papers for the next Annual Meeting or Record series are not accepted after this date.

### November 15

Deadline for submission of revised papers approved for presentation at the TRB Annual Meeting for inclusion in the Compendium of Papers and for rereview.

### March 15

Deadline for submission of the final draft of papers that have been recommended by the peer review committee and that have been accepted for publication in the *Transportation Research Record: Journal of the Transportation Research Board*. **Final drafts are not accepted after this date.**

## GENERAL GUIDELINES

All papers must be submitted in English. To assist authors in preparing papers, the review criteria for the peer review of papers are summarized below. Compliance with the manuscript formatting guidelines presented in the following sections will minimize delays for authors, peer reviewers, and staff and will facilitate subsequent revision of papers for publication.

## PAPER REVIEW CRITERIA

Each paper is evaluated by a minimum of three reviewers selected by TRB in accordance with procedures approved by the Governing Board of the National Research Council of the National Academies. Authors should be mindful of the TRB review criteria, which apply to all papers.

The review criteria and thresholds for acceptance are the same whether the paper is assigned for presentation at a lectern or a poster session. Approximately 50% of the papers accepted for the Annual Meeting are presented in poster sessions. Approximately 25% of all submitted papers are chosen for publication in the *Transportation Research Record*.

- The abstract should concisely convey the meaning of the paper.
- The text should be written in simple, concise, and effective language.
- The content of the paper should be new or original, deal with issues that are timely, and have lasting value.
  - Coverage of the subject should be complete, well organized, and supported by understandable and useful tables, figures, and references.
    - Data presented must be valid, and the research methods described should be appropriate for the studies reported.
    - Conclusions should be valid, appropriate, and properly supported.
    - If the paper addresses government policies, programs, or procedures, the author should offer conclusions and recommendations in a way that recognizes sensitivities and alternative approaches.
    - The paper must be useful to practitioners, researchers, or both.
    - Papers in which special interests are advocated, papers that are of a commercial nature, and papers that deal with subject matter outside the general area of interest of TRB will not be considered. A paper also may be rejected if it describes the properties of a product whose composition or manufacture is not disclosed. Generic names of products and equipment should be used unless the author considers the trade names or manufacturers' names essential to the purpose of the paper.
      - The content must not have been published elsewhere. In some cases, however, TRB may accept papers that have been submitted to or published by other organizations, provided that the publication has had limited distribution and that the author has secured the necessary clearances and permissions. Such cases are handled individually; the author should contact the TRB Technical Activities Division Director.

## MANUSCRIPT SPECIFICATIONS

### Clearances and Copyrighted Material

Authors must secure necessary clearances and written permissions for presentation or publication from any contracting or supervisory agencies involved in the research or from holders of copyrights on material used in the paper. Authors must have concurrence from coauthors or coworkers before submitting papers for presentation or publication by TRB, and all contributions to the work must be properly acknowledged. If a paper accepted for publication contains previously copyrighted material, **authors must obtain written permission from the copyright holder(s)**. TRB will assume the authors have obtained this permission before submission of the manuscript for inclusion in the TRB Annual Meeting Compendium of Papers. **In addition, this permission must be provided to the TRB Publications Office at the time the paper is submitted for publication in TRB's *Transportation Research Record* series.** Volumes of the *Transportation Research Record* are not usually copyrighted; however, it is assumed that the material will not be published elsewhere without prior notice to TRB and that TRB will retain unrestricted rights to the material.

## Length of Manuscripts

The length of each paper, including the abstract and references, **may not exceed 7,500 words**; that is, a paper that is only text should contain no more than 7,500 words. Each table, figure, or photograph accompanying the text counts as 250 words. For example, if two figures and three tables are submitted, the text may be no more than 6,250 words.

Note that 7,500 words is the maximum length; authors are encouraged to keep papers to the minimum length possible and to limit the number of figures and tables, providing only essential information of interest to the reader.

**The number of words in text and the number of figures, tables, or photographs in the paper should be noted on the title page. Overlong papers may not be reviewed at the discretion of the reviewing committee.**

## Length and Content of Abstracts

*Each paper must have an abstract.* The abstract must be no longer than 250 words, it must be self-contained, and it must not require reference to the paper to be understood. In some cases, only the abstract of a paper is read; in other cases, an abstract prompts further reading of the entire paper. The abstract should present the primary objectives and scope of the study or the reasons for writing the paper; the techniques or approaches should be described only to the extent necessary for comprehension; and findings and conclusions should be presented concisely and informatively. The abstract should not contain unfamiliar terms that are not defined, undefined acronyms, reference citations, or displayed equations or lists.

## Author Names and Affiliations

The names, current affiliations, complete mailing addresses, telephone numbers, fax numbers, and e-mail addresses of all authors **must** be listed on the title page. The list should be a single column. One corresponding author must be designated for papers with multiple authors. TRB will communicate only with the corresponding author, who is responsible for informing the coauthors of the paper's submission and disposition. If the research was performed while the author had another affiliation, and the author wishes that affiliation listed in addition to the current one, the author should note that both affiliations are to be used. (Corresponding authors are responsible for notifying TRB of any change in address for themselves or coauthors by following the instructions in the submission confirmation letter.)

