



Final Best Practices Workshop Report



US-41 Highway Reconstruction Program

August 2011

***Prepared by
Value Management Strategies, Inc.
on behalf of National Constructors Group***





"Value Leadership"

CORPORATE OFFICE:
613 W Valley Parkway
Suite 240
Escondido, CA 92025-2504
T: 760 741 5518
F: 760 741 5617

1724 SW Clay Street
Portland, OR 97201-2529
T: 503 957 9642
F: 760 741 5617

1874 Deer Park Circle S
Grand Junction, CO 81507-9578
T: 970 242 5531
F: 760 741 5617

3909 208th Place SE
Bothell, WA 98021-6948
T: 206 679 8029
F: 760 741 5617

9022 West 65th Drive
Merriam, KS 66202-3602
T: 816 206 0067
F: 760 741 5617

2020 X Street, Unit A
Sacramento, CA 95818-2461
T: 916 224 9812
F: 760 741 5617

8532 Woodbriar Drive
Sarasota, FL 34238-5666
T: 941 323 5438
F: 760 741 5617

2670 Ravenoaks Place NE
Marietta, GA 30062-5630
T: 678 488 4287
F: 760 741 5617

321 Riverview Drive W
Great Falls, MT 59404-1335
T: 406 952 4473
F: 760 741 5617

Date: August 12, 2011

To: Colleen Harris
US-41 Program Manager
Wisconsin Department of Transportation

Subject: Final Best Practices Workshop Report
US-41 Highway Reconstruction Project

Dear Colleen:

Value Management Strategies, Inc. is pleased to transmit this Final Best Practices Workshop report for the referenced project. This report summarizes the events of the study conducted July 13-15, 2011.

We enjoyed working with the Wisconsin Department of Transportation and are looking forward to continuing our efforts on future work.

If you have any questions or comments concerning this report, please contact me at (720) 308-4205 or email Greg@vms-inc.com.

Sincerely,

VALUE MANAGEMENT STRATEGIES, INC.

A handwritten signature in black ink, appearing to read "Gregory Brink", is written over a large, light gray watermark that says "DRAFT".

Gregory Brink, CVS, PMI-RMP, PMP, CCE/A
Director of Risk Management

Copy: (PDF) Addressee
(PDF) Brett Wallace
(PDF) Natasha Gwidt
(PDF) Paul Silvestri
(PDF) Bill Womack
(PDF) Adam Clayton

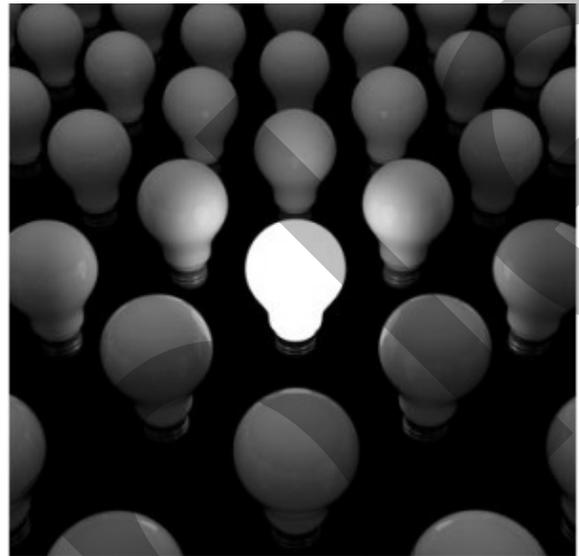
TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
Best Practices	
Results	
Summary of Best Practices	
Commonalities of Best Practices	
Recommendations	
INTRODUCTION	7
Best Practices	
Workshop Objectives	
Elicitation Process	
Other Efforts	
PROJECT INFORMATION	13
Influences of Delivery	
Project Description	
Project Organization	
PROJECT BEST PRACTICES	21
Best Practices by Functional Discipline	
Summary of Best Practices	
Financial and Man-Hour Summaries	
Best Practices Documentation	
APPENDICES	
Appendix A: Workshop Agenda	
Appendix B: Workshop Attendees	

Sample

EXECUTIVE SUMMARY

A Best Practices workshop sponsored by Wisconsin Department of Transportation (WisDOT) and facilitated by National Constructors Group (NCG) in association with Value Management Strategies, Inc. (VMS) was conducted for the US-41 Highway Reconstruction Mega Project. This Final Best Practices workshop report summarizes the events of the workshop conducted July 13-15, 2011. The workshop team was comprised of US-41 project team members including both consultant and department of transportation staff operating in specific functional disciplines for delivery. The focus of the study was to discuss and document the best practices, or those tools and techniques that are not standard operating procedures that have been utilized to effectively deliver the design portion of the project. This report presents results and findings from the perspective of identifying, discussing, consensus building, and documenting the unique management and project delivery practices implemented on the US-41 project.



It should be noted that while other efforts for documentation of best practices has taken place within WisDOT, this document is a representation of a single Mega Project. The findings should be treated as the transfer of institutional knowledge from the US-41 Highway Reconstruction Mega Project team members and staff operating in the various functional disciplines. In the passing of this information it should be acknowledged that some of the best practices contained within this document were the result of specific conditions or delivery needs that may or may not be relevant to the broader delivery of Mega Projects within the state of Wisconsin.

BEST PRACTICES

Best practices are generally-accepted, informally-standardized techniques, methods or processes that have proven themselves over time to accomplish a given task. In general, best practice is considered the process of developing and following a standard and effective means of performing tasks that can be consistently repeated. Often based upon knowledge that becomes common sense, these practices are commonly used where no formal methodology is in place or the existing methodology does not sufficiently address the issue. The idea is that with proper processes, checks, and testing, a desired outcome can be delivered more effectively with fewer problems and unforeseen complications. In addition, a best practice can evolve to become better as improvements are discovered. As such, the best practices contained within this document are not rigid in nature and should be treated as tools and techniques that can be taken and adapted to meet the needs of other projects.

RESULTS

The individual documented best practices were compiled by the functional discipline from which they emanated. In total, 92 best practices were identified by the workshop participants. In Table 1 below is the representative functional disciplines for which best practices were discussed and developed. In addition, the number of best practices identified for each functional discipline are indicated. This is followed by another series of tables providing a summary of the individual best practices developed for each functional discipline. The developed material for each functional discipline can be reviewed in the *Project Best Practices* section of this document.

Table 1: Summary of US-41 Project Best Practice Functional Disciplines

US-41 Highway Reconstruction Mega Project Best Practices	
Functional Discipline	Number of Best Practices Identified
Public Involvement	13
TSS (ROW, Utilities, Geotechnical, Pavement)	12
Environmental/Stormwater/Permitting/Agency & Bureau Coordination	10
SPO (Traffic/TMP)	5
Roadway Design	12
Corridor Tasks (Standards/Manuals/PS&E Reviews/Details)	9
Structure Design	9
Community Sensitive Design (CSD) / Landscaping	7
Project/Program Controls	15
TOTAL	92

SUMMARY OF BEST PRACTICES

No.	Best Practice Title
Public Involvement	
1	Project brand
2	Project website
3	Project listserve
4	Social media for project information sharing
5	Collateral materials development
6	Business interchange groups
7	Media plan
8	Project communications manager
9	Outreach for unique design features
10	Corridor graphics/visualizations
11	Contact list management
12	Construction staff transition meetings
13	Neighborhood liaisons

TSS (Right-of-Way & Plats, Utilities, Geotechnical, Pavement)	
1	Coordination of soil boring schedules, detail, and meetings
3	Accelerated appraisal start time
4	Accelerated real estate appraisal and relocation contracting
5	Real estate activity tracking
6	Central office involvement – litigation
8	Central office involvement – appraisal review
9	Include all players when meeting with property owners during right-of-way acquisition
12	Utility coordination schedule (ucs)
13	Monthly utility coordination meetings
14	Existing utility CADD file creation and maintenance
15	Utility field representative in design process
16	Survey data coordination and requests process

Environmental/Stormwater/Permitting/Agency & Bureau Coordination	
1	Airport and wildlife hazard coordination
2	Corridor-wide permitting for water quality certification and wetland impacts
3	EIS communication with agencies
4	Early identification of wetland mitigation sites
5	Early coordination with Central Office and Agencies on waterway impacts
6	Municipality drainage coordination
7	Early coordination with BIA and Native American Tribes/Nations
8	Ample archaeological survey coverage
9	Identification of construction access covered in Environmental Document/404 permit
10	Hazardous material/OCIP Coordination

SPO (Traffic/TMP)	
1	Use of regional travel demand model
2	Linkage of TMP and construction staging
3	Targeted TMP task forces by interchange corridor
4	Utility inspection of contractor-installed lighting
5	Rapid intervention vehicle

Roadway Design	
1	Prepare separate staging plans with schedule from Traffic Control Plans
2	Roadway design signage
3	Special provision tracking
4	Weekly design team meetings
5	Oversize/overweight vehicle coordination
6	Constructibility reviews
7	Special provisions organization
8	Design management and packaging
9	Construction contract packaging

10	Early and expanded advertisement
11	Early access review
12	Early design review of staging and constructibility

Corridor Tasks (Standards/Manuals/PS&E Reviews/Details)	
1	Corridor task leads
2	FTP site
3	EIS Project Manager
4	Corridor manual
5	Project field office
6	Enhanced independent design reviews
7	Cost estimate validation process
8	Risk management for design and construction
9	Lane closure charts

Structure Design	
1	Corridor structures manual
2	Corridor-specific structure standard detail drawings
3	Monthly structures “pre” meeting
4	Monthly structures meeting
5	Assign a specific person to a mega project from the BOS
6	Schedule alignment between roadway, geotechnical, and structures
7	Dedicated roadway and structure designer integration meetings
8	Grouping of similar structures in design
9	Innovative structure design and procurement

CSD/Landscaping	
1	CSD Design manual
2	Construction verification for CSD
3	Advanced utility coordination
4	CSD meetings/workshops and outreach with stakeholder groups
5	Design construction hand-off meetings
6	Coordination of landscaping and staging
7	CSD design review

Project Controls	
1	P6 master design schedule implementation
2	Weekly PM/design meetings and bi-weekly real estate, soils, and structures schedule status meetings
3	Construction schedule
4	Dedicated program controls staff/gatekeepers
5	Specific project ID for deliver items
6	Project email box

7	File structure
8	Formal change-management process
9	State/municipal agreement process
10	Manage projects to a budget
11	Establish committed program level (annual budget allotments) with OPBF and BSHP
12	Consultant amendment tracking tool
13	Proposal management matrix
14	Upper management reporting
15	Issue tracking and action list for design

COMMONALITIES OF BEST PRACTICES

Common to the best practices across all functional disciplines are themes that convey the drivers behind the best practices. These themes represent the global best practices that will benefit the structuring and delivery of future Mega Projects. The global best practices are those elements that, at the highest level, should be the foundations of project management and delivery. Four key themes were consistently observed across the nine unique functional disciplines that participated in the workshop. Those four themes are summarized as follows:

- **Advance Coordination:** In many of the disciplines a best practice was formulated on the basis of performing advance coordination ahead of when normal coordination would begin for a less complex project. The earlier stakeholders are engaged, the sooner decisions can be made. This allows the project to move forward in a much smoother fashion without the considerable schedule risk of delays ensuing from coordination breaking down later in the delivery process. By engaging sooner, it was noted that the outcomes were generally more positive and that relationships were able to be forged that helping obtaining various approvals and agreements.
- **Clearly Defined Communication Channels:** The establishment of clearly defined communication channels was highlighted in many of the disciplines as a best practice that enabled information flow to occur in a more efficient and effective manner. Key to defining the clear communication channels was the designation of individuals as key points of contact. A single point of contact provides enhanced clarity of who needs to be engaged for specific situations. This also allows for the points of contact to proactively enforce their management roles and responsibilities required for the oversight and delivery of the project. In general, having a clear structure of reporting and specifying key individuals as points of contact for both public interfacing and internal efforts provides a supportive mechanism for information flow and keeping all stakeholders and project team members up to date.
- **Key Data Organization and Management:** Many of the disciplines highlighted the use of unique tools adapted primarily for data organization and management. When working on complex Mega Projects it is important to ensure that data is properly tracked, updated, stored, and easily communicated. This best practice is really a general project management best practice, but the uniqueness here is in acknowledging that for each project team there will be unique needs for certain types of information. From this perspective, project managers need to be prepared to think of ways to most efficiently track, update, and maintain data for everyday uses either with WisDOT tools or by creating their own unique tools. It is important to remember that data

organization and management is a fundamental building block to enabling effective communication.

- **Flexibility in Delivery:** Many of the best practices noted issues associated with a need for flexibility as a result of dynamic changes in contracts and work packages. Realizing that Mega Projects are inherently more complex as a result of the many moving parts and pieces, building in layers of flexibility into the plan for delivery is important. The overall structure of delivery for a Mega Project should allow for a certain degree of flexibility in how projects are scheduled, in terms of their development, execution, and delivery. An example used in the US-41 Mega Project was working towards Early PS&E dates for individual project designs. This allowed for certain projects to be “held on the shelf” or advanced or repackaged as necessary without creating major imbalances in the project critical path. In general, the key is allowing for a structure that enables some flux and shifting of project work packages that can accommodate dynamic schedule change.

RECOMMENDATIONS

First and foremost it is recommended to review the identified best practices for incorporation into other efforts within WisDOT. This document is intended to provide institutional knowledge transfer from the US-41 project team members in relation to the challenges that were faced and how the project management tools and techniques were adapted in response. The documented best practices within this report are conceptual in nature such that they can be reviewed and implemented on other projects of similar complexity.

It is recognized that the US-41 Highway Reconstruction Mega Project is a single project and that other best practices for managing and delivering complex projects may exist elsewhere. Other efforts to document best practices have been undertaken in various forms throughout WisDOT. This includes the documentation of specific functional discipline best practices within the agency, the documenting of the Marquette Project Construction best practices, and the development of I-94 Project Design best practices.

Overall, true best practices are constantly evolving, adapting, and changing to meet the current needs of project and program delivery. While there is no single solution that can be consistently implemented in the exact same fashion and yield the exact same results, WisDOT may find it useful to evaluate other Mega Project best practices for consideration and development. It is recommended that a Programmatic Best Practices manual standardized into a single document be developed for distribution across the greater WisDOT organization. This Programmatic Best Practices manual could then become a guideline and starting point for project structuring, staff development, and Mega Project delivery within WisDOT.

Sample

INTRODUCTION

INTRODUCTION

BEST PRACTICES

Best practices are generally-accepted, informally-standardized techniques, methods or processes that have proven themselves over time to accomplish a given task. Often based upon knowledge that becomes common sense, these practices are commonly used where no formal methodology is in place or the existing methodology does not sufficiently address the issue. The idea is that with proper processes, checks and testing, a desired outcome can be delivered more effectively with fewer problems and unforeseen complications. In addition, a "best" practice can evolve to become better as improvements are discovered. Best practice is considered by some as a business buzzword, used to describe the process of developing and following a standard way of doing things that multiple organizations can use¹.

For the US-41 Highway Reconstruction Mega Project, best practices can be considered an evolution of the management and delivery process. Project teams need adaptive capabilities to execute and deliver their projects in an efficient manner. The natural iterations and modifications of fine tuning process and management techniques in the case of managing a Mega Project results in a series of solutions that seem to best fit the case. One could think of the best practices developed in this workshop as a set of solutions being used to maintain quality as an alternative to mandatory legislated standards (or business as usual) and can be based on self-assessment or benchmarking². Furthermore, best practice implementation is a feature of accredited management standards such as ISO 9000 and ISO 14001³. The lessons learned that evolved into processes, management tools, and techniques for managing multiple work packages is documented in this report in the form of a set of best practices by functional work area.

Documenting and charting procedures and practices can be a complicated and time-consuming process often skipped by companies and organizations, even though they may practice these tools and techniques consistently. It is for this reason that the following best practices are being documented. The US-41 project team has come up with many new and innovative techniques for project delivery both in the face of challenge, as well as in light of success. However the best practice originated, it is important to capture how it was devised and how it might be applied to future Mega Projects.

It is important to note that there can be significant challenges in defining what is "best" in any given context. Best management practice for complex problems is context specific and often contested against a background of imperfect knowledge. In these contexts, it is more useful to think of best management practice as an adaptive learning process rather than a fixed set of rules or guidelines.

¹ "[Best Practice Definition](http://www.businessdictionary.com/definition/best-practice.html)" BusinessDictionary.com. <http://www.businessdictionary.com/definition/best-practice.html>. Retrieved 2009-11-04.

² Bogan, C.E. and English, M.J., 1994: Benchmarking for best practices: winning through innovative adaptation. McGraw-Hill, New York.

³ Nash, J. and Ehrenfeld, J., 1997: Codes of environmental management practice: assessing their potential as a tool for change. Annual Review of Energy and the Environment 22, 487-535.

This approach to best practice focuses on fostering improvements in quality and promoting continuous learning⁴.

WORKSHOP OBJECTIVES

It is important to document the tools and techniques that are working to effectively deliver complex projects and programs. The delivery of complex projects and programs is, by its very nature, an exercise in management beyond the standard protocols and methods of conducting business. The objectives of the US-41 Highway Reconstruction Mega Project Best Practices Workshop were to:

- Vet the established best practice solutions against other solutions
- Provide a working platform to develop Mega Project Best Practices
- Include the best practices established in the US-41 design activities
- Build on the SE Freeway (I-94 Mega Project) design activities
- Reduce the effort and resources required to deliver Mega Projects in Wisconsin through the use of established best practices
- Transfer institutional knowledge for effective management and delivery of future projects

ELICITATION PROCESS

A systematic approach was utilized to identify and define the best practices of the US-41 Highway Reconstruction Mega Project. The process emphasized unique features of management and delivery that were applied to the project beyond what standard practices have been for delivery within WisDOT. In order to identify and elicit the best practices in use, the steps followed throughout the workshop were organized into three distinct phases: (1) Pre-Workshop Preparation, (2) Workshop, and (3) Post-Workshop Procedures.

I. PRE- WORKSHOP PREPARATION

In preparation for the workshop, an elicitation form was developed for the preliminary capture of best practice information. In the week prior to the start of the workshop, the workshop team documented the potential areas for discussion and plausible best practices by their respective disciplines. This information was documented in a spreadsheet that was then distributed to participants of the workshop. The spreadsheet elicited information using the following format:

⁴ Measham, T.G., Kelly, G.J. and Smith F.P. (2007) Best Management Practice for complex problems: a case study of defining BMP for Dryland Salinity. *Geographical Research* 45 (3) pp. 262-272.

Roadway Design Team

US-41 Best Practices

Number	Best Practice Name	Best Practice Description	Issue that was resolved	Solutions Considered	Advantages	Disadvantages	Solution Priority
1	Develop a short, simple name of a best practice	Insert a detailed description of what the best practice activities are	Describe the issue(s) that was resolved, or process(es) that was improved as a result of the best practice. Be as descriptive as possible, for each issue/process that is listed.	1) Insert the solution to the issue(s) listed here. This will be the best practice that was implemented. Prioritize at #1	list any advantages	list disadvantages	
				2) List any other solutions that were attempted or considered (if any), but not utilized in lieu of the above.			
				3)			
				4)			

Each workshop participant was provided the opportunity to list the best practices within their functional area of delivery or discipline, based on their US-41 Highway Reconstruction project experience. As shown above, the focus was on identifying potential issues or symptoms that led to the development of the best practice. The general description of the best practice was captured, as well as the solutions explored; any advantages or disadvantages of the solutions employed were then captured. The best practices were organized into the following functional areas of delivery, or disciplines:

- Public Involvement Team
- TSS (R/E, Plats, Utilities, Geotechnical, Pavement) Team
- Environmental/Stormwater/Permitting/Agency & Bureau Coordination Team
- SPO (Traffic/TMP) Team
- Roadway Design Team
- Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team
- Structure Design Team
- CSD/Landscaping Team
- Project Controls Team

II. BEST PRACTICES WORKSHOP

The Best Practice Workshop focused on discussion of innovations or new tools and techniques for management and delivery, as well as the capture of specific details relating to each identified best practice. During the workshop the preliminary best practice information was reviewed and elaborated on by the workshop participants. Additional tools and techniques identified as best practices were also added to the elicitation tool as discussion progressed.

The workshop was structured with a series of focused sessions specific to each discipline. Each work session lasted approximately two hours. Please see the workshop agenda contained in *Appendix A*. Participants were asked to engage in discussion of details relating to issues the best practices resolved, what the best practice process or tools are, the possible solutions to issues that were explored and the advantages and disadvantages of each solution. Many of the issues that were discussed may have only had a single solution that was adapted or evolved into a best practice; however, there were still a number of other solutions presented for many of the best practices identified. Participants were encouraged to identify additional relevant best practices not identified in the pre-workshop elicitation. During discussion the information and data was captured on screen, which allowed for real-time review, editing and participant input.

III. POST- WORKSHOP PROCEDURES

Following the focused workshop sessions, participants from each discipline were requested to complete a Best Practices Development form for each of the individual best practices identified and discussed during the workshop. These forms allowed the workshop participants to provide additional information that was not possible to develop during the the workshop discussions and to elaborate upon the best practices information captured during discussion of each individual best practice. The Best Practices Development form captured details and information on the following topics:

- Description of the best practice
- Any issue(s) or complications of management and delivery resolved by the best practice
- Advantages and disadvantages of the best practice
- Additional discussion and background relating to the development of the best practice
- Activities that Project Management would have to engage in to apply the best practice to future projects
- Any resource issues that must be taken into consideration when deploying the best Practice
- Actions that must be taken to effectively implement the best practice
- An indication if the best practice was developed as a result of efforts undertaken during the Risk Management Process deployed for the US-41 Mega Project

The individual Best Practice Development forms completed for each discipline by the workshop participants are contained in the *Project Best Practices* section of this report. Please refer to this section of the document for exploration of the information, discussion, and participant elaboration captured for each best practice during the workshop.

OTHER EFFORTS

The US-41 Highway Reconstruction Mega Project Best Practices workshop is an effort undertaken by the project team to formalize WisDOT’s efforts to develop Mega Project Best Practice guidelines. There have been other efforts undertaken by WisDOT to document institutional knowledge, including the tools and techniques used to manage and deliver other Mega Projects in the state of Wisconsin. As such, this document should be considered as one component of what will be formulated into a larger compilation of Mega Project Best Practices. Within this context it is important to keep in mind that the best practices identified in this report are not “business as usual” or current WisDOT guidelines and practices. In the review of the best practices it is also important to reference the section presenting the specific information of the project’s organizational structure and method of delivery. The nature of the reporting hierarchy and level of staffing involved is intended to provide background detail relating to how the best practices were utilized and applied within the project’s organizational structure and how they were relevant.

The number of other explorations of Mega Project Best Practices by WisDOT is limited, as Mega Projects are not common within the state of Wisconsin. The Marquette Project was the first WisDOT project to record Mega Project best practices, but this was completed only for the construction phase to document tools and techniques utilized in bringing efficiencies to construction delivery. It is anticipated that the upcoming SE Freeway I-94 Project best practices will be documented for the design phase. The US-41 best practices of design, I-94 Project best practices of design, and Marquette Project construction best practices could provide the basis for an evolving and developing document that can be refined as more Mega Projects are delivered in the state.

Key to interpretation of information documented in this report is that the findings from this single project may represent project conditions, constraints and requirements unique to the US-41 Highway Reconstruction Project. WisDOT may find it useful to continue to look and evaluate other prior and future projects' best practices for consideration of Programmatic Best Practices in order to standardize the format into a single document. These guidelines, when developed, will transfer institutional knowledge, lower the learning curve, reduce management efforts for structuring of project teams, as well as provide cost and time efficiencies for future projects.

PROJECT INFORMATION

PROJECT INFORMATION

This report summarizes the events of the US-41 Highway Reconstruction Mega Project Best Practices Workshop conducted July 13-15, 2011. The workshop focus was the elicitation and documentation of the tools and techniques that were successfully applied for the management and delivery of the US-41 Mega Project design. In particular, the emphasis was not on standards and practices that could be considered business as usual but rather those tools and techniques that were innovative and not common practice within WisDOT. This section of the report provides background information that frames the logic behind many of the best practices implemented and deployed on the US-41 Mega Project.

INFLUENCES OF DELIVERY

The manner in which a project or program is delivered largely relates to the structure of the organization and the general scope of work. The scope of work, or series of projects comprising the total Mega Project in this case, tend to dictate the level of staffing required to manage and deliver the workload. Within the staffing requirements there is the immediate need for structure to facilitate communication and coordination that best enables management to effectively guide the overall efforts. In this sense the scope of work performed by the project and the organizational structure needed to deliver the project are the controlling influences of delivery. As a result, the general project and structure of the US-41 Highway Reconstruction Mega Project team are discussed in more detail below. This information is intended to provide the rationale and basis for the best practices that were employed by the US-41 Mega Project team.

PROJECT DESCRIPTION

US-41 is a major north-south transportation corridor of significant importance to northeast Wisconsin, Winnebago County, and Brown County. Locally, it is a vital connection between the communities of the Fox River Valley and Green Bay. Regionally, it links the population centers of northeastern Wisconsin and upper Michigan to the Milwaukee and Chicago metropolitan areas. In addition, US-41 is part of the National Highway System, and is a federal/state long-truck route. The segment of US-41 from Milwaukee to Green Bay has been identified as being eligible for interstate designation once upgraded to interstate standards. US-41 is also classified as a multi-lane backbone route in WisDOT's Corridors 2020 plan, which allocates high priority funding to highways connecting major regions and economic centers.

The Winnebago County portion of the US-41 expansion project begins at the US-41/Wis-26 connection and extends north approximately 15 miles to the Breezewood Lane Interchange. The Brown County portion of the US-41 expansion project will begin at Orange Lane and extend approximately 14 miles north to County M (Lineville Road). The project will reconstruct the existing freeway with additional lanes and interchange improvements and upgrades to safely and efficiently accommodate the existing and future traffic wishing to use the facility.

The project includes some of the following specific elements:

- Reconstruction of twelve interchanges, including:
 - ◆ The Breezewood Lane Interchange
 - ◆ The US-45 Interchange
 - ◆ The Wis-21 Interchange / Lake Butte de Morts Causeway
 - ◆ The 9th Avenue Interchange
 - ◆ The Scheuring Road Interchange
 - ◆ The Main Avenue Interchange
 - ◆ The Oneida Street / Waube Lane Interchange
 - ◆ The Lombardi Avenue Interchange
 - ◆ The Mason Street Interchange
 - ◆ The Shawano Avenue / Dousman Street Interchange
 - ◆ The Velp Avenue Interchange
 - ◆ The I-43 Interchange
- Construction of noise walls along US-41 from WIS-172 to WIS-54
- The reconstruction of WIS-29 between County J and Taylor Street, including:
 - ◆ A grade separation of the County J / WIS-29 Intersection
 - ◆ A frontage road between County J and Packerland Drive
 - ◆ An interchange at Packerland Drive
 - ◆ Connect WIS-29 to US-41 with a free flow freeway-to-freeway type interchange
 - ◆ Reconstruction of Taylor Street between Dousman Street and the railroad crossing south of Shawano Avenue
 - ◆ Construction of a shared use path along the north side of Shawano Avenue from Pamperin Park to Taylor Street

Some of the interchanges being reconstructed and upgraded involve the use of roundabouts. The freeway design will also allow for the future installation of Intelligent Transportation System (ITS) technologies should they become necessary to manage traffic congestion. It should also be noted that in 2003, an improvement project was done on US-41 from Lombardi Avenue to I-43 in Brown County. The improvement project scope included repairs needed to extend the life of the pavement and bridges until they could be reconstructed as part of this US-41 capacity expansion project.

PROJECT ORGANIZATION

To effectively frame the best practices documented in this report, it is important to understand the history of the US-41 Highway Reconstruction Mega Project, and the structure that led to the decisions made by the US-41 Project Team. These decisions may not be the same as past or future WisDOT Mega Projects; therefore the application of the noted practices may not apply in the same manner to every project.

The US-41 Corridor Project in Brown and Winnebago Counties began as two separate projects, with the environmental studies completed around 2000. Each project had its own environmental

document, as well as individual planned design and construction schedules. The Winnebago County segment was evaluated under a single environmental document, while Brown County was developed with multiple documents that were segmented along the corridor.

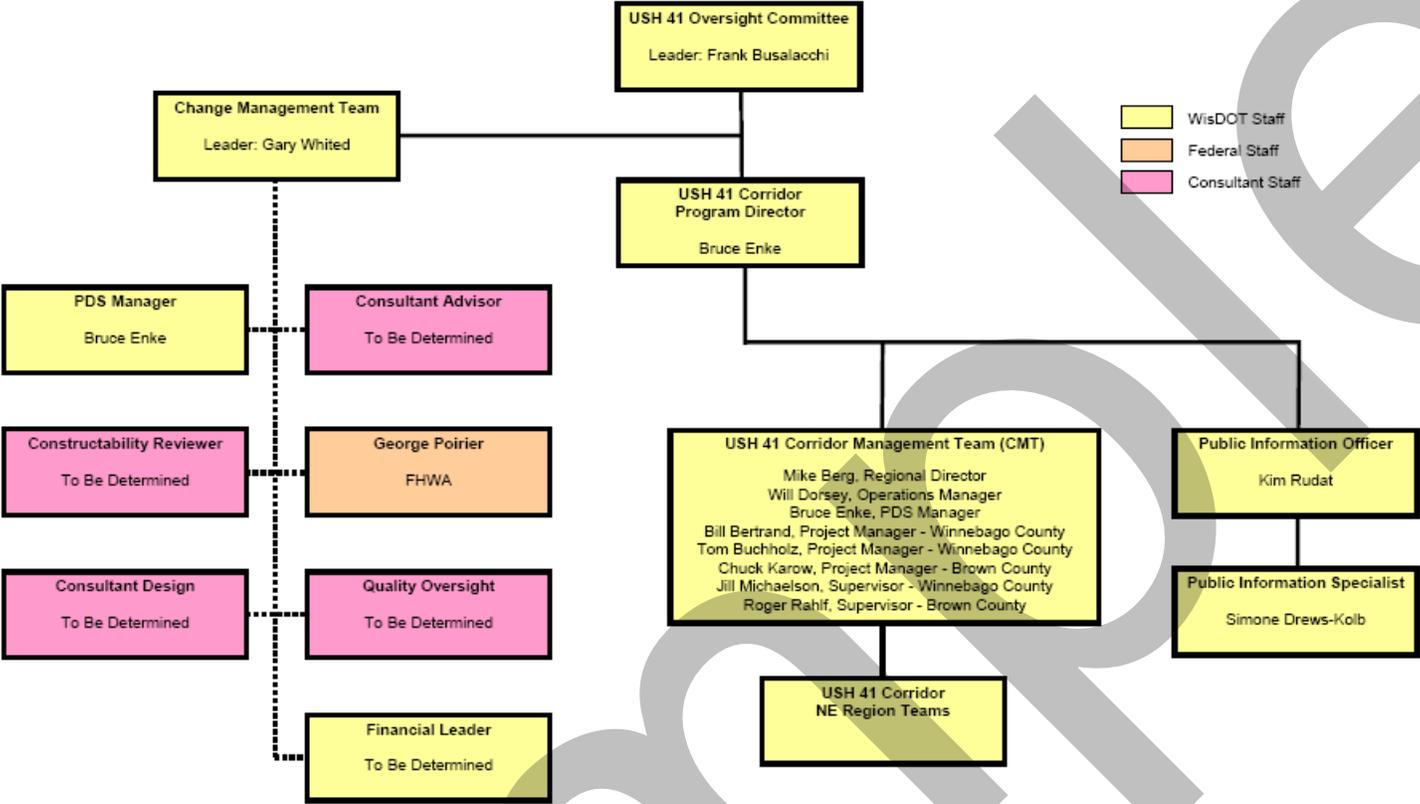
In addition to the two counties being on different tracks during the study phases, the projects also took separate tracks for design delivery. Winnebago County work was separated into three design segments, and consultant resources were brought on board to complete the work in each segment as a full service team. In Brown County, the roadway design was contracted in multiple segments, while many other functions were broken out into corridor-wide activities. For example, the bridges and box culverts were designed under corridor-wide contracts that separated the work by structure type, and were unique contracts from the roadway design contracts. Within this process, there were a limited number of corridor tasks that were intended to create efficiency and consistency in the design and construction process.

In 2008 the projects were combined to qualify as both a Federal and a WisDOT Mega Project to capitalize on funding and delivery efficiencies. This decision and the new designation required some retrofitting of the projects to conform with reporting standards, as well as an attempt to develop additional consistent application of many design and construction activities. Several additional corridor-wide positions were implemented to further foster and reinforce more consistency across operations for delivery of the projects. The implementation of this was challenging, as the projects were in substantially different stages of design and construction.

As a result of the integration of the two projects into a single Mega Project, there have been many structural changes that have evolved over time. The following organization charts provide some clarity to how the project started in 2005, and how it is currently being managed. These large differences in the organization charts highlight the differences between the two counties in terms of structure, as well as differences in philosophy. The organizational structure information is intended to serve as a point of reference to relate to some of the best practices and delivery tools and mechanisms discussed in this document.

