

MDOT Highway Noise Analysis and Abatement Handbook

8.0 - REFERENCES

8.1 Federal Acts/Regulation

[Moving Ahead for Progress in the 21st Century Act \(MAP-21\) of 2012](#)

[Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users \(SAFETEA-LU\) of 2005](#)

[Transportation Equity Act for the 21st Century \(TEA-21\) of 1998](#)

[FHWA Federal-Aid Policy Guide Title 23 Code of Federal Regulations Part 772](#)

[National Environmental Policy Act of 1969 \(NEPA\), as amended](#)

8.2 Federal and State Policy, Guidance, and Directives

[FHWA Report Number FHWA HEP-06-015, "FHWA Highway Construction Noise Handbook", August 2006](#)

["FHWA Road Construction Noise Model \(FHWA RCNM\) User's Guide", January 2006](#)

["FHWA Traffic Noise Model[®] Version 2.5 User's Guide \(v. 2.5 Addendum\)", April 2004](#)

[FHWA Report Number FHWA-EP-00-005 "FHWA Highway Noise Barrier Design Handbook", February 2000](#)

[FHWA Report Number FHWA-PD-96-046, "Measurements of Highway-Related Noise", May 1996](#)

[FHWA Report Number FHWA-HEP-10-025 "Highway Traffic Noise: Analysis and Abatement Guidance", December 2011](#)

[FHWA Technical Advisory T 6640.8A, "Guidance For Preparing and Processing Environmental and Section 4\(f\) Documents", October 30, 1987](#)

[MDOT State Transportation Commission Policy on Noise Abatement - #10136](#)

["MDOT Environmental Procedures Manual", July 28, 2010](#)

["MDOT Document Preparation Process and Procedures Guide for NEPA Documents", June 2009](#)

[MDOT 2012 Standard Specifications for Construction](#)

[MDOT State Transportation Commission Policy on Context Sensitive Solutions - #10138](#)

MDOT 3903 (3/98)		Page	1	OF	2
	COMMISSION POLICY	IDENTIFIER		EFFECTIVE DATE	
		10136		July 31, 2003	
		SUPERCEDES DATED			
		July 19, 2002			
RESPONSIBLE ORGANIZATION: Executive Bureau					
SUBJECT: Noise Abatement					

Federal environmental regulation 23 CFR 772 defines two types of projects. Type I is “a proposed federal or federal-aid highway project for the construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes” (23 CFR 772.5[h]). If noise impacts are identified, noise abatement measures must be considered and implemented where reasonable and feasible. The Michigan Department of Transportation (MDOT) follows all Federal laws, regulations, and guidelines for Type I noise abatement.

Type II, or voluntary, abatement is a proposed federal or federal-aid highway project for noise abatement on an existing highway.

This policy addresses Type II noise abatement to limit the intrusion of highway noise into adjacent residential areas to reasonably achievable levels consistent with the U.S. Department of Transportation’s Code of Federal Regulations (CFR), and taking into consideration MDOT’s life-cycle cost analysis and safety requirements, as well as other technical and financial implications. To achieve this objective the Michigan State Transportation Commission (Commission) supports the following four approaches to alleviate traffic noise impacts:

1. ***Reduction of Noise at the Source.*** Reduction of traffic noise by design or treatment of the road surface is the most cost-effective noise control available to MDOT. Within the group of noise abatements that are reasonable and feasible under 23 CFR 772, and after MDOT’s life-cycle cost analysis has selected a pavement type and other technical and financial constraints, MDOT will use the quietest surface texture available when repaving/reconstructing a freeway in residential areas.
2. ***Noise Abatement.*** MDOT will attempt to locate, design, construct and operate state highways to minimize the intrusion of traffic noise into adjacent areas. When noise impacts occur, they may be attenuated by the most reasonable and prudent means.

MDOT will construct Type II sound walls only in years when MDOT’s Road and Bridge Program, excluding maintenance, exceeds \$1.0 billion, adjusted to the Consumer Price Index (CPI) using 2002 as the base year. MDOT will not spend more than one half of one percent of the budget on sound walls. MDOT will give priority to those communities where the freeway was constructed through an existing neighborhood and where 80 percent or more of the existing residential units were there prior to the construction of the freeway. Communities must make application to MDOT and provide a local match of 10 percent of the cost of the sound wall.

MDOT 3903 (3/98)		Page	2	OF	2
	COMMISSION POLICY	IDENTIFIER		EFFECTIVE DATE	
		10136		July 31, 2003	
		SUPERCEDES DATED			
RESPONSIBLE ORGANIZATION: Executive Bureau					
SUBJECT: Noise Abatement					

3. ***Encouraging Compatible Adjacent Land Use.*** Cities and counties have the power to control development by adoption of land-use plans and zoning, and by subdivision, building or housing regulations. The Commission encourages those who plan and develop land, and local governments controlling development or planning land use near known freeway locations, to exercise their powers and responsibility to minimize the effect of highway vehicle noise through appropriate land-use control. Where such land-use regulations are not in place, cities, townships and counties will not be eligible for MDOT noise mitigation assistance.

4. ***Noise Abatement by Others.*** The Commission encourages developers and local governments to coordinate their efforts to mitigate highway noise. This effort must be done without encroachment of MDOT's property right-of-way unless it is determined to be necessary, and authority granted to permit others to construct a sound barrier in the state's right-of-way. The barrier's design must meet MDOT's geometric, structural, safety and maintenance standards. MDOT shall assume no review authority or responsibility of any kind for the structural integrity or the effectiveness of a sound barrier constructed by others.

MDOT will monitor noise mitigation best practices in other states and provide an activity report to the Commission annually.

The Department shall develop instructions for the implementation of this policy.
Adopted by the Michigan State Transportation Commission on July 31, 2003.

Michigan Department of Transportation

Document Preparation Process and Style Guide

For NEPA Documents

Prepared by
Project Planning Division
Bureau of Transportation Planning

Revised June 2009



TABLE OF CONTENTS

INTRODUCTION AND PURPOSE	7
ELEMENTS OF QUALITY	7
TYPES OF DOCUMENTS	9
<i>Abbreviated Environmental Assessment (EA)</i>	9
<i>Environmental Assessment</i>	9
<i>Environmental Impact Statement</i>	9
<i>Reevaluations</i>	9
PROCESS AND APPROACH	11
DOCUMENT STRUCTURE	11
PROJECT THEMES/FOCAL POINTS	12
STRATEGIES FOR WRITING CLEARLY	12
EDITING, PROOFING AND QUALITY ASSURANCE TOOLS	15
<i>Flesch-Kincaid Grade Level Test</i>	15
<i>Flesch Reading Ease</i>	16
<i>Percent Passive Voice</i>	16
<i>Proofreading Tips</i>	16
<i>Line Numbering</i>	17
<i>Fresh Eyes Review</i>	17
GENERAL FORMAT AND LAYOUT	19
MSWORD™ DOCUMENT TEMPLATES.....	19
MAKING A DOCUMENT ACCESSIBLE	20
GENERAL PAGE LAYOUT	20
<i>Headers and Footers</i>	20
<i>Placing Graphics on a Page with Text</i>	21
<i>Labels for Tables and Figures</i>	21
WORKING WITH FIELDS	21
CREATING HEADINGS	21
NAVIGATION AIDS FOR THE READER	22
<i>Table of Contents, List of Figures, List of Tables and List of Appendices</i>	22
<i>Footers and Section Tabs</i>	22
<i>Built-in Styles</i>	22
<i>Index</i>	23
<i>References to Other Project Documents</i>	24
MAPPING STANDARDS	25
PAGE SET-UP/MAP ORIENTATION	25
TITLE BLOCK	27
COVER PAGE MAPS & PROJECT LOCATION MAPS	29
<i>Cover page</i>	29
<i>Project location page</i>	32
BASIC MAP CONTENT	34
<i>Features</i>	34
<i>Road Symbols/Names</i>	36
<i>Legend/Key</i>	36
<i>Call Out Boxes</i>	37
MAP OUTPUTS	37
<i>Hard Copy/WEB pdf</i>	37
<i>Print Size</i>	37
MAP QUALITY ASSURANCE STANDARDS:.....	39
CONTENT AND DOCUMENT STRUCTURE	41
FRONT COVER.....	41
AMERICANS WITH DISABILITIES ACT, TITLE VI AND COST OF PUBLICATION STATEMENTS.....	41

TITLE PAGE.....	41
PREFACE	42
TABLE OF CONTENTS, LIST OF FIGURES, LIST OF TABLES AND LIST OF APPENDICES.....	42
DOCUMENT SUMMARY	42
PURPOSE AND NEED CHAPTER.....	42
ALTERNATIVES CHAPTER	44
<i>Description and Comparison of Alternatives</i>	44
<i>Range of Reasonable Alternatives</i>	45
<i>No-Build Alternative</i>	45
<i>Screening/Selection of Alternatives</i>	45
AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES CHAPTER.....	46
<i>Common Content Items</i>	46
<i>Additional Content for Land Use Impacts</i>	47
<i>Additional Content for Right-of-way and Relocation Impacts</i>	48
<i>Additional Content for Impacts to Farmland and Agriculture</i>	48
<i>Additional Content for Social Effects</i>	48
<i>Additional Content for Environmental Justice (EJ)</i>	49
<i>Additional Content for Economic Effects</i>	50
<i>Additional Content for Pedestrian and Non-Motorized Travel</i>	50
<i>Additional Content for Parks and Recreation</i>	50
<i>Additional Content for Visual and Aesthetic Resources</i>	50
<i>Additional Content for Effects on Air Quality</i>	50
<i>Additional Content for Noise Impacts</i>	51
<i>Additional Content for Contaminated Sites</i>	51
<i>Additional Content for Wetlands</i>	52
<i>Additional Content for Water Quality</i>	52
<i>Additional Content for Floodplains/Hydraulics</i>	53
<i>Additional Content for Wild and Scenic Rivers or State Designated Natural Rivers</i>	53
<i>Additional Content for Stream/Drain Crossings</i>	53
<i>Additional Content for Fish and Wildlife</i>	54
<i>Additional Content for Threatened and Endangered Species</i>	54
<i>Additional Content for Coastal Zone Resources</i>	55
<i>Additional Content for Above-ground Cultural Resources</i>	55
<i>Additional Content for Archaeological Resources</i>	56
<i>Additional Content for Traditional Cultural Properties</i>	56
<i>Indirect Impacts</i>	57
<i>Cumulative Impacts</i>	57
<i>Maintaining Traffic</i>	57
SECTION 4(F) & SECTION 6(F) EVALUATION CHAPTER	57
MITIGATION CHAPTER	58
PUBLIC AND AGENCY COORDINATION CHAPTER	58
LIST OF PREPARERS.....	58
DISTRIBUTION LIST	58
LIST OF TECHNICAL REPORTS	58
REFERENCES	59
APPENDICES	59
STANDARD MAJOR ACTION DOCUMENT MAPS.....	60
STANDARD GEOGRAPHIC DATA LAYERS	60
INDEX	61
SUPPORTING DOCUMENTATION	63
TECHNICAL REPORTS.....	63
ADMINISTRATIVE RECORD.....	63
MAP DATA MANAGEMENT STRUCTURE.....	64
<i>Data storage environment</i>	64
<i>Projects folder sub structure for each project</i>	64
DELIVERY-READY DOCUMENTS.....	65

PORTABLE DOCUMENT FORMATS (.PDF) FOR CD AND SERVER DISTRIBUTION	65
PORTABLE DOCUMENT FORMATS (.PDF) FOR WEB POSTING	65
ELECTRONIC COPIES	66
HARD COPIES	66
APPENDIX A: TEAM MEMBERS	67
APPENDIX B: REFERENCES	69
APPENDIX C: DOCUMENT COMMENT FORM	71
APPENDIX D: STANDARD TEXT FOR METHODOLOGY USED FOR ENVIRONMENTAL JUSTICE ANALYSIS	73
APPENDIX E: STYLES AND FORMATTING SUMMARY/SAMPLE	75
CHAPTER TITLE	75
MAJOR SECTION TITLE [LEVEL 1]	75
WHY USE THE TEMPLATES AND PRESCRIBED STYLES? [LEVEL 1]	75
THE VISUAL DIFFERENCES AMONG STYLES [LEVEL 1]	75
<i>Normal Paragraph Style [Level 2]</i>	75
<i>Third Level Subsection Title and Paragraphs Styles [Level 3]</i>	75
<i>Another Third Level Subsection Title [Level 3]</i>	76
<i>List Bullet 3 Style [Level 2]</i>	76
RECOMMENDATIONS	76

Introduction and Purpose

This style guide is a companion to the Environmental Procedures Manual. Consultants and Michigan Department of Transportation (MDOT) staff should follow this style guide to prepare National Environmental Policy Act (NEPA) documents. In recent years, MDOT recognized a need to develop guidelines for NEPA documents that would strengthen communication processes and result in major action documents that both meet the information needs of decision-makers, resource agencies, reviewing agencies, local leaders and the public stakeholders, and have a similar overall style and appearance.

This style guide will evolve as MDOT continues to evaluate which communication and design elements work best for the types of studies we undertake. It promotes the use of communication tools and techniques that guide the writer through the process while freeing the writer to tailor content and presentation to the characteristics of a particular study.

This first edition:

- Establishes standards for formatting and page layout
- Establishes a standard approach for incorporating maps and graphics
- Establishes a chapter structure consistent with current federal guidelines
- Retains critical elements from Federal Technical Advisory T 6640.8A
- Sets acceptable ranges for easily measured readability factors
- Provides MSWord™ document templates for each type of document, and
- Recommends ways to organize and emphasize information, reasoning and conclusions in ways that effectively present important considerations to readers

Elements of Quality

Principles for preparing NEPA documents have evolved over many years. No doubt, this trend will continue as practitioners employ new communication techniques to explain the complexities of transportation decision-making to the public. As a rule, document preparers continually strive to provide partner agencies with concise and complete evaluations of alternatives. Clarity and completeness are essential because any NEPA document may be subject to legal challenge. Decision-makers need to know recommendations are based on thorough and complete analyses, yet they rarely have the time for an in-depth review of the

entire study. These types of communications challenges are always with us. A combination of creative approaches and proven techniques allow writers to overcome these challenges.

Great documents have seven common characteristics. A great document is:

- Accurate
- Complete
- Clear
- Concise
- Brief
- Visually appealing, and
- Useful to all target audiences

Accuracy, completeness and clarity are essential qualities of the administrative record of the environmental clearance process. When clarity, conciseness and brevity are evident in the ideas and conclusions presented, readers, reviewers and decision-makers are able to make solid decisions more efficiently.

The broad range of styles and techniques for making a document visually appealing will continue to be matters of debate. Research supports the classic design principles found in this Style Guide. These include:

- Choice of font and font sizes
- Percent of white space on pages
- Proximity of illustrations to the associated text, and
- Visual clues to document structure

While documents should be visually appealing, it is equally important to incorporate features that allow visually impaired people to read a document without difficulty. This style guide includes instructions for formatting documents that are compatible with screen reading software.

While use of color adds to the visual appeal of promotional materials, MDOT encourages NEPA document preparers to limit the use of color to essential elements as described in the chapter on graphics, maps and photos.

Types of Documents

Abbreviated Environmental Assessment (EA)

The Abbreviated EA is an expanded checklist providing sufficient evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). It specifically applies to projects that will have an adverse effect on a single resource, but little, if any, other environmental impacts. The project must also have little or no controversy to be documented with this type of EA. Writers should use the MSWord™ template specifically designed for abbreviated EAs when no significant impacts are anticipated, there is no public controversy surrounding the project, and the resource agency agrees with the proposed mitigation (See also Environmental Procedures Manual, Chapter 7).

Environmental Assessment

The EA provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement or a FONSI. An Environmental Assessment describes the need for the proposed project, identifies alternatives, analyzes the potential for social, economic, or environmental impacts, and identifies appropriate mitigation measures for any adverse environmental impacts (See also Environmental Procedures Manual, Chapter 6).

