Writing Literature Reviews for Transportation Research Projects

The purpose of this TRS is to serve as a synthesis of pertinent completed research to be used for further study and evaluation by MnDOT. This TRS does not represent the conclusions of either CTC & Associates or MnDOT.

Introduction

Despite its importance, the literature review is a relatively poorly understood component of research, and many authors in a number of fields have lamented the poor quality of literature reviews submitted for publication (*1, 2, 3*). Research agencies, professors and others with research administration responsibilities often expect that researchers understand the importance and expectations for a literature review when, in fact, there is often little focus on it or dialogue about its intended contribution in a given research project.

This document, drawing from the literature surrounding the topic, aims to summarize the characteristics of effective literature reviews and approaches for writing them. The intended audience is principal investigators and their teams who conduct research for transportation agencies and who are expected to deliver a literature review as part of each research project.

The literature *search* or preparatory work of identifying and collecting the appropriate writings to be analyzed in the review (such as books, peer-reviewed journal articles, conference proceedings, sponsored research and online information) is treated in a separate document.

Contents

I. Definition and Purpose of a Literature Review

The literature review is a critical portion of the research process in any field of inquiry and an important component of the final research report. For the researcher, a literature review helps to clarify the scope of the research project by creating a narrative of what is and is not known in the field and where there are areas of dispute. For the customer of the research and other readers, the review also provides valuable context, establishes the researcher's expertise and relates the findings of the project to what is already known.

In the case of transportation research, identifying the hallmarks of a good literature review is complicated by the wide range of business functions and research subject areas falling under the jurisdiction of federal and state transportation agencies. What might be a good approach for a literature review in pavement research and related materials sciences may be inappropriate for a literature review related to psychology and human factors in safety research. In addition, the applied nature of most state-sponsored research often means the project scope is already well-defined by the customer and not as open-ended as some academic research.

It is important to remember what a literature review is *not* (*4*). A bibliography, for example, is merely a list of published works with author, publisher, date, etc. An annotated bibliography includes a summary or evaluation with each work, but it is still not a literature review, though it may be a useful step and a separate product of value for both the author and reader.

A literature review is not a list but rather a narrative, organized by topic, with connections between papers made as appropriate. Within each topic of the literature review, cited works should be given prominence according to their importance and relevance rather than being presented equally (*5*):

> A good literature review comprises a flowing, easy-to-understand narrative, written in the author's own style. Each topic should be discussed in turn and, while it is often appropriate to discuss the literature on each topic in chronological order, this should not be done slavishly. The topics are then combined in a chapter that should be well organized, and gives the reader a brief, yet reasonably complete picture of the status of the research in the subject area reviewed (Volume 1, p. 55).

A properly researched and written literature review performs many important functions for a research project. Several sources have outlined the value that a literature review provides to both the researcher and the reader:

- **Informing research.** Conducting a literature review should help a researcher understand what is and isn't known about the research topic, according to a University of Toronto tutorial (*6*). This process should help identify areas of controversy and questions that require further research. It can also help the researcher avoid approaches that have been tried unsuccessfully (*1*, *7*). In an editorial about the quality of literature reviews, Webster and Watson (*3*) argue that:

  > Extending current theories or developing new theories will create directions for future research. However, extending or developing theories is a difficult task and is often the weakest part of a review. Nonetheless, it is the most important part of a review and generally needs the most elaboration (p. xix).

- **Providing context.** According to Washington et al. (*5*), a literature review should summarize the current state of research for the reader and provide an overview of previous works on related topics:

  > It is not sufficient to simply report the findings of each author. The findings must be placed in context, and connected so that the state of knowledge on each topic emerges. In doing the review, the writer should have gained insights in the subject area that are not apparent to a person not undertaking a thorough review. These insights should be shared with the reader (Volume 1, p. 55).

The significance of each of the previous studies cited, and their relevance to the current study, should be clear (*5*). The overview should also justify the significance of the current research (*1*). The literature review should define what is and is not within the scope of an investigation, report and critically examine claims made in existing literature, and synthesize the literature to present a new perspective (*2*).

- **Establishing authority.** A well-done literature review demonstrates the researcher's familiarity with the current state of knowledge and research in a given field (*1*). There is some evidence that poorly written literature reviews can undermine the validity of the research in readers' minds. In their study of Australian dissertation review practices, Mullins and Kiley (*8*) found that a poor literature review will make reviewers more critical as they examine the rest of the thesis.

The purposes of a literature review in a specific transportation research project should be based on that project's objectives and clearly spelled out for the investigator, ideally as the result of a dialogue with the sponsoring agency. **Appendix D: Draft Specification Language** provides a framework for the two parties to define specific deliverables formally or informally.

II. Types of Literature Reviews

As detailed by Cooper's taxonomy (*9*), literature reviews may be comprehensive, representative or concentrated on pivotal works. The research problem statement and the detailed scope of the research project should clearly indicate what is sought from the literature review and promote a common understanding on the part of the agency and investigator before the work begins. Does the agency requesting the research desire a broad review of nearly all applicable literature on the topic to give background and historical perspective? Or is the interest narrower, perhaps focused on a particular time frame or specific subproblem of a larger issue?