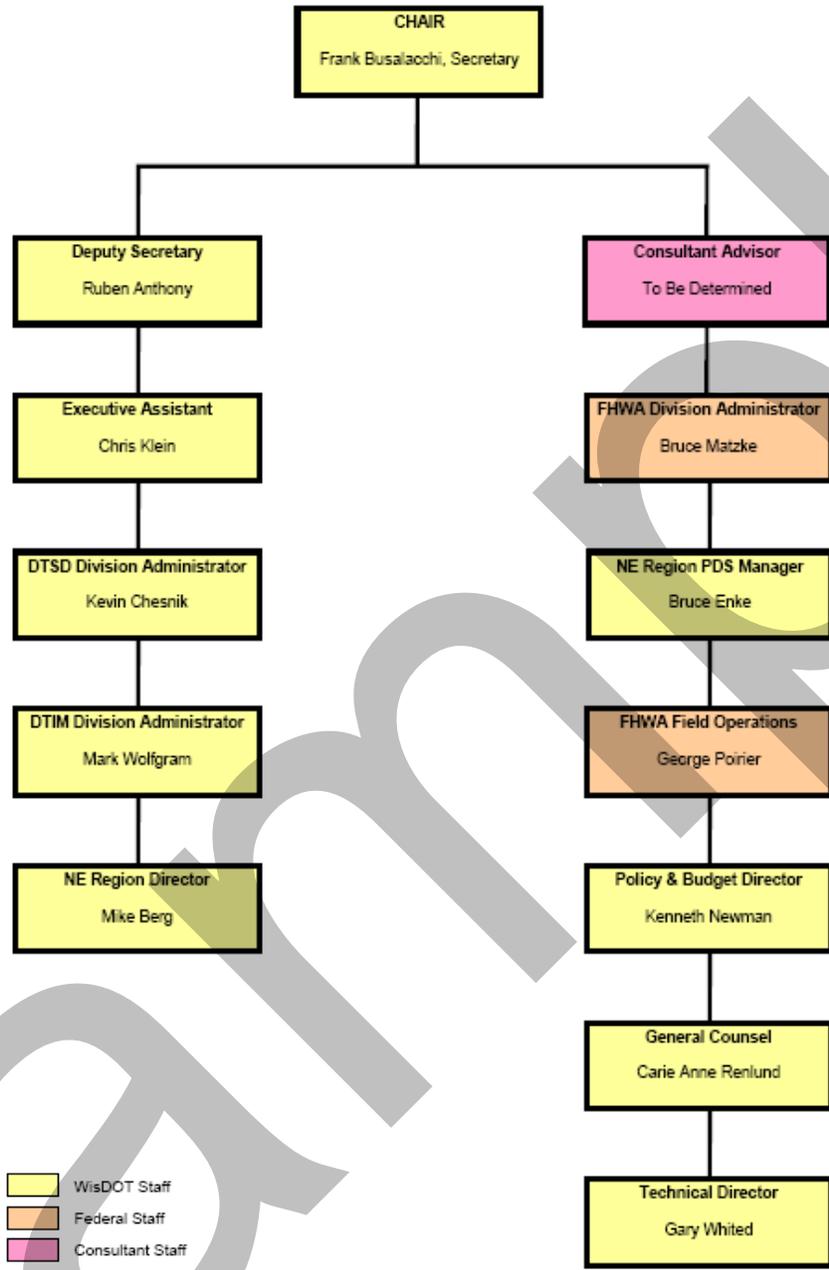
USH 41 Corridor Organizational Structure

(7/22/05)

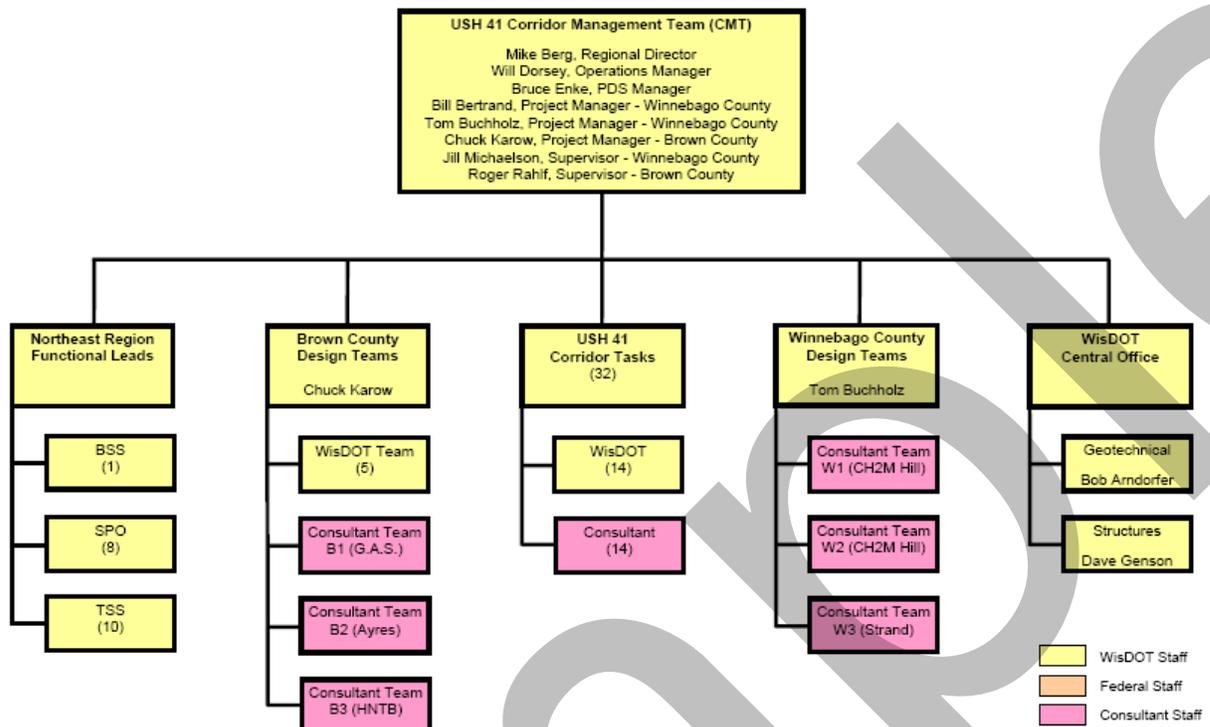


USH 41 Corridor Oversight Committee

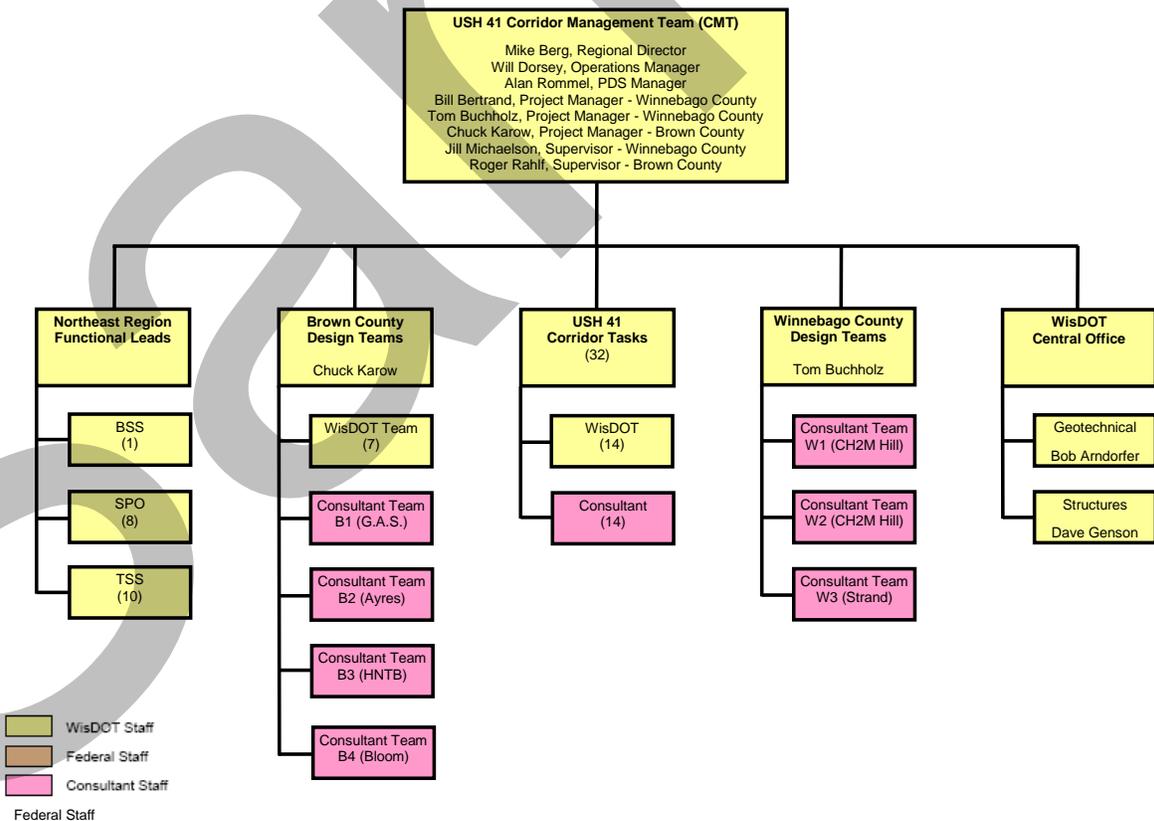
(7/22/05)



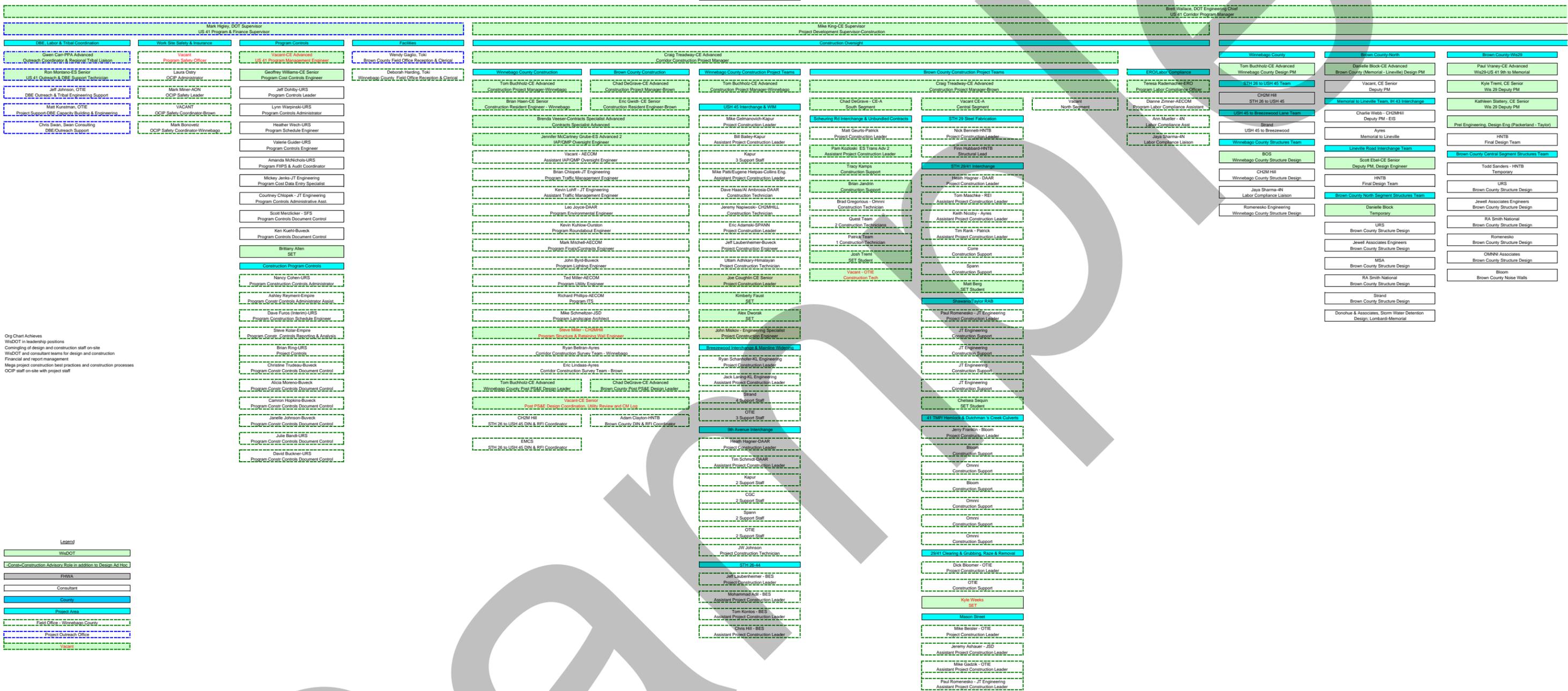
USH 41 Corridor Northeast Region Team (2/16/06)



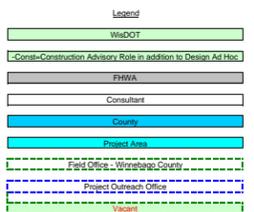
USH 41 Corridor Northeast Region Team (01/04/08)



Will Dorsey
Temporary NE Region Director
Vacant
NE Region Operations Director



Org Chart Achieves
 WinDOT in leadership positions
 Coordinating of design and construction staff on-site
 Financial and report management
 Mega project construction best practices and construction processes
 OCIP staff on-site with project staff



Nasaha Gwilt Project Development Supervisor-Design		
Design Development & Delivery		
Brown County-Mason Street Interchange	Brown County-South	Corridor Design
Paul Vraney-Project Manager Mason Street Interchange	Chad DeGrave - CE Advanced Brown County (Orange - 9b) Design PM	
Kathleen Starnley, CE Senior Mason Street Interchange Deputy PM	Jason Geurts, CE Senior Deputy PM	Corridor Design Management Consultant
HNTB Final Design Team	Change to Glory Team	NGG Corridor Project Development Consultant
	HNTB Change to Glory	HNTB Corridor Project Development Subconsultant
	Glory to Morris Team	CH2M Hill Corridor Project Development Subconsultant
	Graef Glory to Morris	EMCS Corridor Project Development Subconsultant
	Morris - 9th US 41	Corridor Consultants
	HNTB Final Design-Morris - 9th	Todd Sanders - HNTB Temporary
Brown County South Segment Structures Team		HNTB Community Sensitive Design-Brown County
Todd Sanders - HNTB Temporary		Ken Saik, Design Landscape
Bloom Brown County Noise Walls		Scott Ebel-CE Senior Deputy PM
Romenesko Brown County Structure Design		KL Engineering Lighting
Mead & Hunt Brown County Structure Design		Transcore ITS Concept Plan
Bloom Brown County Structure Design		CTE CMP Advisor
Jewel Associates Engineers Brown County Structure Design		TEM Environmental Documentation
DMNI Associates Brown County Structure Design		HNTB Demographic Analysis
Strand Brown County Structure Design		GESTRA Geotechnical
		Heather Dvorak SET
		Collins Type 1 Sign Design-Brown
		Omniv Type 1 Sign Design-Winnebago
		Donohue Stormwater Design
		Strand Salt Storage Facility Design

Public Relations	TSS Design Ad-Hoc & Construction Advisory	SPO Design Ad-Hoc & Construction Advisory	Compliance & Coordination	Project Parallel Freeway Management Coordination
Kirk Schuller-Comm Spec Advanced Public Information Officer	Bruce Eriker-TSS Manager Technical Services Manager	Vacant - DOT Engineering Chief SPO Chief	Tracy McKenney FHWA Major Project Team Leader	Law Enforcement, ETD & Mitigation-Project Coordination
Jack Ferner-Krupp & Watson Public Information/Relations Consultant	Real Estate	Traffic	FHWA ARRA USH 41 Design/Construction	County Maintenance
Sam Hutcheson-HYS Public Information/Relations Subconsultant	Nom Pawelczyk-RE Supervisor Program Real Estate Supervisor-Const	Brian Brock-CE Supervisor Traffic Supervisor ETO Lead-Const	Tom Strock FHWA Structures Coordination	Kurt Wranovsky-CE Supervisor Region Maintenance Supervisor
Brian Foley - HNTB Public Information/Relations Consultant	Curt VanEm-RE Specialist Advanced RE Project Manager-Brown	Mike Frewell-ES Supervisor Signing & Pavement Marking Supervisor-Const	Bill Stark FHWA DBE Program Coordination	Chris Blazek-CE Advanced Bridge Maintenance Engineer
Cynthia DeVor - Dixon & Co. Public Information/Relations Subconsultant	Jay Viste-RE Specialist Advanced RE Project Manager-Winnebago	Randy Armer-CE Advanced ITS & Smart Work Zone Engineer-Const	DeWight-Comb FHWA Program/TIP Coordination	Randy Armer-CE Advanced ITS & Smart Work Zone Engineer
	Community Outreach	Bob Schumann-CE Advanced Lighting & Traffic Signal Engineer-Const	Loi Kaner FHWA Finance Specialist	Sgt. Jeff Nelson Winnebago County DSP
	Caron Kloser, HNTB US 41 PI & Outreach Consult. Coordination	Scott Nelson-CE Advanced Incident Management Engineer-Const	Scott Allen-CE Advanced DTSO Major Project Engineer	Sgt. John Jones Brown County DSP
	Helen Dixon, Dixon & Associates US 41 Neighborhood Liaison Oversight	P.F. O'Connor-CE Advanced NCTC & Design-Build	Kurt Peares-CE Senior (temporary) Program Traffic Engineer-Const	Captain Jon Matz Brown County Sheriff
	Jane Swan US 41 Neighborhood Liaison Coordinator	Kurt Peares-CE Senior (temporary) Program Traffic Engineer-Const	Mike Koval Program Utility Coordinator	Captain Randy Shultz Brown County Sheriff
	Gary Debel US 41 Neighborhood Liaison	Chris Culotta-PPA Advanced Community Sensitive Design Lead	Bikher Hoppe Program Utility Coordinator	BOS Structure Chief
	Brian McGuire US 41 Neighborhood Liaison	Vacant Community Sensitive Design Policy & Budget	Leslie Ashauer-CE Advanced Geotechnical/Pavement Engineer	Steve Revello BOS Structure Development Coordinator
	Jarvis Hirth US 41 Neighborhood Liaison	Risk Pedestrian	David Nelson-CE Advanced Access Control Engineer	Bill McNary BPD Proposal Management Chief
	Shelton Morrison US 41 Neighborhood Liaison	Derek Weyer Region Planner	Tom Klobus-CE Advanced Stormwater/Erosion Control Engineer-Const	Brian Revello BPD Project Development Coordination
		David Nelson-CE Advanced Access Control Engineer	Mike Heinrich-EARS Advanced Environmental Coordinator	David Buschhoff BPD Construction Coordination
		MPD & TMA Coordination	Kathie VanPrice-EAR Specialist Environmental Coordinator	Bob Andorfer BTS Foundations & Pavements
		Chris Culotta-PPA Advanced Green Bay MPO Liaison	Enhancement	Don Grael BPD Claims & Dispute Resolution
		Matt Holsida-PPA Advanced DeKalb MPO Liaison	Tom Klobus-CE Advanced Stormwater/Erosion Control Engineer-Const	Jerry Zogg BPD Standards & Specifications Chief
		Road & Bridge Maintenance	Mike Heinrich-EARS Advanced Environmental Coordinator	Facilities Management
		Kurt Wranovsky-CE Supervisor Region Maintenance Supervisor-Const	Kathie VanPrice-EAR Specialist Environmental Coordinator	Brian Revello BPD Project Development Coordination
		Chris Blazek-CE Advanced Bridge Maintenance Engineer-Const	Safety	David Buschhoff BPD Construction Coordination
		Dale Weber-CE Advanced Bridge Maintenance & Inspection Engineer	Conrad Mohr-Surveyor Advanced 2 Survey Coordinator-Const	Bob Andorfer BTS Foundations & Pavements
		Jason Lahn-CE Advanced Roadway Maintenance Engineer-Const	Ayres Survey - Const	Don Grael BPD Claims & Dispute Resolution
		Park & Ride	Kaput Survey-Design	Jerry Zogg BPD Standards & Specifications Chief
		Chris Culotta-PPA Advanced Park & Ride Coordinator-Brown	Railroad	Facilities Management
		Matt Holsida-PPA Advanced Park & Ride Coordinator - Winnebago	Jared Krutinger-ES Advanced 2 Railroad Coordinator	Brian Revello BPD Project Development Coordination
		Public Relations & Communication	Plans	David Buschhoff BPD Construction Coordination
		Peg Schmitt OPA Director	Caryn Bergeson R/W Plat Coordinator	BTS Foundations & Pavements
		Risk Management & OCP		Don Grael BPD Claims & Dispute Resolution
		Damien Barr OCIP-WisDOT Risk Manager		Jerry Zogg BPD Standards & Specifications Chief
		Kevin Gehrmann OCIP-Project Liaison		Facilities Management
		Legal Review		Brian Revello BPD Project Development Coordination
		Mike Kemats WisDOT Office Of General Counsel		David Buschhoff BPD Construction Coordination
		External Cost Review		BTS Foundations & Pavements
		Jay Schadt OPBF Financial Management Plans		Don Grael BPD Claims & Dispute Resolution
		Joe Nestler BSPH Program Coordination		Jerry Zogg BPD Standards & Specifications Chief
		Jale Seston BSPH Finance Coordination		Facilities Management
		Environmental Review		Brian Revello BPD Project Development Coordination
		Jay Waldschmidt BEES		David Buschhoff BPD Construction Coordination

PROJECT BEST PRACTICES

PROJECT BEST PRACTICES

The US-41 Highway Reconstruction Mega Project Best Practices workshop sought to document the unique and innovative tools, techniques, and management approaches utilized in the delivery of the project's design. This section of the report provides the detailed documentation developed by the workshop participants of each functional discipline.

BEST PRACTICES BY FUNCTIONAL DISCIPLINE

Each documented best practice consists of a summary of the best practice concept, a description of the issues the best practice addressed, a listing of its advantages and disadvantages, a brief narrative providing background and further discussion, project management activities associated with the best practice deployment, resource considerations, actions required to implement the best practice, and an indication if the best practice emerged as a result of prior Risk Management activities and workshops. All of this information is intended to provide a conceptual presentation of what constitutes the best practice itself. It should be noted that the linkage of the best practice to the Risk Management Activities is to identify those best practices that emerged as a result of the project team coming together to discuss project uncertainties and develop response strategies. The association of these efforts also helps to paint a picture of the uncertainties and challenges the project team faced, which further provides context for the logic behind the implementation of the best practices.

In addition, the level of detail in the documentation is intended to inform readers what resource and management considerations need to be taken into account, as well as the manner in which it can be implemented in a project management platform. It is recognized that the documented best practices cannot capture all details associated to the specifics of each situation; however, the intent is to provide institutional knowledge transfer of those innovative or unique tools or techniques which may have a beneficial use on future Mega Projects in the state of Wisconsin.

The individual documented best practices were compiled by the functional discipline from which they emanated. In total, 92 best practices were identified by the workshop participants. Below are the representative functional disciplines for which best practices are presented later in this section:

- 1) Public Involvement
- 2) TSS (ROW, Utilities, Geotechnical, Pavement)
- 3) Environmental/Stormwater/Permitting/Agency & Bureau Coordination
- 4) SPO (Traffic/TMP)
- 5) Roadway Design
- 6) Corridor Tasks (Standards/Manuals/PS&E Reviews/Details)
- 7) Structure Design
- 8) CSD/Landscaping
- 9) Project Controls

SUMMARY OF BEST PRACTICES

No.	Best Practice Title
<i>Public Involvement</i>	
1	Project brand
2	Project website
3	Project listserve
4	Social media for project information sharing
5	Collateral materials development
6	Business interchange groups
7	Media plan
8	Project communications manager
9	Outreach for unique design features
10	Corridor graphics/visualizations
11	Contact list management
12	Construction staff transition meetings
13	Neighborhood liaisons

<i>TSS (Right-of-Way & Plats, Utilities, Geotechnical, Pavement)</i>	
1	Coordination of soil boring schedules, detail, and meetings
3	Accelerated appraisal start time
4	Accelerated real estate appraisal and relocation contracting
5	Real estate activity tracking
6	Central office involvement – litigation
8	Central office involvement – appraisal review
9	Include all players when meeting with property owners during right-of-way acquisition
12	Utility coordination schedule (ucs)
13	Monthly utility coordination meetings
14	Existing utility CADD file creation and maintenance
15	Utility field representative in design process
16	Survey data coordination and requests process

<i>Environmental/Stormwater/Permitting/Agency & Bureau Coordination</i>	
1	Airport and wildlife hazard coordination
2	Corridor-wide permitting for water quality certification and wetland impacts
3	EIS communication with agencies
4	Early identification of wetland mitigation sites
5	Early coordination with Central Office and Agencies on waterway impacts
6	Municipality drainage coordination
7	Early coordination with BIA and Native American Tribes/Nations
8	Ample archaeological survey coverage
9	Identification of construction access covered in Environmental Document/404 permit
10	Hazardous material/OCIP Coordination

<i>SPO (Traffic/TMP)</i>	
1	Use of regional travel demand model
2	Linkage of TMP and construction staging
3	Targeted TMP task forces by interchange corridor
4	Utility inspection of contractor-installed lighting
5	Rapid intervention vehicle

<i>Roadway Design</i>	
1	Prepare separate staging plans with schedule from Traffic Control Plans
2	Roadway design signage
3	Special provision tracking
4	Weekly design team meetings
5	Oversize/overweight vehicle coordination
6	Constructibility reviews
7	Special provisions organization
8	Design management and packaging
9	Construction contract packaging
10	Early and expanded advertisement
11	Early access review
12	Early design review of staging and constructibility

<i>Corridor Tasks (Standards/Manuals/PS&E Reviews/Details)</i>	
1	Corridor task leads
2	FTP site
3	EIS Project Manager
4	Corridor manual
5	Project field office
6	Enhanced independent design reviews
7	Cost estimate validation process
8	Risk management for design and construction
9	Lane closure charts

<i>Structure Design</i>	
1	Corridor structures manual
2	Corridor-specific structure standard detail drawings
3	Monthly structures “pre” meeting
4	Monthly structures meeting
5	Assign a specific person to a mega project from the BOS
6	Schedule alignment between roadway, geotechnical, and structures
7	Dedicated roadway and structure designer integration meetings
8	Grouping of similar structures in design
9	Innovative structure design and procurement

CSD/Landscaping	
1	CSD Design manual
2	Construction verification for CSD
3	Advanced utility coordination
4	CSD meetings/workshops and outreach with stakeholder groups
5	Design construction hand-off meetings
6	Coordination of landscaping and staging
7	CSD design review

Project Controls	
1	P6 master design schedule implementation
2	Weekly PM/design meetings and bi-weekly real estate, soils, and structures schedule status meetings
3	Construction schedule
4	Dedicated program controls staff/gatekeepers
5	Specific project ID for deliver items
6	Project email box
7	File structure
8	Formal change-management process
9	State/municipal agreement process
10	Manage projects to a budget
11	Establish committed program level (annual budget allotments) with OPBF and BSHP
12	Consultant amendment tracking tool
13	Proposal management matrix
14	Upper management reporting
15	Issue tracking and action list for design

FINANCIAL AND MAN-HOUR SUMMARIES

Some of the individual functional disciplines included directly traceable consultant support and delivery activities. Wherever it was possible to directly discern the financials and labor hour inputs into the functional disciplines, the financial budget and costs, as well as the budgeted and expended man-hours are reported. Table 2 on the following page presents a summary of the financials and man-hours for both Brown and Winnebago Counties, as well as a summary of the totals. Note that the data has been drawn from the National Constructors Group (NCG) monthly Financial and Man-Hour Summary reports provided to WisDOT. These reports are not directly provided in this document; however, for individual accounting purposes the task charge categories utilized in NCG's summary reports are provided in Table 2.

Table 2: Summary of US-41 Highway Reconstruction Mega Project NCG Consultant Financial and Man-Hour Monthly Reports.

Functional Discipline	Brown County					Winnebago County					Total			
	Code Category	Current Budget	Expended to Date	Budgeted Hours	Expended Hours	Code Category	Current Budget	Expended to Date	Budgeted Hours	Expended Hours	Current Budget	Expended to Date	Budgeted Hours	Expended Hours
Public Involvement	BC5	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED] ¹	[REDACTED]	[REDACTED]
TSS (ROW, Utilities, Geotechnical, Pavement)		-	-	-	-		-	-	-	-	-	-	-	-
Environmental / Stormwater / Permitting / Agency & Bureau Coordination		-	-	-	-		-	-	-	-	-	-	-	-
SPO (Traffic / TMP)	BC4	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Roadway Design		-	-	-	-		-	-	-	-	-	-	-	-
Corridor Tasks (Standards / Manuals / PS&E Reviews / Details)	BC7, BC15	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Structure Design		-	-	-	-		-	-	-	-	-	-	-	-
CSD / Landscaping	BC6	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Project Controls	BC19, BC20	\$ [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Note: Data drawn from NCG Monthly Financial and Man-Hour Reports for those charge codes directly traceable to the specific functional discipline. Data is current as of 7/1/2011.

Public Involvement

No.	Best Practice Title
1	Project brand
2	Project website
3	Project listserv
4	Social media for project information sharing
5	Collateral materials development
6	Business interchange groups
7	Media plan
8	Project communications manager
9	Outreach for unique design features
10	Corridor graphics/visualizations
11	Contact list management
12	Construction staff transition meetings
13	Neighborhood liaisons

	Budgeted	Actual
Cost	██████████	\$ ██████████
Labor	32,920 hours	39,221 hours

Summary Totals include Brown and Winnebago Counties. See Table 2 on preceding page.

BEST PRACTICE: *Project Brand*

Discipline: Public Involvement

Best Practice Description:

Develop long-term identity of the project through the use of a project brand (logo and project tagline).

Issue Resolved by this Best Practice:

There was no direct identification of what the project was to the general population and which communities the project would affect (i.e., there was nothing making the project uniquely identifiable).

Advantages:

- Builds identity for the project
- Stimulate team atmosphere of project (both project team and in community)
- Enhances communication of project developments to the public
- Distinguishes project from other projects ongoing in the area/region

Disadvantages:

- Can become costly to produce unique materials
- Public confusion over projects that are in close proximity to one another

Discussion/Background:

The “US-41 - Connecting Wisconsin” logo and tagline are integral pieces in the communication and public information efforts of the project. They are recognizable elements used on all print materials to set the US-41 project apart and help drive people to the best sources for project information. It provides a mechanism to communicate with the public about the project.

Project Management Activities:

- At the onset of the project, develop logo and project brand.
- Submit to Central Office (CO) for review and approval.

Resource Considerations:

- Allocate resources to graphic design and brand development resources.
- Budget for development and production of project-specific materials that incorporate logo and brand.

Implementation Action:

Activities to develop brand were initiated at the onset of the project. The Project Communications Manager oversees materials production to ensure the project brand is maintained as the project proceeds.

BEST PRACTICE: *Project Brand*

Discipline: Public Involvement

Issue Identified and Resolved as a result of Risk Management Process?

- YES NO

Sample

BEST PRACTICE: *Project Website*

Discipline: Public Involvement

Best Practice Description:

Creation of a project website which provides complete, accurate, and immediate construction, traffic, and project information for the life of the project.

Issue Resolved by this Best Practice:

There was no single point of communication for the vast amount of project information. In addition, there was no separation from the other WisDOT projects on the WisDOT website and no mechanism to tie into the unique brand of the project.

Advantages:

- Businesses can link their websites and to information relating to the project (ex: US-41 button/link)
- More cost-effective than mass distribution of printed material
- Gives the project manager more control over what can be put on website (there are a lot of processes and procedure controls to place information on WisDOT main website)
- Saves WisDOT project managers time by directing interested parties to the website
- Provides a single location for answers to questions and communicating with the public
- Creates a documentation tool for storing information coming from the public
- Allows the public to ask more educated questions

Disadvantages:

- With a lot of information, it is difficult to organize and put the "right" information on the website to meet the requests of all people
- The method of placing information on a website can be heavily relied on and a portion of the population may not have access to the tool

Discussion/Background:

Communication with all stakeholders is easily achieved through the various content sections of the website. Interactive maps provide visual references and address traffic impacts, news, and closures. Other website sections provide updates on public meetings, long-term shutdowns, project-related print materials, and past meeting materials which highlight past and upcoming business and public meetings for the project.

Project Management Activities:

- At the onset of the project, coordinate with the Office of Public Affairs to initiate website development.
- Contract with a website development consultant.
- Implement a plan to oversee website maintenance and updates.

BEST PRACTICE: *Project Website*

Discipline: Public Involvement

Resource Considerations:

- Allocate resources for overseeing and coordinating website development consultant, including the development of graphics and maps.
- Allocate hours to coordinate with WisDOT project staff to develop project design and construction-related content for the website

Implementation Action:

Activities to develop the US-41 project website were initiated at the onset of the project. Project Communications Manager oversees Public Involvement (PI) team that routinely reviews and updates website content.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Project Listserv*

Discipline: Public Involvement

Best Practice Description:

Create an email database (listserv) to inexpensively and effectively distribute project-related information at any hour of the day.

Issue Resolved by this Best Practice:

There is a need for an inexpensive, efficient, and electronic methods of sharing information and effectively communicating with stakeholders and project team members.

Advantages:

- Rapid information turnaround
- Messages sent out to large audience at relatively little cost
- Relatively easy to administer
- Provides mechanism to reach a target audience (based on structure of data)
- Construction staff has list to start from in the transition from design

Disadvantages:

- No guarantee the receiver will read it
- There are constant changes in the businesses within the community
- Requires continuous collection and updates of contacts
- Sometimes the owners/managers of the business are not directly located on site (e.g., an owner/manager actually resides in, say, Florida)

Discussion/Background:

Maintaining a robust email database is imperative to a mega-project. Messages can be sent to a large audience quickly at little cost. This is important during all stages of a mega-project, but is particularly important during the construction phase.

Project Management Activities:

- At the onset of the project, develop database.
- Take advantage of other project events, meetings, and other outreach activities to collect email addresses from stakeholders.
- Establish process/mechanism to ensure that duplicate email addresses are not entered into the database.
- Develop content to distribute.

Resource Considerations:

- Allocate resources for overseeing and coordinating listserv database development.
- Allocate hours to collect and QC emails prior to submission to listserv and develop content for distribution to listserv.

BEST PRACTICE: *Project Listserv*

Discipline: Public Involvement

Implementation Action:

Activities to develop the listserv were initiated at the onset of the project. Project Communications Manager oversees public involvement team that collects email addresses during outreach activities. Project Communications Manager also oversees public relations/marketing team that maintains and utilizes the listserv.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Social Media for Project Information Sharing*

Discipline: Public Involvement

Best Practice Description:

Use social media websites to build online communities where the US-41 project can share information.

Issue Resolved by this Best Practice:

There was a need for a mechanism to communicate quickly with the mass population. The recent rapid expansion of social media outlets provided such a mechanism for this type of communication.

Advantages:

- Allows for project staff to quickly interact with public directly
- Provides information communication that does not require WisDOT to identify interested parties
- Provides opportunities for the building of public acceptance
- Integrates with new technologies such as smartphones/PDAs
- Creates atmosphere of "open book" and transparency
- Gives project a voice to respond to questions posted by readers
- Users can be updated without going to project website

Disadvantages:

- There are very strict rules for approval of information
- It is relatively "new" and expanding in usage within WisDOT
- Firewalls of WisDOT block access when in office
- CO is not the most experienced in this domain (creates "fear" of information being posted)
- This is a less formal type of communication versus conventional types
- Difficult to formulate detailed information for communication

Discussion/Background:

Creating US-41 Project Facebook and Twitter accounts allows the Northeast Region to continually generate interest and awareness of construction. They are critical tools for sharing traffic delays and construction updates, or various milestones. Additionally, social media sites give the project a voice as WisDOT staff respond to questions posted by readers. These conversations build relationships which benefit the project from a public relations standpoint.

Project Management Activities:

- At the onset of the project, coordinate with the Office of Public Affairs to establish Twitter and Facebook accounts.
- Monitor and respond to questions.

BEST PRACTICE: *Social Media for Project Information Sharing*

Discipline: Public Involvement

Resource Considerations:

Allocate resources for overseeing and coordinating site development and maintenance.

Implementation Action:

Activities to establish the social media sites were initiated after the project was started and following substantial coordination with the Office of Public Affairs. The Project Communications Manager oversees the administration of the social media sites.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Collateral Materials Development*

Discipline: Public Involvement

Best Practice Description:

Produce collateral of various printed materials to educate on a wide scale or to a very targeted audience.