Environmental Impact Statement

MDOT prepares draft and final Environmental Impact Statements (EIS) for federal major actions that significantly affect the quality of the human and natural environment. A Draft Environmental Impact Statement (DEIS) describes the early project development activities and conclusions, compares the benefits and impacts of a range of reasonable alternatives, and demonstrates compliance with other applicable environmental laws and executive orders. A Final Environmental Impact Statement (FEIS) identifies the Preferred Alternative, discusses why other alternatives were eliminated, and describes the potential impacts and mitigation commitments for the Preferred Alternative. The FEIS addresses comments received at the public hearing and from federal, state and local review of the DEIS. FHWA's Technical Advisory 6640.8A describes three approaches to developing a FEIS—traditional, condensed and abbreviated (See also Environmental Procedures Manual, Chapter 9).

Reevaluations

MDOT conducts an environmental reevaluation when the project scope changes after a Finding of No Significant Impact (FONSI) or Record of Decision (ROD) or when no work has occurred for three or more years after a ROD or FONSI. MDOT uses the MSWord™ Reevaluation Checklist template to update information about benefits and consequences of proposed improvements (See also Environmental Procedures Manual, Chapter 11).

Process and Approach

Begin with the end in mind. Identify themes and issues early and document them as they emerge throughout the study. Themes and issues identified during the scoping process not only provide a focus for analysis, but also provide a logical framework for presenting findings in the document.

Remember, although completeness is important, a major action document is only part of the administrative record. It is important to design and structure the document to emphasize and elaborate upon those findings that:

- Demonstrate the strongest relationship to the purpose and need for the project
- Will or should be major considerations for decision-makers, local leaders and reviewing agencies
- Provide solid support for the study conclusions or recommendations, and
- Relate to key issues for the study or are of particular concern to the public.

Document Structure

The structure of a document may vary from project to project. Generally, MDOT environmental documents should have a resource-based structure. The blueprint described in the American Association of State Highway and Transportation Officials (AASHTO) 2006 publication, *Improving the Quality of NEPA Documents*, recommends this approach as most effective, especially for resource agency reviewers.

Within major sections of a document, information should be organized and presented to reflect the uniqueness of individual projects. Writers should emphasize (devote the most space to) those topics and issues that are most important to affected communities and that are the most critical factors for decision-makers. For example, in projects where benefits and adverse impacts vary significantly by jurisdiction, study results may be presented by jurisdiction. When the study team identifies no adverse effects to a resource, detailed information about that resource evaluation may be omitted from the major action document; however, include a brief statement that no impacts would occur for that resource and a reference to other study documents such as a technical report or discipline report showing that the resource was considered.

Structural consistency helps readers move smoothly from topic to topic. When comparing alternatives, for example, writers may need to discuss both regional and localized impacts. If regional impacts are presented first for one alternative, they should be presented first for all

alternatives. Similarly, when one topical discussion moves from general to specific, parallel topical discussions should follow the same pattern.

Project Themes/Focal Points

Take note of the issues identified during the scoping process. Follow the process of resolution during the course of the study. Some may become recurring themes for stakeholders. In other cases, interrelationships between issues or disciplines may become apparent during a study. Use these types of factors to determine whether the major action document should follow the standard structure defined by the document template. Consider deviating from the document template when presenting the key factors for decision-makers another way improves clarity or when the standard document structure obscures important interrelationships between disciplines.

Strategies for Writing Clearly

Anticipate the reader's need to know certain things. Say what needs to be said in an orderly fashion so that various audiences can easily understand the facts and the reasons for the conclusions or recommendations. Time is wasted when readers have to struggle with a poorly organized or poorly composed document. A writer shows respect for all project stakeholders and exhibits good stewardship of resources by producing a clear, well-crafted document.

Remember, a great document is:

- Accurate
- Complete
- Clear
- Concise
- Brief
- Visually appealing, and
- Useful to all target audiences

Help the reader identify and understand the key considerations for the decision. Devoting more space to key decision factors is one way to emphasize the most important considerations. Writers can also bring key considerations forward to the beginning of a chapter or section where even readers who skim will find them. Writers should also include the key considerations in the document summary.

Remember that while EAs and EISs support decisions, they are pre-decisional documents and should not indicate that a decision has been made. It is important to use conditional wording including subjunctive verb forms such as *would* rather than *will* in action descriptions. For example:

“The preferred alternative would absorb a substantial part of the Blue Water Gateway business district and displace established businesses.”

While mitigation would occur only if the project moves forward, these commitments should be stated unconditionally.

Use objective and descriptive language rather than judgmental language when describing the significance of impacts. Present impact data and any applicable or relevant requirements or standards for the reader to form judgments. For example, do not characterize impacts as *acceptable*. Use quantitative comparisons or words such as *very small* or *substantial*, if necessary, to describe impacts. For example:

“None of the noise receivers would be exposed to noise levels that substantially exceed existing noise levels. MDOT defines a change of ten or more dBA as substantial.”

In EAs, do not use the word *significant* or *insignificant* when describing the effect an alternative may have on a resource. Conclusions of overall insignificance or significance will be made in a FONSI or a determination to prepare an EIS.

Avoid using technical terms and acronyms whenever possible. When acronyms are necessary, use parentheses to spell them out the first time they are used within each chapter; for example, National Pollutant Discharge Elimination System (NPDES). Wherever possible, address technical concepts in ways that minimize the need for definitions. For example, a non-technical reader may need a definition for the term *non-attainment* in this sentence:

“St. Clair County is currently classified as being in non-attainment for particulates smaller than 2.5 microns in size (PM_{2.5}) and the eight-hour ozone standard.”

The following alternate sentence makes the meaning clear without requiring further definition:

“St. Clair County does not meet the Clean Air Act Amendment standard for particulates smaller than 2.5 microns in size (PM_{2.5}) or the standard for eight-hour ozone tests.”

Chemical notations most often occur in the air quality section of a document. Spell out the name of the chemical followed by the standard chemical notation in parentheses when the chemical is first mentioned. Use the chemical notation format for subsequent references. Use the subscript font setting as shown in this list of commonly used terms:

- Carbon Monoxide (CO)
- Sulfur dioxide (SO₂)
- Nitrogen dioxide (NO₂)
- Particulate matter less than 2.5 microns in size (PM_{2.5})
- Ozone (O₃)

Use English measurement units.

Occasionally calling words out to provide emphasis is acceptable, but avoid using call outs to define terms except as a last resort. Instead, craft sentences and paragraphs to minimize the need for ancillary definitions. In the following sentence, the meaning of *encroachment* becomes clear simply by providing an example within the sentence:

“Encroachment, such as artificial fill on floodplains, reduces the flood carrying capacity and potentially increases the flood heights of streams...”

Limit callout definitions to two or three definitions per chapter and one per resource topic within the Affected Environment and Environmental Consequences chapter. Use them when there is no plain language alternative.

Identify and explain assumptions and support your statements and conclusions with data and reasoning. Note how the writer of the following paragraph strongly conveys a sense of improbability by leading the reader through reasoning:

“The American burying beetle is currently known only from locations in Nebraska, Rhode Island, Oklahoma and Arkansas. The Michigan Natural Features Inventory (MNFI) shows that the most recent record from Kalamazoo County is for a 1961 sighting of a single beetle from the Kellogg Biological Station. The lack of recent sightings from Kalamazoo County or from anywhere else in Michigan suggests that it is highly unlikely that the American burying beetle is still present in the state. Therefore, it is unlikely that the proposed project will adversely affect this species.”

Identify data sources and describe methods used to develop data. Methodology can be documented in appendices and technical reports, but a brief explanation with a reference to a specific appendix, technical report or procedure manual should be included in the body of the document. The following introductory paragraph prepares the reader for what will follow and lets the reader know that additional documentation exists:

“The air quality impact analysis conducted for the US-31 project consists of two parts: the dispersion modeling of CO emissions around US-31 and a transportation conformity determination. The methodology and models used to perform the air quality analysis conform to FHWA, EPA, MDEQ and MDOT guidelines and are presented in more detail in the Air Quality Technical Report.”

Interpret data. Don't just report it. Many of the data display tools used for analysis can be adapted for use in the document. Use tables and graphs to help readers see relationships and trends in the data that lead to the study conclusions. The following example presents a conclusion supported by a complete, concise presentation of data by jurisdiction:

State Equalized Value (SEV) and Taxes: Estimated 2007 SEV tax base losses due to property acquisition for the Preferred Alternative are shown in Table 4.4-1.

Municipality	Preferred Alternative Impacts	Total Municipal	Percent Loss
Holland Township	\$36,945	\$1,230,607,500	<0.1%
City of Grand Haven	\$63,417	\$566,730,300	<0.1%
Robinson Township	\$3,660,977	\$269,308,700	<0.1%
Crockery Township	\$1,715,921	\$158,871,100	<0.1%
Total:	\$5,477,260	\$2,225,517,600	<0.1%

Source: Ottawa County Department of Equalization

The economic impact on tax bases for municipalities is less than 0.1 percent of their total tax base. The above tax base losses are anticipated to be short-lived and then offset by the increase in new business and its associated tax revenues along an improved existing US-31.

Present a finding or conclusion first, and then present your reasoning. This way of presenting conclusions may seem to contradict the current focus on telling the story; however, in creative writing, this technique is called flashback and is an effective way to engage readers. Because the analytical process begins with data and ends with a conclusion, it may be tempting to describe the data and the process of arriving at a conclusion before making the point. Readers want to know the conclusion first and, then evaluate the supporting data, reasoning, and assumptions.

Writing is part of the analysis. Recognize that the writing process supports clear thinking. As Mark Twain wrote, “The time to begin writing an article is when you have finished it to your satisfaction. By that time, you begin to clearly and logically perceive what it is that you really want to say.” Similarly, the technical writing process may reveal weaknesses in the analytical process. If it takes many words to say what you have in mind or the tone and nuance seems subjective or judgmental, give it more thought. Show your analysis is clearly thought out by presenting a direct, brief, concise and clear rationale for study conclusions.

Editing, Proofing and Quality Assurance Tools

MSWord™ provides three readability-scoring tools and displays readability statistics after every spelling and grammar check. Both the grade level test and the reading ease scores are based upon the number of words in sentences and the number of syllables per word. Use plain words and shorter sentences when it is possible to do this without losing meaning.

Flesch-Kincaid Grade Level Test

Write for readers at the Grade 11 or 12 level for major action documents.

Counts	
Words	94
Characters	486
Paragraphs	1
Sentences	4
Averages	
Sentences per Paragraph	4.0
Words per Sentence	23.5
Characters per Word	5.0
Readability	
Passive Sentences	0%
Flesch Reading Ease	40.7
Flesch-Kincaid Grade Level	12.0

Flesch Reading Ease

This measure uses a 100-point scale. The higher the score, the easier it is to understand the document. Aim for a score of 40 or above for major action documents.

Percent Passive Voice

Limit the use of passive voice to less than 10 percent. Using the active voice in writing generally results in clearer communication; however, the passive voice may be used to give the object of the sentence more emphasis. It is also acceptable to use the passive voice when the actor is unknown or when the readers do not need to know who the actor was. Passive voice sentences such as these can easily be rewritten in the active voice:

“A review of potential impacts was conducted by MDOT and FHWA staff. Those impacts which had a reasonable possibility for individual or cumulative significant impacts were analyzed further.”

Using the active voice makes these sentences easier to read:

“MDOT and FHWA staff reviewed the project to identify potential impacts. The study team analyzed those aspects of the project that could have either individual or cumulative impacts.”

Proofreading Tips

Use the MDOT Style Guide Checklist for Preparing External Publications and the accompanying list of most commonly misused words at MDOT. These are included in MDOT's Office of Communications Guidance Document #10166. Guidance Document #10166 is available at the following Web address:

<http://apps.mdot.state.mi.us/interchange/guidocs/files/10166.pdf> .

Check for correctness and consistency in capitalization, hyphenation and punctuation. Check for periods at the end of a bullet points when the bullet list contains complete sentences. When bullets are phrases or single words, check that punctuation has been omitted at the end of the points.

Many other good sources of information about correct usage, grammar, ambiguity, word choice and punctuation are available on the Web. A broad selection of published style guides provide writers with valuable tools for the task. Recommended Web sites include:

www.plainlanguage.gov/

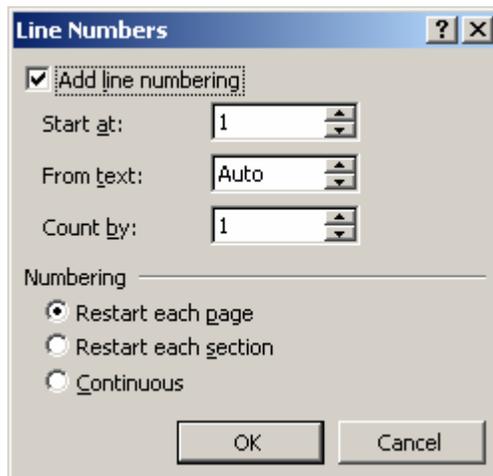
<http://www.rightwords.co.nz>

Line Numbering

Before distributing drafts for staff or resource agency review, add line numbering. In MSWord™, select File/Page Setup. Select the Layout tab and select the Line Numbering button. Set line numbering to restart on each page as illustrated at the right.

Document reviewers refer to page and line numbers on the Document Comment Form when reviewing drafts. (See Appendix C, Document Comment Form)

Remove the line numbering before drafts are distributed for public review and comment.



Fresh Eyes Review

Allow yourself some time between writing and reviewing what you have written. Even a five-minute break can be productive because it will help you get some distance from your document. You will return to your writing with more objectivity.

Read what you have written aloud. Hearing your words will help you uncover mistakes and the overuse of acronyms, technical terms, and passive voice.

After you have written a second or third draft, it is easy to overlook mistakes, repetitions, and omissions. Ask someone who has not been involved with the writing process to read your document. Doing so will provide you with another perspective on your writing. This is called reading with “Fresh Eyes.”

Document leads and project managers must conduct a quality assurance review to ensure that the document is clear, complete and well-crafted before internal MDOT review or initial FHWA review.

Engaging readers is a challenge. Research and experience show that the design, underlying structure and visual appearance of a document can help readers efficiently glean what they need to know from large technical documents such as NEPA documents. Decision-makers and cooperating/reviewing agencies will appreciate and benefit from concise, well-organized and visually inviting technical documentation.

MSWord™ Document Templates

This chapter introduces MSWord™ document templates, and identifies format and layout standards and guidelines. Using these templates and following the standards and guidelines contained in this style guide will not only provide a common structure and appearance for MDOT environmental documents, but will also save time for writers and readers. Using the template features will also result in documents that are accessible to visually impaired readers.

The document template, entitled *EIS Document template Nov 2008.dot*, contains required formatting for Environmental Impact Statements (EISs). The EIS template may be modified and used for Environmental Assessments (EAs). Document preparers should use the checklist templates for Abbreviated EAs and Reevaluations.

The EA and EIS templates have:

- built in headers, footers and one inch margin settings,
- section breaks between chapters,
- page numbering codes,
- font selections and font sizes for up to three heading levels,
- standard text for the cover page and fields to customize the page,
- standard text for inside the front cover with fields for costs of publishing the document,
- standard tab settings for bulleted lists
- 8½ x 11 inch paper selection with portrait orientation.

Making a Document Accessible

Visually impaired individuals often use screen reader technology. Screen reader software relies upon coding within the structure of documents to effectively tell the reader what is displayed on a screen. These structural elements include titles, headings, and alternate text descriptions for illustrations. When you create your document in MSWord™ using the templates, the structures are transferred to a final Adobe .pdf file that can be interpreted by screen reader software when it is posted on MDOT's Web site.

Keep these simple steps in mind as you prepare drafts and final versions:

- When you write a document in MSWord™, be sure to use styles to format text such as titles, headings, and paragraphs. The styles provide structure information when you create a tagged Adobe PDF file. For example, do not use the Enter key to add space between paragraphs. Instead, use the "Spacing Before" and "Spacing After" paragraph properties to achieve this effect.
- Use the Columns command in Word to create columns. Do not use tabs to simulate double-column text.
- Use the Insert Table command or Draw Table tool in Word to create tables.
- Add alternate text to all images and include captions. For example, in Word, you can add alternate text describing an image by using the Web tab of the illustration's Format Picture dialog box. Using both alt text and captions will provide accessibility for either html or .pdf Web postings.
- If you created an illustration out of several smaller illustrations, use the Group command to group them into a single illustration. ¹

General Page Layout

Use 8 ½ inch by 11 inch paper size with portrait orientation for all text pages. Spacing before and after headings, paragraphs and bulleted lists are embedded in the MSWord™ templates for major documents. Layout standards and guidelines for graphic elements are discussed in detail in the chapter titled Mapping Standards.