## Style

To achieve uniformity and consistency in publications, the TRB editorial staff uses certain standard reference works for guidance. In matters of spelling, definition, and compounding of words, Merriam-Webster's Collegiate Dictionary, 11th Edition, is generally followed. Published standards of scholarly organizations are accepted in questions involving usage of technical terms. Other matters of style and usage are based on documents widely accepted as authoritative (e.g., *Chicago Manual of Style*). Authors should avoid jargon, undefined acronyms, use of personal pronouns—particularly first-person singular and plural—and sexist language in their papers.

## Organization of Manuscript

### *For Peer Review and Compendium of Papers*

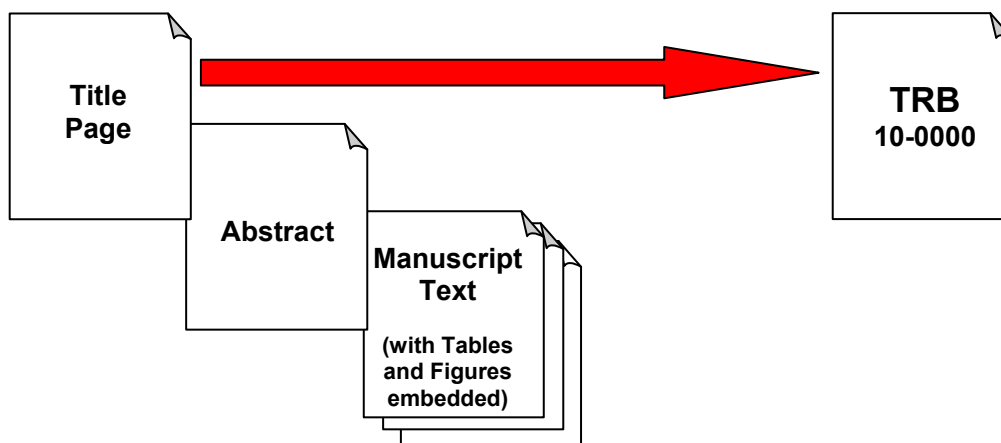
**For peer review and for the Compendium of Papers**, submit the manuscript in a single electronic file organized in the following sequence (see Figure 1):

- Title page, including submission date, word count, and author names, affiliations, addresses, phone numbers, fax numbers, and e-mails (please indicate corresponding author);
- Abstract;
- Body of paper, with figures and tables embedded in the text, as close as possible to the related text;
- Acknowledgment (if any); and
- References.

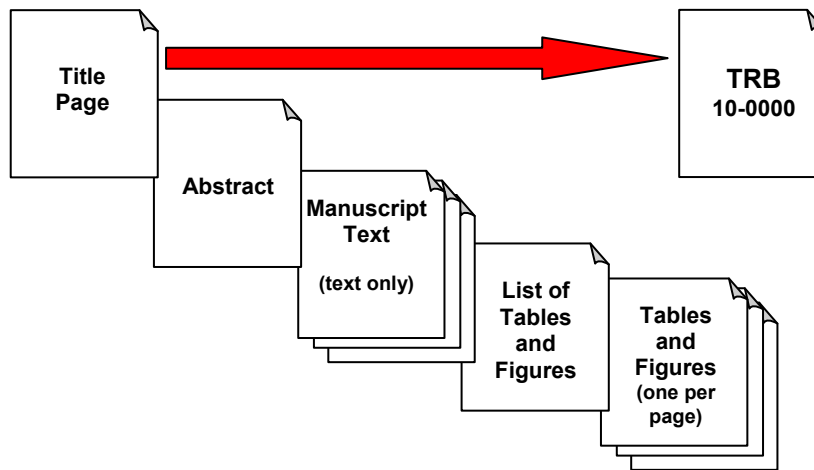
### *For Publication*

If the paper is accepted for publication in the *Transportation Research Record: Journal of the Transportation Research Board*, you must resubmit the manuscript in a single electronic file with all figures and tables moved to the end of the document, each figure or table on a separate page. The manuscript file must be organized as follows (see Figure 2):

- Title page, including submission date, word count, and author names, affiliations, addresses, phone numbers, fax numbers, and e-mails (please indicate corresponding author);



**FIGURE 1 Anatomy of a TRB manuscript submitted for peer review and for the Compendium of Papers.**



**FIGURE 2 Anatomy of a TRB paper submitted for publication in the *Transportation Research Record*.**

- Abstract;
- Body of paper—text only;
- Acknowledgment (if any);
- References;
- List of table titles and figure captions on a separate page; and
- Tables with titles and figures with captions, each table or figure on a separate page.

### **Electronic File Formats**

Manuscripts must be in an electronic format that meets the following specifications:

#### *For Peer Review and Compendium of Papers*

The manuscript file must be a PDF. Authors are encouraged to line-number the text of their papers before converting the files to PDF, to facilitate the review process.