While all literature reviews support research, their specific functions and relation to that research vary. Several methods of classifying literature reviews have been proposed. These classifications inform the research and writing of a literature review.

Cooper (*9*) described an influential taxonomy scheme created to classify literature reviews. The structure was based on interviews with 14 education and psychology scholars and a survey of 68 researchers who had published reviews of research literature. Under this taxonomy, literature reviews can be classified based on:

- **Focus.** Reviews can focus on research outcomes, research methods, theories, and practices or applications. Most reviews will focus on more than one of these areas, although with varying levels of attention.
- **Goals.** Goals include synthesis, criticism and identification of central issues. Nearly all reviews synthesize past literature, which encompasses generalizing from multiple specific instances, proposing explanations that can resolve conflicts between contradictions found in the literature and closing gaps between theories or disciplines by creating a linguistic framework that can be shared.
- **Perspective.** Literature reviews can either present evidence neutrally or advocate for a specific position. Advocating for a specific position is not necessarily an indication of bias; it is possible for an author to fairly review and present conflicting evidence but still reach a conclusion about the correct interpretation and present it.
- **Coverage.** Reviews may be comprehensive (presenting all works relevant to the topic); comprehensive with selected citations (basing conclusions on all works relevant to the topic, but only presenting a selection of the most important works in the review); representative (presenting samples of the relevant material); or concentrated on central or pivotal works.
- **Organization.** Effective literature reviews can be organized chronologically, conceptually or methodologically. More details about organization options and the scenarios where each is most appropriate are presented in step 5 of **Writing the Literature Review**.
- **Audience.** The audience for a literature review—whether specialized researchers, general researchers, practitioners, policymakers or the general public—will affect the writing style and language used.

Webster and Watson (*3*) presented another classification scheme that divided literature reviews based on whether the subject is relatively mature or still emerging. In mature topics, a literature review analyzes and synthesizes existing literature, with the ultimate goal of proposing a model that extends that research. In emerging topics, a literature review presents the theoretical foundations of the research at hand.

Some research projects are scoped to consist *primarily* of the literature review, with little or no additional research. Two of the projects in **Appendix A: Examples of Effective Transportation Literature Reviews** are of this type:

- "Crack and Concrete Deck Sealant Performance" is essentially a review and synthesis of information from 39 relevant studies in support of the overall project's purpose of defining the current state of the art regarding bridge deck sealants and crack sealers. The appendix of the report includes an annotated bibliography summarizing each study discussed in the literature review.
- "Snow Removal at Extreme Temperatures" presents an extensive literature review in a 47-page appendix comprising more than two-thirds of the 72-page report. The literature review uses a topical organization to first provide an overview of the literature on deicing chemicals followed by a synthesis of studies related to various strategies for clearing snow and ice at extremely low temperatures.
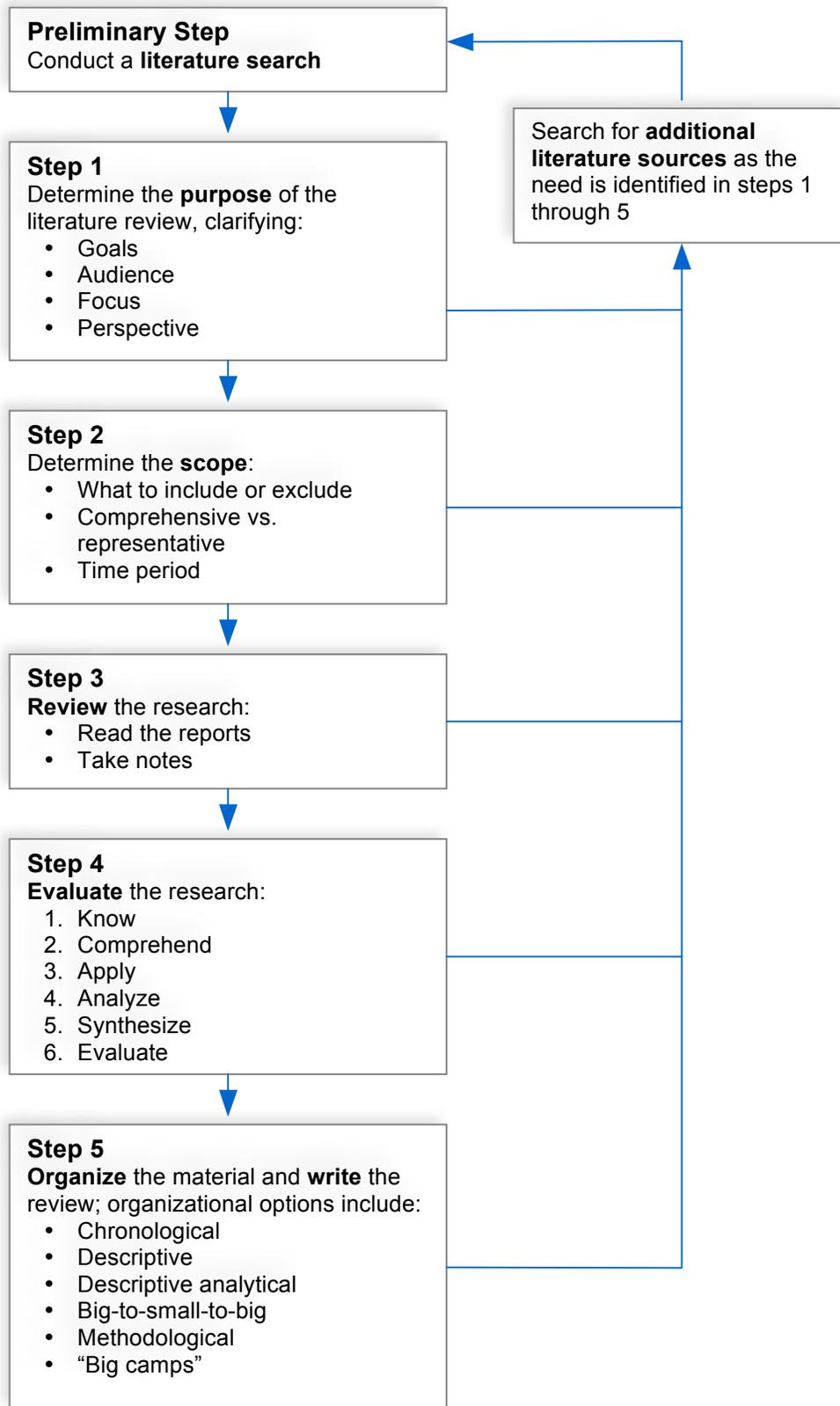
Other research projects consist of engineering studies or other explorations in which the literature review may be a relatively small portion of the project intended to frame or inform the problem being addressed. The following two projects in **Appendix A: Examples of Effective Transportation Literature Reviews** are of this type.