Headers and Footers

The template displays Header 1 only on the first page of each chapter. A chapter should always begin on an odd numbered page. Footers appear on all pages and contain fields for the name of the study, whether it is draft or final, the type of document, the chapter title and page number.

¹ These tips and other aspects of making documents compatible with screen reader software can be found at http://www.adobe.com/products/acrobat/access_booklet.html

Placing Graphics on a Page with Text

When a graphic element is less than 3.5 inches wide, align it with a margin and wrap text around the illustration. Center wider objects and set wrapping style to in line with text. Frame graphics with a 1.5-point black line. Place graphics adjacent to the corresponding text discussion whenever possible (note location of illustrations on the following pages). Refer to the chapter titled Mapping Standards for more information about formatting graphic elements for NEPA documents.

Labels for Tables and Figures

Place labels for tables and figures below and to the left of the graphic. Use Palatino Linotype, 10 point, bold, italic for these labels.

Working with Fields

Click on the field and type text in directly or paste into the field using paste special / unformatted text. The inserted text will take on the formatting defined in the template. Fields are temporary placeholders to tell the writer where to begin entering text. They disappear as soon as any text is entered.

Fields look like this in a template:

“Click and enter or copy and paste/special/unformatted text”

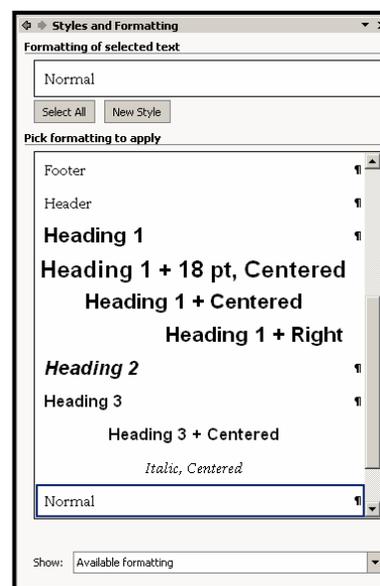
Sample Field

Creating Headings

Headings can be a descriptive phrase or a question; however be consistent throughout the document. Do not use outline numbers in headings.

Refer to Appendix E to view available heading styles. Avoid going beyond three heading levels within any chapter.

Select the heading level from the Styles and Formatting window. Type the heading text and follow with a single return (the template recognizes a single hard return as the end of an element that requires a visual break). The spacing before and after the selected heading is part of the template, so no extra hard returns are needed to set off the heading.



Navigation Aids for the Reader

Readers need to know how to navigate through a large document. MDOT uses seven standard navigation elements in NEPA documents. This style guide assumes the readers are accustomed to the classic visual cues such as change in font size, spacing, chapter organization, headers, footers, and cross-referencing conventions.

Table of Contents, List of Figures, List of Tables and List of Appendices

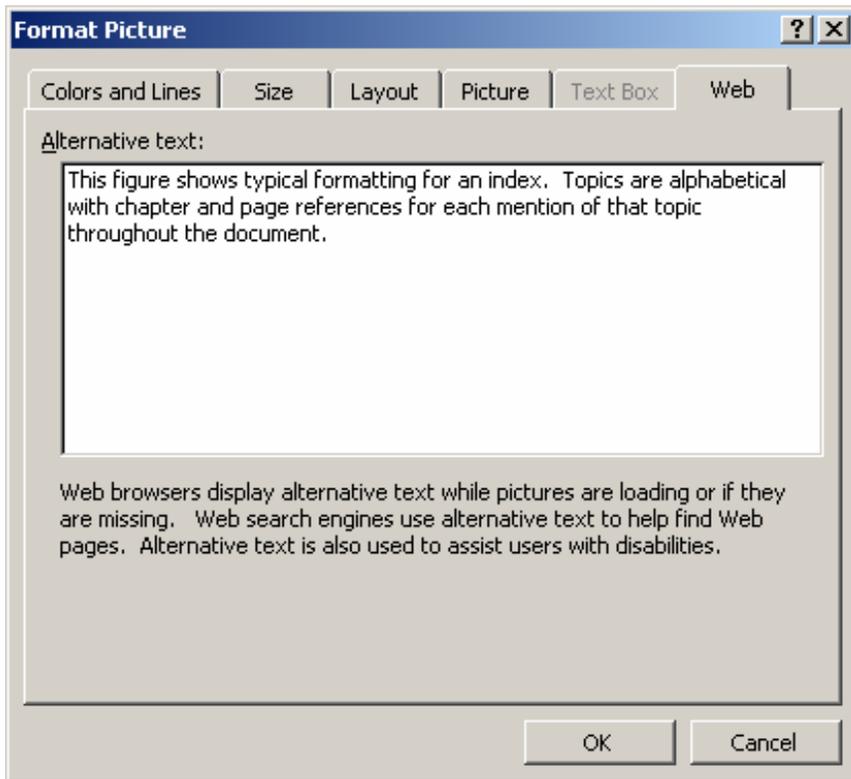
Always include a table of contents, list of figures, list of tables and list of appendices. Create these elements automatically so that listed items are also hotlinks within the document. Show the page number for each content item. Use dot leaders to connect content titles with page numbers. Ensure that chapters and appendices always begin on odd numbered pages.

Footers and Section Tabs

The standard footer contains the study name at the left, chapter number and page number centered and the type of document at the right of each page. These elements are included in the document templates. Use chapter tabs for documents over 100 pages in length. Put the topic on the chapter tab except for exhibits or appendices. For example, use *Mitigation* rather than *Chapter 5*.

Built-in Styles

As mentioned previously, screen reader software relies upon coding within the structure of documents to effectively tell the reader what is displayed on a screen. These structural elements also allow a visually impaired reader to navigate through a document when titles, headings and alternate text descriptions for illustrations are properly formatted. The following figure provides an example of an alternate text description.



Index

Build an index for all EISs. Identify which topics are addressed in multiple locations within the document by key words and perform searches for those key words to build useful cross-references. Some suggested topic areas are:

- specific endangered species
- township, city or neighborhood names
- Title VI
- surface water
- right of way
- pedestrian

S

Schools 3.1-4, 3.2-1, 3.2-10, 3.2-19, 3.2-21, 3.2-22, 3.2-23, 3.2-24, 3.2-25, 3.6-9, 3.7-10, 3.7-12, 3.7-16, 3.9-13, 3.16-3

Section 106 3.15-1, 4-4, 4-5, 4-7

Section 4(f) E-16, E-17, 2.1-6, 2.1-11, 3.2-25, 3.7-19, 3.15-1, 4-1, 4-2, 4-4, Green Sheet

Security E-3, E-4, E-10, E-11, E-13, E-14, 1-1, 1-5, 1-7, 1-8, 1-10, 1-11, 1-12, 1-18, 2.1-4, 2.1-5, 2.1-9, 2.1-16, 2.1-17, 2.1-18, 2.2-2, 2.2-4, 2.2-5, 2.2-11, 2.2-22, 2.2-24, 2.2-34, 3.2-38, 3.2-39, 3.2-52, 3.2-53, 2.3-1, 2.3-2, 2.3-3, 2.3-4, 2.3-5, 2.3-6, 2.3-7, 2.3-11, 2.3-13, 2.3-14, 2.4-2, 2.4-3, 2.4-4, 2.4-5, 2.4-6, 2.4-7, 3.2-22, 3.2-26, 3.3-7, 3.3-10, 3.3-12, 3.3-14, 3.5-1, 3.5-2, 3.5-3, 3.5-4, 3.5-5, 3.5-6, 3.5-7, 3.5-8, 3.5-9, 3.5-10, 3.5-12, 3.7-4, 3.8-7, 3.8-8, 3.8-9, 3.8-10, 3.8-13, 3.15-4, 3.15-7, 3.21-2, 3.21-4, 3.22-1, 3.22-2, 3.23-1, 4-1, 4-6, 5-1, 5-3, 5-17, Green Sheet, 6-5

Soils 2.2-24, 2.2-25, 2.2-39, 2.2-40, 2.2-52, 2.2-53, 2.3-14, 3.7-4, 3.13-2, 3.14-1, 3.14-3, 3.15-3, 3.16-5, 3.17-2, 3.21-6, 5-7, 5-9, 5-10, 5-11, 5-18, Green Sheet

Southeast Michigan Council of Governments (SEMCOG) 1-24, 2.2-6, 2.2-7, 2.2-8, 2.3-1, 3.1-7, 3.2-2, 3.2-7, 3.4-2, 3.4-43, 3.6-3, 3.7-19, 3.17-2, 3.22-3, 6.4

Special Concern E-19, 3.14-4, 6-8

Spotted Turtle 3.14-3, 3.14-7, 5-14, Green Sheet

Sample format for topical cross-referencing

References to Other Project Documents

When study documentation includes technical reports or other stand-alone documents, list these supplementary documents in the NEPA document (see Content and Document Structure chapter). Avoid reiterating information from the technical reports within the NEPA document. Instead, briefly summarize relevant conclusions and introduce the reader to the available technical documentation. Consider including brief summaries of technical reports as appendices for topics of interest to a broad range of readers. In most cases, the information documented in technical reports would already have been evaluated by cooperating and coordinating agencies by the time the DEIS or EA is under review. Make sure, however, that these types of reports or documentation are readily available during public comment periods as well.

Illustrations convey meaning more effectively than words alone can. Begin identifying illustration concepts at the start of the study and develop these illustrations during the analytical process. Just as the study team identifies themes and issues early and documents them as they emerge throughout a study, many of the photographs, maps and graphs used during the analysis will be useful for presenting findings in technical reports or NEPA documents.

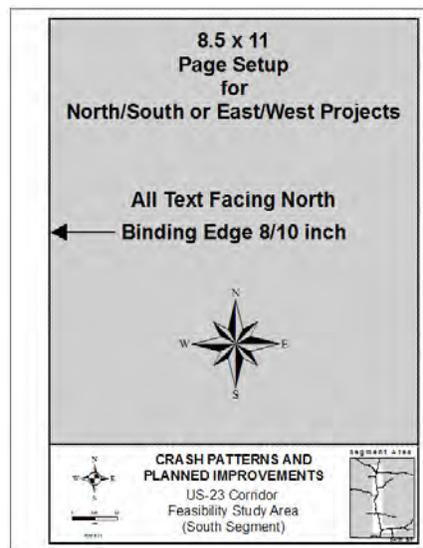
When you begin the environmental review, set up standard directories as described under Map Data Management on page 64. As you develop the major action document, refine the illustrations used during the analysis to conform to the mapping and graphic design standards outlined in this chapter.

Page Set-up/Map Orientation

For most major action NEPA documents an 8.5" x 11" portrait orientation is the preferred format. Use these minimum margin settings:

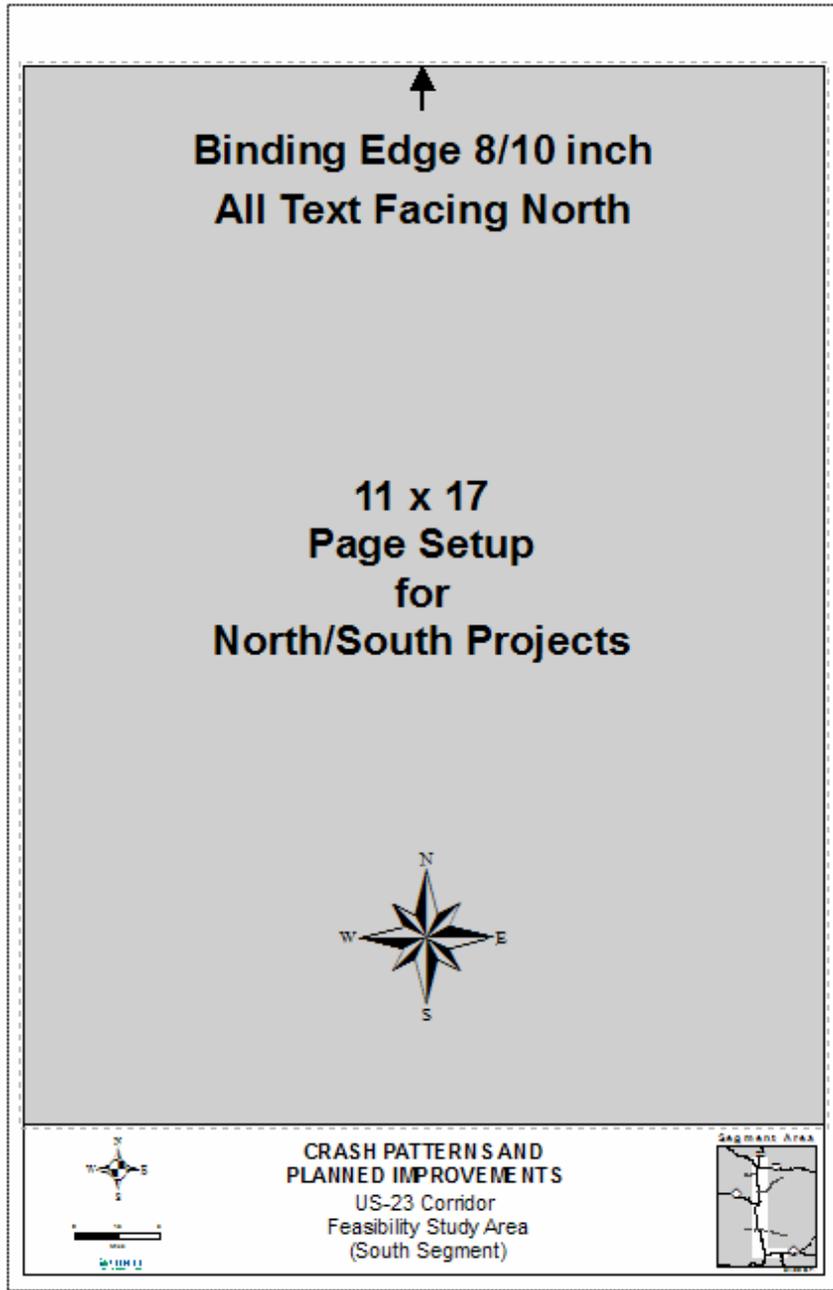
- Binding edge: ¾ inch from papers edge (8 tenths on ruler guide in ArcMap)
- Side and Bottom edges: Consistent setting on remaining three sides
- Page borders are black, line 2wt.

Orient all maps to show North towards the top of the page. As illustrated below, all titles, legends, text, and symbols should read in the same direction as North orientation of the page.

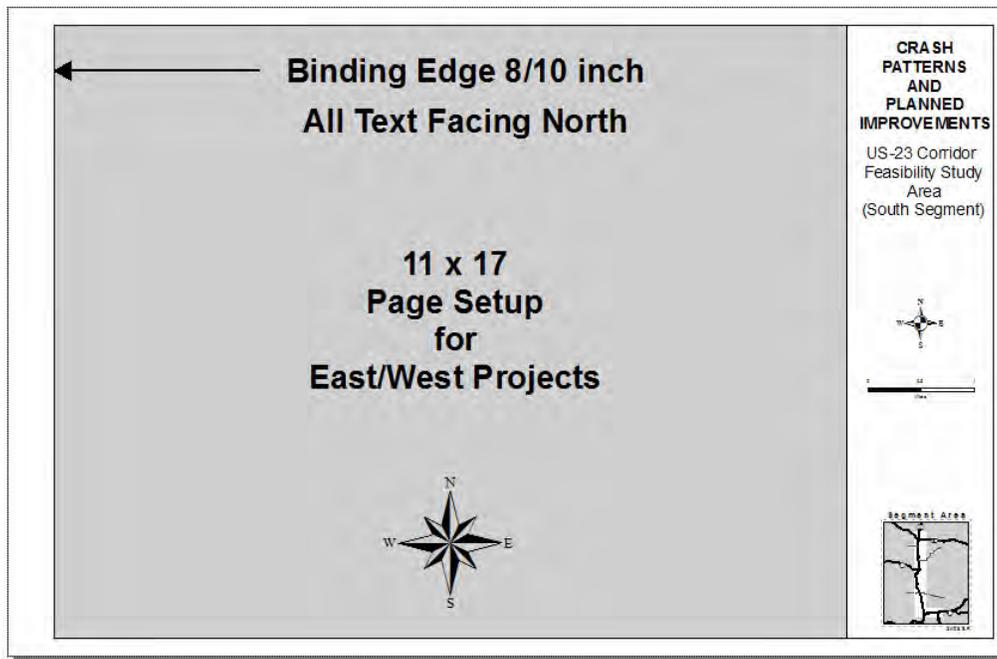


Example of 8.5" x 11" map page layout.