#### *For Publication*

- Do not submit the manuscript as a PDF file. Remove line numbering.
- The manuscript file—with tables and figures placed at the end of the file, each on a separate page—should be in Microsoft Word (6.0 up to 2003, with .doc extension).
  - Do not submit a manuscript file in Word 2007 (.docx or .docm). Before submittal, convert the file (save as) to an earlier version of Word (6.0 up to 2003, with .doc extension).
  - Do not use the Microsoft Word “Styles and Formatting” or “Track Changes” features in the file.
  - Tables should be in MS Word (.doc), one table to a page using hard page breaks.
  - Figures (graphics of any kind) should be placed at the end of the Word document as images, one figure to a page using hard page breaks.
  - Equations may be created and inserted as part of the text, or they may be submitted as embedded images within the text.

## Manuscript Page Setup

- Margins: 25.4 mm (1 in.) top, 25.4 mm (1 in.) left; adjust settings for bottom and right margins so that the text area is not more than 165.1 mm by 228.6 mm (6.5 in. by 9 in.).
- Font (typeface): Times New Roman, no smaller than 10 points.
- Numbering: Insert page numbers at upper right of each page; insert name(s) of author(s) at upper left of each page.
  - Text: Single-spaced.
  - Paragraphs: Indent first line 12.7 mm (0.5 in.); do not use an extra line space between paragraphs; do not indent first line after a subhead.
  - Subheads: All subheads should be flush with the left margin, with one line space above.

### **FIRST-LEVEL SUBHEAD**

(all capitals, boldface, on separate line)

### **Second-Level Subhead**

(initial capitals, boldface, on separate line)

### *Third-Level Subhead*

(initial capitals, italic, on separate line)

**Fourth-Level Subhead** (initial capitals, boldface, on same line as text, with extra letter space between the subhead and text)

*Fifth-Level Subhead* (initial capitals, italic, on same line as text, with extra letter space between the subhead and text)

- Bulleted and numbered lists: Indent first line 12.7 mm (0.5 in.); do not indent for text runovers.
- Table titles and figure captions:

### **TABLE 5 Effects of All Factors**

(Insert title above the table; “Table” is all capitals; title is initial capitals; all type is boldface; extra space but no punctuation after number; no punctuation at end of title.)

### **FIGURE 3 Example of results.**

(Insert caption below the figure; “Figure” is all capitals; caption is sentence case; all type is boldface; extra space but no punctuation after number; period at end of caption.)

## References

### *Searching and Citing Transportation Research Record Papers*

TRB provides two tools to assist authors in conducting a literature review and identifying references for papers: TRR for Authors and TRR Online. The two tools are available to different audiences and have different features, but both provide access to the extensive information on research published in past *Transportation Research Records*.

Citing TRR papers raises the impact factor of the TRR, which enhances the prestige of the journal and of the papers published. TRB hopes that authors will use one or both of these tools in preparing papers to be considered for presentation at Annual Meetings and publication in TRRs.

**TRR for Authors** Individual papers published in the *Transportation Research Record: Journal of the Transportation Research Board* are accessible online to authors preparing papers to be considered for presentation and for publication by TRB. Authors who enter abstracts into the TRB paper submission website will have access to the more than 10,000 papers published in the TRR since 1996, including papers recommended for publication from the most recent Annual Meeting. Authors may access this tool by simply logging onto the TRB paper submission site and submitting only an abstract for their paper. Authors have until the August 1 paper submission deadline to submit their full papers and other required information.

The log-in name and password used for the submission of the abstract will give authors access to the TRR for Authors database. The webpage for the database is [www.TRB.org/TRRforAuthors](http://www.TRB.org/TRRforAuthors). Authors may search for previously published TRR papers by using keyword, topic area, author, Record number, or publication year.

Access to this database will be available to authors only during the following times:

- June 1 to August 1: Open to all authors who have entered at least an abstract of their paper on the TRB paper submission website;
- October 15 to November 15: Open to authors whose papers have been accepted for presentation or publication; and
- February 1 to March 15: Open to authors whose papers have been accepted for publication in the TRR.

**TRR Online** This new TRR search tool provides valuable information to the general public. It provides access to abstracts and references for all papers published in TRRs since 1996 (it does not include papers from the previous Annual Meeting until they have been published in a hard-copy TRR). Each paper has links to other TRR publications by the same author, other papers within that TRR volume, and to publications in other journals and literature databases. Authors who are employees of a TRB sponsor or who subscribe to TRR Online will also have access to the full text of the publications.

The link and more information about TRR Online can be found at [www.TRB.org/TRROnline](http://www.TRB.org/TRROnline).

### *Guidelines for References*

1. The reference list should contain only references that are cited in the text, numbered in the order in which they are first cited. Bibliographic lists will not be published.
2. Denote a reference at the appropriate place in the text with an italicized Arabic numeral in parentheses, e.g., (2). Do not denote text references with superscripts.

3. Do not include in the reference list personal communications, telephone conversations, or similar material that would not be available to readers electronically or in printed form in a library or from the originating agency. Instead, cite the unpublished work in the text and enclose the author's name along with the term "unpublished data" in parentheses.