- "Development of a Concrete Maturity Test Protocol" reports the results of extensive field and laboratory testing of several different test methods and equipment for determining concrete pavement maturity. The literature review reported in Chapter 2 of the report reviews current concrete maturity test methods, providing background for the field and lab studies.
- "Quality of Life: Assessment for Transportation Performance Measures" uses the literature review to provide context for the report by first assessing broader literature on the quality of life followed by a review of papers relating more specifically to transportation's effect on quality of life. The research effort itself includes a survey and focus groups, the results of which comprise the bulk of the research report.

III. Writing a Literature Review

Writing a literature review can be broken down into several steps. Because the observations in this document are intended to cover a broad spectrum of transportation research topics, authors should adapt these observations to their specific situation and in consultation with the sponsoring agency. The steps are outlined as a flow diagram in Figure 1, followed by a detailed description of each step.

Note that the procedure assumes that a literature *search*, which is treated in a separate document, has already been conducted. Each step in the literature review writing process may inform a need to revisit and expand the literature search.

Preliminary Step
Conduct a **literature search**

Step 1
Determine the **purpose** of the
literature review, clarifying:
- Goals
- Audience
- Focus
- Perspective

Search for **additional
literature sources** as the
need is identified in steps 1
through 5

Step 2
Determine the **scope**:
- What to include or exclude
- Comprehensive vs.
  representative
- Time period

Step 3
Review the research:
- Read the reports
- Take notes

Step 4
Evaluate the research:
1. Know
2. Comprehend
3. Apply
4. Analyze
5. Synthesize
6. Evaluate

Step 5
Organize the material and **write** the
review; organizational options include:
- Chronological
- Descriptive
- Descriptive analytical
- Big-to-small-to-big
- Methodological
- "Big camps"

Figure 1. Flow diagram for writing a literature review.

1. **Determine the purpose of the literature review.** All literature reviews perform some basic functions: informing the research by clarifying what is and is not known about a topic, providing context by summarizing the current state of research on the topic, and establishing a researcher's authority by demonstrating his or her understanding of related existing research. However, literature reviews can fall into any number of subclassifications (*9*). Effectively positioning a review in that taxonomy requires a researcher to make some specific decisions:
   - **What is the goal of the review?** While all or nearly all literature reviews synthesize information, they may also analyze the existing literature to attempt to demonstrate which conclusions are warranted and which are not, or to identify issues central to a field, such as methodological problems that have blocked progress in a specific topic or areas of inquiry that have been or should be the focus of research.
   - **Who is the audience?** The writing style and language chosen will change, depending upon whether the literature review is aimed at specialized researchers, general researchers, practitioners, policymakers or the general public.
   - **What is the focus of the review: research outcomes, research methods, theories, or practices and applications?** These topics are not mutually exclusive, and many reviews will address more than one of these areas with varying levels of attention.
   - **What is the perspective of the review?** A literature review may present information neutrally, or it may build a case for a specific position. (Note that this can be achieved without bias; an author should present conflicting evidence and interpret it fairly.)