An 11"x17" format may be used for project areas or corridors that are very large or have extensive resources/impacts that become distorted on an 8.5" x 11" format. The following illustrations show the recommended north/south and east/west 11" x 17" page layouts.



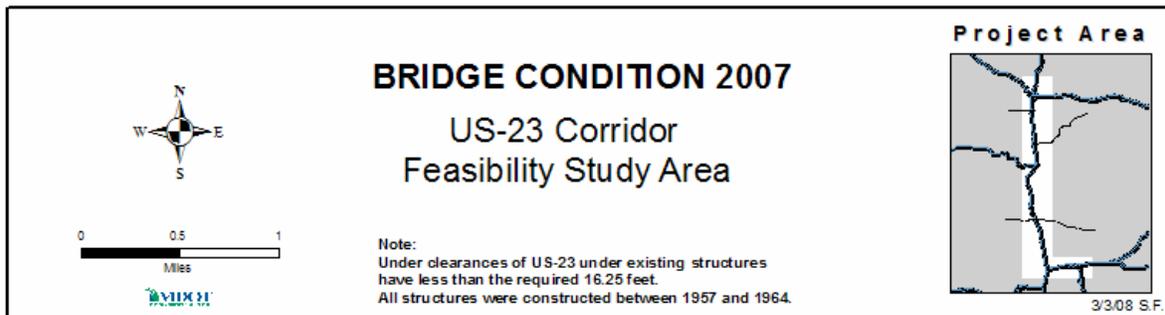
Example of 11" x 17" map orientation/page layout for a North/South project.



Example of 11 x 17 map orientation for an East/West project.

Title Block

The title block should be located on the bottom of the exhibit when using portrait orientation for the map. The title block should be located to the right when using landscape orientation for the map.

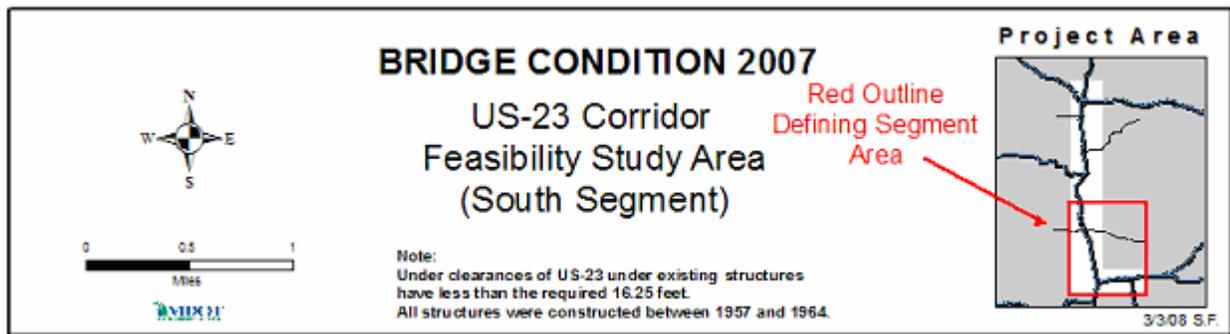


Title Block Example

At a minimum, the title block should include the following information:

- **Inset map of project location.** Place a project location inset map in the lower right hand corner of all project title blocks.

Note: When a series of corridor maps spans more than one page, as shown below, use a segmented project area inset map defining the segment area, defined by a red outline. Include the segment name in the title block, and in the legend key when needed.



Title Block for Inset Map

- **Name of map/exhibit.** Common examples of maps include Bridge Condition, Constraints, Land Use, and Crash Patterns.
- **Title of the project.** Such as US-23 Corridor Feasibility Study Area shown above.
- **North arrow.** Either symbol shown below is acceptable. North orientation of the map content may vary, with the symbol pointing towards the top or right side of the page, indicating the north direction of the map content. Adjust the size to approximately 0.75 inch, or a setting of 75 in ArcMap.



- **Scale bar.** The length of the scale bar should be approximately 1.5 inches. If necessary, adjust to an appropriate measure. Two increments should be shown on the scale bar with miles being the preferred measurement. Feet can be used for small area exhibits. Use Arial 8pt font for the scale bar. Verify that the scale bar reflects the layout map, not the inset map.



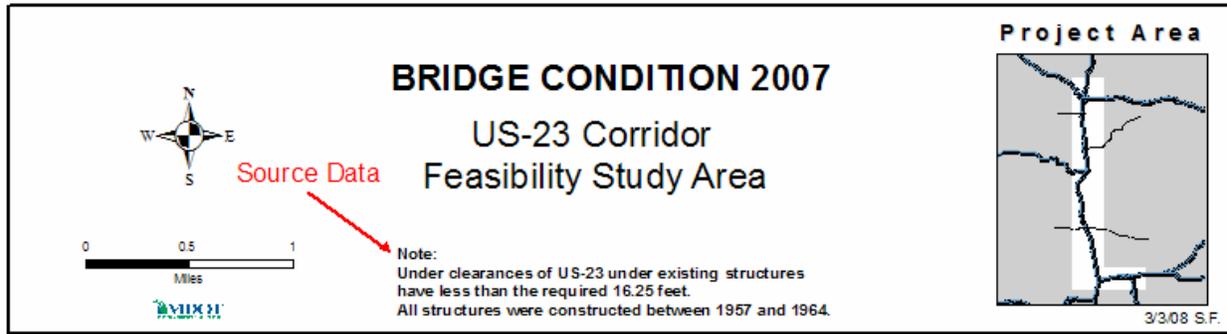
All MDOT major action NEPA document exhibits and maps shall have the following metadata included to ensure map exhibits are identifiable and traceable.

- **Microscopic Signature with Date.** Add the initials of map preparer with date of latest version of the map at the bottom of the document, preferably in the lower right hand corner of map title block or legend. Example, 11/2/08 S.F.
- **MDOT logo.** The size of the MDOT logo should be approximately 0.5 inches wide.



Note: A consultant logo should not appear on map legends or title sheets. The name of the vendor/consultant firm (along with the appropriate source data) should be added to the legend or title sheet only if they are the preparer of the map and should be placed below the MDOT logo.

- **Data Sources and Date.** Add the source of all pertinent map data in the lower center of the map title block as shown below.



Location for Data Source Citations

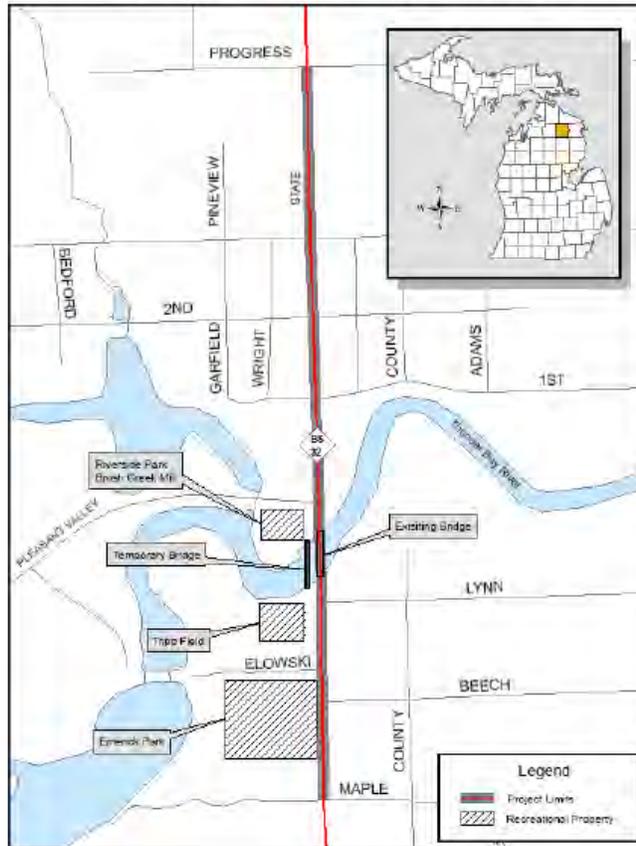
Cover Page Maps & Project Location Maps

When designing the cover page and project location map, strive for a look and feel that is consistent with other MDOT major action NEPA documents. Follow these guidelines as you develop the cover page and project location map.

Cover page

Include a State of Michigan inset map with shading to identify the county(ies) where the project is located. The project area should be highlighted and/or noted in the legend. The POB (Point of Beginning) and POE (Point of Ending) of the trunkline project, cross streets and other landmarks should be identified on the map.

**M-32 Business Spur (BS) Bridge Replacement
over the Thunder Bay River and M-32 Improvements from
Veterans Memorial Highway to north of Progress Street
Village of Hillman
Montmorency County, Michigan**

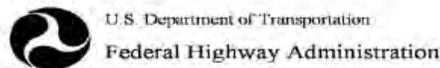


Prepared by the:

MICHIGAN DEPARTMENT OF TRANSPORTATION

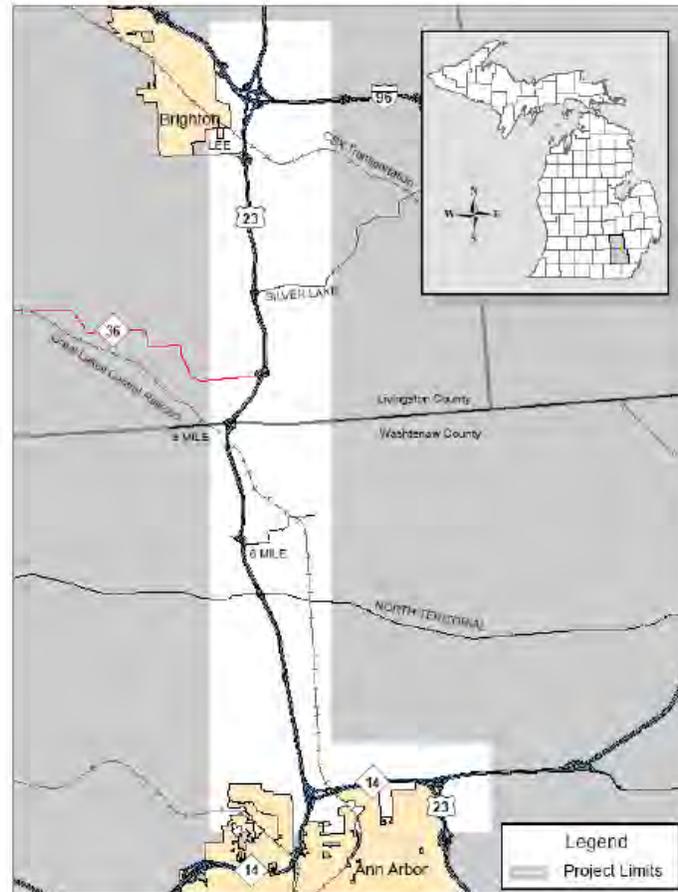
In cooperation with the

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**



Example Cover Page—M-32

US-23 Corridor Improvements from M-14 in Ann Arbor to I-96 in Brighton Washtenaw and Livingston County, Michigan

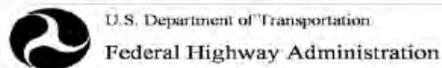


Prepared by the:

MICHIGAN DEPARTMENT OF TRANSPORTATION

In cooperation with the

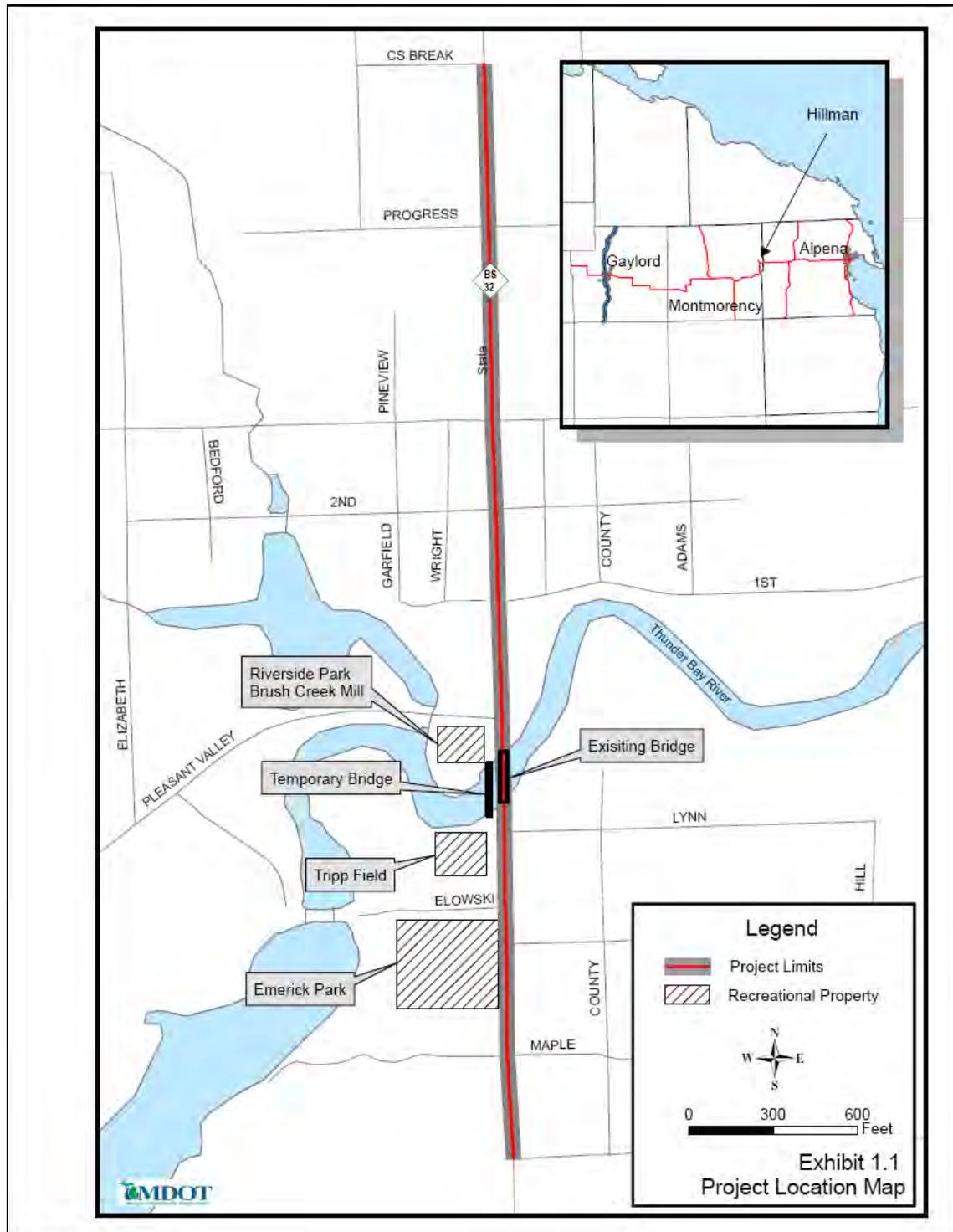
**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**