4. Do not repeat a reference in the list, and do not use *ibid.*, *idem*, *op. cit.*, or *loc. cit.* If a reference is cited more than once in the text, repeat the number first assigned to the reference.

5. Use the following content guidelines and samples in preparing reference lists:

- **Printed sources.** Be sure that references to printed sources are complete. Include names of corporate or personal authors or editors, or both; title of article, chapter, book, or report; publisher or issuing agency; volume and issue or report number; page numbers; location of publisher; and year of publication.

#### *TRB Publications*

Dewan, S. A., and R. E. Smith. Creating Asset Management Reports from a Local Agency Pavement Management System. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1853, Transportation Research Board of the National Academies, Washington, D.C., 2003, pp. 13–20.

#### *Book*

Newland, D. E. *Random Vibrations: Spectral and Wavelet Analysis*. John Wiley and Sons, Inc., New York, 1998.

#### *Periodical*

Dawley, C. B., B. L. Hogenwiede, and K. O. Anderson. Mitigation of Instability Rutting of Asphalt Concrete Pavements in Lethbridge, Alberta, Canada. *Journal of Association of Asphalt Paving Technologists*, Vol. 59, 1990, pp. 481–508.

Sansalone, M., J. M. Lin, and W. B. Streett. Determining the Depths of Surface-Opening Cracks Using Impact Generated Stress Waves and Time-of-Flight Techniques. *ACI Materials Journal*, Vol. 95, No. 2, 1998, pp. 168–177.

#### *Government Report*

Von Quintus, H. L., and A. L. Simpson. *Documentation of the Backcalculation of Layer Parameters for LTPP Test Sections*. Publication FHWA-RD-01-113. FHWA, U.S. Department of Transportation, 2002.

- **CD-ROMs.** References to CD-ROMs should include the same information as references to printed sources and have "CD-ROM" after the title.

Solaimanian, M., J. Harvey, M. Tahmoressi, and V. Tandon. Test Methods to Predict Moisture Sensitivity of Hot-Mix Asphalt Pavements. In *Moisture Sensitivity of Asphalt*

*Pavements*. CD-ROM. Transportation Research Board of the National Academies, Washington, D.C., 2004, pp. 77–110.

- **Websites.** References to websites should include corporate or personal authors, title of document, date of document (if available), web address (complete URL), and date accessed by the author.

State and Local Policy Program. *Value Pricing*. Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis. [www.hhh.umn.edu/centers/slp/vp/vp\\_org](http://www.hhh.umn.edu/centers/slp/vp/vp_org). Accessed Feb. 5, 2008.

*Guide to Developing Performance-Related Specifications*. FHWA-RD-98-155, FHWA-RD-98-156, FHWA-RD-98-171, Vol. III, Appendix C. [www.tfhrc.gov/pavement/pccp/pavespec](http://www.tfhrc.gov/pavement/pccp/pavespec). Accessed March 5, 2003.

Nemmers, C. Transportation Asset Management. *Public Roads Magazine*, July 1997. [www.tfhrc.gov/pubrds/july97/tam.htm](http://www.tfhrc.gov/pubrds/july97/tam.htm). Accessed Jan. 13, 2002.

- **Unpublished papers.** References to unpublished papers presented at meetings should include name(s) of author(s); title of paper; and title, sponsor(s), location, and dates or year of meeting.

Corbett, J. J. Toward Environmental Stewardship: Charting the Course for Marine Transportation. Presented at 83rd Annual Meeting of the Transportation Research Board, Washington, D.C., 2004.

- **Program manuals, tapes, or other documentation for models.** References to these items should cite the specific edition, the department responsible, and the year of release.

*MINITAB User's Guide 2: Data Analysis and Quality Tools*. Minitab, State College, Pa., 2000, pp. 27–52.

If a reference has no date, use “undated.” Detailed reference style instructions are available on request from the Publications Office.

## **Metrication**

Authors are encouraged to provide measurements in both SI (metric) and U.S. customary units. The measurement unit of the original research should be followed by the equivalent conversion in parentheses. Papers accepted for publication without unit conversions will be published with the measurement units as submitted. TRB will not supply specific conversions for the papers; a general conversion chart appears in the front pages of each volume of the TRR. [Table 1](#) supplies some frequently used unit conversion factors.

Note: When converting U.S. customary measures of weight (force) and mass into SI units, express weight (force) in newtons and mass in kilograms; express poundforce per square inch (lbf/in.<sup>2</sup>) of pressure or stress in kilopascals (kPa). For SI units, use prefixes instead of powers of 10.

For tables and figures, provide only the units of the original research and show the base unit conversion in a footnote; for example, NOTE: 1 mi = 1.61 km. Alternatively, in figures, equivalent units may be shown on the top and right axes of data plots.