2. **Determine the scope.** The scope includes three major facets:
   - Defining the specific topic that the literature review will cover and topics that will not be covered.
   - Determining how comprehensive the review will be. It may be appropriate to seek all relevant works, a representative sample or only the significant works on a topic.
   - Defining the time period the review will cover. Literature reviews that seek to synthesize current knowledge often focus on recent research, while reviews that seek to demonstrate how a field has developed over time will naturally incorporate more historical research.

3. **Review the research.** While it is not generally necessary to read every piece of marginal literature in-depth, thorough note-taking that includes bibliographical information is critical to the research process (*10*). It is much easier and much less work to take notes of material that are not ultimately used in the literature review than it is to not make note of material that turns out to be needed.

   A University of Colorado Denver tutorial (*11*) presents two approaches to note-taking:
   - The first is the "summarize-as-you-go" method, in which the researcher writes complete sentences with citations that can be pasted into the literature review nearly verbatim. These notes should summarize a study's context, methods, findings, conclusions and implications.
   - Second is the "note-basic-details" method, in which the researcher captures more basic information about a study's context, methodology, findings, implications and suggestions for future research, without trying to generate nearly publication-ready prose. Prevalent themes in individual studies should also be noted so they can be compared and organized when all studies have been reviewed.

   The former method requires more work early in the process, while the latter requires more effort later.

   Note: While a review of a paper *abstract* may be helpful in determining whether to include it in the literature review, it is not a substitute for reading the entire paper (*12*):

   > A well-prepared abstract enables readers (a) to identify the basic content of a document quickly, (b) to determine its relevance to their interests, and thus (c) to decide whether they need to read the document in its entirety (p. 2).

4. **Evaluate the research.** Levy and Ellis (*4*) outline a six-step framework for processing the information gathered:
   - **Know the material.** This step includes understanding the information in each cited work and the methodology used to reach its conclusions instead of simply identifying works that are relevant without describing their conclusions.
   - **Comprehend the material.** This step involves demonstrating how the information in a source is significant and relevant to the subject of the literature review rather than simply repeating the information within the cited source.
   - **Apply the material.** In this step, the review author identifies the major concepts of each work cited that relate to the study and organizes the information appropriately so it can support the story told by the literature review.
   - **Analyze the material.** Analysis involves demonstrating why the information pulled from sources and presented in the literature review is important. The review author should make the value of the information explicit rather than simply presenting it and leaving the reader to draw conclusions.
   - **Synthesize the material.** A literature review is a narrative, not a collection of facts, and synthesis is what turns it from the latter into the former. The narrative should effectively generalize the material while noting any gaps in knowledge and areas of dispute.
   - **Evaluate the material.** The review author must distinguish between facts, theories and opinions in the works cited instead of simply presenting all material as if each source has equal supporting evidence and validity.

   For each part of the framework (except "apply the material"), Levy and Ellis (*4)* present short excerpts from literature reviews that fail to achieve these goals as well as modifications that improve them.

5. **Organize the material and write the review.** A literature review may be an introduction to a study or a standalone piece. Either way, however, the author must remember that it is a narrative, not simply a listing of resources or an annotated bibliography. Organizing the content in a logical, thematic manner that supports the literature review's overall goals is the most critical part of this step. Poor organization is one of the most prominently cited shortfalls in literature reviews.

   According to Washington et al. (*5*), the literature review should be organized by topic, with connections between papers made as appropriate. Within each topic, cited works should be given prominence according to their importance and relevance rather than being presented equally:

   > A good literature review comprises a flowing, easy-to-understand narrative, written in the author's own style. Each topic should be discussed in turn and, while it is often appropriate to discuss the literature on each topic in chronological order, this should not be done slavishly. The topics are then combined in a chapter that should be well organized, and gives the reader a brief, yet reasonably complete picture of the status of the research in the subject area reviewed (Volume 1, p. 55).

   There are several valid topical organizations, including:

   - **Chronological**, which is useful to show how knowledge in a field grows and changes over time.
   - **Descriptive**, which presents what several authors write about a specific topic, followed by analysis for that topic. This method highlights topical themes that make up the entirety of the subject.
   - **Descriptive-analytical**, which is a variation of the descriptive organization. In this method, the analysis presents the similarities and differences among the sources for each topic rather than presenting them at the end.

- **Big-to-small-to-big**, which begins with the largest and most wide-ranging studies before progressing to smaller ones, and then branches out to larger studies. This organizational method highlights how the results of broader studies differ from smaller ones and is particularly useful for empirically oriented reviews.
- **Methodological**, which groups studies by the methodologies they use. A brief analysis after each methodology shows what it does and does not cover, while a master analysis at the end compares and summarizes the findings.
- **"Big camps,"** which is useful when there are distinct interpretations of a set of data. It can either present various topics and how the different camps' interpretations are similar and different for each, or present each camp and its interpretations of all relevant themes as a single unit.

According to Cooper (*9*) and the University of Colorado Denver tutorial (*11*), literature reviews may also blend these methods as appropriate.

One common organizational method that many sources discourage is presenting literature author by author—that is, presenting the full content of one paper, followed by the full content of the next and so on (*3*, *13*). This type of presentation fails to truly synthesize the literature and show the relationships between various authors' work.

