Improving Communication on Wisconsin Department of Transportation Construction Projects

Gary C. Whited
Construction and Materials Support Center
University of Wisconsin, Madison
1415 Engineering Drive
Madison, WI 53706-1691
whited@engr.wisc.edu

Donald J. Miller
Wisconsin Department of Transportation
4802 Sheboygan Ave.
Madison, WI 53707-7916
donald.miller@dot.state.wi.us

Matthew J. Grove
Wisconsin Transportation Builders Association
1 S. Pinckney St., Suite 818
Madison, WI 53703
mgrove@wtba.org

ABSTRACT

Concerns have been expressed by both the state highway agencies and the construction contractors that deliver transportation projects regarding working relationships, communication, and dispute resolution on construction projects. The increasingly frequent use of consultant engineers for project management has added to the complexity in both the chain of command and in decision making. It has been estimated that 50% to 75% of all construction project time extensions, cost overruns, and contractor claims might have been mitigated or eliminated with better communication and a stronger pre-award focus.

A study was undertaken by the Wisconsin Department of Transportation in collaboration with the Wisconsin Transportation Builders Association to develop tools and techniques that can be used jointly by agency engineers, consulting engineers, and contractors to enhance project-level communication, promote early identification of risk items, and facilitate timely decision making. The communication tools developed include pre-construction and progress meeting agenda templates, meeting note taking forms, responsibility matrices, and dispute escalation forms. A project-specific risk identification process has been developed for use by construction teams that accounts for both the likelihood of the risk and its consequence for the project and suggests communication/issue resolution strategies for the team based upon the risk analysis. A request for information process that fosters better communication and more timely decision making is also outlined and detailed. Instructional guidelines are provided for the tools presented in the paper.

Key words: construction—project communication—project management

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INTRODUCTION

Communication and collaboration are fundamental components of construction management for delivering successful transportation projects. However, the highway construction industry continues to experience poor communication, coordination, and decision making on projects, which leads to cost and schedule overruns, increased disputes, and protracted project close-out processes.

The Wisconsin highway construction community was seeing these issues with increasing frequency on construction projects, and in 2006 the Wisconsin Department of Transportation (WisDOT) and the Wisconsin Transportation Builders Association (WTBA) began jointly looking for solutions. The initial step was to hold fact finding workshops involving WisDOT engineers, consultants, and contractors to obtain feedback on problem areas and to solicit recommendations. The outcome of these workshops was to begin a new initiative that would focus on project communication efforts. The feeling was that improving communication on a project would lead to the more open sharing of information, resulting in more collaboration, improved decision making, a less adversarial approach to the project, and ultimately fewer disputes.

A joint WisDOT/WTBA task force was assembled in late 2006 to work with the Construction and Materials Support Center of the University of Wisconsin, Madison, to develop specific actions that could be taken by contractors, WisDOT personnel, and WisDOT's project management consultants to improve project communication. The task force called the endeavor the Project Communication Enhancement Effort (PCEE). The result of this work was the creation of a series of tools that could be used by construction project teams to enhance their communication efforts and processes.

Project Communication Enhancement Effort

The overall goal of the PCEE effort was to improve communication on highway construction projects before, during, and after the construction phase. The specific identified goals of the task force included the following:

- To avoid adding to the already heavy workloads of field personnel
- To provide tools to help the efficiency and effectiveness of communications already occurring
- To provide guidance and support for inexperienced field personnel

The communication tools were classified as being either (1) post-project award, (2) pre-construction, or (3) construction contract administration. It was felt that this division provided a systematic approach to both developing and implementing the new processes in the field.

Special attention was paid to the post-award (prior to contract execution, in the WisDOT process) and pre-construction communication phases, since the Task Force felt these areas would benefit most from stronger communication between the contractor and WisDOT project leaders. Concentrating on communications before construction begins was also consistent with the results of an informal survey taken at the AASHTO Subcommittee on Construction. That survey of state highway agency construction engineers estimated that 50% to 75% of all construction project time extensions, cost overruns, and contractor claims could have been mitigated or eliminated with better communication and a stronger pre-award (i.e., contract execution) focus.

The task force felt it was at the post-award, pre-construction phase where good communications set the stage for the open sharing of information, early identification of issues, commitment to collaborative

problem solving, and the timely making of decisions to facilitate the successful completion of the project. Tools were also developed to enhance the communication that occurs during the construction phase of a project in an effort to identify and resolve issues before they impact the cost or schedule of the project and to improve the project close out process.