Issue Resolved by this Best Practice:

There are many people to reach and the communication processes require a variety of tools to reach the various demographics of the public.

Advantages:

- Provides alternative informational sources to be distributed to the public
- Distribution of some meeting materials can be mailed or placed in public locations such as kiosks, local gas stations, hotels, etc.
- Advertises the project to specific groups
- Communicates with those that do not predominantly use electronic communication
- Can be used as an education tool throughout region
- Information packets can be disseminated via email or by mail depending on their size and the needs of recipients

Disadvantages:

- Cost of information is not necessarily validated by beneficial use
- It is often difficult to measure the effectiveness of printed materials
- Distribution of materials requires additional coordination
- People can take more material than needed
- Printed material can become dated quickly

Discussion/Background:

A variety of project materials are needed – but particularly a Project Newsletter, ‘Get Around Guide’ and area-specific Project Briefs. The newsletter reaches residents and businesses that may not have internet access. The ‘Get Around Guide’ contains all significant traffic impacts within the project limits for a construction season. The Project Briefs are targeted publications for specific areas/projects in the work zone, with detailed explanations of construction or traffic impacts. Spanish and Hmong translations of most materials are needed. Note: It is best not to include specific schedules due to dating of materials.

Project Management Activities:

- At the onset of the project, develop a PI plan that identifies target groups and the materials to target those groups.
- Create, review, and update materials and respond to feedback and questions as needed.

BEST PRACTICE: *Collateral Materials Development*

Discipline: Public Involvement

Resource Considerations:

- Allocate resources for the development and periodic updates to the PI plan.
- Allocate resources to identify collateral materials.
- Allocate resources for the printing and distribution of materials.

Implementation Action:

A PI plan was developed at the onset of the project. The plan identified a number of target stakeholders. The Project Communications Manager oversees the periodic development and distribution of materials to reach and inform these stakeholders.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Business Interchange Groups*

Discipline: Public Involvement

Best Practice Description:

Develop targeted outreach to businesses along the US-41 corridor to share critical scope and schedule information.

Issue Resolved by this Best Practice:

There is a need to ensure that stakeholders are informed of critical scope and schedule information as early as possible and as the project develops. In addition, there is a need to develop a process to accommodate special business needs.

Advantages:

- Develops a process to identify and accommodate special business needs (e.g., oversize/overweight vehicles)
- Identifies business development plans
- Allows for consideration of unique business cycles
- Informs businesses of the work plan and schedule
- Provides documentation for proof of due diligence
- Coincides with TMP coordination by identifying players
- Taps into existing structure of community businesses
- Identifies business owners that may own multiple businesses and can enhance communication in more than a single area
- Improves business outreach through "word of mouth"
- Gives businesses a "voice" and demonstrates WisDOT's commitment to keep them informed

Disadvantages:

- The value of efforts can be limited if the businesses are not reacting and participating
- When businesses are in a group, they can conspire against WisDOT (i.e., "shoot the messenger")

Discussion/Background:

Business groups were formed according to interchange area and meetings scheduled on a 6-month rotation, at least 1 to 1½ years ahead of construction. The meetings give details regarding the scope of work, construction schedule (if known), business impacts, and most importantly, traffic impacts.

Project Management Activities:

- At the onset of the project, the PI plan identifies key business groups along the corridor.
- Throughout the process, additional businesses or business groups may be identified that would benefit from the outreach activities.

Resource Considerations:

- Allocate resources for the collection and maintenance of business contact information.

BEST PRACTICE: *Business Interchange Groups*

Discipline: Public Involvement

- Allocate resources for the development of business outreach and business meeting materials.
- Identify outreach tools specific to the business audiences targeted by outreach activities.
- Allocate hours for responding to inquiries from businesses.

Implementation Action:

A PI plan was developed at the onset of the project, which identified business groups along the corridor. The Project Communications Manager directed the development of business-related materials and the scheduling of WisDOT's business meetings.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Media Plan*

Discipline: Public Involvement

Best Practice Description:

Implement a media plan to create project awareness using a combination of radio, targeted print materials, cinema advertising, and social media.

Issue Resolved by this Best Practice:

A multi-faceted and flexible media plan is needed to meet the needs of stakeholders across multiple demographics.

Advantages:

- Coordinates messages for effective and consistent project outreach
- Allows to plan and budget for the use of media outreach
- Creates a consistent plan and methodology for identifying *who* and *how* to do outreach

Disadvantages:

- Complex to coordinate
- Difficult to measure the effectiveness of these activities
- Media may target individuals and groups that are not concerned with project information

Discussion/Background:

Given the tremendous impact construction has, the use of media need to be placed in order to reach diverse audiences through the use of business publications, radio spots (Spanish translations), ethnic publications, general market publications, cinema advertising, newspaper inserts, etc.

Project Management Activities:

- At the onset of the project, the Project Communications Manager develops media plan.
- Hire consultant to oversee media buys.
- Adjust as needed.

Resource Considerations:

- Allocate resources for the development of the media plan.
- Coordinate efforts with a public relations consultant.
- Develop a budget and plan for placing media buys.

Implementation Action:

The Project Communications Manager brought public relations firm onto the US-41 project and developed a media plan.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Project Communications Manager*

Discipline: Public Involvement

Best Practice Description:

Utilize a multi-tiered management approach to implement and oversee public involvement activities, including a Project Communications Manager (PCM).

Issue Resolved by this Best Practice:

The media industry operates with daily deadlines and is constantly searching for developing news stories. Ideas must be pitched consistently to media sources and followed up to get information in front of the public. The media does not have time nor expertise to craft the most effective message and provide the most meaningful message. The PCM ensures that the media is pitched at the right time with the right information, with the support of the regional and executive resources.

Advantages:

- Centralizes communication with media
- Establishes single points of contact in order to influence as many media sources as possible
- Ensures that WisDOT communication policies are implemented and followed
- A PCM is able to focus attention directly to a project
- Provides for consistent project messages

Disadvantages:

- Creates multiple resources in regions
- Time management can become complicated with many projects
- Role can be perceived internally as an additional cost (financial perspective)

Discussion/Background:

Having a central PCM-advanced on a mega project is important. This individual has an understanding of all aspects of the project and is able to cultivate relationships with the media. This individual knows the team and will look for opportunities to expose media to project impacts and successes. It is important to have someone that has worked in the media itself and is not directly focused with the engineering details. The PCM needs to be kept up to date in order to manage their time efficiently. The PCM integrates the following levels of public involvement oversight:

- **Project level:** Responsible for day-to-day coordination. The PCM leads, recommends, and coordinates strategies while making cost-conscious outreach decisions. PCM is an integrated member of the project team who serves as the point of contact between key stakeholders, media, elected officials, as well as the WisDOT management team.
- **Regional Director/Regional Operations Director:** Oversees PCM activities. Provides insight into decision-making and review processes.
- **Administrator/Executive Offices:** Final decision-makers on outreach strategies and costs.

BEST PRACTICE: *Project Communications Manager*

Discipline: Public Involvement

Project Management Activities:

Hire PCM at the onset of the project.

Resource Considerations:

Allocate resources for hiring the PCM.

Implementation Action:

When implementing this best practice it is recommended to hire a PCM at the onset of the project.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Outreach for Unique Design Features*

Discipline: Public Involvement

Best Practice Description:

Create outreach to address unique design features of the project.

Issue Resolved by this Best Practice:

There has been vocal opposition and concern about roundabouts on the US-41 project.

Advantages:

- Engages the public early on in the process
- Educates drivers and allows questions
- Provides a forum for feedback for consideration of design elements
- Identifies final solutions early in design that are based on public input, thus avoiding design "throwaway" costs
- Mitigates public's perception of uncertainty

Disadvantages:

- Requires an additional resource
- Can be controversial and political
- Can be time- and labor-intensive

Discussion/Background:

Outreach is used in targeted areas of the construction zone to educate drivers on the benefits of unique design components and features and proper ways to navigate them. This requires early outreach and education of the public to make them more comfortable with the concept. There is also more time for public to adjust to idea of what the new roadway will be.

Given the sometimes controversial nature of roundabouts and the number of them being constructed in the US-41 project, an aggressive outreach program was developed. Based on construction timelines and locations, large-scale roundabout public information meetings were held in targeted neighborhoods ahead of the openings of particular interchanges/intersections. Meetings features large roll plots of the finished design, videos and animations explaining correct ways to navigate a roundabout, and much Q&A. Northeast Region also created a "Roundabouts" page on the US-41 project website, driver's perspective videos, and bike/pedestrian handouts.

Project Management Activities:

- Work with Project Communications Manager to identify unique project features that warrant outreach and develop outreach plan, which can be an appendix in the overall PI plan.
- Implement plan and adjust as necessary.

Resource Considerations:

Allocate resources for plan development and implementation.

BEST PRACTICE: *Outreach for Unique Design Features*

Discipline: Public Involvement

Implementation Action:

Roundabouts were identified as a unique project feature that required specialized outreach. A roundabout outreach plan was developed and implemented.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

BEST PRACTICE: *Corridor Graphics/Visualizations*

Discipline: Public Involvement

Best Practice Description:

Have one consultant develop graphics/visualizations for entire corridor.

Issue Resolved by this Best Practice:

The public could not visualize what the corridor design concepts were.

Advantages:

- Consistent look developed
- Efficient production of renderings
- Public is better able to understand the vision developed by project staff
- Allows one product to cross multiple firms/segments/projects
- Establishes a professional look for project materials

Disadvantages:

- Needs designer input and review (can result in misinformation without it)
- Costly to produce
- Sets level of public expectations that can be costly in the future
- Requires accurate information and updating ("snapshot in time")

Discussion/Background:

One firm/person completes renderings for a corridor. This approach allows for a consistent look to all renderings for the corridor and provides for a single point of contact for WisDOT and all designers.

Project Management Activities:

Identify firm to develop visualization materials.

Resource Considerations:

Allocate resources for development, updating, and displaying visualization.

Implementation Action:

Individual firms were identified to develop renderings, 3D flythrough, and driver's perspective videos.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Contact List Management*

Discipline: Public Involvement

Best Practice Description:

Manage the production, development, and management of an integrated contact list.

Issue Resolved by this Best Practice:

Early in the outreach process, multiple non-standardized lists were developed for individual public information meetings and outreach. These lists were difficult to integrate accurately as the US-41 project advanced and contact areas expanded.

Advantages:

- All contact information for a particular corridor is located in one master list
- Allows quick and efficient development of new lists
- Standardizes the lists, which provides flexibility and scalability
- Lists can be queried and modified by multiple project staff
- Contains maps to identify areas covered by contact lists
- Lists are 'living' documents that can be edited to better serve the specific needs of the project area
- 'Source Columns' identify how entries on these lists have been used in the past

Disadvantages:

- Multiple project staff accessing and editing these lists presents QC challenge
- Due to the size and extent of these lists, changes to entries may not be immediately identified and incorporated

Discussion/Background:

At the beginning of the project, there were multiple contact lists in different locations that were developed for individual public information meetings. As the project advanced, there was a need to combine lists, which required a large amount of time and coordination. Additionally, these lists were limited in availability to design/construction groups and did not, therefore, include the right people. Using a master list ensures that businesses and residents are not overlooked, and also prevents duplicate entries. The lists are maintained on the internal project FTP site. Furthermore, they are available to all project staff and correspond to business interchange areas.

Project Management Activities:

- Identify an individual or firm to oversee and QC the master lists.
- Establish processes and procedures for querying and modifying the master lists as the project requires.
- Identify areas covered by each master list.

BEST PRACTICE: *Contact List Management*

Discipline: Public Involvement

Resource Considerations:

- Allocate resources for consultant oversight of the lists.
- Use technology that can be accessed, understood, and navigated by multiple users.

Implementation Action:

Existing lists were integrated and staff was assigned to maintain and oversee master lists.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Construction Staff Transition Meetings*

Discipline: Public Involvement

Best Practice Description:

Conduct construction staff transition meetings with PI team to ensure that the construction staff are aware of protocols, efforts underway, and the proper channels of communication.

Issue Resolved by this Best Practice:

This practice addresses potential confusion and interruption in outreach activities that can occur when new construction staff starts on the project.

Advantages:

- Enables all staff working on a particular project to come together in one place, face to face
- Identifies roles and expectations for construction staff and their roles in outreach to businesses
- Lays groundwork for integrating construction outreach with future design outreach in the area

Disadvantages:

- Requires all staff to attend meeting
- Can be difficult to keep scopes of work separate

Discussion/Background:

These meetings quickly bring the construction teams up to speed on past PI efforts conducted for each project area. The meetings provide an opportunity to discuss unique issues, special notification, or outreach needs identified for the area during previous PI efforts. Access to existing contact lists, US-41 material templates, updated mapping, and project information are also provided to the new construction staff.

Project Management Activities:

Ensure that construction staff meets with PI team.

Resource Considerations:

- Allocate resources for development of construction PI plan.
- Allocate resources for PI and construction staff to meet and coordinate during construction.

Implementation Action:

PI team developed a construction PI plan and obtained concurrence on anticipated level of coordination from US-41 Construction Supervisor.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Neighborhood Liaisons*

Discipline: Public Involvement

Best Practice Description:

Employ neighborhood liaisons to improve interaction between project staff and individuals and groups in certain communities impacted by the project.

Issue Resolved by this Best Practice:

There was no ability to provide face-to-face communication with the individuals and groups in the various communities in the corridor in a personalized manner. There were no "eyes and ears" of the communities. There was also less familiarity with the general process of conducting meetings in the community.

Advantages:

- Catered and customized approach to direct interaction
- Improves communication between agency and stakeholders
- Cost-effective communication approach
- Provides mechanism to get public/communities involved when they may be unaware of project developments
- Connect with the actual business entities operating a property vs. just the owner of the property leasing to the business owners

Disadvantages:

- Sometimes liaisons cannot provide all the answers immediately and there may be a lag to get back to public
- Liaisons may answer technical questions for which they do not have adequate information

Discussion/Background:

The neighborhood liaisons (individuals/seniors/tribal members in the community with credibility and good standing) are direct connections to neighborhoods, businesses, and the communities along the corridor. This requires individuals that act on behalf of the project with a certain level of trust by those managing and executing the project. Liaisons are able to help in setting up meetings and getting the community actively involved.

Project Management Activities:

- Identify and hire neighborhood liaisons and liaison coordinators.
- Develop training program.

Resource Considerations:

Allocate resources for hiring, training, managing liaisons, tracking outreach activities, and processing invoices. Liaison coordinator can be a consultant, but hours need to be allocated to cover WisDOT oversight of liaisons' activities.

BEST PRACTICE: *Neighborhood Liaisons*

Discipline: Public Involvement

Implementation Action:

Hire and train liaisons and coordinator and identify expectations.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

TSS (Right-of-Way & Plats, Utilities, Geotechnical, Pavement)

No.	Best Practice Title
1	Coordination of soil boring schedules, detail, and meetings
3	Accelerated appraisal start time
4	Accelerated real estate appraisal and relocation contracting
5	Real estate activity tracking
6	Central office involvement – litigation
8	Central office involvement – appraisal review
9	Include all players when meeting with property owners during right-of-way acquisition
12	Utility coordination schedule (ucs)
13	Monthly utility coordination meetings
14	Existing utility CADD file creation and maintenance
15	Utility field representative in design process
16	Survey data coordination and requests process

	Budgeted	Actual
Cost	--	--
Labor	--	--

Best Practice: *Coordination of Soil Boring Schedules, Details, and Meetings*

Discipline: TSS - Geotechnical

Best Practice Description:

A project team member is assigned the responsibility to coordinate the structure soil boring schedules, details, and meetings related to the project/corridors (ex: US-41 corridor in Brown County). Boring and report writing schedules can be lumped into tasks and integrated into project schedules so that the schedules are all in alignment. As projects get advanced or shifted it is important to coordinate and communicate. Falling behind can create bottlenecks in design and it is important to have better control and integration of the process with design. Bi-weekly meetings were created to review the delivery schedule with all responsible design parties. Monthly poor soils meetings were created to discuss mitigation strategies for poor soil conditions discovered along the project corridor.

This person should be involved with geotechnical, structures, and other facets of design. It is beneficial to have this individual have a background in geotechnical /structures. Include geotechnical coordination under design contract instead of project management or have dedicated WisDOT representative for a corridor. The assigned project team member should have direct contact with CO Geotechnical and Regional Geotechnical resources.

Coordination meetings should be held in regular interval without large lags in follow-up meetings (ex: bi-weekly meetings). The meetings should bring all responsible parties to the table – geotechnical consultants, in-house WisDOT boring and geotechnical resources, project managers, and project scheduler.

Changes in WisDOT policy, details, and philosophy can be channeled through the geotechnical coordinator to the design/ geotechnical consultant. The coordinator can also facilitate questions in boring access and report recommendations that need to be discussed within WisDOT. Another function of the geotechnical coordinator is to facilitate the communication and design data transfer between geotechnical and structural designers.

Issue Resolved by this Best Practice:

There is a need to prioritize where soil borings and reports are needed along the corridor and then to coordinate/plan with the geotechnical consultant or in-house staff on acquiring these borings and completing the reports.

As the project progressed, many schedule changes were difficult to track by the geotechnical resources. Priorities were constantly changing and not relayed to the structural or geotechnical resources.

Poor soil conditions, when discovered, were discovered late in the design – possibly compromising project schedule and resulted in late design changes.

Advantages:

- Single point of contact allows for better information management and issue resolution
- One person responsible for maintaining updates to management
- Improved coordination and understanding of the deliverable schedule

Best Practice: *Coordination of Soil Boring Schedules, Details, and Meetings*

Discipline: TSS - Geotechnical

- Management is better able to coordinate and continually re-evaluate and communicate priorities with key players
- Makes priorities and schedule consistent across all groups
- Allows for face-to-face interaction and problem solving

Disadvantages:

- Requires an additional resource
- Depending on the level of project complexity (i.e., number of structures, nature of soils), the role could require 100% of the resources time

Discussion/Background:

Prior to the assignment of a dedicated team member geotechnical borings and report writing was not being tracked with the overall project schedule. There was also a disconnect between the roadway design schedule and the geotechnical/structure design schedule. Not only were the geotechnical investigations behind in terms of the overall project schedule, but the structural information available to conduct the investigations was also behind.

As investigations became available, poor soil conditions were found. At this point in design the mitigation options were limited and put the project schedule at risk. The mitigation strategies were rushed and may have been incorporated into the design more appropriately if more time was available. Structural designers also had to make late changes based on the geotechnical recommendations; this caused late and repeated reviews by WisDOT CO staff.

Project Management Activities:

- Ensure assignment of project team member to geotechnical and structural management.
- Incorporate geotechnical and structural tasks into overall project schedule.
- Ensure project team member has direct contact with Regional and CO resources.

Resource Considerations:

Identify the scope of the project – number of structures, historic soil conditions, fill/cut quantities – then assign project team member(s) and identify the percentage of work hours to be spent on geotechnical and structure coordination.

Implementation Action:

- Approval by WisDOT management for assignment of a new resource.

Best Practice: *Coordination of Soil Boring Schedules, Details, and Meetings*

Discipline: TSS - Geotechnical

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This idea was initially generated during the first Risk Assessment workshop and subsequently implemented as a risk response strategy to geotechnical/structural coordination and planning. This improved coordination, reduced risk exposure on the project to schedule delays, reduced construction costs, and avoided additional re-design.

Sample

Best Practice Name: Accelerated Appraisal Start Time

Discipline: TSS – Right-of-Way & Plats

Best Practice Description:

Starting appraisal process on the project as early as possible with the best information available. This is starting the process prior to Design Study Report (DSR) approval. This practice allows the real estate acquisition process to start earlier in order to help deliver a project with below normal available acquisition timeframes.

Issue Resolved by this Best Practice:

If a project has tight timeframes, the amount of available time to adequately negotiate with the property owner is affected and can lead to rushed settlements, upset property owners or owners appealing their compensation. If adequate time is not allotted to the property owner, they can contest our right to acquire their property because their owner's rights during the acquisition process was not properly handled.

Advantages:

- Appraisals done on time
- Keeps project on schedule
- Certified by PS&E date
- Better right-of-way cost data sooner rather than later
- Identifies problem parcels sooner so that the project can mitigate
- Gives statewide review staff additional time to review appraisals

Disadvantages:

- More costly if design changes
- May take conservative approach and acquire more right-of-way than needed

Discussion/Background:

The real estate section needed to come up with a plan to decrease the amount of time it takes to complete the acquisition process. Tight timeframes and delayed DSR's with no extra time to acquire real estate forced the section to come up with a plan to decrease the acquisition timeline. The area chosen to accelerate was the appraisal process. The region gave the appraisers the best information available in order to start the appraisal process. The early appraisal start time gave the appraisers more time to complete the report which helps improve the quality of the report and allowed for more time in the negotiation process.

Project Management Activities:

- Coordination by real estate staff to supply latest information to appraisers.
- Coordination with other sections to determine project timelines and progress.

Best Practice Name: Accelerated Appraisal Start Time

Discipline: TSS – Right-of-Way & Plats

Resource Considerations:

Allocate staff hours for project management needs.

Implementation Action:

This procedure will be used on future projects when tight timelines for acquisition are determined.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

The risk of not being able to acquire right-of-way in the time available because of delays before it could be acquired was a noted risk and was addressed by this concept.

Best Practice Name: Accelerated Real Estate Appraisal and Relocation Contracting

Discipline: TSS – Right-of-Way & Plats

Best Practice Description:

Working with design staff to get the best information available in order to get the contracting process started as early as possible. It is helpful to establish timelines and to have a better handle on the appraisal and acquisition. Procrastinating on getting contractors for appraisal and relocation can cause project delays. To be successful this practice should include providing a point of contact for the information coordination.

Issue Resolved by this Best Practice:

Getting a late start on the real estate process because of contracting issues can greatly reduce the amount of time needed for successful acquisitions. Waiting too long to hire a real estate consultant can cause delays and create difficulties in finding a qualified consultant.

Changes in the design and fluctuations in project and program needs because of tight timelines to be accommodated for because changes to the acquisition of a property generally causes the damages to change resulting in a new real estate appraisal report or relocation computation to be completed.

Advantages:

- More lead time to acquire qualified appraiser or relocation specialist
- Keeps project on schedule
- Allows for some schedule buffer/flexibility if the program changes
- Provides accessibility to project staff for communication and coordination

Disadvantages:

- Time lag between hiring of consultant to when the appraisal reports can be finalized and negotiation/relocation process can start
- If project schedules change, consultant needs to either accelerate or delay acquisition process
- Can be difficult for consultants to plan for future work if project schedules change

Discussion/Background:

Prior to accelerating the contracting process the real estate section would wait until most acquisition related conflicts with the project were discussed and solved before a consultant would be hired. There is plenty of preliminary work that needs to be done prior to the actual acquisition of property for right-of-way. Hiring a consultant early on in the process allows the department to use the consultant as another resource for problem solving.

Project Management Activities:

- Coordination by real estate staff is needed to supply latest information to consultants.
- Coordination with other sections is needed to determine project timelines in order to be proactive with our consultant needs.

Best Practice Name: Accelerated Real Estate Appraisal and Relocation Contracting

Discipline: TSS – Right-of-Way & Plats

Resource Considerations:

Allocate staff hours for project management needs.

Implementation Action:

This procedure will be used on future projects when tight timelines for acquisition are determined.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

There is always a risk of not being able to hire the best consultants for a particular real estate issue. By selecting a consultant earlier in the process the real estate section is more likely to get the best consultant for the project.

Best Practice Name: *Real Estate Activity Tracking*

Discipline: TSS – Right-of-Way & Plats

Best Practice Description:

This is a detailed spreadsheet used by the real estate section that follows a right-of-way acquisition parcel from start to finish. A key component is to ensure that this schedule is directly coordinated with the corridor schedule. Key milestones should be disseminated to the project scheduler via weekly meetings.

Issue Resolved by this Best Practice:

This allows anybody associated with the project to view this tracking sheet and know exactly where the parcel is in the acquisition process

Advantages:

- Allows for tracking of any step in the right-of-way process from start to end
- Increases likelihood of achieving deadlines for acquisition
- Easier to prioritize as changes are happening
- Can be used for complex project/acquisitions where many parcels are involved
- Anyone at any time can find access to the latest up-to-date project information
- Helps to predict project delivery conflicts

Disadvantages:

- Information needs to be continuously managed to ensure integrity

Discussion/Background:

Generally in the past only a limited amount of people had access to the most up-to-date real estate project information. This procedure, if implemented correctly, will allow all project staff to view right-of-way parcel acquisition status.

Project Management Activities:

- Coordination by real estate staff to supply latest information to project scheduler.
- Real estate staff needs to coordinate with consultants for the most up-to-date parcel acquisition information.

Resource Considerations:

Allocate staff hours for project management needs.

Implementation Action:

This procedure will be used on future projects when tight timelines for acquisition are determined.

Best Practice Name: *Real Estate Activity Tracking*

Discipline: TSS – Right-of-Way & Plats

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Project parcel tracking with the latest up-to-date information was always a concern and challenge in the past.

Sample

Best Practice Name: *Central Office Involvement - Litigation*

Discipline: TSS – Right-of-Way & Plats

Best Practice Description:

Implement the involvement of Regional coordinators and CO litigation coordinators and Office of General Council as early as possible with real estate project scoping and assistance for final offers. Litigation coordinators help the region establish a fair final offer to the owner that will help the department defend its value during the eminent domain process. This provides better information upfront and the litigation coordinators can familiarize themselves with the issues prior to the parcel acquisition becoming a problem.

Issue Resolved by this Best Practice:

The only time the CO litigation coordination is typically performed is when a problem arises. This is a reactionary response rather than a proactive response. They are only exposed to the issue when it becomes a problem in lieu of keeping them involved prior to it becoming a problem.

Advantages:

- Reduces delay time for negotiations
- Helps design team know of issues sooner rather than later
- Can adapt design to mitigate issues earlier
- Enforces WisDOT standard and protocol
- Lets CO know of issues early on before they become a "fire"

Disadvantages:

- Office of General Council (OGC) and CO litigation are backlogged with other projects

Discussion/Background:

The workload for OGC is heavy and their time is limited for assistance. If we can strive to get them involved early in the project and supply them with needed information in a timely manner they should be able to respond to our needs sooner.

Project Management Activities:

- Coordination by real estate staff to supply priority information to litigation coordinators and OGC.

Resource Considerations:

Allocate staff hours for project management needs.

Implementation Action:

This procedure will be used on future projects when tight timelines for acquisition are determined.

Best Practice Name: *Central Office Involvement - Litigation*

Discipline: TSS – Right-of-Way & Plats

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

The amount of litigation occurring on a project is always a concern. Being proactive with the region's acquisitions to avoid or limit litigation should help maintain the project schedule and budget.

Sample

Best Practice Name: *Central Office Involvement – Appraisal Review*

Discipline: TSS – Right-of-Way & Plats

Best Practice Description:

A priority list needs to be created and maintained so that the CO Review Appraisers can be kept up to date on the regions appraisal review priorities.

Issue Resolved by this Best Practice:

CO Review Appraisers, not knowing what the regions parcel acquisition priority is, can cause priority parcels not to be reviewed in a timely manner, causing a delay in the acquisition process.

Advantages:

- Achieve appraisal review in a timely manner
- Does not hold up project schedule
- Single person is more familiar with characteristics of project

Disadvantages:

- None apparent

Discussion/Background:

Appraisal review is always a concern for a project with tight timelines. The real estate section felt that if we would alert CO Real Estate of our review priorities it would help us better stay on schedule with our projects. It would also allow CO to more effectively schedule their review appraisers.

Project Management Activities:

- Coordination by Regional real estate staff to supply priority appraisal review information to CO Reviewers and Management.

Resource Considerations:

Allocate staff hours for project management needs.

Implementation Action:

This procedure will be used on future projects when tight timelines for acquisition are determined.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

The timeline and availability for Review Appraisers on a sensitive project is always a concern. Being proactive by actively coordinating with CO should help maintain the project schedule and budget.

Best Practice Name: *Include All Players When Meeting With Property Owners During Right-of-Way Acquisition*

Discipline: TSS – Right-of-Way & Plats

Best Practice Description:

There is a need to include all players when meeting with property owners or parties of interest so that everyone understands the situation and communicates uniformly in relation to detailed property impacts. In order to accomplish this, it is recommended to engage in coordinated meetings between property owners and WisDOT disciplines so that everyone is on the same page. Keeping all parties informed of what decisions are being made is important so that appraisal issues are all known. Management needs to support this effort and be involved in order to ensure effective communication.

Issue Resolved by this Best Practice:

Various disciplines (design, drainage, utilities, etc.) were not communicating and involved in discussions relating to progression of right-of-way acquisition. Individual disciplines were talking to the property owners and real estate personnel or other disciplines may not be aware. All players (engineering, real estate, etc.) hear the same concerns and discussion. All involved parties also need to understand what the specific detailed property impacts are so that a uniform solution can be crafted. Once a solution is determined in concert with other disciplines, then all will be on the same page.

Advantages:

- Reduces time spent addressing questions
- Speeds up acquisition time
- Everyone is on the same page
- WisDOT projects a professional image and maintains public goodwill
- Promotes team approach and a consistent answer to property owners
- Can be combined with other meetings

Disadvantages:

- Additional coordination of staff
- May create more meetings
- Property owner may gain access to multiple points of contact

Discussion/Background:

The right-of-way acquisition process can be streamlined and create less inconsistency and confusion when all of the players are uniformly involved upfront and throughout the right-of-way process. Communicating with the property owner and understanding the right-of-way impacts earlier to learn the damages to properties is a key in being able to effectively work to acquire parcels. It is important that the engineering teams work with real estate from the beginning to identify potential and realistic impacts before the appraisals are started and during the appraisal process. This helps everyone to understand what impacts may be involved and allows for streamlined and more effective communication to property owners. A past example involved a situation where prior to one common

Best Practice Name: *Include All Players When Meeting With Property Owners During Right-of-Way Acquisition*

Discipline: TSS – Right-of-Way & Plats

meeting there were many separate individual meetings with separate discussions. This created more confusion and resulted in ineffective communication. Use of this best practice prevents this type of communication with property owners and ensures that everyone is working towards the same goals with the same understanding.

Project Management Activities:

This will require additional coordination between all involved players (engineering and real estate).

Resource Considerations:

Requires a coordinated effort to get all players at the meeting, but is worth the effort. The resource considerations involve the staff and their time needed to engage in the meeting.

Implementation Action:

In order to implement this, the meetings will need to be set up in advance and the proper disciplines should be identified and invited. Engineering should be working in advance to have the potential impacts identified for discussion.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Best Practice Name: *Utility Coordination Schedule (UCS)*

Discipline: TSS - Utilities

Best Practice Description:

It is important to create a detailed schedule to manage the progress of the Trans 220 process. This involves laying out the Trans 220 process into an integrated schedule (UCS) that is then rolled into the larger project. This requires communication with the project scheduler to ensure that milestone dates align between various design and development activities. The UCS and project schedule must be updated and managed regularly.

Issue Resolved by this Best Practice:

There are several utility coordination milestones that must be met in order to meet PS&E and the requirements of Trans 220. Project plans were not entering the Trans 220 process at a time that would allow the utilities of a project to submit a work plan, secure land interests and permits, and complete their relocation prior to construction.

Advantages:

- Design teams are aware of when DT1078 plans are needed so utilities can plan and relocate prior to construction
- Prioritizes utility coordination needs from a corridor perspective
- Identifies schedule issues with long material lead times for utilities (i.e., ATC towers)
- Identifies trends with the nature of how a utility company plans the completion of their work plans and relocations

Disadvantages:

- Maintaining the schedule is labor intensive
- When projects are bundled or rebundled it requires extensive modification and formatting to update the spreadsheet

Discussion/Background:

This tool was developed on a previous WisDOT major's project to manage a larger number of projects and utilities per project. The UCS has evolved through an even larger amount of projects between Winnebago and Brown County.

Project Management Activities:

- Schedule updates continuously as utility work is completed.
- At the beginning of each month a current version of the schedule is submitted with the Progress Report to update the Corridor Management Team on the progress of utility coordination.

Resource Considerations:

Allocate utility coordination staff hours to maintain the schedule during the project duration.

Best Practice Name: *Utility Coordination Schedule (UCS)*

Discipline: TSS - Utilities

Implementation Action:

Schedule is submitted to the Corridor Management Team on a monthly basis. Project Controls can then review the progress versus the full project schedule.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This tool was being used prior to the Risk Management Process. The Risk Management Process helps promote the need of this practice to the entire team. The schedule is now reviewed by the Project Managers and Corridor Management Team on a monthly basis as a result of the process, and then during the Trans 220 process is considered in the project planning.

Best Practice Name: *Monthly Utility Coordination Meetings*

Discipline: TSS - Utilities

Best Practice Description:

Establishing a consistent coordination meeting brings the utility companies to the table as a partner. This facilitates better communication and coordination between the utility companies and direct communication between the WisDOT designers and utility designers. The active participation of the design team (WisDOT or consultant) is critical to the success of the practice. It helps to expedite priority relocations and also provides a forum where coordination can happen simultaneously as opposed as sequentially.

Issue Resolved by this Best Practice:

When there are many projects, there are dynamically changing schedules. With lack of information, coordination, and communication, the Trans 220 process may not be followed and complications in consistent relocation arise.

This ensures the utilities are aware of other utility schedules and WisDOT's schedule. Historically, the utility companies are of their own mindset and move on their own schedule.

Advantages:

- Utilities are kept up to date on current design and construction schedules
- Projects with tight timeframes can be managed closer
- Utilities can discuss issues or design details with other utilities
- Municipal utilities (water and sanitary) get involved earlier and understand the impacts of the project and utilities relocations
- Allows opportunities to minimize traffic impacts to adjacent projects
- Allows utilities to plan their resources for upcoming relocations
- Creates a forum to discuss any new WisDOT policies
- Some design adjustments can be made to avoid utility impacts
- Helps identify complicated and long lead time utility relocations (ex: transmission facilities) and ensure these are adequately prioritized
- Consistent meeting agenda from project to project showing project milestones and individual utility responsibilities allows the utilities to understand the expectations of the project

Disadvantages:

- Right players may not come to the table
- Meeting can get lengthy and you can lose interest

Discussion/Background:

The monthly meeting was developed early in the South Segment as a result of the Scheuring Road project schedule being advanced and the large amount of utility work that needed coordination. The meeting scope then continued to increase as more projects began the Trans 220 process.

Best Practice Name: *Monthly Utility Coordination Meetings*

Discipline: TSS - Utilities

Project Management Activities:

- Schedule Monthly Utility Coordination Meeting for each segment of the project.

Resource Considerations:

Allocate utility coordination staff hours to attend meetings, provide minutes, and follow-up on action items during the month.