In the final formatting of the literature review it is important to consult the sponsoring agency's style guide, particularly regarding the format for citations in the references section and bibliography.

Appendix A: Examples of Effective Transportation Literature Reviews

Crack and Concrete Deck Sealant Performance, Karl Johnson, Arturo Schultz, Catherine French, Jacob Reneson, Minnesota Department of Transportation, Report No. MN/RC 2009-13, March 2009.
http://www.lrrb.org/media/reports/200913.pdf
The appendix of this report includes a thorough summary of each study cited in the literature review. The review itself, however, effectively synthesizes this raw information into a more useful form that supports the overall paper's purpose of defining the current state of the art regarding bridge deck sealants and crack sealers.

The literature review addresses bridge deck sealants and crack sealers in turn. Regarding deck sealants, it defines the two categories of sealants, the four performance measures used to evaluate sealants, and variables that affect performance such as concrete parameters and environmental conditions. The section on crack sealers discusses different types of sealers, their properties and application methods, performance measures, general trends in their effectiveness and variables affecting performance.

While there isn't a specific "Gaps in Findings" section, this literature review effectively notes these gaps throughout the review, identifying areas for nearly every topic that existing research has not investigated as well as noteworthy limits to specific research projects cited. Of particular note is how the review identifies a shortcoming with a widely used deck sealant evaluation procedure and a suitable method to compensate for it:

> It should be noted that the NCHRP Series II procedure, which is commonly used by vendors and state highway agencies to evaluate sealer performance, does not implement abrasion or freeze-thaw exposure to which sealers on bridge decks are frequently subjected. However, in determining the absorption properties of concrete sealers, a test was developed by Alberta Department of Transportation and Utilities which is essentially a modification of the NCHRP 244 procedure that incorporates abrasion (Kottke, 1987). Absorption is measured before and after abrading 0.04 in. off the faces of treated, cubic specimens to measure quantitatively the effect of abrasion on the absorption characteristics of sealers (p. 5).

The report clearly identifies the deck sealants and crack sealers that performed best for each of the performance measures, while noting how differences in test procedures can affect results. This provides useful information to support the report's overall conclusions and recommendations.

Snow Removal at Extreme Temperatures, Michelle Akin, Jiang Huang, Xianming Shi, David Veneziano, Dan Williams, Clear Roads Program, Minnesota Department of Transportation, March 2013. http://www.clearroads.org/downloads/Snow-Removal-Extreme-Temps-Final-Report.pdf
This report is immediately noteworthy for the thoroughness of its literature review in Appendix A, which makes up more than two-thirds of the report—47 of 72 pages. Moreover, it includes international research and research from fields such as airports where snow-removal practices are different but potentially relevant to the work of state DOTs.

The literature review also represents a clear topical organization, first providing an overview of literature available on various deicing chemicals with a focus on their physical properties, and then reviewing various strategies for clearing snow and ice from roads at low temperatures.

Development of a Concrete Maturity Test Protocol, W. James Wilde, Center for Transportation Research and Implementation, Minnesota State University, Mankato, Report No. MN/RC 2013-10, April 2013. http://www.dot.state.mn.us/research/TS/2013/201310.pdf
Field and laboratory studies were undertaken to evaluate the applicability of the concrete maturity method to establishing criteria for opening portland cement concrete pavements to traffic. The field study included visits to 18 paving projects in Minnesota over a three-year period. At these projects, different sensor types were evaluated. In the laboratory study, 2-inch mortar cubes were tested to develop sensitivity analyses related to the proportions of cementitious materials, water-cementitious materials ratio and other mix components.

The literature review chapter of the report summarizes and discusses the literature regarding (1) the maturity method in general and its use in concrete pavements in particular; (2) supplementary cementing materials; (3) maturity and flexural strength; and (4) various types of sensors for measuring maturity.

Quality of Life: Assessment for Transportation Performance Measures, Ingrid Schneider, Tian Guo, Sierra Schroeder, Minnesota Department of Transportation, Report No. MN/RC 2013-05, January 2013. http://www.dot.state.mn.us/research/TS/2013/2013-05.pdf
This report investigates a topic (the effect of transportation on quality of life) with relatively little published research and none that addresses the topic comprehensively. To provide context for the report, the researchers start with a broader assessment of research into quality of life. This assessment defines key terms relevant to the study as well as methodologies that have been used to measure and predict quality of life, with a number of demographic distinctions.

Connecting the literature to transportation requires something of a patchwork approach, collecting papers that illuminate some specific element of transportation's effect on quality of life to give as complete a picture as possible. Chapter 2 reports on the limited assessments that have been conducted as well as the strengths and weaknesses of their methodologies, organized by the specific factor investigated. In doing so, the literature review clearly delineates what is known and what is not known about the subject.

Appendix B: Tutorials on Writing Literature Reviews

There is no shortage of online tutorials for writing literature reviews. Most are produced by university libraries and aimed at student researchers working on theses; however, the principles are applicable to all researchers. The majority of these tutorials put more focus on searching for sources than on synthesizing the information into a useful literature review. Five of the more thorough and useful tutorials for the organizational and writing process are:

Literature Reviews: An Overview for Graduate Students, North Carolina State University Libraries, undated.
http://www.lib.ncsu.edu/tutorials/lit-review/
This video includes a unique visualization of the process of organizing existing literature, with major works forming the core of a web and studies that respond or build on them. This web identifies and depicts relationships among sources and provides a framework for developing and connecting original ideas to the body of published literature.