The following sections develop in more detail the three classifications of communication tools: post-award, pre-construction, and construction contract administration.

POST-AWARD COMMUNICATION

Post-award communication tools were developed to help the project team get organized and initiate project communications at the initial stages of the construction project. In the WisDOT contract process, the post-award period begins when the low-bid contractor is notified that they have been awarded the project, but no work can start until the construction contract has been executed by both parties. This process takes approximately four weeks, and it gives both the contractor and WisDOT project management staff time to begin planning for the work. The tools developed for improving communication at this stage were as follows:

- Line of Communication and Decision Time Form
- Pre-construction Issue Identification Form

Line of Communication and Decision Time Form

The Line of Communication and Decision Time Form, Attachment 1 at the end of this paper, is to be initiated by the WisDOT project leader as soon as the low-bid contractor has been confirmed. The form identifies who will be on the project team from each organization (prime contractor and WisDOT) and lists these individuals' contact information. This information is to be recorded prior to the project pre-construction conference and handed out at that conference to facilitate communication between all the stakeholders on the project.

This form also identifies nominal decision times for making decisions that affect the project. These nominal times are to be discussed and agreed upon by both organizations. This information should be presented at the project pre-construction meeting so that everyone on the project is familiar with the decision making process and understands the commitments from the project team to make decisions within these timeframes. If decisions are not made at the identified organizational level within the agreed upon timeframes, the issue should be elevated to the next level for a decision.

The form also provides the basis for dispute escalation should a disagreement arise on the project. It starts at the project leader/foreman level and escalates through the respective organizational hierarchy. The escalation times should be the same as the nominal decision times unless modifications are mutually agreed upon.

Pre-construction Issue Identification Form

Construction projects are complex endeavors, and every project has unforeseen issues that require decisions be made within short timeframes to prevent impacts to the project that may increase costs or extend the schedule. To the degree these potential issues can be identified and planned for prior to starting construction, listing these issues can greatly reduce the impact on the project and the construction delivery

team. The Pre-construction Issue Identification Form, Attachment 2, was developed as a tool to start the process of identifying these potential issues for the project and assessing the impact they may have on the project. What is done with the identified issues will depend upon the type of issue and the nature of the project. Relatively low-impact issue items may simply be assigned to project team members to monitor, while other issues may require extensive analysis, planning, and mitigation efforts. The purpose of this tool is to help identify those issues early in the project and begin the communication process to minimize any effect they might have on the project.

The WisDOT project leader and the prime contractor's superintendent each fill out the Pre-construction Issue Identification Form independently. The two then jointly review the assessments, identify areas of agreement and disagreement, and determine what communication level they will utilize to begin addressing these issue items. A fairly small number of noncomplex, low-cost issues may be best addressed within the pre-construction meeting itself. A large number of complex, high-cost issues could require separate meetings of the project delivery team.

The form is filled out by reviewing each general issue item (other project-specific items can be added as needed) and determining the impact the issue would have on the project should it occur, i.e., a minimal impact or a significant impact. Next, an assessment is made as to the likelihood of the issue occurring on the project. A number from 0 to 3 is then assigned to that particular issue. For example, if an issue/situation has little or no likelihood of occurring, it is given a value of "0." If an issue has little likelihood of occurring and, were it to happen, it would have minimal impact on cost or schedule, it should be assigned a "1." An issue with a high likelihood of occurring and that would have a significant impact should be given a value of "3." The assigned value for each issue is circled, and then a total for each category of issues is calculated and entered on the form. At the bottom of the form, an overall total is calculated.

Depending upon the value calculated for the total of the individual issue identification assessments, various levels of communication strategies are suggested on the second page of the form to assist in further evaluating, planning for, and mitigating these issue items.

PRE-CONSTRUCTION COMMUNICATION

Pre-construction tools were developed to help the project delivery team continue their communications before actually starting construction. The tools developed for this stage include the following:

- Pre-construction Meeting Agenda
- Subcontractors Contact Information Form
- Responsibility Matrix

The first two tools listed above are not presented in this paper, but copies are available from the authors. The Pre-construction Meeting Agenda template was developed to enhance the guidance already provided in the WisDOT *Construction and Materials Manual* for pre-construction meetings in order to specifically focus discussions on issue identification and resolution. The Subcontractor Contact Information Form is similar to the Line of Communication form shown in Attachment 1.