Implementation Action:

Meeting has been scheduled for each segment as the first DT1078 packages are sent to utilities.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This best practice was implemented prior to the Risk Management Meetings.

Best Practice Name: *Existing Utility CADD File Creation and Maintenance*

Discipline: TSS - Utilities

Best Practice Description:

It is important to establish a corridor team or point of contact to develop and review existing utility files. This involves doing field locates and resolving any discrepancies to ensure accuracy. This includes review of existing files with the utility system maps, coordination with survey units to accurately survey information, and forward updated files to design teams.

Issue Resolved by this Best Practice:

The surveyed existing utilities needed to be accurately reviewed and documented in a single CADD file that could be used by all designers. This was especially needed in areas that had multiple projects staged in multiple years, with multiple designers involved.

Advantages:

- Can be easily updated and distributed to all designers
- Having the information in CADD allows the utility coordinators and designers to better review the information in meetings or during work plan reviews
- Fewer delays in design and construction due to inaccurate information
- Expedites the identification of utility conflicts
- There is a single contact and single format
- Provides assurance that the information is accurate

Disadvantages:

- Significant amount of time and effort is put into the review and correction of the existing utility information

Discussion/Background:

When the utility coordination for Brown County was started the project managers informed the utility coordination team that they had a number of issues figuring out what existing utility information was accurate. Once the information was correct for some earlier projects it was decided to continue the process through the entire corridor.

Project Management Activities:

- Review of any potential inaccuracies.
- Call-in Digger's Hotline Locate and coordinate Locate Meeting with WisDOT Survey Unit.
- Attend Locate Meeting.
- Import new survey data received by WisDOT Survey Unit.
- Distribute updated file to segment designers.

Best Practice Name: Existing Utility CADD File Creation and Maintenance

Discipline: TSS - Utilities

Resource Considerations:

Allocate utility coordination staff hours to review system maps and survey, call in Digger's Hotline Locate, attend field review meetings, implement new survey data into CADD file, and send updates to all design teams.

Implementation Action:

A resource is assigned to investigate and correct any inaccuracies that are found during the design process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This best practice was implemented prior to the Risk Management Meetings.

Best Practice Name: *Utility Field Representative in Design Process*

Discipline: TSS - Utilities

Best Practice Description:

The utility field representative has been pulled into the design process prior to the DT1078 submittal to utilities. This provides the field representative more background information on the utilities relocations to be during construction.

Issue Resolved by this Best Practice:

There can be issues with overlapping utility work plans and roadway design plans. The utility companies do not commonly know how to read design plans for roadways, in particular the staging plans. Having the utility field representative in more utility work plan meetings has given the construction team better access to the background of the utility planning process.

Advantages:

- Consistency in the overlap between design and construction
- Reduces utility conflicts during construction
- Reduces risk to the owner
- Minimizes risk of contractor claims on delays
- Provides feedback on special provisions.

Disadvantages:

- Additional resource required (currently one on US-41)
- This resource does not have enough time to visit every project

Discussion/Background:

As projects completed PS&E and pre-construction meetings began, it was quickly identified that the design and construction utility coordination staff needed to transfer information in a better way so the construction staff had some background on what relocations were occurring and when the relocations were occurring.

Project Management Activities:

- Attends Monthly Utility Coordination Meetings.
- Attends Utility Coordination Meetings for specific utilities.
- Coordinate information needs between work plan approval and beginning of relocation.

Resource Considerations:

Allocate utility coordination staff hours to attend pre-construction meetings, review utility relocations in the field, and assist coordination of utility relocations during construction.

Best Practice Name: *Utility Field Representative in Design Process*

Discipline: TSS - Utilities

Implementation Action:

Resource has been assigned to this practice.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This best practice was implemented prior to the Risk Management Meetings.

Sample

Best Practice Name: *Survey Data Coordination and Requests Process*

Discipline: TSS - Utilities

Best Practice Description:

The establishment of a single point of contact as a Survey Data Coordinator. This individual will establish a single file, update the information, and maintain the integrity of the data. This allows for the dissemination of data in a more coordinated fashion with multiple projects. This should include the use of 3-D modeling.

Issue Resolved by this Best Practice:

There are issues with clarity in the survey requests, including the definition of deadlines. There are also overlapping or redundant requests. The data also needs to be maintained in a source file that can be updated by a single point of contact.

Advantages:

- Improves accuracy and integrity of data
- Reduces costs due to inefficiencies in processing requests and carrying out surveys
- Designer is not one doing the updates, thereby reducing consultant delivery costs
- Single surface in lieu of multiple
- Allows for transfer of risk back to WisDOT and limits risk premiums

Disadvantages:

- Communication and coordination with various companies

Discussion/Background:

Survey requests were coming into WisDOT for the US-41 corridor, as well as other corridors in the Northeast Region. This large amount of workload, along with the overlapping requests for survey data were causing inefficiencies in the data management for the Region. As a result, the survey section implemented a data coordinator that was the single point of contact for all survey updates to the corridor DTM models. This person would be able to verify the existing data collected and prioritize as well as manage any new surface requests to eliminate redundancy in data collection. In addition, this person consolidated all survey data into a single surface model to ensure that all data was accounted for and could be accurately inserted, referenced, and disseminated without concern of integrity.

Project Management Activities:

Implement a single point of contact to manage, update, and disseminate survey data from a single surface model for all regions projects.

Resource Considerations:

This activity will require the assignment of a WisDOT staff person, or hiring of a consultant resource, to actively manage and control the flow of data for the survey surface model.

Best Practice Name: *Survey Data Coordination and Requests Process*

Discipline: TSS - Utilities

Implementation Action:

WisDOT allocated resources to manage the survey surface model for consolidation of existing data and management of requests for new or existing survey data to in house and consultant design teams as needed.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

Environmental/Stormwater/Permitting/Agency & Bureau Coordination

No.	Best Practice Title
1	Airport and wildlife hazard coordination
2	Corridor-wide permitting for water quality certification and wetland impacts
3	EIS communication with agencies
4	Early identification of wetland mitigation sites
5	Early coordination with Central Office and Agencies on waterway impacts
6	Municipality drainage coordination
7	Early coordination with BIA and Native American Tribes/Nations
8	Ample archaeological survey coverage
9	Identification of construction access covered in Environmental Document/404 permit
10	Hazardous material/OCIP Coordination

	Budgeted	Actual
Cost	--	--
Labor	--	--

BEST PRACTICE: *Airport and Wildlife Hazard Coordination*

Discipline: Environmental

Best Practice Description:

Engage in early coordination with Austin Straubel Airport, Bureau of Aeronautics, and resource agencies to establish corridor-wide stormwater pond design standards acceptable to all parties. Hire an independent consultant (in case of US-41, the U.S. Department of Agriculture [USDA] was used) to monitor the pond activity and suggest possible mitigation measures if necessary. Landscaping and CSD interests also need to be included in coordination.

Issue Resolved by this Best Practice:

Pond construction on the corridor started prior to having an understanding of what the Wildlife Hazard conflicts are in relation to an airport. These conflicts could not easily be resolved without cost concerns and without creating new concerns from the Wisconsin Department of Natural Resources (WDNR). There was a need to coordinate the goals of these respective agencies to the satisfaction of all parties.

Advantages:

- Provides mitigation of risk to agency as an "at-fault party" in the event there is an incident
- Mitigates tort and public relations liability
- Prevents slippages in project schedule due to lack of early coordination and planning

Disadvantages:

- Requires additional resources for regular wildlife inspection

Discussion/Background:

Federal Aviation Administration (FAA) guidelines indicate a need to mitigate potential wildlife activity at wet stormwater ponds within 5 miles of Austin Straubel Airport. Many of the recommended mitigation measures (seeding and slope design) are in conflict with WDNR stormwater pond design guidelines. Other recommended measures (fencing, netting) are cost-prohibitive to install and maintain.

In order to balance these needs, a staff member was assigned to lead coordination effort and initiate meetings all interested parties with goal of reaching agreement on pond design standards prior to the next earliest pond design delivery date. A consultant (USDA) was also brought on board to monitor wildlife activity at previously constructed and future ponds. Through an iterative design using recommended wildlife mitigation strategies that were also amenable to WDNR, a corridor-wide pond design standard was developed. Periodic evaluation of wildlife activity inspections will allow for extra mitigation measures to be considered where warranted while limiting the use cost-prohibitive measures that may not be necessary.

(Note: No wet ponds are allowed within 10,000 feet of the airport with respect to the glide path.)

BEST PRACTICE: *Airport and Wildlife Hazard Coordination*

Discipline: Environmental

Identification of this issue as a post-construction risk in the Mitchell Interchange Project in the Milwaukee area contributed to its identification as a risk on US-41.

Project Management Activities:

Assign single staff member to lead coordination effort and initiate meetings with goal of reaching agreement on pond design standards prior to earliest pond design delivery date and evaluating ongoing wildlife activity inspections for potential extra mitigation needs.

Resource Considerations:

- Wildlife inspection consultant (USDA) is required.
- Time and resources required for coordination meetings.

Implementation Action:

Wildlife inspection consultant was brought on board and quarterly coordination meetings were initiated.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risk 10.1, "Wildlife Hazard Assessment," and Risks 6.3, 8.6, and 10.2a, "401 WQC - Stormwater," within the Project Risk Registers.

BEST PRACTICE: *Corridor-Wide Permitting for Water Quality Certification and Wetland Impacts*

Discipline: Environmental

Best Practice Description:

Obtain agency buy-in to package several projects under the umbrella of a corridor level permit up front in lieu of multiple individual permits. This is best executed with the use of a single point of contact and corridor lead to drive the process. It is also important to work with WDNR to get final approval (and when they are anticipated to be required) to ensure the permits are in place when needed.

Issue Resolved by this Best Practice:

There were multiple independent projects that result in large delays on a program level when waiting to receive individual permits. The overall 40% TSS Reduction and "big picture" needs to be viewed to ensure that minimum reductions are met.

Advantages:

- Reduces review time on the part of the agency (single vs. multiple)
- Helps ensure project schedule is maintained
- Agencies better understand the project "big picture" in the corridor

Disadvantages:

- All of design may not be moving forward at the same rate resulting in increased chance of amendments
- Requires combining multiple source documents for submittal

Discussion/Background:

A stormwater management plan showing adequate TSS removal is needed prior to DNR issuing their water quality certification. Without a water quality certification (WQC) and an accurate account of project wetland impacts, a valid U.S. Army Corps of Engineers (COE) 404 permit cannot be obtained. Both are required prior to work on any project where these resources are being affected.

It is generally less work for the resource agencies to be able to issue one permit for entire corridor, rather than issuing permits by year or by individual project. This is especially true for the COE, where public notices are required for projects with larger impacts (greater than 5 acres) and where they must do additional environmental documentation.

This will however more than likely result in the need for permit addendums due to the various states of design on large projects.

Project Management Activities:

Assign a single staff member to coordinate permitting effort and hire/provide stormwater management plan design staff to assist.

BEST PRACTICE: Corridor-Wide Permitting for Water Quality Certification and Wetland Impacts

Discipline: Environmental

Resource Considerations:

Staff time for coordination meetings to have a single point of contact for coordinating and compiling all segment design information into one permit application.

Implementation Action:

Coordinate between the overall stormwater management design team and individual project design team to ensure designs are complete enough to quantify stormwater and wetland impacts prior to submittal of permit requests.

As a parallel process, meet regularly with the resource agencies to update them on corridor stormwater design and wetland impact analysis progress and to solicit their input and concerns. Set internal benchmarks for tentative agency agreement on overall stormwater design concepts prior to permit application submittal with milestones based on the date of the earliest project requiring agency permitting. Clearly communicate these milestone goals and expectations to the agencies.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risks 6.3, 8.6, and 10.2a, "401 WQC - Stormwater," within the Project Risk Registers.

BEST PRACTICE: *EIS Communication with Agencies*

Discipline: Environmental

Best Practice Description:

Ensure more continuous and closer contact with the agencies to better clarify when packages will be received for review. This helps to align agency expectations so that they can accommodate and plan their workload. This is particularly useful in instances where there are tight schedules. Proactive coordination identifies issues early on so that they can be mitigated in the EIS and subsequent design. The process and schedule to meet target EIS delivery dates provides a good tracking tool for management of EIS delivery.

Issue Resolved by this Best Practice:

Lack of a consistent quality of communication with agencies does not align expectations and often results in discrepancies in coordination and needed milestone dates. Agency issues are often unclear.

Advantages:

- Establishes agency expectations
- Allows for delivery of EIS under tight schedule
- Develops a better relationship with agencies
- Provides mechanism for early coordination

Disadvantages:

- Agencies may not comply in the end (usually related to change of staff issues)

Discussion/Background:

It is always good practice to coordinate early and often with the resources agencies. The complexities of the major/mega-projects make this even more important and requires more frequent meetings. The result is faster responses at concurrence points and helps eliminate schedule risks.

Project Management Activities:

Assign a single staff person to schedule meetings, track correspondence, and follow up on issues.

Resource Considerations:

There will be some extra time for staff doing the coordination. Extra time invested by resource staff up front should be made up at the time of their reviews and in drafting project comment/ concurrence letters.

Implementation Action:

Conduct a series of meetings with agencies and other interested parties with the specific focus of identifying and resolving EIS document issues ahead of scheduled document submittal milestones.

BEST PRACTICE: *EIS Communication with Agencies*

Discipline: Environmental

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risk 6.2, "EIS Coordination," within the Project Risk Registers.

Sample

BEST PRACTICE: *Early Identification of Wetland Mitigation Sites*

Discipline: Environmental

Best Practice Description:

Identify and acquire parcels for mitigation sites early on in design. This should be done in coordination with design development so that the mitigation is in alignment with design needs.

Note: The requirement needs to be reflective of what is in the EIS document.

Issue Resolved by this Best Practice:

It was desired to have wetland sites developed prior to start of roadway construction. Since it is not an issue of eminent domain, it may take longer than anticipated to procure property for mitigation site(s). In the end, this may result in the delay of issuance of the 404 permit.

Advantages:

- May provide material for borrow sites
- Reduces risk of project delay
- Improves likelihood of 404 permit approval

Disadvantages:

- Acquiring too early may result in a mitigation site that is not needed

Discussion/Background:

The COE requires that mitigation sites be constructed concurrent to project wetlands fills. Given the dynamic nature of majors/mega-projects, it is good practice to be out ahead of the project's anticipated 404 permit submittal year to accommodate a push to accelerate the schedule. Mitigation site acquisition tends to be a long process since eminent domain cannot be used, and in most cases it is difficult to find a willing seller(s).

Preliminary mitigation site plan documentation approval is needed in order to obtain the 404 permit and 401 water quality permit.

Project Management Activities:

Direct design staff to identify wetland impacts and mitigation needs early on in the design process and ensure there are sufficient real estate funds available to acquire mitigation site parcel early.

Resource Considerations:

Overall resources will not change versus a standard timeline, but the acquisition effort and associated work assignments need to be accelerated.

BEST PRACTICE: *Early Identification of Wetland Mitigation Sites*

Discipline: Environmental

Implementation Action:

Identify and begin acquisition of potential mitigation site properties as soon as wetland mitigation needs have been identified.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Not directly identified in the Risk Management Process, but early identification/acquisition will help address these risks, found in the Project Risk Registers:

- Risk 9.5, "Wetland Mitigation Site Plan Preliminary Approval"
- Risks 6.3, 8.6, and 10.2a, "401 WQC – Stormwater"

BEST PRACTICE: *Early Coordination with Central Office and Agencies on Waterway Impacts*

Discipline: Environmental

Best Practice Description:

Engage in early coordination with CO, designers, and agencies to establish the anticipated impacts and possible mitigations. This takes into account agency concerns earlier in the process when they are easier to mitigate in the design.

Issue Resolved by this Best Practice:

There can be delays in the reviews done by the agencies based on the project schedule. This includes issues with waterway realignments, coordination of in-water work windows, and hydraulic (backwater) analysis.

Advantages:

- Establishes agency expectations
- Establishes positive agency relationships
- Provides opportunity for improved fish habitat
- Mitigates schedule risk due to delays in 404 permit approval
- Minimizes negative effects at "crunch time"
- Reduces last-minute redesign

Disadvantages:

- Requires time due to possible iterations to meet agency needs
- Additional costs of specialized construction methods necessary due to coordination

Discussion/Background:

This issue is especially important for significant channel changes. There can be a lot of issues to work through in design for channel stability, floodway, and backwater concerns, and also many natural resources concerns for substrate, shoreline habitat, and invasive species. In order to support the coordination effort, geotechnical borings at potential waterway impact locations should be done as soon as possible after those impact locations are identified.

There can be fairly significant costs to mitigate agency and BOS concerns with wetland/stream plantings and specialty seed mixes that may be requested during coordination. Also, the cost of doing work to construct a specialized stream substrate cross section may be higher than normal construction methods.

This best practice is directly related the corridor-wide permitting effort best practice as waterway impacts is a part of overall WQC.

BEST PRACTICE: *Early Coordination with Central Office and Agencies on Waterway Impacts*

Discipline: Environmental

Project Management Activities:

- Direct design staff to identify waterway impacts early in the design process.
- Assign staff to coordinate waterway design issues.
- Ensure borings are scheduled early enough to inform the coordination effort.

Resource Considerations:

- Staff needs to be assigned to the coordination effort.
- Additional construction effort may be needed to ensure resource agency concerns are being adequately addressed in the field.

Implementation Action:

Identify potential waterways impacts and begin agency and BOS coordination as early as possible in the design process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Not directly identified, but related to Risks 6.3, 8.6, and 10.2a "401 WQC - Stormwater." Please refer to the Project Risk Registers.

BEST PRACTICE: *Municipality Drainage Coordination*

Discipline: Environmental

Best Practice Description:

Coordinating with the municipalities allows for an equitable agreement to be gained where there is alignment in interests. The typical negotiation has resulted in situations where the municipalities are amenable to the WisDOT ponds taking in their water and the municipalities then taking on the maintenance. Also, options to take additional upstream run-off can be done to help meet regional TSS requirements. It should be noted that any options that jeopardize WisDOT's ability to meet the corridor TSS requirements are not considered.

Issue Resolved by this Best Practice:

On the municipal side, they are under new DNR requirements for TSS reductions and are looking for assistance from WisDOT to meet requirements. On the WisDOT side the intent is to reduce maintenance costs of the ponds. The issue lies in the intersection of these two aligning interests.

Advantages:

- Reduce maintenance costs of ponds for WisDOT
- Builds goodwill with communities
- Maximizes the utility of the ponds and the overall environmental stream

Disadvantages:

- This process may not comply with ultimate WisDOT policy (there is no direction at present)
- Expectations of precedence set for certain municipalities
- May create perception that businesses do not need to mitigate their own run-off

Discussion/Background:

Currently there is no guidance in place to determine when we should or can partner with municipalities to gain a common goal for TSS reduction. At times both WisDOT and the municipality can gain from this partnership, and simple maintenance agreements can be put in place to document WisDOT construction and municipality maintenance of stormwater treatment features.

There is a need to make sure that updates to agreements are made as designs get updated. There will be complex document with multiple SMAs for the various municipalities. This document describes cost sharing responsibilities. Costs may be incurred to "eat" the local share of costs

Additional direction is needed from CO management in order to validate this corridor policy direction and to clarify exactly how municipal TSS reduction credits from WDNR should be documented.

Project Management Activities:

Assign single staff to coordinate discussion pond maintenance and drainage basin design with municipalities and initiate individual meetings with each affected municipality.

BEST PRACTICE: *Municipality Drainage Coordination*

Discipline: Environmental

Resource Considerations:

Staff time and some extra construction dollars up front, but there are potential long term cost savings on routine maintenance activities.

Implementation Action:

Commitments to maintain the pond in exchange for treatment of off-site municipal water are documented within the State Municipal Agreements (SMA's) for each municipality.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risk 1.33, "SMA Management," and Risks 6.3, 8.6, and 10.2a, "401 WQC – Stormwater," within the Project Risk Registers.

BEST PRACTICE: *Early Coordination with BIA and Native American Tribes/Nations*

Discipline: Environmental

Best Practice Description:

Engage in coordination and consultation meetings with the Bureau of Indian Affairs (BIA) and Native American tribes as early as possible. It helps to have a single point of coordination that may have previous ties with the Native American tribes/nations. Engaging in on-site monitoring and tribal-sensitivity training can help to build buy-in and consensus with Native American tribes (relationship building). This should be handled by WisDOT staff in coordination with BEES in the case of US-41; however a direct liaison (Region Native American Liaison) is the preferred approach.

Issue Resolved by this Best Practice:

Certain Native American tribe processes can be complex and require a long duration, which can result in considerable schedule delays. This is even more applicable when a project is on reservation land.

Advantages:

- Reduces risk of schedule delay
- Builds rapport and trust with Native American tribes
- Allows for proactive – rather than reactive – engagement
- Outlines requirements that need to be incorporated into contract Special Provisions to ensure compliance with memorandum of understanding (MOU)
- Expedites internal tribal approval

Disadvantages:

- None apparent

Discussion/Background:

Early coordination with Native American tribes is important on all projects, but even more so with the complexity of the major/mega-projects, and for projects with impacts to Native American reservation lands where coordination with BIA is required. Setting up meetings early on in the project's scoping will give the tribe(s) an overview of the proposed project, and regular update meetings will help expedite their reviews and subsequent responses/correspondence.

Project Management Activities:

Assign a liaison to coordinate and track commitments for the corridor.

Resource Considerations:

Staff time for coordination.

Implementation Action:

Assign staff and initiate meetings with BIA and Native American tribes.

BEST PRACTICE: *Early Coordination with BIA and Native American Tribes/Nations*

Discipline: Environmental

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risk 16.2, "Tribal Trust Property at Home Depot," within the Project Risk Registers.

Sample

BEST PRACTICE: *Ample Archaeological Survey Coverage*

Discipline: Environmental

Best Practice Description:

Survey a wide enough corridor early on so that additional surveys will not be required later in the process, which can result in added costs and delays. This should be done on a strategic basis for prioritized areas of concern (versus all areas of potential impact).

Issue Resolved by this Best Practice:

Repeated field surveys during the course of a project add time, especially if permits are needed with the BIA. In Wisconsin, field surveys are limited to non-winter months.

Advantages:

- Maintains project schedule
- Avoids or minimizes Sec. 106 document addenda

Disadvantages:

- Incurs additional up-front costs for surveys that may not be needed
- Substantial field survey may be necessary in rural areas

Discussion/Background:

To avoid delays later on, it is good practice to survey a broad project corridor during initial project surveys. Key areas are interchanges/intersections, overpasses, temporary access roads for construction, and potential stormwater pond locations. Changes in design will create additional survey needs, potentially several times, when a broad corridor is not surveyed initially. This is especially important when working within the boundaries of Native American reservations where additional permits are required for archaeological surveys.

Project Management Activities:

Project design teams should meet with environmental coordination staff to determine maximum (reasonable) areas for survey.

Resource Considerations:

Some extra time spent in preliminary design to determine potential impacts of design alternatives and additional costs for archaeological surveys.

Implementation Action:

Initiate archaeological surveys as soon as possible after identifying potential areas of impact from initial design alternatives.

BEST PRACTICE: *Ample Archaeological Survey Coverage*

Discipline: Environmental

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risk 8.12, "Additional Arch Discovery," within the Project Risk Registers.

Sample

BEST PRACTICE: *Identification of Construction Access Covered in Environmental Document/404 Permit*

Discipline: Environmental

Best Practice Description:

It is recommended to engage in coordination with the agencies early on to make them aware of possible environmental impacts in terms of the Contractor's means and methods for construction. Identifying impacts as early as possible allows for the permit approval to be procured prior to it becoming a schedule issue. On an individual single project, the concerns are not as great; the major issues occur in mega-projects where there are many projects in coordination. This is most important on projects with long structures over waterways and wetlands.

Issue Resolved by this Best Practice:

In terms of possible impacts, the Contractor would have to obtain a permit to proceed forward with work (e.g., construction of causeway on US-41 at Duck Creek). Without the agencies' awareness of the potential issues, there may be schedule delays to construction progression.

Advantages:

- Expedites construction start-up
- Agency buy-in prior to construction
- Reduces Contractor risk premium for means and methods

Disadvantages:

- Contractor requirements are undetermined

Discussion/Background:

There are scenarios for construction that have additional natural resources impacts beyond what was anticipated strictly for design. In most cases, these impacts are temporary, but can include some minor permanent impacts. When we have a good idea that the construction methods of the contractor will have additional resource impacts, we should include these impacts in the permit(s) for the project to save time and also allow the resource agencies to have an idea on the total project impacts. Example would be identification of additional wetland impacts due to haul roads necessary for construction of bridges over wetlands (no "surprise" for agencies later down the road).

Project Management Activities:

Direct design teams to identify potential construction methods and their associated resource impacts early on in design.

Resource Considerations:

Additional time for design teams to review projects for temporary impacts and to coordinate those impacts with resource agencies.

BEST PRACTICE: *Identification of Construction Access Covered in Environmental Document/404 Permit*

Discipline: Environmental

Implementation Action:

Identification and discussion of temporary resource impacts necessary for construction has been incorporated into the EIS coordination process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Not directly identified, but related to Risk 6.2, "EIS Coordination," and Risk 6.4, "Construction Impacts of Stormwater." Please refer to the Project Risk Registers.

BEST PRACTICE: *Hazardous Material/OCIP Coordination*

Discipline: Environmental

Best Practice Description:

Set up a hazardous material (hazmat) coordination contract to coordinate all hazmat removal activities. It is important to have a contract in place and understand that this is only relevant when there is an Owner Controlled Insurance Program (OCIP) policy in effect.

Issue Resolved by this Best Practice:

Given a situation in which there is an OCIP policy in effect, hazmat remediation cannot be done by the Contractor. *Note: This can be done through the existing WisDOT Hazmat master contracts given the contracts are available and have sufficient funds.*

Advantages:

- Improves documentation and report writing
- Improves coordination with DNR
- Consistency in standards

Disadvantages:

- Transfers risk to WisDOT
- Can add costs to construction contract through throwaway work for extra mobilization and site remediation

Discussion/Background:

When OCIP is in place, hazmat remediation cannot be completed by the Contractor. If the hazmat master contracts are in place, the work orders should be coordinated through CO. If the master contracts are not in place, a separate hazmat contract will be required to coordinate all remediation activities.

Project Management Activities:

Set up and manage a separate hazmat contract outside of the construction contract.

Resource Considerations:

- Staff and dollars for managing the extra contracts.
- Extra money involved for the mobilization of a separate contractor to do the remediation.

Implementation Action:

Ensure means are in place to deal with hazmat remediation separately when OCIP is involved with the project. Not documented in the FDM.

BEST PRACTICE: *Hazardous Material/OCIP Coordination*

Discipline: Environmental

Issue Identified and Resolved as a result of Risk Management Process?

YES

NO

Sample

SPO (Traffic/TMP)

No.	Best Practice Title
1	Use of regional travel demand model
2	Linkage of TMP and construction staging
3	Targeted TMP task forces by interchange corridor
4	Utility inspection of contractor-installed lighting
5	Rapid intervention vehicle

	Budgeted	Actual
Cost	██████████	██████████
Labor	12,492 hours	10,957 hours

Summary Totals include Brown and Winnebago Counties. See Table 2.

BEST PRACTICE: *Use of Regional Travel Demand Model*

Discipline: SPO (Traffic/TMP)

Best Practice Description:

Use the regional travel demand model (TDM) to develop initial traffic diversion estimates during construction activities. There should also be engagement in exercises to incorporate considerations of local operations and the larger system network (origin-destination pairing and diversion route consideration). The model should also be validated under construction activities to reinforce model sufficiency to ensure traffic is behaving as assumed. This should also include considerations for staging so that modeling assumptions can be refined on a corridor-by-corridor basis.

Issue Resolved by this Best Practice:

There is a need for quantifiable estimates of traffic diversions, including consideration of multiple adjacent construction projects. Certain corridors are at or near capacity, while others have substantial residual capacity to take diverted traffic. A travel demand model considers capacity and multiple construction projects in assigning traffic to the roadway system

Advantages:

- Model is sensitive to capacity constraints in consideration of other vehicles on the roadway
- Model develops turning movement estimates for further analysis
- Allows for coordination with PI in cases where there is a need to encourage peak spreading in locations where capacity cannot be maintained during construction
- Enables forecasting traffic based on changes in land usage

Disadvantages:

- Does not explicitly consider changes in destination or time of day, resulting in a conservative traffic estimates
- Does not reflect delay/queue impacts of specific over-capacity movements; additional operational analysis may be required to adjust delay and assignments in saturated conditions

Discussion/Background:

The transportation management plan for US-41 Brown County needed to estimate traffic patterns during multiple years of construction, with overlapping schedules of interchange closures and mainline speed/capacity reductions. The regional travel demand model was enhanced, with additional zonal and network detail to replicate local traffic loading and alternative routes. Interchange closure concepts were then tested, with the TDM providing estimates of traffic movements, including turning estimates, diversion plots for visualizing impacts (staging meetings, PI, business meetings, task force meetings, etc.), VMT-VHT estimates for user costs, and subarea trip tables for further micro-simulation analysis. Traffic count data is currently being collected during construction to validate the use of TDM for construction forecasting.

Project Management Activities:

The TDM needs to be an early activity, complete prior to construction staging discussions.

BEST PRACTICE: *Use of Regional Travel Demand Model*

Discipline: SPO (Traffic/TMP)

Resource Considerations:

Staff to detail zonal loadings and networks and code construction staging/adjacent projects.

Implementation Action:

Utilize TDM for review of construction staging options prior to staging workshops, TMP task forces, and public/business meetings.

Issue Identified and Resolved as a result of Risk Management Process?

YES **NO**

Please refer to the following Risks, within the Project Risk Registers:

- Risk 5.1, "Lombardi/Oneida Traffic"
- Risk 17.1, "2-Lane NB On-Ramp at CTH G"
- Risk 12.5, "Traffic Management Plan"
- Risk 1-50, "Traffic Management Plan"
- Risk 2-83, "Traffic Management Changes"
- Risk 2-94, "Traffic Management Changes"

BEST PRACTICE: *Linkage of TMP and Construction Staging*

Discipline: SPO (Traffic/TMP)

Best Practice Description:

Engage in staging workshops where staging, traffic, and various other disciplines can sit down and discuss potential impacts. Consideration for bottlenecks and diversions can be implemented in order to test assumptions and enhance the construction staging to improve the accommodation of traffic demand.

Issue Resolved by this Best Practice:

Construction staging may not be incorporating considerations for adjacent constraints or corridor concerns, such as school crossings, emergency responders, public facilities, or special events.

Advantages:

- Empowers stakeholders to be part of the decision
- Allows for flexibility in the scheduling of the corridor
- Helps in validation of assumptions
- Allows for early opportunity to develop most efficient construction staging that offers least impacts to traveling public

Disadvantages:

- Resource-intensive effort to complete
- Sensitive to changes in program dates, forcing backtracking of constraints, commitments, and decisions when projects move within the program

Discussion/Background:

The transportation management plan for US-41 Brown County included initial outreach meetings with task forces on a corridor-by-corridor basis. The task forces were consistent with a Type IV TMP. The initial task force meetings reviewed staging options and expected traffic impacts, with the task force members providing comments on issues, strategies, and mitigation. This information was then used to refine construction staging in subsequent staging discussions.

Project Management Activities:

The TMP team should be included in initial construction staging discussions (~60%), along with final staging discussions (~90%).

Resource Considerations:

Staff time for participation in staging discussions and TMP task force meetings, along with task force member participation time.

BEST PRACTICE: *Linkage of TMP and Construction Staging*

Discipline: SPO (Traffic/TMP)

Implementation Action:

Ensure TMP team is invited to construction staging meetings.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to the following Risks, within the Project Risk Registers:

- Risk 12.3, "Site Staging"
- Risk 12.5, "Traffic Management Plan"
- Risk 1-50, "Traffic Management Plan"
- Risk 2-83 , "Traffic Management Changes"
- Risk 2-94, "Traffic Management Changes"

BEST PRACTICE: Targeted TMP Task Forces by Interchange Corridor

Discipline: SPO (Traffic/TMP)

Best Practice Description:

Engage in specifying targeted task force groups in lieu of a single task force. Develop a team of local stakeholders (incident response, local roads, bike/pedestrian/transit, schools/parks, major businesses, etc.) to identify issues and strategies associated with various construction staging alternatives.

Issue Resolved by this Best Practice:

There are many stakeholders involved and trying to tackle the whole effort in a single meeting with a large group is challenging. In consideration of different stages of completion for geographical areas and time of construction, it is challenging to consider on a higher level.

Advantages:

- Just-in-time delivery of TMP
- Increases cooperation between municipalities and State
- Empowers municipalities to communicate information to local businesses
- Accurate issue information pertaining to traffic

Disadvantages:

- This process, on a segmental basis, lends itself to "the squeaky wheel gets the grease"
- Works well for municipalities, but can result in bigger efforts for certain businesses
- More labor-intensive

Discussion/Background:

The US-41 corridor in Brown County is reconstructing multiple interchanges, each of which is a vital corridor to the municipalities, businesses, and residents they serve. The TMP process therefore focused on each interchange as a project, with task forces to aid in identifying critical issues and determining staging and mitigation. The TMP Advisory Group oversaw the TMP decision-making process for the entire corridor, taking recommendations from each respective interchange's TMP task force group.

Project Management Activities:

- WisDOT project managers and supervisors participate at the Task Force level, with program manager, FHWA, STOC, Brown County, etc., participating at the Advisory Group level.
- Advisory Group was decision-making board for TMP process.

Resource Considerations:

Interchange corridor-level TMP increases labor, but provides the detailed effort to reduce construction-related impacts to traveling public, businesses, schools, responders, etc.

BEST PRACTICE: Targeted TMP Task Forces by Interchange Corridor

Discipline: SPO (Traffic/TMP)

Implementation Action:

Identify interchange corridors to be grouped into TMP task force study areas.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risks No. 12.5, "Traffic Management Plan," and Risk No. 1-50, "Traffic Management Plan," within the Project Risk Registers.

Sample

BEST PRACTICE: *Utility Inspection of Contractor-Installed Lighting*

Discipline: SPO (Traffic/TMP)

Best Practice Description:

Engage in coordination and communication with utilities to allow the contractor to perform the underground work (with their inspection) for locally owned lighting systems. The above-ground work and the pulling of the wire may then be performed by the utility.

Issue Resolved by this Best Practice:

There are issues with construction contractor coordination pertaining to the construction schedules. This creates the risk that utility owned and installed lighting is not in place on time.

