

Commercial Truck & Bus Safety Synthesis Program

Instructions for Consultants Preparing Syntheses

TRB
Transportation Research Board
The National Academies
Washington, D.C.

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OBJECTIVE

Each synthesis should report the state of the practice for the topic in accordance with the scope. This requires a review of the pertinent literature and ongoing research, along with an examination of current practice, including surveys of transportation agencies or others concerned with the topic. Information gained from these various sources is then integrated into a useful summary of practice. A synthesis is not an accounting of survey responses, but rather a collection of information thoughtfully organized into a concise document that describes current practice

Specific, detailed information, for example, each transportation agency's response to survey questions, typically should be available to the reader, but often that information is best presented in table format, rather than narrative form.

PROCEDURES

- Study the scope. Any questions should be resolved through discussion with the project staff.
- Prepare a proposed work plan and tentative outline for review and comment by project staff and panel members. This outline should include a list of chapter titles, major headings and subheadings, and a brief description (one sentence) of what the chapter, section, or subsection will cover. The work plan should cite the major elements necessary to perform the work and a schedule of benchmarks by which the staff can monitor the consultant's progress. These benchmarks should conform to the contract dates. Consultants are therefore strongly advised to set a realistic schedule. Again, please contact project staff for specific guidance.
- Beginning with TRB's Transportation and Information System (TRIS), conduct a literature search, identify ongoing research, and obtain information on current practices from transportation agencies.

- Specific procedures for the formulation, review, and distribution of survey instruments are required. Therefore, questionnaires, surveys, and related materials *must* be coordinated with the project staff.
- Case studies can effectively illustrate an agency's expertise. A few selected agencies/sites may be visited as a part of the synthesis effort.

SYNTHESIS COMPLETION

The sponsors of the synthesis project expect that each synthesis will be completed promptly, according to the outline and questionnaire, and published at the earliest possible date. Thus, to maintain the schedule set out in the contract, the draft work plan should be completed within 1 month of the date on which the agreement is signed, and the preliminary draft final of the synthesis should be finished within 6 months of approval of the work plan. A revised final of the synthesis will be expected within 3 months after the preliminary draft has been submitted. The consultant should contact project staff if questions or problems arise.

Address all material sent to TRB to:

Christopher Jenks
Manager, CTBSSP
Transportation Research Board
500 Fifth Street, N.W.
Washington, D.C. 20001

Send invoices to the responsible staff officer. Do not send them to the accounting office. Please use only the supplied standard forms. If more forms are needed, contact the project staff.

PREPARATION OF THE REPORT

The acceptability of reports is judged by four criteria: (1) fulfillment of project objectives as set forth in the contract; (2) adequacy of documentation; (3) clarity of presentation; and (4) conformance to submittal requirements. Time and effort devoted to the preparation of a quality report

is clearly a worthwhile investment, because reports not submitted in accordance with the criteria will not fulfill contract requirements.

Included below are some general guidelines for the preparation of reports. These instructions are not all-inclusive; however, careful attention to these guidelines will contribute to a clear, concise report. Please keep in mind that a good technical report avoids wordy discussions, unnecessary digressions, and unfounded opinions. Although the consultant's work and expertise in the subject area are highly regarded, the project staff is ultimately responsible for the quality and content of the finished document and, therefore, reserves the right to make any necessary changes.

For information on the general style and format of synthesis reports, the consultant should refer to the examples provided. Please note that a synthesis begins with a Summary section that synthesizes the information contained in the text. To write such a summary, begin with a paragraph that introduces the topic and states the problem. The summary should be brief (no more than four manuscript or two printed pages) and should follow with a paragraph for each chapter, that summarizes its major points. The summary should not contain headings, references, figures, or tables.

The first chapter should provide brief, relevant background, define terms, and clearly identify the issues to be addressed. It should note any problems common among agencies concerning these issues, and include a paragraph that succinctly describes how the synthesis is organized. The final chapter should contain concluding remarks drawn from and substantiated by the text; new information is appropriately introduced in earlier chapters. Each chapter should start on a new page.

The current edition of Webster's *New International Dictionary* and the *Chicago Manual of Style* are the preferred reference sources for spelling, capitalization, and compound words.

