Procedural Manual

for Contractors Conducting Research

in the

Transportation Research Board's Cooperative Research Programs

July 2019

TRANSPORTATION RESEARCH BOARD

CONTENTS

FIGURES iii

CHAPTER 1 General Information 1

1.1 Purpose of the Manual 1

1.2 Arrangement and Scope of the Manual 1

1.3 Organization of the Academies 1

1.4 Organization of the Transportation Research Board 2

1.5 Communications Pertaining to Contract Matters 3

CHAPTER 2 Research Process and Products 5

2.1 General 5

2.2 Project Statement and Objectives 6

2.3 Principal Investigator 6

2.4 Research Plan 6

2.5 Amplified Work Plan 7

2.6 Monthly Progress Report 7

2.7 Quarterly Progress Report 9

2.8 Interim Deliverables 11

2.9 Deliverables 13

2.9.1 Draft Final Deliverables 13

2.9.2 Panel Comments and Contractor Response 13

2.9.3 Implementation Plan 13

2.9.4 Final Deliverables 14

2.10 Other Products 14

2.11 Use of Preliminary Research Results 14

CHAPTER 3 Performance Requirements 18

3.1 Contract Period 18

3.2 Extensions 18

3.3 Performance History 18

3.4 Transfer of Research Contract 18

3.5 Questionnaire/Survey 18

3.6 Cost Considerations 20

3.6.1 General 20

3.6.2 Maximum Cost 20

3.6.3 Withholding 20

3.6.4 Allowable Costs 20

3.6.5 Prior Approval of Costs 20

3.6.6 Equipment 20

3.6.7 Travel 21

3.6.8 Payment/Invoicing 22

3.7 Subcontracts 22
3.8 Disadvantaged Business Enterprise Plan 22
3.9 Indirect Rates 24
3.10 Close-Out of Contract 24
CHAPTER 4 Project Oversight 25
4.1 Contract Provisions 25
4.2 CRP Project Panels 25
4.3 Project Oversight 25
4.4 Program Oversight 26
CHAPTER 5 Preparing the Final Deliverables 27
5.1 General Requirements 27
5.2 Organization of Final Deliverables 27
5.2.1 Front Matter 27
5.2.2 Body of Guidebooks and Manuals 32
5.2.3 Body of Contractor's Final Report 32
5.2.4 Back Matter 34
5.2.5 Electronic Deliverables 36
5.3 Format and Style of Final Deliverables 37
5.3.1 Layout 37
5.3.2 Pagination 37
5.3.3 Presentation of and Specifications for Artwork 38
5.3.4 Mathematical Notation 40
5.3.5 Units of Measure 40
5.3.6 Abbreviations, Acronyms, Initialisms, and Symbols 40
5.3.7 Reference Citations 40
5.3.8 Standard Reference Works for Style 41
5.4 Use of Intellectual Property, Including Copyrighted Material 41
5.4.1 Reproducing Rights-Protected Material 41
5.4.2 How to Request Copyright Permission 42
5.4.3 For More Information 43
5.5 Submittal to CRP 46
APPENDIX A Airport Cooperative Research Program A-1
APPENDIX B Behavioral Traffic Safety Cooperative Research Program B-1
APPENDIX C National Cooperative Highway Research Program C-1
APPENDIX D Transit Cooperative Research Program D-1
APPENDIX E Tips for Faster Publication of Your CRP Final Deliverable E-1

FIGURES

1. Organization of the National Academies of Sciences, Engineering, and Medicine. 2
2. CRP's relationship to TRB. 2
3. Reporting requirements. 6
4. Progress schedule. 8
5. Quarterly Progress Report cover. 10
6. Example of interim deliverable cover. 12
7. Final deliverables transmittal form. 16
8. Checklist for final deliverables being considered for pre-publication. 17
9. Sample letter to accompany questionnaire. 19
10. Disadvantaged Business Enterprise form. 23
11. Example of draft final deliverable cover. 28
12. Example of final deliverable cover. 29
13. Acknowledgment of sponsorship and disclaimer for CRP draft final deliverables and final deliverables. 30
14. Example of table of contents for Contractor's Final Report. 29
15. Example of a CRP CD-ROM menu screen. 37
16. Example of a screenshot as artwork. 39
17. Certification of compliance with copyright requirements. 44
18. Sample permissions request letter. 45

CHAPTER 1

General Information

1.1 Purpose of the Manual

This manual highlights some important administrative procedures and requirements. It has been prepared as a ready reference and guide for contractors conducting research under the Cooperative Research Programs (CRP). Contractors' cooperation with respect to these procedures will expedite contractual matters and facilitate handling of administrative requirements.

1.2 Arrangement and Scope of the Manual

To the extent practicable, the discussion in this manual is related to specific provisions in the contract for CRP research. This contract will be executed between you, the contractor, and the National Academy of Sciences, the contracting authority for the National Academies of Sciences, Engineering, and Medicine (the Academies). Although this manual sets forth basic procedures that will assist the contractor and the Academies in the orderly administration of contracts for CRP research, it should be understood that it is a **guide** only; the provisions contained herein are not a substitution for or modification of specific contract requirements.

To avoid delays, misunderstandings, and procedural errors, it is absolutely essential that the contractor be completely familiar with all requirements of the contract. In the event of any conflict between the content of this manual and the provisions of a specific contract, the contract prevails. Your CRP Program Officer will assist with any discrepancies.

1.3 Organization of the Academies

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.

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.

The National Academy of Medicine (formerly the Institute of Medicine) was established in 1970 under the charter of the National Academy of Sciences to advise the nation on medical and health issues. Members are elected by their peers for distinguished contribution to medicine and health.

The three Academies work together as the National Academies of Sciences, Engineering, and Medicine to provide independent, objective analysis and advice to the nation and conduct other activities to solve complex problems and inform public policy decisions. See Figure 1 for the organization of the Academies.

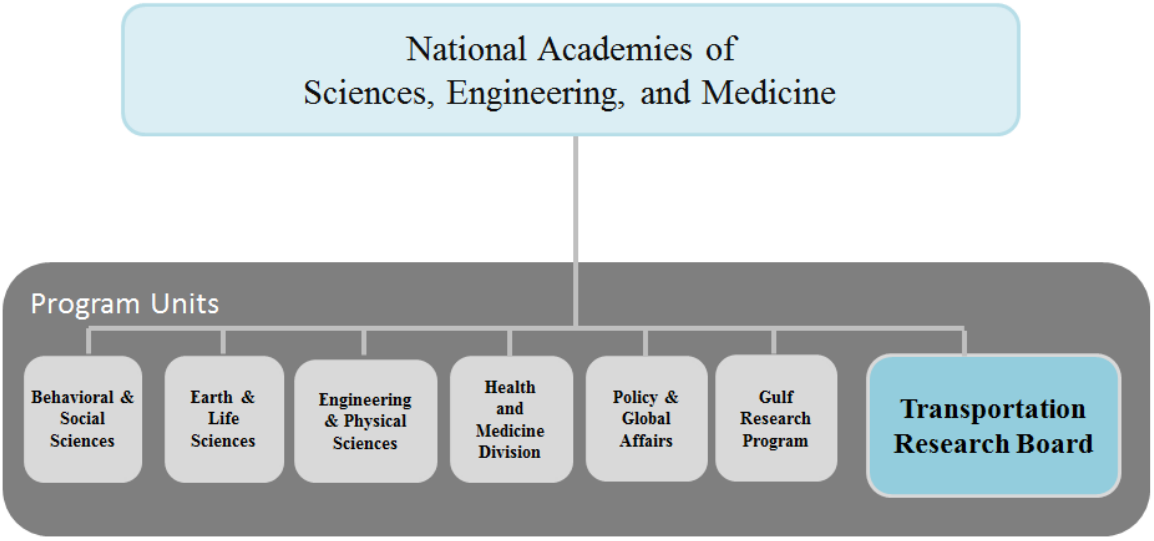


Figure 1. Organization of The National Academies of Sciences, Engineering, and Medicine.

1.4 Organization of the Transportation Research Board

The Transportation Research Board (TRB) is a division of the Academies. Figure 2 shows CRP's relationship to TRB. TRB's mission is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, TRB facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation. TRB's varied activities annually engage more than 7,000 transportation professionals from the public and private sectors and academia, all of whom contribute their expertise in the public interest.

Figure 2. CRP's relationship to TRB.

CRP administers and manages four stakeholder-driven applied research programs that develop near-term, practical solutions to problems faced by the transportation community:

- Airport Cooperative Research Program—ACRP
- Behavioral Traffic Safety Cooperative Research Program - BTSCRP
- National Cooperative Highway Research Program—NCHRP
- Transit Cooperative Research Program—TCRP

Under these programs, CRP organizes panels of experts to provide guidance on the technical aspects of the research and to translate research problems into project statements with well-defined objectives. Research proposals are then solicited from private and public research organizations with capability and experience in the problem areas to be studied. The technical panels review the proposals, recommend contract awards, monitor research in progress, provide technical guidance, and determine the acceptability of the final deliverables. More than 2,000 experienced practitioners and research specialists currently serve on CRP panels.

The four individual cooperative research programs are described in Appendixes A through D.

1.5 Communications Pertaining to Contract Matters

Communications pertaining to **contract matters** should be addressed to the Academies **Contract Administrator** named on the cover sheet of the contract. The Contract Administrator, who is designated by the Contracting Officer, will coordinate with CRP staff when required. All other project-related matters should be addressed to the CRP Program Officer. In either case, copies of correspondence pertaining to contract matters should be furnished to the other party. The Academies Contract Administrator can be reached as follows:

Office of Contracts and Grants
The National Academies of Sciences, Engineering, and Medicine
Keck Center, 10th Floor
500 Fifth Street NW
Washington, DC 20001
(202) 334–2060
Fax (202) 334–1835

Correspondence about project technical matters should be addressed to the appropriate CRP Program Officer at:

Transportation Research Board
The National Academies of Sciences, Engineering, and Medicine
Keck Center, 4th Floor
500 Fifth Street NW
Washington, DC 20001
(202) 334–3224
Fax (202) 334–2006

Please refer to the TRB website at http://www.trb.org/ for a current staff list and other information, including email addresses and telephone numbers.

If you should have occasion to visit TRB, you will find the CRP office on the 4th Floor of the National Academies of Sciences, Engineering, and Medicine William M. Keck Center at 500 Fifth Street NW. The Office of Contracts and Grants is also at 500 Fifth Street, 10th Floor, Room 1054.

CHAPTER 2

Research Process and Products

2.1 General

Research proposals are submitted in response to CRP Project Statements defining the research problems and listing the objectives of the proposed research. The format required for proposals is stipulated in the document entitled "Information and Instructions for Preparing Proposals" on the TRB website. A proposal may be supplemented by addenda prepared in response to questions or recommendations that CRP may provide the selected contractor following selection of a successful proposal. The proposal and its addenda are then incorporated into the contract as the binding scope of research effort. The final deliverables for the research are reviewed in light of the contract's binding scope of work.

The contractor is required to submit monthly progress reports, quarterly progress reports, and interim reports (when specified). These reports are required in order that an evaluation may be made of (1) task achievements, (2) budgetary expenditures, and (3) technical compliance with the contract. These elements provide a basis for compiling a performance record. The contractor should also institute any needed internal reviews to ensure the proper relationship between overall progress and the research plan. The contractor's quarterly progress report information is provided to the project panel and representatives of the sponsors for their information and comment. Up to 20 copies of the draft final deliverables are due to the CRP Program Officer **90 days in advance of the contract expiration date**. These will be reviewed by the project panel and the CRP Program Officer, and the resulting comments forwarded to the contractor in the shortest practical time. Prior to the contract expiration date, the contractor shall consider the review comments and (1) make appropriate revisions to the final deliverables and (2) prepare a detailed response to *every* comment. The contractor should deliver up to 25 hard copies of their response to the review comments and up to 25 hard copies of the final deliverable(s) before or by the contract expiration date. With the increased use of electronic submissions, the requirement to deliver hard copies of deliverables has become more flexible. Your CRP Program Officer will advise you if the quantities required will be less than what is stated above. Reporting requirements are summarized in Figure 3.

NOTE: CRP policy does not permit the contractor to send any project-related documents directly to the panel. All documents should be submitted to the CRP Program Officer through CRPs project management website for distribution, unless directed otherwise by the CRP Program Officer. The CRP Program Officer will provide instructions on using the website after contract execution.

Item (Section where addressed)	Deadline
Amplified Work Plan (Section 2.5)	15 calendar days after beginning date of contract
Monthly Progress Report (Section 2.6)	5 business days after the last day of the previous month
Quarterly Progress Report (Section 2.7)	5 business days after the last day of the calendar quarter
Interim Report—if required by work scope (Section 2.8)	As per project schedule
Draft Final Deliverables (Section 2.9)	90 calendar days before contract expiration date
Final Deliverables and Point-by-Point Response to Panel Comments (Section 2.9)	Contract expiration date

Figure 3. Reporting requirements.

2.2 Project Statement and Objectives

A title is specified in the contract for the research, along with a reference to the research project statement, which contains the problem description and the specific objectives of the research. Should modifications be proposed to the research objectives, a contract amendment will be required.

2.3 Principal Investigator

An essential consideration in the selection of a proposal is the professional capability and time commitment of the Principal Investigator, who is identified as the individual responsible for successful completion of the project objectives. Advance, written approval must be obtained from the CRP Program Officer before the contractor assigns the responsibility of the research to another person. In the event that the contractor is unable to replace the Principal Investigator, the contract will be terminated. The contractor should discuss all changes in key personnel with the CRP Program Officer on a timely basis. The CRP Program Officer will coordinate all research activities and panel interactions only with the Principal Investigator.