Advantages:

- Allows contractor to control schedule
- Reduces delays to opening
- Reduces claims for working day delays
- Reduces risk of weather delay prioritizations by utilities
- Makes it much easier for coordination of lighting with local governments
- Adds work to the let contract

Disadvantages:

- Ensuring proper installation and engaging the contractors to emphasize this important as improper installation will result in this practice being eliminated.
- Utilities may not agree to this practice

Discussion/Background:

Utility-installed lighting was a risk to project delivery. The schedule constraints that were being imposed were consistent with a subconsultant, as the utilities do not operate as sub-consultants. The staged construction may require utility work to be done multiple times in one work zone. The utilities and/or their contractors are not suited for this type of staged effort. Furthermore, the utilities have priority to respond to outages over the construction activities, opening the door for additional schedule risk.

Project Management Activities:

- Coordinate with utilities to develop agreement by which WisDOT contractors install all underground material.
- Coordinate with utility to develop a method to allow for utility inspection of contractor's work while work is being performed.
- Collect and incorporate utility specifications into contracts.

BEST PRACTICE: *Utility Inspection of Contractor-Installed Lighting*

Discipline: SPO (Traffic/TMP)

Resource Considerations:

- Contractors have to acquire the underground materials for installation, and project staff has to coordinate with utilities for inspection.
- Contract with utility must be set up to pay utility for inspector; however, project staff then may reduce inspection efforts for utility-owned work since inspection is being performed by utility.

Implementation Action:

Early coordination with utilities to approve process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to the following Risks, within the Project Risk Registers:

- Risk 0.2, "Un-bundling"
- Risk 1-43.1, "Lighting Plan Delivery"
- Risk 1-43.2, "Utility-Installed Lighting"

BEST PRACTICE: *Rapid Intervention Vehicle*

Discipline: SPO (Traffic/TMP)

Best Practice Description:

Consider purchase of smaller vehicles for emergency response that can be turned over to municipality's emergency services in exchange for commitment to service the corridor. The purchase of vehicles must take into consideration mutual aid agreements to identify ideal placement during construction.

Issue Resolved by this Best Practice:

Construction corridors are constrained requiring smaller emergency responding vehicles. There may also be stages where there are barriers on either side prohibiting standard vehicle access. There can also be difficulty in determining the time and materials cost for emergency response.

Advantages:

- Creates partnership with emergency responders throughout project
- Responds to constrained corridor conditions
- Creates buy-in from municipalities
- One-time cost in lieu of multiple negotiations for services
- Can be located where needed given construction stage

Disadvantages:

- Can be complex to negotiate funding mechanisms
- Not established procedure.
- Sets a precedent for neighboring communities or smaller projects that may not be able to support value

Discussion/Background:

Construction staging on US-41 Brown County will utilize 11-foot lanes, 1-foot shoulders, and temporary concrete barriers to separate directional traffic and the active construction zones. Current emergency response vehicles would have increased response time within these very restricted conditions. A Rapid Intervention Vehicle (RIV) is a heavy pick-up truck capable of maneuvering in the tight conditions around the temporary concrete barriers, as well as along steep shoulders. The RIV is equipped with fire suppression, jaws of life, and other response equipment to effectively respond to most auto crashes.

Project Management Activities:

Negotiation of the funding of the RIV was required, both within WisDOT and with FHWA.

Resource Considerations:

Up front cost of ~\$200,000 per vehicle.

BEST PRACTICE: *Rapid Intervention Vehicle*

Discipline: SPO (Traffic/TMP)

Implementation Action:

MOU between WisDOT, FHWA, and participating municipalities to ensure RIV is used on US-41 corridor, with documentation of effectiveness of equipment.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

Roadway Design

No.	Best Practice Title
1	Prepare separate staging plans with schedule from Traffic Control Plans
2	Roadway design signage
3	Special provision tracking
4	Weekly design team meetings
5	Oversize/overweight vehicle coordination
6	Constructibility reviews
7	Special provisions organization
8	Design management and packaging
9	Construction contract packaging
10	Early and expanded advertisement
11	Early access review
12	Early design review of staging and constructability

	Budgeted	Actual
Cost	--	--
Labor	--	--

BEST PRACTICE: Prepare Separate Staging Plans with Schedule from Traffic Control Plans

Discipline: Roadway Design

Best Practice Description:

Prepare either staging roll-plots (black/white or color) or separate staging sheets to provide overall picture of major stages of project for use by design reviewers, project construction staff, and contractors. In the consideration of staging, there should be a more corridor-wide approach of reviewing the staging plans: how the pieces fit together in a holistic manner that takes into consideration the level of work. The traffic control plans are a factor as to how the staging should be done. P6 schedules can also be provided with the staging plans.

Issue Resolved by this Best Practice:

The construction staging has been considered by many experts to be difficult to fully understand in the past, as it has been integrated as part of the traffic controls plans in PS&E packages. Traditional WisDOT design in the 30% to 60% design develops the staging plans, and historically, traffic control plans are created by the designer.

Advantages:

- Expedites the staging concept to better coordinate with traffic plans
- Provides clarity for complex projects for contractors and staff
- Allows for a quick way to understand how the project can be built
- Eases identification of the interfaces between adjacent projects

Disadvantages:

- Process of implementation still needs work

Discussion/Background:

The corridor manager team advocated that the staging graphics be developed as a separate section in the PS&E packages, as well as developed in a large format to provide clarity to the contractors bidding on the construction work. This also serves as a tool for the design teams and construction inspection teams by giving them an easy way to view the intended project by project staging plans. In addition, this tool can provide an easy way to see how adjacent projects interface between different stages, when the projects are on a similar construction schedule.

Project Management Activities:

Develop construction staging graphics and P6 schedules to depict the construction staging of the major, integrated construction projects along the corridor.

BEST PRACTICE: *Prepare Separate Staging Plans with Schedule from Traffic Control Plans*

Discipline: Roadway Design

Resource Considerations:

This step requires a team or set of individuals that are able to establish the construction staging based on the contract packages that are established by WisDOT, as well as determine the schedules and interfaces that are present if the construction contracts are sequenced.

Implementation Action:

Begin early in the design development and establish the program dollars available by year. At that point, the construction staging and P6 schedules can be reviewed on a corridor level to see how to best stage the corridor, and flush out any logical break points to establish construction packages. As design development continues toward 30%, 60%, and 90%, continue to refine the construction staging and develop plan sheets that are included in the PS&E documents for bid, as well as a roll plot version and a final P6 schedule that can be provided to the construction oversight teams and the contractors.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Roadway Design Signage*

Discipline: Roadway Design

Best Practice Description:

Up front in design, take into consideration where the highway signage (WisDOT 1st priority) will be placed so that the designers are not approaching other stakeholders later when the design is more rigid and less adaptable to accommodate placement of supplementary signage (Business 1st priority, WisDOT 2nd priority). Performing the highway signage layouts earlier allows for businesses to plan ahead in the event that supplementary signing cannot be provided on the roadway. In particular, geometrics play a part into placement of roadway signage, whereas supplementary signage has more specific placement criteria in proximity to areas of interest, and Manual on Uniform Traffic Control Devices (MUTCD) requirements for highway signing.

Issue Resolved by this Best Practice:

Current state statute is that WisDOT does not implement the signage placement for supplementary signs and staging plans into design until final design. However, when large impacts and changes occur along an entire project corridor, identification of highway signage late in the design process may result in inability to cost-effectively accommodate supplementary signage, which can result in loss of project stakeholder buy-in. Also, requests to accommodate supplementary signage based on political pressure late in design can increase design delivery cost.

Advantages:

- Maintains better working relationships with businesses and municipalities (maintains buy-in from business stakeholders)
- Reduces risk of geometric changes resulting from political pressures occurring later in the design process; then also saves potential re-design cost associated with late changes to roadway or structure designs
- Having signing layouts established early allows for early coordination with FHWA regarding signing review as part of Interstate Access Justification Report (IAJR) development

Disadvantages:

- Public may not view this as treating the various businesses equitably (some areas of project may be able to accommodate and others not due to accommodation of highway signage or other project constraints/requirements)
- On large corridors with multiple design segments at various stages in design, it can be difficult to tie down final signing if geometry and scope is not far enough along in less developed segments

Discussion/Background:

Businesses are key stakeholders on any highway project and it is important to maintain their project buy-in. Supplementary signage is always an important aspect of a highway project for business stakeholders. As per state statute, supplementary signage is to be accommodated if/when possible with highway signage taking priority. In order to alleviate potential design modifications late in design to accommodate Specific Information Sign (SIS), early identification of highway signage should be

BEST PRACTICE: Roadway Design Signage

Discipline: Roadway Design

done to determine if/what supplementary signage can be accommodated and evaluate potential design changes that may be required to accommodate it. An example of a design change that may be encountered is a “bump out” of a noisewall alignment to accommodate an SIS.

Project Management Activities:

- Establish clear deadline for completion of highway signing layout. Ensure this is done early in design around 30% design vs. 60 or 90%.
- Complete highway signage layout.
- Complete supplementary signing layout in relation to highway signage constraints. This will clearly define what signing can and cannot be accommodated. Potential design changes (adjusting highway signing locations, adjusting structures, retaining walls, noisewalls, sign bridges, bridges, etc.) to better accommodate the supplementary signage should be discussed with management to make final decisions on what design changes will or will not be implemented.
- Create of a technical memorandum to document final decisions.

Resource Considerations:

Allocate staff to develop signing layouts and technical memo.

Implementation Action:

Key tasks need to be added to master design schedule including:

1. Highway signage layout complete.
2. Supplementary signage layout complete.
3. Signage technical memorandum complete.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Special Provision Tracking*

Discipline: Roadway Design

Best Practice Description:

Corridor management team dates each corridor-wide special provision with the date it was last updated and includes the date as a footer similar to how WisDOT updates the statewide special provisions.

Issue Resolved by this Best Practice:

On previous PS&Es and let plans, the latest corridor-wide special provision was not being included. Sometimes one section or even just a few sentences were changed in a large special provision and the designer was not catching it.

Advantages:

- Provides contractor with the latest corridor-wide special provisions
- Avoids change orders/claims in the field
- Allows designer to quickly verify the correct special provision is being used

Disadvantages:

- Requires some additional staff resources

Discussion/Background:

This best practice eliminates the inclusion of old corridor-wide special provisions in the let plans. By adding the date of the latest revision to the special the designer will be able to easily verify that the special provision to be included is or is not the latest version.

Project Management Activities:

- Assign a single person to be responsible for this activity/process.
- Provide communication opportunity at the monthly corridor meetings.

Resource Considerations:

Allocate corridor management staff hours to update, track, and add the most recent revision date to the special provisions.

Implementation Action:

Implementation has already begun.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Weekly Design Team Meetings*

Discipline: Roadway Design

Best Practice Description:

Hold weekly design team meetings in order to have enhanced communication with the designers and project team. Create a tracking tool to focus discussions during meetings to highlight the most important issues and action items. Meetings should also be streamlined to include only key players (appropriate staff) so that discussions can be more focused. Other concepts include layering meetings with the hierarchy of project management and oversight in order to adapt the meetings to where the project has progressed. Every meeting should have action item summaries to focus priorities; the action item "meeting minutes" should be captured by technical staff with understanding of issues.

Issue Resolved by this Best Practice:

There were many players involved and the challenges included communicating with design teams and other players involved. There was not a specific tracking mechanism that provided for better review and discussion during meetings. A solution derived is to have frequent, focused meetings with key staff and adapt the meetings as the project progresses to ensure that the priority issues are discussed and addressed.

Advantages:

- Allows for meeting to be "working" meeting where discussion focuses on key issues
- Allows final design team to get clarification on final design details
- WisDOT can provide their feedback on what the design team is thinking
- Fosters brainstorming of solutions
- Creates a mechanism for accountability and follow-through

Disadvantages:

- None apparent

Discussion/Background:

The US-41 in-house project team was providing the preliminary design for the central segment. Final design was subsequently consulted to a final roadway design team. There was a transition period to attain a successful "handoff" between the in-house design team and the consultant final design team. As the handoff transition took place, the US-41 Central segment project manager realized that there were still "loose ends" with the transition. Certain tasks and related follow-up items were being inadvertently overlooked during the transition process. It became very apparent that recurring meetings were needed between the US-41 in-house design team and the final design team to address outstanding issues. The recurring meetings were thus set up as weekly events, with the final design consultant meeting the in-house design team at the region office.

At each meeting, the final design consultant provided the design team a summary of remaining tasks/issues list needing resolution for each unbundled contract. Additional issues were added to the list as they were recognized during the design phase. Item resolution was coded a different color on the list and ultimately removed from the list. This tracking system became valuable for successful

BEST PRACTICE: *Weekly Design Team Meetings*

Discipline: Roadway Design

final PS&E development, particularly with the relatively short PS&E delivery timeframes and contract advancements. The gathering also provided an opportunity for the final design team to discuss and receive feedback from the US-41 in-house design team regarding unique design concepts, issues, or challenges.

Project Management Activities:

- Ensure weekly meetings are being conducted. Meetings may be cancelled for the week if no pressing issues or topics need immediate resolution.
- Update item checklist for each contract on a weekly basis at minimum.
- Delegate responsible party for item resolution or follow-up (established during meeting)
- Institute prompt resolution and associated dates if outside parties (i.e., management, other design consultants, other Northeast Region sections) are needed for decisions.
- Foster open, honest communication between in-house and consultant designers.

Resource Considerations:

- Provide ample time for final design teams to travel to Region office for weekly meetings.
- Invite appropriate design consultants to resolve issues (on case-by-case basis).

Implementation Action:

Establish “working” design meetings as early in the project as possible. There is no set procedure in the Facilities Development Manual.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

The concept to implement weekly in-house/consultant design working meetings was not directly generated as a result of previous risk management workshops, but was derived by the in-house design team. Components of the risk workshop process were, however, implemented during the meetings. Establishment of follow-up needs and responsible parties was a by-product of the risk management workshops.

BEST PRACTICE: *Oversize/Overweight Vehicle Coordination*

Discipline: Roadway Design

Best Practice Description:

Identify the routes where oversize/overweight (OS/OW) vehicles are moving and coordinating with CO and industry to ensure that specific needs are being met and accommodated for the traveling public. The designs can be better adapted earlier in the process when they are less rigid. Earlier coordination in consideration of OS/OW allows for better planning and identification of issues needed for resolution on major routes. The design activities include field surveying of actual OS/OW vehicles and specific usage of design software (Autotrack vs. AutoTURN). It is also helpful to work with region OS/OW coordinator and research ahead of time to identify who the players are.

Issue Resolved by this Best Practice:

The major issue is that there were many OS/OW vehicles moving through the corridor. Designs had to be modified to accommodate these vehicles. Making changes late in design, when the design is less flexible, results in potentially more costly and time-consuming changes.

Advantages:

- Eliminates re-design and changes in the field
- Identifies future costs with real estate and land use
- Minimizes negative public perception
- WisDOT can adapt software to other projects
- Recognizes OS/OW vehicles within corridor vs. traveling through corridor

Disadvantages:

- Requires staff effort up front to perform the field work
- May result in possible undesirable designs

Discussion/Background:

There are various OS/OW vehicles distributing throughout the corridor. Some companies were easily identified and others came forward during business outreach meetings. The largest hurdle was collecting sufficient data for the software design companies to replicate vehicle specifications. This was accomplished by essentially surveying entire intersections in the Milwaukee Brewers parking lot and giving the drivers an opportunity to take multiple passes, ensuring conservative yet accurate design input data. AutoTrack (transportation design and analysis software) was much more flexible and the developer was willing to accommodate the specialized design needs and successfully delivered for our project needs.

Project Management Activities:

- Appoint the responsibility of OS/OW coordination to a single point of contact.
- Conduct outreach with region representative.
- Perform vital early coordination.
- Follow-through is key as well due to potential changes in equipment and business locations.

BEST PRACTICE: *Oversize/Overweight Vehicle Coordination*

Discipline: Roadway Design

- Construction coordination should be considered.

Resource Considerations:

This could require a large-scale effort with surveys, project staff, and private company staff hours. That may require as much as two very long days with two to three survey crews to lay out (paint/chalk) 3 roundabouts and collect the movement data. Aside from the survey days, this is a topic that requires 5% to 15% of deputy PM or PM duties.

Implementation Action:

Start early with appointed person identifying potential companies and locations for investigating need. Consult with software companies for required input data and collection. Utilize gates, additional pavement, and design solutions as necessary.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This issue was brought to up during early outreach and will be coordinated though the duration of the project. This helped to avoid issues with the public and potential delays that could arise due to impacts to construction staging and scheduling.

BEST PRACTICE: *Constructibility Reviews*

Discipline: Roadway Design

Best Practice Description:

Perform constructibility reviews – i.e., engage construction personnel in the region for their feedback – sooner in design (conceptual design) to allow for consideration of issues to be resolved and accommodated within the design. Early identification and enlisting of key construction staff creates a better value for the WisDOT in terms of the total project cost.

Issue Resolved by this Best Practice:

There was a considerable amount of temporary work that imposed throwaway costs. Debates occurred too late in the process, making it difficult to make changes and resulted in possible unnecessary costs.

Advantages:

- Minimizes unnecessary costs associated with throwaway work
- Involving Region staff earlier helps coordinate design with WisDOT specifications and how contractors in area would construct the project
- Earlier feedback
- Design can be modified when it is less rigid and does not require as much additional redesign effort
- Results in better project design, thus reduces likelihood of claims by contractors
- Provides better picture of project construction schedule/cost

Disadvantages:

- Too rigid of a construction/staging design established earlier on can result in difficult redesign when potential issues arise (e.g., political pressures)
- May result in concepts that are outside of common practice in the region for which it is difficult to get buy-in from contractors
- Additional resources to review plans early on in the design process

Discussion/Background:

Prior to construction staff/contractor involvement, the design staff utilized their experience to put together an initial staging plan. This plan was based on set schedules and PS&E dates for certain segments in a given year. Due to a very dynamic schedule for the US-41 project, other projects were moved ahead numerous years and staging plans fell behind as a result. Also, construction level reviews did not occur for many projects in Brown County until 90%. This was a result of ongoing construction activities in Winnebago that spread resources too thin to allow for these earlier reviews. Moving forward, it is key to get construction staff involved with plan reviews as early as possible, or at the very least at the 60% design phase. This will allow for more consideration to make significant changes to the design as it moves into the final design stage. This additional time will also provide for more innovative solutions to constructibility issues that may save the project both time and cost.

BEST PRACTICE: *Constructibility Reviews*

Discipline: Roadway Design

Project Management Activities:

- Invite construction staff to review meetings or set up separate meeting to discuss constructibility issues with staff and gather early feedback in the design.
- Coordinate additional meetings as necessary to identify and resolve staging- and/or construction-related comments.

Resource Considerations:

- Allocate construction staff hours to provide constructibility reviews at preliminary design (30%) and final design stages (60%/90%).
- May also hire independent contractor to provide an alternative perspective.

Implementation Action:

Get key construction staff and contractors (national level with perspective and experience, e.g., National Constructors Group) involved early on in the process to enable designers to consider how the project is physically constructed to minimize throwaway.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to Risk 1-25, "Incomplete Staging Plans," within the Project Risk Registers.

BEST PRACTICE: *Special Provisions Organization*

Discipline: Roadway Design

Best Practice Description:

Organize the project special provisions into similar “work type” sections in order to make them more easily navigable. Improved organization makes it easier/faster for the contractor to find specific articles and increases the likelihood the required articles are not missed during design.

Issue Resolved by this Best Practice:

On large construction projects where project special provisions are several hundred pages, it has been difficult to both organize (for the designer) and find (for the contractor and field staff) individual articles following the standard WisDOT special provision format/order. With several different team members working to assemble the plans and specs on most large design projects it was difficult to manage the assembly of the specs when SPV items were organized by sequential item number. Under the standard WisDOT format, contractors also had commented that they had to search through the entire special provision document to make sure they found all the articles pertaining to their particular area of work (e.g., lighting). The new format places all articles pertaining to Lighting/ Electrical work in one section.

Advantages:

- Reduces likelihood that special provision articles are missed when preparing the final plans
- Makes it easier for contractors and field staff to find the specific information/articles they are looking for in the special provisions and assures them they are not missing any key information when preparing their bid or inspecting the work
- Provides a consistent format for all work on the US-41 Corridor
- A secondary benefit is that it helps the Corridor Management Team, designers, and construction field staff organize corridor data to be used by everyone

Disadvantages:

- At the beginning of this project, unless they had worked on the Marquette Interchange, this format was new to contractors and field staff and caused some confusion
- This format is not consistent with the standard special provision format used everywhere else in the state, so there is a learning curve with everyone outside the US-41 Team

Discussion/Background:

This issue was first discussed at the beginning stages of the Marquette Interchange design project. NCG explained that other state DOTs use similar formats to what was proposed, and the standard building specs generally follow this format (organized by “work type”). Based on their experience with projects throughout the country, switching to this format would provide clarity and efficiency in the long run. This format was implemented on the last large “Core” Contract for the Marquette Interchange.

This discussion continued on US-41 in Winnebago County and the decision was made to use the new format on all the larger construction projects. Designers, contractors and field staff have become

BEST PRACTICE: *Special Provisions Organization*

Discipline: Roadway Design

familiar with this format and appreciate the efficiency and ease in finding specific information in the specifications. Brown County will follow the lead and complete the specifications using this format.

Project Management Activities:

- Ensure that all appropriate projects follow the new specification format (decide and communicate which projects are too small for the new format to provide any benefit and will therefore use the standard format, if any).
- Gather feedback from construction staff and contractors and make any adjustments needed moving forward
- The US-41 team should discuss with WisDOT CO the possibility of converting to this format for all projects in the state sometime in the future.

Resource Considerations:

Allocate corridor management team staff hours to continue to refine the special provision format as needed.

Implementation Action:

The special provision format is documented in the US-41 Corridor Manual and is being implemented on projects moving forward

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Design Management and Packaging*

Discipline: Roadway Design

Best Practice Description:

Roll project designs under a single "umbrella" to streamline the management, oversight, and delivery of the design (i.e., not having multiple prime designers working on different components of a single project). From a resource and management perspective, it is more effective to consolidate the levels of communication. It becomes a challenge in estimating the resource side with more designers to manage.

Issue Resolved by this Best Practice:

The manner in which design contracts are broken out and packaged impacts the management and coordination of the design. Independent contracts under multiple other contracts create challenges in coordinating with different designers working on different components of the project. This can result in integration issues with the various design components (e.g., roadway vs. structures being done by different design contractors on a single project). Increasing the number of responsible designers results in increased oversight and management costs.

Advantages:

- Maximizes efficiency and focus in the delivery of design
- Helps ensure project delivery milestones are met
- Increases accountability
- Clarifies roles of each consultant working for WisDOT
- Contract packaging is not driving the staffing of work packages
- Becomes a good tool for staff development

Disadvantages:

- Requires more resources
- In-house costs rise to higher percentages than traditionally seen

Discussion/Background:

The US-41 program was directed to break up projects, creating more prime contracts with designers and offering opportunities for smaller companies to be prime. In doing so, many contract packages had many primes working on one project. For example, in the Early Structure/Early Fill contract in the WIS-29/US-41 interchange, there were nearly 25 structures, many of which had different designers as prime contracts. The lighting designer was also a prime contractor. This required WisDOT to micromanage the contracts and hold additional meetings to get designers to coordinate. All designers were working towards the same submittal dates of 60%/90%. When plans were submitted, they were not cohesive and disorganized. It took many reviews by the roadway designer and WisDOT to make comments and help to make the plans better. This could have been resolved if one prime consultant was managing the others to help in the delivery process.

BEST PRACTICE: *Design Management and Packaging*

Discipline: Roadway Design

Overall, it is recommended to dedicate resources and have them align with the structure and hierarchy of design in order to enforce accountability on the designer side. Consider the use of deputy project managers to help manage efforts.

Project Management Activities:

- Package consultant contracts with the minimum number of primes to ensure that the prime creates a cohesive team and manages each consultant needed to complete the set of plans.
- Work to create full design contracts to utilize the prime consultant as a managing entity for the project.

Resource Considerations:

Many additional meetings were needed to ensure designers were coordinating with each other. Those resources would be reduced with this approach from a management standpoint.

Implementation Action:

Work to create full design contracts to utilize the prime consultant as a managing entity for the project. This may require input from mega-project teams, oversight team, or consultant section of WisDOT for complete direction.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Construction Contract Packaging*

Discipline: Roadway Design

Best Practice Description:

Identify the funding stream early on in the project with funding team. Then high-level construction contract packaging and a fundamental plan can be devised. The key is being flexible to allow for fluctuations that may result. Looking for opportunities to modify work packages as design progresses and fiscal year constraints are imposed requires that construction contract packages be reconfigured. Conceptual plans should attempt to be as accurate as possible. Introduction of early PS&E dates creates a framework in which projects are on the shelf and can be advanced as needed to adapt to overall funding in the state (except when combining projects). Getting better construction cost estimates as early as possible also helps to provide a better understanding of funding needs and how projects can be bundled and configured. Tracking program changes and then responding efficiently is also key.

Issue Resolved by this Best Practice:

Issues for available funding can be lost if the fundamental plan is not devised in a manner in which the overall program is as flexible as possible. Establishing conservative estimates in building program estimates can result in issues later in the flexibility of "designing" the overall program and subsequent project contract packaging.

Advantages:

- Maximizes the use of statewide program dollars
- Flexibility in the management and delivery of projects
- Better able to adapt to industry capacity (contracting)
- More streamlined plan sets in construction

Disadvantages:

- Too much flexibility affects quality of plans

Discussion/Background:

The US-41 program worked to have early PS&E dates and early submittal dates to help with the flexibility to move projects. This worked very well with certain projects. However, this was put to the test since the US-41 program was the only mega-project that was utilizing the majors budget. When requests came from the majors team to move projects to help fill gaps and holes in the majors program, the US-41 program was the "go to" program. This resulted in projects being advanced 1 to 2 years earlier than the expected early PS&E submittal. The projects were delivered, however, many addenda occurred as a result of late changes in the design.

Project Management Activities:

- Front-load mega-project program to allow for the most flexibility for budgeting issues.
- Work with BSHP to get program allowance and achieve flexibility in moving projects to fill large or small holes for the FY budget.

BEST PRACTICE: *Construction Contract Packaging*

Discipline: Roadway Design

Resource Considerations:

Design teams must have good estimates with which to update the program; this requires extra resources to devote time to cost estimating.

Implementation Action:

Front-load mega project program and work towards accurate estimates from designers to work with BSHP to schedule the program effectively.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Refer to risk 15.5 within the risk register. This was identified as an opportunity for schedule advancement that also enabled cost savings by taking advantage of the current construction market conditions.

BEST PRACTICE: *Early and Expanded Advertisement*

Discipline: Roadway Design

Best Practice Description:

On large, complex, or unique projects, advertising the projects for additional time to allow the bidders to ask questions and formulate bids is a good practice. To do this, coordination with the proposal management section is necessary in advance; this ensures that the proposal management section can balance their workload, manage their resources, and be prepared to have an additional project come in early for review. On unique projects, additional nationwide advertising may be necessary to ensure there are enough acceptable bidders for a project to let. Again, coordination with the proposal management section is necessary to capture the proper advertising markets.

Issue Resolved by this Best Practice:

Feedback from contractors indicated they did not have enough time to ask questions and formulate bids for large, complex, or unique projects. Unfair or unbalanced bids occur due to unique work which requires nationwide or out-of-state contractors to take notice of the advertisement and bid on the project.

Advantages:

- Ensures fair, balanced bids
- Ensures project is let on schedule
- Ensures that bids are close to engineers estimate

Disadvantages:

- Requires the project to be submitted early to proposal management section
- May cost additional advertisement dollars for nationwide advertising

Discussion/Background:

The US-41 project had a wick drain project which was unique to Wisconsin construction. During investigation of possible wick drain contractors, it was evident that none existed in Wisconsin. The prime contractor could be the contractor of the wick drains or another major item on the project, so it was important to be sure that it was advertised to a wider market.

The US-41 program has large projects in excess of \$60 million which creates a very large set of plans. Bidders complained about not enough time to prepare competitive sound bids for large projects. They also wanted enough time to address questions and get answers, so an additional month was allowed to prepare bid documents.

Project Management Activities:

US-41 project team will work with proposal management to ensure proper steps are taken well in advance to coordinate early and expanded advertisement.

BEST PRACTICE: *Early and Expanded Advertisement*

Discipline: Roadway Design

Resource Considerations:

No additional resources are needed if early coordination is planned with the design team to prepare for early delivery and with proposal management to ensure their resources are allotted for the early submittal.

Implementation Action:

Utilize proposal management matrix to identify which projects should have early and expanded advertising. Work with proposal management to plan for early submittals and logistics on expanded advertising.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Early Access Review*

Discipline: Roadway Design

Best Practice Description:

Develop a corridor-wide summary of access points along the local roadways adjacent to the interchanges within the project. Denote the existing access (both public and private), as well as the proposed access due to the design changes. In addition to this summary, investigate and summarize all the existing access controls and who maintains the access rights along the local corridors. Document any recent or approved access requests and/or changes, as well as new developments within the project limits that may create traffic pattern changes or new access issues. This report can set precedents during negotiations with property owners requesting new access to ensure consistency in access approvals, as well as a way to document standards or minimums that are created as a result of the roadway project.

Issue Resolved by this Best Practice:

The design team was receiving requests for private development access late in the design process and did not have adequate information available to make rapid, informed decisions to avoid delays in design delivery schedule.

Advantages:

- “One-stop shop” for all team members to reference access decisions, controls, and history
- Facilitates quick decision making for design teams to maintain project development schedule

Disadvantages:

- Can be time-consuming to develop
- Must be maintained regularly to be kept up to date

Discussion/Background:

During the Brown County design development process, multiple private developments requested new or revised access points along the corridor. These became difficult to track, and the Department was concerned that the requests, if not coordinated, would end up with conflicting answers, which would make it even more difficult for the Department to manage. As a result, the US-41 team sought to capture in a single document all the changes that were being evaluated for ease of use by the PD team, to ensure consistency in the decision making process, and provide a resource for the team to combat any property owner claims of inequitable treatment compared to others along the corridor.

Project Management Activities:

The team would need to collaborate along the corridor to ensure that all requests are documented and shared as soon as they are known so that all information regarding that area could be logged. In addition, the management team would need to develop guidelines or expectations of what requests would immediately be denied, and make some speculations on what may be requested along the corridor due to vacant or redevelopment land.

BEST PRACTICE: *Early Access Review*

Discipline: Roadway Design

Resource Considerations:

This task will require the assistance of the Region access group, as well as the resources needed to develop the original document and update it as necessary as design changes, development requests, or decisions on access requests are made.

Implementation Action:

To implement this activity, the design team will need to assign this task to a DPM or consultant resource to gather the existing data and work with the Region access staff to investigate the access controls and most recent access modifications and requests. Upon completion of this task, the team should evaluate potential areas for access and development changes, and create a standard response for these areas. As requests for development and access come to the team during the design development, the team will need to ensure that all parties are reporting this activity to the access document keeper, for updating.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Early Design Review of Staging and Constructibility*

Discipline: Roadway Design

Best Practice Description:

Hold separate meetings to discuss construction staging prior to holding 90% design review meetings with the purpose of identifying any inconsistencies between the roadway plan traffic control staging and the overall corridor staging concepts and resolving any constructibility concerns. The smaller and more focused staging and constructibility review meetings should include discussions of key construction staging timelines, contract milestones, incentives/disincentives, liquidated damages, and pay plan quantity bid items.

Issue Resolved by this Best Practice:

Helps ensure that the larger 90% design review meetings are more productive and focused on their intended purpose of reviewing final plan details rather than dominated by discussions about staging that should have been resolved earlier.

Advantages:

- Less re-work after 90% review
- Allows staging review to be done at a point in which there is enough detail
- Helps with Public Outreach process to communicate with stakeholders
- Earlier reviews for construction and staging staff streamlines discussion with design during later meetings
- Allows for better integration of design with constructibility

Disadvantages:

- None apparent, outside of additional time/resources for meetings

Discussion/Background:

Prior to implementation of the constructibility and staging review meeting, many of the 90% design review meetings became vehicles to discuss broader concerns regarding traffic staging plans and constructibility that should have been resolved earlier – the intent of 90% design review is to focus on final plan and specification details.

This issue came to a head during the 90% review meeting for the Mason Street Interchange plan, in which roughly 2 hours of a 3-hour meeting were spent discussing broader constructibility and staging timeline issues and most of those in attendance had come to discuss finer plan details and had assumed these other issues were already resolved.

These meetings are often referred to as “75% Review meetings,” but it is important to note that 75% does not become a hard deadline. The intent is that this meeting be held as soon as practicable when the design and overall construction staging have progressed far enough that any inconsistencies or concerns are apparent to reviewers.

BEST PRACTICE: *Early Design Review of Staging and Constructibility*

Discipline: Roadway Design

It is also important that this staging and constructibility review be an appropriately smaller size (relative to full 60%/90% design review meetings) in order to have meaningful focused discussions and be able to make decisions. The group should include the roadway design team, the corridor construction staging team, and experienced construction field staff. It is also important that 60% design expectations be well defined to ensure that all of the information necessary to hold a useful staging and constructibility reviews is available.

Project Management Activities:

- Implement a construction and staging review meeting prior to the 90% plan submittal deadline (between 60% and 90% plan design milestones).
- Communicate and enforce the expectation that plans will be developed at 60% design sufficiently to allow for meaningful discussion of these constructibility and staging concerns between 60% and 90% design milestones.

Resource Considerations:

Allocate hours for the roadway design, construction staging team, and field construction staff to participate in this meeting.

Implementation Action:

Implement a construction and staging review earlier (e.g., 75% review – between 60% and 90%) to discuss issues of staging earlier on.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This issue was not directly identified in the Risk Management Process, but does potentially aid in resolving the following risks, presented in detail in the Project Risk Register:

- Risk 10.1, “Design Coordination & Management”
- Risk 12.3, “Site Staging”
- Risk 1-25, “Incomplete Staging Plans”

Corridor Tasks (Standards/Manuals/PS&E Reviews/Details)

No.	Best Practice Title
1	Corridor task leads
2	FTP site
3	EIS Project Manager
4	Corridor manual
5	Project field office
6	Enhanced independent design reviews
7	Cost estimate validation process
8	Risk management for design and construction
9	Lane closure charts

	Budgeted	Actual
Cost	██████████	██████████
Labor	10,462 hours	7,857 hours

Summary Totals include Brown and Winnebago Counties. See Table 2.

BEST PRACTICE: *Corridor Task Leads*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

Consolidate hierarchy to single points of contact with specific task leads. Specific task leads include: structures coordinator, geotechnical, CSD, landscape, stormwater/wetland, utilities, TMP, traffic, SMAs, public involvement, environmental (see Best Practice "EIS Project Manager"), signage, ITS, lighting, traffic signals, plat development, design (specific to issues identified), design reviews, BSHP coordination, railroad, corridor manual. Having the specific task leads aggregates the decision and voice on issues to a single person for resolution.

Issue Resolved by this Best Practice:

There was difficulty in coordinating with multiple design contracts. There was no consistent voice for giving direction to the many questions being posed. Also, there was lack of accountability in relation to the different tasks being performed.