Literature Review, Texas A&M University Libraries, July 23, 2013.
http://guides.library.tamu.edu/content.php?pid=225811
This website includes a lengthy video lecture on planning a literature review, searching for literature, assessing it and writing the review. It advises authors to consider their timeline and any standards they must follow in their planning process. It also recommends that authors determine criteria for papers that would be useful to cite in their research before beginning their literature search—defining details of the subject that are of interest and limiting by factors such as geography or time period. Existing literature reviews can be a useful resource by demonstrating what work has been done recently and by suggesting search methods and articles for inclusion. New literature reviews should not replicate previous ones, and if there is too much overlap, the focus of the review may need to be adjusted to focus on areas not already covered.

The Literature Review: A Few Tips on Conducting It, Dena Taylor, Health Sciences Writing Centre, University of Toronto, undated.
http://www.writing.utoronto.ca/advice/specific-types-of-writing/literature-review
This website offers a series of questions for researchers to help shape the literature review as they research and write it. Additional questions help to assess the validity of the books and articles they consider including in the review.

Writing a Literature Review and Using a Synthesis Matrix, Florida International University Center for Excellence in Writing, 2006.
http://writingcenter.fiu.edu/resources/synthesis-matrix-2.pdf
This presentation describes the synthesis matrix technique for organizing information. The synthesis matrix is a chart with the major ideas found in the literature labeling the rows and the individual sources labeling the columns. Individual chart entries list related information from each source. The technique is useful for clarifying patterns in the literature as well as areas where different sources agree and disagree.

Writing a Literature Review, University of Colorado Denver School of Public Affairs, undated.
This four-part video series presents the elements of writing a literature review.

- Part I discusses basic organization.
  http://video.ucdenver.edu/users/ehowell/litreviewI.html
- Part II specifies that literature reviews are a survey of research and discusses finding and noting representative studies.
  http://video.ucdenver.edu/users/ehowell/litreviewII.html
- Part III goes into detail on finding and developing themes and organizing the literature review, including common organizational models.
  http://video.ucdenver.edu/users/ehowell/litreviewIII.html
- Part IV discusses the introduction and summary of the literature review.
  http://video.ucdenver.edu/users/ehowell/litreviewIV.html

Appendix C: Annotated Bibliography

Bertini, Robert. 2012. *Introduction to Library and Literature Research for Transportation*. Portland, OR: Portland State University.
http://web.pdx.edu/~bertini/pdf/research.pdf
The Intelligent Transportation Systems Laboratory at Portland State University produced this guide for students conducting research. The guide includes specific resources available at the university and online, reference styles, notes on plagiarism and copyright, information about presenting research and instructions for writing literature reviews that include examples of good and bad organization.

Boote, David N., and Penny Beile. August/September 2005. "Scholars Before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation." *Educational Researcher* 34(6): 3-15.
http://eprints.rclis.org/16929/1/diss_lit_review.pdf
From the abstract: A thorough, sophisticated literature review is the foundation and inspiration for substantial, useful research. The complex nature of education research demands such thorough, sophisticated reviews. Although doctoral education is a key means for improving education research, the literature has given short shrift to the dissertation literature review. This article suggests criteria to evaluate the quality of dissertation literature reviews and reports a study that examined dissertations at three universities. Acquiring the skills and knowledge required to be education scholars, able to analyze and synthesize the research in a field of specialization, should be the focal, integrative activity of predissertation doctoral education. Such scholarship is a prerequisite for increased methodological sophistication and for improving the usefulness of education research.

Cooper, Harris. 1988. "Organizing Knowledge Syntheses: A Taxonomy of Literature Reviews." *Knowledge in Society* 1: 104-126.
http://lgdata.s3-website-us-east-1.amazonaws.com/docs/577/213564/Taxonomy_of_Literature_Reviews_Article.pdf
From the abstract: A taxonomy of literature reviews in education and psychology is presented. The taxonomy categorizes reviews according to: (a) focus; (b) goal; (c) perspective; (d) coverage; (e) organization; and (f) audience. The seven winners of the American Educational Research Association's Research Review Award are used to illustrate the taxonomy's categories. Data on the reliability of taxonomy codings when applied by readers is presented. Results of a survey of review authors provide baseline data on how frequently different types of reviews appear in the education and psychology literature. How the taxonomy might help in judging the quality of literature reviews is discussed, along with more general standards for evaluating reviews.