2.4 Research Plan

Following approval, the research plan from the contractor's proposal is incorporated into the contract by reference. It should be noted that the objectives govern and take precedence over the research plan. It is expected, therefore, that the Principal Investigator will communicate promptly with the CRP Program Officer when circumstances indicate that the research plan will likely not effectively accomplish the objectives. Any modification to the research plan must be consistent with the project statement and objectives specified in the contract, and advance written approval for proposed modifications must be obtained. Generally, research plan modifications do not require amending the contract.

2.5 Amplified Work Plan

Included as an attachment to the proposal selection notification letter is the Proposal Review and Recommendations (PR&R) form that contains general comments on the contractor's research proposal and suggested modifications thereto. The letter requires the contractor to provide a point-by-point response to each comment: The response to the PR&R is to be submitted:

- For NCHRP only: prior to contract execution and will be added to the documents constituting the executed contract.
- For all other programs: after contract execution.

An amplified work plan for the proposed research is developed by the Principal Investigator. It should (1) incorporate the contractor's response to the PR&R and all agreed-on changes to the proposed research plan and (2) amplify the approved research plan by providing as much narrative detail as possible and a graphic schedule of events. The amplified work plan is to be submitted as a PDF and uploaded to the CRP project management website for review within 15 calendar days after the effective date of the executed contract. Your CRP Program Officer will provide instructions after contract execution. The amplified work plan (without financial information) may be shared publicly on request to CRP.

The format for a "progress schedule" to be included in the amplified work plan is illustrated in Figure 4. Its purpose is to illustrate graphically the status of the project and research tasks, the expenditure of contract funds, and projected estimates of completion percentages. This schedule serves as the basis for monthly and quarterly progress reporting (see Sections 2.6 and 2.7). In Figure 4, Figure A, "Overall Project Schedule," shows the planned performance period for each task with a monthly expected overall project percentage completion. Figure B shows the anticipated cumulative expenditures on a monthly basis. Figure C shows the anticipated overall progress as a cumulative percentage by month. An electronic template of the progress schedule shown in Figure 4 will be provided to the contractor to ensure uniform reporting on all CRP projects. This template may be modified to suit the characteristics of a particular project; however, the resulting modified progress schedule must look similar to and contain the same information as the progress schedule shown in Figure 4. Once the events in the amplified work plan develop, the progress schedule requires monthly updating to report current progress (see Section 2.6). The progress schedule must be presented in all CRP monthly and quarterly progress reports.

2.6 Monthly Progress Report

At the end of each month during the course of the research, the contractor shall submit, via CRPs project management website, a two-part report consisting of (1) a single cover letter providing (a) a clear and complete account of the work performed on each task during that month, (b) an outline of the work to be accomplished on each task during the next month, and (c) a description of any problem encountered or anticipated that might affect the completion of the contract within the time and fiscal constraints established in the contract together with recommended solutions to such problems (or a statement that no problems exist) and (2) a project progress schedule as illustrated in Figure 4. The right-hand column of Figure A is used to record the "percentage-complete-to-date" for each major task and the estimate of total project completion at the end of the reporting period to facilitate comparison of planned activities and actual progress. Figure B records the estimate of funds expended to show the comparative status of estimated and actual costs. Figure C depicts the overall completion status of the project. Line items below the graphs provide supplementary data for Figures B and C.

The progress report must be uploaded to CRPs project management website **within 5 business days of the last day of the previous month** so that CRP can meet its responsibility for reporting. Exact expenditure figures are **not** necessary on the progress schedule; best judgment in estimating will suffice. A monthly progress report is not required in the month in which a quarterly progress report is due.

AIRPORT COOPERATIVE RESEARCH PROGRAM
TRANSPORTATION RESEARCH BOARD
PROGRESS SCHEDULE

ACRP Project N 05-06 FY 2007 Month MAY
Research Agenc Acme University
Principal Investi A.R. Port

PHASE	RESEARCH TASK	2007 J	A	S	O	N	D	2008 J	F	M	A	M	J	J	A	S	O	N	D	2009 J	F	M	A	M	J	ESTIMATED % COMPLETION
I	1. Literature Review	20	50	80	100																					100
	2. Survey of Airports		10	75	100																					100
	3. Survey of Manufacturers		10	100																						100
II	4. Failure Modes	10	50	80	100																					100
	5. Critical Parameters	10	50	100																						100
	6. Tests vs. Theory	10	50	100																						100
	7. Evaluation of Test Methods	10	20	50	100																					100
III	8. Review Specifications	50	100																							100
	9. Develop Reorganization Plan				100																					100
IV	10. Interim Report		10	30	100																					100
V	11. Analytical Studies		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100				50
	12. Development of Test Methods				10	15	20	25	30	35	40	45	50	60	70	80	85	90	92	95	100					35
VI	13. Develop Performance Specifications												10	20	30	40	50	60	70	80	100					0
	14. Develop Test Procedures												10	20	30	40	50	60	70	80	100					0
VII	15. Revision of Documents															10	30	40	60	80	90	100				0
VIII	16. Final Report																20	40	60	70	80	90	90	95	100	0
	OVERALL % COMPLETED	2	5	10	15	18	20	25	30	35	40	46	53	60	65	70	75	80	83	88	92	96	96	96	100	43

FIG. A - OVERALL PROJECT SCHEDULE

FIG. B -- CONTRACT FUNDS

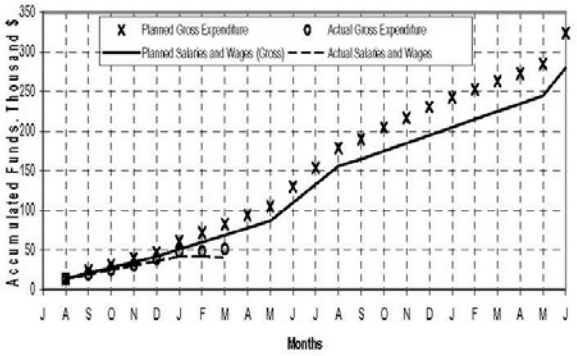
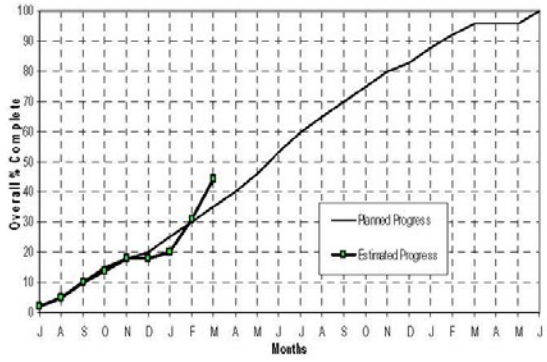


FIG. C -- CONTRACT PERIOD



Funds Expended	%	16	Time Expended	%	38
Contract Amount	$	324,918	Starting Date		July 1, 1997
Expended This Month	$	3,799	Completion Date		June 30, 1999
Total Exp. to Date	$	51359			
Balance	$	273559			

Salaries and Wages Estimated This Month	$	7,000
Salaries and Wages Spent This Month	$	0
Accumulated Salaries and Wages To Date	$	40000

Figure 4. Progress schedule.

The contractor may not send any documents directly to the panel, unless otherwise directed by the CRP Program Officer.

Supplemental documents or interim deliverables should be provided separately from the monthly progress report.

2.7 Quarterly Progress Report

The quarterly progress report (QPR) is the principal means for informing the project panel and the CRP Program Officer of progress and, as such, QPRs are required from the contractor and are always prepared on the basis of **calendar quarters**, with periods ending March 31, June 30, September 30, and December 31. The success of the project depends, to a great extent, on how well the QPRs convey to the panel the status and direction of the research so that panel members can provide timely guidance to the contractor. Including a table in the quarterly report listing the various project deliverables, the original due date, and the date delivered will aid panel review. If detailed technical information is to be included, it is usually best to provide it as a working paper separate from the QPR. The CRP Program Officer can provide advice on the most effective way to present information in the QPR.

The QPR should be uploaded as a PDF to the CRP project management website **within 5 business days of the last day of the quarter**. The QPR is to include the monthly progress schedule illustrated in Figure 4 updated for the last month of the quarter. The report and the progress schedule shall be submitted as one document.

The QPR should not be confused with the two-part monthly progress report. The QPR is made up of the project progress schedule (Figure 4) and a narrative report on the research being conducted. Certain basic information is required, in the following order:

1st page:	Cover to conform with Figure 5, master copies of which are supplied to the contractor.
2nd page:	Progress schedule for the month closing out the quarter.
3rd page & beyond:	Narrative consisting of: • An introduction to the report that consists of a summary of the problem being researched and the project objectives. Information as appropriate may be taken verbatim from the project statement. • A concise narrative reporting the activities pursued during the report period and identifying any activities completed in the period. This should be detailed enough to indicate clearly the overall accomplishments as related to the scheduled plan of activities. Activity descriptions should be related to major tasks listed in the progress schedule. • A statement regarding the activities to be undertaken during the ensuing period. • A discussion of any problems encountered or anticipated and suggested resolutions.

Quarterly Progress Report

to the

[SPECIFIC COOPERATIVE RESEARCH PROGRAM (XCRP OR NCXRP)]

on Project _____

LIMITED USE DOCUMENT

This Quarterly Progress Report is furnished only for review by members of the [xCRP or NCxRP] project panel and is regarded as fully privileged. Dissemination of information included herein must be approved by [xCRP or NCxRP].

for period

_____ to _____

from

_____

Figure 5. Quarterly Progress Report cover.

In the interest of time, CRP staff routinely forward quarterly reports to the panel members without prior review; therefore, it is absolutely essential that the contractor take all steps necessary to ensure complete, correct, and timely reports. The complications arising from failure to do so will negatively affect the evaluation of the contractor's overall performance and would be taken into consideration in evaluating any proposals from the contractor on future projects.

Panel comments on the QPR will be collected by the CRP Program Officer and sent to the contractor. The contractor will provide a point-by-point response to these comments to the CRP Program Officer within 3 weeks of receipt.

2.8 Interim Deliverables

Most projects call for at least one interim report as well as other interim deliverables. These are normally technically substantive presentations of research results to date for contracts that extend beyond 1 year, and they are not usually intended for publication. Whenever interim reports are required, they shall be uploaded as a PDF to CRPs project management website by the dates specified in the contractor's amplified work plan..

When submitting any interim deliverable, the cover page should include the following text:

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE
Privileged Document

This document, not released for publication, is furnished only for review to members or participants in CRP. This document is to be regarded as fully privileged, and dissemination of the information included herein must be approved by CRP.

See Figure 6 for a sample interim deliverable cover.

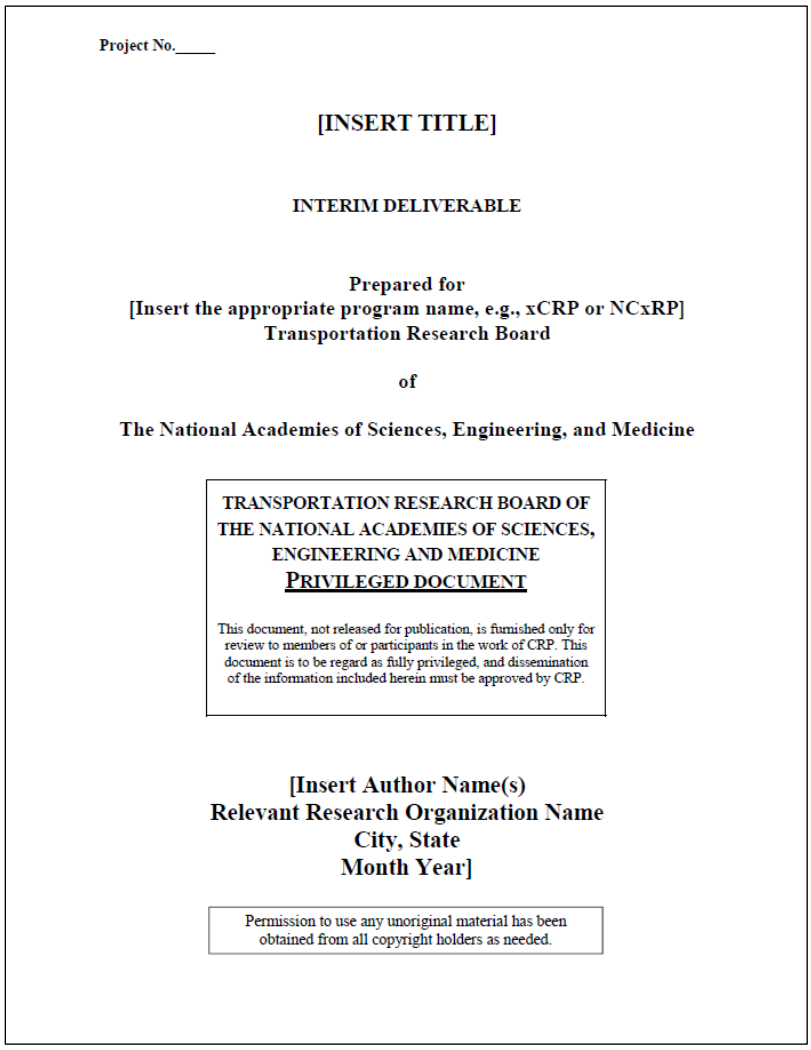


Figure 6. Example of interim deliverable cover.