Advantages:

- Consistency in project development
- Design efficiencies
- Streamlines communications
- Creates "centralized" expertise
- Establishes accountability for specific tasks

Disadvantages:

- Time management for task lead activities in consideration of other responsibilities
- Task lead becomes "critical path" individual
- Possibility of institutional knowledge loss if person leaves

Discussion/Background:

Early in 2010, the US-41 Team held a Risk Workshop to define design delivery issues that were at risk of impacting the schedule of the US-41 program. Within this workshop, many tasks were noted to be critical path for design delivery, and the adopted practice was to assign a point staff person to coordinate all corridor-wide activities through to ensure the schedule was met. This assigned staff person was also utilized in other activities, or on multiple corridor items, to be as efficient as possible in the staffing utilization for the corridor. This need for aggressive coordination stemmed from several US-41 needs. First, the project design was spread between multiple consultants with separate contracts, which required additional levels of coordination to ensure that the corridor activities that affected all the consultants were managed centrally. Also, the US-41 program was experiencing let savings, and was accelerating projects ahead of the planned PSE dates. This accelerated delivery required close monitoring, to ensure permits and other decisions were made on time to meet the aggressive schedule.

BEST PRACTICE: *Corridor Task Leads*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Project Management Activities:

- Assign staff within WisDOT or Consultant team to oversee/manage/coordinate the above listed tasks within the project.
- Monitor the staff and tasks to ensure the schedule required for design delivery is being met. Refocus or reallocate staff to the appropriate tasks as needed to ensure design delivery.

Resource Considerations:

Ensure there is adequate staff to dedicate time to the respective tasks for design delivery.

Implementation Action:

Effort was a solution that came out of the 2010 US-41 Risk Workshop. This was followed up by a schedule review that worked with the task assignees to develop a detailed schedule for completion and/or maintaining the tasks assigned to the individual.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Several tasks were behind schedule, as defined during the first US-41 Risk Workshop. Several of the US-41 delivery tasks were assigned a dedicated task lead with a detailed schedule to complete the tasks associated with the design delivery.

BEST PRACTICE: *FTP Site*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

Create a centralized, project-specific location on a network for distribution and dissemination of current data and information in which all design teams and consultants have accessibility. It is best to ensure that the structure of the filing system be developed up front in a standardized approach. Also, ensure that the system is backed up.

Issue Resolved by this Best Practice:

The coordination and dissemination of current, accurate project data and information between multiple design teams and consultants was challenging.

Advantages:

- Creates mechanism to transfer the most current information
- Consolidates data
- Offers easy sharing of large files
- Allows PMs to check progress
- Allows different teams in different offices to access data remotely in a timely manner

Disadvantages:

- Site is only as good if the information is managed
- Requires "policing" and maintenance
- Only good if people use the tool
- Nothing on FTP is part of document control process

Discussion/Background:

The FTP site concept was developed early in the PSE delivery process and was taken as a low bid proposal from the design consultants based on previous contract work within WisDOT.

Project Management Activities:

Assign the duties of housing and managing the FTP site to a consultant designer.

Resource Considerations:

As developed, the resource requires only limited maintenance to keep the site available to the project team, and have on-call IT resources to address any problems, administer access, and other support as needed.

Implementation Action:

WisDOT solicited for a proposal from the design teams to house the project information in an environment that was accessible to the design consultants, as well as WisDOT.

BEST PRACTICE: *FTP Site*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

The framework and standards for file structure within the FTP site are housed within the Corridor Manual.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

BEST PRACTICE: *EIS Project Manager*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

Identify a designated EIS project manager that only manages the progression of the EIS. The EIS project manager may not be necessary every time, but is useful when conditions of tight timelines and complexities arise. This staff member should have experience with the EIS process these timelines and issues do not lend themselves to learning on the job.

Issue Resolved by this Best Practice:

There was a tight schedule for the delivery timeline of the EIS. Ensuring that work progression with respect to schedule and complexity is challenging.

Advantages:

- Single point of control for progression
- Successful and timely delivery of EIS
- Opportunity to build good relationships with agencies

Disadvantages:

- None apparent

Discussion/Background:

Early in 2010, the US-41 Team held a Risk Workshop to define design delivery issues that were at risk of impacting the schedule of the US-41 program. Within this workshop, many tasks were noted to be on the critical path for design delivery, and the adopted practice was to assign a point staff person to coordinate all corridor-wide activities through to ensure the schedule was met. This assigned staff person was also utilized in other activities, or on multiple corridor items, to be as efficient as possible in the staffing utilization for the corridor. This need for aggressive coordination stemmed from several US-41 needs. The EIS delivery was a critical path item to allow the North Segment of Brown County to progress to final design activities in time to meet the program schedule assigned to that work.

Project Management Activities:

- Assign staff within WisDOT or Consultant team to oversee/manage/coordinate the EIS delivery/ completion.
- Monitor the staff and tasks to ensure the schedule required for design delivery is being met. Refocus or reallocate staff to the appropriate tasks as needed to ensure design delivery.

Resource Considerations:

Ensure there is adequate staff to dedicate time to the respective tasks for design delivery.

BEST PRACTICE: *EIS Project Manager*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Implementation Action:

Effort was a solution that came out of the 2010 US-41 Risk Workshop. This was followed up by a schedule review that worked with the task assignees to develop a detailed schedule for completing and/or maintaining the tasks assigned to the individual.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Several tasks were behind schedule, as defined during the first US-41 Risk Workshop. Several of the US-41 delivery tasks were assigned a dedicated task lead with a detailed schedule to complete the tasks associated with the design delivery.

BEST PRACTICE: *Corridor Manual*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

Develop a corridor manual, which includes project-specific details, processes, procedures, standards, specifications, design details, utility coordination, CADD standards, and policy. The corridor manual is a document that is a reference of guidelines for project delivery and development for the entire team working on the project. This should be developed early in the project (sooner rather than later), and should be updated and maintained on a monthly basis. It is important to validate that the items going into the manual are not being "haphazardly" integrated into the final plans. There needs to be assurance of levels of standardization outside of the critical path of delivery. Working meetings (on an as-needed basis) are useful in manual development and updates.

Issue Resolved by this Best Practice:

There was difficulty in making sure that there was consistency in delivery of work products from the multiple design teams. There was also a need to establish guidelines for dealing with "gray" areas and project-specific guidelines.

Advantages:

- Organized way to disseminate information
- Provides communication vehicle
- Saves time in "reinventing the wheel"
- Provides clarification to team on project delivery
- Allows users to utilize the manual as an extension of the FDM
- Provides consistency to bidding projects

Disadvantages:

- One more layer of standards and specifications that designers must confront
- Advantages more limited with smaller design teams
- Creates scenario where there are multiple sets of standards and specifications for different regions of WisDOT
- Adds another document that needs to be updated when standards and specifications change

Discussion/Background:

The US-41 team took the lead of the SE Freeways projects and developed and formalized a corridor manual that brought together many project level decisions into a single document that can be easily maintained, organized, and updated. By developing a one-stop shop, the project teams can become more integrated into all of the different aspects of the project and move forward with a single point of reference.

BEST PRACTICE: *Corridor Manual*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Project Management Activities:

- Ensure consistent application of corridor standards, expectations, and decisions.
- Provide a single point of reference for corridor-specific items, beyond the standard WisDOT manuals.

Resource Considerations:

- Allocate design team resources to maintain, update, and refine the manual on a regular basis for design team use.
- Requires oversight and assistance by the WisDOT design team and region resources to provide the guidance necessary to make the document relevant.

Implementation Action:

Document parameters, structure, responsible parties, and updating process/schedule were developed as a corridor task, and are reviewed monthly.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Project Field Office*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

Establish office locations where the design, construction, document control, PI, and other staff can be housed. The main reason for a consolidated office is focused on construction. It is not feasible to run a 6- to 8-year construction program with typical office types. This resolves the need to have a place to house staff and conduct meetings. On the design side (depending on resourcing), conferencing space was not an issue. The immediate need for a facility in design is not as beneficial; it is the need for location of sufficient construction staff space.

Issue Resolved by this Best Practice:

There was a need to have a dedicated and sufficient space to conduct meetings for both design and construction, as well as a need for the housing of both design and construction staff together so that they could integrate together. There was also a potential need for multiple construction trailers for all of the projects.

Advantages:

- Provides adequate space to engage in construction operations and oversight
- More efficient communication between team members
- Single "front desk" location for public interface
- Removes issues of logistics associated with field trailers
- Cost efficiency (dependent scalability)

Disadvantages:

- Does not eliminate *all* trailers - some trailers are still required
- May remove construction staff from being on-site
- Challenges in communication and coordination with the project team and region personnel
- Depending on case, it may be more expensive

Discussion/Background:

The project field office concept was considered as part of the mega-project concept: as a construction tool to reduce costs for the construction activities by reducing or eliminating the need for jobsite field trailers for each construction project in instances in which there were multiple simultaneous projects in the same general vicinity. When evaluated purely by cost, it was determined that a centralized field office would be cheaper than multiple field offices along a corridor. Upon establishment of the US-41 Brown County Construction Field Office, it was also determined that the ability to include the design team in the same field office provided an additional opportunity for coordination as an added bonus to the project.

Project Management Activities:

Locate, acquire, and retrofit a building (if possible) to serve as a construction field office and evaluate the opportunity to house design functions in this office.

BEST PRACTICE: *Project Field Office*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Resource Considerations:

There will be up-front costs to acquire a building and set it up to house the construction and/or design teams.

Implementation Action:

Seek a real estate agent to search for property that will meet the needs of size, proximity, and utility for a project field office. Timing to get the field office set up prior to construction start will be key to the effectiveness of the building.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Enhanced Independent Design Reviews*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

In order to establish a level of quality assurance and quality control that was efficient and relevant to the program, independent design reviews by the technical experts in specific disciplines were introduced. The reviews being done were primarily third party.

Issue Resolved by this Best Practice:

There were issues related to individual prime consultants having to aggregate information. That there were constrained resources to review the plans in a timely manner. There was a need to supplement what the department has done. In addition and specific to the corridor, there were many unique specifications and standards that CO may not be aware of. There was also a need to have the proper technical expertise performing the reviews (specialty focus) versus a more generalist approach.

Advantages:

- Eliminates bottleneck effect imposed by CO
- Adds “another set of eyes”
- Improves the quality of the plan
- Ensures interfaces are coordinated
- Post-let CCOs reduced
- Provides consistency in plan sets

Disadvantages:

- Cost of resources (design)
- Time consuming
- Potential issues with ultimate accountability
- Timing is vital – last minute changes may result in addenda

Discussion/Background:

Previous mega-projects in the SE Region were experiencing CCOs and other cost overruns during construction that were noted to have some responsibility tied back to the quality of the PSE packages that were utilized for the bids. A consideration of this issue was tied to the accelerated schedule under which the plan sets were developed, which were dictated by a fluctuating program budget. Also, the resources that were dedicated to review the plans in CO and the Regions were taxed with the additional mega-project PSEs, and a thorough review did not always take place.

A solution to this issue was to implement an additional level of PSE reviews. This independent resource provides an additional level of review that could evaluate the plan sets for design details, but also gives a chance to consider a constructibility review to determine the most efficient way to build a project, based on the constraints established by the design team.

BEST PRACTICE: *Enhanced Independent Design Reviews*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Project Management Activities:

Implement a review process that coincides with the current WisDOT ad-hoc process.

Resource Considerations:

- Establish a team that does independent reviews, along with creation of criteria that will be used to complete the reviews.
- Create a documentation process to have the review comments included in the PSE package.

Implementation Action:

Process was established to coincide with the 60% and 90% PSE reviews done by the Region. The independent review team would follow the same process of review comments for documentation and schedule of submissions that the WisDOT ad-hoc reviewers maintain.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Cost Estimate Validation Process*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

The cost estimate validation process was introduced in order to develop cost estimates in a progressive fashion throughout the project's design life cycle. The concept is to improve the level of information sooner and to better understand what the likely project cost will be for budgeting and programming purposes. The cost estimate validation process also provides direct feedback to project designers on unit costs for their projects so that they are sufficiently developing their estimates with relevant cost data. The process of reviewing the estimates is done at 60%, 90%, and final PS&E. In future implementations, conceptual level of design estimating tools could be developed and refined to also include 30% level of design, as well as refinement of the 60% level of estimating.

Issue Resolved by this Best Practice:

Estimates were not necessarily reflective of the work being done. Estimates early on were inflated to protect against economic pressures and possible programming issues to ensure adequate funding. This creates a situation of uncertainty and lack of clarity. For programming and funding purposes, as well as the packaging of projects, there is a need to have estimates with a relatively reliable level of accuracy.

Advantages:

- Allows for range of anticipated costs to be realized earlier
- Allows for dynamic management of budgets
- Cost estimates are reviewed and updated multiple times throughout design
- Helps to iteratively refine cost estimates with an increasing level of detail
- Provides guidance to designers on reasonable unit costs for use in cost estimates

Disadvantages:

- Requires development of calibrated data model
- Requires buy-in to process for estimating and review

Discussion/Background:

The cost estimates for projects were in need of refinement and updating in order to establish expectations for what projects were going to cost. This is achieved by creation of a data model of unit costs and making adjustments for various market factors and then utilizing that data to develop a range of probable cost. The range of probable cost is then used as a distribution for input into a Monte Carlo simulation model to project the range of anticipated project costs. Improved and refined information that brings project cost estimates more into alignment with what market costs are reflecting allows for increased flexibility in management of the US-41 mega project and the WisDOT program. This allows for the dynamic management and movement of projects to where available funding exists.

The improved information also aids in the development of project cost estimates. Project designers are able to utilize the projected unit cost information and update their estimates to be reflective of

BEST PRACTICE: *Cost Estimate Validation Process*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

the anticipated bidding conditions while being able to forecast project costs in relatively more accurate fashion.

Prior to the cost estimate validation process there was no formal mechanism for updating estimates and developing cost estimates with project level of detail information. Implementation of this process has yielded in better aligning project cost expectations and more effective management of projects in the US-41 mega-project.

Project Management Activities:

Project management will need to support implementation of the process and become familiar with the iterative process and information produced from the validation process.

Resource Considerations:

This will require added time from an individual familiar with cost estimating. Estimates will also have to be reviewed for reasonableness with consideration to labor inputs, equipment rates, and material components.

Implementation Action:

- Develop a unit cost data model.
- Identify cost estimate task lead.
- Implement process of estimate update and review.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Time savings could be realized from updated and improved cost estimating as a mechanism that enables more dynamic management of the greater Mega Project. Gaining more certainty in costs allowed for the acceleration of projects and an opportunity to take advantage of current construction market conditions.

BEST PRACTICE: *Risk Management for Design and Construction*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

Implementing risk assessment and risk management activities resulted in a structured approach to effectively working through issues and managing the project. The Department team took it seriously and this resulted in effective results. The risk management process involves the integration of proactive risk identification, analysis, risk response strategy development, and monitoring and control activities in an iterative fashion. This ensures that risks are constantly being managed and monitored and that the base cost and schedule are better controlled. The process began with an initial risk assessment workshop for design. This was followed by two more monitoring and control workshops to ensure that the risk management strategies were being deployed effectively. This process was followed for the management and delivery of design and is now being deployed for the management and delivery of construction.

Issue Resolved by this Best Practice:

There are many risks facing the development of the design and construction of the individual projects comprising the mega-project. These risks may come in the form of uncertainties that need management that could either result in delays or increased costs to the project. There is a need to develop proactive management strategies and response plans for proactively dealing with risks and finding management solutions for the complexities of the overall project delivery.

Advantages:

- Brings management and teams together for discussion of issues
- Identifies most important issues most in need of management
- Creates open forum for solution development where project team members can establish buy-in and consensus for strategies to effectively manage the project
- Identifies potential impacts and ways to mitigate or respond to uncertain events and impacts
- Development of response strategies and action plans creates detailed risk management plan
- Creates and enforces a structure of accountability for action plans

Disadvantages:

- Must be conducted when all key project staff can come together and it is often difficult to coordinate schedules

Discussion/Background:

The risk management process was implemented in order to identify issues, risks, and uncertainties in need of management attention and to elevate those issues most in need of management. The issues are then managed through the development and deployment of risk response strategies and action plans. A supporting Monte Carlo quantitative risk model measuring the range of projected cost and schedule was developed to utilize as a barometer in gauging the effectiveness of risk response strategies and action plans. The delivery of design and construction is effectively being executed by controlling uncertainties and risks through the use of this process iteratively by engaging in initial risk

BEST PRACTICE: Risk Management for Design and Construction

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

assessment workshops and risk monitoring and control workshops where risks are updated and the effectiveness of risk response strategies can be adapted.

Project Management Activities:

Project management should attend and participate in the process. In addition, project management must buy into the process and be supportive of development of risk response strategies and action plans for deployment. Project management must then enforce accountability for the management of risks through the management of risk owners and implementation of plans to deal with risks.

Resource Considerations:

All key project staff must be able to participate in the workshop. Depending on the number of people involved, there can be many resources involved.

Implementation Action:

An initial risk assessment workshop should be conducted to identify, prioritize, and establish risk response strategies and action plans for those risks most in need of management. This should be supported by the development of a risk register to manage the risk data. Risks should be updated in subsequent monitoring and control workshops, as well as the identification and development of risk response strategies for any new or emerging issues.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

The risk management process is being deployed for both design and construction in order to effectively identify, evaluate, prioritize, and manage uncertainties to control cost and schedule.

BEST PRACTICE NAME: *Lane Closure Charts*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Best Practice Description:

Develop/utilize a chart format for conveying the restrictions imposed on the contractor for time-of-day lane reductions on the mainline highway and local roads. The charting system would follow a Caltrans example that would list the segment, time of day, and number of lanes that were required to be open for the specific time frame. This would be the baseline for all projects, but can be refined or redacted to meet a specific project's lane closure restrictions.

Issue Resolved by this Best Practice:

Lane closure specifications were long text sections that were difficult to interpret (often contractors did in fact misinterpret the material).

Advantages:

- Helps reduce confusion or misinterpretation of lane reduction restrictions
- Provides corridor-wide information that can be redacted to a project-specific implementation easily

Disadvantages:

- Format has not been seen/used by contractors in WI, so learning curve is likely
- Cut and paste format allows for incorrect insertion by designer

Discussion/Background:

The corridor management team provided feedback to establish a way to streamline the traffic lane closure specifications to reflect the options available in an easily interpreted format. Previous investigations with national experts noted that Caltrans had developed an accepted format through a chart. This chart style was retrofitted into the WisDOT process.

Project Management Activities:

Create a traffic spec that reflects the lane closure restrictions in a chart format versus a narrative.

Resource Considerations:

Utilize the traffic team to determine the lane closure constraints, and develop these into a chart that reflects the corridor requirements by segment of highway and local roads.

Implementation Action:

Utilize the traffic team to determine the lane closure constraints, and develop these into a chart that reflects the corridor requirements by segment of highway and local roads.

BEST PRACTICE NAME: *Lane Closure Charts*

Discipline: Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

Issue Identified and Resolved as a result of Risk Management Process?

YES

NO

Sample

Structure Design

No.	Best Practice Title
1	Corridor structures manual
2	Corridor-specific structure standard detail drawings
3	Monthly structures “pre” meeting
4	Monthly structures meeting
5	Assign a specific person to a mega project from the BOS
6	Schedule alignment between roadway, geotechnical, and structures
7	Dedicated roadway and structure designer integration meetings
8	Grouping of similar structures in design
9	Innovative structure design and procurement

	Budgeted	Actual
Cost	--	--
Labor	--	--

BEST PRACTICE: *Corridor Structures Manual*

Discipline: Structures

Best Practice Description:

Produce and continually update a Corridor Structures Manual that establishes a standardized structure design approach. By producing and maintaining a project-specific Structures Manual, procedures and details are more unified than they would be without this manual. The Structures Manual is being fed primarily from the "pre" structures meeting, but also from the Structures Meeting. See Best Practice "Monthly Structures 'Pre' Meeting."

Issue Resolved by this Best Practice:

Given the multiple different structures design firms, including the CO Bureau of Structures, that have been working on the project, a need exists for a level of standardization.

Advantages:

- Uniformity of design
- Uniformity of plan notes
- Living document with updates, especially in reference to changing field conditions
- Allows for addressing of latest technologies
- Acts as a supplement to WisDOT's Structures Manual to bridge gaps in interpretation
- Improves quality of plans

Disadvantages:

- Must be updated and maintained
- Requires communication to ensure that the project has buy-in from CO
- Learning curve required by construction field staff
- When specifications change rapidly the designer may not be working to the latest specification

Discussion/Background:

Prior to the implementation of the Corridor Structures Manual, the numerous structure designers were without standards to follow. Implementing the Corridor Structures Manual provided standards which led to consistency in design.

Project Management Activities:

- Ensure the continued development and updates to the Corridor Structures Manual.
- Coordinate between the project team, Bureau of Structures, and other parties to provide a complete, approved document.

Resource Considerations:

- Need a dedicated resource for the update of the manual.

BEST PRACTICE: *Corridor Structures Manual*

Discipline: Structures

- Need a dedicated resource to coordinate between all of the responsible parties to approve the Corridor Structure Manual and then disseminate the information to the project design team.
- Resources are required to review the document and provide concurrence.

Implementation Action:

Procedure is included in the Corridor Manual and part of the monthly update process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This was implemented as an extension of a risk response strategy to risk 1-27.1. This best practice helps to avoid rework and time delays that can be costly.

BEST PRACTICE: *Corridor-Specific Structure Standard Detail Drawings*

Discipline: Structures

Best Practice Description:

Produce and update Corridor-Specific Structures Standard Detail Drawings. The intent of the project detail drawings is to gain and produce a uniform solution and agreement to the specialized needs ahead of plan production.

Issue Resolved by this Best Practice:

Different designers solve the various project-specialized issues differently unless there exists a uniform approach agreed by all ahead of time.

Advantages:

- Uniform plan details to specialized issues
- Better plan details as more designers have input to proposed detail
- Increases efficiency in putting plan sets together
- Increases efficiency in reviewing plan sets
- Potential cost savings reflected in contractor bids
- Provides consistency for contractors ("no surprises")

Disadvantages:

- Need some time to gain consensus on details; delays start of plan production somewhat
- Errors in detail can be reproduced in multiple plan sets

Discussion/Background:

Prior to the implementation of the Corridor-Specific Structures Standard Detail Drawings, the numerous structure designers were without standards to follow. Implementing the Corridor-Specific Structures Standard Detail Drawings provided standards which led to consistency in design.

Project Management Activities:

- Ensure the continued development and updates to the Corridor-Specific Structures Standard Detail Drawings.
- Coordinate between the project team, Bureau of Structures, and other parties to provide complete, approved standard detail drawings.

Resource Considerations:

- Need a dedicated resource for the update of the details.
- Need a dedicated resource to coordinate between all of the responsible parties to approve the Corridor-Specific Structures Standard Detail Drawings and then disseminate the information to the project design team.
- Resources are required to review the details and provide concurrence.

BEST PRACTICE: *Corridor-Specific Structure Standard Detail Drawings*

Discipline: Structures

Implementation Action:

Procedure is included in the Corridor Manual and part of the monthly update process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

This resulted as part of the risk response strategy to risk 1-27.1. Application of this best practice creates continuity and avoids rework and associated delays and costs.

Sample

BEST PRACTICE: *Monthly Structures "Pre" Meeting*

Discipline: Structures

Best Practice Description:

A meeting is held each month approximately one week in advance of the full Structures Meeting. This meeting is attended by WisDOT staff (including the BOS) to review items to be included in the full structures meeting and gain consensus on the proposed WisDOT solution to the issues discussed.

Issue Resolved by this Best Practice:

Originally, WisDOT did *not* hold a Pre-Structures Meeting. The normal Structures Meeting became bogged down in discussion with an unmanageable number of differing opinions to gain consensus. Without a Structures Pre-Meeting, WisDOT would discuss various possible solutions to project issues in the regular meeting and it would "eat" a lot of time. This precludes focusing the possible solutions ahead of the full Structures Meeting. The full structures meeting became less streamlined and inefficient in transferring WisDOT's desires and expectations to the consultant designers.

Advantages:

- Consensus gained by the end of the regular Structures Meeting
- Shorter, more focused discussion during the regular Structures Meeting
- Better production based discussion for consultant partners
- Maximize meeting effectiveness at Structures Meeting
- Solves issues in advance with a more focused group
- Ensures BOS concurrence

Disadvantages:

- Additional meeting

Discussion/Background:

For the implementation of the Corridor Structures Manual and the Corridor-Specific Structures Standard Detail Drawings, additional coordination is required with the corridor team and the BOS. To better utilize time, the Pre-Structures Meeting was established to discuss the recommended changes and additions to the Corridor Structures Manual and the CO Corridor-Specific Structures Standard Detail Drawings. As a result of the pre-meetings, concurrence was established between all of the responsible parties. A subsequent Structures Design Meeting was held to present the information to the structure design teams.

Project Management Activities:

- Ensure that the meetings are held.
- Ensure that decisions are made in a timely manner.

Resource Considerations:

- Need a dedicated resource for the update of the Corridor Structures Manual and the Corridor-Specific Structures Standard Detail Drawings.

BEST PRACTICE: *Monthly Structures "Pre" Meeting*

Discipline: Structures

- Additional meeting that a number of specific attendees are required to attend. Required dedicated project team attendees and BOS representatives.

Implementation Action:

- Pre-structure meetings are being held prior to the Corridor Structure Meetings.
- Meetings are held monthly.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Creation of the structures Pre-Meeting resulted from discussion risks associated to Design Coordination and Management. This was a meeting established to ensure that everyone was prepared for discussion during the structures meetings so they could be focused and not result in confusion that could delay the structures delivery process.

BEST PRACTICE: *Monthly Structures Meeting*

Discipline: Structures

Best Practice Description:

A monthly meeting of all structures designers, including the CO BOS, is held to discuss project issues and solutions. All structures designers are encouraged to attend the meeting in person or by phone. These monthly structures meetings have been used on previous mega-projects with great success (Marquette, US-41, N/S I-94, Zoo). Uniformity of solutions to structures details and designs was gained through the cooperation of the meeting attendees.

Issue Resolved by this Best Practice:

There was previously a lack of uniformity of solutions to structures details and designs. The Structure Meeting provided the opportunity to notify all of the structures designers of updates to the Structure Corridor Manual and the Corridor-Specific Structure Standard Detail Drawings.

Advantages:

- Coordinates details
- Better details through multiple designer input
- Enhanced communication among designers, CO, and project team
- Provides follow-through on details of decisions made

Disadvantages:

- Additional meeting

Discussion/Background:

For the implementation of the Corridor Structures Manual and the Corridor Specific Structure Standard Detail Drawings, a Structures Design Meeting was held to present the information to the structure design teams.

Project Management Activities:

- Ensure that the meetings are held.

Resource Considerations:

- Need a dedicated resource for the update of the Corridor Structures Manual and the Corridor Specific Structure Standard Detail Drawings.
- Additional meeting that a number of specific attendees are required to attend. Required dedicated project team attendees and BOS representatives.

Implementation Action:

Meetings are held monthly.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Assign a Specific Person to a Mega Project from the BOS*

Discipline: Structures

Best Practice Description:

An employee from the BOS is assigned the responsibility to attend and coordinate the various structural-related issues for the given mega-project. This results in much better and faster consensus building on structures issues within WisDOT and ultimately with the consultants.

Issue Resolved by this Best Practice:

Challenges in consensus building on structures issues within WisDOT and with the consultants (structures design teams).

Advantages:

- Better coordination with Region
- Better coordination with the FHWA
- Better coordination with structures design consultants
- Fewer issues during BOS plan review at PS&E
- Provides direct link back to the BOS management team for information dissemination and decision making
- Allows BOS to plan and schedule resources according to workload

Disadvantages:

- Does take some BOS employee time
- BOS structures person is not located in Region

Discussion/Background:

To improve efficiency, a representative from the Bureau of Structures was appointed for the mega-project to act as the point of contact and held responsibility for providing information to the appropriate parties in the Bureau for approval.

Project Management Activities:

- Ensure that qualified staff is dedicated and available for the task.

Resource Considerations:

- Need a dedicated resource from the BOS to be available as needed for the mega-project.

Implementation Action:

A person from the BOS was identified as a representative and point of contact for the mega project.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Schedule Alignment between Roadway, Geotechnical, and Structures*

Discipline: Structures

Best Practice Description:

Coordinate and align activities and processes for design of roadway, structures, and geotechnical analysis/reporting in order to efficiently move through the design process with quality plan sets in a timely fashion. This involves inclusion of project controls to establish flow charts for the logic path and subsequently develop schedules and milestones for roadway and structures required for items to fall into place. Bi-weekly meetings should be held for schedule status and monthly meetings should be held to discuss mitigation strategies between the project team, CO technical services, BOS, and any geotechnical consultant services.

Issue Resolved by this Best Practice:

The design activities and processes had not been linked in a fashion that allows for each designer (specifically geotech, structures, roadway designers) to efficiently complete their work package. This led to inefficiencies in design and cascades into schedule delays.

Advantages:

- Establishes accountability
- Maintains schedule
- Clear definition of milestones
- Enhances communication amongst design teams
- Forces geotechnical and other design issues to be identified sooner
- Provides clarification of scope

Disadvantages:

- Additional meeting(s)

Discussion/Background:

Prior to the alignment of the schedule of the roadway, geotechnical, and structure design tasks, deliverables were being missed because of the lack of understanding of the milestone dates between all of the responsible prime design consultants and department staff. By aligning all of the schedules and providing specific deliverable milestones, accountability was created. With the addition of check-in and status meetings, each of the responsible parties was required to provide status of their respective activities. If schedule became a concern, it can be quickly identified and accommodations can be made to mitigate the issue.

Project Management Activities:

- Ensure that meetings are held.
- Ensure that a qualified person is assigned to do the scheduling with an understanding of the project delivery, required tasks, and the appropriate software.

BEST PRACTICE: *Schedule Alignment between Roadway, Geotechnical, and Structures*

Discipline: Structures

Resource Considerations:

Need a dedicated resource from the Corridor Team for scheduling.

Implementation Action:

An individual on the Corridor Team was dedicated to project scheduling.

Issue Identified and Resolved as a result of Risk Management Process?

YES **NO**

Alignment and coordination of delivery schedules focuses design teams to work towards a common date. This prevents delays in project delivery.

BEST PRACTICE: *Dedicated Roadway and Structure Designer Integration Meetings*

Discipline: Structures

Best Practice Description:

Establish a dedicated Roadway and Structure Designer Integration Meeting allows for the designers to identify issues early on. It is a forum to discuss potential issues and mitigate concerns in advance of them becoming real issues. The meetings should be held in regular intervals (e.g., monthly) during the preliminary design process. Meetings should be kept focused by design segments.

Issue Resolved by this Best Practice:

Lack of communication between the roadway and structure designers results in poor plans and schedule delays.

Advantages:

- Maintains schedule
- Brings design issues to table early to avoid re-work
- Clarifies scope for structure types and roadway embankment
- Allows for advance of geotechnical work
- Provides balance between roadway geometrics and structural design needs

Disadvantages:

- None apparent

Discussion/Background:

To improve the communication between prime consultant roadway designers and prime consultant structure designers, monthly meetings were set up in the preliminary design phase to discuss project-related issues. This is a proactive approach to developing design solutions between all of the design teams.

Project Management Activities:

- Ensure that meetings are held.
- Ensure that discussions are productive.

Resource Considerations:

Additional meeting for attendees.

Implementation Action:

Early in the design process, coordination meetings between the roadway and structure designers were held.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Grouping of Similar Structures in Design*

Discipline: Structures

Best Practice Description:

Take structures of similar design type and size and group them together in clustered design contracts (e.g., one structure design team designing the same components, such as culverts, repeatedly).

Issue Resolved by this Best Practice:

There can be inefficiencies in structure design resulting from various different structures being designed in different manners.

Advantages:

- Avoids repetitive costs in putting plans together
- Reduces replication of comments
- Results in better quality plan sets
- Can provide opportunity for expedited review time by BOS
- Provides contractor familiarity with plan sets

Disadvantages:

- Good idea in practice but can be difficult to implement

Discussion/Background:

Taking and dividing the structures design work in to repeatable and common design packages allows for more consistent design development and application. With multiple different structure designs for projects it becomes difficult to integrate them all into the greater roadway designs. This practice helps to provide efficiencies in learning curves and provides more consistent development of structural project elements. It should be noted that this is a good idea in practice but can be difficult to implement depending on the project structure. As a result, this best practice is best implemented at the early stages of planning and packaging design contracts.

Project Management Activities:

- Establish packages of similar structure designs to be completed
- Identify coordination of schedule milestones to ensure adherence to the delivery schedule.

Resource Considerations:

- This may require an additional resource to manage and oversee the total structure development effort. This person can perform the necessary coordination and ensure that the process is being properly followed to allow for meeting of schedule milestones.

BEST PRACTICE: *Grouping of Similar Structures in Design*

Discipline: Structures

Implementation Action:

Grouping of Similar Structures was evaluated, but not directly implemented on the US-41 project due to the time in which it occurred. Some of the similar structures were assigned to specific design teams, but not as a matter of practice. It is recommended to identify similar structure designs early in the development of design contract packages and to cluster like items of design.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Innovative Structure Design and Procurement*

Discipline: Structures

Best Practice Description:

This includes the following items: early steel, ABC bridge construction, drilled shafts vs. piles, temporary shoring, thin bonded epoxy overlays, approach aprons (approach settlement risk mitigation), as well as observance of new and emerging bridge technologies, and single-lane ramps wide enough for future staging. Important to implementation is ensuring sufficient structure construction training. If everything is always done the same as it has been, there is no progression forward with consideration to project schedules, cost efficiencies, and the ultimate quality of the product (life cycle).

Issue Resolved by this Best Practice:

Previously, there had been mostly inside-the-box thinking and execution of designs in the same manner as they have always been done.

Advantages:

- Improves life cycle costs
- Promotion of structure longevity
- Less traffic disruption
- Provides opportunities to reduce construction duration
- Allows for increased flexibility for the contractor
- Provides enhanced public satisfaction

Disadvantages:

- Higher first cost
- Institutional resistance
- Limited experience with new approaches
- Requires additional layers of consensus building

Discussion/Background:

In order to solve specific issues of the mega-project construction, innovative thinking was required to find solutions during the design process to specific issues. Additional outside-the-box thinking was implemented to improve the longevity of the structures.

Project Management Activities:

- Ensure acceptance of the design task.
- Ensure acceptance of additional construction costs to reduce future maintenance costs.

Resource Considerations:

Because the implementation of “new” construction techniques may lead to additional contractor questions, resources need to be made available to answer those specific questions.