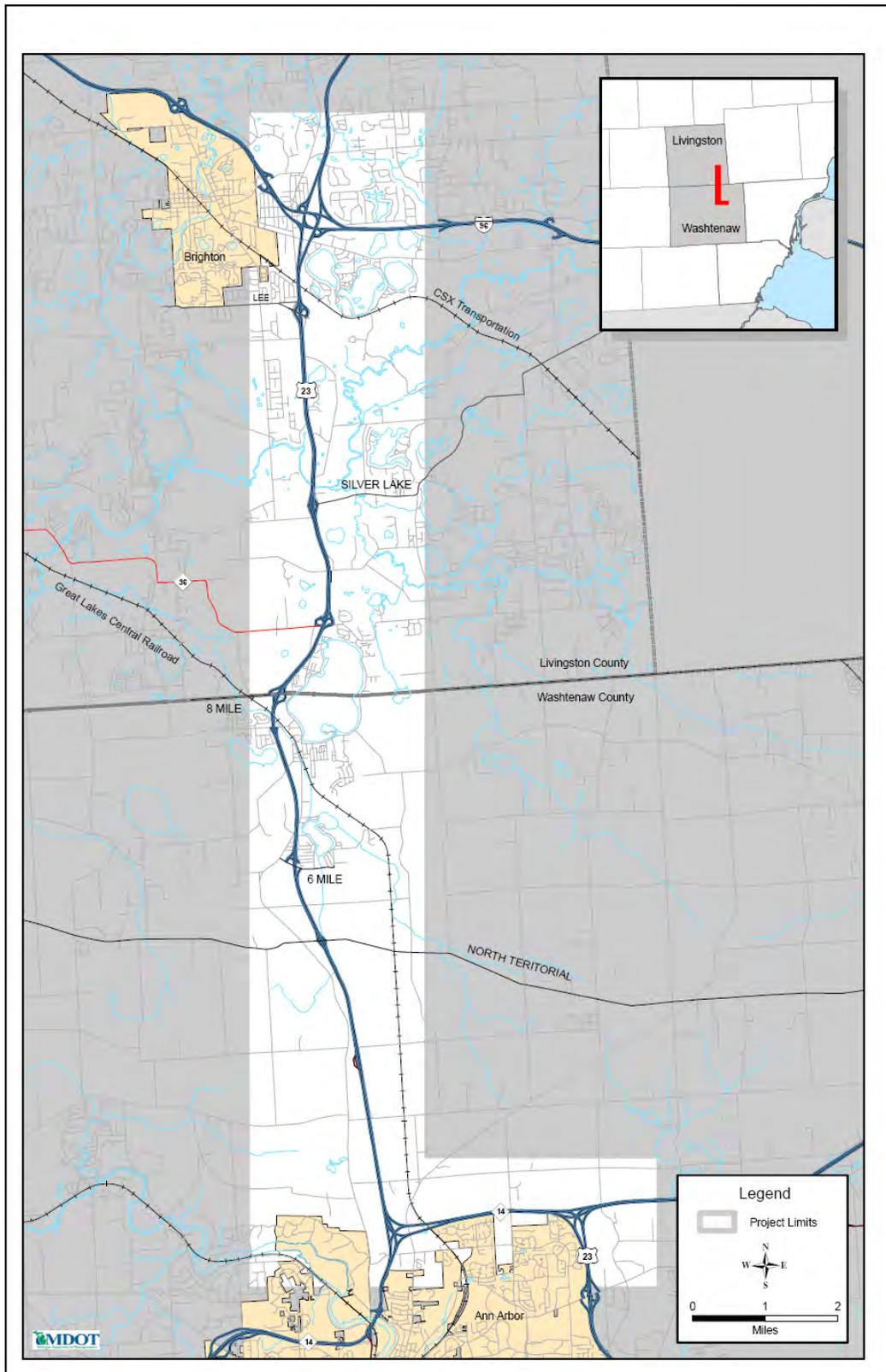
Example Cover Page—US-23

Project location page

Include a more focused area inset map showing the counties adjacent to the project area. The project area should be highlighted and noted in the legend. The POB and POE of the trunkline project, cross streets and other landmarks should be identified on the map.



Example of a Project Location Page



Example of Project Location Page

Basic Map Content

To better facilitate a consistent look among MDOT major action NEPA documents, use the following guidelines for all basic map features such as legends, transportation features, call out boxes, and map fonts.

Features

- To address color blindness needs, strive to design maps/exhibits using high contrast between layers. Dark over light colors is the highest contrast possible, i.e., black text over white background. Another example is avoiding red text over a darker background.
- Use consistent route colors. Use either blue or red as shown below for all MDOT trunk lines based on Functional Class.

 Blue/Black (2.5 width) for Functional Class codes 1, 5, 11, 12.

 Red (1.0 width) for all other Functional Class codes.

- Use black lines with 0.5 width for county roads affected by the project that either intersect, or go under or over trunk line.
- Use 30% gray at a width of 0.25 for county roads not affected by the project that do not intersect, or go under or over trunk line.

Note: All roads may be shown in black to gray depending on the map type and the need to better display the pertinent data. Refer to the example on the next page.

- For airports use the airport symbol shown below.

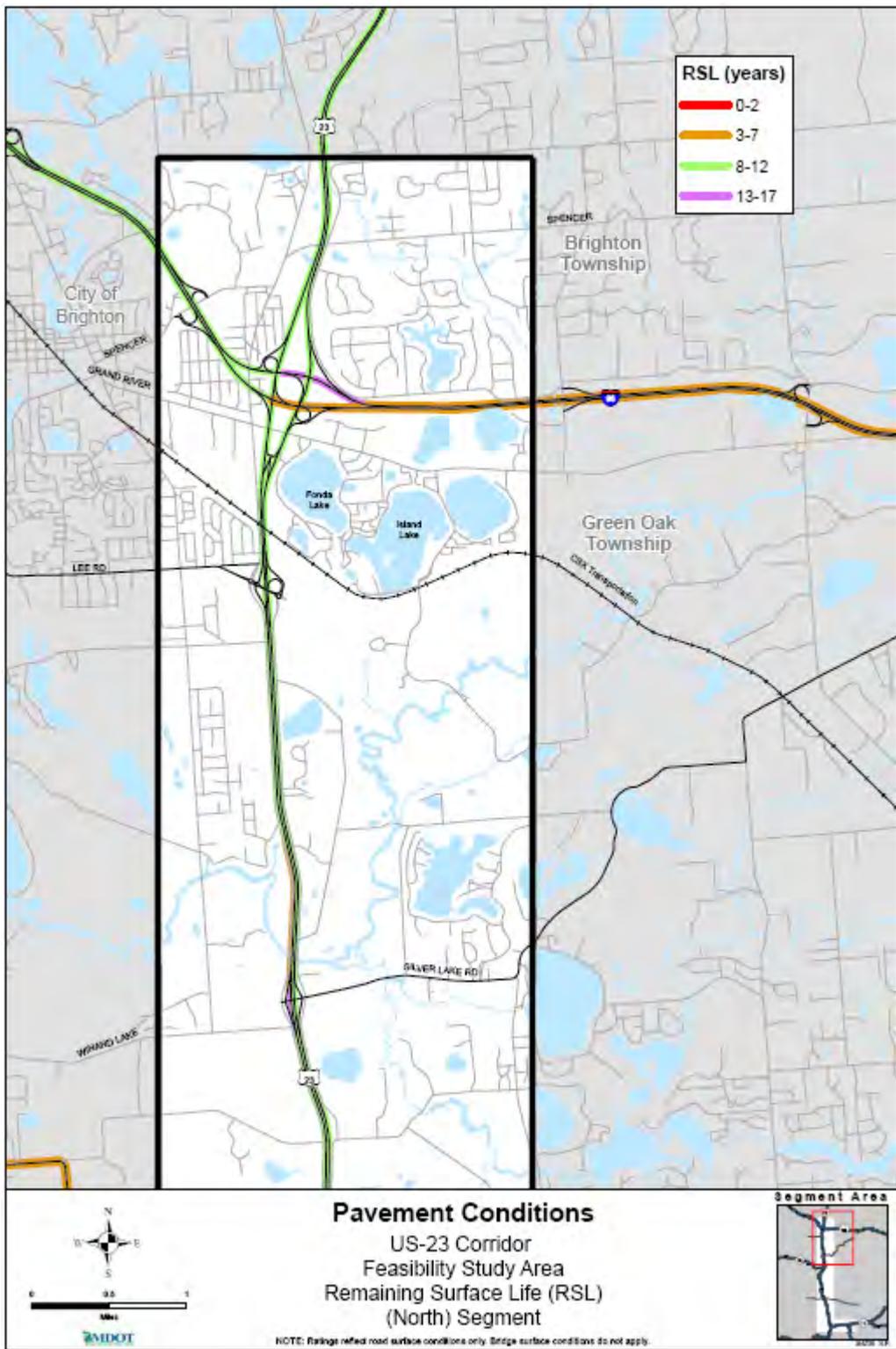


- For transit lines/transfer stations use the public transit symbol shown below.



- For railroad lines use the railroad line symbol shown below and adjust the color of the rail line (black to gray) and width as needed in each map display.





Example of using shades of black to gray

Road Symbols/Names

Use these shields for labeling trunklines:



M-Routes (shield size 18 in ArcMap, just under ¼ inch, font 8pt Arial)



US Routes (shield size 18 in ArcMap, just under ¼ inch, font 8pt Arial)



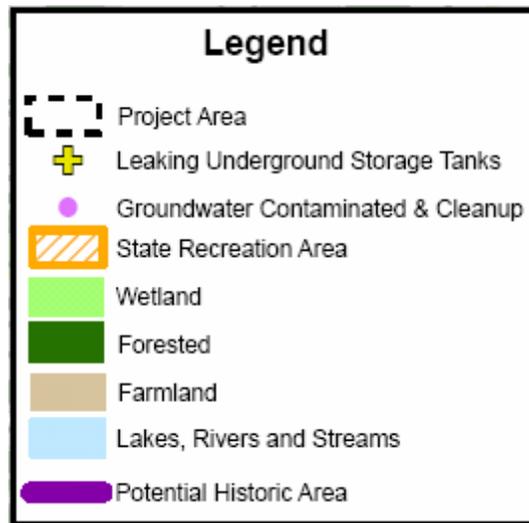
Interstate Routes (shield size 22 in ArcMap, approx. ¼ inch, font 8pt Arial)

Legend/Key

Place the legend in a location that will not block pertinent map data. Use Arial or Arial Narrow font at no less than 8 pt size for text within the legend/key. Arial Narrow font works best when the legend contains many entries. Where possible use pastel colors for all necessary fill areas/fields within a legend/key. Place a border (2 width in ArcView) around the legend/key to separate it from the map content. Two examples are shown below.



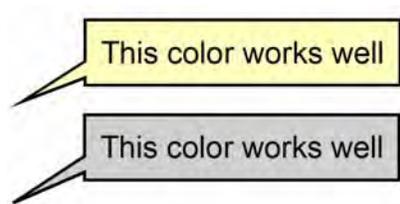
This example uses Arial Narrow due to the number of legend entries.



This example uses Arial font effectively.

Call Out Boxes

As within the body of the document, only use call out boxes on maps or exhibits to emphasize a specific feature. Limit the use of call out boxes to avoid over-cluttering the map. Use Arial font at a minimum size of 8 points. Fill color varies depending on different backgrounds. Generally, a yellowish or grayish background as shown on the following examples works best. A black border is preferred.



Sample Call Out Boxes

Map Outputs

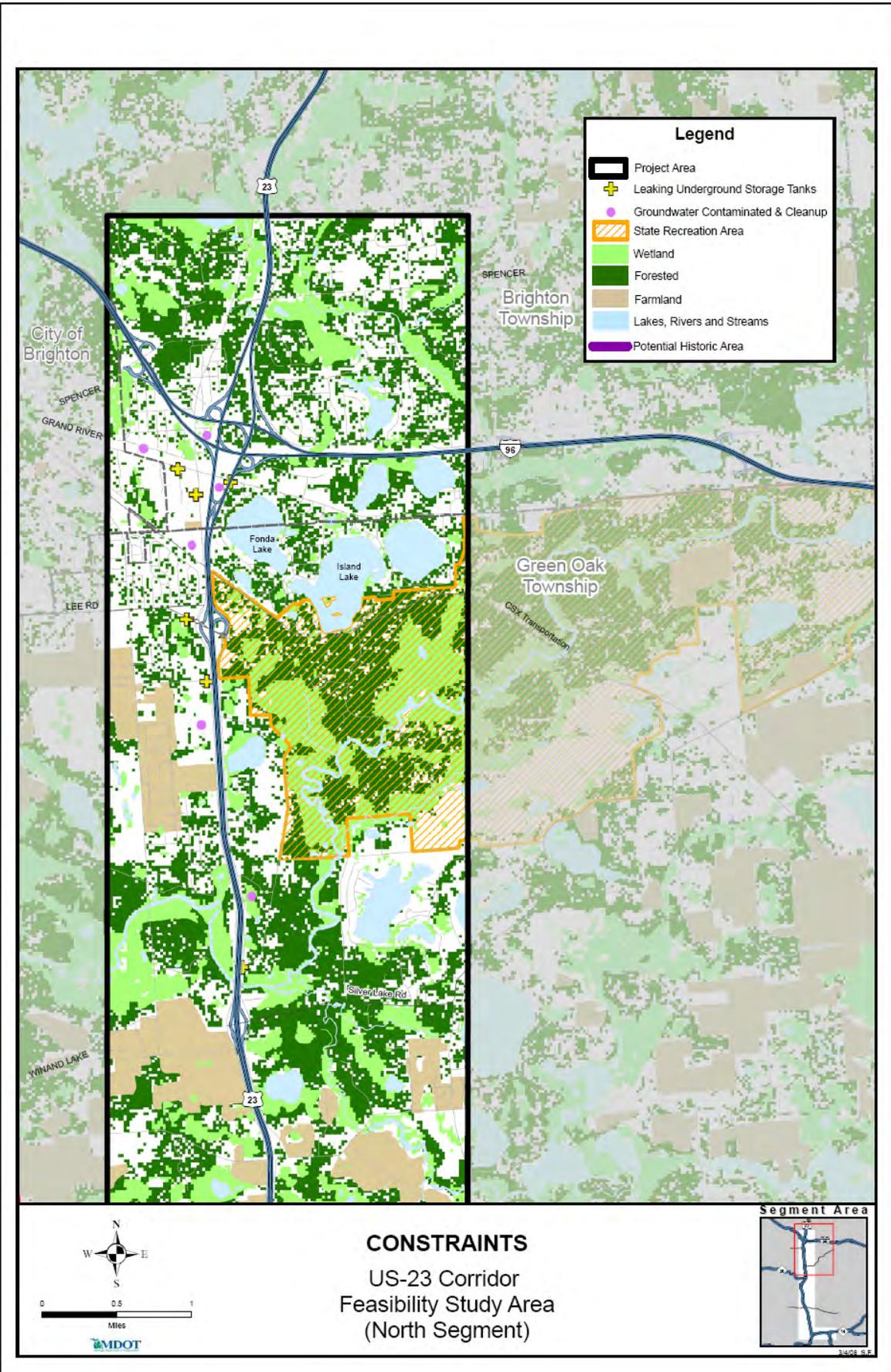
The following are desired major action NEPA document map outputs:

Hard Copy/WEB pdf

- pdf for standard print: 150 DPI minimum (see example on the following page)
- pdf for word document: 150 -300 DPI
- pdf for Web: 96 DPI maximum

Print Size

Print to pdf, then print from pdf to standard (8.5" x 11" or 11" x 17") or preferred size. Set the Page Scaling option to NONE in the Print window to maintain the correct margin.



Map Quality Assurance Standards:

All major action NEPA document maps and exhibits are subject to strict quality assurance checks to minimize distribution of inaccurate data and to ensure that map content and design enhance overall document readability. All quality assurance reviews will at a minimum address the following:

- Screen documents and illustrations for Americans with Disabilities Act (ADA) compliance before posting on the internet.
- Make sure the scale bar reflects layout map, not the inset map.
- Create a PDF with each map produced as a digital hardcopy map showing appropriate QA/QC reviews/approvals.
- Review spelling of names for all roads, villages, townships, cities, and graphic features.

Content and Document Structure

Front Cover

A front cover contains selected study identification elements from the title page, the MDOT logo, and graphic design elements that characterize the study.

Americans with Disabilities Act, Title VI and Cost of Publication Statements

The following statement must appear inside the front cover or on the reverse side of the title page of any published environmental documents:

“This document has been published by authorization of the Director of the State of Michigan’s Department of Transportation in keeping with the intent of the National Environmental Policy Act of 1969 and subsequent implementing regulations and policies, including Title VI of the Civil Rights Act of 1964, that direct agencies to provide the public and other agencies an opportunity to review and comment on proposed projects and alternatives so that potential impacts of the project can be considered and taken into account during the decision-making process. Requests for alternative formats of this document under Title II of the Americans with Disabilities Act may be made by calling 517.373.9534 or TDD 800.649.3777. The cost of publishing___copies of this document at approximately___per copy is_____, and the document has been printed in accordance with Michigan Executive Directive 1991-6.”