2.9 Deliverables

2.9.1 Draft Final Deliverables

Not later than 90 calendar days prior to the expiration date of the contract, the draft final deliverables are to be uploaded to CRPs project management website in a format coordinated in advance with the CRP Program Officer. The draft final deliverables are a compilation of all the deliverables as outlined in the final tasks of the request for proposals (RFP) and as discussed in the approved amplified work plan. Most projects require a final report, referred to as the contractor's Final Report, which documents the research effort. The report shall describe the conduct of the research and set forth the contractor's findings and conclusions, including supporting data and procedures, as well as any other information as specified in the RFP.

The final deliverables must be prepared in a manner consistent with the Academies' policy regarding proper attribution of material from an external source (including the use of copyrighted materials). contractors are advised to review Chapter 5, "Preparing the Final Deliverables," early in the process of preparing deliverables, especially the section on use of intellectual property including copyrighted material. Requesting permission to use copyrighted materials can be a lengthy process and contractors should plan accordingly.

The Contractor's Final Report shall also follow organization and style requirements described in Chapter 5, "Preparing the Final Deliverables." For some projects, the format specified for the Contractor's Final Report may not be the most appropriate for the intended product outlined in the RFP, and the contractor should recommend an alternative as early as practical. For further advice, and at any stage in the project, the contractor should work with the CRP Program Officer to resolve questions concerning preparation of final deliverables.

2.9.2 Panel Comments and Contractor Response

Following review of the draft final deliverables as described in the RFP, comments by the CRP panel and staff are forwarded to the contractor. A point-by-point response to these comments must be forwarded to the CRP Program Officer with the final deliverables as specified in the RFP before the expiration date of the contract. Where the contractor has made revisions, the response should be cross-referenced with the corresponding document and pages. If a revision is not made in response to a review comment, a response is still required stating why revision was not considered appropriate.

2.9.3 Implementation Plan

CRP projects are intended to produce results that will be applied in practice. The final deliverable must include a stand-alone technical memorandum titled "Implementation of Research Findings and Products". The technical memorandum should (a) provide recommendations on how to best put the research findings/products into practice; (b) identify possible institutions that might take leadership in applying the research findings/products; (c) identify issues affecting potential implementation of the findings/products and recommend possible actions to address these issues; and (d) recommend methods of identifying and measuring the impacts associated with implementation of the findings/products. Implementation of these recommendations is not part of the research project and, if warranted, details of these actions will be developed and implemented in future efforts.

2.9.4 Final Deliverables

Up to 25 hard copies of the final deliverables, revised in accordance with the reviewers' comments, shall be submitted by the contractor to the CRP Program Officer not later than the expiration date of the contract. In addition, the contractor should upload the final deliverables in Microsoft Word to CRPs project management website. In addition to being embedded in the document, artwork must be provided in a separate file in its native format or a standard cross-program format. More detailed requirements for the electronic files can be found in Section 5.3.

The final deliverables transmittal form (see Figure 7) must accompany all final deliverables. This form provides detailed instructions for final deliverables. CRP may decide to make the final deliverables available to the public as an online pre-publication draft. Pre-publication drafts are given a cover sheet and placed on-line "as is"; therefore, please make every effort to provide a clean, readable document. If this decision is made, the CRP Program Officer will require that you review and complete the Checklist for Final Deliverables Being Considered for Pre-Publication (see Figure 8).

If a decision is made to publish the final deliverables, the CRP Editorial Staff carries out all subsequent editorial activities. The contractor may be called upon for verification or clarification of editorial matters, but is not involved in review of proofs or other parts of the publication process. Any request for verification/clarification must be met by the editor's deadline, usually within 5 business days, to ensure the publication stays on schedule. However, if the document was produced using a program or software that is not available to our editors, the contractor will be asked to make appropriate edits.

If a decision is made not to publish any of the final deliverables in one of the regular CRP series, the Contractor's Final Report may be made available on request or posted on TRB's website. Other measures may be used, as appropriate, to ensure the availability of all details of the research to the CRP sponsors and other interested parties.

2.10 Other Products

All products of the research, including manuals, videos, and computer software programs and databases, should include appropriate acknowledgments and disclaimers. Although such products are generally handled in a manner similar to handling of final deliverables, the contractor should contact the CRP Program Officer for case-specific guidance.

If the contractor will be producing the electronic deliverables that will be sold or distributed by TRB, they should have the following language included directly within the materials (if possible) or cover:

> This software is offered as is, without warranty or promise of support of any kind either expressed or implied. Under no circumstance will the National Academy of Sciences or the Transportation Research Board (collectively "TRB") be liable for any loss or damage caused by the installation or operation of this product. TRB makes no representation or warranty of any kind, expressed or implied, in fact or in law, including without limitation, the warranty of merchantability or the warranty of fitness for a particular purpose, and shall not in any case be liable for any consequential or special damages.

Electronic deliverable content (such as software programs, documentation, spreadsheets, videos, and other material) is generally not edited by CRP Editorial Staff; therefore, it is important the electronic deliverables function as intended and be thoroughly edited and proofed by the contractor before submission to CRP. In some instances, CRP review of the electronic material may result in a request for changes. The contractor should be prepared to handle such a request should it occur. For more information on development of CDs and DVDs, see Section 5.2.5.

2.11 Use of Preliminary Research Results

Contractors may wish to, or may be asked to, present preliminary research results or status reports at conferences, professional meetings, or other events that are unrelated to the conduct of the research. *Any*

presentation or discussion of research in progress requires explicit authorization from the CRP Program Officer. Project funds shall not be used to support travel or other expenses related to the presentation. If authorized, only information that has been vetted by the CRP project panel should be shared.

Final Deliverables Transmittal Form

(To accompany the complete revised final deliverables)

Date:

To: [Senior Program Officer]

From: [Principal Investigator]

Subject: [Program, Project number]
[*Project Title]*

In transmitting the project's final deliverables, I certify the following:

☐ All changes requested at the Draft Final Deliverables stage have been addressed and written responses to every comment have been provided.

☐ The *Certification of Compliance with Copyright Requirements* form has been signed and is enclosed/attached.

☐ The *Checklist for Final Deliverables Being Considered for Pre-Publication* (if applicable) form has been completed and is enclosed/attached.

☐ XX sets of hard copies of all revised final deliverables are enclosed/attached.
(Itemized list of deliverables - SPO identifies each item that should be delivered.)

☐ Digital versions of all revised final deliverables are enclosed/attached.
(Itemized list of deliverables - SPO identifies each item that should be delivered.)

☐ The digital files match the hard copies exactly with all artwork embedded.

☐ Textual material to be edited is provided in MS Word.

☐ Files in other formats (such as software, databases, and PowerPoint) are acceptable BUT must be fully functional, because they will be used as submitted.

☐ "Native" files for artwork not originally created in MS Word (i.e., before being embedded into a Word document, they were a .jpg, .xls, .ppt, or other file) have been enclosed/attached/transmitted

☐ Names, affiliations, cities, and states of research team members as they should appear on the title page of the CRP publication have been provided and are enclosed/attached.

☐ The Principal Investigator contact information is correct and is provided in the signature box below.

Name of PI or main author	Principal Investigator **[Signature & Date]**
Email address	PI@contractor.email
Phone number	555-555-1212
Shipping/mailing address	

Figure 7. Final deliverables transmittal form.

Checklist for Final Deliverables Being Considered for Pre-Publication

Date:

To: [Senior Program Officer]

From: [Principal Investigator]

Subject: [Program, Project number]
[*Project Title]*

Your final deliverable may be made available to the public as an online pre-publication draft. If your final deliverable becomes a pre-publication draft, it will be given a cover sheet and placed online "as is"; therefore, please make every effort to provide a clean, readable document. To help you with this, please review Chapter 5 of the *Procedural Manual for Contractors Conducting Research in the Transportation Research Board's Cooperative Research Programs*.

__ Run spellcheck on your final deliverable

__ Review each page of the document to ensure that
- __ Pages are numbered and the page numbers are sequential (by chapter is acceptable)
- __ No artwork or text is cut off, runs off of the page, or overlaps
- __ There are no other obvious malfunctions in page layout

__ Check the table of contents to ensure that
- __ All listed parts/sections/appendixes are in the document
- __ Listed headings/sections track with those in the document [it is OK if only the highest-level heading(s) are listed in the table of contents]

__ Check artwork to ensure that
- __ Artwork is credited if it is taken from another source (i.e., not produced for this project by the contracting team)
- __ Authors have obtained permission to use materials not produced by the contracting and/or research team (e.g., photos, artwork, tables or graphs.)

__ Check that supplemental products (e.g., spreadsheets and software tools) are complete and function correctly

__ Check for sensitive content including
- __ Personal contact information (e.g., for survey participants and others) is not included

Figure 8. Checklist for final deliverables being considered for pre-publication.

CHAPTER 3

Performance Requirements

3.1 Contract Period

The effective starting and completion dates of the research are specified in the contract. Costs incurred prior to the starting date or after the completion date are not reimbursed, unless approved in advance by the Office of Contracts and Grants, and must be consistent with the eventual executed contract.

3.2 Extensions

Time extensions should be avoided; however, when unforeseen circumstances constitute a valid basis for extending the contract for an additional period at no increase in the contract cost, the contractor should initiate the request at the earliest practical date, but no later than 30 days prior to contract termination, fully documenting the need by including the following:

- A concise narrative statement explaining the cause of the delay. This statement will be examined by the CRP Program Officer and project panel in considering the request.
- The period for which the extension is requested.
- The unobligated balance of contract funds at the time of the request.
- A revised progress schedule reflecting the additional time period and how the unobligated balance of contract funds will be allocated.
- The steps taken to ensure completion of the research within the requested extension period.

3.3 Performance History

A contractor's performance is shared with future project panels for their consideration during contractor selection on future projects.

3.4 Transfer of Research Contract

CRP contracts are non-transferable except with the written consent of the Office of Contracts and Grants.

3.5 Questionnaire/Survey

If a contractor proposes to send a questionnaire related to the project, the proposed questionnaire and transmittal documents, along with any explanatory materials, must be forwarded to CRP for approval before being distributed. After staff and panel review, the questionnaire will be returned to the contractor with appropriate comments. If the questionnaire/survey is intended for individuals in state departments of transportation (DOTs), copies of the letter transmitting the questionnaire/survey should also be sent to the respective TRB state representatives. An example of a transmittal letter that should accompany such questionnaires is given in Figure 9.

ACME CORPORATION

ACME CORPORATION
341 Business Park
Anytown, Anystate 22040

Dear Sir:

Acme Corporation, under the Transportation Research Board's [specific Cooperative Research Program (xCRP or NCxRP)], is conducting Project [xx-xx, "project title."] The objective of this project is to [e.g., develop a guidebook for planning, designing, conducting, and analyzing airport-user surveys].

[Appropriate background information about the specific cooperative research program such as sponsorship may be added.]

[Task 1 of this project includes the preparation of a summary of gaps and needs in the current state of knowledge or practice where further research is needed on planning, designing, conducting, and analyzing airport-user surveys. The enclosed questionnaire is intended to (1) identify and describe the various survey purposes, range of methodologies used, and results and (2) describe particular successes, problems, shortcomings, and deficiencies they have encountered.]

The questionnaire has been sent to [airport operators, Metropolitan Planning Organizations, state transportation agencies, and private firms who have had experience in conducting airport-user surveys.]

We realize that you receive many inquiries like this and that they take up a lot of your time, but the success of this project depends on your input. Therefore, we sincerely appreciate your efforts in sharing your experience with others who can benefit from it.

Sincerely,

J.T. Kirk
Research Specialist

Figure 9. Sample letter to accompany questionnaire.

3.6 Cost Considerations

3.6.1 General

The proposal submitted by the contractor is included by reference in the contract. Thus, in addition to the specific research objectives outlined in the contract, the contractor's cost estimates are recognized as being part of the agreement and are incorporated into the contract document. To provide the Principal Investigator with flexibility in the conduct of the research, consistent with the general scheme of the proposal, strict adherence to the original estimate in each category of costs is not required, although substantial changes in proposed expenditures must be brought promptly to the attention of the CRP Program Officer.

3.6.2 Maximum Cost

The contract establishes a maximum cost that the contractor may not exceed. CRP sponsors allocate funds for each project when the annual program is approved. Subsequently, CRP sets a contract amount at the time that specific research objectives are defined. The contractor is urged to monitor project expenditures closely to ensure satisfactory conclusion of research within the contract amount.

3.6.3 Withholding

The contract provides for withholding a percentage of the costs that are billed by the contractor. The withholding is paid to the contractor following receipt and acceptance of the final deliverables and full compliance with the contract provisions detailed in Article VIII of the contract. The withholding only applies to cost-plus-fixed-fee and cost-reimbursement contracts and does not apply to fixed-price contracts.

3.6.4 Allowable Costs

Except in the case of a fixed-price contract, allowable costs are specified in the contract. Certain of these costs require advance approval, and they are discussed separately below. Questions concerning costs should be submitted to the CRP Program Officer promptly for the Academies resolution.

3.6.5 Prior Approval of Costs

Advance approval in writing from the CRP Program Officer is required for the following costs:

- Purchase or fabrication of equipment having a value in excess of the level specified in the contract.
- Travel to scientific or technical meetings.
- International travel.
- Subcontracts for an amount in excess of the level specified in the contract.

3.6.6 Equipment

The term "capital equipment" as used here includes equipment, purchased or fabricated by the contractor, that is normally classified as a capital asset and that has a cost in excess of the amount specified in the contract. The contract requires advance approval for the expenditure of funds for the purchase of capital equipment, even though such expenditure may have been included in the proposal budget. A request for approval is to be addressed to the CRP Program Officer as early as possible.