**TABLE 1 Measurement Conversions**

<b>When You Know</b>	<b>Multiply by</b>	<b>To Find</b>
<b>Length</b>		
inches (in.)	25.4	millimeters (mm)
feet (ft)	0.305	meters (m)
yards (yd)	0.914	meters (m)
miles (mi)	1.61	kilometers (km)
<b>Area</b>		
square inches (in. <sup>2</sup> )	645.1	millimeters squared (mm <sup>2</sup> )
square feet (ft <sup>2</sup> )	0.093	meters squared (m <sup>2</sup> )
square yards (yd <sup>2</sup> )	0.836	meters squared (m <sup>2</sup> )
acres	0.405	hectares (ha)
square miles (mi <sup>2</sup> )	2.59	kilometers squared (km <sup>2</sup> )
<b>Volume</b>		
fluid ounces (fl oz)	29.57	milliliters (mL)
gallons (gal)	3.785	liters (L)
cubic feet (ft <sup>3</sup> )	0.028	meters cubed (m <sup>3</sup> )
cubic yards (yd <sup>3</sup> )	0.765	meters cubed (m <sup>3</sup> )
<b>Mass</b>		
ounces (oz)	28.35	grams (g)
pounds (lb)	0.454	kilograms (kg)
short tons (2,000 lb)(T)	0.907	megagrams (Mg)
<b>Temperature (exact)</b>		
Fahrenheit temperature (°F)	$(F - 32)/1.8$	Celsius temperature (°C)
<b>Illumination</b>		
footcandles (fc)	10.76	lux (lx)
footlamberts (fl)	3.426	candela/m <sup>2</sup> (cd/m <sup>2</sup> )
<b>Force and Pressure or Stress</b>		
poundforce (lbf)	4.45	newtons (N)
poundforce per square inch (psi)	6.89	kilopascals (kPa)

## Equations

All variables should be defined at first use, either in the text or in the where list for the equation.

1. Fractions in displayed equations should be stacked, in accordance with preferred mathematical practice.
2. If a displayed equation is numbered, use an Arabic numeral in parentheses, placed flush right.
3. Carefully distinguish the following:
  - All capital and lowercase letters
  - Capital O (“oh”), lowercase o (“oh”), and 0 (zero)
  - Lowercase l (“el”) and number 1 (one)
  - Letter X, Greek chi ( $\chi$ ), and multiplication sign  $\times$
  - Prime  $'$ , apostrophe  $'$ , and superscript one  $^1$
  - English and Greek letters such as
    - B and beta ( $\beta$ ), upper- or lowercase k and kappa ( $\kappa$ ),
    - n and eta ( $\eta$ ), v and nu ( $\nu$ ),
    - u and upsilon ( $\upsilon$ ), u and mu ( $\mu$ ),
    - Upper- or lowercase p and rho ( $\rho$ ), and w and lowercase omega ( $\omega$ ).

## Footnotes

Do not use footnotes to the text. Incorporate the information into the text or delete the notes.

## Abbreviations, Acronyms, and Symbols

Abbreviations, acronyms, and symbols must be fully defined at first use in the paper; the full term should be spelled out first, followed by the abbreviated term in parentheses.

## Acknowledgment

Authors of papers that report results of research sponsored directly or indirectly by federal programs should indicate this sponsorship in an Acknowledgment section at the end of the text, above References.

## Appendices

*Do not use appendices.* Include pertinent material in the paper itself or, where necessary, include a note that background material—such as derivation of formulas, specifications, or survey forms—is available from the author or in another report, which should be cited in the reference list.

## Tables and Figures

**For peer review and for the Compendium of Papers**, figures and tables should be embedded in the text, as close as possible to the related text. Color is permissible.

**If the paper is accepted for publication in the *Transportation Research Record: Journal of the Transportation Research Board***, all tables and figures should be inserted at the end of the manuscript after the list of tables and figures. Use a separate page for each table or figure. Each table and figure must be cited by number in the text.

**Authors should bear in mind that the original tables they submit will be reset and that the figures may be reduced for publication.** Therefore, authors should ensure that the type in any table or figure submitted with their paper is **at least 10-point font** (typeface). Keep type sizes and fonts uniform and consistent.

### *Tables*

Tables should supplement, not duplicate, the text.

1. Tables must conform to TRB style for tables as closely as possible.
  - All tabular material should be single-spaced using a font (typeface) no smaller than 10 points. Use the same font for all tables.
  - Place titles flush left to align with the left margin of the table and use boldface. The word “TABLE” should be in all-capital letters; use initial capitals for the remaining words in the title.
  - Do not submit a table with more than one part. Each part should be a single, separate table with an appropriate table number and title.
  - Tables should not incorporate photographs, illustrations, or other material that cannot be typeset. Graphic materials should be presented as separate figures.
  - Give each column in the table a heading. [In some cases, the first (stub) column may have no heading.] Place abbreviated measurement terms in parentheses under the column heading. All headings should be aligned in flush left format.
  - To adhere to Accessibility Guidelines for the vision-impaired reader, avoid the use of spanner heads. For example, “Production per Year” and “Production per Day” should appear as

Production  
per Year

Production  
per Day

- Insert a rule that extends across the full width of the table under the column heads.
  - Insert a full-width rule at the end of the table (and above the footnotes, if any).
  - Use lowercase italic superscript letters for footnotes.
  - When a dash (–) is used in a table, indicate its meaning in a footnote (for example, missing data, incomplete research, data not applicable or unavailable, or problem investigated but no results).
2. Check the accuracy of all totals included in tables before submitting the paper.
  3. For use of measurements, see section on metrication.
  4. Do not use dots or screens.
  5. Do not place a box or ruled frame around a finished table.