SUBMITTAL OF DELIVERABLES

I. Stage I Deliverable: Work Plan

Submit 30 copies of a draft work plan for panel review and approval within 1 month after contract execution. The work plan must include: proposed details of the literature review and industry survey to be conducted, including a list of agencies proposed for the survey; a detailed questionnaire for the survey; a detailed outline of the synthesis as previously described; and a firm schedule for completing the synthesis. The schedule should allow for 1 month for panel review and approval of the work plan.

II. Stage II Deliverable: Preliminary Draft Final Report

Submit 30 copies of the preliminary draft final report formatted in the synthesis report publication style discussed in the next section. The preliminary draft final report is expected within 6 months of work plan approval.

III. Stage III Deliverable: Revised Final Report

Submit 30 copies of the revised final report within 3 months of submission of the preliminary draft final report (the first 1.5 months of this period is for panel review and comment on the preliminary draft final report and the remaining 1.5 months are for consultant preparation of the revised final report). The revised final report should be formatted in the synthesis report style ready for potential publication.

The package containing the revised final report should also contain the following items:

- A labeled diskette containing the revised final report in synthesis report style, preferably in Microsoft Word format.
- A complete set of original reproducible illustrations, photographs, tables, and charts identified by number and caption.
- Point-by-point responses to all panel comments received on the preliminary

draft final report indicating how each comment was addressed in the preparation of the revised final report.

SYNTHESIS BUDGET/PAYMENT SCHEDULE

A maximum of \$40,000 is paid to the contractor for the preparation of a synthesis report. A fixed-price contract is executed upon submission and acceptance of a detailed budget.

Payment is based on the submission and acceptance of each deliverable. The payment schedule is outlined below.

Stage I Deliverable–Work Plan: 10% of fixed price.

Stage II Deliverable–Preliminary Draft Final Report: 65% of fixed price.

Stage III Deliverable–Revised Final Report: 25% of fixed price.

SYNTHESIS REPORT STYLE

Headings

The use of headings and subheadings in each chapter (but not the Summary or Conclusions) is encouraged. However, the use of more than four levels of headings should be avoided. All headings are set flush left on a separate line except for level four. The following style for headings should be used:

LEVEL ONE: All caps, bold type, flush left. First paragraph begins flush left.

Level Two: Initial cap, bold type, flush left. First paragraph begins flush left.

Level Three: Initial cap, italic type, flush left. First paragraph begins flush left.

Level Four: Initial cap, italic type, followed by two spaces, and run into the text.

A heading should be followed by two or more subheadings at the next level, not by a single subheading. References should not be cited in headings.

Quotations

Quotations of five lines or more (block quotes) should be indented and set off from the text without quotation marks. Quoted material within a block quotation should be enclosed in double quotation marks. Run short quotations into the text, using quotation marks. Cite appropriate references for all quotations directly following quoted material.

Changes should not be made to quoted material; however, interpolations (in brackets) may be added, and obvious misspellings should be corrected.

Footnotes

Do not use footnotes to the text. Cite all such information within the text.

References

Consultants are responsible for the accuracy and completeness of all reference citations. Cite references in the text by author/date and the reference list in alphabetical order.

Each reference should contain the standard bibliographic data required in a scholarly reference list:

- Last name and initials of up to the first six authors (or editors). The first author/editor is cited surname first, followed by initial(s). Subsequent names are cited initial(s) first, followed by surname.
- Title of work.
- Journal title, if applicable.
- Publisher, place (city/state, city/country), and edition.

- Date of publication (or for web site, date of access and for symposium or preprint date of meeting).
- Inclusive pagination, if applicable. Total number of pages if entire work cited.

Examples of references follow:

BOOK:

Haas, R. and W.R. Hudson, *Pavement Management Systems*, McGraw-Hill, New York, N.Y., 1978.

National Advisory Committee on Uniform Traffic Control Devices, *Traffic Control Devices: An Operating Guide*, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C., 1975, pp. 17--34.

BOOK CHAPTER:

Silverstein, L.G., "Safe Handling of Epoxy Resin Systems," in *Epoxy Resin Technology*, P.E. Bruins, ed., Interscience Publishers, Boston, Mass., 1968, pp. 123--139.