Among the points to be covered in any such request for approval are the following:

- The nature and purpose of the expenditure, including a complete description of the articles to be procured, together with a statement indicating the technical necessity for incurring the requested expenditure.

- The total price or estimated costs of the expenditure. Information regarding the price or estimated costs should indicate whether the amounts are based on the contractor's estimate, an estimate submitted by the subcontractor (or vendor), or a firm quotation.
- If the proposed expenditure was not in the proposal budget at the time the contract was negotiated, explain how the expenditure will affect the contractor's budget of funds available under the contract.

Capital equipment procured under the contract will be retained by the contractor during the term of the contract and thereafter until disposition is determined by the Contracting Officer. If the contractor desires to acquire the equipment, a bid may be entered; it shall be subject to approval by the Contracting Officer, in accordance with prescribed policy.

3.6.7 Travel

Travel supported by CRP has been grouped into three categories:

1. Trips made routinely for the collection of data and information for inclusion as a substantial part of the research.
2. Trips made to scientific or technical meetings.
3. International travel. International travel is defined as any travel outside the United States and requires advance approval. Therefore, requests to the Contracting Officer should be submitted well in advance of the planned departure date.

Ordinarily, travel under Category 1 does not require prior approval. If the research budget makes no provision for travel, and it is subsequently determined that such travel is required, with substantial costs in relation to the budget, an appropriate explanation is to be forwarded promptly to the CRP Program Officer.

Advance authorization is required for Categories 2 and 3, unless the travel is identified specifically in the amplified work plan. Such travel will ordinarily be limited to the Principal Investigator or other key investigators performing the work under the contract. In submitting a request for this purpose, the following information is required:

- The role, at the meeting, of the individual requesting the travel.
- The expected contribution of the meeting to the subject research.
- A cost estimate of the travel and the relationship of the costs to the budget.

The following factors will be considered when determining whether attendance at a meeting is directly and specifically in furtherance of the work under the contract:

- The agenda of the meeting includes subjects relating to the contract on which the Principal Investigator is working.
- In the event that attendance involves a personal or other interest in addition to CRP-related considerations, agreement is to be reached prior to the travel for charging an equitable portion of the related expenses to the contract.

If travelers do **not** go directly from their institutions to the meeting, stay only for the period of the meeting, and return directly to their home stations, it is expected that an equitable arrangement for apportioning the expenses of attendance will be accomplished and documented.

Within 2 weeks following the conclusion of the trip, the traveler must submit to the CRP Program Officer a statement of the benefits derived in relation to the subject research.

A trip is directly and specifically related to the performance of the contract if the Principal Investigator is formally invited by CRP to come to Washington or elsewhere to discuss the research.

Contractors should recognize that CRP comprises special-purpose programs, the activities of which are essentially distinct from those of the rest of TRB. Because CRP is not an integral part of the information

dissemination activities carried out by TRB during each Annual Meeting, it follows that the decision to offer a formal paper for presentation in TRB sessions or to accept TRB invitations to engage in informal discussions in various other sessions is at the discretion of the contractor. Such participation is nonetheless subject to all applicable terms of the contract between the contractor and the Academies. Accordingly, charges against the contract for preparation and printing of papers, summaries, or notes and for travel solely for the purpose of presentations at the TRB Annual Meeting are allowed only with prior approval by CRP and to the extent that the costs and activities can be accommodated within the existing budget and schedule.

3.6.8 Payment/Invoicing

Vouchers may be submitted no more than once a month and must conform with the Academies' billing instructions contained in your contract. Each voucher is audited upon receipt, and the absence of required documentation will delay reimbursement.

Do not attach monthly or quarterly progress reports to the vouchers.

Invoices should be submitted electronically per the following guidelines:

1. Email invoices to Invoices@NAS.EDU
2. One invoice per email in **one PDF file** only; multiple PDFs and non-PDF attachments will be lost.
3. Email subject line to read: Unit # (located on the first page of your contract), Your Company Name, Invoice Amount, and Invoice #
4. Fixed-Price Contracts: The invoice should be the FIRST PAGE with the Payment Schedule from the contract (Attachment B) as the second page.
   Cost Reimbursable or Cost + Fixed-Fee Contracts: The invoice should be the FIRST PAGE with all required supporting documentation to follow.
5. Submit everything together in ONE PDF attachment. Absolutely NO cover letters.

3.7 Subcontracts

Subcontracts that are equal to or exceed $25,000 require advance written approval by the Academies Office of Contracts and Grants, even though the concept of subcontracting for materials and/or services may have been approved at the time of contractor selection. The form of the subcontract agreement should parallel as closely as possible the form of the contractor's agreement with the Academies. If not provided in the proposal, an itemized budget and a statement justifying selection of the particular subcontractor are required when submitting the subcontract agreement for approval.

3.8 Disadvantaged Business Enterprise Plan

The proposer's plan for involvement of Disadvantaged Business Enterprises (DBEs) is a factor in selection of the contractor, and the contractor's adherence to its DBE plan will be monitored during the contract period. Contractors are required to submit annual reports comparing actual with proposed payments to DBEs. The format for the DBE progress report is found in Figure 10.

Email to Jsnell@nas.edu

TRANSPORTATION RESEARCH BOARD
COOPERATIVE RESEARCH PROGRAMS

Progress Report on Participation of Disadvantaged Business Enterprises

Contractor: _____

Program: ☐ ACRP ☐ BTSCRP ☐ NCHRP ☐ TCRP

Project Number: _____

Submitted by: _____

Date: _____

Contract Amount: _____

Proposed Expenditures to Date: _____

Actual Expenditures to Date: _____

Name of DBE (List each DBE subcontractor or consultant named in your proposal)	**DBE Expenditures**		
	Total Proposed (for each DBE)	Actual to Date	Total Now Anticipated

Comments: (Please explain any significant differences between proposal and actual DBE expenditures.)_____

_____

_____

_____

Figure 10 DBE Progress Report

3.9 Indirect Rates

Contractors proposing a cost-reimbursement or cost-plus-fixed-fee contract will be asked, prior to contract award, to agree to fix the overhead and other indirect rates for the period of the contract. The contract funding provided for each project does not provide funding to accommodate any adjustments needed for increases in rates. Any rates proposed must be documented by a copy of a rate agreement or audit report approved by a federal or state agency. If the documentation cannot be provided, the Academies reserve the right to award a fixed-price contract.

3.10 Close-Out of Contract

When work is concluded, the following matters require completion prior to final payment:

1. The required copies of the final deliverables are to be submitted in accordance with the terms of the contract and instructions from the CRP Program Officer.
2. The CRP Program Officer notifies the contractor of receipt of the final deliverables and informs the Contracting Officer to send the contractor the necessary documents to close out the award. The documents include a contractor's Release of Claims, contractor's Assignment of Rebates and Credits, and the Inventory of Property and Data.
3. The Contracting Officer prepares and forwards final close-out documents to the contractor for signature.
4. Upon return of completed close-out documents, the Contracting Officer notifies TRB that the final invoice can be paid.
5. The CRP Program Officer approves payment of the final voucher and forwards this approval to Accounts Payable.
6. Accounts Payable issues the final payment.
7. All information and data are the property of the Academies. Capital purchases that meet the definition of capital equipment specified in the contract are the property of the Academies; the contractor must identify all such items and make a recommendation to the Academies for retention or disposition of the capital equipment.

CHAPTER 4

Project Oversight

4.1 Contract Provisions

The CRP research contract provides for monitoring of the research being conducted by the contractor. Monitoring is maintained throughout the contract period by CRP staff.

4.2 CRP Project Panels

Technical guidance for each research project is provided by a project panel consisting of research specialists and experienced practitioners. Liaison representatives may also be assigned by sponsoring agencies or cooperating organizations. The functions of each project panel are to:

- Develop a plan for the attainment of the objectives of its project, including estimates of total cost and time to achieve them.
- Draft a definite statement of objectives for the project within the funds allotted.
- Review research proposals and make recommendations regarding selection of the contractor.
- Review progress of the research.
- Provide counsel and advice regarding technical aspects of the research.
- Review and evaluate project deliverables (including final deliverables) as to the accomplishment of objectives and suitability for publication.
- Make recommendations regarding continuation of the project if appropriate.
- Serve as champions by encouraging and facilitating the implementation of the research results.

The Academies policy specifies that the role of the panels is to make recommendations to TRB, and a two-thirds consensus is necessary. Members and liaison representatives, either collectively or individually, do not act as consultants to project investigators. The Academies policy further specifies that the results of a panel's formal actions can be conveyed to the contractors **only** through CRP staff.

4.3 Project Oversight

Project oversight may include meetings at the research site or prearranged visits of the Principal Investigator to the offices of TRB. An initial site visit may be conducted by the CRP Program Officer at the Principal Investigator's premises after the contract is executed to discuss administrative procedures, performance expectations, and other project-related matters. The CRP Program Officer may request that the contractor's administrative or financial personnel, or other members of the research team, including subcontractors, be present.

Oversight is a two-way flow of information. It is desirable for the Principal Investigator to consistently provide information on problems, tasks, methods of testing or investigating, methods of analysis, progress to date, future plans, and substantive results, especially when a decision or guidance from the project panel is needed. The CRP Program Officer will examine the methodology and accomplishments to ensure that the research is on schedule in terms of both progress and spending and that it is being conducted in

accordance with the approved research plan. Substantive changes that occur at any time during the research may require a contract modification.

Visits or contacts to Principal Investigators by persons other than responsible CRP staff have no official status with respect to project oversight or to contract matters.

Likewise, miscellaneous visits or contacts by Principal Investigators with members and liaison representatives of panels or committees have no official status with respect to contract matters, including prosecution of the research plan. Nonetheless, the CRP Program Officer should be kept informed of such visits in the best interests of oversight and coordinated effort.

Except as approved by the CRP Program Officer, direct contact between the contractor and project panel members with regard to the research is not permitted.

4.4 Program Oversight

Each program has a governing board that is responsible for providing program oversight. Each program is discussed further in Appendixes A through D. CRP provides periodic progress reports on CRP operation and the status and progress of the research program to each program's oversight committee.

CHAPTER 5

Preparing the Final Deliverables

5.1 General Requirements

The quality of research can sometimes be obscured by poorly presented results. Research agencies are encouraged to incorporate the guidelines in this chapter early in their deliverable preparation process.

Research results are of little value if they are not disseminated; therefore, each of the Cooperative Research Programs of the Transportation Research Board makes every reasonable attempt to publish and to distribute widely the products of the research. Research results that are published as reports become part of an ongoing series, therefore, consistency in their style of presentation is necessary. This chapter provides information to research agencies so that the reports conform to the desired format.

The acceptability of final deliverables depends on three criteria: (1) fulfillment of project objectives as set forth in the contract, (2) adequacy of documentation, and (3) clarity of presentation. Deliverables shall be complete in all their parts, organized appropriately to serve their purposes, accurate in matters of fact and documentation, consistent with the Academies policy on attribution of sources and use of copyrighted material, and edited for basic uniformities of style and usage. Furthermore, **all text and artwork should be suitable for publication with minimal editing on CRP's part** so as to reduce the need for extensive modifications that will delay publication and may result in unintended changes of meaning. Generally, final deliverables will be edited by in-house CRP staff and sent to commercial typesetters for final formatting.

If you have questions about preparing your final deliverables, please contact the CRP Editorial Staff at crpeditors@nas.edu.

5.2 Organization of Final Deliverables

Practitioners are the intended audience for most CRP research deliverables, and the deliverables themselves are intended to facilitate implementation of the research results. Typically, the main deliverables of CRP research projects are published in one of CRP's report series. Deliverables that will be published in a CRP report series should include front matter and body and may include back matter. Sometimes the main deliverable of a CRP research project is an electronic product such as software or a spreadsheet that may be published on a website or other digital system. Electronic deliverables may need to follow specific guidelines for formatting. Intellectual property right requirements, including copyright, still apply.