Each MSWord™ document template contains this statement on the reverse side of the front cover of the document.

Title Page

The layout and format for title pages differ slightly depending upon the type of document. The document templates contain the standard elements and fields for study-specific information as defined in FHWA Technical Advisory T6640.8A.² The title page information should fit on one page unless the list of cooperating agencies is long. The project abstract should only be one paragraph long and should include a brief project description including length, scope of work and cost. For draft documents, the abstract should also tell readers how and when to submit comments on the document.

² Technical Advisory T6640.8A is available at <http://www.fhwa.dot.gov/legsregs/directives/techadv/t664008a.htm>

Preface

The MSWord™ document templates contain the approved language for a one-page document preface. This language briefly explains what the document is and that it meets the requirements of federal and state law. The preface also identifies next steps for the reader. Wording for the preface differs slightly based on document type and whether the project impacts Section 4(f) or Section 6(F) properties.

Table of Contents, List of Figures, List of Tables and List of Appendices

See Navigation Aids for the Reader in the chapter on General Format and Layout

Document Summary

The Document Summary is an integral part of a major action document, thus one should be prepared for every major action NEPA document (EA, DEIS or FEIS). The summary clearly answers the following questions:

- why is the project is needed?
- what alternatives were evaluated to fix the problem?
- what impacts would the proposed action have?
- what necessary mitigation measures would be incorporated into the project?

The Document Summary should include an impact summary table. Writers should also describe any outstanding issues or controversy surrounding the project, provide a proposed project schedule and include the estimated project cost. The key considerations and reasons for conclusions and recommendations should be included, especially when discussing the Preferred Alternative.

The Document Summary is not a stand-alone document; rather, it provides a high-level overview of study findings and engages the reader's interest in the project. The document summary should utilize a question and answer format and be no longer than three percent of the document length exclusive of appendices and exhibits.

Purpose and Need Chapter

The Purpose and Need Statement (P&N) sets the stage for the story and is the foundation of the NEPA decision-making process. This section of the document must conclusively illustrate that corrective effort is justifiable and worth the expenditure of public funds. The P&N Statement does not prescribe a recommended solution and should be developed independent of the eventual environmental document.

In most cases, the purpose of a project is to serve an overarching public or societal need and should support MDOT's mission: "Providing the highest quality integrated transportation services for economic benefit and improved quality of life." It answers the question "Why are we proposing to initiate this project?" Examples of recognized MDOT project purposes include:

- Improve Safety
- Enhance Mobility
- Enhance Economic Benefit and Quality of Life
- Improve System Condition
- Improve the National Defense System
- Improve System Connectivity

The need for a project should state why improvements must be made to the existing transportation facility(s) to better achieve the overarching purpose. The need statement should identify the more focused project objectives, which will be utilized to evaluate alternatives. It does not provide process methodology nor ideas for alternative solutions. Example project needs include:

Safety:	Improve safety by reducing queue lengths on the I-94 at the State Road interchange
Roadway Deficiencies:	Improve the condition of 14 existing bridges along I-94 between US-127 and M-50
System Linkage:	Improve access to the Muskegon Area Airport
Transportation Demand/Capacity:	Reduce traffic congestion on I-96 between the Fowlerville (Exit 129) and Howell (Exit 133) interchanges
Legislative:	Implement the requirements identified in SAFETEA LU (Section 1701 & 1702) High Priority Projects
Modal Relationships:	Improve the interface between the public road system and the intermodal terminals/rail lines that support the movement of freight
Economic Development / Quality of Life:	Improve operations and processing capability in accommodating the flow of people and goods

National Security: Provide reasonable and secure border crossing system options to protect society against manmade threats and natural disasters

Background information and existing data (i.e., traffic, crash, system condition, level of service) that support the Purpose and Need statement should be included to provide the reader with sufficient material to logically reach the same conclusion. The project area should be defined within this section. With complex projects, presenting all relevant information by jurisdiction or logical termini is preferable.

Clearly describe the alternatives (or the preferred alternative) and how well each achieves the transportation project objectives and ultimately the stated purpose of the project.

Alternatives Chapter

The Alternatives section describes the process for developing, evaluating, and eliminating potential alternatives based on the purpose of and need for the proposed project. The section includes how alternatives were selected for detailed study, the reason why some alternatives were eliminated from further consideration and describes how alternatives carried forward meet the need for the project and avoid or minimize social, economic and environmental harm.

In the DEIS, discuss all reasonable alternatives at a comparable level of detail. There is no requirement at this stage to have a “preferred” alternative. However, the document may state an official position if one has been determined. The FEIS must identify and describe the preferred alternative and the basis for that decision.

The focus of all EAs should be the “preferred” alternative. A brief description of the alternatives considered can be included.

Always include the No-Build alternative as a baseline against which the impacts of other alternatives can be compared. As part of the No-Build alternative, considerations may include short-term minor reconstruction, such as safety upgrading and maintenance.

Description and Comparison of Alternatives

In defining the scope of an EA or EIS, clearly describe the proposed action and identify the range of reasonable alternatives. Sufficient information should be present to allow readers to evaluate the differences among alternatives. It is crucial to avoid bias for or against alternatives. There should be enough information to support a technical review of the analyses and conclusions.

This chapter should have meaningful graphics-based descriptions of alternatives and text that highlights the key differences and similarities between the alternatives. If necessary, create a

separate technical report or appendices for EIS documents detailing this information and then summarize the information in this chapter.

A flexible format can be used in describing the alternatives. For example, if the project has complicated alternatives and a lengthy project description, consider developing one report that describes the project alternatives rather than repeating the description of alternatives within the document.

Range of Reasonable Alternatives

CEQ regulations state that an EIS must include a comparative analysis of alternatives, including the proposed action. The regulations require a thorough and objective evaluation of reasonable alternatives and that the EIS consider a No-Build Alternative.

It is not required to discuss every unique alternative when a very large number of alternatives are involved. Guidelines state that reasonable alternatives include those that are practical or feasible from a common sense, technical, and economic standpoint. When there are an excessive number of alternatives, only a reasonable number of examples, covering the full spectrum of alternatives, must be available for analysis and comparison in an EIS.

No-Build Alternative

All EAs and EISs must consider the No-Build alternative. The No-Build alternative may or may not be a reasonable or recommended alternative based upon the purpose and need of the proposed project.

The No-Build alternative is a baseline to compare against the other illustrative alternatives. This does not indicate that the No-Build alternative means doing nothing; the intention is for it to be a means of maintaining the existing transportation system.

Screening/Selection of Alternatives

The alternatives chapter of an EIS should include the decisions made in the screening process and the reasons for those decisions. One major factor in the screening of alternatives is to evaluate how an alternative meets the purpose and need of the project. When screening and/or selecting alternatives, the identification and evaluation of the impacts of each alternative needs to be addressed. The presentation of impacts of alternatives should be in comparative form to sharply define the issues and provide a clear basis for choice (40 CFR 1502.14). Tables, charts or graphics should be used to show comparisons, along with text to explain or emphasize major issues. (EXAMPLES TO BE PROVIDED ONCE ELECTRONIC VERSIONS ARE AVAILABLE) It is necessary to cover some important issues in the screening process including:

- Alternatives considered in screening
- Screening criteria/methodology

- Screening results
- Agency and public input into the screening process
- Social, environmental and economic impacts
- Cost
- Ability to meet the purpose and need

Affected Environment & Environmental Consequences Chapter

MDOT traditionally uses a resource-based format for this chapter of a document. The Affected Environment and Potential Impacts chapter describes the condition of existing resources in a study area, and explains how each alternative would affect those resources. The analyses of impacts fall naturally into four groups:

- Impacts to the Social and Economic Environment
- Impacts to the Natural Environment
- Impacts to Cultural Resources
- Construction, Temporary, Indirect and Cumulative Impacts.

Writers should focus the discussion in this chapter on those impacts that are major deciding factors in the selection or elimination of alternatives. When a proposed project will have no effect on a protected resource, a simple statement to that effect is sufficient. For example, if a project is not within or adjacent to a critical dune, a high-risk erosion area or another coastal zone resource, write “the proposed project would have no adverse effect within the coastal zone.” Or, “The proposed project is not within the Coastal Zone Management Boundary.”

Common Content Items

- Cite and describe federal and state statutes, legislation and executive orders protecting the resource. The American Association of State Highway and Transportation Officials (AASHTO) recommends explaining which of the various laws and regulations are applicable to the proposed project and which are not. AASHTO also recommends explaining how the applicable regulations have been met and adds that, although the general reader may have little interest in this topic area, the information has great value for a reviewing court. The document templates contain some standard descriptions of these regulations.
- Identify whether permits under these laws are required from MDEQ and other agencies (e.g., MDNR, U.S. Army Corps of Engineers, U.S. Coast Guard).

- Provide all available information needed for state permits (MDEQ, MDNR) or needed for consultations with federal agencies (e.g., U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service).
- Describe any entity or area of potential effect; for example, descriptions of noise sensitive receptors, existing land uses, wetlands, endangered species, current air quality conditions and status, and the watershed as well as characteristics at stream crossings.
- Describe the methodology (e.g., field surveys, classification systems) used to evaluate the impacts and to compare alternatives. The document templates contain some standard language to describe resource analysis methods where it is required or recommended in federal guidance documents. Reference any technical reports prepared for the subject resource analysis.
- In an Environmental Assessment, clearly state whether the resource has been adequately studied with a proper level of data collection and analysis or whether further surveys are necessary.
- Describe or quantify the short-term and long-term effects and direct and indirect impacts of all alternatives on the subject resource including impacts associated with alternative construction methods in ways that provide a clear comparison of alternatives.
- Reference coordination letters to or from resource agencies and include them in an appendix to the document.
- Refer the reader to the Green Sheet (Mitigation chapter) for a description of commitments or plans to avoid, minimize or mitigate the impact on the protected resource including plans to protect the resource during and after construction.
- Summarize any associated technical reports for the reader and tell the reader how to obtain a copy of the full technical report. In most cases, it is neither prudent nor necessary to append an archaeological technical report to the document. The phrases that the technical report "contains privileged and confidential information" and "is not for release" should be used when referencing the Archeological Technical Report in the document's text.

Additional Content for Land Use Impacts

- Include a list of land use plans, master plans, transportation plans, and zoning regulations in effect within the jurisdiction where the proposed project would be located.
- State to what extent the proposed project would be compatible with these plans.
- Include maps of these existing plans.

- Refer to the Section 4(f) chapter, if applicable.

Additional Content for Right-of-way and Relocation Impacts

- Include the Conceptual Stage Relocation Plan in an appendix.
- Please refer FHWA Technical Advisory, T6640.8A, for other content requirements.

Additional Content for Impacts to Farmland and Agriculture

- List, describe and map all prime, unique, statewide or locally important farmland that would be affected by the proposed project.
- Include a completed Farmland Conversion Impact Rating Form (AD-1006) with a column for each alternative as appendices.
- List, describe and map all Act 451, Part 361 Open Space (formerly PA116) enrolled parcels within the project area and identify those that would be impacted by each alternative. Also, describe the extent of impacts.
- List, describe and map any parcels affected by any alternative(s) that are enrolled in any state or local property development rights program and describe the extent of impacts.
- Describe all impacts to farm operations, such as movement of livestock, movement of machinery, landlocked remainders, irregular-shaped remainders, remainders that would no longer be farmable, uneconomical remainders, impacts to irrigation systems, any temporary impacts during construction (easement or grading permit), etc.
- Describe any other agricultural issues identified at public meetings or by resource agencies.
- Describe and map any proposed wetland mitigation sites that would impact or convert farmland.

Additional Content for Social Effects

- Describe changes in the neighborhoods or community cohesion for the various social groups affected by the proposed project. These changes may be beneficial or adverse, and may include splitting neighborhoods, isolating portions of a neighborhood or an ethnic group, changing property values, or separating residents from community facilities and services.
- Describe changes in travel patterns and accessibility for motorists, transit users, pedestrians and bicyclists.
- Describe and map community facilities, i.e. schools, churches, hospitals, police and fire facilities, libraries, recreation areas, businesses, Government facilities, community centers, etc.

- Describe impacts on schools, churches, hospitals, police and fire facilities and other related emergency services, libraries, recreation areas, businesses, government facilities, community centers, etc. This analysis should include both the direct impacts and indirect impacts to these facilities and services.
- Identify population/social groups that may be affected by the proposed project. The identified groups may include the elderly, handicapped, pedestrians, transit users, minority and ethnic groups and low-income, etc.
- Describe the effects that the project may have on the identified population/social groups. Along with mitigation measures. If minority and low-income population groups are identified, refer to the “Additional Content for Environmental Justice Effects”.

Additional Content for Environmental Justice (EJ)

When describing the methodology in the Environment Justice section, refer to Appendix D in this Style Guide for standard descriptions of the steps. Appendix D contains part of a more comprehensive document on Environmental Justice analysis entitled, *The Michigan Department of Transportation Project Planning Division Guidelines for Addressing Environmental Justice in NEPA Documents*. See that guidance for more information.

- Describe each step and discuss findings before moving on to describe remaining steps.
- If no minority or low-income populations are present in the study area, refer the reader back to the description of population/social groups described in the Social Effects section and state that Executive Directive 12898 does not apply to any population group within the study area.
- If any population groups in the study area are protected by Executive Directive 12898, include a table showing these minority and low-income populations within the study area.
- Describe the methods used to determine whether project impacts associated with identified low-income and minority groups would be disproportionately high and adverse and describe any public involvement efforts to address qualitative impacts to these population groups.
- If impacts would be disproportionately high and adverse, describe measures that would avoid, minimize, and/or mitigate these disproportionately high and adverse impacts, and provide offsetting benefits and opportunities to enhance communities, neighborhoods, and individuals affected by the proposed project.
- If any mitigation or alternative courses of action are judged to be not practicable, that conclusion must be documented, supported by evidence, and included in the NEPA document.

- Include all findings, determinations, or demonstrations.

Additional Content for Economic Effects

Please refer to FHWA Technical Advisory, T 6640.8A, for content requirements.

Additional Content for Pedestrian and Non-Motorized Travel

Please refer to FHWA Technical Advisory, T 6640.8A, for content requirements.

Additional Content for Parks and Recreation

If no Section 4(f) 6(f) properties would be affected by the proposed project, list and briefly describe any unaffected park or recreation areas within the study area.

If the proposed project would affect Section 4(f) or Section 6(f) properties, refer the reader to the Section 4(f) and Section 6(f) chapter.

Additional Content for Visual and Aesthetic Resources

- Refer the reader to the Public and Agency Coordination chapter for descriptions of stakeholder outreach.
- Please refer to FHWA Technical Advisory, T 6640.8A, for content requirements.

Additional Content for Effects on Air Quality

- Include a table showing current National Ambient Air Quality Standards.
- If Mobile Source Air Toxics (MSAT) analyses are required, include any tables necessary to fulfill federal requirements. Refer to FHWA's Interim Guidance on Air Toxic Analysis in NEPA Documents, February 3, 2006 for required language and content pertaining to mobile source air toxics. The document templates contain some of this content.
- If particulate matter (PM2.5 or PM10) hot-spot analyses are required, include any maps and tables necessary to fulfill the requirements of the FHWA and EPA federal joint guidance, Transportation Conformity Guidance for Qualitative Hotspot Analysis in PM2.5 and PM 10 Nonattainment and Maintenance Areas, March 29, 2006.
- If a carbon monoxide (CO) hot-spot analysis is required, include a project area map showing the hot-spot analysis locations and a map of each analysis location showing receptors and CO levels. Also, include a Maximum CO Concentrations Table showing existing and Design³ Year No Build CO concentrations and predicted CO concentrations at the highest emissions year and at the Design Year for all alternatives.

³ Design year is usually 20 years out.

- Describe anticipated air quality impacts that would be associated with the construction phase.