JOURNAL ARTICLE:

Manning, D.G. and F.B. Holt, "Detecting Delamination in Concrete Bridge Decks," *Journal of the American Concrete Institute*, Vol. 2, No. 11, 1980, pp. 34--41.

Jaraiedi, M., R.W. Plummer, and M.S. Aber, "Incentive/Disincentive Guidelines for Highway Construction Contracts," *Journal of Construction Engineering and Management*, Vol. 121, No. 1, March 1995, pp. 112--120.

NEWSPAPER ARTICLE:

Ringle, K., "D.C. Stoplights: Halt, Lame, and a Pain to Maintain," *The Washington Post*, March 27, 1983, p. A1.

SYMPOSIUM:

Deen, R.C., H.F. Southgate, and G.W. Sharpe, "Evaluation of Asphaltic Pavements for Overlay Design," Presented at the ASTM Symposium on Pavement Maintenance and Rehabilitation, Bal Harbour, Fla., December 1--4, 1983.

REPORT:

Rhodes, J.R., J.A. Stout, R.D. Sieberg, and J.S. Shindler, *In Situ Determination of the Chloride Content of Portland Cement Concrete Bridge Deck*, Report No. FHWA/RD-80/030, Federal Highway Administration, Washington, D.C., 1980, 58 pp.

New Jersey Pavement Rating System to Determine Resurfacing Priorities, New Jersey Department of Transportation, Trenton, N.J., February 1986.

Forsyth, R., *NCHRP Synthesis of Highway Practice 189: Pavement Structure Design Practices*, Transportation Research Board, National Research Council, Washington, D.C., 1993, 45 pp.

Asphalt Institute, *Thickness Design—Asphalt Pavements for Highways and Streets*, Manual Series No. 1, Lexington, Ky., September 1981.

DISSERTATION:

Lee, S.W., *Backcalculation of Pavement Moduli by Use of Pavement Surface Deflections*, Ph.D. dissertation, University of Washington, Seattle, 1988.

PROCEEDINGS:

Horak, E., "The Use of Surface Deflection Base Measurements in the Mechanistic Analysis of Asphalt Pavements," *Proceedings of the 6th International Conference on Structural Design of Asphalt Pavements*, University of Michigan, Ann Arbor, 1987, pp. 5--10.

LAW, STATUTE, REGULATION:

Surface Transportation Assistance Act of 1978 (Public Law 95-599, 92 Stat. 2689).

State of Tennessee, Public Law 699, Tennessee Code Annotated, Title 4, Chapter 11, July 1, 1988.

MANUAL, GUIDE:

American Association of State Highway and Transportation Officials, *AASHTO Standard*

Bridge Design Specifications, 15th ed., Washington, D.C., 1992.

Utah State Department of Highways, *Manual of Instructions, Part 8: Materials*, Utah State Department of Transportation, Salt Lake City, 1966.

PREPRINT:

Bay, J.A., K.H. Stokoe, B.F. McCullough, and D.R. Alexander, "Profiling a Flexible Highway Pavement," Preprint No. 991481, Prepared for the 1999 Annual Meeting of the Transportation Research Board, National Research Council, Washington, D.C., January 11--15, 1999.

WEB SITE:

"Selecting the Right Team for Your Project," BPR OnLine Learning Center, Quality Leadership Learning Center, Loveland, Colo., 1998 [Online]. Available: <http://www.prosci.com> [1998, July 24].

- If there are more than six authors/editors for any one citation, cite the first author and et al. (e.g., Smith, J.Y., et al.).
- If not dated, specify as such where date would normally be cited.
- Do not use *ibid*, *idem*, *op. cit.*, or *loc. cit.*
- References to classified documents, personal correspondence (or telephone conversations), or other sources of information that are inaccessible to the reader should be avoided, if possible. If a reference of this type of communication must be included, insert directly into the text (for example: T.C. Boyle, University of California, Berkeley, personal communication, March 1994).

Bibliography

A bibliography should be provided if documents are used as background materials in the preparation of the synthesis, but are not specifically cited in the text. A bibliography may also be used to list documents that supplement the information given in the text. Publications listed in the bibliography

should contain the same information as those cited in the references, and must be arranged alphabetically by author surname. In the document, the bibliography follows the reference list.