5.2.1 Front Matter

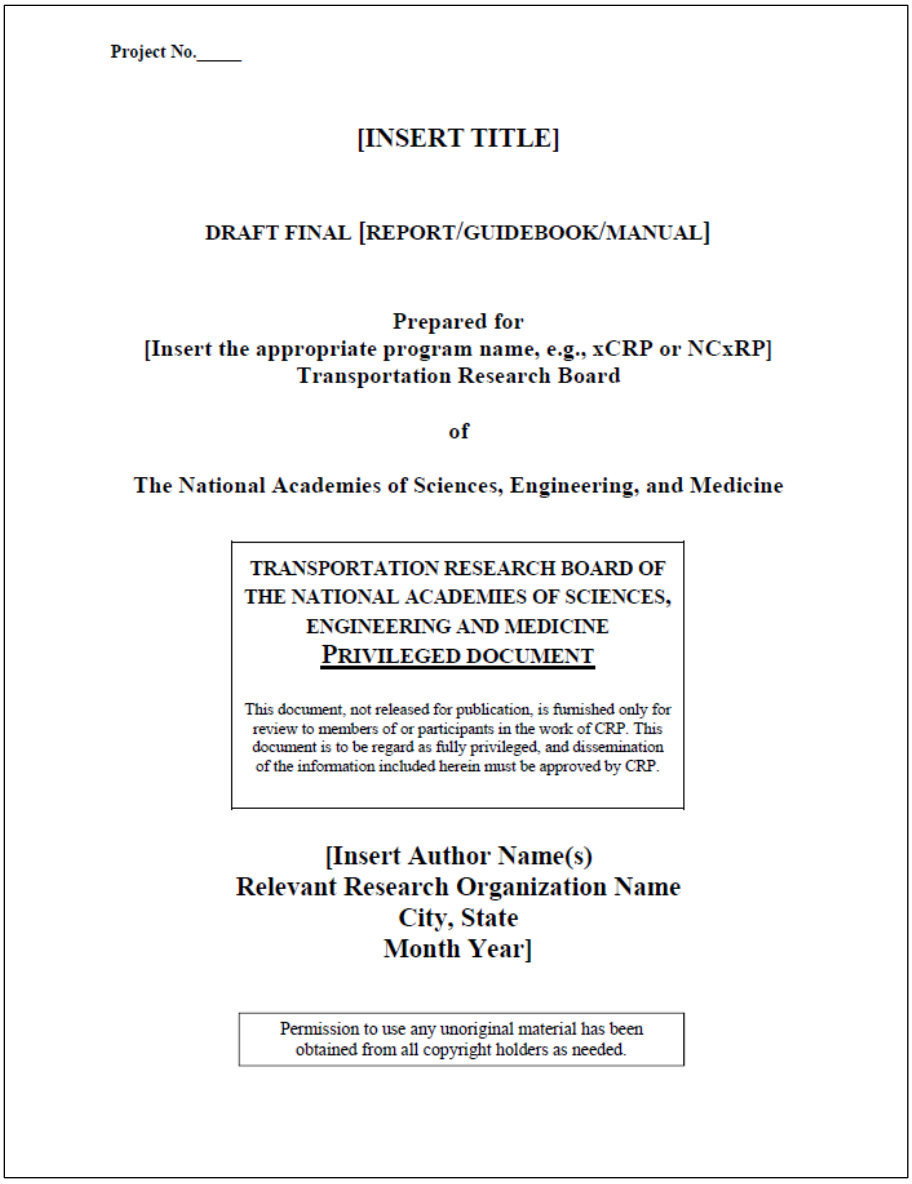
When draft final deliverables and final deliverables are submitted to CRP for review and possible publication, the deliverables should contain all the following items as front matter.

5.2.1.1 Cover

The front external cover must be of light-colored, nonglossy paper or heavy cardstock and capable of accepting rubber-stamp ink without smearing. All copies must be numbered. For sample covers, see Figures 11 and 12.

The cover includes the authors' names, their affiliations, and the cities and states of their affiliations **at the time the research was completed**. Accuracy is critical.

Note: The cover information will be used to determine the listing of the authors in the published report; authors will be grouped by company affiliation.



Project No._____

[INSERT TITLE]

DRAFT FINAL [REPORT/GUIDEBOOK/MANUAL]

Prepared for
[Insert the appropriate program name, e.g., xCRP or NCxRP]
Transportation Research Board

of

The National Academies of Sciences, Engineering, and Medicine

TRANSPORTATION RESEARCH BOARD OF THE NATIONAL ACADEMIES OF SCIENCES, ENGINEERING AND MEDICINE
PRIVILEGED DOCUMENT

This document, not released for publication, is furnished only for review to members of or participants in the work of CRP. This document is to be regard as fully privileged, and dissemination of the information included herein must be approved by CRP.

[Insert Author Name(s)
Relevant Research Organization Name
City, State
Month Year]

Permission to use any unoriginal material has been obtained from all copyright holders as needed.

Figure 11. Example of draft final deliverable cover.

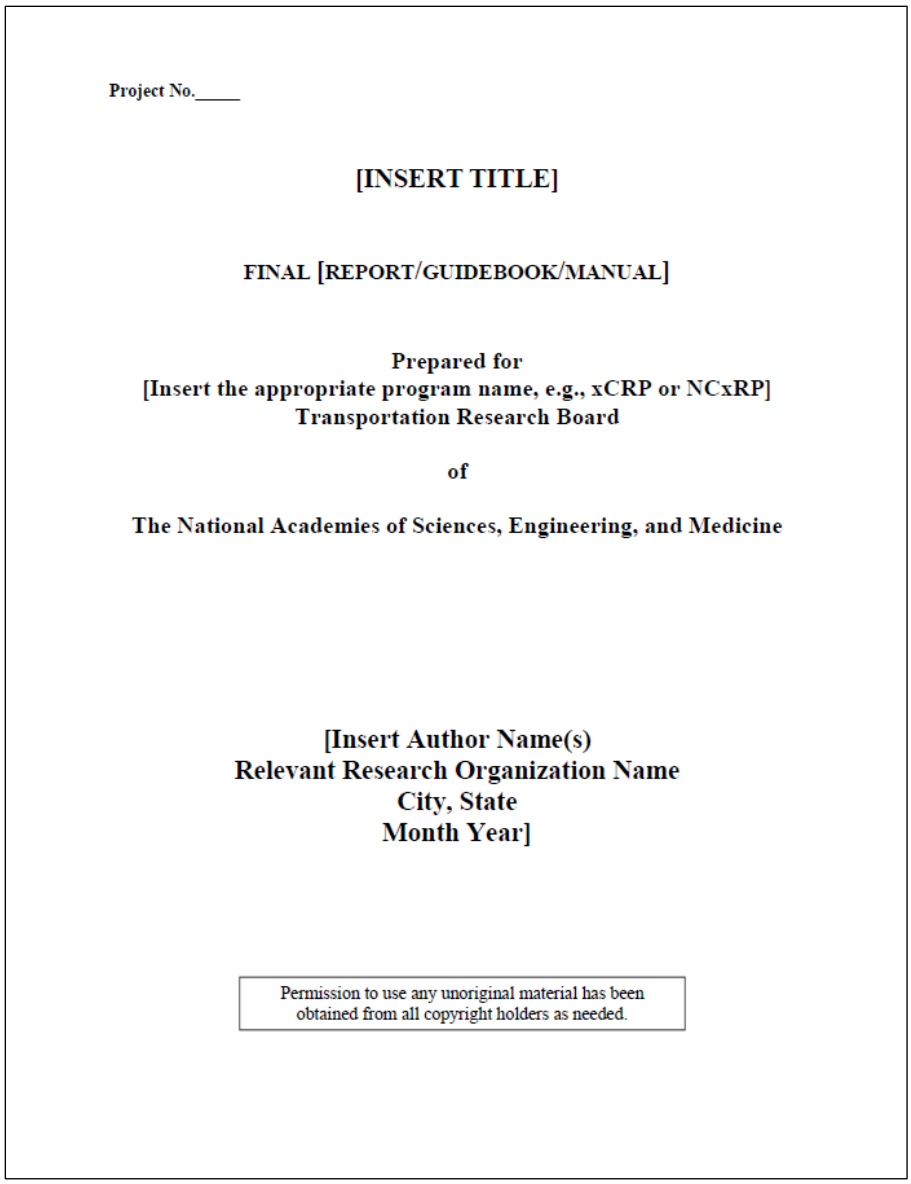


Figure 12. Example of final deliverable cover.

5.2.1.2 Acknowledgment of Sponsorship and Disclaimer

All draft final deliverables and final deliverables must contain two statements printed exactly as indicated in Figure 13, either on the inside front cover or as the first sheet following the cover, preceding everything else and exclusive of any other information.

5.2.1.3 Title Page

A title page listing the same information as the external cover should follow the acknowledgment and disclaimer statements. For sample covers, see Figures 11 and 12.

ACKNOWLEDGMENT OF SPONSORSHIP

This work was sponsored by one or more of the following as noted:

☐ American Association of State Highway and Transportation Officials, in cooperation with the Federal Highway Administration, and was conducted in the **National Cooperative Highway Research Program,**

☐ Federal Transit Administration and was conducted in the **Transit Cooperative Research Program**,

☐ Federal Aviation Administration and was conducted in the **Airport Cooperative Research Program,**

☐ The National Highway Safety Administration and was conducted in the **Behavioral Traffic Safety Cooperative Research Program,**

which is administered by the Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine.

DISCLAIMER

This is an uncorrected draft as submitted by the contractor. The opinions and conclusions expressed or implied herein are those of the contractor. They are not necessarily those of the Transportation Research Board, the Academies, or the program sponsors.

Figure 13. Acknowledgment of sponsorship and disclaimer for CRP draft final deliverables and final deliverables.

5.2.1.4 Table of Contents

A table of contents should be included. Figure 14 presents an example table of contents from a Contractor's Final Report. Tables of contents for other deliverables should reflect the contents of the individual deliverable.

5.2.1.5 List of Figures and Tables

A list of all the figures and tables in the deliverable should be included. Requirements for artwork (e.g., figures, tables, equations, and exhibits) are discussed in Section 5.3.3.

CONTENTS

LIST OF FIGURES AND TABLES v

AUTHOR ACKNOWLEDGMENTS vii

ABSTRACT viii

SUMMARY 1

CHAPTER 1 Background 2
Problem Statement and Research Objective
Scope of Study

CHAPTER 2 Research Approach 5
Summary of the State of the Practice

CHAPTER 3 Findings and Applications 17

CHAPTER 4 Conclusions and Suggested Research 20
Conclusions
Suggested Research

REFERENCES 25

ABBREVIATIONS, ACRONYMS, INITIALISMS, AND SYMBOLS 28

APPENDIX A **State of the Art** A–1

APPENDIX B **Case Study Reports** B–1

APPENDIX C **Annotated Bibliography** C–1

APPENDIX D **Survey Interview Forms** D–1

Figure 14. Example of table of contents for Contractor's Final Report.

5.2.1.6 Author Acknowledgments

Contractors have the option of including author acknowledgments. If contractors exercise this option, this section should include the titles and affiliations (**at the time the research was completed)** of the research team members and other contributors and their connection with the research. If changes in title or affiliation have occurred, the titles or affiliations at the time of the submission of final deliverables also should be stated. Contractors are responsible for the accuracy of all names and affiliations. Author acknowledgments do not cite CRP staff assistance or, usually, the assistance of typists or proofreaders. A typical acknowledgment statement follows:

> The research reported herein was performed under NCHRP Project 12-58 by the Department of Civil, Structural, and Environmental Engineering at the University at Buffalo (UB), State University of New York (SUNY). UB was the contractor for this study, with the Research Foundation of SUNY serving as fiscal administrator.
>
> Dr. Stuart S. Chen, P.E., Associate Professor of Civil Engineering at UB, was the Project Director and Co-Principal Investigator. The other authors of this report are Dr. Amjad J. Aref, Associate Professor of Civil Engineering at UB and Co-Principal Investigator; Il–Sang Ahn, Research Assistant and Ph.D. candidate at UB, Methee Chiewanichakorn, Research Assistant and Ph.D. candidate at UB, Aaron Nottis, Jeffrey Carpenter, and Ioannis Kalpakidis, Research Assistants and M.S. candidates at UB. The work was done under the general supervision of Professors Chen and Aref at UB.

5.2.1.7 Abstract

An abstract of no more than 200 words, suitable for use in computerized information storage and retrieval systems, should be presented after the acknowledgments. The abstract should use direct statements in complete sentences to describe the work scope and principal findings. An example follows:

> This report documents and presents the results of a study of the safety aspect of curb use. Full-scale tests in combination with computer simulations were applied to investigate vehicle behavior upon impact with a series of commonly used curbs. Three curb designs taken from the AASHTO geometric design manual and a special configuration 13 inches high were given consideration in the study. The four curbs were investigated at three vehicle approach angles and at three speed levels. Such vehicle responses as redirection, trajectory, path, roll and pitch, and acceleration were observed and evaluated. The model results correlated well with the full-scale results. The findings of the study suggest that curbs of the configurations tested have no redirection capabilities to enhance safety in a high-speed travel environment.

5.2.1.8 Foreword

If a foreword is required, it will be written by the CRP Program Officer.

5.2.2 Body of Guidebooks and Manuals

Often, a guidebook or manual, rather than the Contractor's Final Report on the project research, is the primary deliverable of a CRP project. Guidebooks and manuals should include the front matter described above. The organization of the body of guidebooks and manuals should be determined by the contractor.

5.2.3 Body of Contractor's Final Report

Contractors must submit a final report as one of the deliverables of a CRP research project whether it is the primary product of the research or not. Contractors' Final Reports should include the front matter described above. The body of a Contractor's Final Report should include the following parts in sequence:

- Summary
- Chapter 1 Background

- Chapter 2 Research Approach
- Chapter 3 Findings and Applications
- Chapter 4 Conclusions and Suggested Research

5.2.3.1 Summary

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

5.2.3.2 Chapter Sequence and Description

Report chapters should be structured in a concise and logical manner that is suitable to the subject matter, clearly describing the research approach, findings, conclusions, and recommendations. Within chapters, four heading levels are usually sufficient.

The recommended sequence of chapters and their typical content are described in the following paragraphs. However, the structure of some reports may not conform to this sequence; in such cases, the contractor is encouraged to confer with the responsible CRP Program Officer.

Chapter 1: Background. Discussions of the problem that led to the study, current knowledge that can help in solving the problem, and the objectives and scope of the completed research are presented in the first chapter. This chapter should not contain the details of any survey that may have been performed, any forms that may have been used in soliciting information, or any details regarding test procedures or mathematical analyses that may have been used. All such details are to be provided in appendixes.

Chapter 2: Research Approach. This chapter presents the approach used in addressing the problem.