Responsibility Matrix

The Responsibility Matrix, Attachment 3, was developed to provide background information that would give members of the project delivery team a better understanding of who is responsible for initiating and

approving various items and how the communication of these items occurs. This information is to be discussed at the pre-construction meeting and to be posted within the project construction office.

CONSTRUCTION CONTRACT ADMINISTRATION COMMUNICATION

Communication between the contractor and the project management team is essential for a successful project, and most project delivery teams feel they do communicate. However, the communication is often not very well structured or documented. The communication tools for this phase of the project were developed to bring more structure to the process and to improve the effectiveness of the communication that had been occurring. The tools developed were as follows:

- Request for Information Submittal Form
- Request for Information Log
- Progress Meeting Agenda
- Progress Meeting Note Form

All projects are encouraged to hold weekly progress meetings. The Progress Meeting Agenda template was developed to provide structure to these meetings and to ensure topics such as work progress, schedule updates, delays, upcoming activities, etc., are discussed and issues resolved. The Progress Meeting Note Form was created to assist project staff in concisely summarizing project developments, major areas of concern, and needed action items. This form also increases accountability for resolving issues and following through on commitments. A meeting agenda template and sample note form are not included in this paper, but copies can be obtained from the authors.

While project progress meetings are fairly standard, use of a request for information (RFI) process is completely new to Wisconsin highway projects. This tool, which includes the first two items listed above, was created to provide more structure to the issue identification process, more accountability for providing answers or decisions to questions, and a more formal documentation process for the issues identified.

Request for Information Process

The purpose of the RFI process is to obtain clarification of the plans, specifications, special provisions, or other contract documents. It also provides for a systematic collection of the analysis and a resolution for questions that arise during the construction of the project. WisDOT had not historically used an RFI process, but a review of construction practices in private building construction and other state highway agencies indicated that an RFI process had many benefits, including enhancing communication on projects, improving the speed at which questions are answered, and providing documentation on the questions and issues that come up during the project. While the use of an RFI process was expected to initially add to the workload of the project team during the project, it was felt that there would be a net time savings over the life of the project and during the project close-out process. The RFI process includes two documents: (1) the RFI Submittal Form, Attachment 4, and (2) the RFI Log, Attachment 5.

The contractor typically initiates the development of an RFI. However, anyone can submit an RFI for clarification on an issue. The WisDOT project leader monitors, tracks, and expedites the response to an RFI. Responses are to be provided on a timely basis (usually within seven days of receipt) so as to not affect the construction schedule. The desired response time is indicated on the RFI Submittal Form to indicate the urgency of the question.

Request for Information Process Responsibilities

Successful implementation of an RFI process requires each member of the construction delivery team to take responsibility for various actions and steps in the process. The responsibilities detailed below are for the most typical situation, in which the contractor initiates the RFI:

- The contractor is responsible for notifying the WisDOT project leader of a request for information using the RFI Form.
- The contractor clearly and concisely sets forth the issue for which clarification or interpretation is sought and explains why a response is needed. Appropriate references to specifications, plans, or drawings should be provided to facilitate a timely response.
- The WisDOT project leader sequentially numbers the RFI and logs it in the RFI Log form.
- The WisDOT project leader processes the RFI and coordinates the response by consulting with others as needed (e.g., project manager, designer, topic experts, etc.). If a response time longer than seven days is needed, the requester is notified of the anticipated response time.
- The WisDOT project leader prepares the response, forwards one copy to the RFI requester, and files one copy on-site for reference.
- The WisDOT project leader maintains the RFI Log to track the status of an RFI and to maintain a catalog of all RFIs submitted during the project.
- The WisDOT project leader and contractor's superintendent discuss outstanding RFIs and potential RFIs as a standing agenda item at the project progress meetings.
- Disagreements regarding the response to an RFI immediately trigger the issue resolution process identified on the Line of Communication and Decision Time Form.
- The WisDOT project leader and contractor are responsible for working together to assure that all RFIs are appropriate and to control the number of RFIs. Contract documents are to be reviewed and researched before submittal of an RFI so as to not overburden the project management staff with large numbers of RFIs.