If circumstances warrant inclusion, an annotated bibliography may be provided. These entries should include all information given in a standard bibliography, plus a description of and evaluation of the information contained in the document.

Appendixes

Appendixes are used to present material that supplements the information given in the text, but that cannot be conveniently inserted into the text. Appendixes should not be used to present information that is crucial to understanding the subject matter; this information should appear in the body of the synthesis. There is no limit on the number of appendixes that can be included in a synthesis; however, each must be lettered and titled, for example:

**APPENDIX A
SURVEY QUESTIONNAIRE**

and be specifically mentioned in the text. Provide a list of appendix titles with the draft report. Appendixes follow the References (or Bibliography).

Tables

Tables provide a useful means of presenting large amounts of detailed information in a short space. Tables should supplement, not duplicate, information given in the text or illustrations. Tables should be understandable without continual reference to the text. Simple lists should not be presented as tables. Number tables consecutively in the text using Arabic numerals (e.g., Table 1). Number Appendix tables by using the appropriate letter and Arabic number (e.g., A-1, A-2, C-1, C-2, . . .).

Each table should have a number and title, column headings, a stub column (containing row headings), field column(s) (containing table data), and explanatory footnotes, if necessary.

- Submit each table on a separate page, apart from the text material.
- Column heads cannot be repeated or changed within a table. If this is the case the table is actually two tables and should be redrawn as such.
- A table taken verbatim from another source must be referenced (add reference number after title or denote source as footnote).
- Notes may be added when the information pertains to the entire table.
- Include a list of table titles with the draft report.
- Tables will be placed as close to their initial callout as possible.
- When a dash (---) is used as data entry, please indicate its meaning in a footnote (e.g., missing data, data not available).
- Use superscript numbers for footnoting material in any part of the table. Footnotes should be numbered consecutively from left to right, top to bottom.

Illustrations

Figures should augment any discussion, not replace it.

Illustrations should be labeled by the word “Figure” and numbered consecutively, using Arabic numbers, throughout the synthesis. In the text, cite as Figure with number (e.g., Figure 2). Number figures in the Appendix using the appropriate letter and consecutive Arabic numeral (e.g., Figure A-3). Provide a one-sentence, descriptive caption for each figure, for example:

FIGURE 12 Schematic of a typical drain installation for a highway embankment.

- If a figure is taken from another source, reference that source as part of the figure caption [e.g., FIGURE 1 Warren truss bridge (Carr and Black 1999)].
- If possible, submit figures at the actual size they are to be reproduced. A full two-column figure is 41.5 picas (6.75 in. and 17.1 mm) and a one-column figure is 20 picas (3.25 in. and 8.25 mm).
- Type size for external lettering should be in the range of 8--10 points (2.1--2.7 mm) and 6--8 points (1.6--2.1 mm) for all internal lettering.
12 point type 10 point type 8 point type
- Labels on line drawings should be clear and legible. Interior graph lines in non-original line art tend not to reproduce well and need not be inserted.
- Figures should not be hand labeled.
- Do not fold any submitted artwork.
- Do not place any tape (including transparent tape) on the figure surface.
- Submit similar figures at comparable size and scale.
- Values on figures should be the same as those used in the text.

Provide the best available copy for any illustrations in the synthesis. Duplicates will not reproduce as well as glossy prints or computer-generated line art and are generally not acceptable. Slides and negatives *are* acceptable. Digital artwork is also acceptable. Include a complete set of prints with any digital figures submitted.

Graphs or other artwork with shading must be of high quality. Duplicate prints with shading will not reproduce well. Illustrations with several gradations of shading will also generally not reproduce well. If possible, use hatching or other distinctive markings (e.g., vertical or horizontal lines) to differentiate between bars.

Artwork does not need to be mounted. Please identify each figure by writing the synthesis topic number and figure number on the back, outside of the figure plane.

Include a separate list of all figure captions with the draft report.