## Figures

Use the following guidelines for figures:

1. Photographs should be high-resolution (at least 300 dpi at a size of 4 in. × 5 in.).
2. Give each figure a caption. Place a figure caption single-spaced below each figure. If a figure contains several parts, label each part with a letter in parentheses—*(a)*, *(b)*, *(c)*, etc.—using the same size type as that in the rest of the figure, and cite each labeled part in the caption.
3. Number figures consecutively in the order first cited in the text, using Arabic numerals. Reference must be made to each figure by number at the appropriate place in the text.
4. **Avoid the use of dots or screens in figures and spreadsheet charts, especially in areas that include type.**
  - As alternatives to dots or screens, consider stripes and crosshatching—but not for areas that include type.
  - If dots or screens are used, they should be no more than 30% black. If more than one dot or screen weight is used, there should be a difference of at least 20% between dot or screen values.
  - Legends identifying the significance of dotted, screened, or crosshatched elements must be included in the figure.
5. Do not place a box or ruled frame around a finished figure.
6. Figures should be clear and legible:
  - The font (typeface) must be easily readable, not too small.
  - Use the same font for all figures.
  - Letters and symbols must be uniform and the same size throughout the figure (e.g., if wording on the ordinate and abscissa is in 10-point type, the symbols used to identify the data points also should be in 10-point type).
  - Line weights (except for lines indicating different data series in a graph) also must be uniform.
7. For use of measurements, see section on metrication.

Note: The use of color in figures in papers accepted for publication can cause problems in black-and-white reproduction for print. Please make sure that color figures translate legibly to black and white (grayscale). The electronic file of the final, published paper that is posted to the web at [www.TRB.org/TRRforAuthors](http://www.TRB.org/TRRforAuthors) will retain the color versions of figures and photographs as originally submitted, whenever possible.

If a figure or photograph submitted is judged not to be of sufficient quality for offset printing, the author will be asked to *(a)* provide the original figure or photograph, *(b)* pay a fee for the redrawing of the figure by the Publications Office, or *(c)* drop the figure or photograph from the paper.

## MANUSCRIPT SUBMISSION

Authors must convert their papers for peer review to PDF format before submission to the TRB website. Authors are reminded that the best way to avoid last-minute complications is to submit their paper well before the deadline. Authors are encouraged to line-number the text of their papers before converting the files to PDF. Line numbering will facilitate the review process.

#### Tips for line-numbering papers:

1. Check word processing Help for instructions on document line-numbering—starting at 1, counting by 1, and restarting each page.
2. For example, in Microsoft Word 2003, insert line numbers as follows:
  - Click on File in the menu bar; select Page Setup; click on the Layout tab at the top of the Page Setup box.
  - Click on the Line Numbers button at the bottom left of the Layout box; click on Add Line Numbering; select the options to Start at 1, Auto, and Count by 1; and select the option to Restart each page.

#### Tips for converting files to PDF:

1. Line-Numbering—Turn on document line-numbering before converting to PDF.
2. Fonts—Use Times New Roman, no smaller than 10 points, as described in the “Manuscript Page Setup” section.
3. Charts—“Paste” charts or images from other applications into the Word document. Do not “Paste Link.”
4. Equations—Check the equations to make sure that symbol substitution has not occurred in the conversion to PDF.
5. Images—Whenever possible, use the JPEG image format (.jpg) instead of the bitmap format (.bmp), because JPEG images are compressed.
6. Track Changes—Make sure that all changes are accepted before converting to PDF. If changes have not been accepted, the markup will appear in the converted document.
7. Check the converted PDF for accuracy and for font and formatting problems before submitting the file to TRB.

## **SUBMITTING DISCUSSIONS FOR PAPERS**

Written discussions of any paper presented at the TRB Annual Meeting are welcome and are considered for publication in TRB’s *Transportation Research Record* series along with the actual paper. The author of the paper will be given the opportunity to submit a closure to each discussion.

### **Criteria for Discussions**

Discussions should adhere to the following criteria:

- A discussion may not exceed 1,250 words; each figure and table in the discussion counts as 250 words.
- A discussion should be written in a professional and respectful manner, focusing on key points and issues raised in the paper. Comments on the authors, their qualifications, or their background are inappropriate.
- A discussion should succinctly identify the key issues being raised, and the comments must be relevant to the paper, in the judgment of the committee or task force chair. Identifying issues that are not discussed by the paper’s author(s) and that have no bearing on the credibility of the paper’s findings is inappropriate.

- A discussion should not be self-serving and should not advocate an approach that benefits the discussant; requests to cite the discussant's work, accusations of misconduct, or personal comments will not be published.
- A discussion should not replicate the peer review process. To the extent possible, a discussion should contribute to the understanding of a particular issue by identifying how alternative approaches, methods, or research designs may have achieved the same or different results or may have expanded understanding in a different way.
- References in the discussion to the literature or other research should be supported by citations.