Additional Content for Noise Impacts

- Include a table showing Noise Abatement Criteria.
- Include an illustration that helps the reader translate noise measurements into common terms.
- Include a map showing field measurement locations, receiver locations with impacted receivers highlighted, considered noise barrier locations with recommended barriers highlighted, and point locations for units that would benefit from barriers.
- Include a calibration table by monitor location showing time of monitoring, traffic volumes, measured dBA, monitored dBA and variance between measured and monitored dBA.
- Include a traffic volume and mix table showing existing and predicted volumes for autos, medium trucks and heavy trucks for each corridor section (interchange to interchange).
- Include a noise level table by receiver location showing the address, existing noise levels, predicted noise levels, and variance between existing and predicted noise levels. Highlight rows pertaining to impacted receivers.
- Include a table describing proposed barriers including location, length and average height (in feet) for each alternative.
- Include a table showing results of the feasible/reasonable analysis by barrier ID containing number of -10 dBA, -5 dBA attained (Y/N), total cost, number of benefiting units, cost per benefiting unit, and whether the barrier would meet the reasonable test (Y/N) and the feasible test(Y/N).
- State that noise impacts will be analyzed again during the design phase.

Additional Content for Contaminated Sites

- Describe how contaminated sites were identified.
- Describe each contaminated site, which alternative(s) would affect the site and the rating (low, medium, high) of each parcel with respect to contamination.
- Include a table showing site name, address, type of site (LUST or Part 201) and which alternative(s) would disturb the site.
- Provide a map showing locations of medium and high-risk sites in relation to each alternative.

- Summarize impacts related to contaminated sites for all alternatives including the number of sites impacted by each alternative, the number of sites rated as medium risk, and the number of sites rated as high risk.
- If any Preliminary Site Investigations (PSIs) have been completed, include a summary of findings and recommendations.
- Include recommended actions for medium or high-risk sites.

Additional Content for Wetlands

- Provide a map of wetlands within the project corridor
- Include a table that summarizes wetland characteristics found within the project area. The table should provide information on the wetland cover type based upon Cowardin, et al, the estimated area of project impact by cover type and any other landuse/cover mapping classification that corresponds to each Cowardin wetland class.
- Discuss the findings of the functional wetland assessment for each identified wetland and include a summary table of these findings.

Note: A wetland finding is included as an appendix to the ROD or FONSI rather than being included in the EA or FEIS.

- In the discussion of impacts, include potential effects to wetland hydrology, alteration of plant and animal community structure and the wetland's use in a landscape context by resident wildlife.
- In cases where more than 10,000 cubic yards of fill would be placed in a wetland (i.e., red file project), include a statement regarding necessary review of the DEQ permit by the Environmental Protection Agency (EPA).

Additional Content for Water Quality

- In the description of laws and regulations, also reference local municipal storm water ordinances.
- Describe the existing and proposed storm water drainage system and drainage patterns including drainage areas, locations of outfalls, land use, amount of impervious surface area, etc.
- List and describe each water body that will receive storm water runoff from the project. Cite the source of this information (e.g., MDEQ/MDNR reports).
- Provide specific information on impaired water bodies listed as not meeting State Water Quality standards, and/or for which a Total Maximum Daily Load (TMDL) has been developed. Discuss pollutants of concern.

- Include specific information on other special designations, which trigger coordination with MDEQ – Water Bureau, including Outstanding State Resource Water, State Designated Trout Stream, State Designated Trout Lake, Coldwater Lake of Michigan, National Wild & Scenic River, or State Designated Natural River.
- Provide ground water information including lists and descriptions of wellhead protection areas, public water supply intakes, private drinking water wells, groundwater contamination issues, and groundwater monitoring wells.
- Identify local watershed advocacy groups or Metropolitan Planning Organizations (MPOs) with existing watershed management plans.

Additional Content for Floodplains/Hydraulics

- Include information about the existing normal flow (ordinary high water mark) and the 100-year storm levels to allow the reader to visualize any potential stream crossing location.
- Identify any structures that would be scour critical and whether any scour protection measures (riprap armoring along abutments, around piers or across the river channel) would be necessary.
- Indicate the width of the floodplain at proposed crossing location(s) and approximately how much of the floodplain would be spanned by the proposed new structure(s).
- Indicate whether a temporary haul road would be needed to provide crane access for bridge or culvert construction.
- Include the amount of fill, if any, that would be placed within the floodplain and if the amount would exceed 300 cubic yards. If greater than 300 cubic yards of fill, identify the proposed locations of compensating cuts to replace floodplain storage.
- Summarize the values and functions analysis and refer the reader to the Hydraulics Report for more detailed information.

Additional Content for Wild and Scenic Rivers or State Designated Natural Rivers

Refer the reader to the Section 4(f) 6(f) chapter, if applicable.

Additional Content for Stream/Drain Crossings

- When describing each crossing location, include width and depth of water courses (measured at the high water mark) and stream velocity under various flow conditions (e.g., base flow, 100-year storm) at existing and potential crossing sites.
- Describe existing and proposed structures including type, opening size and length of culverts and length, width, number of spans, span length, number of piers in the

water, pier type, pier nose shape, pier spacing and vertical under clearance of bridges.

- If any existing structures are scour critical, indicate whether any scour countermeasures can be placed without disturbing the existing foundation (e.g., rip rap armoring along abutments, around piers, or across the channel).
- For alternatives that would require stream relocation or realignment, include the location, and amount of stream location and any change to stream length. Describe the existing and proposed stream cross-section and channel slope profile. If a stream relocation exceeds 500 feet (i.e., red file project), include a statement regarding necessary review of the DEQ permit by the Environmental Protection Agency (EPA).
- In cases where a culvert would enclose an additional 100 feet or more of stream or drain (i.e., red file project), include a statement regarding necessary review of the DEQ permit by the Environmental Protection Agency (EPA).

Additional Content for Fish and Wildlife

- Describe each water body and aquatic species (particularly fish and mussels) found within aquatic habitat, and any special designations. Include a reference to the source of this information (e.g., MDEQ/MDNR reports).
- Discuss short and long term impacts of the proposed project (all alternatives) on aquatic species along with impacts associated with alternative construction methods.
- Reference coordination letter(s) from the Michigan Department of Natural Resources, if applicable. Put coordination letters in an appendix.

Additional Content for Threatened and Endangered Species

- If no surveys are necessary, explain why. Include reference to the resource agency letters (USFWS and MDNR) which indicate no concerns. Put resource agency coordination letters in an appendix. Likewise, give a brief description of the lack of appropriate habitat. Include photos if possible.
- If surveys are necessary and have been completed, include an easy to read table in which each of the species from the USFWS and MDNR coordination letters are listed. Include the scientific name, common name, whether it is a plant or animal, federal status, state status, survey date(s), species present/absent, suitable habitat present/absent.
- Include a table of species not previously noted in the USFWS and MDNR correspondence discovered during the surveys. Include state Special Concern and federal Candidate species in this list.
- When describing impacts, state definitively whether the species will be impacted, what the impacts are and how many individuals will be impacted in relation to the

total species population in the surrounding area. In addition to Threatened or Endangered species, always include Special Concern (SC) or federal Candidate (C) species. If SC or C species will be impacted with no mitigation, state this decision.

- Describe what positive impacts may occur to the species as a result of the proposed project (i.e. tree removals benefiting remnant prairie species, bridge replacement improving water quality for protected aquatics).
- State whether a Section 7 consultation with USFWS is required or whether EPA review of the MDEQ permit (i.e., red file project) would be required. Refer the reader to the technical report for additional details needed for any State Endangered Species Permit and any federal agency consultations.
- Address future maintenance practices that would take place after the construction activity. Describe how new maintenance activity would affect the species and the associated habitat. Provide suggestions on how to avoid impacts from future maintenance.
- See also Environmental Procedures Manual, Chapter 19.

Additional Content for Coastal Zone Resources

- Describe the Michigan Coastal Zone Management (CZM) Program and federal consistency review.
- Explain the difference between the federal consistency review and the final CZM permitting process within Michigan.
- Include a map showing the location of each alternative within the coastal zone. Include the CZM boundary and significant coastal resources on the map (i.e. coastal barrier resources, critical dunes, wooded dune and swale, Great Lakes marsh, high risk erosion areas)
- Explain whether each alternative will positively or adversely affect coastal resources. Likewise, describe how the improvement to the transportation infrastructure may positively or adversely affect the goals of the Coastal Zone Management Program.

Additional Content for Above-ground Cultural Resources

- Describe the National Register Criteria.
- Describe how the historic sites were identified and the underlying methodology used.
- Provide a map of the Area of Potential Effect showing locations of historic properties in relation to each alternative.
- Include at least one photograph of each property and at least one representative photograph of districts.

- When describing each potentially affected property, state why it is eligible. In the case of an historic district, also identify non-contributing properties.
- Describe any pertinent community involvement and reference any comments included in the appendices.
- Refer to the signed Memorandum of Agreement (MOA) and include it as an appendix, if applicable.
- Refer to the Section 4(f) chapter, if applicable.

Additional Content for Archaeological Resources

Discussion of archaeological sites must not include any references to their location. In addition, archaeological sites are not to be depicted in any fashion on figures in these documents. In most cases, it is neither prudent nor necessary to append an archaeological technical report to the document. The phrases that the technical report "contains privileged and confidential information" and "is not for release" should be used when referencing the technical report in the document's text.

- Describe the National Register Criteria.
- When describing methods used to identify archaeological sites, indicate if sites were field verified (shovel testing or pedestrian survey) or identified based on historical references only.
- State the eligibility determination of each affected site and when applicable explain why it is eligible. Presenting this information in a table is an effective way to provide this information.
- Indicate whether further surveys or testing are needed.
- Refer to the signed Memorandum of Agreement (MOA) and include it as an appendix, if applicable.
- Describe any pertinent community involvement and reference any comments included in the appendices.
- Refer to the Section 4(f) chapter, if applicable.

Additional Content for Traditional Cultural Properties

- Describe the National Register Criteria.
- Briefly describe the consultation process and results of consultations with tribal governments and tribal historic preservation officers (THPO) for all alternatives.
- Refer to the Tribal government/THPO coordination letters located in the Appendix.

- Refer to the signed Memorandum of Agreement (MOA) and include it as an appendix, if applicable.
- Describe any pertinent community involvement and reference any comments included in the appendices.

Indirect Impacts

- Include a brief definition of indirect impacts.
- Describe any resources that would be indirectly impacted by the project and the magnitude of those impacts.
- List agencies or organizations that were involved in identifying and analyzing indirect impacts.

Cumulative Impacts

- Include a brief definition of the term *cumulative impacts*.
- List agencies such as metropolitan planning organizations, county road commissions and departments of public works involved in determining cumulative impacts and which of their projects (if any) contribute to these cumulative impacts.
- Summarize any past, present and reasonably foreseeable actions that have or are expected to have an effect upon the same resources as the proposed project. Include details such as the number of relocations, changes in access, extended detours, etc.
- Provide a timeline of all work done on the same route in the past and planned for the future.
- Describe or quantify the anticipated overall effects of accumulated impacts.

Maintaining Traffic

- Describe any effects of construction on traffic flows for all affected modes.
- Describe any effects on access to adjacent properties during construction of each of the proposed alternatives.
- Identify by mode any detour or alternative routes that would be used for each alternative and any work required to bring the detour route up to standards for use as a detour.

Section 4(f) & Section 6(f) Evaluation Chapter

See FHWA Technical Advisory, T 6640.8A, for content requirements.

Mitigation Chapter

The Mitigation chapter contains a Project Mitigation Summary (Green Sheet) and describes the standard mitigation measures established for all projects. The EA and EIS templates contain the standard content for the Mitigation Chapter and they are also included in the Environmental Procedures Manual. For further guidance on the mitigation commitment process, refer to Environmental Procedures Manual Section, Chapter 21 and contact the MDOT Mitigation Specialist.

Public and Agency Coordination Chapter

This chapter must provide a record of public and resource agency consultation throughout the study. For public meetings and workshops, include dates, locations, formats, the number of participants and a brief description of outcomes (issues and concepts brought forward from participants). Provide similar information for contacts with stakeholder groups including all resource agencies and state, federal and local government agencies. Include a timeline to visually report public and stakeholder participation throughout the study process.

An appendix containing copies of all public and agency coordination letters supports this chapter. Reference this appendix by number and name within the chapter.

List of Preparers

This section includes a list of the individuals primarily responsible for preparing the document or technical reports. Identify MDOT staff and consultants by name, qualifications, expertise, experience and professional discipline. List FHWA and MDOT staff first. Include the following text before listing participating consultants:

“MDOT selected the consultant with assurance that no members of the consultant team have any financial or other personal interest in the project outcome. FHWA independently evaluated consultant disclosure statements in accordance with the regulations.”

Distribution List

This is a complete list of all persons and agencies who receive copies of documents for this study (See also Environmental Procedures Manual, Chapter 17).

List of Technical Reports

Include a list of any technical reports prepared for the study. This list should be ordered according to the order of reference in the document body. All technical reports must be referenced in the document body. Provide cross references between this list of technical reports

and any summary reports included in the appendix. Let the reader know how to request copies of technical reports or refer the reader to contacts listed on the cover page.

Common technical reports include:

- Air Quality Report
- Noise Analysis Report
- Hydraulic Analysis
- Traffic Operational Analyses
- Project Area Contamination Survey (PACS)
- Threatened and Endangered Species Survey
- Above-ground Cultural Resources Report
- Wetland Impacts, Functions and Values Assessment and Wetland Mitigation

References

Cite published sources of information, including information obtained from Web sites using the formats approved by the Modern Language Association.

Appendices

Order appendices according to the order of reference in the document body. Describe analytical methods in appendices if methods are highly technical and result in more than a one-paragraph description. Consider including brief summaries of technical reports as appendices for topics of interest to a broad range of readers. Examples of appendices are:

- Public and Agency Coordination Letters (organized by date with a chronological index of agency letters designed to assist the reader in locating specific elements of the record).
- Conceptual Stage Relocation Plan
- Farmland Conversion Impact Rating
- Memoranda of Agreement (e.g., with State Historic Preservation Office)
- Above-ground Cultural Resources Report Summary
- Traffic/Operational/Crash Analysis Report Summary

- Engineering Report Summary
- Project Area Contamination Survey (PACS) Summary
- Air Quality Report Summary
- Noise Analysis Report Summary
- Wetlands Report Summary
- Wetland Mitigation Plan Report Summary
- Threatened and Endangered Species Report Summary
- Plant and Wildlife Survey Report Summary
- Illustrative Alternative Report Summary

Standard Major Action Document Maps

The following are typical maps/exhibits that are contained within a traditional MDOT Environmental Assessment (EA) or Environmental Impact Statement (EIS):

- Cover map
- Project Location
- Environmental Constraints
- Land Use
- Future Land Use
- Zoning
- Traffic counts
- Cross sections
- Simplified Figures

Standard Geographic Data Layers

The following are representative geographic data layers contained in traditional MDOT EA/EISs:

- Land Use
- Future Land Use from Townships
- Zoning from Townships
- Wetlands
- Flood Plain
- Contaminated Sites
- Endangered Species
- Archaeological Site
- Aerial Imagery
- Design Drawings
- Soils
- Traffic Counts
- Bridge Data
- Pavement conditions

Index

Refer to Navigation Aids for the Reader included in the chapter on General Format and Layout.

Technical Reports

Technical reports document analytical methods used by the study team to evaluate alternatives. They contain data and outcomes of surveys, analyses and research. Although this type of document is intended for a technical audience, writers should still follow guidelines for clear writing, general page layout and graphic illustration standards.

Administrative Record

Maintaining accurate and up-to-date project files is an important task that should begin at the project on-set for major NEPA studies, regardless of whether litigation is anticipated. The project file allows the project team to locate important documents for compiling the administrative record and also when responding to Freedom of Information Act requests. The main project team (FHWA, MDOT Project Manager, prime consultant) is tasked with maintaining separate project files that will later provide the basis for the federal agency's administrative record. The administrative record is a written record which documents the agency's decision-making process and should contain "all documents and materials directly or indirectly considered by the agency" in making its decision. The administrative record is a requirement under federal law that empowers courts to review federal agencies' decisions. FHWA is ultimately responsible for the final administrative record.