Copyright Permission

To reproduce any copyrighted materials (tables, figures, charts, etc.) written authorization must be obtained from the owner of the original copyright. It is the responsibility of the author to secure this permission. Permission is not needed for brief quotations (50 words or fewer) when the quotation is properly referenced. Permission must be obtained for longer quotations.

Material published by the U.S. government is not usually copyrighted and, if not, does not require permission, unless it credits a previously copyrighted source. A typical acknowledgment should read: “Reprinted with permission from Reference 32. Copyright 1983 American Institute of Physics.”

For a figure, the acknowledgment should read: Photo (or graphic) courtesy of . . . (e.g., Arizona DOT).

For a table, reprinted without change, the acknowledgment should read: Source: . . . (e.g., Houston METRO).

Use of Numbers

- Always spell out numbers at the beginning of a sentence.
- Within a sentence use only Arabic numerals with units of measure (e.g., 5 feet, 18 percent). Otherwise, spell out all numbers less than 10 (e.g., five bridges, two departments) and use Arabic numerals for numbers greater than 10.
- Both the International System of Units (SI) and customary U.S. equivalents must be provided for measurements, with SI units cited first [e.g., 10 km (6.5 mi)]. The project staff uses ASTM E 380-91 for metric conversions. Exceptions to this policy may be warranted by the nature of certain topics.

- Use Arabic numerals for all numbers including decimals (e.g., 5.7). For numbers of less than one, use a zero to the left of the decimal point (e.g., 0.06).
- Spell out the word percent when using any percentages in the text. The percent symbol (%) can be used in tables.
- Spell out the word number in the text; “No.” can be used in tabular material.
- Commas are used with numerals of four or more digits except for years, page numbers, military time, and model numbers.
- Hyphenate compound numbers.

Equations

Equations should be written so that all elements are easily definable and the spatial relations between symbols are obvious. All variables should be in italic type, with numbers, subscripts, and superscripts in Roman type. Display equations should be numbered sequentially throughout the text using an Arabic number in parentheses, set flush right on the same line as the equation, e.g.,

$$X^2 + Y^2 = Z^2 \quad (1)$$

When referring to an equation in the text, use the abbreviation “Eq.” followed by number in parentheses [e.g., This relationship can be illustrated by the use of Eq. (2)].

All letters or symbols that might be confused with any other (e.g., circles, “ohs,” zeros; ones and “els”) should be marked at first use.

Label all Greek letters at first mention.

Lists

Lists may be presented in three ways: (1) as a numbered series within a sentence; (2) as numbered items, each on a separate line or lines; or (3) as bulleted items, each on a separate line or lines. All items in a single list should follow the same grammatical

style, either a word, phrase, sentence, or paragraph.

Abbreviations/Acronyms

Abbreviations and acronyms should not be introduced unless they are repeated at least three times in the text or tables (except for units of measurement). In addition, abbreviations used in the Summary must be used at least three times as well. Abbreviations/acronyms must be spelled out at first use [e.g., Intelligent Vehicle Highway System (IVHS)].

- A term should be represented by only one form of abbreviation/acronym, and no two terms should have the same abbreviation/acronym.
- Do *not* begin a sentence with an abbreviation.
- Spell out all abbreviations in titles and headings, except table titles and figure captions.
- United States is spelled out when used as a noun and abbreviated (U.S.) when used as an adjective (e.g., U.S. Department of Transportation).

Common Abbreviations

DOT	department of transportation
ft	foot
g	gram
gal	gallon
HOV	high-occupancy vehicle
hr	hour
HVAC	heating, ventilation, air conditioning
in.	inch
IT	information technology
L	liter
m	meter
km	kilometer
kW	kilowatt
Mg	megagram
mg	milligram
mi	mile
min	minute
MIS	management information system

mL	milliliter
mm	millimeter
oz	ounce
PC	personal computer
RFP	request for proposal
sec	second
yd	yard

NOTE: These instructions are part of the contract. Draft manuscripts not in conformance may be rejected and payment withheld.

CTBSSP Staff

Christopher W. Jenks, Manager, CTBSSP
(202) 334-3089; e-mail: cjenks@nas.edu

Sheila Moore, Program Assistant
(202) 334-2886; e-mail: smoore@nas.edu

CTBSSP Fax: (202) 334-2006