### **Process for Submitting Discussions**

Please notify Rosa Allen at TRB, [rallen@nas.edu](mailto:rallen@nas.edu), by February 1 if you plan to submit a written discussion. Include the following information in your notification.

Your contact information:

- Name,
- Title,
- Organization,
- Address,
- Phone,
- Fax, and
- E-mail address.

Paper information:

- Title of the paper as listed in the program and
- Paper number.

After receiving notification about the discussion, TRB staff will verify that the paper will be published. When the final manuscript of the paper is received from the author, TRB will provide the discussant with a copy. This ensures that all prepared discussions address the most recent version of the paper.

The discussion manuscript should be submitted to Rosa Allen at TRB, [rallen@nas.edu](mailto:rallen@nas.edu), by April 15 in electronic format as Microsoft Word (6.0 or later version—but not .docx or .docm); please see the file format guidelines for papers. TRB will notify the discussant about the publication status of the discussion manuscript within a month of its submission

### **ALTERNATIVE SUBMISSION VIA MAIL AND E-MAIL ATTACHMENT**

TRB strongly encourages authors to submit papers electronically **via the Internet**. However, authors who do not have web access may submit the electronic file of the manuscript via mail on 3.5-in., IBM-compatible diskettes or other electronic storage media such as CD, or they may send the file as an e-mail

attachment. **The electronic files must conform to the specifications for Internet submission.** The package submitted by mail must include a hard-copy printout of all files and all tables and figures; hard copies also should be mailed for files sent as e-mail attachments.

Submission in any format not compatible with the specifications for Internet submission as outlined above and special instructions for submission by mail as described in this section will be subject to fees for special handling and processing.

To submit papers by mail or as an e-mail attachment for peer review or for the Compendium of Papers after acceptance for presentation, contact Rosa Allen, Transportation Research Board, Keck W440, 500 Fifth Street, NW, Washington, DC 20001; e-mail: rallen@nas.edu.

The deadlines for receipt of submissions via the web also apply to papers submitted by mail: August 1 for peer review and November 15 for the Compendium of Papers.

To submit papers by mail or as an e-mail attachment after acceptance for publication in the Record series, contact Phyllis Barber, Transportation Research Board, Keck 436, 500 Fifth Street, NW, Washington, DC 20001; e-mail: pbarber@nas.edu. The deadline is March 15.

## **OTHER INFORMATION**

### **Contacting TRB**

Visit the TRB website to find the appropriate TRB staff representative:  
<http://gulliver.trb.org/publications/dva/DivA-Directory.pdf>.

### **Publication Proofs**

TRB editors make every effort to preserve the meaning or emphasis of the authors' language. Nevertheless, changes in meaning may be introduced inadvertently, and errors occasionally may occur in print. Some authors, therefore, may wish to see proofs of their papers before publication in TRB's *Transportation Research Record*.

Proofs may be obtained only by written request to the TRB Publications Office. A flat-rate charge of \$20 (payable in advance to TRB) will be assessed for copying and handling a proof paper.

Authors are required to review proofs within 2 days of receipt and to telephone, fax, or e-mail any corrections, subsequently mailing the corrected proofs to the Publications Office for verification within 10 days. (The author requesting review of proofs will receive written notice approximately 3 weeks before proofs are mailed so that an alternative reader can be designated if the author will be unavailable at the scheduled time.)

Decisions about whether changes (other than correction of errors) will be made must rest with the editors. Authors will be charged a fee for alterations to the original paper submitted for publication, but not for corrections of any errors inadvertently introduced during the editing process. Because alterations are costly, **authors should not consider the review of proofs an opportunity to revise or update their papers.**

To obtain a proof copy of a paper, contact Phyllis Barber, Transportation Research Board, Keck 436, 500 Fifth Street, NW, Washington, DC 20001; e-mail: [pbarber@nas.edu](mailto:pbarber@nas.edu).

### **Annual Meeting Registration Fees**

All participants listed in the printed Annual Meeting program are entitled to reduced registration fees. TRB is unable to reimburse travel and other expenses of participants.

### **TRB PEER REVIEW PROCESS FOR PUBLICATION**

([Click here for a detailed account of the TRB Peer Review Process.](#))

# TRANSPORTATION RESEARCH RECORD: JOURNAL OF THE TRANSPORTATION RESEARCH BOARD

## Peer Review Process

The *Transportation Research Record: Journal of the Transportation Research Board* publishes approximately 25% of the more than 3,000 papers that are peer reviewed each year. The mission of the Transportation Research Board (TRB) is to disseminate research results to the transportation community. The Record series contains applied and theoretical research results as well as papers on research implementation.

The TRB peer review process for the publication of papers allows a minimum of 30 days for initial review and 60 days for rereview, to ensure that only the highest-quality papers are published. At least three reviews must support a committee's recommendation for publication. The process also allows for scholarly discussion of any paper scheduled for publication, along with an author-prepared closure.