CONCLUSION

In response to growing concerns within the Wisconsin highway construction community over the increasing number of disputes, growing length of time to resolve issues, increasing amount of time to close out projects, and deteriorations in overall project working relationships, WisDOT and the WTBA collaborated with the Construction and Materials Support Center of the University of Wisconsin, Madison, to enhance communication on WisDOT projects. The result of that effort was the creation of a number of communication tools to improve upon the effectiveness of the communication already occurring on construction projects. Many of the tools specifically focus on the pre-construction communication between the construction delivery team to help identify project issues and promote resolution of the issues before the start of construction. Other tools assist in communication during construction in an effort to develop collaboration and information sharing among everyone on the project. The tools will initially add to the workload of the project team, but overall it is believed that workloads will be reduced with less time spent resolving disputes and dealing with claims, and fewer issues will come up during the project close-out process. The tools are being piloted on seven WisDOT construction projects in 2007, and follow-up studies will be conducted to evaluate the effectiveness of the tools and further improve communication on highway projects.

ATTACHMENT 1. LINE OF COMMUNICATION AND DECISION TIME FORM

Foreman	**Superintendent**
Name _____	Name _____
Phone _____	Phone _____
Mobile _____	Mobile _____
Email _____	Email _____
FAX _____	FAX _____

Project Leader	*__Nominal Decision Time__
Name _____	
Phone _____	**1 Day**
Mobile _____	(Days)
Email _____	
FAX _____	

Project Manager

Name _____	
Phone _____	
Mobile _____	**2 Days**
Email _____	(Days)
FAX _____	

Project Development Supervisor

Name _____	
Phone _____	
Mobile _____	**3 Days**
Email _____	(Days)
FAX _____	

Project Development Chief		**Contractors Main Office**
Name _____		Name _____
Phone _____		Phone _____
Mobile _____	**4 Days** Mobile	_____
Email _____	(Days) Email	_____
FAX _____		FAX _____

*Designated times are generally assumed to be the maximum, however, these decision time frames may be adjusted to fit unique project circumstances by mutual agreement.

ATTACHMENT 2. PRE-CONSTRUCTION ISSUE IDENTIFICATION FORM

Pre-Construction Issue Identification Form

(Construction issues that can impact cost and schedule)

[M: Minimal Impact S: Significant Impact] Circle one number per issue; Sum for each issue group

Problem/Issue/Situation	Likelihood & Impact Assessment		
Project Personnel and Coordination	**M**	**S**	**Total**
Coordination and directing of subcontractors	**0 1**	**2 3**	
Conflicting construction operations	**0 1**	**2 3**	
Significant 3rd Party involvement	**0 1**	**2 3**	
On-site management by prime contractor or WisDOT	**0 1**	**2 3**	

Utility Disruption	**M**	**S**	**Total**
Unknown or unanticipated discovery of utilities	**0 1**	**2 3**	
Relocation of utilities in work zone	**0 1**	**2 3**	
Coordination of work activities with utilities	**0 1**	**2 3**	

Differing Site Conditions	**M**	**S**	**Total**
Unsuitable subgrade material	**0 1**	**2 3**	
Groundwater	**0 1**	**2 3**	
Hazardous materials	**0 1**	**2 3**	
Man-made buried objects	**0 1**	**2 3**	
Unstable slopes or excavations	**0 1**	**2 3**	
Archeology sites	**0 1**	**2 3**	

Site Conditions	**M**	**S**	**Total**
Inadequate staging areas	**0 1**	**2 3**	
Erosion and sediment control	**0 1**	**2 3**	
Disruption to local traffic and business operations	**0 1**	**2 3**	
Complex traffic control plan	**0 1**	**2 3**	
Noise, vibration, and dust impacts on adjacent properties	**0 1**	**2 3**	
Detours, Haul Roads & Repair	**0 1**	**2 3**	

Schedule and Operations	**M**	**S**	**Total**
Submitted schedule, updates, controlling items	**0 1**	**2 3**	
Interim completion dates	**0 1**	**2 3**	
Staging and sequencing	**0 1**	**2 3**	
Waste and/or borrow sites	**0 1**	**2 3**	
Shortages or delayed delivery of materials	**0 1**	**2 3**	
Expedited schedules or night/week-end work	**0 1**	**2 3**	
Extreme weather conditions or seasonal effects	**0 1**	**2 3**	