BEST PRACTICE: *Innovative Structure Design and Procurement*

Discipline: Structures

Implementation Action:

Innovative Structure Design and Procurement was implemented as appropriate to meet specific challenges presented during the design process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

CSD/Landscaping

No.	Best Practice Title
1	CSD Design manual
2	Construction verification for CSD
3	Advanced utility coordination
4	CSD meetings/workshops and outreach with stakeholder groups
5	Design construction hand-off meetings
6	Coordination of landscaping and staging
7	CSD design review

	Budgeted	Actual
Cost	\$ [REDACTED]	[REDACTED]
Labor	8,012 hours	11,097 hours

Summary Totals include Brown and Winnebago Counties. See Table 2.

BEST PRACTICE: CSD Design Manual

Discipline: CSD/Landscaping

Best Practice Description:

Create a design manual illustrating general aesthetic applications for the various types of structures within the corridor project area. The design concepts will be modified by the design engineer as each structure enters the final design phase. The manual includes a design matrix that identifies each structure and what type of the CSD treatment it should have. Draft special provisions for CSD elements are also included in the design manual as a guide for the special provisions in the final PS&E.

The design manual is a file resource (DGN) to be utilized by the design engineer to expedite design and allow for the timely submittal (two weeks in advance) of review drawings to the CSD team.

Attendance of the CSD team at Structures Meetings helped resolve aesthetic issues, but for a complete explanation and understanding of design issues, a drawing needed to be developed when responding to most questions.

Issue Resolved by this Best Practice:

The main issue resolved was the lack of definition and implementation of corridor-wide aesthetic treatments that the numerous design firms could integrate into their final designs.

Since the design manual is intended to be a conceptual design guide for the engineers, care must be taken not to include too much detail in the design manual. By making the design concepts very general there is no question that the drawings are not final engineers plans and simply cut and pasted into the engineer's final PS&E.

Advantages:

- Allows for early identification of any CSD misinterpretations of the design manual
- Standardizes and defines a corridor-wide aesthetic
- Simple reference for the CSD applications for all designers
- Provides a vehicle for communications of design ideas

Disadvantages:

- Difficult to keep the design manual updated with ongoing modifications

Discussion/Background:

Design continuity is the goal of the project but it is difficult to achieve, especially when there are numerous design engineers from many different design firms. As the project moved into design and while the first bridge was under design, the design manual was still being developed. Some of the design manual CSD treatments were developed for the first bridge but modified as the design manual was completed. The completed manual will be used as the Mega Project moves through its various design phases.

BEST PRACTICE: *CSD Design Manual*

Discipline: CSD/Landscaping

Small revisions to the manual may be needed as the project progresses but those changes will be minor and not affect the overall aesthetic (CSD) treatments.

Project Management Activities:

Set a regular schedule for design manual revisions.

Resource Considerations:

- The State Bridge Design Manual provides guidance for the CSD team in terms of general construction detailing.
- Dedication of staff for ongoing updates.

Implementation Action:

Project is implemented. Action for future projects is to start the CSD process much earlier in the design.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Construction Verification for CSD*

Discipline: CSD/Landscaping

Best Practice Description:

Ensure that there is adequate construction verification of CSD elements included in the plans and contract documents. Enact a Contractor requirement to submit "shop drawings" and/or a test sample on all CSD design features to WisDOT for department approval. The shop drawings should also be provided to the construction inspectors prior to installation to ensure proper application in the field. Make sure that all CSD/retaining wall/structure special provisions contain the following phrase:

“Contractor shall provide shop drawing for approval by engineer, or Contractor shall provide test "sample" of _____ for approval by engineer prior to fabrication and placement.”

Issue Resolved by this Best Practice:

Misinterpretation of design drawings and special provisions led to improper application of CSD elements by both the contractor and construction inspection staff.

Advantages:

- CSD design features are applied as envisioned
- Minimizes re-work – potential cost savings
- Consistent application of CSD treatments along the corridor

Disadvantages:

- Need resources available to provide approval

Discussion/Background:

Originally, the submittal of CSD test panels for approval prior to fabrication was required in the contract documents. This requirement was not enough to ensure that the overall theme/look of the CSD treatment was applied correctly in the field. There was also an issue of construction field staff not recognizing the correct CSD application, creating an issue with field inspection and timely response to incorrect installation.

The test panel approval is still required in the spec – the best practice language is being added in addition.

Project Management Activities:

- Ensure dedicated staff has the availability to monitor and engage in the approvals.
- Coordination required between design and field staff.

Resource Considerations:

Allocate CSD design/review hours to complete the approvals.

BEST PRACTICE: *Construction Verification for CSD*

Discipline: CSD/Landscaping

Implementation Action:

Best practice language has been inserted into the US-41 Corridor specs and is ready for immediate use by designers. For those projects already out the door, addenda and notes to field staff have been disseminated.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Refer to risk 2-68 contained within the risk register. The risk response strategies focused on measures for consistent application of the intent of CSD when physically constructing the individual projects within a corridor. The result of this best practice mitigated potential impacts in the form of added costs and delays due to re-work for proper application.

BEST PRACTICE: *Advanced Utility Coordination*

Discipline: CSD/Landscaping

Best Practice Description:

Prior to 90% design submittals, an advance DT 1078 utility coordination submittal is provided (typically on a large rendered roll plot) of the specific interchange area to the corridor-wide utility coordination team to depict the location and mature height/spread of proposed plantings, planter walls, or other landscape items.

About a month before the 90% design submittals, the landscape design team submits to the corridor-wide utility coordination team a set of pre-90% landscape plans to get utility mark-ups drawn on the plans that are available at the time.

Issue Resolved by this Best Practice:

The DT 1078 submittal helps coordinate early landscape design intent with the utility coordination team. The second review step (pre-90%) allows a more refined level of review after landscape plans have been developed and more proposed utility files become available. Both steps help minimize last-minute design changes.

Advantages:

- Helps coordinate design intent upfront with utility coordination team and minimizes last minute design changes as plans progress through Draft and Final PS&E design submittals
- Avoids change orders/claims in the field
- Ensures early communication of CSD/landscape design intent with municipalities so that the landscape design is not regarded as an afterthought
- Streamlines communication process for coordinating utilities by having one contact that manages all utility files and mark-ups

Disadvantages:

- Requires additional staff resources

Discussion/Background:

Prior to the suggested coordination between the landscape and utility plans, items such as plantings, irrigation lines, and other landscape features were encountering changes in the field due to conflicts with existing and relocated utilities incompatible with the proposed landscape features. In order to resolve this issue the US-41 team developed a corridor-wide utility team and put in place a process where the landscape design team submits to the utility coordination team a set of pre-90% landscape plans to have currently available utility mark-ups drawn on the plans.

Project Management Activities:

- Ensure development of corridor utility team with single point of contact.
- Mark up utilities on landscape plans prior to 90% plan submittal.
- Provide a DT 1078 utility coordination submittal (large rendered roll plot) with the location and mature heights/spreads of proposed plantings, planter walls, or other landscape items.

BEST PRACTICE: *Advanced Utility Coordination*

Discipline: CSD/Landscaping

Resource Considerations:

Allocate utility and landscape staff hours to develop mark-ups identified above.

Implementation Action:

Procedure has been put into place – landscape designers receive notice of the DT 1078 utility coordination schedule in order to prepare plans.

Issue Identified and Resolved as a result of Risk Management Process?

YES **NO**

This idea was initially generated during the first Risk Assessment workshop and subsequently implemented as a risk response strategy to utility coordination and planning. This reduced risk exposure on the project to schedule delays and avoided additional re-design.

BEST PRACTICE: CSD Meetings/Workshops and Outreach with Stakeholder Groups

Discipline: CSD/Landscaping

Best Practice Description:

CSD meetings / workshops and outreach should engage counties, municipalities, tribal nations, businesses, and residents. The purpose of the meetings is to educate the stakeholders about the scope of the project. The stakeholders will identify and develop an overall vision of the corridor and their community. The design vision will identify local aesthetic treatments that fit within the project budget and define maintenance responsibilities.

The overall CSD design elements and “theme” should be in place by the 30% plan submittal. Refined CSD elements should be included in the 60% submittal for review by the CSD team.

Issue Resolved by this Best Practice:

It was difficult achieving community acceptance of the project aesthetics and application of the CSD elements.

Advantages:

- Engages stakeholders through the design development process
- Generates and strengthens consensus throughout the communities
- Established a unique aesthetic for the corridor and communities
- Identifies issues leading to early discussion of State-Municipal Agreements
- Refines a process template for future projects within the municipalities
- Community workshops give stakeholders and residents a sense of “ownership”

Disadvantages:

- Can be controversial in terms of project costs
- There may be disagreement among the public regarding the CSD and landscaping design elements
- May increase the possibility for errors in design and construction
- Possible inconsistent application of CSD
- Unique design may create delays in design development

Discussion/Background: CSD workshops with the public are necessary to develop the desired aesthetic effect. The workshops are designed to draw upon the participants’ knowledge and vision of the corridor.

Project Management Activities:

- Assemble and coordinate the citizens committee.
- Review all printed and exhibit materials for public meetings and workshops to assure quality and an accurate depiction of design ideas.

Resource Considerations:

Assign dedicated staff to CSD implementation and material development.

BEST PRACTICE: CSD Meetings/Workshops and Outreach with Stakeholder Groups

Discipline: CSD/Landscaping

Implementation Action:

Identify and contact potential stakeholders and get their commitment to serve.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

BEST PRACTICE: *Design Construction Hand-off Meetings*

Discipline: CSD/Landscaping

Best Practice Description:

Provide CSD specifications and renderings to the construction inspection staff in hard copy. In addition, conduct a face-to-face meeting with CSD staff and construction staff to highlight unique CSD applications within their specific project, which increases the likelihood of proper application. This provides a mechanism to inform construction staff how best to communicate with CSD staff.

Issue Resolved by this Best Practice:

There can be misinterpretation of CSD intent by the construction Contractor and inspection staff during construction in terms of the physical CSD elements put in place.

Advantages:

- Reduces likelihood of improper fabrication/installation
- Reduces questions and need for future communication between parties
- Reduces delays in relation to applications of CSD

Disadvantages:

- None apparent

Discussion/Background:

During past construction projects there has been no formal meeting with construction and design staff to discuss unique CSD features prior to the beginning of construction operations. Due to the complexity of CSD treatments along the US-41 corridor, a formal meeting is necessary to highlight the features to which construction field staff should pay special attention. During the meeting the following occurs:

1. Review specs related to CSD treatments and requirements
2. Construction staff meets CSD approval staff
3. Renderings of the final design are submitted and contact info for questions related to CSD shared

Project Management Activities:

- Ensure dedicated staff has the availability to meet.
- Ensure the communication with construction project management and buy-in on the concept.

Resource Considerations:

Allocate CSD design/review hours to complete the meetings.

BEST PRACTICE: *Design Construction Hand-off Meetings*

Discipline: CSD/Landscaping

Implementation Action:

Construction program controls staff includes CSD elements and documents into the Project Construction Leads binder. This binder is used by the field staff as a specific reference document. The construction program controls staff also schedules the meeting and ensures the proper players are included.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

BEST PRACTICE: *Coordination of Landscaping and Staging*

Discipline: CSD/Landscaping

Best Practice Description:

Coordinate landscaping IDs to match the construction staging schedules. This is applicable when there are multiple, separate landscaping contracts coinciding with multiple stages. There is an opportunity to apply landscaping elements earlier in the construction process to allow for enhanced aesthetics sooner.

Note: This must coincide with ideal planting seasons; otherwise, it should not be done.

Issue Resolved by this Best Practice:

Construction impacts such as removals and demolition result in increased noise, degraded visual access, and traffic leading to negative short-term impacts in local communities. There may be opportunities to accelerate landscaping implementation during construction but should be evaluated on a case-by-case basis to determine if early landscape installation will jeopardize long-term plant health and survivability due to later heavy construction like roads, sidewalks, etc.

Advantages:

- Creates positive public relations
- Combining multiple construction IDs under one contract minimizes landscape contractor costs
- Allows contractor to minimize mobilization/start-up costs and order materials in larger quantities
- Plant establishment disrupts acceptance of major components of construction
- Plant establishment prevents irregular traffic impacts alongside live traffic
- Eliminates unnecessary removals

Disadvantages:

- May create conflict between landscape and prime contractors
- Plant establishment can disrupt acceptance of major construction components
- By initiating landscape installation prior to future heavy construction, it jeopardizes long-term plant health and survival
- May create future removals and plant replacement

Discussion/Background:

Coordinating early landscape installation with construction staging can help mitigate the effects of construction. A work plan for construction staging and landscape installation should be developed early in the design process to allocate time for evaluation of potential conflicts with early landscape installation and future heavy construction.

Project Management Activities:

- Combine landscape IDs to coincide with construction staging schedule where applicable.

BEST PRACTICE: *Coordination of Landscaping and Staging*

Discipline: CSD/Landscaping

- Should not install plantings early if their health and survivability will be jeopardized by future heavy construction impacts.

Resource Considerations:

Allocate construction team, roadway team, and landscape design staff hours to identify which landscape IDs are best combined under a single contract to coincide with construction staging and which should not due to potential construction conflicts.

Implementation Action:

Procedure is in place on the US-41 project. Ensure sufficient hours are allocated in the design contracts for coordination of staging and landscaping.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: CSD Design Review

Discipline: CSD/Landscaping

Best Practice Description:

Implement CSD review at the 60%, 90%, and PS&E milestone delivery dates. CSD comments are provided to structure designers early in the design process so the intent of the CSD of the corridor is maintained. As a result of this design review, the CSD intent is reviewed early in the design process and comments are provided to the structure designers.

Issue Resolved by this Best Practice:

Design reviews were occurring at final PS&E or not at all. The intent of the CSD was either missed or made through addendum. There were frequent misinterpretations of design manual concepts and difficulty of incorporation of the CSD treatments at the right locations and as envisioned by CSD team.

Advantages:

- Achieves the proper CSD aesthetic
- Maintains continuity of design
- Identify and modify design elements the CSD team determines to be used improperly
- Minimizes contractor questions
- Review should decrease number of RFIs
- Keeps design activities on schedule
- Minimizes last-minute revisions

Disadvantages:

- Requires submittal of all design phases two weeks before plans are due, putting pressure on the designers to meet that requirement
- PS&E schedule is constantly changing and deadlines may be advanced reducing time for reviews

Discussion/Background:

On CSD projects, the designers and contractors are working with design elements that are unfamiliar to them. The CSD review process will identify and correct gaps in design, notes, and/or special provisions. The goal of the review is to make the plans user-friendly to the contractor and keep the project flowing seamlessly. To ensure the intent of the CSD is met for the mega-project corridor, CSD design reviews were conducted at the milestone structure submittal dates.

Project Management Activities:

- Ensure that qualified staff is dedicated and available for the task.
- Maintain regular contact with design engineer to assess proposed design changes that may impact CSD element.

BEST PRACTICE: CSD Design Review

Discipline: CSD/Landscaping

Resource Considerations:

- Need a dedicated resource from the Corridor Team to be available as needed for the reviews.
- Utilize WisDOT PS&E schedule for each structure

Implementation Action:

Present the procedure and discuss at regular structures meeting to design engineers stressing the importance of this step in the design process. One person from the design team was identified as a reviewer of all structures for CSD. Reviews were conducted at each structure milestone submittal.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Project Controls

No.	Best Practice Title
1	P6 master design schedule implementation
2	Weekly PM/design meetings and bi-weekly real estate, soils, and structures schedule status meetings
3	Construction schedule
4	Dedicated program controls staff/gatekeepers
5	Specific project ID for deliver items
6	Project email box
7	File structure
8	Formal change-management process
9	State/municipal agreement process
10	Manage projects to a budget
11	Establish committed program level (annual budget allotments) with OPBF and BSHP
12	Consultant amendment tracking tool
13	Proposal management matrix
14	Upper management reporting
15	Issue tracking and action list for design

	Budgeted	Actual
Cost	████████	████████
Labor	1,353 hours	1,495 hours

Summary Totals include Brown and Winnebago Counties. See Table 2.

BEST PRACTICE: P6 Master Design Schedule Implementation

Discipline: Engineering Program / Project Scheduling

Best Practice Description:

It is important that there is management buy-in to the use of the scheduling tool and an understanding of the value of managing the program/project with a detailed and integrated P6 schedule. It is important that key milestones and critical tasks are well defined in the schedule and integrated in order to meet overarching delivery dates for each project. The creation of an integrated schedule allows for the meeting with groups of project principals so that the key issues and dates can be discussed. This creates consistency in information and the ability to create custom reports for individual disciplines.

P6 schedules should be updated frequently (can be updated as frequent as daily). Start by meeting with PMs using the template and build in the detail (durations and tasks) by tailoring the schedule with specific information of interest to the PMs. Initially, it is a template that is not set in stone and allows for the introduction of complexity as information is input from individual teams and projects. Once everyone becomes aware of dates that are set, meetings can be streamlined because teams are communicating with a level field of information. The tasks should be linked in a manner that creates a pathway that defines the ultimate critical path. The P6 schedule can then be used for analysis of "what if" scenarios in terms of managing the projects and tasks and ensuring that milestone dates align and can be met. It is an efficient methodology that provides flexibility in the program to schedule towards early lets versus program lettings so that projects can be advanced as necessary.

Issue Resolved by this Best Practice:

General

- Multiple spreadsheets in various departments with inconsistent and misaligned due dates.
- Time consuming spreadsheet maintenance.
- Communication gaps when program and/or project priorities change, causing delays in delivery or reduction in quality of design.
- Resistance to using other methodologies, resulting in a lack of trust and perception of general unreliability.
- There was not a detailed master integrated critical path schedule with defined relationships and precedents for many of the functions to enable alignment for key milestone delivery dates.
- Multiple critical paths for each discipline that were not linked together to complete tasks in a very tight timeframe with many moving pieces.

Real Estate

- Real estate personnel were not aware of changing PS&E dates, resulting in working towards different target milestones.
- Real estate personnel were not aware of parcels designated with incorrect project IDs.
- No accountability for appraiser deadlines required or direct tracking in a consistent and singular schedule.

BEST PRACTICE: P6 Master Design Schedule Implementation

Discipline: Engineering Program / Project Scheduling

- Many appraisals require review by CO; CO not aware of the upcoming heavy workloads to resource the level of effort.
- Plat personnel managing to plat sheet number were not aware of the contract/project ID naming conventions within the program, causing communication gaps.
- Insufficient recognition and importance of the due dates required for design to submit “final” slope intercepts to plats, resulting in heavy workloads on plats resources and thus even tighter timeframes to complete real estate negotiations and acquisitions.
- Plat personnel not aware of when preliminary plats’ are required for the DT 1078 process.

Structures

- Inputting multiple structures into spreadsheets to track schedules was time-consuming: gathering data, maintenance, and ensuring that the dates were relatively accurate in excel.
- With multiple different schedules being managed, it was difficult to have consistent information across the entire program.
- Challenges in communication and information dissemination with many different structure design teams.
- No clear way of helping streamline the BOS review process of similar structure types.
- Information was not making it to the highest level as there was no framework for tracking and accountability.
- No clear tracking system to monitor plan submittals to BOS.
- Plans not approved by BOS within the required advanced deadlines.
- Submittal of plans for approval close to or past end dates, resulting in a strain on BOS resources and re-submittals/redesign of plans by design causing further delays and plan quality concerns.
- Non-approval reasons
 - BOS waiting for information they requested of design from initial submittals and had not received back.
 - No tracking/accountability reporting for this process.
 - BOS utilizing downloaded PS&E/Let dates out of Fiips & PMP which utilizes program let dates vs. the advance-able let dates followed in the schedule.

Reporting – Various Disciplines (ITS, Lighting, Landscaping)

- Priorities and goals were not aligned for meeting milestone dates.
- ITS, Lighting, and Landscaping unaware when submittals were due and were working towards major milestone dates that were changing.
- Other teams were keying off of the PS&E dates in lieu of the other key milestone dates and priorities that other teams were working towards.
- Limited ability to meet advancing project dates because the various teams were all working towards different varying dates that did not necessarily line up with milestones.

BEST PRACTICE: P6 Master Design Schedule Implementation

Discipline: Engineering Program / Project Scheduling

Advantages:

- All activities are logic tied and due dates are maintained in one source to ensure that everyone is working towards the same goal.
- Centralized control of information and dissemination to a key single point of contact.
- Can be done very early in project development to provide analysis/"what if" scenarios to begin framework for project due date requirements.
- A variety of consistent and custom reports of interest by various design teams and functions can be created from the database.
- The schedule is updated almost daily with current status to maintain alignment and consistency in reporting.
- Logic tied schedule provides critical due dates for various tasks within the project.
- The schedule is created and managed based on advance-able schedules for program flexibility.
- P6 scheduler is interactive and provides analysis and feedback of pertinent items and due dates.
- Creates a structure for accountability and responsibility.
- Creates a true "team" culture.
- Internal and external milestone dates can be achieved and budgets can be better controlled.
- The reporting functions can be customized by discipline to ensure that relevant information is communicated in a consistent fashion.
- Provides level of confidence for managers in reporting consistency and delivery of the projects/program.
- Meetings can be streamlined.
- Helps to define/align budget requirements for delivery.
- P6 allows for faster development of custom reports vs. WisDOT in-house software.
- Allows for designers to focus on important tasks rather than spending many hours on schedule functions.

Disadvantages:

- There may be initial skepticism or resistance due to lack of familiarity.
- Scheduler will initially need to come up to speed with technical disciplines.
- WisDOT does not have in-house expertise in P6 scheduling.
- There is limited software support and licensing availability for P6 within WisDOT.
- There is a conflict of having multiple schedule platforms within WisDOT.

Discussion/Background:

There are currently multiple scheduling tools utilized in WisDOT depending on the type of project, department, and region. The core WisDOT programs do not provide the CPM scheduling methodology that is greatly needed, especially for projects that have a variety of disciplines and multiple critical paths to manage. P6 has a multitude of functions and data output reporting formats, which can be customized without extensive programming requirements.

BEST PRACTICE: P6 Master Design Schedule Implementation

Discipline: Engineering Program / Project Scheduling

Project Management Activities:

- Utilize a P6 gatekeeper as the point of contact to maintain the integrity of the P6 coding structure, process, schedule updates, schedule management and analysis.
- Utilize P6 “what if” templates early on for project development.
- Have PM’s & design establish structures #'s, locations, real estate and railroad parameters early on in the schedule development process.

Resource Considerations:

A dedicated and proficient P6 scheduler can provide analysis, feedback, and tailored reports to guide the program/project team towards successful project completion dates.

Implementation Action:

This best practice has been implemented for the US-41 team, and has also begun with another mega-project.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Program/project scheduler initiated the template, weekly/bi-weekly meetings, reporting and coding structure of P6, and began the organizational process of entering key components to the schedule (e.g., real estate and structures) to better enhance the levels of communication. Many of the advantages listed above are a result of this initial implementation. The scheduling process continued to be enhanced as a result of team input at Risk Management Workshop’s in regards to tasks that were then additionally tracked in the schedule and included in the master schedule template.

BEST PRACTICE: *Weekly PM/Design Meetings and Bi-Weekly Real Estate, Soils, and Structures Schedule Status Meetings*

Discipline: Program / Project Scheduling

Best Practice Description:

The program scheduler engages in various meetings with the individual disciplines and functional groups to gain status updates and correspondingly update the P6 schedule. This allows the PMs to gain feedback and analysis from the scheduler on important issues by engaging in interactive communication. The weekly update meetings are a vehicle that enables the master P6 schedule to be effectively utilized.

Issue Resolved by this Best Practice:

- Communication gaps, incorrect schedule status and priorities.
- Misalignment of tasks and activities and discontinuity in information.
- PMs having to meet with specific functional units and expend considerable time to ensure that all tasks are on track.

Advantages:

- Ensures project schedule is up to date
- Ability to discuss priorities and concerns with the various disciplines
- Maintains level of communication
- Ability to forecast and recommend changes
- Provides a sense of project ownership to functional groups and teams and how their activities fit into big picture
- Frees up time for PMs and design team resources by having the program scheduler acquire the necessary information and perform research and schedule management
- Allows for advance delivery and notification of milestones to CO and Region reviewers and tasks
- Allows for focused meetings vs. discussion of details
- Once dates and priorities are understood between the disciplines, meeting times gradually decrease

Disadvantages:

- None apparent

Discussion/Background:

Previous P6 schedule methods did not include regular weekly meetings or customized reporting processes to ensure that accurate schedule information was being utilized and disseminated. The various disciplines were working towards different goals and reporting methods were not consistent. The P6 schedule was only being updated with status once per month. This did not show the true picture and various disciplines did not have confidence in the schedule information provided; thus, each group continued to maintain their own spreadsheets.

BEST PRACTICE: *Weekly PM/Design Meetings and Bi-Weekly Real Estate, Soils, and Structures Schedule Status Meetings*

Discipline: Program / Project Scheduling

Current P6 administration and management strategies has established an organization of structured meetings, detailed schedule tasks, reporting processes, and almost daily updating of the schedule to gain a level of confidence from the team in the P6 schedule tool and the value it provides to the program/projects.

Project Management Activities:

Utilize a P6 gatekeeper as the point of contact to maintain the integrity of the P6 coding structure, process, updates, management, analysis ,and weekly or bi-weekly meeting organization.

Resource Considerations:

A dedicated and proficient P6 scheduler can provide analysis, feedback, and tailored reports to guide the program/project team towards successful project completion dates.

Implementation Action:

This action has been implemented.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Construction Schedule*

Discipline: Construction Program / Project Scheduling

Best Practice Description:

Stage 1: Match and develop a schedule in P6 using the construction phasing/staging/traffic data based on assumed production rates for principal construction activities (high level overview that ties major activities together) prior to construction. This helps to coordinate contract schedules together with linkages to ensure the progression of delivery of the project and the relationships of individual projects. The staging schedules can be provided to bidders at time of final PS&E for informational purposes as part of the information package.

Stage 2: Monitor the contractor schedule by working alongside the Contractor in the development of their construction schedules. This not only provides an insight into Contractor vision and methods, but also acts as a forum for educating the Contractor on certain scheduling tools. This enables the tools for providing a defensible form of documentation in the event of contractor claims. There should be monthly updates to ensure that there are accurate "as-built" schedules to align contractor priorities with department philosophies.

This process is important for the department to be able to understand and manage sufficient resourcing levels.

Issue Resolved by this Best Practice:

Stage 1: There is a need to have a high level understanding of how the project will be constructed in design in order to establish expectations of relative production rates and the ability to deliver the project based on the developed designs. There are bar charts produced by WisDOT representing the anticipated duration to completion that have many interface issues with scheduling tools. The layers of complexity are further compounded by the tying of construction contracts together for overall program delivery.

Stage 2: Challenges in monitoring the construction schedule because the contractors are not as detailed; WisDOT does not have tools to monitor; there can be disputes without a means of defensible documentation.

Advantages:

- Offers a high-level look at each project's constructibility and timeline for use as reference to contractors
- Provides a starting point for the contractor to develop their construction schedule
- Establishes expectations of delivery timeframe to construction contractor at time of bidding
- Identifies restrictions during construction (e.g., public events, in-water work windows) so that the contractor can anticipate these events and properly plan their delivery
- Allows an agreed baseline relatively easily
- Eases adapting the schedule and modifying of the baseline in the event of changes
- Presents opportunity for team building with contractors
- Reduces cost by not developing detailed schedule and focusing on resource loading.

BEST PRACTICE: *Construction Schedule*

Discipline: Construction Program / Project Scheduling

Disadvantages:

- Staging schedules are a high level only and do not provide intricate details
- Every Contractor has a different way of construction delivery
- May constrain Contractor creativity
- Some contractors do not have P6; many only have P3 or Microsoft Project
- Differing schedule platforms and the transfer of information

Discussion/Background:

A dedicated P6 scheduler can ensure that contractor's schedules are functional and fit with program/project requirements. This is necessary to complete projects satisfactorily and maintain the budget. The construction schedules can be utilized to quantify impacts by comparing a baseline schedule with actual performance and can also be utilized for liability purposes.

Project Management Activities:

- Utilize a P6 gatekeeper as the point of contact to maintain the integrity of the P6 coding structure, process, schedule updates, schedule management, and analysis.
- Utilize P6 "what if" templates early on for project development.
- Utilize P6 for all staging schedules in a master schedule format.

Resource Considerations:

A dedicated and proficient P6 scheduler can provide analysis, feedback, and tailored reports to guide the program/project team towards successful project completion dates.

Implementation Action:

This action is currently being implemented.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Please refer to risk 2-76 within the Project Risk Register. The issue of project schedule interfaces was identified and in need of an approach where the contractor's could adapt and buy-in to a process that provided better scheduling information for management control. This helps to avoid both cost and time risk impacts.

BEST PRACTICE: *Dedicated Program Controls Staff/Gatekeepers*

Discipline: Program Controls

Best Practice Description:

Create a dedicated Program Controls Team with key team members identified as primary point of contact for key controls functions and to serve as gatekeepers for key controls functions. Make mega-project team members aware of procedures, protocol, and defined processes, along with the critical points of contact controls team members. Create a defined roles and responsibilities matrix, updating as needed as project progresses.

Issue Resolved by this Best Practice:

There is communication and efficiency for the rest of the mega-project team: they are familiar with where to go, to whom they should refer, and what processes to follow in order to perform their job duties. This was absent in many cases. There is also control over projects being moved, changed, added, or deleted, ensuring proper approval and considerations given for decisions being made. The ability to provide a gatekeeper function over changes ensures procedures and approvals are being followed in decision making.

Advantages:

- Establishes single points of contact for key tasks/processes
- Enables project team and management to focus on their highest priority delivery activities
- Reduces errors, inconsistencies, and delays
- Communication is enhanced
- Allows for improved control and alignment with procedures by having gatekeepers

Disadvantages:

- Requires additional program controls staff resources
- Time and effort resources to create and maintain documentation and procedures

Discussion/Background:

As program controls was introduced to the US 41 mega project, the need to both create a roles/responsibilities matrix and to establish clear roles and communicate them was identified. As this was done, in following the guidance on controls, the need to establish procedures to ensure control was also identified. This ultimately uncovered the benefits of identifying gatekeeper roles for key functions and was incorporated into the roles and procedures. This has grown so that many of the tasks have identified go-to controls staff, which the rest of the team appreciates in terms of “one-stop shopping” efficiency. These benefits, which have been incorporated into the roles and procedures, are now the core of this identified best practice.

Project Management Activities:

Management support of the program controls procedures and the gatekeeper roles is critical for this best practice success. Buy-in from the team starts at the top and is maintained by management and team members experiencing the efficiencies and benefits first hand.

BEST PRACTICE: *Dedicated Program Controls Staff/Gatekeepers*

Discipline: Program Controls

Resource Considerations:

This best practice does require resources on the program controls team, especially in administrative roles, in order to have effective gatekeeper go-to staff.

Implementation Action:

Early in the project, procedures and roles need to be created, communicated, and enforced.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Specific Project ID for Delivery Items*

Discipline: Program Controls

Best Practice Description:

Assign specific Project ID numbers for any delivery items that will need to be tracked and reported in the future. This is more granular than corridor tasks (i.e., public relations/public involvement [PR/PI], archeological investigation, program controls, Owner Controlled Insurance Program [OCIP], Transportation Alliance for New Solutions [TrANS] program, facilities, utility delivery). Basically, this establishes a separate chart of accounts with specific IDs to track on the program level. This should be thoughtfully implemented so as to avoid excessive burden on staff for reporting and accountability.

Issue Resolved by this Best Practice:

Retroactive division of delivery items for reporting purposes – such as public relations/public involvement, program controls, etc. – has led to extensive, time-consuming duplication of work. The items requested to be tracked are difficult (sometimes impossible) to split accurately among the categories for reporting.

There is a need for the ability to identify and report out detailed costs based on functional areas. There is also a need for breaking out contract items for delivery tracking and reporting.

Advantages:

- Less time spent manually tracking and reporting
- Enables reporting in more detailed form (task costs) without extra work
- Allows for enhanced budget control at a more detailed level
- Can easily identify areas of potential cost overrun

Disadvantages:

- Awareness/enforcement of correct IDs for charging (multiple IDs for some users)
- Complicated contracting structure (Consultant contract divided over multiple IDs)
- More complex structure may make auditing difficult
- Challenging to roll out statewide(not how we currently do business)

Discussion/Background:

Although much simpler to have a single ID for charging, it becomes much more difficult to divide tasks afterwards. The US-41 project has a mix of both split and combined task IDs and has seen the benefits and difficulties of both. There is definitely a benefit for tasks that must be split out, such as Safety Program (OCIP), Facilities (Field Offices), Tribal Monitoring, and the TrANS program. As the project progresses, there is more interest in other specific areas (like PI/PR, etc.) as they relate to the overall budget and how much benefit we are receiving compared to the additional cost.

The US-41 project has also had its share of errors in charging due to unfamiliarity of the additional/non-traditional IDs. There has been confusion between the various “Corridor” IDs for both design and construction, and users occasionally need to be informed/reminded of the existence of some of the split-out IDs.

BEST PRACTICE: *Specific Project ID for Delivery Items*

Discipline: Program Controls

Project Management Activities:

- Discuss and decide at an early point in the project which tasks will be significant for reporting from both complexity and cost perspectives. It is very difficult to add IDs later in the project, especially if a consultant contract is involved.
- Develop/distribute/educate/enforce a project ID list for charging. Special emphasis should be put on staff not “dedicated” to the project, such as TSS/SPO staff doing short-term tasks and staff external to the Region.
- Provide regular audits to prevent charging errors and to ensure the integrity of the data.

Resource Considerations:

Time needed to audit charges should already be part of staff responsibilities. This best practice should be a net savings of time based on the additional staff time needed to divide charges into categories if not implemented.

Implementation Action:

Specific unique ID’s should be developed for the various *key* delivery items. Note that this task should be considered carefully when determining which tasks are beneficial to have a unique ID. Creation of too many unique ID’s may lead to confusion and creation of too few ID’s leads to additional time for reporting.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Project Email Box*

Discipline: Program Controls

Best Practice Description:

Create an electronic project email box and protocol for inclusion as early as possible which provides a location to capture all relevant documentation of important decisions for storage and retrieval to ensure ease of searching capabilities. Request creation of email box through WisDOT IT with clearly defined criteria of accessibility and size constraints. Communicate to all project team members the importance of using the email box for long-term storage and retrieval. Establish a file code system for users to interface with the email box. Users will need to be trained on the system for maximum efficiency.

Issue Resolved by this Best Practice:

There is a need to locate important email discussions/documents with minimal delay and resources. Information from current and former project team members needs to be captured in a location that can be accessed in their absence.