The basic elements of the rigorous peer review of papers submitted to TRB for publication are described below.

### Paper Submittal: June 1–August 1

Papers may be submitted to TRB at any time. However, most authors use the TRB web-based electronic submission process available between June 1 and August 1, for publication in the following year's Record series.

### Initial Review: August 15–November 15

TRB staff assigns each paper by technical content to a committee that administers the peer review. The committee chair assigns at least three knowledgeable reviewers to each paper. The initial review is completed by mid-September.

By October 1, committee chairs make a preliminary recommendation, placing each paper in one of the following categories:

1. Publish as submitted or with minor revisions,
2. Publish pending author changes and rereview, or
3. Reject for publication.

By late October, TRB communicates the results of the initial review to the corresponding author indicated on the paper submission form. Corresponding authors communicate the information to coauthors. Authors of papers in Category 2 (above) must submit a revised version addressing all reviewer comments and must include a cover letter explaining how the concerns have been addressed.

### Rereview: November 20–January 25

The committee chair reviews revised papers in Category 1 (above) to ensure that the changes are made and sends the Category 2 revised papers to the initial reviewers for rereview. After rereview, the chairs make the final recommendation on papers in Categories 1 and 2. If the paper has been revised to the committee's satisfaction, the chair will recommend publication. The chair communicates the results of the rereview to the authors.

### Discussions and Closures: February 1–May 15

Discussions may be submitted for papers that will be published. TRB policy is to publish the paper, the discussion, and the author's closure in the same Record.

Many papers considered for publication in the *Transportation Research Record* are also considered for presentation at TRB meetings. Individuals interested in submitting a discussion of any paper presented at a TRB meeting must notify TRB no later than February 1. If the paper has been recommended for publication in the *Transportation Research Record*, the discussion must be submitted to TRB no later than April 15. A copy of this communication is sent to the author and the committee chair.

The committee chair reviews the discussion for appropriateness and asks the author to prepare a closure to be submitted to TRB by May 15. The committee chair reviews the closure for appropriateness. After the committee chair approves both discussion and closure, the paper, the discussion, and the closure are included for publication together in the same Record.

### Final Manuscript Submittal: March 15

In early February, TRB requests a final manuscript for publication—to be submitted by March 15—or informs the author that the paper has not been accepted for publication. All accepted papers are published by December 31.

### Paper Awards: April to January

The TRB Executive Committee has authorized annual awards sponsored by Groups in the Technical Activities Division for outstanding published papers:

- Charley V. Wootan Award (Policy and Organization Group);
- Pyke Johnson Award (Planning and Environment Group);
- K. B. Woods Award (Design and Construction Group);
- Patricia F. Waller Award (Safety and System Users Group);
- D. Grant Mickle Award (Operations and Preservation Group); and
- John C. Vance Award (Legal Resources Group).

Other Groups also may nominate published papers for any of the awards above. In addition, each Group may present a Fred Burggraf Award to authors 35 years of age or younger.

Peer reviewers are asked to identify papers worthy of award consideration. Each Group reviews all papers nominated for awards and makes a recommendation to TRB by September 1. TRB notifies winners of the awards, which are presented at the following TRB Annual Meeting.



# THE NATIONAL ACADEMIES

## *Advisers to the Nation on Science, Engineering, and Medicine*

The **National Academy of Sciences** is a private, nonprofit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. On the authority of the charter granted to it by the Congress in 1863, the Academy has a mandate that requires it to advise the federal government on scientific and technical matters. Dr. Ralph J. Cicerone is president of the National Academy of Sciences.

The **National Academy of Engineering** was established in 1964, under the charter of the National Academy of Sciences, as a parallel organization of outstanding engineers. It is autonomous in its administration and in the selection of its members, sharing with the National Academy of Sciences the responsibility for advising the federal government. The National Academy of Engineering also sponsors engineering programs aimed at meeting national needs, encourages education and research, and recognizes the superior achievements of engineers. Dr. Charles M. Vest is president of the National Academy of Engineering.

The **Institute of Medicine** was established in 1970 by the National Academy of Sciences to secure the services of eminent members of appropriate professions in the examination of policy matters pertaining to the health of the public. The Institute acts under the responsibility given to the National Academy of Sciences by its congressional charter to be an adviser to the federal government and, on its own initiative, to identify issues of medical care, research, and education. Dr. Harvey V. Fineberg is president of the Institute of Medicine.

The **National Research Council** was organized by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the federal government. Functioning in accordance with general policies determined by the Academy, the Council has become the principal operating agency of both the National Academy of Sciences and the National Academy of Engineering in providing services to the government, the public, and the scientific and engineering communities. The Council is administered jointly by both the Academies and the Institute of Medicine. Dr. Ralph J. Cicerone and Dr. Charles M. Vest are chair and vice chair, respectively, of the National Research Council.

The **Transportation Research Board** is one of six major divisions of the National Research Council. The mission of the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board's varied activities annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation. [www.TRB.org](http://www.TRB.org)

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TRANSPORTATION RESEARCH BOARD

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