The administrative record should include, but not be limited to, the following:

- Signed DEIS, FEIS, ROD, EA, FONSI and Letters of Reevaluation
- Federal Register Notices, Commission Minutes, Agency and Public Comments and Responses, Public Transcripts and Exhibits
- Technical Reports and Studies, Schematics, Photos, Maps, Emails, Computer Files, Meeting Minutes discussing studies/work
- List of all meetings and hearings (formal and informal) and attendance sheets
- Interviews and all correspondence showing process and decision
- Anything before agency at time before decision, even if not specifically considered by the final decision-maker
- Project Schedules and Progress Reports
- Public and Agency Comments and responses to community issues

All materials should be digitally archived. Additional guidance can be found in the AASHTO Practitioner’s Handbook dated July 2006.

Map Data Management Structure

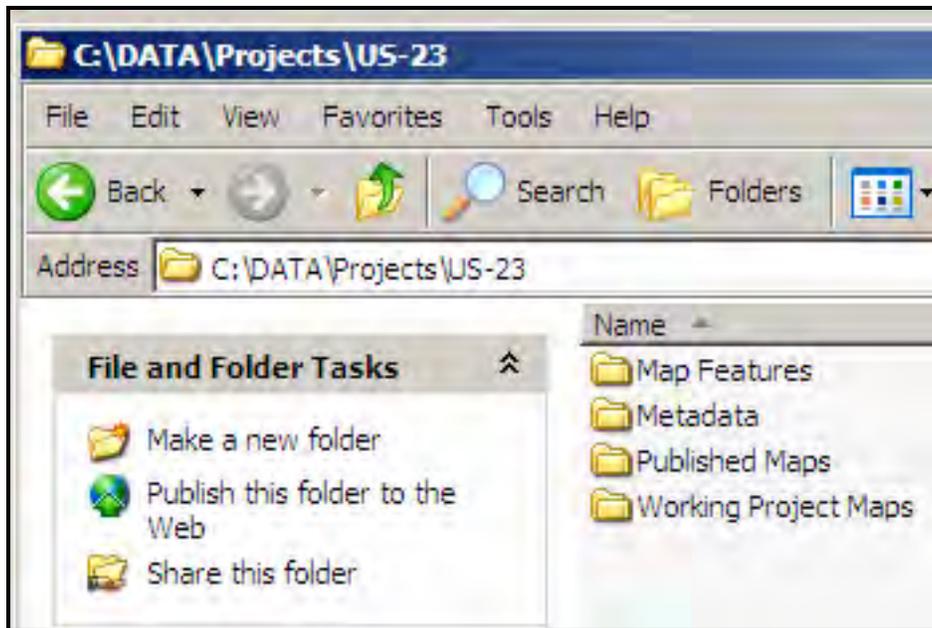
The following steps should be followed for storing mapping and graphics files for all major action NEPA documents:

Data storage environment

Maintain a “shared” folder on your computer under DATA called Projects: C:/DATA/Projects
Place individual Project folders in that folder.

Projects folder sub structure for each project

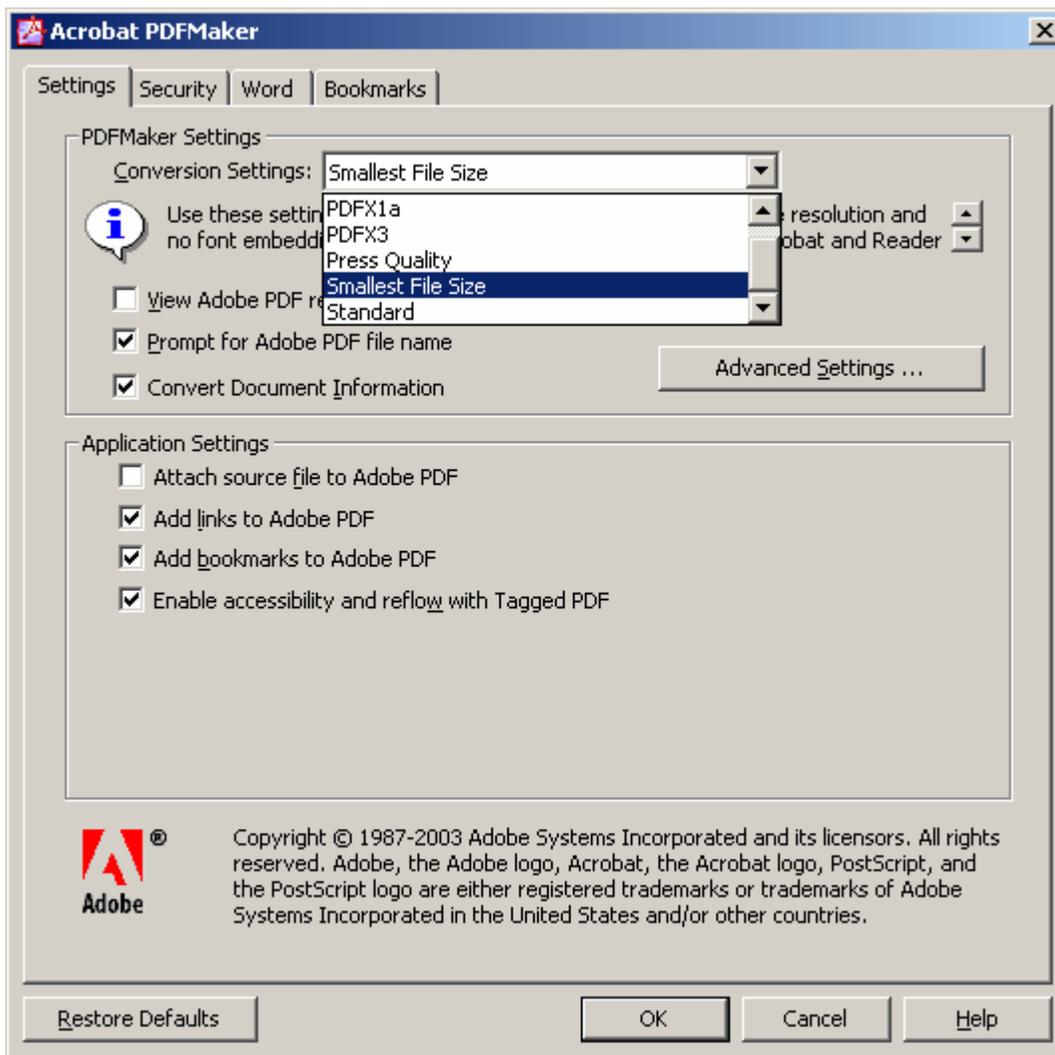
- Working Project Maps folder containing mxd files, and dgn files
- Map Features folder containing shp files, dgn files, imagery, photos, word documents. Create separate sub folders for each county’s data if more than one county in the project area.
- Metadata folder
- Published Maps folder for Supervisors access to final map in pdf format as well as keeping digital hard copy



Map and GIS Folder Structure 1

Portable Document Formats (.pdf) for CD and Server Distribution

All NEPA documents must be in an ADA accessible format. In addition to following the accessibility guidelines presented in the General Format and Layout chapter, use the conversion settings shown in the screen capture below before converting the document from MSWord to the Adobe portable document format (.pdf.) Adjust the resolution setting to yield the smallest .pdf file size. The smallest file size setting is adequate for text documents.



Portable Document Formats (.pdf) for Web Posting

Currently, the maximum file size for posting on MDOT's Web site is 2MB. Many NEPA documents are significantly larger than this allowable maximum. Consider this size constraint

as the document is designed and developed so that the navigation and accessibility features remain intact when the document is posted to the Web site.

Electronic Copies

Electronic copies of technical reports and major action documents must be in MSWord™ or in MSWord™ compatible formats.

Hard Copies

Print hard copies of technical reports and major action documents using the two-sided print setting. Ensure that chapters and other elements of the document such as appendices always begin on an odd numbered page (right facing page).

Appendix A: Team Members

The following individuals actively participated in the development of this style guide:

Richard Bayus, Transportation Planner
Sigrid Bergland, Historian
Keri Haidamous, Administrative Support
Barbara Hicks, Manager, Office of Communications
Doug Proper, Transportation Engineer
David Schuen, Resource Specialist
Gloria Siwek, Transportation Planning Specialist
John Tilley, Departmental Analyst
Cynthia Von Klingler, Departmental Specialist
Matt Webb, Manager of Project Studies and Justification Unit

These individuals provided direction for or developed the mapping standards:

Geralyn Ayers, Environmental Section Unit Supervisor
Chuck Baird, DIT
Lisa Benck, Cartographer/Departmental Analyst
Gary Eiseler, Graphic Arts Designer
Steve Fowler, Cartographer/GIS Analyst
Tom Hanf, Air/Noise Impact Analysis Coordinator
Kris Hart, Graphic Arts Designer
Kim Henderson, Graphic Design and Mapping Unit Supervisor
Cory Johnson, Transportation Planner
Ann Lawrie, Environmental Clearance Coordinator
Paul McAllister, Environmental Section Unit Supervisor
Jan Miller, DIT Web Services
Charity Pearsall, DIT Web Services

Appendix B: References

External Communications Review Policy, Michigan Department of Transportation Guidance Document #10166. <http://apps.mdot.state.mi.us/interchange/guidocs/files/10166.pdf>

Improving the Quality of Environmental Documents, American Association of State Highway and Transportation Officials, the American Council of Engineering Companies, and the Federal Highway Administration, May 2006. http://environment.transportation.org/pdf/IQED-1_for_CEE.pdf

Synthesis of Data Needs for EA and EIS Documentation—A Blueprint for NEPA Document Content, TransTeck Management, Inc. & Parsons Brinckerhoff with Akin, Gump, Strauss, Hauer & Feld LLP for the American Association of State Highway and Transportation Officials (AASHTO), January 2005. [http://www.trb.org/NotesDocs/25-25\(1\)_FR.pdf](http://www.trb.org/NotesDocs/25-25(1)_FR.pdf)

Technical Advisory T 6640.8A, Guidance for Preparing and Processing Environmental and Section 4(f) Documents, USDOT Federal Highway Administration, October 30, 1987. <http://www.environment.fhwa.dot.gov/projdev/impTA6640.asp>

Appendix D: Standard Text for Methodology Used for Environmental Justice Analysis

The EJ methodology has several steps, along with a series of questions that need to be answered in order to determine if there will be disproportionately high and adverse effects on minority population groups or low-income population groups in the study area.

Step One: Determine if a minority or low-income population is present in the study area. If no, document the results. If yes, provide a table showing the minority and low-income populations within the study area; and proceed to Step Two.

Step Two: Determine whether project impacts associated with the identified low-income and minority populations are disproportionately high and adverse. The questions that need to be asked are:

- Question 1: Is the anticipated adverse impact high? Any impact that exceeds a state or federal standard should be considered high. If an impact is determined to be "significant" per NEPA, it would also be considered high. In some areas there may be quantitative standards to draw upon, e.g., noise, air quality, water quality contamination, etc. In other impact areas, the decision will be based on qualitative standards. A public involvement effort will often be necessary to address qualitative impacts thoroughly.
- Question 2: Is the high and adverse impact anticipated to fall disproportionately on a low-income or minority population?

Both questions need to be answered to determine whether there maybe disproportionate impacts. The first question is whether the overall adverse impact is predominantly borne by the minority or low-income group? If the answer is "NO", then the impact may not be disproportionate in nature. The second question is whether the adverse effect is "appreciably more severe" than that experienced by non-minority or non-low-income persons. When an adverse effect will be experienced by a low income or minority population, the second question is will the effect experienced by either of these groups be "appreciably more severe" than that experienced by non-minority or non-low-income persons? If the project is similar in its design, comparative impacts, and the relevant number of similar existing system elements in non-minority and non-low-income areas, the project may not reach the disproportionately high and adverse standard. That is, if the proposed facility is similar to that used in many other locations throughout the state or region, and there are non-minority or non-low-income populations who have been affected in a similar manner in these locations, then the adverse impact resulting from the proposed action may not reach the high adverse and disproportionate standard.

If it is determined that there is disproportionately high and adverse impacts to minority and low-income populations, proceed to Step Three.

Step Three: Propose measures that will avoid, minimize, and or mitigate disproportionately high and adverse impacts, and provide offsetting benefits and opportunities to enhance communities, neighborhoods, and individuals affected by the proposed project.

Step Four: If after mitigation, enhancements, and offsetting benefits to the affected populations, there remains a high and disproportionate adverse impact to minority or low-income populations, then the following questions must be considered:

- Question 1: Are there further mitigation measures that could be employed to avoid or reduce the adverse effect to the minority or low-income population? If further mitigation measures exist, then those measures must be employed unless they are "not practicable".
- Question 2: Are there other additional alternatives to the proposed action that would avoid or reduce the impacts to the low income or minority population? If such an alternative exists, and it is "practicable", then that alternative must be selected. If further mitigation or alternatives that avoid the impact are judged to be not practicable, that conclusion must be documented, supported by evidence, and included in the NEPA document.
- Question 3: Considering the overall public interest, is there a substantial need for the project?
- Question 4: Will the alternatives that would still satisfy the need for the project and have less impact on protected populations (a) have other social, economic, or environment impacts that are more severe than those of the proposed action, or (b) have increased costs of extraordinary magnitude.

Step 5: Include all findings, determinations, or demonstrations in the environmental document prepared for the project.

Appendix E: Styles and Formatting Summary/Sample

Chapter Title

Major Section Title [Level 1]

The body of a major action documents is divided into chapters with up to three section levels within chapters. The page you are reading is one of the appendices in the Style Guide. The style of the Appendix E title (above) is called **Appendix Title** in the templates for major action documents. The setting is Arial bold size 16 font with 0 points before and 18 points after. With these settings, a single return after entering the appendix title provides enough space to set off the title. It is also centered.

The style for **Chapter Title** is the same font as the Appendix Title style but is right justified and spacing before is 12 points while spacing after is 3 points. Adding a line below chapter titles completes the chapter heading.

The **Major Section Title** style is used for the highest level of division within a chapter. These are formatted with Arial size 14 bold italic font. Spacing is set for 18 points before and 12 points after with left justification.

Why Use the Templates and Prescribed Styles? [Level 1]

The primary reason for using the prescribed styles from the template is to ensure that your document works well with screen reader software. Use of the prescribed styles will also ensure that MDOT major action documents have a consistent appearance. Using the Styles and Formatting features of MSWord™ also allows you to easily create a multi-level table of contents for your document.

The Visual Differences Among Styles [Level 1]

Normal Paragraph Style [Level 2]

The normal paragraph text is 11 point Palatino Linotype font with full justification. Do not use a double return at the end of the last sentence of a normal paragraph. A single return is set to provide standard spacing between paragraphs. For the **Normal Paragraph** style, spacing before is set to 0 points and space after is set to 18 points with single spacing selected for lines within a paragraph.

Third Level Subsection Title and Paragraphs Styles [Level 3]

Third level normal paragraphs are indented 0.5" from the left margin, as are the third level subsection titles. This sets them off as subordinate to and a component of the previous subsection title. **Third level subsection** titles have the same appearance as subsection titles except for this indentation.

The **Third Level Normal Paragraph** style is also used to frame direct quotations.

Another Third Level Subsection Title [Level 3]

The font for the **Subsection Title** style is Arial 12 point bold italic font. Third Level Subsection titles are indented 0.5" but otherwise are the same as normal paragraphs.

List Bullet 3 Style [Level 2]

The style called **List Bullet 3** is used for all bulleted lists regardless of section level. This means that bullets are indented from the left edge of the paragraph at the major section or subsection level, but they are even with the left edge of the paragraph in a third level subsection. The List Bullet 3 style includes the following:

- Indentation of 0.5" from the left margin
- The bullet hangs 0.25" out from the associated text.
- Text for each bullet uses the same settings as a normal paragraph except space after is set at 12 points.
- A hard return takes you back to the left margin, so when you begin your next paragraph, you will need to reselect a style for whatever follows the bulleted list.

Recommendations

Follow basic outlining rules when developing sections and subsections within chapters. Section or subsection headings at the same level should be of equal importance. When you divide anything, you always have at least two parts. This rule holds true for deciding when to use subheadings. If you think that you have only one subtopic, include it in the topic above without breaking it into a subheading.

Readability is a function of many factors including visual appeal (i.e., pictures, white space), visual clues to structure changes or hierarchy (i.e., font sizes, italics, indentations, etc.), but most importantly, matching those visual clues to a logical argument structure. Using the styles available in the major action document templates will give readers the visual clues they need to understand and evaluate your logic.