Design and Contractual Issues	**M**	**S**	**Total**
Constructability of plan	**0 1**	**2 3**	
Sensitive environmental features	**0 1**	**2 3**	
Unique special provisions	**0 1**	**2 3**	
Document submittal, review and approval	**0 1**	**2 3**	
Need for permits	**0 1**	**2 3**	
QMP Specifications & certifications	**0 1**	**2 3**	
DBE involvement	**0 1**	**2 3**	

ATTACHMENT 2. CONTINUED

OVERALL TOTAL FROM PREVIOUS PAGE: _____

OVERALL SCORE	**RECOMMENDED COMMUNICATION LEVEL**
0 - 15	(1) Discuss identified issues at the Preconstruction Meeting
15 – 30	(2) Project Leader, Project Manager, Contractor's Foreman and Superintendent meet to discuss strategies for addressing the identified issues
30 – 45	(3) Half-day issues meeting involving WisDOT Project Team, Prime Contractor, Major Subcontractors and Utilities to address issues, impacts, and how to minimize the impacts of should they occur.
45 +	(4) Facilitated full-day issues workshop to further identify the issues, impacts, and resolution. Continuing follow-up issues meeting should be scheduled monthly for duration of the project.

ATTACHMENT 3. RESPONSIBILITY MATRIX

Responsibility Matrix

I- Initiates R- Receives
A- Approves C- Receives copy
PS- Participate in/supports
PN- Prepares Notes D- Distributes

	DOT Inspector	DOT-Project Leader	DOT Project Manager	PD Super-visor	PD Chief	BPD Oversight Engr	FHWA-oversight only	Foreman	Superin-tendent	Contractor Main Office	Sub-con
Precon Meeting		I/PN/D	PS	C/PS		C	PS	PS	PS/I	C	PS
Request to Sublet		A	R						PS	I	
Project Schedule		PS/D	R	C		C	C	PS	I	PS	PS
Notice to proceed		I/D	C	C/PS		C	C			C	
Source of Materials		A	C/R					C	PS	I/D	PS
Project Progress Meetings	PS	I/PN/D	C/PS			C		PS	I/PS	C	PS
CRI Proposals	PS	R	A/PS	PS	C	PS/C	C	PS	I/D	PS	PS
RFI by Contractor		R/PS						I	I		I
RFI by WisDOT		I	I					PS	P/R		
Payment estimates	PS	I	R/A							C	
Contract Modifications	PS	I/D	C/A	C/A	A	C	C/A	PS	I	C/PS	PS
Work Inspection Report	I	R/D						C	C		
Report of deficient materials	I	I	PS			C		PS	PS	PS	PS
Final project acceptance	PS	I/D/PS	A/PS	C		C	PS/C			C/I	
DBE Performance										I	
Certified Payrolls		PS							PS	I/C	I/PS
Shop Drawings		PS/C								I/D	PS
Environmental permits		R							PS	I/D	PS
Modifications to traffic control	PS	I/D	PS	PS	PS		PS	PS	PS	I/D	PS
Erosion Control Insp. Report	I/PN	A						PS	A		
Claim Initiation Form		I	C	C	C	R					

ATTACHMENT 4. REQUEST FOR INFORMATION FORM

REQUEST FOR INFORMATION (RFI)	
PROJECT ID	**PROJECT NAME**
DATE	**RFI NUMBER (Assigned By Project Leader)**
TO:	**FROM:**
METHOD SENT: ____ FAX ____ MAIL ____ E-MAIL ____ DELIVERED	
INITIATED BY:	
DESCRIPTION OF REQUEST:	
ADDITIONAL SUPPORT DOCUMENTS _____ ARE _____ ARE NOT ATTACHED	
DATE REQUIRED:	
DATE RESPONSE RECEIVED:	
RESPONSE FROM:	
RESPONSE:	

ATTACHMENT 5. REQUEST FOR INFORMATION LOG

Request for Information Log

PROJECT ID: _____
PROJECT NAME:_____
LOCATION:_____
PROJECT LEADER:_____

RFI NUMBER	DATE SUBMITTED	DESCRIPTION OF INFORMATION NEEDED	SUBMITTED TO	DATE OF RESPONSE	WHO INITIATED	STATUS (PENDING/CLOSED)