Advantages:

- Optimizes searching for important documentation
- Allows for accessibility to all (or dedicated) team members
- Provides secondary data protection mechanism above personal email or hard copy
- Documents important decisions as well as decision trail
- Reduces information requests from interfacing users
- Centralizes information and establishes point of access control

Disadvantages:

- Mailbox size incurs cost for data storage
- Resource required to maintain email box
- Requires proper training/use or can create confusion or inconsistent filing
- Can create time lags in requests if not kept up to date

Discussion/Background:

Document retrieval on mega-projects is a critical function. Having a project email box provides a location to send important documents/discussions where they can be stored and retrieved in a timely fashion. It prevents complicated search missions through personal email, individual computers, hard copy files, and other less-searchable locations. There is a learning curve for staff in getting accustomed to using the mailbox, but the efficiencies are worth the effort.

The hierarchy of mailbox accessibility needs to be determined as there would be staff who are highly adept in document retrieval and staff trained for basic searches. There also needs to be an evaluation of appropriate file codes to be used to expedite search capabilities. The US-41 project has seen a great benefit to having a project email box, including the ability to locate documents from staff that are no longer part of the project team.

BEST PRACTICE: *Project Email Box*

Discipline: Program Controls

Project Management Activities:

- Discuss and decide the level of usage for a project email box at an early point in the project, including team members responsible for its continued viability. However, this best practice is something that could be retroactively implemented later in a project, but with minor losses in integrity.
- Develop/distribute/educate/enforce procedures and a detailed file code list to assist in accurate document storage and timely document retrieval. Generally, project team members should be able to provide all correspondence, so there is only a minimal need to provide training to staff not “dedicated” to the project.
- Provide ongoing updates on procedure changes or for new staff and conduct audits to ensure the integrity of the data and compliance with procedures.

Resource Considerations:

There is an additional time commitment required to maintain the project email box. The person dedicated to the mailbox should develop an understanding of the overall project scope and schedule to make retrieval more efficient. This best practice could be a net savings of time based on the additional staff time needed to locate/retrieve documents if not implemented.

Implementation Action:

The benefit of readily available documentation of complicated decisions on mega-projects far exceeds any disadvantages related to data storage costs or minimal additional staff time.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *File Structure*

Discipline: Program Controls

Best Practice Description:

Establish a consistent, intuitive file structure to mitigate duplication of folders, files, and project information as early as possible. The protocol for storage of data needs to be policed and enforced. This requires proper up-front training for those managing the system. Guidelines must be communicated and adhered to by the users of the system.

Issue Resolved by this Best Practice:

Non-intuitive file storage leads to confusion and inefficient locating and/or retrieval of project documents. Duplication of documentation in multiple locations can cause inconsistent data to be accessed, and may prevent updates to the correct files. This problem is compounded by the length of time that passes before implementation.

Advantages:

- Project team members store documents in a similar fashion, providing consistency
- Efficient document retrieval due to intuitive nature of file structure
- Reduced duplication and confusion when storing or retrieving documents

Disadvantages:

- Determining file structure that “makes sense” to all can be difficult
- Enforcing compliance is difficult as all project team members have access
- Retroactively applying a file structure is excessively time-consuming
- Requires proper education/use or can create confusion or inconsistent filing

Discussion/Background:

Document storage on mega-projects is a critical function. Having a consistent and intuitive file structure allows all team members the ability to locate project documents with more success. Although difficult to enforce due to the myriad of complicated files to be stored for mega-projects, having rigid guidelines provides a framework that allows the majority of project documents to be easily stored and retrieved.

The US-41 project did not have a consistent file structure through most of its early years. An attempt to regain a consistent and intuitive file structure was only marginally successful. Duplicated and non-intuitively stored documents continue to be an issue. Continued diligence has reduced the number of occurrences of duplication and efforts are being made to gain the desired file structure.

Project Management Activities:

- Identify key roles in implementing a file structure system that is intuitive for current and future project staff. Assign staff to monitor file structure to ensure its viability.
- Develop/educate/enforce procedures for document storage based on an intuitive file structure and reducing/eliminating duplication.

BEST PRACTICE: *File Structure*

Discipline: Program Controls

Resource Considerations:

- If implemented at the onset of a project, there should be minimal time commitments by project team members.
- Periodic reviews of file structure should be done as needed to ensure the quality of the data storage process.
- All team members should be cognizant of the process to eliminate duplication should any be found.

Implementation Action:

This procedure sets the foundations for document storage on mega-projects, providing intuitive file structure and facilitating ease of recovery. Although retroactively applied to the US-41 project, this procedure should be a basis for future projects.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Formal Change-Management Process*

Discipline: Program Controls

Best Practice Description:

Create, teach, and enforce a formal change-management process, including approval thresholds and required sign-off authority. The change-management process should be a means of control of both cost and schedule and creates an enforceable structure to the master schedule and programmed budgets.

Issue Resolved by this Best Practice:

Changes related to scope, schedule, and budget were constantly being introduced without any formal way to track their effects on the project. Inconsistent changes, hastily prepared requests, and unauthorized additions were a cause for confusion and insecurity for both staff and management. Changes were made without regard for implications to other aspects of the project, including schedule and budget. In addition, FHWA requires a defined change-management process to be implemented on mega-projects. Some changes require authorization from outside of the project/Region in order to move forward.

Advantages:

- Minimizes unexpected changes and overruns
- Provides a backup if processes with gatekeepers are not being followed
- Provides structure of accountability for tracking and reporting purposes
- Provides FHWA compliance requirements
- Offers opportunity for framework of consistent decision making
- Creates mechanism to identify root causes that can be used to mitigate future overruns

Disadvantages:

- May require additional resource(s) to directly own and manage the process

Discussion/Background:

Change-management does not come naturally to WisDOT projects. The majority of staff (including consultants) do not realize the amount of interaction between scope, schedule, and budget as they relate to financial programs in the State of Wisconsin. There are very definite lines that cannot be crossed without proper authorization, and having a process that uses these guidelines as a starting point for all changes helps to streamline the approval process.

Members of the US-41 Project Team have learned that change-management is not an easy process for all to accept. Having dedicated “gatekeepers” to the schedule and budget allow the majority of changes to filter through the process while also identifying the items that require a higher level of tracking and approval. This best practice is especially handy during early design when many decisions affecting the long-term results of the project are being made, as well as to keep track of construction changes in the field. Ideally, all of this information can be used to track trends like “scope creep” and identify repeat issues.

BEST PRACTICE: *Formal Change-Management Process*

Discipline: Program Controls

Project Management Activities:

- Develop/distribute/educate/enforce the change-management process early in the project, including authorization and approval levels. This should extend to all functions, including Real Estate and Utilities.
- Continually monitor the change-management process to identify deficiencies and improvements. Discuss items that have gone through the change-management process at management-level meetings.

Resource Considerations:

Additional time is needed to develop the Change-management process and train staff. Time needed to use the process should already be part of staff responsibilities.

Implementation Action:

The change-management process has been used on the US-41 project for a few years and seems to be functioning quite well. Periodic reminders are needed when staff becomes lax with the process.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *State/Municipal Agreement Process*

Discipline: Project Controls

Best Practice Description:

Establish a uniform and singular State/Municipal Agreement (SMA) process early on. The US-41 team developed an SMA for each municipality involved with the project for Brown County, instead of having a separate agreement for each project ID.

The SMAs include:

- Municipality cost sharing percentages
- Local road agreements
- Maintenance agreements
- Connecting highway agreements
- Traffic management plan information
- General terms and conditions
- Project specific terms and conditions
- Cost-sharing agreements specific to corridor
- Overview maps of each project

Determine a “point person” to compile, track, and maintain SMAs. The text should be written and reviewed by designers or design lead(s). There should also be an established dedicated numbering convention and consistent cost-sharing policies for categories to keep SMAs and projects consistent. Municipalities must be contacted and informed of the new process. Establish a clear process of SMA implementation (inclusive of meetings and negotiation process). Throughout the process, as revisions/changes occur, the standardized SMA process should be followed to ensure proper updating.

Issue Resolved by this Best Practice:

There is a need to establish a consolidated format for SMAs. Typically SMAs are created on a project-by-project basis. In a project that is multi-year with multiple contracts, this becomes difficult to manage if it is not rolled up to the municipal level. Negotiation of multiple SMAs is less efficient than managing to a higher order.

The Municipality is able to budget both cost and resources for the project and there is a lesser chance of SMAs being overlooked for projects that need them.

Advantages:

- Municipality only receives one SMA
- Municipality is able to budget both cost and resources for the project
- Creates an easier approach to managing SMAs (Municipality, CO, and WisDOT side)
- Allows for flexibility in negotiations for different issues and offsetting costs
- Enables WisDOT to provide consistency in cost-sharing percentages across municipalities

Disadvantages:

- Coordination of information for preparing and updating the document is time-consuming and resource-intensive
- Municipalities are “nervous” about signing large contracts that are relatively further out on the horizon

BEST PRACTICE: *State/Municipal Agreement Process*

Discipline: Project Controls

- Certain parts of the agreement need additional signatures from other departments, not only the Municipality and project manager

Discussion/Background:

Certain documents were overlooked and had to be either completed at the last minute or required exceptions at PS&E. There were also instances where SMAs were not being completed until after the letting, which could have delayed the letting without an exception from CO. Having multiple projects that needed SMAs and other agreements, it was difficult to track them all separately. Therefore, a new process was implemented to combine them into one document. This created a “one-stop shop” for the information needed for a particular municipality. However, the negotiation process takes much longer due to the amount of information and length of the document.

Being a new process, meetings were held to determine formatting and content of the SMAs. There were also meetings held with CO and the municipalities to receive their buy in of the new SMA process.

Project Management Activities:

- Inform designer and SMA coordinator of local funding on projects and if any of the local funding changes
- Review and approve all SMAs for accuracy and consistency
- Negotiate SMA with Municipality and obtain Municipality signature
- After Municipality signs, WisDOT approves and signs

Resource Considerations:

Allocate staff hours to coordinate, develop, review, and update SMA documents. Having project controls complete this task frees up time for the project manager and designers to attend to other duties and allows for an audit process to be in place for the SMAs. However, having a project manager or designer write the SMAs reduces the number of hours spent producing SMAs by eliminating the need for coordination between the designer and the SMA writer.

Implementation Action:

A section of the project controls team was assigned to SMA development and tracking.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Refer to risk 1-33 contained within the Project Risk Register. This best practice evolved as a risk response strategy. Implementation of this best practice helps to reduce risk exposure to added cost impacts and possible schedule delays.

BEST PRACTICE: *Manage Projects to a Budget*

Discipline: Program Controls

Best Practice Description:

This process describes the financial management of a mega-project. Individual projects have budgets created using budgeting templates and budget- and cost-tracking software tools. The individual project budgets are then rolled up into a single mega-project budget that is used extensively in reporting and communicating about the mega-project. Other tools in this process include the use of standardized estimate templates and regular estimate updates. Expenditures are tracked against the budgets and cost-to-complete information is reported. Project and program reserves are assigned as part of the budgets, and the change-management process is used to track and control overruns and use of reserves.

Issue Resolved by this Best Practice:

This best practice is required on mega-projects by legislative direction and by FHWA guidance for mega-project management and is different from the traditional WisDOT methods of managing project finances and costs. This best practice also provides for the reporting capabilities to inform management, stakeholders, and the public of the financial status of the project.

Advantages:

- Individual projects more likely to be delivered on budget and at a lower cost because increased focus and awareness results in lower overall costs
- Mega-project more likely to be delivered on budget and at a lower cost
- Enables proactive response to overruns and change orders and enables learning from experience as the project progresses
- Provides compliance with legislative requirements and FHWA guidance for mega-projects
- Upper management and public stakeholders can easily be informed of project budgets and cost status
- Enables dynamic programming of mega-project to take advantage of funding opportunities

Disadvantages:

- Requires additional resources to manage budgets, generate reports, and respond to inquiries

Discussion/Background:

Guidance is provided by FHWA and by executive management on requirements for financial reporting of mega-projects. In order to be able to effectively provide the budget and cost information required, tools are used to create individual project budgets, and to track expenditures against those budgets. Reports for management showing cost-to-complete trending performance against the budgets are developed. Project and program reserves are established, and procedures to manage change requests are created to enable project-level control of overages up to set limits. The visibility and awareness of the project budgets allows for greater attention to cost management and details than the traditional model, which simply allows change orders to go against a separate change order budget. Estimate updates are scheduled on a regular basis, every six months and at key milestones. The mega-project budget works within an annual allotment of the state Majors program, and as

BEST PRACTICE: *Manage Projects to a Budget*

Discipline: Program Controls

Majors funding availability and project budgets change, the schedule and programming of the individual projects can be changed to take best advantage of staging or funding opportunities.

Project Management Activities:

- Create standard project budget templates and establish individual project budgets which are then rolled up into a mega-project budget.
- Costs are tracked against the budgets and reports regularly generated that show the up to date budget and expenditure details.

Resource Considerations:

This best practice does require additional resources that traditional project management does not include. Because of lack of automation and integration of financial systems, there are some data entry resources required as well. The increased demand for estimate updates requires design team resources. The Federal financial plan requirement also uses Central Office resources for support in generating the plan report.

Implementation Action:

As a required best practice, previous models are used to form the team, set up the tools, and design the processes that are used for managing the project and mega-project level budgets.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Establish Committed Program Level (Annual Budget Allotments) with OPBF and BSHP*

Discipline: Program Controls

Best Practice Description:

Coordinate with OPBF and BSHP to agree to program allocation dollars up front for the duration of the mega-project. This needs to be done as it is a fundamental part of dynamically managing the program and the overall budget. This process must include continual communication and coordination throughout the life of the mega-project. Program allocations may be part of a funding program such as the Majors program or may be a separate legislative allocation.

Issue Resolved by this Best Practice:

There is a need to create a program financial plan by year that can be agreed upon and managed between project management and funding sources. This is also a requirement of the Federal Financial Plan, which is one component of the FHWA guidance for mega-project management.

Advantages:

- Enables reliable annual levels of program funding
- Helps define design and project milestones
- Establishes program baseline to manage changes and project moves
- Enables dynamic management of the program schedule within the budget allocation framework to take advantage of funding availability and staging requirements

Disadvantages:

- Resources and attention given to coordination with OPBF and BSHP, as well as resources to manage the programming

Discussion/Background:

After the mega-project is created from the individual project budgets, the programming of that budget by fiscal year needs to be determined and agreed. This can be simply received by legislative direction and requirement, or may be coordinated with OPBF and BSHP. This agreed funding stream then becomes part of the Federal Financial Plan, meeting the requirement of mega-projects to have their funding streams identified throughout the life of the project before the project construction begins. This funding schedule then becomes the foundation around which the scheduling of projects is built. As projects are scheduled based on design and staging requirements, they must fit within the budget fiscal year allocations.

Project Management Activities:

Create a budget- and schedule-tracking tool that includes the project budgets and the annual allocations. This tool is then used to make schedule changes and adjustments and balance them against the annual financial commitments. BSHP and OPBF are involved with all significant changes to the programming of the projects, and are involved with and approve any requests to change the

BEST PRACTICE: *Establish Committed Program Level (Annual Budget Allotments) with OBPF and BSHP*

Discipline: Program Controls

annual fiscal allocations. If additional funding becomes available, projects are identified for advancement and the annual allotments are adjusted.

Resource Considerations:

- Additional resources to integrate the financial estimate and project schedule information into a tool that can manage the program.
- Frequent communication and coordination with OPBF and BSHP.

Implementation Action:

- Schedule and budget tracking tools are created to enable tracking schedule change impacts to the budget allocations.
- Communicate and coordinate with OPBF and BSHP.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Consultant Amendment Tracking Tool*

Discipline: Project Controls

Best Practice Description:

Create and maintain a consultant contract tracking spreadsheet in order to facilitate information sharing with the design team on a regular basis. The key fields of this tool are:

- Contract
- Contract Description
- Consultant Name
- Project Manager
- Contract Amount (Authorized Cost)
- Paid to Date
- Amendment Number
- Amendment Amount
- Total Amount of Amendments
- Actual Percent Complete
- Forecasted Amount to Completion
- Contract Expiration Date

This provides a framework for sufficient tracking and reporting of amendments in the management of design contracts. This tool should be updated on a quarterly basis, at minimum.

Issue Resolved by this Best Practice:

It is difficult to track the number of amendments to a consultant contract, the financial status of that contract, who is managing it, and its duration. This resulted in delays in amendments that halted work progression.

Advantages:

- Proactive approach to the management of consultant contracts
- Reduces likelihood of work stoppages due to contract expiration
- Improves awareness of consultant spending
- Provides a “one-stop shop” for monitoring and controlling contract status

Disadvantages:

- Resource-intensive process to track and update data when it is managed manually

Discussion/Background:

Questions were raised regarding the status of consultant contracts, their expiration dates, and their need for amendments. The next step in the process would be using this tool to forecast a reasonable estimated cost at completion for consultant contracts.

Due to the large amount of consultant contracts, there was concern for duplication in contracts. There was also a concern about contracts being lost in the shuffle as far as no one knowing which consultant was performing which task.

Project Management Activities:

- Discuss or develop a level of detail required for reporting.
- Review the document to verify contracts are on task and if/when they need amendment.

BEST PRACTICE: *Consultant Amendment Tracking Tool*

Discipline: Project Controls

Resource Considerations:

Very time-consuming task and one person will need to be dedicated to the development of this document.

Implementation Action:

It is currently being developed on the US-41 project. Early versions have been given to US-41 management. Additional information will be added for analyzing cost at completion.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Proposal Management Matrix*

Discipline: Project Controls

Best Practice Description:

Develop and implement a tool (e.g., spreadsheet) to track [by project] each of the items for the preparation of Highway Work Proposals. The tracking of these items is used by CO and FHWA in tracking. This tracking tool provides an organized framework to manage this data for easy access and reporting if maintained and updated. There is a need for a consistency in the management of this tool to ensure that there is no perception of favoritism for particular municipalities (specifically Construction Administration on incentives/disincentives).

Issue Resolved by this Best Practice:

There are contract requirements that are not direct bid items that need to be included in contract documents. The issue is that these items are sometimes overlooked by consultants and WisDOT staff. Items include LDEs, interim completions, DBE goals, labor compliance, DWDs, etc. (See Proposal Management Matrix from US-41 project).

Advantages:

- Centralized location for the management of contract requirements
- Summarizes that projects are consistent
- Allows for review of incentive/disincentive discussion
- Provides a tool to track the contract requirement information over the life of the program across multiple projects

Disadvantages:

- Data comes from multiple sources, which makes it challenging to update and maintain the tool
- Tool can become large and unmanageable
- Resource-intensive process to track and update data when it is manually managed

Discussion/Background:

There were tasks that were being overlooked and management asked that a spreadsheet be put together to track these tasks to be certain they were completed on time. Due to the complicated nature of the source of information for the Proposal Management Matrix, this tool has been difficult to update and has at times been neglected. There needs to be an emphasis of keeping this document up to date if it is going to be used as a tracking tool.

Project Management Activities:

- Decide the level of detail that needs to be in this spreadsheet initially.
- Review document for accuracy and missing information.
- Ensure fairness between contractors and municipalities.

BEST PRACTICE: *Proposal Management Matrix*

Discipline: Project Controls

Resource Considerations:

Highly resource-intensive to obtain data and update document.

Implementation Action:

Staff is currently assigned to updating this document.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Sample

BEST PRACTICE: *Upper Management Reporting*

Discipline: Program Controls

Best Practice Description:

Create financial reports for upper management that show the current financial budget and expenditure status of the project as part of the FHWA guidance for mega-projects. Standard regularly scheduled reports for upper management have also been internally requested to track project performance against budgets, as well as reports that enable management to see where the expenditures are going and make decisions about future spending. These reports should be delivered in a relevant and easily understandable format.

Issue Resolved by this Best Practice:

WisDOT upper management has requested monthly report updates on project finances and expenditure performance against the budgets. This also meets one of the FHWA requirements on financial reporting for mega-projects.

Advantages:

- Information gathered for required monthly reports can be utilized for other reporting purposes
- Information from monthly reports can be repackaged as needed to communicate with public stakeholders
- Keeps executive management informed of project financial status
- Meets FHWA requirement on financial reporting

Disadvantages:

- Requires significant resources to produce large monthly reports

Discussion/Background:

When the mega-projects began in WisDOT, the executive management requested standardized monthly reports on the project progress. These reports included large amounts of data, and were organized and formatted to be easy to read and attention-getting. Most aspects of the project had a section of the report where recent activities or current status could be shared. As administration has changed, these reports are being examined for modification and streamlining, yet will still effectively communicate what is needed and meet the FHWA requirements.

Project Management Activities:

A schedule for completing the monthly report is created. All report contributors are told of the schedule requirements and asked to contribute their pages or information on schedule. Reports are run from the financial systems and report pages are updated to reflect current data. The report is drafted and reviewed before sharing with executive management.

BEST PRACTICE: *Upper Management Reporting*

Discipline: Program Controls

Resource Considerations:

The frequent creation and delivery of large detailed monthly reports has significant resource impacts, both within the report team and from the contributing resources to the report.

Implementation Action:

- Receive guidance on regular reporting expectations and requirements.
- Create report schedule and request information from contributors.
- Receive information from contributors and reports, and create scheduled report.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

BEST PRACTICE: *Issue Tracking and Action List for Design*

Discipline: Project Controls

Best Practice Description:

A tool should be created to track design issues and clearly define responsibilities and deadlines, as well as the corrective actions being implemented. There is a need for accountability for addressing design issues in a timely manner. There is also a need to identify and elevate critical issues most in need of resolution. This tool enables the tracking of decisions made to provide a historical account of what was done. Lessons learned can be drawn from this tool for future progression of the project.

Issue Resolved by this Best Practice:

There is a need to communicate issues occurring and a mechanism to provide lessons learned. It is also an FHWA requirement to track issues on a mega-project, inclusive of defining responsibilities and actions to be taken.

Advantages:

- Provides framework for accountability
- Provides a mechanism for focusing on top priorities
- Provides a historical account of decisions made and by whom
- Gives a uniform process for action items and accountability across multiple meetings
- Provide easy access to issues, especially those needing to go to upper management for discussion

Disadvantages:

- Requires constant attention and updating

Discussion/Background:

Questions were raised about what issues there were and this is a way to consolidate and them. It is also required by FHWA. Previously, meeting minute items were assigned a ball in court, but this was not getting tasks accomplished in a timely manner. Therefore, as a result of previous risk workshop, each meeting developed an action item list with responsible persons and due dates.

Project Management Activities:

- Review design issues for accuracy and discussion at meetings.
- Assign action items to appropriate staff and ensure completion of these items.
- Verify accurate decisions are being made.

Resource Considerations:

Allocate staff hours to take notes at meetings and update matrix/action items.

BEST PRACTICE: *Issue Tracking and Action List for Design*

Discipline: Project Controls

Implementation Action:

Procedure was implemented at design meetings and has worked efficiently for the US-41 project Team.

Issue Identified and Resolved as a result of Risk Management Process?

YES NO

Refer to risks 12.2 (Segment 1), 10.1 (Segment 2), and 7.1 (Segment 3) contained within the risk register. In the management and coordination for design, the risk response strategy included the development of issue tracking and action lists needed for accountability and management of project deadlines. This best practice helps to avoid large schedule delays by establishing key tasks needed for action and ensuring that proper response has been taken.

Sample

APPENDIX A:

Workshop Agenda

Wednesday, July 13 (Green Bay, Wisconsin – The Wellington)

7:30 **Workshop Arrive & Setup**

8:00 **Meet with Public Involvement Team**

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

10:00 **Meet with TSS (R/E, Plats, Utilities, Geotechnical, Pavement) Team**

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

12:00 **Lunch**

1:00 **Meet with Environmental/Stormwater/Permitting/Agency & Bureau Coordination Team**

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

3:30 **Meet with SPO (Traffic/TMP) Team**

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

5:00 **Adjourn**

Thursday, July 14 (Green Bay, Wisconsin – The Wellington)

7:30 Workshop Arrive & Setup

8:00 Meet with Roadway Design Team

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

11:00 Meet with Corridor Tasks (Standards/Manuals/PS&E Reviews/Details) Team

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

12:00 Lunch (*continue working with Corridor Tasks Team*)

1:00 Meet with Structure Design Team

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

3:30 Meet with CSD/Landscaping Team

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

5:00 Adjourn

Friday, July 15 (Green Bay, Wisconsin – The Wellington)

8:30 Workshop Arrive & Setup

9:00 Meet with Project Controls Team

- Overview of Activities
- Issues Encountered
- Solutions Implemented
- Identification of Preferred Solutions
- Advantages/Disadvantages
- Next Steps

12:00 Lunch

1:00 Workshop Wrap-up and Recap

- Summary of Information
- Identify Any Gaps
- Path Forward – Report Structure and Delivery

2:00 Adjourn

Sample

APPENDIX B:

Workshop Attendees

WORKSHOP ATTENDEES
Best Practices Workshop
Wisconsin Department of Transportation

2011 July				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
13	14	15						
X				Greg Brink	VMS, Inc.	Best Practices Facilitator	(720) 308-4205	greg@vms-inc.com
X				George Hunter	VMS, Inc.	Best Practices Facilitator	(916) 224-9812	george@vms-inc.com
X				Adam Clayton	WisDOT USH 41	Corridor Manager	(608) 512-9983	aclayton@hntb.com
X				Andy Fulcer	WisDOT- TriCounty Freeway	Deputy Project Manager	(920) 492-2236	andrew.fulcer@dot.ca.gov
x				Bob Schuurmans	WisDOT- Traffic	Traffic Engineer	(920) 360-4149	Robert.Schuurmans@doy.wi.gov
X				Chad DeGrave	WisDOT-Brown County USH 41	Project Manager	(920) 492-2221	chad.degrave@dot.wi.gov
X				Jason Geuris	WisDOT USH 41	Deputy Project Manager	(920) 492-2242	jason.geuris@dot.wi.gov
X				Jerry Shadewald	HNTB	TMP	(608) 294-5009	jshadewald@hntb.com
X				Kathleen Slatter	WisDOT USH 41	Deputy Project Manager	(920) 492-2243	kathleen.slatter@dot.wi.gov
X				Kurt Peters	WisDOT- TriCounty Freeway	Project Manager	(920) 492-2213	kurt.peters@wi.dot.gov
X				Natasha Gwidt	WisDOT USH 41	Design Supervisor	(920) 492-2235	natasha.gwidt@dot.wi.gov
X				Scott Ebel	WisDOT USH 41/LLF	Project Manager	(920) 492-2242	scoott.ebel@dot.wisgov

WORKSHOP ATTENDEES
Best Practices Workshop
Wisconsin Department of Transportation

2011 July				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
13	14	15						
	X			Greg Brink	VMS, Inc.	Best Practices Facilitator	(720) 308-4205	greg@vms-inc.com
	X			George Hunter	VMS, Inc.	Best Practices Facilitator	(916) 224-9812	george@vms-inc.com
	X			Adam Clayton	WisDOT USH 41	Corridor Manager	(608) 512-9983	aclayton@hntb.com
	X			Mark Becherer	HNTB		(414) 559-8900	mbecherer@hntb.com
	X			Andy Fulcer	WisDOT- TriCounty Freeway	Deputy Project Manager	(920) 492-2236	andrew.fulcer@dot.ca.gov
	X			Brian Engles	Graef	Project Engineer	(920) 592-9440	brain.engles@graef-usa.com
	X			Brittany Allen	WisDOT	SET Student	(920) 492-2216	brittany.allen@dot.wi.gov
				Brett Wallace	WisDOT	??Construction???? Deputy Directgor	(414) 750-1697	brett.wallace@dot.wi.gov
	X			Chad DeGrave	WisDOT-Brown County USH 41	Project Manager	(920) 492-2221	chad.degrave@dot.wi.gov
	X			Danielle Block	WisDOT- Brown County	Project Manager	(920) 492-2212	danielle.block@dot.wi.gov
	X			Jason Geuris	WisDOT USH 41	Deputy Project Manager	(920) 492-2242	jason.geuris@dot.wi.gov
	X			Jeff Bauer	WisDOT USH 41	Project Manager	(414) 847-0323	Jeff. Bauer@ch2m.com

WORKSHOP ATTENDEES
Best Practices Workshop
Wisconsin Department of Transportation

2011 July				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
13	14	15						
	X			Jim Buschkopf	WISDOT-I39 Corridor	Project Manager	(608)246-3851	james.oettinger@dot.wi.gov
	X			Jim Oettinger	WisDOT-I39 Corridor	Project Manager	(608)246-3879	james.oettinger@dot.wi.gov
	X			Kathleen Slatter	WisDOT USH 41	Deputy Project Manager	(920) 492-2243	kathleen.slatter@dot.wi.gov
	X			Kurt Peters	WisDOT- TriCounty Freeway	Project Manager	(920) 492-2213	kurt.peters@wi.dot.gov
	X			Kyle Trent	WisDOT USH 41	Deputy Project Manager	(920) 492-2245	kyle.trent@wi.dot.gov
	X			Mark Higley	WisDOT USH 41	Program Controls	(920) 492-2220	mark.higley@dot.wi.gov
	X			Natasha Gwidt	WisDOT USH 41	Design Supervisor	(920) 492-2235	natasha.gwidt@dot.wi.gov
	X			Paul Vraney	WisDOT USH 41- Central	Project Manager-	(920) 492-2213	paul.vraney@dot.wi.gov
	X			Scott Ebel	WisDOT USH 41/LLF	Project Manager	(920) 492-2242	scoott.ebel@dot.wisgov
	X			Stefanie Christensen	EMCS	Project Manager	(715) 845-1081	schristensen@emxsinc.com
	x			Bill Womak	NCG	Constructability	(508) 380-5049	bwocons@aol.com
	X			J. Paul Silvestri	NCG	Constructability	(707) 257-8994	jpaulsilvestri@aol.com

WORKSHOP ATTENDEES
Best Practices Workshop
Wisconsin Department of Transportation

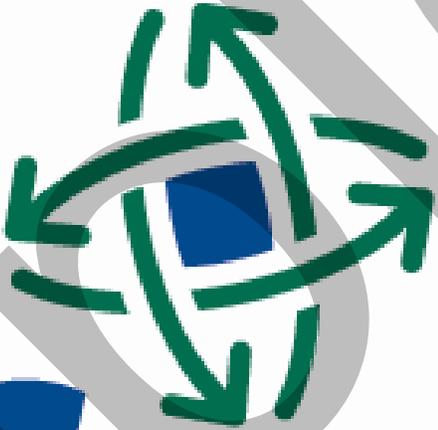
2011 July				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
13	14	15						
		X		Greg Brink	VMS, Inc.	Best Practices Facilitator	(720) 308-4205	greg@vms-inc.com
		X		George Hunter	VMS, Inc.	Best Practices Facilitator	(916) 224-9812	george@vms-inc.com
		X		Adam Clayton	WisDOT USH 41	Corridor Manager	(608) 512-9983	aclayton@hntb.com
		X		Andy Fulcer	WisDOT- TriCounty Freeway	Deputy Project Manager	(920) 492-2236	andrew.fulcer@dot.ca.gov
		X		Chad DeGrave	WisDOT-Brown County USH 41	Project Manager	(920) 492-2221	chad.degrave@dot.wi.gov
		X		Danielle Block	WisDOT- Brown County	Project Manager	(920) 492-2212	danielle.block@dot.wi.gov
		X		Jason Geuris	WisDOT USH 41	Deputy Project Manager	(920) 492-2242	jason.geuris@dot.wi.gov
		X		Jim Buschkopf	WisDOT-I39 Corridor	Project Manager	(608)246-3851	james.oettinger@dot.wi.gov
		X		Jim Oettinger	WisDOT-I39 Corridor	Project Manager	(608)246-3879	james.oettinger@dot.wi.gov
		X		Kathleen Slatter	WisDOT USH 41	Deputy Project Manager	(920) 492-2243	kathleen.slatter@dot.wi.gov
		X		Kurt Peters	WisDOT- TriCounty Freeway	Project Manager	(920) 492-2213	kurt.peters@wi.dot.gov
		X		Kyle Trent	WisDOT USH 41	Deputy Project Manager	(920) 492-2245	kyle.trent@wi.dot.gov

WORKSHOP ATTENDEES
Best Practices Workshop
Wisconsin Department of Transportation

2011 July				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
13	14	15						
		X		Mark Highley	WisDOT USH 41	Program Controls	(920) 492-2220	mark.higley@dot.wi.gov
		X		Mindy Gardener	WisDOT USH 41	Deputy Project Manager	(920)492-2247	mindy.gardener@dot.wi.gov
		X		Natasha Gwidt	WisDOT USH 41	Design Supervisor	(920) 492-2235	natasha.gwidt@dot.wi.gov
		X		Scott Ebel	WisDOT USH 41/LLF	Project Manager	(920) 492-2242	scoott.ebel@dot.wisgov
		X		Bill Womak	NCG	Constructability	(508) 380-5049	bwocons@aol.com
		X		J. Paul Silvestri	NCG	Constructability	(707) 257-8994	jpaulsilvestri@aol.com
		X		Geoff Williams	WisDOT	USH 41 Cost Controls	(920) 492-7377	geoffrey.williams@dot.wi.gov
		X		Lynn Warpinski	URS Corp	Program Controls Administrator	(920) 492-4977	lynn.warpinski@dot.wi.gov
		X		Heather Wich	URS Corp	Scheduling	(920) 432-4877	heather.wich@dot.wi.gov
		X		Jim Robinette	URS Corp	SEF Finance / Civil Engineer	(414) 881-1064	heather.wich@dot.wi.gov
		X		Josh Schultz	WisDOT	SEF PDAA	(414)750-3308	Josh.Schultz@dot.wi.gov
		X		Jeff Wallace	WisDOT			

WORKSHOP ATTENDEES
Best Practices Workshop
Wisconsin Department of Transportation

2011 July				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
13	14	15						
x				Bill Womak	NCG	Constructability	(508) 380-5049	bwocons@aol.com



VMMS

Value Management Strategies, Inc.

Offices in Escondido and Sacramento, California; Grand Junction, Colorado; Sarasota, Florida; Marietta, Georgia; Portland, Oregon; Seattle, Washington; Kansas City, Kansas; and Great Falls, Montana

Value Management
Strategies, Inc.

Final Best Practices Workshop
US-41 HIGHWAY RECONSTRUCTION PROGRAM
Wisconsin Department of Transportation



August 2011

Value Management
Strategies, Inc.

Final Best Practices Workshop
US-41 HIGHWAY RECONSTRUCTION PROGRAM
Wisconsin Department of Transportation



August 2011

Value Management
Strategies, Inc.

Final Best Practices Workshop
US-41 HIGHWAY RECONSTRUCTION PROGRAM
Wisconsin Department of Transportation



August 2011

Value Management
Strategies, Inc.

Final Best Practices Workshop
US-41 HIGHWAY RECONSTRUCTION PROGRAM
Wisconsin Department of Transportation



August 2011

Value Management
Strategies, Inc.

Final Best Practices Workshop
US-41 HIGHWAY RECONSTRUCTION PROGRAM
Wisconsin Department of Transportation



August 2011