Fitt, M. Harrison, Andrew Walker, and Heather Leary. April 1, 2009. "Assessing the Quality of Doctoral Dissertation Literature Reviews in Instructional Technology." Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.
http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1007&context=itls_facpub
From the abstract: Assessment of the doctoral dissertation literature review provides insight into a student's preparation for future work as a researcher. In 2004, efforts to assess the quality of literature reviews in doctoral dissertations were pioneered by Boote and Beile. Their work represents an important response to the call for improved research skills among emerging scholars. The purpose of this study is to replicate their work in a focused area of educational research, specifically Instructional Technology, and to examine the inter-rater reliability of the rubric. The findings suggest that dissertation literature reviews in Instructional Technology show the same need for improvement as dissertation literature reviews from education as a whole. Potential avenues of research are identified as well as improvements for rubric.

Gall, M. D., W. R. Borg, and J. P. Gall. 1996. *Educational Research: An Introduction*. 6th edition. White Plains, NY: Longman.
From the abstract: A comprehensive introduction to the major research methods and types of data analysis used [in educational research], this text provides detailed coverage of all facets of research.

Guidelines for Abstracts. ANSI/NISO Z39.14-1997. NISO Press. Bethesda, MD.
http://www.niso.org/apps/group_public/download.php/6609/Guidelines%20for%20Abstracts.pdf
From the abstract: Guidance is presented for authors and editors preparing abstracts that represent the content of texts reporting on the results of experimental work or descriptive or discursive studies. Suggestions for the placement of abstracts within publications or other media are given, along with recommendations for abstracting specific documents. Types of abstracts and their content are described. Also included are suggestions on the style of abstracts and a list of selected readings on the subject of abstracting. Examples of abstracts are appended.

Hart, Chris. 1998. *Doing a Literature Review: Releasing the Social Science Research Imagination*. London: Sage.
This book about writing a literature review is for students in social sciences and humanities. The contents include guidance on searching for literature on a topic, analyzing arguments, organizing ideas and perspectives, producing a literature review and justifying the need for an investigation.

Levy, Yair, and Timothy Ellis. 2006. "Towards a Framework of Literature Review Process in Support of Information Systems Research." *Proceedings of the 2006 Informing Science and IT Education Joint Conference*.
http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CDMQFjAA&url=http%3A%2F%2Fciteseerx.ist.psu.edu%2Fviewdoc%2Fdownload%3Fdoi%3D10.1.1.102.1506%26rep%3Drep1%26type%3Dpdf&ei=d_OvUeu_JsaKrAGNtoDADg&usg=AFQjCNELzDU01TVR6xxrJS8rnrpEvlvbgw&sig2=B-fClB-aXSMRVynQwbOLfw&bvm=bv.47534661,d.aWM
From the abstract: This paper introduces an initial effort towards developing a framework for writing an effective literature review. The target audience for the framework are novice IS researchers or other researchers who are constantly struggling with the development of an effective literature-based foundation for the proposed research. The proposed framework follows the systematic data processing approach comprised of three major stages: 1) inputs (literature gathering and screening), 2) processing (Blooms Taxonomy), and 3) outputs (writing the review). This paper provides the rationale for developing a solid literature review and addresses the central stage, processing the literature. The paper concludes by providing arguments for the value of an effective literature review as well as implications for future work in this proposed framework.

Mattson, Jeremy, and David Ripplinger. December 1, 2008. "How to Conduct a Literature Review." *Transportation and Logistics Seminar*, Small Urban & Rural Transit Center, Upper Great Plains Transportation Institute.
http://www.ugpti.org/events/seminar/downloads/2008-12-01DaveRipplinger.pdf
This presentation includes why a literature review is necessary, tips on searching, evaluating sources, reading literature, note-taking, writing and traps to avoid.

Mullins, Gerry, and Margaret Kiley. 2002. "'It's a PhD, Not a Nobel Prize': How Experienced Examiners Assess Research Theses." *Studies in Higher Education* 27(4): 369-386.
http://www.studentservices.uwa.edu.au/__data/page/65297/Its_a_PhD_not_a_Nobel_Prize.pdf.
From the abstract: Research to date on the examination process for postgraduate research theses has focused largely on the deconstruction of examiners' reports. This article reports on a study of the processes that experienced examiners go through, and the judgements they make before writing their reports. A sample of 30 experienced examiners (defined as having examined the equivalent of at least five research theses over the last five years), from a range of disciplines in five universities was interviewed. Clear trends emerged with regard to: the criteria used by examiners and the levels of student performance expected by them; critical judgement points in the examination process; the examiners' perceptions of their own role in the process; the influence on examiners of previously published work, the views of the other examiner(s) and their knowledge of the student's supervisor and/or department, and the level of perceived responsibility between student and supervisor.

Randolph, Justus. June 2009. "A Guide to Writing the Dissertation Literature Review." *Practical Assessment, Research & Evaluation* 14(13).
http://pareonline.net/getvn.asp?v=14&n=13
From the abstract: Writing a faulty literature review is one of many ways to derail a dissertation. This article summarizes some pivotal information on how to write a high-quality dissertation literature review. It begins with a discussion of the purposes of a review, presents taxonomy of literature reviews, and then discusses the steps in conducting a quantitative or qualitative literature review. The article concludes with a discussion of common mistakes and a framework for the self-evaluation of a literature review.