Chapter 3: Findings and Applications. The material in this chapter expands on the summary. A "finding" is the result of an examination. This chapter should include, as appropriate, summary data; principal mathematical formulas developed; the meaning of findings in terms of use in standards, specifications, policies, and procedures; what the findings add to an understanding of the problem and what effects they have on economy, safety, amenities, and convenience; an assessment of the limitations of the findings; and other information. However, details should be presented in the appendixes. Design charts, spreadsheets, software, and other items of immediate use to practicing engineers or other users may be presented here or presented in the appendixes.

Chapter 4: Conclusions and Suggested Research. The conclusions should emphasize the most important findings and may extend the findings beyond conditions specific to the project. Successful applied research will result in specific guidance that should facilitate application of the findings and should be accompanied by information on potential benefits that can be expected from using the research products. A plan for implementing the research products should be part of the guidance. If the project findings have revealed specific areas where further research would be valuable, these areas should be described in this chapter.

5.2.4 Back Matter

Back matter typically comprises material that is supplemental to the material in the body of a guidebook, manual, or Contractor's Final Report such as publication information on sources (reference lists and bibliographies), background information on the topic, and tools such as surveys. Contractors should decide whether back matter should be included in their deliverables. Decisions about including back matter will depend to a large extent on the content of the main body of the document (e.g., if sources are cited in the main body of a document, a reference list providing publication information should be included in the back matter, but if no sources are cited, no reference list is necessary). The types of back matter that appear most commonly in CRP deliverables are references, bibliographies, and appendixes. Instructions for preparing these types of back matter are provided below.

5.2.4.1 References

Reference sections, unlike bibliographies, list only sources cited in the text. (Bibliographies generally include all sources consulted, not just those cited in text.) CRP prefers reference sections to bibliographies.

The following documents are not considered references and should *not* be placed in the reference list (although they can be cited parenthetically within the text):

- Specifications
- Standards of standard-setting organizations (e.g., standards for AASHTO, ASTM, and ANSI)
- Legislative acts
- CRP projects (however, unpublished reports/documents from CRP projects are references; see below for correct format)

The listing of references must be accurate. At a minimum, authors should supply enough information so that readers can verify the reference. Use the author–date reference system for the reference list:

- In a separate section following the last chapter, list references in alphabetical order by last name of the author (or first author), then chronologically. For example:
  - Jones, R. 2001. …
  - Jones, R. 2003. …
  - Jones, R., and T. Smith. 2002. …
- Be sure that
  - Names are spelled correctly and consistently.
  - Initials and dates are correctly given.
  - The title of the reference is given as published.
- Avoid unpublished references if papers/reports have been published. Do not use expressions such as "Paper prepared for presentation…," or "Paper presented at…" when publication has already occurred.
- Print the names of journals, proceedings, bulletins, and so forth in italics; print the titles of papers in Roman, thus: Jones, J.J. 1922. "A Technical Paper." *Proceedings, American Society for Testing Materials*, Vol. 22, Part II, p. 450.
- In citing (and in listing), if reference is made only to a specific part of the work, provide the page numbers of the pages on which the material appears. If several separate pages or parts of the same work are referred to at different places in the text, give the entire work in the reference list; in the text, simply use, for example, (Jones and Smith 2005, 16–21, 24) to cite pages 16 through 21 and page 24 of Jones and Smith (2005). A reference in the list should not be repeated or be referred to by the use of ibid., loc. cit., and so forth.
- Make sure that reference entries agree with text and other citations of references. Text revisions may require changes to the reference list.

- Use the following samples as guidance on treating reference items:

Periodical:	Smith, J.M. 2009. "Unanticipated Uses of Asphalt by Juveniles." *Highway Periodical*, Vol. 1, No. 2, pp. 36–39.
Proceedings:	Smith, J.M., and A.B. Jones. 2009. "Punishment and Reducing Vandalism." In *Conference Proceedings 23: 5th International Conference on Enhancing Transit*, Enhancing Transit Organization, Jacksonville, FL, pp. 1–8.
Conference presentation:	Smith, T.R. 2003. "Effect of Temperature on Cement." Presented at the 35th Conference on Cement, San Jose, CA.
Report/Book:	Smith, K.T., and T.D. Jones. 2009. *Challenges to Marketing Transit in the Death Valley*. Brown Publishing, Inc., Bristol, England.
Unpublished report from a CRP project:	Jones, J.M. 2009. "Title of document—can be title of project." Draft (or revised final) report, NCHRP Project 17-2. Highwater Engineering, San Diego, CA.
Pre-publication draft of a CRP report:	Smith, K.T., and T.D. Jones. 2009. *Final Title of the Report.* Pre-publication draft of *ACRP Report XXX*. Transportation Research Board, Washington, DC.
Websites:	http://www.trb.org (As of July 21, 2010).

5.2.4.2 Bibliography

Bibliographies, unlike reference sections, list sources consulted but not necessarily cited in the text. Bibliographies generally are organized alphabetically. Although CRP prefers reference sections, if a bibliography is included, arrange the entries according to one of the following:

- Alphabetical Arrangement by Author. Arrangement by author will include names of persons (i.e., authors, editors, and compilers) and corporate bodies (e.g., governmental agencies, societies, institutions). In listing federal governmental agencies, "U.S." should precede the name of the agency so that such entities may be grouped in the bibliography.
- Chronological Arrangement. A bibliography may be arranged chronologically to show the development of a subject. Entries are then arranged alphabetically by author under the year.
- Classified Subject Arrangement. This arrangement is made on the basis of a systematic division by subject of the bibliography. Alphabetical author arrangements are used in such lists under each subject.

Each entry in a bibliography provides information that should result in ready identification. Entries must be sufficiently detailed, intelligible, and consistent in form with the style followed throughout the bibliography.

An annotation, in the form of a paragraph, may be placed after the main body of the entry. Compress the annotation to the fewest possible words.

5.2.4.3 List of Abbreviations, Acronyms, Initialisms, and Symbols

Lists of abbreviations, acronyms, initialisms, and/or symbols are not necessary but may be included (see Figure 13 for placement). However, such terms must still be defined within the text. See Section 5.3.6 for more information.

5.2.4.4 Appendixes

Generally, appendix materials are provided for researchers, developers of manuals and guidelines, and other users of the research results who are interested in the maximum degree of technical detail provided by the project effort. Appendixes are typically not published by CRP as part of a report, but are made available electronically or on a loan basis.

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

Appendixes may include the following items:

- Proposed specifications
- Documentation and further elaboration of research findings
- Forms, checklists, and worksheets
- Mathematical analyses
- Bibliography (however, these may also be handled as a separate section in the same way that references are handled)
- Project statement and project work plan (including any approved revisions).

The table of contents provided in Figure 13 shows the appendix material provided with one Contractor's Final Report. Ordinarily, if a project has generated a sizable quantity of background data (such as computer-related files), these data are not provided but are retained by the contractor (see CRP contract article relating to data retention and disposition).

5.2.5 Electronic Deliverables

Products developed for dissemination electronically are typically created for use on a computer or other electronic device. To ensure dissemination of a quality product that is accessible and user-friendly, contractors should

- Ensure that interactive content functions correctly.
- Provide any necessary instructions for users of electronic products.
- Provide any necessary documentation regarding platforms and versions on which the electronic product functions (or doesn't function).
- Adhere to intellectual property right requirements, including copyrights.
- Acquire any necessary permissions for freeware or shareware included on the electronic product. (Free software may require explicit written permission to be distributed/bundled with a package that is being sold by a third party.) See Section 5.4.2 for how to request permission.
- If there is an install file, ensure that the folder where the software will be installed on the hard drive is named CRP (not the contractor's or subcontractor's name).

When submitting final deliverables that include products to be distributed electronically, include a specific list of all files that make up the electronic product(s), including final file names, file types, and, as appropriate, a description of the file structure or other information necessary to access or use the deliverable. Figure 15 shows a sample CRP CD-ROM screen with menu buttons.

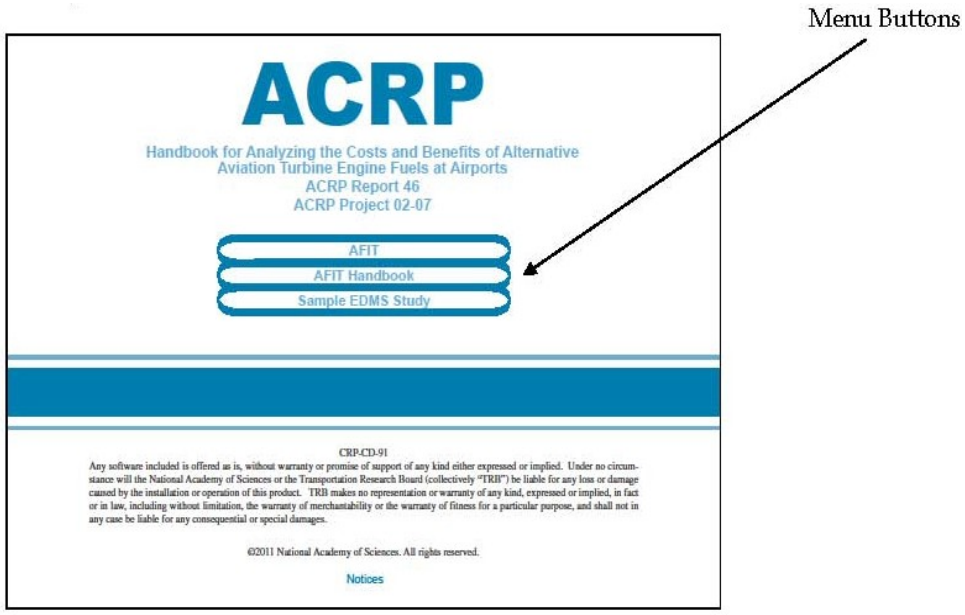


Figure 15. Example of a CRP CD-ROM menu screen.

5.3 Format and Style of Final Deliverables

In the following sections, formatting and style specifications for CRP final deliverables are provided. Please note that these specifications differ from the Style Manual used by other divisions of TRB.

A **Microsoft Word template** is available for contractors to use in developing final deliverables for CRP. A **template guide** and the template can be downloaded from the Information for contractors page of the TRB website. This Procedural Manual has been formatted using the template.

5.3.1 Layout

Please adhere to the following in the layout of your document:

- Provide textual material (including tables and figures) in a basic, single-column Microsoft Word document or using the appropriate CRP template.
- Keep formatting simple. (Please consult crpeditors@nas.edu before using text boxes, icons, elaborate headers and footers, color, shading, pull quotes, and so forth).
- Use chapters, sections, and/or parts to structure CRP final deliverables prepared for publication in a report series.
- Start new sections, chapters, and appendixes on a new page.
- Within each chapter or section, use subheadings to separate subject matter. Four heading levels are usually sufficient for CRP final deliverables.
- **Do not use footnotes to the text.** Incorporate such notes within the text. Footnotes are acceptable only for artwork. If material does not make sense in the body of the text, it is probably not necessary to the report.

5.3.2 Pagination

Please paginate your document according to the following instructions:

- Paginate the front matter with lowercase Roman numerals at the bottom of the page (i.e., i, ii, …).
- Paginate the body of the report consecutively with Arabic numbers at the bottom of the page (i.e., 1, 2, …).
- Paginate appendixes with letters and Arabic numerals at the bottom of the page (i.e., A-1, A-2, …,

B-1, B-2, and so forth).

5.3.3 Presentation of and Specifications for Artwork

Artwork consists of (1) tables (that is, systematic arrangements of data, in rows and columns for ready reference) and (2) figures (that is, diagrams or pictorial illustrations of textual matter). Artwork should be self-explanatory and should supplement, not duplicate, information given in the text. **Please adhere to the following instructions:**

- Number all tables in the body of the report consecutively with Arabic numerals.
- Number all figures in the body of the report consecutively with Arabic numerals.
- Order the tables/figures in appendixes by appropriate letter and consecutive Arabic numerals, respectively (e.g., A-1, A-2, …, B-1, B-2, …).
- Title all tables to identify their contents and/or to convey contextual information about the table. Cite the source of the material.
- Caption all figures to identify their contents and/or to convey contextual information about the figure. Cite the source of the material.
- Arrange tabular matter so that the intended comparisons are clear. Choose appropriate vertical columns to provide reasonable balance to horizontal and vertical dimensions.
- When a dash (–) is used in a table, **indicate its meaning** in a footnote (e.g., missing data, data not available or applicable).
- Use superscript **letters** for footnoting values in tables.
- Combine tables of similar form in order to reduce space requirements, eliminate heading duplications, and permit easier comparison of values.
- Check the **accuracy of all totals**.
- Call out the artwork in the text (for example, “See Figure 1”) to indicate the position of the artwork.
- Design figures and tables to meet CRP publication requirements. CRP cannot accept or print artwork larger than 8½ x 11 in. In the published report, artwork will be reduced to 1-column width (~3½ in.) or full-page width (~7¼ in.). Lettering and numerals must be of adequate size and clarity on original drawings to permit this reduction.
- Use figures of comparable size and scale when they are intended to be compared.
- Use abbreviations, numerals, and capitals consistent with text material (consult Section 5.3.8 for recommended style manuals).
- Check the spelling of all text in figures and tables.
- Develop figures and tables so that their **meaning does not depend on use of color** (e.g., in bar charts) — CRP cannot guarantee that readers or users will access the published work in color.
- Define variables and abbreviations used in tables and figures.