Washington, Simon, John Leonard, David Manning, Craig Roberts, Billy Williams, Ataur Bacchus, Adarsh Devanhalli, Jennifer Ogle, and Daniel Melcher. 2001. "Scientific Approaches to Transportation Research." *NCHRP Report 20-45*, Vols. 1 and 2.
http://onlinepubs.trb.org/onlinepubs/nchrp/cd-22/start.htm
This document is an extensive manual on transportation research. Of particular note are Volume 1, Chapter 5, which addresses the purpose and organization of literature reviews; Volume 1, Appendix A, which covers the evaluation of sources; and Volume 1, Appendix C, which covers formatting.

Webster, Jane, and Richard Watson. June 2002. "Analyzing the Past to Prepare for the Future: Writing a Literature Review." *MIS Quarterly* 26(2): xiii-xxiii.
http://www.sis.uta.fi/~pt/TIEA5_Thesis_Course/Session_08_2013_02_11/webster02-AnalyzingPastToPrepareForFuture-WritingLiteratureReview_0.pdf
This editorial addresses the quality of literature reviews that accompanied works submitted to *MIS Quarterly*, with notes about the journal's expectations, organization of reviews, and use of the review to extend theories and identify directions for new research.

Appendix D: Draft Specification Language

The suggested language below is meant to provide a framework for dialogue between the transportation agency and the principal investigator regarding what is expected in the literature review for a particular research project. The final language may be inserted into the research contract or used as a memorandum of understanding or other less formal agreement. A shared understanding of the features of the literature review outlined below is an important starting point. Defining specific deliverables will increase the likelihood that the investigator will understand the agency's objectives for the literature review and make a good faith effort to meet them.

- **Scope.** The literature review for this project shall include [*all literature/a representative sample of literature/all major works*] related to [*project topic*], published within the last [*xx*] years as well as older research pivotal to the subject. The literature review shall identify where there are gaps in knowledge in the published literature.
- **Purpose.** The literature review shall support the research project by analyzing and synthesizing previous literature. The following specific aspects of the research topic shall be addressed as well as others the investigator deems appropriate. [*List specific topics and desired methods of analysis.*]
- **Perspective.** Where there is controversy or disagreement in the published literature, diverse views shall be presented. The literature review shall evaluate arguments with the intent of illuminating the strengths and weaknesses of each rather than advocating for a specific position and shaping the evaluation of literature to support that position.
- **Organization.** The literature review shall be organized in such a way that conclusions the researcher has drawn, and the evidence to support those conclusions, are clearly presented. Works that are topically related shall be presented together.
- **Pertinence.** Literature cited in the review shall primarily be of research quality: peer-reviewed journals, conference proceedings and scholarly books. Other sources may be included as the investigator deems appropriate, with an explanation of the rationale for inclusion.
- **Audience.** The audience for this literature review and the research report is primarily agency practitioners and policymakers. The language and writing style should be appropriate for this audience.

References

1. Randolph, Justus. June 2009. "A Guide to Writing the Dissertation Literature Review." *Practical Assessment, Research & Evaluation* 14(13).
2. Boote, David N., and Penny Beile. August/September 2005. "Scholars Before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation." *Educational Researcher* 34(6): 3-15.
3. Webster, Jane, and Richard Watson. June 2002. "Analyzing the Past to Prepare for the Future: Writing a Literature Review." *MIS Quarterly* 26(2): xiii-xxiii.
4. Levy, Yair, and Timothy Ellis. 2006. "Towards a Framework of Literature Review Process in Support of Information Systems Research." *Proceedings of the 2006 Informing Science and IT Education Joint Conference.*
5. Washington, Simon, John Leonard, David Manning, Craig Roberts, Billy Williams, Ataur Bacchus, Adarsh Devanhalli, Jennifer Ogle, and Daniel Melcher. 2001. "Scientific Approaches to Transportation Research." *NCHRP Report 20-45*, Vols. 1 and 2.
6. The Literature Review: A Few Tips on Conducting It, Dena Taylor, Health Sciences Writing Centre, University of Toronto, undated.
7. Gall, M. D., W. R. Borg, and J. P. Gall. 1996. *Educational Research: An Introduction*. 6th edition. White Plains, NY: Longman.
8. Mullins, Gerry, and Margaret Kiley. 2002. "'It's a PhD, Not a Nobel Prize': How Experienced Examiners Assess Research Theses." *Studies in Higher Education* 27(4): 369-386.
9. Cooper, Harris. 1988. "Organizing Knowledge Syntheses: A Taxonomy of Literature Reviews." *Knowledge in Society* 1: 104-126.
10. Mattson, Jeremy, and David Ripplinger. December 1, 2008. "How to Conduct a Literature Review." *Transportation and Logistics Seminar*, Small Urban & Rural Transit Center, Upper Great Plains Transportation Institute.
11. Writing a Literature Review, University of Colorado Denver School of Public Affairs, undated.
12. Guidelines for Abstracts, ANSI/NISO Z39.14-1997, NISO Press. Bethesda, Maryland.
13. Bertini, Robert. 2012. *Introduction to Library and Literature Research for Transportation*. Portland, OR: Portland State University.