All artwork must be capable of being reproduced directly from **original** material submitted by the author. Contractors should provide the highest possible resolution of art. Because art typically looks better on a computer screen than in print, something may look to be of acceptable quality on a screen, but be unacceptable for print. Photos should be at least 300 dpi. **Screen captures will probably look blurry—don’t use them unless necessary.**

5.3.3.1 Using Screenshots as Artwork

To obtain clear and crisp screenshots, please follow the directions below:

1. Set your screen (monitor) resolution as high as possible.
2. Do NOT resize the screenshot if at all possible; if you do, use increments of 25% (25%, 50%, 75%).
3. Try to use PNG image format because it uses lossless compression; JPEG or BMP all use lossy compression.
4. Try not to edit the resulting screenshot in any way. If necessary, supply both the original screenshot and the edited screenshot.
5. The screenshot example in Figure 16 was created on a Mac, is PNG format, has not been edited or resized in any way, and is great for print.

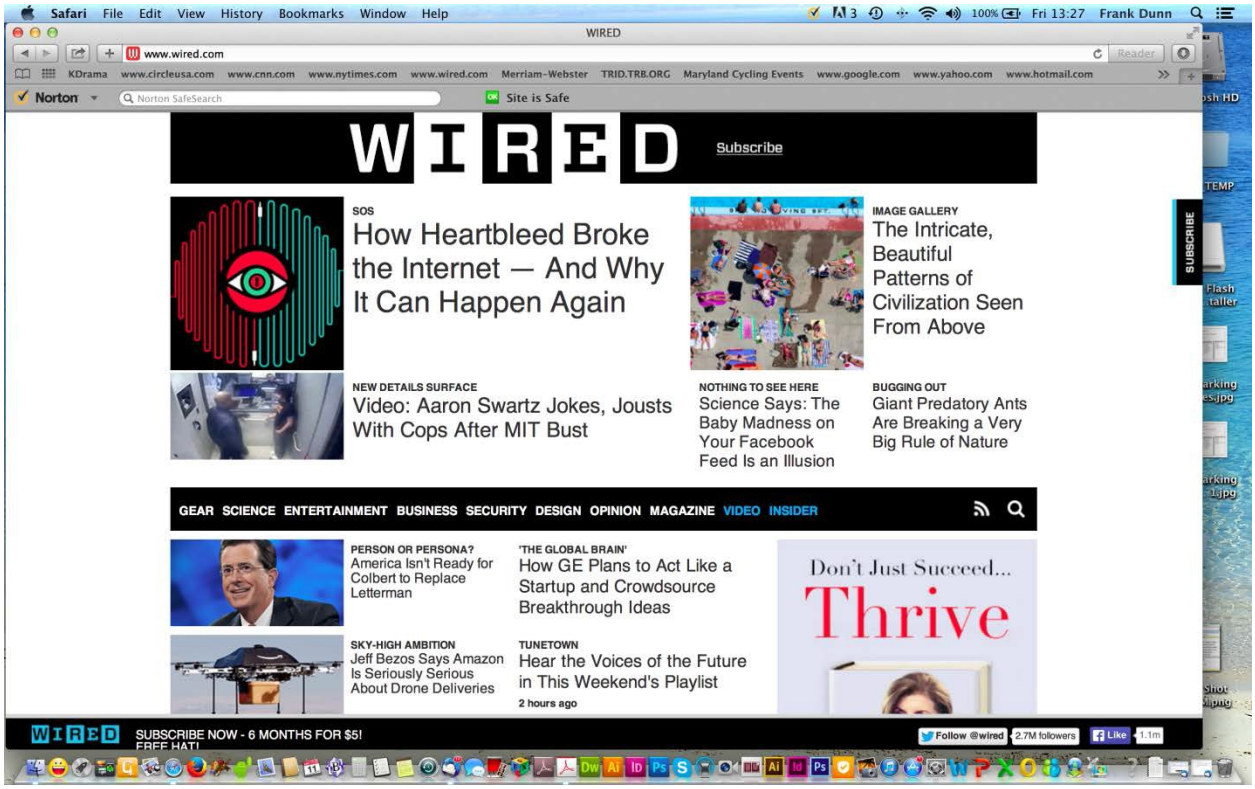


Figure 16. Example of a screenshot as artwork.

5.3.4 Mathematical Notation

When using mathematical notation,

- Make sure that all symbols, Greek letters, and mathematical signs are exact, defined, and absolutely unambiguous; for example
  - w versus ω [omega]
  - p versus ρ [rho]
  - Y versus Ψ [psi]
  - capital O versus θ [theta] versus 0 [zero]
  - capital X versus χ [chi] versus × [multiplication sign]
  - lowercase l [el] versus number 1 [one]
- Show the relative positions in equations and formulas of all subscripts, superscripts, fractions, and operators.

5.3.5 Units of Measure

Give units of measure common to the field of research reported. Specific requirements for the units to be used in a project are dictated by the need to facilitate application of the findings in a particular technical area.

Projects may require that reports use (1) customary U.S. units solely; (2) customary U.S. units as primary systems, followed by SI units in parentheses; (3) SI units of measurement exclusively; or (4) SI units as the primary unit of measurement, followed by customary U.S. units of measurement in parentheses. Additionally, issues related to hard or soft conversions of measurement may arise. The contractor should discuss the use of measurement with the CRP Program Officer.

General guidance on the appropriate use of metric units is available through the AASHTO *Guide to Metric Conversion* [AASHTO R1 (AASHTO's formal policy on metric)] or through ASTM E380 [*Standard Practice for Use of International System of Units (SI)*].

5.3.6 Abbreviations, Acronyms, Initialisms, and Symbols

Abbreviations, acronyms, initialisms, and symbols should be fully defined the first time they are used in the report; the definition of abbreviations, acronyms, and initialisms should be given first followed by the abbreviated term in parentheses. Avoid the first use of acronyms and initialisms in tables or figures. Symbols in equations and formulas should be defined in "where" statements.

Lists of abbreviations, acronyms, initialisms, and symbols can be included (see Figure 13 for placement). However, including such lists does not absolve report authors from defining terms in the text itself—this is particularly true for equations and formulas.

5.3.7 Reference Citations

References are cited in the text by the author name(s) and year of publication in parentheses at the pertinent point. See the following examples:

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

As noted in Section 5.3.1, Layout, do not use footnotes (*end*notes are acceptable).

5.3.8 Standard Reference Works for Style

Authors can consult the latest edition of *Merriam Webster's Collegiate Dictionary* for spelling and capitalization style. For all other issues of writing style, please consult the latest editions of *The Chicago Manual of Style* and/or *Words into Type*.

5.4 Use of Intellectual Property, Including Copyrighted Material

It is National Academies of Sciences, Engineering, and Medicine policy that permission to use unoriginal material must be obtained from the copyright holder of any graphic image, table, or section of text that exceeds accepted standards of fair use and that will be included in a National Academies publication or posted on the public section of the Web site in any form.

As a facilitator and disseminator of research, CRP has a particular interest in ensuring that all applicable laws and guidelines regarding intellectual property are followed in the preparation of materials for CRP projects and publications. Thus, contractors who submit proposals to conduct research under the auspices of CRP must sign the "Cooperative Research Programs Liability Statement" (May 2006, http://onlinepubs.trb.org/onlinepubs/crp/docs/Liability.pdf). By signing the liability statement, contractors

- Agree not "to infringe upon any copyright, patent, property right, personal right, or other right" [see Paragraph (b)] and
- Accept legal responsibility for any such infringement that may occur in their work [see Paragraphs (a) and (c)].

Authors of final deliverables are responsible for obtaining any permissions necessary for use of intellectual property, including copyrighted material. Authors should be familiar with appropriate practices for use of copyrighted or other rights-protected material in final deliverables. **In signing a contract with CRP, authors accept legal responsibility for any infringement of intellectual property rights (e.g., copyright) that may exist in the work they have done for CRP.** Contractors must obtain appropriate permissions for materials even if the published deliverables will have only limited distribution or will not be produced for sale. For guidance contractors should consult their firm's legal counsel. Section 5.4.1 summarizes guidelines that are particularly relevant in preparing CRP deliverables.

5.4.1 Reproducing Rights-Protected Material

The particular area of rights-related law that is most commonly at issue for CRP contractors is the area covering reproduction of copyrighted and other rights-protected work. **IN ADDITION TO OBTAINING PERMISSIONS, YOU MUST RETAIN ALL PERMISSIONS-RELATED DOCUMENTATION AND BE ABLE TO PRODUCE IT IF NECESSARY.** In preparing deliverables for CRP, contractors should take care when they

- **Directly quote substantial portions of text.** Permission is required to incorporate a quotation of copyrighted text large enough to be considered a significant proportion of the work as a whole (e.g., more than 300 words from a book or more than 50 words from a magazine, journal, or newspaper article). Moreover, permission is required to reproduce a section or part of a copyrighted text that is complete in itself (e.g., a chapter).
- **Reproduce tables, diagrams, illustrations, charts, and other artwork.** These items are almost always copyrighted. Permission is required when incorporating them into another work. Rights holders may require the inclusion of specific credit lines with the images. Adapted tables or figures may also need permissions.
- **Reproduce photos and/or use photos containing the likenesses of recognizable individuals.** Photographs, like tables, diagrams, illustrations, and charts, are almost always copyrighted and therefore permission is required to incorporate them into another work. To be used in deliverables, photographs that include likenesses of recognizable individuals also require signed releases from the individuals photographed.
- **Reproduce maps.** Many maps are copyrighted, and most importantly, Google maps and Google Earth images are copyrighted, so permission must be requested to include them in a work. Google provides specifics on its "Google Permissions" webpage (www.google.com/ permissions/geoguidelines.html).
- **Reproduce presentation content.** Many presentations incorporate copyrighted material (e.g., text, images, videos, and music). A single image or slide may be considered a significant portion of a short PowerPoint presentation.
- **Reproduce website content.** Websites often contain copyrighted or licensed materials. Moreover, reproducing content from websites may require separate permissions from different rights holders. Even though it is easy to copy and paste material from a website into another document, if that document will be published in any way, permission is required to reproduce the copied-and-pasted material.

In addition, contractors should be aware of the following:

- A work can have more than one rights holder. An author and a publisher may both own rights in a particular work; also, online sources may involve rights-protected material from multiple sources. Permission is usually needed from all rights holders for reproduction of the work.
- Some material is in the "public domain," which means it can be reproduced without infringing anyone's rights. However, this area of rights-related law is more complex than many people realize. Material that is publicly available—free or otherwise—is not necessarily in the public domain.
- While a contractor may have been granted permission to reproduce material in a deliverable prepared in fulfillment of a CRP project, the terms of that permission may not cover the subsequent publication of the deliverable by CRP. When obtaining permission from the rights holder, be sure that the rights requested and granted cover the circumstance of publication by CRP (see Section 5.4.2.3). Be sure to include any required credit lines in the deliverable and provide information about any restrictions on use (e.g., if material is released for use in print but can't be posted online).

5.4.2 How to Request Copyright Permission

1. **Begin requesting permissions as soon as possible**. It can take 6 to 8 weeks or longer for publishers to process permission requests. Publication of a product can be delayed if contractors have to wait for permissions. Permissions should be in writing—an email is fine.

2. **Direct your initial permission requests to the Copyright Clearance Center (www.copyright.com) and/or the publisher.** If the Copyright Clearance Center manages the rights to the material, contractors can request permission to use the material on their website. If not, the publisher should be contacted. Even if the publisher is not the rights holder (or the only rights holder), the publisher should be able to help find and contact the rights holder(s). Many publishers have online permission request processing. Look for a link that says "permissions," "rights," or "licenses." There may be a fee involved. Many rights holders will waive or reduce the fee for reproducing their material if they are informed that the work will be included in a research document that will be published by a nonprofit organization and that will be available to the public at no charge.

3. **Request permission by email, letter, fax, or online form and include the following**:
   - Description of the material the contractor wants to use (e.g., Table 3: Road improvements)
   - Page number(s) on which the material appears in the original document
   - Author, title, publisher, and date of publication of the original document
   - Contractor name and contact information
   - Title of CRP publication in which you will use the material (or tentative title, such as the CRP Project title)
   - The rights requested (the quoted text below covers the rights needed for CRP publication)

     "a nonexclusive worldwide license in all media and languages now or hereafter known, in both printed and electronic formats, to use the material specified below in the referenced work, and in the creation and dissemination of derivative works, subsequent and alternative editions of the referenced work (including versions made for use by blind or physically handicapped individuals)."

Submission of the final deliverables must include a signed Certification of Compliance with Copyright Requirements indicating that the contractor has obtained all necessary permissions (see Figure 17). CRP must be notified if only partial permission has been granted for a property or properties (for example, English language rights may be granted, but not other language rights). **Material should only be used in deliverables if permission has been obtained or if the contractor team created the material.**

For a sample permission request letter (including the boilerplate), see Figure 18.

5.4.3 For More Information

The Copyright Clearance Center has a video on its website that provides a basic overview of copyright. Go to www.copyright.com/learn/media-download/copyright-basics.

The U.S. Patent and Trademark Office also offers information on the types of intellectual property rights and the differences among copyright, trademark, and patents.

If you have specific questions about copyright or other intellectual property requirements that may apply to content you plan to use in a deliverable for CRP, consult with legal counsel.

Keep copies of permissions received to refer to in case there is a problem later.

Transportation Research Board
Cooperative Research Programs

Certification of Compliance with Copyright Requirements

Project Title and Number:

(The signature of an authorized representative of the contractor and its employees and agents ("Contractor") is required on the following unaltered statement in order for the TRB to accept the agency's draft final deliverables. **Failure to submit this executed and unaltered statement may prevent publication**.)

The Contractor certifies that no part of any draft final deliverable(s) being delivered to the Academy ("Work Product") nor the title to the Work Product infringes on any copyright, patent, property right, personal right, or other right; that all statements in the Contractor's Work Product are true to the Contractor's actual knowledge and belief, or based upon reasonable research for accuracy; and that the draft final deliverables supplied comply with Federal and state governmental requirements regarding copyright and patent law.

Anything other than full permission must be detailed below or attached. Full permission is defined as nonexclusive worldwide license to use the materials specified in all media and languages now or hereafter known, in both printed and electronic formats and in the creation and dissemination of derivative work, and subsequent and alternative editions of the revised final deliverable(s) (including versions made for use by blind or physically handicapped individuals).

Contracting Organization:

Authorized Representative: Title:

Signature: Date:

Figure 17. Certification of compliance with copyright requirements.

[Date]
[Rights holder's Name]
ATTN: RIGHTS & PERMISSIONS
[Rights holder's Street Address]
[Rights holder's City, State, Zip]

Dear Permissions Department:

I am writing to request permission to reprint material in a publication of the Transportation Research Board (TRB), a program unit of the National Academies of Sciences, Engineering, and Medicine. The publication is tentatively titled:

[*XXXXXXXXXXXXXXXXXXXX*]

Author(s): [Author(s) name(s)]

We request a nonexclusive worldwide license in all media and languages now or hereafter known, in both printed and electronic formats, to use the material specified below in the referenced work, and in subsequent and alternative editions in perpetuity (including versions made for use by blind or physically handicapped individuals). We also request a nonexclusive license to electronic distribution that may be granted to external parties on behalf of the National Academies.

If you do not control these rights in their entirety, would you please indicate to whom I should apply?

Thank you for your consideration.

Sincerely,
[Your name]
[Your full address]
[your phone #, fax #, email address]

MATERIAL REQUESTED:
[Fully describe the material. See example below.]

From [Nutt, Redfield, and Valentine et al., *NCHRP Report 620: Development of Design Specifications and Commentary for Horizontally Curved Concrete Box-Girder Bridges*, 2008, Figure 4-3. Typical single-cell cast-in-place cross section. p. 33.]

Permission granted by (name, title, phone number):

_____ _____
Date:

Credit line to be used: _____
_____

Fee (if any): _____

Figure 18. Sample permission request letter.

5.5 Submittal to CRP

When submitting final deliverables to CRP:

- Complete and include the Final Deliverables Transmittal Form.
- Provide hard copy of all textual material (including quotes and references) on 8.5 x 11 in. paper.
- Provide all textual material electronically in Microsoft Word–compatible format. If the Senior Program Officer requests portions of the final deliverables to be provided as PDF files, Microsoft Word-compatible files are still required for editorial purposes.
- Place figures and tables in text **and** provide separate electronic files for all figures and tables *not* created in Microsoft Word. These separate electronic files should be provided in the native file format of the originating program (for example, .ppt, .pptx, .ai, .psd, .xls, .xlsx) or, if the originating program is not a common one, a standard cross-program format (for example, .jpg, .tif, .pdf, .png). Tables created in Microsoft Word or Excel should stay in Microsoft Word or Excel.
- Provide appendix material as separate electronic files. Appendixes should be paginated individually (for example, A-1, A-2, …, B-2, etc.).
- Ensure that your files are spellchecked, current, and complete. Hard copy and electronic files must match exactly; all numbering, figures, text, etc. should be the same.

If you have questions about formatting your final deliverables, please contact the CRP Editorial Staff at crpeditors@nas.edu. All other questions should be directed to the CRP Program Officer.

APPENDIX A

Airport Cooperative Research Program

Systematic, well-designed research provides the most effective approach to solving many problems facing airport operators. Airport problems are often of local interest and can best be studied by airport operators individually or in cooperation with universities or other institutions and commercial organizations. A coordinated program of cooperative research is the most efficient way to meet the needs of many airport operators interested in airport research.

In recognition of these needs, the Vision 100-Century of Aviation Reauthorization Act in 2003 established the Airport Cooperative Research Program (ACRP). ACRP undertakes research and other technical activities on a variety of airport problems involving operations, planning, engineering, maintenance, human resources, administration, and policy-related issues. ACRP is funded directly by the Federal Aviation Administration (FAA). ACRP operating procedures are outlined in a memorandum of agreement between the FAA and The National Academies of Sciences, Engineering, and Medicine (the Academies), acting through TRB.

Each annual cycle of ACRP research begins with a nationwide request for research problem statements. These research problem statements are submitted to TRB and reviewed by the ACRP Oversight Committee (AOC). The amount of funding available to the AOC to allocate to projects is determined annually by the federal legislative process. The AOC selects research projects from the problem statements and establishes a budget for each project. In accordance with the Academies' and TRB's established practices and procedures to provide for competitive, merit-based selection of research institutions, research project oversight, and dissemination of research results, project panels are created through a nationwide request for nominations of outstanding professionals who are very knowledgeable in the specifics of a particular project. It is the panel's responsibility to prepare a research project statement for its specific project, select the research contractor, and provide project oversight.

Research problems are grouped into 11 broad research fields: Administration, Environment, Policy and Planning, Safety, Security, Human Resources, Design, Construction, Maintenance, Operations, and Special Projects. Projects that do not fall easily into one of the first 10 broad fields are assigned to Special Projects.

Program staffing consists of a Director, Cooperative Research Programs; an ACRP Manager, who is responsible for overall operational matters; Project Managers (referred to hereafter and in contracts as Senior Program Officers) who are responsible for all administrative and technical matters related to contractors' research projects; and Editorial Staff who prepare project final deliverables for publication in one of ACRP's formal series.

More information can be found at www.trb.org/acrp

APPENDIX B

Behavioral Traffic Safety Cooperative Research Program

A forum for coordinated and collaborative research, the Behavioral Traffic Safety Cooperative Research Program (BTSCRP) is a partnership between the Governors Highway Safety Association (GHSA), the National Highway Traffic Safety Administration (NHTSA), and The Transportation Research Board (TRB). The BTSCRP develops practical solutions to save lives, prevent injuries, and reduce costs of road traffic crashes associated with unsafe behaviors.

The GHSA Executive Board serves as the Governing Board for the BTSCRP. The Board consists of representatives of the 10 NHTSA regions and appoints the GHSA Research Committee, who monitors and facilitates the activities of BTSCRP. Its ultimate goal is to oversee a quality research program that is committed to addressing research issues facing the State Highway Safety Offices and to promote research findings that improve highway safety.

Each year the GHSA Research Committee facilitates the development of research project problem solicitations. Anyone can write or contribute to preparing a problem statement. However, problem statements must be endorsed by a State Highway Safety Offices, GHSA Executive Board members, GHSA Committees, or NHTSA to be eligible for consideration. Submitters are strongly encouraged to do a literature search, before submitting, to ensure the problem hasn't been solved or isn't being studied already. NHTSA and TRB staff will review the submitted research project problem statements and provide feedback to the Governing Board. The Governing Board gives final approval of the annual research projects.

Once the research projects are approved, TRB assigns the problem statements to technical panels of experts who provide guidance on the technical aspects of the research and translate the problem statements into BTSCRP research Requests for Proposals (RFPs) with well-defined objectives. On the basis of these statements, TRB solicits research proposals from private and public research organizations that can demonstrate capability and experience in the problem area to be researched.

The technical panels of experts review the proposals, recommend contract awards, monitor research in progress, provide technical guidance, and review reports for acceptability and for accomplishing the research plan. They also provide counsel to TRB staff in matters of overall project administration.

More information can be found at www.trb.org/btscrp

APPENDIX C

National Cooperative Highway Research Program

The National Cooperative Highway Research Program (NCHRP) was established in June 1962 to provide a continuing program of highway research on acute problems that affect highway planning, design construction, operation, and maintenance nationwide. NCHRP is sponsored by member departments of the American Association of State Highway and Transportation Officials (AASHTO), in cooperation with the Federal Highway Administration (FHWA), U.S. Department of Transportation. All of the state highway and transportation departments contribute funds annually to fund the program. AASHTO committees and member departments and the FHWA recommend research topics each year, and the AASHTO Standing Committee on Research selects both the projects to be funded and the level of funding for each project. At least two-thirds of the member departments must then approve these research problems and agree to their support before they can be brought into the program.

The TRB Executive Committee Subcommittee for NCHRP Oversight (SNO) provides guidance in overall policy formulation and makes recommendations to TRB concerning the acceptance of research problems referred to The National Academies of Sciences, Engineering, and Medicine (the Academies) for administration by AASHTO. The SNO is drawn from the officers and ex-officio members of TRB's Executive Committee. In accordance with the Academies' established practices and procedures to provide for competitive, merit-based selection of research institutions, research project oversight, and dissemination of research results, project panels are created through a nationwide request for nominations of outstanding professionals who are very knowledgeable in the specifics of a particular project. It is the panel's responsibility to prepare a research project statement for its specific project, select the research contractor, and provide project oversight.

Each project is assigned to one of 25 problem areas falling within eight broad research fields. For example, in the field of "Transportation Planning," each project falling within the more specific problem areas of "Forecasting" or "Impact Analysis" is assigned a project panel composed of outstanding individuals very knowledgeable in the specifics of the particular project, who are looked to for guidance and counsel throughout the research and reporting phases. Those projects that do not easily fall under one of the broad fields are assigned to Special Projects.

Program staffing consists of a Director, Cooperative Research Programs; an NCHRP Manager, who is responsible for overall operational matters; Project Managers (referred to hereafter and in contracts as Senior Program Officers) who are responsible for all administrative and technical matters related to contractors' research projects; and Editorial Staff who prepare contractors' final deliverables for publication in one of NCHRP's formal series.

More information can be found at www.trb.org/nchrp

APPENDIX D

Transit Cooperative Research Program

Authorized by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the Transit Cooperative Research Program (TCRP) was created on May 13, 1992, by a memorandum of agreement executed between the Federal Transit Administration; the National Academies of Sciences, Engineering, and Medicine (the Academies), acting through TRB; and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research arm of the American Public Transportation Association. Under this agreement, TCRP provides a unique program of transit research with funding from the Federal Transit Administration.

Each annual cycle of TCRP research begins with a nationwide request for research problem statements. These research problem statements are submitted to TRB and reviewed by the TCRP Oversight and Project Selection (TOPS) Committee, whose members also comprise the Board of Directors of the TDC. The TOPS Committee selects the research projects from the problem statements and determines the level of funding for each project. In accordance with the Academies' established practices and procedures to provide for competitive, merit-based selection of research institutions, research project oversight, and dissemination of research results, project panels are created through a nationwide request for nominations of outstanding professionals who are very knowledgeable in the specifics of a particular project. It is the panel's responsibility to prepare a research project statement for their specific project, select the research contractor, and provide project oversight.

Research problems are grouped into eight broad research fields. Those projects that are not readily identified with one of the first eight broad fields are assigned to Special Projects.

Program staffing consists of a Director, Cooperative Research Programs; a TCRP Manager, who is responsible for overall operational matters; Project Managers (referred to hereafter and in contracts as Senior Program Officers) who are responsible for all administrative and technical matters related to contractors' research projects; and Editorial Staff who prepare contractors' final deliverables for publication in one of TCRP's formal series.

More information can be found at www.trb.org/tcrp

APPENDIX E

Tips for Faster Publication

Tips for Faster Publication of Your CRP Final Deliverables

(For more detail, see Chapter 5 of "Procedural Manual for Contractors Conducting Research in the Transportation Research Board's Cooperative Research Programs")

- **Keep the formatting *SIMPLE.*** *Provide a basic, single-column,* ***MS Word*** *document or use the appropriate CRP template.* Consult with crpeditors@nas.edu before using quote boxes, icons, elaborate headers and footers, color, shading, pull quotes, and so forth. (See Section 5.3.)
- **Place artwork appropriately in text *and* provide separate electronic files for all art (unless the artwork was actually created in MS Word).** This art should be provided in its original format (.ppt, etc.) or a cross-program format (.jpg. etc.) and should be at least 300 dpi. Tables created in Microsoft Word or Excel should stay in Microsoft Word or Excel. (See Section 5.5.)
- **Call out the artwork in the text** (for example, "See Figure 1") to indicate the position of the artwork**.** (See Section 5.3.3.)
- **Make sure that artwork titles clearly convey information about the art.** (See Section 5.3.3.)
- **Provide the highest possible resolution of artwork.** Photos should be **at least** 300 dpi. Screen captures will probably look blurry—don't use them unless you have to. (See Section 5.3.3.)
- **Make sure that artwork <u>does not depend on color</u> to convey meaning**—CRP cannot guarantee that readers or users will access the work in color. (See Section 5.3.3.)
- **Use the author–date reference system for references.** The author–date system allows references to be added or deleted more quickly than the numbered system. (See Sections 5.2.4.1 and 5.3.7.)
- **Check every reference citation in the text to ensure that the publication year and the spelling of the author's name match those of the reference list in the end.** (See Sections 5.2.4.1 and 5.3.7.)
- **Don't footnote text** (See Section 5.3.1.)
- **Obtain any necessary permission for use of copyrighted material and other intellectual property.** You must get permission from the original publisher to reprint any table, photo, or other artwork or to excerpt large portions of text. (See Sections 5.2.5 and 5.4.) Include specified credit lines or "Reproduced by permission" as necessary.
- **Ensure that your files are spellchecked, current, and complete.** (See Section 5.5.)
- **Do *not* submit PDF files only. Word files are necessary for the editorial process.** (See Section 5.5.)

If you have questions, contact your project's Senior Program Officer or contact the CRP editors via email at crpeditors@nas.edu.